SCORPION
9055

CLAAS

Operator’s Manual

Service & Parts

2 Safety

2.1 Safety symbols and signal words

Explanation

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

DANGER

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

Consequences in case of non-observance.

► Avoidance of injury or death.

WARNING

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

Consequences in case of non-observance.

► Avoidance of injury or death.

CAUTION

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

Consequences in case of non-observance.

► Avoidance of injury.

NOTICE

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

► Avoidance of damage to property.

2.7 Attachment operation

Attachments

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

Operation

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

Removing and fitting attachments

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

Working near electric supply lines

- Before performing any work, the operator must check whether there are any electric supply lines in the job site.
- If there are electric supply lines, only a machine with cabin may be used (Faraday cage).
- Keep a safe distance from existing electric supply lines.
- If this is not possible, the operator must take other safety measures (for example switching off the current) in agreement with the operating company or owner of the supply lines.
- If supply lines are exposed, they must be fastened, supported and secured accordingly.
- If live supply lines are touched nevertheless:
  - Do not leave/touch the cabin (Faraday cage)
  - If possible, drive the machine out of the danger zone
  - Warn others against approaching and touching the machine
  - Have the live wire de-energized
  - Do not leave the machine until the supply lines that have been touched or damaged have been safely de-energized

Working near non-electric supply lines

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

Machine inspections

Fig. 1

In Germany, the Operational Safety Ordinance (BGV A1/BetrSichV §10) requires all machine operators to have all machines and equipment inspected regularly.

Inspections must be performed as required, but at least once a year, by an expert and must be documented in written form. Subsequent inspections of detected defects must be performed, too.

The competent inspection authority may require the inspection report to be available at the place where the machine is used.

Affix inspection label **A** for evidence (example).

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

This requirement is met, for example, if the results are documented in a test logbook, a test log file or in a test report; see also policy of German employers' liability insurance association for construction engineering "Inspection of vehicles by experts" (BGG 916).

When operating the machines, the national safety regulations must be followed as well, for example in Germany, the regulations for accident prevention "Deutsche Prüfstelle für Land- und Forsttechnik" (DPLF German inspection and certification body for agriculture and forestry) and the accident prevention regulation "Fahrzeuge (vehicles)" (BGV D29 § 57 clause 1).

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

Documents

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

- National Type Approval (Germany) or machine documentation
- Driving licence
- Test report according to BGV D29 § 57 clause 2 (safety and health regulations of German employer's liability insurance association)
- Operator's Manual

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

Symbols

Fig. 6

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

Type labels

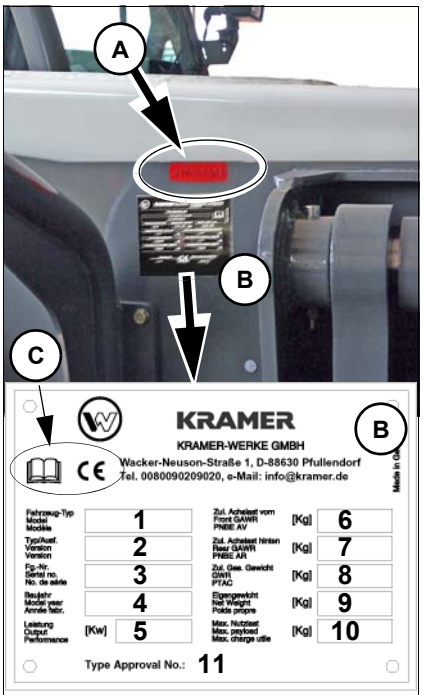


Fig. 7

Serial number

The serial number **A** is stamped on the machine frame (next to the mudguard attachment, at the front right). It is also located on the type label **B**.

The **CE** mark **C** on the type label means that the machine meets the requirements of the Machine Directive and that the conformity procedure has been performed.

Type label indications (example)

1	Machine model	416
2	Version	416-05
3	Serial no.	416 05 xxxx
4	Year of construction	
5	Output (kW)	115
6	Front gross axle weight rating (kg)	7100
7	Rear gross axle weight rating (kg)	7100
8	Permissible maximum weight (kg)	12500
9	Dead weight (kg)	–
10	Maximum payload (kg)	–
11	Check number of EC tractor approval (only for machines with agricultural or forestry registration)	e1*2003/37*xxxx[1]*

1. Refer to the machine documentation (National Type Approval or Data Confirmation) for the corresponding EC standard + approval number.

Fig. 8

Cabin number

The cabin type label (arrow) is located on the left in travel direction, on the tank of the washer system.

Fig. 47

Wheel nut information label

1. Tightening torque 600 Nm, do not oil wheel nuts and bolts!
2. Retighten the wheel nuts to the specified torque after one operating hour.
3. Retighten the wheel nuts to the specified torque every 10 operating hours (5 times to 50 operating hours since a wheel change)
   – see chapter 7 “ Mounting the wheels” on page 7-82,
   – see chapter 9 “9.9 Tightening torques” on page 9-17.

Located on the rims.

Field of vision during work operation

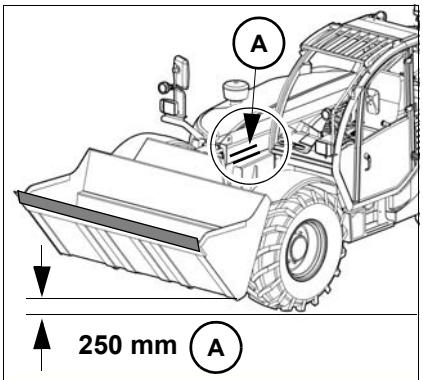


Fig. 58

WARNING

Accident hazard due to restricted field of vision!

Can cause serious injury or death.

- ► Before putting the machine into operation, check the field of vision and adjust the mirrors so that the visible area behind and beside the machine is seen as close as possible to the machine.
- ► Additional equipment or attachments must not be installed if they impair visibility.
- ► Remove obstacles within the work range.
- ► Do not move material with a raised loader unit.
- ► Move material only in transport position.
- ► If the field of vision cannot be safely adjusted with the mirrors, the operator must take appropriate measures (optional camera, person guiding the operator).
  The operator of the machine always has the sole responsibility for this.

- Adjust the visual aids before putting the machine into operation:
  – see “Mirror adjustment” on page 4-13
  – see “Electric mirror adjustment (option)” on page 4-17
  – see “Camera (option)” on page 4-18.

WARNING

Accident hazard due to persons in the danger zone!

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

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

Rear window heating (option), mirror heating (option)

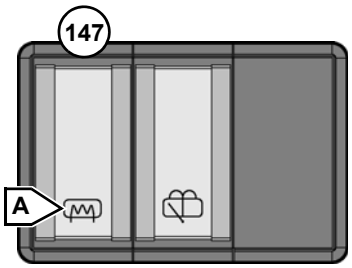


Fig. 76

The operating push button is located on the switch console in the cabin roof.

Operation of rear window and mirror heating		Function
ON	Press push button **147** to position **A**.	➥ The indicator light in the push button illuminates. ➥ Heating is in operation.

Information

The rear window and/or mirror heating is switched off automatically as soon as the correct temperature is reached!

Key-based immobilizer (option)

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

Scope of delivery:

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

Coding (“training”) new ignition keys

New personal keys are coded with the master key (red).
This is why it must be carefully stored outside the machine.

Information

The immobilizer has only one master key!

► The immobilizer must be replaced by an authorized service centre if the master key is lost.

- The master key is only used for coding new keys, and cannot be used for disabling the immobilizer.
- Switch on the machine lights (side marker lights) before coding a new key (blue).
  - Switch on the machine lights
    – see chapter 5 “ Parking lights/low beam” on page 5-26.
- Coding is performed by inserting the master key in the ignition lock and by turning it to position (1) for a maximum 5 seconds. After the master key has been returned to position (0) and removed, you have 15 seconds for inserting a key that requires coding. It must be inserted in the ignition lock and turned to position (1) in order to be registered as a valid key.
- Coding is automatically stopped if no key requiring coding is detected within 15 seconds.
- Several keys requiring coding can be inserted one after another in the ignition lock.
- Each key must remain at least 1 second in position (1).
- Coding can be performed for a maximum 10 keys.

Instrument panel with indicator lights (overview)	Page
89 Indicator light (yellow) – pressure monitoring (not assigned)	
90 Not assigned	
91 Indicator light (yellow) – oscillating-axle interlock (option)	*4-46*, *5-138*
92 Indicator light (green) – changeover valve for 3rd control circuit in operation (option)	*5-56*, *5-61*
93 Indicator light (green) – front socket (option)	*5-135*
94 Warning light (red) – hydraulic oil level (option)	*4-47*, *7-60*
95 Warning light (red) – hydraulic oil filter dirt	*4-47*, *7-60*
96 Indicator light (green) – trailer operation indicator light (option)	*4-47*
97 Indicator light (yellow) – differential lock	*4-47*
98 Indicator light (green) – turn indicator on the right/left	*4-47*
99 Warning light (red) – hydraulic oil temperature	*4-47*, *7-59*
100 Indicator light (green) – reverse machine travel	*4-47*
101 Indicator light (yellow) – coolant level	*4-48*, *7-46*
102 Indicator light (green) – forward machine travel	*4-48*
103 Indicator light (blue) – high beam	*4-48*

Instrument panel (left)	Page
104 Rotary switch – fan speed control for cabin heating	*5-37*
105 Switch (grey) – air conditioning (option)	*5-38*
106 Not assigned	
107 Not assigned	
108 Switch with lock (green) – continuous operation of 3rd control circuit (option)	*5-61*
109 Front socket switch (grey, option)	*5-135*
110 Switch with lock (green) – tilt ram lock (option)	*5-134*
111 Switch (green) – bucket, fork-lift and manual mode (overload control)	*5-48*, *5-49*, *5-50*
112 Not assigned	
113 Push button (green) – overload protection (boom)	*5-51*
114 Switch with lock (red) – joystick lock for road travel	*4-63*, *5-42*
115 Push button (green) – unlocking of quickhitch lock ram	*5-57*
116 Switch (3 positions) (green) – load stabilizer (option)	*5-106*
117 Hazard warning switch (red)	*5-32*
118 Switch (grey) – machine lights (road travel)	*5-26*
119 Push button (grey) – diesel particulate filter regeneration	*7-89*
120 Rotary switch – heating controls for cabin heating	*5-37*

