CLAAS

SCORPION
7045 (403-03)
7040 (402-03)
7030 (401-03)
6030 (400-01)

Operator's Manual

SERVICE & PARTS

1.9 EC declaration of conformity model 401-03

EC Declaration of Conformity

according to the relevant EC Directive

KRAMER-WERKE GmbH
Nussdorfer Str. 50
D-88662 Überlingen

declare, under their own responsibility, that the product

Name of product	Telehandler
Model	400
Version	401-03
Serial no.	401-03_ _ _
Engine output	88 kW

to which this declaration refers, corresponds to the pertinent fundamental requirements regarding safety and health of

EC Directive 98/37/EC,
EMC Directive 89/336/EC

and the requirements of further pertinent EC Directives and standards.

2000/14/EC appendix VIII technical construction engineering committee, test and certification unit Landsberger Strasse 309 D-80687 Munich	Noise level information	dBA
	Measured sound power level	101.5
	Guaranteed sound power level	103

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

EN 1459, EN 474-1, EN 474-3,
ISO EN 12100-1 and 12100-2,
ISO 3471, EN 13510, EN ISO 3744, EN ISO 3746, ISO 3449

Überlingen, (date)

i. A.
Dipl.-Ing.
M. Mack
Head of Research & Development
KRAMER-WERKE GmbH

2 Safety instructions

2.1 Identification of warnings and dangers

Important indications regarding the safety of the staff and the machine are identified in this Operator's Manual with the following terms and symbols:

Danger!

Failure to observe the instructions identified by this symbol may result in personal injury or death for the operator or other persons.

☞ *Measures for avoiding danger*

Caution!

Failure to observe the instructions identified by this symbol may result in damage to the machine.

☞ *Measures for avoiding danger for the machine*

Important!

This symbol identifies instructions for a more efficient and economical use of the machine.

Environment!

Failure to observe the instructions identified by this symbol may result in damage to the environment.
The environment is in danger if environmentally hazardous material (e.g. waste oil) is not subject to proper use or disposal.

2.2 Warranty

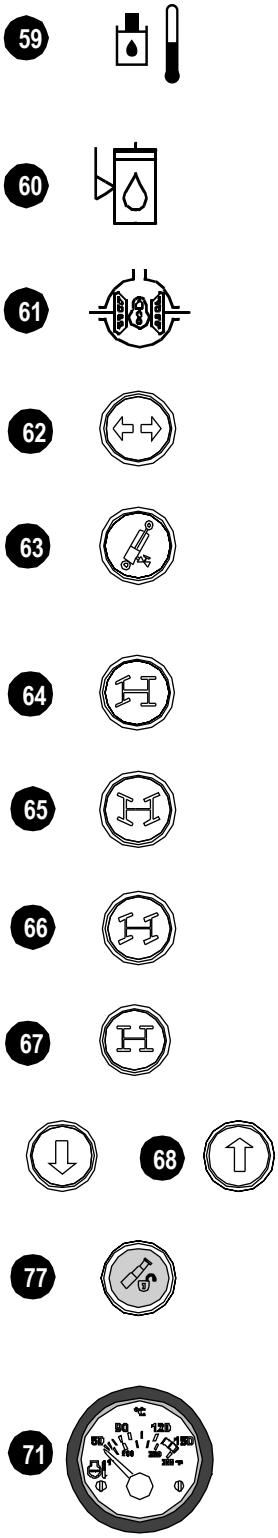
Warranty claims can be made only if the conditions of warranty have been observed. They are included in the General Conditions of Sales and Delivery for new machines and spare parts sold by the dealers . Furthermore, the instructions in this Operator's Manual must be observed.

