KÄRCHER

OPERATING INSTRUCTIONS

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Foreword

Kärcher Municipal GmbH would like to thank you for purchasing a vehicle from our company and wishes you a safe journey at all times.

Please read these operating instructions carefully before using your multifunctional equipment carrier for the first time so that you can fully utilise its performance potential. These operating instructions contain important information on the operation, use and maintenance of your vehicle.

For the sole purpose of better readability, gender-specific spelling and multiple designations have been omitted. All personal designations should nevertheless be regarded as gender-neutral.

On-board literature

The following documents are always supplied with the vehicle as on-board literature:

- Operating instructions with maintenance schedule
- Service handbook

In addition, further descriptions, such as e.g. supplements to the operating instructions, can also be found in the on-board literature.

All on-board literature must always be kept at hand in the vehicle so that it is available to every user and operator. It must be handed over to any other owner, as it is a necessary component of the vehicle.

Operating instructions

These operating instructions are an integral part of the vehicle and must remain with the vehicle. If you have lost the operating instructions, order a replacement immediately by contacting your service partner or Kärcher Municipal GmbH.
If you sell your vehicle, you must hand over these operating instructions to the new owner. Obtain written confirmation that the operating instructions have been handed over to the new owner and keep this proof.

These operating instructions describe all possible equipment variants, not all of which are necessarily available in your vehicle.
The scope of equipment of your vehicle is based on your purchase contract for the vehicle. Further information is available from your service partner.

The illustrations contained in these operating instructions are only to be understood as basic illustrations, as they may differ from your vehicle in individual details or only show one of the possible vehicle and equipment variants.
No claims can be inferred from the figures, specifications and/or descriptions in these operating instructions.

Directional indications such as “left” and “right” are always to be understood in the travel direction of the vehicle is travelling, unless a different view is expressly described.
Rotation directions such as “clockwise” are to be understood from the operator's point of view, unless a different view is expressly described.

As we incorporate new developments and improvements into the production of our vehicles as quickly as possible, it is possible that one or two details in the operating instructions may appear out of date. In this case, please do not hesitate to contact your responsible service partner, who has access to the most up-to-date information.

Service handbook

The service booklet is only an original document if a vehicle-specific inspection label is affixed to it. Keep your vehicle's service booklet in a safe place.

The service handbook documents the service and maintenance work carried out, as well as evidence of the corrosion protection carried out.
The maintenance work documented with the stamp and signature of your service partner secures your warranty claims and product liability claims.

Table of Contents

1 Safety instructions

The operating instructions are a component of the vehicle. To ensure proper and safe use of the vehicle, read these operating instructions and act accordingly.

- Read the operating instructions completely before working with this vehicle.
- Read and follow the operating instructions and observe the information in the “Safety instructions” chapter.
- Keep the operating instructions in the vehicle for future reference and pass them on to a subsequent owner of the vehicle.
- Add any supplement published by Kärcher Municipal GmbH, such as enclosed supplementary sheets, to these operating instructions.
- Handle the operating instructions with care. Do not remove any pages or make any parts illegible.

Read these operating instructions before using your vehicle for the first time. Pay particular attention to the information in the “Safety instructions” chapter and read this chapter from start to finish.
Before carrying out a handling instruction, read the relevant warnings that precede it.
Follow this information and act accordingly.

In addition to these operating instructions, reference is made to other generally applicable safety regulations.

Store these operating instructions for later use, for the instruction of new operating personnel or for subsequent owners.

Where these operating instructions refer to attachments [1] or attached containers [2], this includes attachments that can be mounted at the front or rear, or containers that are designed to hold various media or serve as fresh water tanks and can be mounted on the vehicle behind the driver cabin.

1.1 Operating instructions: Obligation to read

The operating instructions are a component of the vehicle. To ensure proper and safe use of the vehicle, read these operating instructions and act accordingly.

- Read the operating instructions completely before working with this vehicle.
- Read and follow the operating instructions and observe the information in the “Safety instructions” chapter.
- Keep the operating instructions in the vehicle for future reference and pass them on to a subsequent owner of the vehicle.
- Add any supplement published by Kärcher Municipal GmbH, such as enclosed supplementary sheets, to these operating instructions.
- Handle the operating instructions with care. Do not remove any pages or make any parts illegible.

1 *option*
2 *option*

The illustrations in these operating instructions do not show a specific vehicle.

– Depending on the variant, the illustrations may differ from the actual equipment of your vehicle.
– The illustrations in these operating instructions should be understood as examples.

1.2 Before using the vehicle

The operating instructions are a component of the vehicle. To ensure proper and safe use of the vehicle, read these operating instructions and act accordingly.

– Read the operating instructions completely before working with this vehicle.
– Read and follow the operating instructions and observe the information in the “Safety instructions” chapter.
– Keep the operating instructions in the vehicle for future reference and pass them on to a subsequent owner of the vehicle.
– Add any supplement published by Kärcher Municipal GmbH, such as enclosed supplementary sheets, to these operating instructions.
– Handle the operating instructions with care. Do not remove any pages or make any parts illegible.

Any person who is involved in the assembly, installation, initial startup, operation, maintenance, servicing and troubleshooting of the vehicle, the attachments and the attached containers, e.g.a waste container, must have read and understood the complete operating instructions and in particular the safety chapters for the vehicle and the attachments and attached containers before starting work of any kind.

The respective person must confirm this in writing with their signature and date. This confirmation must be stored safely.

1.3 Operating location | Road approval | Driving licence

Operating location

The vehicle may only be used outdoors and is intended for use in ambient temperatures from -20 °C to 40 °C (-4 °F to 104 °F).

The vehicle is designed for use on public roads and can be authorised by the relevant authorities in your country.

Road approval

The vehicle must conform to the nationally applicable regulations when used on public roads.

This also includes a licence plate requirement of the vehicle for clear identification on public roads. If you have any questions about road approval, please contact your service partner or the relevant authority in your country.

Observe the applicable national regulations for travelling on public roads.

Driving licence

When driving on public roads, ensure that the driver has a valid driving license for this vehicle. If you are unsure, please contact the authority responsible for this in your country.

It is prohibited to drive the vehicle on public roads and places without a valid driving licence for this vehicle.

1.4 Intended use

The vehicle is an equipment carrier (multifunctional system vehicle) designed for municipal use as a narrow-track vehicle with excellent manoeuvrability. The vehicle is primarily used as a sweeper (with attached brush sweeping system [1] and waste container [2]). The vehicle is also suitable for towing trailers, for a container attachment and for the use of various attachments. The maximum trailer load to be pulled is stated on the type plate and must not be exceeded. Passengers may only be transported if suitable and authorised seating is available.

The vehicle must be driven with appropriate care in road traffic. The instructed driver must decide which driving situations he/she can handle with the vehicle. This decision is at the sole discretion of the driver.

We would like to point out that an optional attachment, such as e.g.a brush sweeping system, and an installed container (especially when transporting liquids), changes the center of gravity of the vehicle and the driver must therefore take these changed boundary conditions into account through his/her driving style (speed, steering movements, curve radii, etc.).

A vehicle with an optionally attached brush sweeping system is designed exclusively for use in plant maintenance for sweeping (on hard surfaces such as asphalt, cobblestones, screed, concrete, etc.) and for transporting waste such ase.g. dirt, leaves, dust, paper, small branches, small fragments, grit, etc.

The vehicle may only be used for the intended use, as illustrated and described in these operating instructions. Intended use also includes regular cleaning of the vehicle, the attachments and installed containers, compliance with the prescribed maintenance intervals and the specified intervals for replacing all hydraulic hoses every 6 years (recommended: BG 12817 or DIN 20066).

The vehicle, the attachments and installed containers may only be used, maintained and serviced by persons familiar with these and who have been instructed on the dangers associated with these. The legally applicable general safety and accident prevention regulations must be adhered to.
All other safety regulations, occupational health care regulations and road traffic regulations must also be adhered to.

Symbols and signs on the vehicle, attachments and containers that are no longer legible or no longer present must be replaced. Please contact your service partner or Kärcher Municipal GmbH.
This also applies when replacing components, e.g.in the case of a new driver cabin due to damage to the original driver cabin, on which symbols and information notices were originally attached. These must be reattached to the new components in the same place.

The operating personnel must:

- Be physically and mentally suitable.
- Have been instructed in the handling of the vehicle and attachments.
- Have read and understood these operating instructions and the operating instructions for any attachments or towed machinery prior to starting work.
- Have provided the operating company with verification of capability to operate the vehicle.
- Be explicitly nominated to operate the vehicle by the operating company.

1 *option*
2 *option*

1.5 Unauthorised use

Any use other than the described intended use is unauthorised use. Any hazard caused by unauthorised use is the responsibility of the operator and not of Kärcher Municipal GmbH. The manufacturer is not responsible for any resultant damage. Use for other purposes than those described in these operating instructions is prohibited.
Transporting persons on the loading area or attachments is not allowed.

Never sweep or vacuum explosive liquids, inflammable gases or undiluted acids and solvents. These include petrol, paint thinners or heating oil, which can form explosive vapours or mixtures through suction air turbulence, also acetone, undiluted acids and solvents because these attack the materials used in the machine.

Never sweep and/or vacuum reactive metal dusts (e.g. aluminium, magnesium, zinc). In conjunction with highly alkaline or acidic detergents these generate explosive gases.

No smouldering or burning objects may be swept in or sucked in with the vehicle.

1.6 Human error

⚠ DANGER

Risk of accident with possible fatal consequences due to driving and operating errors under the influence of alcohol and other mind-altering substances.

Persons under the influence of alcohol, drugs (cannabis) and medication, are prohibited from carrying out work on and with the vehicle, attachments and container attachments (waste container) and are also prohibited from driving and operating the vehicle and its attachments and container attachments.

- Driving and operating errors can lead to serious accidents with fatal consequences for the driver himself as well as for uninvolved third parties in the vicinity of the vehicle due to a substance-induced change in perception.
- Persons who are under the influence of alcohol, mind-altering substances such as intoxicants or drugs, performance-enhancing substances and/or medication are prohibited from driving, operating, maintaining and repairing the vehicle, attachments and container attachments.
- This also applies to people who have undergone a general or local anesthetic in the last 24 hours, e.g. in the course of dental treatment.

All persons in the area of the vehicle and the attachments must be made aware of potential dangers.

Dangers could be:

- Human error due to failure to observe the safety instructions.
- Unexpected movements of the attachments and vehicle.
- Escaping operating materials due to leaks, bursting of pipes and containers etc.
- Risk of accident when driving, steering and braking as a result of unfavourable ground conditions such as slopes, slipperiness, unevenness or poor visibility etc.
- Fire and explosion hazard caused by the battery and voltage.

- Risk of poisoning from exhaust fumes.
- Risk of fire due to fuel and operating materials.

1.7 Foreseeable misuse

Comply with the applicable national regulations.
Any type of improper use is prohibited.
The operating personnel are liable for hazards resulting from incorrect use. Use for other purposes than those described in these operating instructions is prohibited.
No structural, design or other modifications may be made to the vehicle.
No safety devices may be deactivated, bypassed or switched off. Only use the vehicle with intact and complete safety equipment.

- Do not remain in the danger zone.
- Never operate the vehicle in potentially explosive environments.
- Never transport persons with the vehicle (except in the seats provided), on the loading area, on container attachments or other attachments.
- Do not use the vehicle in the forestry industry.
- Do not use the vehicle for dispersing insecticide, pesticide or fertiliser.
- The engine cover is not suitable as a cargo bed. Walking on the engine cover is prohibited.
- The vehicle is not a toy for children. Keep children away from the vehicle and the attachments. Do not leave children unattended in the vehicle interior.

1.8 Danger zones

⚠ WARNING

There is a risk of injury from crushing and trapping when operating the vehicle.

– No persons may be in the vicinity of the vehicle, the articulated joint and the attachments during operation.
– When using the vehicle as a tractor, make sure that there are no persons between the vehicle and the trailer during operation.

⚠ WARNING

Injuries and/or crushing due to unforeseeable movements of the vehicle, attachments and superstructures and in the articulation area.

– It is not permitted for third parties in particular to remain in the danger zones.

The operating and service personnel must ensure that no persons are present in the danger zones during operation.

The hazard zones of the vehicle, especially with attached implements, can vary significantly depending on the setting, speed, curve radii, etc.

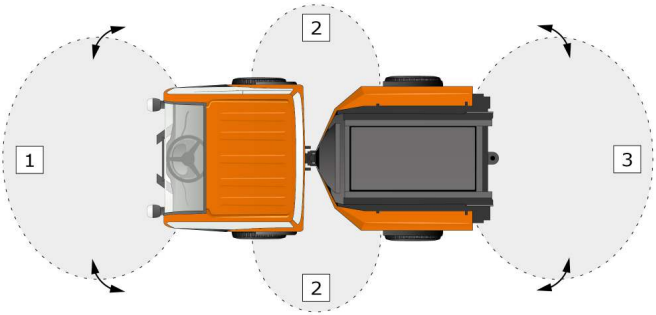


Fig. 1: Danger zones on vehicles with articulated steering

(1) Front mounting space
(2) Articulated area
(3) Rear mounting space

1.9 Equipment carrier

This vehicle is a multifunctional equipment carrier that allows various optional attachments to be mounted. Container attachments are also possible, for example for holding sweepings or as grit containers.

This vehicle is suitable for work applications using various attachments, as well as for towing braked and unbraked trailers.
The maximum trailer load to be towed is stated on the factory nameplate and must not be exceeded.

Only attachments approved by Kärcher Municipal GmbH may be used. Kärcher Municipal GmbH accepts no liability for accidents, material damage or malfunctions from non-approved attachments.

Observe the manufacturer's operating instructions for the attachments.

1.10 For the US state of California

CALIFORNIA Proposition 65 Warning

⚠ WARNING

Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

– Always start and operate the engine in a well-ventilated area.
– If you are in an enclosed area, discharge the exhaust air to the outside.
– Do not modify or manipulate the exhaust system.
– Only run the engine at idle speed if necessary.

Further information can be found at www.P65warnings.ca.gov/diesel.

⚠ WARNING

This product can expose you to chemicals such as benzene, which are known to the State of California to cause cancer, birth defects or other reproductive harm.

Among other uses, benzene is used in the production of cleaning agents, lubricants, coolants and other chemicals.

- Restrict any contact with media containing benzene and the resulting vapours.
- Ensure adequate ventilation when handling media containing benzene in an enclosed area.
- Where possible, do not use cleaning agents and other chemicals as additives in a fresh water tank.
- If you want to use well water to fill fresh water tanks, have this well water tested for benzene contamination before use.
  If your water comes from a public supplier, it is already regularly tested for benzene.

Further information can be found at www.P65warnings.ca.gov/benzene.

1.11 Warning and hazard notices, signal words

Preceding warning and hazard information

⚠ DANGER

Designates a danger with a high degree of risk, which will result in death or serious injuries if not avoided.

⚠ WARNING

Designates a danger with a moderate degree of risk, which may result in death or serious injuries if not avoided.

⚠ CAUTION

Designates a danger with a low degree of risk, which may result in death, moderate or minor injuries if not avoided.

NOTICE

Deals with damage to the environment and the vehicle as well as further information for the user.

Signal words for embedded warning and hazard information

⚠ DANGER Designates a danger with a high degree of risk, which will result in death or serious injuries if not avoided.

⚠ WARNING Designates a danger with a moderate degree of risk, which may result in death or serious injuries if not avoided.

⚠ CAUTION Designates a danger with a low degree of risk, which may result in death, moderate or minor injuries if not avoided.

NOTICE Deals with damage to the environment and the vehicle as well as further information for the user.

1.12 Symbols on the vehicle

All symbols and signs must be present, clean and in legible condition.

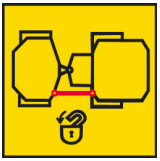
– Immediately replace illegible, lost or absent symbols and information notices. Please contact your service partner or Kärcher Municipal GmbH.

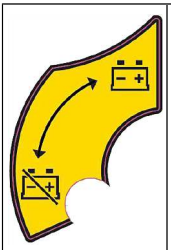
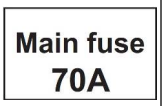
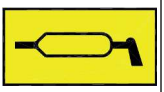
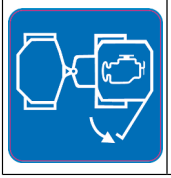
– When replacing components on which symbols or signs were attached, these symbols and information signs must be reattached to the replaced components.

	**⚠ WARNING Risk of tipping over.** Tip the waste container only on a level surface.
	**⚠ DANGER Risk of fire.** Do not sweep up burning or glowing objects, such as cigarettes, matches or similar.
	**⚠ DANGER Risk of tipping over.** Do not exceed the maximum side inclination of 10 % with the vehicle. Risk of tipping over. Do not exceed the maximum side inclination of 10 % with the vehicle.
	**⚠ DANGER Risk of damage.** Observe the maximum opening angle of the waste container.
	**⚠ DANGER Risk of crushing.** Keep your hands away from this area.
	**⚠ DANGER Risk of injury from rotating brushes.** Ensure that no persons are in the vicinity of the danger zone.

	**DANGER** **Access prohibited.** Tip the waste container only when nobody is in the danger zone.
	**DANGER** **Tipping prohibited.** Remove the sweeper body only when in the operating position.
	**CAUTION** **Risk of injury from the machine rolling away.** Always apply the parking brake when parking the machine with a running engine.
	**CAUTION** **Driving with a raised waste container is not possible.** The machine only drives when the waste container is retracted.
	**CAUTION** **Climbing prohibited.** Do not climb on the machine.
	**DANGER** **Risk of tipping over.** There is a risk of tipping due to a high centre of gravity, fast driving speed or rapid steering movement. See safety instructions for driving.
	**DANGER** **General warning symbol.** Please note the further information on this.
	**DANGER** **Risk of burns from hot surfaces.** Allow the vehicle and all components to cool down before working on it.

	**DANGER** **Risk of burns from hot surfaces.** Allow the components to cool down before working on them.
	**DANGER** **Risk of burns from a hot exhaust pipe.** Do not touch the exhaust pipe. Allow the exhaust pipe to cool down before working on it.
	**DANGER** **Risk of tipping over.** Only drive on terrain with a maximum lateral inclination of 10°.
	**DANGER** **Risk of injury due to spraying objects.** Keep a sufficient distance away from persons, animals and other objects.
	**DANGER** **Risk of crushing.** Make sure that there no persons are in the vicinity of the articulated joint or the vehicle during operation. When using the vehicle as a tractor, make sure that there are no persons between the vehicle and the trailer during operation.
	**DANGER** **Risk of injury from rotating parts.** Do not open the hood until the engine has come to a standstill.
	**DANGER** **Risk of injury due to unauthorised use.** Switch off the engineand remove the key before carrying out maintenance, cleaning or repair work. Observe the notices on service and repair in the operating instructions.

	**DANGER** **Risk of injury due to unintended seat.** Only sit on the driver's seat.
	**DANGER** **Risk of injury from rolling over.** No persons may be in the vicinity of the vehicle during use.
 	**DANGER** **Risk of impact, risk of crushing.** When transporting or working under suspended loads, use suitable means for supporting.
	**WARNING** **Danger of injury.** Danger of crushing and shearing at belts, side brushes, waste container and hood.
	**WARNING** **Risk of injury from high-pressure jet.** Do not point the high-pressure jet at people, animals, live electrical equipment or at the device itself. Protect the device high-pressure cleaner frost.
	**CAUTION** **Warning of escaping high-pressure fluid.** Beware of escaping high-pressure fluid. Observe the notices in the operating instructions.
	**ADVICE** **Material damage due to incorrect transport.** Always attach the transport lock to the articulated joint during transport.

	Main switch (battery disconnect switch).
	Position of the main fuse.
	Position of fuse F2.
	Read and adhere to the operating instructions.
	Lubrication point.
	Use DOT 4 brake fluid.
	Refuel with diesel according to DIN EN 590.
	Mounting point for jack.
	Open the bonnet.

1.13 Positions of the safety signs on the vehicle

All symbols and signs must be present, clean and in legible condition.

– Immediately replace illegible, lost or absent symbols and information notices. Please contact your service partner or Kärcher Municipal GmbH.

– When replacing components on which symbols or signs were attached, these symbols and information signs must be reattached to the replaced components.

For a complete overview, the illustrations show a vehicle with attached sweeping system [1] and waste container [2].
The symbols on the attachments are slightly paler.

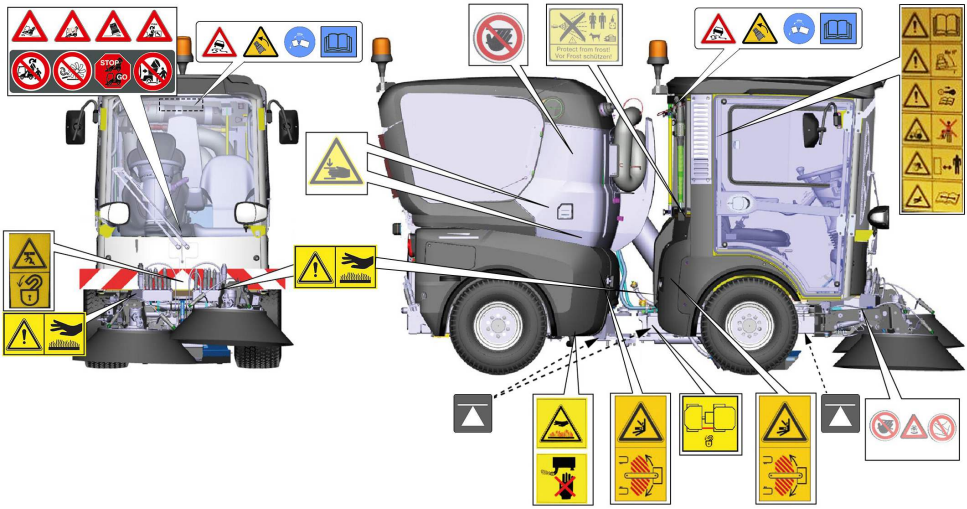


Fig. 2: Positions of the safety signs on the vehicle, front and right-hand side of the vehicle

1 *option*
2 *option*

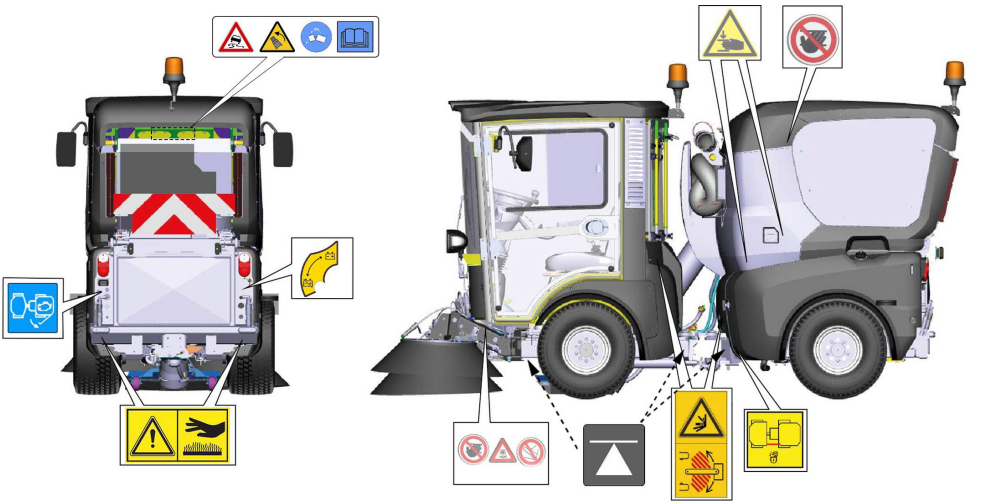


Fig. 3: Positions of the safety signs on the vehicle, rear and left-hand side of the vehicle

1.14 User groups

1.14.1 Operations manager

Qualification:

- Specialised technical training.
- Instructed by qualified employees of the manufacturer or their authorised representatives in the handling of the vehicle, the attachments and the container attachments (e.g. waste container).
- Instructed on safety regulations, accident prevention rules and occupational safety.
- Driving licence (the required driving licence category varies from country to country and can be obtained from the relevant authority).

Obligation of the person responsible for operations

- The vehicle with its attachments and container attachments, e.g.a waste container, may only be operated in perfect and safe condition.
- The operating and service personnel must be instructed in the operation and maintenance of the vehicle, the attachments and the superstructure containers, e.g. a waste container with tipping function.

- A work and safety briefing must be carried out with the operating and service personnel. Safety- and hazard-conscious working must be taught. Ensure that only persons who are familiar with the basic regulations on occupational safety and accident prevention and who have been instructed in the safe handling of the vehicle, the attachments and the container attachments work on and in the vicinity of the vehicle, the attachments and the container attachments. Operating and service personnel to be trained may only work with and on the vehicle, the attachments and the container attachments under supervision.
- The operating and service personnel must wear their personal protective equipment (PPE) (protective goggles, close-fitting protective clothing, protective gloves and suitable footwear if necessary). Persons not wearing personal protective equipment (PPE) must be removed from the vehicle, the attachments and the container attachments.

1.14.2 Operating personnel

Qualification:

- Trained.
- Physically and mentally suitable.
- At least 16 years old. National regulations deviating from these may also apply.
- Instructed by qualified employees of the manufacturer or their authorised representatives in the handling of the vehicle, the implements and the container implements (e.g. waste container).
- Driving licence (the required driving licence category varies from country to country and can be obtained from the relevant authority).
- Operating instructions for the vehicle and, if implements are used, also the operating instructions for the attachments, have been read and understood.

Obligations of the operating personnel

⚠ DANGER

Risk of accident with possible fatal consequences due to driving and operating errors under the influence of alcohol and other mind-altering substances.

Persons under the influence of alcohol, drugs (cannabis) and medication, are prohibited from carrying out work on and with the vehicle, attachments and container attachments (waste container) and are also prohibited from driving and operating the vehicle and its attachments and container attachments.

- Driving and operating errors can lead to serious accidents with fatal consequences for the driver himself as well as for uninvolved third parties in the vicinity of the vehicle due to a substance-induced change in perception.
- Persons who are under the influence of alcohol, mind-altering substances such as intoxicants or drugs, performance-enhancing substances and/or medication are prohibited from driving, operating, maintaining and repairing the vehicle, attachments and container attachments.
- This also applies to people who have undergone a general or local anesthetic in the last 24 hours, e.g. in the course of dental treatment.

⚠ DANGER

Risk of accident and injury due to a faulty vehicle.

The vehicle may have undetected defects that cannot be recognised without carrying out the departure check.

– Perform the recommended safety checks (departure checks) each time before using the vehicle.
– Do not start up the vehicle when one item of the safety check is not fulfilled and have the vehicle repaired.

⚠ CAUTION

Risk of accident and injury due to improper operation of attachments, towed equipment and trailers.

Incorrect operation of the vehicle and incorrectly attached implements or towed implements and trailers can lead to accidents and subsequent injuries.

– Read and follow the relevant operating instructions when using attachments or towed devices and trailers before setting off.
– Observe the safety instructions in these operating instructions and also in the operating manuals for the attachments, towed devices or trailers.
– Observe the permissible loads of the vehicle (see chapter “Technical data”) and the information on attachments in these operating instructions.

The operating instructions are a component of the vehicle. To ensure proper and safe use of the vehicle, read these operating instructions and act accordingly.

– Read the operating instructions completely before working with this vehicle.
– Read and follow the operating instructions and observe the information in the “Safety instructions” chapter.
– Keep the operating instructions in the vehicle for future reference and pass them on to a subsequent owner of the vehicle.
– Add any supplement published by Kärcher Municipal GmbH, such as enclosed supplementary sheets, to these operating instructions.
– Handle the operating instructions with care. Do not remove any pages or make any parts illegible.

1.14.3 Service personnel

General qualification:

- Specialised technical/hydraulic/mechanical/electrical training.

- Instructed by qualified employees of the manufacturer or their authorised representatives in the handling of the vehicle, the implements and the container implements (e.g. waste container).
- Instructed on safety regulations, accident prevention rules.

- Handling of air conditioning refrigerant only by trained personnel.
- Driving licence (the required driving licence category varies from country to country and can be obtained from the relevant authority).

Obligations of the service personnel

⚠ DANGER

Risk of accident with possible fatal consequences due to driving and operating errors under the influence of alcohol and other mind-altering substances.

Persons under the influence of alcohol, drugs (cannabis) and medication, are prohibited from carrying out work on and with the vehicle, attachments and container attachments (waste container) and are also prohibited from driving and operating the vehicle and its attachments and container attachments.

– Driving and operating errors can lead to serious accidents with fatal consequences for the driver himself as well as for uninvolved third parties in the vicinity of the vehicle due to a substance-induced change in perception.
– Persons who are under the influence of alcohol, mind-altering substances such as intoxicants or drugs, performance-enhancing substances and/or medication are prohibited from driving, operating, maintaining and repairing the vehicle, attachments and container attachments.
– This also applies to people who have undergone a general or local anesthetic in the last 24 hours, e.g. in the course of dental treatment.

⚠ DANGER

Risk of severe chemical burns and poisoning if battery acid is swallowed.

Battery acid can be mixed up with normal drinks and swallowed unintentionally.

– Never pour battery acid into containers that are normally used for drinking. There is a risk of severe chemical burns and poisoning, including death, if accidentally drinking from a drink bottle containing e.g.battery acid.

⚠ DANGER

Risk of explosion due to sudden ignition of the fuel. This can result in serious injuries or even death.

Fuels are highly flammable, so special care must be taken when handling fuels.

– Never refuel in confined spaces.
– Do not smoke during the refuelling process, avoid naked flames and flying sparks.
– Do not allow fuel to come into contact with hot surfaces.

The operating instructions are a component of the vehicle. To ensure proper and safe use of the vehicle, read these operating instructions and act accordingly.

- Read the operating instructions completely before working with this vehicle.
- Read and follow the operating instructions and observe the information in the “Safety instructions” chapter.
- Keep the operating instructions in the vehicle for future reference and pass them on to a subsequent owner of the vehicle.
- Add any supplement published by Kärcher Municipal GmbH, such as enclosed supplementary sheets, to these operating instructions.
- Handle the operating instructions with care. Do not remove any pages or make any parts illegible.

1.15 Departure check before starting

Familiarise yourself with all the controls, switches, indicator lights and other operating options before setting off on your journey. Otherwise there is a risk of accidents due to carelessness while driving.

Perform the departure check each time before using the vehicle.
Do not operate the vehicle if any of the points listed below are not in order. Risk of accident and injury due to a faulty vehicle. If necessary, contact your service partner to have the vehicle repaired.

Check the following points before travelling:

Check outside the driver cabin:	Result
Has the transport lock on the articulated joint been removed?	
Enough fuel in the tank?	
Engine oil level correct?	
Coolant level correct?	
Is the windscreen washer fluid level correct and are the windscreen wipers intact?	
Hydraulic oil level correct?	
Visual inspection of the hydraulic lines for leaks and damage.	
Visual inspection of the brake system for leaks and damage.	
Tyres intact (wear limit not yet reached and no damage) and tyre pressure correct?	
Windows, mirrors, lighting and running boards clean and fog-free?	
If present: Trailer coupling and electrical connections intact?	
Visual inspection of the vehicle, engine and radiator grille for damage.	
Visually check the engine air filter for cleanliness (especially when working in a dry, dusty environment).	
Visually check the driver cabin interior air filter for cleanliness (especially when working in a dry, dusty environment).	
Especially after cleaning, maintenance or repair: Have you disposed of rags, tools and other unnecessary items?	

Inspections from the driver cabin:	Result
Does the vehicle have an approved warning triangle, a light, a sufficient number of high-visibility waistcoats and a first aid kit (expiry date not yet exceeded)? Find out about the regulations on vehicle safety equipment that apply in your country.	
Steering wheel, seat position and mirrors correctly adjusted?	
Brakes intact (including parking brake)?	
The brake pedal is not blocked by any objects in the footwell?	
Accelerator pedal moves easily?	
With the ignition switched on: ■ Do the [Charge indicator] and [Oil pressure] warning lights light up?	
With the engine running: ■ Do the [Charge indicator] and [Oil pressure] warning lights go out? ■ Are the temperature indicator and fuel level indicator functioning? ■ Are the lighting and signalling devices (horn, direction indicator, rotating warning light) intact?	
Before setting off: ■ Doors closed? ■ Seat belt applied?	

1.15.1 Driver's seat and steering wheel position

Before the journey, adjust the position of the steering wheel with the vehicle at a standstill. You must be able to reach the pedals, steering wheel and other controls at all times.

Adjusting the driver's seat and steering wheel position while driving is prohibited. There is a risk of accidents in road traffic due to carelessness or uncontrolled movements of the vehicle.

1.15.2 Seat belt

Always wear your seat belt before travelling. There is a risk of injury or even death when driving without wearing a seat belt.

In the event of vehicle deceleration caused by an accident, vehicle occupants are held in place by sturdy belts connected to the vehicle body. This means that the driver and any passenger travelling with them cannot be thrown through the vehicle or even out of it.

If the seat belt is damaged, soiled or has been used in an accident, it must be replaced. Check the condition of the seat belt regularly and have it replaced by a service partner if necessary.

1.15.3 Clear view from the driver cabin: Windows and mirrors

Before driving, check whether the windows or mirrors are dirty or damaged. All windows and mirrors must be free of ice, snow, condensation and dirt before driving off. Ice, snow, fogging, dirt or damage can jeopardise safety and there is a risk of accidents and, as a result, injury in road traffic due to poor visibility.

The driver cabin is equipped with ventilation slots or air vents. Always keep these clear to ensure adequate ventilation and fog-free windows.

Ensure a clear all-round view before each use of the vehicle:

- The window interiors must be fog-free.
- Remove snow, ice, fallen leaves etc. from the windscreen before driving off.
- Clean the exterior mirrors from moisture, snow, ice and adhering dirt, such as e.g. fallen leaves etc.
- When used in wintry conditions, windscreen wipers can also ice up and make clear wiping results impossible. In this case, carefully remove the ice from the wiper rubber and the joints of the wiper blade. Do not use any hard, sharp-edged or rough objects for this purpose. Take care not to damage the wiper rubber.
- Replace a damaged or worn wiper blade immediately.

1.15.4 Brakes | Steering | Lighting

Before driving, carefully check on a secure surface whether the brakes, including the parking brake, and the steering are working. If there is something wrong with the brake system and/or the steering, switch off the vehicle immediately and contact your service partner. Have the irregularities rectified by your service partner.

Check that the lights including indicators etc. are working before you set off. If the vehicle's lighting system is not fully functional, switch off the vehicle. Have the irregularities rectified by a service partner.

If the lighting system is not fully functional, there is a risk of accidents on the road due to poor forward visibility and because you and the vehicle with its driving manoeuvres cannot be recognised in time by other road users.

1.16 Driving mode

1.16.1 Doors

Your vehicle is equipped with two doors.

Both doors must be properly closed during the journey. There is a risk of accidents when driving with the doors open. There is also a risk of injury to third parties outside the vehicle if they are caught by an open door while driving past.

Keep the door sills free of dirt and deposits such as e.g.wet leaves, mud, ice and snow to ensure a secure grip when getting on and off. There is a risk of injury from slipping on a dirty or icy doormat.

Handles are present on the inside of the doors and on the respective A-pillar, which must be used as entry and exit aids to prevent injuries, for example from falling when getting in and out of the vehicle.