Control lever (joystick)	Page
121 Push button (grey) – speed range reduction	*5-17*
122 Push button (grey) – speed range increase	*5-17*
123 Push button (grey) – 3rd control circuit changeover valve (option)	*5-59*
124 Switch (scroll wheel, grey) – unlock/lock 3rd control circuit	*5-57*
125 Push button (grey) – differential lock	*5-25*
126 Push button (grey) – bucket repositioning (option)	*5-42*, *5-132*
127 Push button (orange) – travel direction neutral position	*5-20*
128 Switch (scroll wheel, grey) – extend/retract telescopic boom	*5-45*
129 Switch (scroll wheel, orange) – change of forward/reverse travel direction	*5-18*, *5-19*

Information display on indicating instrument

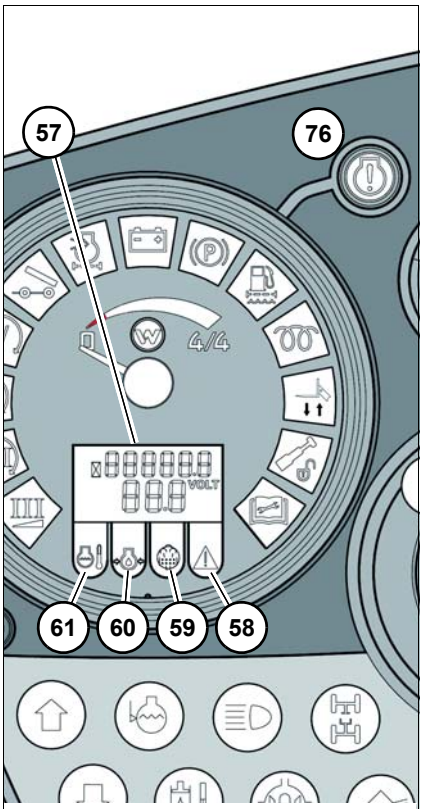
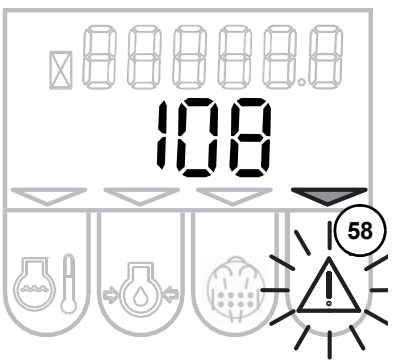


Fig. 101

Information display **57** on the indicating instrument monitors a range of operating states and values of the machine, and displays the current error codes.

The information display **57** has two lines and a warning-light section.

- The upper line displays the current operating hours of the machine.
- The lower line displays the current operating states and values of the machine.
- If a warning message is issued, warning light **61**, **60, 59** or **58** illuminates in addition.
  The separate current error codes and operating states can be selected with push button **76**.

Information display		Operating value	Unit	Remarks
		Operating hours	o/h	**Example:** 826.5 o/h • Current operating hours since delivery of machine
		Error code	–	**Example:** Error code 108 ➥ Warning light **58** illuminates ➥ Permanent acoustic warning **Possible causes:** • Malfunctioning hydraulic oil temperature sensor • Hydraulic oil temperature over 120 °C • Hydraulic oil temperature below −40 °C ➥ Move to next message with push button **76** Further information – *see "Digital display of error codes" on page 8-5*.

Operation checklist

Designation		X
1	Alternator indicator light gone out?	
2	Warning light in brake pressure indicator gone out?	
3	Braking effect sufficient?	
4	Temperature gauge for engine coolant in normal range?	
5	Steering system working properly?	
6	Anyone dangerously close to the machine?	
7	Safe load indicator checked and OK?	
8	Mirrors adjusted?	
During machine travel on public roads, particular attention should be paid to the following points:		
9	Telescopic boom completely retracted?	
10	Oscillating axle interlock (option) switched off?	
11	Telehandler levelled horizontally (frame levelling option)?	
12	Bucket and attachments in transport position?	
13	Transport locks installed?	
14	Control lever for lift and tilt hydraulics of the loader unit locked with switch **114**?	
15	Front-edge protection fitted to bucket?	

“Parking” checklist

“Parking” checklist		X
1	Attachments on the telescopic boom lowered to the ground?	
2	All additional control circuits disabled?	
3	Parking brake applied?	
4	Diesel engine stopped?	
5	Cabin locked, especially if the machine cannot be supervised?	
Parking on public roads:		
6	Machine appropriately secured?	
Parking on slopes:		
7	Machine additionally secured with chocks under the wheels to prevent it from rolling away?	

Load indication of diesel particulate filter

Important information on the diesel particulate filter (DPF)

The soot resulting from the combustion of the diesel fuel is collected and burned in the DPF at regular intervals.

WARNING

The diesel particulate filter gets very hot, fire and burn hazard!

Can cause serious injury.

- ► Keep your hands clear of the exhaust outlet, keep children and other persons away!
- ► During machine operation, ensure that there is no easily flammable material in the immediate vicinity of the exhaust system, in particular near the exhaust pipe!
- ► When stopping the machine while the engine is running, ensure that there is no flammable or combustible material in the immediate vicinity of the exhaust opening (for example paper, dry grass, straw, wood, wood ceilings, oil, fuel, etc.).
- ► Do not park the machine in high dry grass or straw.
- ► Never use corrosion-protection agents for exhaust pipes, heat shields or the diesel particulate filter. They can catch fire if the engine is hot.

NOTICE

In order to avoid damage to the diesel engine and exhaust system, only refuel with commercially available diesel fuel (EN 590, for example).

- ► According to the legal exhaust-gas regulations, diesel engines equipped with a diesel particulate filter (exhaust-gas treatment system) must be operated with sulphur-free diesel fuel only.
- ► Operation with RME/PME fuel (biodiesel) or vegetable oils is prohibited!
- ► Using diesel fuels with an increased sulphur content can greatly reduce the service life of the diesel particulate filter.
- ► Please contact your dealer if you require more information on fuel.

Front axle steering

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

Important information

WARNING

Accident hazard when changing steering mode during machine travel!

Can cause serious injury or death.

- ► Do not select the steering mode during machine travel on public roads.
- ► Change the steering mode only at a standstill or at walking speed.

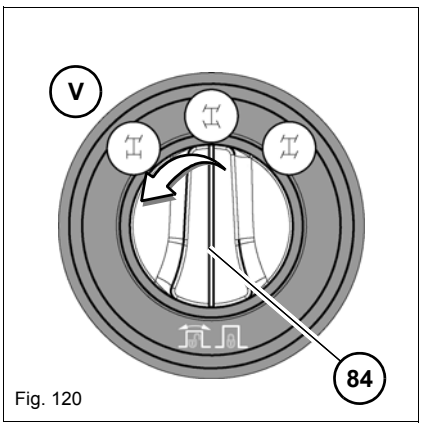


Fig. 120

Changeover to front axle steering

1. Brake the machine to walking speed.
2. Press and turn rotary switch **84** to the left to position “Front axle steering”.
   - ➥ Indicator light **V** flashes.
3. **Slowly** turn the steering wheel to the left and/or right until the wheels of the front and rear axles have passed through the straight-ahead position from both directions.
   - ➥ Indicator light **V** for front axle steering illuminates continuously.
   - ➥ Front axle steering is in operation.

Information

Do **not** stop the diesel engine with the wheels turned to the limit in diagonal steering mode.
When the machine starts again, this can cause tension in the steering system and malfunctions in the automatic steering synchronization.

- ► Set the wheels of the front axle to the straight-ahead position before stopping the diesel engine.

5.4 Travel operation

Performing machine travel

WARNING

Accident hazard due to persons in the danger zone!

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

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

Information

The operator seat is equipped with an operator presence switch.
The machine cannot be driven unless the operator is seated on the seat.

The drive switches to neutral position after 3 seconds if the load on the operator seat is reduced during machine travel. After another 4 seconds, the parking brake is enabled and all operating hydraulic functions on the joystick are locked.

5.5 Differential lock

Important information on the differential lock

The 100 % front axle differential lock neutralizes the compensating effect of the differential. In other words, traction is distributed evenly to both front wheels.

NOTICE

In order to avoid damage to the differential,

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

Switching on the differential lock

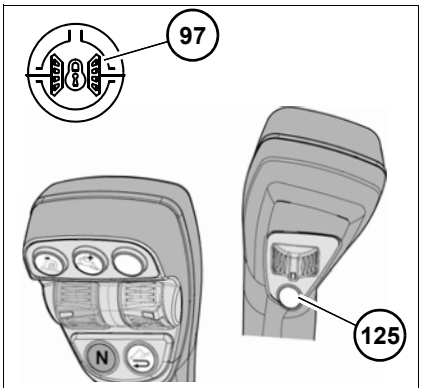


Fig. 147

In order to avoid damage to the differential lock when switching it on, the differential lock can only be enabled by pressing push button **125** on the control lever **and** the brake/inching pedal **48**!

1. Stop the machine.
2. Press and hold push button **125** on the control lever.
3. Press brake/inching pedal **48** (3 – 5 sec) until indicator light **97** on the instrument panel illuminates.
   ➥ The differential lock is enabled.
4. Carefully move off the machine with push button **125** pressed.

