



KRAMER

Operator's Manual

Wheel loader

8075 / 8075L
8085 / 8085L
8095 / 8095L



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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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EC Declaration of Conformity

Manufacturer

Kramer-Werke GmbH, Wacker-Neuson-Str. 1, D-88630 Pfullendorf

Product

Vehicle designation model	Wheel loader 352		
Version	351-04S / 351-04L	351-05S / 351-05L	351-06S / 351-06L
Trade name	8075 / 8075L	8085 / 8085L	8095 / 8095L
Serial number	351 04 _ _ _ _	351 05 _ _ _ _	351 06 _ _ _ _
Diesel engine/output kW	35	55,4	55,4
Measured sound power level dB(A)	100	100	100
Guaranteed sound power level dB(A)	101	101	101

Conformity assessment procedure

According to 2000/14/EC appendix VIII

Notified body involved in procedure

DGUV Test Prüf- und Zertifizierungsstelle (EU identification number: 0515)
Fachbereich Bauwesen
Landsberger Str. 309
D-80687 München

Applied directives and standards

We hereby declare that this product corresponds to the relevant regulations and requirements of the following EC Directives and standards:
2006/42/EC, 2000/14/EC, 2003/37/EC, EN 13309,
DIN EN ISO 12100: 2010, DIN EN 474-1 and 3.

Authorized representative for the compilation of technical documentation

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Wacker-Neuson-Str. 1
D-88630 Pfullendorf

Pfullendorf, (date) _ _ . _ _ _ _

i. A.

Michael Arndt
Head of product development
Kramer-Werke GmbH

Original declaration of conformity
(only for EU member states)



Declaration of manufacturer

This vehicle is not approved for application within the European Union (EU).

Manufacturer

Kramer-Werke GmbH, Wacker-Neuson-Str. 1, D-88630 Pfullendorf

Product

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Version	351-04S / 351-04L	351-05S / 351-05L	351-06S / 351-06L
Trade name	8075 / 8075L	8085 / 8085L	8095 / 8095L
Serial number	351 04 _ _ _ _	351 05 _ _ _ _	351 06 _ _ _ _
Diesel engine/output kW (exhaust fume values do not correspond to the EC standards for low-exhaust engines)	35	55,4	55,4

The following standards and/or technical specifications have been used for the proper application of the requirements regarding safety and health stated in the EC Directives:

2006/42/EC, EN 13309, DIN EN 1459, DIN EN ISO 12100: 2010

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M. Arndt
Head of product development
Kramer-Werke GmbH

Original declaration of manufacturer
(not meant for EU member states)

1 Preface

1.1 Operator's Manual

Important information about the operating personnel

This Operator's Manual only applies to the machines listed on the cover sheet.

It provides information on how to use, adjust and operate the machine, and on how to perform maintenance on it, and is therefore only intended for the operator and operating company.

Before driving or using the machine for the first time, the user must be briefed on this machine and must carefully read and understand this Operator's Manual, in particular chapter "**Safety instructions**".

Work on the machine may only be performed by trained and instructed personnel that have been authorized by the operating company. Any person involved in operation, inspection, maintenance, servicing, repair work or transport of the machine must read, understand and follow the complete instructions in the Operator's Manual and in particular the safety instructions.

The buyer/operating company is responsible for the operators' training in safe working on and with the machine. Kramer-Werke GmbH recommends repeating training at regular intervals.

The buyer/operating company is responsible for ensuring that any additional safety regulations applicable in the country of use of the machine are followed.

The machine may only be operated by persons who are physically, mentally and professionally suited for this work.

- Persons under the influence of alcohol or drugs may **not** use the machine.

The operator is the person performing machine operation and/or travel.

- Before putting the machine into operation, the operator of the machine must ensure that it is in a perfect condition, and during operation, the operator must observe the regulations regarding operation.
- The operator is responsible for ensuring that the machine and its use do not pose a risk.
- Before working with the machine, operators must familiarize themselves with all the control elements and their functions, and with the handling of the machine.



Information

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

Important information about this Operator's Manual

- The Operator's Manual and amendments form part of the machine and must always be available at the place of use of the machine.
- Store this Operator's Manual in the storage compartment or net provided for this in the cabin.
- Immediately replace an incomplete or illegible Operator's Manual by a new one.
- In addition to the Operator's Manual, observe and instruct the operator in all other generally applicable, legal and other mandatory regulations relevant to accident prevention and environmental protection.
- Please contact your dealer if you require more information about the machine and the Operator's Manual.
- Kramer-Werke is constantly working to improve their products as part of the latest technical developments. For this reason, we may from time to time need to make changes to figures and descriptions in this documentation that do not reflect products that have already been delivered and that will not be implemented on these machines.
- Technical data, dimensions and weights are only given as an indication. Responsibility for errors or omissions not accepted.

Explanation of symbols

The indication **left** or **right** in the descriptions always refers to the travel direction of the machine.

Symbols	Explanation
•	Identifies a general list
1 2	Identifies a list in a table (position numbers)
1. 2.	Identifies activities that must be performed in a certain order
➡	Identifies results
▶	Identifies things to be avoided in the warning and safety instructions

Abbreviations

Abbreviation	Explanation
(opt)	Option
approx.	approximately (about, circa)
ATF	Automatic Transmission Fluid (lubricant)
BG	Employer's liability insurance association
BGG	Employer's liability insurance association principles
BGV	Employer's liability insurance association rules and regulations
Cars	Cars
DGUV	German Social Accident Insurance
DIN	German Institute for Norming
Doc.	Document
DPF	Diesel particulate filter
e.g.	for example
EBE	Authorization for stand-alone operation
EC	European Community
ECU	Electronic Control Unit (controller)
EN	European Norm
etc.	et cetera (from Latin), and so forth
EU	European Union
Fig.	Figure
FOPS	Falling Object Protective Structure
FZV	Vehicle Admission Ordinance
General certification	National Type Approval (Germany)
HMI	Human Machine Interface (display and operation unit)
if nec.	if necessary
ISO	International Organization for Norming
LED	Light Emitter Diode (light diode)
LoF	Agriculture and forestry
LWA	Sound power level
max./MAX.	maximum
min./MIN.	minimal, at least
No.	Number
o.s.	or similar
o/h	Operating hours

Abbreviation	Explanation
OK	okay, alright
Order no.	Order, item or part number
poss.	possibly
resp.	respectively
ROPS	Roll Over Protective Structure
RZ	Ripper tooth
SAE	Society of Automotive Engineers, viscosity class for motor oil
StVZO	German road traffic regulations
Trucks	Trucks
VCU	Vehicle Control Unit (controller)
VDE	Association of Electrical Engineers, Electronic and Information Technology



1.2 Warranty and liability

Warranty claims can be made only if the conditions of warranty have been observed.

They are included in the General Conditions of Sales and Delivery for new machines and spare parts sold by the dealers. Furthermore, the instructions in this Operator's Manual must be observed.

Information about maintenance, repairs and spare parts

Operational safety and readiness of the machine do not only depend on your reliable control, but also on maintenance and servicing of the machine. This is why regular maintenance and servicing is absolutely necessary.



Information

Repair work, maintenance or modifications may only be performed by specifically trained technical personnel or by a service center!

Pay particular attention to chapters "Information on maintenance" and "Maintenance overview".



Information

Insist on using original spare parts for repairs!

The machine's permits, certifications, registrations, etc., may be withdrawn if machine parts/components with a prescribed condition or quality, or machine parts/components that can put persons at risk during operation, are subsequently modified or exchanged!

2 Safety

2.1 Safety symbols and signal words

Explanation

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

DANGER

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

Consequences in case of non-observance.

- ▶ Avoidance of injury or death.

WARNING

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

Consequences in case of non-observance.

- ▶ Avoidance of injury or death.

CAUTION

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

Consequences in case of non-observance.

- ▶ Avoidance of injury.

NOTICE

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

- ▶ Avoidance of damage to property.
-



2.2 Conduct and safety instructions

Prerequisites for operation

- The machine 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 machine.
- Store this Operator's Manual in the place provided for this in or on the machine. Immediately replace a damaged or illegible Operator's Manual and any supplements to it.
- The machine 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 machine.
 - If a damage or malfunction occurs during operation, put the machine 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 machine 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.

2.3 Qualification of operating and maintenance personnel

Owner's duties

- Only allow specifically authorized, trained and experienced persons to operate, drive and perform maintenance on the machine.
- 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 machine or machine 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 machine 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 machine may only be operated by authorized and safety-conscious persons who are fully aware of the risks involved in operating the machine.
- The operator and owner are obligated to operate the machine only in a safe and working condition.
- All persons working on or with the machine 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 machine.
- Be familiar with the emergency exit of the machine.

Preparatory measures for the operator

- Before starting, check the machine 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.



2.4 Operation

Preparatory measures

- Operation is only allowed with correctly installed and intact protective structures.
- Keep the machine 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 machine 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.



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 machine 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 machine 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 machine operation immediately if persons do not stay clear of the danger zone.



Carrying passengers

- Carrying passengers with the machine 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 machine only in a safe and working condition.
- Operate the machine only if all protective and safety-oriented equipment (for example, protective structures such as a cabin or rollbar, removable safety devices) is installed and functional.
- Check the machine for visible damage and defects.
- In case of damage and/or unusual behavior, put the machine 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 machine only with the seat belt fastened and only from the place provided for this.
- Put the machine 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 machine 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 machine 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 machine and never jump off the machine.

**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 machine is in compliance with the national regulations.
- In order not to blind other motorists, using the existing work lights during machine 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 machine must be empty and in transport position.
- The attachment fitted onto the machine must be equipped with the mandatory lights and protective equipment.
- Take measures against unintentional operation of the operating hydraulics.
- If the machine 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 machine

- 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 machine 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 machine.
 - 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 machine and its work equipment are not being moved.
- Danger zones must not overlap with the work zones of other machines.



Lifting gear applications

- The machine 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 machine 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 machine 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.
- A front attachment has to be installed during trailer operation.
- 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 machine and the trailer when hitching a trailer.
- Hitch the trailer onto the machine correctly.
- Ensure that all equipment works correctly (for example, the brakes, lights).
- Before starting machine travel, ensure that nobody is between the machine and the trailer.
- If the vehicle has no license for agricultural and forestry applications, only the machine's own attachments may be transported with a trailer.
- Start machine travel carefully, in particular on slopes.

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 machine 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.

Operation

- Carrying persons on/in an attachment is prohibited.
- Installing a work platform is prohibited.
 - Exception: The machine is certified and equipped with the necessary safety equipment.
- 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 machine 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 machine 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 machine.
- 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 machine against unintentional movement.
- Raise the machine only after it is safely attached and the person attaching the machine 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 machine when loading the machine.
- Observe the national regulations (for example, "Merkheft Erdbau-maschinen", leaflet on earth moving machines of the German employers' liability insurance association for construction engineering).
- Load the machine only in accordance with this Operator's Manual to avoid damage to the machine.
- 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 machine during transportation.
- Observe the national regulations (for example, “Merkheft Erdbau-maschinen”, leaflet on earth moving machines of the German employers’ liability insurance association for construction engineering).
- Bear in mind the weather conditions (for example, ice, snow).
- Ensure the minimum load on the steering axle(s) of the transport vehicle, and ensure an even load distribution.

2.9 Maintenance

Maintenance

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

Measures for performing maintenance

- Perform only the maintenance described in this Operator's Manual.
- All work that is not described in this Operator's Manual must be performed by qualified and authorized technical personnel.
- Follow the maintenance plan – see "Maintenance plan".
- Always use specially designed or otherwise safety-oriented ladders and working platforms to perform overhead maintenance. Do not use machine 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).

Tracks

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

Hydraulic system (air compressor system optional)

- 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 machine 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 not start or let the engine run in case of leaks.
- Breathing the exhaust fumes causes death very quickly.
- Engine exhaust contains gases you cannot see or smell (for example carbon monoxide and dioxide).
 - Never operate the machine in enclosed premises or areas (for example, in pits), if there is no suitable ventilation (for example, exhaust-gas filters, suction systems).
- Do not operate the machine in potentially explosive areas.
- Do not touch the engine, exhaust system and cooling system as long as the engine is still running or has not cooled down yet.
- Do not remove the radiator cap when the engine is running or hot.
- The coolant is hot, under pressure and can cause serious burns.

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 machine 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 machine is equipped with a fire extinguisher, have it installed in its specific location.
- Keep the machine 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 machine 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 machine 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 (compressed-air hammer, concrete saw).
- Do not remove the sound baffles of the machine/attachment.
- Have damaged sound baffles immediately replaced (for example, an insulating mat, muffler).
- Before starting work, get informed on the noise level of the machine/attachment (for example, on the adhesive label) – wear ear protectors.
- Do not wear ear protectors during machine travel on public roads/sites.

Clean

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

3 Introduction

3.1 Machine overview

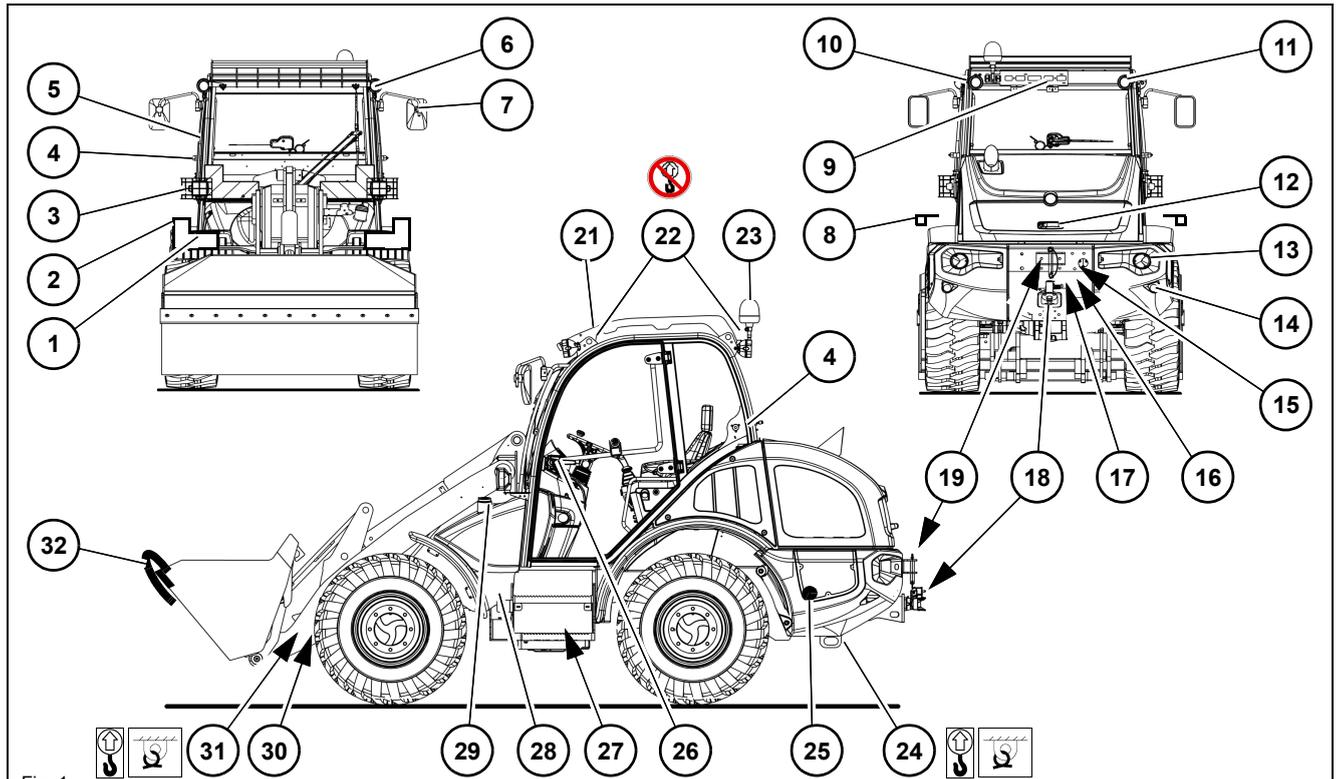


Fig. 1

Outside view of components

1	Bracket for warning stripe (option)
2	Numberplate bracket (option)
3	Headlights (left/right) with turn indicators
4	Door arrester
5	Handle for access (left/right)
6	Front left/right working lights (option)
7	Left/right rearview mirrors
8	Left/right side marker lights with reflectors (option)
9	Number plate bracket with light (option)
10	Rear left working light (option)
11	Rear right working light (standard)
12	Engine cover lock
13	Turn indicator/brake/rear light
14	Reflectors
15	Connections for pneumatic (compressed-air) trailer brake (option)
16	Rear socket (option)
17	Plug coupling for hydraulic trailer brake (option)
18	Trailer coupling (option)
19	Towing gear ¹
20	Plug couplings for additional control circuit (option) and tipping trailer (option)

Outside view of components

21	Protective FOPS screen (option)
22	4 x eye hooks (removing the cabin) ²
23	Rotating beacon (option)
24	Rear hooks for loading/tying down the machine (left/right)
25	Socket for hydraulic oil preheater (option)
26	Door handle with lock
27	Safety prop for loader unit (option)
28	Wheel chock
29	Fuel tank filler inlet
30	Front right towing gear ¹
31	Hooks for loading/tying down the machine at front of frame (left/right)
32	Front-edge protection

1. **Not** certified as a trailer coupling or for loading or tying down the machine.
2. Eye hooks are for removing the cabin only, and may **not** be used for lifting the machine.



Models and trade names (overview)

The machine is identified by two designations.

- **“Model designation”** => stamped on the type label in square 5
– see *“Serial number” on page 3-31*.
- **“Trade name”** => affixed outside on the machine.

Letter **S** or **L** in the model designation identifies the loader unit version:

- **S** = standard loader unit
- **L** = extended loader unit

Model designation	Trade name
351-04S	8075
351-04L	8075L
351-05S	8085
351-05L	8085L
351-06S	8095
351-06L	8095L

3.2 Brief description of machine

Main components of machine

- Sturdy steel sheet frame; Rubber-mounted engine.
 - ROPS/FOPS tested cabin (roll-over/falling object protection); category I series standard, category II optional) – see [chapter 4.1 “Cabin/control stand” on page 4-1](#).
 - ROPS is the abbreviation for “Roll Over Protective Structure”.
 - FOPS is the abbreviation for “Falling Object Protective Structure”.
 - Four-cylinder, water-cooled diesel engine:
 - YANMAR – for model 351-04S/L
 - DEUTZ – for models 351-05S/L and 351-06S/L.
 - Automotive drive, progressive hydrostatic axial-piston gearbox
 - Maximum speed - standard: 20 km/h (12.43 mph)
 - Maximum speed - optional: 30 or 40 km/h (18.64 or 24.85 mph)
 - Hydraulic power steering with emergency steering features.
 - Front and rear planetary steering axles, rear axle with oscillation.
 - Service brake:
 - For the 20 km/h (12.43 mph) version; Brake disc on front axle drive shaft, brake effect is transferred to rear axle via cardan shaft.
 - For the 30 or 40 km/h (18.64 or 24.85 mph) version; Brake disc on front and rear axle input shaft (option).
 - Parking brake on brake disc on front axle drive shaft.
-



Information

For the operator's safety, the vehicle can optionally be outfitted with a seat contact switch. In this case:

- ▶ The diesel engine will not start unless the operator is seated on the seat.
 - ▶ The drive switches off after 5 seconds if the load on the operator seat is reduced when driving the machine.
-



Information

The machine can be equipped with the **“Telematic” option (transmission of operational data, location, etc. via satellite)**!

Please contact your dealer if you require information on this option.

Diesel engine

For models 351-04S / 351-04L the vehicles are equipped with a YANMAR diesel engine and an exhaust system as per exhaust norm IIIA 97/68/EC.

- Applicable for all EU member states, the U.S., Canada and Switzerland – see chapter “EC Declaration of Conformity” on page EG-1.

For models 351-05S / 351-05L and 351-06S / 351-06L the vehicles are equipped with a DEUTZ diesel engine TCD 2.9 and an exhaust system as per exhaust norm IIIB 97/68/EC.

- This exhaust system is a closed system consisting of a diesel oxidation catalytic converter (DOC). Optionally with additional diesel particulate filter (DPF).
- Applicable for all EU member states, the U.S., Canada and Switzerland – see chapter “EC Declaration of Conformity” on page EG-1.



Information

In **non** EU member states, the vehicles models 351-05S / 351-05L as well as 351-06S / 351-06L can be equipped with a DEUTZ diesel engine TD 2.9 EDG and an exhaust system as per exhaust norm IIIA 97/68/EC.

These vehicles do not have a certificate (CE) and are therefore **not permitted** in EU member states, the U.S., Canada, Switzerland and Australia – see chapter “Declaration of manufacturer” on page EG-2.

Hydrostatic drive

The diesel engine permanently drives a hydraulic pump (variable displacement pump), whose oil flow is sent to a hydraulic motor flanged on the transfer gearbox (20 km/h / 12.43 mph) or high speed gearbox (option – 30 or 40 km/h / 18.64 or 24.85 mph).

The hydraulic motor transmits its power to the rear axle (via the transfer gearbox) and to the front axle (via the cardan shaft) to create permanent 4 wheel drive. If the machine is equipped with a high-speed gearbox, power is transmitted to the front and rear axles via the cardan shaft.



Operating hydraulics and 4 wheel steering

The diesel engine also drives the joint gear pump for the operating hydraulics and the hydrostatic 4 wheel steering. The oil flow of this pump depends on the diesel engine speed only.

When the machine is in operation, the entire diesel engine output can be transmitted to the gear pump for the operating hydraulics and steering. This is made possible by a so-called inching valve that responds as soon as the brake/inching pedal is used, reducing or cutting off power input of the drive.

Therefore, engine output is fully available for the operating hydraulics (loader unit) by pressing the accelerator pedal and the brake/inching pedal at the same time.

Cooling system

A combined water/hydraulic oil radiator (for the diesel engine and the hydraulic oil) is located in the engine compartment.

Fan drive for water/hydraulic oil radiator:

- Model 351-04S/L: directly on the YANMAR engine
- For Models 351-05S/L and 351-06S/L: via a gear pump on the auxiliary drive of the DEUTZ engine.

3.3 Information and regulations on use

General information on the machine

This machine is a versatile and powerful helper on construction sites, in agriculture and for recycling applications.

The wide range of attachments makes it possible to use the machine for numerous applications: as a snow plough, a construction machine, a fork lift for applications with palletized goods, or as a tractor for transport applications in agriculture with agriculture and forestry certification.

- Possible applications with attachment – see *“Use of attachments on the machine” on page 3-12.*
- Retrofit the specific attachments with safety equipment when using the wheel loader for lifting gear applications – see *chapter “Lifting gear applications” on page 2-9* and *Load hook (option) on page 5-102.*

Safe machine operation

Your own safety, as well as the safety of others, depends to a great extent on how the machine is moved and operated.

Read this Operator’s Manual carefully prior to the first drive.

Basic rule: careful and prudent working is the best way to avoid accidents!

Operational safety and readiness of the machine do not only depend on your reliable control, but also on maintenance and servicing. This is why regular maintenance and servicing is absolutely necessary – see *chapter 7.5 “Cleaning and maintenance” on page 7-17.*



Information

Repair work, maintenance or modifications may only be performed by specifically trained technical personnel or by a service centre!

Insist on using original spare parts for repairs.

The machine’s permits, certifications, registrations, etc., may be withdrawn if machine parts/components with a prescribed condition or quality, or machine parts/components that can put persons at risk during operation, are subsequently modified or exchanged.



Designated use

The machine can be used as a self-propelled work machine or tractor if registered accordingly (**agricultural or forestry applications**), see page – see *“Type label” on page 3-30* for the EC check number.

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

NOTICE

In order to avoid damage to the machine, only the attachments listed in the following tables have been authorized for use with the machine – see *“Use of attachments on the machine” on page 3-12*.

Note that **not all** specified attachments are allowed for machine travel on public roads in Germany.

- If the machine is registered as a “self-propelled work machine”, please refer to the **National Type Approval (Germany) or the Data Confirmation** for the equipment items (authorized attachments) and specific requirements!
- If the machine is registered as an agricultural or forestry tractor, the **National Type Approval (Germany)/the Data Confirmation** does not specify any attachments. Only the attachments (in connection with the specific requirements) listed in this Operator’s Manual are authorized for use on public roads – see *“Use of attachments on the machine” on page 3-12!*
- Attachments without a National Type Approval (Germany) or Data Confirmation, or attachments that are not listed in this Operator’s Manual, require a **special registration** made out by the competent authorities. The special measures stated in “Merkblätter für Anbaugeräte” (leaflet with specific instructions for attachments) §30 clauses 10/11/12 StVZO (German traffic regulations) must be observed – see *“Use of attachments on the machine” on page 3-12*.

Get informed on and follow the legal regulations of your country.

Improper use

Not using the machine according to its designated use means that it is used for an application that is not specified by the manufacturer. Therefore, this is misuse in the terms of the Machine Guideline.

Alone the user/operating company shall be liable for damage resulting from this.

Misuse with the machine is, for example:

- Transporting persons in or on the machine/attachments.
- Use of surfaces and spaces that are not described as work or maintenance spaces in the Operator's Manual.
- Machine travel with liquid material in the bucket.
- Machine and attachment modifications without proper authority.
- Fastening/installation of additional equipment that has not been certified or released.
- Use for spraying applications.
- Use for forestry applications.
- Use for below-ground or mining applications.
- Use in contaminated areas.
- Use as a carrier machine for equipment that has not been certified/released by the manufacturer.
- Use in stretches of water or flood areas.
- Use for lifting gear applications.
- Installation of work platforms.
- Raising heavy loads (overload).
- Machine operation outside the machine (machine operator not seated on operator seat).
- 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.
- Failure to follow warning instructions on the machine and in the Operator's Manual.
- Maintenance and repair work by untrained personnel.
- Use of non-original spare parts.



Information

The machine is certified for lifting-gear applications only if the mounting parts described on page [5-102](#) are installed and if the specific safety measures have been taken.

No other lifting gear (hooks, eyelets, etc.) may be installed on the attachments or loader unit!

Failure to observe this results in loss of warranty, liability and certification for the machine.

Driving license

Vehicles may be driven on public roads only if the operator has a driving license as defined by national traffic regulations.

The buyer/operating company is responsible for the operators' training in safe working on and with the machine.

The basis for this in the Federal Republic of Germany is the "DGUV principle 308-009."

According to **EU regulations** and German legislation, one of the following driving licenses is required for driving the wheel loader:

- **Driving licence category L**
 - Self-propelled work machines up to 25 km/h
 - Agricultural or forestry tractors up to 40 km/h (with trailer 25 km/h)
- **Driving licence category C**
 - Motor vehicles with over 3500 kg gross weight rating (with trailers up to 750 kg)
- **Driving licence category C1**
 - Motor vehicles between 3500 and 7500 kg gross weight rating (with trailers up to 750 kg)
- **Driving licence category CE**
 - Motor vehicles with over 3500 kg gross weight rating (with trailers over 750 kg)
- **Driving licence category T**
 - Self-propelled work machines for agriculture and forestry up to 40 km/h
 - Tractors and agricultural or forestry machinery up to 60 km/h

Machine registration/identification

§ 3 FZV (German vehicle licensing ordinance) requires self-propelled work machines with maximum speeds **over 20 km/h** (>12.44 mph) to be fitted with their own number plates **in accordance with §8 FZV (German vehicle licensing ordinance)**.

§ 4b of FZV (German vehicle licensing ordinance) requires owners of self-propelled work machines with maximum speeds **below 20 km/h** (<12.44 mph) to affix their first name, last name and place of residence (company and registered office) in indelible print on the left side of their machines.

Get informed on and follow the legal regulations of your country.

Machine inspections

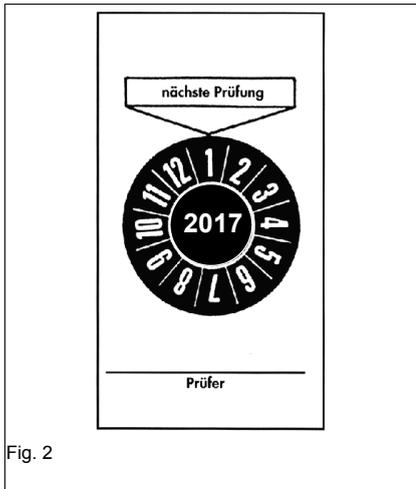


Fig. 2

When operating the machines, the national safety regulations must be followed as well, for example in Germany, the regulations for accident prevention "Deutsche Prüfstelle für Land- und Forsttechnik" (DPLF German inspection and certification body for agriculture and forestry) and the accident prevention regulation "Fahrzeuge (vehicles)" (DGUV regulation 70 § 57 clause 1).

In Germany, legislation, supplemented by the technical rules for operational safety (TRBS) 1201 and the accident prevention regulations (DGUV regulation 1), requires all machine operators to have all machines and equipment inspected regularly (BetrSichV § 10).

- Inspections must be performed as required, but at least once a year, by an expert and must be documented in written form.
- Subsequent inspections of detected defects must be performed, too.
- The competent inspection authority may require the inspection report to be available at the place where the machine is used.
- Affix an inspection label on the machine for evidence (see example in the figure on the left).

The inspection tag can be acquired from the relevant inspection authorities.

Bear in mind that all work equipment is inspected, not only the machine but also all technical auxiliary means, tools and attachments. (Work equipment is defined as all tools, attachments, machines or systems.).

This requirement is fulfilled, for instance, when the results are logged in a test booklet, file or report; Also see the professional association principle "Testing vehicles by an expert" (BGG 916).

Failure to observe this results in loss of warranty, liability and certification for the machine.



Information

Get informed on and apply the legal regulations of your country.



Documents

German traffic regulations require to have the following documentation on board:

- National Type Approval (Germany) or machine documentation
- Driving license
- Test report according to DGUV regulation 70 § 57 clause 2 of the accident prevention regulation "Vehicles"
- Operator's Manual

Get informed on and follow the legal regulations of your country.

On-board equipment

§ 53 StVZO (German road traffic regulations) requires the following equipment to be supplied by the operating company and to be fitted on the machine, for example:

- 1 warning triangle with design certification
- 1 warning light with design certification
- 1 safety vest with design certification
- 1 first-aid kit in compliance with DIN 13 164 sheet 1

Get informed on and follow the legal regulations of your country.

Machine warning identification

§ 52 clause 4.1 of StVZO German road traffic regulations requires wheel loaders that are used on public roads for the construction and maintenance of roads, and for the cleaning of roads or facilities, to be fitted with the red and white warning identification as per DIN 30710 in connection with a yellow rotating beacon (option).

Failure to observe this can lead to machine travel on public roads being prohibited.

Get informed on and follow the legal regulations of your country.

Permissible operating temperature range

The operating temperature range for a machine serviced in compliance with the maintenance instructions is between -15 and $+40$ °C ($+5$ and $+104$ °F) during normal operation with short intervals of operation at maximum output.

Operating temperatures below -15 °C ($+5$ °F) or over $+40$ °C ($+104$ °F) require special equipment and/or material (fuel, engine and hydraulic oil).

Please contact your dealer if you require more information on operation in extreme temperature ranges.



Use of attachments on the machine

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

- The machine can be equipped with quickhitches for fitting KRAMER, SKID-STEER, EURO or VOLVO attachments.
- Refer to the following tables for the certified attachments and the specific requirements:
 - – see *“Attachments for Kramer quickhitch” on page 3-13*
 - – see *“Attachments for SKID STEER quickhitch” on page 3-24*
 - – see *“Attachments for EURO quickhitch” on page 3-25*
 - – see *“Attachments for Volvo quickhitch” on page 3-26*
- Attachments of self-propelled work machines certified for travel on public roads must also be listed in the National Type Approval (Germany)/Data Confirmation or in the license certificate.
- For attachments that are not listed in the National Type Approval (Germany), the Data Confirmation (Germany), the registration documents or the following lists for the specific quickhitch, get in touch with a dealer for authorization (warranty claims)! A Separate Certification for Vehicles (Germany) is required by the appropriate national authorities— see chapter *“Fitting attachments from other manufacturers (option)” on page 5-96!*
- This Operator’s Manual only describes how to install, use and remove the standard bucket, multipurpose bucket and pallet forks – see chapter 5.10 *“Attachments” on page 5-57.*
- Refer to the Operator’s Manuals of the attachments for information on installing, removing and using other attachments.

Get informed on and follow the legal regulations of your country.

Attachments for Kramer quickhitch

NOTICE

Damage to the machine due to the use of uncertified attachments.

- ▶ Use only attachments that are certified for the existing quickhitch system and that are fitted with a load diagram certified for the specific attachment.
 - ▶ If other attachments are used, conformity (stability test) in accordance with the EC machine guideline or the EN 474-3 standard must be checked and documented by an authorized service centre.
-



Information

Machine travel on public roads with a full bucket is prohibited in the Federal Republic of Germany!



Information

Observe the following for attachments that are not certified for use on public roads in the Federal Republic of Germany:

- ▶ Remove the attachments for transport on public roads.
 - ▶ Load the attachment on a transport vehicle and transport it to the job site.
-



Information

Observe the footnotes in the tables!

- If uncertified attachments are installed, or if parts of the quickhitch facility or attachment are subsequently modified or replaced, the operation license and the warranty become void.
- In addition to the Operator's Manual, observe and instruct the operator in all other generally applicable, legal and other mandatory regulations relevant to accident prevention and environmental protection.
- Please contact your dealer if you require more information on the quickhitch and the specific attachments.

Overview of KRAMER attachments, model 351-04S / 351-04L

Attachment	Machine model	Part no. (model)	Dimension mm (in)	Capacity ¹ m ³ (ft ³)	Use
Approved attachments for machine travel on public roads (Federal Republic of Germany)					
Standard bucket (normal material)	351-04S 351-04L	1000102344 1000160648	1750 (68.90) with RZ 1750 (68.90) without RZ	0,5 / 0,75 (17.65) / (26.84)	Loosening, picking up, transporting and loading loose or solid material (material density $\leq p = 1.8 \text{ t/m}^3$ (112 lb/ft ³))
Multipurpose bucket ²	351-04S	1000187786 1000187787	1750 (68.90) with RZ 1750 (68.90) without RZ	0,5 / 0,75 (17.65) / (26.84)	for grading, removing and scraping vegetation, for example stripping grass; for picking up and evenly spreading bulk material; for grabbing bulky material; Truck loading (bulk material density $\leq p = 1.8 \text{ t/m}^3$ (112 lb/ft ³))
	351-04L	1000187786	1750 (68.90) with RZ	0,5 / 0,75 (17.65) / (26.84)	
	351-04S	1000250021	1850 (72.83) without RZ	0,5 / 0,075 (17.65) / (26.84)	
Standard bucket (lightweight material) ³	351-04S 351-04L	1000137538	1850 (72.83) without RZ	0,65 / 0,85 (22.95) / (26.84)	Picking up, transporting and loading very lightweight material (material density $\leq p = 1.3 \text{ t/m}^3$ (81 lb/ft ³))
Standard bucket (super lightweight material) ³	351-04S 351-04L	1000332562	2150 (84.64) without RZ	0,9 / 1,1 (31.78)/(38.84)	Picking up, transporting and loading lightweight material (material density $\leq p = 0.9 \text{ t/m}^3$ (56 lb/ft ³))
Side swing bucket ^{2, 4}	351-04S 351-04L	1000175757	1744 (68.66) without RZ	0,4 / 0,55 (14.12) / (19.42)	Standard bucket, however with benefits for filling and backfilling
Pallet forks with foldable fork arms ^{2, 5}	351-04S 351-04L	1000237336	1200 (47.24)	–	Picking up and transporting pallets
Salt spreader ^{2, 6, 7, 8}	351-04S 351-04L	1000333962	–	170 l (44.9 gal)	Winter service



Attachment	Machine model	Part no. (model)	Dimension mm (in)	Capacity ¹ m ³ (ft ³)	Use
Non-approved attachments for machine travel on public roads (Federal Republic of Germany)					
Pallet forks ²	351-04S 351-04L	1000237357 1000237358	1000 (39.37) 1200 (47.24)	–	Picking up and transporting pallets
High-tilt bucket ^{2, 4}	351-04S	1000156433 1000154475	1850 (72.83) without RZ	–	As standard bucket, however with a 80 – 100 cm higher tilt height (material density $\leq p = 1.3 \text{ t/m}^3$ (81 lb/ft ³))
	351-04L	1000156433	1850 (72.83) without RZ	–	
Heavy duty bucket with hydraulic clamp ^{2, 4}	351-04S 351-04L	1000111090	1850 (72.83) without RZ	0,55 / 0,7 (19.42) / (24.72)	Picking up and transporting for example bulky recycling material (material density $\leq p = 1.3 \text{ t/m}^3$ (81 lb/ft ³))
Pallet forks (hydraulic lateral displacement) ²	351-04S 351-04L	1000247565	1200 (47.24)	–	Picking up and transporting pallets
Pallet forks (floating fork arms) ²	351-04S 351-04L	1000177240	1000 (39.37)	–	
Material pusher ²	351-04S 351-04L	1000330950	3000 (118.11)	–	For moving loose bulk material
3-point adapter with drive (CAT II) ²	351-04S 351-04L	1000251760 1000251781	–	–	Installing special CAT II attachments (for example a mower)
Quickhitch triangle ²	351-04S 351-04L	1000252244	–	–	
Snow plough ^{2, 6, 8}	351-04S	1000142915	2500 (98.42)	–	Winter service
		1000275571	2400 (94.49)		
		1000275572	2400 (94.49)		
		1000284633	2500 (98.42)		
Removable load hook ⁹	351-04S 351-04L	1000290054	See load diagram	–	Picking up and transporting loads with lifting gear
Rotary broom ^{2, 6}	351-04S	1000139717 ¹⁰ 1000161527 ¹¹	2000 (78.74) 2050 (80.71)	–	Sidewalk and street cleaning
Mulcher UMK 18 FM ²	351-04S 351-04L	1000266611	–	–	Mulching grass



Attachment	Machine model	Part no. (model)	Dimension mm (in)	Capacity ¹ m ³ (ft ³)	Use
Non-approved attachments for machine travel on public roads (Federal Republic of Germany)					
Work platform ^{2, 12, 13}	351-04S	1000336399	–	–	Mounting work
Manure forks ²	351-04S 351-04L	1000292240	Tines 800 (31.50) Width 1900 (74.80)	–	Picking up and transporting silage, straw and hay bales
Round bale clamp ²	351-04S 351-04L	1000177701	Clamping width 800 – 1800 (31.50 – 70.86)	Payload 1550 kg (3417.1 lb)	
Bale spike ²	351-04S 351-04L	1000290452	Tines 1000 (39.37) Width 1200 (47.24)	Payload 1800 kg (3968.2 lb)	
Silage bucket with hydraulic clamp ²	351-04S 351-04L	1000292272	1800 (70.86)	–	
Silage cutting clamps ²	351-04S 351-04L	1000308431	1570 (61.81)	–	
Multipurpose forks with grab ²	351-04S 351-04L	1000292247	Tines 800 (31.50) Width 1900 (74.80)	–	

1. Capacity struck according to ISO 7546/capacity heaped
2. See the Operator's Manual of the attachment for putting the attachment into operation and using it
3. During machine travel on public roads (Federal Republic of Germany), additional side marker lights (order no. 1000185392) with reflectors must be installed on the left and right of the cabin. Observe the legal regulations of your country.
4. Only authorized in connection with option "Throttle orifice in tilt ram".
5. Fork arms must be folded up and secured during machine travel on public roads (Federal Republic of Germany)
6. Authorized for use on public roads only with EBE (separate certification for operation, Federal Republic of Germany)
7. In order to ensure the correct load on the front axle, fit a snow plough or bucket onto the machine if a salt spreader is used.
8. Only in connection with rotating beacon
9. Only in conjunction with load diagram (order no. 1000290082)
10. TUCHEL
11. BEMA
12. Installation only allowed with the "Tilt ram lock" option.
Follow the instructions in the work platform operator's manual under all circumstances.
13. Not certified for transporting persons and for machine travel on public roads

For more information on attachments, see:

Data sheet for attachments §30 para. 10 / 11 / 12 StVZO (Federal Republic of Germany)

Merkblatt für angehängte land- oder forstwirtschaftliche Arbeitsgeräte (leaflet with specific instructions for hitching agricultural or forestry equipment onto the machine according to German legislation)



Overview of KRAMER attachments, model 351-05S / 351-05L

Attachment	Machine model	Part no. (model)	Dimension mm (in)	Capacity ¹ m ³ (ft ³)	Use
Approved attachments for machine travel on public roads (Federal Republic of Germany)					
Standard bucket (normal material)	351-05S	1000096388 1000137538	1850 (72.83) with RZ 1850 (72.83) without RZ	0,65 / 0,85 (22.95) / (30.02)	Loosening, picking up, transporting and loading loose or solid material (material density $\leq p = 1.8 \text{ t/m}^3$ (112 lb/ft ³))
	351-05L	1000102344 1000160648	1750 (68.90) with RZ 1750 (68.90) without RZ	0,5 / 0,75 (17.65) / (26.84)	
Multipurpose bucket ²	351-05S	1000187296 1000187297	1850 (72.83) with RZ 1850 (72.83) without RZ	0,5 / 0,75 (17.65) / (26.84)	Grading, scraping vegetation (e.g. grass cover); for picking up and evenly spreading bulk material; for grabbing bulky material; Bulk material density $\leq p = 1.8 \text{ t/m}^3$ (112 lb/ft ³))
	351-05L	1000187786	1750 (68.90) with RZ	0,5 / 0,75 (17.65) / (26.84)	
Standard bucket (lightweight material)	351-05S	1000233791 ³	2050 (80.70) without RZ	0,85 / 1,0 (30.0) / (35.31)	Picking up, transporting and loading very lightweight material (material density $\leq p = 1.3 \text{ t/m}^3$ (81 lb/ft ³))
	351-05L	1000245973	1950 (76.77) without RZ	0,7 / 0,95 (24.72) / (33.54)	
Standard bucket (superlightweight material) ³	351-05S 351-05L	1000330536	2150 (84.64) without RZ	1,0 / 1,4 (35.31) / (49.44)	Picking up, transporting and loading lightweight material (material density $\leq p = 0.9 \text{ t/m}^3$ (56 lb/ft ³))
Side swing bucket ^{2, 4}	351-05S	1000176121 1000247210 ⁵	1844 (72.60) without RZ	–	Standard bucket, however with benefits for filling and backfilling
Pallet forks with foldable fork arms ^{2, 6}	351-05S 351-05L	1000237336	1200 (47.24)	–	Picking up and transporting pallets
Salt spreader ^{2, 7, 8, 9}	351-05S 351-05L	1000333962	–	170 l (44.9 gal)	Winter service



Attachment	Machine model	Part no. (model)	Dimension mm (in)	Capacity ¹ m ³ (ft ³)	Use
Non-approved attachments for machine travel on public roads (Federal Republic of Germany)					
Pallet forks ²	351-05S 351-05L	1000237357 1000237358	1000 (39.37) 1200 (47.24)	–	Picking up and transporting pallets
High-tilt bucket ^{2, 4}	351-05S	1000156433 1000154475	1850 (72.83) without RZ	–	As standard bucket, however with a 80 – 100 cm higher tilt height (material density $\leq p = 1.3 \text{ t/m}^3$ (81 lb/ft ³))
	351-05L	1000156433	1850 (72.83) without RZ		
Pallet forks (hydraulic lateral displacement) ²	351-05S 351-05L	1000247565	1200 (47.24)	–	Picking up and transporting pallets
Pallet forks (floating fork arms) ²	351-05S 351-05L	1000177240	1000 (39.37)	–	
3-point adapter with drive (CAT II) ²	351-05S 351-05L	1000251760 1000251781	–	–	Installing special CAT II attachments (for example a mower)
Quickhitch triangle ²	351-05S 351-05L	1000252244	–	–	



Attachment	Machine model	Part no. (model)	Dimension mm (in)	Capacity ¹ m ³ (ft ³)	Use
Non-approved attachments for machine travel on public roads (Federal Republic of Germany)					
Snow plough ^{2, 6, 8}	351-05S 351-05L	1000142915	2500 (98.42)	–	Winter service
Removable load hook ¹⁰	351-05S 351-05L	1000290054	See load diagram	–	Picking up and transporting loads with lifting gear
Rotary broom ^{2, 6}	351-05S	1000139717 ¹¹ 1000161527 ¹²	2000 (78.74) 2050 (80.71)	–	Sidewalk and street cleaning
Mulcher UMK 18 FM ²	351-05S 351-05L	1000266611	–	–	Mulching grass
Work platform ^{2, 13, 14}	351-06S 351-06L	1000336399	–	–	Mounting work
Round bale clamp ²	351-05S 351-05L	1000177701	Clamping width 800 – 1800 (31.50 – 70.86)	Payload 1550 kg (3417.1 lb)	Picking up and transporting silage, straw and hay bales

1. Capacity struck according to ISO 7546/capacity heaped
2. See the Operator's Manual of the attachment for putting the attachment into operation and using it
3. During machine travel on public roads (Federal Republic of Germany), additional side marker lights (order no. 1000185392) with reflectors must be installed on the left and right of the cabin. Observe the legal regulations of your country.
4. Only authorized in connection with option "Throttle orifice in tilt ram".
5. Tilts out to the left
6. Fork arms must be folded up and secured during machine travel on public roads (Federal Republic of Germany)
7. Authorized for use on public roads only with EBE (separate certification for operation, Federal Republic of Germany)
8. In order to ensure the correct load on the front axle, fit a snow plough or bucket onto the machine if a salt spreader is used.
9. Only in connection with rotating beacon
10. Only in conjunction with load diagram (order no. 1000290082)
11. TUCHEL
12. BEMA
13. Installation only allowed with the "Tilt ram lock" option.
Follow the instructions in the work platform operator's manual under all circumstances.
14. Not certified for transporting persons and for machine travel on public roads

For more information on attachments, see:

Data sheet for attachments §30 para. 10 / 11 / 12 StVZO (Federal Republic of Germany)

Merkblatt für angehängte land- oder forstwirtschaftliche Arbeitsgeräte (leaflet with specific instructions for hitching agricultural or forestry equipment onto the machine according to German legislation)



Overview of KRAMER attachments, model 351-06S / 351-06L

Attachment	Machine model	Part no. (model)	Dimension mm (in)	Capacity ¹ m ³ (ft ³)	Use
Approved attachments for machine travel on public roads (Federal Republic of Germany)					
Standard bucket (normal material)	351-06S	1000154547 1000245973	1950 (76.77) with RZ 1950 (76.77) without RZ	0,7 / 0,95 (24.72) / (33.54)	Loosening, picking up, transporting and loading loose or solid material (material density $\leq p = 1.8 \text{ t/m}^3$ (112 lb/ft ³))
		1000112105	1600 (62.99) without RZ	0,65 / 0,75 (22.95) / (24.72)	
		1000110166	1700 (66.92) without RZ	0,85 / 1,0 (30.01) / (35.31)	
		1000110167	1700 (66.92) without RZ	0,7 / 0,8 (24.72) / (28.52)	
Multipurpose bucket ²	351-06S	1000236118 1000236120	1950 (76.77) with RZ 1950 (76.77) without RZ	0,7 / 0,8 (24.72) / (28.52)	for grading, removing and scraping vegetation, for example stripping grass; for picking up and evenly spreading bulk material; for grabbing bulky material; Truck loading (bulk material density $\leq p = 1.8 \text{ t/m}^3$ (112 lb/ft ³))
Standard bucket (lightweight material) ³	351-06S	1000233791	2050 (80.70) without RZ	0,85 / 1,0 (30.0) / (35.31)	Picking up, transporting and loading very lightweight material (material density $\leq p = 1.3 \text{ t/m}^3$ (81 lb/ft ³))
		1000332562	2150 (84.64) without RZ	0.9 / 1.1 (31.78) / (38.84)	
Standard bucket (superlightweight material) ³	351-06S	1000187889	2300 (90.55) without RZ	-/1.3 -/(45.90)	Picking up, transporting and loading lightweight material (material density $\leq p = 0.9 \text{ t/m}^3$ (56 lb/ft ³))
Side swing bucket ^{2, 4}	351-06S	1000176121 1000247210 ⁵	1844 (72.60) without RZ	-	Standard bucket, however with benefits for filling and backfilling
Pallet forks with foldable fork arms ^{2, 6}	351-06S 351-06L	1000237336	1200 (47.24)	-	Picking up and transporting pallets
Salt spreader ^{2, 7, 8, 9}	351-06S	1000333962	-	170 l (44.9 gal)	Winter service



Attachment	Machine model	Part no. (model)	Dimension mm (in)	Capacity ¹ m ³ (ft ³)	Use
Non-approved attachments for machine travel on public roads (Federal Republic of Germany)					
Standard bucket (normal material)	351-06L	1000096388 1000137538	1850 (72.83) with RZ 1850 (72.83) without RZ	0,65 / 0,85 (22.95) / (30.02)	Loosening, picking up, transporting and loading loose or solid material (material density $\leq p = 1.8 \text{ t/m}^3$ (112 lb/ft ³))
Multipurpose bucket ²	351-06L	1000187296 1000187297	1850 (72.83) with RZ 1850 (72.83) without RZ	0,5 / 0,75 (17.65) / (26.84)	for grading, removing and scraping vegetation, for example stripping grass; for picking up and evenly spreading bulk material; for grabbing bulky material; Truck loading (bulk material density $\leq p=1.8 \text{ t/m}^3$ (112 lb/ft ³))
Standard bucket (superlightweight material) ³	351-06L	1000187889	2300 (90.55) without RZ	-/1.3 -(/45.90)	Picking up, transporting and loading lightweight material (material density $\leq p=0.9 \text{ t/m}^3$ (56 lb/ft ³))
High-tilt bucket ^{2, 4}	351-06S	1000156433 1000154475	1850 (72.83) without RZ	-	As standard bucket, however with a 80 – 100 cm higher tilt height (material density $\leq p = 1.3 \text{ t/m}^3$ (81 lb/ft ³))
	351-06L	1000156433	1850 (72.83) without RZ	-	
Stone bucket with hydraulic clamp ^{2, 4}	351-06S 351-06L	1000100611	1850 (72.83) without RZ	/ 0.7 / (24.72)	Picking up and transporting for example bulky recycling material (material density $\leq p = 1.3 \text{ t/m}^3$ (81 lb/ft ³))



Attachment	Machine model	Part no. (model)	Dimension mm (in)	Capacity ¹ m ³ (ft ³)	Use
Non-approved attachments for machine travel on public roads (Federal Republic of Germany)					
Pallet forks ²	351-06S 351-06L	1000237357 1000237358	1000 (39.37) 1200 (47.24)	–	Picking up and transporting pallets
Pallet forks (hydraulic lateral displacement) ²	351-06S 351-06L	1000247565	1200 (47.24)	–	Picking up and transporting pallets
Pallet forks (floating fork arms) ²	351-06S 351-06L	1000177240	1000 (39.37)	–	
Material pusher ²	351-06S 351-06L	1000330950	3000 (118.11)	–	For moving loose bulk material
		1000330961	4000 (157.48)	–	
3-point adapter with drive (CAT II) ²	351-06S 351-06L	1000251760 1000251781	–	–	Installing special CAT II attachments (for example a mower)
Quickhitch triangle ²	351-06S 351-06L	1000252244	–	–	
Removable load hook ¹⁰	351-06S 351-06L	1000290054	See load diagram	–	Picking up and transporting loads with lifting gear
Rotary broom ^{2, 6}	351-06S	1000161527 ¹¹	2050 (80.71)	–	Sidewalk and street cleaning
Mulcher UMK 18 FM ²	351-06S 351-06L	1000266611	–	–	Mulching grass
Work platform ^{2, 11, 12}	351-06S 351-06L	1000336399 ¹³	–	–	Mounting work



Attachment	Machine model	Part no. (model)	Dimension mm (in)	Capacity ¹ m ³ (ft ³)	Use
Non-approved attachments for machine travel on public roads (Federal Republic of Germany)					
Manure forks ²	351-06S 351-06L	1000292240	Tines 800 (31.50) Width 1900 (74.80)	–	Picking up and transporting silage, straw and hay bales
Round bale clamp ²	351-06S 351-06L	1000177701	Clamping width 800 – 1800 (31.50 – 70.86)	Payload 1550 kg (3417.1 lb)	
Bale spike ²	351-06S 351-06L	1000290452	Tines 1000 (39.37) Width 1200 (47.24)	Payload 1800 kg (3968.2 lb)	
Silage bucket with hydraulic clamp ²	351-06S 351-06L	1000292249	2000 (78.74)	–	
Silage cutting clamps ²	351-06S 351-06L	1000308514	1780 (70.08)	–	
Multipurpose forks with grab ²	351-06S 351-06L	1000292246	Tines 800 (31.50) Width 1900 (74.80)	–	

1. Capacity struck according to ISO 7546/capacity heaped
2. See the Operator's Manual of the attachment for putting the attachment into operation and using it
3. During machine travel on public roads (Federal Republic of Germany), additional side marker lights (order no. 1000185392) with reflectors must be installed on the left and right of the cabin. Observe the legal regulations of your country.
4. Only authorized in connection with option "Throttle orifice in tilt ram".
5. Tilts out to the left
6. Fork arms must be folded up and secured during machine travel on public roads (Federal Republic of Germany)
7. Authorized for use on public roads only with EBE (separate certification for operation, Federal Republic of Germany)
8. In order to ensure the correct load on the front axle, fit a snow plough or bucket onto the machine if a salt spreader is used.
9. Only in connection with rotating beacon
10. Only in conjunction with load diagram (order no. 1000290082)
11. Installation only allowed with the "Tilt ram lock" option.
Follow the instructions in the work platform operator's manual under all circumstances.
12. Not certified for transporting persons and for machine travel on public roads
13. Under preparation

For more information on attachments, see:

Data sheet for attachments §30 para. 10/11/12 StVZO (Federal Republic of Germany)

Merkblatt für angehängte land- oder forstwirtschaftliche Arbeitsgeräte (leaflet with specific instructions for hitching agricultural or forestry equipment onto the machine according to German legislation)



Attachments for SKID STEER quickhitch

The machine manufacturer has not released any attachments for this quickhitch!

NOTICE

Damage to machine due to attachments that have not been released.

- ▶ If attachments that are not released are used, conformity (stability test) in accordance with the EC machine guideline or the EN 474-3 standard must be checked and documented by an authorized service centre.
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Information

Refer to the following information sheets – [see chapter “Stability calculations for attachments from other manufacturers” on page 5-97](#) for the stability test.



Information

Machine travel on public roads with a full bucket is prohibited in the Federal Republic of Germany!



Information

Observe the following for attachments that are not certified for use on public roads in the Federal Republic of Germany:

- ▶ Remove the attachments for transport on public roads.
 - ▶ Load the attachment on a transport vehicle and transport it to the job site.
-

- If attachments that have not been released are installed, or if parts of the quickhitch or attachment are subsequently modified or replaced, the operation licence and the warranty become void.
- In addition to the Operator’s Manual, observe and instruct the operator in all other generally applicable, legal and other mandatory regulations relevant to accident prevention and environmental protection.
- Please contact your dealer if you require more information on the quickhitch and the specific attachments.

Attachments for EURO quickhitch

The machine manufacturer has not released any attachments for this quickhitch!

NOTICE

Damage to machine due to attachments that have not been released.

- ▶ If attachments that are not released are used, conformity (stability test) in accordance with the EC machine guideline or the EN 474-3 standard must be checked and documented by an authorized service centre.
-



Information

Refer to the following information sheets – [see chapter “Stability calculations for attachments from other manufacturers” on page 5-97](#) for the stability test.



Information

Machine travel on public roads with a full bucket is prohibited in the Federal Republic of Germany!



Information

Observe the following for attachments that are not certified for use on public roads in the Federal Republic of Germany:

- ▶ Remove the attachments for transport on public roads.
 - ▶ Load the attachment on a transport vehicle and transport it to the job site.
-

- If attachments that have not been released are installed, or if parts of the quickhitch or attachment are subsequently modified or replaced, the operation licence and the warranty become void.
- In addition to the Operator's Manual, observe and instruct the operator in all other generally applicable, legal and other mandatory regulations relevant to accident prevention and environmental protection.
- Please contact your dealer if you require more information on the quickhitch and the specific attachments.

Attachments for Volvo quickhitch

NOTICE

Damage to the machine due to the use of attachments that have not been released.

- ▶ Use only attachments that are released for the existing quickhitch and that are fitted with a load diagram certified for the specific attachment.
 - ▶ If other attachments are used, conformity (stability test) in accordance with the EC machine guideline or the EN 474-3 standard must be checked and documented by an authorized service centre.
-



Information

Refer to the following information sheets – [see chapter “Stability calculations for attachments from other manufacturers” on page 5-97](#) for the stability test.



Information

Machine travel on public roads with a full bucket is prohibited in the Federal Republic of Germany!



Information

Observe the following for attachments that are not certified for use on public roads in the Federal Republic of Germany:

- ▶ Remove the attachments for transport on public roads.
 - ▶ Load the attachment on a transport vehicle and transport it to the job site.
-



Information

Observe the footnotes in the table!

- If attachments that have not been released are installed, or if parts of the quickhitch or attachment are subsequently modified or replaced, the operation licence and the warranty become void.
- In addition to the Operator’s Manual, observe and instruct the operator in all other generally applicable, legal and other mandatory regulations relevant to accident prevention and environmental protection.
- Please contact your dealer if you require more information on the quickhitch and the specific attachments.



VOLVO attachments model 351-05 (overview)

**Information**

For reasons of stability, the attachments listed in the table below are **not** certified for installation on machine model 351-05L (extended loader unit)!

Attachment	Machine model	Kramer order no.	Volvo order no.	Dimension mm (in)	Capacity ¹ m ³ (ft ³)	Material density
Standard bucket	351-05S	1000335675	–	1900 (74.80) with RZ	0,75 / 0,9 (24.72) / (31.78)	≤ p = 1.8 t/m ³ (112 lb/ft ³)
		1000325052	–	1900 (74.80) without RZ		
Multipurpose bucket ²	351-05S	1000335570	–	1800 (70.86) with RZ	0,5 / 0,7 (17.65) / (24.72)	≤ p = 1.8 (112 lb/ft ³)
		1000328984	–	1800 (70.86) without RZ		
		1000306515	CL 11391144	1900 (74.80) with RZ	–	
Pallet forks ³	351-05S	1000308375	Tines CL 2890381 + Mount CL 2812454	1200 (44.10) (fork arm length)	–	–

1. Capacity struck according to ISO 7546/capacity heaped

2. See the Operator's Manual of the attachment for putting the attachment into operation and using it

3. Not approved for machine travel on public roads (Federal Republic of Germany)

For more information on attachments, see:

Data sheet for attachments §30 para. 10/11/12 StVZO (Federal Republic of Germany)

Merkblatt für angehängte land- oder forstwirtschaftliche Arbeitsgeräte (leaflet with specific instructions for hitching agricultural or forestry equipment onto the machine according to German legislation)

VOLVO attachments model 351-06 (overview)

**Information**

For reasons of stability, the attachments listed in the table below are **not** certified for installation on machine model 351-06L (extended loader unit)!

Attachment	Machine model	Kramer order no.	Volvo order no.	Dimension mm (in)	Capacity ¹ m ³ (ft ³)	Material density
Standard bucket	351-06S	1000330673	–	2050 (80.70) with RZ	0,8 / 0,95 (28.25) / (33.54)	≤ p = 1.8 t/m ³ (112 lb/ft ³)
		1000330458	–	2050 (80.70) without RZ		
Multipurpose bucket ²	351-06S	1000306515	CL 11391144	1900 (74.80) with RZ	–	≤ p = 1.8 (112 lb/ft ³)
		1000335005	–	1900 (74.80) with RZ	0,6 / 0,8 (21.88) / (28.25)	
		1000328996	–	1900 (74.80) without RZ		
Pallet forks ³	351-06S	1000308375	Tines CL 2890381 + Mount CL 2812454	1200 (44.10) (fork arm length)	–	–

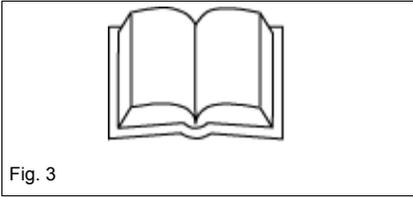
1. Capacity struck according to ISO 7546/capacity heaped
2. See the Operator's Manual of the attachment for putting the attachment into operation and using it
3. Not approved for machine travel on public roads (Federal Republic of Germany)

For more information on attachments, see:

Data sheet for attachments §30 para. 10/11/12 StVZO (Federal Republic of Germany)

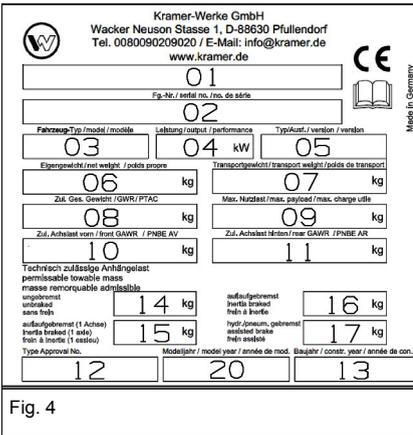
Merkblatt für angehängte land- oder forstwirtschaftliche Arbeitsgeräte (leaflet with specific instructions for hitching agricultural or forestry equipment onto the machine according to German legislation)

Symbols



The “Book” symbol on the signs and type labels indicates that the Operator’s Manual contains more detailed information and explanations.

Type label



The type label is located at the front right of the machine frame (on one side of the loader unit bulkhead).

The CE mark on the type label means that the machine meets the requirements of the Machine Directive 2006/42 EC within the European Community and that the conformity procedure has been performed.

Example: model 351-04S (8075 / 8075L)

1. Machine designation	Wheel loader
2. Serial no.	351 04 xxxx
3. Machine model	352
4. Output kW (hp)	35 (46.9)
5. Machine model/version	351-04S or 351-04L
6. Dead weight (kg)	–
7. Transport weight (kg)	–
8. Permissible maximum weight (kg)	5500
9. Maximum payload (kg)	–
10. Front axle weight rating (kg)	3600
11. Rear gross axle weight rating (kg)	3600
12. Check number of EC approval (only for machines with agricultural and forestry licence)	e1*2003/37*xxxx*xx
13. Year of construction	2016
14. Gross unbraked trailer weight rating ¹ (kg)	–
15. Gross trailer weight rating (kg) overrun brake (1 axle)	3500
16. Gross trailer weight rating overrun brake (kg)	–
17. Gross trailer weight rating (kg) (hydraulically/pneumatically braked)	–
20. Model year	2016

Other information – see chapter 9 “Technical data” on page 9-1

1. Trailer coupling option

Serial number

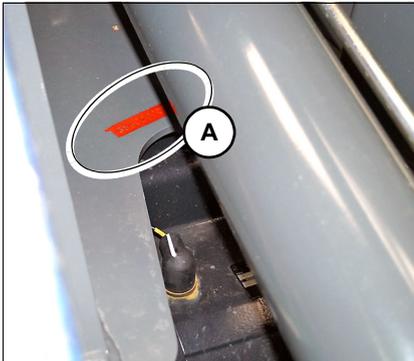


Fig. 5

Serial number

The serial number is stamped on machine frame **A**.
It is also located on the type label.

Cabin number

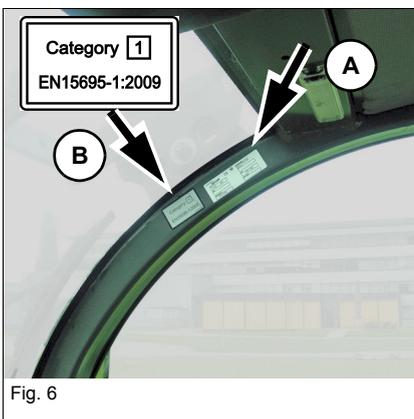


Fig. 6

Cabin number

The cabin type label (**A**) is located on the upper right in travel direction on the beam.
Information label (**B**) specifies that the cabin does not protect against substances that pose a risk to health and that therefore the machine is not authorized for work operation with sprays either.

EC cabin approval mark (agriculture and forestry certification option)

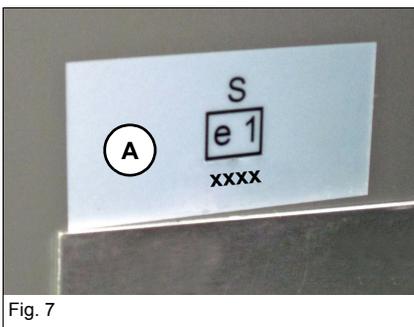


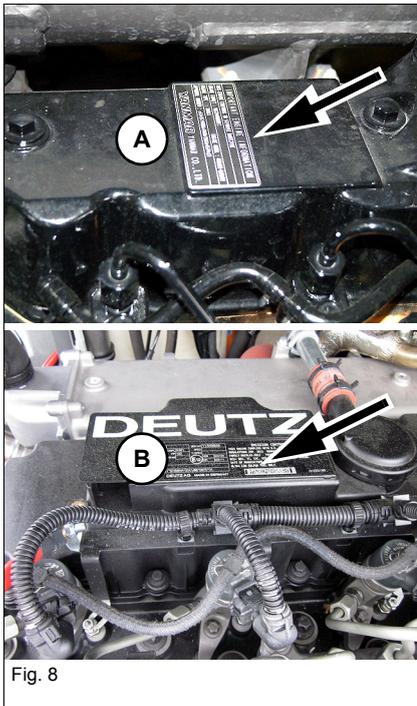
Fig. 7

EC cabin approval mark (example)

Identification of cabin for machines with agricultural or forestry registration for use in the European Community.

- e1 = EC approval mark.
- xxxx = approval number, also included in machine documents (National Type Approval [Germany] or Data Confirmation [Germany]).

Engine number

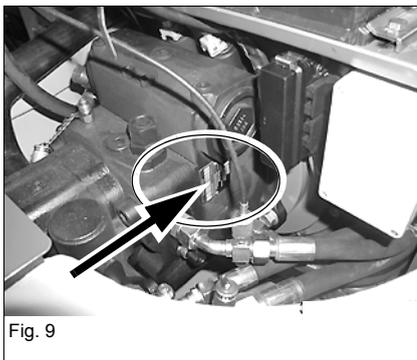


The type label (arrow) is located on the cylinder-head cover (engine).

A YANMAR – for model 351-04S/L

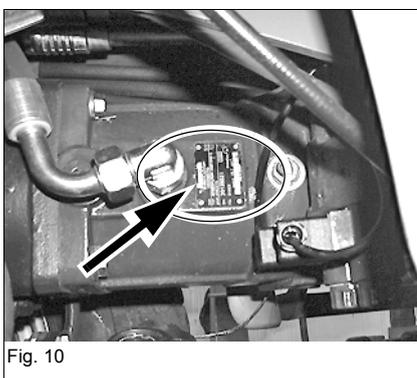
B DEUTZ – for models 351-05S/L and 351-06S/L.

Variable displacement pump number



The type label (arrow) is located on the housing of the variable displacement pump (drive, next to where the pump is installed on the diesel engine).

Variable displacement motor number (20 km/h / 12.43 mph)



The type label (arrow) is located on the variable displacement motor (rear axle drive), on the right in travel direction.

High speed gearbox number (option)



Fig. 11

The type label (arrow) is located on the gearbox housing.

Rear axle number

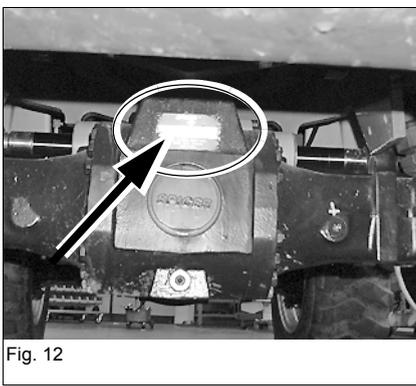


Fig. 12

The type label (arrow) is located on the upper side of the differential housing, at the rear.

Front axle number

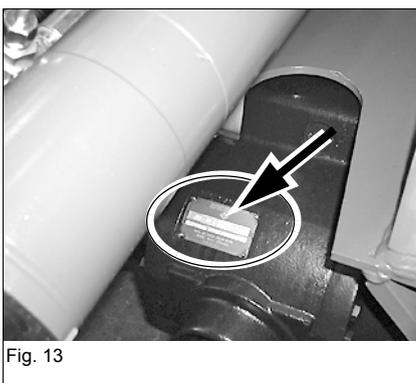


Fig. 13

The type label (arrow) is located on the upper side of the differential housing, at the front.

Warning labels



Fig. 14



Fig. 15

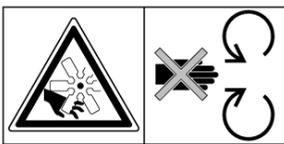


Fig. 16



Fig. 17: Brake fluid label



Fig. 18

! WARNING

Accident hazard due to damaged or missing warning and information labels!

Causes serious injury or death.

- ▶ Immediately replace damaged or missing warning and information labels by new ones.
- ▶ In particular this applies to information labels referring to hazards!

Warning label: Cabin eye hooks

The eye hooks on the cabin are for removing the cabin only and may **not** be used for crane-lifting the machine – see *“Crane-lifting the machine” on page 6-6* for further details.

Located at Cabin roof (4x).

Warning label: General indication of danger

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

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

Warning label: Danger of shearing

Caution! Do not touch any turning parts!

Perform inspections and maintenance only at diesel engine standstill!

Located near the engine cooling (V-belt protection) and near the handle on the engine cover.

Brake fluid label!

A Caution! Do not add any water!

B Use only LHM brake fluids!

- ▶ – see chapter *“Checking/adding brake fluid” on page 7-61* and *Overview of lubricants on page 7-12*

Located on the trim next to the brake-fluid reservoir (cabin access on the left).

Read and understand warning label of Operator's Manual!

Caution! Read and understand the Operator's Manual before starting up, servicing or repairing the machine!

Located on the pillar on the right inside the cabin.



Fig. 19

Warning label: Remove the starting key!

Caution! Remove ignition key before performing inspections and maintenance on the machine.

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

Located on the pillar on the right inside the cabin.

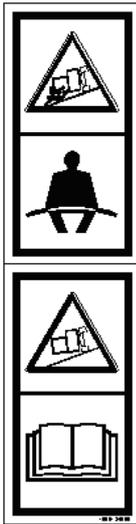


Fig. 20

Warning label: Seat belt and machine stability!

- Operate the machine only from the operator seat.
- Fasten your seat belt before operating the machine.
- Ensure machine stability.
- Read and understand the Operator's Manual.

Located on the pillar on the right inside the cabin.



Fig. 21

Warning label: No transport of persons!

Warning! Do not raise or transport persons on the machine, in the bucket or on the pallet forks.

Located inside the cabin, on right side of front window.



Fig. 22

Warning label: No transport of persons!

Warning! Do not transport accompanying persons in the cabin.

Located on the pillar on the right inside the cabin.



Fig. 23

Warning label: Reservoir 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.

Fixed in the engine compartment on the radiator.



Fig. 24

Warning label: Burn hazard!

Caution! Do not touch.

- Wear protective gloves and clothing during maintenance.

Located on the left on the rear wall of the engine compartment, near the exhaust silencer, and near the handle on the engine cover.

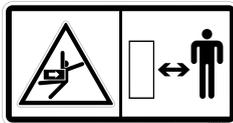


Fig. 25

Swivelling range warning label!

Warning! Injury hazard!

Stay clear of the machine's swivelling range during operation!

Located inside the cabin, above the rear window.

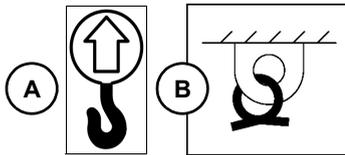
Information labels

Fig. 26

Tie-down point labels for loading and tying down the machine

Eye hooks for tying down the machine **B** during transport, and eye hooks **A** for loading the machine.

- – see chapter “Loading the machine on a transport vehicle” on page 6-4
- – see chapter “Crane-lifting the machine” on page 6-6

Located on left and right of machine frame above the front axle attachment and at the rear under the machine.



Fig. 27

Information label: Maximum design-specific speed!

Design-specific max. machine speed 20 km/h (30 / 40 km/h option)

Located at the rear of the machine and on the left/right of the counterweight.

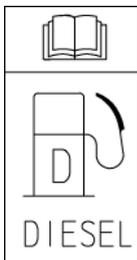


Fig. 28

Information label: Fuel filler opening

Use only the diesel fuels indicated!

- DIN EN 590 (EU) / ASTM D975-94 (USA).
- Do not use diesel fuel with additives.

If other fuels are used, warranty rights shall not apply in case of diesel engine damage (guarantee) – see chapter 7.3 “Fluids and lubricants” on page 7-12!

Located near the filler inlet of the fuel tank (left side of machine).

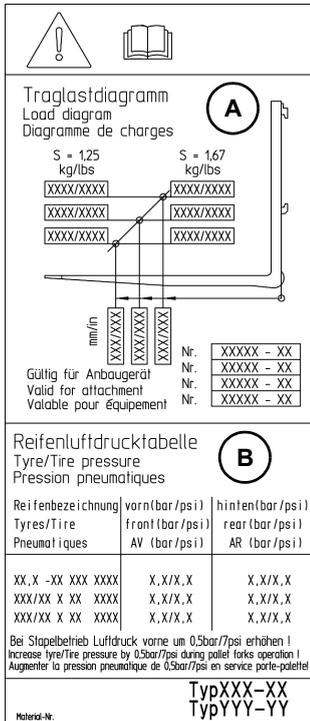


Fig. 29

Load diagram label (A)

Load diagram with maximum payload indications for pallet forks applications – see chapter 9.14 “Payload/lift capacity/stability” on page 9-21.

Information

The load diagram (on the left on the front window) is only valid for applications with the released pallet forks and corresponding tyre size.

The load diagram also applies to released buckets if the specified capacities and material densities are observed.

Pay attention to the specific load diagrams of other attachments used – see chapter “Fitting attachments from other manufacturers (option)” on page 5-96!

Tyre pressure table label (B)

List of certified types of tires with mandatory tire inflation pressures.

Located inside the cabin, on left side of front window.

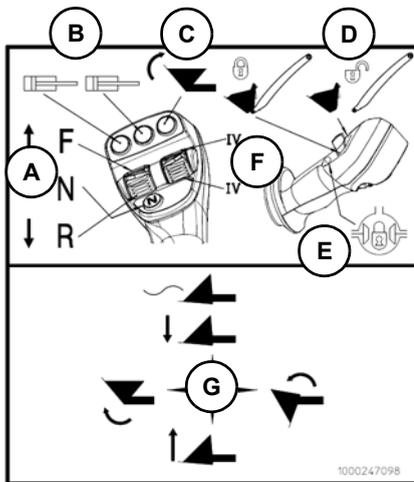


Fig. 30

Information label for control lever (joystick) and 3rd control circuit control lever with mechanical lock.

Position: front right trim

- A Travel direction: (F) forward/(R) reverse and (N) neutral position
- B Additional control circuit with additional functions (option)
- C Automatic bucket repositioning (option) or front socket power supply
- D Locking/unlocking an attachment fitted on the quickhitch
- E Operation: differential lock (option)
- F Operation of 4th control circuit (option)
- G Loader unit control pattern: raise/lower and tilt in/out (optional float position)

For more information on loader unit operation

– see chapter 5.9 “Operating hydraulics” on page 5-35.

Located on the right on the side window, next to the control lever (joystick).

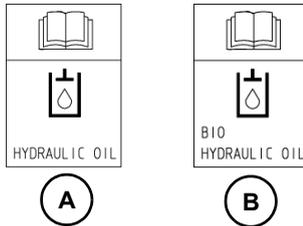


Fig. 31

Information label: Filler opening for hydraulic oil!

- A** Hydraulic oil
- B** Biodegradable hydraulic oil

Located on the rear wall of the engine compartment, on the left near the filler inlet (hydraulic oil reservoir).

Other information – see chapter “Important information on operation with biodegradable oils” on page 7-15.

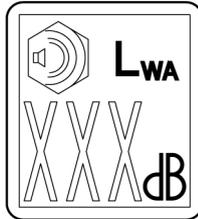


Fig. 32

Noise level label

Noise levels produced by the machine.

LW_a = sound power level

Other information – see chapter 9.11 “Noise emissions” on page 9-19.

Affixed on the rear window.



Fig. 33

Emergency exit label!

Indicates the emergency exit in case of an emergency!

– see chapter “Emergency exit” on page 4-5

Located on the door handle on the right.

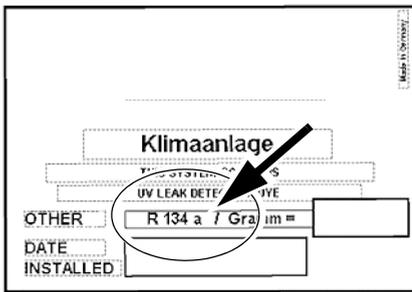


Fig. 34

Information label for air conditioning system refill (option)

Use only the refrigerants (see arrow) indicated on the label for refilling the air conditioning system.

Located inside the cabin.