- Have loads fastened and crane operators instructed by experienced persons only!
  The person giving the instructions to the operator must be within sight or sound of him!
- Always use specially designed or otherwise safety-oriented ladders and working platforms to carry out overhead assembly work.
  Never use machine parts or attachments/superstructures as a climbing aid!
  Wear a safety harness when carrying out maintenance work at greater heights!
  Keep all handles, steps, handrails, platforms, landings and ladders free from dirt, snow and ice!
- Clean the machine, especially connections and threaded unions, of any traces of oil, fuel or preservatives before carrying out maintenance/repair work!
  Do not use aggressive detergents!
  Use lint-free cleaning rags!
- Before cleaning the machine with water, steam jet (high-pressure cleaning) or detergents, cover or tape up all openings which – for safety and functional reasons – must be protected against water, steam or detergent penetration. Special care must be taken with the electric system!
- After cleaning, remove all covers and tapes applied for that purpose!
- After cleaning, examine all fuel, lubricant and hydraulic oil lines for leaks, chafe marks and damage!
  Rectify all defects without delay!
- Always tighten any screwed connections that have been loosened during maintenance and repair!
- Any safety devices removed for set-up, maintenance or repair purposes must be refitted and checked immediately upon completion of the maintenance and repair work!
- Make sure all consumables and replaced parts are disposed of safely and with minimum environmental impact!
- Do not use the work equipment as lifting platforms for persons!
- Before taking up work on machine parts dangerous for life and limb (bruising, cutting), always ensure safe blocking/support of these areas!
- Carry out maintenance and repair work beneath a raised machine, work equipment/ attachments or additional equipment only if a safe and secure support has been provided for (the sole use of hydraulic rams, jacks etc. does not sufficiently secure raised machines or equipment/attachments)!
- Avoid contact with hot parts, such as the engine block or the exhaust system during the operation of the machine and for some time afterwards – danger of burns!
- Retainer pins can fly out or splinter when struck with force – danger of personal injury!
- Do not use starting fuel! This especially applies to those cases in which a heater plug (intake-air preheating) is used at the same time – danger of explosions!
- Apply special care when working on the fuel system – increased danger of fire!

Service and maintenance work on ROPS/FOPS superstructures (ROPS bar)

- Straightening and welding work on ROPS/FOPS structures is prohibited. These structures must be replaced by original spare parts from the manufacturer!

Telltale and warning light – front instrument panel



Telltale (red) – hydraulic oil temperature

Indicates that the temperature in the hydraulic system is too high.

➥ *– see chapter 5 "Monitoring the hydraulic oil and the reflux filter"* on page 5-20

Telltale (red) – hydraulic oil level

Indicates that the hydraulic oil level in the tank is too low:

➥ *– see chapter 5 "Checking the hydraulic oil level once a day"* on page 5-20

Telltale (green) – differential lock

Indicates that the differential lock is switched on

Telltale (green) – turn indicator right/left

Flashes intermittently when turn indicator 24/**43** is used

Telltale (yellow) – hose burst valve (option)

Indicates that the hose burst valve is switched on. This avoids lowering or dumping out the telescopic boom without any resistance.

Telltale (green) – front axle steering

Indicates that front axle steering is switched on

Telltale (green) – 4 wheel steering

Indicates that 4 wheel steering is switched on

Telltale (green) – diagonal steering (crab steering option)

Indicates that diagonal steering is switched on

Telltale (red) – steering synchronisation

Indicates that the wheels on both axles are aligned

Telltale (green) – driving direction

Indicates forwards/reverse driving direction

Telltale (red) – disabling/enabling the lock function of the safe load indicator

Indicates that the hydraulic functions "Raising, Lowering, Dumping In/Out and Extending" locked by the safe load indicator are available again

Temperature indicator – engine coolant

Indicates the engine temperature detected by a sensor.

Important!

Engine temperature should be between 80 and 105 °C

- Max. admissible temperature is 110 °C.

3.9 Function: warning telltale in tip switch (103 kW diesel engine)

Reading out the flash code

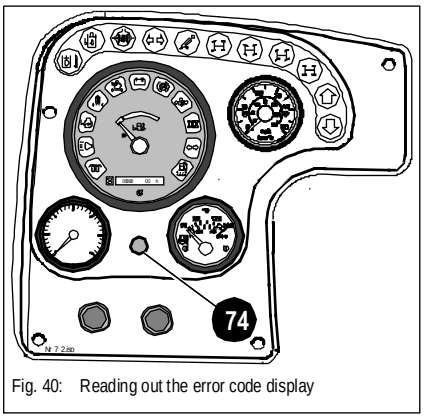


Fig. 40: Reading out the error code display

The diagnosis switch allows you to read out pending errors as flashing codes.

- **Telltale comes on continuously**
- **Telltale flashes**

Diagnosis switch **74** with the integrated telltale is located on the instrument panel. Errors are indicated by means of a flashing or continuously lit telltale. Detailed information on pending errors can be read out only at engine standstill by means of these flashing codes.

☞ *Press diagnosis switch **A*** about 1 second

➥ The telltale displays the error by means of the different lengths of the flashing signals

➥ *see "Overview of flashing codes"* on page 3-19.