Switching off the differential lock

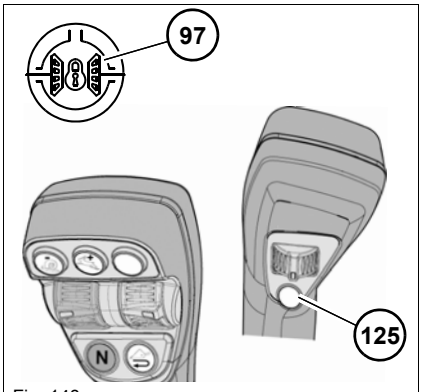


Fig. 148

1. First reduce travel speed and engine speed.
2. Release push button **125** on the control lever.
   ➥ Indicator light **97** on the instrument panel goes out, the differential lock is disabled.

5.7 Wiper/wash system

Washer system operation

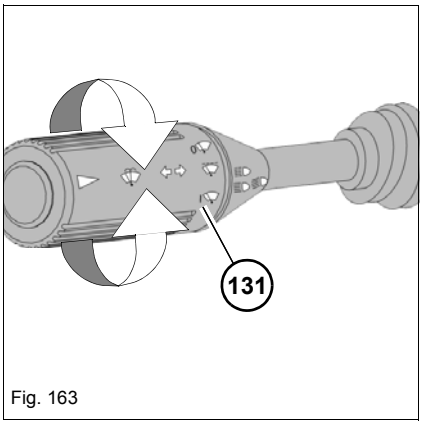


Fig. 163

Front wiper		Function
ON	Turn rotary switch **131** on the lever to the **1st** position	➥ Intermittent wipe
ON	Turn rotary switch **131** on the lever to the **2nd** position	➥ Continuous wiping
OFF	Turn rotary switch **131** on the lever completely back	➥ Wipers return to base position

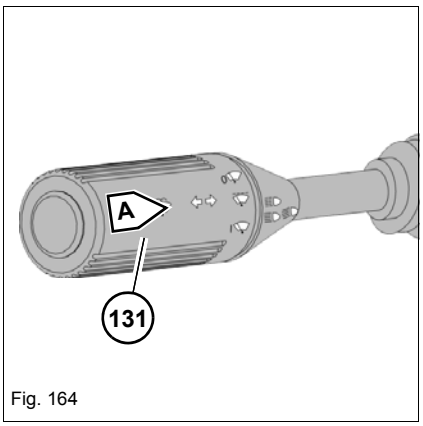


Fig. 164

Front window washer pump		Function
ON	Press and hold rotary switch **131** on the lever to the right **A**	➥ Washer nozzle in operation ➥ Wiper wipes 3 times
OFF	Release rotary switch **131** on the lever	➥ Washer nozzle off ➥ Wiper off

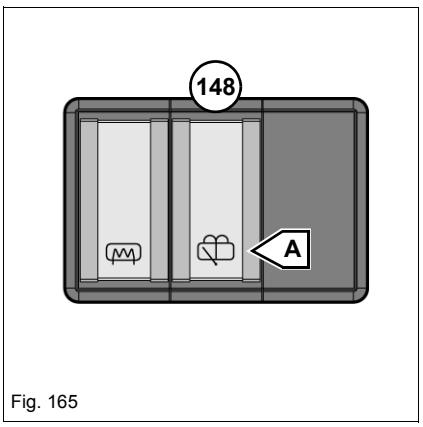


Fig. 165

Rear (standard) and side (option) wiper		Function
ON	Press and hold switch **148** in position **A**	Rear and side wipers in operation
OFF	Release switch **148**	Rear and side wipers return to initial positions

Rear window washer pump		Function
ON	Press and hold switch **148** beyond position **A** (push button function)	➥ Washer nozzle in operation ➥ Wiper wipes 3 times

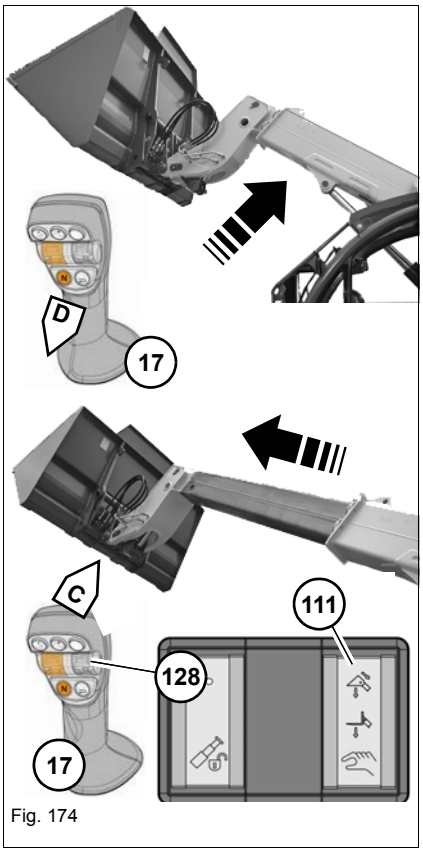


Fig. 174

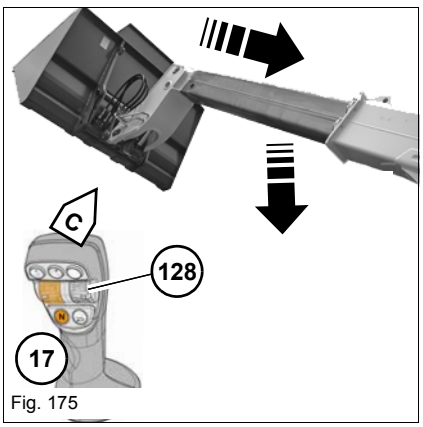


Fig. 175

Raising the loader unit/extending the telescopic boom

WARNING

Failure to observe the overload control indicator and the load diagram results in danger of tipping over!

Can cause serious injury or death.

- ► Carefully retract and lower the telescopic boom before the orange and red LEDs illuminate in the display.
- ► Do not perform any jerky movements with the joystick.

1. Select a mode with switch **111**
   – see “Overload control in bucket mode” on page 5-48,
   – see “Overload control in fork-lift mode” on page 5-49,
   – see “Overload control in manual mode” on page 5-50.
2. Raise the loader unit with the telescopic boom retracted to the required height. To do this: pull control lever **17** backward **D.**
   ➥ If it is tilted in, the bucket is moved parallel to its initial position as the loader unit is raised.
3. Extend the telescopic boom. To do this: press switch (potentiometer) **128** on control lever **17** forward **C** until reaching the required telescopic boom length.

Retracting the telescopic boom/lowering the loader unit

1. Retract the telescopic boom. To do this: press switch (potentiometer) **128** on control lever **17** backward until the telescopic boom is fully retracted.
2. Lower the loader unit with the telescopic boom retracted. To do this: push control lever **17** forward **C**.

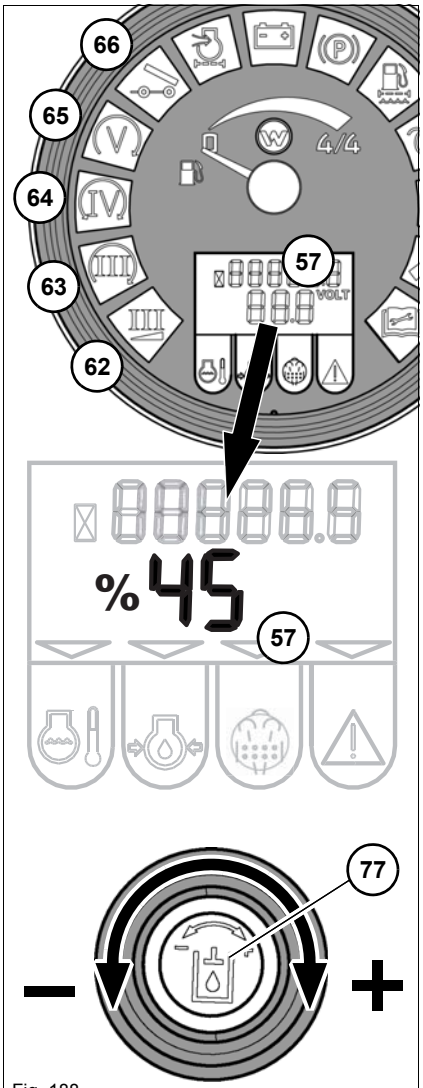


Fig. 188

Modifying and confirming the oil volume

1. Start the engine
2. Actuate the corresponding control circuits with the switch or push button.
   ➥ The indicator light of the selected control circuit **flashes** slowly.
3. Set the oil volume. To do this: turn rotary switch **77** to the left (−) or right (+) within 10 seconds until the required oil volume appears in digital display **57** in %.
   ➥ The oil volume is modified in steps of 5 %.
4. Save the selected oil volume. To do this: **press** rotary switch **77**
   ➥ The indicator light of the selected control circuit illuminates continuously on the indicator.
   ➥ The selected oil volume can be used for the attachment.

Information

Starting the year of construction 02/2015 (see machine's type label), two-hand control ("Press and hold push button, and press rotary switch at the same") and manual confirmation of the selected oil volume with the rotary switch ("Press") is no longer required after a software update of the electronics.

The preset or newly set oil volume of the active control circuit is automatically saved within a maximum 10 seconds. However, manual adjustment is still possible.