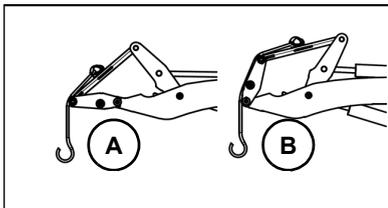


Fig. 35

Information label: Load hook diagram on quickhitch (option)

Maximum load-bearing capacity

- A** Load indications = extended loader unit and quickhitch.
- B** Load indications = extended loader unit and quickhitch tilted in.
 - Load indications – see chapter *“Payload with load hook on KRAMER quickhitch (option)”* on page 9-25 and *“Payload with load hook on VOLVO quickhitch (option)”* on page 9-25.

Located inside the cabin, on left side of front window.

4 Putting into operation

4.1 Cabin/control stand

Important information on the cabin

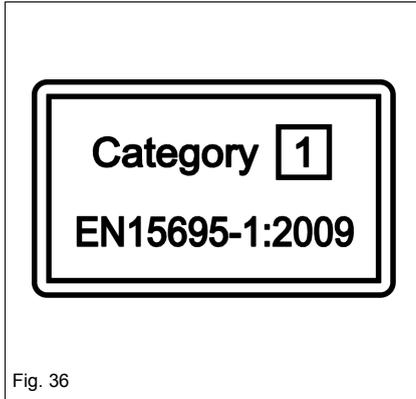


Fig. 36

- According to EN 15695-1:2009, the machine cabin does not protect against substances that pose a risk to health and is therefore not authorized for spraying applications.
- Only put the machine into operation if all cabin windows are free of dirt, snow and ice.
- In forestry applications, the standard cabin does not offer enough protection against falling trees or branches, or objects penetrating into the cabin. Therefore, the machine has not been released for forestry applications.
- A cabin damaged (deformed) in an accident may not be repaired but must be replaced by an authorized service center.
- Welding, removing or drilling through elements of the cabin is prohibited since this work modifies the cabin. Therefore it does not correspond to the certification any longer.



Information

For the operator's safety, the vehicle can optionally be outfitted with a seat contact switch. In this case:

- ▶ The diesel engine will not start unless the operator is seated on the seat.
- ▶ The drive switches off after 5 seconds if the load on the operator seat is reduced when driving the machine.

EC cabin approval mark (agriculture and forestry certification option)

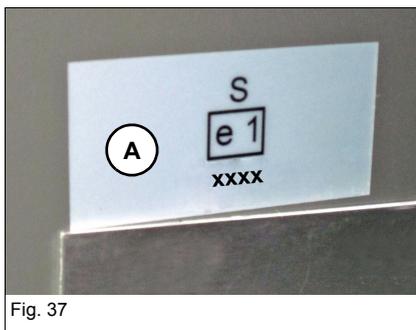


Fig. 37

Machines with agricultural or forestry certification for use in the European Community have an EC approval number **A** in accordance with the 2009/75 EC Directives.

- e1 = EC approval mark.
- xxxx = approval number, also included in machine documents.

Safety instructions regarding accessing and leaving the cabin

CAUTION

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 machine as you enter and leave it.
-



Fig. 38

Information

Cabin access on the left = main access and exit!

Use the cabin access on the right in an emergency only (see the emergency exit label)!

Secure the control lever (joystick) and fold back the control lever base before leaving the cabin by the right door!

Protective screens for front window and/or main lights (option)

The wheel loader can be fitted with protective screens on the front window and/or the main lights as a protection against falling material.

CAUTION

Accident hazard due to restricted field of vision if a protective screen is installed!

Can cause injury.

- ▶ Removing the protective screens before performing machine travel on public roads.
 - ▶ Protective screens may be used only for work operation.
 - ▶ The protective screens have no National Type Approval (Germany) or data confirmation (Germany), and no licencing according to StVZO (German road traffic regulations).
-

Opening and closing the cabin door (left/right)

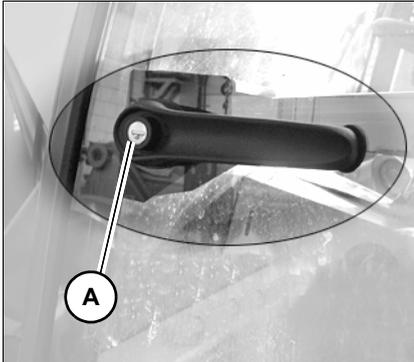


Fig. 39

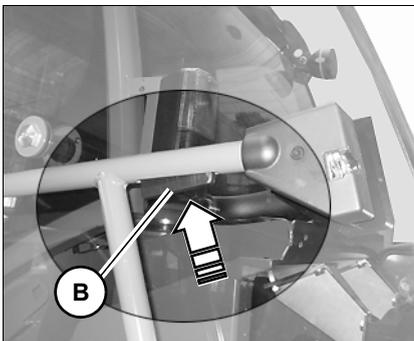


Fig. 40

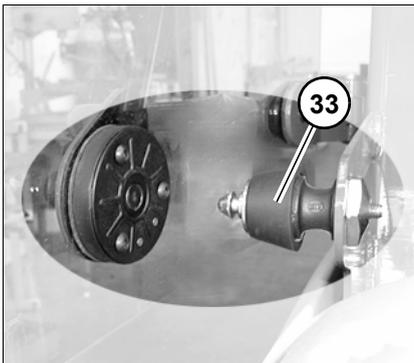


Fig. 41

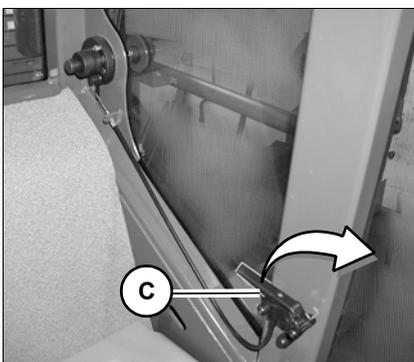


Fig. 42

CAUTION

Crushing hazard due to unlocked cabin door!

The door can cause crushing when it is being closed.

- ▶ Lock the door or secure it in the door arrester before moving the machine.

Opening the door from outside

1. Unlock the door with the ignition key (turn to the right).
2. Press door button **A**.

Closing the door from outside

1. Lock the door with the ignition key (turn to the left).

Opening the door from inside

1. Push handle **B** up.

Information

The machine has a one-key system. All the locks (cabin, ignition lock, engine cover, fuel tank and tool kit) are opened and locked with the key of the machine.

Securing the door in the open position

1. Open the door completely and let it lock into place in arrester **33**.

Information

Lubricate the door arrester regularly!

Releasing the door out of the arrester

1. Press arrester lever **C** forward.
 - ➡ The door is released from the lock by spring action.
2. Closing the door.

Opening the right door to a gap

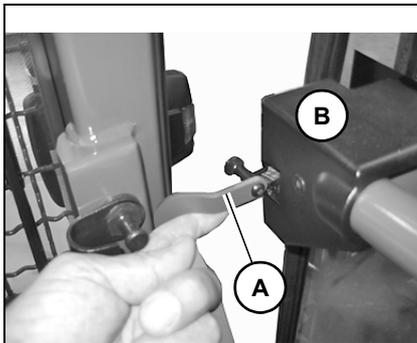


Fig. 43

The door on the right can be opened to a gap and secured with the arrester to improve cabin ventilation!

1. Safely engage lever **A** in door lock **B**.

Folding back the control lever base

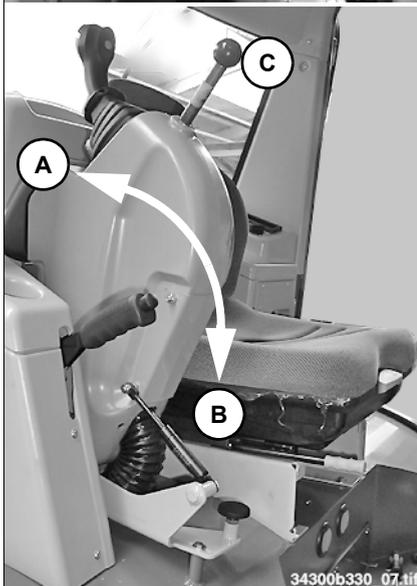


Fig. 44: Control lever base

Enter and leave the cabin only by the left door as a rule. Use the access on the right in an emergency only!

WARNING

Accident hazard if the control lever base is folded down too early

Can cause serious injury or death due to unintentional movement of machine or loader unit

- ▶ Stopping the machine.
- ▶ Lower the loader unit to the ground.
- ▶ Put on parking brake.
- ▶ Stop the engine and remove the starting key.
- ▶ Move control lever **10** (joystick) back and forth several times to release the pressure.
- ▶ Securing the control lever (joystick).

NOTICE

The control lever base is damaged if the load on it is too heavy.

- ▶ Do **not** use handle **D** to ease your entrance into the cabin.

1. Fully raise the control lever base to position **A** with handle **C**.
 - The gas strut keeps the control lever base in the top position.
2. Fold the control lever base down to position **B** after entering or leaving the cabin.
 - The gas strut keeps the control lever base in the lower position.

Emergency exit



Information on emergency exit

Information

Cabin access on the left = main access and exit!

Use the cabin access on the right in an emergency only (see the emergency exit label)!

Secure the control lever (joystick) and fold back the control lever base before leaving the cabin by the right door – see *“Folding back the control lever base” on page 4-4!*

Machines certified for agriculture and forestry (option) are equipped with emergency hammers.

In an emergency, a window can be smashed with the emergency hammer and used as an emergency exit.

The emergency hammer is located to the right of the parking brake.

Using the emergency exit



CAUTION

Smashing a window pane sends glass splinters flying around – injury hazard!

- ▶ Protect face and eyes before smashing a window pane.
 - ▶ If possible, ask for help before smashing a window pane.
-

1. Stop the diesel engine.
 2. Switch off all electric consumers and remove the ignition key.
 3. If possible, ask for help.
 4. Smash the window with the emergency hammer and carefully exit the cabin.
-

Information

Before putting the machine back into operation, put the emergency hammer back in place and seal it!

Have the damaged window replaced by an authorized service centre!

Operator seat

 **WARNING**

Accident hazard when adjusting the operator seat during machine travel!

Can cause serious injury or death.

- ▶ Adjust the operator seat only at machine standstill.
 - ▶ Lock the seat adjustment lever safely into place.
-

 **CAUTION**

Damage to health can result from an incorrectly adjusted or malfunctioning operator seat!

Can cause injury to spinal column!

- ▶ Adjust the operator seat to the operator's weight before putting the machine into operation or when changing operators.
 - ▶ In order to avoid injury, do not store any objects in the suspension travel range of the operator seat.
 - ▶ Do not modify the operator seat (for example by retrofitting parts other than original).
 - ▶ Contact an authorized service centre immediately if the seat does not function as usual (for example the seat suspension).
-

 **Information**

For the operator's safety, the vehicle can optionally be outfitted with a seat contact switch. In this case:

- ▶ The diesel engine will not start unless the operator is seated on the seat.
 - ▶ The drive switches off after 5 seconds if the load on the operator seat is reduced when driving the machine.
-

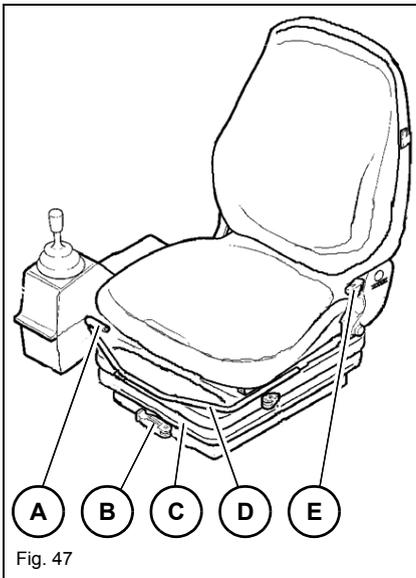


Fig. 47

Seat adjustment (overview)

The operator seat can be set to the following positions:

- A** Horizontal adjustment without control lever base
- B** Weight adjustment
- C** Weight indicator
- D** Horizontal adjustment with control lever base
- E** Backrest adjustment

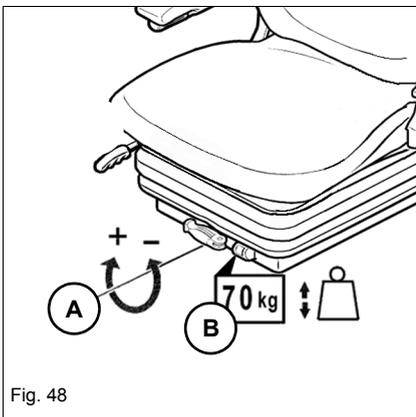


Fig. 48

Weight adjustment

1. Sit down on the operator seat.
2. Adjusting the weight.

Use lever **A** to adjust the seat suspension to the operator's weight. The weight indicator **B** shows the set operator weight [kg].

Weight	Adjustment
Higher operator weight	Turn handle A clockwise until reaching the weight in indicator B (10 kg / 22 lb per notch).
Lower operator weight	Turn handle A anticlockwise until reaching the weight in indicator B (10 kg / 22 lb per notch).

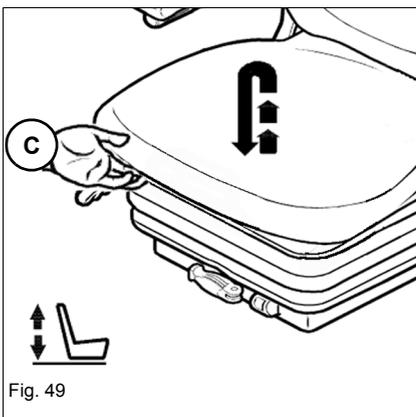
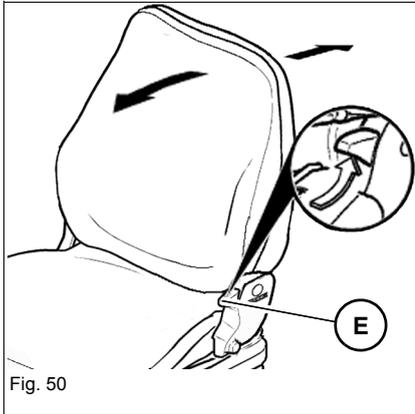


Fig. 49

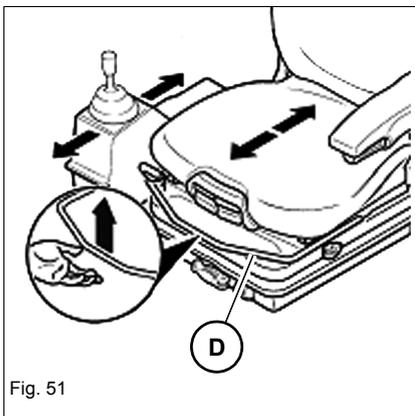
Height adjustment

1. Raise or lower the operator seat as required until it engages with an audible click.



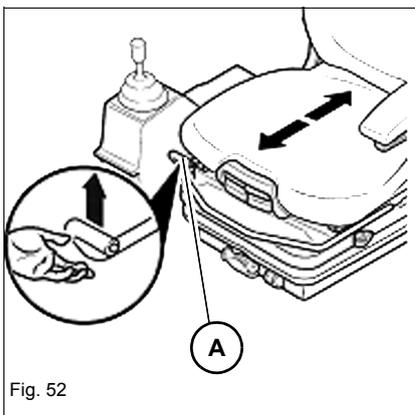
Backrest adjustment

1. Sit down on the operator seat.
2. Pull lever **E** upward and at the same time, lean back to push the backrest into the required position.
3. Allow lever **E** to engage.



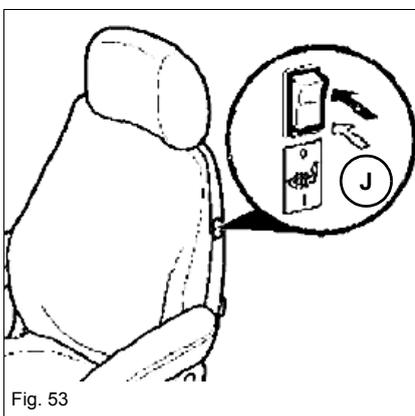
Horizontal adjustment with control lever base

1. Sit down on the operator seat.
2. Pull lever **D** up and at the same time, move the seat forward or backward.
3. Allow lever **D** to engage in required position.



Horizontal adjustment without control lever base

1. Sit down on the operator seat.
2. Pull lever **A** up and at the same time, move the operator seat forward or backward.
3. Allow lever **A** to engage in required position.



Heated seat (option)

The heated seat is switched on with switch **J**.

Air-suspension seat (option)

Before putting the machine into operation, check the switches on the operator seat for correct function.

CAUTION

Accident hazard in case of malfunctioning air-suspension seat!

Can cause injury.

- ▶ Do not put a machine into operation with a malfunctioning air-suspension seat.
- ▶ Have the operator seat repaired by an authorized service centre.



Fig. 54

The air-suspension seat height can be adjusted continuously.

There are two settings for the automatic weight adjustment. The second setting allows for an individual height adjustment.

- Pull or press lever **K**.
 - Seat height changes.
 - Upon reaching the upper or lower limit, the height is automatically adjusted to ensure a minimum spring travel.

NOTICE

Do not run the air compressor for more than 1 minute to avoid damage to it!

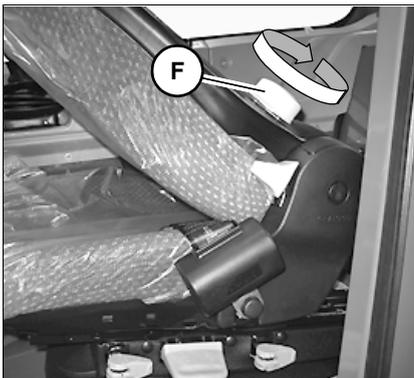


Fig. 55

Lumbar support adjustment (option)

Turn hand wheel **F** to the left or right to adjust the height and the intensity of the arch in the backrest padding.

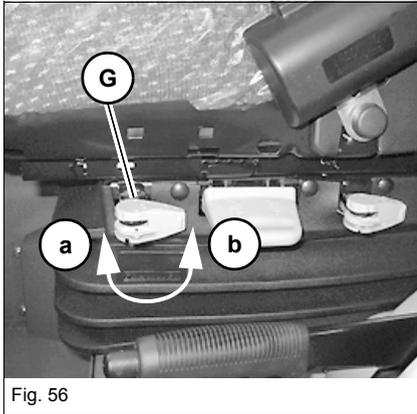


Fig. 56

Adjustment of horizontal suspension (option)

Switching on the horizontal suspension with lever **G** may be recommendable under certain conditions (for example driving with a trailer).

This enables the operator seat to dampen shocks in travel direction.

- Position **a** = horizontal suspension **ON**
- Position **b** = horizontal suspension **OFF**

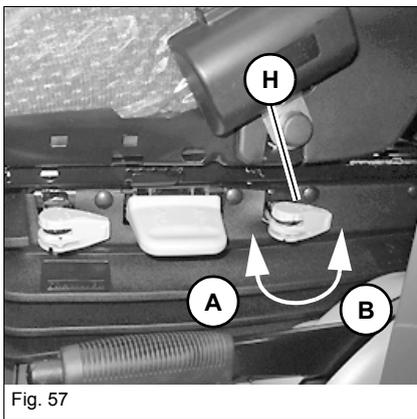


Fig. 57

Adjustable seat suspension damper (option)

The operator can adjust the seat suspension to his own requirements and to different work conditions.

Four levels ranging from **soft** to **hard** are possible.

- Lever **H** in position **A** = **soft**

Lever **H** in position **B** = **hard**

Fire extinguisher (option)



Fig. 58

The fire extinguisher is **not** included in the machine's standard equipment (option).

Subsequent installation of the fire extinguisher must be performed by an authorized service centre.

- It is installed on the right on the seat pan, below the control lever base.
- Operate the fire extinguisher according to the instructions printed on the fire extinguisher.



Information

In order to ensure the full serviceability of the fire extinguisher:

- ▶ Have the fire extinguisher checked at regular intervals and refilled, see inspection tag.
 - ▶ Remove the fire extinguisher from the cabin only in an emergency.
 - ▶ After the fire extinguisher has been used: have it filled by an authorized service centre, or replace it with a new one.
-

Seat belt (lap belt)

 **WARNING**

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

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

- ▶ Fasten the seat belt before machine operation!
 - ▶ Do not fasten a twisted seat belt!
 - ▶ Seat belt must run over the hips – not over the stomach – and must always be applied tightly!
 - ▶ Do not place the seat belt over hard, edged or fragile items in your clothes!
-

 **WARNING**

Accident 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 replaced by an authorized service centre.
 - ▶ 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.
-

 **WARNING**

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).
-

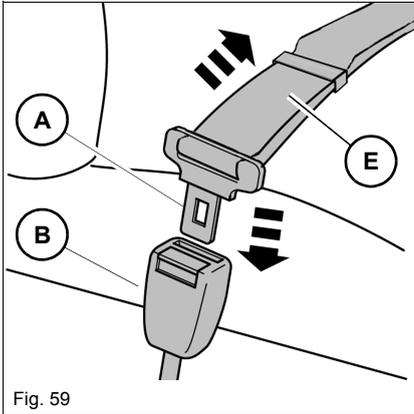


Fig. 59

Fastening the seat belt

1. Sit down on the operator seat.
2. Hold seat belt **E** at buckle latch **A** and run it steadily over the hips to buckle **B**.
3. Insert buckle latch **A** into buckle **B** until it engages audibly (*pull test*).
4. Tighten the seat belt by pulling at its end.
 - ➔ The seat belt must not be twisted and must run tightly over the hips!

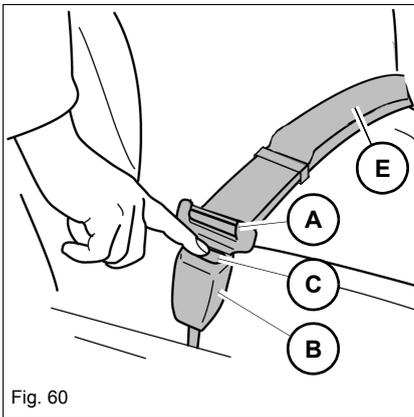


Fig. 60

Unfastening the seat belt

1. Hold seat belt **E**.
2. Press red button **C** on buckle **B**.
 - ➔ Latch **A** is released from buckle **B**.
3. Slowly return the seat belt to the retractor.

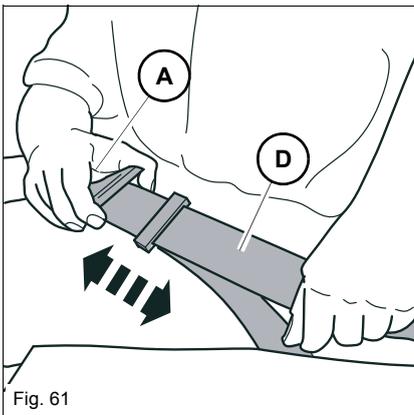


Fig. 61

Longer/shorter seat belt adjustment

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

Information

When pulled slowly, the automatic seat belt offers full freedom of movement. It locks however during abrupt braking. The automatic seat belt may also lock when passing through potholes or uneven terrain.

Engine cover lock

! **CAUTION**

Injury hazard 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.

Opening the engine cover:

1. Stop the engine and remove the starting key.
2. Unlock lock **A** with the starting key.
3. Press lock **A**.
 - The engine cover is raised over the gas pressure absorber.

Closing the engine cover:

1. Firmly press down the engine cover until lock **A** engages with an audible click.
2. Lock the engine cover with the ignition key.

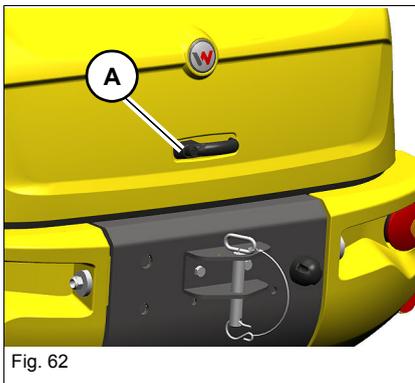


Fig. 62

Battery master switch

The battery master switch separates the entire electrical system from the battery and prevents unauthorized engine start.

Battery master switch **A** is located in the engine compartment on the right next to the engine oil filter.

NOTICE

Interrupting the electrical circuit early can cause damage to the diesel engine and auxiliary heater (option).

- ▶ Never turn the battery master switch out of the notch with the engine running.
- ▶ After stopping the engine, wait at least 30 seconds (a minimum 2 minutes if the machine is equipped with an auxiliary heater).
- ▶ Follow the correct order (see label)!

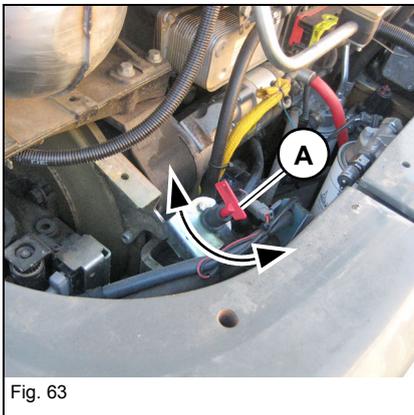


Fig. 63

Switch off the battery master switch

1. Stop the diesel engine.
2. Wait at least 30 seconds (a minimum 2 minutes if the machine is equipped with an auxiliary heating).
3. Turn key **A** out of the notched position.
 - ➔ The entire electrical system is out of operation.

Switch on the battery master switch

1. Insert the key in the battery master switch and turn it to the notched position.
 - ➔ The entire electrical system is in operation.

Information

An external auxiliary heater (option) cannot be operated if the battery master switch is removed.

Key-based immobilizer (option)

The immobilizer is integrated in the ignition lock and can only be disabled with the blue ignition keys!

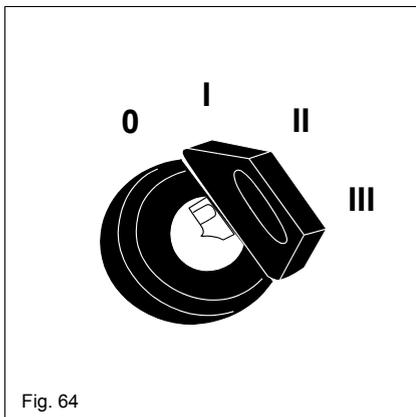
Scope of delivery:

- Immobilizer installed in the machine
- 2 x blue ignition keys (coded)
- 1 x red master key (for coding blue keys)

Coding the ignition keys

New personal keys are coded with the master key (red). This is why it must be carefully stored outside the machine. The master key is only used for coding new keys, and cannot be used for disabling the immobilizer.

1. Switch on the side marker lights – *see chapter “Parking lights/low beam” on page 5-25.*
2. Insert the master key in the ignition lock and turn it to position (2).
3. Turn and remove the master key from position (0) within 5 seconds.
4. Insert the key to be coded into the ignition lock, turn it to position (2) and leave it in this position for at least 1 second.
 - The key is registered as a valid key.
5. Remove the key.
 - Step 4 can now be repeated for other keys to be coded.
 - Coding can be performed for a maximum 10 keys.
 - Coding is automatically stopped if no other key is detected within 15 seconds.



Information

The immobilizer has only one master key!

- ▶ The immobilizer must be replaced by an authorized service center if the master key is lost.

Enabling the immobilizer

1. Apply the parking brake – *see chapter “Parking brake (hand brake)” on page 5-16.*
2. Stop the engine – *see “Stopping the engine” on page 4-57.*
3. Remove the starting key (blue).
 - The immobilizer is enabled in 30 seconds.



Information

The immobilizer remains disabled if the ignition key (blue) is **not** removed from the ignition lock!

Disabling the immobilizer

- Insert the ignition key into the ignition lock.
 - ➔ The immobilizer is disabled after 5 seconds.
- Start the engine – see [“Start engine for model 351-04S / 351-04L” on page 4-54.](#)
 - ➔ The immobilizer remains disabled as long as the engine runs.

Deleting coded keys

Deleting coded keys is necessary whenever a key is lost.

1. Switch on the side marker lights – see [chapter “Parking lights/low beam” on page 5-25.](#)
2. Insert the master key (red) into the ignition lock, turn it to position (2) and leave it in this position for at least 20 seconds.
 - ➔ All coded keys are deleted and can be re-coded – see [“Coding the ignition keys” on page 4-16.](#)



Information

All coded keys are deleted.

The code of the master key (red) is retained.

Safety functions

- The immobilizer remains enabled for 15 minutes and does not accept any valid keys if more than 5 keys with different invalid codes are inserted and turned in the ignition lock within 1 minute.
- This function avoids ‘finding’ the correct key by chance by trying different keys.
- Valid keys are accepted only after 15 minutes and after the position (0) of the ignition lock has been detected. This avoids testing keys without actuating the mechanical ignition lock, for example by moving the ignition lock to position (2) by force.
- Interruptions of the supply line or other control lines do not disable the immobilizer or delete data (for example data codes).
- All important data is saved in a non-volatile memory.

Immobilizer with code input (option)

Keypad for entering codes (overview)

The immobilizer is enabled or disabled with “personal” codes entered via the keypad. Two codes are available:

- The existing unchangeable six-digit main code for disabling the immobilizer, for entering a personal code or for changing the personal code.
- The four, five or six-digit personal code is used for disabling the immobilizer and is entered by the operator.



Information

We recommend using the personal code for disabling the system. Keep the main code in a safe place.

NOTICE

The immobilizer can be damaged by heat and humidity.

- ▶ Protect the keypad and the control unit from heat and humidity.

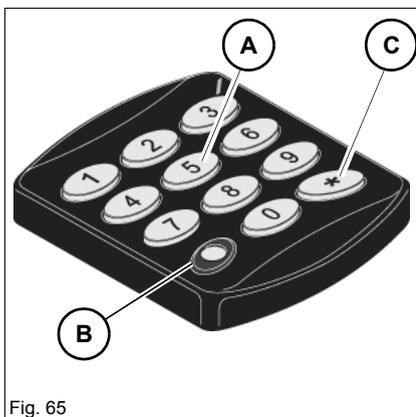


Fig. 65

Keypad (overview)

A	10 numeric keys for entering the codes
B	LED (red indicator light)
C	(*) key for confirming the code that has been entered

- The keypad emits a sound to indicate operations.
Example: A confirmation signal sounds when hitting a key.
- The keypad illuminates whenever one of the keys is pressed.
- The keypad flashes to indicate specific system statuses.

Entering/changing the personal code

1. Disable the immobilizer. To do this: enter the main code (6 digits) and confirm it with the (*) key.
 2. Turn the ignition key to position 1.
 - ➔ The LED illuminates for 2 seconds.
 3. Enter the 4, 5 or 6-digit new personal code and confirm with the (*) key within 20 seconds after the LED has gone out.
 - ➔ The LED flashes briefly.
 4. Enter the new personal code again and confirm it with the (*) key.
 - ➔ LED flashes twice briefly, then illuminates for 2 seconds.
 5. Turn the ignition key to the ZERO position and remove it as soon as the LED goes out.
 - ➔ The new personal code is now set and can be used for disabling the immobilizer.
-



Information

The personal code must be entered correctly twice consecutively otherwise an error is indicated by means of a single flashing of the LED:

- Codes consisting of 3 and less, or of more than 6 digits are ignored by the system.
 - Simple codes (with identical or consecutive digits, for example 1, 2, 3, 4) are rejected by the system with four short acoustic signals.
 - Entering a new personal codes replaces the previous code. A code can be changed any time if the main code is known.
-

Enabling the immobilizer

1. Stop the engine.
2. Remove the starting key.
 - ➔ The immobilizer is automatically enabled.
 - ➔ The LED flashes.



Disabling the immobilizer

1. Enter the personal code or the main code (6 digits) and confirm with the (*) key.

- 2 long acoustic signals and long LED flashing.
- LED OFF = immobilizer is disabled.
- Diesel engine can be started.

If a wrong code has been entered:

- 4 short acoustic signals, flashing LED = wrong code.
- Diesel engine cannot be started.

2. Re-enter the code.

3. Turn the ignition key and start the engine before the LED flashes again (30 seconds).



Information

The keypad is blocked for 5 minutes and no codes can be entered if the wrong code is entered four times consecutively.

- Enter the code after 5 minutes.
- The keyboard does not light up for the duration of the lock; It lights up briefly every 4 seconds, and an acoustic signal sounds.
- Press the (*) key after every code.
- The LED illuminates briefly when turning the ignition key to the engine start position.



Information

If power supply is interrupted with the immobilizer enabled, short acoustic signals sound when the keypad is switched on.

In this case, wait until the acoustic signals are no longer given. The immobilizer can then be disabled with the personal or main code.

Putting the immobilizer out of operation

We recommend putting the immobilizer out of operation, for example if the machine has to stay in a service centre or if the machine does not require any protection. This avoids having to communicate the code.

1. Disable the system by entering the personal or main code and by confirming with the (*) key.
 2. Turn the ignition key to position 1.
 - ➔ The LED illuminates for 2 seconds.
 3. As soon as the LED goes out, press the (*) key for about 2 seconds until a short acoustic signal, followed by two further signals, sounds.
 - ➔ The LED now flashes very slowly, and the keypad is disabled.
 4. Turn the ignition key to the zero position and remove it.
 - ➔ The engine can be started without entering the code. The system is out of service even if electric power is interrupted.
-



Information

If the system is out of operation, the LED flashes slowly even if the ignition key is in position 1.

Entering the personal or main code does not have the effect of putting the system back into operation again (the acoustic signals for confirmation are still given). See the following procedure ("Putting the immobilizer back into operation again") to leave the out-of-operation status again.

Putting the immobilizer back into operation again

1. Turn the ignition key to position (0).
2. Press the (*) key 2 seconds until two short acoustic signals sound.
3. The system is now re-activated; The code has to be entered again to start the engine.

Hydraulic oil preheating (option)

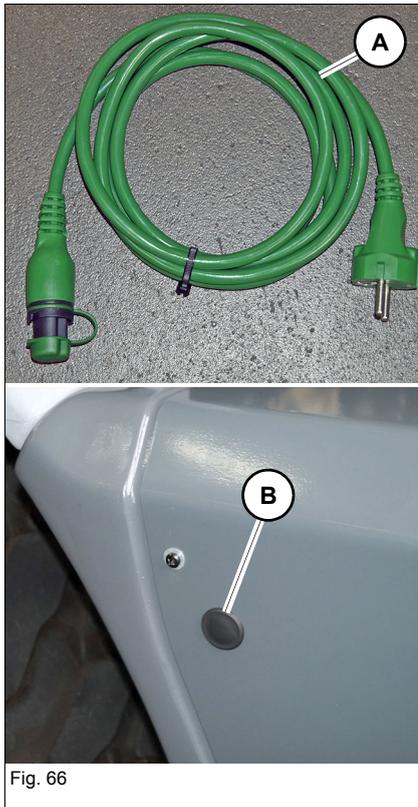


Fig. 66

The hydraulic oil preheating is used as a cold-starting aid at temperatures below $-5\text{ }^{\circ}\text{C}$ ($23\text{ }^{\circ}\text{F}$).

The hydraulic oil preheater reduces pollutant emissions during the warm-up phase and saves fuel at the same time.

WARNING

Danger due to electric tension

Damaged cables and voltage sources can cause serious injury or death.

- ▶ In Germany, cable **A** and the voltage source must be regularly checked by an electrician according to the VDE 0701 standard. Observe and follow the legal regulations of your country.

Information on putting into operation

Heating elements warm up the hydraulic oil in the hydraulic oil reservoir.

The hydraulic oil circuit can only be thoroughly warmed up if the preheating is connected over a longer period of time.

Machine outlet B (230 V or 110 V) for the heating element is located on the left in the access (special cable A for the outlet is included in the scope of delivery of this option).

Start the preheating

Socket **B** is located in the cover (servicing lid) at the rear left of the machine.

1. Park the machine near a socket (230 or 110 V).
2. First connect cable **A** supplied with the kit to machine outlet **B**, then to the mains outlet.

Switch off the preheating

1. Before starting the diesel engine, first remove special cable **A** from the mains outlet, then remove it from the machine outlet.
2. Close machine outlet **B** with a protective cap.

**Fuel preheater (option)**

The fuel preheater prevents paraffin crystals forming, which otherwise clog the fuel filter and the fuel system at low temperatures.

At temperatures below +10 °C (50 °F), a temperature switch automatically switches on the fuel preheater when ignition lock is switched on.

The heating element in the fuel line (between the fuel tank and the prefilter) is energized by the machine's electrical system.



Notes:

4.2 Overview of control elements

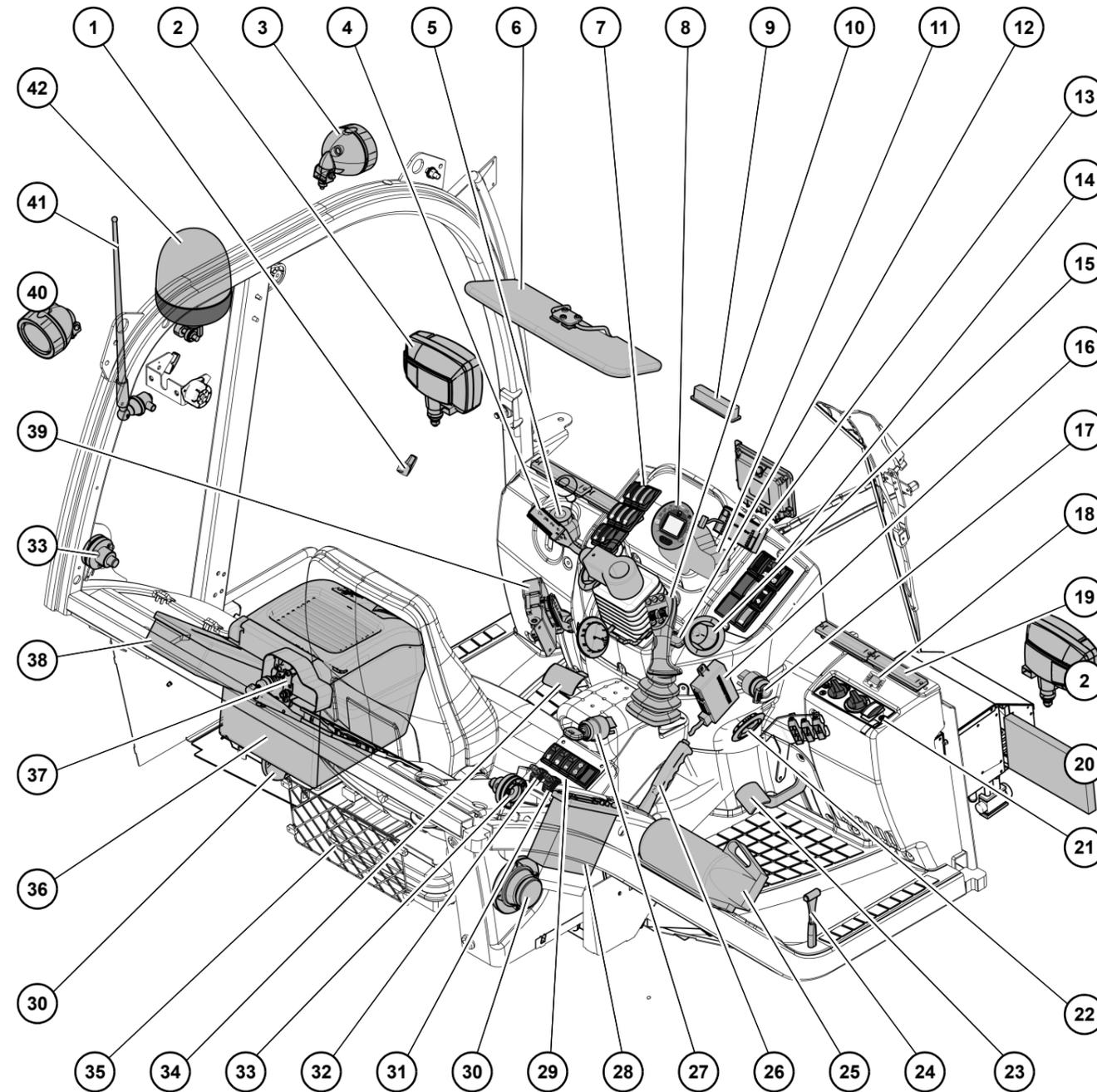
Description of control elements

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

The pages stated in the table refer to control operation.

You can unfold the pages for a better overview.

Inside the cabin



Inside the cabin

Inside of cabin (overview)

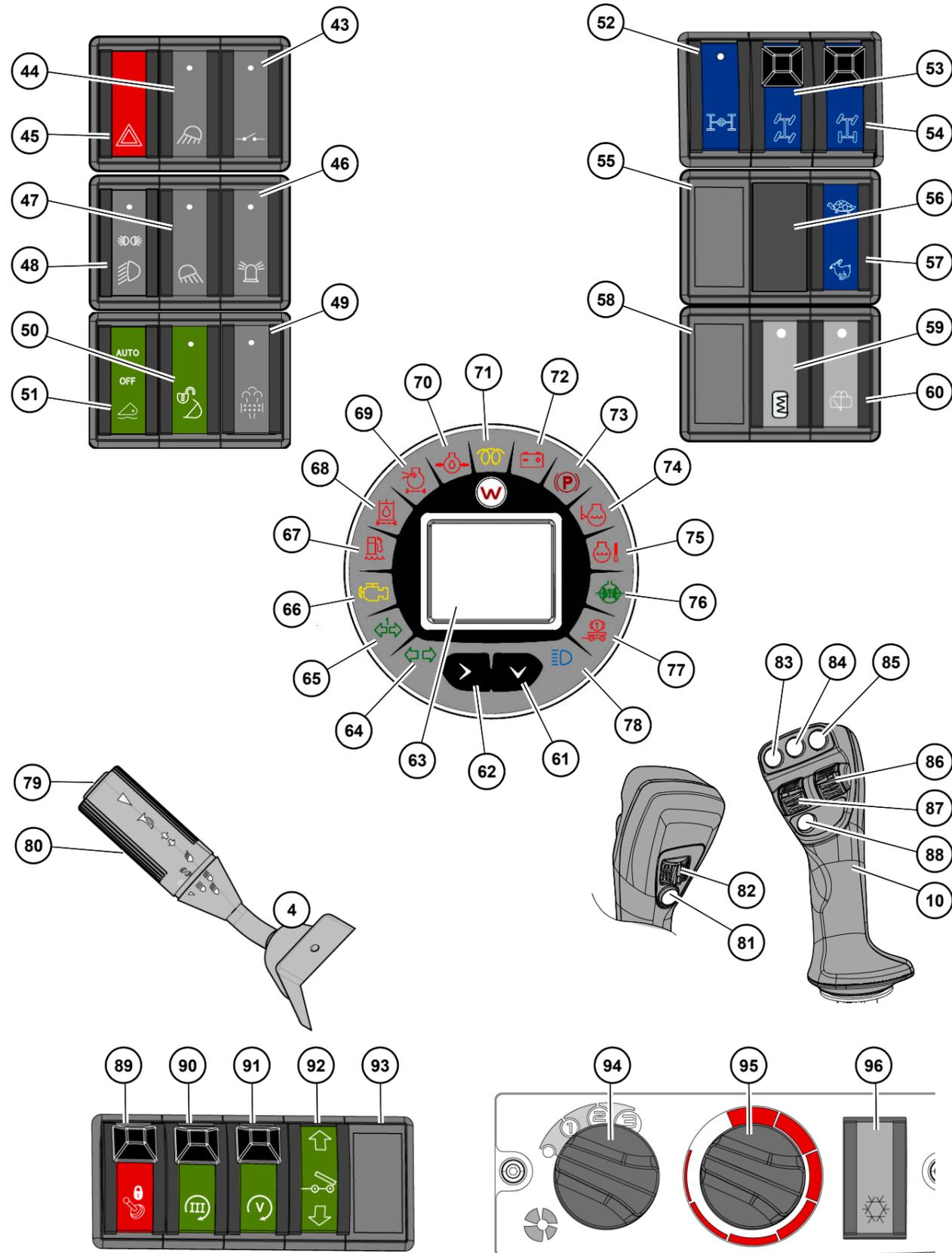
For more information see page

1	Hook	
2	Headlights (left/right)	5-25
3	Front working lights (option)	5-27
4	Multifunctional lever – turn indicators, wipers, horn	5-26, 5-28, 5-29, 5-30
5	Brake fluid reservoir	7-61
6	Sun visor	
7	Left control console; Relay and fuses under the envelope	7-52, 9-13
8	Indicating instrument	
9	Interior light	5-28
10	Control lever (joystick)	5-36
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12	Steering column adjustment lever	5-1
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23	Accelerator pedal	5-9
24	Emergency exit hammer (only for machines with agricultural or forestry certification)	4-5
25	Fire extinguisher (option)	4-11
26	Parking brake lever	5-16
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30	Loudspeakers (left/right) (option)	
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33	Left/right door arrester	4-3
34	Brake/inching pedal	5-14
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Fig. 67

Instrument panel with control elements

Instrument panel
with control
elements



Instrument panel with control elements

Switch console on the left

For more information see page

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48	Switch (grey) – lights	5-25
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55	Not assigned	
56	Not assigned	
57	Switch (blue) – speed range selection	5-18
58	Not assigned	
59	Push button (grey) – rear window heating (option) or switch – mirror heating (option)	5-123
60	Switch (grey) – rear wiper	5-30

Indicating instrument

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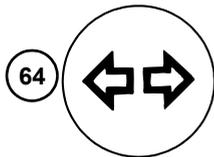
Fig. 68



Multifunctional lever turn indicators, wipers, horn		For more information see page
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Control lever (joystick)		For more information see page
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82	Switch – unlock/lock 3rd control circuit.....	5-40
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94	Rotary switch – heater fan.....	5-32
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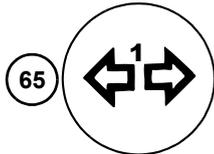
4.3 Overview of indicator lights

Indicator lights on indicating instrument



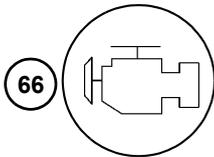
Indicator light (green) – left/right turn indicators

Flashes intermittently when the direction indicators are used
– see *“Turn indicators” on page 5-28.*



Indicator light (green) – right/left turn indicator light on rear attachment

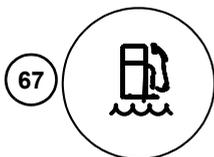
Flashes intermittently when the turn indicators are used and a front or rear attachment is connected electrically.



Indicator light (yellow) – control unit/controller

Illuminates if an error of the engine control unit or the cabin electronics is detected.

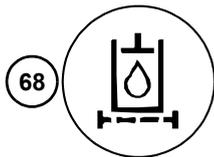
If the control lamp lights up, we recommend first determining the cause of the disorder. Read the error memory for this purpose – see *“Error memory” on page 4-40*, – see *chapter “Overview error codes of diesel engine electronics” on page 8-6* and *Overview of cabin electronics error codes on page 8-11.*



Indicator light (red) – fuel system water separator (option)

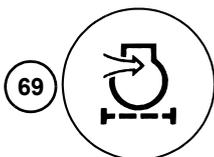
Illuminates if there is too much water in the water separator of the fuel pre-filter:

Drain water– see *“Fuel system” on page 7-26.*



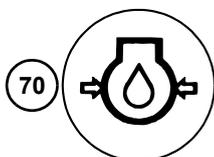
Indicator light (red) – dirt in hydraulic oil filter

Illuminates if the resistance of the oil flow in the return filter is too high
– see *“Monitoring the hydraulic oil and the return filter” on page 7-42.*



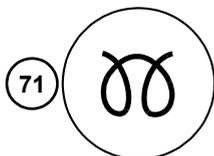
Indicator light (yellow) – air filter

Illuminates if the air filter is dirty– see *“Air filter” on page 7-38.*



Indicator light (red) – engine oil pressure

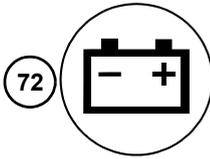
Illuminates if the engine oil pressure is too low – see *“Engine lubrication system” on page 7-30.*



Indicator light (yellow) – preheating

Illuminates when the key in preheating start switch is in position 1.

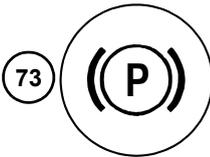
A sheathed-element glow plug preheats the intake air of the diesel engine during this time and is switched off once the preheating time is over
– see *“Start engine for model 351-04S / 351-04L” on page 4-54.*

**Indicator light (red) – alternator charge function**

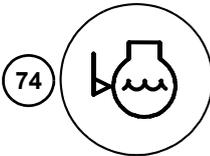
Illuminates when the starter is turned on and goes out as soon as the engine runs.

The V-belt is malfunctioning or there is an error in the charging circuit of the alternator if the indicator light illuminates with the engine running.

- The battery is no longer charged.
- The water pump does not turn any more – see [“V-belt/toothed belt” on page 7-40.](#)

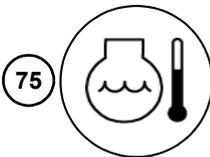
**Indicator light (red) – parking brake**

Illuminates when the parking brake is applied.

**Indicator light (yellow) – coolant level**

Illuminates if the coolant level in the radiator is too low

– see [“Cooling system” on page 7-33.](#)

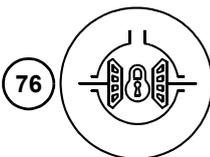
**Indicator light (red) – coolant temperature**

Illuminates if the maximum permissible coolant temperature is reached.

**Information**

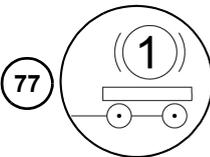
The coolant temperature should be between 80°C (176°F) and 105°C (221°F).

- ▶ The max. permissible temperature is 110°C (230°F).
- ▶ An alarm sounds if the temperature is 115°C (239°F) or higher – see [“Cooling system” on page 7-33.](#)

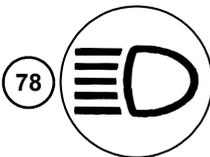
**Indicator light (green) – differential lock**

Illuminates if the differential lock is enabled

– see [“Differential lock” on page 5-24.](#)

**Indicator light (red) – trailer brake (option)**

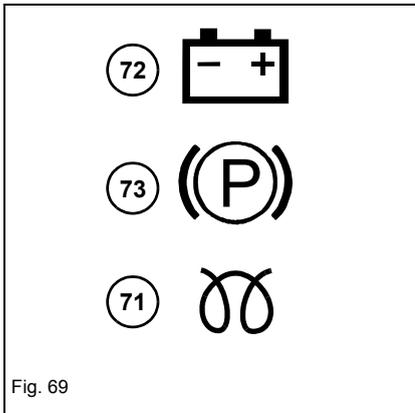
Not assigned.

**Indicator light (blue) – high beam**

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

– see [“Parking lights/low beam” on page 5-25.](#)

Indicator light check



When the ignition is switched on, all indicator lights on the indicating instrument illuminate briefly for a check and then go out after a few seconds.

i Information

Indicator lights **72** and **73** remain lit when ignition is turned on!
At cold outside temperatures, the indicator light **71** (preheating) remains lit for a few seconds and turns off when the temperature is reached.

i Information

For your own safety and in order to avoid consequential damage to the machine, have malfunctioning indicator lights immediately checked or replaced by an authorized service center!

Digital display

The indicating instrument is equipped with an acoustic warning and digital display **63** providing information on active functions, current operating states, service information, machine status and error codes.

WARNING

Accident hazard when operating the digital display during machine travel!

Can cause serious injury or death.

► Stop the machine before operating the digital display.

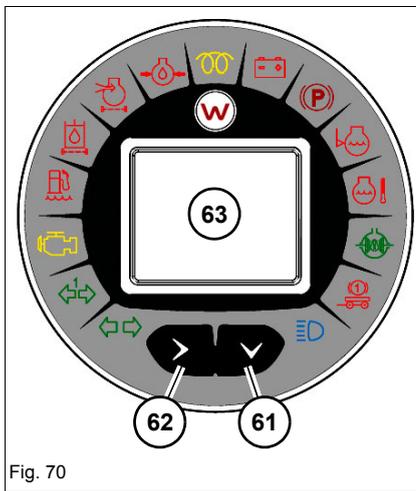


Fig. 70

Operation of digital display

The following table gives an overview of the menu structure of the digital display.

Push button **61** takes you through the indications of the 1st level.

Push button **62** takes you to the 2nd level.

Example:

Proceed as follows in order to leave the **Main indication 1** and to go to the **Service indication**:

1. Press push button **61** once.
 - ➔ Main indication 1 appears.
2. Press push button **62** once.
 - ➔ The service indication appears.

1st level	2nd level
Main indication 1	Service indication
Main indication 2	–
Machine status indication HMI	–
Machine status indication VCU	–
Machine status indication ECU ¹ (optional)	<ul style="list-style-type: none"> • Ash = ash load • Soot = soot load • DEF = urea capacity • Ø l/h = fuel consumption
Error memory	–
Digital display settings	–

1. The query of the machine status indication ECU is only possible with the DEUTZ diesel engine 1CD 2.9 as per exhaust standard III B/97/68/EC) with the option diesel particulate filter.

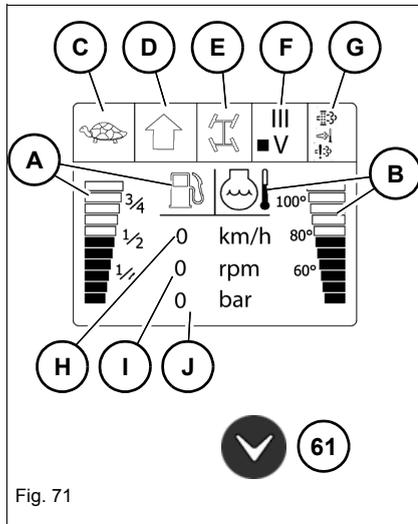


Fig. 71

Main indication 1

- To call the contents of main indication 1, press push button **61** repeatedly.

Indication	Meaning
<p>A</p>	<p>Indication – fuel level/spare fuel</p> <p>Indicates the fuel level detected by a resistance-based sensor in the tank.</p> <p>If the level is down to spare, the tank symbol starts flashing and an acoustic warning sounds every 10 seconds.</p>
<p>B</p>	<p>Indication – coolant temperature</p> <p>Indicates the engine coolant temperature detected by a sensor.</p> <p>When the maximum coolant temperature allowed is reached, the indicator light 75 on the indicating instrument illuminates and an acoustic warning sounds – see <i>“Cooling system”</i> on page 7-33.</p>
<p>C</p> <p>1</p>	<p>Indicator display – high speed range (hare)</p> <p>Illuminates if high speed was enabled with the switch 57 – see chapter <i>“Overview of speed ranges”</i> on page 5-18.</p>
<p>2</p>	<p>Indicator display – work speed range (turtle)</p> <p>Illuminates if work speed is enabled with the switch 57 – see chapter <i>“Overview of speed ranges”</i> on page 5-18.</p>
<p>1</p>	<p>Indicator display – forward travel direction</p> <p>Illuminates if forward machine travel is activated – see chapter <i>“Selecting a travel direction and starting machine travel”</i> on page 5-20.</p>
<p>2</p>	<p>Indicator display – reverse travel direction</p> <p>Illuminates if reverse machine travel is enabled – see chapter <i>“Selecting a travel direction and starting machine travel”</i> on page 5-20.</p>
<p>3</p>	<p>Indicator display – neutral travel direction</p> <p>Illuminates if the travel direction is disabled – see chapter <i>“Selecting a travel direction and starting machine travel”</i> on page 5-20.</p>

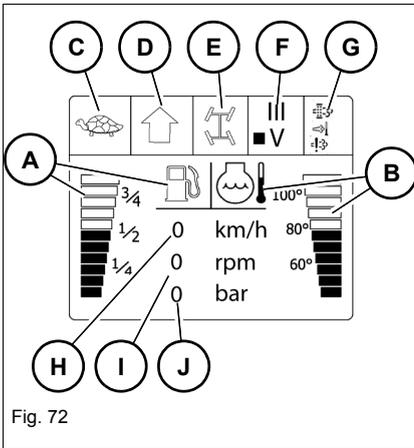


Fig. 72

		<p>Indicator display – steering synchronization Indicates that the wheels on both axes are aligned – see <i>“Manually synchronizing the steering system (standard)”</i> on page 5-2.</p>
E		<p>Indicator display – front axle steering (option) Illuminates if front axle steering is enabled – see <i>“Front axle steering (option)”</i> on page 5-6.</p>
		<p>Indicator display – 4 wheel steering Illuminates if 4 wheel steering is enabled – see <i>“4 wheel steering”</i> on page 5-5.</p>
		<p>Indicator display – diagonal (crab steering) (option) Illuminates if diagonal steering is enabled – see <i>“Diagonal steering (crab steering option)”</i> on page 5-7.</p>
		<p>Indicator display – 3rd control circuit in jog mode Appears if the 3rd control circuit is enabled in jog mode – see <i>“3rd control circuit”</i> on page 5-40.</p>
		<p>Indicator display – 3rd control circuit in continuous operation Appears if the 3rd control circuit is enabled in continuous operation – see <i>“Putting an attachment into continuous operation”</i> on page 5-43.</p>
F		<p>Indicator display – additional control circuit in jog mode (option) Appears if the additional control circuit is enabled in jog mode – see <i>“Additional front/rear control circuit (option)”</i> on page 5-44.</p>
		<p>Indicator display – additional control circuit in continuous mode (option) Appears if the additional control circuit is enabled in continuous operation – see <i>“Additional front/rear control circuit (option)”</i> on page 5-44.</p>
		<p>Indicator display – lock for operating hydraulics/road travel Appears if the lock for operating hydraulics/road travel is enabled with switch 89. ➔ The complete operating hydraulics is switched off – see <i>“Securing the control lever (joystick)/switching off the operating hydraulics”</i> on page 4-50.</p>

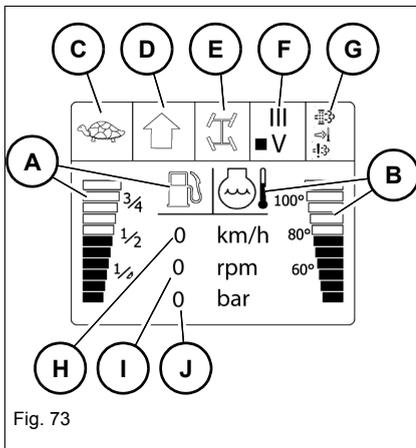


Fig. 73

		<p>Indicator display – diesel particulate filter (option)¹ – see chapter 7.21 “Exhaust gas treatment” on page 7-72</p> <ul style="list-style-type: none"> • Symbol 1 illuminates permanently: regeneration in operation. • Symbol 2 flashes: put regeneration into operation manually. • Symbol 3 load is too high. Diesel engine output is reduced. (Contact an authorized service centre). • Symbol 4 (under preparation) urea level below 10% (not assigned). <p>The symbols are displayed separately.</p>
<p>H</p>	<p>Indicator display – travel speed</p>	
<p>I</p>	<p>Indicator display – diesel engine speed</p>	
<p>J</p>	<p>Indicator display – compressed-air braking system</p>	

1. The query of the control indicator is only possible with the DEUTZ diesel engine 1CD 2.9 as per exhaust standard III B/97/68/EC) with the option diesel particulate filter.

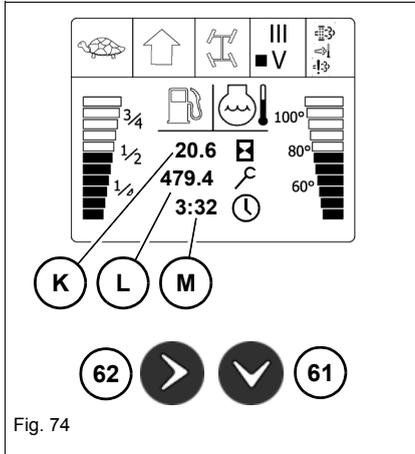


Fig. 74

Service indication

- In order to call the contents of the service indication, press push button **61** until main indication 1 appears, then press push button **62** repeatedly.

Indication	Meaning
K	Hour meter Number of operating hours since delivery of machine.
L	Maintenance calculator Indicates the remaining working hours up to the next maintenance interval. If less than 30 working hours remain until the next maintenance interval, the maintenance symbol appears briefly in the main menu instead of the tank and temperature symbol when the diesel engine is started. The maintenance intervals are displayed in the following order: <ul style="list-style-type: none"> • 100 operating hours • 400 operating hours • 500 operating hours • and every other 500 operating hours • Maintenance intervals – see chapter 7.2 “Maintenance overview” on page 7-3 The maintenance indication can be reset only by an authorized service center. Resetting does not affect the display of the next interval.
M	Time

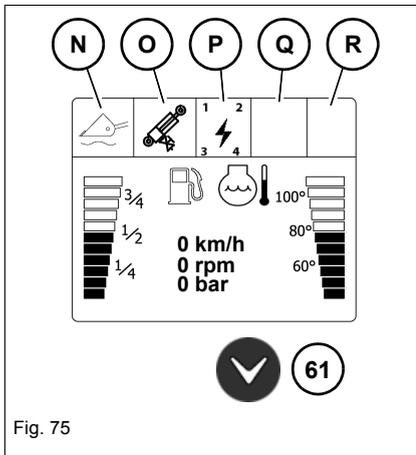
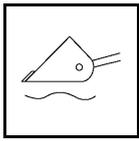
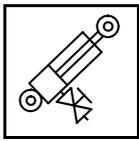
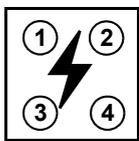
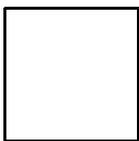
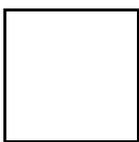


Fig. 75

Main indication 2

- To call the contents of main indication 2, press push button **61** repeatedly.

Indication	Meaning
N	 <p>Indicator display – loader unit load stabilizer Appears if the load stabilizer is enabled – see chapter “<i>Load stabilizer for loader unit (option)</i>” on page 5-126.</p>
O	 <p>Indicator display – hose burst valve Appears if the hose burst valve is activated – see chapter “<i>Hose burst valve (option)</i>” on page 5-73.</p>
P	 <p>Indicator display – front socket Appears if electrical circuit 1, 2, 3 or 4 of the front socket is enabled – see “<i>7-pole front socket (option)</i>” on page 5-54, – see “<i>14-pole front socket (option)</i>” on page 5-55.</p>
Q	 <p>Not assigned</p>
R	 <p>Not assigned</p>

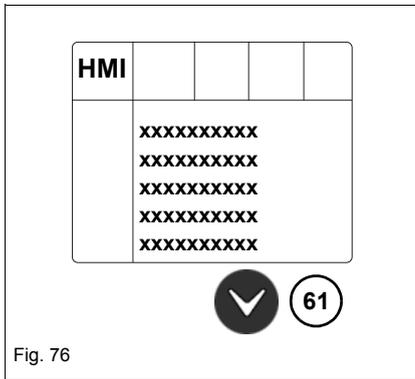


Fig. 76

Machine status indication on indicating instrument (HMI)

- In order to call the status indication “Indicating instrument”, press push button **61** repeatedly.
 - ➔ Contains indications (data) on the indicating instrument.

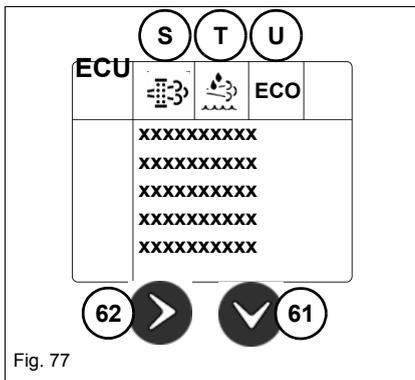


Fig. 77

Machine status indication on engine control unit (ECU)¹

- In order to call the “**ECU**” status indication, press push button **61** repeatedly.
 - ➔ Contains indications (data) on the engine control unit.
- In order to call the “**S, T, U**” status indication, press push button **62** repeatedly.
 - ➔ **S** – ash and soot load of diesel particulate filter
 - see chapter 7.21 “Exhaust gas treatment” on page 7-72
 - ➔ **T** – Urea level (not assigned)
 - ➔ **U** – fuel consumption

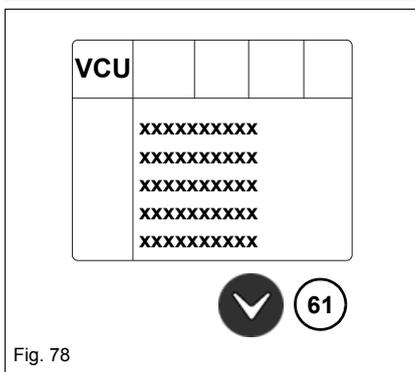
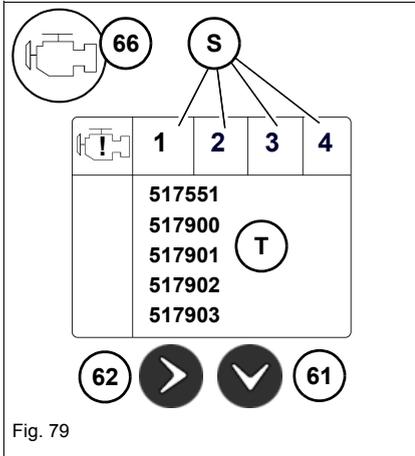


Fig. 78

Machine status indication on cabin controller (VCU)

- In order to call the status indication “Cabin controller”, press push button **61** repeatedly.
 - ➔ Contains indications (data) on the cabin controller.

1. The query of the control indicator is only possible with the DEUTZ diesel engine TCD 2.9 as per exhaust standard III B/97/68/EC) with the option diesel particulate filter.



Error memory

- In order to call the error memory, press push button **61** repeatedly.
- If the machine electronics detects an error, an acoustic warning sounds and the error is briefly displayed in the main indication instead of the tank and temperature symbol.
- The error is also saved and can be viewed in the error memory until the next restart.
- The error memory can receive up to 20 different error codes (4 pages X with a maximum 5 error codes).
- Pressing push button **62** takes you to the next page of the error memory.
- If the control lamp **66** lights up, we recommend first determining the cause of the error. Read the error memory for this purpose.

Indication	Meaning
S	1 – 4 Pages 1 – 4 for issuing error codes.
T	<div style="border: 1px solid black; padding: 5px; width: fit-content;"> 517551 517900 517901 517902 517903 </div> <div style="border: 1px solid black; padding: 5px; width: fit-content;"> </div> 6-digit error codes. Coding – see chapter 8 “Malfunctions” on page 8-1 . No error code.

If an error code is displayed, first:

1. Lower the load to transport position,
2. If possible, drive the machine out of the danger zone,
3. Stop the engine and switch off the ignition,
4. Restart the engine,

If the acoustic warning sounds again:

5. Make a note of the error code of the display,
6. Determine cause of error,
7. Rectify the error or inform a service center of the error code,
8. Further information – see [chapter “Overview error codes of diesel engine electronics” on page 8-6](#) and [Overview of cabin electronics error codes on page 8-11](#).

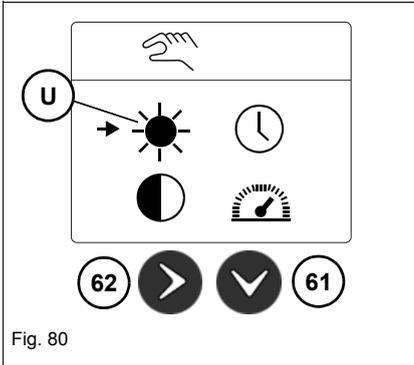


Fig. 80

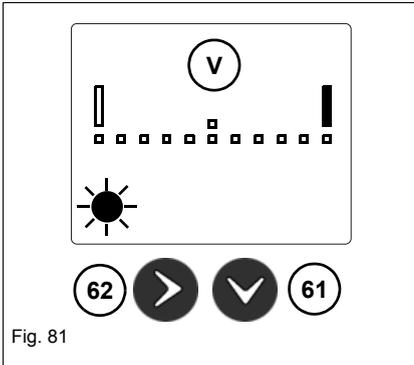


Fig. 81

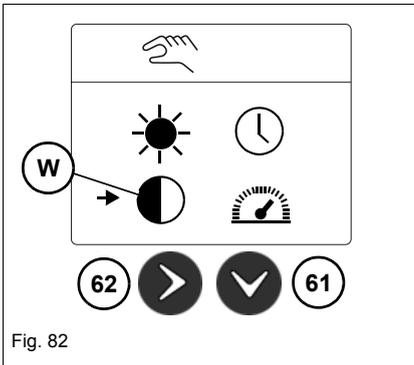


Fig. 82

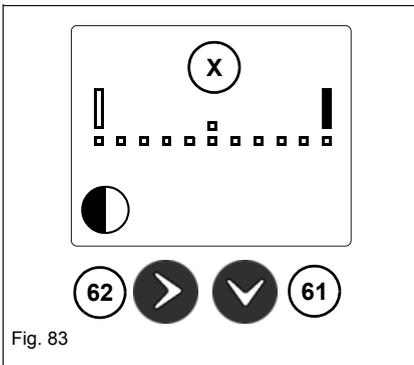


Fig. 83

Digital display settings – adjusting brightness

1. Press push button **61** repeatedly until the display settings appear.
2. Press push button **62** until symbol **U** is selected.

3. Press push button **61**
➔ Indication **V** appears.
4. Press push button **62** repeatedly until you have the required brightness.
5. Press push button **61** to leave indication **V**.

Digital display settings – adjusting contrast

1. Press push button **61** repeatedly until the display settings appear.
2. Press push button **62** until symbol **W** is selected.

3. Press push button **61**
➔ Indication **X** appears.
4. Press push button **62** repeatedly until you have the required contrast.
5. Press push button **61** to leave indication **X**.

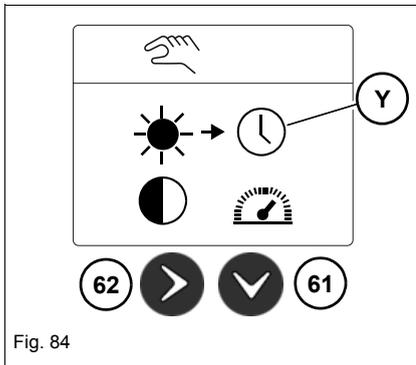


Fig. 84

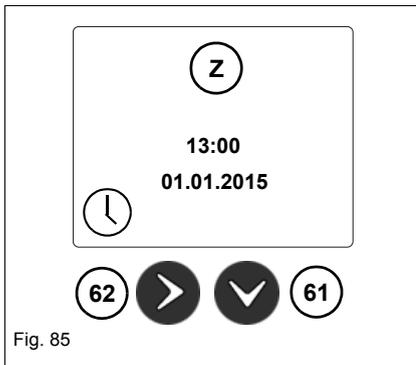


Fig. 85

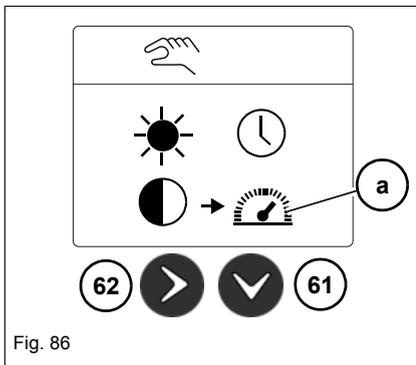


Fig. 86

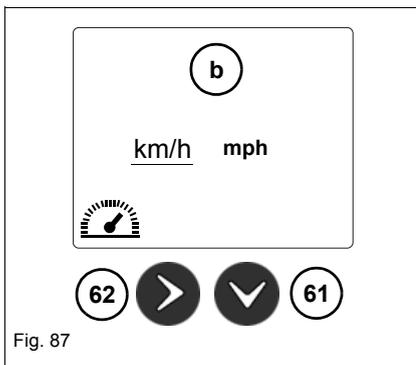


Fig. 87

Digital display settings – adjusting time

1. Press push button **61** repeatedly until the display settings appear.
2. Press push button **62** until symbol **Y** is selected.

3. Press push button **61**.
 - Indication **Z** appears. The year flashes.
4. Press push button **62** repeatedly until the required year appears, and press push button **61**.
5. Repeat step 3 for the month, day, hours and minutes.

Digital display settings – adjusting mph or km/h.

1. Press push button **61** repeatedly until the display settings appear.
2. Press push button **62** until symbol **a** is selected.

3. Press push button **61**.
 - Indication **b** appears.
4. Press push button **62** repeatedly until the required setting is selected, and press push button **61**.
5. Repeat step 3 for the month, day, hours and minutes.
6. Press push button **61** to leave indication **b**.

Acoustic warnings

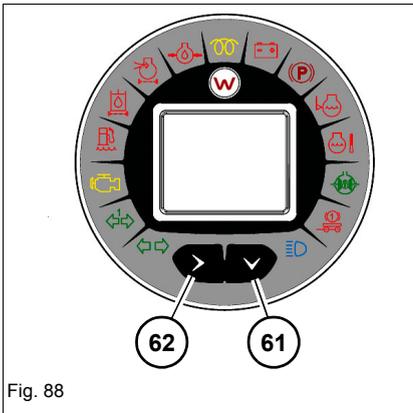


Fig. 88

Machine electronics buzzer

Errors in the machine electronics are indicated by error codes in the information display of the indicating instrument and by acoustic warnings of different lengths.

Permanent acoustic warnings sound until they are confirmed.

- Short acoustic warnings are automatically confirmed.
 - ➔ The error is saved.
- Confirm a permanent acoustic warning by pressing push button **61** or **62**.
 - ➔ The error is saved.

NOTICE

Failure to pay attention to the warnings can cause damage to the machine.

- ▶ Errors with permanent acoustic warnings are displayed every time the engine starts until they are read out and repaired by an authorized service centre.

- **Permanent** acoustic warning: engine oil pressure below 2 bar. This permanent warning sounds when the diesel engine is started, until the engine oil pressure reaches 2 bar – see chapter “Checking the engine oil level” on page 7-31.
- **Permanent** acoustic warning: coolant temperature of diesel engine over 120 °C – see chapter “Checking/filling up the coolant level model 351-04S / 351-04L” on page 7-35.
- **Short** acoustic warning: soot load of diesel particulate filter over 125 % and continues rising to 143 % – see chapter “Description of symbols (regeneration of diesel particulate filter)” on page 7-74.
- **Permanent** acoustic warning: soot load of diesel particulate filter over 214 % – see chapter “Description of symbols (regeneration of diesel particulate filter)” on page 7-74.
- **Permanent** acoustic warning: low beam switched on and starter disengaged – see chapter “Parking lights/low beam” on page 5-25.

Backup warning system (option)

The signal transmitter generates an acoustic signal when shifting into reverse – see chapter “Backup warning system (option)” on page 5-124.

4.4 Preparatory work

Important information before putting the machine into operation



CAUTION

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 machine as you enter and leave it.
 - ▶ Have damaged climbing aids replaced.
-

Requirements and information for the operating personnel

- The operating personnel (operator) must have read and understood this Operator's Manual before putting the machine into operation.
- The machine may only be put into operation by **authorized personnel that has been instructed**.
- The machine may only be put into operation when the operator is seated.
- Never get on a moving machine. Never jump off the machine.
- Before leaving the machine, lower the loader unit to the ground, stop the diesel engine and apply the parking brake.
- Carrying or transporting accompanying persons in the cabin and/or on the machine is prohibited.
- Tell persons to leave the danger zone.
- The machine may only be used in technically perfect condition in accordance with its designated use and the instructions set forth in the operation licence, the Data Confirmation (Germany) and in the Operator's Manual, and only by persons who are fully aware of the risks involved in operating the machine.
- Always observe the warning and information labels, and the load diagrams.
- Immediately replace (or have replaced) damaged or illegible warning and information labels with new ones.
- Adjust the rearview mirrors on the left and right.
- Observe the checklists in the following tables and take appropriate action – see *"Check lists" on page 4-45*.



Running-in period

The machine is equipped with an automatic thermal protection for the engine oil, drive and operating hydraulics oil that avoids putting the machine into operation in a cold state at high diesel engine speed.

- At temperatures below -10 °C , the maximum diesel engine speed is automatically limited to 1500 rpm.
- At temperatures between -10 °C and 10 °C , the diesel engine idling speed is slightly increased until it reaches 10 °C .
- At temperatures over 10 °C , the diesel engine can run without any restriction.

Handle the machine carefully during its first **100 operating hours**.

- Do not put a cold diesel engine under load.
 - Avoid loading the diesel engine at idling speed.
 - Do not run the diesel engine at high speed for extended periods.
 - Increase the load gradually while varying the diesel engine speed
 - Full travel speed (machine dynamics) is reached as soon as the temperature of the drive reaches $20 - 30\text{ °C}$ ($68 - 86\text{ °F}$).
 - Strictly observe maintenance schedules and perform (or have performed) the specified maintenance – [see chapter 7.2 “Maintenance overview” on page 7-3](#).
-

NOTICE

If the oil temperature of the drive hydraulics is too high ($> 105\text{ °C}$), travel speed (machine travel dynamics) is automatically reduced by 50 % until the oil temperature is below 105 °C in order to avoid damage to the drive hydraulics.

- ▶ Have the cause for the high oil temperature checked or repaired by an authorized service centre under all circumstances.
-

Check lists

These checklists are not intended to be exhaustive; They are only intended to help you to fulfill your obligation to exercise due care.

The checking and monitoring work listed below is described in greater detail in the following chapters of the Operator's Manual.

If questions are answered with NO, first rectify the cause of the malfunction before starting or continuing work.