☞ *Error codes are read out as follows*

2 — 3 — 1

Example:

Flashing code 2-3-1 =>**2** short (0.4 sec) – **3** long (0.8 sec) – **1** short (0.4 sec)

➥ Engine oil pressure = not enough or too much oil in the engine

Please contact your dealer if you require more information

Warning limit – coolant temperature

Error display		Troubleshooting
Tip switch telltale **74** comes on continuously	**Caution!** Coolant temperature 111 °C (see also temperature indicator **71** on the instrument panel)	☞ ***Stop the machine as quickly as possible*** ☞ ***Read out the error with the ignition switched on*** ➥ *– see Overview of flashing codes* on page 3-19 ☞ *Let the diesel engine run briefly at idling speed so it can cool down, then switch off the engine* ☞ *Check the coolant level or fill up the coolant* ☞ *Check the cooling circuit for leaks* ☞ *Have repair work carried out by an authorised workshop if necessary*
Tip switch telltale **74** flashes	**Danger!** Coolant temperature 119 °C (see also temperature indicator **71** on the instrument panel)	☞ ***Stop the machine immediately and switch off the diesel engine*** ☞ ***Read out the error with the ignition switched on*** ➥ *– see Overview of flashing codes* on page 3-19 ☞ *Check the coolant level or fill up the coolant* ☞ *Check the cooling circuit for leaks* ☞ *Have repair work carried out by an authorised workshop if necessary*
Tip switch telltale **74** goes out	Coolant temperature below 109 °C (see also temperature indicator **71** on the instrument panel)	☞ *Start the diesel engine* ☞ *Check the cooling system for leaks and correct function*

Taking the drive interlock out of service

We recommend taking the drive interlock out of service if the machine has to stay in a workshop, for instance, or if the machine does not require any protection. This avoids having to communicate the code.

1 Disable the system by entering the personal or main code and by confirming with the **(*)** key

2 Turn the ignition key to position “ON” as soon as the LED goes out

3 The LED comes on for 2 seconds

4 As soon as the LED goes out, press the **(*)** key for about 2 seconds until a short acoustic signal, followed by two further signals, sounds (within 20 seconds after the LED has gone out)

5 The LED now flashes very slowly, and the keypad is disabled

6 Turn the ignition key to the OFF position and remove it

7 The engine can be started without entering the code. The system is out of service even if electric power is interrupted.

Caution!

With the system out of service,

☞ *the LED flashes slowly even if the ignition key is in position ON*

☞ *Entering the personal or main code does not have the effect of putting the system back into service again (the acoustic signals for confirmation are still given). See the following procedure (“Putting the drive interlock back into service again”) to leave the out-of-service status again.*

Putting the drive interlock back into service again

☞ *Press the* **(*)** *key for 2 seconds (ignition key in position OFF) until two short acoustic signals are given for confirmation*

➥ The system is enabled again. The code must be entered to start the engine.

Interruption of drive interlock power

If the drive interlock was **enabled** before electric power was interrupted, short acoustic signals are given upon switching on the keypad (similar to those that are given when entering the wrong code four times). In this case, wait until the acoustic signals are no longer given. Then disable the drive interlock with the dem personal or main code.

The LED still does not come on if the drive interlock was **disabled**. The engine can be started before the LED starts flashing again.

If the drive interlock was out of service, this status remains unchanged and the LED flashes slowly.

Drive interlock maintenance

The MED 310.1T drive interlock does not require any maintenance.

Protect the keypad and the control unit from heat and humidity

Selecting the drive range (0 – 20 kph, standard)

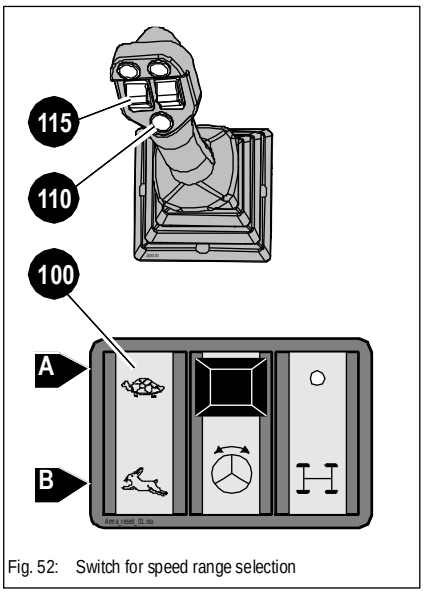


Fig. 52: Switch for speed range selection

The telehandler has a work and drive range. The switch for selecting the speed ranges is located on the switch console on the right

☞ *Set the driving direction to neutral with tip switch **110** on the control lever*

Selecting the work range (0 – 7 kph)

☞ *Press switch* **100** *to position **A***

☞ *Select the required driving direction with switch **115** on the control lever (joystick)*

Selecting the drive range (0 – 20 kph)

☞ *Press switch* **100** *to position **B***

☞ *Select the required driving direction with switch **115*** (on the joystick)

Symbol	Drive speed	Recommended
	Work range **A** = 0 – 7 kph	Used for work involving short loading cycles, i.e. a rapid succession of loading and unloading operations, e.g. onto a truck, and for work requiring precise speed adjustment.
	Drive range **B** = 0 – 20 kph	For long-haul travel

Selecting the drive range (0 – 30/40 kph, option)

Important!