1.16.2 Emergency exit

There is a second door for the co-driveron the opposite side of the driver cabin to the driver 's door. This passenger door serves as an emergency exit.

Right-hand drive:

- The driver's seat and driver's door are located on the right side in the travel direction.

Left-hand drive:

- The driver's seat and driver's door are located on the left side in the direction of driving.

1.16.3 Original floor mats

Risk of accident due to using floor mats that are not approved by Kärcher Municipal GmbH.
Only use the original floor mats.
Do not place any additional floor mats on top of or underneath the existing original floor mats.

1.16.4 Heated windscreen and heated exterior mirrors

The vehicle is equipped with a heated windscreen and, if applicable, heated exterior mirrors [1].

Only operate the vehicle if the windscreen and exterior mirrors are free of ice, snow and condensation. There is a risk of accidents and injuries in road traffic due to poor visibility.

1.16.5 Windscreen wiper

The vehicle is equipped with windscreen wipers. Switch off the vehicle if the windscreen wipers are not working correctly in precipitation. There is a risk of accidents due to poor visibility.

Have the function of the windscreen wiper checked by your service partner and repaired if necessary.

1.16.6 Operating the multifunction display

The software must not be operated via the multifunction display while driving. There is a risk of severe accidents in road traffic due to inattention.

Stop the vehicle before operating the software. Then continue your journey.

1.16.7 Brakes

The vehicle is equipped with a service brake and a parking brake. If there are any irregularities in the brake system, switch off the vehicle immediately and have it checked by a service partner. There is an increased risk of accident.

Service brake

The service brake may be used while driving to reduce the speed of the vehicle to a standstill. Press the brake pedal carefully: The harder you depress the brake pedal, the harder the vehicle brakes.

There is a risk of accidents for you and other road users if you brake abruptly in traffic. Adjust the braking power to the correct level.

Releasing the accelerator pedal provides a form of active braking and the vehicle brakes abruptly. In a car, on the other hand, only the engine brake acts as a decelerator after the accelerator pedal is released.
The braking force applied when you release the accelerator pedal is weaker in higher gears and stronger in lower gears.
The braking force applied when you release the accelerator pedal in transport mode is significantly weaker than in working mode.

Emergency braking

In an emergency situation, the accelerator pedal must be released immediately and the brake pedal fully depressed until the vehicle comes to a standstill.

[1] *option*

Parking brake

The parking brake prevents the vehicle from rolling away when parking/parking.
It is automatically activated when the engine is switched off.
It is also automatically activated when the engine is running and the travel direction switch is in the neutral position (center position).

1.16.8 Stop vehicle or emergency braking

1. Take your foot from the accelerator pedal. Releasing the accelerator pedal provides no noticeable braking effect.

2. Press and hold the brake pedal until the vehicle comes to a standstill.
   In the event of an emergency stop, depress the brake pedal quickly and forcefully as far as it will go.
3. Bring the travel direction selector switch into the neutral position (middle position).
   The parking brake activates automatically.
4. Turn the ignition key to position [0] (switchoff the engine).
   Please note that the steering now only works in emergency mode. This means that considerably more force is required for steer movements.

1.16.9 Flashing beacon

The legal requirements in the country where the product is placed on the market apply.

The flashing beacon may only be switched on during work on public roads or in public traffic areas.

Work applications are e.g.:

- Mowing/watering in public parks.
- Snow clearing/sweeping on pavements or in pedestrian zones.

1.16.10 Work lights

Your vehicle may be equipped with one or more work lights. These are located at the front or rear of the vehicle.

The work lights must not be used while driving on public roads. They can dazzle other road users and thus cause road accidents.

The work lights may only be used when working must not be used while driving on public roads.

1.16.11 Diesel engine

Never operate vehicles with diesel engines in confined spaces. There is a risk of poisoning from inhaling the exhaust fumes.

Do not lean over the exhaust gas opening, do not touch it and do not hold any parts of your body in the escaping exhaust gas flow. There is a risk of burns due to the hot exhaust gases.

When working with the vehicle, do not point the rear of the vehicle with the escaping exhaust gas towards highly flammable materials such as e.g. dry leaves or paper waste.

Never close off the exhaust gas openings.

Keep away from the drive unit at all times. There is a risk of injury due to moving engine parts.

Be aware of the engine after-running time after switching off. This is approx. 3 - 4 seconds.

1.16.12 Refuelling

Switch off the engine before fueling and remove the ignition key from the ignition lock. The parking brake activates automatically.

Do not refuel near open flames, ignitable sparks or hot vehicle parts, as there is a risk of explosion and fire. Do not smoke while refuelling. Keep fuel away from the vehicle battery.

Fuel

Only refuel the vehicle with commercially available diesel fuel in accordance with DIN EN 590 and do not run the tank completely empty, otherwise there is a risk of damage to the engine and fuel system. If the fuel tank is completely empty, the fuel system must be bled. Contact your service partner for this.

At temperatures below 0 °C (32 °F) use Winter diesel.

Do not park the vehicle with an empty tank for a longer period of time. If you want to take the vehicle out of service for a longer period of time, you must first fill up the tank.

Additive

Only top up with diesel additive of specification F51. 1 liter of additive is sufficient for approx. 1700 liters of diesel and is not subject to an expiry date.

The actual consumption depends on the regeneration and load profile during operation.

1.16.13 Winter diesel

NOTICE

Risk of damage to engines with common rail injection due to fuel additives.

Fuel additives cause damage to the fuel system.

– Admixtures of petroleum and the addition of additional fluidity additives are not permitted for engines with common rail injection.

At low ambient temperatures, paraffin deposits can cause blockages in the fuel system and cause malfunctions. Winter diesel fuel must be used below 0 °C (32 °F) ambient temperature (offered by petrol stations in good time before the start of the cold season).

For winter operation, special requirements are placed on the cold behaviour (temperature limit value of filterability). Suitable fuels are available at petrol stations in winter.

1.16.14 Wheels and tyres

Check all wheel nuts regularly for tightness, especially after a wheel change. If necessary, have the wheel nuts retightened by your service partner to the prescribed tightening torque.

The fitting and removal of tyres on rims may only be carried out by trained specialist personnel using the correct fitting tools.

After a wheel change, even if the wheels are replaced on each axle, the wheel nuts must be retightened to the specified tightening torque after 10 operating hours.

Observe the load capacity and the correct tyre inflation pressure of the tyres, especially if attachments are fitted to the vehicle. Incorrect tyre pressure changes the handling and traction of the vehicle. There is a risk of accidents if the tyre pressure is too high or too low. In addition, the tyres wear out significantly faster than with the correct tyre pressure.

Be careful not to point the water jet directly at the tyres when cleaning the vehicle with a high-pressure cleaner. This can lead to tyre damage that cannot be seen with the naked eye. There is a risk of accident and damage to the vehicle due to the sudden detachment of tyre components or the bursting of a tyre while driving.

Change your vehicle from summer tyres to winter tyres in good time depending on the season. Summer tyres lose their grip at low temperatures due to hardening. Winter tyres are too soft for warm temperatures and they lose their grip at higher temperatures. In both cases, unsuitable tyres can lead to accidents due to loss of control of the vehicle. Contact your service partner if you have any questions on this.

1.16.15 Snow chains

Your vehicle can be fitted with snow chains if necessary. You can fit snow chains from different manufacturers if they match the tyre dimensions. Ask the tyre manufacturer whether the tyres on your vehicle can be fitted with snow chains. Not all tyres can be fitted with snow chains.

The snow chains must have sufficient space in the wheel arch. They must not drag in the wheel housing or similar. There is a risk of serious injury as a result of road traffic accidents and the possibility of damage to the vehicle.
Contact your service partner or Kärcher Municipal GmbH for this.

1.16.16 Salt adhesion during winter operation

Before starting winter operation, have your service partner apply an underbody protection suitable for winter operation to your vehicle and a cavity preservation.
This protective measure extends the service life of your vehicle by sealing surfaces, cracks, grooves and cavities into which road salt or brine could penetrate and cause damage through corrosion and erosion.

If you use your vehicle in winter for clearing and gritting work, there is a risk of considerable salt ingress into the entire vehicle.
The road salt applied (e.g. sodium chloride or calcium chloride) not only collects as massive incrustations on the entire vehicle, especially in areas closer to the road such as the entire underbody, but also penetrates into all cavities, cracks, grooves and joints on and in the vehicle.
The aggressive road salt quickly causes damage to the vehicle through corrosion and attacks seals, rubbers and add-on parts.

During winter operation, the vehicle must therefore be thoroughly cleaned more frequently in order to remove the salt ingress and prevent corrosion damage and further consequential damage caused by salt ingress.
Wash the vehicle thoroughly after winter service. Take care to remove salt from hard-to-reach areas in particular and then rub these areas dry.
Also check the interior of the vehicle. Snow, moisture and salt are also brought into the driver cabin when getting in and out of the vehicle in winter and can cause corrosion that spreads from the inside of the vehicle to the outside. Remove accumulated snow and ice from the cab floor and dry the areas where liquid such as condensation has collected. Otherwise there is a risk of injury due to slipping on an icy cabin floor and/or an accident due to slipping off an icy accelerator or brake pedal.
It may also be necessary to remove incrustations formed by road salt during use in order to protect relevant vehicle parts from loss of function.

This applies in particular to:

- Ventilation openings and all openings for air inlets
- Radiator grille and covers
- Headlights, indicators and flashing beacon
- Exterior mirrors and windscreen wipers
- Attachments
- Front and rear area
- Running boards
- Handle
- Door handles and the surrounding door gaps

1.16.17 Engine | Engine compartment | Radiator | Diesel particulate filter

Engine

When the engine is running, toxic exhaust fumes are produced. Inhaling the exhaust fumes is harmful to health and can lead to unconsciousness or even death by suffocation. Never allow the engine to run in confined spaces.

Switch off the engine and remove the ignition key from the ignition lock before carrying out any work on the vehicle, especially in the engine compartment and on the engine. There is a risk of injury from entrapment of limbs, clothing and hair.

If the [Engine oil pressure]lights up in the multifunction display, move the vehicle to a safe place and switch off the engine. There is a risk of engine damage.
Check the engine oil filling level and correct an incorrect level if necessary. If necessary, contact a service partner to rectify the problem.

Engine compartment

Parts of the engine are very hot when the vehicle is in operation. There is a risk of fire due to impurities that may accumulate in the engine compartment, such as those produced during sweeping and maintenance work, especially in autumn. Check the engine compartment at least once a day and clean it if necessary.

Radiator

Parts of the engine and of the cooling system are very hot when the vehicle is in operation. There is a risk of burns from hot surfaces, do not reach into the area of the engine and radiator. Allow the engine and cooling system to cool down beforehand.

The vehicle's cooling system is pressurised, never open the cooling system cap while the engine is running or when the cooling system and the engine have not yet cooled down. There is a risk of scalding from escaping hot coolant. Allow the engine and cooling system to cool down.

Top up any missing coolant immediately, otherwise the engine may be damaged due to inadequate cooling.

Contact your service partner if your vehicle repeatedly lacks coolant at short intervals. The cause of the repeated loss of coolant must be determined and eliminated.

Diesel particulate filter DPF

If the diesel particulate filter needs to be regenerated, this takes place automatically during driving. The regeneration process can also be started manually when the indicator light in the multifunction display lights up.

Never reach into the area of the diesel particulate filter. There is a risk of fire and burns, the diesel particulate filter becomes very hot during operation and regeneration.

Temperatures of up to 650 °C (1202 °F) can occur on the exhaust pipe during regeneration of the DPF. Be careful not to touch the exhaust pipe when leaving the vehicle, as there is a risk of serious burns. Due to the very high temperatures, do not regenerate the DPF on a highly flammable surface.

1.16.18 Travel drive | Steering | Risk of tipping over | Swaying behaviour

The vehicle has a hydrostatic drive and articulated steering. Please note that the driving characteristics of a vehicle with articulated steering differ considerably from those of a normal car.
The vehicle also has suspension and independent wheel suspension on both axles. The suspension absorbs shocks and bumps. The independent suspension allows each wheel to react to uneven ground independently of the other wheels. The suspension and independent wheel suspension significantly reduce the pendulum behavior. The vehicle is more stable and comfortable to drive, even on uneven terrain and at higher speeds. The wheels maintain better contact with the ground, which increases traction and safety.
You should therefore take care to use the rear-view mirrors to keep an eye on the rear of the vehicle.

Drive around curves at an even and appropriate speed. This applies, in particular, for driving uphill/downhill and driving across the face of a slope.
Be aware of the changes in the center of gravity of the vehicle depending on attachments.
Adjust the travel speed to the ambient conditions when driving in a straight line and when driving around bends, e.e.g. road conditions and load status.
Note decoupling of the front and rear part of the vehicle via an articulated joint.

Vehicles with articulated steering exhibit a more direct response to steering movements than cars, particularly when taking bends at high speed, on snow, ice and wet/loose ground as well as during turning manoeuvres on slopes. Avoid rapid successive steering movements.

Release the accelerator pedal provides a form of active braking. In a car, on the other hand, only the engine brake acts when the accelerator pedal is released.
The braking force applied when you release the accelerator pedal is weaker in higher gears and stronger in lower gears.
The braking force applied when you release the accelerator pedal in transport mode is significantly weaker than in working mode.

If you have little or no experience with these vehicles, familiarise yourself with the response behavior of the steering on a secure surface when you start working with your vehicle.

Rear attachments and load statuses influence the vehicle's centre of gravity and the driving characteristics. You must be ready to adjust to changed driving characteristics, particularly after changing attachments and in the case of changeable load statuses. Limit ranges may be reached earlier.

There is a risk of tipping over due to the unusual driving characteristics of this vehicle.

Observe the following points:

- Drive around curves at an even and appropriate speed. There is a risk of accidents due to inappropriate speed.
- When travelling uphill and downhill and across slopes, pay particular attention to an appropriate speed and a balanced driving style.
- If the vehicle is tilted to the side by more than 10°, there is a significantly increased risk of it tipping over. Avoid driving across the slope if the gradient is more than 17 % (10° inclination of the vehicle corresponds to 17 % gradient).
- Pay attention when attaching optional implements and/or attachment containers, e.g. a waste container, to the shift in centre of gravity and a change in the driving characteristics of the vehicle. Likewise, if you change attachments or containers, your vehicle may react differently than before.
- Be aware that a change in the loading conditions, e.g. when the waste container is initially empty and later full, also changes the centre of gravity and driving characteristics of the vehicle. Limit ranges can be reached earlier and there is a risk of accidents due to unpredictable vehicle driving characteristics.
- Only use the vehicle on solid ground. There is an increased risk of tipping over on loose ground if a wheel suddenly slips or sags.

The list of the risks of overturning is not necessarily comprehensive. It is the responsibility of the driver to adapt the travel speed, driving maneuvers and travel direction to the location where the vehicle is being used, the prevailing weather conditions and the current load condition of the vehicle.

1.16.19 Danger of overturning

Operate the vehicle with its optional attachments and optional container attachments, e.g.a waste container, only in such a way that stability is guaranteed at all times and overturning is ruled out.

A danger of overturning exists in particular due to:

- A narrow vehicle width.
- Steering angle changing too fast.
- Full steering angle.
- Cornering too fast.
- Heavy braking when cornering.

- Loose and irregular soil conditions.
- Additional ballast for attachments and container attachments.
- One-sided side load of attachments.
- Rocking of the vehicle due to surge movements of transported liquids or bulk goods, such as e.g. loose chippings or road salt.
- Exceeding the permissible total weight.
- Exceeding the permissible trailer load.
- Poor weather conditions.
- The vicinity of excavation pits, shafts, trenches, pit and embankment edges.

Avoid the listed sources of danger and any others beyond these. The driver must take these conditions and sources of danger into account and avoid them.

Adapt the speed to the respective work, driving situations, weight distribution, weather and ground conditions.

The vehicle must always be under control. When driving, steering, braking, cornering and traveling up or downhill, observe the ballast weight and the mass of attachments and container attachments, as well as the driving characteristics of trailers with and without braking equipment.

1.16.20 Driving on inclines and driving on slopes

Driving on gradients

When travelling on gradients, observe the maximum climbing ability of your vehicle specified in the “Technical data” chapter.

Driving on slopes

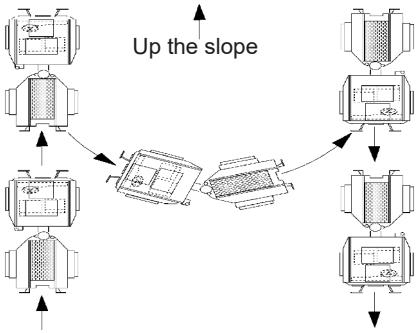
Driving on slopes is dangerous. If handled incorrectly, the vehicle may tip over if the centre of gravity exceeds the tipping limits. There is a risk of serious injury or even death if the vehicle overturns.

Only use the vehicle on slopes if there is no risk of slipping, falling or overturning.

The following factors can minimise the risk:

- Correct loading.
- Low centre of gravity.
- Low travel speed.
- Correct tyre pressure depending on the load.
- Large track width.

For turning on a slope we recommend the driving style shown in the diagram:



1.16.21 Differential lock [1]

The differential lock may only be used if the road conditions do not provide sufficient traction (the vehicle is in danger of not being able to move forwards), e.g.in icy or snowy conditions, on unpaved roads, etc., or because the drive wheels are on ground with varying degrees of grip and it is no longer possible to continue driving.
The differential lock can be activated in these cases to free the vehicle.

The differential lock should only be activated when the vehicle is stationary in order to avoid the risk of an accident due to an abrupt change in the vehicle's driving characteristics and possible damage to the drive train.

Only switch on the differential lock if:

- the vehicle drives straight ahead,
- the wheels do not spin,
- the vehicle is stationary, or
- at speeds below 15 km/h (9.32 mph).

If the differential lock is engaged while the wheels are travelling at different speeds, the claw clutch may be damaged or destroyed.

From a vehicle speed of 20 km/h (12.4 mph.) the differential lock is automatically deactivated.

The differential lock may only be used in the event of poor traction, e.g.:

- on unpaved roads or
- in icy and/or snowy conditions.

1 option

The differential lock must be disengaged before driving or continuing to drive on paved, ice- and snow-free or dry roads. The differential lock must also not be used when cornering.

Failure to do so may damage or destroy the claw clutch.

If the differential lock cannot be switched off due to tension in the drive train, carry out short steering movements on both sides and/or a load change. Repeat this until the differential lock switches off.

The differential lock must not be used in continuous operation. Switch off the differential lock as soon as the road conditions no longer require it.

1.16.22 Working hydraulics

Your vehicle is equipped with electronic control of the working hydraulics. As soon as the driver leaves the driver's seat of the vehicle, any active auxiliary power units are automatically switched off.
For stationary operation or further working operation, you must switch the desired function off and on again.

If there are any irregularities in the working hydraulics, switch off the vehicle immediately and have it checked by a service partner. There is a risk of accidents, for example if the working hydraulics can no longer be controlled or if the entire working hydraulics system fails.

1.16.23 Load

Secure any load to be transported in accordance with the regulations and observe the permissible total weight of the vehicle. There is a risk of injury and accidents due to incorrectly secured loads and exceeding the permissible total weight.

Only use load slinging equipment and securing straps intended and approved for this purpose.

Cargo may only be transported with attachments and assemblies intended for this purpose. The load must be correctly distributed and secured. There is a danger to life from unsecured, flying loads and a sudden change in the vehicle's centre of gravity.

When transporting liquids and bulk goods, such as e.g. loose chippings or road salt, swirling movements can occur which cause the vehicle to rock up and down. There is a risk of accident due to uncontrolled movements of the vehicle.

1.17 Electrics | Electronics | Vehicle battery

Observe the vehicle's operating voltage for all work and installations on the vehicle.

Replace defective fuses with new original fuses and ensure that they are of the correct rating. If the fuse is too strong, there is a risk of destruction of the electrical system or damage to components, e.g. due to a cable fire because the fuse did not trip in time in the event of an overload. If the fuse is too weak, it will be defective (blown) again after a short time.

1.17.1 Main switch

⚠ DANGER

The HV system may only be de-energised by an “expert for work on HV intrinsically safe vehicles in service workshops”.

The main switch can be used to deactivate all vehicle functions, which is why it is also known as the battery disconnect switch

After switching off the engine (ignition key in position 0), wait at least 60 seconds, or 300 seconds (5 minutes) on vehicles with AdBlue®, before disconnecting the vehicle battery via the Main switch. The vehicle's control units shut down during this period. Only then is it possible to disconnect the battery via the switch.

Disconnect the vehicle battery via the switch before carrying out any work on the vehicle and the electrical system. Otherwise there is a risk of injury or even death from electric shock or short circuit.

A short circuit can cause vehicle parts, attachments, etc. to move unpredictably. This poses a risk of injury.

Electrical and electronic components can be damaged by a short circuit.

1.17.2 Additional electronic devices

The vehicle is equipped with electronic components whose function may be affected by electromagnetic emissions from other devices. These influences can endanger people. Only have additional devices installed by your service partner.

Ensure that the additional devices comply with the statutory product safety regulations.

The maximum permissible current consumption specified in the manufacturer's installation instructions must always be observed.

Before installation and connection to the vehicle electrical system, it must be checked whether the additional electrical or electronic device causes interference with the vehicle electronics or other components. Otherwise there is a risk of accidents due to unforeseen malfunctions of the vehicle and its components.

The operation of portable or mobile devices inside the vehicle is only permitted with a permanently installed external antenna. The transmitter part of portable or mobile devices must be installed separately from the vehicle electronics.

1.17.3 Electrical overhead lines

There is a risk of high voltage when working with the vehicle in the vicinity of overhead power lines.

Always keep a sufficient distance from overhead power lines:

Voltage	Minimum distance
Less than 1 kV	1 m (3.2 ft.)
1 kV to 110 kV	3 m (9.84 ft.)
110 kV to 220 kV	4 m (13.12 ft.)
220 kV to 1380 kV	5 m (16.4 ft.)
Unknown voltage	5 m (16.4 ft.)

1.17.4 Vehicle battery

Only use vehicle batteries) and chargers (original spare parts) approved by Kärcher Municipal GmbH.

Only replace vehicle batteries with the same battery type, see the “Technical data” section. Before disposing of the vehicle, remove the vehicle battery and dispose of the vehicle battery in accordance with national or local regulations.

Check if your radio is secured with a radio code before disconnecting the vehicle battery.
If so, make a note of it so that you can unlock the radio with the radio code after connecting the vehicle battery.
The manufacturer does not keep a copy of the unlocking code.

Always disconnect the vehicle battery before carrying out any work on the electrical system, where tools, spare parts etc. may come into contact or come into contact with electrical components. Never place metal parts on the battery terminals of the vehicle battery.

Vehicle batteries emit explosive gases. There is a risk of injury due to explosion or bursting of a vehicle battery. Do not smoke when handling vehicle batteries and do not use naked flames or open flames.

Ensure that the room is well ventilated when charging batteries in confined spaces.

Observe the manufacturer's operating instructions for the battery charger.

If a vehicle battery is frozen or the acid level is too low, do not attempt to start with a jumper cable. There is a risk of injury due to explosion or bursting of a vehicle battery. Replace frozen vehicle batteries and vehicle batteries with a low acid level with a new vehicle battery.

If you are removing an **old vehicle battery**, be sure to follow the correct sequence when disconnecting the terminals:

- ▶ Disconnect the negative terminal first, then disconnect the positive terminal.

When **installing a new vehicle battery**, be sure to follow the correct sequence when connecting the terminals:

- ▶ Connect the positive terminal first, then connect the negative terminal.

Protect the environment by disposing of old vehicle batteries or battery fluids in an environmentally friendly manner and in accordance with legal guidelines. If necessary, contact your service partner or a specialised waste disposal company.

1.17.5 Vehicle battery

⚠ DANGER

Risk of severe chemical burns and poisoning if battery acid is swallowed.

Battery acid can be mixed up with normal drinks and swallowed unintentionally.

– Never pour battery acid into containers that are normally used for drinking. There is a risk of severe chemical burns and poisoning, including death, if accidentally drinking from a drink bottle containing e.g. battery acid.

Battery acid contains sulphuric acid, which is corrosive and toxic.

Do not allow battery acid to enter the groundwater. This leads to severe environmental damage.

Only deliver the hazardous substances to be disposed of to authorised collection points. You can obtain detailed information from your authority responsible for this.

Wear your personal protective equipment PSA/PPE, at least protective gloves and safety goggles, when handling battery acid. There is a risk of chemical burns from leaking or splashing battery acid.

Avoid contact of battery acid with skin and eyes at all costs. In case of contact with the eyes or skin, rinse immediately with copious amounts of water and seek medical advice.
Never swallow even the smallest amounts of battery acid.

Avoid contact of battery acid with clothing. Battery acid on clothing can damage the textile fabric. Wash contaminated clothing under running water and don fresh clothing.

Procedures in the event of unintentional release of battery acid

When used normally, and when observing the instructions, lead-acid batteries do not pose any risk. However, keep in mind that lead-acid batteries contain sulphuric acid that can cause serious chemical burns and corrosion.

If battery acid has been split or has leaked from a leaking vehicle battery proceed as follows:

1. Bind the battery acid with a binding agent, e.g. sand and prevent it from spreading further. Never allow the battery acid to enter the sewage system, the ground or waterways. Do not use water to neutralise the battery acid, as the water would only spread the battery acid even more widely.
2. Neutralise the battery acid with lime or soda.
3. Dispose of the bound and neutralised battery acid in accordance with the applicable local regulations and in compliance with all environmental protection aspects.
4. To dispose of a defective or leaking vehicle battery, contact an authorised waste disposal company or your service partner.

1.17.6 Symbols on the Vehicle battery

Observe the following warnings and hazard information when handling the vehicle battery:

	Fire, sparks, open flames and smoking are prohibited when handling vehicle batteries.
	Keep children away from the vehicle battery.
	Battery acid is corrosive and toxic. There is a risk of chemical burns and environmental and material damage.
	Explosion hazard due to explosive gases.

	Wear eye protection.
	Observe notes in the instructions for the vehicle battery and on the vehicle battery itself and in these operating instructions.

Further information on handling the vehicle battery

	Danger when charging the vehicle battery..
	The vehicle batteryis recyclable. Follow local recycling and recovery procedures.

1.18 Attachments [1]

Attachments are optional and can be attached to the intended attachment points on the vehicle.

Before purchasing and mounting attachments, check whether they are suitable for mounting and use: Weight, suspension, speed, power requirements etc.
Attachments that endanger the safety and/or stability of the vehicle may not be used.

Only attachments that comply with the vehicle-specific attachment specifications of
Kärcher Municipal GmbH may be used. Further information is available from your service partner.

Please contact your responsible service partner before fitting attachments that are not specifically intended for this vehicle. Your dealer will check if installation and use of these attachments is permitted on your vehicle. This is important for the safety of the driver and the vehicle and also for any warranty claims.
Attachments that endanger the safety or stability of the vehicle may not be used.

Read and follow the operating instructions for an attachment before fitting it.

A change in the vehicle's centre of gravity when an attachment is fitted or replaced changes the driving characteristics of the vehicle. This presents an increased risk of accident. In this case, familiarise yourself with the vehicle and its altered driving characteristics in a safe area before driving off.

Keep the hydraulic connections clean. Clean the plug and coupling with a lint-free cloth before use.

1 option

There is a risk of injury from crushing and entrapment when installing the attachments. Do not reach between the attachment point and the attachment. Read the operating instructions for the attachment carefully. Wear your personal protective equipment PSA/PPE (protective gloves, safety shoes and suitable protective clothing) when installing, removing and operating attachments.
There is a risk of burns when releasing the hydraulic connections due to hot hydraulic couplings. Allow the vehicle to cool down before releasing the hydraulic connections. Wear your personal protective equipment PSA/PPE (protective gloves, safety shoes and suitable protective clothing) when releasing the hydraulic connections.
Make sure that you connect the hydraulic connections correctly. The hydraulic system must not be pressurised when doing this. If the hydraulic connections are swapped, the function may be reversed (e.g. right-hand instead of left-hand movement of the attachment, simultaneous movement of front and rear attachment when using the same hydraulic circuit). Test the functions of attachments in a safe environment before starting work.

Always switch off the vehicle's engine (ignition key in position [0]) and remove the ignition key from the ignition lock when attaching or removing implements. As a general rule, no persons are allowed to stand underneath attachments.

No-one may stand between the vehicle and the attachment. There is a risk of injury or even death from falling components.

When working under raised attachments, these must also be mechanically supported to prevent them from falling suddenly in the event of a loss of pressure.

Attachments may only be put into operation and used if all protective devices are fitted, in the protective position and functional.

When the vehicle is travelling on the road with an attachment, the attachment must be in the transport position (raised, secured and covered with any protective covers). Ensure that the attachment does not move unintentionally by switching off the work functions.

Lower attachments (except sweeping systems) completely during work breaks and switch off the work functions to prevent unintentional movements.

It is forbidden to transport persons on or with the attachments.

1.18.1 Ballasting

When using attachments, make sure that equalising ballast is used if necessary. Please contact your service partner.

Always adhere to these specifications. There is a risk of injury due to the vehicle tipping over and a risk of damage to the vehicle or components. All warranty claims become null and void if the vehicle or vehicle parts are damaged due to incorrect ballasting.

The following loads on the axles of the vehicle must always be observed:

- Front axle
  At least 30 % of the unladen weight of the vehicle.
- Rear axle
  At least 30 % of the unladen weight of the vehicle.

Before purchasing and attaching an attachment, check that these requirements are fulfilled by weighing the vehicle-attachment combination.

1.18.2 Floating position

Carefully lower an attached attachment before switching on the floating position. When the floating position is switched on, a raised attachment quickly falls to the ground, depending on its own weight.

Ensure that no persons are in the danger zone when switching on the floating position. There is a risk of injury due to a rapidly falling attachment.

1.18.3 Tilting device for emptying the waste container

⚠ DANGER

Risk of serious injury, crushing and even death when working under an unsecured, raised waste container.

In the event of a pressure drop in the system, the raised, unsecured waste container can suddenly lower and trap or shear off persons or body parts.

– For all work under a raised waste container, the safety bolts must be inserted on both sides of the raised waste container and secured with the retaining clips. The safety bolts mechanically secure the raised waste container against sudden lowering in the event of a pressure drop.
– Never carry out work under an unsecured, raised waste container.

You can mount a tiltable waste container on your vehicle. If you want to empty a waste container that complies with the vehicle-specific attachment specifications of Kärcher Municipal GmbH, drive to a suitable location and park the vehicle on a level surface **without a steering angle** and set the travel direction selector switch to the neutral position (centre position) so that the parking brake is activated. Emptying while travelling is prohibited.
If you park the vehicle with a steering angle in order to tip a waste container, the waste container may damage the driver cabin when it is lifted or the vehicle may tip over due to unevenly distributed loads. There is a risk of injury due to the vehicle tipping over and a risk of damage to the vehicle and components.

When raising and lowering the waste container, make sure that there are no people in the danger zone. There is a risk of injury as the tilting device with the waste container may fall due to an unforeseeable drop in pressure.

Keep a safe distance from the surroundings and structural installations when emptying the waste container on heaps and ramps.

For emptying, move the direction lever to the neutral position (center position) so that the parking brake is activated. Otherwise the vehicle may start moving unintentionally and there is a risk of personal injury and damage to property.

When emptying, always lift the waste container completely to the end position to avoid any residue remaining in the waste container.

Make sure that no persons or animals are in the swivel range of the waste container during the emptying process.

Do not reach into the linkage of the emptying mechanism. This presents a risk of crushing and shearing.

1.18.4 High dumping

There is a risk of injury from the raised waste container on vehicles with high dumping.
Secure the lifted waste container before working. Fit the retainer only from outside the danger zone.

1.18.5 Additional lighting/work lights

If the lower headlights of your vehicle are covered by an attachment, you must use the upper work lights. You can switch on the upper work lights in the ceiling console in the driver cabin.

If an attachment or container attachment, e.g. a waste container, conceals the exterior lighting equipment of the vehicle, this lighting equipment must also be fitted to the attachment or container attachment and must be functional.
Observe the country-specific registration conditions that apply to the country in which you are using the vehicle.

1.18.6 Special attachments

If you would like to operate a special attachment on your vehicle, please contact your service partner or Kärcher Municipal GmbH.

In principle, attachments that have not been approved by Kärcher Municipal GmbH must not be operated.

1.19 Cleaning

Before cleaning, switch off the vehicle's engine (ignition key position [0]) and remove the ignition key from the ignition lock.

Only clean your vehicle, attachments and container attachments in designated areas with a suitable collection point for waste water. Do not allow the washing water to enter the environment. There is a risk of environmental damage.

If you are cleaning the vehicle with the tipping device raised, the raised tipping device, e.g. a lifted waste container, must always be additionally mechanically secured to prevent injuries caused by a suddenly lowering tipping device.

Protect electrical parts (sockets, control units, alternator, etc.) and air filters, etc. from moisture.

Clean your vehicle regularly. Use a high-pressure cleaner for exterior cleaning and keep a minimum distance of 75 cm (29.5 in.) from the vehicle. Use a maximum pressure of 80 bar (1160 psi) at 70 °C (158 °F) water temperature. Cover electrical/electronic parts, insulation panels and stickers and do not expose them to direct water jets.
Do not expose seals, all ventilation grilles and air intake grilles, air inlet openings, the screw-in cover with air filter of the hydraulic oil tank, all other covers and closures of containers and tanks etc. as well as the hydraulic hoses and valves to a direct jet of water.

Do not clean the articulated joint of your vehicle using a high-pressure cleaner.

Be careful not to point the water jet directly at the tires when cleaning the vehicle with a high-pressure cleaner. This can lead to tire damage that cannot be seen with the naked eye.
There is a risk of accident and damage to the vehicle due to the sudden detachment of tire components or the bursting of a tire while driving.

Cleaning the interior of the driver cabin

Avoid any soiling of the cab interior and always keep the cab interior clean and tidy. Otherwise there is a risk of accident or even death due to functional impairment of the controls and pedals.

Do not clean the cab interior with high-pressure or steam cleaners or with a strong jet of water, as pressurised water can penetrate the electrical installation and cause a short circuit and damage seals and control parts.

We recommend the following aids for cab cleaning:

- Vacuum cleaner,
- Damp cloths and
- soft brushes.

1.20 Operating materials

Observe the safety instructions on the handling of operating materials. Observe the safety data sheets for the respective operating material; these can be obtained from the manufacturer.

Do not eat or drink when handling operating materials. Do not inhale mists or vapours. Wear your personal protective equipment PSA/PPE (safety goggles and protective gloves) when handling operating materials.

The hydraulic system is under high pressure. There is a risk of injury from hydraulic oil escaping under high pressure. Hydraulic oil can penetrate the skin and cause serious injuries. Seek medical attention immediately, even for small wounds, otherwise serious infections may occur.

Do not allow any operating materials to come into contact with hot parts, e.g.on the motor. There is a risk of fire due to flammable operating materials.

There is an increased risk of fire when refuelling. Do not smoke during the refuelling process and do not light an open fire.

Immediately absorb leaked or spilt operating materials with suitable binding agents and dispose of them in an environmentally friendly manner in accordance with the regulations applicable at your operating location.