Starting checklist

Designation	X
1 Enough fuel in the tank?	
2 Engine oil level OK?	
3 Coolant level OK?	
4 Oil level in hydraulic reservoir OK?	
5 Water level in washer reservoir OK?	
6 V-belt condition and tension OK?	
7 Loader unit lubricated?	
8 Brake system (including parking brake) OK?	
9 Brake fluid level (LHM) OK?	
10 Tire condition and inflation pressure OK?	
11 Wheel nuts safely tightened (especially after a wheel change)?	
12 Pedal area clean?	
13 Lights, signals, indicators, warning lights and indicator lights OK?	
14 Windows, mirrors, lights and steps clean?	
15 Attachment on the loader unit safely locked?	
16 Engine cover safely locked?	
17 Especially after cleaning, maintenance or repair work: Rags, tools and other loose objects removed?	
18 Approved warning triangle, warning light and first aid kit in the machine?	
19 Seat position and mirrors correctly adjusted?	
20 Seat belt fastened?	
21 All additional control circuits disabled?	
22 Battery master switch switched on?	

**Operation checklist**

Designation	X
1 Indicator light for engine oil pressure and alternator gone out?	
2 Braking effect sufficient?	
3 Temperature gauge for engine coolant in normal range?	
4 Steering system working properly?	
5 Anyone in the danger zone of the machine?	
6 Attachment locked in quickhitch?	
During machine travel on public roads, particular attention should be paid to the following points:	
7 Bucket and attachments in transport position?	
8 Transport locks installed?	
9 Control lever for lift and tilt hydraulics of the loader unit locked?	
10 Front-edge protection fitted to bucket?	
11 Compliance with requirements of machine documentation (Data Confirmation [Germany]/National Type Approval [Germany])?	

“Parking” checklist

“Parking” checklist	X
1 Attachments on the loader unit lowered to the ground?	
2 All additional control circuits disabled?	
3 Parking brake applied?	
4 Diesel engine stopped?	
5 Vehicle cab locked; particularly if the vehicle cannot be supervised?	
Parking on public roads:	
6 Machine appropriately secured?	
Parking on slopes:	
7 Machine additionally secured with chocks under the wheels to prevent it from rolling away?	



Instructions for machine travel on public roads

- Carrying or transporting **accompanying persons** in the cabin or on the telehandler is prohibited.
- The machine is subject to the applicable national legal regulations (**StVZO** German road traffic regulations, for example) and to the provisions laid down in the **National Type Approval (Germany)**, the **Data Confirmation (Germany)** or the **machine certification papers**.
- Only the attachments are authorized for use on public roads that are described in the National Type Approval (Germany), in the Data Confirmation (Germany), the license certificate (Germany) and in this Operator's Manual – see *“Use of attachments on the machine” on page 3-12*.
- Remove inadmissible attachments – see *“Use of attachments on the machine” on page 3-12*.
- Machine travel on public roads with a loaded attachment is prohibited.
- If the machine is certified as a self-propelled work machine:
With a trailer hitched, the machine **must not transport any material**. Only machine attachments may be transported on a trailer.
- Bear in mind the mandatory national regulations for accident prevention of the employers' liability insurance associations.
- Observe and follow the legal regulations of your country.

Preparing machine travel on public roads

- Remove **attachments that are not authorized** for travel on public roads – see chapter *“Use of attachments on the machine” on page 3-12.*
- Empty the attachment completely and secure it – see chapter *“Pick up the attachment” on page 5-57.*
- Set the loader unit to transport position (ground clearance about 250 mm/9.84 in) – see chapter *“Machine travel on public roads with a bucket” on page 5-74.*
- Set the steering column to the front position – see chapter *“Steering column height and angle adjustment” on page 5-1*
- Install the protection on the leading edge of the bucket.
- Fold up and secure the fork arms of the pallet forks.
- Switch off the working lights during machine travel on public roads – see chapter *“Working lights” on page 5-27.*
- High speed version (30, 35, 40 km/h /18.64, 21.75, 24.85 mph): switch the steering system to front axle steering – see chapter *“Front axle steering (option)” on page 5-6.*
- Switch on the load stabilizer (option) – see chapter *“Load stabilizer for loader unit (option)” on page 5-126.*
- Secure the control lever (loader unit) and the 3rd control circuit of the loader unit – see chapter *“3rd control circuit” on page 5-40.*
- Close the stop cock on the tilt ram (optional) – see chapter *“Tilt ram lock (option)” on page 5-105.*
- Check all signaling and light systems for correct function.
- Remove the protective screens for the front window and/or the main lights (options) – see chapter *“Protective screens for front window and/or main lights (option)” on page 5-123.*
- Lock the cabin door and the hinged window.
- When using a trailer, ensure that the trailer is safely locked in the coupling jaw and that the loads are safely tied down on the trailer.
- Adjust the correct seat position – see chapter *“Operator seat” on page 4-6.*
- Fasten the seat belt – see chapter *“Engine cover lock” on page 4-14.*
- Check and if necessary adjust the rearview mirrors.



CAUTION

Accident hazard due to incorrect adjustment of rearview mirrors!

Can cause injury.

- ▶ Adjust the rearview mirrors ensuring good visibility to the rear (rear part of machine).

Securing the control lever (joystick)/switching off the operating hydraulics

WARNING

Accident hazard due to unintentional loader unit operation!

Can cause injury or death.

- ▶ Always lock the joystick before performing machine travel on public roads and before leaving the machine.

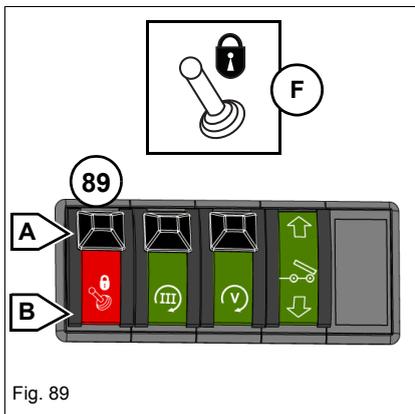
Switch **89** (lock for operating hydraulics/road travel) is located on the switch console (armrest).

Securing the control lever (joystick)/switching off the operating hydraulics

1. Slide the lock in switch **89** backward and press the switch to position **B** at the same time.
 - Symbol **F** appears in the digital display.
 - Control lever (joystick) **10** is out of operation.
 - The complete operating hydraulics is switched off.

Unlocking the control lever (joystick)/switching on the operating hydraulics

1. Slide the lock in switch **89** forward and press the switch to position **A** at the same time.
 - Symbol **F** disappears from the digital display.
 - Control lever (joystick) **10** is unlocked.
 - The complete operating hydraulics is operational.
 -



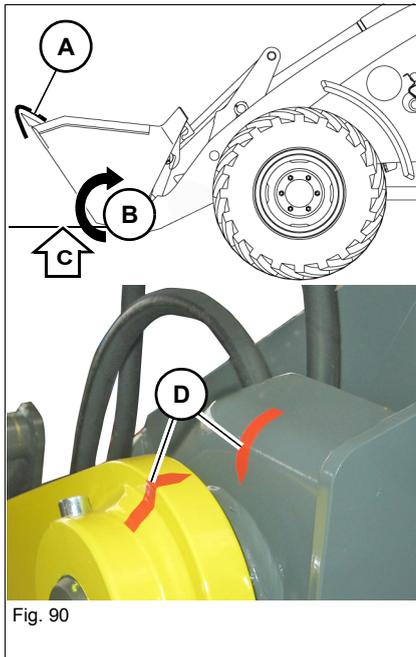
Functional check of all control elements

- – see [“Checking the steering system” on page 5-1](#)
- – see [“Brake/inching pedal” on page 5-14](#)
- – see [“Lights/signalling system” on page 5-25](#)
- – see [“Operating hydraulics” on page 5-35](#)

Transport position of bucket

Information

Remove buckets/attachments that are not certified for transportation on public roads, and move or transport them with a suitable means of transportation – see chapter *“Use of attachments on the machine”* on page 3-12.



Loader unit operation – see *“Operating hydraulics”* on page 5-35:

1. Empty and tilt back the bucket **B**.
2. Raise the loader unit until both red marks **D** on the lift frame and the bulkhead are aligned.
 - Ground clearance **C** about 250 mm (9.84 in).
3. Cover the blade or teeth of the bucket across their entire width with the tooth guard **A** provided.
4. Lock the control lever – see *“Securing the control lever (joystick)/switching off the operating hydraulics”* on page 4-50.

4.5 Starting and stopping the engine

Preparing to start the engine

- Go through the “Starting” checklist – see *“Starting checklist” on page 4-46.*
- Switch on the battery master switch – see *“Battery master switch” on page 4-15.*
- Sit down on the operator seat.
- Apply the parking brake!
 - The motor will not start unless the parking brake is applied.
- Adjust your seating position – see *“Operator seat” on page 4-6.*
 - All controls must be within easy reach.
 - You must be able to move the brake and accelerator pedals to their limit positions!
- Adjust the mirrors.
- Fasten your seat belt.
- Check whether all additional control circuits are switched off – see chapter *“Additional front/rear control circuit (option)” on page 5-44.*
- Disable the immobilizer (option)
 - see *“Key-based immobilizer (option)” on page 4-16,*
 - see *“Immobilizer with code input (option)” on page 4-18.*
- Set the manual throttle (option) to idling speed – see chapter *“Manual throttle (option)” on page 5-10.*
- Set the low-speed control to the base position – see chapter *“Low-speed control with regulated travel speed (option)” on page 5-119.*
- Move the control lever (loader unit) to neutral – see chapter *“Selecting a travel direction and starting machine travel” on page 5-20.*



Information

For the operator's safety, the vehicle can optionally be outfitted with a seat contact switch. In this case:

- ▶ The diesel engine will not start unless the operator is seated on the seat.
- ▶ The drive switches off after 5 seconds if the load on the operator seat is reduced when driving the machine.

Important information on avoiding engine damage

NOTICE

Do not use additional starting aids (for example injection with start pilot).

NOTICE

In order to avoid damage to the starter, do **not** start the engine again immediately after stopping it!

- ▶ Wait at least 10 seconds before starting again.
-



Information

The machine is equipped with an automatic thermal protection for the engine oil, drive and operating hydraulics oil that avoids putting the machine into operation in a cold state at high diesel engine speed.

- ▶ At temperatures below -10 °C , the maximum diesel engine speed is automatically limited to 1500 rpm.
 - ▶ At temperatures between -10 °C and 10 °C , the diesel engine idling speed is slightly increased until it reaches 10 °C .
 - ▶ At temperatures over 10 °C , the diesel engine can run without any restriction.
-



Information

At outside temperatures below -10 °C (14 °F), we recommend retrofitting the machine with a fuel and/or engine and hydraulic oil preheater (option)!



Information

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

If the diesel engine does not start, interrupt the start attempt after a max. 10 seconds so that the battery can recover.

- ▶ Repeat the start attempt only after about 1 minute.
 - ▶ **The engine cannot be started by tow starting the machine**, as there is no driving connection between the engine and the gearbox (for example a cardan shaft)! (Hydrostatic drive.).
-

Start engine for model 351-04S / 351-04L

Start the engine as follows

The preheating start switch **27** is located in the armrest to the right.

1. Ensure that the parking brake is applied.
2. Turn the ignition key to position I.
 - Indicator light check:
all indicator lights illuminate briefly.

The following warning and indicator lights remain illuminated:

- Indicator light **70** (engine oil pressure).
 - Indicator light **73** (parking brake applied).
 - Indicator light **72** (alternator charge function).
3. Turn and hold the ignition key in position II (preheating).
 - Indicator light **71** (preheating) illuminates. Preheating time depends on the outside temperature and can last up to 15 seconds.
 4. Press the accelerator pedal through about 1/4 of its travel after indicator light **71** goes out.
 5. Turn the ignition key to position III and hold it until the engine runs (max. 30 seconds).
 6. Release the starting key.
 7. Slowly increase engine speed.
 8. Actuate the operating hydraulics and travelling drive only after all indicator lights have gone out.

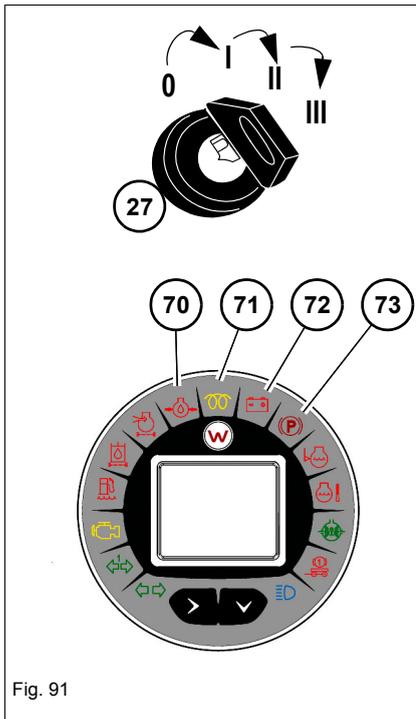


Fig. 91

NOTICE

If one of the indicator lights **70** or **72** does not go out, stop the engine immediately and have the cause checked by an authorized service centre! Have a malfunctioning indicating instrument immediately replaced.



Information

If the engine does not start after 30 seconds:

- ▶ Remove your foot from the accelerator pedal.
- ▶ Turn the ignition key back to position **0**.
- ▶ Wait at least one minute before starting again

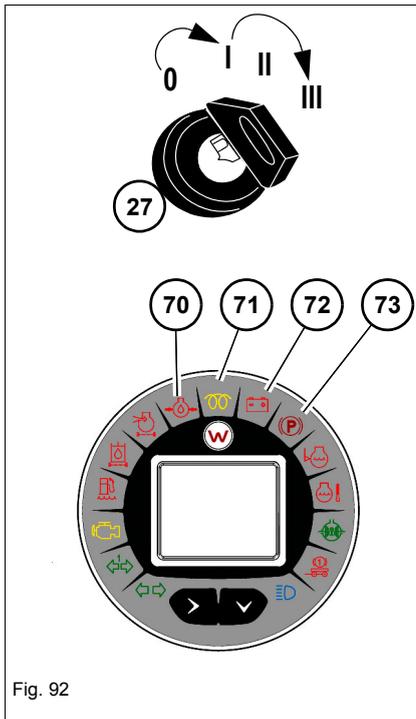
Start engine for model 351-05S / 351-05L and 351-06S / 351-06L

Fig. 92

Start the engine as follows for

The preheating start switch **27** is located in the armrest to the right.

1. Ensure that the parking brake is applied.
2. Turn the ignition key to position **I**.
 - ➔ Indicator light check:
all indicator lights illuminate briefly.

The following warning and indicator lights remain illuminated:

- Indicator light **73** (parking brake applied).
 - Indicator light **72** (alternator charge function).
 - At cold outside temperatures, indicator light **71** (preheating) remains lit for a few seconds.
3. Press the accelerator pedal through about 1/4 of its travel after indicator light **71** goes out.
 4. Turn start switch over position **II** to position **III** and hold it until the engine runs.
 5. Release the starting key.
 6. Slowly increase engine speed.
 7. Actuate the operating hydraulics and travelling drive only after all indicator lights have gone out.

NOTICE

If one of the indicator lights **70** or **72** does not go out, stop the engine immediately and have the cause checked by an authorized service centre! Have a malfunctioning indicating instrument immediately replaced.

**Information**

If the engine starts too early (indicator light **71** still illuminates), an error message appears in the digital display.

- ▶ Switch off ignition and repeat the start procedure.

**Information**

If the engine does not start after 30 seconds:

- ▶ Remove your foot from the accelerator pedal.
- ▶ Turn the ignition key back to position **0**.
- ▶ Wait at least one minute before starting again

Jump-starting the engine

Safety instructions regarding external starting aids

NOTICE

Damage to electrical system due to short circuit when starting the machine with an external starting aid.

- ▶ Ensure that there is no contact among the vehicles.
- ▶ 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 jump-starting.
- ▶ Use only tested and certified 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.

Perform the starting aid as follows:

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

Once the engine has started:

1. With the engine running, disconnect both battery jumper cables in the reverse order (first the **- terminal**, then the **+ terminal**).
 - This prevents sparking at the battery terminals!

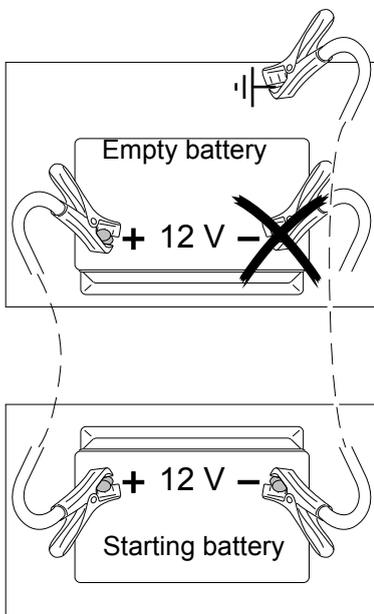


Fig. 93

Avoiding low-load engine operation

NOTICE

The running behavior of the engine may be impaired if it is operated at higher RPMs and at less than 20% load!

► Effects:

- Operating temperature is not reached
- Increased lube oil consumption
- Lube oil in exhaust system, and therefore dirt in the engine
- Blue smoke in exhaust

► Run the engine in regular operation at loads of over 20 %

Stopping the engine

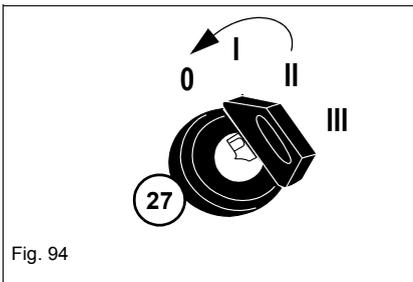
NOTICE

In order to avoid engine damage due to overheating: Before stopping the engine after operation under full load, let it run about 3 minutes at idling speed so that the temperature can stabilize, then stop the engine.

NOTICE

In order to avoid damage to the starter, do **not** start the engine again immediately after stopping it!

► Wait at least 10 seconds before starting again.



1. Lower the loader unit fully.
2. Apply the parking brake.
3. Let the engine run at idling speed for about 2 minutes.
4. Turn the ignition key (preheating start switch **27**) to position "0" and remove it.



Notes:

5 Operation

5.1 Steering system

Steering column height and angle adjustment

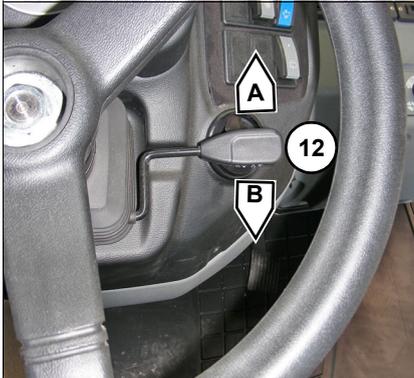


Fig. 95

WARNING

Accident hazard due to adjustment of steering column during machine travel!

Can cause serious injury or death.

► Adjust the steering column only at machine standstill.

1. Stop the wheel loader and the engine.
2. Apply the parking brake.
3. Sit down on the seat and adjust the height and the inclination of the steering column to your size (see table).

Function	Operation
Height adjustment	Pull lever 12 upward to position A , pull or push the steering column to the correct position, and release the lever.
Angle adjustment	Push lever 12 downward to position B , adjust the correct inclination of the steering column, and release the lever.

Checking the steering system

WARNING

Accident hazard due to leaking steering system not working correctly!

Can cause serious injury or death.

► Have a steering system that leaks or does not work correctly immediately repaired by an authorized service centre.

1. Turn the steering wheel to the left and right with the engine running and at walking speed. As you do so, check whether the wheels turn in the same way as the steering wheel.

Information

The steering system is only operational when the engine is running! However the machine can still be steered if the diesel engine or the pump drive breaks down – **emergency steering feature!**

Turning the steering wheel requires greater effort! Take this into account especially when towing the machine!

► Adapt the towing speed to the modified steering behaviour (Walking speed)!

Manually synchronizing the steering system (standard)

Applies to standard-equipment machines with bypass synchronization (without steering electronics and without high speed).

Due to internal leakage in the steering hydraulics, the front and rear axle wheels of the machine no longer follow the same track during straight-ahead machine travel after extended work operation. The steering system must be synchronized from time to time.



WARNING

Accident hazard when synchronising the steering system during machine travel!

Can cause serious injury or death.

▶ Synchronise the steering system only at walking pace.

1. At walking speed, slowly turn the steering wheel to the left and right as far as it will go and try turning it even further in the end position for a few seconds (as for cornering).
2. Turn the steering wheel rapidly back to straight-ahead position.
 - Contact your dealer if this does not synchronize the wheels.

Synchronizing the steering system electronically (option)

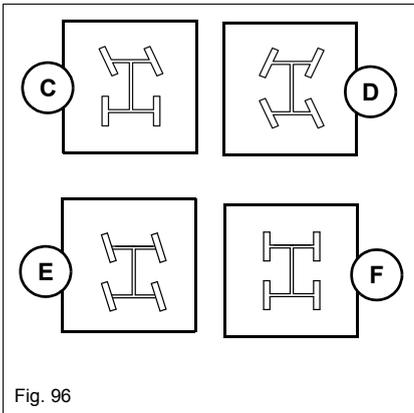


Fig. 96

Applies to machines with steering electronics option and/or high-speed gearbox 30 km/h (18.64 mph) or 40 km/h (24.85 mph).

Due to internal leakage in the steering hydraulics, the front and rear axle wheels of the machine no longer follow the same track during straight-ahead machine travel after extended work operation. The steering system must be synchronized from time to time.

Synchronization during machine restart and steering-mode change



WARNING

Accident hazard when synchronising the steering system during machine travel!

Can cause serious injury or death.

- ▶ Synchronize the steering system only at a standstill or at walking speed.



Information

Synchronization is only possible in the "Turtle" speed range!

During synchronization, the "Hare" speed range can be selected with switch **57**. However, it only becomes active when synchronization is over.

1. Start the diesel engine and select a new steering mode as required.
 - The symbol for the selected steering mode **C**, **D** or **E**, and the synchronization symbol **F** flash alternately.
2. Turn the steering wheel to the left and right several times.
 - Synchronization is over as soon as both steering rams (front and rear axle) have reached or passed through the straight-ahead position and the symbol of the steering mode selected **C**, **D** or **E** illuminates continuously in the digital display.

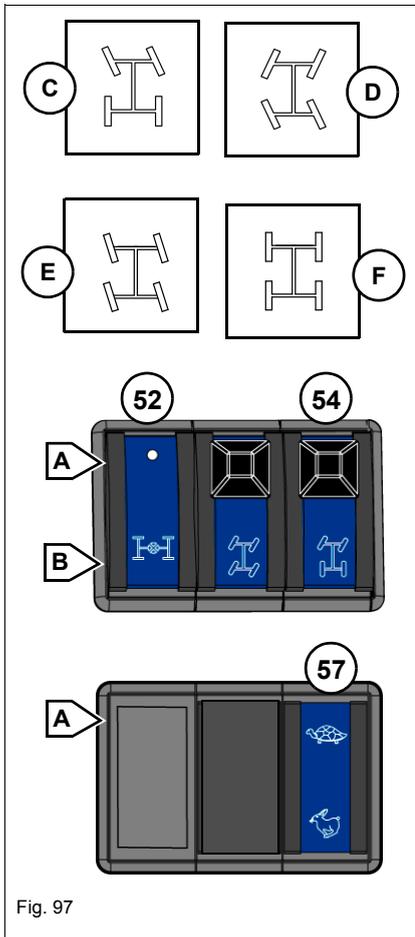


Fig. 97

Synchronization during work operation

WARNING

Accident hazard when synchronising the steering system during machine travel!

Can cause serious injury or death.

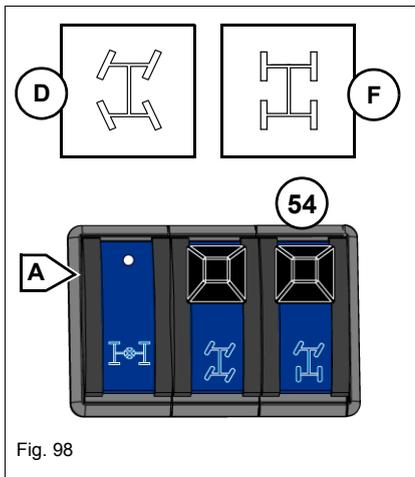
► Synchronize the steering system only at walking speed.

Information

If the machine is equipped with the front axle steering option, switch over to 4 wheel steering before synchronizing the steering system – see “4 wheel steering” on page 5-5.

1. Enable 4 wheel steering. To do this: pull the lock in switch **54** downward and press the switch to position **A**.
2. Select the “Turtle” speed range. To do this: press switch **57** to position **B**.
3. At walking speed, press and release push button **52** (synchronization) in position **B**.
 - The symbol for the selected steering mode **C**, **D** or **E**, and the synchronization symbol **F** flash alternately.
4. Turn the steering wheel to the left and right several times.
 - Synchronization is over as soon as both steering rams (front and rear axle) have reached or passed through the straight-ahead position and the symbol of the steering mode selected **C**, **D** or **E** illuminates continuously in the digital display.
5. Perform a functional check of the steering system.

4 wheel steering



4 wheel steering is used for fast loading operations in confined spaces where only small turning circles are possible.

WARNING

Accident hazard when changing steering mode during machine travel!

Can cause serious injury or death.

► Change the steering mode only at a standstill or at walking speed.

Enabling 4 wheel steering

1. Stop the machine or slow it down with the brakes to walking speed.
2. Set the steering to straight ahead.
3. Slide the lock in switch **54** downward and press the switch to position **A** at the same time.

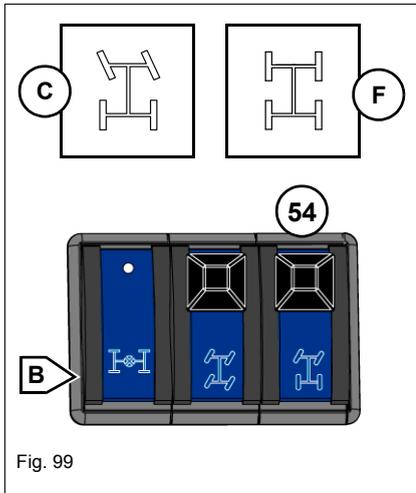
If symbols **D** and **F** appear alternately in the digital display:

4. Turn the steering wheel to the left and/or right until the wheels of the front and rear axles have reached or passed through the straight-ahead position from both directions.
 - ➔ Symbol **D** appears permanently in the digital display.
 - ➔ 4 wheel steering is in operation.

Information

If the machine is equipped with the high-speed option, changing over to 4-wheel steering automatically reduces speed to 20 km/h (20.43 mph)!

Front axle steering (option)



Front axle steering is used for fast transport and road travel.

Front axle steering has to be selected for trailer operation or high-speed machine travel (30 or 40 km/h / 18.64 or 24.85 mph) on public roads.



WARNING

Accident hazard when changing steering mode during machine travel!

Can cause serious injury or death.

► Change the steering mode only at a standstill or at walking speed.

Enabling front axle steering

1. Stop the machine or slow it down with the brakes to walking speed.
2. Set the steering to straight ahead.
3. Slide the lock in switch **54** downward and press the switch to position **B** at the same time.

If symbols **C** and **F** appear alternately in the digital display:

4. Turn the steering wheel to the left and/or right until the wheels of the front and rear axles have reached or passed through the straight-ahead position from both directions.
 - Symbol **C** appears permanently in the digital display.
 - Front axle steering is in operation.



Diagonal steering (crab steering option)

Use diagonal steering (crab steering) only for moving away laterally, for example from a wall, or for **briefly** repositioning the machine laterally.

WARNING

Accident hazard during machine travel on public roads with diagonal steering (crab steering)!

Can cause serious injury or death.

- ▶ Before performing machine travel on public roads, change over to front axle steering mode!
-

WARNING

Accident hazard due to use of manual throttle with diagonal steering (crab steering)!

Can cause serious injury or death.

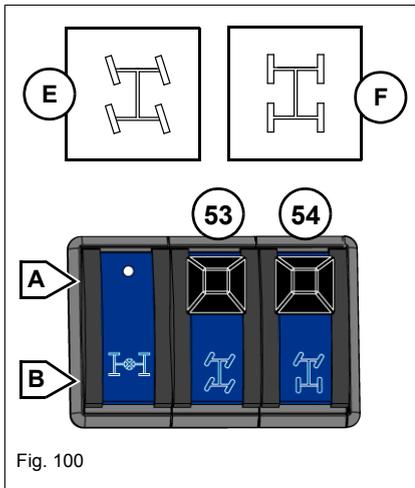
- ▶ Do not use the manual throttle if diagonal steering (crab steering) is enabled.
-

WARNING

Accident hazard when changing steering mode during machine travel!

Can cause serious injury or death.

- ▶ Change the steering mode only at a standstill or at walking speed.
-

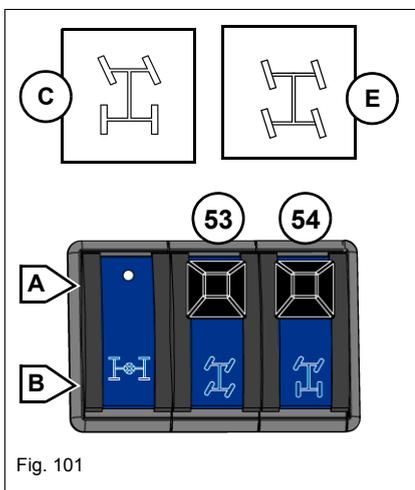


Changing over from 4 wheel steering to diagonal steering

1. Stopping the machine.
2. Select 4 wheel steering. To do this: slide the lock in switch **54** downward and press the switch to position **A** at the same time.
3. Slide the lock in switch **53** downward and press the switch to position **B** at the same time.

If symbols **E** and **F** appear alternately in the digital display:

4. Turn the steering wheel to the left and/or right until the wheels of the front and rear axles have reached or passed through the straight-ahead position from both directions.
 - Symbol **E** appears permanently in the digital display.
 - Diagonal steering is in operation.



Changing over from front axle steering to diagonal steering

i Information

Diagonal steering cannot be selected directly from front axle steering!

If diagonal steering is nevertheless selected with switch **53** with front axle steering enabled, the machine gently brakes to 10 km/h (6.2 mph) and stays in front axle steering. In addition, a buzzer sounds and the symbols **C** and **E** flash in the digital display.

1. In order to change over to diagonal steering, slide the lock in switch **54** downward and press the switch to position **A**.
2. Turn the steering wheel to the left and/or right until the wheels of the front and rear axles have reached or passed through the straight-ahead position from both directions.
 - Symbol **E** appears permanently in the digital display.
 - Diagonal steering is in operation.

5.2 Accelerator actuation

Accelerator pedal

 **WARNING**

Accident hazard due to blocked or dirty accelerator pedal!

Can cause serious injury or death.

- ▶ Keep the accelerator pedal clean and remove all objects in the area of the pedal.



Fig. 102

Accelerator pedal **23** is located on the right in the machine.

Engine and machine speed is continuously adjusted with the accelerator pedal.

The maximum speed depends on the speed range set! – see [“Overview of speed ranges” on page 5-18](#).

Manual throttle (option)

Important information

Using this function, a certain speed of the diesel engine can be set and saved. The speed is usually specified by the required speed for the attachment.

The manual throttle function guarantees a continuous supply of hydraulic oil when operating hydraulic attachments.

The manual throttle function can be combined with the low-speed control option.



WARNING

Accident hazard during machine travel on public roads with manual throttle!

Can cause serious injury or death.

- ▶ Before performing machine travel on public roads, disable the manual throttle.



WARNING

Accident hazard due to unexpected handling!

Can cause serious injury or death.

- ▶ Do **not** use the manual throttle if diagonal steering (crab steering) is enabled!
- ▶ Disable the manual throttle before changing over to diagonal steering.



WARNING

Accident hazard due to unexpected handling when changing operators with the manual throttle enabled!

Can cause serious injury or death.

- ▶ Before changing operators, stop the diesel engine and switch off ignition.
 - This disables the manual throttle and deletes the engine speed saved.
-



Fig. 103

Setting engine speed/enabling manual throttle
WARNING
Danger of accident due to fast acceleration of the machine!

Can cause serious injury or death.

- ▶ When starting with the activated manual throttle, make sure that no people or objects are in the danger area.
 - ➔ If the manual throttle has been activated and then a travel direction is chosen with the rocker switch in the joystick, the vehicle accelerates according to the saved speed.

Information

In the "hare" speed, the saved engine speed is deleted after the manual throttle function is disabled and **cannot** be retrieved again.

Information

Engine speed can be increased with the accelerator pedal as required. If the accelerator pedal is not pressed any more, the engine speed is reset to the value last saved.

1. Select the speed and the desired steering mode.
2. Set the travel direction to neutral. Press touch button **88** on the joystick to do this.
 - ➔ Symbol **D/3** appears in the digital display.
3. Select the required engine speed with the accelerator pedal.
 - ➔ The current engine speed **I** appears in the digital display.
4. Press manual throttle regulator **31** forward **A** for at least 3 seconds.
 - ➔ The engine speed is saved.
5. Adapt the engine speed as required by (repeatedly) tapping the manual-throttle regulator **31**:
 - ➔ forward **A** – speed is increased
 - ➔ Backward **B** – engine speed is reduced
6. Select the travel direction with switch **87** on joystick.
 - ➔ The machine accelerates according to the preselected engine speed.

Specific features of manual throttle in “turtle” speed

WARNING

Danger of accident due to fast acceleration of the machine!

Can cause serious injury or death.

- ▶ When starting with the activated manual throttle, make sure that no people or objects are in the danger area.
 - Engine speed is not changed if the machine is braked, with manual throttle enabled, by means of brake/inching pedal . In other words, as soon as the brake-inch pedal is released, the machine accelerates back to the saved speed.
-
- If push button **88** (neutral travel direction) is pressed with the manual throttle enabled, the manual throttle function is interrupted and the machine is evenly braked. The saved engine speed can be retrieved – see *“Access the saved engine speed (only for speed “turtle”)”* on page 5-13.

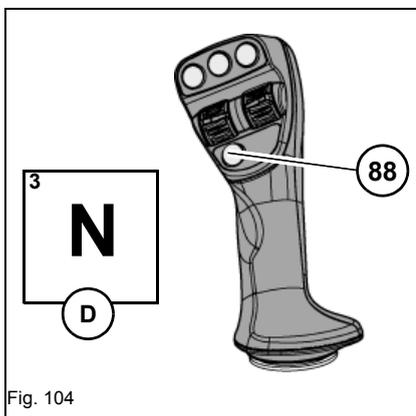


Fig. 104

Disabling manual throttle in the “Turtle” speed range

1. Press push button **88** on the joystick (neutral travel direction).
 - Symbol **D/3** appears in the digital display.
 - The manual throttle is disabled.
 - The speed of the diesel engine falls to the lower idling speed.
 - The **saved speed remains preserved**.

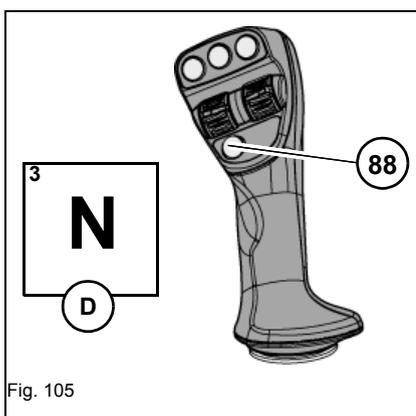
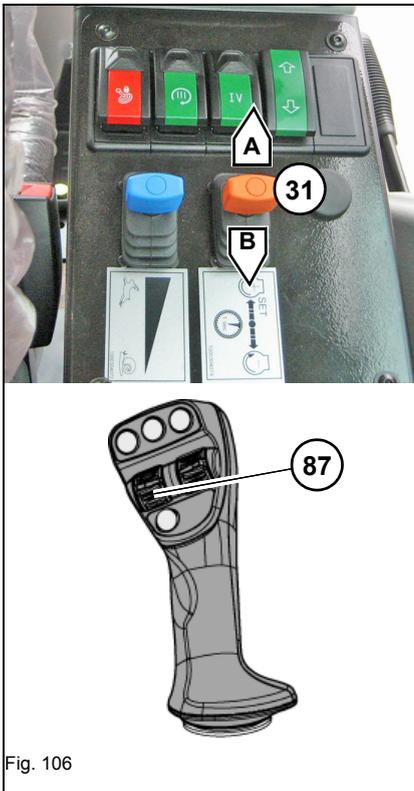


Fig. 105

Disabling manual throttle in the “Hare” speed range

1. Press the brake/inching pedal or push button **88** on the joystick (neutral travel direction).
 - Symbol **D/3** appears in the digital display.
 - The manual throttle is disabled.
 - The speed of the diesel engine falls to the lower idling speed.
 - The **saved speed is deleted**.



Access the saved engine speed (only for speed "turtle")

WARNING

Danger of accident due to fast acceleration of the machine!

Can cause serious injury or death.

- ▶ If the manual throttle is still activated, consider the saved speed and the resulting vehicle behavior before actuating the travel direction touch button.

1. Briefly tap manual-throttle regulator **31** forward or backward.
 - ➔ The diesel engine increases the speed to the saved value.
2. Select the travel direction with switch **87** on joystick.
 - ➔ The machine accelerates according to the set engine speed.

Information

If the travel direction is chosen, the control will **not** increase the speed of the control to the saved value before the diesel engine speed is reactivated.

Information

Switching off the ignition disables the manual throttle and at the same time deletes the engine speed saved.

5.3 Brake

Brake/inching pedal



Important information on brake/inching pedal actuation

Brake/inching pedal **34** is located on the left in the machine. The brake/inching pedal is used for two functions:

- **Inching** – engine speed does not change, however travel speed is reduced to increase the output of the operating hydraulics.
- **Brakes**

DANGER

Accident hazard due to blocked or dirty pedal!

Can cause serious injury or death.

- ▶ Keep the brake/inching pedal clean and remove all objects in the area of the pedal.

Braking with the brake/inching pedal (service brake)

WARNING

Accident hazard when moving down a slope too fast!

Can cause serious injury or death. Excessive engine speed can cause damage to the travelling drive or diesel engine.

- ▶ Select the next lower speed range  before performing downhill machine travel.
- ▶ Reduce engine speed: remove your foot from the accelerator pedal.
- ▶ Reduce your travel speed with the brake/inching pedal (intermittent braking).

1. Check in the rearview mirror that no one will be hindered.
2. Release accelerator pedal **23** completely.
3. Press down brake/inching pedal **34** with force with your left foot.

**Performing a brake test**

1. After looking in the rearview mirror and at low speed, press down the brake/inching pedal **34** and check the braking effect.
 - ➔ A deceleration must be felt in the brake/inching pedal after half the pedal travel, and the brake lights must illuminate.

Inching with the brake/inching pedal

1. Press the brake/inching pedal **34** down slightly.
 - ➔ Press the pedal lightly In the inching range, the pedal can be used like a car's clutch.
 - ➔ The drive's output is reduced and the engine power is now available for the operating hydraulics.
 - ➔ This makes it possible to raise the loader unit more quickly.

**Information**

The brake lights do not illuminate in the inching range.

Parking brake (hand brake)

Information on the parking brake

The parking brake is located to the right of the control lever base.

A starting interlock prevents the machine from starting even with the parking brake slightly applied.



Information

The travel direction can only be selected if the parking brake is completely released.

Applying the parking brake automatically cancels the selection of the forward/reverse travel direction (drive) and switches the drive to neutral.

Applying the parking brake

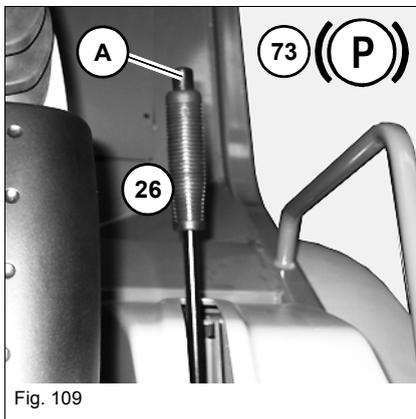


Fig. 109



CAUTION

Applying the parking brake during machine travel abruptly brakes the machine!

Can cause injury.

- ▶ Apply the parking brake only at machine standstill.
- ▶ In travel operation use only the brake/inching pedal as a brake.

1. Pull lever **26** up with force.
 - Indicator light **73** on the indicating instrument illuminates.
 - The engine can be started.
 - Selection of forward/reverse driving direction (drive) is automatically cancelled and neutral activated
2. Secure the machine with wheel chocks.

Release the parking brake

1. Pull lever **26** up slightly.
2. Press button **A**.
3. Move lever **26** down as far as it will go.
 - Indicator light **73** on the indicating instrument goes out.

5.4 Travel operation

Important information before putting into operation



WARNING

Accident hazard due to persons in the danger zone!

Serious injury or death can be caused by not staying clear of the danger zone of the machine.

- ▶ Ensure that no one is in the danger zone.
 - ▶ Stop all work movements immediately if persons enter the danger zone.
 - ▶ Seal off the danger zone with barriers.
-

NOTICE

If the oil temperature of the drive hydraulics is too high $>105^{\circ}\text{C}$ ($>221^{\circ}\text{F}$), travel speed (machine travel dynamics) is automatically reduced by 50 % until the oil temperature is below $<105^{\circ}\text{C}$ ($<221^{\circ}\text{F}$) in order to avoid damage to the drive hydraulics.

- ▶ Have the cause for the high oil temperature checked or repaired by an authorized service centre under all circumstances.
-



Information

For the operator's safety, the vehicle can optionally be outfitted with a seat contact switch. In this case:

- ▶ The diesel engine will not start unless the operator is seated on the seat.
 - ▶ The drive switches off after 5 seconds if the load on the operator seat is reduced when driving the machine.
-

Overview of speed ranges

The machine has two speed ranges (see table).

The possible speed ranges depend on the steering mode selected.

Before changing the speed range, select the required steering mode

- see *“Front axle steering (option)” on page 5-6,*
- see *“4 wheel steering” on page 5-5,*
- see *“Diagonal steering (crab steering option)” on page 5-7.*

Speed range	Travel speed	Recommended
	0 – 7 km/h (0 – 4.35 mph) possible with all steering modes!	Used for work involving short loading cycles; in other words, a rapid succession of loading and unloading operations, for example onto a truck, and for work requiring precise speed adjustment, for example rotary broom applications
	0 – 20 km/h (0 - 12 mph, standard) 0 – 30 km/h (0 – 18.64 mph, option) 0 – 40 km/h (0 – 24.85 mph, option)	For long-haul travel



Information

For machines with high-speed gearbox (option), the following conditions must be fulfilled so that the machine can reach maximum speed:

- a travel drive temperature of about 20–30°C (68–86°F)
- level asphalted ground conditions
- empty standard bucket
- no trailer operation

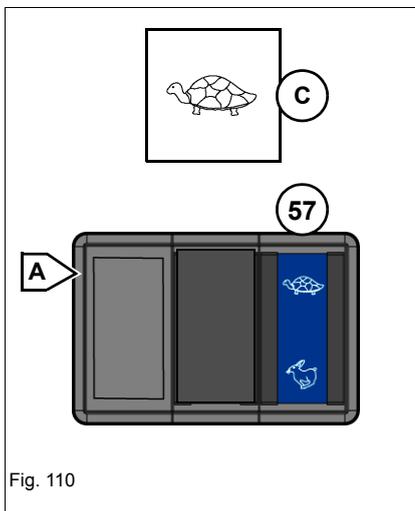
Changing speed range

WARNING

Accident hazard during downhill travel!

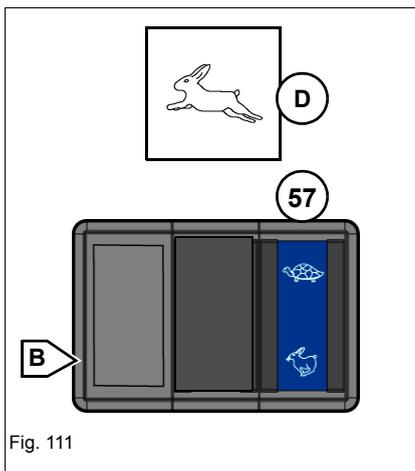
Serious injury or death can be caused by travelling too fast. Excessive engine speed can cause damage to the travelling drive or diesel engine.

- ▶ Select the next lower speed range “Turtle” before performing downhill machine travel.
- ▶ Reduce engine speed: remove your foot from the accelerator pedal.
- ▶ Reduce your travel speed with the brake/inching pedal (intermittent braking).



Reducing travel speed

1. Set the required steering mode.
2. Press switch **57** to position **A** (“Turtle”).
 - Symbol **C** appears in the digital display.
 - If symbol **C** flashes, the speed is too high for the selected speed range.
3. Brake the machine with the brake/inching pedal.
 - If the speed has been reduced according to the selected speed range, symbol **C** appears permanently in the digital display.



Increasing speed

1. Set the required steering mode.
2. Press switch **57** to position **B** (“Hare”).
 - Symbol **D** appears in the digital display.

Information

The 40 km/h speed range (Hare) is active only if front axle steering is switched on – see [“Front axle steering \(option\)” on page 5-6](#).

Selecting a travel direction and starting machine travel

WARNING

Injury hazard to persons in the danger zone!

Persons in the danger zone can be overlooked and seriously injured or killed 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.

CAUTION

Accident hazard when changing the travel direction on public roads!

Can cause injury.

- ▶ Do not change the travel direction 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.

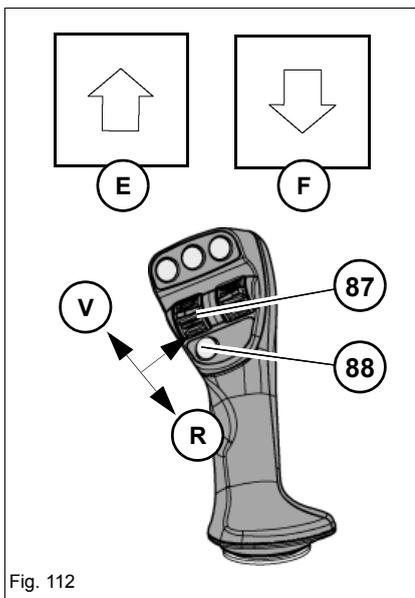


Fig. 112

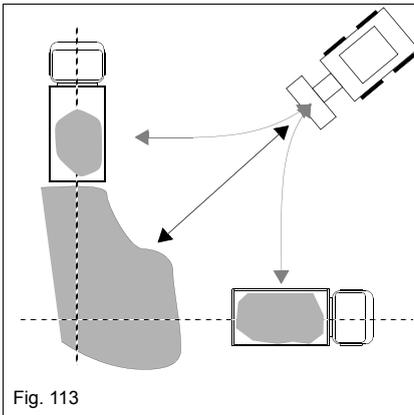
1. Brake the machine with the service brake.
2. Select the travel direction with switch **87** on the control lever:
 - **F** = forward – symbol **E** appears in the digital display.
 - **R** = reverse – symbol **F** appears in the digital display.
3. Press accelerator pedal slowly.
 - ▶ Machine travel starts.
4. Test the brakes at low speed.

Information

If the selection of the travel direction is not accepted (no function), this means that push button **83** (travelling drive – neutral position) has been pressed unintentionally!

- ▶ Select the travel direction again.

Reversing operation (changing travel direction)



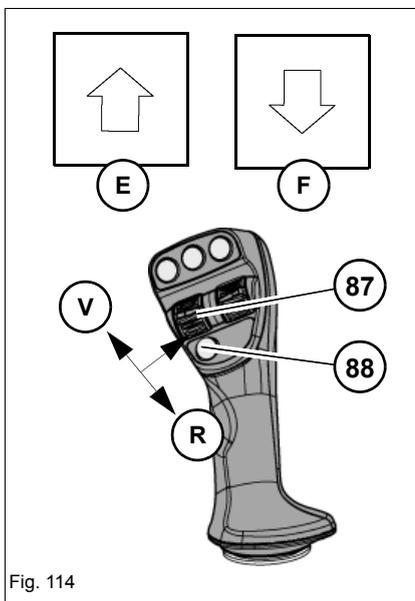
Reversing operation (change of travel direction without stopping) is only allowed in a secured job site for fast loading at low travel speed and lift heights.

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.



1. Reduce the travel speed to below 15 km/h (9.32 mph).
2. Select the travel direction with switch **87** on the control lever:
 - **F** = forward – symbol **E** appears in the digital display.
 - **R** = reverse – symbol **F** appears in the digital display.

Information

Changing direction during machine travel in the “Hare” speed range is only possible below 15 km/h (9.32 mph) for safety reasons!

Information

If the selection of the travel direction is not accepted (no function), this means that push button **88** (travelling drive – neutral position) has been pressed unintentionally!

- ▶ Select the travel direction again.

Neutral position, stopping the machine

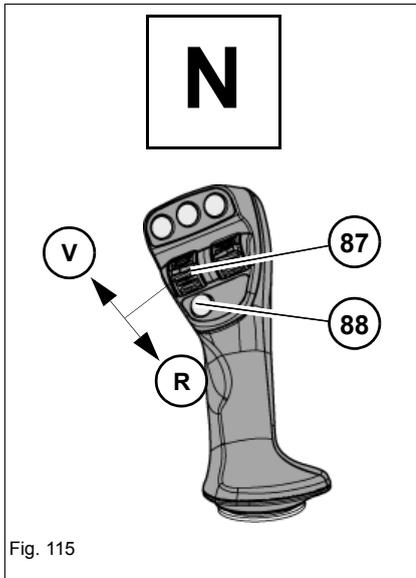


Fig. 115

Variant 1

3. Reduce the travel speed 0 – 20 km/h (0 – 12 mph).
4. Press push button **88** on the control lever.
 - Symbol **N** appears in the digital display.
5. Brake the machine to a standstill with the service brake.
6. Apply the parking brake – see [“Parking brake \(hand brake\)” on page 5-16.](#)

Variant 2

1. Reduce engine speed. To do this: remove your foot from the accelerator pedal.
2. Stop the machine with the service brake.
3. Switch the travel direction to neutral position with push button **88**.
 - Symbol **N** appears in the digital display.
4. Apply the parking brake – see [“Parking brake \(hand brake\)” on page 5-16.](#)

Parking the machine

WARNING

Accident hazard when parking the machine on a slope!

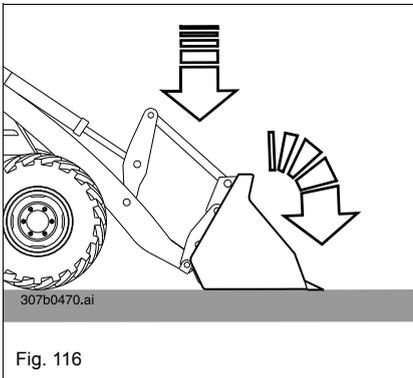
Serious injury or death can be caused by the machine rolling away.

- ▶ Apply the parking brake.
 - ▶ In addition to the parking brake, secure the machine by placing chocks (option) under the downhill sides of the wheels.
-

NOTICE

Engine damage by stopping the engine after full load.

- ▶ Let the engine run at idling speed for about 3 minutes so that the temperature can stabilize, and then stop it.
-



1. Apply the parking brake – see *“Parking brake (hand brake)”* on page 5-16.
2. Switch off all additional control circuits – see *“Additional front/rear control circuit (option)”* on page 5-44.
3. Lower the loader unit completely and set the bucket horizontally with the ground. Operation – see *“Control lever (joystick) overview”* on page 5-36.
4. Stop the engine and remove the starting key.
 - ➔ The immobilizer (option) is enabled.
5. Close and lock the door and the windows.
6. Remove the key from the battery master switch – see chapter *“Battery master switch”* on page 4-15.
7. Close the engine cover.

Additionally on slopes:

8. In addition to the parking brake, secure the machine by placing chocks under the downhill sides of the wheels.
 - ➔ Wheel chock A is located on the left on the frame in front of the cabin.

5.5 Differential lock

The 100 % front and rear axle differential lock neutralizes the compensating effect.

of the differential, in other words, traction acts evenly on the wheels of the front and rear axles.

NOTICE

In order to avoid damage to the differential,

- ▶ Switch on the differential lock only if you expect a wheel to spin, when working on slopes or on slippery ground, for example.
- ▶ Switch on the differential lock only at machine standstill.
- ▶ Switch off the differential lock when cornering.

Switching on the differential lock

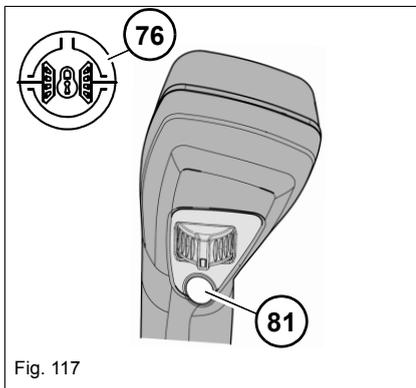


Fig. 117

WARNING

Accident hazard! The driving and steering behaviour changes considerably if the differential lock is enabled!

- ▶ Use the differential lock only at low speed and when travelling straight ahead.

In order to avoid damage to the differential lock when switching it on, the differential lock can only be enabled by pressing push button **81** on the control lever **and** the brake/inching pedal!

1. Stop the machine.
2. Press and hold push button **81** on the control lever.
3. Press the brake/inching pedal (2 – 3 seconds) until indicator light **76** on the indicating instrument illuminates.
 - The differential lock is enabled.
4. Carefully start machine travel and then stop the machine with push button **81** pressed.

Switching off the differential lock

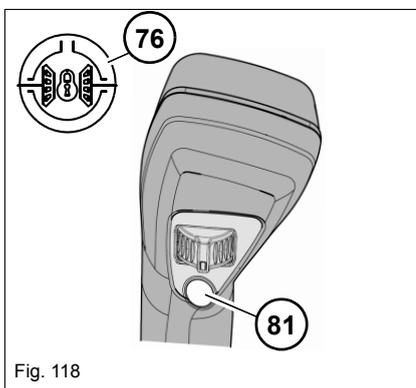


Fig. 118

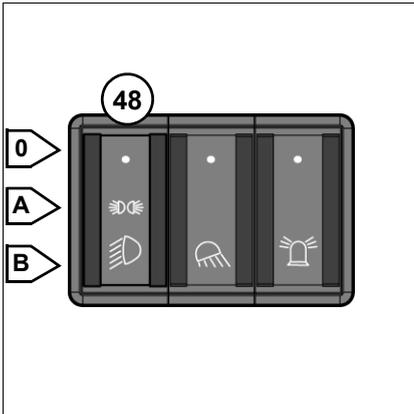
1. Reduce travel speed and engine speed.
2. Release push button **81** on the control lever.
 - Indicator light **76** on the indicating instrument goes out, the differential lock is disabled.

Information

Depending on the load on the power train, the differential lock can still be active for a short time even after releasing the push button. The differential lock is disabled only after indicator light **76** goes out!

5.6 Lights/signalling system

Parking lights/low beam



The machine lights switches are located on the rear switch panel to the right of the operator seat.

Side marker light operation		Function
ON	Press switch 48 to position A .	➤ The indicator light in the switch illuminates.
AUS	Press switch 48 to position 0 .	➤ Indicator light in switch goes out.

Low beam operation		Function
ON	Press switch 48 to position B .	➤ The indicator light in the switch illuminates.
AUS	Press switch 48 to position 0 .	➤ The indicator light in the switch goes out.

Information

The side marker lights stay lit if ignition is switched off while low beam is still switched on!

High beam/headlight flasher

WARNING

Accident hazard due to blinded motorists!

During machine travel on public roads, the high beam or headlight flasher can blind other motorists. This can cause serious injury or death.

- ▶ Switch off high beam or the headlight flasher in time during machine travel on public roads.
- ▶ Observe the national regulations.

High beam and the headlight flasher are operated with multifunctional lever **5**. The multifunctional lever is located on the left of the steering wheel.

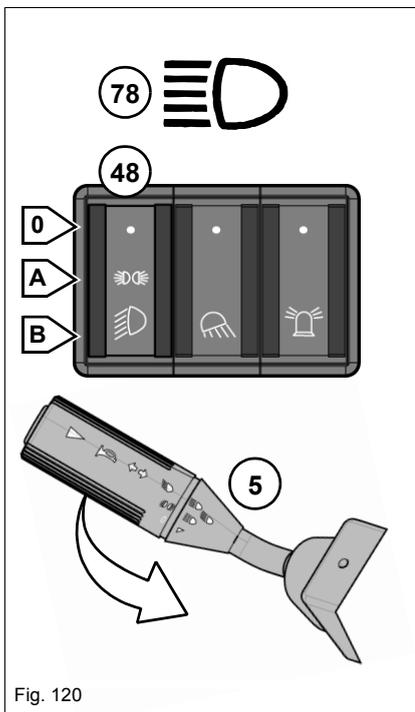


Fig. 120

High beam operation		Function
ON	1. Press switch 48 to position B . 2. Pull multifunctional lever 5 toward the steering wheel and release it.	➔ High beam and indicator light 78 illuminate.
AUS	Pull multifunctional lever 5 again toward the steering wheel and release it.	➔ High beam and indicator light 78 go out.
Headlight flasher operation		Function
ON	Pull multifunctional lever 5 at short intervals toward the steering wheel.	➔ High beam and indicator light 78 illuminate.

Working lights

The machine is equipped with the following working lights in different versions to ensure optimal light conditions of the job site:

- Rear right working light (standard)
- Front and/or rear left working lights (option)

The switches are located on the switch console on the left beside the steering wheel.

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.

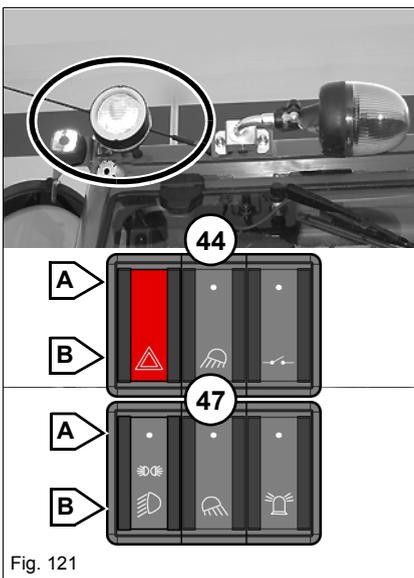
- ▶ Always switch off the working lights during machine travel on public roads.
- ▶ When operating the machine, only switch on the working lights when no one can be blinded by them.
- ▶ Pay attention to national regulations on construction site lighting.

Information

The working lights stay lit after switching off ignition.

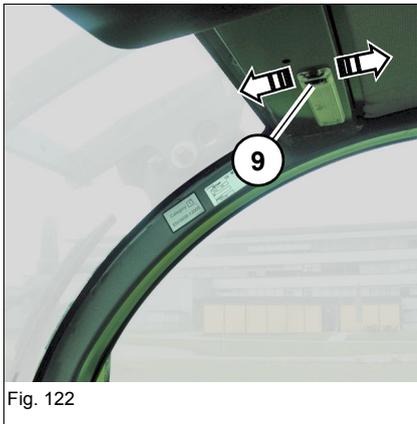
This drains the battery of the machine.

- ▶ Switch off the working lights if you do not need them.



Working lights operation		Function
ON	Press the toggle switch 44 (front) and/or toggle switch 47 (rear) in position B .	➤ The indicator light in the switch illuminates.
AUS	Press switch 44 (front) and/or switch 47 (rear) to position A .	➤ Indicator light in switch goes out.

Interior light



The interior light is located at the upper right on the cabin roof and is adjusted with switch 9.

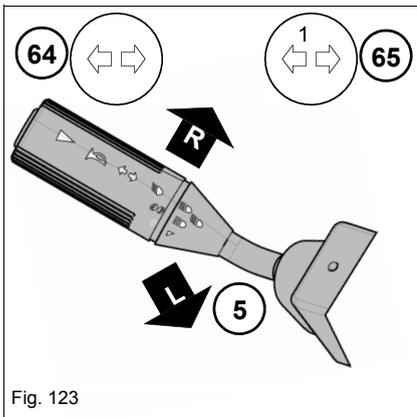
Switch position	Interior light function
Front	Illumination via door contact switch
Center	Light OFF
Rear	Light permanently ON

Turn indicators

NOTICE

The turn indicator system is not in order if indicator light 64 and/or 65 flashes about twice as fast as normally!

► Have the turn indicator system repaired.



Operating the turn indicators		Function
Right	Push multifunctional lever 5 forward R.	➔ Indicator light 64 flashes.
Left	Pull multifunctional lever 5 to the rear L.	➔ Indicator light 65 flashes during trailer operation.

Hazard warning system

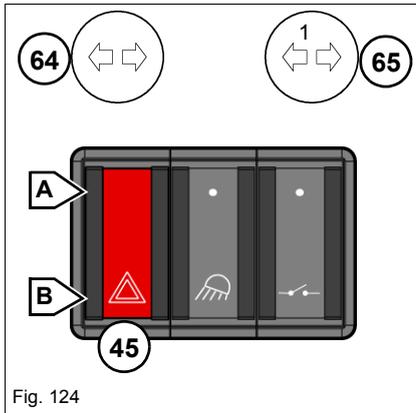


Fig. 124

The hazard warning switch is located on the switch console on the left beside the steering wheel.

Hazard warning system operation		Function
ON	Switch 45 in position B Press.	<ul style="list-style-type: none"> ➤ The indicator light in the switch and indicator light 64 both flash. ➤ Indicator light 65 flashes, too, during trailer operation.
AUS	Switch 45 in position A Press.	<ul style="list-style-type: none"> ➤ The indicator light in the switch and indicator lights 64 and 65 go out.

Horn

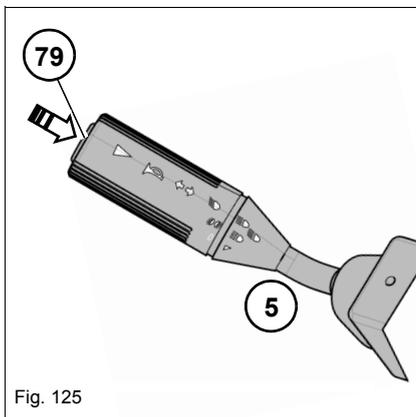
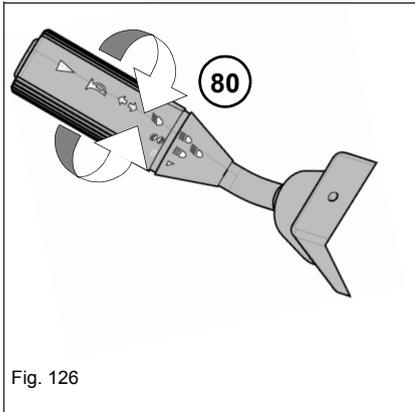


Fig. 125

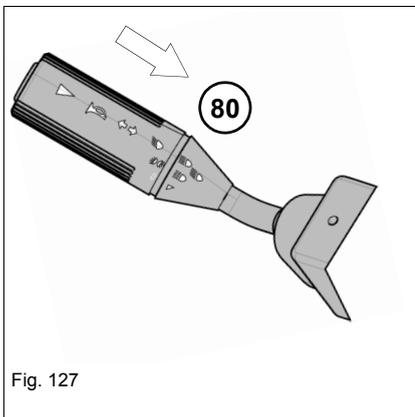
Operating the horn		Function
ON	Press push button 79 .	<ul style="list-style-type: none"> ➤ The horn sounds.

5.7 Wiper/wash system

Front wiper operation



Front wiper		Function
ON	Turn rotary switch 80 on the multifunctional lever to the 1st position.	➔ Intermittent wipe.
ON	Turn rotary switch 80 on the multifunctional lever to the 2nd position.	➔ Continuous wiping.
AUS	Turn rotary switch 80 fully back.	➔ Wipers return to base position.



Wash water (front/rear window)		Function
ON	Press and hold rotary switch 80 toward the steering column.	➔ Washer fluid is sprayed at the front and rear. ➔ The front wiper wipes 3 times.
AUS	Release rotary switch 80 .	➔ Front wipers return to base position.

Rear wiper operation

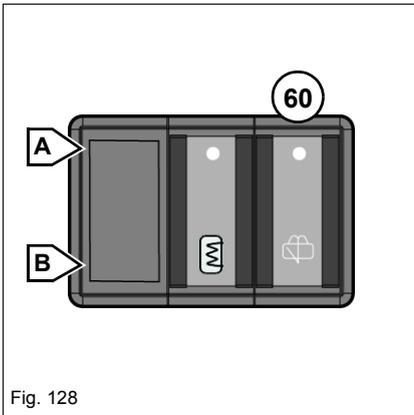


Fig. 128

The push button for the rear wiper is located on the switch console on the right beside the steering wheel.

Rear wiper		Function
ON	Press switch 60 on the rear wiper to position B .	➤ Rear wiper is on.
AUS	Press switch 60 on the rear wiper to position A .	➤ Rear wiper returns to base position.

Rear window washer pump		Function
ON	Press and hold switch 60 beyond position B (push button function).	➤ Washer nozzle in operation. ➤ Wiper wipes 3 times.



Information

For refilling washer fluid – see chapter *“Washer system reservoir”* on page 7-58.

5.8 Heating, ventilation and air conditioning system (option)

Heating and ventilation

The air is directed to the front window, the leg room area and the cabin by means of two nozzles each – see chapter “Inside the cabin” on page 4-26.

Each nozzle can be directed and/or closed.

2 operating modes can be selected:

- Ventilation, fresh air
- Heating

Rotary switches **94** and **95** for adjusting the heating and ventilation are located on the switch console on the right (near the cabin door).

Ventilation, fresh air

1. Adjust the fan speed with rotary switch **94** (positions **1 – 3**).
2. Turn rotary switch **95** to the limit to position **K** (cold).

Heating

1. Adjust the fan speed with rotary switch **94** (positions **1 – 3**).
2. Adjust the temperature with rotary switch **95**:

K = cold

W = warm

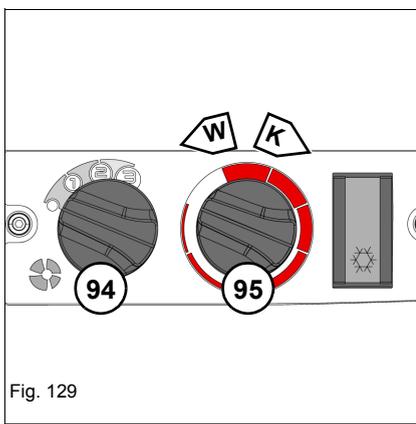


Fig. 129



Air conditioning (option)

Information on putting the air conditioning into operation

For cooling and heating, the air conditioning system supplies dehumidified and purified air to the cabin.

In order to achieve best air conditioning results:

- Before putting into operation, ventilate the cabin thoroughly.
 - Close the windows and doors.
 - Set the fan to maximum output first, and then adjust it to your needs.
 - In order to prevent condensation water from forming on the condenser, switch off the air conditioning system in due time before the end of work.
-

NOTICE

Observe the following points in order to avoid malfunctions, loss of refrigerant and drying-out of the seals:

- ▶ Run the air conditioning system at least once a month (always leave it switched on it if possible).
 - ▶ Clean the heat exchanger (condenser) regularly. Daily in dusty or dirty work conditions – see chapter “Air conditioning (option)” on page 7-54.
 - ▶ Check the V-belt for cracks and correct tension – see chapter “Checking the V-belt” on page 7-40.
 - ▶ Have the air conditioning checked at least once a year by an authorized service centre.
 - ▶ The air conditioning system must only be repaired, serviced and filled with a refrigerant by trained personnel and an authorized service centre.
-

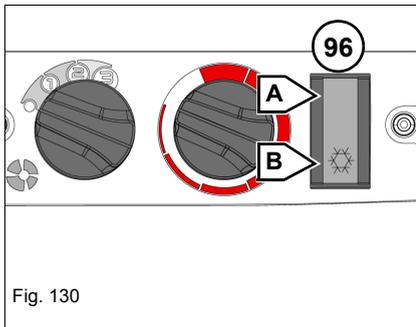


Fig. 130

Air conditioning operation

Switch **96** is located on the switch console on the right (near the cabin door).

Air conditioning operation		Function
ON	Press switch 96 to position B .	<ul style="list-style-type: none"> ➔ Indicator light in switch illuminates. ➔ Air conditioning system in operation.
AUS	Press switch 96 to position A .	<ul style="list-style-type: none"> ➔ Air conditioning system OFF.



Information

The air conditioning system allows you to select the same operating modes as with the heating and ventilation system!

The heating output is then restricted when the air conditioning system is in use!

5.9 Operating hydraulics

Important safety instructions on loader unit operation



WARNING

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 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.
-



WARNING

Crushing hazard due to tipping over of machine!

A tipping machine can cause serious injury or death.

- ▶ Lower the loader unit to transport position before starting machine travel.
 - ▶ Adapt the travel speed to the prevailing conditions.
 - ▶ Adapt the driving speed to the material loaded.
 - ▶ Pay attention to persons and obstacles.
 - ▶ Reduce travel speed before performing downhill machine travel.
 - ▶ Always fasten your seat belt.
 - ▶ Ensure that no parts of the body protrude outside the machine.
 - ▶ Carefully steer the machine if the loader unit is raised.
 - ▶ Do not exceed the permissible payloads.
-



Information

With the "seat contact switch" option, the vehicle can only be put into operation from the operator's seat.

If the operator's seat is left during operation, the diesel engine automatically switches off after about 5 seconds for safety reasons.

Control lever (joystick) overview

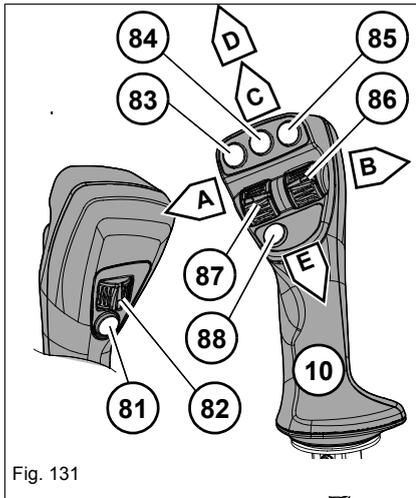


Fig. 131

Operation		Function
A	To the left	➔ Tilts in the attachment
B	To the right	➔ Tilting in the attachment
C	Forward	➔ Lowering the loader unit
D	Fully forward (2nd position)	➔ Lowers the loader unit to float position (option)
E	Backward	➔ Raises the loader unit
81	Push button	➔ Enable the differential lock – see “Differential lock” on page 5-24
82	Switch	➔ 3rd control circuit (attachment unlocking and locking or auxiliary control circuit attachment)
83 / 84	Push button	➔ Additional control circuit with additional functions (option)
85	Push button	➔ Front socket push button (option) or bucket repositioning (option)
86	Switch	➔ Additional control circuit (4th control circuit proportional controls option)
87	Switch	➔ Travel direction (forward/reverse) – see “Selecting a travel direction and starting machine travel” on page 5-20
88	Push button	➔ Disabling the travel direction – see “Neutral position, stopping the machine” on page 5-22

i Information

The control lever **10** can only be operated if the diesel engine runs and the operating hydraulics lock is disabled.

For safety reasons, the loader unit cannot be lowered with the hose burst valve (option) if the diesel engine is stopped and the ignition is switched off!

i Information

As an option the control valve can be fitted with a float position. This is beneficial when working with a rotary broom or snowploughs, or for grading bulk material in reverse.

Hydraulic control circuits/plug couplings (overview)

The following control circuits and hydraulic connections are available on the machine depending on equipment.

See following pages for instructions on how to operate the separate control circuits and hydraulic connections.

KRAMER quickhitch plug couplings (standard)

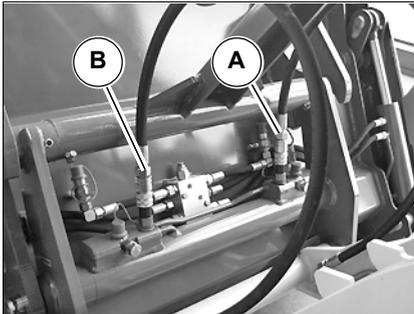


Fig. 132

Control circuits:	Hydraulic connections:	For operation, see page:
3rd control circuit	A + B	5-40
Continuous operation of 3rd control circuit		

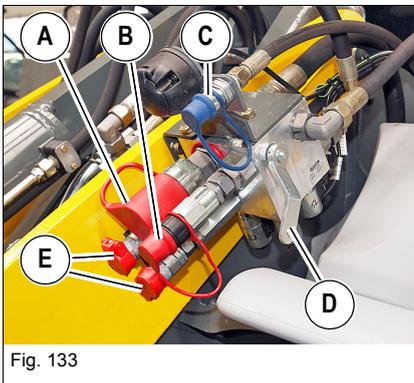


Fig. 133

Plug couplings for front additional control circuit

Control circuits:	Hydraulic connections:	For operation, see page:
Front plug coupling (return without pressure)	A	5-44
Front plug coupling (pressure)	B	
Plug coupling (leak oil line)	C	
Changeover tap to plug couplings E	D	
Front plug coupling for additional functions	E	5-47



Fig. 134

Plug couplings for rear additional control circuit (option)

Control circuits:	Hydraulic connections:	For operation, see page:
Rear plug coupling (return without pressure to reservoir)	G	5-44
Rear plug coupling (single-action pressure)	H	

Rear tipping trailer connection (option)

Control circuits:	Hydraulic connections:	For operation, see page:
Rear plug coupling (double-action pressure)	H	5-48

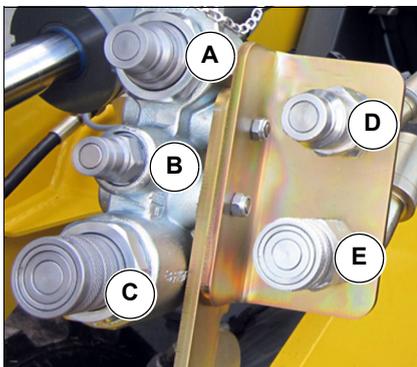


Fig. 135

Plug couplings of 3rd control circuit (FASTER block) and additional control circuit laterally on loader unit (option)

i Information

This option (FASTER block) is only possible in connection with the SKID STEER quickhitch!

Control circuits:	Hydraulic connections:	For operation, see page:
Plug coupling (3rd control circuit, permanent operation, return without pressure)	A	5-52
Plug coupling (leak oil line)	B	–
Plug coupling (3rd control circuit, permanent operation – pressure)	C	5-52
Plug coupling (additional control circuit, return without pressure)	D	5-53
Plug coupling (additional control circuit – pressure)	E	

Important information on connecting and operating the hydraulic control circuits



WARNING

Connecting the flexible lines incorrectly results in incorrect operation and/or uncontrolled movements of the attachment!

Failure to observe this can cause serious injury or death.

- ▶ Ensure that the flexible lines of the attachment are connected to the appropriate plug couplings.
 - ▶ Follow the instructions in the Operator's Manual of the attachment manufacturer.
 - ▶ Check the response direction before putting the attachment into operation.
-

NOTICE

In order to avoid leaks on the plug couplings and dirt in the hydraulic oil,

- ▶ carefully clean the plug couplings and flexible lines before connecting them.
 - ▶ Stop the diesel engine before connecting the flexible lines.
-

NOTICE

Danger of damages to the attachment due to excessive hydraulic pressure!

- ▶ Check the flow rate of the attachment before putting it into operation.
 - ▶ Refer to the Operator's Manual of the attachment.
-



Information

The hydraulic system of the machine is still pressurized even when the engine is not running. The plug couplings can be released, however they cannot be re-attached because the pressure in the hydraulic lines has not been released.

- ▶ Release the pressure in the sections of the system and hydraulic lines that are to be opened before installing and removing an attachment
– see *“Releasing the pressure at the plug couplings” on page 5-65.*
-



Information

Operation of attachments at the front and rear coupling connections at the same time is not possible! Remove an attachment that is not used!

3rd control circuit

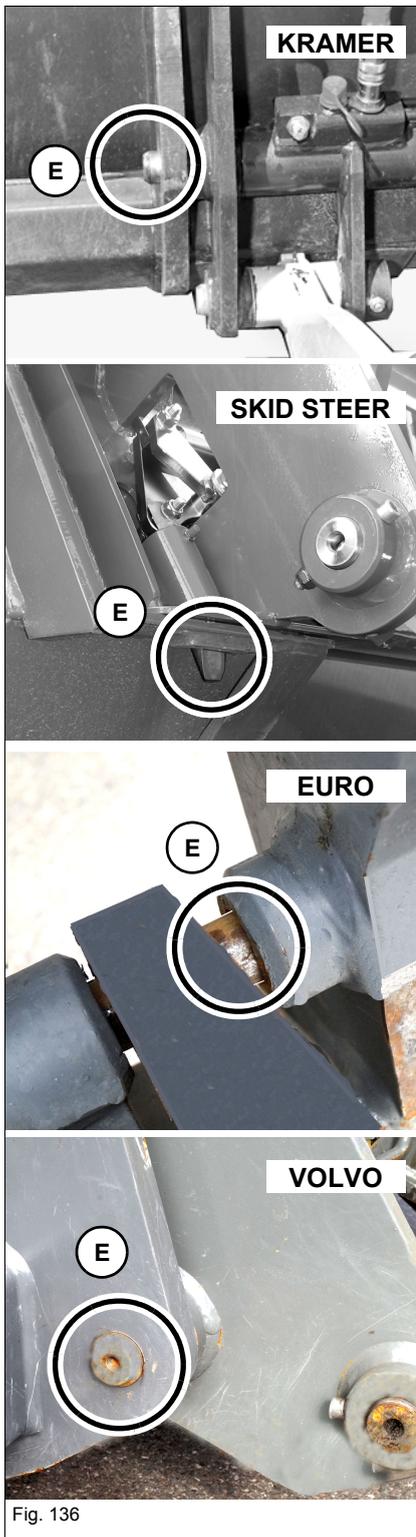


Fig. 136

Locking the attachment

WARNING
Accident hazard due to unlocked attachment!