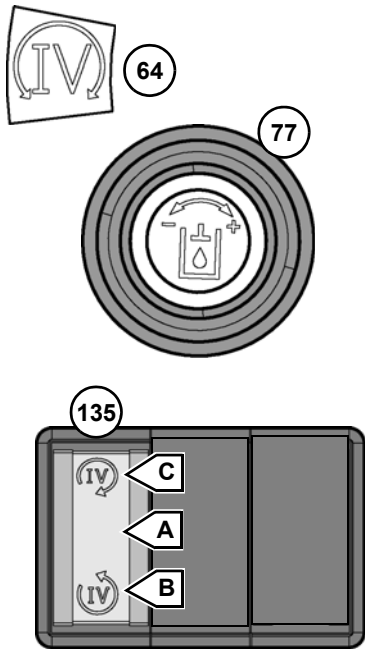


Fig. 204

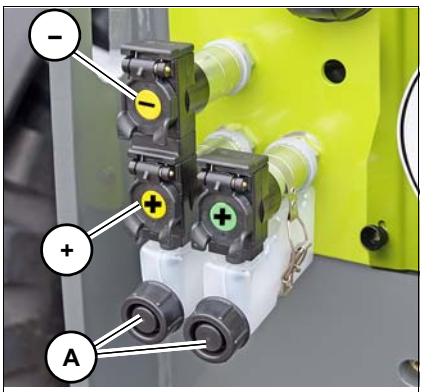


Fig. 205

Operation of additional rear control circuit IV

Switch position switch 135	Function
A (centre position)	➥ Additional control circuit IV **switched OFF**.
B (below)	➥ **Pressure applied to plug coupling (–).** ➥ Indicator light **64 flashes**
C (above)	➥ **Pressure applied to plug coupling (+).** ➥ Indicator light **64** flashes.

1. Start the engine
2. Press switch **135** to position **B or C** (see table).
   ➥ Indicator light **64 flashes** slowly.
3. If necessary, set the oil volume with rotary switch **77**
   – see "Modifying and confirming the oil volume" on page 5-55
   (oil volume set to 20 % at the factory).
4. Confirm the preset or newly set oil volume. To do this: **press** rotary switch **77.**
   ➥ The additional control circuit IV at the rear plug couplings **+ or –** is enabled.
   ➥ Indicator light **64** on the indicator illuminates
5. Operate the additional control circuit with switch **135**

Information

The oil volume of the additional control circuit IV can be set only during operation.

The adjusted and saved oil volume remains unchanged even after restarting the diesel engine.
If the additional control circuit IV is put into operation again after restarting the engine, it has to be enabled again with the switch and confirmed again with rotary switch **77** for safety reasons
– see "Confirming the oil volume" on page 5-54.

Removing an attachment from the quickhitch with mechanical locking

WARNING

The attachment can tip over after lowering it to the ground!

Can cause serious injury or death.

► Uncouple all flexible lines from the attachment.

► Lower the attachment to the ground and ensure it cannot tip over.

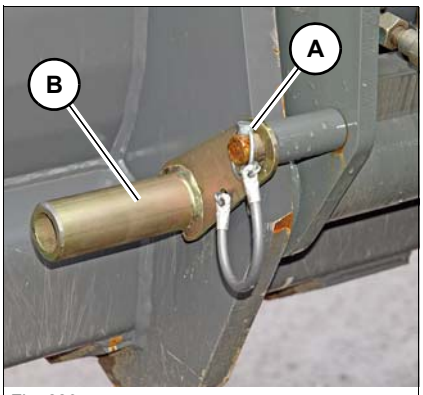


Fig. 223

Lowering the bucket to the ground.

1. Drive the telehandler to the drop-off position.
2. Lower the telescopic boom until the attachment is about 5 – 10 cm above the ground (horizontally).
3. Release split pin **A** on lock pin **B**.

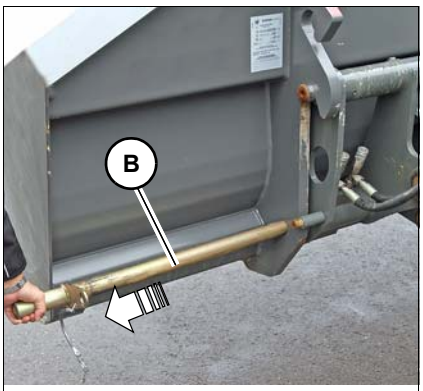


Fig. 224

4. Completely remove lock pin **B** from the quickhitch frame by hand.

CAUTION

Accident hazard due to falling catch bolt!

Can cause injury!

► Lock pin **B must** be secured in the bracket with split pin **A**.

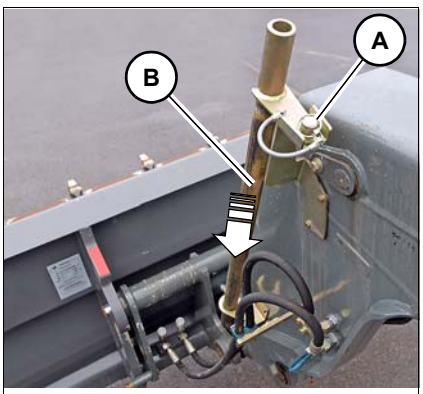


Fig. 225

5. Insert lock pin **B** laterally in the bracket.
6. Secure lock pin **B** in the bracket with split pin **A**.

Picking up pallet forks with the quickhitch

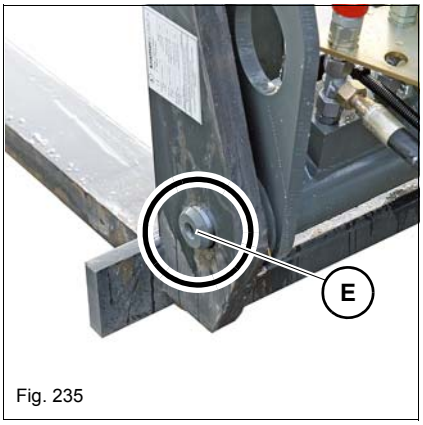


Fig. 235

WARNING

Accident hazard if the attachments are not locked!

Can cause serious injury or death.

► Check whether lock pins **E are visible on either side** in the mounting bores of the attachment.

Information

The pallet forks are picked up and installed on the quickhitch in the same way as the standard bucket

► *– see "Checking the lock bores of the attachment" on page 5-71*.

► *– see "Installing an attachment on a quickhitch with a hydraulic lock" on page 5-72*.

► *– see "Installing an attachment on a quickhitch with a mechanical lock" on page 5-73*.

Removing the pallet forks from the quickhitch

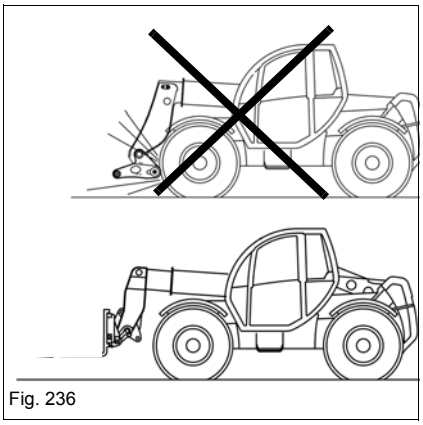


Fig. 236

NOTICE

In order to avoid damage to the tyres, do not move the machine with the quickhitch fully tilted out!

► Tilt in the quickhitch and lower the loader unit to transport position.

Information

The pallet forks are removed from the quickhitch in the same way as the standard bucket

► *– see "Removing an attachment from the quickhitch with hydraulic locking" on page 5-77*.

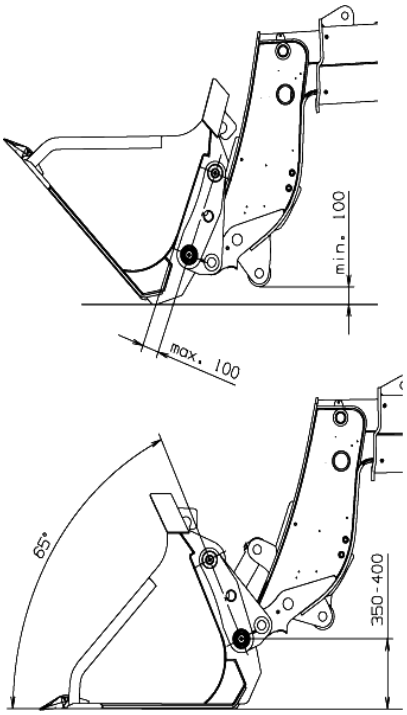


Fig. 243

Calculation of stability for attachments from other manufacturers (bucket)

Maximum authorized bucket payloads = pallet forks payloads – bucket weight.

- ➥ Bucket kerb weight, see type label affixed on bucket.
- ➥ Pallet forks payload *– see "Load diagram for pallet forks from other manufacturers Applies to machines with rigid front axle and oscillating rear axle" on page 5-96*.

Example: telescopic boom retracted

Payload 4990 kg (see pallet forks load diagram) – 600 kg (bucket kerb weight) = 4390 kg actual payload in bucket

Example: telescopic boom extended

Payload 2000 kg (see pallet forks load diagram) – 600 kg (bucket kerb weight) = 1400 kg actual payload in bucket

Information

A **Separate Certification for Vehicles (Germany)** issued by the specific authorities is necessary if the dimensions (length/width), material density and loads of the authorized attachments *– see chapter 3 " Fields of application and use of attachments" on page 3-11* are **not** in compliance with the requirements!

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

Transporting with a full bucket

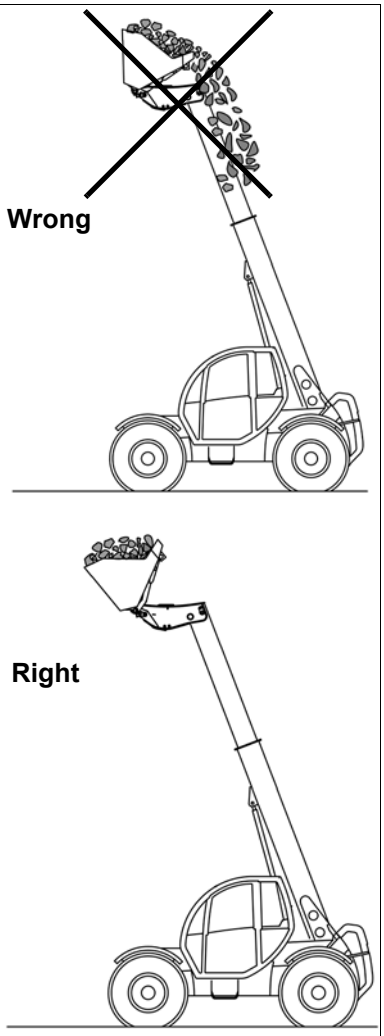


Fig. 246

If it is tilted in, the bucket is moved parallel to its initial position as the loader unit is raised.