Liquid waste is hazardous to groundwater and must be collected in closed, authorised containers and disposed of in an environmentally friendly manner in accordance with the regulations applicable at your operating location.

Never pour operating materials or liquid waste into containers that are normally used for drinking. There is a risk of severe chemical burns and poisoning, including death, if accidentally drinking from a drink bottle containing e.g.from a drink bottle in which one of these substances was filled.

1.21 Maintenance | Repair | Service

Comply with the legally prescribed safety inspections for mobile, commercially used vehicles at your operating location.

Repairs and service work may only be carried out by your service partner or authorised Customer Service.

We expressly point out that the warranty for your vehicle will only remain valid if the specified maintenance intervals are observed and the respective service and inspection work is carried out by your service partner or an authorised Customer Service.
Daily and weekly maintenance work must be carried out by the operating personnel, see chapter “Care, maintenance and cleaning”. Failure to carry out maintenance work that must be carried out by the operator, or maintenance work that is overdue, incomplete or not carried out at all, will also invalidate the warranty.

During operation, maintenance or servicing, an electronic fault or similar malfunction may cause the vehicle to accelerate when the driver is not in the vehicle. For example, during test operation in the workshop, etc.

For maintenance, repair and servicing:

- Bring the travel direction selector switch into the neutral position (middle position).
- Switch off the engine (ignition key position [0]) and remove the ignition key from the ignition lock.
- Make sure that the parking brake has automatically activated.
- Use chocks to secure the vehicle against rolling away.
- Disconnect the vehicle battery via the main switch.

The vehicle must be stationary and the engine switched off during all maintenance, repair and/or service work. The vehicle must be parked safely and without a steering angle. Above all, it must be secured against rolling away, e.g.via the parking brake or, if necessary, by placing wedges underneath. Never carry out maintenance or repair work on the vehicle while the engine is running.

After repairs, check the repaired or replaced components and the levels of the operating fluids and lubricants by carrying out a test run or test drive in a safe area and test for correct function and correct filling level.

For all work under a raised waste container, the safety bolts must be inserted on both sides of the raised waste container and secured with the retaining clips. The safety supports secure the raised waste container against sudden lowering in the event of a pressure drop.
Never carry out work under an unsecured, raised waste container.

Remove non-tipping container attachments before maintenance, repair and service work.

Allow the vehicle to cool down before carrying out any work, otherwise there is a risk of burns due to hot surfaces.

During maintenance, repair or similar work, immediately collect leaked or spilt operating materials in suitable containers and dispose of them in an environmentally friendly manner in accordance with the regulations applicable at your operating location.

Before carrying out any work on the vehicle's electrical system the main switch [vehicle battery disconnected] .

Always disconnect the vehicle battery before carrying out any work on the electrical system, where tools, spare parts etc. may come into contact or come into contact with electrical components. Check beforehand whether your radio is secured with a radio code and whether you have this code to hand for restarting the radio at a later date.

Only have work on the hydraulic system carried out by an authorised Customer Service. Never disconnect hydraulic lines during operation. Depressurise the hydraulic system before working on it.

Troubleshooting, fault elimination and repair during thunderstorms, blizzards, sandstorms, etc. only in roofed buildings.

No welding, sawing or grinding work on safety-related components, e.g.load-bearing structures such as frames, etc.

Only use original spare parts. Contact your service partner or Kärcher Municipal GmbH for this. Otherwise the vibration values cannot be guaranteed.

1.22 Transport | Towing | Storage

Transport

Note the weight of the vehicle to be transported, including any mounted attachments and container attachments.a waste container, with the respective load statuses.
If a waste container is mounted on the vehicle to be transported, the vehicle should only be transported on the transport trailer in the travel direction. Otherwise, the container lid may be pushed upwards by the airstream.
If transportation is only possible backwards, the container lid must be secured with appropriate safety measures, e.g.suitable lashing straps from opening by a headwind.

Before transporting the vehicle, the transport lock must be attached to the articulated joint.

Drive the vehicle slowly and carefully onto the transport vehicle (trailer, lorry, etc.).

If it is no longer possible to drive the vehicle under its own power, it must be towed onto the transport vehicle using the Towing eye.
If the engine is no longer functional and the parking brake is activated, it must first be released using the emergency actuation, as there is no longer any hydraulic pressure available for the release, see chapter “Troubleshooting guide”.

Loading by crane or forklift truck is not possible.

Set the travel direction selector switch to the neutral position (centre position) and also secure the vehicle against rolling away and sliding sideways.

Set the main switch to [Vehicle battery disconnected].

Attach the transport securing devices and lash the vehicle with approved lashing equipment designed for this purpose.

Observe the vehicle height when transporting the vehicle on a trailer or transport vehicle. Sufficient clearance height must be ensured, especially when driving through subways and gates, under bridges or when entering halls.

Towing

The vehicle may not be towed away if the hazard warning lights are defective, the steering is defective or the brake system is defective or has failed. There is a risk of accidents as the vehicle is partially unable to manoeuvre and cannot be recognised as a towed vehicle by other road users without the hazard warning lights switched on.

If your vehicle can no longer be driven under its own power due to other damage, it may be towed away. If possible, the engine must be running during the towing process so that the steering and brakes are fully functional. The hazard warning lights of both vehicles must be switched on.
If the engine can no longer be started, at least the ignition (ignition key in position [I]) must still work so that the hazard warning lights of the damaged vehicle can be switched on.

The towing eye must be used for towing.
We recommend the use of a tow bar. Otherwise, the damaged vehicle may drive into the towing vehicle, causing injuries and material damage.

Have the vehicle towed away from the danger zone of moving traffic at a maximum speed of 5 km/h (3 mph.). Then load the vehicle onto a transport vehicle.

The towing vehicle may only move off slowly. There is a risk of damage to the damaged vehicle and the towing vehicle if the vehicle is driven off abruptly.

The towing vehicle must have sufficient pulling and braking force for the unbraked trailer load when using a tow bar. When the engine of the damaged vehicle is switched off, the steering is stiff and you can only steer with increased effort. The brakes may be out of order, so that the towing vehicle alone must provide the necessary braking force. The damaged vehicle then pushes onto the tow bar and generates additional thrust for the towing vehicle.

Do not tow over long distances. This can cause damage to the travel drive.

Storage

If, for example, you park the vehicle for longer than 2 months for operational reasons, it may only be parked in a well-ventilated, clean and dry room with a level surface.

Jack up the vehicle so that all wheels are off the ground. This prevents permanent deformation of the tyres.

Disconnect the vehicle battery and recharge it every 2 months.

Do not use plastic film to cover the device, as this will encourage the formation and accumulation of condensation.

If there is a risk of frost, ensure that the antifreeze concentration in the coolant is sufficient. Otherwise, there is a risk of corrosion in the cooling system and engine circuit, as well as a risk of the entire engine freezing. In this case, the engine block may be completely destroyed by bursting.
You can check the antifreeze concentration yourself on a cold engine using a test spindle available from specialised dealers, or you can contact your service partner for a check.

If you do not follow these instructions, there is a risk of damage to components and the vehicle.

1.23 Disposal | Packaging

The operator must ensure that replaced parts and fluids (e.g. operating fluids and lubricants) are disposed of in an environmentally friendly manner in accordance with the regulations applicable at the operating location and the applicable safety data sheets.

When the vehicle has reached the end of its service life, the operator is responsible for the legally compliant disposal of the vehicle. For this purpose, the vehicle can be handed over to a legally authorised private or public company.

Packaging waste is produced when the vehicle is delivered. Remove the packaging residues from the vehicle immediately and dispose of them in an environmentally friendly manner. You can obtain detailed information from your environmental protection authority responsible for this.
Packaging residues are not toys for children. Keep packaging residues out of the reach of children.

For further questions regarding the disposal of a disused vehicle, please contact your local service partner or contact Kärcher Municipal GmbH directly.

1.23.1 Environmental protection

Components such as thevehicle battery, rechargeable batteries operating materials and lubricants that pose a potential danger to human health and the environment if handled incorrectly or disposed of incorrectly must not be disposed of with household rubbish.

If you have any questions about environmental protection and the disposal of components and substances that are hazardous to health and the environment, please contact Kärcher Municipal GmbH or your local service partner.

2 Safety devices

Safety devices protect the user and may not taken out of operation or functionally circumvented. Observe the safety instructions in the individual chapters.

2.1 Start inhibitor

The vehicle has a start interlock that prevents the engine from being started accidentally.
The main switch for the start interlock is located at the rear of the vehicle on the right-hand side below the rear light unit.

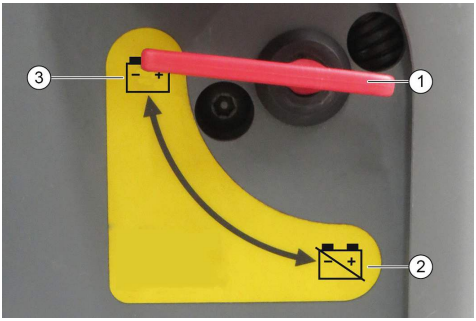


Fig. 4: Main switch

(1) Main switch
(2) [Vehicle battery disconnected] position: It is not possible to start the engine.
(3) [Vehicle battery connected] position: The engine can be started.

Requirements for starting the engine:

- Driver is sitting on the driver's seat.
- The travel direction selector switch is in the neutral position (middle position).
  If the travel direction selector switch is set to forwards or reverse when starting the engine, the engine can still be started. However, driving is only possible when the travel direction selector switch is first set to the neutral position.
- The vehicle battery has been connected via the main switch.

2.2 Seat contact switch

The vehicle is equipped with an electronic seat contact switch. If the driver leaves the seat, the vehicle stops automatically. The power take off (PTO) is simultaneously switched off.

Seat monitoring

– The vehicle can only be moved if the driver’s seat is occupied.

2.3 Parking brake

⚠ WARNING

Risk of injury due to insufficient holding force of the parking brake. This can result in serious injuries or even death.

If the vehicle is parked on a slope with a gradient of more than 25 %, it may start to roll despite the parking brake being activated.

– When parking the vehicle on slopes and inclines, secure it additionally with wheel chocks to prevent it from rolling away.

An applied parking brake is indicated by a warning light.

– When the parking brake is applied, the [Parking brake applied] warning light illuminates in the multifunction display.

- The parking brake requires hydraulic pressure to release.
- The parking brake is automatically applied when the engine is switched off (ignition key in position [0]).
- The parking brake is also automatically applied when the engine is running and the travel direction selector switch is in the neutral position (middle position).
- The parking brake is automatically released when a travel direction is selected with the travel direction selector switch while the engine is running.

2.4 Driver cabin

The driver cabin complies with protection category KAT I in accordance with DIN EN 15695.

The operator is protected from lightning strikes when sitting in the driver cabin.
The driver cabin has a roll-over protective structure (ROPS, Roll Over Protective Structure), which prevents excessive deformation of the driver cab after the occurrence of a special event such as a lightning strike.e.g. tipping over or rolling over.

The driver cabin does not have a structure providing protection from falling objects (FOPS, Falling Object Protective Structure).
The driver cabin does not have a structure providing protection from falling objects (OPS, Operator Protection System).

Always ensure you and your passenger are wearing your seat belt before starting each journey. There is a risk of injury or even death when driving without wearing a seat belt.
The rollover protection structure alone, without a correctly fastened seat belt, cannot protect you from serious injury or, in the event of an accident, from being thrown out of the vehicle.

2.5 Seat belt

In the event of vehicle deceleration caused by an accident, vehicle occupants are held in place by sturdy belts connected to the vehicle body. This means that the driver and any passenger travelling with them cannot be thrown through the vehicle or even out of it.
Always wear your seat belt before travelling. There is a risk of injury or even death when driving without wearing a seat belt.

If a seat belt is damaged, soiled or has been used in an accident, it must be replaced immediately with a new seat belt. Check the condition of the seat belts regularly and contact your service partner if a seat belt needs to be replaced.

3 General notes

3.1 Scope of delivery

Checking the scope of delivery

Your vehicle will be handed over or delivered to you in accordance with the order confirmation. Check the scope of delivery of your vehicle against this order confirmation when handing over the vehicle or when your vehicle is delivered.

The scope of delivery may vary depending on the equipment and order.

Please report any defects or shipping damage identified on the vehicle when it is handed over directly to your service partner.

The instruction on how to handle and operate the vehicle is carried out when the vehicle is handed over. The vehicle is subject to instruction and may not be driven and/or operated without instruction, which must be confirmed with date and signature.

The vehicle is supplied with the following accessories:

- Service bag for your vehicle documents and on-board literature
- Operating instructions with maintenance schedule
- Service handbook
- 2 ignition keys
- 2 door keys
- 2 gas cap keys
- Key folder

Engine MC 150

Please refer to the order confirmation for the scope of delivery of your vehicle.

The following vehicle is described in these operating instructions:

- MC 150
  - Kubota engine 48 kW (66 hp)
    V2403-CR-T-EW03
  - Particulate filter: Diesel Particulate Filter (DPF)
  - All-wheel drive (4WD)
  - Articulated steering
  - Active suspension

3.2 Operator's workplace

When using this vehicle, the operator's workplace is always in the driver cabin on the driver's seat. When using attachments, please refer to the separate attachment operating instructions for the respective workplace of the operator for the corresponding vehicle.

3.3 Notes on servicing

Have the planned maintenance work carried out regularly according to the maintenance schedule and have this confirmed by your service partner by stamping and signing the service booklet. This is important, as only the proven execution of the maintenance work maintains the warranty claim and the claims arising from product liability.

3.4 Warranty

The warranty conditions issued by our relevant sales company apply in all countries.
We shall remedy any malfunctions on your vehicle within the warranty period free of charge, provided that a material defect or manufacturing flaw is the cause.
In the event of a warranty claim, please contact your service partner.

Expiry of the warranty

The following circumstances, among others, lead to expiry of the warranty:

- Failure to observe the specifications, notes and instructions in these operating instructions.
- Improper use.
- Continued operation despite recognisable damage and defects.
- Switching off, bypassing or manipulating safety devices.
- Structural, constructional or other changes.
- Installation of accessories and spare parts that have not been approved by Kärcher Municipal GmbH.
- Attaching implements that do not comply with the applicable installation guidelines.
- Failure to carry out maintenance work that must be carried out by the operator, or maintenance work that is overdue.
- Service and inspection work that is missed, overdue, not carried out or not carried out in full, which must be carried out by the service partner and/or an authorised Customer Service.
- Welding work not carried out by the service partner or an authorised Customer Service in accordance with the specifications of Kärcher Municipal GmbH.

This list is not necessarily complete. Please contact your service partner or Kärcher Municipal GmbH for more information.

3.5 Accessories and spare parts

Only use original accessories and original spare parts because they ensure that the device will run safely and fault-free.
Only by using original accessories and original spare parts (products approved by Kärcher Municipal GmbH) will you retain your warranty claims.

To avoid hazards and material damage, the installation of spare parts and other repairs may only be carried out by your service partner or an authorised Customer Service.

For information on accessories and spare parts, please contact your service partner or Kärcher Municipal GmbH.

Original accessories: Suction mouth camera [1] and reversing camera [2]

Fig. 5: Use as suction mouth camera or reversing camera

The suction mouth camera is fastened at the brush sweeping system suction mouth [3].

As a reversing camera, the camera is attached to the rear of the vehicle.

1 *option*
2 *option*
3 *option*

4 Vehicle overview

4.1 Vehicle views

For a complete overview, the illustrations show a vehicle with attached sweeping system [1] and waste container [2].

Fig. 6: Side view from front left

(1) Sweeping system: Left side brush
(2) Sweeping system: Right side brush
(3) Front right hydraulic connection
(4) Front left hydraulic connection
(5) Driving light and flasher
(6) Driving light and flasher
(7) Windscreen wiper
(8) Working light
(9) Licence plate bracket
(10) Working light
(11) Exterior rear-view mirror
(12) Lockable passenger door
(13) Waste container
(14) Tank cap
(15) Left-hand side panel (hood)
(16) Rear wheel (2x)
(17) Front wheel (2x)

Fig. 7: View with waste container on supports

(1) Rotating beacon warning lamp
(2) Waste container
(3) Exhaust gas/diffusor
(4) Radiator protective grille
(5) Reversing light and indicator, right
(6) Main switch
(7) PTO hydraulic connection rear right
(37 l/min)
(8.1 imp. gal./minute | 9.77 us. gal./minute)
(8) Waste container rear support, right
(9) Trailer coupling [3]
(10) Waste container rear support, left
(11) PTO return flow (37 l/min)
(8.1 imp. gal./minute | 9.77 us. gal./minute)
(12) Reversing light and indicator, left
(13) Attachment frame with tilting function
(14) Waste container side supports (2x)
(15) Driver cabin dust filter
(16) Driver cabin
(17) Licence plate bracket

1 option
2 option
3 option

Fig. 8: View from the right, with raised waste container

(1) Raised waste container
(2) Manual suction hose storage compartment
(3) Suction hose
(4) Driver cabin dust filter
(5) Exterior rear-view mirror
(6) Spray nozzles for side brushes
(7) Side brushes
(8) Lockable driver cabin
(9) Front side panel cover
(10) Articulated joint transport lock
(11) Water system
(12) Recycling water hose
(13) Right-hand side panel
(14) Rear hydraulic connection
(15) Hydraulic connection for raising/lowering the waste container

4.2 Type plate position

The type plate is located in the driver cabin underneath the driver's seat.

Fig. 9: Type plate

(1) Type plate below driver's seat

Chassis number FIN/VIN

The chassis number is stamped into the frame on the right-hand side of the vehicle.

You can also find the VIN on the type plate, where it is also listed for easy reading.

4.3 Hydraulic connections: Assignments

NOTICE

Risk of damage to the hydraulic connections due to ingress of contamination.

– Keep the hydraulic connections clean.
– Clean the plugs and couplings with a clean, lint-free cloth before connecting and disconnecting hydraulic connections.
– Close all unused hydraulic connections with the dust protection cap provided. This prevents dirt and dust deposits on the hydraulic connection, which can enter the hydraulic system and damage it when a hydraulic line is connected.

Your vehicle has two types of hydraulic connections:

- Hydraulic PTO
  Power Take Off = hydraulic force output.
- AUX
  Auxiliary Valve = auxiliary hydraulic valve.

Front hydraulic connections (linear hydraulics)

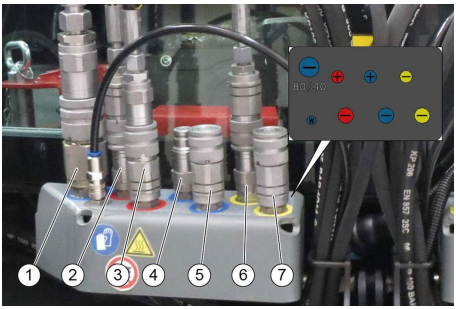


Fig. 10: Front right hydraulic connections

(1) Return PTO
(2) Swivel in the side brush
(3) Swivel out the side brush
(4) Additional function [1]
(5) Additional function [2]
(6) Leakage oil
(7) Additional function (front power lift)

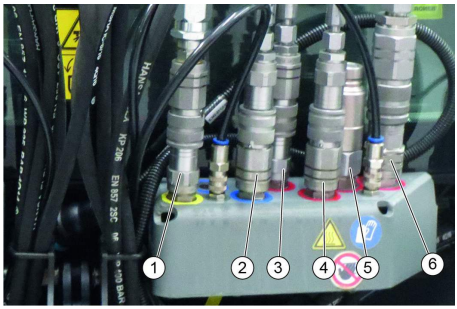


Fig. 11: Front left hydraulic connections

(1) Suction mouth/front power lift
(2) Lift the right and left brush arms together
(3) Swivel in the side brush
(4) Swivel out the side brush
(5) Hydraulic PTO (74 l/min) [3]
(16.3 imp. gal./minute | 19.55 us. gal./minute)
(6) Hydraulic PTO (37 l/min)
(8.1 imp. gal./minute | 9.77 us. gal./minute)

Rear hydraulic connections

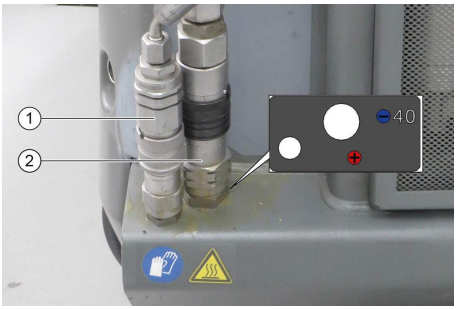


Fig. 12: Rear left hydraulic connections

(1) AUX hydraulic connection, raise/lower
(2) Return flow (37 l/min)
(8.1 imp. gal./minute | 9.77 us. gal./minute)

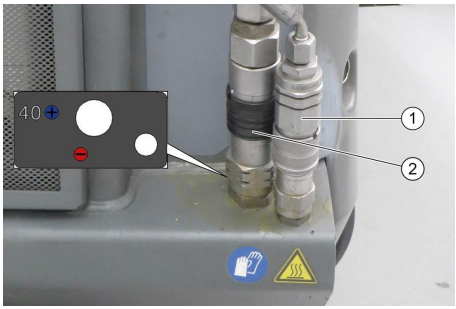


Fig. 13: Rear right hydraulic connections

(1) AUX hydraulic connection, raise/lower
(2) Hydraulic PTO (37 l/min)
(8.1 imp. gal./minute | 9.77 us. gal./minute)

1 option
2 option
3 option

4.4 Electrical connections for attachments: Assignments

Your vehicle has an electrical PTO.
Power Take Off = electrical force output.

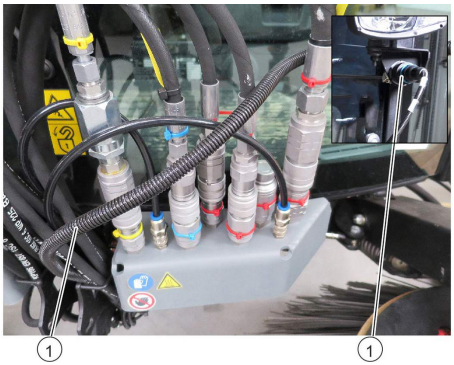


Fig. 14: Front electrical connections for front attachment

(1) Attachment detection

Fig. 15: Rear electrical connections for rear attachment

(1) Attachment detection, 8-pin
(2) 21-pin connection for rear attachment

4.5 Water connections: Assignments

Spray water connections

Fig. 16: Front right spray water connections

(1) Right side brush dust spray water

Fig. 17: Front left spray water connections

(1) Left side brush dust spray water
(2) Suction mouth spray water

4.6 Waste container/attachment frame changeover

The switch lever is located at the front of the rear carriage, above the articulated joint.

There are two different versions of the switch lever depending on the version of the vehicle.

The switch lever is used to operate the changeover valve, which switches the hydraulics between an attached waste container and a tiltable attachment frame.

ADVICE The waste container and attachment frame are electronically monitored. Both functions cannot be activated simultaneously.

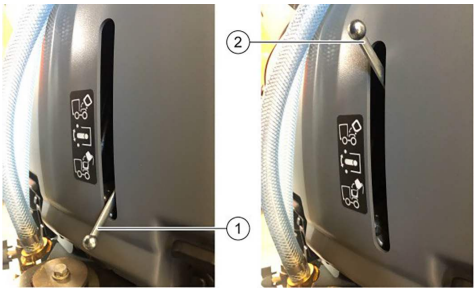


Fig. 18: Waste container/attachment frame changeover

(1) Switch lever in lower position: Waste container

(2) Switch lever in upper position: Attachment frame

4.7 Main switch

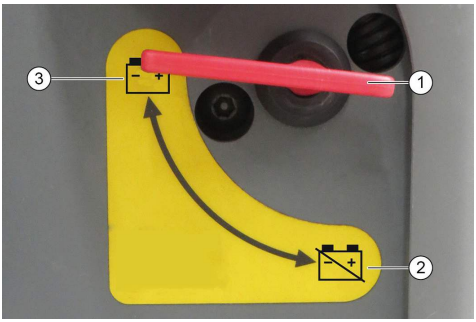


Fig. 19: Main switch

(1) Main switch

(2) [Vehicle battery disconnected] position: It is not possible to start the engine.

(3) [Vehicle battery connected] position: The engine can be started.

The main switch interrupts the electrical supply line to the starter motor.
If the main switch is actuated when the engine is running, i.e. the battery is disconnected, the engine will stop running.
Always disconnect the battery when you switch off the vehicle.

Requirements for starting the engine:

- Driver is sitting on the driver's seat.
- The travel direction selector switch is in the neutral position (middle position).
  If the travel direction selector switch is set to forwards or reverse when starting the engine, the engine can still be started. However, driving is only possible when the travel direction selector switch is first set to the neutral position.
- The vehicle battery has been connected via the main switch.

5 Driver cabin

5.1 Doors

The emergency exit is on the side opposite the driver's door and is marked with a symbol.

– The position of the driver's door depends on the side of the vehicle where the steering is located.

– Always lock both doors after parking the vehicle to prevent unauthorised use of the vehicle.

Fig. 20: Driver's door

(1) Sliding windows
(2) Door lock
(3) Door handle

Right-hand steering vehicle variant
The driver's seat and the driver's door are located to the right in the travel direction, a second door is located on the left side of the driver cabin.

Left-hand steering vehicle variant
The driver's seat and the driver's door are located to the left in the travel direction, a second door is located on the right side of the driver cabin.

Entry and exit aids
Handles that can be used as entry and exit aids are located inside the doors and on the A-pillars.

5.2 Interior filter

Outside on both sides of the driver cabin

The fresh air for the interior is sucked in at the side of the driver cabin through a dust filter or fine dust filter [1].

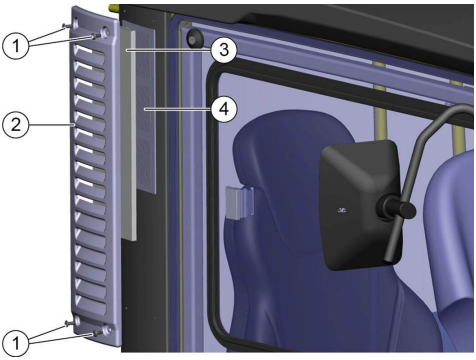


Fig. 21: Outside interior filter

(1) Screws
(2) Cover
(3) Dust filter, coarse
(4) Fine dust filter, filter class F8 [2]

The optionally available fine dust filter (4) has filter class F8 If you replace this fine dust filter (4), make sure it is of the same filter class.

Inside the driver cabin

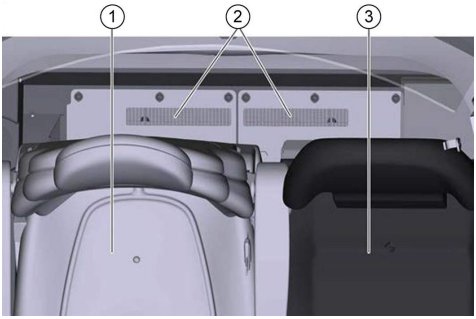


Fig. 22: Interior filter

(1) Driver's seat
(2) Dust filter
(3) Passenger seat

1 option
2 option

5.3 Interior lighting

The interior lighting is located in the ceiling console.

Fig. 23: Interior light

(1) Press the light on the left: The lighting is switched on

(2) Light in the centre position: Door-dependent lighting

(3) Press the light on the right: The lighting is switched off

1. Set the interior light to the centre position (2) so that the interior light switches on when a door is opened and switches off again when the door is closed.

5.4 Radio [1]

Limited radio reception due to unfavourable radio aerial position.

– Position the radio aerial as vertically as possible to ensure good reception.

The optionally available radio is located in the ceiling console.

To operate the radio, read the manufacturer's operating instructions.

Fold the antenna over if necessary (drive-throughs, underground garages) to remain within the vehicle contour.

1 *option*

5.5 Switch panel

Active functions are indicated by illuminated symbols.

– The symbols in the switches and buttons light up when the respective function is switched on.

The switch panel is located in the ceiling console.

Unless otherwise described, the switch positions have the same on/off functionality for all buttons:

- Top switch position = Off (function is switched off)
- Bottom switch position = On (function is switched on, symbol lights up)

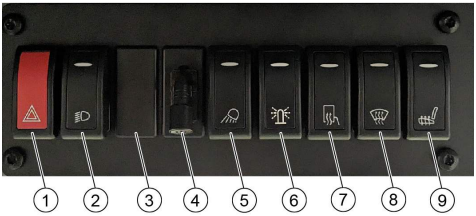


Fig. 24: Switch panel in the ceiling console

1	Warning flasher system
2	Lighting ■ Top switch position: Driving lights off ■ Center switch position: Parking lights switched on ■ Bottom switch position: Headlights switched on The daytime running lights are switched on automatically as soon as the ignition is started (ignition key in position [I])..
3	Not used
4	Microphone for hands-free system [1] Operating instructions are provided in the operating instructions for the radio [2].
5	Front work lights ■ Top switch position: Working lights switched off ■ Center switch position: Lower work lights (standard equipment) switched on ■ Bottom switch position: Lower and upper [3] Work lights switched on Without optional working lights in the roof, this switch setting corresponds to the centre position.
6	Flashing beacon

1 option
2 option
3 Option

7	Heated exterior mirrors [4] The heating switches off automatically.
8	Heated windscreen The heating switches off automatically.
9	Seat heater

5.6 Heating | Ventilation | Air-conditioner

The air conditioning only works when the fan engine is switched on.

– The air conditioning system is only activated when the fan level switch (3) is set to at least level [1].

The control elements are located in the ceiling console.

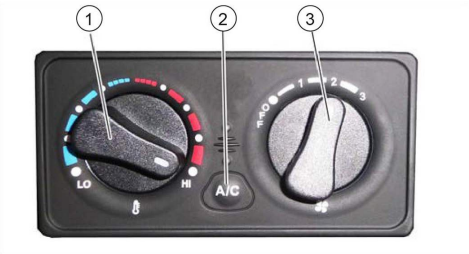


Fig. 25: Controls for heating, ventilation and air-conditioner

(1) Temperature controller for cooling/heating
(2) Button: Air-conditioner on/off
(3) Fan level switch

Make sure you have a comfortable climate while in the driver cabin. Adjust this using the control elements (1), (2) and (3).
Adjust the ventilation nozzles in the cab to be draft-free.

[4] *option*

Fresh air supply/recirculation mode and ventilation nozzles

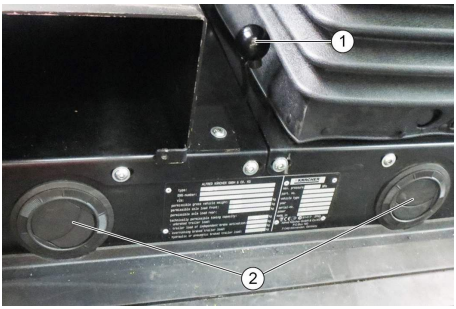


Fig. 26: Air vents and recirculation mode

(1) Lever for fresh air supply or recirculation mode

(2) Ventilation nozzles

Fig. 27: Air recirculation

(3) Fresh air supply from outside

(4) Air circulation in the driver cabin

1. Press the flaps of the desired air vent (2) to open or close the air vent.
2. Turn the open ventilation nozzle (2) to change the direction of the air flow.
3. Set the lever (1) to the position for recirculation mode (4) to stop the supply of fresh air from outside.
   This can reduce the penetration of bad odors or hazardous substances, such as dust, vapour or aerosols, if you work in an environment where such odors or substances occur.

Recirculation mode and windscreen defrost function

⚠ CAUTION

Risk of accident due to misted-up windshield caused by poor ventilation.

A fogged windshield can impair your vision and lead to accidents.

– Always keep the ventilation openings in the footwell in front of the windshield clear so as not to impair the ventilation of the windshield.

The circulation air function ensures that a fogged windscreen clears more quickly when the air-conditioner or air blower is switched on.
The cab air can also be warmed more quickly.
When working in very dusty environments, the recirculation mode can prevent dust or bad odors from entering the interior of the driver cabin.

⚠ CAUTION Only use the recirculation function for a limited period, since air is not exchanged from the outside with this setting.

5.7 Storage compartment

A lockable storage compartment is located under the passenger seat. This can be used for storing documents, operating instructions, small parts or the towing eye.

Fig. 28: Storage compartment under passenger seat

- **(1)** Passenger seat
- **(2)** Lock
- **(3)** Storage compartment

5.8 Steering wheel panel

The steering wheel console is located in the centre of the steering wheel.

Fig. 29: Steering wheel console with multifunction display

- **(1)** Steering wheel
- **(2)** Multifunction display with function and setting buttons
- **(3)** Multi-function switch
- **(4)** Steering wheel knob
- **(5)** Travel direction selector switch

5.8.1 Multi-function switch

The multi-switch is located on the left-hand side of the steering wheel.

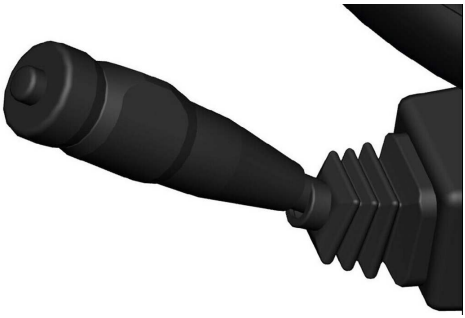


Fig. 30: Multi switch on the steering wheel

- **Horn:** Press the button on the front.
- **Turn indicator to the right:** Press the lever forwards.
- **Turn indicator to the left:** Press the lever backwards.
- **Switch on the high beam:** Press the lever down with the driving light switched on.
  Press the lever up again to switch off the high beam.
- **Flasher:** Pull the lever and release it again.
- **Switch on the windscreen wiper:** Turn the ring backwards.
  1st level for normal wiping speed.
  2nd level (turn the ring further) for fast wiping speed.
- **Wiping with washer water:** Press the ring.
- **Activatewindscreen wiper interval switching**: Turn the ring forwards.

5.8.2 Travel direction selector switch

⚠ CAUTION

Risk of accident and injury due to incorrect operation of the direction selector switch.

– To be able to select the travel direction or change the operating program, the vehicle must be stationary and the direction selector switch must be in the neutral position (middle position).
– If the direction switch is in the forward or reverse direction when selecting the travel direction or switching the driving program, the symbol display in the multi-function displaywill change but the travel direction or driving program switchover will not occur.
– The travel directionand the driving program can only be changed via the neutral position (middle position) when the vehicle is stationary.

The travel direction selector switch is located on the right side of the steering wheel.
Select the travel direction using the travel direction selector switch and switch over the driving program.

Fig. 31: Travel direction selector switch

(1) Travel direction selector switch

1. Pull the travel direction selector switch (1) upwards towards the steering wheel, then move it in the desired travel direction.
   – Forwards for drive.
   – Backwards for reverse.

   The selected travel direction is indicated by a symbol in the multifunction display.
2. Select the speed using the accelerator pedal.
3. Bring the travel direction selector switch (1) into the neutral position (middle position).
   The travel drive is now in neutral and the parking brake has been activated.

In transport mode: Switching the driving programs

1. Bring the travel direction selector switch (1) into the neutral position (middle position).
2. Press the travel direction selector switch in the direction of the axle towards the steering column to switch between the driving programs:
   – Fast driving program = Hare (V_{max} depending on vehicle configuration)
   – Slow driving programme slow = Tortoise (V_{max} = 20 km/h | 12.43 mph.)

   The active driving programme is shown in the multifunction display.