The attachment can come off unexpectedly and cause serious injury or death.

- ▶ Ensure that the attachment is visibly locked on either side with lock pins **E**.

1. Pick up attachment with quickhitch – see [“Pick up the attachment” on page 5-57](#).
2. Press switch **82** on the joystick to the left.
 - The attachment is locked in the quickhitch.
3. Enable the road travel lock. To do this: slide the lock in switch **89** downward and press it to position **B**.
 - Symbol **F** appears in the digital display, the switch on the control lever is not functional.

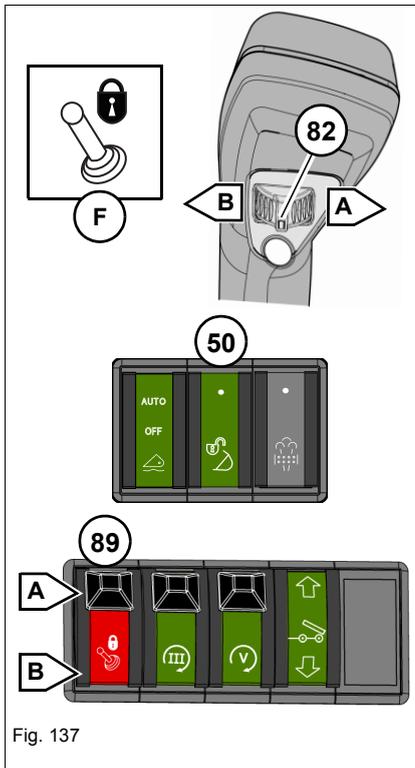


Fig. 137

Unlocking an attachment

The attachment locked onto the quickhitch is secured against unintentional unlocking (operation of switch **82** on the joystick).

The attachment can only be unlocked by additionally pressing button **50**. The operator must be seated on the seat for this.

i Information

In order to avoid damage to the attachment lock, follow the order for performing unlocking.

1. Disable the lock for the operating hydraulics/road travel. To do this: slide the lock in switch **89** downward and press it to position **A**.
 ➔ Symbol **F** disappears from the digital display.
2. Press and hold push button **50**.
3. Press switch **82** on the joystick to the right at the same time until the catch bolts fully come out of the mounting bores of the attachment.
4. Release switch **82** on the joystick.
5. Then release push button **50**.

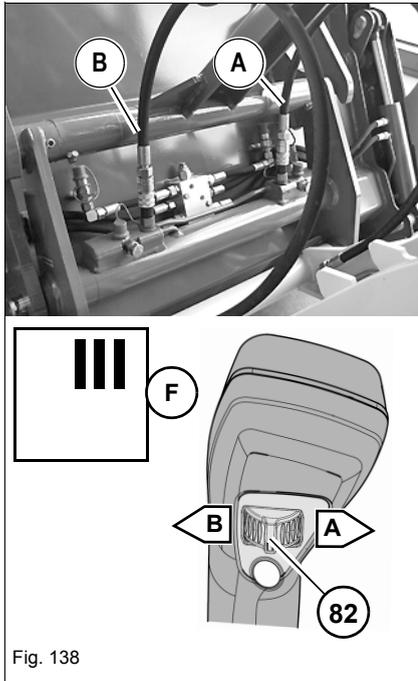


Fig. 138

Putting a hydraulic attachment into operation

A hydraulic attachment (for example a multipurpose bucket) can be operated with the 3rd control circuit.

Flexible lines **A + B** of the quickhitch quick couplers are connected to the attachment for this.

Operation is performed with switch **82** on the control lever (joystick).

! WARNING

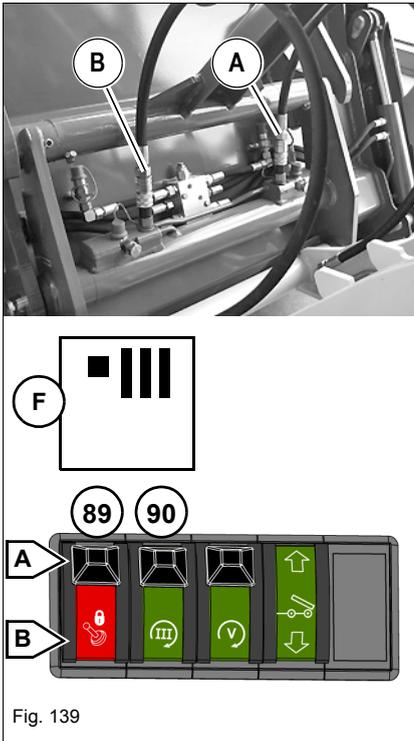
Connecting the flexible lines incorrectly results in incorrect operation and/or uncontrolled movements of the attachment!

Failure to observe this can cause serious injury or death.

- ▶ Ensure that the flexible lines of the attachment are connected to the appropriate plug couplings.
- ▶ Follow the instructions in the Operator's Manual of the attachment manufacturer.
- ▶ Check the response direction of the control elements before using the attachment.

1. Pick up the attachment and safely lock it
 - see *"Pick up the attachment"* on page 5-57,
 - see *"Locking the attachment"* on page 5-40.
2. Release the pressure at the plug couplings
 - see *"Releasing the pressure at the plug couplings"* on page 5-65.
3. Connect the hydraulic lines to the 3rd control circuit
 - see *"Connecting hydraulic lines to the 3rd control circuit"* on page 5-68.

Operating an attachment	Function
Slide switch 82 to the left A (as seen in the travel direction).	<ul style="list-style-type: none"> ➤ Symbol F appears in the digital display. ➤ Pressure is applied to plug coupling B on the left. ➤ The attachment is actuated proportionally (multipurpose bucket is opened, for example).
Slide switch 82 to the right B (as seen in the travel direction).	<ul style="list-style-type: none"> ➤ Symbol F appears in the digital display. ➤ Pressure is applied to plug coupling A on the right. ➤ The attachment is actuated proportionally (multipurpose bucket is closed, for example).



Putting an attachment into continuous operation

Continuous operation is used for movements/procedures over a long period of time or operation of hydraulic motors (for example a rotary broom) or for operation of attachments with an integrated control valve adjusted to maximum oil flow, with an unpressurized return.

1. Pick up the attachment and safely lock it
 - see *“Pick up the attachment” on page 5-57,*
 - see *“Locking the attachment” on page 5-40.*
2. Lower the loader unit and apply the parking brake.
3. Stop the engine, but do **not** switch off ignition.
4. Release the pressure at the plug couplings
 - see *“Releasing the pressure at the plug couplings” on page 5-65.*
5. Switch off the starter and remove the starting key.
6. Remove flexible lines **A** and **B** from the plug couplings of the quickhitch and connect them to the plug couplings of the attachment.
7. Start the diesel engine.

Switching on continuous operation

1. Disable the lock for the operating hydraulics/road travel. To do this: slide the lock in switch **89** downward and press it to position **A**.
2. Slide the lock in switch **90** downward to position **B**.

- Symbol **F** appears in the digital display.
- Continuous operation is enabled, the oil pressure is being built up.
- – see *chapter “Usable consumer pressure at quick couplings (3rd control circuit)” on page 9-12.*

Information

Restart lock in continuous operation!

If the ignition is switched off and on again, permanent operation is automatically disabled for safety reasons!
Permanent operation has to be enabled again when it is resumed!

Information

In order to avoid loss of output, switch off continuous operation if it is no longer required.

Additional front/rear control circuit (option)

The additional control circuit in the front is used for the operation of hydraulic attachments, for example a rotary sweeper or a snow cutter with an additional swiveling ejector function.

The rear additional control circuit is for the operation of hydraulic attachments, for example a salt spreader or tipping trailers.

The front or rear additional control circuits are selected with the changeover tap **D**. Simultaneous operation is not possible.

Connections for additional control circuits (overview)

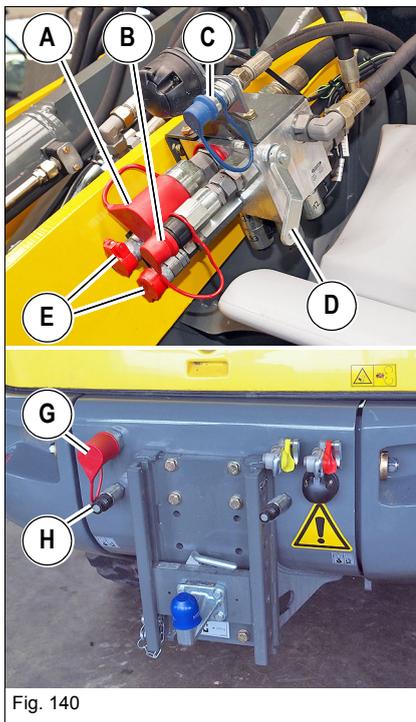


Fig. 140

Hydraulic connections on front and rear distributing block

A	Front plug coupling (return without pressure)
B	Front plug coupling (pressure)
C	Plug coupling (leak oil line)
D	Changeover tap for connections A/B (front) or G/H (rear)
E	Front plug coupling (for additional functions)
G	Rear plug coupling (return without pressure)
H	Rear plug coupling (pressure)

Important information on the front/rear additional control circuits

 **WARNING**

Connecting the flexible lines incorrectly results in incorrect operation and/or uncontrolled movements of the attachment!

Failure to observe this can cause serious injury or death.

- ▶ Ensure that the flexible lines of the attachment are connected to the appropriate plug couplings.
 - ▶ Follow the instructions in the Operator's Manual of the attachment manufacturer.
 - ▶ Check the response direction of the control elements before using the attachment.
-

NOTICE

In order to avoid leaks on the plug couplings and dirt in the hydraulic oil,

- ▶ carefully clean the plug couplings and flexible lines before connecting them.
-

NOTICE

Danger of damages to the attachment due to excessive hydraulic pressure!

- ▶ Check the flow rate of the attachment before putting it into operation.
 - ▶ Refer to the Operator's Manual of the attachment.
-

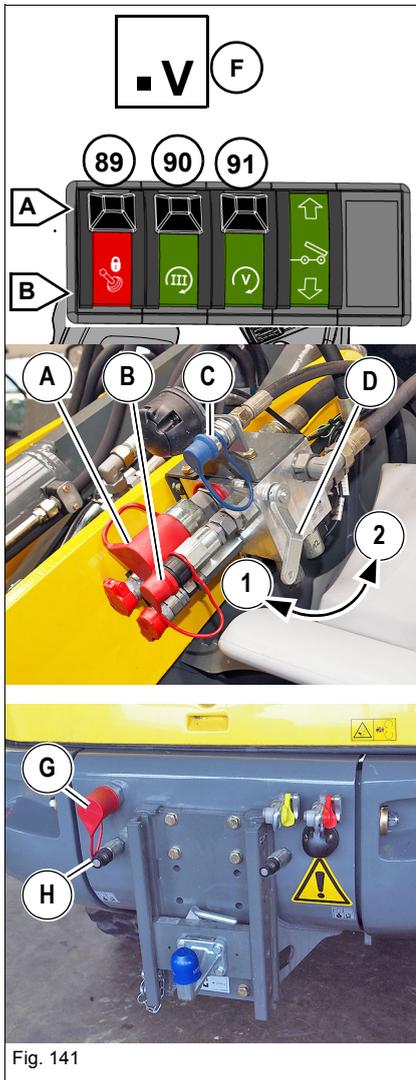


Fig. 141

Putting the front/rear additional control circuit into permanent operation

Before connecting the flexible line to the machine:

- Pick up the attachment and safely lock it
 - see [“Pick up the attachment” on page 5-57](#),
 - see [“Locking the attachment” on page 5-40](#).
- Lower the loader unit and apply the parking brake.
- Stop the engine, but do **not** switch off ignition.
- Release the pressure at the plug couplings
 - see [“Releasing the pressure at the plug couplings” on page 5-65](#).
- Switch off the starter and remove the starting key.

Additional front/rear control circuit

1. Connect the flexible lines of the attachment to the coupling connections **A + B at the front** or **G + H at the rear**.
 - Indicator display **F** appears.
 - Pressure is applied to coupling connections **B (front)** or **H (rear)**.
 - No pressure is applied to coupling connections **A (front)** or **G (rear)**.
 - – see chapter [“Usable consumer pressure at additional control circuit \(option\)” on page 9-12](#).
2. Turn changeover tap **D** to position **1 (front)** or **2 (rear)**.
3. Slide and press the lock in switch **89** downward to **A**.
4. Slide the lock in switch **91** downward to position **B**.

Additional front control circuit (115 l/min – 30.38 gal/min)

1. Connect the flexible lines of the attachment to the coupling connections of distributing block **A + B at the front**.
 - Indicator display **F** appears.
 - Pressure is applied to coupling connection **B** at the front.
 - Coupling connection **A** for return.
 - – see chapter [“Usable consumer pressure at additional control circuit \(option\)” on page 9-12](#).
2. Turn changeover tap **D** to position **1 (front)**.
3. Slide and press the lock in switch **89** downward to position **A**.
4. Slide the lock in switch **90** downward to position **B**.
5. Slide the lock in switch **91** downward to position **B**.

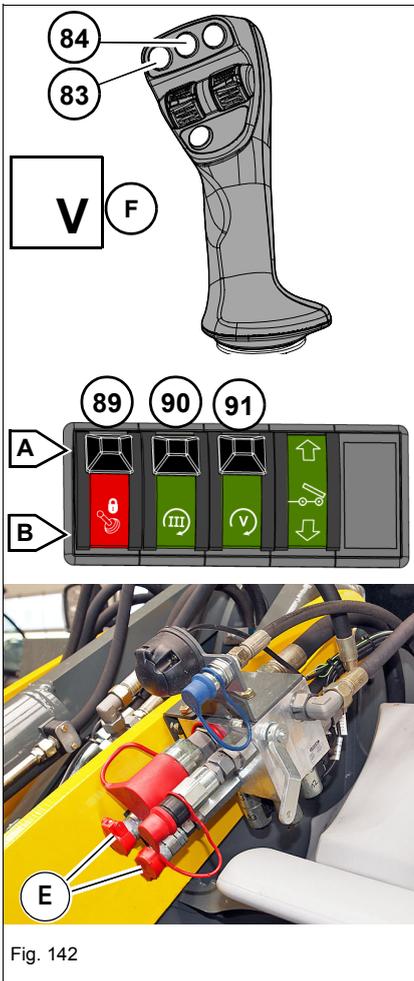


Fig. 142

Switching on the additional functions of the additional front control circuit

Additional functions of additional front control circuit (115 l/min – 30.38 gal/min)

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Connect the flexible lines of the attachment to the coupling connections E and F. 2. Slide and press the lock in switch 89 downward to position A. 3. Slide the lock in switch 90 downward and press the switch to position B. 4. Slide the lock in switch 91 downward and press the switch to position B. | <ul style="list-style-type: none"> ➤ Indicator display F appears. ➤ The additional control circuit is enabled. |
| <ol style="list-style-type: none"> 5. Press push button 83 or 84 on the control lever (joystick). | <ul style="list-style-type: none"> ➤ Pressure is applied to coupling connections E depending on push button operation. ➤ – see chapter “Usable consumer pressure at quick couplings (3rd control circuit)” on page 9-12. |

Additional control circuit for a tipping trailer (option)

Only tipping trailers with single-action tilt rams can be operated with this option.

Important information on the additional control circuit for tipping trailers

WARNING

Connecting the flexible lines incorrectly results in incorrect operation and/or uncontrolled movements of the attachment!

Failure to observe this can cause serious injury or death.

- ▶ Ensure that the flexible lines of the attachment are connected to the appropriate plug couplings.
- ▶ Follow the instructions in the Operator's Manual of the attachment manufacturer.
- ▶ Check the response direction of the control elements before using the attachment.

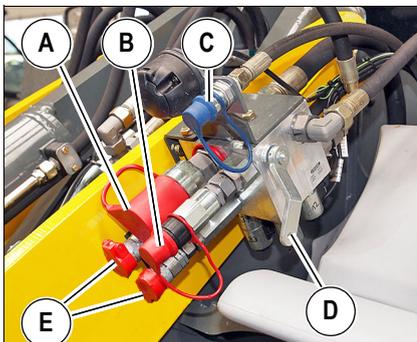


Fig. 143

WARNING

Accident hazard!

No attachments must be connected to the plug couplings "Additional front control circuit" (A, B, C, E) before putting the tipping trailer into operation!

- ▶ Uncouple the attachments.
- ▶ Close the plug couplings with protective caps.

NOTICE

In order to avoid leaks on the plug couplings and dirt in the hydraulic oil,

- ▶ carefully clean the plug couplings and flexible lines before connecting them.

NOTICE

Danger of damages to the attachment due to excessive hydraulic pressure!

- ▶ Check the flow rate of the attachment before putting it into operation.
- ▶ Refer to the Operator's Manual of the attachment.

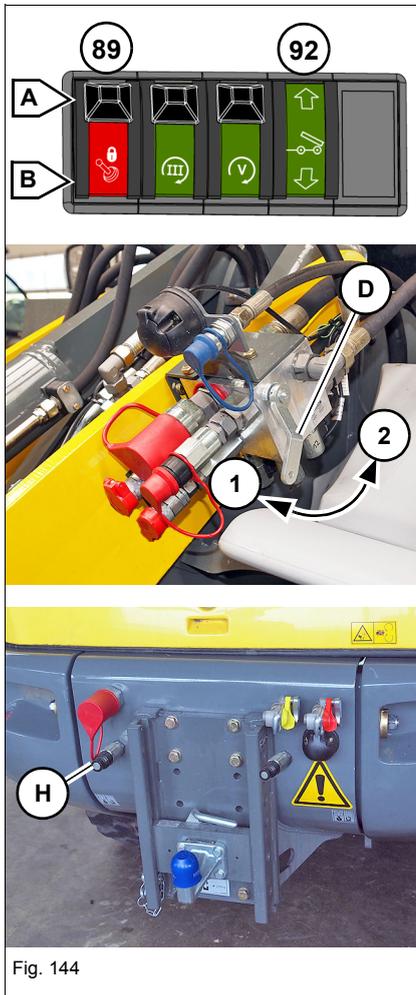


Fig. 144

Putting the additional control circuit for tipping trailers into operation

1. Lower the loader unit and apply the parking brake.
2. Stop the engine, but do **not** switch off ignition.
3. Release the pressure at the plug couplings
– see *“Releasing the pressure at the plug couplings” on page 5-65.*
4. Switch off the starter and remove the starting key.
5. Connect the flexible line of the tipping trailer to coupling connection **H** of the distributing block.
6. Turn changeover tap **D** to position **2 (rear)**.
7. Start the diesel engine.
8. Slide the lock in switch **89** downward to position **A**.
➔ The additional control circuit for the tipping trailer is activated.
9. Lower the tipping trailer: press push button **92** to position **B**.
10. Raise the tipping trailer: press push button **92** to position **A**.

Putting the additional control circuit for tipping trailers out of operation

1. Stop the engine, but do **not** switch off ignition.
2. Release the pressure at the plug couplings
– see *“Releasing the pressure at the plug couplings” on page 5-65.*
3. Switch off the starter and remove the starting key.
4. Remove the flexible line of the tipping trailer from coupling socket **H**.

Additional control circuit of proportional controls (option)

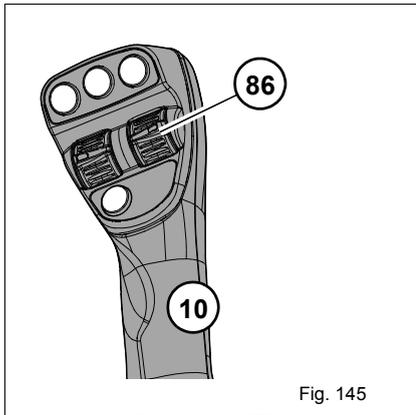


Fig. 145

Plug couplings with hydraulic hoses are installed on the loader unit of the wheel loader for the operation of hydraulic attachments with additional hydraulic functions (for example high-tilt bucket with clamp).

The additional control circuit is operated electronically (proportional controls) by means of scroll wheel **86** on the control lever (joystick) and a solenoid valve on the control valve.

Important information on the additional control circuit (proportional controls)



WARNING

Connecting the flexible lines incorrectly results in incorrect operation and/or uncontrolled movements of the attachment!

Failure to observe this can cause serious injury or death.

- ▶ Ensure that the flexible lines of the attachment are connected to the appropriate plug couplings.
- ▶ Follow the instructions in the Operator's Manual of the attachment manufacturer.
- ▶ Check the response direction of the control elements before using the attachment.

NOTICE

In order to avoid leaks on the plug couplings and dirt in the hydraulic oil,

- ▶ carefully clean the plug couplings and flexible lines before connecting them.

NOTICE

Danger of damages to the attachment due to excessive hydraulic pressure!

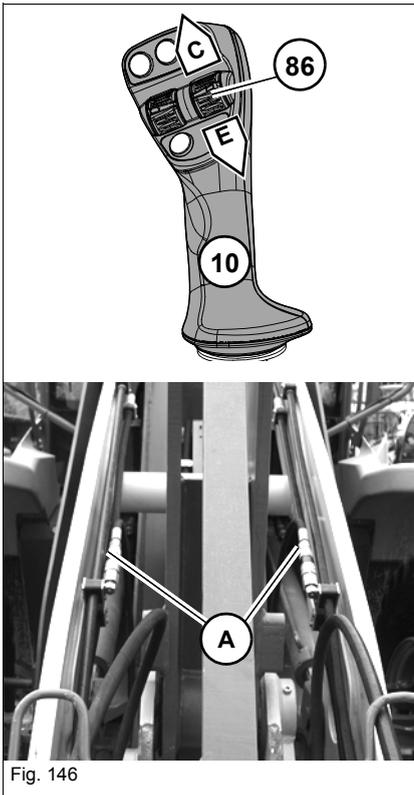
- ▶ Check the flow rate of the attachment before putting it into operation.
- ▶ – see chapter *“Usable consumer pressure at additional control circuit (option)”* on page 9-12 also refer to the Operator's Manual of the attachment.



Information

Always operate attachments with only one hydraulic circuit on the plug couplings of the 3rd control circuit.

Putting the additional control circuit (proportional controls) into operation



WARNING

Connecting the flexible lines incorrectly results in incorrect operation and/or uncontrolled movements of the attachment!

Failure to observe this can cause serious injury or death.

- ▶ Ensure that the flexible lines of the attachment are connected to the appropriate plug couplings.
- ▶ Follow the instructions in the Operator's Manual of the attachment manufacturer.
- ▶ Check the response direction of the control elements before using the attachment.

1. Lower the loader unit and apply the parking brake.
2. Stop the engine, but do **not** switch off ignition.
3. Release the pressure on the plug couplings. To do this: press and hold switch **86** in either position **C** and **E** about 5 seconds.
 - Pressure in hydraulic lines is released.
4. Switch off the starter and remove the starting key.
5. Remove plug couplings **A** from the dummy sockets and insert them in the plug couplings on the attachment.
6. Starts the engine.
7. Operate the additional control circuit (proportional controls) with scroll wheel **86** on the control lever (joystick).

Continuous operation of 3rd control circuit for SKID STEER attachments (option)

Continuous operation is used for movements/procedures over a long period of time or operation of hydraulic motors (for example a rotary weeper) or for operation of attachments with an integrated control valve, which is adjusted for maximum **oil flow**, with an unpressurized return.

NOTICE

Damage hazard to the machine and/or the attachment!

- ▶ Check the flow rate of the attachment before putting it into operation.
- ▶ Flow rate indications and consumer pressure on the plug couplings of the machine – see chapter “Usable consumer pressure at quick couplings (3rd control circuit)” on page 9-12.
- ▶ Also refer to the Operator’s Manual of the attachment for the required oil quantities.

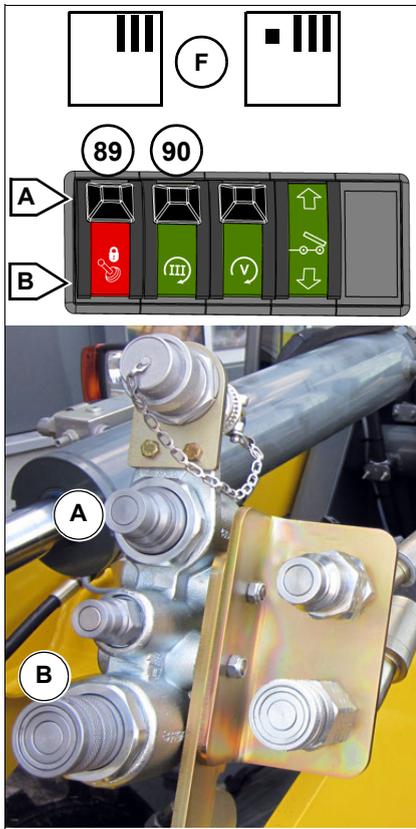


Fig. 147

Putting into continuous operation	
<ol style="list-style-type: none"> 1. Connect the flexible lines of the attachment to the coupling connections A + B of the distributing block. 2. Slide the lock in switch 89 downward to position A. 3. Slide the lock in switch 90 downward to position B. 	<ul style="list-style-type: none"> ➤ Indicator display F appears. ➤ Pressure is applied to coupling connection B. ➤ Coupling connection A for return.
Stopping continuous operation	
<ol style="list-style-type: none"> 1. Disable continuous operation of the 3rd control circuit. To do this: press switch 90 to position A. 1. Disable the 3rd control circuit. To do this: slide the lock in switch 89 downward and press it to position B. 	<ul style="list-style-type: none"> ➤ Plug couplings A + B are not operational.

i Information

For safety reasons, the diesel engine cannot be restarted with continuous operation switched on (start interlock)!

- ▶ Before starting the diesel engine, switch off continuous operation of the 3rd control circuit first.

Operation of the additional control circuit – SKID STEER attachments (option)

Using the additional control circuit in continuous operation

The additional control circuit is used for the operation of hydraulic attachments, for example a rotary broom or a snow cutter with an additional swivelling ejector function.

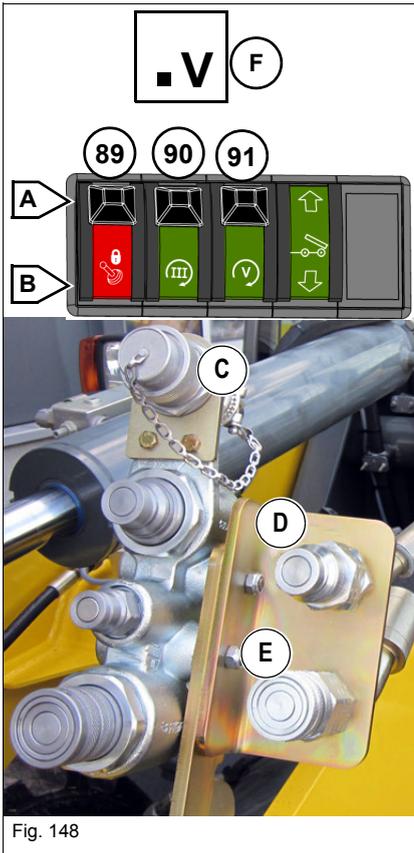


Fig. 148

Putting into operation: Additional control circuit

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Connect the flexible lines of the attachment to the plug couplings D + E. 2. Slide the lock in switch 89 downward and press the switch to position A. 3. Slide the lock in switch 90 downward and press the switch to position B. 4. Slide the lock in switch 91 downward and press the switch to position B. | <ul style="list-style-type: none"> ➤ Indicator display F appears. ➤ Pressure is applied to coupling connection E. ➤ Coupling connection D for return. ➤ <i>Usable consumer pressure at additional control circuit (option) on page 9-12.</i> |
|--|---|

Putting the additional control circuit out of operation

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Press switch 91 to position A. 2. Press switch 90 to position A. 3. Disable the 3rd control circuit. To do this: slide the lock in switch 89 downward and press it to position A. | <ul style="list-style-type: none"> ➤ Plug couplings D + E are out of operation. |
|--|---|

i Information

For safety reasons, the diesel engine cannot be started again (after it has been stopped) if continuous operation is switched on (start interlock)!

- ▶ Before restarting the diesel engine, switch off continuous operation of the additional control circuit.

i Information

Operation of additional functions, for example electro-hydraulic control valves in the attachments, is possible with the front power outlet **C** – see “14-pole front socket (option)” on page 5-55.

7-pole front socket (option)

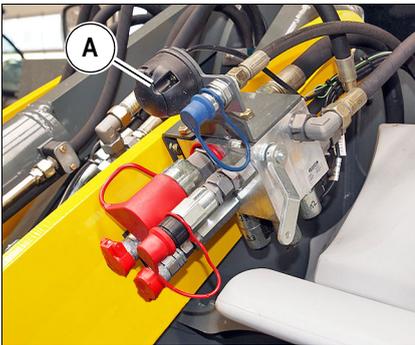


Fig. 149

The machine is equipped with an optional 7-pole socket **A** (at the front left on the loader unit) for electrical attachments.

The front socket option is available in two variants:

- With one electrical circuit if the machine is equipped with the “Bucket repositioning” option.
- With two electrical circuits if the “Bucket repositioning” option is not installed.

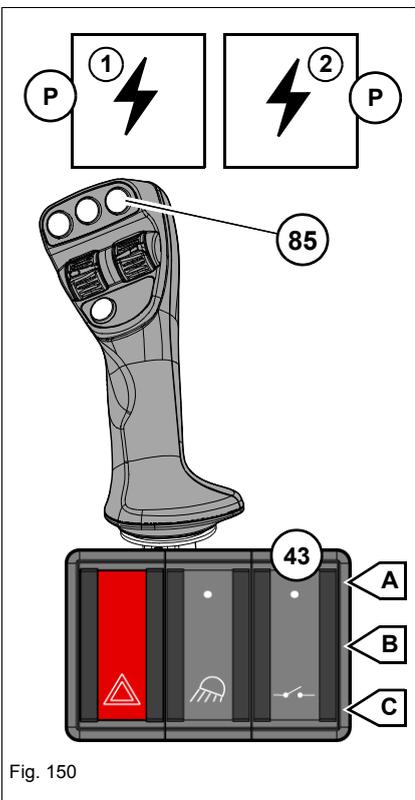


Fig. 150

Front electrical socket with two electrical circuits

The power supply can be set to push-button or continuous operation, or switched off, with switch **43** in the switch console.

Changeover between both electrical circuits is possible with push button **85** on the control lever (joystick) (for electrical attachments with two different electrical functions).

Operation		Function
Push-button operation	Press switch 43 to position B .	<ul style="list-style-type: none"> ➔ Symbol P/2 appears in the digital display. ➔ Electrical circuit 2 is enabled.
	Press and hold push button 85 .	<ul style="list-style-type: none"> ➔ Symbol P/1 appears in the digital display. ➔ Electrical circuit 1 is enabled.
AUS	Press switch 43 to position A .	➔ The power supply is switched off.
Operation		Function
Continuous operation	Press switch 43 to position C .	<ul style="list-style-type: none"> ➔ Symbol P/2 appears in the digital display. ➔ Electrical circuit 2 is enabled.
	Press push button 85 to change over to electrical circuit 1 or 2.	➔ Symbols P/2 or P/1 appear in the digital display.
AUS	Press switch 43 to position A .	➔ The power supply is switched off.

14-pole front socket (option)

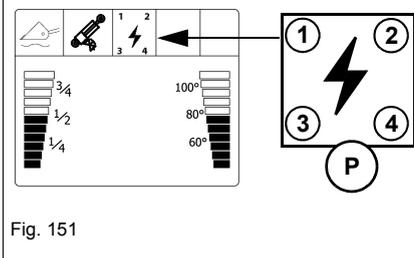
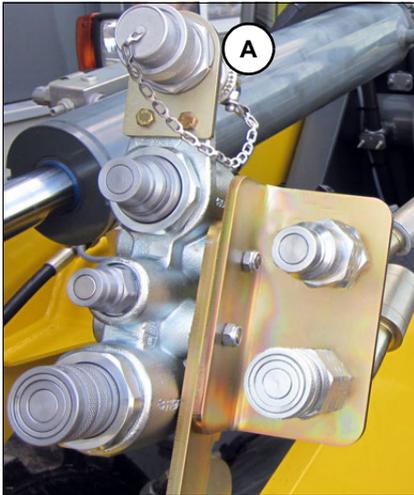


Fig. 151

Important information about putting the machine into operation

Three electrical circuits for activating electro-hydraulic control valves, and an additional electrical circuit for switching electrical functions on or off can be operated with the 14-pole front plug receptacle **A**.

NOTICE

In order to avoid faulty operation and/or damage to the attachment, before taking the attachment into service, the assignment of the individual circuits in the electric plug connection of the attachment must be checked for the assignment and operation of the 7-pole plug receptacle.

- ▶ Have troubleshooting only performed by an authorized service center.
- ▶ The assignment of the circuits (pin) in the 14-pole plug receptacle is listed in the wiring diagram (see system manual of the vehicle).

Information

The first 3 electrical circuits can only be operated separately. The circuit is then shown in the digital display through the corresponding symbol **P1, 2 or 3**.

The 4th electrical circuit symbol **P/4** can be operated in addition to the other three electrical circuits.

Operation of the 14-pole plug receptacle (A)

- The selection and activation of the first 3 control circuits **P/1, 2 or 3** occurs via the toggle switch and touch button **43**.
- The selected electrical circuit is operated via the toggle switch **84** on the joystick.
- The operation of the 4th control circuit **P/4** occurs with the touch button **85** on the joystick and can be used in parallel to the other control circuits.

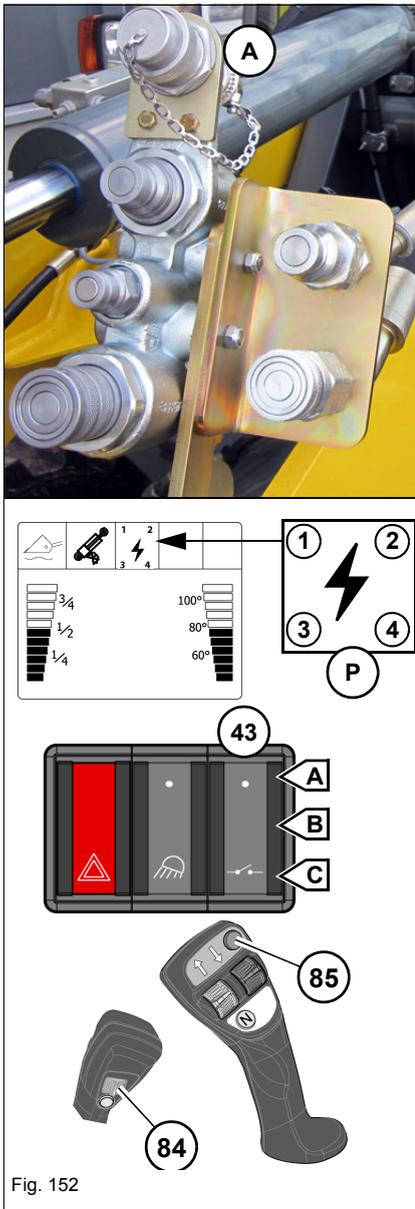


Fig. 152

Operation of electrical circuit 1, 2 or 3	Function
1. Establish the electric connections to the attachment.	➔ Plug – plug receptacle
2. Put switch 43 in the middle position B .	➔ The LED in the switch illuminates. ➔ Operation of the 3rd hydraulic control circuit is disabled.
3. Choose electrical circuit to do so, press the touch button 43 briefly in position C until the required electrical circuit is indicated in digital display with the symbol P/1, 2 or 3 .	➔ The selected electrical circuit is activated.
4. Press and hold switch 84 on the joystick to the left or right.	➔ Operation of active electrical circuit(for example for controlling different electro-hydraulic control valves).
Operation of electrical circuit 4	Function
5. Press the touch button 85 on the joystick briefly ON .	➔ Continuous operation for electrical functions (e.g. electric water pump on sweeper). ➔ Symbol P/4 lights up in the digital display.
6. Briefly press touch button 85 repeatedly: OFF .	➔ Symbol P/4 goes out in the digital display. ➔ Continuous operation for electrical functions is disabled.
Disabling all electrical circuits	Function
1. Press push button 43 to position A .	➔ All electrical circuits are disabled. ➔ Operation of the 3rd hydraulic control circuit is enabled.

5.10 Attachments

Pick up the attachment

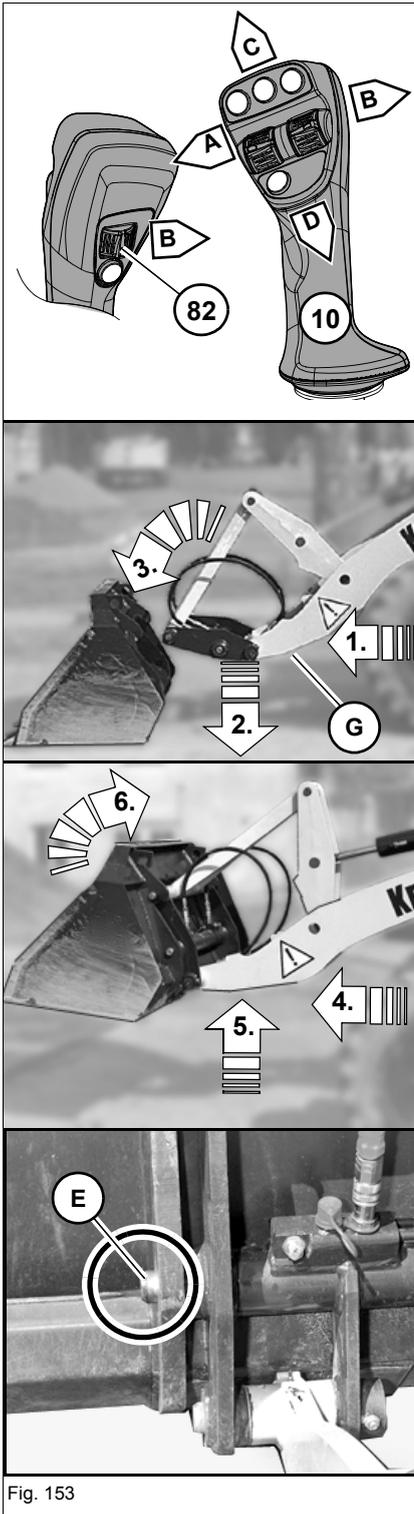


Fig. 153

Fitting an attachment onto a KRAMER quickhitch facility

WARNING

Accident hazard due to incorrect locking of attachment!

Failure to observe this can cause serious injury or death.

- ▶ Check the lock pins and mounting bores of the attachment regularly for damage.
- ▶ Have damaged parts immediately replaced by an authorized service centre.
- ▶ Only lock and unlock empty attachments without any load.
- ▶ Ensure that the attachment is visibly locked on either side with lock pins **E**.

1. Approach the machine to the attachment.
2. Lower the loader unit. To do this: push the control lever forward **C**.
3. Tilt the quickhitch forward. To do this: push the joystick to the right **B**.
4. Drive the machine forward until mounts **G** of the quickhitch are directly beneath the catch hooks of the attachment.
5. Raise the loader unit until the quickhitch engages in the mount of the attachment. To do this: pull back **D** control lever.
6. Fully tilt in the quickhitch. To do this: push the control lever to the left **A**.
7. Lock the attachment. To do this: press switch **82** on the joystick to the left – see [“Locking the attachment” on page 5-40](#).

Information

After connecting it to the quickhitch, the attachment is secured against unintentional unlocking. It can only be unlocked from the quickhitch by means of the two-hand controls – see [“Unlocking an attachment” on page 5-41](#).

Fitting an attachment onto a SKID STEER quickhitch facility

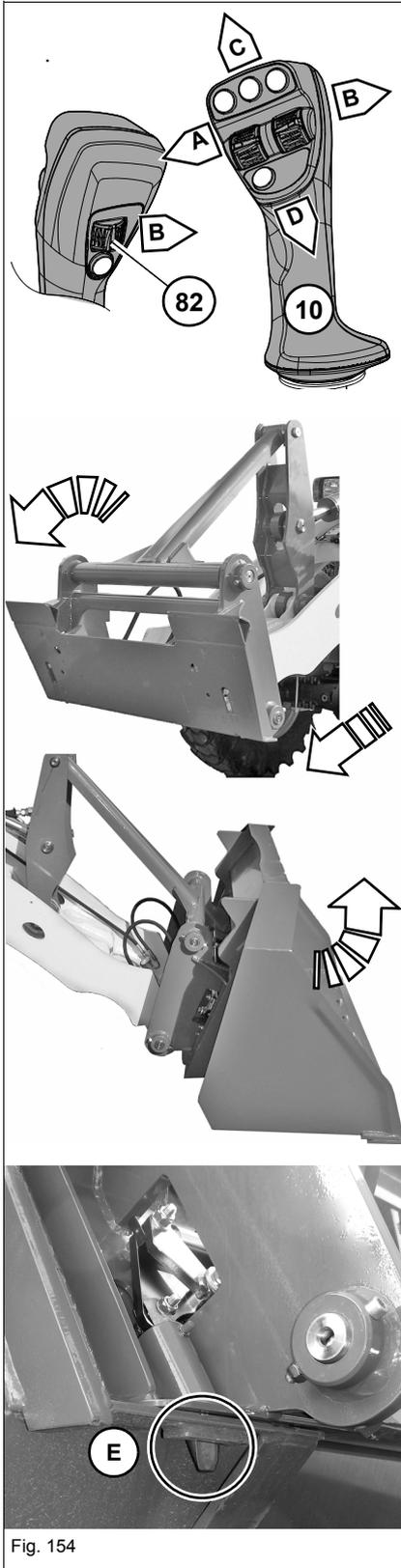


Fig. 154

! WARNING

Accident hazard due to incorrect locking of attachment!

Failure to observe this can cause serious injury or death.

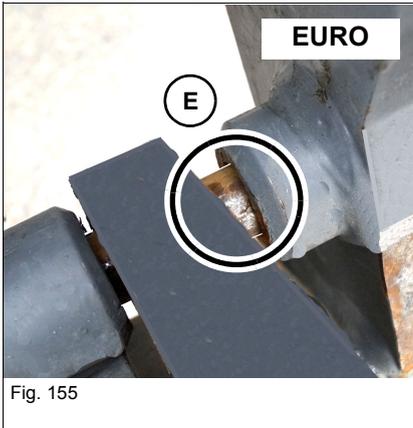
- ▶ Check the lock pins and mounting bores of the attachment regularly for damage.
- ▶ Have damaged parts immediately replaced by an authorized service centre.
- ▶ Only lock and unlock empty attachments without any load.
- ▶ Ensure that the attachment is visibly locked on either side with lock pins **E**.

1. Approach the machine to the attachment.
2. Lower the loader unit. To do this: push the control lever forward **C**.
3. Tilt the quickhitch forward. To do this: push the joystick to the right **B**.
4. Drive the machine forward until mounts **G** of the quickhitch are directly beneath the catch hooks of the attachment.
5. Raise the loader unit until the quickhitch engages in the mount of the attachment. To do this: pull back **D** control lever.
6. Fully tilt in the quickhitch. To do this: push the control lever to the left **A**.
7. Lock the attachment. To do this: press switch **82** on the joystick to the left – see *“Locking the attachment” on page 5-40*.

i Information

After connecting it to the quickhitch, the attachment is secured against unintentional unlocking. It can only be unlocked from the quickhitch by means of the two-hand controls – see *“Unlocking an attachment” on page 5-41*.

Fitting an attachment onto a EURO quickhitch facility



 WARNING**Accident hazard due to incorrect locking of attachment!**

Failure to observe this can cause serious injury or death.

- ▶ Check the lock pins and center bores of the attachment regularly for damage.
 - ▶ Have damaged parts immediately replaced by an authorized service centre.
 - ▶ Only lock and unlock empty attachments without any load.
 - ▶ Ensure that the attachment is visibly locked on either side with lock pins **E**.
-

 Information

The attachment occurs in the same way as with the VOLVO quickhitch facility – see [“Fitting an attachment onto a VOLVO quickhitch facility” on page 5-60.](#)

 Information

After connecting it to the quickhitch, the attachment is secured against unintentional unlocking. It can only be unlocked from the quickhitch by means of the two-hand controls – see [“Unlocking an attachment” on page 5-41.](#)

Fitting an attachment onto a VOLVO quickhitch facility

WARNING

Accident hazard due to incorrect locking of attachment!

Failure to observe this can cause serious injury or death.

- ▶ Check the lock pins and center bores of the attachment regularly for damage.
- ▶ Have damaged parts immediately replaced by an authorized service centre.
- ▶ Only lock and unlock empty attachments without any load.
- ▶ Ensure that the attachment is visibly locked on either side with lock pins **E**.

1. Approach the machine to the attachment.
2. Lower the loader unit. To do this: push the joystick forward **C**.
3. Tilt the quickhitch facility forward. To do this, press the joystick to the right **B**.
4. Drive the machine forward until the supports **G** of the quickhitch facility are directly beneath the catch hooks of the attachment.
5. Raise the loader unit until the quickhitch engages in the mount of the attachment. To do this: pull back control lever **D**.
6. Fully tilt in the quickhitch. To do this: push the joystick to the left **A**.
7. Lock the attachment. To do this: press switch **82** on the joystick to the left – see [“Locking the attachment” on page 5-40](#).

Information

After connecting it to the quickhitch, the attachment is secured against unintentional unlocking. It can only be unlocked from the quickhitch by means of the two-hand controls – see [“Unlocking an attachment” on page 5-41](#).

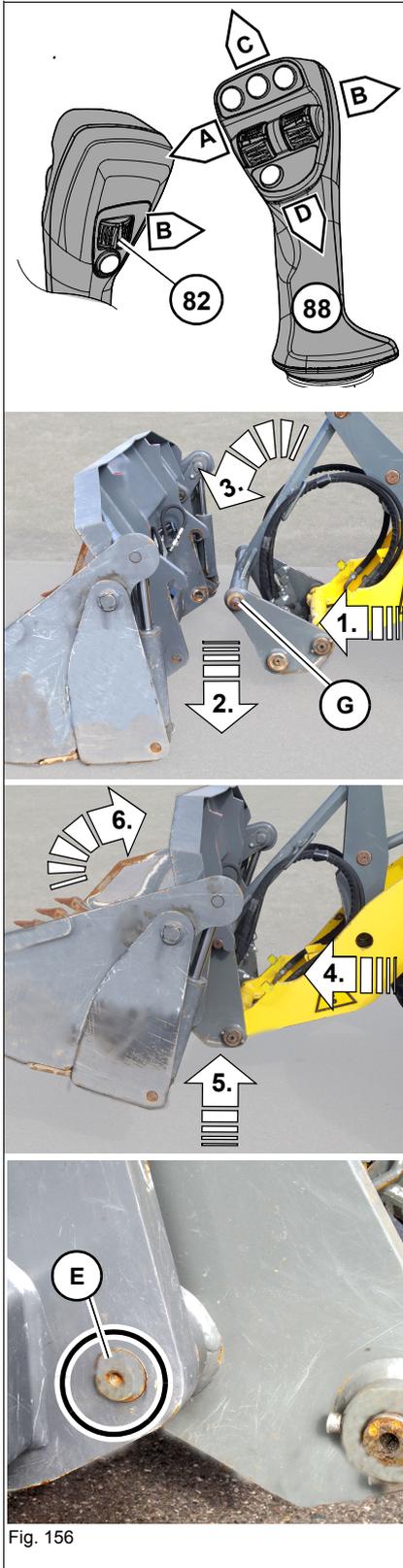


Fig. 156

Lower the attachment

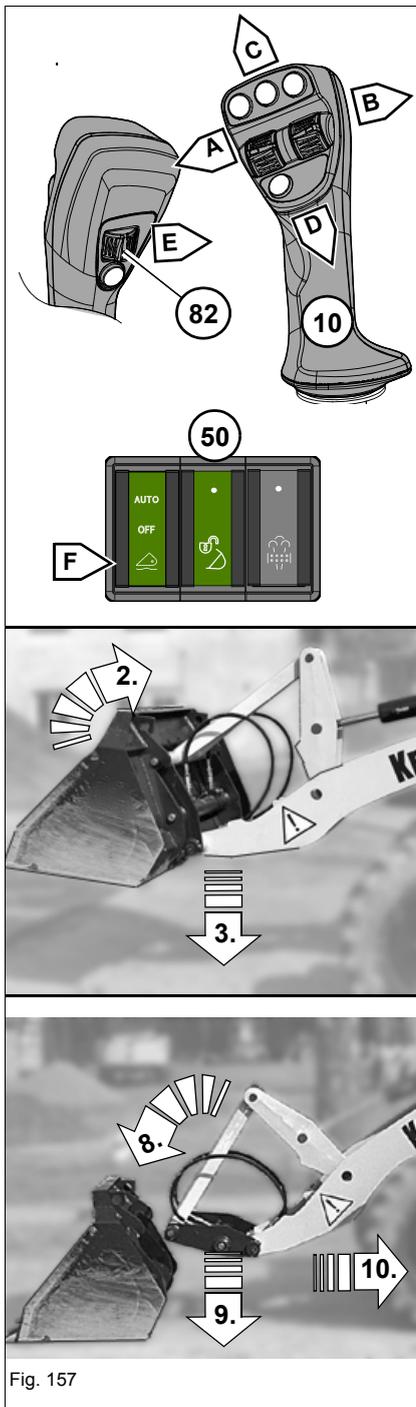


Fig. 157

Removing an attachment from a KRAMER quickhitch facility

The locked attachment is secured against unintentional actuation of switch **82**. It can only be unlocked from the quickhitch by means of the two-hand controls.

WARNING

The attachment can tip over after lowering it to the ground!

Failure to observe this can cause serious injury or death.

- ▶ Uncouple all flexible lines from the attachment.
- ▶ Lower the attachment to the ground and ensure it cannot tip over.

1. Empty the attachment and drive it to the drop-off position.
2. Align the attachment parallel with the ground. To do this: push the control lever to the left or right **A/B**.
3. Lower the loader unit until the attachment is about 5 – 10 cm (0.2 – 0.39 in) above the ground by pushing the control lever forward **C**.

Information

In order to avoid damage to the attachment lock, follow the order of unlocking.

4. Unlock the attachment. To do this: press and hold push button **50** in position **F**.
5. Press and hold switch **82** on the joystick to the right **E** at the same time until the catch bolts fully come out of the mounting bores of the attachment.
6. Release switch **82** on the joystick.
7. Then release push button **50**.
8. Tilt the attachment slightly forward. To do this: push the control lever to the right **B**.
9. Lower the loader unit. To do this: push the control lever to the front **C** until the attachment is on the ground without risking falling over.
10. Reverse the machine away from the attachment.

Information

If the attachment is placed in direct sunlight after having been taken off, the oil in the hydraulic cylinders will warm up. This leads to a pressure increase in the hydraulic cylinders that will make it difficult to attach the hydraulic lines to the hydraulic connections.

- ▶ Set down the attachment out of the sun.

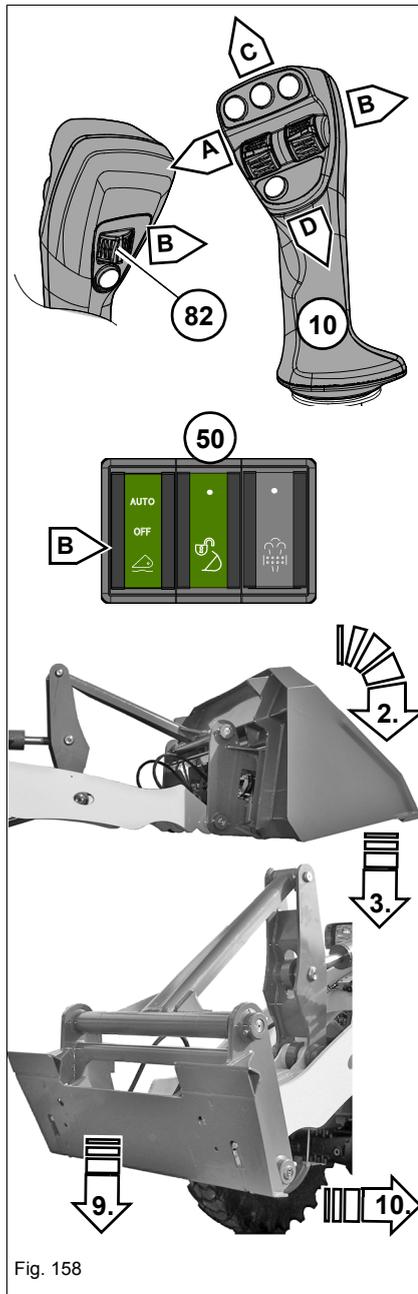


Fig. 158

Removing an attachment from a SKID STEER quickhitch facility

The locked attachment is secured against unintentional actuation of switch **82**. It can only be unlocked from the quickhitch by means of the two-hand controls.

WARNING

The attachment can tip over after lowering it to the ground!

Failure to observe this can cause serious injury or death.

- ▶ Uncouple all flexible lines from the attachment.
- ▶ Lower the attachment to the ground and ensure it cannot tip over.

1. Empty the attachment and drive it to the drop-off position.
2. Align the attachment parallel with the ground. To do this: push the control lever to the left **A**.
3. Lower the loader unit until the attachment is about 5 – 10 cm (0.2 – 0.39 in) above the ground by pushing the control lever forward **C**.

Information

In order to avoid damage to the attachment lock, follow the order of unlocking.

4. Unlock the attachment. To do this: press and hold push button **50** in position **B**.
5. Press switch **82** on the joystick to the right at the same time until the catch bolts fully come out of the mounting bores of the attachment.
6. Release switch **82** on the joystick.
7. Then release push button **50**.
8. Tilt the attachment slightly forward. To do this: push the control lever to the right **B**.
9. Lower the loader unit. To do this: push the control lever to the front **C** until the attachment is on the ground without risking falling over.
10. Reverse the machine away from the attachment.

Information

If the attachment is placed in direct sunlight after having been taken off, the oil in the hydraulic cylinders will warm up. This leads to a pressure increase in the hydraulic cylinders that will make it difficult to attach the hydraulic lines to the hydraulic connections.

- ▶ Set down the attachment out of the sun.

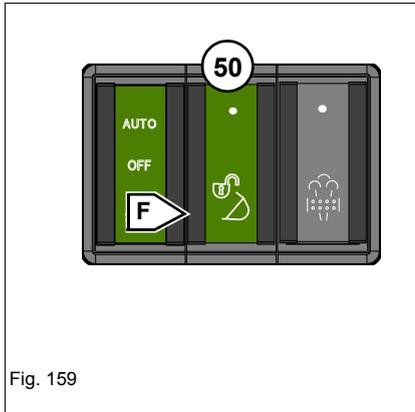


Fig. 159

Removing an attachment from a EURO quickhitch facility

The locked attachment is secured against unintentional actuation of switch **50**. It can only be unlocked from the quickhitch by means of the two-hand controls.

**WARNING**

The attachment can tip over after lowering it to the ground!

Failure to observe this can cause serious injury or death.

- ▶ Uncouple all flexible lines from the attachment.
- ▶ Lower the attachment on level ground and ensure it cannot tip over.

**Information**

The setting down occurs in the same way as with the VOLVO quickhitch facility – see [“Removing an attachment from a VOLVO quickhitch facility” on page 5-64](#).

**Information**

If the attachment is placed in direct sunlight after having been taken off, the oil in the hydraulic cylinders will warm up. This leads to a pressure increase in the hydraulic cylinders that will make it difficult to attach the hydraulic lines to the hydraulic connections.

- ▶ Set down the attachment out of the sun.



Fig. 160

Removing an attachment from a VOLVO quickhitch facility

The locked attachment is secured against unintentional actuation of switch **82**. It can only be unlocked from the quickhitch by means of the two-hand controls.

! WARNING

The attachment can tip over after lowering it to the ground!

Failure to observe this can cause serious injury or death.

- ▶ Uncouple all flexible lines from the attachment.
- ▶ Lower the attachment on level ground and ensure it cannot tip over.

1. Empty the attachment and drive it to the drop-off position.
2. Set the attachment parallel to the ground. To do this, press the joystick to the left **A**.
3. Lower the loader unit until the attachment is about 5 – 10 cm (2 – 3.9 in) above the ground. To do this, push the joystick forward **C**.

NOTICE

In order to avoid damage to the attachment lock, follow the order of unlocking.

4. Unlock the attachment. To do this, press and hold the touch button **50** in the position **B**.
5. Press the rocker switch **82** on the joystick to the right at the same time until the lock pins fully come out of the center bores of the attachment.
6. Release switch **82** on the joystick.
7. Release push button **50**.
8. Slightly tilt the attachment forward. To do this, press the joystick to the right **B**.
9. Lower the loader unit. To do this: push the joystick forward **C** until the attachment is on the ground without risk of falling over.
10. Reverse the machine away from the attachment.

i Information

If the attachment is placed in direct sunlight after having been taken off, the oil in the hydraulic cylinders will warm up. This leads to a pressure increase in the hydraulic cylinders that will make it difficult to attach the hydraulic lines to the hydraulic connections.

Set down the attachment out of the sun.

Releasing the pressure at the plug couplings

Information

The hydraulic system of the machine is still pressurized even when the engine is not running! The hydraulic plug couplings can be released, however they cannot be re-attached because the pressure in the hydraulic lines has not been released.

- ▶ Release the pressure in the system before installing or removing an attachment!

3rd control circuit (quickhitch) – releasing the pressure mechanically

1. Apply the parking brake.
2. Pull the lock in switch **89** backward and press the switch to position **B**.
3. Stop the diesel engine, but do not switch off ignition.
4. Press and hold push button **50**. Press and hold switch **82** in each of positions **C** and **D** at the same time for about 5 seconds.
 - Pressure in hydraulic lines is released.
 - The plug couplings can now be changed over – see [“Hydraulic control circuits/plug couplings \(overview\)”](#) on page 5-37.

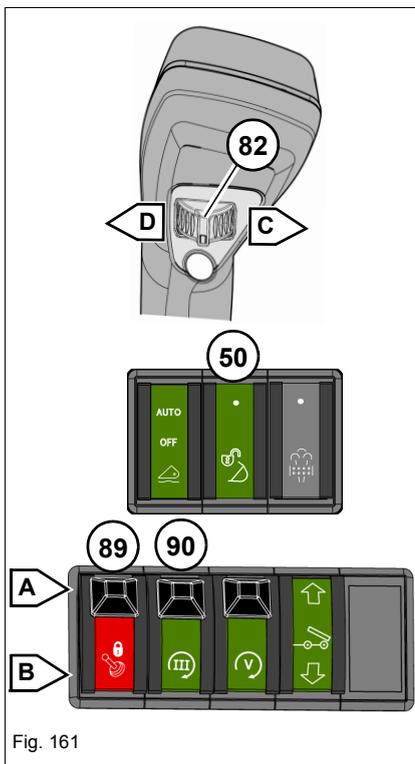


Fig. 161

3rd control circuit – releasing the pressure plug couplings quickhitch (option)

With this option, the pressure in the plug couplings on the quickhitch can be released with a push button on the loader with the engine running.

1. Lower the loader unit and apply the parking brake.
2. Pull and press the lock in switch **89** downward to position **A**.
3. Press and hold push button **C** about 5 seconds.
 - The pressure in flexible lines is released.
4. Change over the plug couplings – see [“Hydraulic control circuits/plug couplings \(overview\)” on page 5-37](#).

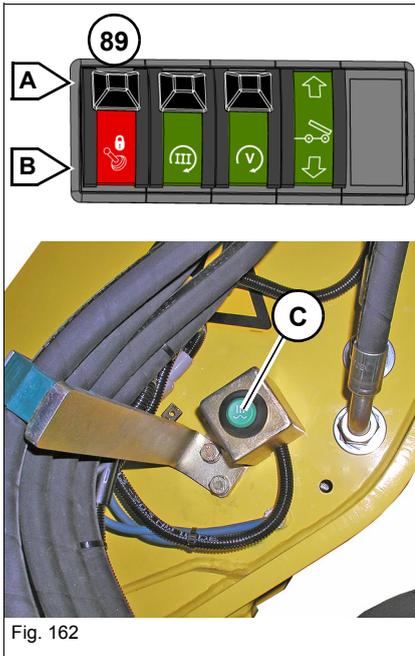


Fig. 162

Additional function of additional control circuit – releasing the pressure

1. Apply the parking brake.
2. Pull and press the lock in switch **89** downward to position **A**.
3. Stop the diesel engine, but do not switch off ignition.
4. Press and hold push buttons **83** and **84** for about 5 seconds.
 - Pressure in hydraulic lines is released.
5. Change over the plug couplings – see [“Hydraulic control circuits/plug couplings \(overview\)” on page 5-37](#).

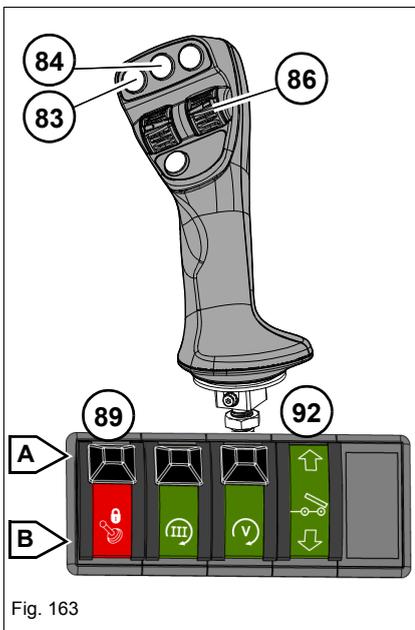
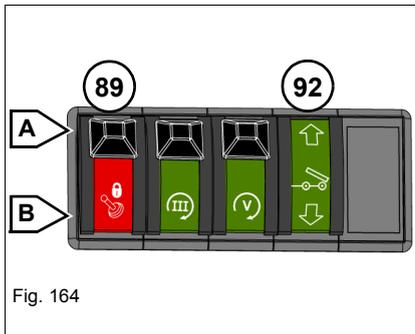
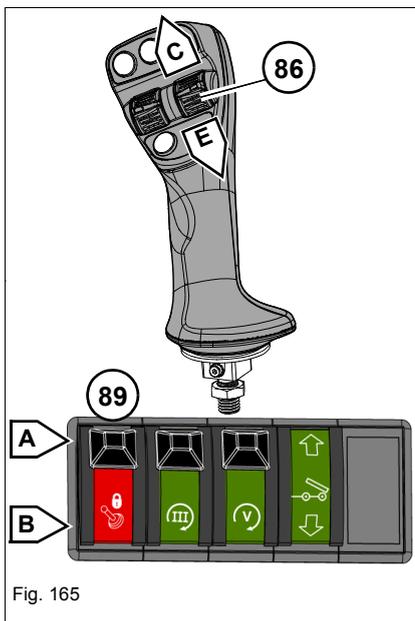


Fig. 163


Tipping trailer – releasing the pressure (optional)

1. Apply the parking brake.
2. Press the lock in switch **89** downward to position **A**.
3. Stop the diesel engine, but do not switch off ignition.
4. Press and hold push button **50**. Press and hold switch **92** in each of positions **C** and **D** at the same time for about 5 seconds.
 - ➔ Pressure in hydraulic lines is released.
5. Change over the plug couplings – see *“Hydraulic control circuits/plug couplings (overview)” on page 5-37.*


Releasing the pressure in the additional control circuit (proportional controls)

1. Apply the parking brake.
2. Press the lock in switch **89** downward and press the switch to position **A**.
3. Stop the diesel engine, but do not switch off ignition.
4. Press and hold switch **86** in each of positions **C** and **E** for about 5 seconds.
 - ➔ Pressure in hydraulic lines is released.
 - ➔ The plug couplings can now be changed over– see *“Hydraulic control circuits/plug couplings (overview)” on page 5-37.*

Connecting hydraulic lines to the 3rd control circuit

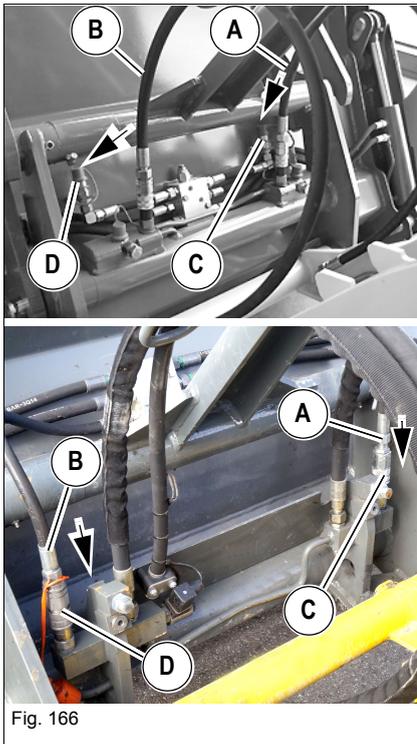


Fig. 166

A hydraulic attachment (for example a multipurpose bucket) can be operated with the 3rd control circuit. Flexible lines **A** + **B** of the quickhitch quick couplers are connected to the attachment for this.

WARNING

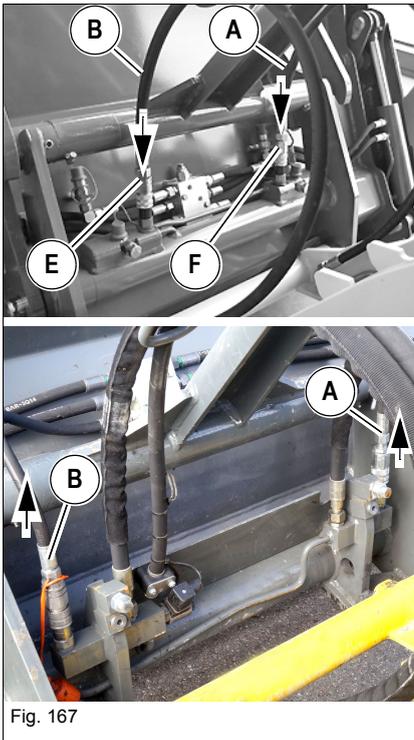
Connecting the flexible lines incorrectly results in incorrect operation and/or uncontrolled movements of the attachment!

Failure to observe this can cause serious injury or death.

- ▶ Ensure that the flexible lines are connected correctly (NOT crosswise)
- ▶ Follow the instructions in the Operator's Manual of the attachment manufacturer!
- ▶ Check the response direction of the control elements before using the attachment.

1. Pick up the attachment and safely lock it – see *“Pick up the attachment” on page 5-57* and *Locking the attachment on page 5-40*.
2. Lower the loader unit.
3. Apply the parking brake.
4. Stop the engine, but do **not** switch off ignition.
5. Release the pressure in the hydraulic lines – see *“Releasing the pressure at the plug couplings” on page 5-65*.
6. Switch off the starter and remove the starting key.
7. Remove screwed nose caps.
8. Clean plug couplings on the attachment or on the quickhitch.
9. For KRAMER quick hitches: Flexible lines **A** and **B** of the quickhitch on the plug couplings of the attachment
10. For quickhitches from other manufacturers: flexible lines **A** and **B** of the attachment to the plug coupling of the quickhitch.
 - Flexible line **A** to plug coupling **C**
 - Flexible line **B** to plug coupling **D**
11. Start the diesel engine.
12. Check the attachment for correct operation – see *“Putting a hydraulic attachment into operation” on page 5-42*.

Removing hydraulic lines from the 3rd control circuit



WARNING

The attachment can tip over after lowering it to the ground!

Can cause serious injury or death.

- ▶ Uncouple all flexible lines from the attachment.
- ▶ Lower the attachment to the ground and ensure it cannot tip over.

1. Empty and tilt in the attachment completely.
2. Stop the engine, but do **not** switch off ignition.
3. Apply the parking brake.
4. Release the pressure in the hydraulic lines of the 3rd control circuit – see *“Releasing the pressure at the plug couplings” on page 5-65.*
5. Clean the flat connector plugs.
6. For KRAMER quickhitch: remove flexible lines **A** and **B** from the coupling plugs of the attachment and connect them to the coupling plugs of the quickhitch.
 - Flexible line **A** to plug coupling **F**
 - Flexible line **B** to plug coupling **E**
7. Close the coupling plugs of the attachment with the screwed nose caps.
8. For quick hitches from other manufacturers: remove flexible lines **A** and **B** of the attachment from the plug couplings of the quickhitch.
9. Close the plug couplings on the quickhitch from another manufacturer with protective caps.
10. Start the engine and lower the attachment to the ground – see *“Lower the attachment” on page 5-61.*

Standard bucket

Field of application of standard bucket

- The standard bucket is mainly used for digging earth, and for loosening, picking up, transporting and loading loose or solid materials.
- Machine travel on public roads with a full bucket is prohibited in Germany – see [“Instructions for machine travel on public roads” on page 4-48](#) and [Preparing machine travel on public roads on page 4-49](#).
- Observe and follow the legal regulations of your country.
- In addition, observe the applicable national regulations relevant to accident prevention, for example the UVV regulations for accident prevention of the German social insurance against occupational accidents.



WARNING

Accident hazard due to installing lifting gear on the attachment without proper authorization!

Can cause serious injury or death.

- ▶ The attachment is not certified for lifting gear applications.
- ▶ Hitching hooks, eyelets or other lifting gear onto the attachment is prohibited as well.



Information

The load diagram (on the left on the front window) is valid only for applications with the released pallet forks and corresponding tire size and pressure.

The load diagram also applies to attachments released by KRAMER if the specified capacities and material densities are observed

– see chapter [“Use of attachments on the machine” on page 3-12](#).

Pay attention to the specific load diagrams of other attachments used
– see [“Fitting attachments from other manufacturers \(option\)” on page 5-96!](#)



Information

Installing and removing the attachment is described in the following sections:

– see [“Pick up the attachment” on page 5-57](#) or [Lower the attachment on page 5-61](#).

Multipurpose bucket

Field of application of multipurpose bucket

- The multipurpose bucket is mainly used for digging earth, and for loosening, picking up, transporting, loading and pushing loose or solid materials.
- Machine travel on public roads with a full bucket is prohibited in Germany – see [“Instructions for machine travel on public roads” on page 4-48](#) and [Preparing machine travel on public roads on page 4-49](#).
- Observe and follow the legal regulations of your country.
- In addition, observe the applicable national regulations relevant to accident prevention, for example the UVV regulations for accident prevention of the German social insurance against occupational accidents.



WARNING

Accident hazard due to installing lifting gear on the attachment without proper authorization!

Can cause serious injury or death.

- ▶ The attachment is not certified for lifting gear applications.
- ▶ Hitching hooks, eyelets or other lifting gear onto the attachment is prohibited as well.



Information

The load diagram (on the left on the front window) is valid only for applications with the released pallet forks and corresponding tire size and pressure.

The load diagram also applies to attachments released by KRAMER if the specified capacities and material densities are observed

– see chapter [“Use of attachments on the machine” on page 3-12](#).

Pay attention to the specific load diagrams of other attachments used

– see [“Fitting attachments from other manufacturers \(option\)” on page 5-96!](#)



Information

Installing and removing the attachment is described in the following sections:

– see [“Pick up the attachment” on page 5-57](#) or [Lower the attachment on page 5-61](#).

Pallet forks

Fields of application of pallet forks

- The pallet forks are mainly used for picking up, transporting and loading palletized material, pallets and other stacked material!
- Pallet forks with fixed fork arms are not certified for machine travel on public roads in Germany.
- Pallet forks with foldable fork arms are authorized for transport on public roads. The fork arms must be fully raised – see [“Instructions for machine travel on public roads” on page 4-48](#) and [Preparing machine travel on public roads on page 4-49](#).
- Observe and follow the legal regulations of your country.
- In addition, observe the applicable national regulations relevant to accident prevention, for example the UVV regulations for accident prevention of the German social insurance against occupational accidents.



Information

The load diagram (on the left on the front window) is valid only for applications with the released pallet forks and corresponding tire size and pressure.

The load diagram also applies to attachments released by KRAMER if the specified capacities and material densities are observed – see [chapter “Use of attachments on the machine” on page 3-12](#).

Pay attention to the specific load diagrams of other attachments used – see [“Fitting attachments from other manufacturers \(option\)” on page 5-96!](#)



Information

Installing and removing the attachment is described in the following sections:

– see [“Pick up the attachment” on page 5-57](#) or [Lower the attachment on page 5-61](#).

5.11 Work operation

Hose burst valve (option)

Important safety instructions

The hose burst valve prevents the loader unit from being lowered or tilted out without being braked, in the event of a bursting hose or pipe!

If a hose bursts, the lift or tilt rams are blocked and cannot be operated.



WARNING

Accident hazard when lowering the loader unit in an emergency!

Can cause serious injury or death!

- ▶ Secure the danger zone.
 - ▶ Do not try to repair the machine under a raised load.
 - ▶ Perform emergency lowering with extreme care.
-

In the event of a bursting hose or pipe on the loader unit

1. Stop the machine immediately.
 2. Apply the parking brake.
 3. Stop the engine and remove the starting key.
 4. Secure the danger zone.
 5. Perform emergency lowering if this is possible without any danger – see *“Emergency lowering of loader unit in case of diesel engine breakdown” on page 5-101*.
 6. Have a burst hose or pipe and the hose burst valve immediately repaired by an authorized service centre.
-



Environment

Collect the hydraulic oil as it drains with a suitable container (**if this can be done without any danger**) and dispose of it in an environmentally friendly manner.

Machine travel on public roads with a bucket

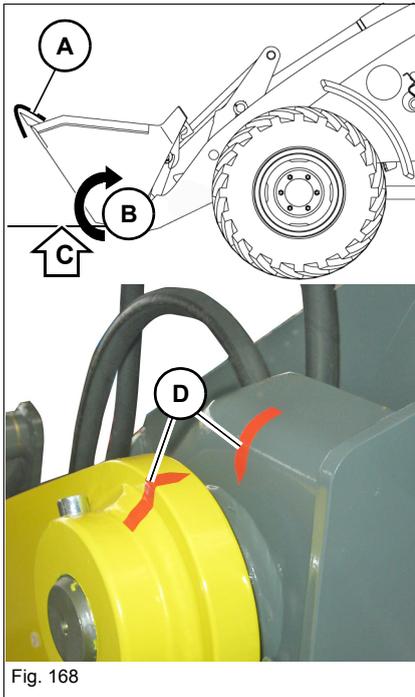


Fig. 168

i Information

During machine travel on public roads, equip the machine only with attachments that are certified for this machine – see chapter “Use of attachments on the machine” on page 3-12.

i Information

Machine travel on public roads **is prohibited** if the distance between the front edge of the bucket (transport position) and the center of the steering wheel is over **3500 mm (137.7 in)**. The special measures stated in “Merkblätter für Anbaugeräte” (leaflet with specific instructions for attachments) §30 clauses 10/11/12 StVZO (German traffic regulations) must be observed in addition.

i Information

Machine travel on public roads with a full standard bucket is prohibited in Germany!
Observe the legal regulations of your country.

Preparing machine travel on public roads

1. Empty and dump in the bucket **B**.
2. Raise the loader unit until red marks **D** on the lift frame and the bulkhead are aligned.
 - Ground clearance **C** about 250 mm (9.84 in).
3. Cover the blade or teeth of the standard bucket across their entire width with the tooth guard **A** provided.
4. Secure the control lever (loader unit) – see “Securing the control lever (joystick)/switching off the operating hydraulics” on page 4-50.

Safety instructions regarding work with a standard bucket

 **WARNING**

The machine risks tipping over if sinks or falls into a pit!

Can cause serious injury or death.

- ▶ Never drive up to the edge of a pit from outside.
 - ▶ Never undermine the foundations of walls.
-

 **WARNING**

Risk of death due to electric high-voltage cables, underground cables, gas and water pipes!

Can cause serious injury or death.

- ▶ Get in touch with the energy supplier before starting work.
-

 **WARNING**

Crushing hazard due to tipping over of machine!

A tipping machine can cause serious injury or death.

- ▶ Lower the loader unit to transport position before starting machine travel.
 - ▶ Adapt the travel speed to the prevailing conditions.
 - ▶ Pay attention to persons and obstacles.
 - ▶ Always fasten your seat belt.
 - ▶ Ensure that no parts of the body protrude outside the machine.
 - ▶ Carefully steer the machine if the loader unit is raised.
 - ▶ Do not exceed the permissible payloads. Refer to the load diagram affixed on the front window or on the left on the front trim in the cabin.
 - ▶ Do not exceed the certified values for capacity and material density.
 - ▶ Do not perform any jerky movements with the joystick.
-

 **WARNING**

Accident hazard if machine is not parked safely!

Can cause serious injury or death.

- ▶ Before leaving the machine, lower the bucket to the ground, stop the diesel engine, switch off ignition and remove the key.
-

Transporting with a full bucket



WARNING

Accident hazard due to falling material, and tipping hazard during transportation of loads with a raised loader unit!

Can cause serious injury.