The 30 or 40 kph drive range is active only if front axle steering is switched on.

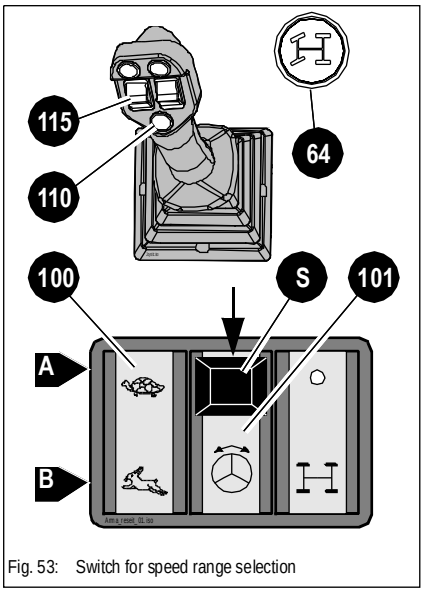


Fig. 53: Switch for speed range selection

☞ *Set the driving direction to neutral with tip switch **110** on the control lever*

1 Selecting the work range (0 – 7 kph)

☞ *Press switch* **100** *to position **A***

☞ *Select the required driving direction with switch **115*** on the control lever

Selecting the 2nd speed range (0 – 30 kph or 0 – 40 kph)

☞ *Press switch* **100** *to position **B***

☞ *Press lock **S*** in switch ***101*** in the direction of the arrow and at the same time, press the switch to position **B**

☞ *Release lock **S***

➥ Front axle steering is enabled

➥ Also refer to *"Changing steering mode"* on page 3-42

☞ *Select the required driving direction with switch **115*** on the control lever

Symbol	Drive speed	Recommended
	1st speed range = 0 – 7 kph	Used for work involving short loading cycles, i.e. a rapid succession of loading and unloading operations, e.g. onto a truck, and for work requiring precise speed adjustment.
	2nd speed range = 0 – 30 kph (option)	For long-haul travel
	2nd speed range = 0 – 40 kph (option)	For long-haul travel

3.34 Signalling system

Turn indicator

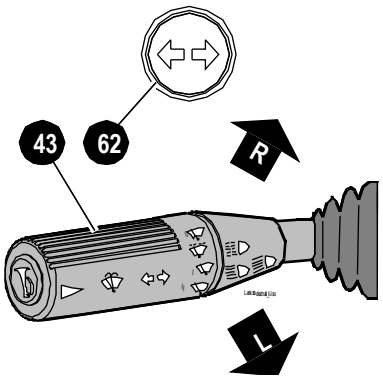


Fig. 64: Turn indicator

Turn indicator		
RIGHT	☞ *Push lever **43** forwards **R***	➥ Telltale **62** on the instrument panel flashes
LEFT	☞ *Pull lever **43** to the rear **L***	➥ Telltale **62** on the instrument panel flashes

Caution!

The turn indicator system is not in order if telltale **62** flashes about twice as fast as normally!

☞ *Check the front and rear turn indicators immediately*

➥ Have the turn indicator system repaired if necessary

Hazard warning system

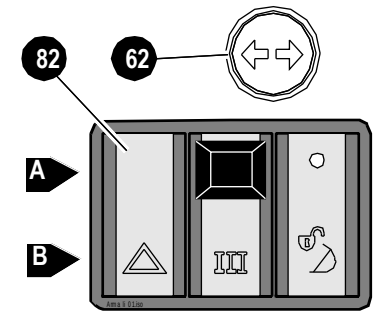


Fig. 65: Switch for hazard warning system

The hazard warning switch is located on the switch console on the left

Hazard warning system		
ON	☞ *Press hazard warning switch **82** to position **B***	➥ The telltale in the switch and telltale **62** both flash
OFF	☞ *Press hazard warning switch **82** to position **A***	➥ The telltale in the switch and telltale **62** both go out