5.8.3 Ignition lock

The ignition lock is located on the right side of the steering wheel below the travel direction selector switch.

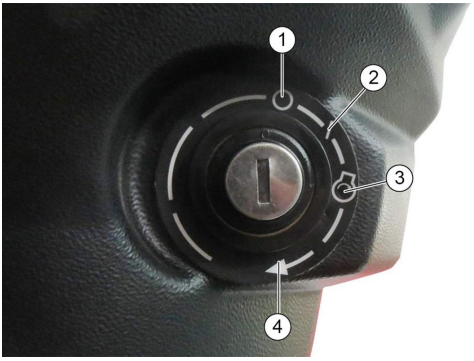


Fig. 32: Ignition lock

(1) Position [0] = engine is switched off.
(2) Position [I] = ignition is switched on.
(3) Preheating (automatic).
(4) Start the engine.

5.9 Pedals

The pedals are located in the footwell at the lower end of the steering column.

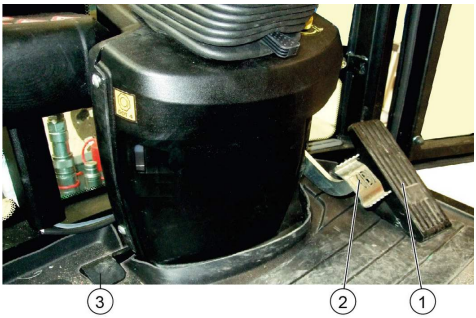


Fig. 33: Pedals

(1) Accelerator pedal
(2) Brake pedal
(3) Pedal for brush unloading/brush speed (function only active with an attached sweeping system [1].)

1 option

5.9.1 Accelerator pedal

⚠ WARNING

Risk of accident and injury because releasing the accelerator pedal brakes the vehicle abruptly.

– The hydrostatic drive brakes or stops the vehicle abruptly when the accelerator pedal is released.
– The braking force applied when you release the accelerator pedal is weaker in higher gears and stronger in lower gears.
– The braking force applied when you release the accelerator pedal in transport mode is significantly weaker than in working mode.

- Press the accelerator pedal: The engine speed and travelling speed increase.
- Release the accelerator pedal slightly: The engine speed and travelling speed decrease.
- Release the accelerator pedal completely: The hydrostatic drive stops the vehicle.

5.9.2 Brake pedal

The brake pedal activates the brake system on the front axle and brakes the vehicle.

5.9.3 Parking brake

⚠ WARNING

Risk of injury due to insufficient holding force of the parking brake. This can result in serious injuries or even death.

If the vehicle is parked on a slope with a gradient of more than 25 %, it may start to roll despite the parking brake being activated.

– When parking the vehicle on slopes and inclines, secure it additionally with wheel chocks to prevent it from rolling away.

An applied parking brake is indicated by a warning light.

– When the parking brake is applied, the [Parking brake applied] warning light illuminates in the multifunction display.

- The parking brake requires hydraulic pressure to release.
- The parking brake is automatically applied when the engine is switched off (ignition key in position [0]).
- The parking brake is also automatically applied when the engine is running and the travel direction selector switch is in the neutral position (middle position).
- The parking brake is automatically released when a travel direction is selected with the travel direction selector switch while the engine is running.

5.10 Multifunction display

The multifunction display is located in the steering wheel console.

5.10.1 Function buttons and setting buttons

The following display appears in the multifunction display in the steering wheel console after switching on the ignition:

Fig. 34: Buttons on the multifunction display

(1) Function buttons
(2) Display in start/transport mode
(3) Setting buttons

	Assignment of the function buttons
F1	Information such as the vehicle operating instructions can be provided here. In working mode: Switch on the [High-pressure cleaner [1]].
F2	Terrain mode
F3	Various settings In the Service menu: Call up the suspension menu, see "Suspension and chassis status", page 116
F4	In working mode: Bridge the seat contact switch. In transport mode: Activate/deactivate the car park mode, see "Suspension and chassis status", page 116.
F5	Reversing warning buzzer on/off
F6	Reversing camera on/off
F7	Suction-mouth camera [2] (optional with “sweeping” attachment kit)
F8	Set cruise control
F9	Resume cruise control
F10	Service menu

- Pressing the corresponding function button changes the information shown in the multifunction display.
- Return by pressing again or by pressing the [Home] button.
- Use the settings buttons [+] and [-] to change the settings.

	Button	Process
	[+] Setting button	Jumps one field up when making settings.

1 Option
2 Option

	Button	Process
	[-] Setting button	Jumps one field down when making settings.
	[Home] button	Navigates to the “Home” screen for the respective operating mode (Transport / Work).
	[Esc] button	Jumps one step back when making settings.
	[Enter] button	Completes a setting procedure.

5.10.2 Menu & settings

The multifunction display can be used for e.g. making vehicle settings, making settings for the information shown on the multifunction display and displaying vehicle information.

The default multifunction display language is English, but the language can be changed via the [Settings] menu.

The central elements for menu navigation and selection of menu items in the multifunction display are the rotary knob (1) and pushbutton (2) on the arm rest control panel.

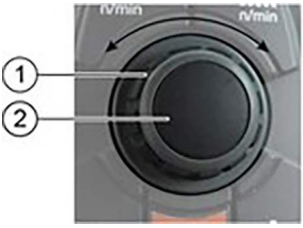


Fig. 35: Rotary knob with button for multifunction display

(1) Rotary knob
(2) Button

	[Back] symbol Select the symbol with the rotary knob (1) and press the button (2) to go back in the menu or to return to the previous view.
	[Home] symbol Select the symbol with the rotary knob (1) and press the button (2) to return to the home menu.
	[OK] symbol Select the symbol with the rotary knob (1) and press the button (2) to save the changed settings/values.

Navigating through the menus and making settings

1. Press the integrated button (2) to call up the basic view of the menu and settings interface.
2. Use the rotary knob (1) to select the symbol for the desired menu item.
   The symbol is highlighted in the multifunction display.
3. Press the integrated button (2) to confirm your selection of the menu item.
   The menu or other submenus are opened.
4. Use the rotary knob (1) again to select the desired submenu and confirm your selection with the button (2).
5. If there are no further submenus or you are in the desired submenu, use the rotary knob (2) again to select the desired setting or change a set value.
6. Confirm your selection or the newly set value by pressing the button (2) again.
   Your selection or the value is saved.
   When the [OK] symbol appears on the multifunction display, you can select it using the rotary knob (1) and confirm by pressing the button [2] to save.
7. If you want to exit the menu or submenu without making a setting, use the rotary knob (1) to navigate to the [Back] symbol and confirm your selection with the button (2).
   The multifunction display switches to the previous menu level.
8. If you want to exit the menu, use the rotary knob (1) to navigate to the [Home] symbol and confirm your selection with the button (2).
   The multifunction display returns to the start screen.

5.10.3 Displays in start/transport mode

The following values are shown on the multifunction display in Start/Transport mode:

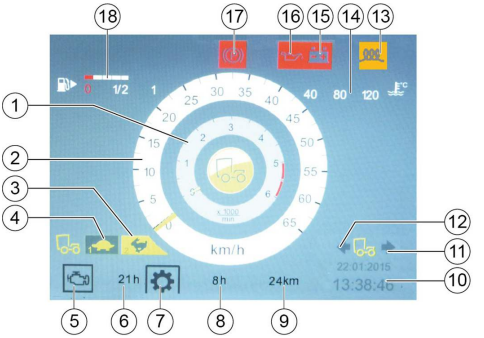


Fig. 36: Multifunction display: Displays in start/transport mode

(1) Engine speed
(2) Travel speed
(3) Rabbit symbol: [Fast] mode indicator
(4) Tortoise symbol: [Slow] mode indicator
(5) Engine operating hours symbol
(6) Operating hours counter
(7) Working hours symbol (no function)
(8) Working hours meter
(9) Mileage
(10) Date and time
(11) Reverse travel direction
(12) Forwards travel direction
(13) [Preheating coil] symbol
(14) Engine coolant temperature
(15) [Battery charging monitor] warning light
(16) [Engine oil pressure] warning light
(17) [Parking brake actuated] warning light
(18) Fuel level indicator

5.10.4 Working mode indicators

If you switch to working mode, i.e. a PTO is active, the following indicators are shown in the multifunction display:

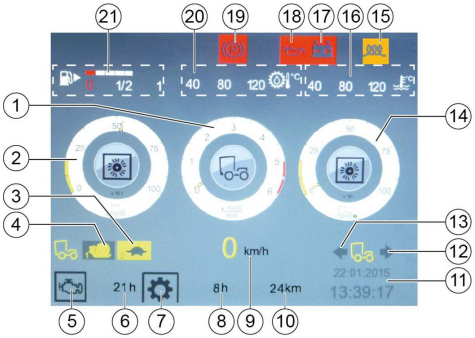


Fig. 37: Multifunction display: Working mode indicators

(1) Engine speed
(2) Front attachment drive triggering level in %
(3) Tortoise symbol: [Fast] mode indicator
(4) Snail symbol: [Slow] mode indicator
(5) Engine operating hours symbol
(6) Operating hours counter
(7) Working hours symbol (no function)
(8) Working hours meter
(9) Working speed
(10) Mileage
(11) Date and time
(12) Reverse travel direction
(13) Forwards travel direction
(14) Rear attachment drive triggering level in %
(15) [Preheating coil] symbol
(16) Engine coolant temperature
(17) [Battery charging monitor] warning light
(18) [Engine oil pressure] warning light
(19) [Parking brake actuated] warning light
(20) Hydraulic oil temperature
(21) Fuel level indicator

5.10.5 Reversing camera [1]

⚠ WARNING

Risk of accident and injury due to overlooking obstacles when using the reversing camera.

The reversing camera never replaces the driver's awareness of the surroundings. There is a risk of accidents due to overlooking obstacles and the risk of injury due to an accident, not only for the driver himself, but also for uninvolved third parties who are in the vicinity.

– When reversing, always pay attention to your surroundings and never rely solely on the image from the reversing camera.
– There must be no persons, children or objects in the manoeuvring area.

The reversing camera is located at the rear of the vehicle.

When reversing, the camera automatically turns on and appears in the multifunction display.

5.10.6 Bridging the seat contact switch

⚠ WARNING

Risk of accident and injury due to bridged seat contact switch.

The vehicle and/or an attachment may start moving unintentionally if the seat contact switch is bypassed, thereby endangering you and other persons.

– The seat contact switch may only be bypassed for very specific activities.
– Never bypass the seat contact switch for any reason other than the activities described here. The seat contact switch is a safety device that must not be bypassed for purposes other than those described here.

The seat contact switch may only be bypassed during activities that require the driver to leave the driver's seat.

These include, for example:

- Working with the manual suction hose [1].
- Working with the high-pressure cleaner [2].

1 option
1 option
2 option

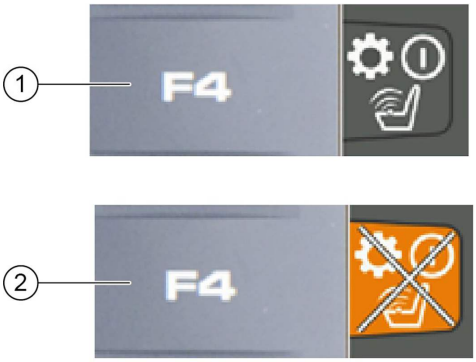


Fig. 38: Bridging the seat contact switch

(1) [Seat contact switch active] symbol
(2) [Seat contact switch bridged] symbol

1. Set the travel direction selector switch to the neutral position.
   The parking brake is automatically applied.
2. Activate the working hydraulics (PTO on).
   Working mode is now active.
3. Press the [F4] function button on the multifunction display.
   The [Seat contact switch overridden] warning symbol appears on the multifunction display.
   The seat contact switch is now bridged and although the driver's seat is not loaded, the PTO is active.
4. Deactivate the seat contact switch bypass again immediately after completing the work by pressing the [F4] function button on the multifunction display again.

5.10.7 Depressurise the hydraulic system (pressure relief)

⚠ CAUTION

Risk of injury due to attachment lowering.

Relieving pressure with a raised attachment can lead to injures and crushing due to the sudden lowering of the attachment.

– Always lower lifted attachments before depressurising.

NOTICE

Risk of damage due to attachment lowering.

Depressurising with a raised attachment can lead to material damage to the vehicle and the attachment due to the sudden lowering of the attachment.

– Always lower lifted attachments before depressurising.

The hydraulic system must be depressurised before disconnecting the hydraulic hoses from the hydraulic connections.

Fig. 39: Multifunction display

1. Unplug the attachment detection plug at the front and rear.
2. Sit on the seat.
3. Switch on the ignition.
4. Switch to the service menu in the multifunction display using the function button [F10] (1).

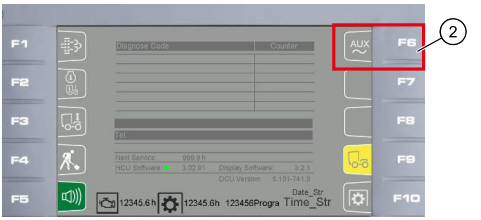


Fig. 40: Service menu

5. Press the [F6] (2) function button in the service menu.

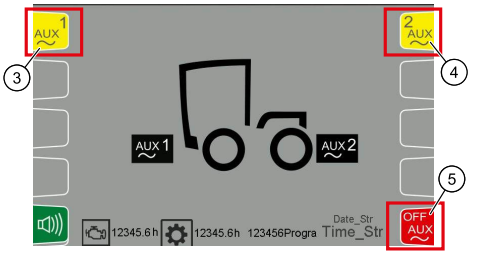


Fig. 41: Pressure relief

6. Actuate the pressure relief with AUX 1 front (3) or AUX 2 rear (4).
7. Change the attachment when the pressure relief is activated.
8. Once the hydraulic coupling of the attachment is complete, switch off the pressure relief with function button [F10] (5).

5.10.8 Symbols in the multifunction display

Symbols can be shown in different colours on the multifunction display:

Colour of the symbol	**Meaning**	**Request to take some action**
Green	Note	For your information.
Orange	Indication of faults or pending changeovers of operating states.	It is possible to continue driving with appropriate caution.
Red	Errors and safety-related warnings.	Read the operating instructions for the relevant topic. Do not continue driving and park the vehicle as quickly as possible. Contact your service partner immediately.

The individual symbols and their specific meanings are described on the following pages.

The following symbols can be shown in the multifunction display:

	High beam
	Parking light
	Driving light
	Travel direction indicator (indicator)
	Trailer travel direction indicator (indicator)
	Floating position for AUX 1 active
	Floating position for AUX 2 active
	Floating position for AUX 1 and AUX 2 active
	Attachment Working mode: Function 99 dB(A) active
	Reversing camera active
	Suction mouth camera activated
	Cruise control activated
	Cruise control inactive
	Delete speed specification
	Preheating active
	Fuel filling level warning

	General fault (uncritical), check fault list
	Differential lock activated
	Switching operation
	Neutral position (middle position) of the travel direction selector switch is required
	Seat contact switch not recognised
	No auxiliary outputs active, seat contact switch not active
	Seat contact switch malfunction
	Open regeneration menu
	Perform the regeneration process
	High exhaust pipe temperature (regeneration is active)
	Regeneration not possible
	Open engine error menu
	Engine malfunction, MIL orange
	Engine malfunction, MIL red
	Warning, battery charge status
	DCU fault (control unit)

	Rear fog light switched on
	Service required
	Drive temperature is high
	Drive temperature too high
	High hydraulic oil level warning
	Low hydraulic oil level warning
	Warning, hydraulic oil temperature high
	Hydraulic oil filter malfunction
	AUX menu
	AUX front active
	AUX rear active
	Exit AUX and menu
	Activate Work mode
	Oil quantity menu
	Pulled 2-brush system not active Only when the 3rd brush of a 3-broom system is inactive. With a pushed 2-brush system, the symbol must be gray (= inactive).
	Pulled 2-brush system active

	DCU in stop state
	Engine air filter malfunction
	Switch off the engine
	Critical malfunction, switch off the engine
	Warning, engine coolant temperature too high
	Reversing signal off
	Parking brake active
	Warning, brake pressure too low
	Fault in the brake system
	Warning, engine oil pressure too low
	Water in the fuel
	Safety mode, limited speed
	Malfunction, only transport mode at 5km/h (3 mph.)
	Lower suction mouth
	High-pressure cleaner active
	High-pressure cleaner not active
	Release accelerator pedal

	Only when the 3rd brush of a 3-broom system is inactive. With a pushed 2-brush system, the symbol must not be yellow (= active).
	3-brush system active
	3-brush system Classic active
	Container and platform closed
	Warning: Container is raised
	Warning: Platform is raised

	Automotive drive
	Drive preset speed
	Automatic calibration
	Suspension menu: Lower suspension status
	Loading mode: Upper suspension status
	Device carrier mode active
	Warning: Exit height too high

	Seat contact not active
	Seat contact active
	High-pressure cleaner active

	Car park mode active
	Terrain mode active
	Fault in the suspension system

6 Control panels and controls

6.1 Arm rest control panel

The control panel is located on the arm rest next to the driver's seat.
The arm rest can be individually adjusted to suit the driver.

ADVICE The assignment of the control panel elements when the vehicle is used as a sweeper is described in the operating instructions “MC 150 Attachments”.
The assignments of the control panel differ depending on the mounted brush sweeping system.

6.2 Overview of the control panel

Active functions are indicated by illuminated symbols.

– The symbols in the switches and buttons light up when the respective function is switched on.

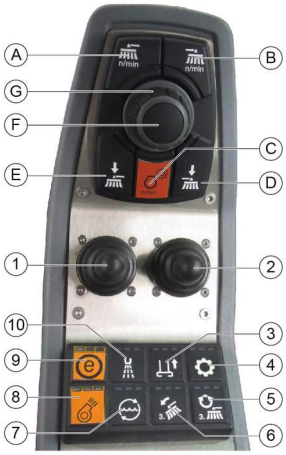


Fig. 42: Control panel assignment

(A) PTO front
(B) Rear PTO
(C) Button for adjusting the engine speed.
(D) Not used
(E) Front power lift device pressure relief
(F) Button to save the set values
(G) Rotary knob

(1) Front power lift joystick
(2) AUX 2 and AUX 3 joystick
(3) Not used
(4) Switch the PTO hydraulic system on/off
(5) Front electrical AUX 1
(6) Front electrical AUX 2
(7) Rear electrical AUX 1
(8) Rear PTO
(9) ECO function
(10) Front electrical AUX 2

6.3 Using the device carrier mode - freely programmable

6.3.1 Device carrier mode

To be able to use the freely programmable device carrier mode, an attachment detection plug must not be plugged in.

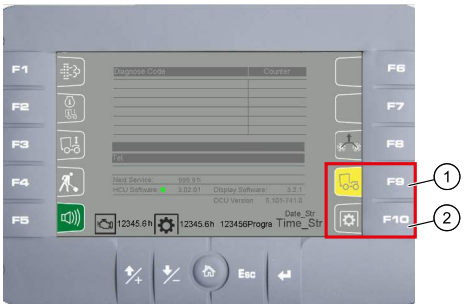


Fig. 43: Service menu

(1) Function key [F9]: Activation of device carrier mode (symbol is highlighted in yellow when active)

(2) Function key [F10]: Setting the oil quantities

To enable the freely programmable device carrier mode, the parameter “1.1.8” must be set to “1” in the control unit. This is done during Start-Up or subsequently by service personnel. By setting the parameter to 1, the function keys [F9] and [F10] in the service menu (F10) are enabled in the display.

6.3.2 Oil quantity selection

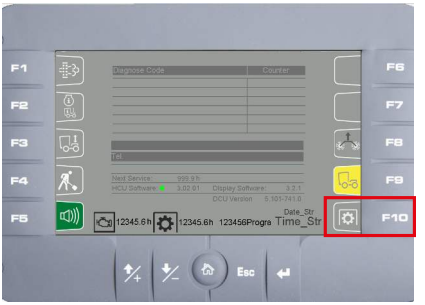


Fig. 44: Service menu - Oil quantity selection

Fig. 45: Oil quantity selection

1. Press function button [F10] in the service menu on the multifunction display.
2. Use the rotary knob (G) on the control panel to select between PTO front or rear and confirm the selection with the button (F).
3. Then use the rotary knob (G) to select the amount of oil at the front or rear and confirm your selection with the button (F).

Selection options for the oil quantity

Front	Rear
0 l/min (0 imp. gal./minute | 0 us. gal./minute)	0 l/min (0 imp. gal./minute | 0 us. gal./minute)
0 l/min (0 imp. gal./minute | 0 us. gal./minute)	37 l/min (8.1 imp. gal./minute | 9.77 us. gal./minute)
37 l/min (8.1 imp. gal./minute | 9.77 us. gal./minute)	0 l/min (0 imp. gal./minute | 0 us. gal./minute)
37 l/min (8.1 imp. gal./minute | 9.77 us. gal./minute)	37 l/min (8.1 imp. gal./minute | 9.77 us. gal./minute)
74 l/min (16.3 imp. gal./minute | 19.55 us. gal./ minute)	0 l/min (0 imp. gal./minute | 0 us. gal./minute)

6.3.3 Setting and activating the engine speed

Setting the engine speed

1. In working mode, press the button (C) for less than 2 seconds.
2. Set the desired engine speed using the rotary knob (G) on the control panel.
3. Confirm your selection by pressing the button (F).

Activation/deactivation of engine speed

- To activate, press the button (C) on the control panel for 2 seconds in working mode.
- To deactivate, press the button (C) again for 2 seconds.

6.3.4 Activating/deactivating the PTO - 37 litre circuits

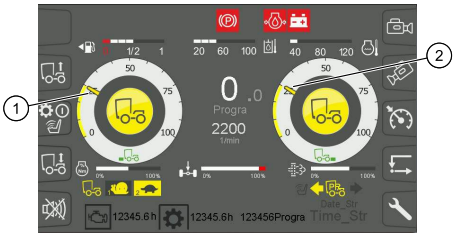


Fig. 46: Percentage display of the oil quantity

(1) Front PTO
(2) Rear PTO

Activating the front PTO

1. Set the engine speed and activate it.
2. Tap the left joystick on the control panel forwards.

✓ The front power lift floating position is switched on.

3. To activate the front PTO, briefly tap the left joystick forwards again.

✓ If the front PTO is active, the set percentage oil quantity is shown on the display.

Deactivating the front PTO

1. Tap the left joystick of the control panel backwards.
2. Deactivate the engine speed.

Activating the rear PTO

1. Set the engine speed and activate it.
2. To activate, press the rear PTO button (8) on the control panel.

✓ If the rear PTO is active, the set percentage oil quantity is shown on the display.

3. Deactivate the engine speed.

Deactivating the rear PTO

1. Press the rear PTO button (8) to deactivate.
2. Deactivate the engine speed.

6.3.5 Setting oil quantity of front/rear PTO 37 litres

The oil quantity can be adjusted in 2 ways:

- Changing the engine speed changes the flow rate of the pump.
- By adjusting the front/rear PTO proportional valve.

Changing the engine speed

1. Press the button (C) on the control panel.
2. Use the rotary knob (G) to change the engine speed from 1,300 to 2,700 rpm.
3. Confirm your selection by pressing the button (F).

Adjusting the proportional valve

1. **Front PTO:** Press button (A) on the control panel.
1. **Rear PTO:** Press the button (8) on the control panel for at least 3 seconds.
2. Use the rotary knob (G) to set the oil quantity percentage.
3. Confirm your selection by pressing the button (F).

✓ The oil quantity percentage is shown in the display.

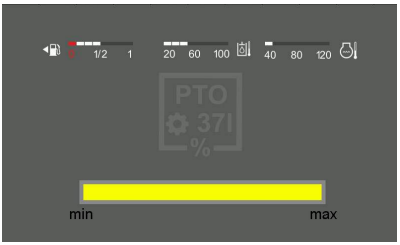


Fig. 47: Setting the oil quantity - 37 litres circuit

6.3.6 Activating/deactivating the PTO - 74 litres circuit

If an oil quantity of 74 litres is required at the front, no attachment may be coupled to the 37 litre circuit at the rear. The front attachment must be coupled to the 74 litre circuit (see "Hydraulic AUX connections on the vehicle", page 95).

Activating the front PTO

1. Set the engine speed and activate it.
2. Tap the left joystick on the control panel forwards.

✓ The front power lift floating position is switched on.

3. To activate the front PTO, briefly tap the left joystick forwards again.

✓ If the front PTO is active, the set percentage oil quantity is shown on the display.

Deactivating the front PTO

1. Tap the left joystick of the control panel backwards.
2. Deactivate the engine speed.

6.3.7 Front PTO oil quantity setting 74 litres

The oil quantity can be adjusted in 2 ways:

- Changing the engine speed changes the flow rate of the pump.
- By adjusting the front/rear PTO proportional valve.

Changing the engine speed

1. Press the button (C) on the control panel.
2. Use the rotary knob (G) to change the engine speed from 1,300 to 2,700 rpm.
3. Confirm your selection by pressing the button (F).

Adjusting the proportional valve

1. Press the button (8) on the control panel for at least 3 seconds.
2. Use the rotary knob (G) to set the oil quantity percentage.
3. Confirm your selection by pressing the button (F).

✓ The oil quantity percentage is shown in the display.

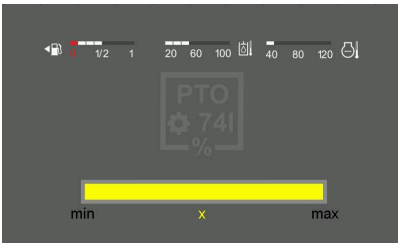


Fig. 48: Setting the oil quantity - 74 litres circuit

6.3.8 Hydraulic operation AUX

Fig. 49: Control panel assignment

AUX 1a	Press and hold the left joystick (1) to the right.
AUX 1b	Press and hold the left joystick (1) to the left.
AUX 2a	Press and hold the right joystick (2) to the left.
AUX 2b	Press and hold the right joystick (2) to the right.
AUX 3 floating position 1	1. Preselect the left brush relief button (E). 2. Set the neutral contact pressure using the rotary knob (G) and press the button (F). 3. Tap the left joystick (1) forwards.
AUX 3a	Pull the left joystick (1) backwards and hold.
AUX 3b	1. Preselect the left brush relief button (E). 2. Use the rotary knob (G) to set the maximum contact pressure or as required and confirm with button (F). 3. Press the left joystick (1) forwards and hold.
AUX 4 floating position	1. Preselect rotation direction reversal (5). 2. Tap the left joystick (1) forwards.
AUX 4a	1. Preselect rotation direction reversal (5). 2. Pull the left joystick (1) backwards and hold.
AUX 4b	1. Preselect rotation direction reversal (5). 2. Press the left joystick (1) forwards and hold.
AUX 5 floating position 2	1. Preselect the right brush relief button (D). 2. Set the neutral contact pressure using the rotary knob (G) and press the button (F). 3. Tap the joystick right forwards.

AUX 5 (lift)	Pull the joystick right (2) backwards and hold.
AUX 5	1. Preselect the right brush relief button (D). 2. Use the rotary knob (G) to set the maximum contact pressure or as required and confirm with button (F). 3. Tap the right joystick (2) forwards.
AUX 6a	Press switch S7 (tilting frame / wast container) forwards and hold. (see "Controls for waste container or mounting frame", page 98)
AUX 6b	Press and hold switch S7 (tilting frame / waste container) to the rear. (see "Controls for waste container or mounting frame", page 98)

6.3.9 Hydraulic AUX connections on the vehicle

Front hydraulic connections

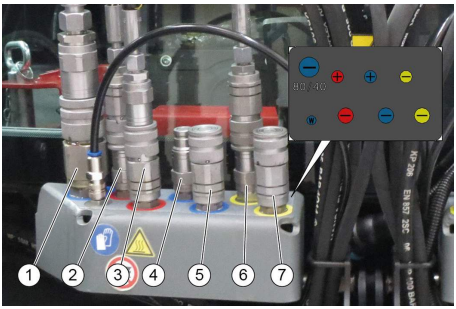


Fig. 50: Front right hydraulic connections

(1) Return PTO
(2) AUX 2a
(3) AUX 2b
(4) AUX 3a
(5) AUX 3b
(6) Procedure
(7) AUX 4b

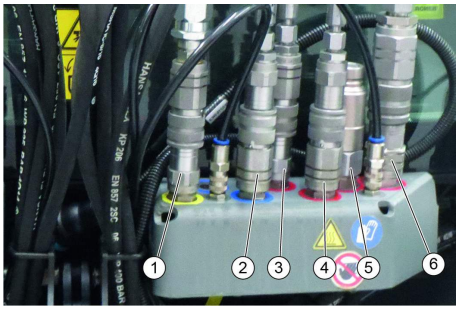


Fig. 51: Front left hydraulic connections

(1) AUX 4a
(2) AUX 5
(3) AUX 1a
(4) AUX 1b
(5) PTO 2 (74 l/min)
(16.3 imp. gal./minute | 19.55 us. gal./minute)
(6) PTO 1 (37 l/min)
(8.1 imp. gal./minute | 9.77 us. gal./minute)

Rear hydraulic connections

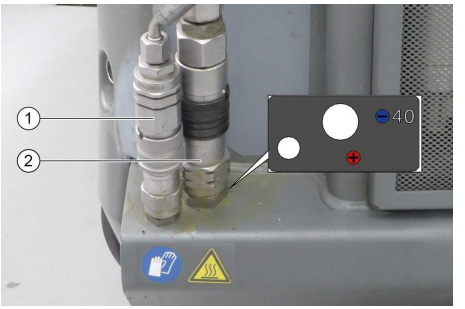


Fig. 52: Rear left hydraulic connections

(1) AUX 6b
(2) Return PTO

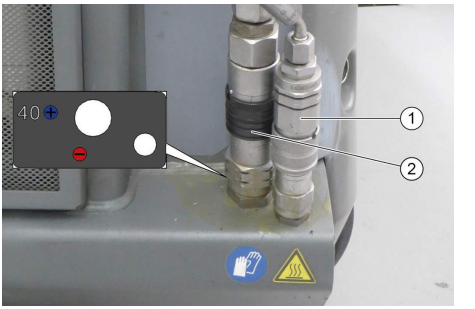


Fig. 53: Rear right hydraulic connections

(1) AUX 6a
(2) PTO

6.3.10 Electrical AUX connections on the vehicle

Front Electrical AUX at the attachment detection interface (1), switched contact PIN C or/and PIN F switched to ground PIN B.

Fig. 54: Front electrical connections for front attachment

(1) Attachment detection

Fig. 55: Front electrical connection

Rear Electrical AUX at the attachment detection interface (1), switched contact PIN A switched to ground PIN H.

Fig. 56: Rear electrical connections for rear attachment

Fig. 57: Rear electrical connection

(1) Attachment detection, 8-pin

(2) 21-pin connection for rear attachment

6.3.11 Electrical AUX operation

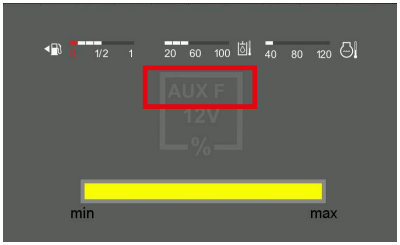


Fig. 58: AUX F setting

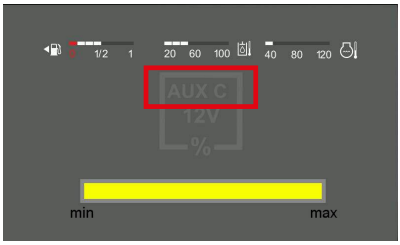


Fig. 59: AUX C setting

Rear AUX electrical activation	1. Press the button (10) on the control panel (fresh water pump). Rear attachment plug X105.2A2 PIN A (HCU OUT_15) max. 5 A
Front AUX F electrical activation	1. Press the button (6) on the control panel (nod front brush). Front attachment plug X100.2A1 PIN F (HCU OUT_9) max. 2.5 A
Front AUX F electrical setting	1. Press the button (6) on the control panel for at least 2 seconds. 2. Use the rotary knob (G) to set the voltage (0 to 12 V). 3. Confirm the value by pressing the (F) button.
Front AUX C electrical activation	1. Press the button (7) on the control panel (water circulation button). Front attachment plug X100.2A1 PIN C (HCU OUT_3) max. 2.5 A

Front AUX C electrical setting	1. Press the button (7) on the control panel for at least 2 seconds. 2. Use the rotary knob (G) to set the voltage (0 to 12 V). 3. Confirm the value by pressing the (F) button.

6.4 Controls for waste container [1] or mounting frame [2]

The switch for raising and lowering an attached waste container or attachment frame is located next to the driver's seat.

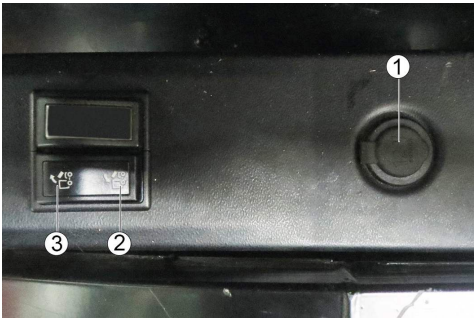


Fig. 60: Waste container controls

(1) Additional socket 12 V

(2) Switch position [Lower waste container/attachment frame]

(3) Switch position [Raise waste container / attachment frame]

1. Actuate the switch at position (3) to raise the waste container or attachment frame.
2. Actuate the switch at position (2) to lower the waste container or attachment frame.

1 *option*

2 *option*

6.5 Spraying controls (with attached brush sweeping system [1])

The controls for dosing the spray function when the brush sweeping system is fitted are located to the side of the steering column.

Fig. 61: Dosing knobs for spraying

(1) Left side brush spray
(2) Right side brush spray
(3) Suction mouth spray

1. Switch on the water pumps on the control panel in the arm rest.
   The corresponding button is only assigned the [Switch water pump on/off] function when the brush sweeping system is fitted.
2. Turn the corresponding dosing knobs (1) to (3) to set the amount of spray water:
   – Turn left (anti-clockwise): Spray water volume increases.
   – Turn right (clockwise): Spray water volume decreases.

1 *option*

7 Before starting a journey

⚠ CAUTION

Risk of accident and injury due to improper operation of attachments, towed equipment and trailers.

Incorrect operation of the vehicle and incorrectly attached implements or towed implements and trailers can lead to accidents and subsequent injuries.

– Read and follow the relevant operating instructions when using attachments or towed devices and trailers before setting off.
– Observe the safety instructions in these operating instructions and also in the operating manuals for the attachments, towed devices or trailers.
– Observe the permissible loads of the vehicle (see chapter “Technical data”) and the information on attachments in these operating instructions.

7.1 Articulated joint transport lock

When your vehicle is delivered, the articulated steering is protected from damage during transport with a transport lock.

If you have not already done so, you must remove this transport lock before the first journey.

If the vehicle is being transported, e.g. in the event of a breakdown, the transport lock must be reattached after loading onto the transport vehicle.