- ▶ Do not transport loads with a raised loader unit.
- ▶ Raise a full bucket only at the tilt-out position, and only when the machine is at a standstill.
- ▶ Lower the loader unit to transport position and tilt in the bucket completely.
- ▶ Do not perform any U-turns on steep slopes.
- ▶ Ensure good visibility of the material you want to pick up and of the work and travel range.
- ▶ Whenever possible, perform machine travel in reverse when transporting material on a steep slope.
- ▶ In case of bulky loads:
 - Secure the load.
 - Fit a protection to the rear of the bucket.
 - Install a protective screen (option) on the cabin.
 - Use attachments with hydraulic grabs (option).



Information

Machine travel on public roads with a full bucket is prohibited in Germany!

Observe the legal regulations of your country.

Working with the standard bucket

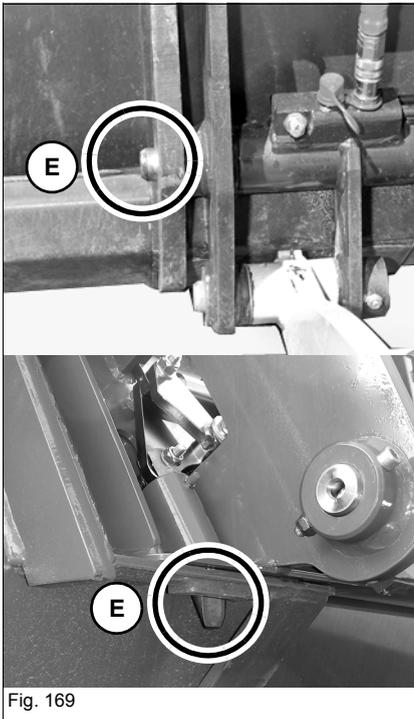


Fig. 169

WARNING

Accident hazard due to unlocked attachment!

The attachment can come off unexpectedly and cause serious injury or death.

- ▶ Ensure that the attachment is visibly locked on either side with lock pins **E**.

Information

Observe the safety instructions before working with the machine, and take appropriate action if necessary – see [chapter 2.7 “Attachment operation” on page 2-11](#).

Observe the certified values for capacity and material density for the released attachments – see [“Use of attachments on the machine” on page 3-12](#).

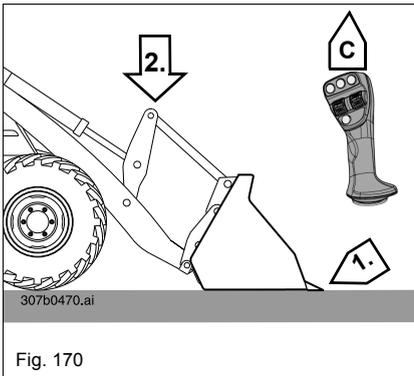


Fig. 170

Loading loose material

1. Align the blade parallel with the ground.
2. Lower the loader unit to the ground. To do this: push the control lever forward **C**.

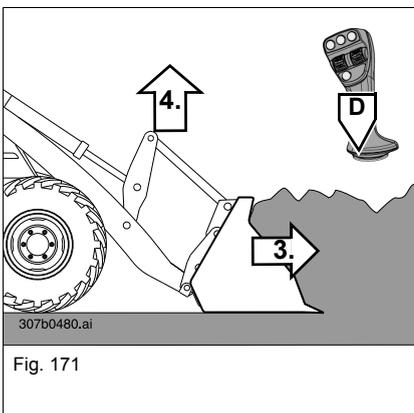
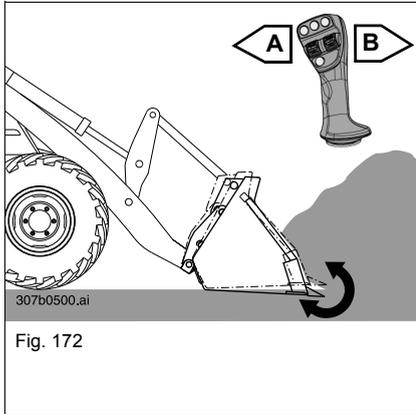


Fig. 171

3. Travel forward into the material.

When the diesel engine speed is reduced due to too much material:

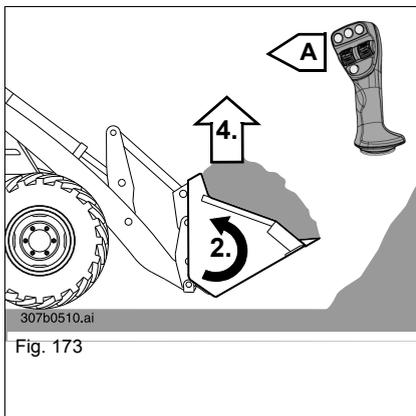
4. Raise the loader unit a little. To do this: pull the control lever backward **D**.



Loading if the material is hard to penetrate

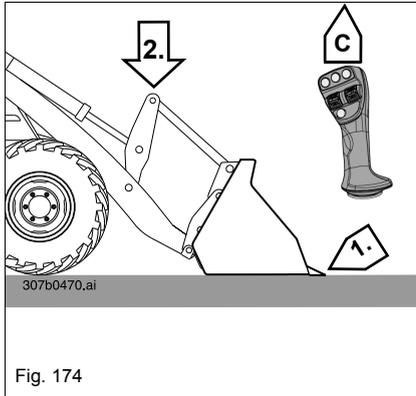
Load as for loading loose material, but in addition:

1. Tilt the bucket in and out a little. To do this: move the control lever to the left **A** and right **B**.

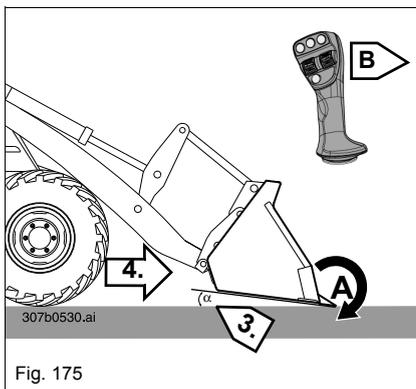


When the bucket is full:

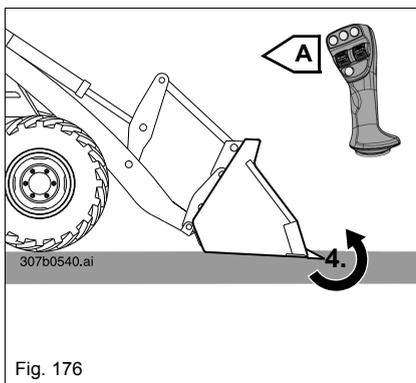
2. Tilt in the bucket. To do this: push the control lever to the left **A**.
3. Reverse out of the material.
4. Raise the bucket to transport position.

**Removing material/digging in soft soil**

1. Align the blade parallel with the ground.
2. Lower the loader unit to the ground. To do this: push the control lever forward **C**.

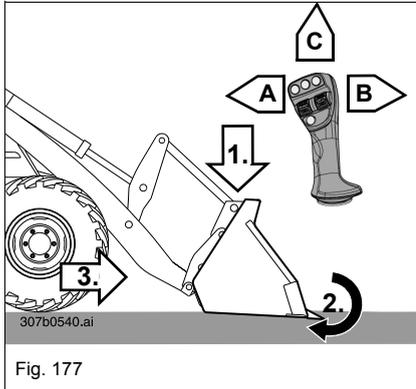


3. Adjust the digging angle. To do this: push the control lever to the right **B**.
4. Travel forward.



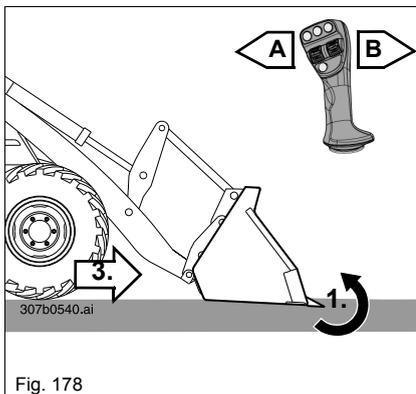
Once the bucket has penetrated the soil:

5. Set the digging angle a little flatter. To do this: push the control lever to the left **A**, so that the layer being removed is as even as possible and so that the wheel spin is reduced.
6. Proceed as for loading loose material.



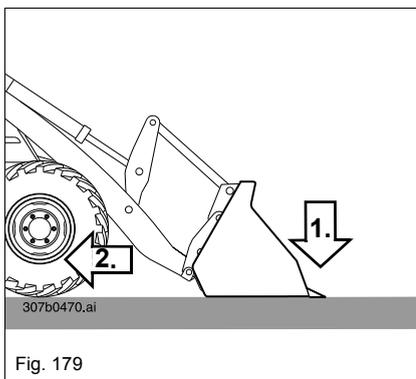
Removing material/digging in hard soil

1. Place the bucket horizontally on the ground. To do this: push the control lever forward **C**.
2. Adjust the digging angle flatter than for digging in soft soil. To do this: push the control lever to the left **A**.
3. Drive forward and press the bucket downward a little as you do so. To do this: push the control lever forward **C** a little.



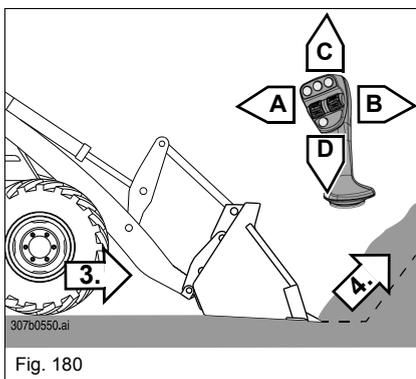
Once the bucket has penetrated the soil:

4. Set the digging angle a little flatter. To do this: push the control lever to the left **A**, so that the layer being removed is as even as possible and so that the wheel spin is reduced.
5. Move the control lever to the left **A** and right **B** to loosen the material.
6. Proceed as for loading material hard to penetrate.



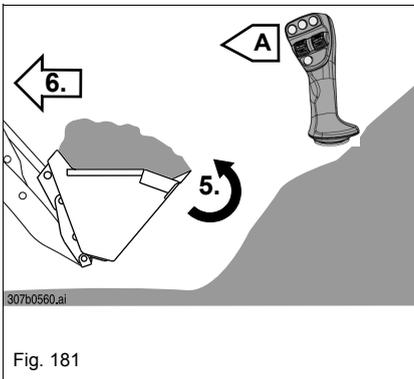
Grading

1. Lower the loader unit horizontally to the ground.
2. Reverse across the surface to be graded.

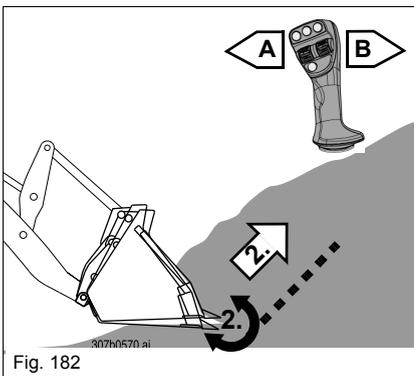


Loading heaped material (non-compacted material)

1. Set the blade parallel to the ground. To do this: move the control lever to the left or right **A** and **B**.
 2. Place the bucket horizontally on the ground. To do this: push the control lever forward **C**
 3. Drive forward.
- After penetrating the heaped material:
4. Raise the loader unit evenly. To do this: pull the control lever backward **D**.

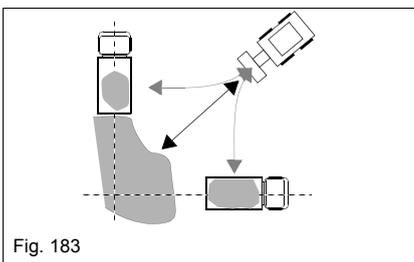


5. Tilt in the bucket. To do this: push the control lever to the left **A**.
6. Reverse out of the material.
7. Lower the loader unit to transport position.



Loading heaped material (compacted material)

1. Proceed as for non-compacted material.
2. When raising the loader unit through the heaped material, tilt the bucket slightly in and out. To do this: move the control lever alternately to the left **A** and right **B**.
 - The material is loosened.



Loading vehicles

1. If possible, the truck and the working direction of the machine should form an angle of 45°.
2. Only raise the full bucket to the tilt-out height when you are performing machine travel in a straight line toward the truck.

Information

If possible load material with the wind behind you to keep the dust away from your eyes, air filters and fans.

Freeing the machine

Proceed as follows if the machine should get stuck when picking up material:

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

Working with the multipurpose bucket

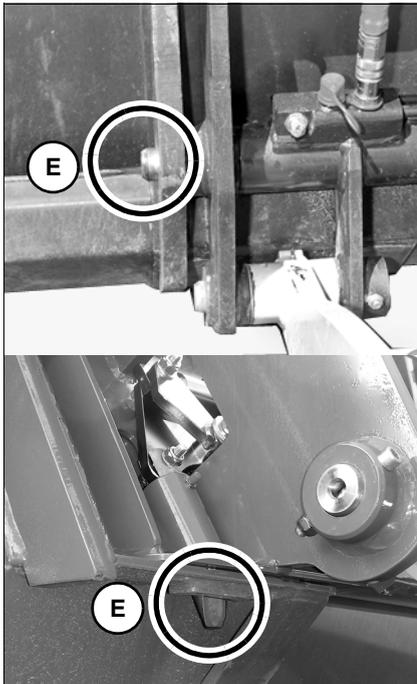


Fig. 184

WARNING

Accident hazard due to unlocked attachment!

The attachment can come off unexpectedly and cause serious injury or death.

- ▶ Ensure that the attachment is visibly locked on either side with lock pins E.

Information

Observe the safety instructions before working with the machine, and take appropriate action if necessary – see [chapter 2.7 “Attachment operation” on page 2-11](#).

Observe the certified values for capacity and material density for the released attachments – see [“Use of attachments on the machine” on page 3-12](#).

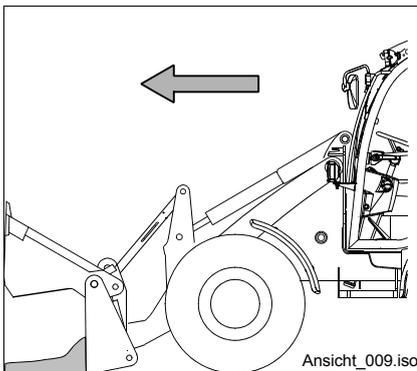


Fig. 185

Grading

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

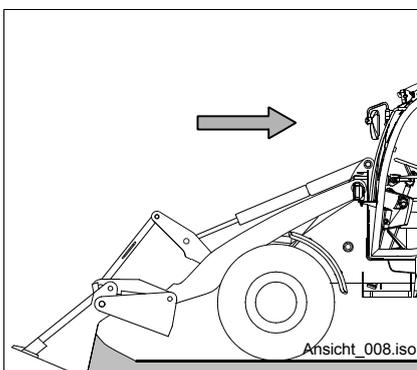
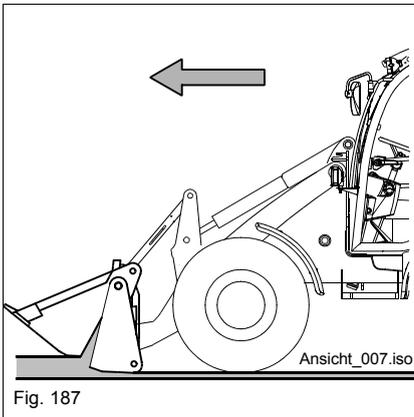


Fig. 186

Drawing material backward

1. Tilt out the multipurpose bucket.
2. Raise the bucket with the lift hydraulics.
3. Fold up the front half of the bucket.
4. Lower the multipurpose bucket to the ground.
5. Set the angle of the bucket.
6. Draw the material driving backward on the surface.



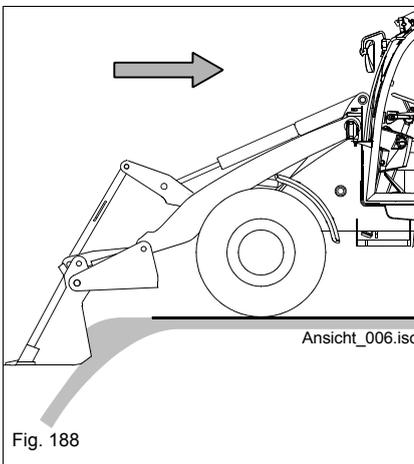
Removing and spreading material in thin layers

Removing material in thin layers:

1. Set a flat digging angle.
2. Fold up the front half of the bucket by about 10 to 15 cm (3.9–5.9 in).
3. Move off the machine.
 - The material rolls into the bucket and is picked up at the same time.
 - This position allows the stripping of grass turf, for example, down to a thickness of about 8 cm (3.1 in).

Spreading material in thin layers:

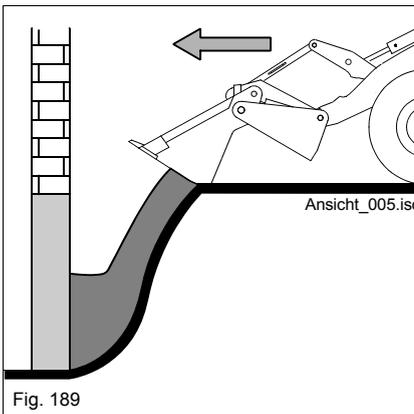
1. Set the rear cutting edge parallel to the ground.
2. Fold up the front half of the bucket until the required quantity of material is emptied onto the ground.
3. Move off the machine.
4. Lower the multipurpose bucket to the ground.
 - The rear cutting edge grades the material as it is emptied by opening the front half of the bucket. This position allows to spread material without performing machine travel on the lower layer.



Pulling out material from slopes

Information

This position allows to pull material out of slopes or roadside ditches with maximum safety and to spread it as required.

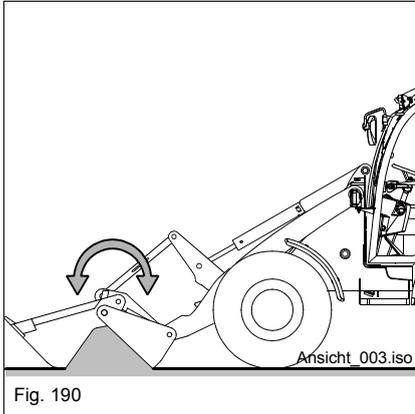


Moving material with longer reach

Information

This position allows to move material without damaging slopes or structures.

- Backfilling with maximum safety and without damaging slopes.



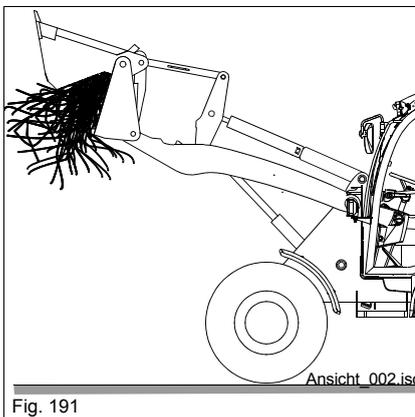
Picking up remaining material

1. Fold up the front half of the bucket (multipurpose bucket).
2. Tilt out the bucket.
3. Lower the bucket to the ground. Ensure that both bucket halves touch the ground.
4. Close and tilt in the multipurpose bucket at the same time.
5. Raise the bucket with the lift hydraulics.



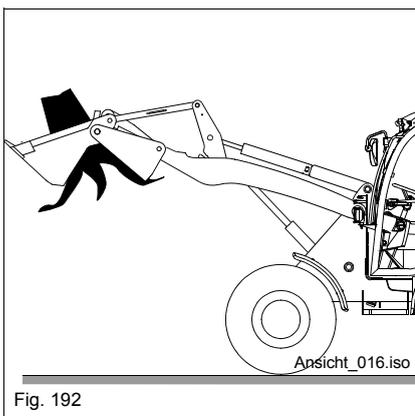
Information

Both bucket halves must touch the ground so that all the material is picked up.

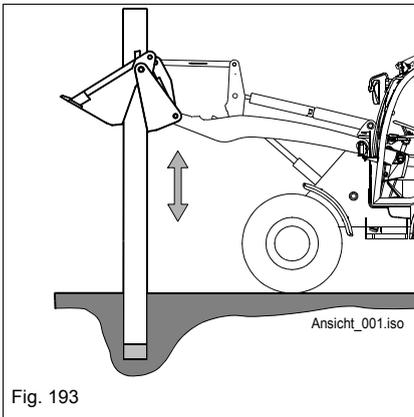


Grabbing bulky material

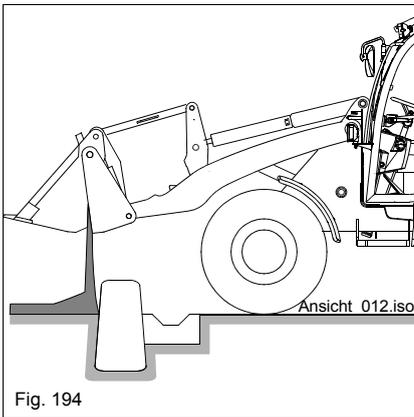
- The multipurpose bucket allows to safely grab, pick up and transport building timber, reinforcement bars, packaging bands, wire, etc.



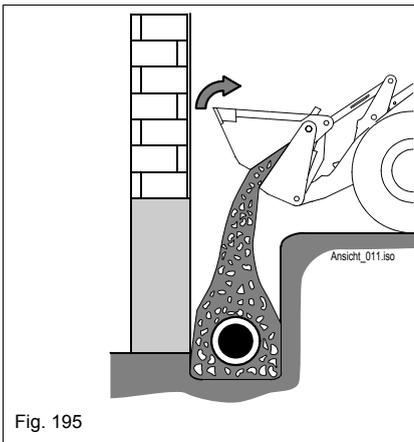
- The multipurpose bucket allows to safely grab, pick up and transport large objects.

**Pulling out and setting posts**

1. Open the multipurpose 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.

**Backfilling round gravel and precise unloading**

- Precise dosing and placement of pourable material.

**Advantage of working method:**

- Teeth move back from the wall as the bucket opens.

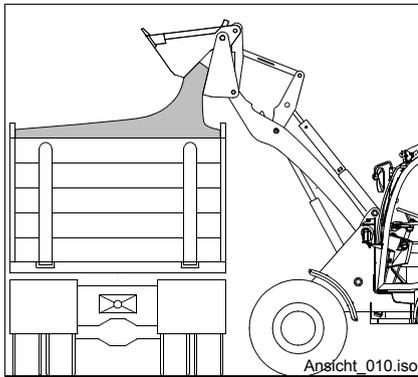


Fig. 196

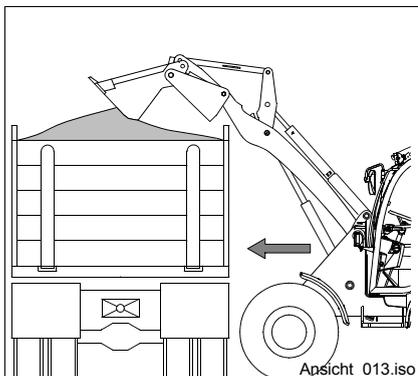


Fig. 197

Unloading from the bottom of the bucket for increased tilt-out heights

Advantage of working method:

- Tilt-out height can be increased by at least 55 cm (depending on bucket size), as compared to tilting out with a standard bucket.

- Material can be pushed with the open multipurpose bucket.

Working with the pallet forks

Important safety instructions for working with the pallet forks

WARNING

Danger of accident due to damaged or not secured fork arms!

Failure to observe this can cause serious injury or death.

- ▶ Never use bent, cracked or otherwise damaged fork arms/pallet forks!
 - ▶ Before starting work, ensure that the fork arms on the fork frame are safely locked!
-

WARNING

Accident hazard due to incorrect use of attachment!

Failure to observe this can cause serious injury or death.

- ▶ Transporting persons is prohibited.
 - ▶ Stay clear of suspended loads!
 - ▶ The attachment is not certified for lifting gear applications.
 - ▶ Do not fasten any hooks, eyelets or other lifting gear on the attachment.
-

WARNING

Crushing hazard due to tipping over of machine!

Failure to observe this can cause serious injury or death.

- ▶ Lower the loader unit to transport position before starting machine travel.
 - ▶ Adapt the travel speed to the prevailing conditions.
 - ▶ Ensure that no parts of the body protrude outside the machine.
 - ▶ Do not exceed the permissible payloads. Refer to the load diagram affixed on the front window or on the front trim in the cabin.
 - ▶ Do not exceed the certified values for capacity and material density of the buckets.
 - ▶ Do not perform any jerky movements with the joystick.
-

Important safety instructions for machine travel on public roads with the pallet forks

WARNING

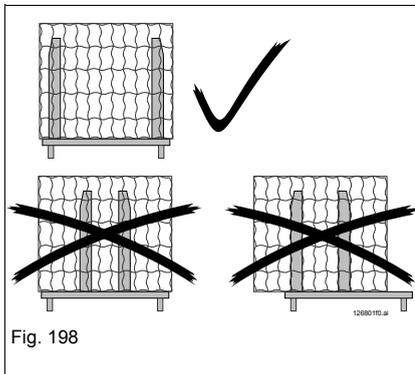
Accident hazard during machine travel with attached pallet fork on public roads!

Failure to observe this can cause serious injury or death.

- ▶ In Germany, machine travel on public roads with the pallet forks fitted is **prohibited**.
- ▶ Remove the pallet forks and transport them with a suitable means of transport (trailer).
- ▶ Do not transport the pallet forks in a bucket fitted onto the machine.
- ▶ Get informed on and follow the legal regulations of your country.

Important information on picking up loads

- Approach the material as closely as possible!
- Always approach the material with the machine wheels in straight-ahead position!
- Always load on firm and level ground with sufficient load-bearing capacity only!
- Never raise a load with only one fork arm!
- Move the fork arms all the way through under the pallets, as far as they will go, so that the load is picked up the nearest possible to the fork frame!
- Move under the load with the straight fork arms as far apart as possible and at an equal distance from the left and right side of the load!



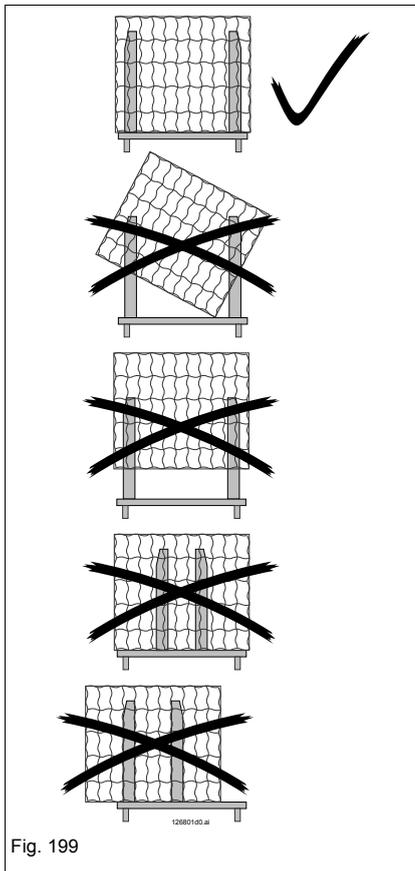


Fig. 199

Important information on load transport

- Always tilt in the attachment a little (toward the machine) for transport!
- Always transport the load close to the ground!
- Always adapt the transport speed to the load you are transporting and to the ground conditions!
- Never leave the machine with the load raised!
- Secure the 3rd control circuit on the machine – see [“Securing the control lever \(joystick\)/switching off the operating hydraulics” on page 4-50.](#)
- On slopes, the load must be on the uphill side of the machine/attachment. Drive the machine backward on sloping terrain to prevent the load from falling off and the machine from tilting forward when braking.
- When transporting large bulk loads perform backward machine travel for improved visibility.
- Observe the load-bearing capacity of bridges, basement ceilings, vaults, etc., before moving the machine on them!
- Bear in mind the clearances of underpasses, tunnels, gates, etc. before machine travel through or under them!

Important information on setting down loads

- Loads must only be set down on a suitable base with sufficient stability and load-bearing capacity.
- Do not stack or set down in higher places loads which are not properly packaged or which have shifted, or load units with damaged pallets/stacking containers.
- Set down loads only in places where they will stand safely without tilting, falling down or sliding! Affix appropriate marks to loads which have been set down, especially in the area of public and private traffic!
- Observe the load-bearing capacity of the set-down area (for example truck platforms, storage area in high-bay warehouses, etc.).
- Load the loading area of vehicles or trailers evenly and distribute the load evenly on the axles.
- Stack loads only up to the authorized maximum pallet height.
- Do not set down loads too near to slopes, construction pits, etc.
- Do not set down loads in transit or escape routes, and not in front of safety facilities or works equipment which must be accessible at any time.



Brief instructions for fork arms

The following brief instructions are based on the "Guidelines for testing and repairing fork arms" (© by VETTER Umformtechnik GmbH):

- Use fork arms only according to their designated use.
- Do not exceed the load centre and the load-bearing capacity.
- Keep the fork arms clean at all times.
- Load both fork arms evenly.
- Do not use standard fork arms as reverse forks.
- Do not push, pull or shove the fork arms, or move them in at a slanting angle (risk of damaging them due to lateral forces).
- Do not pull off loads, or allow them to fall onto the fork arms.
- Tie down loads, if necessary, to avoid losing them.
- Do not raise with the tilt ram (tilt device).
- Bear in mind the limits of application for the fork lift, and its Operator's Manuals.
- Perform frequent visual checks.
- Have regular checks performed according to the Operator's Manual and the legal regulations of your country.
- Do not modify the fork arms, or attach any additional device.
- Only the manufacturer is authorized to perform repair work on the fork arms.
- No transport of persons on the fork arms.
- Transporting flammable, liquid material is prohibited.
- Observe the legal regulations of your country during machine travel on public roads.
- The operating company/operator must check at regular intervals:
 - Lock: functional check
 - Hooks: visual check for cracks and deformations
 - Bend: visual check for indents, nicks and cracks
 - Bend and blade: do not use any longer if worn over 10 %
 - Blade and tip: check for deformations
- In case of damage or if you are unsure:
 - Immediately stop using the fork arms!

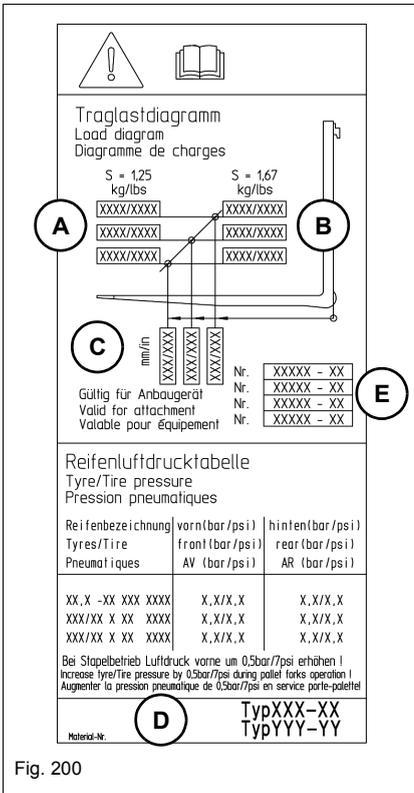


Fig. 200

Load diagram for pallet forks

The load diagram (on the left on the front window) is only valid for applications with the released pallet forks **E** and corresponding tire size.

The load diagram also applies to released buckets if the specified capacities and material densities are observed – see chapter “Use of attachments on the machine” on page 3-12.

Pay attention to the specific load diagrams of other attachments used – see “Fitting attachments from other manufacturers (option)” on page 5-96!

! WARNING

Tipping hazard of machine due to failure to pay attention to the load diagram!

Can cause serious injury or death.

► Observe the load diagram, and take appropriate action if necessary.

- Line **D** in the load diagram specifies the machine certified for a specific attachment.
- Do not exceed the maximum loads stated, otherwise machine stability is no longer ensured.
- Column **A** shows the maximum loads for applications on level ground (stability s = 1.25).
- Column **B** shows the maximum loads for off-road applications (stability s = 1.67).
- The maximum load is a function of the distance (load distance) **C** between the load centre and the fork frame (lower row of numbers). Take this into account also when using fork arm extensions!
- The load depends on the machine’s attachments – see chapter 9.14 “Payload/lift capacity/stability” on page 9-21.

Example:

- At a load distance **C** of 600 mm (23.62 in), the maximum load for off-road applications is 1170 kg (2580 lbs)!

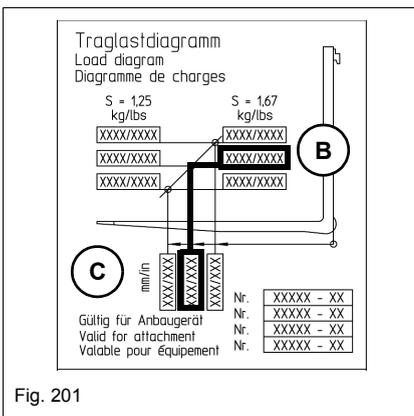
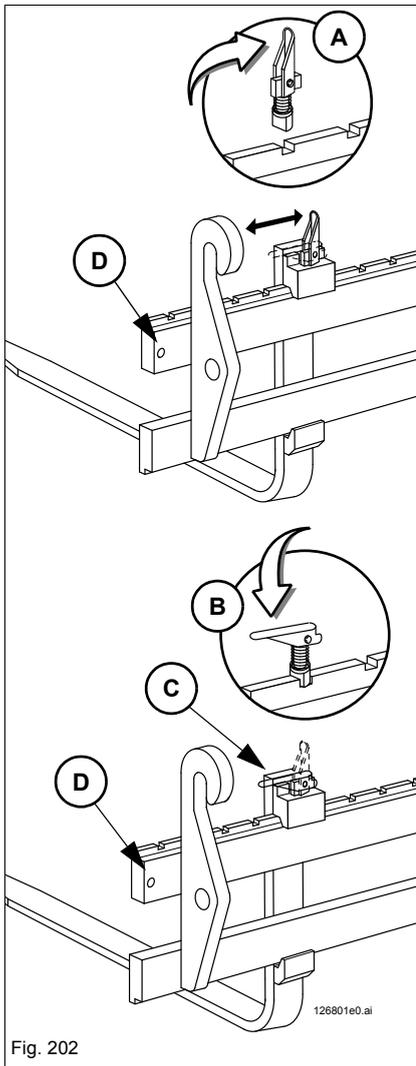


Fig. 201

Adjusting the fork arms of the pallet forks



! WARNING

Accident hazard if the fork arms are not correctly locked on the fork frame!

The fork arms can come off and cause serious injury or death.

- ▶ Check before working whether locking levers **A** on both fork arms are folded down and safely engaged in the fork frame!
- ▶ Adjust the fork arms centrally with regard to the fork frame.
- ▶ Check whether safety screws **D** on either side on the upper slide rail of the fork frame are not damaged and whether they are firmly screwed.

! CAUTION

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 gloves.

1. Set the locking lever to the vertical position (position **A**).
2. Slide the fork arms to the required distance until the safety pin engages in a slot on the fork frame.
3. Fold down the locking lever (pos. **B**).
 - The upper edge of the locking lever must be flush with the edge **C**.
 - Also refer to the Operator's Manual of the pallet forks.

Fig. 202

Picking up material with the pallet forks

WARNING

Tipping hazard of machine due to failure to pay attention to the load diagram!

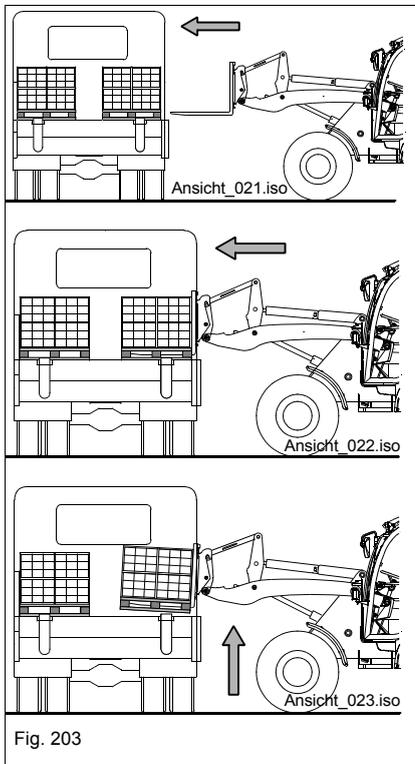
Can cause serious injury or death.

- ▶ Pay attention to the load diagram in the cabin.

Information

Switch off the load stabilizer (option) in order to

- pick up a load as exactly as possible.
- ensure that the machine is protected against line damage if it is equipped with the “Hose burst valve” option.



1. Move the machine up to the load so that the pallet forks or the fork arms are at a right angle to the load.
 - The fork arms must be the furthest possible apart, and at an equal distance from the left and right side of the load.
2. Drive the machine forward and move the fork arms as far as possible underneath the pallet until the material touches the fork frame
3. Raise the load carefully and tilt it in slightly.

Safety instructions on transporting material

 **WARNING**

The load can tip backward if it is not secured and if the loader unit is raised!

Can cause serious injury or death.

- ▶ Do not transport loads with a raised loader unit.
 - ▶ Always tilt in the attachment a little toward the machine, carry it as close as possible to the ground and bear in mind the required ground clearance!
 - ▶ After picking up the load, lower the loader unit to transport position and tilt the pallet forks.
 - ▶ Unload material only at machine standstill and do not tilt back the pallet forks to the limit.
 - ▶ In case of a bulky load: secure the load.
 - ▶ Fit the rear of the pallet forks with a protection.
 - ▶ Install a protective screen (option) onto the cabin.
 - ▶ Use attachments with hydraulic grabs (option).
 - ▶ Ensure good visibility of the material you want to pick up and of the work and travel range.
-

 **WARNING**

The machine can tip over during machine travel or manoeuvres on slopes with a load on the pallet forks!

Can cause serious injury or death.

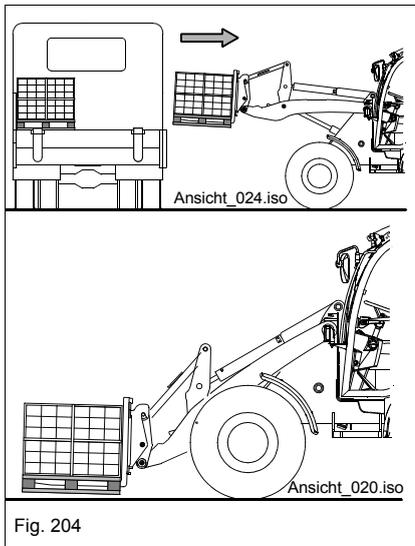
- ▶ Lower the loader unit to transport position.
 - ▶ If possible, travel in reverse with a load on the pallet forks.
-

 **WARNING**

The machine can tip over and the load can fall down in conditions of strong wind and poor visibility with a raised loader unit and fully loaded pallet forks!

Can cause serious injury or death.

- ▶ Avoid high storage positions for material which should not be exposed to wind.
 - ▶ Stop fork lift work in conditions of strong wind and poor visibility.
-



Transporting material

- Move the load only when it is safely placed on the fork arms.
- Start, turn and stop smoothly.
- Concentrate on your work, avoid distractions.
- When moving and transporting loads, always tilt it slightly back toward the machine and raise or lower it to transport position (bear in mind the ground clearance).
- Always perform machine travel slowly in off-road applications, to avoid strong swinging movements of the load.
- On slopes, the load must be on the uphill side of the machine/attachment.
- Drive the machine backward on sloping terrain to prevent the load from falling off and the machine from tilting forward when braking.
- When transporting large bulk loads drive the machine backward for improved visibility.

Fitting attachments from other manufacturers (option)

Quickhitches for attachments from other manufacturers

- The following quickhitches can be purchased from your dealer and installed by an authorized service centre:
 - Quickhitch for VOLVO attachments
 - Quickhitch for EURO attachments
 - Quickhitch for SKID STEER attachments
- **Important!**
Only approved attachments with an approved load diagram may be used with the quickhitch
 – see *“Use of attachments on the machine” on page 3-12.*
- If other attachments are used, conformity (stability test) in accordance with the EC machine guideline or the EN 474-3 standard must be checked and documented by an authorized service centre.
 In the case of non-EU countries, follow and apply the national regulations of these countries.
- Refer to the following information sheets *on page 5-97 “Stability calculations for attachments from other manufacturers”* for the stability test.
- Warranty and the operation license become void if non-approved attachments are installed, or if parts of the quickhitch or attachment (with a prescribed condition or quality, or the operation of which can put persons at risk) are subsequently modified or replaced.
- In addition to the Operator’s Manual, observe and instruct the operator in all other generally applicable, legal and other mandatory regulations relevant to accident prevention and environmental protection.

Important information on fitting attachments from other manufacturers

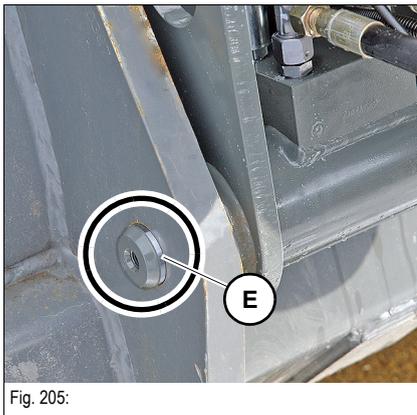


Fig. 205:



WARNING

Accident hazard if the attachments are not locked!

Can cause serious injury or death.

- ▶ Check whether lock pins **E** are visible on either side in the mounting bores of the attachment.



Information

Before connecting the hydraulics of the attachment from another manufacturer to the 3rd control circuit, ensure that the pressure in the quick couplers is released – see *“Releasing the pressure at the plug couplings” on page 5-65!*

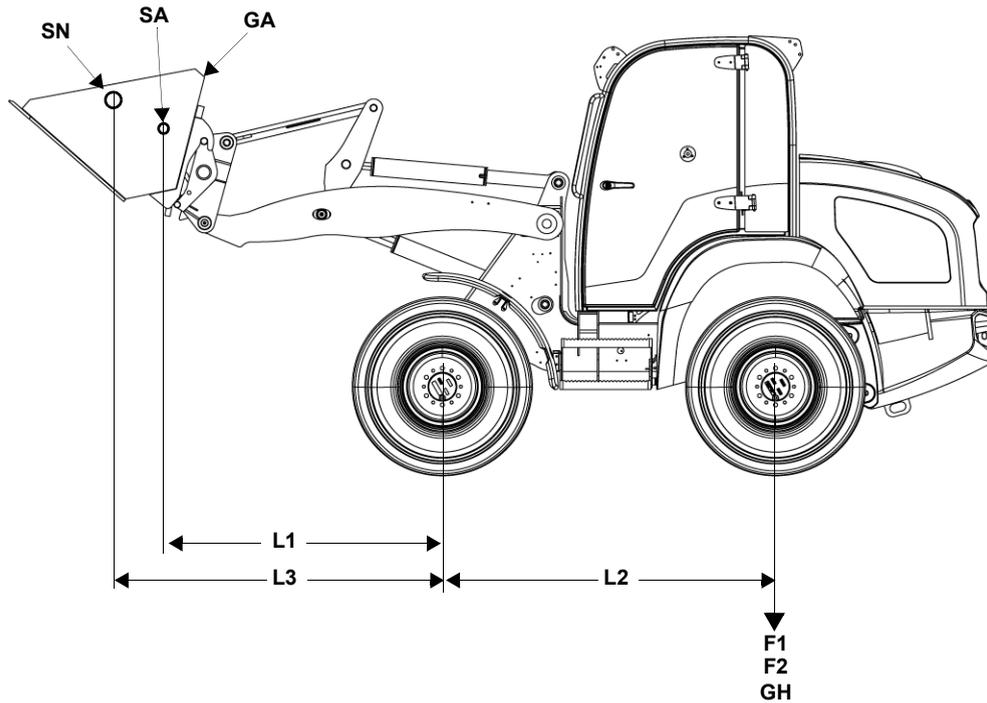
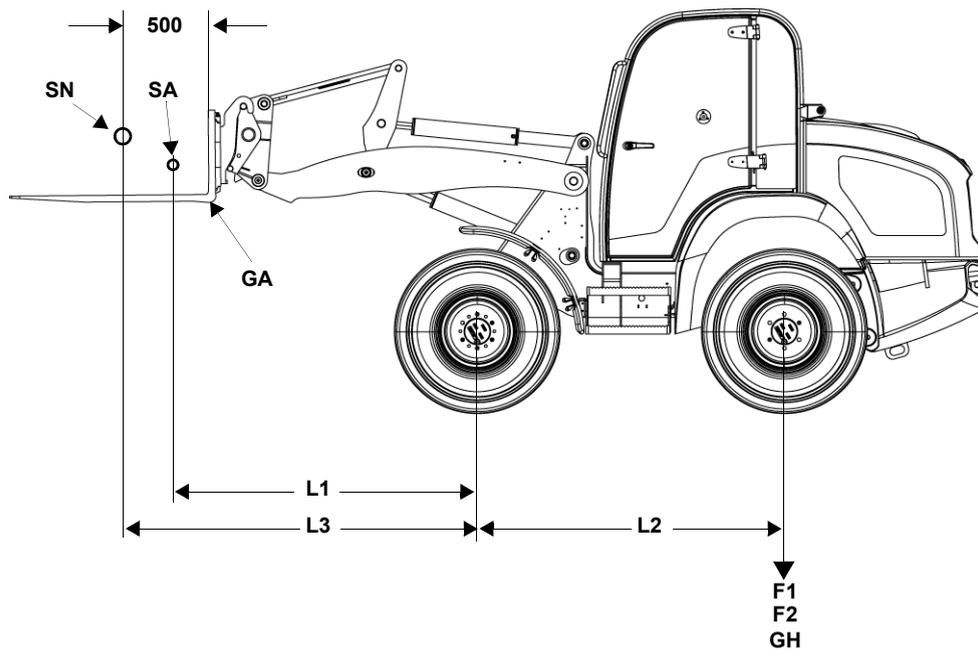
Stability calculations for attachments from other manufacturers**Overview with bucket according to ISO 14397-1****Overview with pallet forks according to ISO 14397-1**

Fig. 206



Table for values that have been determined

Enter the values that have been determined in the column "Entry".

Designation		Measure/determine	Entry	
GN	Maximum authorized payload	Enter the calculated values in the load diagram – see <i>"Calculation formula for stability (load diagram)"</i> on page 5-99.		kg (lb.)
SN	Position of load centre: pallet forks	Values entered in load diagram according to ISO 14397-1.	500 (19.7) 600 (23.6) 700 (27.5)	mm (in.)
SN	Position of load: bucket or other attachments			mm (in.)
S	Stability factor	Refer to table <i>Determining the safety factor for applications with pallet forks (S)</i> on page 5-99 for the values.		–
L1	Distance: between centre of front axle and centre of gravity of attachment	Measure		mm (in.)
L2	Axle base: between centre of front axle and centre of rear axle			mm (in.)
L3	Distance: between load centre (payload) and centre of front axle			mm (in.)
GH	Load on rear axle (without load on loader unit)	Calculated		kg (lb.)
F1	Measured load on rear axle (without attachment, with extended loader unit)	Determined on scales without attachment.		kg (lb.)
F2	Load reduction on rear axle due to installed pallet forks/attachment	Calculated, or measured if scales and an attachment are available.		kg (lb.)
GA	Weight of pallet forks/attachment	Ask attachment manufacturer.		kg (lb.)
SA	Centre of gravity of pallet forks/attachment			–
p_{max}	Material density of load	Calculated: depends on material picked up with the bucket.		t/m ³ (lb./ft ³)
V	Bucket capacity (ISO 7546)	Ask attachment manufacturer.		m ³ (ft ³)
M	Payload mass	Calculated.		kg (lb.)

**Determining the safety factor for applications with pallet forks (S)**

Ground conditions	DIN EN 474-3	
Rough terrain	60 %	S = 0.6
Firm and level ground	80%	S = 0.8

Bucket safety factor	ISO 14397-1	
–	0,5	S = 0.5

Calculation formula for stability (load diagram)

$$F2 = \frac{GA \times L1}{L2}$$

$$GH = F1 - F2$$

$$GN = S \times \frac{GH \times L2}{L3}$$

$$P_{\max} = \frac{GN}{V}$$

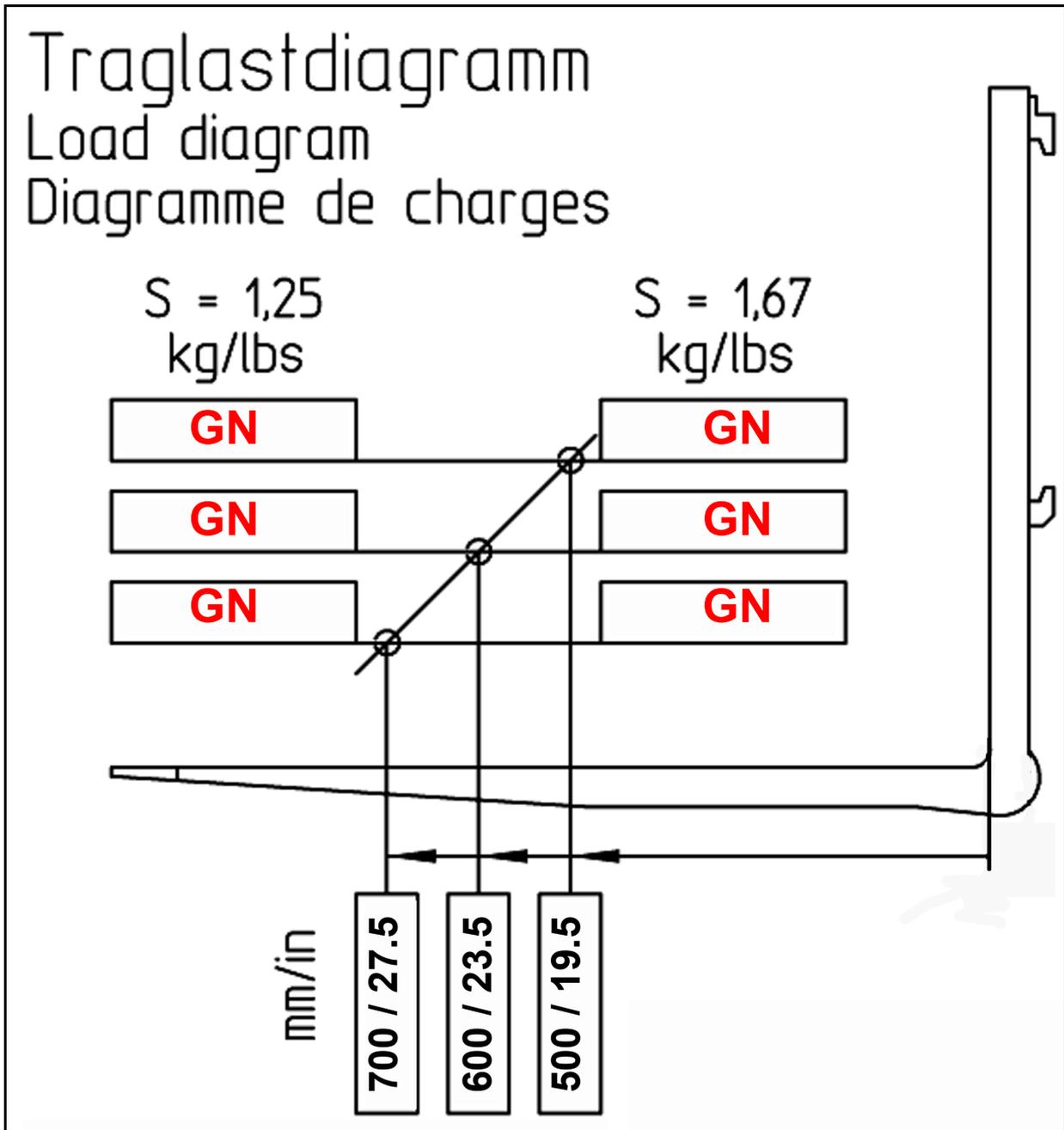
Load diagram (sample)

Enter the calculated values "GN" in the load diagram.



Information

Affix the completed load diagram in the cabin in a position that is easily visible for the user/operator.



5.12 Emergency lowering

Emergency lowering of loader unit in case of diesel engine breakdown

If the machine is equipped with the hose burst valve option, the loader unit cannot be lowered with the ignition switched off and/or in case of diesel engine breakdown!

In this case the loader unit can only be lowered by means of the emergency lowering feature.

CAUTION

Imminent accident hazard when lowering the loader unit in an emergency!

Can cause serious injury or death!

- ▶ Secure the danger zone.
- ▶ Do not try to repair the machine under a raised load.
- ▶ Immediately ask a service center for assistance.

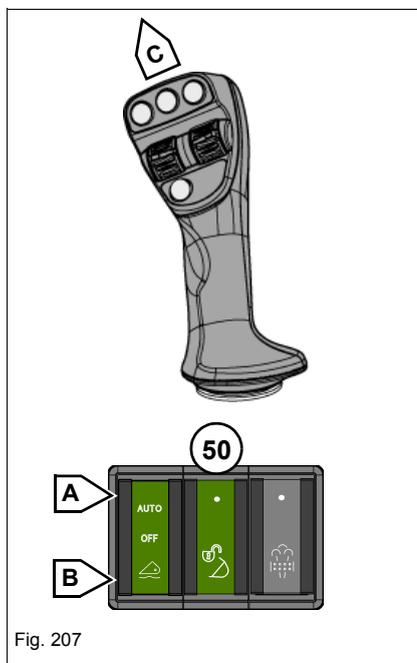


Fig. 207

Lowering

1. Ensure that no one is in the danger zone of the machine.
2. Apply the parking brake.
3. If the machine is equipped with a hose burst valve (option), switch on ignition.
4. Slide the lock in switch **50** backward, and press and hold the switch in position **B**.
5. Slowly push the control lever forward **C** until the loader unit is fully lowered.
6. Switch off the starter and remove the starting key.
7. Have the machine immediately repaired by an authorized service centre.

Raising

1. Fasten lifting gear (crane) onto the loader unit.
2. Pull and hold the control lever backward.
3. Raise the loader unit to transport position with the lifting gear.
4. Release the control lever.
5. Have the machine immediately repaired by an authorized service centre.

5.13 Options

Load hook (option)

Shaft rings, containers, pipes, etc., can be transported with a load hook and suitable lifting gear (belts, cables, chains).



WARNING

Injury hazard when working with a load hook!

Observe the following precautionary measures in order to avoid accident hazard!

- ▶ Read and follow the instructions given in chapter "Safety Instructions, Lifting-gear applications".
 - ▶ Bear in mind the load diagram on the front window.
 - ▶ Move loads only on firm and level ground.
 - ▶ Wear safety gloves.
 - ▶ Ensure that the ratchet safely engages in the hook as you hook up the lifting gear (belts, cables, chains).
 - ▶ Do not use damaged lifting gear.
 - ▶ Never place the lifting gear over sharp edges.
 - ▶ Adapt your speed to the load as you move it near to the ground.
 - ▶ Persons guiding the load must stay in visual contact with the machine operator.
 - ▶ Do not transport loads on public roads.
-

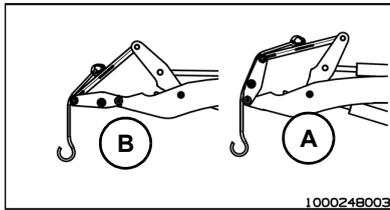
Load hook on loader unit tilt rod


Fig. 208

NOTICE

Damage hazard to the lifting gear and machine.

- ▶ Remove the attachment (bucket, pallet forks, etc.) from the quickhitch.
- ▶ Safely hitch the lifting gear (belts, cables, chains, etc.) on the load hook above the quickhitch.
- ▶ Never place the lifting gear over sharp edges.

1. Hitch the lifting gear in the mounts (eyelets, shackles) provided for transporting the load.
2. Carefully raise the load and transport it near the ground.
 - ➔ Do not exceed the load capacity, see load diagram **A** in the cabin (front window).

Example: load diagram for load hook

- A** Extended loader unit and quickhitch tilted in
- ➔ Max N => 2400 kg (5291.0 lb)
- B** Extended loader unit and quickhitch
- ➔ Max N => 1800 kg (3968.3 lb)

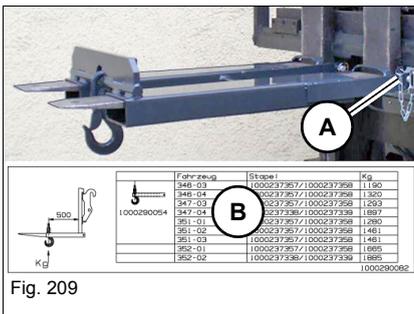
Load hook on forks arms of pallet forks


Fig. 209

WARNING
Injury hazard when working with a load hook!

Observe the following precautionary measures in order to avoid accident hazard!

- ▶ Do not tilt the pallet forks in or out as you raise a load.
- ▶ Bear in mind the load diagram on the front window.

1. Set the fork arms of the pallet forks horizontally.
2. Put the load hook on the fork arms of the pallet forks.
3. Secure the load hook with safety pin **A**.
4. Carefully raise the load with lifting gear (belts, cables, chains, etc.) and transport it close to the ground.
5. Do not exceed the load capacity, see load diagram **B** in the cabin (front window).

Bucket repositioning (option)

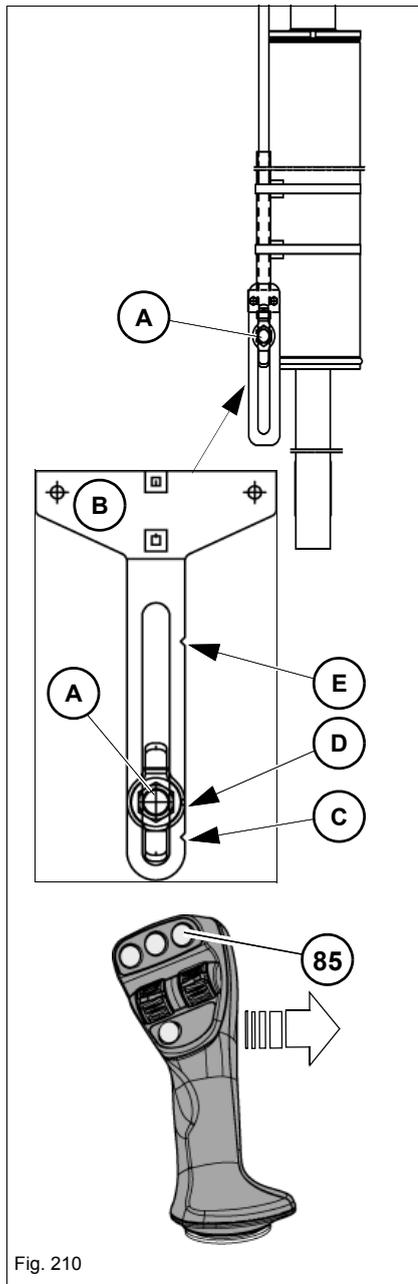


Fig. 210

The bucket repositioning function can be used for performing cyclical work (for example for loading trucks) efficiently and with minimum impact to the material: by pressing a button, the attachment is automatically positioned from the tilt-out position to the preset work position (for example a horizontal bucket base).

However, the efficiency of the bucket repositioning is ensured only if the attachment and the position of sensor **A** on the tilt ram are adjusted to each other.

This adjustment is performed easily by means of the marks (notches) on bracket **B** (see assignment of notch to attachment in table below).

i Information

Before putting the automatic bucket repositioning into operation, switch off the tilt ram lock (option)!

Adjusting the sensor

1. Pick up and lock the attachment in the quickhitch
 - see [“Pick up the attachment” on page 5-57](#),
 - see [“Locking the attachment” on page 5-40](#).
2. Set the attachment to the base position (for example bucket base aligned horizontally with the ground).
3. Loosen the wing nut on sensor **A** (sensor bracket on tilt ram).
4. Slide the sensor to the respective mark (notch) on bracket **B**.
5. Tighten the wing nut.

Notch	Attachments
A	Side swing bucket
B	Bucket (normal material)
	Bucket (lightweight material)
	Multipurpose bucket
C	Pallet forks

Enabling the bucket repositioning

1. Press push button **85** on the control lever.
2. The attachment is automatically tilted in to the position that has been set.
3. Lower the loader unit to load position.

Disabling the automatic bucket repositioning.

1. Press control lever to the right (tilt out).

Tilt ram lock (option)



Fig. 211

This option is used for securing the tilt ram if it is not supposed to be operated (for example when setting down material on high piles).



Information

Installing a work platform is PROHIBITED.

The tilt-ram lock is enabled with key-operated switch **C** in the switch console under the armrest.

Switching on the tilt ram lock

1. Set the loader unit to transport position.
2. Set the tilt ram and the material to the required position.
3. Turn key-operated switch **C** to position **A**.
 - ➔ The tilt ram is locked and can no longer be operated in the position to which it has been adjusted.
4. Setting down a load.

Switching off the tilt-ram lock

1. Turn key-operated switch **C** to position **B**.
 - ➔ Tilt ram is unlocked.

Automatic trailer coupling (option)

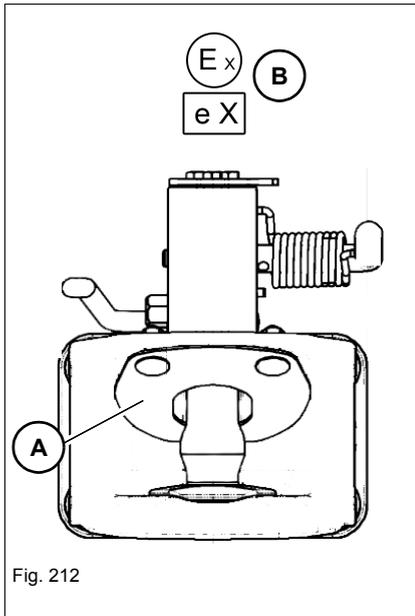


Fig. 212

Information

Only trailer couplings with EC acceptance or EC control marks are certified for use on public roads in Germany (StVZO German road traffic regulations).

Refer to and follow the General Certification for Vehicles (Germany) or the Data Confirmation (Germany) for information on other requirements!

Get informed on and follow the legal regulations of your country!

The automatic trailer coupling is used for tractor vehicles according to § 43 clause 4 of the StVZO (German road traffic regulations).

- Follow the regulations of the employer's liability insurance associations of your country when coupling or uncoupling a trailer.
- The attachments (trailer) and the trailer coupling use are listed in the National Type Approval (Germany) or the Data Confirmation (Germany).
- Bear in mind the trailer and drawbar loads – see chapter *“Trailer weight/drawbar load: trailer couplings (option)”* on page 9-24.
- Have a damaged or malfunctioning trailer coupling immediately repaired or replaced by an authorized service centre.

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).

➔ See type label B on trailer coupling and trailer drawbar.

If the trailer coupling is equipped with a stabilizing feature A (push-down plate), only lugs in compliance with DIN 74054 (ISO 8755) are allowed.

➔ See type label B on the trailer coupling.

Important information on the automatic trailer coupling

 **WARNING****Accident hazard if the load on the front axle is too low**

Can cause serious injury or death.

- ▶ Install and safely lock attachments (for example buckets) on the loader unit that are certified for public roads.
 - ▶ Cover the blade or teeth of the bucket across their entire width with the protection provided.
-

 **WARNING****Accident hazard due to a damaged trailer coupling!**

Can cause injury.

- ▶ Check the trailer coupling for damage before using it.
 - ▶ Have a damaged or malfunctioning trailer coupling immediately repaired or replaced by an authorized service centre.
-

NOTICE

Before performing downhill machine travel, select the “Turtle” speed range and use the service brake to support the braking effect of the drive. This avoids damage to the drive and/or the diesel engine due to excessive speed! This applies to trailer operation in particular!

- ▶ Reduce the speed to less than 15 km/h (9.32 mph) with the service brake.
 - ▶ Select 1st speed “Turtle”.
 - ▶ Support the drive’s braking effect with the brake/inching pedal by pressing it down with force beyond the inching range (intermittent braking).
-

**Information**

When equipped with a high speed gearbox (option), the wheel loader reaches maximum speed only on a level and asphalted surface, without a trailer and with an empty standard bucket!

Hitching a trailer

CAUTION

Accident hazard due to coupling pin snapping down!

Can cause injury.

- ▶ Do not touch the coupling pin with your hands.

WARNING

Accident hazard during backward machine travel.

Can cause serious injury or death.

- ▶ Ensure that nobody is between the machine and the trailer.
- ▶ Have another person guide you if necessary.

CAUTION

Accident hazard due to unlocked coupling pin!

Can cause injury.

- ▶ After coupling a trailer, check whether the coupling pin is engaged in the lug.

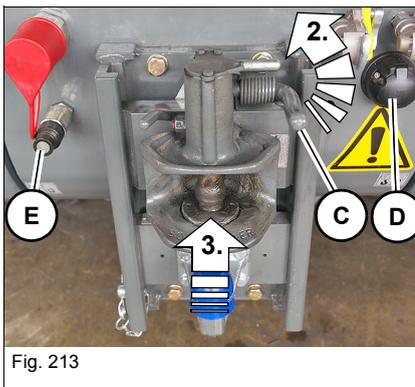


Fig. 213

1. Before hitching a trailer, adjust the height of the trailer coupling to the height of the trailer drawbar – see *“Adjusting the height-adjustable trailer coupling (option)” on page 5-115.*
2. Open the trailer coupling. To do this: press lever **C** upward until the coupling pin audibly engages in the open position.
3. Reverse the tractor vehicle slowly until the lug engages in the coupling jaw with an audible click.
 - The trailer is locked in the coupling jaw as the lug touches the release trigger.
4. Stop the engine.
5. Apply parking brake.
6. Visually check the locking condition.
7. Establish the electric **D** and hydraulic **E** connections between the trailer and the machine.
8. Release the trailer brake.
 - Refer to the Operator’s Manual of the trailer.
9. Remove the wheel chocks from the wheels of the trailer and safely store them on the trailer.

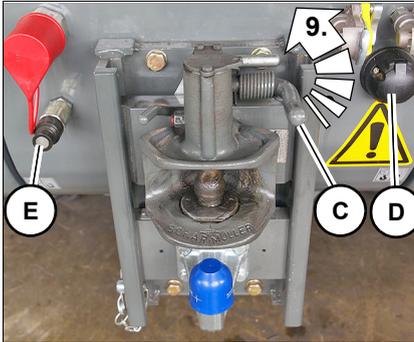


Fig. 214

Unhitching the trailer

NOTICE

In order to avoid dirt accumulation in the trailer coupling eyelets, close them again after uncoupling the trailer!

- ▶ Press lever **F** down until the coupling pin engages in the trailer coupling.

1. Park the machine and the trailer on level ground.
2. Apply parking brake.
3. Stop the engine.
4. Switch off the starter and remove the starting key.
5. Secure the trailer with wheel chocks.
6. Apply the trailer parking brake.
7. Disconnect the electric **D** and hydraulic **E** connections between the machine and the trailer.
8. Close the plug couplings on the machine and the trailer with the protective caps provided.
9. Uncouple the trailer. To do this: push lever **C** of the trailer coupling upward until the coupling pin locks into place.

Closing the coupling by hand (for example for a tow cable)

CAUTION

Accident hazard due to coupling pin snapping down!

Can cause injury.

- ▶ Do not touch the coupling pin with your hands.

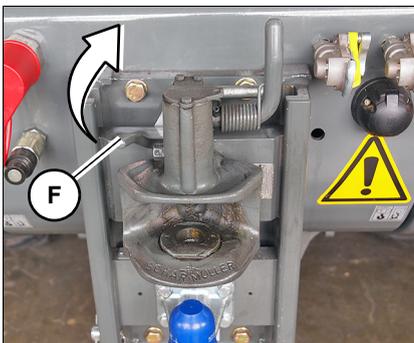


Fig. 215

1. Carefully press lever **F** down until the coupling pin engages in the trailer coupling.

Balltrailer coupling (option)



Fig. 216

Information

Only trailer couplings with EC acceptance or EC control marks are certified for use on public roads in Germany (StVZO German road traffic regulations).

Refer to and follow the General Certification for Vehicles (Germany) or the Data Confirmation (Germany) for information on other requirements!

Get informed on and follow the legal regulations of your country!

The ball hitch coupling is used for tractor vehicles and self-propelled work machines according to § 43 clause 4 of the StVZO (German road traffic regulations) in the Federal Republic of Germany.

- Only trailers may be towed that are equipped with ball traction couplings. Any other use is prohibited
- Do not hitch trailers with positive steering.
- Follow the regulations of the employer's liability insurance associations of your country when coupling or uncoupling a trailer.
- The attachments (trailer) and the trailer coupling use are listed in the National Type Approval (Germany) or the Data Confirmation (Germany).
- Bear in mind the trailer and drawbar loads – see chapter [“Trailer weight/drawbar load: trailer couplings \(option\)”](#) on page 9-24.
- Keep the ball clean and apply a thin coat of grease. However, do not apply any grease to the ball when using a stabilization system, such as Westfalia “SSK”.
- Check all fastening screws of the towing gear regularly or have them re-tightened by an authorized service centre to the specified tightening torque.
- Adapt the height of the drawbar if necessary.

Important information about the ball hitch

 **WARNING****Accident hazard if the load on the front axle is too low**

Can cause serious injury or death.

- ▶ Install and safely lock attachments (for example buckets) on the loader unit that are certified for public roads.
 - ▶ Cover the blade or teeth of the bucket across their entire width with the protection provided.
-

 **WARNING****Accident hazard due to a damaged trailer coupling!**

Can cause injury.

- ▶ Check the trailer coupling for damage before using it.
 - ▶ Ensure a minimum diameter of 79.0 mm at any point of the ball head.
 - ▶ Have a damaged or malfunctioning trailer coupling immediately repaired or replaced by an authorized service centre.
-

NOTICE

Before performing downhill machine travel, select the “Turtle” speed range and use the service brake to support the braking effect of the drive. This avoids damage to the drive and/or the diesel engine due to excessive speed! This applies to trailer operation in particular!

- ▶ Reduce the speed to less than 15 km/h (9.32 mph) with the service brake.
 - ▶ Select 1st speed “Turtle”.
 - ▶ Support the drive’s braking effect with the brake/inching pedal by pressing it down with force beyond the inching range (intermittent braking).
-

 **Information**

When equipped with a high speed gearbox (option), the wheel loader reaches maximum speed only on a level asphalted surface without a trailer and under normal load (attachment)!

Piton ball hitch (option)



Fig. 217

Information

Only trailer couplings with EC acceptance or EC control marks are certified for use on public roads in Germany (StVZO German road traffic regulations).

Refer to and follow the General Certification for Vehicles (Germany) or the Data Confirmation (Germany) for information on other requirements!

Get informed on and follow the legal regulations of your country!

The Piton ball hitch is used for tractor vehicles according to § 43 clause 4 of the StVZO (German road traffic regulations) in the Federal Republic of Germany.

- Follow the regulations of the employer's liability insurance associations of your country when coupling or uncoupling a trailer.
- The attachments (trailer) and the trailer coupling use are listed in the National Type Approval (Germany) or the Data Confirmation (Germany).
- Bear in mind the trailer and drawbar loads – *see chapter "Trailer weight/drawbar load: trailer couplings (option)" on page 9-24.*
- Have a damaged or malfunctioning trailer coupling immediately repaired or replaced by an authorized service centre.
- Do not hitch trailers with positive steering.

Important information about the Piton ball hitch

 **WARNING****Accident hazard if the load on the front axle is too low**

Can cause serious injury or death.

- ▶ Install and safely lock attachments (for example buckets) on the loader unit that are certified for public roads.
 - ▶ Cover the blade or teeth of the bucket across their entire width with the protection provided.
-

 **WARNING****Accident hazard due to a damaged trailer coupling!**

Can cause injury.

- ▶ Check the trailer coupling for damage before using it.
 - ▶ Have a damaged or malfunctioning trailer coupling immediately repaired or replaced by an authorized service centre.
 - ▶ The towing pin must have a maximum wear of 2 mm (0.07 in).
-

NOTICE

Before performing downhill machine travel, select the “Turtle” speed range and use the service brake to support the braking effect of the drive. This avoids damage to the drive and/or the diesel engine due to excessive speed! This applies to trailer operation in particular!

- ▶ Reduce the speed to less than 15 km/h (9.32 mph) with the service brake.
 - ▶ Select 1st speed “Turtle”.
 - ▶ Support the drive’s braking effect with the brake/inching pedal by pressing it down with force beyond the inching range (intermittent braking).
-

 **Information**

When equipped with a high speed gearbox (option), the wheel loader reaches maximum speed only on a level asphalted surface without a trailer and under normal load (attachment)!

Hitching a trailer

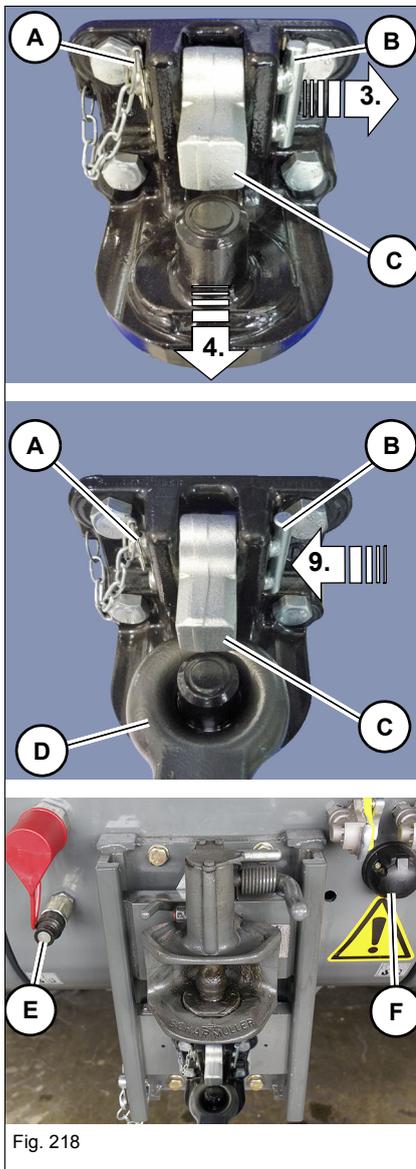


Fig. 218

! WARNING

Accident hazard during backward machine travel.

Can cause serious injury or death.

- ▶ Ensure that nobody is between the machine and the trailer.
- ▶ Have another person guide you if necessary.

! CAUTION

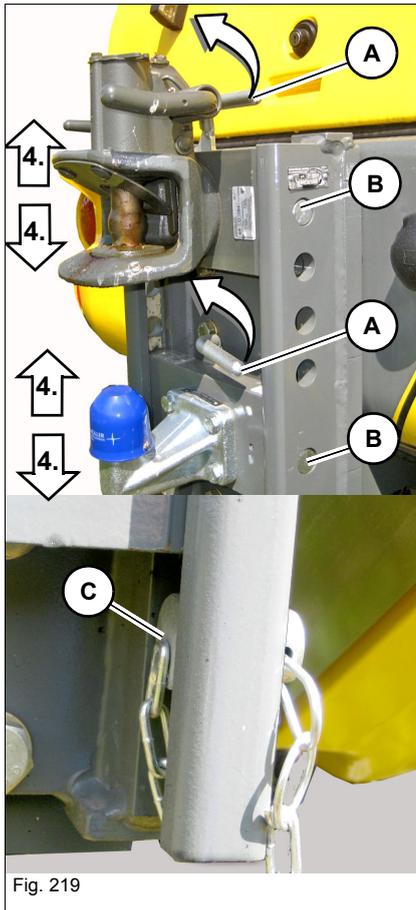
Accident hazard due to unlocked coupling pin!

Can cause injury.

- ▶ After coupling a trailer, always check whether the lug is safely seated on the towing pin and whether the push-down plate is safely locked.

1. Adapt the height of the drawbar to the height of the trailer coupling.
2. Pull spring plug **A** out of lock pin **B**.
3. Hold push-down plate **C** and remove lock pin **B** in the direction of the arrow.
4. Reverse the machine slowly until the lug is above the towing pin.
5. Stop the engine.
6. Apply parking brake.
7. Lower the drawbar prop and fold it to transport position.
8. Ensure that lug **D** is safely seated on the towing pin.
9. Put the push-down plate back in again and lock it with lock pin **B** (longer pin at the top).
10. Secure lock pin **B** with spring plug **A**.
11. Establish the electric and hydraulic connections (**E F**) between the trailer and the machine.
12. Release the trailer brake.
 - Refer to the Operator's Manual of the trailer.
13. Remove the wheel chocks from the wheels of the trailer and safely store them on the trailer.

Adjusting the height-adjustable trailer coupling (option)



Before hitching a trailer, the height of the trailer coupling can be adjusted to the height of the trailer drawbar with the height-adjustable trailer coupling.

CAUTION

Injury hazard due to falling trailer coupling!

If no lock pin is pre-adjusted, the trailer coupling can fall on limbs when adjusting it.

- ▶ Lock pin **A** must be pre-adjusted before adjusting the trailer coupling.
- ▶ Never remove lock pin **A**.

WARNING

Accident hazard due to incorrectly locked trailer coupling

The trailer coupling can come out of the lock on the adjusting plate.

- ▶ Ensure that the lock pins on the left and right are visible and engaged flush in holes **C** of the adjusting plate.

1. Put the trailer drawbar in a horizontal position.
2. Insert lock pin **C** in the required position.
3. Pull lever **A** upward.
4. Slide the trailer coupling upward or downward until it is at the same height as the trailer lug (at the middle of the coupling jaw).
5. Release lever **A**.
 - ➔ Lock pins **B** must engage on either side.