Rotating beacon (option)

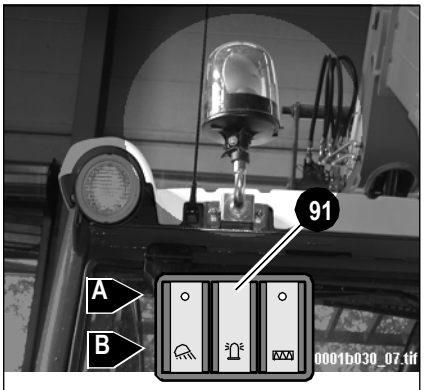


Fig. 66: Switch for rotating beacon

The switch is located on the switch console on the left

Rotating beacon (option)		
ON	☞ *Press switch **91** to position **B***	➥ Telltale in switch comes on
OFF	☞ *Press switch **91** to position **A***	➥ Telltale in switch goes out

Important!

Legal regulations of your country may require you not to switch on the rotating beacon on public roads unless the road is within the machine's working range and the machine represents an obstruction to the normal flow of traffic when the machine is in work operation.
Get informed on and follow the legal regulations of your country.

Towing the machine

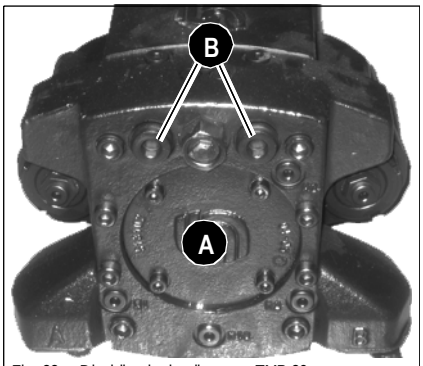


Fig. 88: Disabling hydraulic pump TMP 89

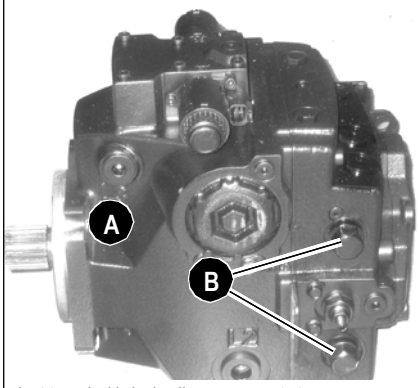


Fig. 89: Disable hydraulic pump H1 P 078

Danger!

Careful when towing away the telehandler –

Danger of accidents!

☞ *The towing vehicle must have enough tractive power and be fitted with a safe brake system*

☞ *Only tow away with a towing bar*

➥ See chapter *"Specifications"* on page 6-1 for the machine's dimensions and weights!

☞ *Eye hooks for towing the machine – see chapter 1 "Machine overview" on page 1-2*

☞ *If possible, run the engine at idling speed when towing the machine*

➥ Turning the steering wheel requires greater effort if the diesel engine and the brakes break down.

☞ *Tow away the machine from the danger area only after you have opened the HP pressure relief valves and the brake discs*

➥ **Towing distance and speed => max 300 m at a max. 8 kph**

Once towing is over

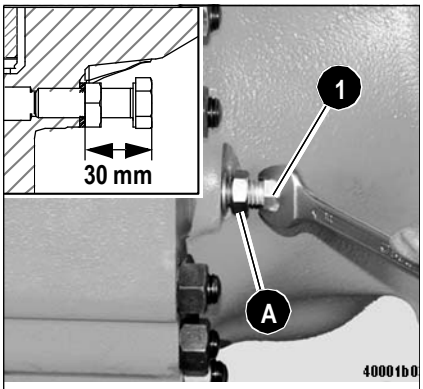


Fig. 90: Releasing the parking brake for towing

Enabling drive A (variable displacement pump)

☞ *Screw in the high pressure valves **B*** by 3 – 4 turns and tighten them to 85 Nm

Enabling the brake discs in the front axle

Danger!

After having been opened mechanically, the brake discs in the axle must be enabled once towing is over! Otherwise –

Danger of accidents!