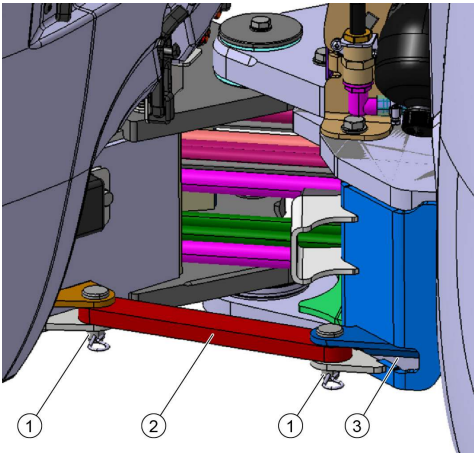


Fig. 62: Articulated joint transport lock

(1) Bolt with locking pin
(2) Transport lock
(3) Transport lock storage

Removing the transport lock at the articulated joint

1. Pull the two locking pins out of the bolts (1).

2. Pull out both bolts (1).
3. Slide the transport lock (2) into its storage compartment (3).
4. Fit both bolts (1) back in place.
5. Secure both bolts (1) with the locking pins.
   The articulated steering is now no longer secured and the vehicle can be driven.

Fit the transport lock to the articulated joint

1. Pull the two locking pins out of the bolts (1).
2. Pull out both bolts (1).
3. Slide the transport lock (2) out of its storage compartment (3).
4. Position the transport lock (2) so that it can be secured with the inserted bolts (1).
5. Push both bolts (1) back into place through the eyelets of the transport lock (2).
6. Secure both bolts (1) with the locking pins.
   The articulated steering is now secured and protected against damage. The vehicle can no longer be driven.

7.2 Switching on the main switch

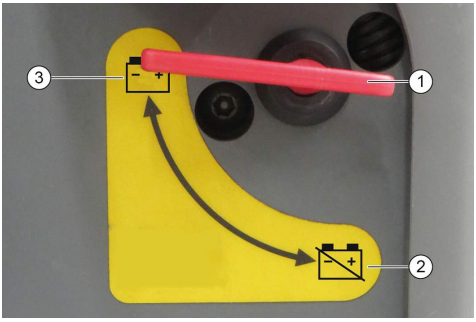


Fig. 63: Main switch

(1) Main switch
(2) [Vehicle battery disconnected] position: It is not possible to start the engine.
(3) [Vehicle battery connected] position: The engine can be started.

The main switch interrupts the electrical supply line to the starter motor.
If the main switch is actuated when the engine is running, i.e. the battery is disconnected, the engine will stop running.
Always disconnect the battery when you switch off the vehicle.

Requirements for starting the engine:

- Driver is sitting on the driver's seat.
- The travel direction selector switch is in the neutral position (middle position).
  If the travel direction selector switch is set to forwards or reverse when starting the engine, the engine can still be started. However, driving is only possible when the travel direction selector switch is first set to the neutral position.
- The vehicle battery has been connected via the main switch.

7.3 Safety checks before starting | Departure check

⚠ DANGER

Risk of accident and injury due to a faulty vehicle.

The vehicle may have undetected defects that cannot be recognised without carrying out the departure check.

– Perform the recommended safety checks (departure checks) each time before using the vehicle.

– Do not start up the vehicle when one item of the safety check is not fulfilled and have the vehicle repaired.

Safety inspection of the vehicle

Check outside the driver cabin:	Result
Has the transport lock on the articulated joint been removed?	
Enough fuel in the tank?	
Engine oil level correct?	
Coolant level correct?	
Is the windscreen washer fluid level correct and are the windscreen wipers intact?	
Hydraulic oil level correct?	
Visual inspection of the hydraulic lines for leaks and damage.	
Visual inspection of the brake system for leaks and damage.	
Tyres intact (wear limit not yet reached and no damage) and tyre pressure correct?	
Windows, mirrors, lighting and running boards clean and fog-free?	
If present: Trailer coupling and electrical connections intact?	
Visual inspection of the vehicle, engine and radiator grille for damage.	
Visually check the engine air filter for cleanliness (especially when working in a dry, dusty environment).	
Visually check the driver cabin interior air filter for cleanliness (especially when working in a dry, dusty environment).	
Especially after cleaning, maintenance or repair: Have you disposed of rags, tools and other unnecessary items?	

Inspections from the driver cabin:	Result
Does the vehicle have an approved warning triangle, a light, a sufficient number of high-visibility waistcoats and a first aid kit (expiry date not yet exceeded)? Find out about the regulations on vehicle safety equipment that apply in your country.	
Steering wheel, seat position and mirrors correctly adjusted?	
Brakes intact (including parking brake)?	
The brake pedal is not blocked by any objects in the footwell?	
Accelerator pedal moves easily?	
With the ignition switched on: ■ Do the [Charge indicator] and [Oil pressure] warning lights light up?	
With the engine running: ■ Do the [Charge indicator] and [Oil pressure] warning lights go out? ■ Are the temperature indicator and fuel level indicator functioning? ■ Are the lighting and signalling devices (horn, direction indicator, rotating warning light) intact?	
Before setting off: ■ Doors closed? ■ Seat belt applied?	

7.4 Adjusting the driver and front passenger seat

⚠ CAUTION

Risk of accidents due to carelessness in road traffic.

– Only adjust the driver's seat when the vehicle is stationary.

⚠ CAUTION

Compliance with the vibration values only for driver's seats that have been approved by Kärcher Municipal GmbH.

Vibration values for driver's seats that have not been approved by Kärcher Municipal GmbH cannot be guaranteed.

– Only the driver's seats listed below and offered by Kärcher Municipal GmbH may be used.

⚠ CAUTION

Risk of accident and injury due to unsecured load.

Flying objects could lead to carelessness in traffic or block one of the pedals in the footwell and cause an accident.

– Do not use a folded backrest as a storage area when driving on public roads.
– If it cannot be avoided for a brief moment, secure the objects accordingly to prevent them from flying around.

The driver's seat is automatically damped.

Kärcher Municipal GmbH offers 3 variants of driver's seats:

- Deluxe driver's seat (air suspension, lumbar support, seat heating, 3-point safety belt)
- Comfort driver's seat (air suspension, 2-point safety belt)
- Standard driver's seat (mechanical suspension, 2-point safety belt)

Adjusting the Standard and comfort driver's seat

Fig. 64: Standard and comfort driver's seat, shown without arm rest

(1) Driver's seat
(2) Horizontal adjustment
(3) Damping adjustment (depending on the version for mechanical suspension or air suspension)
(4) Seat belt
(5) Lever for folding down the backrest
(6) Headrest

1. Adjust the inclination, height and position of the left arm rest for operating the control panel.

2. Adjust the driver's seat so that the pedals and steering wheel can be easily reached and operated safely.
3. To adjust the driver's seat horizontally, pull the lever (2) upwards and slide the driver's seat backwards or forwards to the desired position.
   Release the lever (2) again and make sure that it engages correctly.
4. Pull the headrest (6) up or push it down to the correct height setting.
   The headrest (6) should be adjusted so that the upper edge is level with the top of your head.
5. Use the rotary knob (3) to set the desired damping depending on the rider's weight.

Adjusting the deluxe driver's seat

Fig. 65: Driver's seat

(1) Backrest with extension
Pull out for height adjustment.
(2) Backrest inclination adjustment
(3) Horizontal adjustment
Pull the lever upwards to adjust.
(4) Compressor switch
For air-cushioned seat [1].
(5) Right arm rest height adjustment
(6) Left arm rest side adjustment
(7) Left arm rest length adjustment
(8) Arm rest control panel
(9) Document storage compartment
(10) Lumbar support adjustment
(11) Seat belt
(12) Horizontal shock absorber

1. Adjust the inclination, height and position of the left arm rest for operating the control panel.

[1] *option*

2. Adjust the driver's seat so that the pedals and steering wheel can be easily reached and operated safely.
3. To adjust the driver's seat horizontally, pull the lever (3) upwards and slide the driver's seat backwards or forwards to the desired position.
   Release the lever (3) again and make sure that it engages correctly.
4. Adjust the lumbar support (10) so that it supports the natural curvature of your lumbar spine.
5. To adjust the height of the air-sprung seat [2], use the compressor switch (4) to move the seat to the highest possible position and then release enough air from the spring until the seat has lowered by approximately 2 - 3 cm (0.79 - 1.18 in.).

Adjusting the passenger seat

1. To adjust the seat horizontally, pull the lever upwards and slide the driver's seat backwards or forwards to the desired position.
   Release the lever again and make sure that it engages correctly.

7.5 Setting the steering wheel position

⚠ CAUTION

Risk of accidents due to carelessness in road traffic.

– Only adjust the position of the steering wheel when the device is standing.

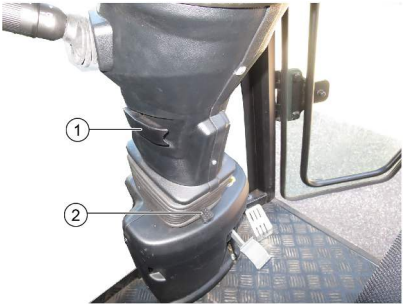


Fig. 66: Steering wheel adjustment on the steering column

(1) Steering wheel height adjustment locking lever
(2) Steering wheel inclination adjustment lever

1. Loosen the clamping lever (1) and set the desired height of the steering wheel.
2. Lock the clamping lever (1) again.
3. Press and hold the lever (2) and adjust the steering wheel to the desired angle.
4. Release the lever (2), to lock the steering wheel.

[2] *option*

7.6 Wear a seat belt

⚠ WARNING

Risk of injury or even death if the seat belt is not fastened.

– Always wear your seat belt before travelling.

Always wear your seat belt before travelling. There is a risk of injury or even death when driving without wearing a seat belt.

In the event of vehicle deceleration caused by an accident, vehicle occupants are held in place by sturdy belts connected to the vehicle body. This means that the driver and any passenger travelling with them cannot be thrown through the vehicle or even out of it.

If the seat belt is damaged, soiled or has been used in an accident, it must be replaced. Check the condition of the seat belt regularly and have it replaced by a service partner if necessary.

7.7 Refuelling

⚠ DANGER

Risk of explosion due to sudden ignition of the fuel. This can result in serious injuries or even death.

Fuels are highly flammable, so special care must be taken when handling fuels.

– Never refuel in confined spaces.
– Do not smoke during the refuelling process, avoid naked flames and flying sparks.
– Do not allow fuel to come into contact with hot surfaces.

⚠ CAUTION

Note the risk of slipping due to spilled fuel.

There is a risk of injury from slipping on spilled fuel.

– Do not allow fuel to overflow when refueling the vehicle.

NOTICE

Fuel leakage from the tank filler neck due to thermal expansion.

Fuel expands under heat.

– Do not refuel your vehicle to the brim.

1. Switch off the ignition (ignition key in position 0).
2. Open the fuel filler cap.
3. Fill the fuel tank with diesel fuel.
   Only diesel fuel according to DIN EN 590 may be used.
   ADVICE If you are refuelling the vehicle from a canister, estimate the amount of fuel beforehand to avoid overflowing.

4. Wipe off any fuel that has overflowed and/or dripped off.
5. Close the fuel filler cap.
   Ensure that the fuel filler cap is correctly positioned on the filling nozzle, otherwise leaks may occur.

8 Operation of the vehicle

⚠ WARNING

There is a risk of injury from crushing and trapping when operating the vehicle.

– No persons may be in the vicinity of the vehicle, the articulated joint and the attachments during operation.

– When using the vehicle as a tractor, make sure that there are no persons between the vehicle and the trailer during operation.

⚠ WARNING

Risk of accident due to blocked pedals when using floor mats that are not approved by Kärcher Municipal GmbH.

– Only use the original floor mats. Do not place any additional floor mats on top of the existing original floor mats.

⚠ CAUTION

Risk of burns from hot surfaces.

– Only use the vehicle if all covers are correctly fitted.

⚠ CAUTION

Risk of accident and injury due to reduced stability caused by superstructures.

– Adapt your driving style to the reduced stability when attaching bodies to your vehicle.

NOTICE

Risk of damage due to overheated hydraulic oil or engine.

If the temperature of the hydraulic oil or the engine coolant is too high, the corresponding warning lights come on.

– If the temperature is too high, allow the engine to run at idling speed until the respective temperature returns to the normal range and the corresponding warning light goes out.

NOTICE

Risk of damage due to absence of engine lubrication.

The [Engine oil pressure] warning light illuminates during operation if the engine lubrication is insufficient.

– Move the vehicle out of the danger zone of moving traffic immediately and switch off the engine.

– Have the cause of the fault determined and rectified before continuing the journey. Please contact your service partner for this.

8.1 Running-in period of the vehicle: The first 50 | 100 operating hours

The first 100 operating hours:

- Drive the vehicle gently and avoid overloading it.

After 50 operating hours:

- Check the tightening torque of the wheel bolts and retighten if necessary.
  Contact your service partner for this if necessary.
- Change of engine oil, engine oil filter and hydraulic oil filter as part of the initial inspection in accordance with the inspection checklist (ICL) by the authorised Customer Service. Contact your service partner for this.

8.2 Parking brake

⚠ WARNING

Risk of injury due to insufficient holding force of the parking brake. This can result in serious injuries or even death.

If the vehicle is parked on a slope with a gradient of more than 25 %, it may start to roll despite the parking brake being activated.

– When parking the vehicle on slopes and inclines, secure it additionally with wheel chocks to prevent it from rolling away.

An applied parking brake is indicated by a warning light.

– When the parking brake is applied, the [Parking brake applied] warning light illuminates in the multifunction display.

- The parking brake requires hydraulic pressure to release.
- The parking brake is automatically applied when the engine is switched off (ignition key in position [0]).
- The parking brake is also automatically applied when the engine is running and the travel direction selector switch is in the neutral position (middle position).
- The parking brake is automatically released when a travel direction is selected with the travel direction selector switch while the engine is running.

8.3 Entering and exiting

⚠ CAUTION

Risk of injury from slipping and falling when getting in and out of the vehicle.

– There is a step in the driver cabin in the lower door area to help you get on and off.
– Keep the steps free of dirt and deposits such as e.g.wet leaves, mud, ice and snow to ensure a secure grip when getting on and off. There is a risk of injury from slipping on a dirty or icy step.
– Handles are present on the inside of the doors and on the respective A-pillar, which must be used as entry and exit aids to prevent injuries, for example from falling when getting in and out of the vehicle.
– If necessary, a warning symbol will appear in the multifunction display to indicate that the exit height is too high. See the chapter “Suspension and chassis status”.

8.4 Start the engine

1. Switch the main switch to the [Vehicle battery connected] position.
2. Enter the vehicle.
3. Sit in the driver's seat.
4. Close the driver's door and fasten the seat belt.
5. Insert the ignition key in the ignition lock.
6. Set the travel direction selector switch in the neutral position (middle position).
7. Switch on the ignition: Turn the ignition key to position [I]the ignition is switched on, see "Ignition lock", page 74.
8. Wait until the multifunction display is ready.
   The [Charge indicator] and [Engine oil pressure] warning lights must light up.
9. Start the engine: Turn the ignition key to the [Engine start] position, the engine starts.
   If the [Charge indicator] and [Engine oil pressure] warning lights do not go out, switch off the engine and remedy the fault, see "Error messages for symbols in the multifunction display", page 185.
10. At ambient temperatures below 0 °C (32 °F): Warm up the vehicle at low engine speed until the [Hydraulic temperature too low] warning light goes out.

8.5 Selecting the travel direction

⚠ CAUTION

Risk of accident and injury due to incorrect operation of the direction selector switch.

- To be able to select the travel direction or change the operating program, the vehicle must be stationary and the direction selector switch must be in the neutral position (middle position).
- If the direction switch is in the forward or reverse direction when selecting the travel direction or switching the driving program, the symbol display in the multi-function displaywill change but the travel direction or driving program switchover will not occur.
- The travel directionand the driving program can only be changed via the neutral position (middle position) when the vehicle is stationary.

The travel direction selector switch is located on the right side of the steering wheel.
Select the travel direction using the travel direction selector switch and switch over the driving program.

Fig. 67: Travel direction selector switch

(1) Travel direction selector switch

1. Pull the travel direction selector switch (1) upwards towards the steering wheel, then move it in the desired travel direction.
   - Forwards for drive.
   - Backwards for reverse.

   The selected travel direction is indicated by a symbol in the multifunction display.
2. Select the speed using the accelerator pedal.
3. Bring the travel direction selector switch (1) into the neutral position (middle position).
   The travel drive is now in neutral and the parking brake has been activated.

In transport mode: Switching the driving programs

1. Bring the travel direction selector switch (1) into the neutral position (middle position).

2. Press the travel direction selector switch in the direction of the axle towards the steering column to switch between the driving programs:
   – Fast driving program = Hare (V_{max} depending on vehicle configuration)
   – Slow driving programme slow = Tortoise (V_{max} = 20 km/h | 12.43 mph.)

   The active driving programme is shown in the multifunction display.

8.6 Driving

⚠ WARNING

Risk of accident due to incorrectly attached implement.

– Only drive with a correctly installed attachment.

⚠ WARNING

Risk of accident when driving with a raised waste container.

– Only drive with a fully lowered waste container.

⚠ WARNING

Risk of accident and injury because releasing the accelerator pedal brakes the vehicle abruptly.

– The hydrostatic drive brakes or stops the vehicle abruptly when the accelerator pedal is released.
– The braking force applied when you release the accelerator pedal is weaker in higher gears and stronger in lower gears.
– The braking force applied when you release the accelerator pedal in transport mode is significantly weaker than in working mode.

⚠ CAUTION

Risk of accident if the PTO (Power Take Off) working hydraulics are switched on.

– Switch off the PTO when driving on public roads for transportation purposes (not when cleaning public roads).

NOTICE

Risk of damage when driving over obstacles due to the vehicle touching down.

– Make sure that the vehicle does not touch down when driving over obstacles.
– Drive over obstacles **up to a height of** 150 mm (5.9 in.) slowly and carefully at an angle of 45°.
– Only drive over obstacles **higher than** 150 mm (5.9 in.) only with the assistance of a suitable ramp.

NOTICE

Risk of damage to the rotating beacon warning lamp when driving through gates, covered driveways, underground car park entrances.

– Pay attention to the protruding rotating beacon warning lamp (2.20 m or 86.6 in.) when driving into underground garages etc. (2.20 m | 86.6 in.).
– Remove the rotating beacon warning lamp beforehand if necessary.
Do not stand on any parts of the vehicle's trim.

1. Check that the seat belt is correctly fastened and engaged in the buckle.
2. Switch off the PTO work hydraulics.
3. Select the travel direction using the travel direction selector switch.
The parking brake is automatically deactivated when the travel direction is selected.
4. Operate the accelerator pedal carefully.
5. Use the steering wheel to steer your vehicle in the desired direction.
6. For braking, step on the brake pedal and hold it down until the vehicle reduces speed as desired or comes to a standstill.

8.7 Stop

⚠ WARNING

Risk of accident and injury because releasing the accelerator pedal brakes the vehicle abruptly.

– The hydrostatic drive brakes or stops the vehicle abruptly when the accelerator pedal is released.
– The braking force applied when you release the accelerator pedal is weaker in higher gears and stronger in lower gears.
– The braking force applied when you release the accelerator pedal in transport mode is significantly weaker than in working mode.

1. Release the accelerator pedal.
The vehicle brakes automatically and comes to a standstill.
2. For a stronger braking effect or in an emergency, step on the brake pedal and hold it down until the vehicle comes to a standstill.

8.8 Parking the vehicle

⚠ WARNING

Risk of injury due to insufficient holding force of the parking brake. This can result in serious injuries or even death.

If the vehicle is parked on a slope with a gradient of more than 25 %, it may start to roll despite the parking brake being activated.

– When parking the vehicle on slopes and inclines, secure it additionally with wheel chocks to prevent it from rolling away.

⚠ WARNING

Risk of injury due to attachments not being lowered and attachments lowering unexpectedly when the vehicle is parked.

– Always fully lower attached attachments (except for a sweeping system) before parking a vehicle.

NOTICE

If the vehicle is parked without cleaning, the suspension may not be able to move to the lower position due to blockages caused by coarse dirt.

– Pay attention to the corresponding symbol in the multifunction display, which warns you that the exit height is too high. See the chapter “Suspension and chassis status”.
– Clean the vehicle thoroughly at the end of work.

1. Stop the vehicle.
2. Set the travel direction selector switch in the neutral position (middle position).
   The parking brake is automatically applied in this position.
3. Lower attached implements completely, unless it is a sweeping system.

   If used as a sweeper:

   – Raise the side brushes.
   – Switch off the [ECO] function or:
     – Switch off the water pump.
     – Wait 20 seconds.
     – Switch off the suction fan.
     – Raise the suction mouth.
     – Switch off the PTO.
       All sweeping functions are now deactivated.
4. Allow the engine to run in idle mode for 2 minutes.
5. Switch off the vehicle's engine (ignition key position 0) and remove the ignition key from the ignition lock.
6. Wait for 30 seconds to allow the engine control unit storage process to complete.
7. Switch the main switch to the [Vehicle battery disconnected] position.
8. Unfasten the seat belt and exit the vehicle.
9. Close both doors of the vehicle.

8.9 Suspension and chassis status

⚠ WARNING

Risk of accident and injury due to reduced ground clearance at speeds above 10 km/h (6.21 mph).

If you prevent the automatic height change at higher speeds by activating the car park mode, this will result in a reduced ground clearance of the vehicle. This can lead to a risk of accidents when travelling on ramps or uneven ground.

– An activated car park mode is saved by the system when the engine is switched off and remains active after the engine is restarted.
– An activated car park mode must be deliberately deactivated again by the operator.

NOTICE

Risk of damage to the rotating beacon warning lamp when driving through gates, covered driveways, underground car park entrances.

– Pay attention to the protruding rotating beacon warning lamp (2.20 m or 86.6 in.) when driving into underground garages etc. (2.20 m | 86.6 in.).
– Remove the rotating beacon warning lamp beforehand if necessary.
Do not stand on any parts of the vehicle's trim.

Your vehicle is equipped with hydropneumatic, active suspension. In transport mode, the suspension ensures that the driver cabin and the rear section of the vehicle are level on uneven ground. This increases driving comfort and stability.

For special operating conditions, e.g.driving in transport mode in a multi-storey car park or underground car park with a low ceiling height, you can lock the high vehicle level so that the vehicle remains at the low vehicle level even when travelling at speeds above 10 km/h (6.21 mph.).
This function is called car park mode and can be activated during the journey in transport mode.

In transport mode, the function of the active suspension is speed-dependent:

	Gray status symbol: Chassis height in the lower position.	Travel speed up to 10 km/h (6.21 mph.) = low vehicle level
	Green status symbol: Chassis height in top position.	Travel speed from 10.1 km/h (6.28 mph.) or greater driving speed = high vehicle level The height change between low and high vehicle level is approx. 26 mm (1.02 in.).

	Orange status symbol: Car park mode active. The orange arrow symbol is shown in the middle of the multifunction display.	Available in all driving speeds.
	Red status symbol: There is a fault in the suspension system. An orange warning triangle is also shown in the multifunction display.	Driving and working with the vehicle is still possible without restrictions.

8.9.1 Suspension menu

⚠ WARNING

Risk of accident and injury from operating the multifunction display while driving.

The software must not be operated via the multifunction display while driving. There is a risk of severe accidents in road traffic due to inattention.

– Stop the vehicle before operating the software. Then continue your journey.

You can call up the suspension menu via the service menu.

You can read the following information and perform the following functions:

- Retrieve information on the current actual height of the suspension.
  Target suspension height up to 10 km/h (6.21 mph.): 33 % ±5 %
  Target suspension height from 10.1 km/h (6.28 mph.): 60 % ±5 %
- Execution of the loading mode.
- Execution of the suspension calibration (manual calibration).

Opening the suspension menu

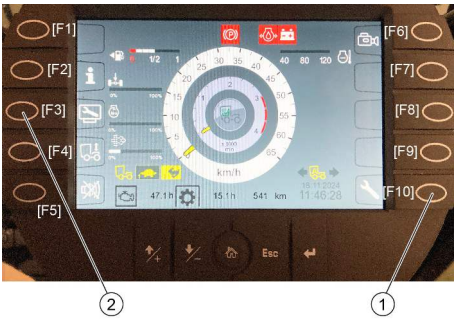


Fig. 68: Multifunction display

(1) Function key [F10]
(2) Function key [F3]

Fig. 69: Service menu

(2) Function key [F3]

Fig. 70: Suspension menu

(3) Display of the current actual height of the suspension
(4) [Home] button

1. Press function button [F10] (1) in the basic view on the multifunction display.
   The service menu appears.
2. Press function button [F3] (2) in the service menu on the multifunction display.
   The suspension menu appears with information on the current actual height of the suspension (3).
3. Press the [Home] button (4) to return to the basic view.

If the suspension menu (3) displays an actual height value of 255 %, there is an error in the suspension system. In this case, the control system no longer allows height control.

Carry out a manual calibration as described in the following chapter.

8.9.2 Car park mode

Fig. 71: Activated car park mode

(1) Function key [F4]
(2) Status symbol [Parking garage mode active]
(3) Status symbol [Suspension in parking garage mode]

1. In Transport mode, press the [F4] (1) function button on the multifunction display,
   The orange status symbols [Parking garage mode active] (2) and [Suspension in parking garage mode] (3) light up in the multifunction display.
   The suspension assumes the lower position and the vehicle now remains at a low vehicle level even at speeds above 10 km/h (6.21 mph.), i.e. there is no change in height upwards.

   ADVICE You can also activate parking garage mode while driving at any travel speed.
   Parking garage mode is also active after restarting the engine, unless you deactivate it before switching off the engine.
2. As soon as the conditions for remaining in the low vehicle level are no longer present, press the [F4] function button again in transport mode (1).
   Symbols (2) and (3) for the activated car park mode goes out in the multifunction display.
   At speeds above 10 km/h (6.21 mph.), the change in height upwards now takes place again.

8.9.3 Loading mode

The loading mode can be used for driving onto ramps, driving onto sidewalks over the curb or driving onto transport trailers.
If you use the loading mode, the vehicle's ground clearance is increased by adjusting the chassis upwards to its maximum height.

The loading mode prevents an attached implement, e.g. a brush-sweeper system, from coming into contact with the implement when driving onto ramps, sidewalks or transport trailers and causing damage.

Activating the loading mode

Fig. 72: Arm rest control panel

(1) Activate Work mode

Fig. 73: Activating the loading mode

(2) Function key [F6]

(3) [Home] button

ADVICE Loading mode can only be activated at driving speeds below 9 km/h (5.59 mph.). During an activated loading mode, there is no automatic height control of the chassis.

1. With the engine running, press the button (1) on the control panel on the armrest to activate working mode.
2. Press the function buttons [F10] and then [F3] on the multifunction display in succession to access the suspension menu.
3. Press and hold the function button [F6] (2) to activate loading mode.
   The chassis moves upwards to its maximum height.
   Loading mode is active as long as you keep the function button [F6] (2) pressed.
4. To exit loading mode, release the function button [F6] (2).
   The chassis is returned to its original height.
5. Press the [Home] button (3) to return to the basic view.

8.9.4 Warning against too high an exit height

If the chassis is too high (actual height 33 % +5 %), an orange warning symbol is shown in the center of the multifunction display in the following situations to warn you that the exit height is too high:

- Before switching off the motor.
- Before getting out with the engine running.

If this warning symbol is displayed after starting the engine and there is no fault, there are two ways of acknowledging the warning symbol:

Acknowledging the warning symbol [Exit height too high]

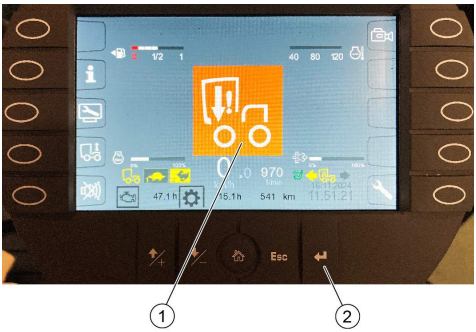


Fig. 74: Warning symbol in the center of the multifunction display

(1) Warning symbol [Exit height too high]

(2) [Enter] button

1. Start the journey with the vehicle.
   The chassis automatically adjusts to its target height and the [Exit height too high] warning symbol (1) goes out.
   Or:
2. With the engine running, sit in the driver's seat and pull the direction selector switch up towards the steering wheel and move it forwards (forward direction).
3. Press the [Enter] button on the multifunction display (2),
   The control adjust the chassis to its target height and the [Exit height too high] warning symbol (1) goes out.

   If neither of the two procedures leads to the [Exit height too high] warning symbol (1) disappearing, calibrate the vehicle manually, see "Manual calibration", page 121.
   If the [Exit height too high] warning symbol (1) is still displayed after manual calibration, there is a fault in the suspension system. In this case contact your service partner or an authorised Customer Service.

8.9.5 Manual calibration

If the height value is implausible, your vehicle's control system will no longer allow the height to be changed. This error in the suspension system (“implausible height value”) is displayed in the suspension menu with an actual height value of 225 %.

In this case, you must perform a manual calibration.

ADVICE If manual calibration does not eliminate the implausible height value due to a technical defect, authorised customer service must be called in.

Manual calibration

Fig. 75: Manual calibration

Fig. 76: Gray display symbol [Manual calibration]

(1) Function key [F4]
(2) Display symbol [Manual calibration]

1. Sit in the driver's seat while the vehicle is parked.
2. Start the engine.
3. Press function button [F10] and then [F3] on the multifunction display.
   The suspension menu is now displayed.
4. Pull the direction selector switch up towards the steering wheel and move it forwards (forward travel direction).
5. Press and hold the function button [F4] (1) to calibrate the suspension system manually.

   ADVICE The function key [F4] (1) must be pressed and held during the entire calibration process until the calibration is complete. If the button is released during calibration, the process is aborted and must be restarted.

   Calibration procedure:

   – Suspension moves to 100 % → Dwell time approx. 20 seconds.
   – Suspension moves to 0 % → Dwell time approx. 20 seconds.
   – Suspension moves to target value 33 % ±5 %.
     Calibration is now complete and you can release the [F4] function button (1).
     If the suspension does not move to the target value, there is a technical defect. In this case contact your service partner or an authorised Customer Service.

8.9.6 Fault in the suspension system

Fig. 77: Fault detection in the event of a fault in the suspension system

(1) Red status symbol

(2) Orange warning triangle

If there is a fault in the suspension system, this is indicated by the red status indicator (1) in combination with an orange warning triangle (2).

- If there is a fault in the suspension system, you can still drive and work with the vehicle without any restrictions.
- Depending on the chassis height at which the fault occurs, the vehicle remains at this height. There is no longer any upward or downward height control.
- If the multifunction display shows an error in the suspension system, calibrate the vehicle manually, see "Manual calibration", page 121.
  If the error is still showing after manual calibration, contact your service partner or an authorised Customer Service.

Display of the error code.

A fault in the suspension system shown in the multifunction display is also shown in the fault memory of the service menu with a corresponding fault code.

Fig. 78: Suspension system fault codes

(1) Function key [F10]
(2) Function key [F2]
(3) [Home] button

1. Press function button [F10] (1) in the basic view on the multifunction display.
   The service menu appears.
2. Press function button [F2] (2) in the service menu on the multifunction display.
   The display with the recorded, active faults of the suspension system appears.
3. Press the [Home] button (3) to return to the basic view.

8.10 Differential lock [1]

⚠ CAUTION

Risk of damage when activating the differential lock if the vehicle is not stationary.

There is a risk of accidents due to an abrupt change in driving characteriistics when the differential lock is activated while driving.

– Therefore, if possible, only activate the differential lock when the vehicle is stationary.

NOTICE

Risk of damage to the drive train if the differential lock is activated when the vehicle is not stationary.

– Therefore, if possible, only activate the differential lock when the vehicle is stationary.

The differential lock may only be used if the road conditions do not provide sufficient traction (the vehicle is in danger of not being able to move forwards), e.g.in icy or snowy conditions, on unpaved roads, etc., or because the drive wheels are on ground with varying degrees of grip and it is no longer possible to continue driving.
The differential lock can be activated in these cases to free the vehicle.

Observe the safety instructions for the differential lock, see "Differential lock", page 39.

1 option

Fig. 79: Differential lock button

(1) Push-button (dead man's function)

Fig. 80: Differential lock symbol in the multi-function display

(2) Symbol for active differential lock

Activating the differential lock

1. Activate the working mode.
2. Bring the steering wheel into the straight-ahead position.
3. Press and hold the differential lock button (1) on the side of the control panel.
   The differential lock engages and the symbol for the active differential lock (2) lights up orange in the multifunction display.
4. Continue to hold down the differential lock button (1) and drive the vehicle at reduced speed on a surface with good grip.

Deactivating the differential lock

1. Release the differential lock button (1).
   The differential lock switches off and the symbol for the active differential lock (2) goes out.

8.11 Cruise control

The cruise control is only available in Working mode. Activated cruise control can be deactivated at any time by pressing the brake pedal.

Activating Tempomat

1. Select the desired working speed using the accelerator Working speed.
2. When you have reached the desired speed, press the [F8] function button.
   Cruise control is activated at the speed you have selected.

Deactivating cruise control

1. Step on the brake pedal.
   Cruise control is activated.
2. Alternatively, you can also press the [F8] function key again to switch cruise control off again.

Reactivate cruise control at the previously set speed

1. Press function button [F9 = Resume cruise control].
   Cruise control is reactivated at the speed you have selected.

8.12 Regeneration process for vehicles with a diesel particle filter (DPF)

The DPF collects soot particles that are burned off by increasing the exhaust gas temperature when the filter is clogged (regeneration).
The regeneration process runs either automatically during working mode or driving mode but can also be started manually if necessary.
The higher the speed when driving, or the greater the load, the less frequent the need for manual regeneration.

8.12.1 Starting regeneration

⚠ WARNING

Risk of burns due to hot exhaust gases during the regeneration process.

– Keep yourself, other people and animals away from the exhaust pipe while a regeneration process is running.

NOTICE

During the regeneration process, hot exhaust gases of up to 600 °C (1112 °F) can escape and ignite flammable materials in the vicinity.

– Never start a manual regeneration in the vicinity of flammable materials, such as dry grass, dry leaves, wood waste, etc.

If the regeneration indicator on the multifunction display lights up during operation then a regeneration process must be started.
Regeneration can be performed automatically or manually.
You can continue working when automatic regeneration is active.

ADVICE Only interrupt the regeneration process in the case of an emergency.

Fig. 81: Starting regeneration

1. For manual cleaning (Parked regeneration), stop at suitable location within 15 minutes. Regeneration duration is approx. 30 minutes.
2. Set the travel direction selector switch in the neutral position (middle position) and do not press the accelerator.
   The driver's seat can be vacated during this period.

3. To start the regeneration process, first press the [F10] function button on the multifunction display and then
   – press the [F1] function key for automatic regeneration,
   – press the [F2] function key for manual regeneration.

   ADVICE The engine speed increases noticeably during both types of cleaning. When regeneration has finished the indicator lamp goes out and the engine speed decreases again.

8.12.2 Manual regeneration

⚠ WARNING

Risk of burns due to hot exhaust gases during the regeneration process.

– Keep yourself, other people and animals away from the exhaust pipe while a regeneration process is running.

NOTICE

During the regeneration process, hot exhaust gases of up to 600 °C (1112 °F) can escape and ignite flammable materials in the vicinity.

– Never start a manual regeneration in the vicinity of flammable materials, such as dry grass, dry leaves, wood waste, etc.

Notes on manual regeneration.

– Only interrupt the regeneration process in the case of an emergency.
– Manual regeneration is not possible at less than 50 operating hours.
– The average duration of the burning procedure during manual regeneration is approximately 20 minutes.