Information

In connection with a hydraulic or pneumatic trailer brake, the trailer coupling has to be set in the lowest position. If the machine is equipped with an automatic trailer coupling, the drawbar lug must rest on the base of the jaw.

Information

The height-adjustable trailer coupling can be completely removed if necessary. To do this, remove lock pin **C**, unlock the trailer coupling with lever **A** and take it out downward.

Hydraulic trailer brake (option)

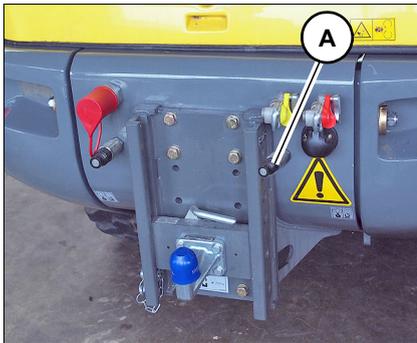


Fig. 220

Important safety instructions regarding the hydraulic trailer brake

- Plug coupling **A** for the hydraulic trailer brake is installed at the rear of the machine.
- The hydraulic trailer brake is operated with the machine's service brake!

NOTICE

The parking brake has **no** effect on the hydraulic trailer brake!

NOTICE

Only trailers with hydraulic brakes may be used that are certified for a braking pressure of a maximum of 150 bar (2175.5 psi) at full braking!



Information

The hydraulic trailer brake is certified for public roads in Germany (StVZO German road traffic regulations) provided it is adapted to the tractor! The maximum road travel speed is limited to 25 km/h (15.5 mph) in Germany (according to German traffic regulations).

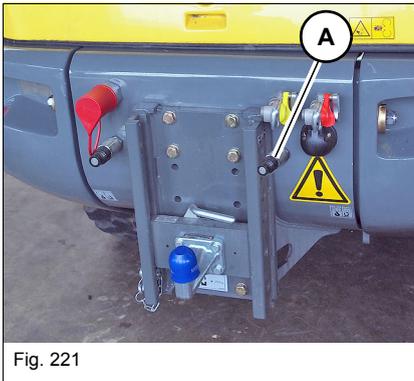
- ▶ Refer to the National Type Approval (Germany), the Data Confirmation (Germany) or the license certificate (Germany) for the applicable provisions!
 - ▶ Observe the legal regulations of your country, or have country-specific final acceptance performed!
-

Coupling a trailer brake hose

NOTICE

Clean the plug coupling carefully before connecting the flexible line of the trailer in order to ensure correct functioning and sealing!

- ▶ Inspection and maintenance work on the hydraulic brake may be performed only by trained personnel or an authorized service center.
-



1. Hitch the trailer onto the trailer coupling, – see *“Hitching a trailer” on page 5-108.*
2. Clean the brake hose and plug coupling **A**.
3. Couple the brake hose onto plug coupling **A**.
4. Establish the electric and hydraulic connections between the trailer and the tractor vehicle.
5. Remove the wheel chocks from the wheels of the trailer and safely store them on the trailer.
6. Release the trailer brake.
 - Refer to the Operator’s Manual of the trailer.

Performing machine travel with the hydraulic trailer brake

WARNING

**Performing machine travel too fast can cause serious accidents!
The trailer brake can overheat on longer downhill stretches with the brake/inching pedal pressed only halfway through!**

Can cause serious injury or death.

- ▶ Before cornering or traveling down a slope, reduce the travel speed by fully pressing the brake/inching pedal **34** in short intervals (intermittent braking) to brake the tractor-trailer combination.
- ▶ Reduce engine speed: remove your foot from the accelerator pedal.
- ▶ Select the "Turtle" speed range.

When the machine is braked with brake/inching pedal **34**, oil pressure is applied to the hydraulic braking system of the trailer to brake it.

The parking brake has no effect on the trailer braking system.

If the travel speed is reduced with brake/inching pedal **34**, oil pressure is applied to the trailer braking system after about 20 % of the pedal travel. This "advance action" slightly brakes the trailer, and the tractor-trailer combination is held in a taut line.

Uncoupling the trailer brake hose:

1. Park the machine and the trailer on level ground.
2. Apply parking brake.
3. Stop the engine.
4. Switch off the starter and remove the starting key.
5. Secure the trailer with wheel chocks.
6. Apply the trailer parking brake.
7. Disconnect the electric and hydraulic connections from the tractor vehicle to the trailer.
8. Close the plug couplings on the machine and the trailer with the protective caps provided.
9. Unhitch the trailer – see *"Unhitching the trailer" on page 5-109.*

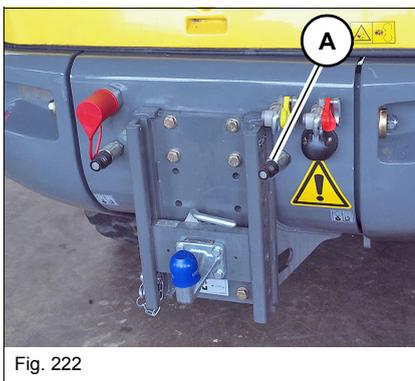


Fig. 222

Low-speed control with regulated travel speed (option)



Fig. 223

Important information on the low-speed control with regulated travel speed (CSD = Constant Speed Drive)

Using this function, an even driving speed can be achieved. The selected driving speed is largely self-contained of the driving resistance.

When operating hydraulically activated attachments (e.g. sweepers or ground mills), the function of the low-speed control ensures an even driving speed or starting from a standstill with a high engine speed.

With the sliding control, **32** the driving speed can be variably set regardless of the engine speed.

WARNING

Danger of accident due to fast acceleration of the machine!

Failure to observe this can cause serious injury or death.

- ▶ If a high speed is still pre-set via the manual throttle function, consider the saved speed and the resulting vehicle behavior before actuating the travel direction touch button.

Information

Operate low-speed control only in conjunction with the manual throttle option – see *“Manual throttle (option)” on page 5-10.*

Information

Operation of low-speed control is only possible from an engine speed of about 1100 rpm and in the "Turtle" speed range – see *“Changing speed range” on page 5-19!*

The low speed control is not effective in the "hare" speed.

Information

In order to achieve the maximum speed in the "Turtle" speed in normal application, the slide control **32** must be pushed forward to the detent (**A**).

If the slide control **32** is in position **B**, the vehicle will not drive.

Activate the low-speed control function

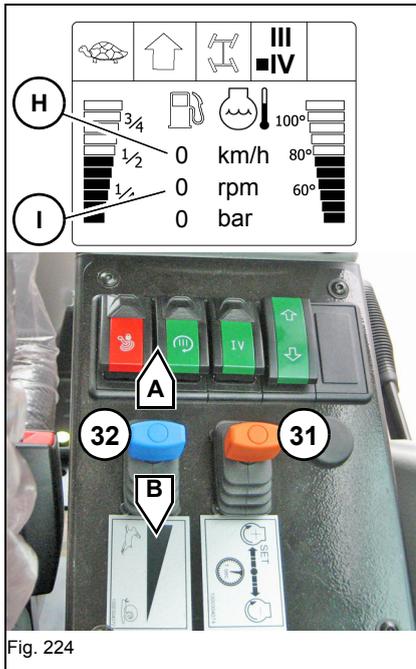


Fig. 224

Operation	Lever position	Result
Select the "Turtle" speed range.	– see "Changing speed range" on page 5-19.	
Activate the low-speed control function.	1. Pull the sliding heater control 32 all the way to the rear B .	➔ Driving speed = 20 km/h (0 mph).
	2. Set the engine speed via the manual throttle controller 31 to the speed required for the attachment – see "Manual throttle (option)" on page 5-10.	➔ The speed I is shown in the display (rpm).
	3. Select a travel direction.	➔ Driving speed = 20 km/h (0 mph).
Select the driving speed.	Push the slide control 32 forward A until the desired speed is achieved.	➔ The speed H is shown in the display (km/h). ➔ The speed is largely self-contained of the driving resistance.

Disabling the low-speed control

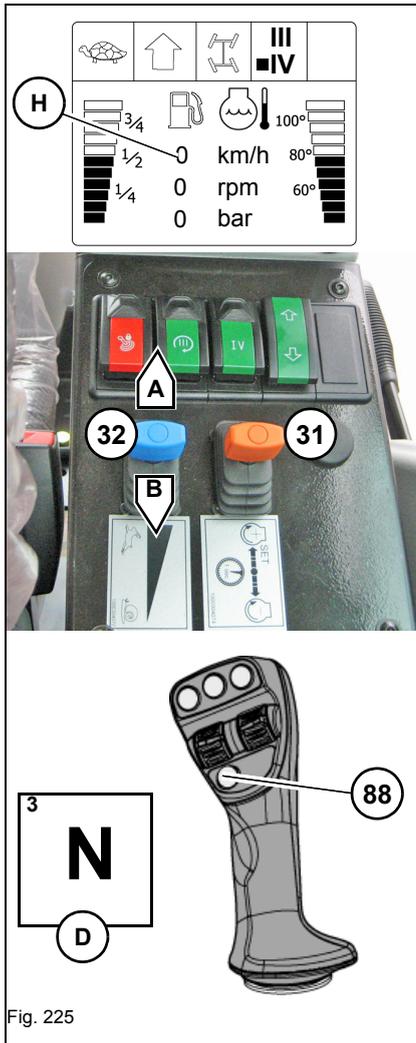


Fig. 225

Operation	Lever position	Result
Disabling the low-speed control.	1. Push the slide control 32 all the way to the rear B .	<ul style="list-style-type: none"> ➔ The speed H is reduced to 0 km/h (0 mph). The saved manual throttle speed remains preserved.
	2. Once the work operation is completed, press the touch button 88 "Neutral travel direction."	<ul style="list-style-type: none"> ➔ The speed of the diesel engine falls to the lower idling speed. ➔ The manual throttle is disabled. ➔ Symbol D/3 appears in the digital display.
	3. Push the slide control 32 all the way forward A for normal work operation.	<ul style="list-style-type: none"> ➔ The speed is regulated via the accelerator pedal.

i Information

The low-speed control is also disabled for safety reasons when the engine is restarted or the speed "Hare" is chosen.

If the low-speed control was disabled, the function must be reactivated and set.

Rotating beacon (option)



Information

In Germany, the rotating beacon may only be switched on public roads if:

- ▶ the road is within the machine's working range,
- ▶ the machine is an obstruction to the normal flow of traffic during work operation,
- ▶ the machine is equipped with a warning identification at the front and rear according to DIN 30710 (option).

Observe the legal regulations of your country.

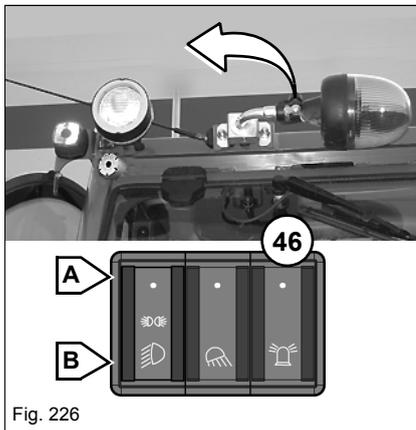


Fig. 226

Switch **46** is located on the switch console on the left beside the steering wheel.

Rotating beacon operation		Function
ON	Press switch 46 to position A .	➔ The indicator light in the switch illuminates.
AUS	Press switch 46 to position B .	➔ Indicator light in switch goes out.



Information

Fold up and lock the rotating beacon before using it. In order to avoid possible damage, lower and lock the rotating beacon after using it.

Rear window heating (option)

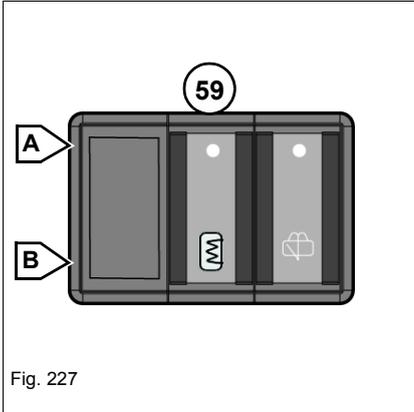


Fig. 227

The switch of the rear window heating is located on the switch console on the left beside the steering wheel.

Rear window heating (option)		Function
ON	Press push button 59 to position B .	<ul style="list-style-type: none"> Indicator light in switch illuminates. Rear window heating in operation.
AUS	Press push button 59 to position A .	<ul style="list-style-type: none"> Rear window heating out of operation.

NOTICE

In order to avoid damage, the rear window heating is automatically switched off after about 5 minutes (time-lag relay).

Protective screens for front window and/or main lights (option)

Removing the protective screens for machine travel on public roads

The wheel loader can be fitted with protective screens on the front window and/or the main lights as a protection against falling material.

Information

The protective screens may be used only for work operation and must be removed during machine travel on public roads!

- ▶ See also the machine documentation and the Data Confirmation (Germany).

Backup warning system (option)

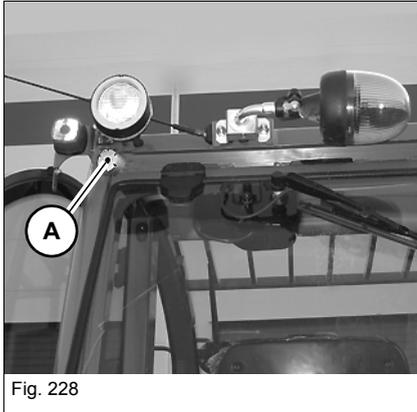


Fig. 228

The backup warning system consists of signal transmitter **A** fitted at the rear top left of the cabin.

Signal transmitter **A** generates an acoustic signal when shifting into reverse.

The acoustic level is about 103 dB (A) at a distance of 1 m (1.09 yd) and at a frequency of 2800 Hz.

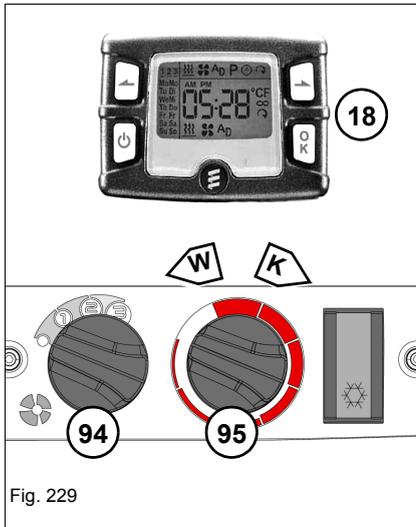
WARNING

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.

- ▶ Do not rely on the backup warning system.
 - ▶ 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.
-

Auxiliary heating (night heater option)



Auxiliary heater **18** is located above the switch console on the right (near the door).

At engine standstill, the auxiliary heater (night heater) warms up the coolant that flows through the cabin heating to warm up the cabin.

Double advantage: warm cabin and preheated engine!

The heaters (engine heating and auxiliary heater) can be used independently of each other.



WARNING

Explosion hazard during operation of the auxiliary heater near flammable vapours or dust!

Can cause serious injury and death

- ▶ Switch off the auxiliary heater before refuelling the machine.



WARNING

Poisoning and suffocation hazard during operation of auxiliary heater in enclosed areas!

Can cause serious damage to health or death.

- ▶ Do not put the auxiliary heater into operation in enclosed areas.

NOTICE

The auxiliary heater can be damaged by a loss of voltage.

- ▶ After switching it off, the auxiliary heater still runs for about 2 minutes to cool down.
- ▶ Switch off the battery master switch only if the auxiliary heater does not run any more.

Operating/programming the auxiliary heater

1. Adjust the fan speed with rotary switch **94**: positions **1 – 3**
2. Adjust the temperature with rotary switch **95**:
K = cold / **W** = warm
3. Set the auxiliary heater timer.



Information

Refer to the Operator's Manual of the auxiliary heater supplied with the machine for operating and programming the timer.

Load stabilizer for loader unit (option)

During machine travel over longer distances, off-road or on public roads, the load stabilizer dampens the movements of the loader unit and avoids pitching movements of the machine. This increases drive comfort and safety.

WARNING

Accident hazard due to pitching movements of the machine during machine travel on public roads.

Failure to observe this can cause serious injury or death.

- ▶ Always switch on the load stabilizer during machine travel on public roads.
- ▶ Lower the loader unit to transport position.

Information

In order not to restrict the functions of the load stabilizer, do not tilt in the tilt ram to the limit, or briefly release the hydraulic pressure in the tilt ram after tilting in the bucket.

Information

The loader unit yields easily with the load stabilizer switched on (continuous operation), making it difficult to perform any precise lifting movements.

- ▶ Only put the load stabilizer into operation during longer machine travel.
 - ▶ Switch off the load stabilizer during work operation with the loader unit.
-

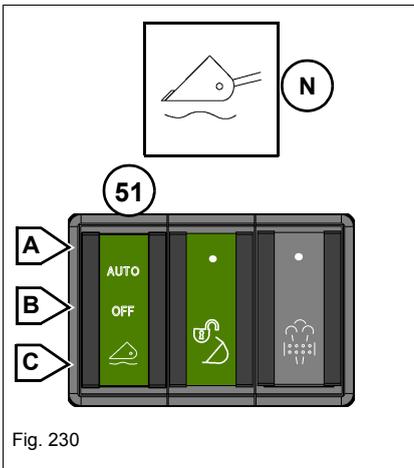


Fig. 230

Operating the load stabilizer

The load stabilizer can be used in automatic and continuous mode.

Information

Depending on the load, the loader unit can rise or go down slightly as you switch the load stabilizer on or off (pressure equalization)!

Additionally, the loader unit yields very easily with the load stabilizer switched on, making exact steering, especially for pallet fork operation, difficult.

► We recommend not switching on the load stabilizer during pallet fork operation.

- The load stabilizer in **automatic mode** is suitable for machine travel on public roads, for lighter work with the loader unit and for light off-road transport.
It is switched on and off by means of an automatic driving speed control.
 - ➔ Travel speed over 15 km/h (9.3 mph) => **ON**
 - ➔ Travel speed below 15 km/h (9.3 mph) => **OFF**
- The load stabilizer in **continuous operation** is suitable for longer trips off-road as well as on public roads.
- **Load stabilizer off for difficult loading operations, or switch to automatic operation.**

The operation of the load stabilizer is performed via the switch **51**.

The switch is located on the switch console on the left beside the steering wheel.

Load stabilizer operation		Function
AUTO	Press switch 51 to position A .	<ul style="list-style-type: none"> ➔ Load stabilizer in automatic mode. ➔ Symbol N in the digital display illuminates above 15 km/h (9.3 mph). ➔ Goes off under 15 km/h (9.3 mph).
AUS	Press switch 51 to centre position B .	<ul style="list-style-type: none"> ➔ Load stabilizer out of operation. ➔ Symbol N disappears from the digital display.
Continuous operation is switched ON	Press switch 51 to position C .	<ul style="list-style-type: none"> ➔ Load stabilizer in continuous operation. ➔ Symbol N appears in the digital display.

5.14 Putting out of operation/back into operation

Putting out of operation



WARNING

Accident hazard if machine tips over or rolls away after parking it!

Can cause serious injury or death.

- ▶ Stop the machine on firm, level and horizontal ground.
 - ▶ Secure the machine accordingly (chocks, for example).
-

NOTICE

In order to avoid engine damage, allow the diesel engine to run for a while after operation under full load, so that the temperature can stabilize!

1. Lower the loader unit completely and set the bucket horizontally with the ground – see *“Working with the standard bucket” on page 5-77*.
2. Set the drive to a neutral position – see *“Selecting a travel direction and starting machine travel” on page 5-20*.
3. Stop the engine and remove the starting key.
 - The immobilizer (option) is enabled.
4. Apply the parking brake – see *“Parking brake (hand brake)” on page 5-16*.
5. Close and lock the windows and the door as you leave the cabin.
6. Lock the engine cover securely.
7. Remove the key from the battery master switch – see *chapter “Battery master switch” on page 4-15*.
8. Take additional measures to secure the machine by placing chocks under the downhill sides of the wheels.



Putting out of operation for a longer period of time

1. If possible, retract the piston rods of the hydraulic rams to protect them against damage. If this is not possible, apply grease to the piston rods and to the bare parts of the hydraulic rams that are not paint-coated.
2. **Before putting the machine into operation**, clean the piston rods, however not with a grease solvent or a high-pressure cleaner.
 - ➔ The scraper is not water-tight.
 - ➔ Water in the guide bushing causes corrosion and damage to the piston rod.

Preserving the diesel engine

- Preserving inside
- Preserving outside



Information

Preserving work may be performed by an authorized service centre only!

5.15 Permanently putting out of operation

Information on decommissioning

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

Preparing disposal

- Follow all applicable safety regulations regarding machine decommissioning!
- Ensure that the machine cannot be operated between decommissioning and disposal!
- Ensure that there is no leakage of environmentally hazardous consumables, and that the machine presents no other hazards at its storage place!
- Ensure that the loader unit is fully lowered and that the bucket is placed horizontally on the ground! Install all protective devices!
- Ensure that the parking brake is used for parking the machine safely and for preventing it from rolling away and that the machine is secured in addition by placing chocks under the downhill sides of the wheels!
- Secure the machine against unauthorized use! Safely lock all openings (doors, windows, engine cover) of the machine!
- Repair all leaks on the diesel engine, reservoirs, gearbox and hydraulic system!
- Remove the battery!
- Store the machine in a place that is secured against access by unauthorized persons!



Environment

Avoid environmental damage!

Do not allow the oil and oily wastes to get into the ground or stretches of water! Dispose of different materials and consumables separately and in an environmentally friendly manner!

Disposal

Further recycling of the loader 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.
- Separate the material as you recycle parts!
- Ensure environmentally compatible disposal of consumables as well!



6 Transport

6.1 Towing the machine

Information on towing



WARNING

Accident hazard due to towing!

Can cause serious injury or death.

- ▶ The machine may only be towed using suitable towing equipment (towing bar or cable) in connection with suitable towing facilities, such as a towing coupling, hooks and eyes.
 - ▶ Ensure that no one is between the vehicles during towing.
 - ▶ Max. towing distance is 300 m (328 yd.).
 - ▶ The max. towing speed is walking speed (5 km/h / 3.1 mph).
 - ▶ Have a recovery service or an authorized service centre tow the machine away if necessary.
-



WARNING

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.
-

Disabling the variable displacement pump

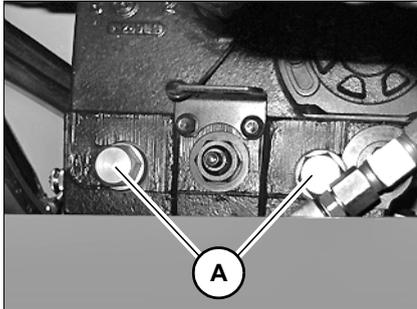


Fig. 231

NOTICE

The high pressure valves must be opened before towing in order to avoid damage (high pressure) to the variable displacement pump when towing away the machine.

Disabling the variable displacement pump (neutral position)

1. Apply the parking brake.
2. Stop the diesel engine.
3. Switch off the starter and remove the starting key.
4. Unscrew both high-pressure relief valves **A** on the variable displacement pump about 2 revolutions (wrench size 22 mm – 0.87 in).

Towing the machine

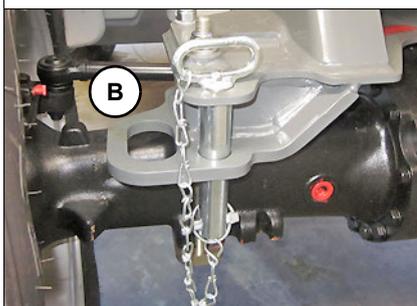
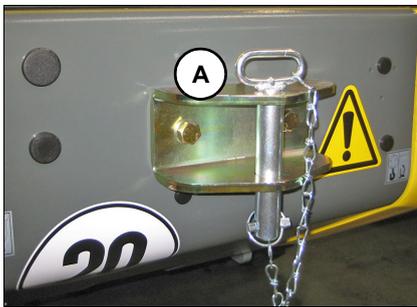


Fig. 232

Tow away the machine as follows:

i Information

The towing gear at the rear **A** and front **B** of the machine is only certified for towing the machine. They are not certified as a trailer coupling, for fitting attachments or for raising, loading and tying down the machine.

1. Put the towing vehicle (with sufficient traction force and a safe braking system) in the towing position.
2. Attach suitable towing equipment (towing bar) to the towing facilities **A** or **B** (eyelets) on the machine.
 - Bear in mind the machine's dimensions and weights.
3. Tow the machine out of the danger zone at walking speed.
 - If possible, run the diesel engine at idling speed when towing the machine.

Once towing is over

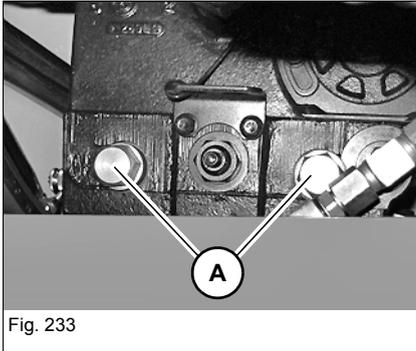


Fig. 233

Reset the variable displacement pump to drive operation once towing the machine is over!

1. Secure the machine with wheel chocks.
2. Remove the towing gear.
3. Screw in both high-pressure valves **A** on the variable displacement pump and tighten them to 70 Nm (51.6 ft. lbs.) (wrench size 22 mm / 0.87 in).
4. In case of diesel engine and/or hydraulic drive breakdown, have an authorized service centre perform repair work.



6.2 Loading the machine

Loading the machine on a transport vehicle

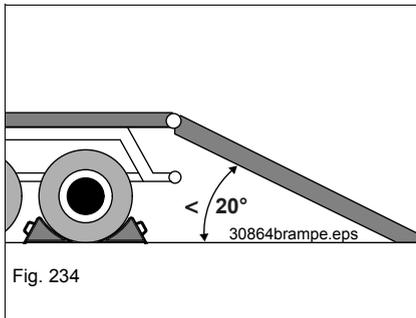
Safety instructions regarding loading

- The transport vehicle must be of appropriate size – refer to chapter [Technical data on page 9-1](#) for the dimensions and weights of the machine to be loaded.
- Remove mud, snow or ice from the loading area and from the tyres of the machine to be loaded.
- Secure the transport vehicle against unintentional movement.
- When positioning the machine on the platform, ensure that the centre of gravity of the load is as low as possible and in the longitudinal centre line of the transport vehicle if possible (load distribution plan).
- Do not exceed the permissible maximum weight and the gross axle weight rating of the transport vehicle.
- Ensure that the load does not fall short of the minimum axle load of the steering axle of the transport vehicle, otherwise the steering behaviour of the vehicle is seriously affected.
- Place partial loads so as to ensure an even load on all axles of the transport vehicle.
- Store or secure the load (machine) with suitable auxiliary means so that it cannot slip, slide, roll, tip over or fall, or cause the vehicle to tip over under usual transport 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, load-securing straps and chains, clamping beams, protective paddings, nets, edge protectors and many others.
- Always use the existing tie-down points when using belts and chains – see chapter 3.1 [“Machine overview” on page 3-1](#).
- Use only tested ropes, belts, hooks and shackles (lockable brackets with screws or socket pins) for tying down!

NOTICE

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

- ▶ Before loading, check the oil level in the diesel engine.
 - ▶ The oil level must be visible at the MAX mark of the oil dipstick.
-



Loading and tying down the machine

1. Secure the transport vehicle with chocks to prevent it from rolling.
2. Place the access ramps at the smallest possible angle.
 - Do not exceed an **angle of 20°**.
 - Use access ramps with an antiskid surface only.
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 oil, grease and ice.
5. Check the oil level of the diesel engine.
 - The oil level must be visible at the MAX mark of the oil dipstick.
6. Start the machine.
7. Raise the loader unit enough so that it will not touch the access ramps.
8. Carefully drive the machine onto the middle of the transport vehicle.
9. Set the drive to a neutral position – see chapter “Neutral position, stopping the machine” on page 5-22.
10. Lower the loader unit to the loading area.
11. Stop the engine.
12. Apply the parking brake – see chapter “Parking brake (hand brake)” on page 5-16.
13. Remove the starting key.
14. Do not allow anyone to stay in the cabin, lock the door and the engine cover.
15. Ensure that the overall height of the machine is not exceeded.



Crane-lifting the machine

Safety instructions regarding crane-lifting

In order to avoid injury or accident hazard, bear in mind the following information when loading the machine!

- Ensure that **no one is in the machine to be loaded!**
- Seal off the danger zone.
- The crane and the lifting gear must have suitable dimensions.
- Take into account the machine's overall weight
– see chapter 9.13 "Weight" on page 9-20.
- Use only tested ropes, belts, hooks and shackles (lockable brackets with screws or socket pins) for fastening!
- In the USA, only use lifting gear tested and certified by the Occupational Safety and Health Administration (OSHA).
- The slinging points on the machine are marked with symbols
– see "Crane-lifting the machine" on page 6-6.
- Have loads fastened and crane operators guided by experienced persons only!
- 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 machine 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 lifting chain around it!
- Bear in mind the load distribution (centre of gravity) when fastening the lifting gear.
- Load the machine only with the standard bucket empty and in transport position!
- Stay clear of suspended loads!
- Follow the safety instructions in this Operator's Manual on page 2-1 under all circumstances!

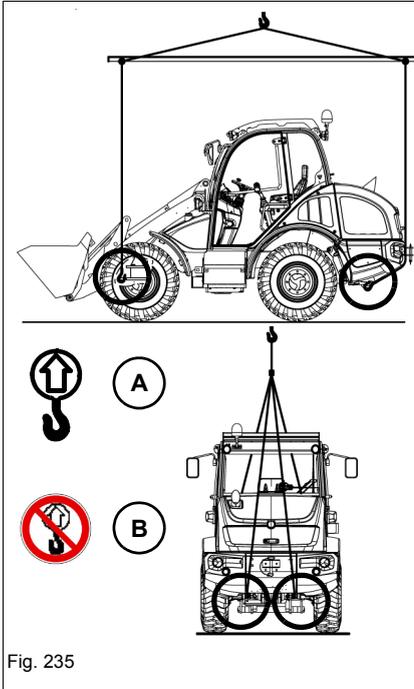


Fig. 235

Perform crane-lifting as follows:

1. Install and safely lock the standard bucket – see chapter “Pick up the attachment” on page 5-57.
2. Set the drive to a neutral position – see chapter “Neutral position, stopping the machine” on page 5-22.
3. Stop the engine and remove the starting key.
4. Apply the parking brake – see chapter “Parking brake (hand brake)” on page 5-16.
5. Lock the cabin and the engine cover.
6. Fasten the machine at the 4 slinging points (symbol **A** on the frame) with lifting gear of sufficient size.
7. Carefully raise the machine with the crane.

NOTICE

Tie-down points **B** on the cabin are for removing the cabin only and may **not** be used for crane-lifting the machine.



6.3 Transporting the machine

Safety instructions regarding transport

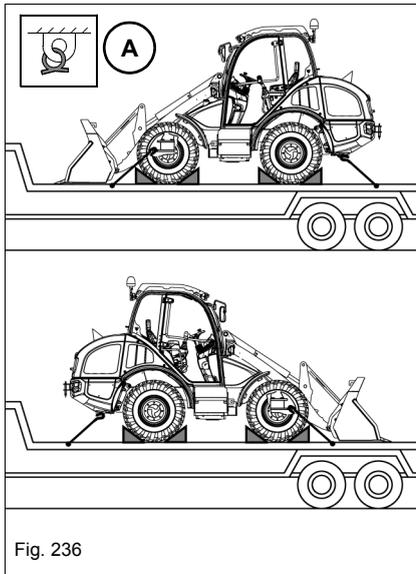
- Depending on the load, adapt the travel speed of the transport vehicle to the road and traffic conditions, and to the driving characteristics.
- The transport vehicle must be of sufficient size
– see chapter “Transportation” on page 2-14.
- See chapter “Technical data, Weights” on page 9-20 for the machine’s dimensions and weights.
- Ensure that the authorized maximum height of the transport vehicle is not exceeded.
- Remove any mud, snow or ice from the tyres so that the machine can be safely driven onto the ramps.
- When positioning the load on the platform of the transport vehicle, ensure that the centre of gravity of the load is as low as possible and in the longitudinal centre line of the vehicle if possible (load distribution plan).
- Do not exceed the gross weight rating and the gross axle weight rating of the transport vehicle when loading and transporting the machine.
- Ensure that the load does not fall short of the minimum axle load of the steering axle of the transport vehicle. Failure to meet the minimum rated capacity will cause a hazardous loss of steering control.
- Place partial loads so as to ensure an even load on all axles of the transport vehicle.
- Store or secure the load with suitable auxiliary means so that it cannot slip, slide, roll, tip over or fall, or cause the vehicle to tip over under usual transport 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, load-securing straps and chains, clamping beams, protective paddings, nets, edge protectors, etc.
- Depending on the load, adapt the travel speed to the road and traffic conditions and to the handling of the transport vehicle.
- Always use the existing tie-down points of the machine when using belts and chains – see “Tying down the machine” on page 6-9.
- When you tie down the machine with belts, do not place and tighten them in sharp-edged eyelets.

NOTICE

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

- ▶ Before loading, check the oil level in the diesel engine.
 - ▶ The oil level must be visible at the MAX mark of the oil dipstick.
-

Tying down the machine



Tie down as follows

1. Secure all tyres of the machine with chocks in front of and behind each wheel.
2. Firmly tie down the machine at the eye hooks – see symbol **A** on the front and rear machine frame – see [chapter 3.1 “Machine overview” on page 3-1](#) – with ratchet straps or chains of sufficient size onto the platform.
 - Do not place cables, belts, etc. over sharp-edged objects.
 - Use only tested ropes, belts, hooks and shackles (lockable brackets with screws or socket pins) for tying down.
3. Before transporting the machine through heavy rain, close the outlets of the exhaust silencer with a simple cap or suitable adhesive tape.
4. Ensure that the operator of the transport vehicle knows the overall height, width and weight (including the loaded machine) before moving off, and the legal transport regulations of the country or countries in which transport will take place!



Notes:

7 Maintenance

7.1 Information on maintenance

Responsibilities and prerequisites

- Operational readiness and the service life of the machine are heavily dependent on maintenance.
- **The “Daily maintenance and maintenance every 20 operating hours” indicated in the maintenance plan have to be performed by a specially trained operator.**
- Have the following maintenance performed by an authorized service center otherwise warranty claims will not be acknowledged:
 - Delivery inspection,
 - Oil and filter replacement every 500 o/h,
 - 1st inspection at 100 o/h,
 - 2. Review at 500 o/h, then every 500 o/h
 - 1500 o/h (once a year)
- The manufacturer shall not be liable for damage or personal injury caused by failure to observe instructions.
- Please contact your dealer if you require more information on service work.
- Insist on using original spare parts for repairs.
The machine's permits, certifications, registrations, etc., may be withdrawn if machine parts/components with a prescribed condition or quality, or machine parts/components that can put persons at risk during operation, are subsequently modified or exchanged.

Important safety instructions regarding maintenance



CAUTION

Injury hazard due to maintenance!

Injury hazard!

- ▶ Lock the service brake.
 - ▶ Stop the engine and remove the starting key.
 - ▶ Observe the danger indications and safety instructions during maintenance.
 - ▶ Always park the machine on firm and level ground and secure it to prevent it from rolling away.
 - ▶ Secure the raised loader unit against unintentional lowering.
 - ▶ Remove the key of the battery master switch if the machine is equipped with this option.
 - ▶ Follow the maintenance and safety instructions given in the Operator's Manuals of the attachments.
-

Safety prop for loader unit (option)

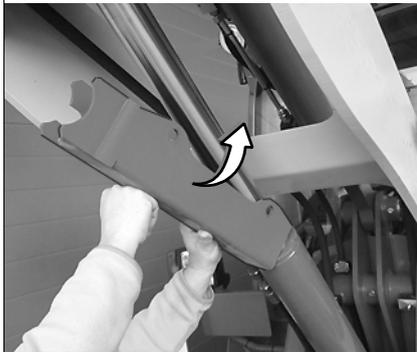
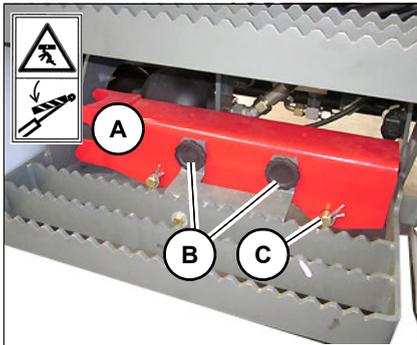


Fig. 237

WARNING

Crushing hazard during maintenance on a raised loader unit that is not secured!

Can cause serious injury or death.

- ▶ Lower the loader unit to the ground during maintenance.
- ▶ If the machine is equipped with a safety prop **A** (option), install it on the extended lift ram and secure it with lock pin **C**.

Installing the safety prop onto the lift cylinder

The safety prop is located on the machine frame, on the left at the access.

1. Park the machine on firm and level ground.
2. Empty and tilt in the attachment (bucket).
3. Raise the loader unit.
4. Put on parking brake.
5. Stop the engine and remove the starting key.
6. Remove fastening screws **B** and the safety prop
7. Remove lock pin **C** from the safety prop.
8. Slide safety prop **A** from below over the piston rod of the extended lift ram and turn it 180°.
9. Install lock pin **C** and secure it with a safety pin.
10. Carefully lower the loader unit (without pressure) onto the safety prop.

NOTICE

Install the safety support as shown in [Fig. 237](#) in order to avoid damage to the piston rod and the safety support!

- ▶ Opening showing downward.



Information

Before putting the machine into operation, remove the safety prop from the lift cylinder and fasten it in its storage place again!



7.2 Maintenance overview

Maintenance plan

Important information on the maintenance plan

In order to be able to claim on the warranty, maintenance operations, transfer-inspection, **A** 1st inspection at 100 o/h., **B** every 500 o/h and **C** every 1500 o/h (annually) must be carried out by an authorized service centre.

For service and maintenance on the attachment, please refer to the operation and maintenance manual of the attachment manufacturer as well.

Oil and filter changes ¹ ()	Service centre	User/operator		Service centre		
	Delivery Inspection	Every 10 o/h (once a day)	Every 20 o/h	1st Inspection at 100 o/h "A"	every 500 o/h "B"	every 1500 o/h once a year "C"
Change the engine oil					●	●
Replacing the engine oil filter					●	●
Replace fuel filter, fuel prefilter					●	●
Replace the air filter insert ²					●	●
Replace the safety cartridge of the air filter insert ³						●
Change the gearbox oil in the rear axle gearbox				●		●
Change the gearbox oil in the differential (front and rear axles)				●		●
Change the gearbox oil in the planetary drives on the left and right (front and rear axles)				●		●
Replace the hydraulic oil ⁴						●
Replace the hydraulic oil filter insert				●		●
Replace the hydraulic oil reservoir ³ – breather filter						●
Replace the fine-dust filter of the heating ⁵					●	●

1. Have the 1st Inspection at 100 operating hours and the 2nd Inspection at 500 operating hours performed by an authorized service centre otherwise warranty claims will not be acknowledged
2. Replace filter insert at least once a year or 1500 o/h
3. When working in an acidic environment, replace the filter every 300 o/h
4. When using biodegradable oil in the hydraulic oil reservoir: drain the condensation water every 500 o/h, in any case before the cold season.
5. Depending on operation and dust conditions, it may be necessary to replace the fine-dust filter more frequently



Inspection work ¹ () :	Service centre	User/operator		Service centre		
	Delivery inspection	Every 10 o/h (once a day)	Every 20 o/h	1st Inspection at 100 o/h "A"	every 500 o/h "B"	every 1500 o/h once a year "C"
Check engine oil level	●	●		●	●	●
Check hydraulic oil level	●	●		●	●	●
Check coolant level ^{2, 3}	●	●		●	●	●
Clean the coolant level sensor					●	●
Check gearbox oil level in front and rear axle differential	●			●	●	●
Check gearbox oil level in gearbox	●			●	●	●
Check gearbox oil level in front and rear axle, left and right planetary drives	●			●	●	●
Brake fluid (ATF): check the level ^{2, 4}	●	●		●	●	●
Check water/oil radiator for dirt and clean it if necessary ⁵		●		●	●	●
Check charge air cooler (diesel engine) for dirt, clean if necessary ⁵		●		●	●	●
Check the heat exchanger (air conditioning option) for dirt, clean it if necessary ⁵		●		●	●	●
When using biodegradable oil: drain the condensation water in the hydraulic oil reservoir ⁶					●	●
Clean dust valve on air filter housing	●	●		●	●	●
Check all pressure accumulators, correct the pressure level if necessary ⁷					●	●
Check the area around the pedals. Clean them and apply grease or oil if necessary		●		●	●	●
Check the locks/door arrester. Clean them and apply grease or oil if necessary		●		●	●	●
Check condition and pretension of V-ribbed belt ⁸ (water pump and alternator), retighten or replace it if necessary	●				●	●
Check condition and pretension of V-belt (compressed-air trailer brake), have it retightened or replaced if necessary.	●	●		●	●	●



Inspection work ¹ () :	Service centre	User/operator		Service centre		
	Delivery inspection	Every 10 o/h (once a day)	Every 20 o/h	1st Inspection at 100 o/h "A"	every 500 o/h "B"	every 1500 o/h once a year "C"
Check condition and pretension of V-belt (air conditioning), have it retightened or replaced if necessary.	●				●	●
Fuel prefilter: drain the water					●	●
Check battery charge condition; and charge if necessary ⁹	●				●	●
Clean the fine-dust filter of the heating system (replace every 500 o/h)			●	●	●	●
Check the brake pads ¹⁰ on the service brake and parking brake and adjust or renew as required .				●	●	●
Tire check (damage, inflation pressure, tread depth)	●		●	●	●	●
Compressed-air brake (option): check for leaks (sound of escaping air) and damage			●	●	●	●
Check condition of trailer couplings ¹⁰ (option). Replace them if necessary			●	●	●	●
Aggressive media (option): check anticorrosion protection, renew it if necessary			●	●	●	●

1. Have the 1st Inspection at 100 operating hours and the 2nd Inspection at 500 operating hours performed by an authorized service centre otherwise warranty claims will not be acknowledged
2. Replace every 2 years.
3. Clean the cooling system with clean water before refilling the cooling system.
4. Do not mix the brake fluid with other brake fluids for safety reasons. Use only **ATF** brake fluids.
5. Clean radiator more frequently depending on operation and dust conditions, in particular if the machine is used for mowing and mulching applications
6. When using biodegradable oil in the hydraulic oil reservoir: drain the condensation water every 500 o/h, in any case before the cold season.
7. Have the pressure accumulators checked only by an authorised service centre (acknowledgement of warranty claims).
8. Must be replaced every 3000 o/h by an authorized service centre.
9. Make a note of the date the battery is charged
10. Safety part! Have maintenance and repairs performed only by an authorised service centre



Lubrication ^{12, 3} () (Note: lubricate more frequently when in heavy-duty operation!)	Service centre	User/operator		Service centre		
	Delivery inspection	Maintenance work (daily)	Every 20 o/h	1st Inspection at 100 o/h "A"	2nd Inspection every 500 o/h "B"	every 1500 o/h once a year "C"
Hinges, joints (for example door arresters)			●	●	●	●
Rear axle oscillating bearing	●		●	●	●	●
Front and rear axle planetary drive bearings (left and right)	●		●	●	●	●
Trailer coupling – joint (option)	●		●	●	●	●
Loader unit – see <i>"Lubricating the loader unit" on page 7-25</i>						
Lift chassis bearing	●	●		●	●	●
Tilt rod bearing	●	●		●	●	●
Rocker arm bearing	●	●		●	●	●
Lift cylinder bearing	●	●		●	●	●
Tilt cylinder bearing	●	●		●	●	●
Quickhitch: storage on lift frame	●	●		●	●	●

1. Observe the manufacturer's indications for lubrication of the attachment!
2. Have the 1st Inspection at 100 operating hours and the 2nd Inspection at 500 operating hours performed by an authorized service centre otherwise warranty claims will not be acknowledged
3. More frequently when the machine is used for extremely heavy work. The "Central lubrication system" option is recommended in this case



Functional check ¹ ():	Service centre	User/operator		Service centre		
	Delivery inspection	Maintenance work (daily)	Every 20 o/h	1st Inspection at 100 o/h "A"	2nd Inspection every 500 o/h "B"	every 1500 o/h once a year "C"
Service and parking brake ²	●	●		●	●	●
Steering system ² : steering column adjustment, synchronous position of wheels	●	●		●	●	●
Electrical system – lights, indicator lights, signalling system, washer system	●	●		●	●	●
Air conditioning (option)	●	●		●	●	●
Trailer couplings ² (option)	●	●		●	●	●
Drive interlock (option)	●	●		●	●	●
Seat adjustment, seat belt	●	●		●	●	●
Electro-hydraulic lock – control lever (joystick) and 3rd control circuit (road travel)	●	●		●	●	●
Loader unit load stabiliser (option)	●	●		●	●	●
Front and rear additional control circuit (option)	●	●		●	●	●

1. Have the 1st Inspection at 100 operating hours and the 2nd Inspection at 500 operating hours performed by an authorized service centre otherwise warranty claims will not be acknowledged
2. Safety part! Have maintenance and repairs performed only by an authorised service centre

Leakage check ¹ 	Service centre	User/operator		Service centre		
	Delivery inspection	Maintenance work (daily)	Every 20 o/h	1st Inspection at 100 o/h "A"	2nd Inspection every 500 o/h "B"	every 1500 o/h once a year "C"
Air intake line ² (air filter – engine)	●	●		●	●	●
Engine lubrication (engine – filter)	●	●		●	●	●
Fuel lines ³	●	●		●	●	●
Cooling system (engine – hydraulic oil)	●	●		●	●	●
Steering system ⁵ (flexible lines and steering rams)	●	●		●	●	●
Hydraulic system/loader unit (flexible lines ⁴ and rams)	●	●		●	●	●
Braking system ⁵ (flexible lines and cylinders)	●	●		●	●	●
Air conditioning system (option) – flexible lines, condenser, dehumidifier	●	●		●	●	●

1. Have the 1st Inspection at 100 operating hours and the 2nd Inspection at 500 operating hours performed by an authorized service centre otherwise warranty claims will not be acknowledged
2. In order to avoid engine damage, have air intake lines with cracks and chafe marks immediately replaced by an authorized service center
3. Replace flexible fuel leak oil lines (synthetic material) every 2 years
4. Replace flexible lines every 6 years (DIN 20066 part 5)
5. Safety part! Have maintenance and repairs performed only by an authorised service centre

Check bolts and nuts ¹ for tightness, retighten them if necessary:	Service centre	User/operator		Service centre		
	Delivery inspection	Maintenance work (daily)	Every 20 o/h	1st Inspection at 100 o/h "A"	2nd Inspection every 500 o/h "B"	every 1500 o/h once a year "C"
Engine and engine bearing			●	●	●	●
Steering system ²			●	●	●	●
Hydraulic system			●	●	●	●
Loader unit (pin locking)			●	●	●	●
Axle mounting, axle suspension			●	●	●	●
Counterweight (attachment)			●	●	●	●
Fastening screws of cardan shafts			●	●	●	●
Fastening screws of cabin			●	●	●	●
Wheel nuts	●		●	●	●	●
Fastening screws of trailer couplings (option)	●		●	●	●	●
Electrical system: check electric and ground connections, chafing on wiring harnesses, battery terminals	●		●	●	●	●

1. Have the 1st Inspection at 100 operating hours and the 2nd Inspection at 500 operating hours performed by an authorized service centre otherwise warranty claims will not be acknowledged
2. Safety part! Have maintenance and repairs performed only by an authorised service centre

Service indication

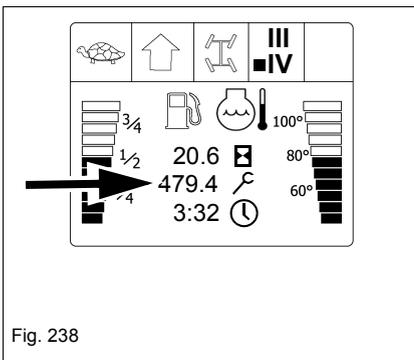


Fig. 238

The maintenance intervals are indicated by the service indication in the digital display.

Description – see [chapter 4 "Overview of control elements" on page 4-25](#).

Information

Maintenance intervals – see ["Maintenance plan" on page 7-3](#).

Explanation of symbols on the maintenance label

Affixed on the cabin

Symbol	Explanation
	Before starting maintenance, follow the safety instructions in the Operator's Manual!
	Before starting maintenance, read the "Maintenance" chapter in the Operator's Manual!
	Perform a functional check of the light system!
	Check tyres for damage, inflation pressure and tread depth!
	Perform a functional check and synchronise the steering system!
	Perform a functional check of the braking system!
	Check hydraulic oil level. Add oil if necessary!
	Check engine oil level. Add oil if necessary!
	Check the brake fluid. Add fluid if necessary!
	Check the coolant. Add coolant if necessary!
	Compress the dust valve.
	Check radiator for engine coolant and hydraulic oil for dirt. Clean if necessary!
	Check condition and initial tension of V-belt. Retension or replace it if necessary!
	Leakage check: Check for tightness, leaks and chafing: pipes, flexible lines and threaded fittings. Rectify if necessary!
	Leakage check: Check the fuel/water separator. Drain water if necessary!
	Lubrication service: Lubricate the assemblies concerned!



7.3 Fluids and lubricants

Overview of lubricants

Component/application	Capacities ¹	Fluid/lubricant ²	SAE grade Specification	Season/temperature
YANMAR diesel engine ³	About 7,5 l (1.95 gal)	Engine oil with oil filter	EUROLUB Multitec 10W-40	Year-round
DEUTZ diesel engine ⁴	About 10,5 l (2.77 gal)	Engine oil ⁵ with oil filter	Supermax – SAE 10W-40	
Cooling YANMAR diesel engine	Water 4,4 l. (1.16 gal) Antifreeze 5,4 liters (1.42 gal)	Antifreeze ^{6, 7}	Water 55 % + HAVOLINE XLC or DEUTZ cooling system protective agent 45 %	Year-round –35 °C (–31 °F)
Cooling ⁸ DEUTZ diesel engine	Water 12 l. (3.04 gal) Antifreeze 11 liters (3.04 gal)			
Fuel system ⁹ , fuel tank	About 85 l (22.45 gal)	Diesel fuel ^{10, 11}	DIN EN 590 (EU) ASTM D975-94 (USA)	Year-round –40 °C (–40 °F)
20 km/h gearbox	0,8 l (0.21 gal)	Gearbox oil ¹²	SAE 90 LS (Eurolub Gear LS 80W-90 GL5)	Year-round
30 km/h gearbox (option)	4,5 l (1.188 gal)			
40 km/h gearbox (option)				
Front or rear axle differentials ¹³	4,0 l (1.05 gal)			
Planetary drives front or rear axle ¹³	0,9 liters (0.23 gal)			
Braking system	0,5 l (0.13 gal)	Brake fluid ¹⁴	ATF Suffix A	Year-round
Hydraulic oil reservoir ¹⁵	About 50 l (13.21 gal)	Hydraulic oil ¹⁶	HVLPD 32 ¹⁷	30 °C (–22 °F)
			HVLPD 46 (HYD0530)	Year-round
		Biodegradable oil	AVILUB Syntofluid 46 PANOLIN HLP Synth 46	
Grease zerks, loader unit/axles	As required	Multi-purpose grease	Lithium-saponified brand-name grease MPG-A	Year-round
Insertion of bolts, shafts ¹⁸	As required	Special grease	Optimoly paste "TA"	Year-round
Battery terminals	As required	Acid-proof grease	SP-B	Year-round

Continued on next page



Component/application	Capacities ¹	Fluid/lubricant ²	SAE grade Specification	Season/temperature
Air conditioning (option) ¹⁹	About 0,85 kg (1.87 lbs.)	Refrigerant	R 134a	Year-round
Washer system	Water 1,0 l. (0.26 gal) Antifreeze 2,0 l(0.52 gal)	Cleaning agent ⁶	Water 33 % + antifreeze 67 %	Year-round -20 °C (-4 °F)
Aggressive media (option)	As required	Anticorrosion protection	ELASKON 2000 ML, ELASKON UBS light, ELASKON Aero 46 special, ELASKON Multi 80	Year-round

1. The capacities indicated are approximate values; the oil level check alone is relevant for the correct oil level
2. Bear in mind the safety data sheet during maintenance
3. Machine model 351-04 (8075)
4. Machine model 351-05/351-06 (8085/8095)
5. Specification Deutz DQC III/IV LA
6. Compound table – see chapter 9 “Coolant” on page 9-19 or the manufacturer’s indications on the packaging
7. The antifreeze must be replaced every 2 years by an authorized service centre
8. In order to avoid engine damage and loss of warranty, use only antifreeze released according to DEUTZ DQC CA-14, CB-14, CC-14. For other released antifreeze products, see: www.deutz.de/service/betriebsstoffe_br_und_additive/kuehlsystemsicherheit.de.html
9. The complete fuel system may be emptied, and the fuel tank may be cleaned only by an authorised service centre.
10. In order to avoid engine damage, do not add additives to the diesel fuel!
11. If fuels are used that do not comply with the standards in the table, warranty rights shall not apply in case of diesel engine damage
12. Specifications: MIL-L-2105B; API - GL5
13. Capacity for each axle or planetary drive
14. In order to avoid a failure of the braking system, do not mix this brake fluid (ATF) with other brake fluids
15. Complete refill of hydraulic system about 80 liters(21.13 gal)
16. DIN 51 524
17. Used in Scandinavian countries only
18. Note: Pins and shafts are hard-chromium plated or coated with Molykote 3400A, and are inserted in dry state.
Once assembly is over, lubricate shafts and pins with Optimoly paste via grease zerks. 250 gr tube, order no.: 1000030311
19. Maintenance work may be performed by an authorized workshop only.

Diesel fuel specification



Information

According to the legal exhaust-gas regulations, diesel engines equipped with exhaust-gas treatment systems must be operated with sulfur-free diesel fuel only.



CAUTION

Health hazard due to diesel fuel!

Diesel fuel and fuel vapors are harmful to health!

- ▶ Avoid contact with the skin, eyes and mouth.
- ▶ Seek medical attention immediately in case of accidents with diesel fuel.
- ▶ Wear protective gloves during maintenance and refuelling of the machine.

NOTICE

In order to avoid damage on the diesel engine, use only the diesel fuels specified in the table!

- ▶ If other fuels are used, warranty rights shall not apply in case of damage (guarantee)!
- ▶ When adding additives to the diesel fuel, only use the ones authorized by Deutz.
- ▶ Operation with RME/PME fuel (biodiesel) or vegetable oils is prohibited!
- ▶ Please contact your dealer if you require more information on fuel.

fuel specification	Cetane number	Use (°C)
DIN EN 590 (EU) ASTM D975-94 (USA)	Min. 49	Up to -44°C (-47°F) outside temperatures

Coolant

Only use the coolant additives specified in table "Overview of lubricants" – see page [7-12](#).



Environment

Dispose of throwaway containers according to national regulations.

Important information on operation with biodegradable oils

- Use only the tested and approved biodegradable hydraulic fluids – see “*Fluids and lubricants*” on page 7-12. Always contact the manufacturer for the use of products other than those that have been recommended. In addition, ask the oil supplier for a written declaration of guarantee. This guarantee is applicable to damage occurring on the hydraulic components that can be proved to be due to the hydraulic fluid.
- Use only biodegradable oil of the same type for adding oil. In order to avoid misunderstandings, a label providing clear information is located on the hydraulic oil reservoir (next to the filler inlet) regarding the type of oil currently used! Replace missing labels!
The joint use of two different biodegradable oils can affect the quality of one of the oil types. Therefore, ensure that the remaining amount of initial hydraulic fluid in the hydraulic system does not exceed 8 % when changing biodegradable oil (manufacturer indications).
- Do not add mineral oil – the content of mineral oil should not exceed 2 % by weight in order to avoid foaming problems and to ensure biological degradability.
- When running the machine with biodegradable oil, the same oil and filter replacement intervals are valid as for mineral oil – see maintenance plans in the appendix.
- The condensate in the hydraulic oil tank has to be drained by an authorised specialist workshop every 500 hours of operation; and in any case before the cold season starts.
The water content must not exceed 0.1 % by weight.
- The instructions in this Operator’s Manual concerning environmental protection are also valid for the use of biodegradable oil.
- If additional hydraulic attachments are installed or operated, use the same type of biodegradable oil for these attachments to avoid mixtures in the hydraulic system.



Information

Subsequent change from mineral oil to biodegradable oil must be performed by an authorised service centre or by a dealer.

7.4 Maintenance accesses

Engine cover

CAUTION

Injury hazard 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.

Opening the engine cover:

1. Stop the engine and remove the starting key.
2. Unlock lock **A** with the starting key.
3. Press lock **A**.
 - The engine cover is raised over the gas pressure absorber.

Closing the engine cover:

1. Firmly press down the engine cover until lock **A** engages with an audible click.
2. Lock the engine cover with the starting key.



Fig. 239

Lower engine vat

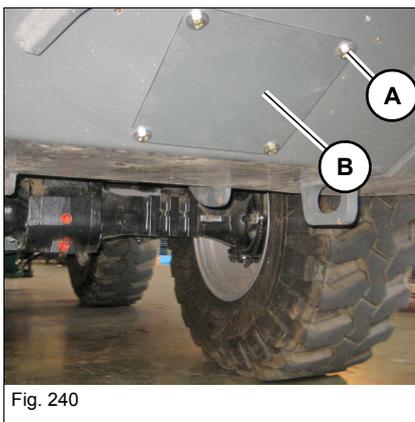


Fig. 240

Opening the cover

CAUTION

Injury hazard due to falling cover!

Can cause bruises and injury on head and face.

- ▶ Hold the cover when you remove the last screw.

1. Stop the engine and remove the starting key.
2. Unscrew screws **A** with a wrench (10 mm).
3. Remove cover **B**.

Closing the cover

4. Close cover **B** again with screws **A**.

7.5 Cleaning and maintenance

Important information on cleaning and maintenance

The wrong choice of cleaning equipment and agents can impair the operating safety of the machine on the one hand, and on the other put the health of the persons in charge of cleaning the machine at risk. Therefore always observe the following instructions.

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 radiator fins with a high-pressure cleaner.
 - ▶ Always cover the intake opening of the air filter before cleaning the engine.
 - ▶ Do not point the water jet of the high-pressure cleaner at the seals of the piston rods of the hydraulic cylinders.
 - ▶ Do not clean electrical components (instrument panel, fuses, alternator, compact connectors, control levers, etc.) with a high-pressure cleaner.
-



Information

Machines with anticorrosion protection ("aggressive media") must be cleaned separately – see "[Machine preservation](#)" on page 7-77!



Environment

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



Cleaning with washing solvents

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

Cleaning with compressed air

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

Cleaning with a high-pressure cleaner or steam jet

- Electrical components and damping material must be covered and **not** directly exposed to the water jet.
- Cover the vent filter on the hydraulic oil reservoir and the filler caps for fuel, hydraulic oil, etc.
- Cover the piston rods of the hydraulic cylinders (the scraper is not water-tight, and water in the guide bushing causes corrosion and damage to the piston rod).
- Cover electric parts, such as fuses, the alternator, the starter, the turn indicator and light switches, the relays, etc.
- Cover the controls and seals.
- Cover the air-intake filter, etc.

Cleaning with flammable anticorrosion protection

- Ensure sufficient room ventilation.
- Do not use unprotected lights or open flames.
- Do not smoke.



Cleaning inside the cabin

NOTICE

Never use high-pressure cleaners, steam jets or high-pressure water to clean inside the cabin.

- ▶ Water under high pressure can penetrate into the electrical system and cause short circuits.
 - ▶ Seals are damaged and control elements are disabled!
-

The following aids are recommended for cleaning:

- Broom
- Vacuum cleaner
- Damp cloth
- Bristle brush
- Water with mild soap solution

Cleaning the seat belt (lap belt)



CAUTION

Injury hazard! Dirty or malfunctioning automatic safety belts can prevent them from rolling up properly and impair the operator's safety!

Can cause injury.

- ▶ Clean the seat belt with water and a mild soap solution.
 - ▶ Only wind the seat belt when it is dry!
 - ▶ Have a malfunctioning belt immediately replaced by an authorized service centre.
-

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

Cleaning the pedals



WARNING

Accident hazard due to dirt or malfunction of the pedals.

Can cause serious injury or death.

- ▶ Keep the floor under the pedals clean.
 - ▶ Do not place any objects in the leg room.
 - ▶ Clean the pedal plates.
-

1. Park the machine on firm and level ground.
2. Apply the parking brake.
3. Stop the engine, but leave the starter switched on.
4. Lower the loader unit and the attachment to the ground without applying any pressure to it.
5. Switch off the starter and remove the starting key.
6. Thoroughly clean the pedals and the leg room.



Cleaning the exterior of the machine

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.
 - ▶ 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 point the water jet of the high-pressure cleaner at the seals of hydraulic cylinders.
 - ▶ Do not clean sensitive electrical components (instrument panel, alternator, compact connectors, control levers, etc.) with a high-pressure cleaner.
-

NOTICE

Damage due to corrosion on paint finish, joints, threaded fittings, etc.

- ▶ Thoroughly clean the machine with water after performing machine travel on saline ground or roads and going to a different site!
-

The following aids are recommended for cleaning:

- High-pressure cleaner
- Steam jet

Cleaning the engine and the engine compartment



CAUTION

Injury hazard 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 clothes.
-

NOTICE

When cleaning the engine with a water or steam jet, humidity penetrating the electronics can cause them to fail and damage the engine!

- ▶ The engine must be cold.
 - ▶ Do not point the water jet directly at any of the electric sensors such as temperature and oil pressure switches or control valves.
 - ▶ Protect all electric parts, such as the alternator, connectors, relays, etc. from humidity.
 - ▶ If the water jet is unintentionally pointed at electrical components, dry them with compressed air and apply contact spray to them.
-

The following aids are recommended for cleaning:

- High-pressure cleaner
- Steam jet

Checking threaded fittings

- All threaded fittings must be checked regularly, even if they are not listed in the maintenance plans.
- Retighten loose connections immediately. Refer to chapter "Technical data" for the tightening torques.

Checking pivots and hinges

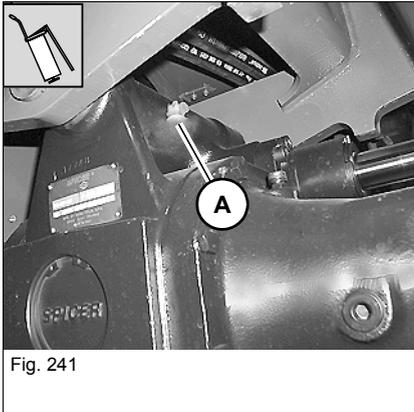
- Lubricate all mechanical pivot points on the machine (for example door hinges, joints) and fittings (for example door arresters) regularly, even if they are not listed in the lubrication plan.
- Check the accelerator and brake/inching pedals for dirt, clean them if necessary, apply spray oil to the joints.

7.6 Lubrication work

Lubricating the rear axle oscillation-type bearing

i **Information**

Maintenance intervals – see *“Maintenance plan”* on page 7-3.
Lubricant – see *chapter 7 “Fluids and lubricants”* on page 7-12.

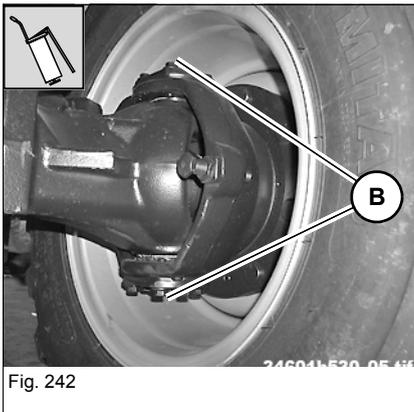
**Lubricate the oscillation-type bearing as follows**

1. Park the machine on level ground.
2. Apply the parking brake and secure the machine with an additional wheel chock.
3. Only raise the loader unit until all grease zerks can be accessed without any risk.
4. Stop the engine and remove the starting key.
5. Switch off the battery master switch (option).
6. Lubricate grease zerk **A** of the oscillation-type bearing.

Lubricating the planetary drive bearing (front and rear axles)

i **Information**

Maintenance intervals – see *“Maintenance plan”* on page 7-3.
Lubricant – see *chapter 7 “Fluids and lubricants”* on page 7-12.

**Lubricate the planetary drive bearing as follows**

1. Park the machine on level ground.
2. Apply the parking brake and secure the machine with an additional wheel chock.
3. Only raise the loader unit until all grease zerks can be accessed without any risk.
4. Turn the steering wheel for better access.
5. Stop the engine and remove the starting key.
6. Switch off the battery master switch (option).
7. Lubricate grease zerks **B** (2 x) on each planetary drive bearing.

Lubricating the door arrester

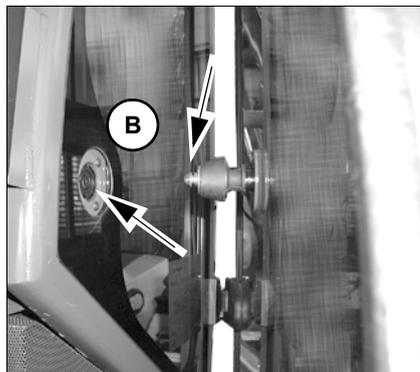


Fig. 243

Information

Maintenance intervals – see *“Maintenance plan”* on page 7-3.
Lubricant – see *chapter 7 “Fluids and lubricants”* on page 7-12.

- Apply a thin coat of grease to door arrester **B**.

Lubricating the loader unit

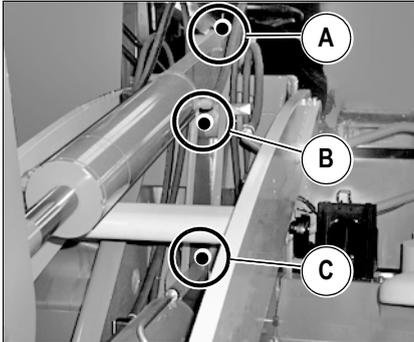


Fig. 244

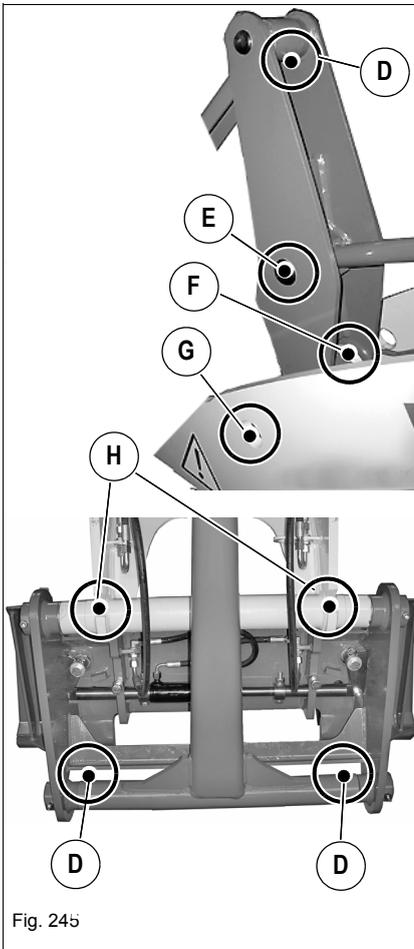


Fig. 245

Loader unit lubrication points (overview):

- A** Lubricate the grease zerk of the tilt cylinder bearing on the frame every 10 operating hours. Lubricate more frequently when in heavy-duty operation.
- B** Lubricate the grease zerk of the loader unit bearing every 10 operating hours. Lubricate more frequently when in heavy-duty operation.
- C** Lubricate the grease nipple on the lift ram bearing on the frame every 10 operating hours.
- D** Lubricate the grease zerk of the tilt rod bearing every 10 operating hours. Lubricate more frequently when in heavy-duty operation
- E** Lubricate the grease zerk of the tilt ram bearing every 10 operating hours
- F** Lubricate the grease zerk of the lift ram bearing every 10 operating hours. Lubricate more frequently when in heavy-duty operation
- G** Lubricate grease zerks of the tilt lever bearing every 10 operating hours. Lubricate more frequently when in heavy-duty operation
- H** Lubricate the grease zerks of the quickhitch bearing every 10 operating hours. Lubricate more frequently when in heavy-duty operation

Lubricate the loader unit as follows

1. Set the quickhitch to a horizontal position.
2. Only raise the loader unit until all grease zerks can be accessed without any risk.
3. Stop the engine.
4. Apply the parking brake.
5. Switch off the starter and remove the starting key.
6. Apply grease to the lubrication points with a grease gun.



Information

Maintenance intervals – see *“Maintenance plan”* on page 7-3.
Lubricant – see *chapter 7 “Fluids and lubricants”* on page 7-12.

7.7 Fuel system

Important safety instructions for refueling



CAUTION

Fire hazard due to diesel fuel

Diesel fuel gives off flammable vapours and can cause injury.

- ▶ Do not smoke.
 - ▶ Avoid fire and open flames.
 - ▶ Do not refuel in closed rooms.
 - ▶ Adding gasoline is prohibited.
-



CAUTION

Health hazard due to diesel fuel!

Diesel fuel and fuel vapours are harmful to health and can cause injury!

- ▶ Avoid contact with the skin, eyes and mouth.
 - ▶ Seek medical attention immediately in case of accidents with diesel fuel.
 - ▶ Wear protective gloves when refuelling the machine.
-

NOTICE

Damage to machine due to diesel fuel.

- ▶ The complete fuel system may be emptied, and the fuel tank may be cleaned only by an authorized service centre.
 - ▶ 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.
-



Environment

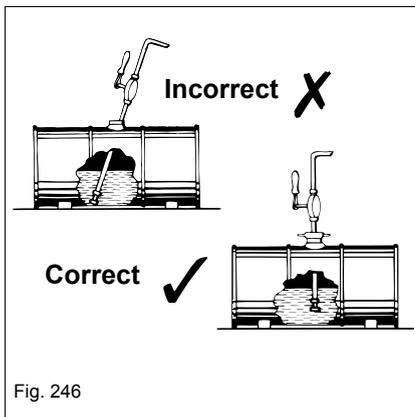
Use a suitable container to collect the fuel as it drains and dispose of it in an environmentally friendly manner! Keep the machine clean to reduce the fire hazard and wipe away fuel spills immediately.

Stationary fuel pumps

NOTICE

In order to avoid damage in the fuel system, only refuel from stationary fuel pumps.

- ▶ fuel from barrels or cans is usually contaminated and causes increased engine wear.
- ▶ Malfunctions in the fuel system and reduced effectiveness of the fuel filters.



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

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

Refuelling

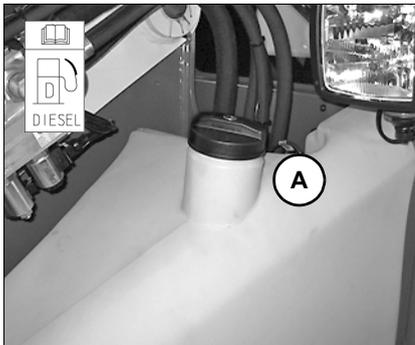


Fig. 247

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

WARNING

Fire and explosion hazard due to flammable vapours

Failure to observe this can cause serious injury or death.

- ▶ Ensure that there are no open flames or sources of sparks near the machine.
- ▶ Do not smoke

WARNING

Fire and suffocation hazard due to refuelling in closed rooms

Can cause serious damage to health or death.

- ▶ Do not refuel in closed rooms.

1. Park the machine on level ground.
2. Lower the loader unit to the ground.
3. Apply the parking brake.
4. Stop the diesel engine and remove the starting key.
5. Clean the area around filler cap **A** before opening the filler cap.
6. Open the filler cap **A** and refuel the fuel tank via the filling screen.

Information

Technical data and fill capacities – see [“Diesel fuel specification” on page 7-14](#) and [Fluids and lubricants on page 7-12](#).

Information

The complete fuel system may be emptied, and the fuel tank may be cleaned only by an authorized service centre.

Bleeding the fuel system

If the fuel tank has been run empty, or after having performed maintenance on the fuel system (for example filter replacement, water separator cleaned, etc.), the fuel system bleeds itself automatically when starting the engine.

Checking/cleaning the additional fuel filter (water separator, option)

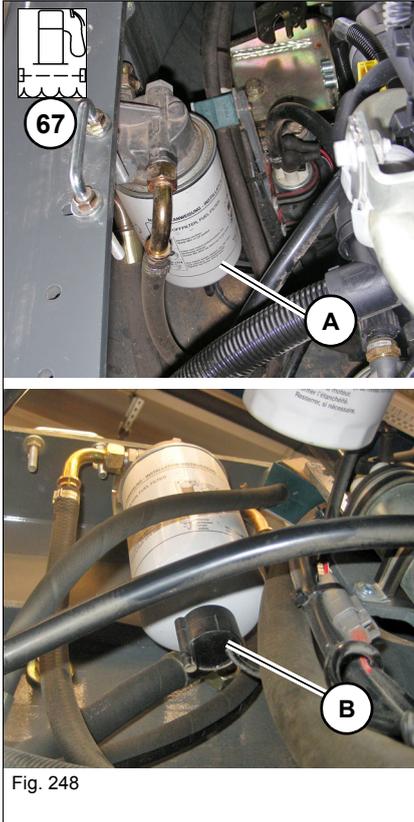


Fig. 248

Drain the condensation water in the fuel prefilter at the latest if indicator light **67** on the instrument panel illuminates.

Drain water more frequently at temperatures around or below 0 °C / 32 °F, otherwise problems can arise even if winter diesel is used.

CAUTION

Injury hazard due to rotating parts!

Rotating parts in the engine compartment can cause serious injury.

- ▶ Stop the engine before opening the engine cover.
- ▶ Switch off the starter and remove the starting key.
- ▶ Switch off the battery master switch.
- ▶ Apply the parking brake.

1. Lower the loader unit to the ground.
2. Stop the engine and remove the starting key.
3. Apply the parking brake.
4. Open the engine cover.
5. Remove the servicing lid below on the engine vat if necessary – see [“Lower engine vat” on page 7-16](#).
6. Place a container to collect the fuel.
7. Open drain cock **B** on the additional fuel filter and drain the condensation water.
8. Close drain faucet **B**.
9. Start the engine and check the additional fuel filter for leaks.

Information

Maintenance intervals – see [“Maintenance plan” on page 7-3](#).

Specifications and fill quantities – see [chapter 7 “Fluids and lubricants” on page 7-12](#).

Have the additional fuel filter **A** (cartridge) replaced by an authorized service centre every 500 o/h.

Environment

Use a suitable container to collect the fuel as it drains off and dispose of it in an environmentally friendly manner!

7.8 Engine lubrication system

Important safety instructions regarding the engine lube oil system



CAUTION

Injury hazard 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.



CAUTION

Burn hazard due to hot engine oil!

Splashes of hot oil can cause burns to the skin.

- ▶ Let the engine cool down.
- ▶ Wear protective clothes.

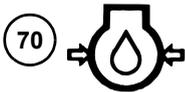


Fig. 249

NOTICE

Loss of output and engine damage due to wrong engine-oil level, and wrong or used engine oil.

- ▶ Observe the intervals for engine-oil and filter replacement.
- ▶ If indicator light **70** on the indicating instrument illuminates, check the engine-oil level immediately.
- ▶ Check the engine-oil level regularly and add oil if necessary.
- ▶ If the engine oil is used (black), have the oil immediately changed by an authorised service centre.
- ▶ Observe the specifications and fill quantities.

- Follow the safety instructions and country-specific regulations when handling lube oil!
- Dispose of drained oil correctly. Do not allow used oil to seep into the ground!
- Perform a test run every time work has been performed!
- Check for leaks and correct lube oil pressure, and then check the lube oil level in the diesel engine!

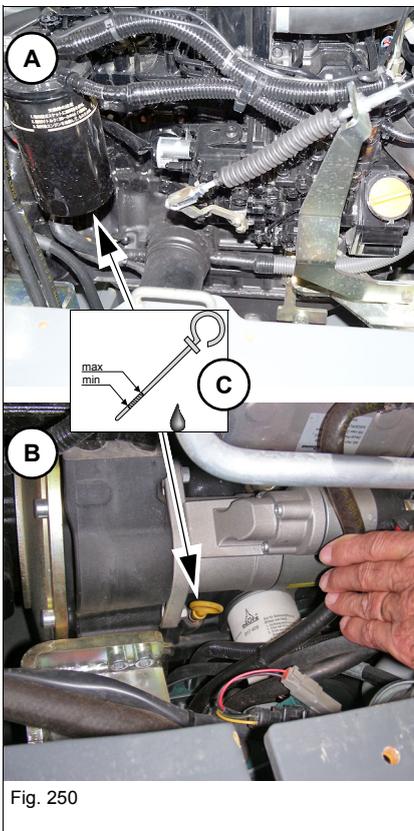
Checking the engine oil level

CAUTION

Injury hazard 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 clothes.



A = YANMAR diesel engine

B = DEUTZ diesel engine

1. Park the machine on level ground.
 2. Stop the engine.
 3. Switch off the starter and remove the starting key.
 4. Apply the parking brake.
 5. Open the engine cover.
 6. Pull out oil dipstick **C** and wipe it with a lint-free cloth.
 7. Push in the oil dipstick as far as possible, pull it back out and read off the oil level.
 - ➔ 1st notch = MIN mark
 - ➔ 2nd notch = MAX mark
 8. Add oil if the oil level is near the MIN mark – see [“Adding engine oil” on page 7-32](#).
- Example: oil dipstick with 2 notches
- 1st notch = MIN mark
 - 2nd notch = MAX mark
- Example: oil dipstick with 4 notches
- Cold engine – 1st notch = MIN mark, 3rd notch = MAX mark
 - Warm engine – 2nd notch = MIN mark, 4th notch = MAX mark

Information

Maintenance intervals – see [“Maintenance plan” on page 7-3](#).