☞ *Unscrew set screws **1** (2 on either side of the axle tube) evenly and alternately until reaching **30 mm*** between the end of the screw head and the contact area (lock nut – axle tube)

☞ *Secure set screw **1** with lock nut **A*** (2 on either side of the axle tube)

➥ **Important!** Do not modify the **dimension of 30 mm** as you secure the set screw

➥ Parking brake is enabled (blocked)

Once you have enabled the parking brake:

☞ *Check the service and parking brake for correct function*

Retracting/lowering the telescopic boom

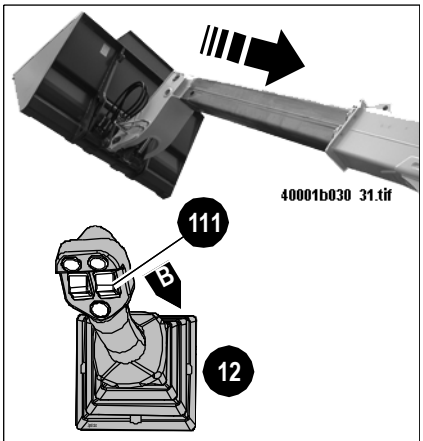


Fig. 99: Retracting the telescopic boom

Danger!

The **safe work load** can be exceeded when lowering the extended telescopic boom. This may cause the machine to tip forwards –

Danger of tipping and of accidents!

☞ *Always retract the telescopic boom before you lower it!*

☞ *Bear in mind the safe load indicator*

- – *see Safe load indicator* on page 3-63

☞ *Retract the telescopic boom. To do this:*

☞ *Scroll the potentiometer wheel **111**/ B* on the control lever ***12*** backwards until the telescopic boom is fully retracted

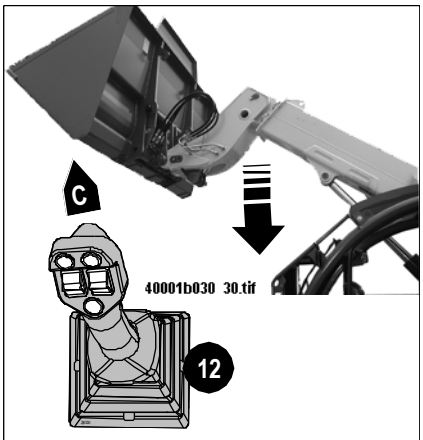


Fig. 100: Lowering the telescopic boom

☞ *Lower the retracted telescopic boom. To do this:*

☞ *Push control lever **12** forwards C*

Emergency lowering of the telescopic boom in case of a diesel engine breakdown

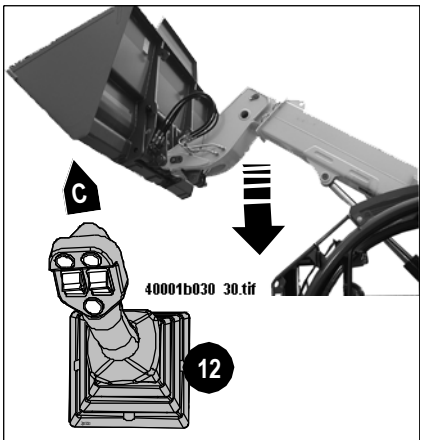


Fig. 101: Emergency lowering

Important!

Safety feature! The telescopic boom cannot be lowered with the ignition switched off!

☞ *Make sure no-one is dangerously close to the machine when lowering the telescopic boom*

☞ *Switch on ignition*

☞ *Slowly push and hold control lever **12*** forwards ***C***

➥ Until the telescopic boom is completely lowered

☞ *Have the breakdown of the diesel engine checked by an authorised workshop*

Load diagram for pallet forks (EN 1459/1998)

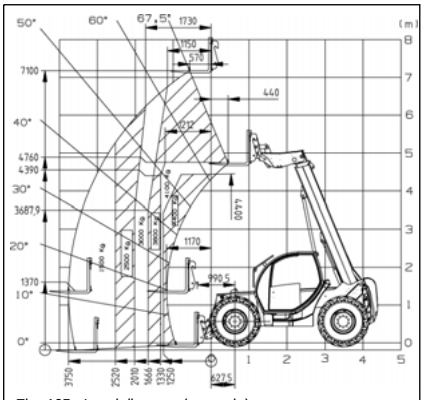


Fig. 105: Load diagram (example)

The load diagram in the cab is valid only for use with the pallet forks with fork arms as specified and released in "*Attachments*" on page 1-4. Observe the specific load diagrams of other attachments (e.g. crane jib) used!

Danger!

Observe the load diagram **under all circumstances** in order to ensure the telehandler's full stability with the pallet forks fitted, otherwise –

Danger of tipping and of accidents!

Maximum load depends on how the telehandler is equipped!

☞ *The weight of the attachment and the respective maximum load may not exceed the payload specified in the load diagram for the specific range!*

➥ Also refer to "*Safe load indicator*" on page 3-63

☞ *The centre of gravity of the attachment/payload may be located*

➥ horizontally: at a **max. 650 mm** in front of the lock pin

➥ vertically: at a **max. 250 mm** over the lock pin!