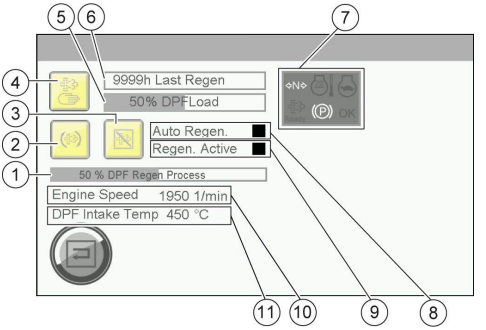


Fig. 82: Manual regeneration

(1) Progress of current regeneration
(2) Activating automatic regeneration
(3) Reschedule automatic regeneration
(4) Activate manual regeneration
(5) Load status DPF
(6) Last regeneration in hours
(7) Prerequisite for starting a manual regeneration
(8) Automatic regeneration
- Black box: not active (as in illustration)
- Green tick: active

(9) Regeneration
- Black box: not active (as in illustration)
- Green tick: active

(10) Current engine speed
(11) Current temperature at the DPF

Manual regeneration can only be started when all 6 conditions are met (all 6 symbols are white):

	The travel direction selector switch is in the neutral position (middle position)
	Cooling water temperature at least 70 °C (158 °F)
	Engine speed in idle mode
	Feedback from the DPF that regeneration is possible
	The parking brake is activated
	OK - regeneration can be started

Interrupting regeneration

1. Press the [ESC] button on the multifunction display, see "Function buttons and setting buttons", page 77.
2. Select a driving mode (forwards or reverse).
3. Switch off the engine.
   The regeneration process is interrupted.

8.12.3 Automatic regeneration

⚠ WARNING

Risk of burns due to hot exhaust gases during the regeneration process.

– Keep yourself, other people and animals away from the exhaust pipe while a regeneration process is running.

NOTICE

During the regeneration process, hot exhaust gases of up to 600 °C (1112 °F) can escape and ignite flammable materials in the vicinity.

– Never allow an automatic regeneration in the vicinity of flammable materials, such as dry grass, dry leaves, wood waste, etc.

– During an automatic regeneration process, do not leave your vehicle standing on or near flammable materials for long periods of time, e.g. over dried mown grass or on an area covered with dry leaves.

Notes on automatic regeneration.

– You can continue working with automatic regeneration.

– You can postpone automatic regeneration in certain situations.

8.13 Winter use: Frost protection

Before the onset of low temperatures, check the antifreeze concentration in the coolant.
Contact your service partner if necessary.

Also check whether there is sufficient antifreeze in the windscreen washer fluid.

Please also note the detailed explanations on salt input during winter operation, see "Salt adhesion during winter operation", page 34.

9 Advanced functions

9.1 Lifting the brush and suction mouth during the transport journey

If the suction mouth or brush drops during a transport journey due to leaks, this can be rectified during the journey.

1. To do this, pull both joysticks of the control panel backwards simultaneously during the transport journey.

✓ This raises both units without switching to working mode.

9.2 Terrain mode suspension

The terrain mode for the suspension system enables continuous driving in the upper suspension position. Activating terrain mode gives the vehicle better ground clearance when working on rough terrain. This mode is available in all modes (working mode, transport mode, implement carrier mode, sweeper).

Activation of terrain mode

– Terrain mode can be activated in both transport mode and working mode.
– Terrain mode can be activated both while driving and when stationary. When the vehicle is stationary, the direction of travel switch must be set to F.

Terrain mode activation

1. To activate the terrain mode, press the [F2] function button on the multifunction display.

✓ While the vehicle is stationary or at speeds below 10 km/h (6.21 mph), the chassis and suspension automatically move to the upper position.

✓ When driving at a speed of 10 km/h (6.21 mph), the chassis and suspension remain in the upper position.

Fig. 83: Terrain mode active when sweeper is in working mode

Fig. 84: Terrain mode active when sweeper is in transport mode

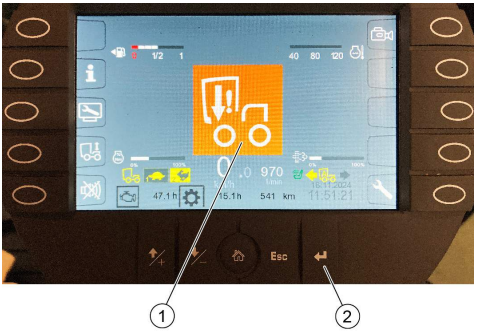


Fig. 85: Warning symbol in the center of the multifunction display

(1) Warning symbol [Exit height too high]
(2) [Enter] button

If the engine is switched off when terrain mode is activated, a reset is performed for safety reasons. When the engine is restarted, the [Exit height too high] warning symbol (1) appears.

As before, the warning symbol can be removed in 2 ways:

- When the vehicle is stationary and the travel direction switch is set to F, the [Enter] button (2) must be pressed to confirm.
  Or:
- The vehicle moves to the predetermined position by driving off.

Safety functions

– The terrain mode cannot be activated if the car park mode has previously been activated (see "Car park mode", page 119).
– If car park mode is activated when terrain mode is active, terrain mode is automatically deactivated and the system switches to car park mode.

Deactivation of terrain mode

1. To deactivate terrain mode, press the [F2] function button on the multifunction display again.

✓ While the vehicle is stationary or at speeds below 10 km/h (6.21 mph), the chassis and suspension automatically move to the lower position.

✓ When driving faster than 10 km/h (6.21 mph), the chassis and suspension remain up until the speed is less than 10 km/h (6.21 mph).

Special features as a sweeper with 2-brush system or 3-brush system

In sweeping mode, the suction mouth and all brush arms are automatically raised when the terrain mode is activated. This enables damage-free driving onto pavements.
If terrain mode is then deactivated again, the suction mouth and brush arms lower to their previous position.

Special feature with activated floating position of suction mouth

If the suction mouth is in the floating position and the terrain mode is activated, the brush arms and the suction mouth move upwards.
If the terrain mode is deactivated again, the brush arms and the suction mouth move to the ground as described.
The floating position must be reactivated (see "Suction mouth floating position", page 133).

9.3 Suction mouth floating position

The hovering position enables sweeping with a slightly raised suction mouth. This allows more air to be sucked in when driving through a pile of leaves, which results in fewer blockages in the suction hose.

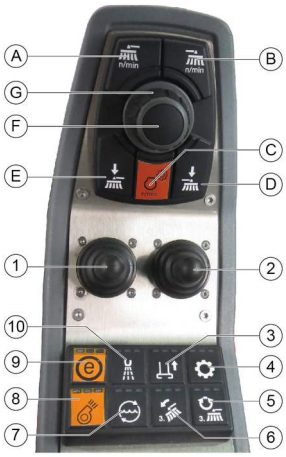


Fig. 86: Control panel assignment

1. Lower the suction mouth first to activate the function.
   – With the engine running, press the button (4) on the control panel on the armrest to activate work mode.
   – Then press the button (3).
2. When the suction mouth is lowered, press the button (3) for more than 2 seconds.

✓ The suction mouth lifts to the floating position.

3. To deactivate, press the button (3) again.

✓ The suction mouth lowers to the previous position.

Fig. 87: LED display - suction mouth positions

(1) Suction mouth lowered
(2) Suction mouth in floating position
(3) Suction mouth raised

- The current position of the suction mouth is indicated by the status LED (1 - 3) on the keypad.
- When the suction mouth is in the floating position and terrain mode is activated, it is raised completely. If the terrain mode is then deactivated, the suction mouth lowers to the ground. If the floating position is required again, it must be reactivated.

9.4 Axle load indicator

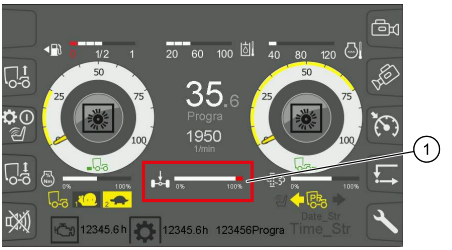
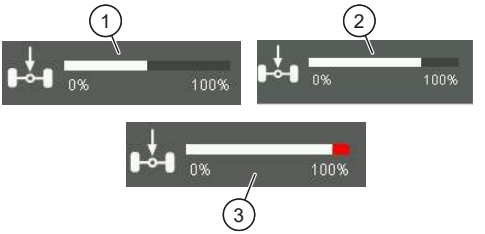


Fig. 88: Axle load indicator as sweeper in working mode

(1) Axle load indicator

Axle load indicator of rear axle

The axle load indicator for the rear axle is available as an option and provides information on the load status of the rear axle.



(1) Axle load condition under 75 %
(2) Axle load condition 75 %
(3) Axle load condition 100 %

Fig. 89: Axle load conditions

- If the axle load indicator switches to 100 % (red), the maximum permissible axle load of 2,000 kg (4409.25 lbs) has been reached.
- The axle load display is only available in working mode.
- The information is only reliable when the vehicle is on level ground.
- When driving uphill, the centre of gravity shifts to the rear axle so that the display value can increase accordingly.
- When driving on downhill gradients, the centre of gravity shifts to the front axle, so that the display value can decrease accordingly.
- While driving, the display may fluctuate in the area of the switching points due to the driving dynamics.
- **When using a sweeping system, the permissible total weight of 3,500 kg (7,716.18 lbs) of the vehicle is also reached when the permissible axle load is reached.**

10 Attachments [1]

⚠ WARNING

Risk of accident due to changed vehicle centre of gravity and changed driving characteristics.

When transporting liquids and/or bulk goods, such ase.g. loose chippings, swirling movements can occur which cause the vehicle to rock up and down.

– In the case of conversions, especially when converting from winter to summer operation, and with modified payload states, the driver must adapt themselves to changes in driving characteristics.

⚠ WARNING

Risk of accident due to incorrectly attached implement.

– Only drive with a correctly installed attachment.

⚠ CAUTION

There is a risk of injury from crushing and entrapment when installing and detaching the attachments.

– Do not reach between the attachment point and the attachment.

– Wear your personal protective equipment PSA/PPE (protective gloves, safety shoes and suitable protective clothing) when installing, removing and operating attachments.

⚠ CAUTION

Risk of accident and injury due to improper operation of attachments, towed equipment and trailers.

Incorrect operation of the vehicle and incorrectly attached implements or towed implements and trailers can lead to accidents and subsequent injuries.

– Read and follow the relevant operating instructions when using attachments or towed devices and trailers before setting off.

– Observe the safety instructions in these operating instructions and also in the operating manuals for the attachments, towed devices or trailers.

– Observe the permissible loads of the vehicle (see chapter “Technical data”) and the information on attachments in these operating instructions.

Attachments are optional and can be attached to the intended attachment points on the vehicle.

Only attachments that comply with the vehicle-specific attachment specifications of Kärcher Municipal GmbH may be used. Further information is available from your service partner.

1 option

Please contact your responsible service partner before fitting attachments that are not specifically intended for this vehicle. Your dealer will check if installation and use of these attachments is permitted on your vehicle. This is important for the safety of the driver and the vehicle and also for any warranty claims.
Attachments that endanger the safety or stability of the vehicle may not be used.

10.1 Coupling attachments to the vehicle hydraulically

⚠ CAUTION

There is a risk of burns when releasing the hydraulic connections due to hot hydraulic couplings.

– Allow the vehicle to cool down before releasing the hydraulic connections.
– Wear your personal protective equipment PSA/PPE (protective gloves, safety shoes and suitable protective clothing) when releasing the hydraulic connections.

NOTICE

Risk of damage to the hydraulic connections due to ingress of contamination.

– Keep the hydraulic connections clean.
– Clean the plugs and couplings with a clean, lint-free cloth before connecting and disconnecting hydraulic connections.
– Close all unused hydraulic connections with the dust protection cap provided. This prevents dirt and dust deposits on the hydraulic connection, which can enter the hydraulic system and damage it when a hydraulic line is connected.

Fig. 90: Hydraulic coupling

(1) Coupling connector
(2) Coupling sleeve
(3) Ring

Coupling

1. Pull the ring (3) of the coupling sleeve (2) downwards and hold.
2. Press the coupling connector (1) of the attachment hydraulic hose into the coupling sleeve (2).

3. Release the ring (3).
4. Check that the hydraulic coupling is securely engaged.
   The attachment is hydraulically coupled to the vehicle.

Uncoupling

1. Depressurise the hydraulic system, see chapter “Depressurising the hydraulic system (pressure relief)” in the vehicle operating instructions.
2. Pull the ring (3) of the coupling sleeve (2) downwards and hold.
3. Pull the attachment hydraulic hose out of the coupling sleeve (2).
   The attachment is hydraulically uncoupled from the vehicle.

10.2 Tow bar

Permissible support load and trailer load "Vehicle technical data ".

10.3 Ballasting the vehicle

⚠ WARNING

Risk of accident and injury from tipping over due to incorrect ballasting of the vehicle.

– When using attachments, make sure that equalising ballast is used if necessary. Please contact your service partner.

NOTICE

Risk of damage due to incorrect ballasting.

All warranty claims become null and void if the vehicle or vehicle parts are damaged due to incorrect ballasting, e.g. due to tipping over.

The following loads on the axles of the vehicle must always be observed:

– Front axle
  At least 30 % of the unladen weight of the vehicle.
– Rear axle
  At least 30 % of the unladen weight of the vehicle.
– Before purchasing and attaching an attachment, check that these requirements are fulfilled by weighing the vehicle-attachment combination.

The following data is required for determining the total weight, the axle loads, the tyre loading capacity and the required minimum ballast:

- All weights in kilograms (kg). Weigh the vehicle if necessary.
  Conversion pound (lb.) to kilogram (kg): 1 lb. = 0.4536 kg.
  The conversion factor is “xx pounds divided by 2.20462”.
- All dimensions in meters (m).
  Conversion from inches (in.) to metres (m): 1 in. = 0.0254 m.
  The conversion factor is “xx inches divided by 39.37”.

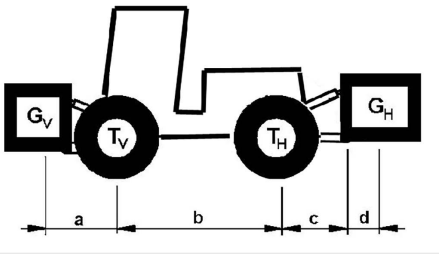


Fig. 91: Ballasting the vehicle

		Value		
TL	kg		Net weight of the vehicle	*
TV	kg		Front axle load of the empty vehicle	*
TH	kg		Rear axle load of the empty vehicle	*
GH	kg		Total weight rear attachment / rear ballast	**
GV	kg		Total weight of front attachment / front ballast	**
a	m		Distance between front attachment (front ballast) centre of gravity and middle of front axle, max. = 0.86 m (33.86 in.)	** ***
b	m		Wheelbase of the vehicle	* ***
c	m		0,56 m (22.05 in.)	
d	m		Distance between the centre of the equipment-side attachment point and the centre of gravity of the rear attachment / rear ballast	** ***

* see "Vehicle technical data ", page 193
** See operating instructions of the attachment
*** Measure

10.3.1 Calculation of the minimum front ballast for rear-mounted attachments

$$G_{V\,min} = \frac{G_H \times (c + d) - T_V \times b + 0{,}2 \times T_L \times b}{a + b}$$

Fig. 92: Calculation of the minimum front ballast for rear-mounted attachments

1. Enter the result in the table in the [Value] column.

10.3.2 Calculation of the minimum rear ballast for front-mounted attachments

$$G_{H\,min} = \frac{G_V \times a - T_H \times b + x \times T_L \times b}{b + c + d}$$

Fig. 93: Calculation of the minimum rear ballast for front-mounted attachments

Value “x”: See the manufacturer's specifications or use a value of x = 0.45 (0.45) if no specifications are available.

1. Enter the result in the table in the [Value] column.

10.3.3 Calculation of the actual front axle load

$$T_{V\,tat} = \frac{G_V \times (a + b) + T_V \times b - G_H \times (c + d)}{b}$$

Fig. 94: Calculation of the actual front axle load

1. If the necessary minimum front ballast weight (GV min) for the front attachment (GV) is not reached, then the weight of the front attachment must be increased to the minimum front ballast weight.
2. Enter the actual calculated permissible front axle load and the permissible front axle load specified in the machine operating instructions into the table in the [Value] column.

10.3.4 Calculation of the actual total weight

$$G_{tat} = G_V + T_L + G_H$$

Fig. 95: Calculation of the actual total weight

1. If the necessary minimum rear ballast weight (GH min) for the rear attachment (GH) is not reached, then the weight of the rear attachment must be increased to the minimum rear ballast weight.

10.3.5 Calculation of the actual rear axle load

$$T_{H\,tat} = G_{tat} - T_{V\,tat}$$

Fig. 96: Calculation of the actual rear axle load

1. Enter the actually calculated rear axle load in the table in the [Value] column.

11 Transport

11.1 Loading the vehicle

⚠ WARNING

Risk of accident and injury due to improper transport of the vehicle.

– Note the weight of the vehicle to be transported, including any mounted attachments, sweeping material containers or container attachments.
– Drive the vehicle slowly and carefully onto the transport vehicle (trailer, lorry, etc.).
– Only transport a vehicle with the waste container installed in the travel direction to prevent the container lid from being opened by the airstream.
If transportation is only possible backwards, the container lid must be secured with appropriate safety measures, e.g.suitable lashing straps.

NOTICE

Damage to the vehicle due to loading with a crane or forklift truck.

The risk of damage ranges up to irreparable damage to the vehicle.

– Loading by crane or forklift truck is not possible.

If the vehicle is no longer roadworthy, it can be towed onto the transport vehicle using the towing device.
In this case, please note that you may have to release the spring actuator of the parking brake on the damaged vehicle before pulling it onto the transporter.
See "Towing the vehicle", page 143.

1. Drive the vehicle onto the transport vehicle at a slow speed.
2. Have a second person instruct you when driving onto the transport vehicle.
3. Lower an attached implement completely (except for a sweeping system).
4. Set the travel direction selector switch in the neutral position (middle position) and switch off the engine.
The parking brake is automatically applied.
5. Leave the vehicle and close the doors.
6. Use chocks to secure the vehicle against rolling away.
7. Fit the transport lock to the articulated joint, see "Articulated joint transport lock ", page 100.
8. Attach the lashing straps to the vehicle to secure it for transport, see "Fitting the transport locks", page 141.

11.1.1 Fitting the transport locks

⚠ CAUTION

Risk of accident due to an unsecured vehicle during transportation.

In the event of an abrupt braking maneuver, the driver of the transport vehicle could lose control of the transport vehicle due to uncontrolled sliding of the transported vehicle and cause an accident.

– Always secure the transported vehicle against slipping during transport.

NOTICE

Risk of damage due to slipping of an unsecured vehicle.

– Always secure the vehicle against slipping during transport.

NOTICE

Risk of damage to the vehicle being transported and the transporting vehicle due to unsuitable lashing system.

– Make sure that all straps, hooks and ratchets are intact and undamaged and that the label on each strap is present and clearly legible.
– Worn lashing straps or lashing straps without a label must not be used.

NOTICE

Risk of damage to electrical and/or mechanical components when attaching the lashing straps.

– The lashing straps must not be passed over cables, lines or components that could be crushed, pinched or damaged as a result.

ADVICE The vehicle illustrated in this chapter is not the MC 150.
The vehicle shown in the following illustrations is only intended as an illustrative description for attaching the transport locks. The procedures are identical.

Transport securing is carried out on the 4 wheels of the vehicle with the “wheel securing lashing system”.
Each wheel is strapped with the long lashing straps and clamped with the short cross straps.

Fig. 97: Wheel lashing system

(1) Cross belts, short (4x)
(2) Lashing straps with ratchets, long (4x)

Fig. 98: Lashing strap on front wheel

(1) Front wheel
(2) Strapping of the lashing strap on the front wheel

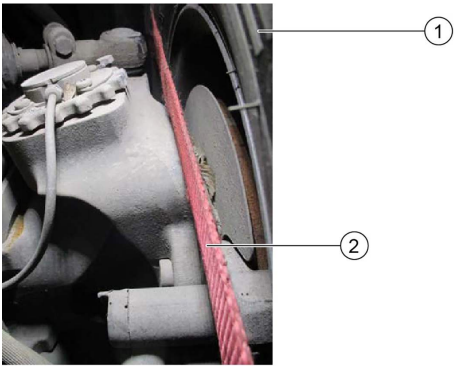


Fig. 99: Lashing strap on rear wheel

(1) Rear wheel
(2) Strapping of the lashing strap on the rear wheel

1. Place the long lashing strap (2) around the respective wheel without pinching a cable or component.
   The centre of the lashing strap (2) should be approximately behind the wheel.
2. Guide both ends of the lashing strap (2) outwards.
3. Attach a cross strap to each lashing strap (2).
4. Push the cross straps as close as possible to each wheel.
   The cross strap should sit slightly lower than the strapping with the lashing strap (2).

Lashing down the vehicle

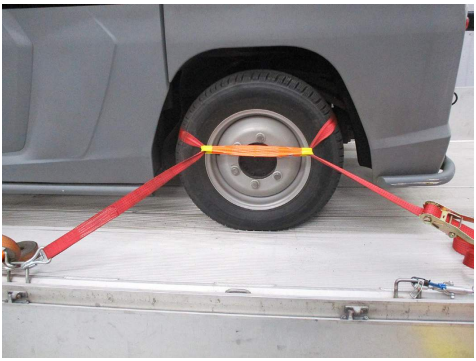


Fig. 100: Complete lashing system on one rear wheel

1. Hook the lashing straps into the fastening eyelets on the transport vehicle.
2. Tighten the lashing straps lightly with the ratchets.
3. Check that the lashing strap is correctly positioned on each wheel and that no lines or cables are trapped.
4. Lash down the vehicle by alternately tightening the respective lashing strap evenly on all 4 wheels using the ratchet.
   The wheels of the vehicle are lashed down and clamped at the same time by the cross belt.
5. If necessary, secure longer loose ends of the lashing straps to prevent them from flapping in the air stream, e.g.by winding and knotting.
6. Fit the transport lock to the articulated joint, see "Articulated joint transport lock ", page 100.

11.2 Towing the vehicle

⚠ CAUTION

Risk of accident when towing an unmaneuverable vehicle and/or if the hazard warning lights of the vehicle being towed are not working.

If the vehicle is unable to maneuver, it will not be possible to control it during the towing process.
If the hazard warning lights are not working, other road users cannot recognise that the vehicle is being towed.

– The vehicle may not be towed away if the hazard warning lights are defective or not working, the steering is defective and/or the brake system is defective or has failed.

Instructions for towing the vehicle:

- If your vehicle can no longer be driven under its own power due to other damage, it may be towed away. If possible, the engine must be running during the towing process so that the steering and brakes are fully functional. The hazard warning lights of both vehicles must be switched on.
- If the engine can no longer be started, at least the ignition (ignition key in position [I]) must still work so that the hazard warning lights of the damaged vehicle can be switched on.
- The towing device must be used for towing.
  The use of a tow bar is recommended. Otherwise, the damaged vehicle may drive into the towing vehicle, causing injuries and material damage.
- Have the vehicle towed away from the danger zone of moving traffic at a maximum speed of 5 km/h (3 mph.). Then load the vehicle onto a transport vehicle.
- The towing vehicle may only move off slowly. There is a risk of damage to the damaged vehicle and the towing vehicle if the vehicle is driven off abruptly.
- The towing vehicle must have sufficient pulling and braking force for the unbraked trailer load when using a tow bar. When the engine of the damaged vehicle is switched off, the steering is stiff and you can only steer with increased effort. The brakes may be out of order, so that the towing vehicle alone must provide the necessary braking force. The damaged vehicle then pushes onto the tow bar and generates additional thrust for the towing vehicle.

Preparation for towing

If the vehicle has to be towed away, the traction drive pump must first be bypassed to prevent damage to the power unit.
If there is no hydraulic pressure available to release the automatically actuated parking brake, the spring mechanism must also be released.

The traction drive pump is located at the bottom of the front section of the rear carriage near the articulated joint.
The spring actuator is released either at the traction drive pump or at the optional emergency lift block.

Bypass the drive pump and release the parking brake spring mechanism

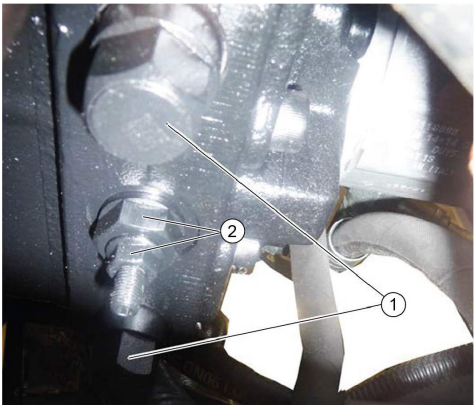


Fig. 101: Bypass drive pump

(1) Bypass valves

(2) Nut and lock nut

1. Unscrew the bypass valves (1) by 3 turns.
   The drive pump is now bypassed (inactive).
2. Loosen the nuts (2) until the threaded rod secured with them is loose.
   The spring mechanism is now released and the effect of the automatically activated parking brake is cancelled.

   ADVICE This step is only necessary if the vehicle does not have an emergency lift block (option).
3. You can now pull the damaged vehicle up onto a transporter or tow it away with a tow bar.
4. After loading or towing, screw the bypass valves (1) back in.
   The traction drive pump is now active again.
5. Retighten the two nuts (2) on the threaded rod.
   The parking brake can now be reactivated.

Releasing the parking brake spring actuator [1]

1. Please read the chapter "Emergency operation of the hydraulic valve via the emergency lift block", page 187.

Fitting the towing device

ADVICE The towing device is housed in a storage compartment under the front passenger seat.

1 *option*

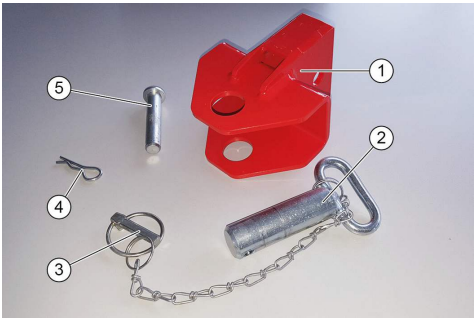


Fig. 102: Towing device

(1) Towing eye
(2) Towing bolt with chain
(3) Safety split pin (on chain) for towing bolt
(4) Locking pin for bolt
(5) Bolt

1. Remove the entire towing device from the storage compartment under the front passenger seat.

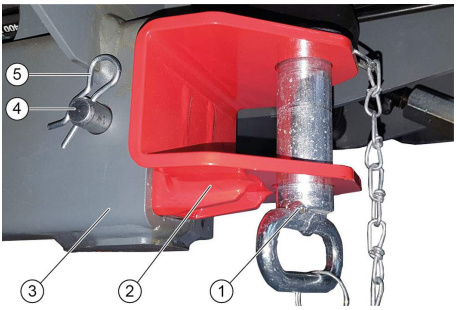


Fig. 103: Towing device on the vehicle

(1) Towing bolt with chain and safety pin
(2) Towing eye
(3) Vehicle chassis
(4) Bolt
(5) Locking pin for bolt

1. Attach the towing eye (2) to the front of the right-hand vehicle frame (viewed in the travel direction).
2. Secure the towing eye (2) on the vehicle with the bolt (4) and the safety split pin (5).
3. Hook the tow rope or tow bar into the towing bolt (1) and secure it to the chain with the safety split pin.

Towing the vehicle after the towing device is attached

1. Attach the tow bar or tow bar to the towing device.
   Observe the instructions and specifications of the tow bar manufacturer.
2. Start the engine of the damaged vehicle.
   Steering and braking assistance is only available during the towing process when the engine is running.
3. If the engine can no longer be started, switch on the ignition (ignition key in position [I]).
4. Switch on the hazard warning lights on the towing vehicle and on the damaged vehicle.
   You must indicate changes of direction with hand signals, as the hazard warning lights must remain switched on continuously.
5. The driver of the damaged vehicle must wear a seatbelt during the towing process.
6. Tow the damaged vehicle out of the danger zone.
   Take the shortest possible route to tow the vehicle out of the danger zone of moving traffic.
7. Then load the damaged vehicle for onward transport, see "Loading the vehicle", page 140.

12 Maintenance, cleaning and care

12.1 General notes

⚠ DANGER

Risk of injury from electric shock.

– Switch off the engine before all care and maintenance work.
– Remove the ignition key from the ignition lock.
– Disconnect the vehicle battery via the main switch.

⚠ DANGER

Risk of serious injury, crushing and even death when working under an unsecured, raised waste container.

In the event of a pressure drop in the system, the raised, unsecured waste container can suddenly lower and trap or shear off persons or body parts.

– For all work under a raised waste container, the safety bolts must be inserted on both sides of the raised waste container and secured with the retaining clips. The safety bolts mechanically secure the raised waste container against sudden lowering in the event of a pressure drop.
– Never carry out work under an unsecured, raised waste container.

⚠ DANGER

Risk of crushing due to the attachment lowering unexpectedly.

– If you are working under raised attachments, always secure them mechanically against sudden lowering, e.g.by underlaying them with suitable blocks, for example wooden blocks.

⚠ WARNING

Risk of injury due to engine continuing to run after switching off.

– Wait 5 seconds after switching off the engine. Be sure to keep away from the work area during this period.

⚠ WARNING

Risk of burns from hot surfaces in the engine compartment.

The surfaces of the engine and other components such as the exhaust system, transmission, oil cooler, etc., become very hot during operation and can cause severe burns.

– Do not touch the engine, gearbox, exhaust system or other hot components when the engine is hot.

⚠ WARNING

Risk of poisoning of the organism by operating fluids and lubricants.

– Do not eat or drink when handling operating fluids and lubricants.
– Do not swallow any operating fluids or lubricants.
If accidentally swallowed, do not induce vomiting, but seek medical advice.
– Do not inhale spray mist and/or vapours.
– Wear your personal protective equipment (PPE) (safety goggles and protective gloves) when handling operating fluids and lubricants.
– Clean areas of skin that have come into contact with operating fluids and lubricants thoroughly with soap under running water.
– Consult a doctor if symptoms persist.

⚠ CAUTION

Risk of slipping due to spilled or leaked operating fluids and lubricants.

– Remove leaked or spilled operating fluids and lubricants immediately with a binding agent and dispose of them in an environmentally friendly manner.

NOTICE

Risk of fire due to leaked oil, operating fluids or lubricants contacting hot surfaces on the vehicle.

– Remove any leaked, flammable media from the vehicle immediately.
– Immediately eliminate any leaks from which flammable media escapes or could escape.
If necessary, contact an authorised Customer Service or your service partner.

Observe the following instructions:

- Allow the vehicle to cool down sufficiently prior to all care, maintenance and cleaning work.
- Remove a non-tipping container attachment mounted on the vehicle before carrying out maintenance, cleaning and repair work.
- Before you clean and service the vehicle, exchange parts or convert them to a different function, switch off the engine and remove the ignition key.
- Disconnect the vehicle battery using the Main switch.
- Check if your radio is secured with a radio code before disconnecting the vehicle battery.
If your radio has a radio code, make a note of it so that you can unlock the radio with the radio code after connecting the vehicle battery.
- Disconnect the vehicle battery before working on the electrical system.
- Have repair work, service work, inspections and work on electrical components carried out only by an authorised Customer Service.
- Any welding work on the vehicle or attachments is only permitted by an authorised Customer Service. Please contact your service partner for this.

12.2 Preparing the vehicle

For maintenance, repair and servicing:

- Bring the travel direction selector switch into the neutral position (middle position).
- Switch off the engine (ignition key position [0]) and remove the ignition key from the ignition lock.
- Make sure that the parking brake has automatically activated.
- Use chocks to secure the vehicle against rolling away.
- Disconnect the vehicle battery via the main switch.

The vehicle must be stationary and the engine switched off during all maintenance, repair and/or service work. The vehicle must be parked safely and without a steering angle. Above all, it must be secured against rolling away, e.g.via the parking brake or, if necessary, by placing wedges underneath. Never carry out maintenance or repair work on the vehicle while the engine is running.

Remove the container attachment before carrying out maintenance, cleaning and repair work.

Daily and weekly maintenance work must be carried out by the operating personnel,.

12.3 Service indicator

The service indicator must be reset by the authorised Customer Service.

– Once the service has been carried out, the Customer Service will reset your vehicle's service indicator and the service interval will start again.

The service indicator lights up when appropriate maintenance must be performed according to the inspection checklist (ICL).

The service indicator flashes in the multifunction display:

- For the first time after 50 operating hours, when the initial inspection must be carried out.
- Thereafter according to the maintenance intervals according to the inspection checklist (ICL).

12.4 Maintenance intervals and instructions

Safeguarding warranty claims during the warranty period.

– To preserve eligibility for warranty claims, all servicing and maintenance work during the warranty period has to be performed by an authorised Customer Service (ICL), in accordance with the inspection check list.

Observe the following instructions:

- Lubricate all bearings after washing the vehicle.

  ADVICE If your vehicle is equipped with central lubrication, this point does not apply.
- The daily/weekly intervals for testing and maintenance by the customer/operator are listed in a table.

- Have the safety checks according to the applicable local regulations performed by the Customer Service as necessary.
- Further maintenance work must be carried out by the authorised Customer Service according to the inspection checklist.
  Please inform the Customer Service or your service partner in time.

12.4.1 Maintenance plan: Regular activities of the operator

The maintenance activities in this table must be carried out by the operator.
The individual activities are described in chapter "Maintenance work", page 160.

ADVICE We expressly point out that the warranty for your vehicle will only remain valid if the specified intervals are observed and the respective maintenance work is carried out by the operator.
All anomalies, defects, complaints and/or faults must be rectified immediately. If necessary, contact an authorised Customer Service or your service partner.

Activity	Daily	Weekly
Clean the outside of the vehicle at the end of the work assignment.	X	
Check tyre condition and inflation pressure, correct inflation pressure if necessary. When the wear limit of the tyres is reached, contact your service partner.	X	
Lubricate all bearings according to the lubrication schedule.		X
Check all Bowden cables and moving parts for freedom of movement.	X	
Check the side brushes and suction mouth for wear and tangled pieces of tape (for sweepers).	X	
If the device has been operated with a switched-off water circulation system [1]: Clean the filter and valve of the water circulation system to ensure reliable operation of the water circulation system and prevent damage.	X	
Check the rollers at the suction mouth for freedom of movement (for sweepers).		X
Check the spray pattern of the brush irrigation spray nozzles and in the suction mouth. Clean or replace the nozzles if necessary (for sweepers). Replace the water filter on the brush system if necessary.		X
Check all hoses and cable clamps.		X
Check the hydraulic hoses for leakage and damage. Contact your service partner in the event of leaks or damage. **ADVICE** The hydraulic hoses must be replaced by the authorised Customer Service every 6 years.	X	
Check the coolant hoses.	X	

1 option

Activity	Daily	Weekly
Clean the cooler fins on the water cooler, oil cooler and air-conditioning system.	X	
Visual inspection of the V-belt and V-belt tension on the engine fan and air conditioning compressor: Check for wear/damage.	X	
Check the electrical cables for damage. Contact your service partner in the event of damage.		X
Check that the parking brake functions correctly and is correctly adjusted.	X	
Check the pedals for correct functionality.	X	
Check engine air filter, clean or replace if necessary.	X	
Clean cooler grille.	X	
Check the exhaust system for tight fit, noise and damage.	X	
Clean the blower chamber.	X*	
Clean the waste container [2] and cover.	X*	X
* several times daily in the case of heavy soiling.		