Specifications and fill quantities – see [chapter 7 “Fluids and lubricants” on page 7-12](#).

Adding engine oil

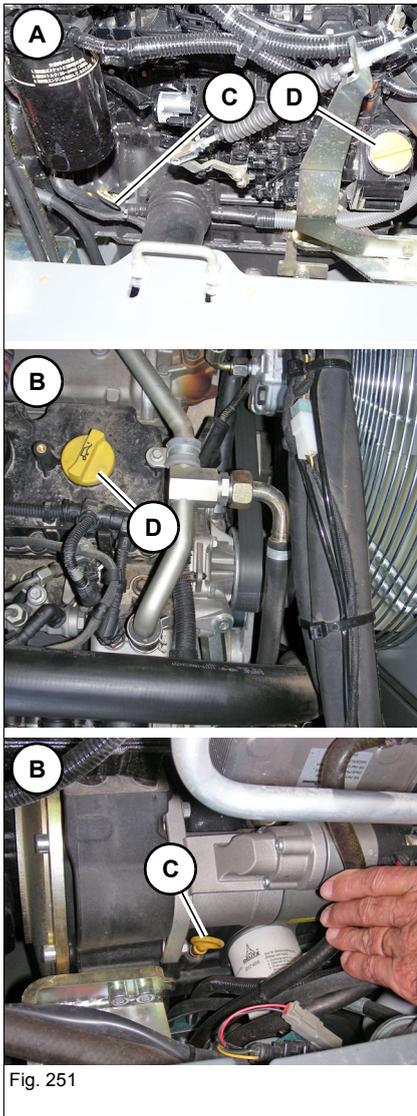


Fig. 251

A = YANMAR diesel engine

B = DEUTZ diesel engine

NOTICE

Loss of output and engine damage due to wrong engine-oil level, and wrong or used engine oil.

- ▶ The oil level must not drop below the “Min” mark on the dipstick.
- ▶ The oil level must not rise above the “Max” mark on the dipstick.
- ▶ Observe the intervals for engine-oil and filter replacement.
- ▶ Observe the specifications and fill quantities.

1. Park the machine on level ground.
2. Stop the engine.
3. Switch off the starter and remove the starting key.
4. Apply the parking brake.
5. Open the engine cover.
6. Clean the area around oil filler cap **D** with a lint-free cloth.
7. Open filler cap **D**.
8. Pull out oil dipstick **C** and wipe it with a lint-free cloth.
9. Add engine oil.
10. Wait a moment until all the oil has run into the oil sump.
11. Check the oil level with oil dipstick **C** – see [“Checking the engine oil level” on page 7-31](#).
12. Add oil if necessary and check the oil level again.
13. Close filler cap **D**.
14. Completely remove all oil spills from the engine.



Environment

Use a suitable container to collect the engine oil as it drains and dispose of it in an environmentally friendly manner!



Information

Maintenance intervals – see [“Maintenance plan” on page 7-3](#).

Specifications and fill quantities – see [chapter 7 “Fluids and lubricants” on page 7-12](#).

7.9 Cooling system

Safety instructions regarding the cooling system

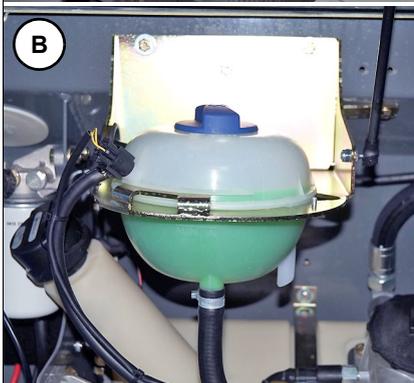
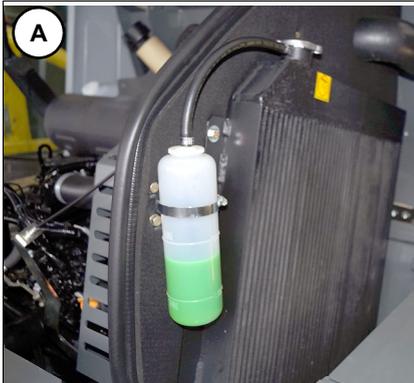


Fig. 252

The combined water and oil radiator is located in the engine compartment. It cools the diesel engine coolant, and the hydraulic oil of the drive and operating hydraulics.

- A** = cooling system YANMAR diesel engine model 351-04S / 351-04L
B = cooling system (old) DEUTZ diesel engine model 351-05S / 351-05L and 351-06S / 351-06L
C = cooling system (new) DEUTZ diesel engine model 351-05S / 351-05L and 351-06S / 351-06L

WARNING

Caustic injury hazard! Risk of swallowing antifreeze when handling it!

Can cause serious injury or death.

- ▶ Seek medical attention immediately if antifreeze has been swallowed.
- ▶ Keep antifreeze out of reach of children.

CAUTION

Burn hazard due to hot coolant!

Non-observance can lead to burns to face and 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 clothes.

NOTICE

In order to avoid possible damage to the cooling system, have the coolant drained (every 2 years) and the radiator cleaned only by an authorised service centre.

Information on inspection and cleaning work on the cooling system

Dirt on the radiator fins reduces the radiator's cooling capacity! To avoid this:

- Clean the outside of the radiator at regular intervals. Refer to the maintenance plans for the cleaning intervals.
- In dusty or dirty work conditions, clean more frequently than indicated in the maintenance plans.
- An insufficient coolant level reduces the cooling capacity as well and can cause engine damage! Therefore:
 - Check the coolant level once a day.
- If the coolant must be replaced frequently, have the cooling system checked for leaks by an authorised service centre!
- Never add cold water/coolant if the engine is warm!
- After filling the radiator, make a test run with the engine and check the coolant level again after stopping the engine.
- Add enough antifreeze to the coolant.
- Use brand-name antifreeze agents since they already contain anticorrosion protection – [see chapter 7 "Fluids and lubricants" on page 7-12.](#)

NOTICE

In order to avoid sludge in the cooling system that damages the engine, do not use radiator-cleaning compounds if an antifreeze agent has been added to the coolant.

NOTICE

In order to avoid possible damage to the cooling system, have the coolant drained (every 2 years) and the radiator cleaned only by an authorised service centre.



Environment

Use a suitable container to collect the coolant as it drains and dispose of it in an environmentally friendly manner.



Information

Check the antifreeze with suitable testing equipment (antifreeze tester) before the winter – [see chapter 7 "Fluids and lubricants" on page 7-12.](#)

Checking/filling up the coolant level model 351-04S / 351-04L

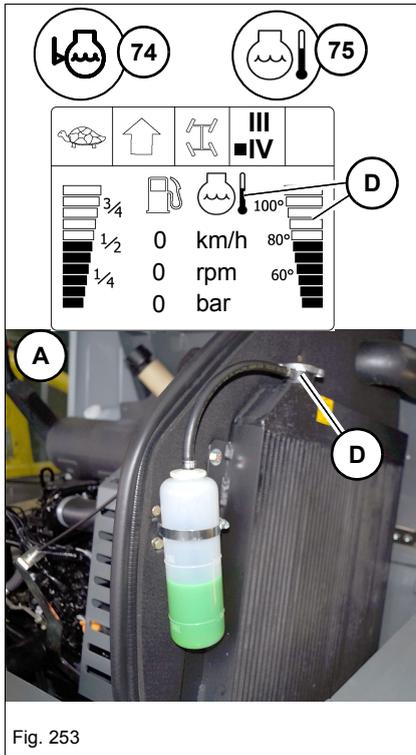


Fig. 253

Temperature indicator **D** (with acoustic warning) in the digital display on the indicating instrument monitors the cooling system.

Engine temperature should be between 80 and 105 °C (176 and 221 °F). If the engine-coolant temperature rises above 110 °C (230 °F), indicator light **75** illuminates and a warning sounds.

If the coolant level drops below minimum, indicator light **74** illuminates and a warning sounds.

NOTICE

Risk of engine damage due to overheating in case of coolant leakage!

- ▶ Let the engine run at idling speed for a short time until indicator light **75** and the buzzer go out.
- ▶ Stop the engine and check the coolant level
- ▶ Clean the radiator fins.

1. Park the machine on level ground.
2. Lower the loader unit.
3. Stop the engine and remove the starting key.
4. Apply the parking brake.
5. Open the engine cover.
6. To check coolant level turn cover **D** of the coolant reservoir up to the first notch.
7. Release the pressure.
8. Open the cover completely.
9. Checking the coolant level.
 - ➔ Radiator fins must be visibly covered.
10. Adding coolant.
 - ➔ Use brand-name antifreeze compounds – see [“Overview of lubricants” on page 7-12.](#)
11. Close cover over the notch.

Leakage check

1. Open the heating circuit fully – see [chapter 5 “Heating, ventilation and air conditioning system \(option\)” on page 5-32.](#)
2. Start the engine and let it warm up for about 5 – 10 minutes.
3. Stop the engine and check the coolant level.
 - ➔ Add coolant if necessary and repeat the procedure.

Checking/filling up the coolant level model 351-05S / 351-05L and 351-06S / 351-06L

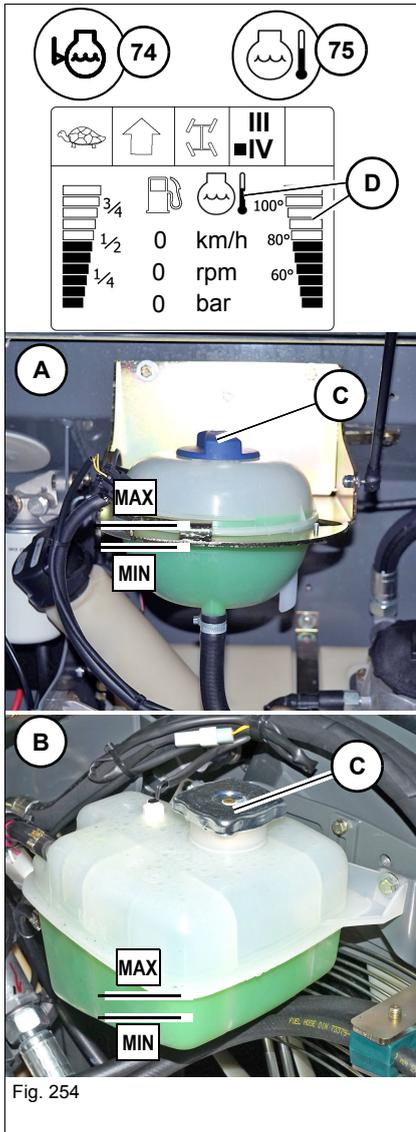


Fig. 254

A = cooling system (old)
B = cooling system (new)

1. Park the machine on level ground.
2. Lower the loader unit.
3. Stop the engine and remove the starting key.
4. Apply the parking brake.
5. Open the engine cover.
6. To check coolant level turn cover **C** of the coolant reservoir up to the first notch.
7. Release the pressure.
8. Open cover **C** fully.
9. Check the coolant level in the transparent reservoir.
10. If the coolant level is below the "MIN" mark, add coolant up to the "MAX" mark.
 - Use brand-name antifreeze compounds – see ["Overview of lubricants" on page 7-12.](#)
11. Close cover **C** over the notch.

Leakage check

1. Open the heating circuit fully – see [chapter 5 "Heating, ventilation and air conditioning system \(option\)" on page 5-32.](#)
2. Start the engine and let it warm up for about 5 – 10 minutes.
3. Stop the engine and check the coolant level.
 - The coolant level in the reservoir must be between **MAX** and **MIN**.
4. Add coolant if necessary and repeat the procedure.



Information

Check the antifreeze with suitable testing equipment (antifreeze tester) before the winter – see [chapter 7 "Fluids and lubricants" on page 7-12.](#)

Cleaning the radiator on the outside

CAUTION

Burn hazard during maintenance on a hot engine and radiator!

Failure to observe this can cause serious injury.

- ▶ Wear protective gloves and eye protection.
 - ▶ Let the radiator cool down at least 10 minutes after stopping the diesel engine.
-

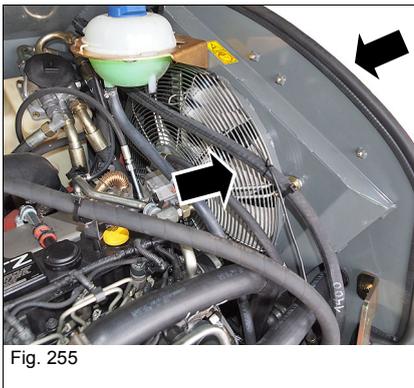
NOTICE

Dirt on the radiator fins reduces the radiator's heat dissipation capacity and can cause damage to the engine and the hydraulic system!

- ▶ Check and clean the outside of the radiator once a day.
 - ▶ Clean the radiator more frequently in dusty or dirty work conditions.
-

Information

Observe the maintenance intervals – see [“Maintenance plan” on page 7-3](#).



1. Park the machine on level ground.
 2. Lower the loader unit fully.
 3. Apply the parking brake.
 4. Stop the engine and remove the starting key.
 5. Let the engine cool down.
 6. Open the engine cover.
 7. Clean the radiator fins by blowing compressed air from either side of the radiator.
 8. Remove dirt in the intake area of the radiator.
 9. Check the firm position of the brush seal on the fan cowl. Have a sticky or worn brush seal replaced by an authorized service centre.
-

Information

In order to ensure the radiator's cooling capacity, do not damage the radiator fins as you clean them with a compressed-air gun!

7.10 Air filter

Important information on cleaning the air filter



Fig. 256



CAUTION

Injury hazard 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 clothes.

NOTICE

In order to avoid damage to the engine due to dirty intake air, bear in mind the following:

- ▶ Replace the filter cartridges if indicator light **69** on the instrument panel illuminates.
- ▶ Do not reuse damaged filter cartridges.
- ▶ Do not clean the filter cartridges with compressed air or a brush.
- ▶ Ensure cleanliness inside the air-filter housing during filter cartridge replacement!
- ▶ Do not operate the engine without the filter cartridges.

Cleaning the dust valve

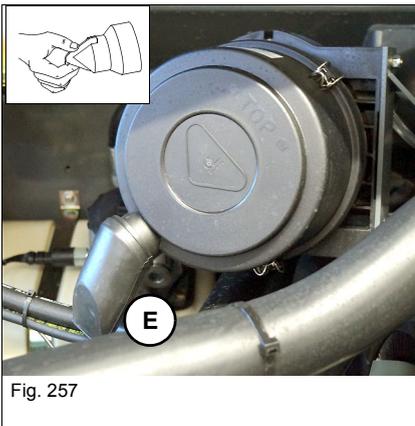


Fig. 257

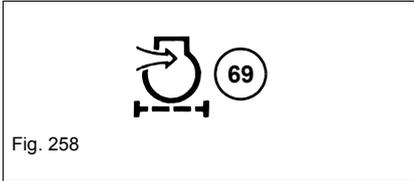
1. Stop the engine.
2. Apply the parking brake.
3. Switch off the starter and remove the starting key.
4. Remove the key from the battery master switch
– see [chapter 4 “Battery master switch” on page 4-15](#).
5. Open the engine cover.
6. Squeeze the discharge slot of dust valve **E**.
▶ Squeezing the discharge slot removes hardened dust.
7. Clean the discharge slot.



Information

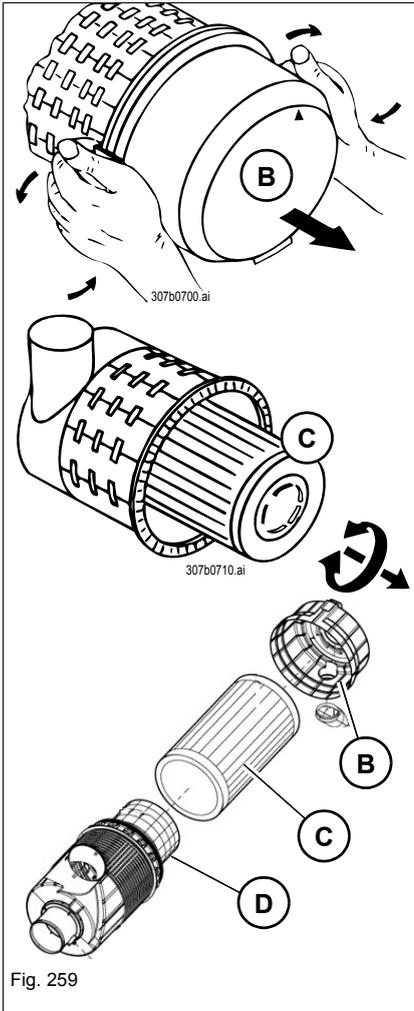
Observe the maintenance intervals – see [“Maintenance plan” on page 7-3](#).

Replacing the air-filter cartridge



Indicator light **69** on the indicating instrument monitors the air-filter cartridge. Replace filter cartridge **D** if this indicator light illuminates at the latest.

Safety cartridge **F** must be replaced in addition every third air-filter replacement.



NOTICE

In order to avoid damage to the engine due to dirty intake air, bear in mind the following:

- ▶ Do not clean the filter cartridges with compressed air or a brush.
- ▶ Replace the filter cartridges when the indicator light illuminates.
- ▶ Never reuse a damaged filter cartridge.
- ▶ Ensure cleanliness inside the air-filter housing during filter cartridge replacement!
- ▶ Do not operate the engine without the filter cartridges.

Information

Observe the maintenance intervals – see [“Maintenance plan” on page 7-3](#).

Replacing the filter cartridge and safety cartridge:

1. Stop the engine.
2. Apply the parking brake.
3. Switch off the starter and remove the starting key.
4. Open the engine cover.
5. Fold the bow hooks to the outside, off the seam of the filter housing.
6. Remove housing cover **B**.
7. Carefully remove filter cartridge **C** with slightly turning movements.
8. In addition, every 3rd time the filter is replaced, carefully remove the safety cartridge **D** with slightly turning movements.
9. Remove all dirt (dust) inside the filter housing and the cover before installing the new filter.
10. Insert a new safety cartridge **D** into the filter housing.
11. Insert a new filter cartridge **C** into the filter housing.
12. Safely hitch and close the bow hooks into the notch of the filter housing.

7.11 V-belt/toothed belt

Checking the V-belt

Check the V-belt once a day or every 10 operating hours and if necessary, have it retightened by an authorised service centre.



CAUTION

Injury hazard due to rotating parts!

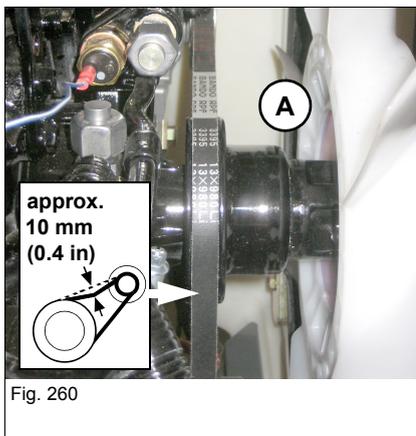
Rotating parts can cause serious injury.

- ▶ Stop the engine before opening the engine cover.
- ▶ Only check the V-belt and flat belt when the engine is stopped.

NOTICE

A cracked and stretched V-belt causes engine damage!

- ▶ Have a damaged V-belt replaced by an authorized service centre. Retension new V-belts after about 15 minutes of running time.
- ▶ Have the V-belt replaced by an authorized service centre every 2 years at the latest.



1. Stop the machine on level ground and lower the loader unit completely.
2. Apply the parking brake.
3. Stop the engine and remove the starting key.
4. Remove the key from the battery master switch
– see chapter 4 “Battery master switch” on page 4-15.
5. Open the engine cover.
6. Remove protective cover **A**.
7. Carefully inspect V-belt **B** for damages (tears).
8. Press with your thumb to check whether the V-belts can be deflected between the V-belt pulleys by no more than **about 10 mm (0.4 in)**.
 - ▶ Have the V-belts retightened by an authorized service centre if necessary.



Information

Have an authorized service center replace highly stretched or cracked V-belts.

7.12 Hydraulic system

Important information on the hydraulic system



CAUTION

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.
-

NOTICE

Contaminated hydraulic oil, lack of oil or wrong hydraulic oil poses a risk of serious damage to the hydraulic system!

- ▶ Take care to avoid dirt when working!
 - ▶ Always add hydraulic oil using the filling screen!
 - ▶ Only use authorized oils of the same type – see [“Overview of lubricants” on page 7-12](#).
 - ▶ Always add hydraulic oil in time using the filling screen – see [“Adding hydraulic oil” on page 7-44](#).
 - ▶ If the hydraulic system is filled with biodegradable oil, then only use biodegradable oil of the same type for adding oil – observe the sticker on the hydraulic oil reservoir.
 - ▶ Have the hydraulic oil only changed by an authorised service centre.
 - ▶ Immediately contact an authorised service centre if the filter insert is contaminated with metal chippings, otherwise follow-on damage can result.
-

Observe the following before starting maintenance

- Lower the loader unit to the ground.
- Lower all hydraulically controlled attachments to the ground.
- Stop the engine and remove the starting key.
- Switch off the battery master switch.
- Use the parking brake to park the machine safely and to prevent it rolling away.
- Release the pressure in the hydraulic system.
- Wear protective clothes.
- Collect drained hydraulic oil and biodegradable oil in a suitable container, and dispose of it in an environmentally friendly manner.

Monitoring the hydraulic oil and the return filter

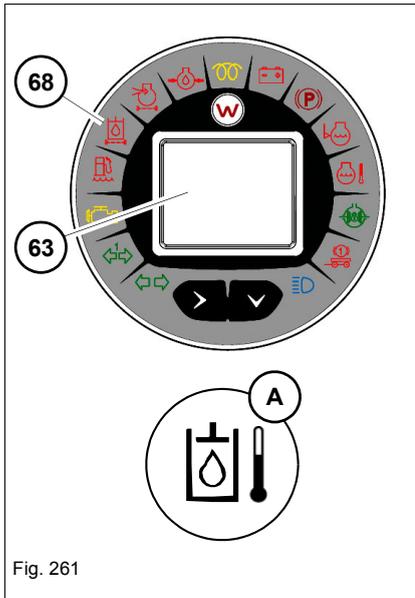


Fig. 261

indicator light **68** on the indicating instrument monitors the return filter (dirt).

The oil temperature can be read off digital display **63** of the indicating instrument – see chapter 4 “Error memory” on page 4-40.

NOTICE

Indicator light **68** on the indicating instrument illuminates if the oil-flow resistance in the return filter is too high.

- ▶ The filter element is dirty and must be replaced by an authorized service centre.

If symbol **A** appears in the digital display of the indicating instrument, the operating temperature of the hydraulic oil is too high.

- ▶ Check the hydraulic oil level (not enough oil in the reservoir).
- ▶ The filter element or the hydraulic oil is dirty and must be replaced by an authorized service center.

NOTICE

Damage to hydraulic system due to incorrect or dirty hydraulic oil!

- ▶ If the oil is cloudy this means that either water or air has entered the system; this can damage the hydraulic oil pump. Have this checked by an authorized service centre. Do not use the machine unless the problem has been rectified.



Information

In cold weather indicator light **68** can illuminate immediately when the engine is started. This is caused by increased oil viscosity. In such a case, regulate the rotational speed of the engine so that the indicator light does not light up.

- ▶ Bear in mind the instructions concerning warmup – see chapter 4 “Running-in period” on page 4-45.

Checking the hydraulic oil level

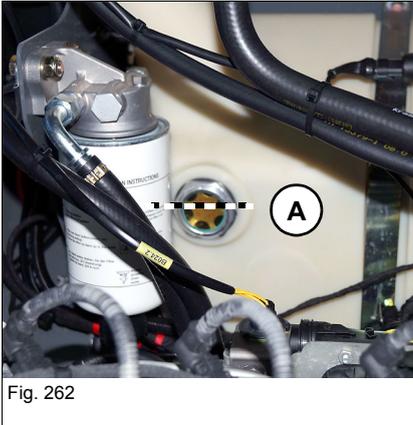


Fig. 262

The oil level sight glass is located on the hydraulic oil reservoir on the left in the engine compartment.

CAUTION

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.

NOTICE

Damage to hydraulic system due to a low hydraulic oil level.

- ▶ The hydraulic-oil level must be visible in the oil level sight glass (slightly over the middle).
- ▶ Check or have the hydraulic system checked for leaks.
- ▶ Have leaks repaired by an authorized service centre.

-
1. Park the machine on level ground.
 2. Retract all hydraulic cylinders.
 3. Apply the parking brake.
 4. Stop the engine.
 5. Switch off the starter and remove the starting key.
 6. Clean oil level sight glass **A** and check the oil level.
 - If the oil level is visible slightly over the middle of the oil level sight glass: oil level is OK.
 - If the oil level is no longer visible in the lower half of the oil level sight glass: **not enough oil!**
 7. Add hydraulic oil – see [“Adding hydraulic oil” on page 7-44.](#)



Information

Observe the maintenance intervals – see [“Maintenance plan” on page 7-3.](#)

Specifications and fill quantities – see [“Fluids and lubricants” on page 7-12.](#)

Adding hydraulic oil

Important information

CAUTION

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.

1. Clean the area around the filler and breather filter **B**.
2. Place a container under the hydraulic oil reservoir to collect the oil.
3. Open breather filter **B** by hand.
4. Add hydraulic oil with the filter insert in place.
5. Check the hydraulic oil level on oil level sight glass **A**.
6. Add if necessary and check again.
7. Firmly close breather filter **B** by hand.



Environment

Excess hydraulic oil is released via the breather filter during loader unit operation.

- ▶ Drain the oil in a suitable container until the oil level is visible in oil level sight glass **A**.



Information

Maintenance intervals – see [“Maintenance plan” on page 7-3](#).

Specifications and fill quantities – see [chapter 7 “Fluids and lubricants” on page 7-12](#).



Fig. 263

Hydraulic System – Checking pressure lines for leaks

Important safety instructions regarding pressure line checks

WARNING

Burn and injury hazard due to hot hydraulic oil escaping under high pressure!

Hydraulic oil escaping under high pressure can catch fire, damage property, penetrate the skin, and cause serious burns.

- ▶ Do not operate the machine with leaking or damaged hydraulic system components.
 - ▶ Never search for leaks with your bare hands, wear protective gloves and clothes.
 - ▶ Wear safety glasses to protect the eyes. If oil contacts the eye flush immediately with clean water and seek emergency medical treatment.
 - ▶ Seek immediate medical attention if oil penetrates the skin. Oil can cause serious infections.
 - ▶ Never weld or solder defective or leaky pressure hoses.
 - ▶ Retighten leaking threaded fittings and hose connections only when the hydraulic system is not under pressure. In other words, release the pressure before working on pressurised lines.
 - ▶ Do not check for leaks with an open flame due to explosive fire risk from vaporised oil mist.
-

Information

Maintenance intervals – see *“Maintenance plan” on page 7-3.*

Hydraulic system – checking membrane accumulators

Important safety instructions for checking the membrane accumulators



WARNING

Risk of suffocation through uncontrolled release of large quantities of gas and risk of injury due to entrained components.

Failure to observe this can cause serious injury or death.

- ▶ Immediately put machine out of operation in case of leaking or damaged membrane accumulators.
 - ▶ Never search for leaks with your bare hands.
 - ▶ Have the membrane accumulator checked only by an authorized service center in accordance with the maintenance plan intervals.
 - ▶ Never weld or solder defective or leaky membrane accumulators.
 - ▶ Damaged membrane accumulators cannot be repaired and must be replaced by an authorized service center.
-



WARNING

Danger of explosions by filling the membrane accumulator with non-permitted gas!

Failure to observe this can cause serious injury or death.

- ▶ Have work on the membrane accumulator performed only by an authorized service center.
-



Information

Maintenance intervals – see *“Maintenance plan”* on page 7-3.

Checking hydraulic hoses for damage and ageing

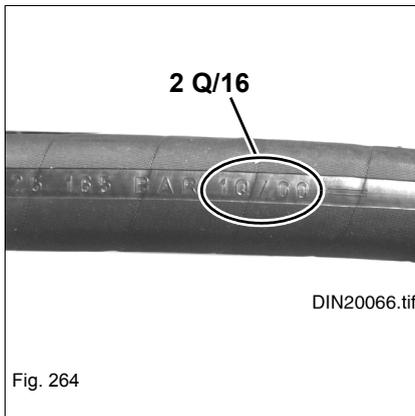
Important information for the owner of the machine:

Information

Observe the maintenance intervals – see *“Maintenance plan” on page 7-3.*

The entrepreneur/owner of the machine must ensure that flexible lines are replaced in appropriate intervals, even if no safety-relevant malfunctions can be detected on the flexible line.

- Have flexible lines checked at least once a year for safe operational condition by an authorised service centre.
 - Leaks and damaged pressure lines must be immediately repaired or replaced by an authorised service centre.
 - Have hydraulic hoses replaced by an authorised service centre every 6 years from the date of manufacture, even if they do not seem to be damaged.
 - The date of manufacture (month or quarter and year) is indicated on the flexible line.
Example: The indication **“2 Q/16”** means manufactured in the 2nd quarter of 2016.
-



Information

In the Federal Republic of Germany, reference is made in this connection to the “Safety regulations for hydraulic lines” and to DIN 20066, part 5. Issued by the Central Office for Accident Prevention and Occupational Medicine.

7.13 Electrical system

Qualification of maintenance personnel

Replacement and repair work on the electrical system may be performed only by an authorised service centre!

Checks and service work, as well as the replacement of light bulbs, fuses and the battery, must be performed by a specifically trained operator.

Safety instructions regarding the battery



WARNING

Injury hazard due to malfunctioning batteries!

Batteries give off explosive gases that can cause deflagrations if ignited, and therefore injury or death.

- ▶ Do not smoke, avoid fire and open flames.
- ▶ Do not place any tools on the battery.
- ▶ Wear protective clothes.



CAUTION

Accident hazard due to sparks during jump-starting!

Can cause serious injury.

- ▶ Use only 12 V power sources. Higher voltages will damage the electrical components.
- ▶ When connecting the battery leads, ensure that the poles +/- are not inverted, otherwise sensitive electrical components will be damaged.
- ▶ Do not interrupt electrical circuits at the battery terminals.
- ▶ Do not place tools or other conductive articles on the battery – risk of short circuit.



CAUTION

Injury hazard due to battery acid!

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 rinse the affected parts of the body with plenty of clear water and seek medical attention at once.
- ▶ Wear protective clothes.

Checking/replacing the battery

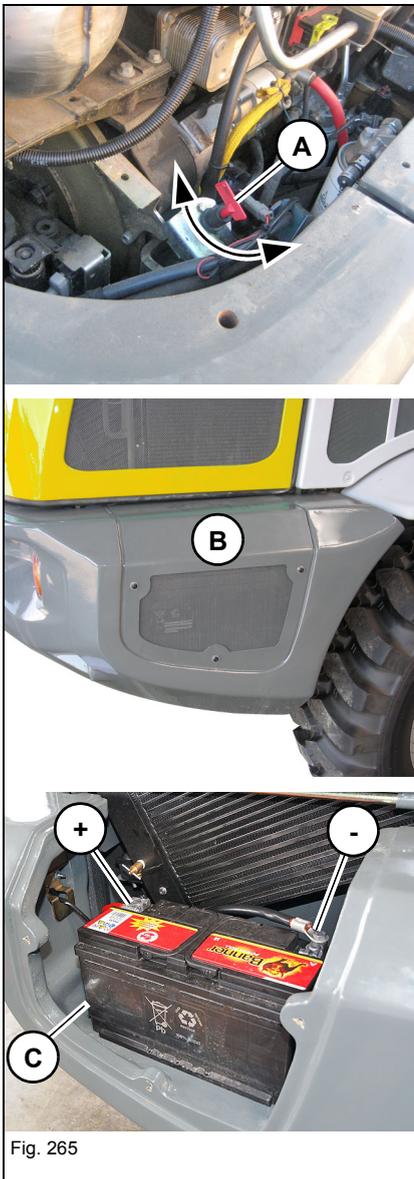
The battery is located in the engine compartment, on the right (in travel direction) beside the radiator.

It is low in maintenance and no fluid needs to be refilled under normal operating conditions. However have it checked at regular intervals to ensure that the electrolyte level is between the MIN and MAX marks.

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.
-



NOTICE

In order to avoid damage to the machine electronics, only use batteries of the specified capacity!

NOTICE

If the battery is low, charge it with a tested and automatically controlled battery charger.

- ▶ Refer to the Operator's Manual of the battery charger.
-

1. Park the machine on level ground.
2. Lower the loader unit.
3. Apply the parking brake.
4. Switch off the starter and remove the starting key.
5. Open the engine cover.
6. Remove the key from battery master switch **A** (option).
7. Remove battery cover **B**.
8. Remove the battery leads at the negative pole (-) (small terminal) first, then at the positive pole (+) (big terminal).
9. Remove battery fixture **C**.
10. Replace the battery with a new one.
11. Install battery fixture **C**.
12. The battery lead at the positive pole (big terminal) first, then the battery lead at the negative pole (small terminal).
13. Install the positive terminal cover.

Inspections and maintenance on the electrical system at regular intervals



CAUTION

Fire hazard! Blown fuses indicate overloading or short circuits of an electrical component.

Can cause injury.

- ▶ Have the electrical system checked by an authorised service centre before inserting new fuses.
 - ▶ In order to avoid damage to the electrical system, use only fuses of the specified load capacity (amperage).
-



Information

Observe the maintenance intervals – see [“Maintenance plan” on page 7-3](#).

Daily checks before operating the machine

- Is the light system OK?
- Is the signalling and warning system OK?

Weekly check

- Electric fuses: replace defective fuses by new ones with the specified amperage only.
- Battery charge condition and condition of battery terminals.
- Check the electric lines for tightness and chafing and have them repaired by an authorized service centre **if necessary**.

Checking the alternator

- Only test run the engine with the battery connected.
- When connecting the battery, ensure that the poles (+/-) are not inverted.
- Always disconnect the battery before performing welding work or connecting a quick battery charger.
- Have malfunctioning charge indicator lights immediately replaced.

Checking/replacing relays and fuses in the main fuse box

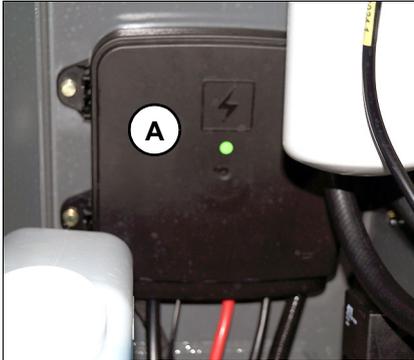


Fig. 266

The main fuse box with the power relays and the preheating time control unit is located on the left in the engine compartment.

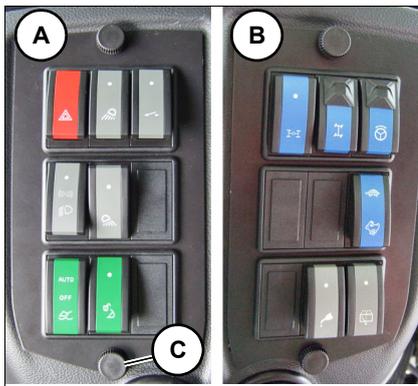
1. Lower the loader unit.
2. Apply the parking brake.
3. Stop the engine and remove the starting key.
4. Remove the key from the battery master switch or disconnect the negative lead (-) from the battery.
5. Open the maintenance flap.
6. Remove cover **A** from the fuse box.



Fig. 267

7. Replace the malfunctioning fuses or relays.
 - Main fuse and relay descriptions and output indications
– see [chapter 9 “Main fuse box with relays \(models 351-05S / 351-05L / 351-06S / 351-06L\)” on page 9-14.](#)
8. Check the electrical system for correct function.

Checking/replacing relays and fuses on the board

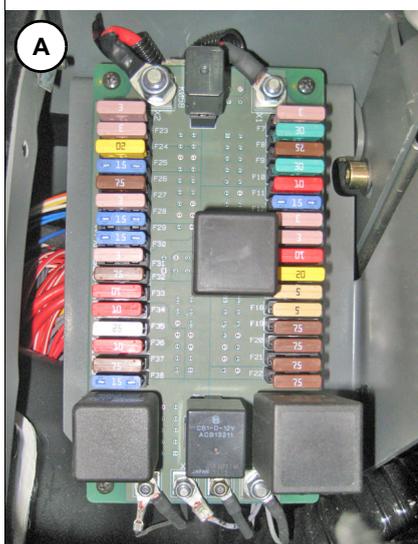


The relays and fuses are located under the switch console on the left **A** and right **B** in the cabin.

NOTICE

Blown fuses indicate overloading, short circuits or wiring harness damage.

- ▶ Have the electrical system checked before installing new fuses!
- ▶ Only use fuses with the specified load capacity (amperage).



1. Park the machine on level ground.
2. Lower the loader unit.
3. Stop the engine and remove the starting key.
4. Apply the parking brake.
5. Disengage the starter.
6. Remove knurled screws **A** from the switch panel.
7. Replace the malfunctioning fuse or relay.
8. Fuse and relay descriptions and output indications
 - see chapter 9 “Fuse assignment” on page 9-15,
 - see chapter 9 “Switching relay assignment” on page 9-17.

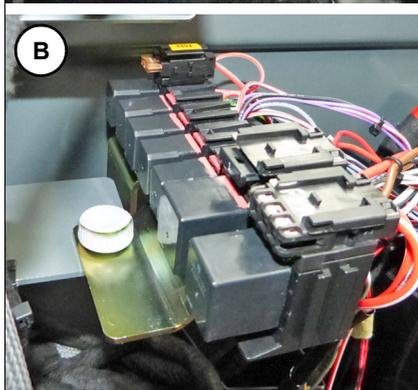


Fig. 268

7.14 Heating, ventilation and air conditioning system

Cleaning/replacing the dust filter of the cabin ventilation



Fig. 269

The dust filter is located behind the maintenance flap on the outside right of the cabin.

CAUTION

Health hazard due to incorrectly installed or damaged dust filter!

Can cause health damage to respiratory tracts.

- ▶ Replace a damaged or very dirty dust filter by a new one!
- ▶ Clean the fine-dust filter every 20 operating hours, however replace it every 500 operating hours at the latest.
- ▶ The machine may not be used in an environment requiring protection against aerosols and vapours!

-
1. Service lid; Remove the screw (2x).
 2. Pull out the fine-dust filter and check it for damage.
 3. Knock the filter element on a plate on either side.
 4. Blow compressed air from the inside to the outside to clean the filter, or wash it with water and dry it.
 5. Replace the fine-dust filter if necessary:
 - Replace the fine-dust filter every 500 o/h (operating hours).
 - Replace or clean the filter more frequently if the machine is used in severe dust conditions.
 6. Clean the inside of the filter housing.
 7. Insert the fine-dust filter.
 8. Install the servicing lid with the screws (2 x).

Information

In order to ensure the cleanest possible air inside the cabin, ensure the correct position of the fine-dust filter.

Information

Observe the maintenance intervals – see [“Maintenance plan” on page 7-3](#).

Replace the fine-dust filter every 500 o/h (operating hours) by a new one.

Air conditioning (option)

Responsibilities and prerequisites

- Functional and visual checks must be performed by the operator/user.
- All maintenance and repair work may only be performed by the trained personnel of an authorized service center.

Important safety instructions regarding the air conditioning system

CAUTION

Injury hazard due to rotating parts!

Rotating parts can cause serious injury.

- ▶ Stop the engine before opening the engine cover.
 - ▶ Switch off the starter and remove the starting key.
 - ▶ Switch off the battery master switch.
 - ▶ Apply the parking brake.
 - ▶ Let the engine cool down.
-

CAUTION

Injury hazard due to damaged hoses and lines!

Escaping refrigerant can cause serious injury.

- ▶ Do not open tubes, hoses or other components.
 - ▶ Avoid all contact with the refrigerant.
-

CAUTION

Injury hazard during inspection work! The evaporator and heat exchanger have sharp-edged fins. Lines and hoses containing coolant can be hot!

Failure to observe this can cause injury.

- ▶ Wear protective clothing (working gloves, safety glasses).
 - ▶ Do not perform maintenance unless the heating and air conditioning systems are switched off.
-

Important information regarding filling the air conditioning system

NOTICE

To ensure the correct function of the air conditioning, perform inspections and maintenance at regular intervals.

- ▶ Perform a visual check of the air conditioning system once a day.
 - ▶ Check and clean the heat exchanger once a day.
 - ▶ Have the air conditioning system checked twice a year by trained personnel in an authorized service centre.
 - ▶ Have the dehumidifier replaced every 2 years by an authorized service centre.
-

The air conditioning system must be checked and serviced twice a year by trained personnel in an authorized service centre!

- For the first fill, see the air conditioning label inside the engine compartment on the air guide plate of the radiator.
-

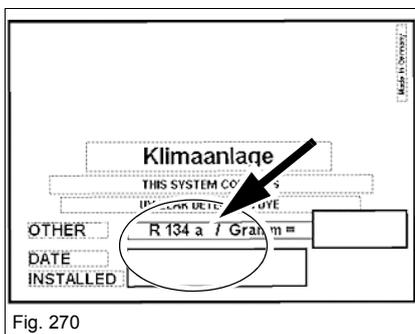


Fig. 270

i Information

Use only the refrigerants indicated on the label for refilling the air conditioning system (see arrow).

Daily visual check of the air conditioning system (operator, driver)

CAUTION

Injury hazard 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 clothes.
-



1. Stop the engine.
2. Apply the parking brake.
3. Switch off the starter and remove the starting key.
4. Remove the key from the battery master switch (option).
5. Check the heating and coolant lines for damage.
6. Check the hoses for tightness, leaks and chafing.
7. Check the electric connections for correct condition and tightness.

Cleaning the heat exchanger (condenser) of the air conditioning system

Check and clean the heat exchanger once a day in order to ensure the correct function of the air conditioning. During mowing and mulching operation, clean the heat exchanger and the protective screen more frequently because of the increased dust (plant particles).

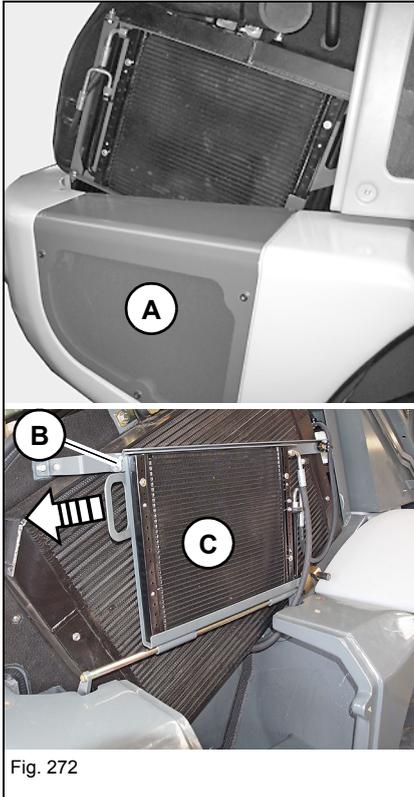


Fig. 272

CAUTION

Injury hazard 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

Damage to the heat exchanger due to cleaning.

- ▶ Do not use high-pressure cleaners or compressed air.

1. Stop the engine.
2. Apply the parking brake.
3. Remove the starting key.
4. Remove battery cover **A** from the counterweight.
5. Remove screws **B** and pull heat exchanger **C** backward, or lower it.
6. Clean the heat exchanger with a water jet.
7. Clean the air intake area.
8. Install heat exchanger **C**.
9. Install intake screen **A** onto the counterweight.

7.15 Washer system

Washer system reservoir



Reservoir **A** is located on the left in the engine compartment.

Information

Add only clean tap water!

Add a suitable cleaning agent if required – see [chapter 7 “Overview of lubricants” on page 7-12](#).

At temperatures around or below the freezing point:

- ▶ Add antifreeze for washer systems to the water.
- ▶ Refer to the antifreeze instructions for further information on concentrations.

Information

Maintenance intervals – see [“Maintenance plan” on page 7-3](#).

Specifications and fill quantities – see [chapter 7 “Fluids and lubricants” on page 7-12](#).



7.16 Axles/travelling drive

Maintenance on axles/drive

NOTICE

If the oil temperature of the drive hydraulics is too high > 105°C (221°F), travel speed (machine travel dynamics) is automatically reduced by 50% until the oil temperature is below <105°C (221°F) in order to avoid damage to the drive hydraulics.

- ▶ Have the cause for the high oil temperature checked or repaired by an authorized service centre under all circumstances.
-



Information

Maintenance on the axles and drive may only be performed by an authorized service centre for reasons of safety, warranty and liability.

Observe the maintenance intervals – see [“Maintenance plan” on page 7-3](#).

Specifications and fill quantities – see [chapter 7 “Fluids and lubricants” on page 7-12](#).

7.17 Braking system

Important safety instructions regarding the braking system



WARNING

Accident hazard due to malfunctioning brake lines or hoses!

Can cause serious injury or death.

- ▶ Damaged brake lines or hoses must immediately be replaced by an authorized service centre.
-



Information

The brakes are a safety part of the first level; improper maintenance can cause the brakes to fail.

Maintenance on the axles and drive may only be performed by an authorised service centre for reasons of safety, warranty and liability.

An exception to this is the following work that must be performed by the operator:

- ▶ Daily check of the brake lines.
 - ▶ Daily check of the level in the brake fluid reservoir – see [“Checking/adding brake fluid” on page 7-61](#).
-



Information

Observe the maintenance intervals – see [“Maintenance plan” on page 7-3](#).

Specifications and fill quantities – see [chapter 7 “Fluids and lubricants” on page 7-12](#).

Checking/adding brake fluid

The brake fluid reservoir is located at the front left in the cabin (near the brake/inching pedal).

WARNING

Accident hazard due to poor quality of brake fluid or low brake fluid level!

Loss of machine control can cause serious injury or death.

- ▶ Check the brake fluid in the reservoir at regular intervals.
- ▶ Add brake fluid up to the **MAX** level of the sight glass.
- ▶ If the braking system loses too much brake fluid, have the braking system checked by an authorized service center.
- ▶ The brake fluid must comply with the **(ATF)** specification – see “Fluids and lubricants”.
- ▶ The brake fluid must be replaced every 2 years by an authorized service centre.

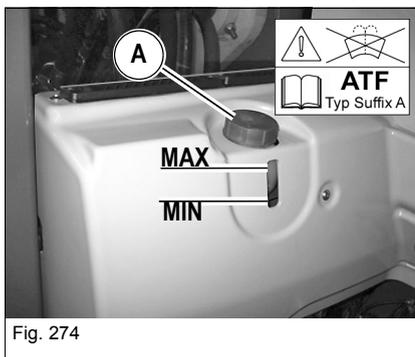


Fig. 274

If the fluid level is in the MIN range of the sight glass:

1. Clean the area around the opening with a clean cloth.
2. Open reservoir cover **A**.
3. Add brake fluid up to the **MAX** range on the sight glass.
 - Use only **ATF** brake fluids – see [chapter 7 “Fluids and lubricants” on page 7-12](#).
4. Close reservoir cover **A**.
5. Immediately wipe away brake fluid spills.

7.18 Tyres

Important information on the tyres



WARNING

Accident hazard due to use of tires other than certified!

Can cause serious injury or death.

- ▶ Install only certified tires/wheels (see "Technical data – tires").
 - ▶ Have wheels changed by an authorised service centre if possible.
-



Information

Have maintenance on the tyres and rims only performed by the trained personnel of an authorized service centre.



WARNING

Risk of tyres bursting during inflation!

Can cause serious injury or death.

- ▶ Wear gloves and safety glasses.
 - ▶ Check the tires and rims for damage before inflating the tires.
 - ▶ Stay clear of the tyres when checking the inflation pressure and/or inflating the tyres.
 - ▶ Observe the mandatory tire inflation pressure (see label on front window).
-

Checking the tyres

Reifenluftdrucktabelle Tyre/Tire pressure Pression pneumatiques		
Reifenbezeichnung Tyres/Tire Pneumatiques	vorn(bar/psi) front(bar/psi) AV (bar/psi)	hinten(bar/psi) rear(bar/psi) AR (bar/psi)
XX,X -XX XXX XXXX	X,X/X,X	X,X/X,X
XXX/XX X XX XXXX	X,X/X,X	X,X/X,X
XXX/XX X XX XXXX	X,X/X,X	X,X/X,X

Bei Slopebetrieb Luftdruck vorne um 0,5bar/7psi erhöhen !
Increase tyre/tire pressure by 0,5bar/7psi during pallet forklift operation !
Augmenter la pression pneumatique de 0,5bar/7psi en service porte-palette!

Modelle: **TypXXX-XX**
TypYYY-YY

Fig. 275

Information

Observe the maintenance intervals – see *“Maintenance plan” on page 7-3.*

Regular checks for damage and of the tire pressure increase operational safety and the service life of the tires, and reduce the machine’s downtimes.

1. Check the tire pressure with a measuring instrument.
 - ➔ Refer to the notice sign on the front window or – see *chapter 9 “Tyres” on page 9-7* in this operator's manual.
2. Check the tires and the rims – also on the inside – for cracks, ageing and tread thickness.
3. Remove foreign bodies from the tire tread.
4. Remove traces of oil and grease from the tires.
5. Check the wheel nuts for correct seating and retighten them if necessary – see *chapter 9 “Tightening torques” on page 9-18.*

Installing/removing wheels

Important safety instructions



WARNING

Crushing hazard when raising the machine!

Can cause serious injury or death.

- ▶ Place the machine on firm and level ground.
 - ▶ Seal off the job site and ensure constant supervision of the machine.
 - ▶ To raise; use only authorised lifting devices with the required lift load.
 - ▶ Use trestles to secure and stabilise the machine, not the jack.
 - ▶ Do not start the engine if the machine is jacked up or raised on trestles.
 - ▶ Have wheels changed by an authorised service centre if possible.
-



WARNING

Accident hazard due to wrong tyres

Can cause serious injury or death.

- ▶ Use only tyres that have been certified for the machine.
-



WARNING

Accident hazard due to loose wheel nuts

Can cause serious injury or death.

- ▶ Check the wheel nuts for tightness after every wheel or tire change.
-

NOTICE

The threads on the wheel bolts can be damaged when fitting the heavy wheels.

- ▶ Use suitable assembly tools, such as lifting gear or covering sleeves for the wheel bolts.
-

**Removing the wheels**

1. Park the machine on level and firm ground.
2. Lower the loader unit to the ground.
3. Apply the parking brake.
4. Stop the engine and remove the starting key.
5. Prevent the machine from rolling away (wheel chocks).
6. Loosen the wheel nuts a little of the wheel you want to remove.
7. Raise the machine only until the wheel can be moved freely.
8. Put a trestle under the axle tube ensuring stability.
9. Lower the machine onto the trestle.
10. Completely remove the wheel nuts.
11. Remove the wheel.

Mounting the wheels

1. Clean the flange surfaces of the wheels and axles.
2. Place the covering sleeves onto the wheel bolts.
3. Place the wheel onto the wheel bolts with a suitable means.
4. Remove the covering sleeves.
5. Fit all the wheel nuts and tighten them part-way.
6. Lower the raised axle.
7. Tighten the wheel nuts to the specified tightening torque
– see chapter 9 “Tightening torques” on page 9-18.

**Information**

Retighten the wheel nuts after 10 operating hours to the specified torque.



7.19 Maintenance of attachments

Correct maintenance and servicing is absolutely necessary for smooth and continuous operation, and for an increased service life of the attachments.

Observe the lubrication and maintenance instructions in the Operator's Manuals of the attachments!

7.20 Maintenance of options

Automatic trailer coupling (option)

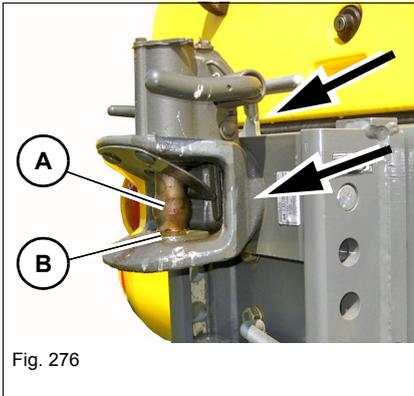


Fig. 276

Cleaning and lubricating the trailer coupling

NOTICE

In order to ensure the full functionality of the trailer coupling, close the coupling pin in the trailer coupling before cleaning with high-pressure cleaning equipment!

i Information

Maintenance intervals – see [“Maintenance plan” on page 7-3](#).
Specifications and fill quantities – see [chapter 7 “Fluids and lubricants” on page 7-12](#).

1. Close the trailer coupling.
2. After cleaning, lubricate the coupling pin **A**, the bearing support **B** and the drawbar eye with tough waterproof grease.
3. Apply tough water-proof grease to the lower bearing of the coupling jaw.
4. Apply grease to the grease zerk on the joint.
5. Lubricate all moving parts of the height adjustment.

Check the trailer coupling for wear

WARNING

Accident hazard in case of worn coupling pins, too much play in the bearing or a worn base ring!

Can cause injury.

- ▶ Check the trailer coupling once a day for wear and play.
- ▶ Apply grease to the base ring.
- ▶ Have an authorized service centre replace a malfunctioning trailer coupling by a new one.

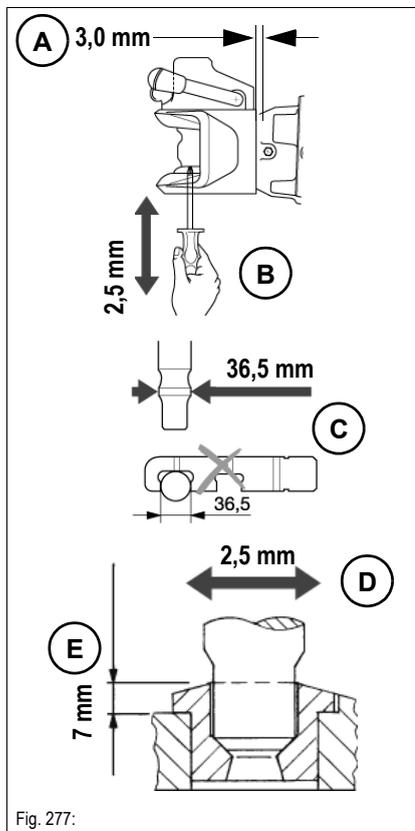


Fig. 277:

Check the bearing and **longitudinal play A** of the coupling head:

- Move the uncoupled coupling head with force in travel direction.

Check the **height-wise play** of the coupling head:

- Open the coupling.
- Move the coupling head up and down with a suitable tool (mounting lever).
 - Play **A** in the centre axis of the coupling head = **max. 3 mm (0.12 in)**

Check coupling pin **C/D**:

- Measure wear by means of a slide gage on the thickest section of the coupling pin **C**.
 - Diameter **C** may **not drop below 36,5 mm (1.44 in)**.
 - Height-wise play **B** **max. 2,5 mm (0.1 in)**.
- Check pin play **D** in the base ring and thickness **E** of the base ring.
 - Pin play **D** **max. 2,5 mm (0.1 in)**
 - Thickness of base ring **min. 7 mm (0.28 in)**

Ball trailer coupling (option)

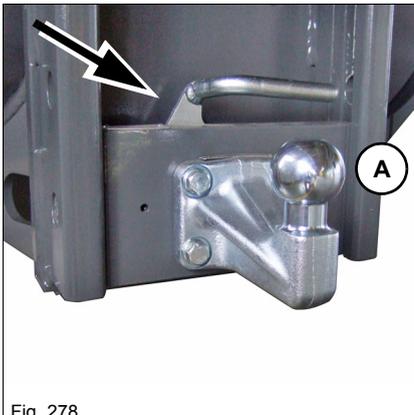


Fig. 278

Cleaning and lubricating the trailer coupling

Information

Maintenance intervals – see *“Maintenance plan”* on page 7-3.
Specifications and fill quantities – see *chapter 7 “Fluids and lubricants”* on page 7-12.

1. After cleaning, apply tough waterproof grease to trailer ball **A** and the trailer cap.
2. Lubricate all moving parts of the height adjustment.

Piton ball hitch (option)

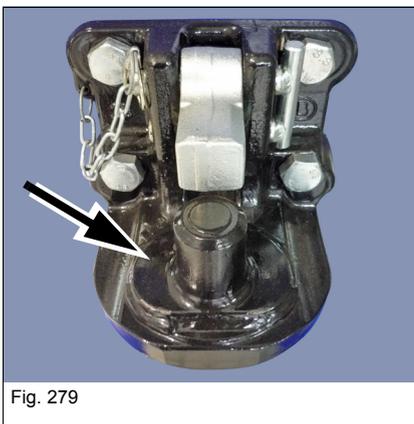


Fig. 279

Cleaning and lubricating the trailer coupling

Information

Maintenance intervals – see *“Maintenance plan”* on page 7-3.
Specifications and fill quantities – see *chapter 7 “Fluids and lubricants”* on page 7-12.

1. After cleaning, apply tough waterproof grease to the contact surface at the coupling point.
2. Lubricate all moving parts of the height adjustment.

Central lubrication system (option)

Function description

The central lubrication system allows you to lubricate all lubrication points of the machine in one single step.



Information

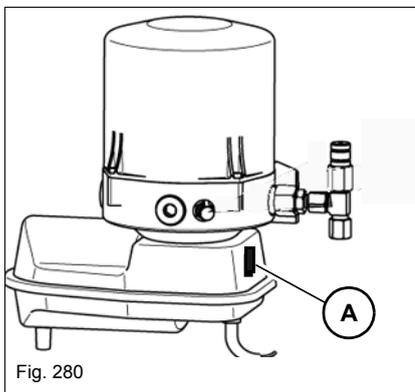
Maintenance intervals – see “Maintenance plan” on page 7-3.

Lubricant – see chapter 7 “Fluids and lubricants” on page 7-12.

- The yellow LED illuminates for 1.5 seconds upon engaging the starter to indicate functional readiness of the controls (switch-on check). 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.

Time control

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



Information

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

The pump then immediately starts with a 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.

Repair work

Repair work on the central lubrication system may only be performed by authorized service centers!

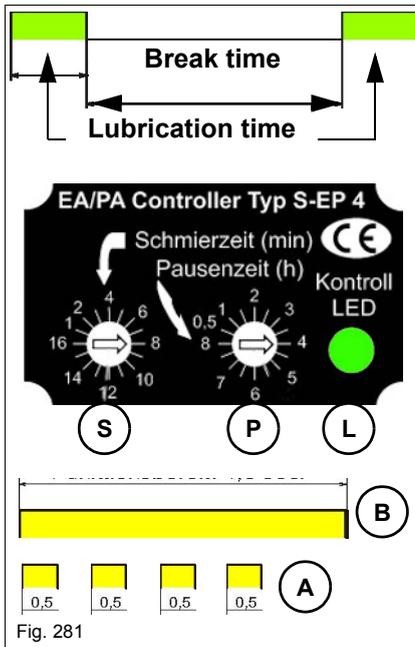


Fig. 281

Setting the lubrication and break times.

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

1. Remove the red frame on the protective motor housing of the pump with a flat screwdriver to set the time.
2. Loosen the four cross-slotted screws and remove the transparent cover.
3. Set the break time **P** and the lubrication time **S** with a flat screwdriver.
4. Install the transparent cover (window) once the settings are performed.

Lubrication times (S)

- 1 to 16 min. (16 notches each up to 1 min.)
- 2 to 32 min. (16 notches each up to 2 min.)

Break time (P)

- 0.5 to 8 h (16 notches, 0,5 h each)

Yellow LED (L)

- **(B)** lubrication system in operation
- **(A)** lubrication in progress: 0,5 sec. LED ON / 0,5 sec. LED OFF

NOTICE

Close the lid of the controls correctly in order to avoid malfunctions due to the penetration of water in the controls of the lubrication system!

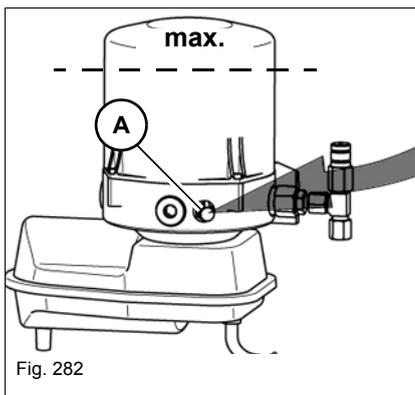


Fig. 282

Filling the central lubrication system

The lubrication system is filled via grease zerk **A** or a fill coupling with a manual or pneumatic grease gun.

NOTICE

Only fill up to the maximum level in order to ensure the ventilation of the central lubrication system.

7.21 Exhaust gas treatment

Diesel particulate filter (DPF) (option)

Important information



Information

This option is only possible for machine model: 351-05S / 351-05L and 351-06S / 351-06L with the DEUTZ diesel engine TCD 2.9 in accordance with exhaust standard IIIB/97/68/EC in all EU member states.



Fig. 283

The diesel particulate filter **A** is a closed soot filter system that collects the soot caused by the combustion of diesel fuel.

The filter is automatically regenerated during machine operation as the soot load increases. This means that the soot is burned in the diesel particulate filter.

Combustion (regeneration) is a continuous process that automatically starts as soon the conditions required for it (soot load and exhaust-gas temperature) are fulfilled.

The filter load is permanently monitored by an electronic system.

If automatic regeneration should not be possible for different reasons, the system indicates (by means of symbols and warning lights in the display) that manual regeneration is necessary – see [“Description of symbols \(regeneration of diesel particulate filter\)” on page 7-74](#) and [Regenerating the diesel particulate filter manually on page 7-75](#).

Ash is also collected during the combustion of soot, however it is not eliminated by regeneration.

This results in shorter regeneration intervals requiring the replacement of the diesel particulate filter during maintenance.

The ash and soot load appears in % in the digital display by means of a query.

Status check of ash and soot load

Information

This option is only possible for machine model:
351-05S / 351-05L and 351-06S / 351-06L with the DEUTZ diesel engine
TCD 2.9 in accordance with exhaust standard IIIB/97/68/EC in all EU
member states.

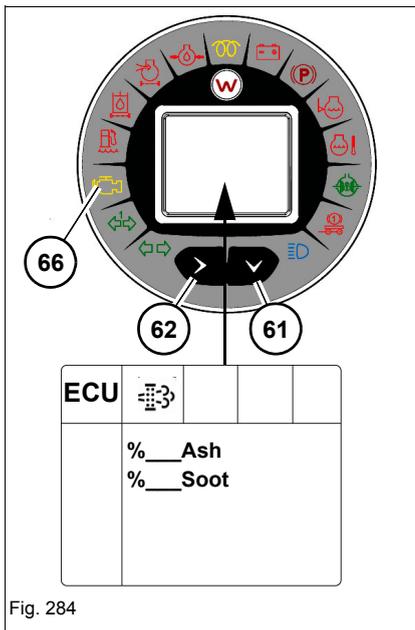


Fig. 284

1. Press push button **61** on the indicator repeatedly until symbol “**ECU**” appears in the digital display.
2. Press push button **62** on the indicator repeatedly until symbol “” appears in the digital display.
 - ➔ **Ash** = ash load in %
 - ➔ **Soot** = soot load in %
3. At an **ash load of 105 %**, due maintenance is indicated by warning light **66**, an acoustic warning and a corresponding CAN message in the digital display.

Information

At an ash load of 100 %, have an authorized service centre replace the diesel particulate filter.

- ▶ Repair and maintenance work on the diesel particulate filter may be performed only by authorized service centres and trained personnel.
- ▶ DEUTZ’s replacement programme ensures that full diesel particulate filters are returned and replaced by clean ones.

Description of symbols (regeneration of diesel particulate filter)

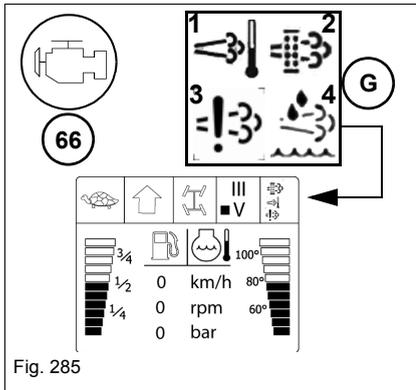


Fig. 285

i Information

This option is only possible for machine model: 351-05S / 351-05L and 351-06S / 351-06L with the DEUTZ diesel engine TCD 2.9 in accordance with exhaust norm IIIB/97/68/EC.

Symbol in field G	Function	Result
• All symbols OFF		<p>Normal operating conditions</p> <ul style="list-style-type: none"> The soot load is in the permissible range.
1	<ul style="list-style-type: none"> Symbol 1 illuminates permanently. 	<p>Increased soot load.</p> <ul style="list-style-type: none"> Automatic regeneration in operation. Machine operation can be continued. Increase the diesel engine load.
2	<ul style="list-style-type: none"> Symbol 2 flashes. 	<p>Caution! The soot load is in the high range.</p> <ul style="list-style-type: none"> Automatic regeneration is no longer possible. Perform manual regeneration on the next occasion – see <i>“Regenerating the diesel particulate filter manually”</i> on page 7-75
2 66	<ul style="list-style-type: none"> Symbol 2 flashes. Warning light 66 illuminates. Acoustic warning SOUNDS. 	<p>Caution! Critical soot load.</p> <ul style="list-style-type: none"> Diesel engine output is reduced by 30 %. Start manual regeneration immediately – see <i>“Regenerating the diesel particulate filter manually”</i> on page 7-75.
3 66	<ul style="list-style-type: none"> Symbol 3 flashes. Warning light 66 illuminates. Acoustic warning SOUNDS. 	<p>Caution! Soot load too high.</p> <ul style="list-style-type: none"> Diesel engine output is reduced by 30 %. Diesel engine speed is limited to 1200 rpm. Manual regeneration is no longer possible The diesel particulate filter has to be replaced by an authorized service centre – see <i>“Diesel particulate filter (DPF) (option)”</i> on page 7-72.
4	<p>(under preparation “AdBlue”)</p> <ul style="list-style-type: none"> Symbol 4 illuminates. 	<ul style="list-style-type: none"> Level below 10 %. Add urea.

Regenerating the diesel particulate filter manually

Important information



Information

This option is only possible for machine model:
351-05S / 351-05L and 351-06S / 351-06L with the DEUTZ diesel engine
TCD 2.9 in accordance with exhaust norm IIIB/97/68/EC.



WARNING

The diesel particulate filter gets very hot, injury and fire hazard!

Can cause serious injury.

- ▶ Do not touch the area of the exhaust outlet since regeneration (combustion of soot) creates temperatures of about 650°C (1202°F)!
 - ▶ When parking the machine, ensure that there is no flammable material (for example paper, dry grass, straw, wood, oil, fuel, etc.) near the silencer outlet.
 - ▶ Perform manual regeneration only outdoors, **not** in enclosed premises.
-



Information

Manual regeneration of the diesel particulate filter can be performed only if the following points are met!

- ▶ Engine coolant temperature must be at least 75°C (167°F).
 - ▶ The parking brake must be applied.
 - ▶ The operating hydraulics must be locked.
 - ▶ The machine must not be moved during regeneration. (The time required for regeneration is about 30 minutes.)
 - ▶ The machine must be parked on firm, non-flammable ground and in non-flammable surroundings.
-

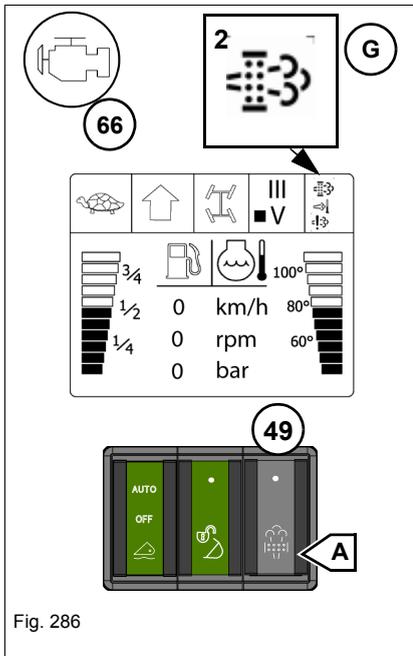


Fig. 286

Perform manual regeneration as follows

1. Run the diesel engine warm (coolant temperature at least 75°C (167°F)).
2. Park the machine on non-flammable ground and in non-flammable surroundings.
3. Lower the loader unit to the ground.
4. Apply the parking brake.
5. Do **not** stop the diesel engine, but let it run at idling speed.
6. Disable the lock for the operating hydraulics/road travel – see chapter 4 “Securing the control lever (joystick)/switching off the operating hydraulics” on page 4-50.
7. Start regeneration. To do this: press push button 49 to position A.
 - Regeneration is in operation.
 - Engine speed is automatically increased.
 - The time required for regeneration is about 30 minutes.
8. Regeneration has finished successfully:
 - if the diesel engine idling speed is lowered and symbol 2 in display field G and warning light 66 go out.



Information

If regeneration is interrupted for a specific reason (symbol 2 flashes, warning light 66 illuminates, acoustic warning SOUNDS), then regeneration has to be fully repeated as described above.

If regeneration is interrupted yet again, have the diesel particulate filter checked and replaced by an authorized service centre.

7.22 Machine preservation

Anticorrosion protection (option)

The machine can be specially protected against corrosion for work in aggressive media (for example in a saline environment).

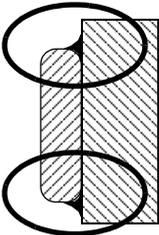
However, this anticorrosion protection is affected by external factors, for example dirt, cleaning, etc. This is why it only has ongoing effect if checked at regular intervals and renewed or reapplied as required.

If no anticorrosion protection is applied to the machine, for example for work in a saline environment, we recommend retrofitting your machine with this option by a sales partner.

The following anticorrosion protection is used:

- Designation:** Elaskon 2000 ML, Elaskon UBS light
Elaskon Aero 46 spezial, Elaskon Multi 80
- Manufacturer:** ELASKON Sachsen GmbH & Co. KG, Dresden (Germany)

Components coated with anticorrosive wax

Component	Remarks
All electric plug-and-socket, grounding and crimp connections	<p>Before applying the wax:</p> <ul style="list-style-type: none"> • Apply contact spray to contact surfaces and connect the plug-and-socket connections again. • Apply a particularly thick anticorrosion layer to the connecting parts of the fuel level transmitter.
<p>All parts of the machine, for example Axles, gearbox, trim panels, servicing lids, loader unit, quickhitch</p>	<p>Except:</p> <ul style="list-style-type: none"> • Piston rods (chromium coating) • Cabin, cabin bearings • Engine cover, engine mounting • Air filter • Counterweight • Fastening surfaces for installing parts on chassis • Radiator and insulating mat • Mudguards, rubber and plastic parts • Light elements
<p>Flange surfaces</p> 	<p>for example axles, diesel engine and cabin bearing:</p> <ul style="list-style-type: none"> • Seal gaps with anticorrosion wax after assembly.

Measures for maintaining anticorrosive protection

WARNING

Special hazards during anticorrosion protection!

Can cause serious injury or death.

- ▶ When handling chemical substances of any kind, such as solvents, wax, etc., observe the specific product-related safety regulations (safety data sheet)!
 - ▶ Ensure sufficient room ventilation!
 - ▶ Do not use unprotected lights or open flames!
 - ▶ Do not smoke!
 - ▶ Corrosion on electric connections or components can cause hazardous operating malfunctions.
 - ▶ Perform work on the electrical system only with the battery disconnected and the diesel engine stopped!
-

Information

Maintenance intervals – see “[Maintenance plan](#)” on page 7-3.

Cleaning

NOTICE

Contrary to the instructions given in Chapter “General service work” in the Operator’s Manual of the machine, neither clean the machine with a bristle brush nor with a steam jet or a high-pressure cleaner!

- ▶ If cleaning the machine with these means cannot be avoided, check the wax coating very carefully and have it renewed or reapplied as required.
 - ▶ If you replace components, check whether they are classified as in the table “Components coated with anticorrosive wax” and whether they are subject to special treatment before assembly.
 - ▶ Have the sealing checked and repaired at least once a year by ELASKON – see the Elaskon servicing pass supplied with the machine.
-

- If the machine is used in corrosive environment over a longer period of time, remove the floor mat in the cabin to avoid the accumulation of corrosive humidity.
- Thoroughly clean machines that are put out of operation over a longer period of time.
- Clean the machine at least once a week. In particular, remove corrosive deposits (such as salt crusts) as fast as possible.
- Clean the machine with cold running water preferably.

Applying the anticorrosion protection

Bear in mind the following instructions as you apply the anticorrosion protection:

- Carefully cover all fastening surfaces and elements to which the anticorrosion protection may not be applied
– see chapter 7 “Components coated with anticorrosive wax” on page 7-77.
- Apply Elaskon products with a brush or commercially available spray equipment.
- The protective Elaskon coating can be removed with an Elaskon cleanser if necessary.
- Spots are difficult to remove from clothing.
- Affix a “Wet paint!” or a similar sign to newly coated machines.

Treatment of oxidised surfaces

If in spite of all precautionary measures some components should be affected by corrosion (oxidized), treat the oxidized area follows:

Electric connections

- Remove the remaining protective wax at the oxidised area with an Elaskon cleanser.
- Apply an oxide solvent (Elaskon Multi 80) to the affected area.
- Apply Elaskon Multi 80 to the contact surfaces of the plug-and-socket connection.
- Establish the connection.
- Apply/spray the anticorrosion protection onto the electric connection from all sides.

Sheet-metal parts

- Remove the remaining protective wax at the oxidised area with an Elaskon cleanser.
- Remove all remaining corrosion and paint coating from the affected area down to the bare material, otherwise the protective coating will not adhere properly.
- Clean the affected area with a cleaning solvent, and apply a 2-component prime coating and then a 2-component paint coating to it.
- Then preserve the area with the anticorrosion protection.



Notes:



8 Malfunctions

8.1 Diesel engine malfunctions



Information

Errors may be rectified and repairs may be performed only by an authorized service center.

We recommend first determining the cause of the error. Read the error memory for this purpose – see *“Digital display of error codes” on page 8-5.*

Diesel engine malfunctions	Possible causes	Remedy/avoidance	See
Engine does not start or is not easy to start	Parking brake not applied	Put on parking brake	5-16
	3rd control circuit is switched on	Lock the 3rd control circuit	4-50
	Wrong SAE grade of engine lubrication oil	Contact an authorized service centre	7-14
	Fuel grade does not comply with specifications	Observe fuel specification when adding fuel	7-14
	Insufficient fuel supply	Contact an authorized service centre	–
	Malfunctioning or empty battery	Replace the battery with a new one.	7-49
	Seat contact switch (optional) issues no release.	Sit down on the operator seat.	–
	Loose or oxidized cable connections in starter circuit		–
	Malfunctioning starter, or pinion does not engage	Contact an authorized service centre	–
	Wrong valve clearance		–
	Malfunctioning fuel injector		–
Engine starts, but does not run smoothly or faultless	Fuel grade does not comply with specifications	Observe fuel specification when adding fuel	7-14
	Wrong valve clearance		–
	Injection line leaks		–
	Malfunctioning fuel injector	Contact an authorized service centre	–
Engine does not run on all cylinders	Injection line leaks		–
	Insufficient fuel supply		–
	Malfunctioning fuel injector		–



Diesel engine malfunctions	Possible causes	Remedy/avoidance	See
Engine overheats. Temperature warning system responds	Oil level too low	Add engine oil, observe the engine oil specification	7-30
	Oil level too high	Contact an authorized service centre	–
	Dirty air filter	Replace air filter	7-38
	Malfunctioning air filter maintenance switch or gauge	Contact an authorized service centre	–
	Dirty oil/water radiator fins	Cleaning the radiator	7-33
	Malfunctioning fan, torn or loose V-belt	Retension the V-belt Contact an authorized service centre	7-40
	Malfunctioning fuel injector		–
Insufficient engine power	Oil level too high	Contact an authorized service centre	–
	Fuel grade does not comply with specifications	Observe fuel specification when adding fuel	7-26
	Dirty air filter	Replace air filter	7-38
	Malfunctioning air filter maintenance switch or gauge	Contact an authorized service centre	–
	Wrong valve clearance		–
	Injection line leaks		–
	Malfunctioning fuel injector		–
	Malfunctioning diesel particulate filter		–
Soot load of diesel particulate filter is too high	Regenerating the diesel particulate filter	7-72	
Insufficient or no engine oil pressure	Oil level too low	Add engine oil, observe the engine oil specification	7-30
	Engine inclination too high	Move machine out of inclination	–
	Wrong SAE grade of engine lubrication oil	Contact an authorized service centre Observe engine oil specification	7-12
Engine oil consumption too high	Oil level too high	Contact an authorized service centre	–
	Malfunctioning piston rings		–
	Engine inclination too high	Move machine out of inclination	–
	Low-load operation of engine	Avoid too long engine idle times	–



Diesel engine malfunctions		Possible causes	Remedy/avoidance	See
Engine smoke	Blue	Oil level too high	Contact an authorized service centre	–
		Engine inclination too high	Move machine out of inclination	–
	White	Engine starting temperature too low	Contact an authorized service centre	–
		Fuel grade does not comply with specifications	Observe fuel specification when adding fuel	7-26
		Wrong valve clearance	Contact an authorized service centre	–
	Malfunctioning fuel injector	–		
	Black	Dirty air filter	Clean, replace air filter	7-38
		Malfunctioning air filter maintenance switch or gauge	Contact an authorized service centre	–
		Wrong valve clearance		–
		Malfunctioning fuel injector		–
		Leaking charge-air line		–
		Malfunctioning injector		–
Regeneration light flashes	Soot load of diesel particulate filter is too high	Regenerating the diesel particulate filter	7-72	



8.2 Malfunctions of the traveling drive

Important information

Repairs on the travelling drive may only be performed by an authorized service centre – see [“Overview of cabin electronics error codes” on page 8-11](#) and chapter Maintenance, [Axles/travelling drive on page 7-59](#).