WARNING

Danger of falling material when transporting loads with a raised and extended loader unit!

Can cause serious injury.

► Always tilt in the attachment a little toward the machine, carry it as close as possible to the ground and bear in mind the required ground clearance!

WARNING

If the bucket is unintentionally tilted in to the limit in the raised position, material can fall over the rear of the bucket!

Can cause serious injury.

► Do not tilt in a raised bucket.

► In case of bulky loads:
– Secure the load
– Fit a protection to the rear of the bucket
– Install a protective screen (option) on the cabin
– Use attachments with hydraulic grabs (option)

WARNING

Danger of tipping over during machine travel or manoeuvring on slopes with a full bucket!

Can cause serious injury or death.

► Lower the loader unit to transport position and tilt in the bucket completely.

► Ensure good visibility of the material you want to pick up and of the work and travel range.

► Observe the overload control display, and take appropriate action if necessary.

NOTICE

Dirt on the slide surfaces of the extended telescopic boom causes increased wear.

► Do not completely tilt in a full bucket if the telescopic boom is extended.

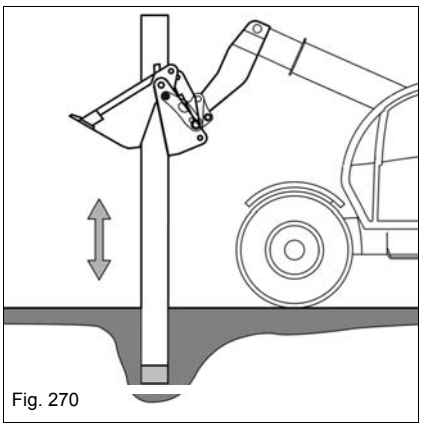


Fig. 270

Pulling out and setting posts

1. Open the multipurpose bucket and lower it over the post. Close the bucket to grip the post firmly
2. Loosen the post with careful up-and-down movements.

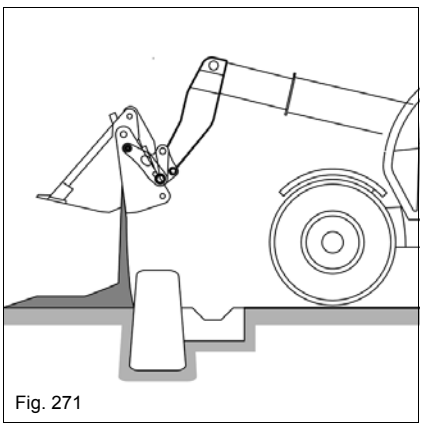


Fig. 271

Backfilling round gravel and precise unloading

- Precise dosing and placement of pourable material.

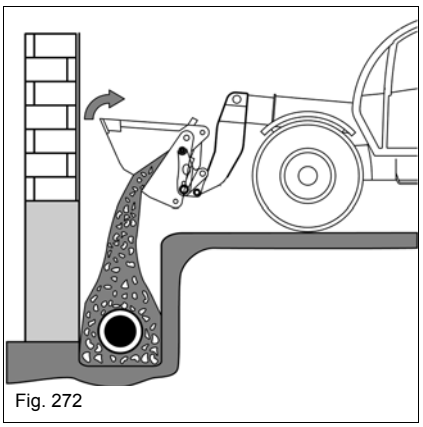


Fig. 272

Advantage of working method:

- Teeth move back from the wall as the bucket opens.

Picking up material with the pallet forks

Information

The loader unit yields easily with the load stabilizer switched on, making it difficult to perform any precise lifting movements.

► Switch off the load stabilizer in fork-lift mode!

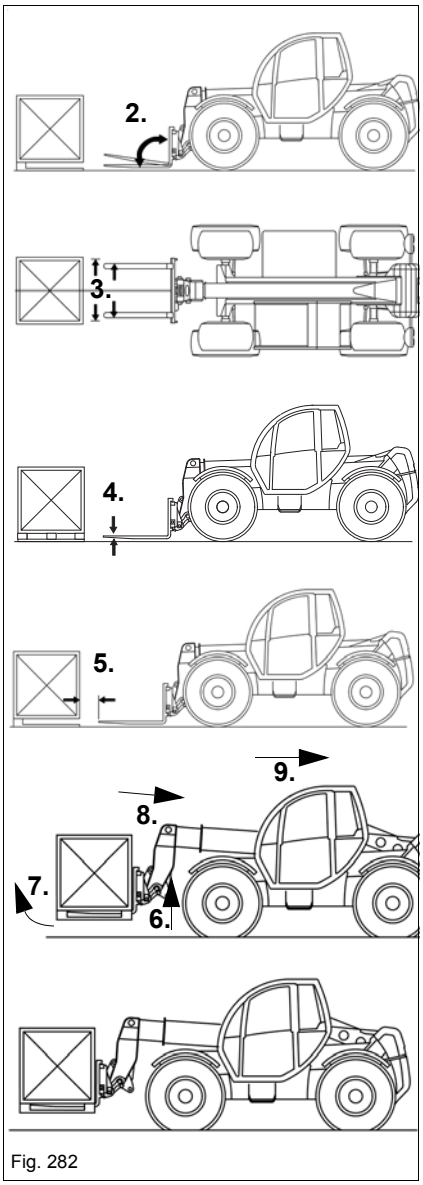


Fig. 282

1. Switch off the load stabilizer before working
   – see “Load stabilizer for loader unit (option)” on page 5-106.
2. Stop the telehandler right before the load and align the fork arms parallel to the ground.
3. Adjust the distance of the fork arms with regard to the centre line (dashed line).
4. Raise the loader unit until the pallet can be picked up easily.
5. Move carefully forward until the fork frame is in contact with the material.
6. Raise the loader unit and ensure that the limits of load diagram and safe load indicator are not exceeded!
   ➥ Ensure machine stability
   – see “Function of LEDs in safe load indicator” on page 5-41.
   ➥ In case of danger, lower the load immediately!
7. Tilt the fork frame backward.
8. Fully retract the telescopic boom.
9. Ensure that the area behind the telehandler is clear.
10. Reverse carefully until the loader unit can be lowered to transport position.
11. Transport the material in transport position.
    ➥ Transport height is about **320 mm** above the ground.

Front socket (option)

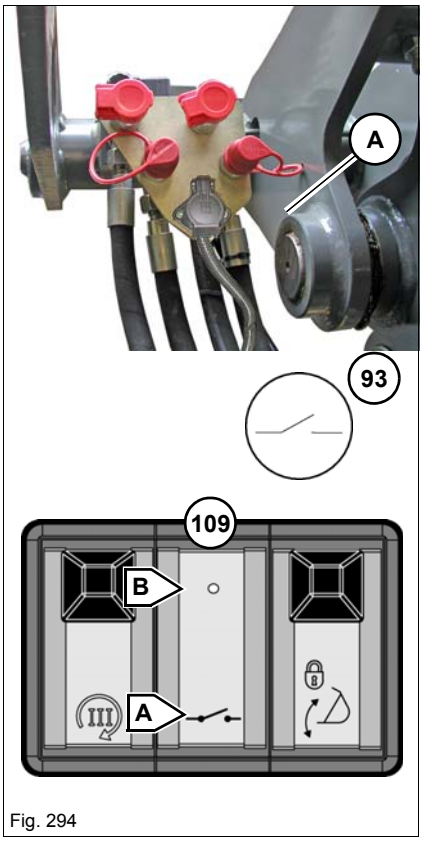


Fig. 294

The 4-pole front socket **A** is used for the electrical connection of attachments with lights and/or additional electrical functions, for example for a rotary broom with lights and an electric water pump.

Functions:

- Side marker lights (left)
- Side marker lights (right)
- Additional function, operation with switch **109**
- Ground

Front socket **A** is located on the left on the quickhitch.

Switch **109** is located on the instrument panel.

Operation of 4-pole front socket		Function
ON	Press switch **109** to position **A**	➥ Additional function enabled. ➥ Indicator light **93** illuminates.
OFF	Press switch **109** to position **B**	➥ Additional function OFF. ➥ Indicator light **93** goes out.

Hitching a trailer

WARNING

Accident hazard during reverse machine travel.

Can cause serious injury or death.

► Ensure that nobody is between the machine and the trailer.

► Have another person guide you if necessary.

CAUTION

Accident hazard due to unlocked coupling pin!

Can cause injury.

► After coupling a trailer, check whether the coupling pin is engaged in the lug.

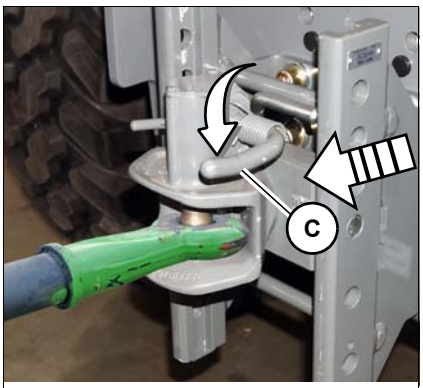


Fig. 305

2. Before hitching a trailer, adjust the height of the trailer coupling to the height of the trailer drawbar.
3. Reverse the tractor vehicle slowly until the lug engages in the coupling jaw with an audible click.
   ➥ The trailer is locked in the coupling jaw as the lug touches the release trigger.
4. Stop the engine.
5. Apply parking brake.
6. Visually check the locking condition.