12.4.2 Service and inspection: Intervals for service partners according to the ICL inspection checklist

The service and inspection work in the following tables and any resulting repairs/repairs must be carried out by your service partner or an authorised Customer Service in accordance with the inspection checklist (ICL) of Kärcher Municipal GmbH.

Some of the listed service and inspection work and any resulting repairs/repairs require special, product-specific expertise and/or special tools, which is why the performance of these activities is reserved for your service partner or authorised Customer Service.

Always observe the original manufacturer's operating instructions.

ADVICE We expressly point out that the warranty for your vehicle will only remain valid if the specified intervals are observed and the respective service and inspection work is carried out by your service partner or an authorised Customer Service.

General assembly	Once during operating hours	inspection interval after operating hours (or at least 1x/year)
Safety check based on national regulations.		As required
Instruct the operator again	50	
Lubricate all lubrication points. To be carried out weekly by the operator.	50 / 250	500

[2] *option*

General assembly	Once during operating hours	inspection interval after operating hours (or at least 1x/year)
Check the tightening torque of the wheel bolts: See service manual for tightening torque.	50 / 250	500
Check the tow bar.	50 / 250	500
Clean the machine after maintenance.	50 / 250	500

Engine assembly	Once during operating hours	inspection interval after operating hours (or at least 1x/year)
Change the engine oil.	50 / 250	500 / 1 year
Replace the engine oil filter.	50 / 250	500 / 1 year
Replace the fuel filter.		500
Replace the fuel pre-filter.		500
Drain water from the fuel filter.	50 / 250	500
Adjust the engine valves.		1000
Replace the air filter and safety cartridge.		500
Clean the air filter.	50 / 250	500
Replace the alternator and water pump V-belts.		1000 / 5 years
Check the alternator and water pump V-belts.	50 / 250	500
Check the air intake hoses.	50 / 250	500
Check the air conditioning compressor holder.	50 / 250	500
Check the lower engine speed: 900 rpm	50 / 250	500
Check the upper engine speed: 2700 rpm	50 / 250	500
Check the exhaust system.		500
Check injection system (as specified by the engine manufacturer).		1500
Check the turbocharger.		2000

Cooling system assembly	**Once during operating hours**	**inspection interval after operating hours (or at least 1x/year)**
Clean the radiator.	50 / 250	500
Check the coolant level.	50 / 250	500
Replace the coolant.		1000
Check the antifreeze mixture ratio.	50 / 250	500
Check the cooling water hoses.	50 / 250	500

Control station assembly	**Once during operating hours**	**inspection interval after operating hours (or at least 1x/year)**
Check and top up the wiper fluid.	50 / 250	500
Check and clean the interior and exterior cab air filters.	50 / 250	500
Replace the interior and exterior cab air filters.		1000
Check the air-conditioner and heating system.	50 / 250	500
Service the air-conditioner.		2000 / 2 years
Check the pedals and levers for ease of movement and correct functionality.	50 / 250	500
Check the steering play.	50 / 250	500
Check the driver's seat.	50 / 250	500
Check the windscreen wiper and washing system.	50 / 250	500

Hydraulics assembly	**Once during operating hours**	**inspection interval after operating hours (or at least 1x/year)**
Change the hydraulic oil.		1000
Replace the hydraulic oil tank breather.		500
Change the return filters (2 pieces).	50 / 250	500
Change the pressure filter.	50 / 250	500
Check the hydraulic oil level.	50 / 250	500

Hydraulics assembly	**Once during operating hours**	**inspection interval after operating hours (or at least 1x/year)**
Check the hydraulic system for leaks and abraded hoses.	50 / 250	500
Check the plug couplings for functionality and leaks.	50 / 250	500
Check the auxiliary control valves.	50 / 250	500
Replace the check valves in the freewheel valve.		1000
Replace the check valves in the compensation valve.		1000
Replace all hydraulic hoses (observe national regulations).		6 years

Electrical assembly	**Once during operating hours**	**inspection interval after operating hours (or at least 1x/year)**
Clean the battery terminals.	50 / 250	500
Clean the alternator ventilation slits.	50 / 250	500
Check lighting.	50 / 250	500
Check the battery acid level.	50 / 250	500
Check the battery condition.	50 / 250	500
Check the chassis grounding points.	50 / 250	500
Check the indicator lights and electrical functions.	50 / 250	500
Check the electrical cables for damage and oxidation.		500
Check and reset the diagnostic codes.	50 / 250	500

Chassis and suspension assembly	**Once during operating hours**	**inspection interval after operating hours (or at least 1x/year)**
Check the tyre pressure on all wheels.	50 / 250	500
Check the tread depth and condition of the tyres.		500
Check the brakes.	50 / 250	500
Check the ease of motion of the Bowden cables.	50 / 250	500
Check the travelling drive neutral position.	50 / 250	500

Chassis and suspension assembly	**Once during operating hours**	**inspection interval after operating hours (or at least 1x/year)**
Check the play in the steering cylinder bearings.	50 / 250	500
Check the play in the articulated steering bearings.		500
Change the brake fluid.		2000 / 2 years
Pressure test of the suspension cylinders/nitrogen accumulators: Front and rear 26 bar (377.1 psi.) each. Check and readjust if necessary.	50	1000 / 1 year
Check the entire running gear for leaks and damage.		1000 / 1 year

Brush system and suction mouth assembly	**Once during operating hours**	**inspection interval after operating hours (or at least 1x/year)**
Check the play in the brush system bearings and suction mouth bearings.	50 / 250	500
Check the hydraulic system for leaks.	50 / 250	500
Check the suction mouth adjustment.	50 / 250	500
Check the brush adjustment.	50 / 250	500
Lubricate the lubrication points. To be carried out daily by the operator.	50 / 250	500
Check the wear and tear on the suction mouth lips and sensing wheels.	50 / 250	500
Check the ease of motion of the coarse dirt flap.	50 / 250	500

Waste container assembly (hopper)	**Once during operating hours**	**inspection interval after operating hours (or at least 1x/year)**
Check the play in the high dumping bearings.	50 / 250	500
Check the play in the quick change system.	50 / 250	500
Check the seals for damage and wear and tear.	50 / 250	500
Check the suction hose for damage and wear and tear.	50 / 250	500

Waste container assembly (hopper)	Once during operating hours	inspection interval after operating hours (or at least 1x/year)
Check the wear protection of the suction turbine for wear and tear.		500
Check the speed of the suction turbine.	50 / 250	500
Clean the coarse dirt grille in the waste container cover.	50 / 250	500
Clean the diffusor.	50 / 250	500
Check the manual suction hose changeover.	50 / 250	500
Check the hydraulic system for leaks.	50 / 250	500
Check the turbine drive V-belt tension.	50 / 250	500
Replace the turbine drive V-belt.		1000

12.4.3 Maintenance packages

Various maintenance packages with predefined spare and wear parts are available from Kärcher Municipal GmbH for service and inspection work depending on the interval due.

For more information on the various maintenance packages for your vehicle, please contact your service partner or Kärcher Municipal GmbH.

12.5 Lubrication plan

Notes on lubricating the vehicle:

- Greasing the vehicle is not workshop work.
  Ensure that the vehicle is lubricated regularly in accordance with the information in the “Lubrication schedule” chapter.
- The vehicle especially requires lubrication after cleaning with a high-pressure cleaner.
- If the vehicle is used in extreme conditions, such as in heavy rainfall, on boggy ground, in very dusty environments or in winter when road salt has been applied, the lubrication intervals are shortened and lubrication must be carried out more frequently.
- Do not use solvents to clean the grease nipples and to remove the grease that has leaked from the bearing seals.
- Do not press in too much grease as this can damage the bearing seals. This can result in damage to the vehicle or components.
- Keep all V-belts and drive belts free of grease when lubricating, as otherwise malfunctions may occur.
- Only use grease in accordance with the operating materials recommendation, see chapter “Technical data”.

The lubrication points are labelled with a yellow sticker.
All grease nipples are fitted with a coloured protective cap.

Lubrication point		Number of lubrication points	Lubrication interval under normal operating conditions
1	Steering cylinder (in the area of the articulated joint)	1	Every 50 operating hours
2	Articulated joint (top)	1	Every 50 operating hours
3	Lower bearing for articulated joint	1	Every 50 operating hours
4	Steering cylinder (in the area of the articulated joint)	1	Every 50 operating hours
5	Hydraulic cylinder mounting frame, piston rod	1x each side (2x total)	Every 50 operating hours
6	Hydraulic cylinder mounting frame, piston head	1x each side (2x total)	Every 50 operating hours
7	Rear left mounting frame	1	Every 50 operating hours
8	Rear right mounting frame	1	Every 50 operating hours

Fig. 104: Lubrication points in the area of the articulated joint

(1) Steering cylinder
(2) Articulated joint (top)

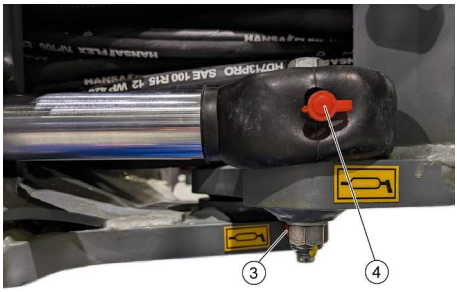


Fig. 105: Lubrication points in the area of the articulated joint

(3) Lower bearing for articulated joint
(4) Steering cylinder

Fig. 106: Mounting frame hydraulic cylinder lubrication point

(5) Piston rod

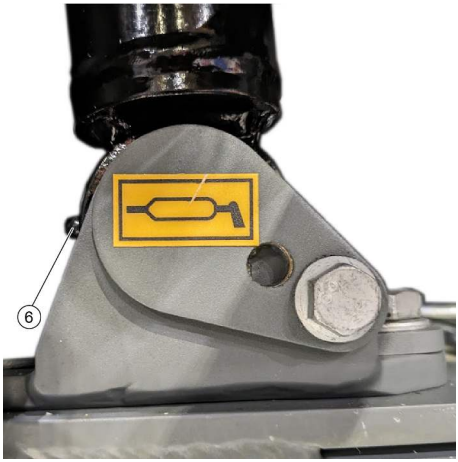


Fig. 107: Mounting frame hydraulic cylinder lubrication point

(6) Piston head

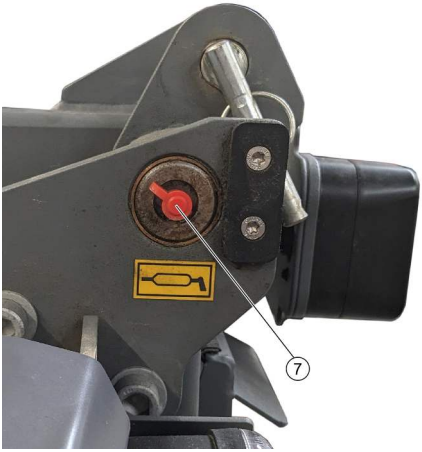


Fig. 108: Mounting frame lubrication point

(7) Rear left mounting frame

Fig. 109: Mounting frame lubrication point

(8) Rear right mounting frame

1. Remove the protective cap from the grease nipple.
2. Remove all dirt from the grease nipple with a clean, dry cloth.
   No dirt or impurities must get into the opening of the grease nipple during lubrication.
3. Attach the hand lever grease gun to the grease nipple.

4. Operate the hand lever of the grease gun to press the grease into the grease nipple.
   Minimum lubrication quantity per grease nipple: 2 strokes with the hand lever grease gun.
   1 stroke corresponds to approx. 2.5 ml (0.088 imp. fl. oz. | 0.085 us. fl. oz.) grease.
5. Continue lubricating carefully until grease begins to leak from the seals of the bearings belonging to the grease nipple.
6. Remove the hand lever grease gun and replace the protective cap on the grease nipple.
7. Use a clean, dry cloth to remove any grease that has escaped from the corresponding seals.
   Lubrication is complete when you have lubricated all the grease nipples in this way in accordance with the table.

12.6 Maintenance work

12.6.1 Check and correct tyre pressure

NOTICE

Always adhere to the specified tyre inflation pressures, otherwise this may result in increased tyre wear and unstable handling.

– Do not neglect to check the tyre pressure regularly, as your vehicle's tyres are subject to increased loads and only offer optimum grip and driving comfort if the tyre pressure is set correctly.
– Please note that if the vehicle load changes, e.g. when attaching an implement or coupling a trailer, you must check and possibly correct the tyre pressures again.
– For tyre inflation pressures, see the Technical Data chapter.

1. Check the tyre pressure on cold tyres.
2. Ensure that the vehicle is secured against rolling away, e.g. using wheel chocks.
3. Unscrew the valve cap from the tyre inflation valve.
   Take care not to lose the valve cap. Keep the valve cap and the valve stem free of dirt.
4. Place the adapter of the tyre inflator on the valve.
5. Read the current tyre inflation pressure on the pressure gauge of the tyre inflator.
6. If necessary, correct the tyre pressure by inflating the tyre or deflating it.
   You control the functions via the tyre inflator.
7. Once the correct tyre inflation pressure has been set, remove the tyre inflator adapter from the tyre inflation valve.
8. Screw the valve cap back onto the tyre inflation valve.
9. Proceed in this way on all 4 wheels of the vehicle.

12.6.2 Open the side panel

⚠ WARNING

Risk of burns from hot vehicle parts.

– Allow the vehicle to cool down sufficiently before opening panel parts.

You must open the side panel for some maintenance activities, e.g.to check the coolant level.

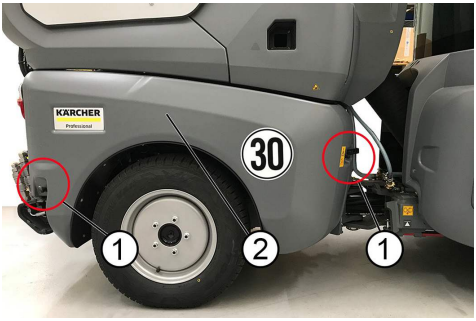
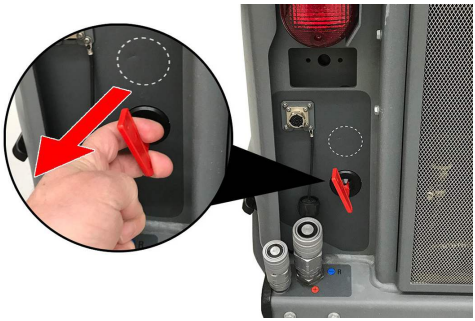


Fig. 110: Opening the right side panel

(1) Lock
(2) Side panel

1. Open the catches (1) on both sides of the right-hand side panel (2).
2. Open the right-hand side panel (2) forwards.
3. Switch the main switch of the vehicle battery from the right-hand side to the left-hand side.



4. Simultaneously turn and pull the main switch to unlock the left side panel.
5. Pull the main switch and simultaneously pivot the left side panel outwards.

12.6.3 Filling the wiping water container

Observe the manufacturer's instructions for the antifreeze for the windscreen washer system.

– The mixing ratio of antifreeze with water can vary from manufacturer to manufacturer.
– In warm temperatures, the antifreeze added to the screenwash is used to clean the windscreen.

The wiping water container is located in the rear of the vehicle on the left-hand side under the side panel.

Fig. 111: Wiping water container

(1) Wiping water container
(2) Lock

1. Lift the attachment frame.
2. Unlock the side panel and remove it.
3. Open the cap (2) of the wiper water tank (1) by turning it.
4. Top up with wiper fluid.
   If there is a risk of frost, ensure that there is a sufficient concentration of antifreeze in the wiper water.
5. Close the cap (2) of the wiper water tank (1).
6. Re-install the side panel.
   Make sure that it is correctly locked.
7. Lower the attachment frame again.

12.6.4 Checking and replenishing coolant

⚠ WARNING

Risk of burns from hot surfaces of the cooling system.

The surfaces of the engine radiator and other cooling system components become very hot during operation and can cause severe burns.

– Do not touch the engine radiator and the cooling system components when the engine is hot.
– Allow the cooling system to cool down prior to all work on it.

⚠ WARNING

Risk of scalding and injury due to pressurised coolant.

The hot coolant is under high pressure and can spray out if the cooling system is opened when hot.

– Allow the cooling system to cool down prior to all work on it.
– Open the expansion tank of the cooling system carefully after cooling down using the 2-stage lock.

NOTICE

Danger of serious engine damage due to leakage in the cooling system.

– If there is a large or repeated loss of coolant, determine the cause and rectify it.
– If necessary, contact an authorised Customer Service or your service partner.

NOTICE

Danger of engine damage and damage to the cooling system due to the use of incorrect coolant and/or incorrect mixing ratios.

Observe the following instructions:

– Only top up with coolant when the engine is cold and switched off.
– Observe the manufacturer's instructions for the coolant.
– Do not mix different coolants.
– Coolant should also be added to the coolant at warm temperatures, as the coolant protects the cooling system from corrosion.
– Coolant should have a water:coolant mixing ratio of 60:40 to 50:50.
  This usually corresponds to a frost protection from -25 °C to -40 °C (-13 °F to -40 °F).
– Minimum mixing ratio:
  Water:coolant = 70:30
– Maximum mixing ratio:
  Water:coolant = 40:60
  A further increase in the coolant concentration (e.g. 30:70) does not cause any further increase in frost protection at freezing temperatures.
– The coolant mixture must consist of softened water and coolant in accordance with the standards SAE J814C.
  See the “Technical data” chapter for the coolant specification.
– You can check the antifreeze concentration yourself when the coolant is cold using a test spindle available from specialist shop or you can contact your service partner for a check.

ADVICE To check the coolant level correctly, you must check the level in the coolant expansion tank and in the engine radiator.

The coolant expansion tank is located in the rear of the vehicle under the side panel on the left-hand side.

Check the coolant level in the expansion tank and top-up

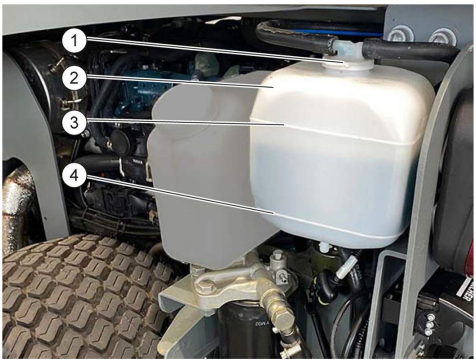


Fig. 112: Coolant expansion tank

(1) Lock
(2) Coolant expansion tank
(3) MAX marking: Upper filling level
(4) MIN mark: Lower filling level

1. Open the left-hand side panel when the engine is cold.
2. Check the coolant level at the coolant expansion tank (3).
   The correct coolant level is between the MIN mark (4) and MAX mark (3).
   If the coolant level is close to or below the MIN mark, you must top up the coolant.

   ADVICE If the coolant expansion tank (3) is completely empty, you must first top up the coolant in the engine radiator.
3. To top up, remove the cap (1) from the coolant expansion tank (2).
4. Top up the coolant to the MAX mark (3) with the correct concentration of coolant according to the temperatures in which the vehicle is used.

   ADVICE Topping up the expansion tank does not replace checking and filling the engine radiator itself.
5. Close the cap (1) again.
   Check that the cap is fitted correctly.

Check the coolant level in the engine radiator and top-up

Fig. 113: Engine radiator cover

(1) Engine radiator cap cover

(2) Engine radiator cap

6. Remove an attached waste container [1], see “Operating instructions MC 150 Attachments”.
7. Fold the cover (1) of the engine radiator cooler cap (2) open.
   The cover (1) is located at the top of the rear carriage, in the rear area.
8. Turn the engine radiator cap (2) one notch anticlockwise to release any residual pressure in the cooling system.
9. When the cooling system is depressurised, unscrew the engine radiator cap (2) completely.
10. Fill the engine radiator to the top with coolant of the correct concentration.
    Ensure bubble-free filling.
11. Screw the engine radiator cap (2) back on.
    Check that the cap is fitted correctly and screwed closed.

    ADVICE If you have topped up the engine radiator because the coolant expansion tank was completely empty, you must now also top up the coolant expansion tank.
12. Fold the cover (1) of the engine radiator cooler cap (2) closed again.
13. Close the left-hand side panel again.
14. If necessary, re-install a waste container, see “Operating instructions MC 150 Attachments”.

12.6.5 Checking/topping up the engine oil level

⚠ WARNING

Risk of burns from hot surfaces in the engine compartment.

The surfaces of the engine and other components such as the exhaust system, transmission, oil cooler, etc., become very hot during operation and can cause severe burns.

– Do not touch the engine, gearbox, exhaust system or other hot components when the engine is hot.

[1] *option*

NOTICE

Risk of damage to the engine due to incorrect engine oil level.

Do not operate the engine with an engine oil level that is too low or too high. This can result in engine damage due to insufficient lubrication or oil overfilling.

– Always check the engine oil level with the vehicle in a horizontal position and the engine at operating temperature. If the engine has not yet reached operating temperature (70 °C to 80 °C |158 °F to 176 °F), let it run for approx. 2 minutes and then switch it off.
– The engine oil level must be between the MIN and MAX markings on the oil dipstick.
– Only top up with engine oil with the appropriate specification, see chapter “Technical data”.
– Do not fill with too much engine oil. This can cause engine damage due to oil overfilling.

Checking the engine oil level

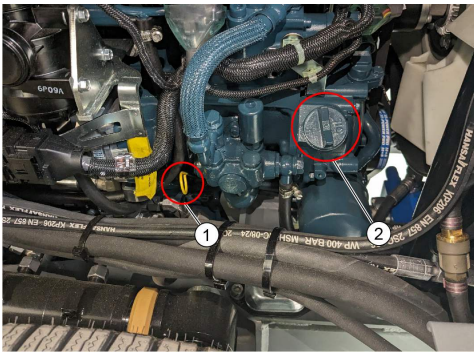


Fig. 114: Checking the engine oil level

(1) Oil dipstick
(2) Oil filler cap

1. After switching off the engine, wait approx. 5 minutes until the engine oil has flowed back into the oil pan.
2. Open the side panel on the left-hand side of the rear carriage.
3. Pull out the oil dipstick (1).
4. Wipe off the oil dipstick (1) and push it all the way back in.
5. Pull the oil dipstick (1) out again and read the engine oil level from the mark.
   The engine oil level is between the MIN and MAX markings on the oil dipstick.
   If the oil level is well above the MAX mark, contact your service partner.

Topping up the engine oil

6. If the engine oil level is below the MIN mark, top up the engine oil via the oil filler cap (2).
   Gradually add a small amount of engine oil (100 - 200 ml) at a time (3.52 - 7.04 imp. fl. oz. / 3.38 - 6.76 us. fl. oz.).
   For the specification of the engine oil, see "Vehicle technical data ", page 193.
7. Wait approx. 5 minutes after each top-up and check the engine oil level again on the oil dipstick (1) until the correct engine oil level is reached.

8. Make sure that the oil dipstick (1) is fully inserted and the oil filler cap (2) is correctly closed.
9. Close the side panel on the left-hand side.
10. If the engine oil level is too low several times in succession despite repeated correct topping up, have your vehicle checked for leaks by a service partner.

12.6.6 Changing the engine oil and oil filter

⚠ WARNING

Risk of burns from hot surfaces in the engine compartment.

The surfaces of the engine and other components such as the exhaust system, transmission, oil cooler, etc., become very hot during operation and can cause severe burns.

– Do not touch the engine, gearbox, exhaust system or other hot components when the engine is hot.

⚠ CAUTION

Risk of slipping due to spilled or leaked operating fluids and lubricants.

– Remove leaked or spilled operating fluids and lubricants immediately with a binding agent and dispose of them in an environmentally friendly manner.

Safeguarding warranty claims during the warranty period.

– To preserve eligibility for warranty claims, all servicing and maintenance work during the warranty period has to be performed by an authorised Customer Service (ICL), in accordance with the inspection check list.

NOTICE

Risk of damage to the engine due to incorrect engine oil level.

Do not operate the engine with an engine oil level that is too low or too high. This can result in engine damage due to insufficient lubrication or oil overfilling.

– Always check the engine oil level with the vehicle in a horizontal position and the engine at operating temperature. If the engine has not yet reached operating temperature (70 °C to 80 °C |158 °F to 176 °F), let it run for approx. 2 minutes and then switch it off.
– The engine oil level must be between the MIN and MAX markings on the oil dipstick.
– Only top up with engine oil with the appropriate specification, see chapter “Technical data”.
– Do not fill with too much engine oil. This can cause engine damage due to oil overfilling.

ADVICE Allow the vehicle to cool down sufficiently before changing the engine oil and engine oil filter.
The engine oil is easier to drain when the engine is warm.

1. Set the travel direction selector switch in the neutral position (middle position) so that the parking brake is activated and switch off the engine.
2. If necessary, secure the vehicle against rolling away.
3. Place a suitable catch pan with a capacity of at least 10 liters (2.2 brit. gal. | 2.6 us. gal.) under the oil pan.

4. Unscrew the oil filler cap.
5. Unscrew the oil drain plug.
6. Let the oil drain into the oil collection container.
7. Unscrew the engine oil filter.
8. Clean the sealing surface on the vehicle.
9. Remove the sealing ring from the engine oil filter.
10. Clean the sealing surface on the new engine oil filter.
11. Coat the sealing ring of the new engine oil filter with oil and place it on the new engine oil filter.
12. Screw in the new engine oil filter and tighten it hand-tight.
13. Replace the sealing ring on the oil drain plug.
14. Clean the sealing surface on the oil pan and screw the oil drain plug back in.
    Tightening torque = 60 Nm (531 lbf. in.).
15. Fill with fresh engine oil according to the specifications in the technical data.
16. Close the oil filler cap.
17. Let the engine run for 30 seconds and switch it off again.
18. After a waiting time of 5 minutes, check the engine oil level on the oil dipstick.
19. If the oil level is too low, top up with the appropriate amount of engine oil.
20. If the engine oil level is too high, you must drain some engine oil from the engine to prevent damage due to overfilling.
21. After a test run, check the tightness of the new engine oil filter and the oil drain plug.

12.6.7 Checking the hydraulic oil filling level and topping up

The hydraulic oil must be cool when checking the hydraulic oil level.

– Check the hydraulic oil level at a hydraulic oil temperature of 20 °C to 30 °C (68 °F to 86 °F).

Special accessories are required for topping up the hydraulic oil.

– Any lack of hydraulic oil can be topped up using a special accessory tool connected to the leakage coupling on the vehicle.
– If hydraulic oil is topped up using the special accessories or filled for the first time, the screw-in cap with air filter must be opened so that the air contained in the hydraulic oil tank can escape.
– To purchase the special accessories, please contact Kärcher Municipal GmbH or have your service partner top up any missing hydraulic oil.

The sight glass for the hydraulic oil level is located on the hydraulic oil tank, under the right-hand side panel.

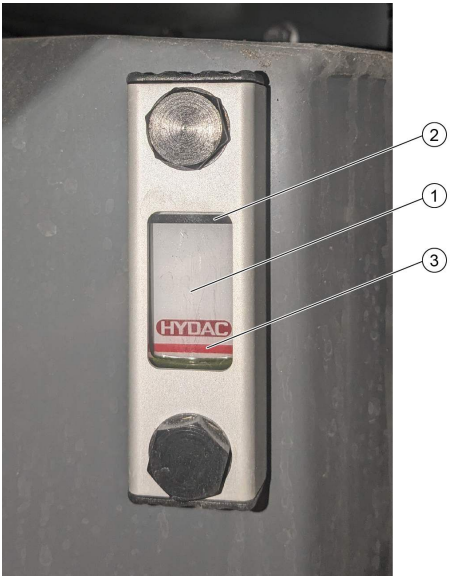


Fig. 115: Hydraulic oil level viewing glass

(1) Hydraulic oil level viewing glass
(2) Black bar = MAX marker
(3) Red bar = MIN mark

1. Check the hydraulic oil level at the sight glass (1).
   The correct hydraulic oil level is between the lower red MIN mark(3) and the upper blackMAX mark (2).
   When attaching implements, note any pendulum volume of the hydraulic cylinders.
   ADVICE A low hydraulic oil level is also indicated by a warning light in the multifunction display.
2. If the hydraulic oil level is too low, top up the missing hydraulic oil using the special accessories (see note above) or contact your service partner.
   Type of hydraulic oil see "Vehicle technical data ", page 193.

12.6.8 Cleaning and replacing the air filter

⚠ CAUTION

Risk of injury to the eyes and respiratory tract when cleaning air filters.

Flying foreign bodies could get into the eyes and whirled up dust could get into the respiratory tract and cause injuries.

- When cleaning air filters with a jet of compressed air or water, do not aim the jet at body parts or other persons.
- Do not inhale the dust blown out of the air filter, as this could cause injury to the respiratory tract.
- Wear a breathing mask when blowing out air filters.

NOTICE

Risk of damage to the engine due to ingress of foreign bodies if the air filter is removed.

– The vehicle's engine must be switched off when removing the air filter and while the air filter is removed.
– No foreign objects may enter the intake tract when cleaning the air filter and while the air filter is removed.

The air filter is located in the rear of the vehicle under the side panel on the right-hand side.

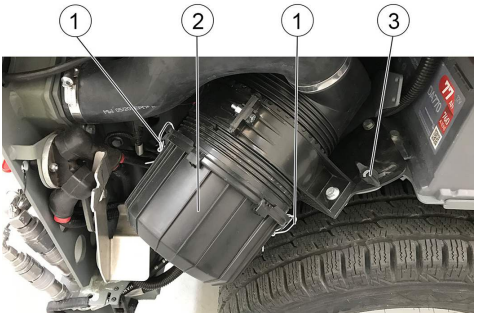


Fig. 116: Air filter

(1) Lock
(2) Air filter housing
(3) Wing screw

1. Open the side panel on the right-hand side of the vehicle.
2. Unscrew the wing screw (3) by approx. 2 turns.
3. Pivot the complete air filter unit outwards as far as it will go.
4. Screw the wing screw (3) tight again.
5. Open the locks (1) on the air filter housing.
6. Remove the air filter housing casing.

Fig. 117: Air filter housing and cartridges

(1) Safety cartridge
(2) Filter cartridge
(3) Cover of the air filter casing

7. Pull the filter cartridge (2) and the inner safety cartridge (1) out of the air filter housing (3).
8. Thoroughly clean the inside of the entire air filter housing (the removed part and the part remaining on the vehicle).
   Ensure that no foreign objects get into the intake tract.
9. Knock the dust out of the filter cartridge (2) on a hard surface.
   ADVICE Do not blow out the filter cartridge (2) with compressed air as this could cause damage.
10. Check that the filter cartridge (2) and sealing surfaces on the filter cartridge are clean and undamaged.
    If the filter cartridge (2) is heavily soiled or damaged, it must also be replaced.
11. Replace the used inner safety cartridge (1) with a new safety cartridge.
    A used safety cartridge cannot be cleaned or re-used.
12. Fit the filter cartridge (2) and the inner safety cartridge (1) into the air filter housing (3).
13. Replace the air filter housing (3) and close the latches (1).
14. Unscrew the wing screw (3) by approx. 2 turns.
15. Swivel the complete air filter unit back to its original position.
16. Screw the wing screw (3) tight again.
17. Close the side panel on the right-hand side of the vehicle.

12.6.9 Changing the interior filter

Outside on both sides of the driver cabin

The fresh air for the interior is sucked in at the side of the driver cabin through a dust filter or fine dust filter [1].

[1] *option*

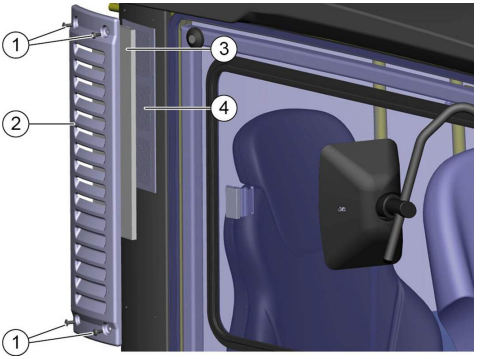


Fig. 118: Outside interior filter

(1) Screws
(2) Cover
(3) Dust filter, coarse
(4) Fine dust filter, filter class F8 [2]

The optionally available fine dust filter (4) has filter class F8 If you replace this fine dust filter (4), make sure it is of the same filter class.

Change the dust filter (3) and optional fine dust filter (4)

1. Unscrew the screws (1) and remove the cover (2).
2. Blow out the dust filter (3) with compressed air (at reduced pressure) if it is slightly soiled. Replace a heavily soiled or damaged dust filter (3) with a new dust filter.
3. If an optionally available fine dust filter (4) is installed, replace it with a new fine dust filter of the same filter class.
4. Replace the cover (2) and screw the screws (1) back in.

[2] *option*

Inside the driver cabin

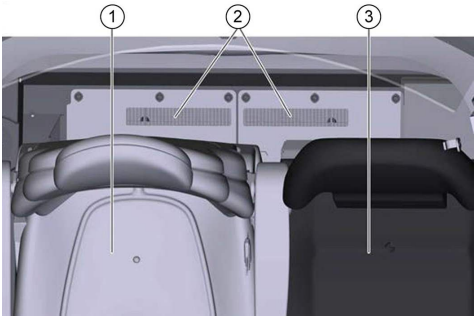


Fig. 119: Interior filter

(1) Driver's seat
(2) Dust filter
(3) Passenger seat

1. Slide both seats (1) and (3) forwards.
2. Remove the dust filters (2).
3. In the case of light soiling, blow out the dust filter (2) with compressed air (at reduced pressure). Replace a heavily soiled or damaged dust filter (2) with a new dust filter.
4. Refit the dust filters (2) in their correct installation position.

12.6.10 Removing and installing the vehicle battery

⚠ WARNING

Risk of injury from bursting or exploding vehicle battery, risk of poisoning from battery acid.

– Be sure to observe the safety instructions when handling the vehicle battery, see "Electrics | Electronics | Vehicle battery", page 40.

Only use vehicle batteries) and chargers (original spare parts) approved by Kärcher Municipal GmbH.

Check if your radio is secured with a radio code before disconnecting the vehicle battery.
If so, make a note of it so that you can unlock the radio with the radio code after connecting the vehicle battery.
The manufacturer does not keep a copy of the unlocking code.

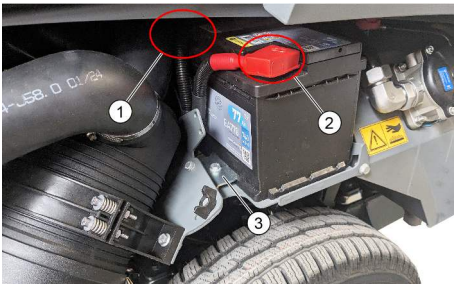


Fig. 120: Vehicle battery

(1) Negative terminal [-] (black)
(2) Positive terminal [+] (red)
(3) Support

Fig. 121: Battery terminals

(1) Negative terminal [-] (black)
(2) Positive terminal [+] (red)

Removing the vehicle battery

1. Lift the cover of the black negative terminal [-] (1).
2. Disconnect the terminal clamp on the negative terminal [-] (1).
   Ensure that the negative terminal clamp [-] (1) does not come into contact with any metallic components of the vehicle when the positive terminal clamp [+] (2) has not yet been disconnected.
3. Lift the cover of the red positive terminal [+] (2).
4. Disconnect the terminal clamp on the positive terminal [+] (2).
5. Unscrew the holder (3) at the bottom of the vehicle battery.
6. Remove the vehicle battery from the battery holder.