8.3 Malfunctions of the hydraulic system

Important information

Repairs on the hydraulic system may only be performed by an authorized service centre – see [“Overview of cabin electronics error codes” on page 8-11](#) and chapter Maintenance, [Hydraulic system on page 7-41](#).

8.4 Malfunctions of the electrical system

Important information

Repairs on the electrical system may only be performed by an authorized service centre.

Digital display of error codes

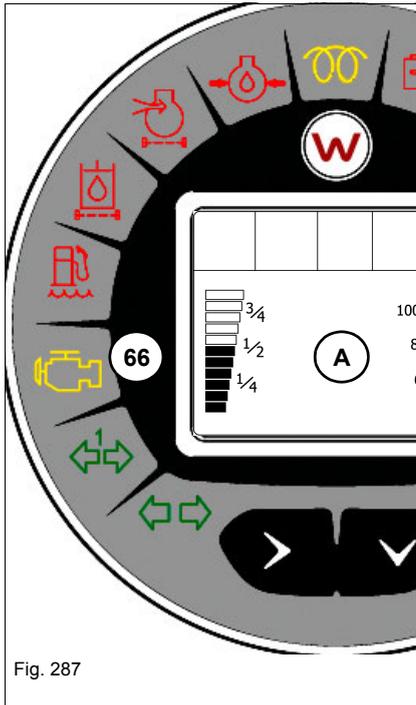


Fig. 287

An error code is issued if a machine component is malfunctioning.

The error codes are displayed in the main display of the digital display instead of the tank and temperature symbol **A** as well as with the control lamp **66**.

Causes for an error code could be:

- Open wiring, interruption
- Overvoltage, undervoltage
- Grounding contact error
- Malfunctioning component
- Over/under permissible values (temperature, pressure, speed, etc.)
- Sensor error due to dirt

If an error code is displayed, first:

1. Lower the load to transport position.
2. If possible, drive the machine out of the danger zone.
3. Stop the engine and switch off the ignition.
4. Restart the engine.

If the acoustic warning sounds again:

5. Make a note of the error code of the display.
6. Determine cause of error.
7. Rectify the error or inform a service centre of the error code.

Error code table – see [“Overview error codes of diesel engine electronics” on page 8-6](#) and [Overview of cabin electronics error codes on page 8-11](#).

Overview error codes of diesel engine electronics



Information

This option is only possible for machine model 351-05S / 351-05L and 351-06S / 351-06L with the DEUTZ diesel engine TCD 2.9.

Errors may be rectified and the necessary repairs may be performed only by an authorized service center.

Error code	Diesel engine electronics	Possible causes	Remedy	
100	Engine oil pressure	Engine oil pressure in inadmissible range.	<p>Caution! Critical error!</p> <ol style="list-style-type: none"> 1. Stop the engine immediately. 2. Get in touch with an authorized service centre and have the error rectified. 	
105	Charge-air temperature	Charge-air temperature in inadmissible range.		
110	Error, coolant temperature	Sensor error coolant temperature; Signal range exceeded or fallen below.		
111	Coolant level	Coolant level too low.		
175	Engine oil temperature	Engine oil temperature too high, or below minimum value. Sensor engine oil temperature; Implausible signal.		
190	Engine speed	Engine speed above permissible range.		
	Camshaft/crankshaft speed	Implausible value from camshaft/crankshaft speed sensor.		
523009	Common Rail System	Error detected on pressure relief valve.		
132	Intake air/temperature sensor	Implausible value from intake-air volume/temperature sensor.		<p>Non-critical error!</p> <ol style="list-style-type: none"> 1. The machine can continue to be operated if no functions are affected. 2. Have error rectified by an authorized service center when the opportunity arises.
172		Intake air temperature sensor; Implausible signal.		
168	Battery voltage	Battery/on-board voltage in inadmissible range.		
523982				
524025				



Error code	Diesel engine electronics	Possible causes	Remedy
1180	Exhaust-gas temperature	Exhaust-gas temperature above permissible range.	<p>Non-critical error!</p> <ol style="list-style-type: none"> 1. The machine can continue to be operated if no functions are affected. 2. Have error rectified by an authorized service center when the opportunity arises.
3248	Exhaust-gas temperature	Exhaust-gas temperature after the diesel particulate filter (DPF) – Above maximum value – Under minimum value – Regeneration cut-off – Warning	
4765	Exhaust-gas temperature	Above or under the exhaust-gas temperature before the silencer.	
4766	Exhaust-gas temperature	Above or under the exhaust-gas temperature after the silencer.	
4768	Exhaust-gas temperature	Sensor error of exhaust gas temperature before (DOC); Signal range exceeded or fallen below .	
4769	Exhaust-gas temperature	Sensor error of exhaust gas temperature after (DOC); Signal range exceeded or fallen below .	
524024	Exhaust-gas temperature	Regeneration temperature of catalytic converter outside permissible range.	
3711	Regeneration diesel particulate filter ¹ (DPF)	Not able to regenerate diesel particulate filter successfully.	
524025			
3251	Differential pressure of diesel particulate filter ¹ (DPF)	Differential pressure at diesel particulate filter in inadmissible range.	
3253	Differential pressure of diesel particulate filter ¹ (DPF)	Sensor error differential pressure (DPF); Signal range exceeded or fallen below.	
3254		Sensor differential pressure DPF; Implausible signal.	
523920	Exhaust gas back pressure at diesel particulate filter ¹ (DPF)	Exhaust-gas back pressure at burner: – Above maximum value – Below minimum value – Regeneration cut-off	
		Sensor error at burner exhaust-gas back pressure: – Beyond signal range – Under signal range	



Error code	Diesel engine electronics	Possible causes	Remedy
523913	Preheating system	Error detected on preheating system.	<p>Non-critical error!</p> <ol style="list-style-type: none"> 1. The machine can continue to be operated if no functions are affected. 2. Have error rectified by an authorized service centre when the opportunity arises or on the occasion of the next maintenance interval at the latest.
523914			
102	Charge-air pressure too high	Charge-air pressure in inadmissible range.	
651	Injector error cylinder 1	Error detected on cylinder 1 injector.	
523929			
523946			
523895			
652	Injector error cylinder 2	Error detected on cylinder 2 injector.	
523896			
523930			
523947			
653	Injector error cylinder 3	Error detected on cylinder 3 injector.	
523897			
523931			
523948			
654	Injector error cylinder 4	Error detected on cylinder 4 injector.	
523898			
523932			
523949			
2797	Injector error cylinder bank 1	Error detected on one or more injectors.	
2798			
523350		Injector cylinder bank 2; Short circuit.	
523352			
523998			
523354	Injector control	Error detected on injector control.	
523999			
108	Ambient air pressure	Implausible value from ambient air pressure sensor.	
109			



Error code	Diesel engine electronics	Possible causes	Remedy
97 524057	Fuel monitoring	Implausible value from water separator.	<p>Non-critical error!</p> <ol style="list-style-type: none"> The machine can continue to be operated if no functions are affected. Have error rectified by an authorized service centre when the opportunity arises or on the occasion of the next maintenance interval at the latest.
94	Fuel initial pressure	Fuel initial pressure in inadmissible range.	
174	Fuel temperature outside permissible range	Fuel temperature in inadmissible range.	
523615	Common Rail System	Error detected on metering unit.	
523612	Internal software error of control units	Internal software error detected on control unit.	
523612		Internal software error EMR; Injection cut off.	
523612		Internal software error (electronic, measurement and control systems).	
102	Charge-air pressure	Implausible value from charge-air sensor.	
51	AGR system ¹ (exhaust gas treatment)	Error detected on EGR system.	
52		Error detected on EGR system.	
411		Differential pressure Venturi unit (EGR); maximum value exceeded.	
412		Error detected on EGR system.	
2659			
523960			
524030			
524031			
524033			
91	Accelerator pedal	Implausible signal from drive pedal.	
1079	Sensor voltage	Sensor voltage in inadmissible range.	
1080			
523601			
677	Starter relay error	Error detected on starter relay.	

Error code	Diesel engine electronics	Possible causes	Remedy
172	Intake-air temperature error	Charge-air temperature in inadmissible range.	<p>Non-critical error!</p> <ol style="list-style-type: none"> 1. The machine can continue to be operated if no functions are affected. 2. Have error rectified by an authorized service centre when the opportunity arises or on the occasion of the next maintenance interval at the latest.
1188	Wastegate system error	Error detected on Wastegate system.	
1136	ECU temperature outside permissible range	ECU temperature: – Above maximum value – Below minimum value	
523550	Starter switch	Starter switch actuated too long.	
524018	DPF regeneration ¹	DPF does not regenerate, diesel engine output is reduced.	
524022			
524023			
29	Manual throttle	Manual throttle signal range exceeded; Battery short circuit.	
107	Air filter differential pressure	Differential pressure too high/warning threshold reached/system reaction triggered.	
171	Ambient-air temperature	Sensor error; Signal range exceeded or fallen below.	
676	Cold-starting aid relay	Malfunctioning relay/open wiring.	
729		Open wiring/power output element overtemperature.	
1176	Pressure sensor before exhaust gas turbocharger	Sensor error; Signal range exceeded/fallen below.	
3699	EAT system ¹	Error in exhaust-gas treatment/maximum standstill time reached; Change the oil.	
524062	EAT system	Suppression switch/release switch not available.	

1. The query of the control indicator is only possible with the DEUTZ diesel engine TCD 2.9 as per exhaust norm IIIB/97/68/EG) with the optional diesel particulate filter.

Overview of cabin electronics error codes

Information

Have malfunctions rectified and necessary repairs performed only by an authorized service center.

Error code	Cabin electronics/possible causes	Remedy
517551	Control unit flash – flash memory	Caution! Critical error 1. Stop and park the machine immediately 2. Have the error rectified by an authorized service centre.
	Application – machine configuration (object initialization failed)	
517900	Control unit, internal	
517901		
517902	Control unit communication, internal	
517903	Control unit power supply	
517904	Control unit environmental data – application timeout	
517908	Internal control unit memory	
517909		
517910		
517911		
517912		
517913		
519015	Travelling drive – neutral push button	
519398	Trailer braking system – solenoid valve (compressed-air parking brake)	
519463	Trailer braking system – solenoid valve (hydraulic trailer brake)	
519461	Trailer braking system – proportional valve (hydraulic trailer brake)	
519910	Travelling drive – accelerator pedal signal 2	
519911	Travelling drive – accelerator pedal signal 1	
521995	Travelling drive – configuration error/error in application software of travel function	
522282	Error quickhitch lock/unlock control circuit III – configuration error/error in application software of control circuit III	



Error code	Cabin electronics/possible causes	Remedy
517006	Fan control – hydraulic oil temperature sensor	<p>Non-critical error!</p> <ol style="list-style-type: none"> 1. The machine can continue to be operated if no functions are affected. 2. Have error rectified by an authorized service centre when the opportunity arises or on the occasion of the next maintenance interval at the latest.
517905	Control unit environmental data	
517906		
517907	CAN BUS	
518960	Release switch – parking brake	
518974	Differential lock – differential lock push button	
518979	Quickhitch lock/unlock control circuit III – push button/scroll wheel	
518980		
518982	Highflow 2 (continuous function of control circuit III) – switch (continuous function of control circuit III)	
518983	Travelling drive – FWD scroll wheel	
518984	Travelling drive – RWD scroll wheel	
518989	Hydraulic quickhitch – release switch (quickhitch unlocking)	
518993	Load stabilizer – load stabilizer switch	
518996	Tilt ram lock – tilt-ram lock switch	
519005	Highflow 1 (control circuit IV/raise tipping trailer) – switch (control circuit IV)	
519016	Front socket/bucket repositioning – push button (front socket/bucket repositioning)	
519019	Raise/lower tipping trailer – switch (raise/lower tipping trailer)	
519034	Release switch – switch (control circuit III/lock for long-haul travel)	
519046	Travelling drive – manual throttle (joystick signal 1 S097)	
519050	Additional function 2 – switch (additional function 2)	
519051	Plunger switch (front/rear additional control circuit) – plunger switch (front ball-type cock)	
519052	Plunger switch for front/rear additional control circuit – rear ball-type cock (plunger switch)	
519053	Release switch – seat switch	
519066	Additional function 1 – push button (additional function 1)	
519358	Differential lock – solenoid valve (differential lock)	
519360	Highflow 2 (continuous function of control circuit III) – solenoid valve (continuous function of control circuit III)	
519361	Highflow 1 (control circuit IV/raise tipping trailer) – solenoid valve error (control circuit IV/raise tipping trailer)	
519365	Control circuit III (lock/unlock quickhitch) – solenoid valve (control circuit III, lock quickhitch)	
519366	Control circuit III (lock/unlock quickhitch) – solenoid valve (control circuit III, unlock quickhitch)	
519369	Load stabilizer – load stabilizer solenoid valve	
519370		



Error code	Cabin electronics/possible causes	Remedy
519371	Hose burst valve disabling – solenoid valve (hose burst valve)	<p>Non-critical error!</p> <ol style="list-style-type: none"> 1. The machine can continue to be operated if no functions are affected. 2. Have error rectified by an authorized service centre when the opportunity arises or on the occasion of the next maintenance interval at the latest.
519374	Hydraulic quickhitch – solenoid valve (quickhitch unlocking)	
519375	Tilt ram lock – solenoid valve (tilt ram lock)	
519376		
519377	Front socket/bucket repositioning – solenoid valve (bucket repositioning Y028)	
519378	Float position – solenoid valve (float position)	
519382	Additional function 1 – solenoid valve (additional function 1)	
519383	Additional function 2 – solenoid valve (additional function 2)	
519384	Fan control – proportional valve (fan control)	
519386	Fan control – solenoid valve (reversing fan)	
519393	Raise/lower tipping trailer – solenoid valve error (raise tipping trailer)	
519394	Raise/lower tipping trailer – solenoid valve (lower tipping trailer)	
519442	Release switch – solenoid valve (boom interlock)	
521911	Travelling drive – manual throttle (joystick signal 2 S097)	

8.5 Malfunctions in the air conditioning system (option)



Information

Repairing, filling up and emptying the air conditioning system may be performed only by an authorized service center!

Malfunctions	Possible causes	Remedy	See page
Fan does not run	Malfunctioning or loose fuse	Replace fuses	7-48
	Interrupted line	Contact an authorized service centre.	–
	Malfunctioning fan motor		–
	Malfunctioning fan switch		–
Fan cannot be switched off	Short circuit in cable or fan switch		–
Reduced fan output	Dirty contacts	Contact an authorized service centre.	–
	Undersized electric lines		–
	Very dirty heat exchanger	Clean the heat exchanger.	7-53
Insufficient heating output or none at all	Flow temperature too low	Contact an authorized service centre.	–
	Malfunctioning thermostat		–
	Dirty heat exchanger fins	Clean the heat exchanger.	7-53
	Dirty filter	Clean the filter.	7-53
Loss of refrigerant on equipment	Loose hose connection	Contact an authorized service centre.	–
	Damaged hose		–
	Damaged heat exchanger		–
Compressor does not run	Interruption in solenoid coil of compressor	Contact an authorized service centre.	–
	V-belt pulley does not turn even though magnetic clutch is applied		–
	Compressor clutch slips		–
	Malfunctioning controls		–
	Loose connection on compressor		–
	Torn V-belt		–
	Loose V-belt	Retension the V-belt.	7-40



Malfuctions	Possible causes	Remedy	See page
Condensor overflow	Expansion valve is stuck in open position		–
Iced-up evaporator	Thermostat sensor in wrong position	Contact an authorized service centre.	–
	Malfunctioning expansion valve or thermostat		–
Clogged condensor	Dirty radiator fins	Clean the condenser.	7-53
Loss of refrigerant	Interruption of refrigerant line		–
	System leak		–
Insufficient refrigerating output	Clogged fan duct	Contact an authorized service centre.	–
	Refrigerant level too low		–
	Humidity in system		–
System cools with interruptions	Line interruption, insufficient ground connections or loose contacts in solenoid coil of compressor		–
	Malfunctioning fan motor		–
Very loud system	Excessive V-belt wear	Contact an authorized service centre.	7-40
	Loose compressor bracket or worn inside parts of the compressor		–
	Excessive wear of fan motor		–
	System overfill		–
	Not enough refrigerant in the system		–



Notes:



9 Technical data

9.1 Model and trade names

The machine is identified by two designations.

- **“Model designation”**
stamped on the type label in square 5 under model/version
– see chapter *“Serial number” on page 3-31.*
- **“Trade name”** – affixed outside on the machine.

Letters **S** or **L** in the model designation identify the loader unit version:

- **S** = standard loader unit
- **L** = higher loader unit

Model designation	Trade name
351-04S	8075
351-04L	8075L
351-05S	8085
351-05L	8085L
351-06S	8095
351-06L	8095L



9.2 Engine

Engine for vehicle model 351-04S / 351-04L

Designation	Values
Product	YANMAR diesel engine
Type	4TNV 88 (BKNKR)
Exhaust-emission level corresponds to the norm	IIIA / 97/68/EC
Design	Water-cooled in-line engine
Number of cylinders	4
Displacement	2190 cm ³ (133.6 in ³)
Nominal bore and stroke	88 x 90 mm (3.46 x 3.54 in)
Compression ratio	–
Output according to ISO 14396	35 kW (46.9 hp) at 2800 rpm
Max. torque	140,4 Nm (103.5 ft.lbs.) at 1820 rpm
Idling speed	About 1100 rpm
Min. specific fuel consumption	225 g/kWh (7.9 oz/kWh)
fuel injection system	Direct injection
Firing order	1 – 3 – 4 – 2
Starting aid	Glow plugs
Max. inclined position (engine no longer supplied with oil)	30° in all directions Observe the tilting limit of the machine (20° laterally)!



Engine for vehicle model 351-05S / 351-05L and 351-06S / 351-06L

Designation	Values	
Product	DEUTZ diesel engine	
Type	TD 2.9 EDG ¹	TCD 2.9
Exhaust-emission level according to standard	IIIA/97/68/EC ¹	IIIB/97/68/EC
Design	Water-cooled in-line engine	
Number of cylinders	4	
Displacement	2925 cm ³ (178.5 in ³)	
Nominal bore and stroke	92 x 110 mm (3.62 x 4.33 in)	
Compression ratio	1:17,8	
Output according to ISO 14396	55,4 kW (74 hp) at 2300 rpm	
Max. torque	260 Nm (191.7 ft. lbs.) 1800 rpm	300 Nm (221.3 ft. lbs.) 1600 rpm
Idling speed	About 900 – 950 rpm	
Min. specific fuel consumption	248 g/kWh (8.7 oz/kWh)	210 g/kWh (7.4 oz/kWh)
fuel injection system	Direct fuel injection	Common rail direct injection
Firing order	1 – 3 – 4 – 2	
Starting aid	Sheathed-element glow plug	
Max. inclined position (engine no longer supplied with oil)	30° in all directions Observe the tilting limit of the machine (20° laterally)!	

1. Without intercooling.

The engine corresponds to the exhaust level III/A without a certificate and is therefore **not permitted** in the EU member states, the USA, Canada, Switzerland and Australia.



9.3 Travelling drive/axles

Variable displacement pump/boost pump

Wheel loader	351-04S / 351-04L	351-05S / 351-05L 351-06S / 351-06L
Design	Automotive, infinitely variable hydrostatic axial-piston gearbox	
Displacement	45 cm ³ /rev (2.75 in ³ /rev)	60 cm ³ /rev (3.66 in ³ /rev)
Max. operating pressure	450 bar (6526.7 psi)	
Starting speed	Approx. 1300 rpm	Approx. 1000 rpm
Droop	Approx. 2600 rpm	Approx. 2100 rpm
Boost pump (integrated in variable displacement pump)		
Design	Internal gear pump	
Displacement	12 cm ³ /rev (0.73 in ³ /rev)	14 cm ³ /rev (0.85 in ³ /rev)
Charging/boost pressure	32 – 34 bar (464.1 – 493.1 psi)	
Control	Speed-sensitive, electro-hydraulic feed volume adjustment	
Travel direction	Electro-hydraulic control	
Inching	Electric via proportional control (potentiometer)	

Variable displacement motor

Wheel loader	351-04S / 351-04L 351-05S / 351-05L 351-06S / 351-06L	351-05S / 351-05L 351-06S / 351-06L
Design	Axial piston motor (swash plate design)	
Capacity 20 km/h (standard)	80 cm ³ /rev (4.88 in ³ /rev)	–
Capacity 30/40 km/h (option)	–	233 cm ³ /rev (14.22 in ³ /rev)
Travel speed ^{1, 2} (forward and reverse)	1st speed range: 0 – 7 km/h (0 – 4.35 mph) 2nd speed range: 0 – 20 km/h (0 – 12.43 mph) (standard) 0 – 30/40 km/h (0 – 18.6/24.8 mph) (option)	
Pushing power	42 kN³ (9441.9 lbf)	40 kN⁴ (8992.3 lbf)

1. Maximum speed is reached when the drive has a minimum temperature of 20 – 30 °C, on level, asphalted ground, without a trailer and with an empty bucket.

2. High speed 30/40 km/h (0 – 18.6/24.8 mph) (option) applies only to wheel loaders 351-05, 351-06

3. Tyres 12.2-18

4. Tyres 12.5-20

**Front axle**

Front axle	
Design	Planetary steering and drive axle, rigid screw connection with frame
Differential lock (100 %)	Traction is evenly distributed to all 4 wheels by means of the cardan shaft
King-pin inclination	0°
Camber	0°
Steering angle	40°
Toe-in	0 mm (0 in)
Track (distance over hubs)	1400 mm (55.11 in)

Rear axle

Rear axle	
Design	Oscillating planetary steering and drive axle
Differential lock (100 %) Option	Traction is evenly distributed to all 4 wheels by means of the cardan shaft
King-pin inclination	0°
Camber	0°
Total oscillation angle ¹	± 11°
Steering angle	40°
Toe-in	0 mm (0 in)
Track (distance over hubs)	1400 mm (55.11 in)

1. With standard tyress



9.4 Brakes

Service brake

Service brake	
Design	Foot-operated hydraulic disc brake
Location	Front axle input shaft (also the rear axle for machines equipped with optional 30 or 40 km/h (18.6 or 24.8 mph) high speed)
Brake fluid	Special hydraulic fluid based on basic mineral oil (ATF) – <i>see chapter 7.3 “Fluids and lubricants” on page 7-12</i>

Parking brake

Parking brake	
Design	Manual mechanical disc brake
Location	Front axle drive shaft



9.5 Tyres

Tyres for wheel loader model 351-04S / 351-04L

Tire size	Tyre pressure ¹		Wheel rims	
	Front bar (psi)	Rear bar (psi)	Wheel rim	Wheel offset
12.5-18 10PR MPT-04 TBL 131 D	2,5 (35.5)	2,0 (28.4)	11 x 18	0 mm
365/70R18 EM 146A2/ 135B SPT9				
335/80 R18 145A2/134B SPT9				
340/80 R18 143A8/143B /XMC				
340/80 R 18 550 143A8/138D				
340/80 R18 143 A8/B BIBLOA				
340/80 R18 80 TRI2 Nokian			11 x 20	0 mm
375/70R20 MPT 136G AC70				
405/70 R18 EM 153A2/141B SPT9 ²			13 x 18	0 mm
405/70 R18 153A2/141B A608 ²				

1. Increase front tire pressure by 0.5 bar (7.2 psi) during pallet forks operation!
2. The steering angle must be limited to 38° by an authorized service centre if the machine is equipped with these tyres.


Tyres for wheel loader model 351-05S / 351-05L / 351-06S / 351-06L

Tire size	Tyre pressure ¹		Wheel rims			
	Front bar (psi)	Rear bar (psi)	Wheel rim	Wheel offset		
12.5-20 132D MPT-04 10 PR	2,5 (35.5)	2,0 (28.4)	11 x 20	0 mm		
335/80 R20 EM 136B/147A2 SPT9						
375/70R20 MPT 136G AC70						
335/80 R20 147K MPT 81						
335/80 R20XZSL TL 141B						
365/70R18 EM 146A2/135B SPT9			11 x 18			
340/80 R18 550 143A8/138D						
340/80 R18 143 A8/B BIBLOAD						
12.5-18 10PR ² MPT-04 TBL 131 D			3,0 (42.6)		2,5 (35.5)	13 x 18
405/70 R18 153A2/141B A608						
405/70 R18 EM 153A2/141B SPT9 ³						

1. Increase front tire pressure by 0.5 bar (7.2 psi) during pallet forks operation!
2. Not approved with agricultural or forestry registration (EC tractor registration)
3. The steering angle must be limited to 38° by an authorized service centre if the machine is equipped with these tyres



9.6 Steering system

Steering system	
Design	Hydrostatic 4 wheel steering with emergency steering features
Types of steering systems	4 wheel steering, optional front axle steering, optional diagonal steering (crab steering)
Assemblies	Hydraulic pump, priority valve, servostat with safety valves, 1 steering ram per axle. Option: changeover valve for steering mode "Front axle, diagonal and 4 wheel steering"
Displacement per steering wheel revolution	
Model 351-04	20 cm ³ /rev (1.22 in ³ /rev)
Models 351-05 / 351-06	32 cm ³ /rev (1.95 in ³ /rev)
Max. steering pressure	190 bar (2702.3 psi)



9.7 Work hydraulics

Hydraulic pump

Hydraulic pump	351-04S / 351-04L	351-05S / 351-05L 351-06S / 351-06L
Hydraulic pump	Gear pump	
Displacement	20 cm ³ /rev (1.22 in ³ /rev)	32 cm ³ /rev (1.95 in ³ /rev)
	52 l/min (13.73 gal/min) at 2800 rpm	70 l/min (18.5 gal/min) at 2300 rpm
Hydraulic pump with auxiliary output pump (option)		
Displacement at 2300 rpm	–	32 cm ³ /rev (1.95 in ³ /rev) + 17 cm ³ /rev (1.07 in ³ /rev)
	–	70 l/min (18.50 gal/min) + 45 l/min (11.89 gal/min)
Location	Variable displacement pump (drive)	

Hydr. Pilot control

Boost pump of variable displacement pump	351-04S / 351-04L	351-05S / 351-05L 351-06S / 351-06L
Displacement	12 cm ³ /rev (0.73 in ³ /rev)	14 cm ³ /rev (0.85 in ³ /rev)
Charging/ boost pressure	32 – 34 bar (464.1 – 493.1 psi) at 2800 rpm	32 – 34 bar (464.1 – 439.1 psi) at 2300 rpm

Pilot control unit

Designation	
Control lever (joystick)	Universal lever – operation of lift and tilt rams, change of direction, 3rd control circuit and differential lock
Lock against unintentional operation (for long-haul travel and transport)	Push button + solenoid valve for 3rd control circuit unlocking. Switch – lock for operating hydraulics/road travel



Control valve

Control valve	
Design	3-fold pilot-control (standard)
Max. operating pressure ¹	240 bar (3480.9 psi)

1. Measured at hydraulic pump

Hydraulic ram protection

Designation	
Tilt ram secondary protection	Rod side 270 bar (3916.0 psi) Base side 100 bar (1450.4 psi)
Lift ram secondary protection	Rod side anticavitation valve Base side 270 bar (3916.0 psi)
Quickhitch ram (3rd control circuit) secondary protection	270 bar (3916.0 psi)

Lift and tilt cylinder speed

Speed (seconds) ¹		351-04S	351-04L	351-05S 351-05L	351-06S 351-06L
Hydraulic pump		20 cm ³ /rev (1.22 in ³ /rev)		32 cm ³ /rev (1.95 in ³ /rev)	
Lift cylinder	Raise	Approx. 5,0	Approx. 7.0	Approx. 5,5	Approx. 7.0
	Lower	Approx. 3,0	Approx. 5,0	Approx. 4,0	Approx. 5,5
Tilt cylinder	Tilt in	Approx. 2,5	Approx. 2,5	Approx. 2,5	Approx. 2,5
	Tilt out	Approx. 2,5	Approx. 2,5	Approx. 2,5	Approx. 2,5

1. At 2400 rpm (engine speed) without any load



Usable consumer pressure at quick couplings (3rd control circuit)

Wheel loader model		351-04S / 351-04L	351-05S / 351-05L 351-06S / 351-06L
Hydraulic pump		20 cm ³ /rev (1.22 in ³ /rev)	32 cm ³ /rev (1.95 in ³ /rev)
Quick coupler flow rates ¹		Rpm / l/min / bar (rpm / gal/min / psi)	Rpm / l/min / bar (rpm / gal/min / psi)
Front 3rd control circuit (return without pressure)	Electric control (solenoid valve) via 3rd control circuit. Push button operation on joystick (3rd control circuit)	2800 / 45 / 175 (2800 / 11.88 / 2489.04)	2300 / 65 / 175 (2300 / 17.17 / 2489.04)
Front 3rd control circuit (double action)		2800 / 45 / 155 (2800 / 11.88 / 2204.58)	2300 / 65 / 155 (2300 / 17.17 / 2204.58)

1. The specified flow rates are available at the front or rear quick couplers

Usable consumer pressure at additional control circuit (option)

Wheel loader model	351-05S / 351-05L / 351-06S / 351-06L	
Hydraulic pump with auxiliary output pump	32 cm ³ /rev (1.95 in ³ /rev) + 17 cm ³ /rev (1.07 in ³ /rev)	
Quick coupler flow rates ¹	Rpm / l/min / bar (rpm / gal/min / psi)	
Front additional control circuit installed outside on loader unit	Electric control (solenoid valve) via 3rd control circuit	2300 / 90 / 180 (2300 / 23.77 / 2560.15)
Rear additional control circuit installed with external return		2300 / 35 / 180 (2300 / 9.25 / 2560.15)

1. The specified flow rates are available at the front or rear quick couplers



9.8 Electrical system

Electric units/light bulbs

Designation	351-04S / 351-04L	351-05S / 351-05L 351-06S / 351-06L
Alternator	14 V 80 A	14 V 95 A
Starter	12 V 2.3 kW (3.08 hp)	12 V 2.6 kW (3.48 hp)
Battery	12 V 77 Ah	
Light bulb – high beam (left/right)	12 V 55 W / H3	
Light bulb – low beam (left/right)	12 V 55 W / H7	
Light bulb – side marker light (left/right)	12 V 4 W	
Light bulb – front and rear turn indicators (left/right)	12 V 21 W	
Light bulb – brake/rear lights (left/right)	12 V 21/5 W	
Light bulb – working light	12 V 55 W / H3	
Light bulb – rotating beacon	12 V 55 W / H1	
Light bulb – interior light	12 V 10 W	

Main fuse box with relays (model 351-04S / 351-04L)

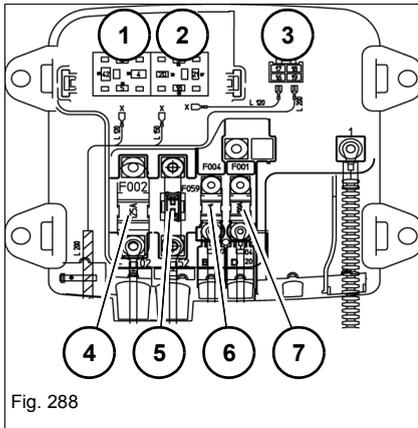


Fig. 288

The main fuse box is located in the engine compartment (on the left on the rear wall).

Pos.	Relay no.	Protected circuit
1	K005	Preheating relay
2	K009	Engine cut-off relay
3	K008	Cutoff solenoid relay

Pos.	Fuse	Rated current (A)	Protected circuit
4	F002	125	Preheating system (engine)
5	F059	15	14-pole front socket (option)
6	F004	40	Starter
7	F001	100	Main fuse (cabin supply)

Main fuse box with relays (models 351-05S / 351-05L / 351-06S / 351-06L)

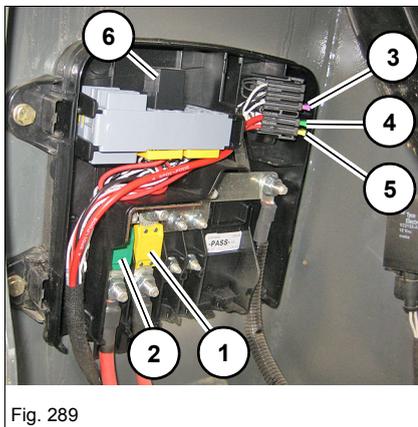


Fig. 289

The main fuse box is located in the engine compartment (on the left on the rear wall).

Pos.	Fuse	Rated current (A)	Protected circuit
1	F001	100	Main fuse (cabin supply)
2	F002	125	Preheating system (engine)
3	F004	20	Starter
4	F005	30	Main fuse (cabin supply)
5	F006	3	Exhaust gas recirculation ¹ (diesel particulate filter option)

1. The fuse is only assigned for the DEUTZ diesel engine TCD 2.9 as per exhaust norm IIIB/97/68/EC) with the option diesel particulate filter.

Pos.	Relay no.	Protected circuit
6	K088	Relay 20/35A fuel pump

Fuse assignment

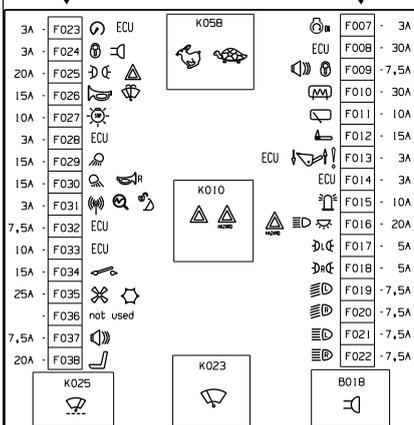


Fig. 290

Fuses behind switch console on the left

Pos.	Fuse	Rated current (A)	Protected circuit	
A	F007	3	Starting key	
	F008	30	Cabin controller	
	F009	7.5	Radio and immobiliser	
	F010	30	Window heating	
	F011	10	Rear wiper	
	F012	15	12 V power outlet	
	F013	3	Cabin controller / overload warning	
	F014	3	Cabin controller	
	F015	10	Rotating beacon	
	F016	20	Hazard warning light / Flash light / Interior light	
	F017	5	Left parking light / searchlight	
	F018	5	Right parking light / searchlight	
	F019	7.5	Low beam (left)	
	F020	7.5	Low beam (right)	
	F021	7.5	High beam (left)	
	F022	7.5	High beam (right)	
	B	F023	3	Instrument panel / cabin controller
		F024	3	Buzzer / searchlight / immobiliser
		F025	20	Parking light / flasher
		F026	15	Horn / front wiper
		F027	10	Brake lights
		F028	3	Cabin controller
F029		15	Front working lights	
F030		15	Rear working light / reversing warning system	
F031		3	Coupling signal / telematic power supply / diagnostic power supply / quick-itch lock	
F032		7.5	Steering controller	
F033		10	Drive controller	
F034		15	Front power outlet	
F035		25	Heating / air conditioning	
F036		–	empty	
F037		7.5	Radio	
F038		20	Operator seat	

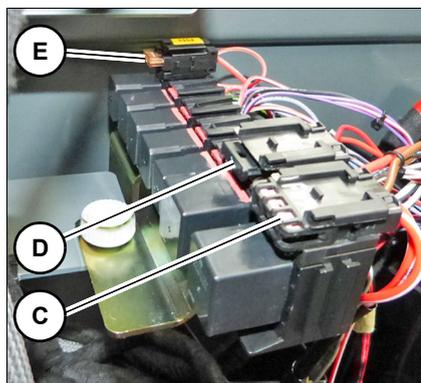
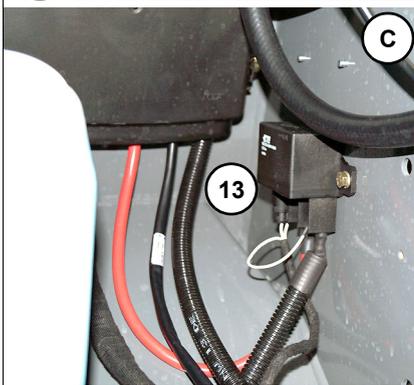
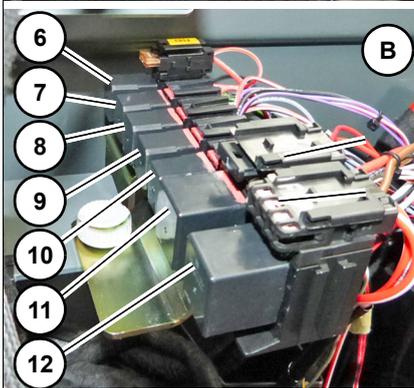
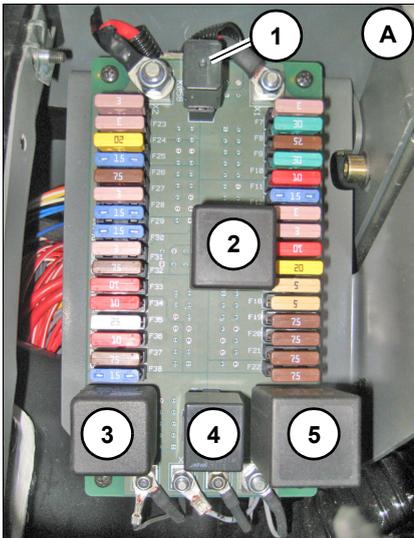


Fig. 291

Fuses behind control panel on the right

Pos.	Fuse	Rated current (A)	Protected circuit
C	F050	3	Powerflow plus
D	F040	1	Telematic
E	F053	5	Tilt sensor

Switching relay assignment



The relays (figure **A** and **B**) are located under the switch console in the cabin, and in the engine compartment beside the main fuse box (figure **C**).

Pos.	Switching relay no.	Protected circuit
1	K058	1st/2nd speed switching relay
2	K010	Turn indicator relay
3	K025	Intermittent-wipe switching relay
4	K023	Switching relay for wiper
5	B018	Buzzer
6	K124	Tilt sensor
7	K030	Brake lights switching relay
8	K003	Reversing switching relay (reversing alarm)
9	K016	Front power outlet switching relay
10	K106	Start interlock
11	K033	Rear window heating high current relay
12	K107	Powerflow plus switching relay
13	K005	Preheating high current relay (70 A)

Fig. 292

9.9 Tightening torques

General tightening torques

Screw dimensions	Tightening torques ¹		
	8.8	10.9	12.9
M4	3 Nm (2.2 ft.lbs.)	4 Nm (2.9 ft.lbs.)	5 Nm (3.7 ft.lbs.)
M5	5,5 Nm (4.1 ft.lbs.)	8 Nm (5.9 ft.lbs.)	10 Nm (7.4 ft.lbs.)
M6	10 Nm (7.4 ft.lbs.)	14 Nm (10.3 ft.lbs.)	16 Nm (11.8 ft.lbs.)
M8	23 Nm (17 ft.lbs.)	34 Nm (25.1 ft.lbs.)	40 Nm (29.5 ft.lbs.)
M10	46 Nm (33.9 ft.lbs.)	67 Nm (49.4 ft.lbs.)	79 Nm (58.2 ft.lbs.)
M12	79 Nm (58.2 ft.lbs.)	115 Nm (84.8 ft.lbs.)	135 Nm (99.5 ft.lbs.)
M14	125 Nm (92.1 ft.lbs.)	185 Nm (136 ft.lbs.)	220 Nm (162 ft.lbs.)
M16	195 Nm (144 ft.lbs.)	290 Nm (214 ft.lbs.)	340 Nm (251 ft.lbs.)
M18	280 Nm (206 ft.lbs.)	400 Nm (295 ft.lbs.)	470 Nm (346 ft.lbs.)
M20	395 Nm (291 ft.lbs.)	560 Nm (413 ft.lbs.)	660 Nm (486 ft.lbs.)
M22	540 Nm (398 ft.lbs.)	760 Nm (560 ft.lbs.)	890 Nm (656 ft.lbs.)
M24	680 Nm (501 ft.lbs.)	970 Nm (715 ft.lbs.)	1150 Nm (848 ft.lbs.)
M27	1000 Nm (737 ft.lbs.)	1450 Nm (1069 ft.lbs.)	1700 Nm (1253 ft.lbs.)
M30	1350 Nm (995 ft.lbs.)	1950 Nm (1437 ft.lbs.)	2300 Nm (1695 ft. lbs.)

1. These values are valid for screws with untreated, non-lubricated surfaces.

Specific tightening torques

Designation	Tightening torque
Wheel nut	390 \pm 10 Nm (287 \pm 7 ft.lbs.)



9.10 Coolant

Outside temperature	Water ¹	Antifreeze
Up to °C (°F)	% by volume	% by volume
-22 (-7.6)	65	35
-28 (-18.4)	60	40
- 35 (-31)	55	45
- 41 (-41.8)	50	50

1. Water quality = 6.5–8.5 pH/total hardness 3–20 °dGH
(do not use salt, lake, river, brackish or industrial water)

9.11 Noise emissions

Noise levels (self-propelled work machines)

Outside noise level			
Wheel loader/ model	Diesel engine	Sound power level	dB(A)
351-04S / 351-04L	YANMAR 4TNV 88	Measured value	100
		Guaranteed value	101
351-05S / 351-05L 351-06S / 351-06L	DEUTZ TCD 2.9	Measured value	100
		Guaranteed value	101
Operator-perceived noise level			
Wheel loader/ model	Diesel engine	Sound pressure level	dB(A)
351-04S / 351-04L	YANMAR 4TNV 88	Measured value	77
351-05S / 351-05L 351-06S / 351-06L	DEUTZ TCD 2.9	Guaranteed value	77



Information

As per the requirements of norm DIN EN 474-1
and the guideline 200/14/EC
Measurements performed on asphalted surface



9.12 Vibration

Vibration ^{1, 2}	
Overall vibration value for upper extremities of the body	$< 2.5 \frac{m}{s^2}$
Maximum effective value of weighted acceleration for body	$< 0.5 \frac{m}{s^2}$

1. Instruct or inform the operator of danger arising from vibrations
2. Uncertainty of measurement of the vibration measurement according to DIN EN 474-1:2014-03 and EN 12096:1997

9.13 Weight

Weights	351-04S / 351-04L	351-05S / 351-05L	351-06S / 351-06L
Kerb weight ¹	4300 kg (9479.7 lb)	4750 kg (10471.8 lb)	4990 kg (11000.8 lb)
Permissible maximum weight	6500 kg (14329.8 lb)		
Gross axle weight rating in front ²	4000 kg (8818.3 lb)		
Rear axle weight rating ²			
Front axle weight rating ³	4000 kg (8818.3 lb)	4240 kg (9347.4 lb)	
Rear axle weight rating ³			

1. With bucket, operator and full fuel tank
2. National Type Approval (Germany)
3. EC licence for agricultural and forestry applications



9.14 Payload/lift capacity/stability

Payload with bucket KRAMER quickhitch

Bucket ¹	Model 351-04S	Model 351-05S	Model 351-06S
Loader unit standard (S)			
Bucket capacity ²	0,5 / 0,75 (17.65 / 26.84)	0,65 / 0,85 (22.95 / 30.02)	0,7 / 0,95 (24.72 / 33.54)
Tilt load: kg (lb) ³	2700 / 3500 (5962.4 / 7716.0)	3060 / 3650 (6746.03 / 8046.7)	3420 / 3890 (7539.7 / 8575.8)
Payload: kg (lb)	1350 (2976.2)	1530 (3373.0)	1710 (3769.8)
Breakout force: kN (lbf) ⁴ lift ram	33.9 / 34 (7621.0 / 7643.5)	34,2 / 43,0 (7688.7 / 9666.7)	36,1 / 42,8 (8115.6 / 9621.8)
Breakout force: kN (lbf) tilt ram	31,8 (7148.9)	42,6 (9576.8)	41,1 (9239.6)
Scraping depth: mm (in)	50 (1.96) ⁵	60 (2.36) ⁶	100 (3.93) ⁶

1. With standard bucket and standard loader unit S (standard)
2. Capacity struck according to ISO 7546/capacity heaped
3. Required/actual tilt load
4. Breakout force (kN): mechanical/hydraulic
5. With tyres 12.5-18
6. With tyres 12.5-20

Bucket ¹	Model 351-04L	Model 351-05L	Model 351-06L
Loader unit extended (L)			
Bucket capacity ²	0,5 / 0,75 (17.65 / 26.84)	0,5 / 0,75 (17.65 / 26.84)	0,65 / 0,85 (22.95 / 30.02)
Tilt load: kg (lb) ³	2700 / 3100 (5962.4 / 6834.20)	2700 / 3000 (5962.4 / 6613.7)	3060 / 3240 (6746.03 / 7142.8)
Payload: kg (lb)	1350 (2976.2)	1350 (2976.2)	1530 (3373.0)
Breakout force: kN (lbf) ⁴ lift ram	31,6 / 42,9 (7103.9 / 9644.3)	27,3 / 44,4 (6137.3 / 9981.5)	29,5 / 44,4 (6631.8 / 9981.5)
Breakout force: kN (lbf) : tilt ram	46.4 (10431.1)	42,9 (9644.3)	42,7 (9599.3)
Scraping depth: mm (in)	100 (3.93) ⁵	30 (1.18) ⁶	30 (1.18) ⁶

1. With standard bucket and extended loader unit L (option)
2. Capacity struck according to ISO 7546/capacity heaped
3. Required/actual tilt load
4. Breakout force (kN): mechanical/hydraulic
5. With tyres 12.5-18
6. With tyres 12.5-20

Payload with bucket VOLVO quickhitch

Payload ¹	351-05S	351-06S
Bucket capacity ²	0,75 / 0,9 (24.72) / (31.78)	0,8 / 0,95 (28.25) / (33.54)
Tilt load: kg (lb) ³	3240 / 3340 (7142.8 / 7363.3)	3420 / 3630 (7539.7 / 8002.6)
Payload: kg (lb)	1620 (3571.4)	1710 (3769.8)
Breakout force: kN (lbf) ⁴ lift ram	31,4 / 41,4 (7059.0 / 9239.6)	34,4 / 41,4 (7733.4 / 9239.6)
Breakout force: kN (lbf) tilt ram	34,9 (7845.8)	37,9 (8520.2)
Scraping depth: mm (in)	40 (1.57)	

1. With standard bucket and standard loader unit S (standard)
2. Capacity struck according to ISO 7546/capacity heaped
3. Required/actual tilt load
4. Breakout force (kN): mechanical/hydraulic

Payload with pallet forks KRAMER quickhitch

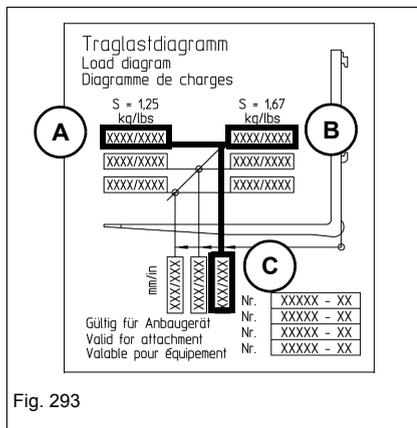


Fig. 293

Payload ¹	351-04S	351-04L	351-05S	351-05L	351-06S	351-06L
Payload (A) safety factor 1.25	2000 kg (4409.1 lb)	1900 kg (4188.7 lb)	2150 kg (4739.8 lb)	2000 kg (4409.2 lb)	2300 kg (5070.5 lb)	2000 kg (4409.1 lb)
Payload (B) safety factor 1.67	1500 kg (3306.9 lb)	1400 kg (3086.4 lb)	1600 kg (3527.3 lb)	1500 kg (3306.9 lb)	1700 kg (3747.7 lb)	1500 kg (3306.9 lb)
Movable payload ² in transport position: safety factor 1.25	2400 kg (5291.0 lb)	2300 kg (5070.5 lb)	2600 kg (5731.9 lb)	2300 kg (5070.5 lb)	2750 kg (6062.6 lb)	2400 kg (5291.0 lb)
Movable payload ² in transport position: safety factor 1.67	1800 kg (3968.2 lb)	1700 kg (3747.8 lb)	1950 kg (4298.9 lb)	1700 kg (3747.8 lb)	2060 kg (4541.4 lb)	1800 kg (3968.2 lb)

1. Loader unit in horizontal position, load distance (C) 500 mm (19.68 in)
2. The movable payload is only authorized in transport position of the loader unit, and is not specified in the load diagram.

Payload with pallet forks VOLVO quickhitch

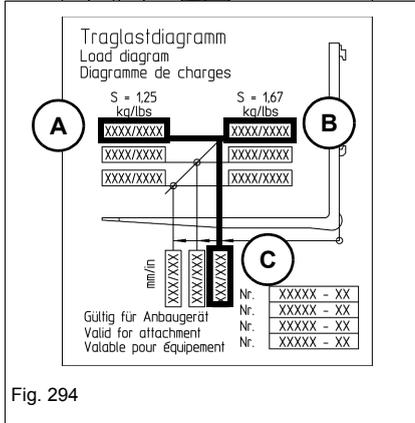


Fig. 294

Payload ¹	351-05S	351-06S
Payload (A) safety factor 1.25	2100 kg (4,29.6 lb)	2250 kg (4960.3 lb)
Payload (B) safety factor 1.67	1500 kg (3306.9 lb)	1680 kg (3703.7 lb)
Movable payload ² in transport position: safety factor 1.25	2600 kg (5731.9 lb)	2800 kg (6172.8 lb)
Movable payload ² in transport position: safety factor 1.67	1900 kg (4188.7 lb)	2100 kg (4629.6 lb)

1. Loader unit in horizontal position, load distance (C) 500 mm (19.68 in)
2. The movable payload is only authorized in transport position of the loader unit, and is not specified in the load diagram.

Payload with pallet forks (foldable fork arms) (KRAMER quickhitch) (option)

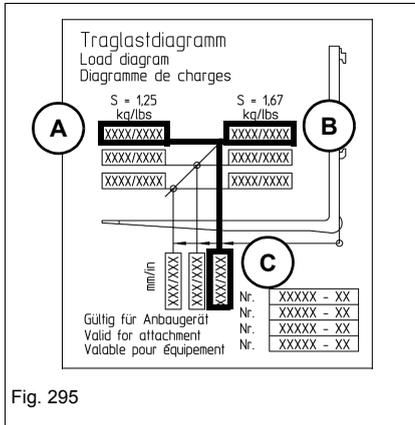


Fig. 295

Payload ¹	351-04S	351-04L	351-05S	351-05L	351-06S	351-06L
Payload (A) safety factor 1.25	2000 kg (4409.1 lb)	1900 kg (4188.7 lb)	2150 kg (4739.8 lb)	1800 kg (3968.2 lb)	2300 kg (5070.5 lb)	2000 kg (4409.1 lb)
Payload (B) safety factor 1.67	1500 kg (3306.9 lb)	1400 kg (3086.4 lb)	1600 kg (3,27.3 lb)	1300 kg (2865.9 lb)	1700 kg (3747.7 lb)	1500 kg (3306.9 lb)
Movable payload ² in transport position: safety factor 1.25	2400 kg (5291.0 lb)	2300 kg (5070.5 lb)	2600 kg (5731.9 lb)	2100 kg (4629.6 lb)	2750 kg (6062.6 lb)	2400 kg (5291.0 lb)
Movable payload ² in transport position: safety factor 1.67	1800 kg (3968.2 lb)	1700 kg (3747.8 lb)	1950 kg (4298.9 lb)	1500 kg (3306.9 lb)	2060 kg (4541.4 lb)	1800 kg (3968.2 lb)

1. Loader unit in horizontal position, load distance (C) 500 mm (19.68 in)
2. The movable payload is only authorized in transport position of the loader unit, and is not specified in the load diagram.



Trailer weight/drawbar load: trailer couplings (option)

Agricultural and forestry tractors Directive 2003/37 EC	Gross trailer weight rating ¹	Gross drawbar load rating
Trailer without brakes	750 kg (1653.4 lb)	500 kg ² (1102.2 lb)
Trailer with brakes (1 axle – braked with overrun or hydraulic brake)	3500 kg (7716.0 lb)	
Trailer with brakes ³ (all axles – braked with overrun or hydraulic brake)	8000 kg (17636.6 lb)	
Ball ⁴	3500 kg (7716.0 lb)	250 kg (551.1 lb)
For the control mark, refer to the machine documentation and the type label on the trailer coupling		
Towing gear	Only certified for towing the machine Not certified for trailer operation	

1. Bucket certified for travel on public roads must be fitted during trailer operation. D-value of trailer coupling ≥ 45.8
2. In consideration of the axle loads and the overall weight of the wheel loader (see EC Certificate of Conformity)
3. In connection with height-adjustable trailer coupling, install only in lowest position. Do not install the trailer coupling in the position of the towing facility.
4. See also indications on type label. Only in connection with height-adjustable drawbar.

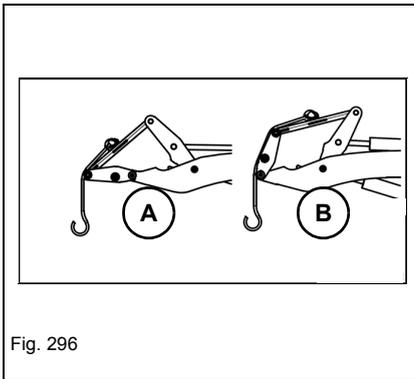
Payload with load hook on KRAMER quickhitch (option)


Fig. 296

Payload¹	351-04S	351-04L	351-05S	351-05L	351-06S	351-06L
A) Payload with extended loader unit and quickhitch	1500 kg (3306.8 lb)	1350 kg (2976.2 lb)	1550 kg (3417.1 lb)	1400 kg (3086.4 lb)	1700 kg (3747.7 lb)	1450 kg (3196.6 lb)
B) Payload with extended loader unit and quickhitch tilted in	2000 kg (4409.1 lb)	1700 kg (3747.8 lb)	2050 kg (4519.4 lb)	1850 kg (4078.5 lb)	2200 kg (4850.1 lb)	1850 kg (4078.5 lb)

 1. Payloads apply *with* lifting gear (chains, cables, towing gear)

Payload with load hook on VOLVO quickhitch (option)

Payload¹	351-05S	351-06S
A) Payload with extended loader unit and quickhitch	1600 kg (3527.3 lb)	1650 kg (3637.5 lb)
B) Payload with extended loader unit and quickhitch tilted in	2050 kg (4519.4 lb)	2100 kg (4629.7 lb)

 1. Payloads apply *with* lifting gear (chains, cables, towing gear)

9.15 Dimensions

DIN/EN – American measures

Volume	
1 l	2.1 pts (pints)
1 l	1.06 qts (quarts)
1 l	0.26 gals (gallons)
1 cm ³	0.0611 cu. in. (cubic inch)
Length indications	
1 mm	0.03937 in (inches)
1 m (metre)	3.281 feet
1 m (metre)	1.0936 yards
1 km (kilometer)	0.622 mile
1 mile	1.607 km (kilometer)
Mass (weights)	
1 kp/cm ² (kilopond/cm ²)	2.2 lbs
1 kg (kilogram)	2.205 lbs (pounds)
1 g (gram)	0.035 oz (ounces)
Torques	
1 Nm (Newton metre)	0.737 ft/lbs (foot-pounds)
Pressure	
1 bar	14.29 psi
Force/output	
1 PS (horsepower) 0.735 kW (kilowatts)	0.985 hp (horsepower)



Dimensions with KRAMER bucket (model 351-04S / 351-04L)

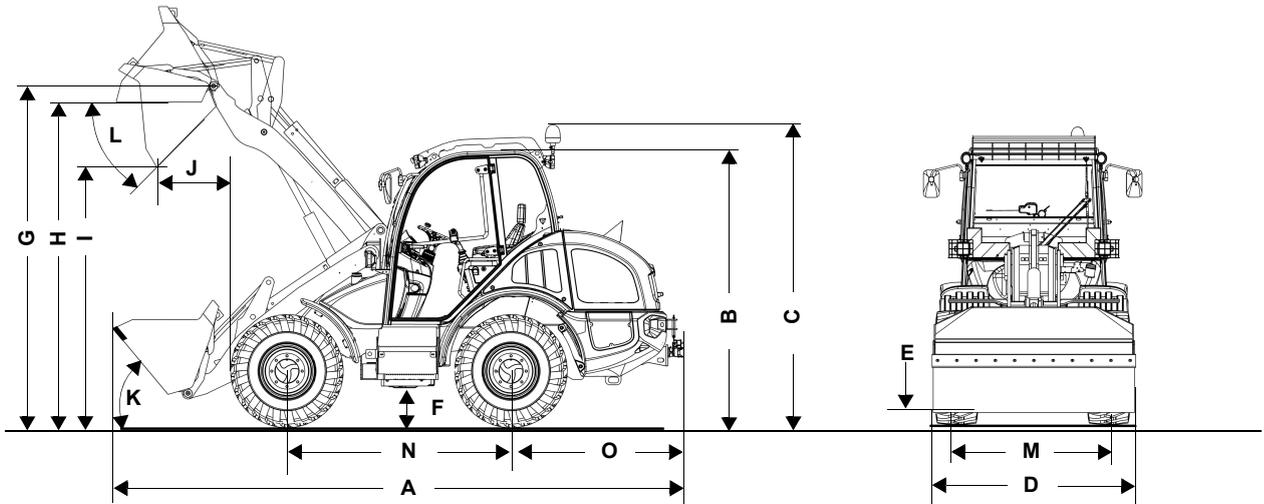


Fig. 297

Dimensions with bucket		Model 351-04S	Model 351-04L
A	Overall length ¹	5080 mm (200.0 in)	5180 mm (203.9 in)
B	Overall height ^{2, 3}	2450 mm (96.45 in)	
C	Overall height with rotating beacon ²	2680 mm (105.51 in)	
D	Overall width without bucket ^{2, 4}	1720 mm (67.71 in)	
D	Overall width with bucket ¹	1750 mm (68.89 in)	
E	Ground clearance in transport position of loader unit	250 mm (9.84 in)	
F	Ground clearance ² under gearbox	300 mm (11.81 in)	
G	Pin height	3065 mm (120.66 in)	3260 mm (128.34 in)
H	Load-over height	2915 mm (114.76 in)	3110 mm (122.44 in)
I	Tilt-out height	2400 mm (94.48 in)	2595 mm (102.16 in)
J	Tilt reach	650 mm (25.59 in)	630 mm (24.80 in)
K	Tilt-in angle	50°	
L	Tilt-out angle	45°	
M	Front/rear track width	1400 mm (55.11 in)	
N	Front/rear axles	2020 mm (79.52 in)	
O	Rear axle – rear end of machine	1490 mm (58.66 in)	
P	Front axle – bucket	1570 mm (61.81 in)	1670 mm (65.74 in)
-	Turning radius ^{2, 5}	2900 mm (114.17 in)	

1. With standard bucket
2. With tyres 12.5-18
3. 2560 mm (100.78 in) with FOPS protective grating (option)
4. With outside mirrors folded in
5. Measured at outer edge of wheel

Dimensions with KRAMER bucket (model 351-05S / 351-05L)

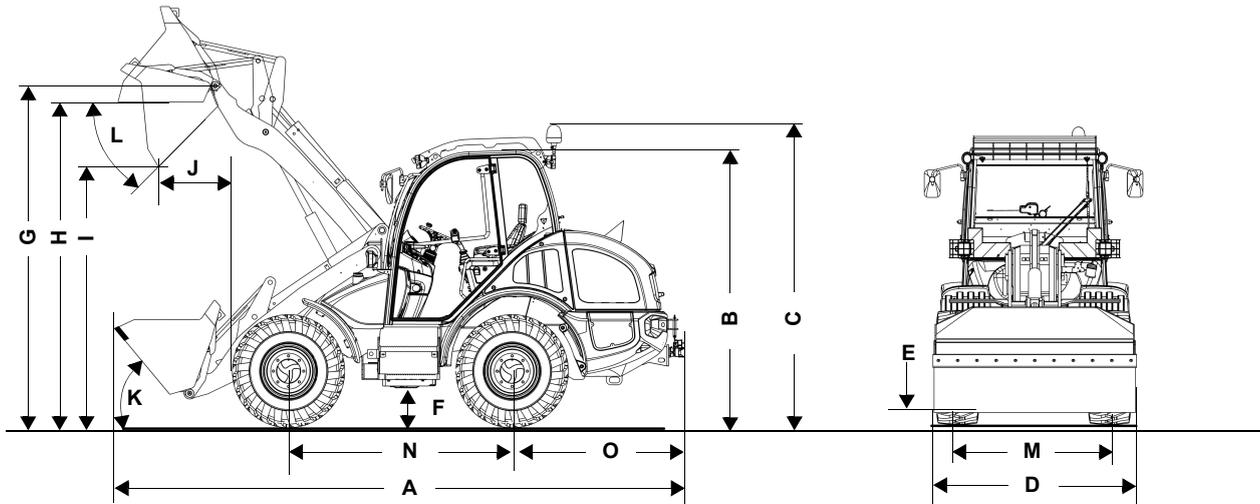


Fig. 298

Dimensions with bucket		Model 351-05S	Model 351-05L
A	Overall length ¹	5280 mm (207.87 in)	5600 mm (220.47 in)
B	Overall height ^{2, 3}	2480 mm (97.63 in)	
C	Overall height with rotating beacon ²	2710 mm (106.69 in)	
D	Overall width without bucket ^{2, 4}	1780 mm (70.10 in)	
D	Overall width with bucket ¹	1850 mm (72.83 in)	
E	Ground clearance in transport position of loader unit	250 mm (9.84 in)	
F	Ground clearance under gearbox ²	330 mm (12.99 in)	
G	Pin height	3290 mm (129.52 in)	3550 mm (139.76 in)
H	Load-over height	3140 mm (123.62 in)	3400 mm (133.85 in)
I	Tilt-out height	2560 mm (100.78 in)	2850 mm (112.20 in)
J	Tilt reach	635 mm (25.0 in)	730 mm (28.74 in)
K	Tilt-in angle	50°	
L	Tilt-out angle	45°	
M	Front/rear track width	1400 mm (55.11 in)	
N	Front/rear axles	2020 mm (79.52 in)	
O	Rear axle – rear end of machine	1490 mm (58.66 in)	
P	Front axle – bucket	1770 mm (79.92 in)	2090 mm (82.28 in)
–	Turning radius ^{2, 5}	2900 mm (114.17 in)	

1. With standard bucket
2. With tyres 12.5-20 MPT-04
3. 2590 mm (101.96 in) with FOPS protective grating (option)
4. With outside mirrors folded in
5. Measured at outer edge of wheel



Dimensions with KRAMER bucket (model 351-06S / 351-06L)

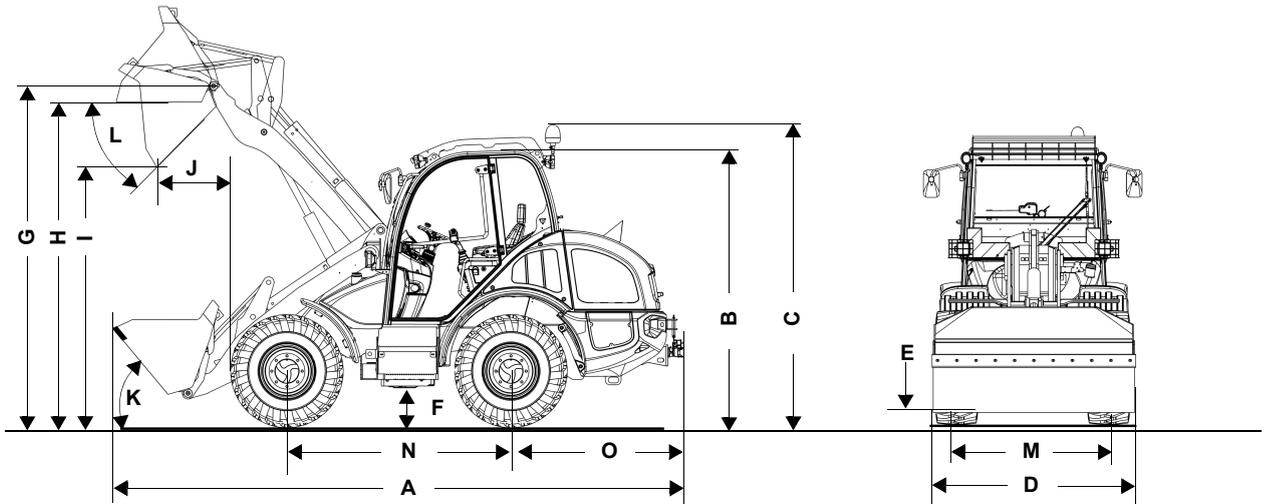


Fig. 299

Dimensions with bucket		Model 351-06S	Model 351-06L
A	Overall length ¹	5410 mm (212.99 in)	5650 mm (222.44 in)
B	Overall height ^{2, 3}	2480 mm (97.63 in)	
C	Overall height with rotating beacon ²	2710 mm (106.69 in)	
D	Overall width without bucket ^{2, 4}	1780 mm (70.10 in)	
D	Overall width with bucket ¹	1950 mm (76.77 in)	
E	Ground clearance in transport position of loader unit	250 mm (9.84 in)	
F	Ground clearance under gearbox ²	330 mm (12.99 in)	
G	Pin height	3290 mm (129.52 in)	3550 mm (139.76 in)
H	Load-over height	3140 mm (123.62 in)	3400 mm (133.85 in)
I	Tilt-out height	2560 mm (100.78 in)	2850 mm (112.20 in)
J	Tilt reach	635 mm (25.0 in)	730 mm (28.74 in)
K	Tilt-in angle	50°	
L	Tilt-out angle	45°	
M	Front/rear track width	1400 mm (55.11 in)	
N	Front/rear axles	2020 mm (79.52 in)	
O	Rear axle – rear end of machine	1490 mm (58.66 in)	
P	Front axle – bucket	1900 mm (74.80 in)	2140 mm (84.25 in)
-	Turning radius ^{2, 5}	2900 mm (114.17 in)	

1. With standard bucket
2. With tyres 12.5-20
3. 2590 mm (101.96 in) with FOPS protective grating (option)
4. With outside mirrors folded in
5. Measured at outer edge of wheel

Dimensions with VOLVO bucket (model 351-05S)

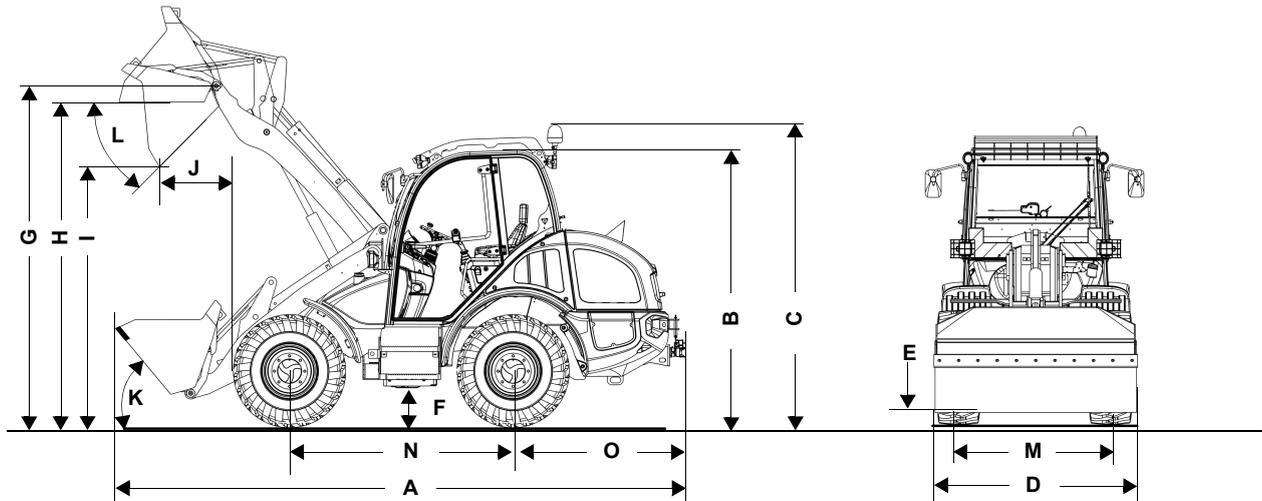


Fig. 300

Dimensions with bucket		Model 351-05S
A	Overall length ¹	5410 mm (212.99 in)
B	Overall height ^{2, 3}	2480 mm (97.63 in)
C	Overall height with rotating beacon ²	2710 mm (106.69 in)
D	Overall width without bucket ^{2, 4}	1780 mm (70.10 in)
D	Overall width with bucket ¹	1850 mm (72.83 in)
E	Ground clearance in transport position of loader unit	250 mm (9.84 in)
F	Ground clearance under gearbox ²	330 mm (12.99 in)
G	Pin height	3290 mm (129.52 in)
H	Load-over height	3120 mm (122.83 in)
I	Tilt-out height	2500 mm (98.42 in)
J	Tilt reach	590 mm (23.22 in)
K	Tilt-in angle	50°
L	Tilt-out angle	45°
M	Front/rear track width	1400 mm (55.11 in)
N	Front/rear axles	2020 mm (79.52 in)
O	Rear axle – rear end of machine	1490 mm (58.66 in)
P	Front axle – bucket	1900 mm (74.80 in)
-	Turning radius ^{2, 5}	2900 mm (114.17 in)

1. With standard bucket
2. With tyres 12.5-20
3. 2590 mm (101.96 in) with FOPS protective grating (option)
4. With outside mirrors folded in
5. Measured at outer edge of wheel

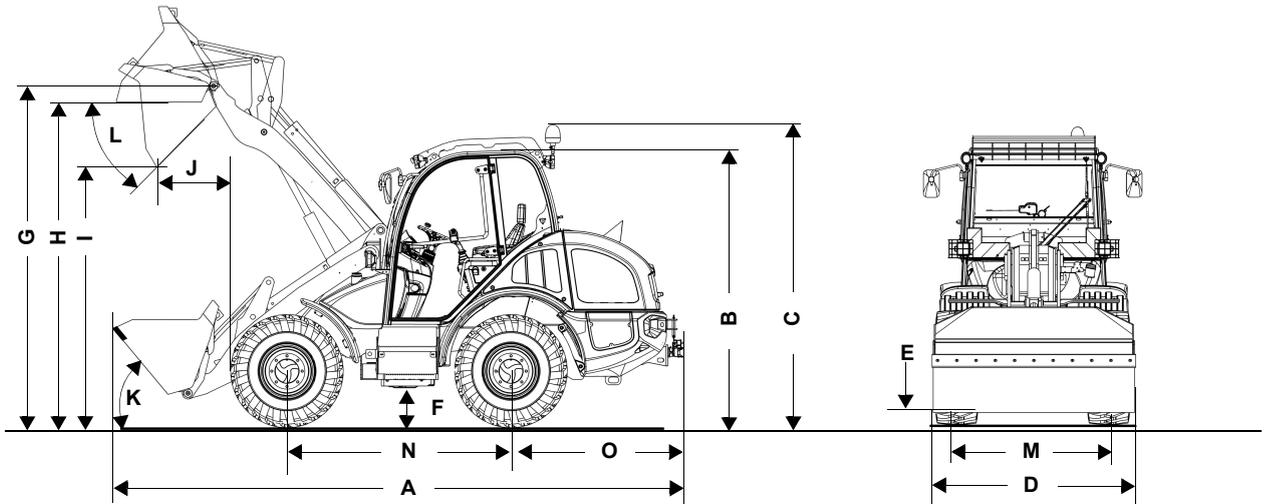
Dimensions with VOLVO bucket (model 351-06S)


Fig. 301

Dimensions with bucket		Model 351-06S
A	Overall length ¹	5460 mm (214.96 in)
B	Overall height ^{2, 3}	2480 mm (97.63 in)
C	Overall height with rotating beacon ²	2710 mm (106.69 in)
D	Overall width without bucket ^{2, 4}	1780 mm (70.10 in)
D	Overall width with bucket ¹	2050 mm (80.70 in)
E	Ground clearance in transport position of loader unit	250 mm (9.84 in)
F	Ground clearance under gearbox ²	330 mm (12.99 in)
G	Pin height	3290 mm (129.52 in)
H	Load-over height	3120 mm (122.83 in)
I	Tilt-out height	2530 mm (99.60 in)
J	Tilt reach	680 mm (26.77 in)
K	Tilt-in angle	44°
L	Tilt-out angle	42°
M	Front/rear track width	1400 mm (55.11 in)
N	Front/rear axles	2020 mm (79.52 in)
O	Rear axle – rear end of machine	1490 mm (58.66 in)
P	Front axle – bucket	1950 mm (76.77 in)
–	Turning radius ^{2, 5}	2900 mm (114.17 in)

1. With standard bucket
2. With tyres 12.5-20
3. 2590 mm (101.96 in) with FOPS protective grating (option)
4. With outside mirrors folded in
5. Measured at outer edge of wheel

Dimensions with KRAMER pallet forks

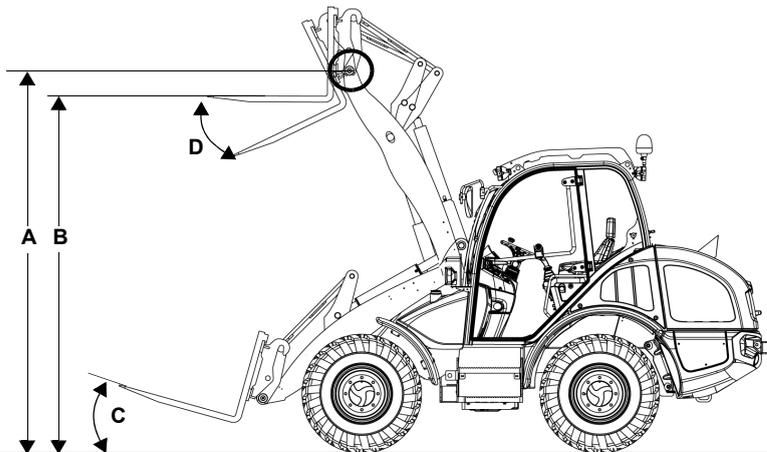


Fig. 302

Dimensions with pallet forks		Type	Dimension
A	Pin height	351-04S	3065 mm (120.66 in) ¹
		351-04L	3260 mm (128.34 in) ¹
		351-05S / 351-06S	3290 mm (129.52 in) ²
		351-05L / 351-06L	3550 mm (139.76 in) ²
B	Pallet height	351-04S	2800 mm (110.23 in) ¹
		351-04L	2995 mm (117.91 in) ¹
		351-05S / 351-06S	3040 mm (119.68 in) ²
		351-05L / 351-06L	3300 mm (129.92 in) ²
C	Tilt-in angle in transport position		17°
D	Tilt-out angle		85°

1. With tyres 12.5-18
 2. With tyres 12.5-20

Other information

– see “Dimensions with KRAMER bucket (model 351-04S / 351-04L)” on page 9-27,

– see “Dimensions with KRAMER bucket (model 351-05S / 351-05L)” on page 9-28,

– see “Dimensions with KRAMER bucket (model 351-06S / 351-06L)” on page 9-29.

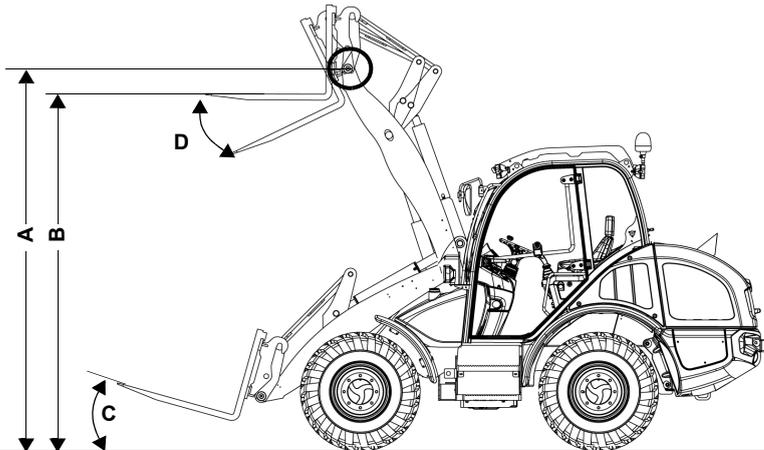
Dimensions with VOLVO pallet forks


Fig. 303

Dimensions with pallet forks	Model 351-05S / 351-06S
A Pin height	3290 mm (129.52 in) ¹
B Pallet height	3200 mm (125.98 in)
C Tilt-in angle in transport position	16°
D Tilt-out angle	70°

1. With tyres 12.5-20

Other information

- see “Dimensions with VOLVO bucket (model 351-05S)” on page 9-30,
- see “Dimensions with VOLVO bucket (model 351-06S)” on page 9-31.



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