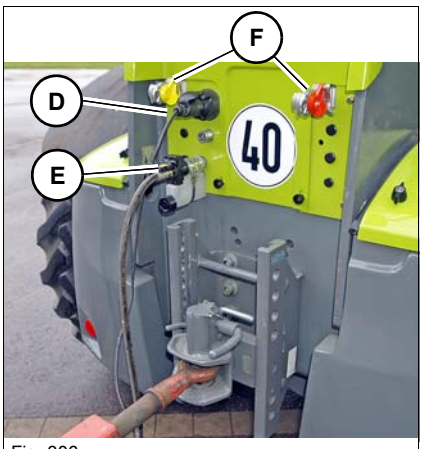


Fig. 306

7. Connect the electric **D**, hydraulic **E** and pneumatic **F** connections between the trailer and the tractor vehicle.
8. Release the trailer brake.
   ➥ Refer to the Operator's Manual of the trailer.
9. Remove the wheel chocks from the wheels of the trailer and safely store them on the trailer.

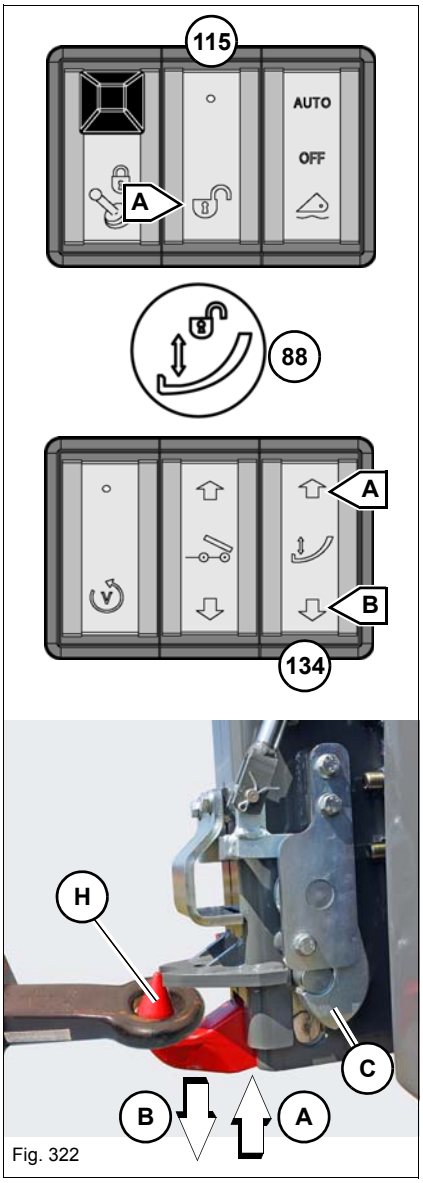


Fig. 322

Unhitching the trailer

1. Start the diesel engine.
2. Press and hold push button **115** to position **A**.
3. Press push button **134** to position **B** (two-hand control).
   - ➥ Towing hook **H** moves upward to the limit and automatically unlocks the safety lock.
   - ➥ Warning light **88** illuminates.
4. Press and hold push button **134** in position **B** until the trailer is unlocked.
   - ➥ Towing pin **H** moves downward.

NOTICE

Do not lower towing hook **H** completely to the ground since this raises the machine and can damage the Autohitch trailer coupling.

---

5. Use the rear mirror to carefully move away from the trailer until towing hook **H** is no longer below the lug of the trailer coupling.

Closing the Hitch trailer coupling

1. Press push button **134** to position **A** until the trailer coupling ***audibly*** encounters resistance.
   - ➥ Towing hook **H** rises to the final position.
   - ➥ Warning light **88** illuminates.
2. Only if warning light **88** still illuminates: press push button **134** briefly in position **B** so that towing hook **H** safely engages in the safety lock.
   - ➥ Warning light **88** goes out.

Information

The machine can only travel in snail mode (max. 7 kph) if the Autohitch trailer coupling is unlocked (warning light **88** illuminates)!

Fig. 334

Performing machine travel with the hydraulic trailer brake

WARNING

Performing machine travel too fast can cause serious accidents! The trailer brake can overheat on longer downhill stretches with the brake/inching pedal pressed only halfway through!

Can cause serious injury or death.

- ► Reduce the travel speed early enough before turning or downhill machine travel.
- ► Reduce engine speed: remove your foot from the accelerator pedal.
- ► Brake the tractor-trailer combination by braking intermittently. To do this: fully press brake/inching pedal **48** briefly several times.
- ► Select the next lower speed range  .

When the machine is braked with brake/inching pedal **48**, oil pressure is applied to the hydraulic braking system of the trailer to brake it.

The parking brake has no effect on the trailer braking system.

If the travel speed is reduced with brake/inching pedal **48**, oil pressure is applied to the trailer braking system after about 20 % of the pedal travel. This “advance action” slightly brakes the trailer, and the tractor-trailer combination is held in a taught line.

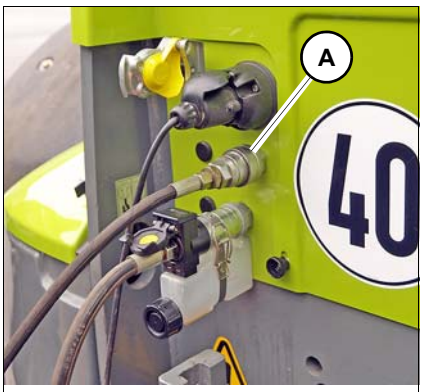


Fig. 335

Uncoupling the trailer brake hose:

1. Park the machine and the trailer on level ground.
2. Apply parking brake.
3. Stop the engine.
4. Switch off ignition and remove the ignition key.
5. Secure the trailer with wheel chocks.
6. Apply the trailer parking brake.
7. Disconnect the electric and hydraulic connections from the tractor vehicle to the trailer.
8. Close the plug couplings on the machine and the trailer with the protective caps provided.
9. Unhitch the trailer *– see “Unhitching the trailer” on page 5-146*.

SPLIT 1, SPLIT 2, PIP, TRIPLE, QUAD	For each display mode and display range: – Selects the camera image to be displayed.
TRIGGER	For each trigger input: – Selects the mode to be displayed when enabling the input. – Sets the delay time until the trigger view is disabled.
CAM/mode	– Selects the current camera or display mode to be displayed.
System menu	– Hides the system menu.

Function menu

Submenu	Description
Language	Selects a language.
System	Selects a colour system. • PAL • NTSC
Direction	Adjusts image orientation. • 0 Normal view. • 180 Image rotated by 180°.
Dimmer	Switches automatic display dimming ON/OFF. • AUTO Automatic display dimming by CDS sensor. • OFF Manual display dimming with DIM push button.
Reset	Resets the screen to the preset values.

Rear towing gear

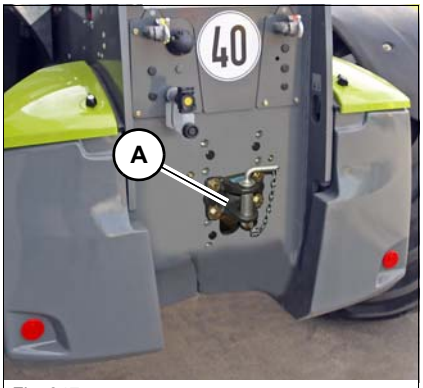


Fig. 347

CAUTION

Accident hazard due to a damaged towing gear!

Can cause injury.

- ► Check the towing gear for damage before using it.
- ► Have a damaged or malfunctioning towing gear immediately repaired or replaced by an authorized service centre.

Information

The rear towing gear **A** may only be used for towing the machine!

Any other use of the rear towing gear **A** is prohibited!

Front towing gear

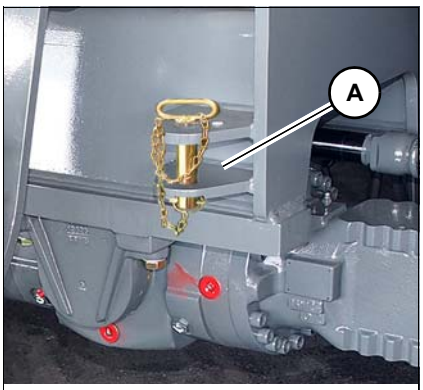


Fig. 348

CAUTION

Accident hazard due to a damaged towing gear!

Can cause injury.

- ► Check the towing gear for damage before using it.
- ► Have a damaged or malfunctioning towing gear immediately repaired or replaced by an authorized service centre.

Information

The front towing gear **A** on the frame is only used for towing the machine!

Any other use of the front towing gear **A** is prohibited!

7.2 Maintenance overview

Maintenance plan

Important information on the maintenance plan

For servicing and maintenance on the attachment, please refer to the Operator's and maintenance manual of the attachment manufacturer as well.

Have maintenance, the Delivery Inspection, the 1st Inspection at 100 o/h and the 2nd Inspection every 500 and 1500 o/h (once a year) performed by an authorized service centre, otherwise warranty claims will not be acknowledged.

"A", "B" and "C" refer to the respective maintenance kits

Work description[1] (o/h = operating hours)	**Service centre**	**User/operator**		**Service centre**[2]		
Oil and filter changes ( ) **(check the oil levels after a test run):**	**Delivery inspection**	**Every 10 o/h (daily)**	**Every 20 o/h**	**"A" 1st Inspection at 100 o/h**	**"B" every 500 o/h**	**"C" every 1500 o/h once a year**
Engine oil				●	●	●
Engine oil filter					●	●
Fuel filter					●	●
Replace the fuel prefilter					●	●
Air filter insert [3]					●	●
Air filter insert – safety cartridge[4]						●
Gearbox oil in front and rear axle differential				●		●
Gearbox oil in gearbox[5]					●	●
Gearbox oil in high speed gearbox[5] (option)					●	●
Gearbox oil in four wheel cutoff[5] (option)					●	●
Gearbox oil in front and rear axle planetary drives[5] (left and right)				●		●
Hydraulic oil						●
Hydraulic oil filter insert/return filter (reservoir)				●		●
Boost-pressure filter – travelling drive (variable displacement pump boost pressure)					●	●
Hydraulic oil reservoir breather filter [4]						●
Heating fine-dust filter (outside the cabin)[4]					●	●
Heating recirculated-air filter (inside the cabin)[4]					●	●

1. Have repair work performed only by an authorized service centre
2. Have maintenance performed by an authorized service centre (acknowledgement of warranty claims)
3. Replace the filter insert as indicated by the maintenance display, and more frequently in an acidic environment.
4. Depending on operation and dust conditions, and in an acidic environment it can be necessary to replace the filters more frequently
5. At 500 o/h. Oil change after putting the machine into operation for the first time, then every 1500 o/h.