Installing the vehicle battery

1. Fit the vehicle battery into the battery holder.
2. Tightly screw the holder (3) at the bottom of the vehicle battery.
3. Apply some terminal protection grease to the terminals of the vehicle battery and to the terminal clamps (1) and (2).
4. Connect the terminal clamp to the red positive terminal [+] (2).
   Ensure that the negative terminal clamp [-] (1) does not come into contact with any metallic components of the vehicle when the positive terminal clampl [+] (2) is already connected.
5. Fit the cover of the positive terminal [+] (2) again.
6. Connect the terminal clamp to the black negative terminal [-] (1).
7. Fit the cover of the negative terminal [-] (1) again.

12.6.11 Charging the vehicle battery

⚠ WARNING

Risk of injury from bursting or exploding vehicle battery, risk of poisoning from battery acid.

– Be sure to observe the safety instructions when handling the vehicle battery, see "Electrics | Electronics | Vehicle battery", page 40.

Only use vehicle batteries) and chargers (original spare parts) approved by Kärcher Municipal GmbH.

Check if your radio is secured with a radio code before disconnecting the vehicle battery.
If so, make a note of it so that you can unlock the radio with the radio code after connecting the vehicle battery.
The manufacturer does not keep a copy of the unlocking code.

Ensure that the room is well ventilated when charging batteries in confined spaces.

Observe the manufacturer's operating instructions for the battery charger.

1. Disconnect the negative terminal [-] of the vehicle battery.
   Ensure that the negative terminal clamp[-] does not come into contact with any metallic components of the vehicle.
2. Make sure that the mains plug of the charger is not yet plugged in and that the charger is switched off.
3. First connect the charger with the red positive terminal to the positive terminal [+] of the vehicle battery.
   Ensure that the polarity of the connection terminals is correct. The positive terminal of a charger is labelled red.
4. Then connect the black negative terminal clamp to the negative terminal [-] of the vehicle battery.
5. Plug the mains plug of the charger into a power socket.
6. Switch on the charger.
7. Charge the vehicle battery with the lowest possible charging current.
8. Switch off the charger when charging is complete.
9. Pull the mains plug of the charger out of the power socket.
10. First disconnect the black negative terminal clamp from the negative terminal [-] of the vehicle battery.
11. Then disconnect the red positive terminal clamp from the positive terminal [+] of the vehicle battery.
12. Connect the negative terminal [-] of the vehicle battery again.

12.6.12 Bleeding the fuel system

Air must be bled from the fuel system to remove any air bubbles if the fuel tank has been run empty of the fuel filter has been changed.

1. Refuel the fuel tank.
2. Turn the ignition key to position I (the ignition is switched on).
   The fuel feed pump now starts up.
3. Let the fuel feed pump run until it runs audibly quieter after 2 - 5 minutes.
   The fuel system is then bled and you can resume operation of the vehicle.

12.6.13 Changing a wheel

⚠ DANGER

Danger of death when changing wheels in moving traffic.

– Bring the vehicle out of the danger zone of moving traffic before changing a wheel and performing repair work.
– Switch on the hazard warning lights on your vehicle.
– Immediately don a warning vest.
– Set up the warning triangle in accordance with the applicable regulations.

⚠ WARNING

Risk of injury due to the vehicle lowering.

– Never stand under a vehicle that has only been raised with the jack.
– The vehicle can lower suddenly and trap you under the vehicle and injure you.

⚠ CAUTION

Risk of accident and injury due to unstable positioning of the jack.

The vehicle may suddenly slip off the jack and cause an accident and/or injure you or third parties.

– Ensure that the ground under the jack is level, firm and able to bear the load.
– If necessary, use a large, stable base under the jack.

NOTICE

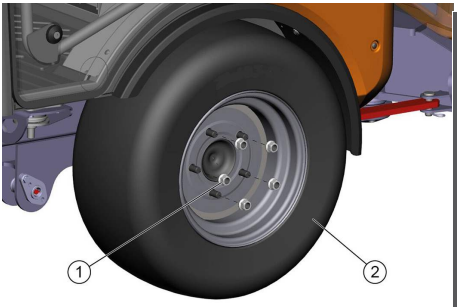
Risk of damage to the vehicle due to unstable positioning of the jack.

The vehicle can suddenly slip off the jack and be damaged, e.g. the brake disc can be damaged when hitting asphalt with the wheel removed.

– Ensure that the ground under the jack is level, firm and able to bear the load.
– If necessary, use a large, stable base under the jack.

Observe the following instructions:

- Perform the wheel change only if you are familiar with the necessary steps for changing a wheel. Otherwise, seek professional assistance from an authorised breakdown service or your service partner.
- Use only suitable and undamaged tools for changing a wheel.
- Use a suitable commonly available vehicle jack.
- Use a torque spanner for the wheel bolts with a tightening torque of at least 200 Nm (1770 lbf. in.).



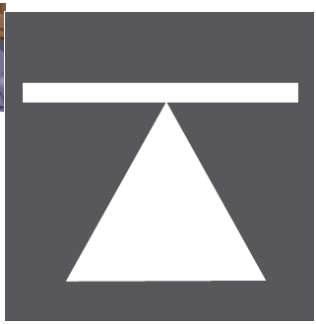


Fig. 122: Wheel change

(1) Wheel nuts
(2) Wheel

ADVICE Fit the jack only at the designated mounting points.
The mounting points are labelled with this symbol and are located on the frame on both sides of the vehicle, in front of and behind the articulated joint.

1. Park the vehicle on level and solid ground.
2. Set the travel direction selector switch in the neutral position (middle position), switch off the engine and remove the ignition key from the ignition lock.
   The parking brake activates automatically.
3. Secure the vehicle against rolling away, e.g.with wheel chocks on the intact wheels.
4. Secure the articulated joint with the transport lock, "Articulated joint transport lock ".
5. Use a suitable tool to loosen the wheel nuts on the defective wheel by approx. 1 turn.
6. Position the jack at the mounting point that is closer to the defective wheel and raise the vehicle.
   Only lift the vehicle with the jack until the defective wheel is free to move.
7. Additionally secure the raised vehicle with suitable supports.
8. Unscrew the wheel nuts of the defective wheel completely.
9. Remove the defective wheel.
10. Clean dirty wheel nuts.
11. Fit the new wheel flush.
    Make sure that it does not tilt.
12. Screw in all wheel nuts fully hand-tight.
13. Tighten the wheel nuts crosswise in several passes.
    Do not use a torque spanner at this stage.
14. Lower the jack so that the vehicle is standing on all 4 wheels again.
15. Tighten the wheel nuts crosswise in several passes using a torque spanner that works correctly:
    Tightening torque= 180 Nm (1593 lbf. in.).
16. Tighten the wheel nuts crosswise to the specified torque after 50 - 100 km (32 - 62 mi.).

12.7 Cleaning the vehicle

⚠ CAUTION

Risk of accidents and injuries when cleaning tyres with high-pressure cleaners.

This can lead to tyre damage that cannot be seen with the naked eye. There is a risk of accidents due to the sudden detachment of tyre components or the bursting of a tyre while driving.

– Be careful not to point the water stream directly at the tyres during a vehicle wash with a high-pressure cleaner.

NOTICE

Risk of damage through incorrect cleaning.

– Do not clean joints, tyres, radiator fins, hydraulic hoses and valves, seals, electrical and electronic components using a high-pressure cleaner.
– Never clean the articulated joint with a high-pressure cleaner.
– Observe the respective safety regulations when cleaning the vehicle with a high-pressure cleaner.
– Do not use aggressive detergents.
– Wash the vehicle only when the engine is switched off to protect the air filter.

NOTICE

Risk of damage to tyres from high-pressure cleaners.

This can lead to tyre damage that cannot be seen with the naked eye. There is a risk of damage to the vehicle due to the sudden detachment of tyre components or the bursting of a tyre while driving.

– Be careful not to point the water jet directly at the tyres when cleaning the vehicle with a high-pressure cleaner.

Clean the vehicle daily after finishing work. When using the vehicle under extreme conditions, e.g., very dry and dusty environments or in winter operation, cleaning several times a day may be necessary.

Observe the safety instructions for this, see "Cleaning", page 47 and "Salt adhesion during winter operation", page 34.

1. Before cleaning, check whether your vehicle is leaking oil .

   ADVICE Leaks of lubricants and operating fluids increase the risk of fire and must be eliminated immediately. Contact your service partner or an authorised Customer Service in the case of .

2. Clean the of plant residues, residues and dirt as well as grease and oil.
   Use a dry brush, a hand brush and dry, clean cloths.

   ADVICE If the and other heat-generating components are very dirty, the risk of fire increases due to heat build-up.

3. In the case of more stubborn dirt, clean the with a brush dipped in water, a low-pressure water stream and/or compressed air.

4. Clean the vehicle's lighting equipment with a clean, soft cloth and clean water.
   Do not use any aggressive or abrasive cleaning agents, as this could damage the panes of the lighting equipment.
5. Clean the mud flaps, wheel arches and wheel arches of the wheels.
6. Allow the vehicle to dry in a well-ventilated area or outdoors.

12.7.1 Removing/installing the radiator protective grille

Fig. 123: Removing the radiator protective grille

Removing the radiator protective grille

1. Lift the radiator grille upwards (see arrow “1.”).
2. Pull out the lower section.
3. Remove the radiator grille downwards and off (see arrow “2.”).

Installing the radiator protective grille

1. Position the radiator grille at the bottom and snap it into place.
2. Fold the radiator grille upwards and close it.

12.7.2 Cleaning the radiator

⚠ CAUTION

Risk of injury from sharp edges

– Wear protective gloves when cleaning sharp-edged surfaces and components.

1. Remove the radiator grille, see "Removing/installing the radiator protective grille", page 179.
2. Remove coarse dirt from the engine radiator, the air conditioning radiator and the fuel cooler by hand.
3. Clean the engine radiator, air-conditioner radiator and fuel cooler with a soft brush and a low-pressure water stream and/or compressed air (maximum 5 bar | 72.5 psi.).
   Take care not to damage the radiator fins in the process.
4. Refit the radiator grille, see "Removing/installing the radiator protective grille", page 179.
5. Allow the vehicle to dry in a well-ventilated area or outdoors.

13 Fuses

13.1 Fuses

NOTICE

Risk of damage to the on-board electronics and the vehicle's electrical equipment due to incorrect fuses.

– Only replace defective fuses with fuses that have the same ampere value.

The fuses are located in the driver cabin behind a cover on the rear wall of the cab.

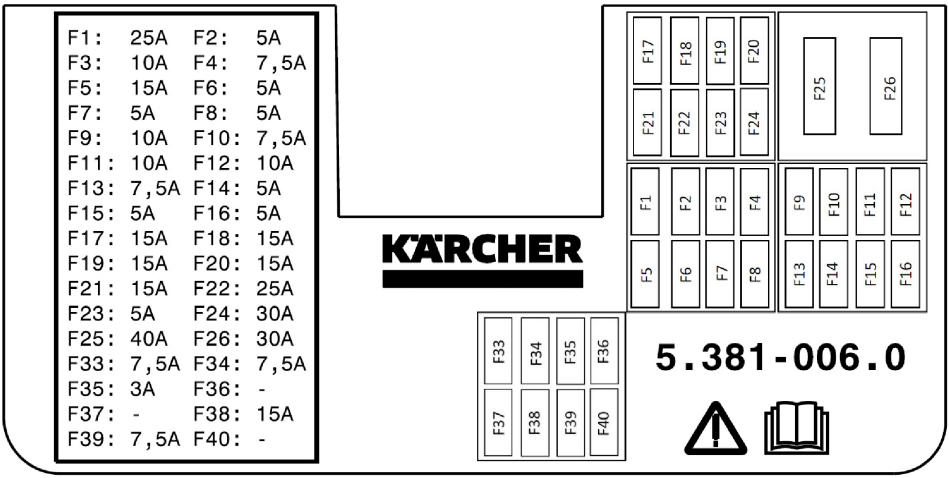


Fig. 124: Fuse assignment

Table of fuses on the vehicle		
F1	25 A	Kubota engine control unit (ECU)
F2	5 A	BODAS main control unit Interface connector X106
F3	10 A	Brake light Reversing light*
F4	7.5 A.	Water spray pump
F5	15 A	Warning flasher system
F6	5 A	Rear fog lamp
F7	5 A	Locator light switch Position light, left
F8	5 A	Position light, right
F9	10 A	Differential lock* Horn Windscreen wiper
F10	7.5 A.	Radio*
F11	10 A	Direction indicator left and right Daytime running light
F12	10 A	Flashing beacon
F13	7.5 A.	Brake pressure switch Alternator Reversing camera Reverse warning system Traction drive pump controller

Table of fuses on the vehicle		
F14	5 A	BODAS main control unit Encoder & keypad (arm rest)
F15	5 A	Kubota exhaust gas return valve
F16	5 A	Kubota air flow meter
F17	15 A	Headlights
F18	15 A	Front work lights
F19	15 A	Cab ventilation Air-conditioner Air conditioning compressor
F20	15 A	Seat heater* Mirror heater*
F21	15 A	Front attachment interface (X100)* Suction mouth camera*
F22	25 A	Rear attachment interface* Seat compressor*
F23	5 A	Ignition lock terminal 50
F24	30 A	Windscreen heater
F25	40 A	Preheating system
F26	30 A	BODAS main control unit
*option/accessories		

Table of fuses on the vehicle		
F31	70 A	Main fuse (located on the engine)
F32	3 A	Tera7 steering wheel display (located on the engine) Radio (located on the engine)
F33	7.5 A.	Suspension control unit (SCU)
F34	7.5 A.	Interface for external consumers connector X38
F35	3 A	Axle load indicator
F36		Spare
F37		Spare
F38	15 A	Suspension control unit (SCU)
F39	7.5 A.	Interface for external consumers connector X38
F40		Spare

Replacing a defective fuse

1. Remove the cover under which the fuses are located.
2. Replace defective fuses with fuses that have the same ampere value.
3. Then replace the cover.
4. Replenish any missing spare fuses in the fuse box as soon as possible.

14 Troubleshooting guide

14.1 Vehicle malfunctions

⚠ DANGER

Risk of injury from electric shock.

– Switch off the engine before all care and maintenance work.
– Remove the ignition key from the ignition lock.
– Disconnect the vehicle battery via the main switch.

You can remedy minor faults on your vehicle using the following table.

In case of doubt or if you cannot rectify the fault yourself, as well as for all faults not listed here, please contact the authorised Customer Service or contact your service partner.

Error	Cause	Remedy
Vehicle does not start.	Battery charging state low.	Charge the vehicle battery.
	Seat contact switch is not activated.	Sit in the driver's seat.
	Main switch in the [vehicle battery disconnected] position.	Activate the vehicle battery with Main switch.
	The travel direction selector switch is not in the neutral position.	Bring the travel direction selector switch into the neutral position (middle position).
	Vehicle tank is empty.	Refuel the vehicle.
	Fuel system contains air.	Bleed the fuel system.
	Fuel filter contaminated.	Check, clean and/or replace the fuel filter.
	Fuel connections and lines are leaking or defective.	Check the fuel connections and lines, eliminate any leaks. Contact an authorised Customer Service in the case of defects.
	Cause cannot be determined.	Contact an authorised Customer Service.

Error	Cause	Remedy
Engine running irregularly.	Air filter dirty.	Check and clean the air filter, replace if necessary.
	Vehicle tank is almost empty.	Refuel the vehicle.
	Fuel system contains air.	Bleed the fuel system.
	Fuel filter contaminated.	Check, clean and/or replace the fuel filter.
	Fuel connections and lines are leaking or defective.	Check the fuel connections and lines, eliminate any leaks. Contact an authorised Customer Service in the case of defects.
	Cause cannot be determined.	Contact an authorised Customer Service.
Engine is running, but the vehicle does not drive or just slowly.	Insufficient hydraulic oil in the hydraulic oil tank.	Check the hydraulic oil filling level and top up the hydraulic oil if it is too low.
	Due to sub-zero temperatures, the hydraulic oil is cold and viscous.	Allow the vehicle to warm up while parked for at least 3 minutes.
	The travel direction selector switch is in the neutral position.	Bring the travel direction selector switch out of the neutral position (middle position).
Engine does not switch off, main switch in [vehicle battery disconnected] position	Engine continues to receive fuel.	Close the fuel cock at the fuel filter .
	Fuel feed pump continues to run.	Unplug the fuel supply pump.
	Cause cannot be determined.	Contact an authorised Customer Service.

14.2 Error messages for symbols in the multifunction display

Error	Cause	Remedy
	Coolant temperature too high.	■ Switch off the engine. ■ Clean the radiator, see "Cleaning the radiator", page 180 . ■ Check the coolant level in the expansion tank and top-up if necessary, see "Checking and replenishing coolant", page 162. ■ If the warning light does not go out within 5 minutes: Switch off the engine and contact authorised Customer Service.
	Hydraulic oil temperature too high.	■ Operate the engine at idling speed until the warning light goes out.

Error	Cause	Remedy
	Hydraulic oil temperature too low.	■ Carefully warm up the engine until the warning light goes out.
	Engine oil pressure is too high.	■ Visit an authorised Customer Service.
	Parking brake active.	■ Release the parking brake, see "Parking brake", page 54.
	Error in the braking system	■ Visit an authorised Customer Service. When the error occurs, the symbol appears for 5 seconds large and in the middle of the multi-function display, then it lights up continuously until the error has been rectified.
	Low fuel filling level.	■ Top up the fuel, see "Refuelling", page 107. ■ Vent the fuel system if the tank was run dry.
	Vehicle battery is not being charged.	■ Visit an authorised Customer Service.
	Regeneration process required.	■ Perform regeneration, see "Regeneration process for vehicles with a diesel particle filter (DPF)", page 126.
	Service required.	■ Have the service performed by Customer Service. The service indicator is reset by authorised Customer Service after the service has been carried out.

Error	Cause	Remedy
	Warning against too high an exit height	■ See "Warning against too high an exit height", page 120.
	Error in suspension system	■ See "Fault in the suspension system", page 123.

14.3 Emergency operation of the hydraulic valve via the emergency lift block [1]

⚠ WARNING

Risk of burns from hot surfaces in the engine compartment.

The surfaces of the engine and other components such as the exhaust system, transmission, oil cooler, etc., become very hot during operation and can cause severe burns.

– Do not touch the engine, gearbox, exhaust system or other hot components when the engine is hot.

⚠ CAUTION

Risk of accident and injury due to vehicle rolling away.

– Before releasing the parking brake, secure the vehicle against unintentional rolling away using the emergency actuation, e.g.with wheel chocks.

NOTICE

Risk of damage to the hydraulic system.

– Only operate the emergency lift pump when the engineis switched off.

If the engine of your vehicle is no longer functional and/or there is no hydraulic pressure available, you must manually release the parking brake to load or tow the vehicle.

Manual operation of the waste container or attachment frame, as well as the front power lift or suction mouth, is also possible via the optional emergency lift block as part of emergency operation.

The emergency lift block is located on the outside left of the driver cabin, below the rear window frame.

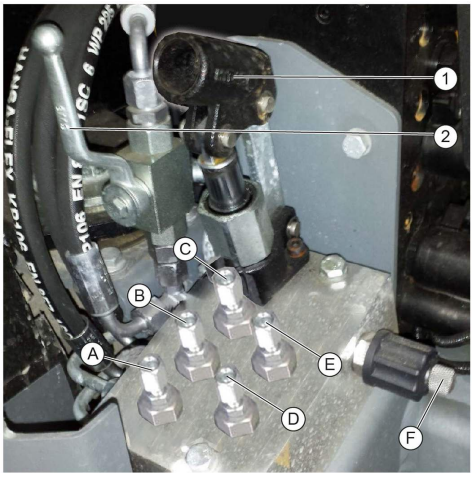


Fig. 125: Emergency lift block: Emergency operation hydraulic valve

1 option

1 Manual pump

2 Ball valve (illustration shows position in normal operation)

A-E Screws

F Knurled screw

ADVICE You need the pipe for operating the manual pump (1) and this is located at the side behind the driver's seat. A ring spanner to actuate the screws is included.

Releasing the parking brake spring actuator

1. Turn the 3 screws on the cover on the outside of the driver cabin to the left to unlock the cover.
2. Remove the cover.
3. Move the ball valve (2) to the horizontal position.
4. Unscrew the screw (C).
5. Insert the hand tube into the holder of the hand pump (1) and use it to actuate the hydraulic valve. The spring actuator releases.
6. Load the vehicle or tow it away.
7. Move the ball valve (2) back to the vertical position.
8. Screw in the screw (C).
   Spring actuator is actuated again (original position).
9. Attach the cover.
10. Lock the cover again with the 3 screws.

Manually raising/lowering the waste container/attachment frame

1. Turn the 3 cover screws to the left to unlock the cover.
2. Remove the cover.
3. Unscrew the screws (B, E, F).
4. Insert the hand tube into the holder of the hand pump (1) and use it to actuate the hydraulic valve. The waste container/attachment frame raises.
5. Turn the screw (F) in slowly.
   The waste container/attachment frame lowers.
6. Screw in all screws.
   The basic position is now restored.

Manually raising/lowering the front power lift/suction mouth

1. Turn the 3 cover screws to the left to unlock the cover.
2. Remove the cover.
3. Unscrew the screws (A, D, F).
4. Insert the hand tube into the holder of the hand pump (1) and use it to actuate the hydraulic valve. The front power lift/suction mouth raises.

5. Turn the screw (F) in slowly.
   The front power lift/suction mouth lowers.
6. Screw in all screws.
   The basic position is now restored.

14.4 Spare parts

Only use original accessories and original spare parts because they ensure that the device will run safely and fault-free.
Only by using original accessories and original spare parts (products approved by Kärcher Municipal GmbH) will you retain your warranty claims.

To avoid hazards and material damage, the installation of spare parts and other repairs may only be carried out by your service partner or an authorised Customer Service.

For information on accessories and spare parts, please contact your service partner or Kärcher Municipal GmbH.

15 Vehicle storage | Disposal

15.1 Storing the vehicle

If, for example, you take the vehicle out of operation for longer than 2 months for operational reasons, it may only be parked in a well-ventilated, clean and dry room with a level surface.

Do not use plastic film to cover the device, as this will encourage the formation and accumulation of condensation.

If there is a risk of frost, ensure that the antifreeze concentration in the coolant is sufficient. Otherwise, there is a risk of corrosion in the cooling system and engine circuit, as well as a risk of the entire engine freezing. In this case, the engine block may be completely destroyed by bursting.
You can check the antifreeze concentration yourself on a cold engine using a test spindle available from specialised dealers, or you can contact your service partner for a check.

1. Fill up the vehicle with petrol.
   This prevents corrosion damage to the fuel tank.
2. Empty all containers and systems that are filled with water when operating as a sweeper (water container and pipe system, with an optional recycling system the water from the waste container).
3. Clean the vehicle thoroughly inside and out.
4. Increase the tyre inflation pressure by 0.5 bar (7.25 psi) compared to the manufacturer's specification.
5. Check the filling levels of coolant, engine oil and hydraulic oil.
   Top up if the filling level is too low.
6. Grease the vehicle.
7. Apply a thin film of oil or grease to all mechanical components that are not painted.
8. Remove the vehicle battery and recharge every 2 months.
9. Check the condition and, if necessary, the acid density of the vehicle battery, grease the battery terminals and the terminal clamps on the vehicle with acid-free grease.
   Observe the stipulations of the battery manufacturer.
10. Store the vehicle battery in a frost-free, dry room.
11. Jack up the vehicle safely and securely with the doors closed and, if the vehicle is equipped with a waste container, with the waste container lowered so that none of the wheels are in contact with the ground.
12. Start the engine once a month and let it run for 5 minutes after reaching the operating temperature (70 °C to 80 °C | 158 °F to 176 °F).
    Then switch the engine off again.

Recommissioning of the vehicle

Before you put a stored vehicle back into operation, proceed as you would when starting a journey and carry out a thorough safety check on the vehicle, see "Before starting a journey", page 100.

If you want to put the vehicle back into operation after a long period of storage, you may need to have it serviced at regular intervals by an authorised Customer Service.
Contact your service partner if you have any questions on this.

15.2 Disposal

When the vehicle has reached the end of its service life, the operator is responsible for the legally compliant disposal of the vehicle. For this purpose, the vehicle can be handed over to a legally authorised private or public company.

Follow the instructions in the safety chapter for disposal, see "Disposal | Packaging", page 51.

16 Technical data

All specifications in the technical data correspond to the values at the time of printing of these operating instructions.

– The technical data of your vehicle may differ from the values specified here depending on the equipment.

16.1 Vehicle dimensions

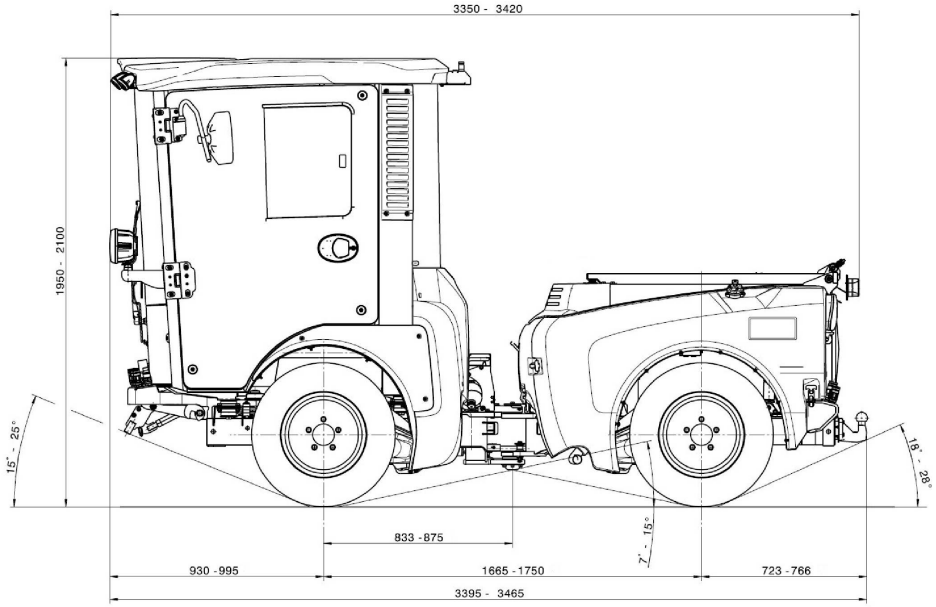


Fig. 126: Dimensions (view from left)

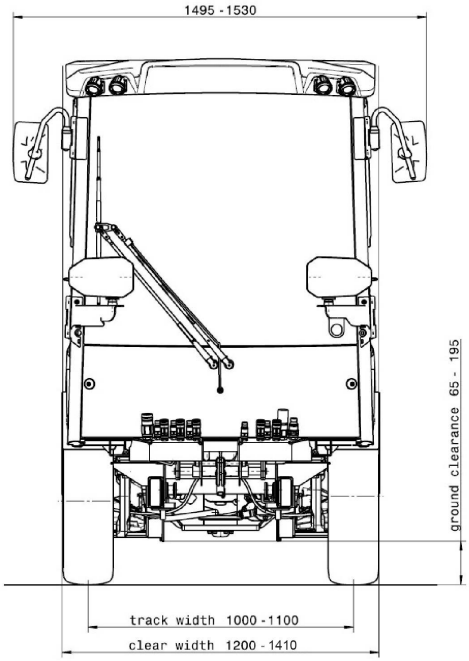


Fig. 127: Dimensions (front view)

16.2 Vehicle technical data

Vehicle performance data	
Travel speed (max.)	40 (30, 25) km/h | 24.85 (18.6, 15.53) mph.
Working speed (max.)	20 km/h | 12.43 mph.
Driven wheels	4
Theoretical surface coverage	24000 m²/h | 5.93 ac./h.
Working width	1200 - 2400 mm | 47.24 - 94.49 in.
Working width (min.)	1200 mm | 47.24 in.
Standard working width	1540 mm | 60.63 in.
Turning circle	1173 mm | 46.18 in.
Climbing ability (max.)	25 %
Maximum lateral tilt angle (inclined position)	10°

Ambient conditions	
Ambient temperature	-20 °C to 40 °C | -4 °F to 104 °F

Electrical system/Vehicle battery	
Battery type	Maintenance-free
Battery voltage	12 V
Battery capacity	80 Ah

Dimensions and weights	
Length	3395 - 3465 mm | 133.66 - 136.42 in.
Width without exterior mirrors	1200 - 1410 mm | 47.24 - 55.51 in.
Width with exterior mirrors	1495 - 1530 mm | 58.86 - 60.24 in.
Height (max. with flashing beacon)	2200 mm | 86.6 in.
Net weight (vehicle)	2,054 kg | 4,528.30 lbs.
Net weight as sweeper with 2-brush system	2,700 kg | 5,952.48 lbs.
Net weight as sweeper with 3-brush system	2,870 kg | 6,327.27 lbs.
Approved total weight	3500 kg | 7716.18 lbs.
Maximum permissible front axle load	2000 kg | 4409.25 lbs.
Maximum permissible rear axle load	2000 kg | 4409.25 lbs.
Permissible trailer load [1], braked	3000 kg | 6613.87 lbs.
Permissible trailer load [2], unbraked	750 kg | 1653.47 lbs.
Trailer coupling [3] vertical load	250 kg | 551.16 lbs.

Operating materials	
Fuel type	Diesel In accordance with the specifications of DIN EN 590.
Fuel tank capacity	60 l | 13.20 imp. gal. | 15.85 us. gal.
Engine oil type	Shell Rimula R6 LM 10W-40 **ADVICE** Do not mix engine oils with different properties.
Engine oil volume (max.)	9.5 l | 2.09 imp. gal. | 2.51 us. gal.
Engine coolant (SAE J814C)	Havoline XLC Antifreeze
Coolant quantity	5.5 l | 1.21 imp. gal. | 1.45 us. gal.
Hydraulic oil as per DIN 51524, Part 3	Renol B HV 46 (ISO 11158)
Hydraulic oil quantity	43 l | 9.46 imp. gal. | 11.36 us. gal.

1 *option*
2 *option*
3 *option*

Operating materials	
Grease for manually lubricated lubrication points	EP Lithium soaps (NLGI 2) Observe the lubrication point symbols on the vehicle.

Subject to technical changes without notice.

16.3 Engine technical data

Engine type	Kubota V2403-CR-T-EW03
Type	Four cylinder 4-stroke diesel engine with diesel particle filter (DPF)
Engine power at 2700 rpm	48 kW | 64.37 hp.
Cooling type	Water cooling
Engine capacity	2434 cm^3 | 95.69 in^3.

Subject to technical changes without notice.

16.4 Determined values in acc. with EN 60335-2-72

	MC 150
Sound pressure level L_{pA}	74 dB(A)
Uncertainty K_{pA}	3 dB(A)
Sound power level L_{wA}	104 dB(A)
Uncertainty K_{WA}	3 dB(A)
Hand-arm vibration value	0.4 m/s^2 | 1.3123 $ft./s^2$
K uncertainty	0.2 m/s^2 | 0.6562 $ft./s^2$

16.5 Tyres

	**195/75 R14C 106/104 R** **Winter tyres (M+S)**
Axle load	2000 kg (4409.25 lbs.)
Speed	40 km/h (24.85 mph.)
Air pressure	5.0 bar (82.52 psi.)

	**205/65 R16C 8PR 107/105 TL** **All-season tyres**			
Axle load	1400 kg 3086.47 lbs.	1600 kg 3527.4 lbs.	1800 kg 3968.32 lbs.	1950 kg 4299.01 lbs.
Speed	40 km/h (24.85 mph.)			
Air pressure	3.0 bar (43.51 psi.)			4.75 bar (68.89 psi.)

	**300/60-12 109B 8 PR** **Grass tyres**
Axle load	2200 kg (4850.2 lbs.)
Speed	40 km/h (24.85 mph.)
Air pressure	3.2 bar (46.41 psi.)

	**26X12.00-12 NHS 117A3** **Grass tyres** **ADVICE** **Special equipment with different speeds and separate approval.**					
Speed	Axle load					
20 km/h 12.43 mph.	1480 kg 3262.8 lbs.	1560 kg 3439.2 lbs.	1760 kg 3880.1 lbs.	2020 kg 4453.3 lbs.	2240 kg 4938.4 lbs.	2520 kg 5555.6 lbs.
30 km/h 18.64 mph.	1360 kg 2998.3 lbs.	1440 kg 3174.7 lbs.	1620 kg 3571.5 lbs.	1860 kg 4100.6 lbs.	2060 kg 4541.5 lbs.	2320 kg 5114.7 lbs.
40 km/h 24.85 mph.	1300 kg 2866 lbs.	1360 kg 2998.3 lbs.	1540 kg 3395.1 lbs.	1760 kg 3880.1 lbs.	1940 kg 4276 lbs.	2180 kg 4806.1 lbs.
Air pressure:	1,2 bar	1,4 bar	1,7 bar	2,1 bar	2,5 bar	3,0 bar
	17.4 psi.	20.31 psi.	24.66 psi.	30.46 psi.	36.26 psi.	43.51 psi.

16.5.1 Adjusting protective covers to different tyres

The protective covers can be adjusted to suit different tyre widths by pulling them out or pushing them in.

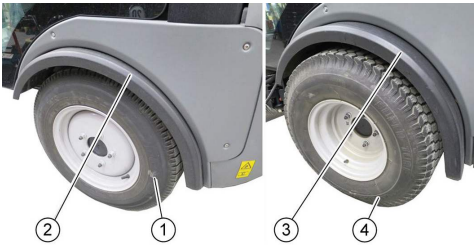


Fig. 128: Protective cover

(1) Tyres, narrow
(2) Protective cover pushed in
(3) Protective cover pulled out
(4) Tyres, wide

1. Release all screws on the relevant protective cover.
2. Adjust the protective cover to suit the width of the tyres.
3. Tighten all screws again.
4. Proceed in the same way on the opposite side.
   Ensure that the protective covers are set in the same position on each axle.

17 Index

18 List of figures

19 Glossary

4WD	Four Wheel Drive Four-wheel drive (all-wheel drive)
AC	Alternating Current Alternating Current
AUX	Auxiliary valve Auxiliary valve
Car	Passenger car Passenger car
DCU	Diesel Control Unit Control unit for diesel engines
DPF	Diesel Particulate Filter Diesel particulate filter
FIN	Vehicle identification number Vehicle identification number, also known as chassis number.
FOPS	Falling Object Protective Structure Protection against falling objects.
HV	High Voltage High voltage (high voltage)
ICL	Inspection Check List Inspection checklist
MIL	Malfunction Indicator Light Engine indicator light
OPS	Operator Protection System Protection against penetrating objects.
PPE	Personal Protective Equipment Personal protective gear
PSA	Personal protective gear Personal protective gear
PTO	Power Take Off Working hydraulics (hydraulic power output). Take-off point for hydraulic power output for the constant drive of an attachment.
ROPS	Roll Over Protective Structure Rollover protection structure

VIN	Vehicle Identification Number Vehicle identification number, also known as chassis number.

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