☞ *Place/operate the payload on the attachment symmetrically, i.e. the centre of gravity must be at the centre of the attachment with respect to the transverse axis!*

Loads for pallet forks, see:

➥ "*Payload: model 400-01 load diagram*" on page 6-14

➥ "*Payload: models 401-03 load diagram*" on page 6-15

➥ "*Payload: model 402-03 load diagram*" on page 6-16

➥ "*Payload: models 403 03 load diagram*" on page 6-17

3.56 Continuous operation of 3rd control circuit (option)

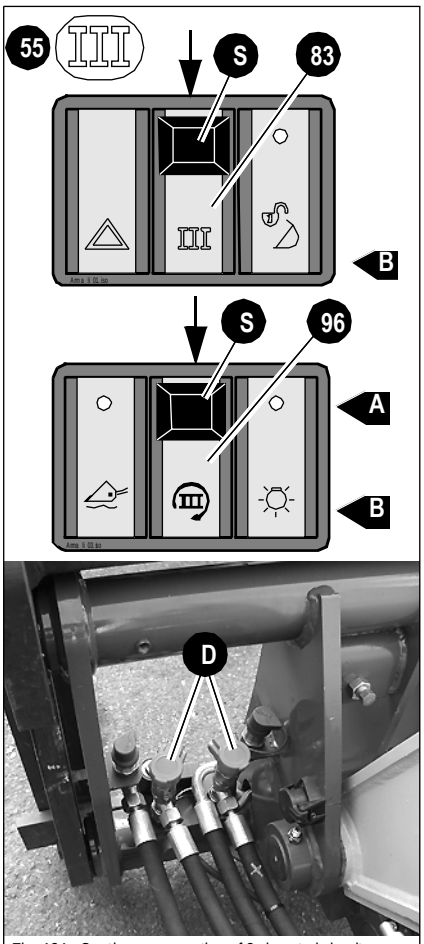


Fig. 124: Continuous operation of 3rd control circuit

With an attachment fitted, quick couplers **D** are used for hydraulic movements/procedures over a longer period of time or operation of hydraulic motors (e.g. rotary broom) or for operation of a hydraulic attachment equipped with a control valve.

Continous operation of the 3rd control circuit is carried out via switches **83** and **96** (switch console on the left) as follows.

Switching continuous operation on/off

After an attachment has been fitted and safely locked onto the quickhitch facility

☞ *Slide switch* **83** *(lock* ***S****) in the direction of the arrow and press it to position* ***B***

➥ 3rd control circuit switched ON

➥ Telltale ***55*** in the instrument panel comes on

☞ *Slide switch* **96** *(lock* ***S****) in the direction of the arrow and press it to position* ***B***

➥ 3rd control circuit is in continuous operation

☞ *Slide switch* **96** *(lock* ***S****) in the direction of the arrow and press it to position* ***A***

➥ Continuous operation of the 3rd control circuit is switched OFF

4 Troubleshooting

The information given in this chapter is provided for the fast and reliable detection of malfunctions and their appropriate repair.

4.1 Diesel engine malfunctions

Caution!

Diesel engine repairs may be carried out only by authorised workshops and trained staff

Problem	Possible causes	See
Engine does not start or is not easy to start	Parking brake not applied	*3-35*
	Drive lever not in neutral	*3-36*
	Wrong SAE grade of engine lubrication oil	*5-49*
	Fuel grade does not comply with specifications	*5-49*
	Insufficient fuel supply	
	Defective or flat battery	*5-36*
	Loose or oxidised cable connections in starter circuit	
	Defective starter, or pinion does not engage	
	Wrong valve tip clearance	
	Defective fuel injector	
Engine starts, but does not run smoothly or faultless	Fuel grade does not comply with specifications	*5-49*
	Wrong valve tip clearance	
	Injection line leaks	
	Defective fuel injector	
Engine overheats. Temperature warning system responds	Oil level too low	*5-7*
	Oil level too high	*5-7*
	Dirty air filter	*5-17*
	Defective air filter maintenance switch or gauge	*5-16*
	Dirty oil/water radiator fins	*5-14*
	Defective fan, torn or loose V-belt	*5-18*
	Defective fuel injector	

Filling up engine oil

Caution!

Too much or incorrect engine oil may result in engine damage! For this reason:

☞ *Do not add engine oil above the **MAX mark** of oil dipstick **A***

☞ *Use only the specified engine oil*

☞ *– see Fluids and lubricants on page 5-49*

Environment!