Component/application	Capacities[1]	Fluid/lubricant	SAE grade/specification	Temperature
Engine cooling	Total about 23 l	Antifreeze[2]	12 l (55 %) water +11 l (45 %) DEUTZ cooling system protective agent [3, 4, 5]	Year-round -35 °C
			Alternatively: 100 % CLAAS AGRI-COOL	Year-round −37 °C
Battery terminals	As required	Acid-proof grease	SP-B3	Year-round
Fuel system, fuel tank	About 235 l	Diesel fuel[6]	EN 590 (EU) ASTM D975-94 (USA)	Year-round −40 °C
Washer system	About 3.0 l	Cleaning agent[7]	Water + antifreeze	Year-round −20 °C
Aggressive media (option)[8]	As required	Anticorrosion protection	ELASKON 2000 ML, ELASKON UBS light ELASKON Aero 46 spezial, ELASKON Multi 80	Year-round
Air conditioning (option)[9]	About 1300 g	Refrigerant[10]	R 134a/DIN 9860	Year-round

1. The capacities indicated are approximate values; the oil level check alone is relevant for the correct oil level
2. The antifreeze must be replaced every 2 years by an authorized service centre
3. In order to avoid engine damage and possible loss of warranty, use only the coolant “DEUTZ cooling system protective agent” or as an alternative, an antifreeze released in compliance with DEUTZ DQC CA-14, CB-14, CC-14.
4. Compound table – *see chapter 9 “9.10 Coolant” on page 9-17* or the manufacturer’s indications on the packaging
5. For other released antifreeze products, see: *www.deutz.de/service/betriebsstoffe_br_und_additive/kuehlsystemschutz.de.html*
6. If fuels that do not comply with DIN EN or ASTM (USA) are used, warranty rights shall not apply in case of diesel engine damage
7. See manufacturer indications on the packaging. Pay attention to the antifreeze compound table.
8. Have the sealing checked and repaired at least once a year by ELASKON – see the ELASKON servicing pass supplied with the machine.
9. Maintenance may only be performed by specifically trained personnel.
10. Bear in mind the safety data sheet during maintenance.

Cleaning the engine and the engine compartment

CAUTION

Injury hazard due to hot and moving engine parts!

Hot and moving engine parts can cause injury.

► Do not open the engine cover if the engine is running.

► Let the engine cool down.

► Wear protective equipment.

NOTICE

When cleaning the engine with a water or steam jet, the humidity penetrating the electronics causes it to fail and leads to engine damage!

► The engine must be cold.

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

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

► If the water jet is unintentionally pointed at electrical components, dry them with compressed air and apply contact spray to them.

The following auxiliary means are recommended for cleaning:

- High-pressure cleaner
- Steam jet

Checking threaded fittings

- All threaded fittings must be checked regularly, even if they are not listed in the maintenance plans.
- Retighten loose connections immediately.
  Refer to chapter “Technical data” for the tightening torques.

Checking pivots and hinges

- Lubricate all mechanical pivot points on the machine
  (for example door hinges, joints) and fittings (for example door arresters) regularly, even if they are not listed in the lubrication plan.
- Check the accelerator and brake/inching pedals for dirt, clean them if necessary, apply spray oil to the joints.

Filling the central lubrication system (option)

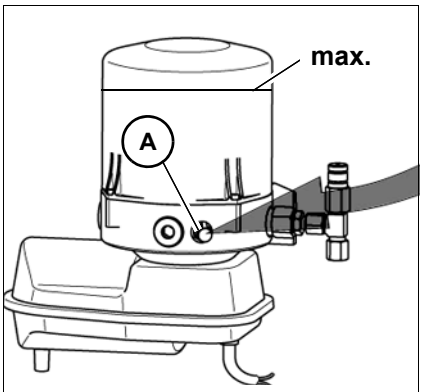


Fig. 377

The lubrication system is filled via conical grease nipple **A** or a fill coupling with a manual or pneumatic grease gun.

NOTICE

Damage to central lubrication system due to penetration of humidity in the controls.

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

NOTICE

Only fill up to the maximum level in order to ensure the ventilation of the central lubrication system.

Information

Maintenance intervals *– see “Maintenance plan” on page 7-3*.
Specifications and fill quantities *– see chapter 7 “7.3 Fluids and lubricants” on page 7-12*.

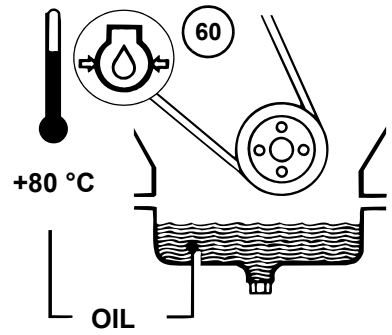


Fig. 385

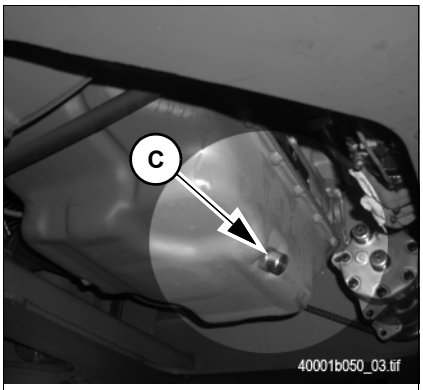


Fig. 386

Changing engine oil:

1. Park the machine on level ground and stop the engine.
2. Lower the telescopic boom fully.
3. Apply the parking brake.
4. Let the engine run until it reaches its operating temperature (about 70 – 80 °C).
5. Switch off ignition and remove the ignition key.
6. Open the engine cover.
7. Remove the servicing lid under the engine vat.
8. Place a container (about 20 l capacity) under the opening to collect the oil as it drains.
9. Unscrew oil drain plug **C**.

Once the oil is completely drained.

1. Screw in oil drain plug **C**.
2. Replace the engine oil filter
   – see "Replacing the engine oil filter" on page 7-44.
3. Add engine oil and check the oil level
   – see "Checking the engine oil level" on page 7-40.
4. Start the engine and let it run briefly at low speed.
5. Check indicator light **60** for the engine oil pressure.
6. Stop the engine and wait (about 10 seconds) until all the oil has run into the oil sump.
7. Check the oil level again.
8. Add if necessary and check again.
9. Completely remove all oil spills from the engine.

Cleaning the radiator with the reversing fan (option)

The telehandler can be equipped with a reversing fan (option).

Pressing push button **136** (on the right on the instrument panel) reverses the fan's direction of rotation and cleans the radiator.

Information

The radiator can be cleaned with the reversing fan during machine operation and only with the diesel engine running.

NOTICE

Dirt on the radiator fins reduces the radiator's heat dissipation capacity and can cause damage to the engine and the hydraulic system!

- ► Check and clean the radiator once a day.
- ► Clean the radiator more frequently in dusty or dirty work conditions.
- ► Do not clean in closed premises.

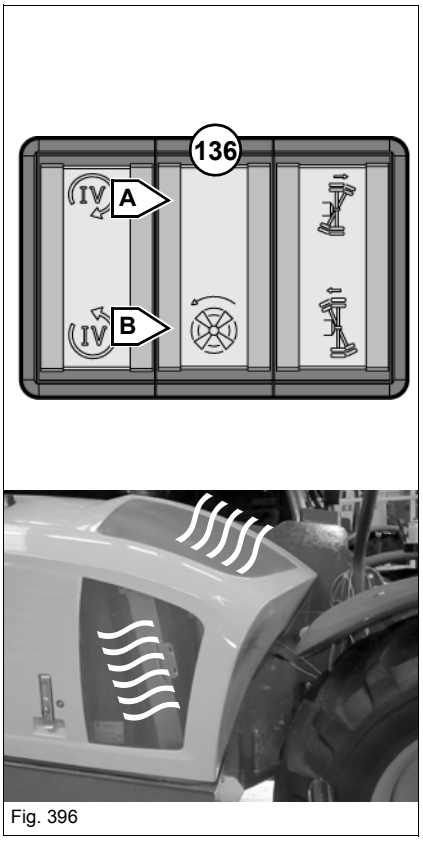


Fig. 396

Cleaning with the reversing fan:

- Briefly press push button **136** to position **B** with a running engine.
  - ➥ The fan rotates the other way round with a certain delay.
  - ➥ The fan is in cleaning mode and dirt is removed from the radiator.
  - ➥ This can be seen by the dust blown out from the intake screen on the engine cover.
  - ➥ The fan automatically switches back to normal cooling mode after about 1 minute.

Information

When working in especially dusty environment, clean the radiator repeatedly and more frequently!

Checking the hydraulic system for leaks

Safety instructions regarding pressure line checks

CAUTION

Burn and injury hazard if hot hydraulic oil escapes under high pressure!

Hydraulic oil escaping under high pressure can catch fire, damage property, penetrate the skin, and cause severe burns.

- ► Do not operate the machine with leaking or damaged hydraulic system components.
- ► Never search for leaks with your bare hands, wear protective gloves and clothes.
- ► Wear safety glasses to protect the eyes. If oil contacts the eye flush immediately with clean water and seek emergency medical treatment.
- ► Seek immediate medical attention if oil penetrates the skin. Oil can cause serious infections.
- ► Retighten leaking screwed fittings and hose connections only when the hydraulic system is not under pressure. In other words, release the pressure before working on pressurized lines.
- ► Never weld or solder damaged or leaking pressure lines and threaded fittings. Have damaged parts replaced with new ones by a qualified service centre.
- ► Do not check for leaks with an open flame due to explosive fire risk from vapourized oil mist.

Filling up the air conditioning system

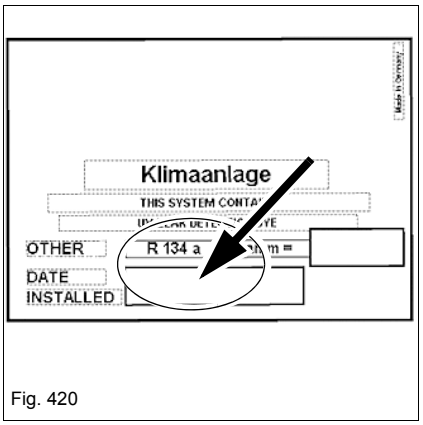


Fig. 420

The air conditioning system must be checked and serviced twice a year by trained personnel in a qualified service centre!

- For the first fill, see the air conditioning label on the side panel of the radiator.

Information

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

7.19 Maintenance of attachments

Correct maintenance and service is absolutely necessary for smooth and continuous operation, and for an increased service life of the attachments.

Observe the lubrication and maintenance instructions in the Operator's Manuals of the attachments!

Measures for maintaining anticorrosive protection

WARNING

Special hazards during anticorrosion protection!

Can cause serious injury or death.

- ► When handling chemical substances of any kind, such as solvents, wax, etc., observe the specific product-related safety regulations (safety data sheet)!
- ► Ensure appropriate room ventilation!
- ► Do not use unprotected lights or open flames!
- ► Do not smoke!
- ► Corrosion on electric connections or components can cause dangerous operating malfunctions.
- ► Perform work on the electrical system only with the battery disconnected and the diesel engine stopped!

Information

Maintenance intervals *– see “Maintenance plan” on page 7-3*.
Specifications and fill quantities *– see chapter 7 “7.3 Fluids and lubricants” on page 7-12*.

Cleaning

NOTICE

Contrary to the instructions given in Chapter “General maintenance” in the Operator’s Manual of the machine, neither clean the machine with a bristle brush nor with a steam jet or a high-pressure cleaner!

- ► If cleaning the machine with these means cannot be avoided, check the wax coating very carefully and have it renewed or reapplied as required.
- ► If you replace components, check whether they are classified as in the table “Components coated with anticorrosive wax” and whether they are subject to special treatment before assembly.
- ► Have the sealing checked and repaired at least once a year by ELASKON – see the ELASKON servicing pass supplied with the machine.

- If the machine is used in corrosive environment over a longer period of time, remove the floor mat in the cabin to avoid the accumulation of corrosive humidity.
- Thoroughly clean machines that are put out of operation over a longer period of time.
- Clean the machine at least once a week. In particular, remove corrosive deposits (such as salt crusts) as fast as possible.
- Clean the machine with cold running water preferably.

Error codes of diesel engine electronics		Troubleshooting
236	ECU temperature outside permissible range	Contact an authorized service centre
237	Starter switch	
238	Diesel particulate filter regeneration	
239	Diesel particulate filter regeneration	
240	Diesel particulate filter regeneration	
241	Manual throttle	
242	Air filter differential pressure	
243	Coolant level	
244	Ambient-air temperature	
245	Cold-starting aid relay	
246	Pressure sensor before exhaust gas turbocharger	
247	Exhaust gas treatment (CRT system)	
248	Exhaust gas treatment (EAT system)	

9 Technical data

9.1 Model and trade names

Telehandler model	Trade name
416-05	9055

9.2 Engine

Engine exhaust-emission level 3b (applies to all EU member states)

Designation	
Type	TCD 4.1 L4
Output (as per ISO 14396)	**115 kW** at 2300 rpm with charge-air cooler
Max. torque (anticlockwise rotation)	609 Nm 1600 rpm
Min. specific fuel consumption	212 g/kWh
Number of cylinders	4
Displacement	4038 cm³
Bore and stroke	101/126 mm
Compression ratio	1:17.6
Fuel injection system	Common Rail
Firing order	1 – 3 – 4 – 2
Starting aid	Heating flange
Max. inclined position (engine no longer supplied with oil)	Max. lateral left/right inclination: 30° (57 %) Max. uphill/downhill inclination: 30° (57 %) Observe the tilting limit of the machine!
Oil pressure	Forced feed lubrication
Valve clearance[1]	Intake valve 75° ±15° Exhaust valve 120° ±15°
Exhaust emissions according to EC standard	2011/88 EC Tier 3b

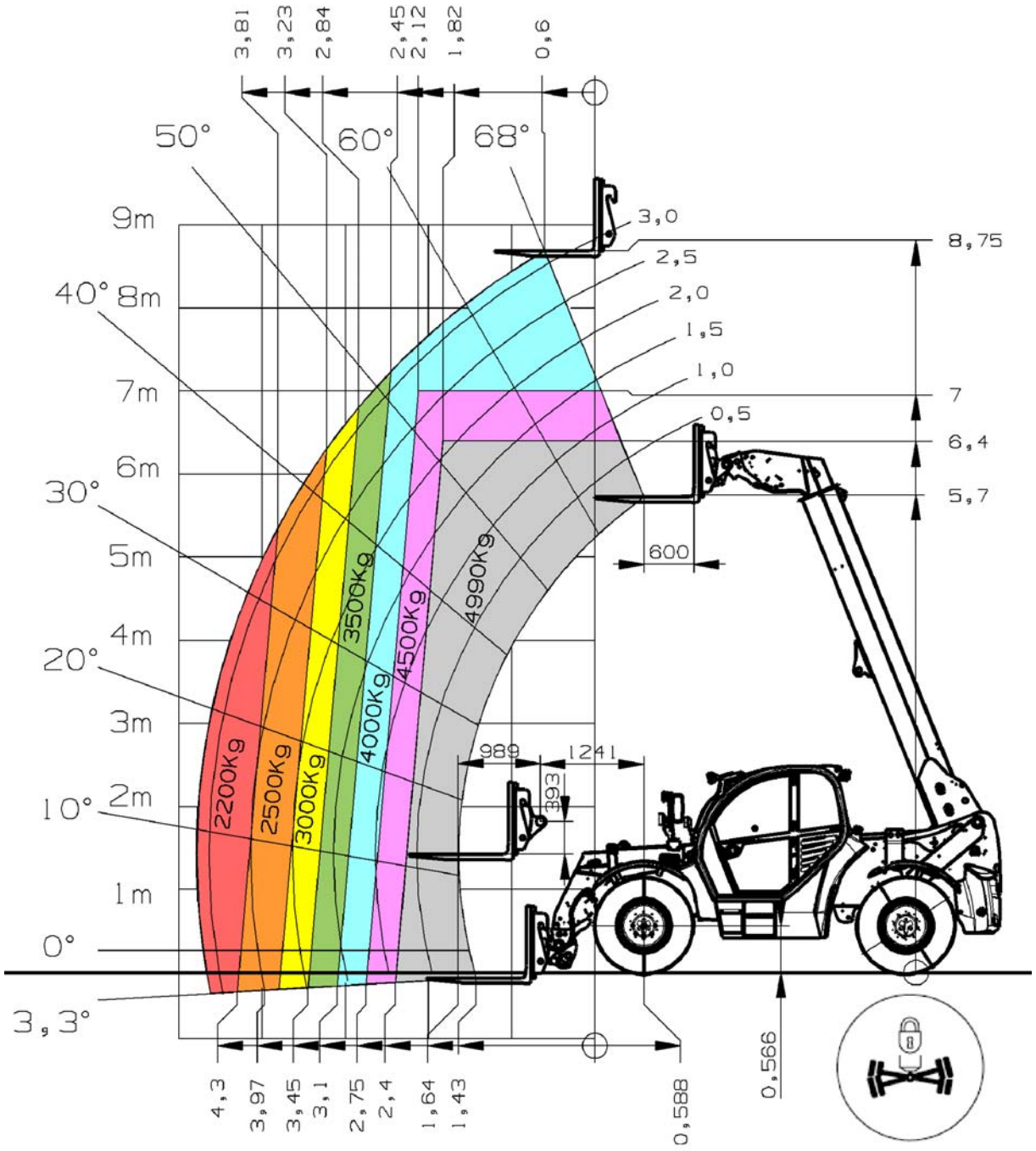
1. Set valve clearance on a cold engine

No.	(A)	Protected circuit
F21	5	Safe load indicator, window heating time-lag relay, window heating switching relay Push button for: quickhitch unlock, axle cutoff, Autohitch, tipping trailer, hydraulics cutoff Switch for: lock for long-haul travel, continuous function of 3rd control circuit, vertical lowering, boom limit switch
F22	20	Switching relay wiper 1st speed, intermittent wipe relay, front wiper, washer pump, horn
F23	3	Radio, seat belt contact switch, operator presence switch, Telematic
F24	7.5	High beam (right)
F25		High beam (left)
F26		Low beam (right)
F27		Low beam (left)
F28	5	Side marker lights (right), rear light (right), rear clearance light (right), rear numberplate light, switch lights
F29		Side marker lights (left), rear light (left), rear clearance light (left), instrument lights, light for cigarette lighter
F30	3	High-current relay, start switching relay, radio, Telematics module
F31	10	Main fuse: side marker light, rear light, rear socket for additional lights, front socket for additional lights, switch lights, instrument lights, light for cigarette lighter, interior light
F32	15	Side working lights, immobilizer, auxiliary heater
F33	10	Rotating beacon
F34		Boom working lights
F35		Rear working lights
F36		Front working lights
F37	7.5	Turn indicator relay, turn indicators, radio
F38	15	Socket (cigarette lighter)
F39	150	Glow plug/heating flange
F40	100	Machine
F41	30	Diesel engine electronics
F42	5	Exhaust gas mass flow sensor
F43	10	Exhaust gas recirculation
F44	15	Fuel preheater

Load diagram valid for machines:

- **with mechanically or hydraulically locked rear axle and with rigid front axle (without frame levelling, option)**

Load centre 600 mm



Example for load diagram – see page *5-123*.