Use a suitable container to collect the engine oil as it drains and dispose of it in an environmentally friendly manner!

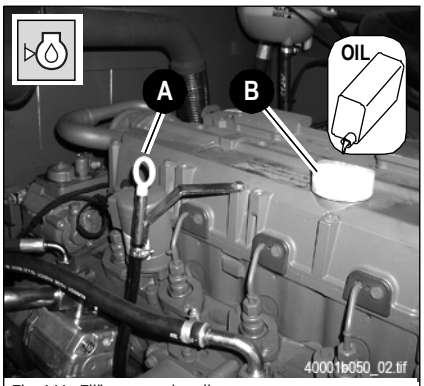


Fig. 144: Filling up engine oil

☞ *Clean the area around oil filler cap **B** with a lint-free cloth*

☞ *Open filler cap **B***

☞ *Raise oil dipstick **A** slightly to allow any trapped air to escape*

☞ *Fill in engine oil*

➥ Wait a moment until all the oil has run into the oil sump

☞ *Check the oil level*

➥ *– see Checking the engine oil level* on page 5-6

☞ *Fill up if necessary and check the oil level again*

☞ *Close filler cap **B***

☞ *Push oil dipstick **A** back in as far as possible*

☞ *Completely remove all oil spills from the engine*

Replacing the filter cartridge at 500 s/h (service hours)

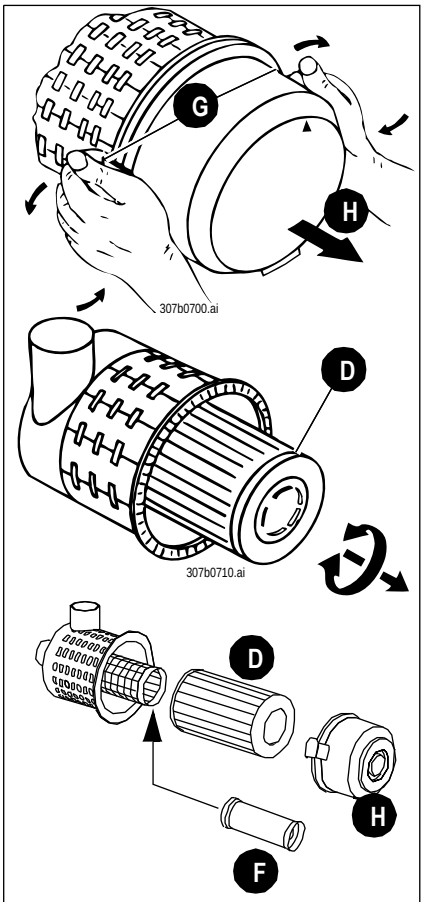


Fig. 157: Removing the filter element

Caution!

The filter cartridge will be damaged if it is washed or brushed out!
Bear in mind the following to avoid premature engine wear!

☞ *Do not clean the filter cartridge*

☞ *Replace the filter cartridge when the telltale comes on*

☞ *Never reuse a damaged filter cartridge*

☞ *Ensure cleanliness when replacing the filter cartridge!*

☞ *Proceed as follows:*

- Switch off the engine
- Apply the parking brake with the switch (fig. 30/**99**)
- Switch off the ignition and remove the ignition key
- Open the engine cover
- Fold both locks **G** on lower housing section **H** to the outside
- Remove lower housing section **H**
- Carefully remove filter cartridge **D** with slightly turning movements

In addition, every 3rd time the filter is replaced:

- Carefully remove safety cartridge **F** with slightly turning movements
- **Make sure** all contamination (dust) inside the upper and lower housing sections has been removed
- Insert a new safety cartridge **F** into the upper housing section
- Insert new filter cartridge **D** into the upper housing section
- Position lower housing section **H** (make sure it is properly seated)
- Close both locks **G**

5.12 Maintenance of the brake system

Environment!

Use a suitable container to collect the brake fluid as it drains and dispose of it in an environmentally friendly manner!

Specific safety instructions

LHM

- Brakes are crucial to safety. Incorrect work may cause brake failure. **Therefore all maintenance and repair work on the brakes must be carried out by trained staff.** An exception to this is the following work which must be carried out by the driver of the machine:
  - Daily check of the level in the brake fluid tank!
- Damaged brake lines or hoses must immediately be replaced by an authorised workshop – danger of accidents!

Checking/filling up the brake fluid level

The brake-fluid tank is located inside the cab to the left of the seat.

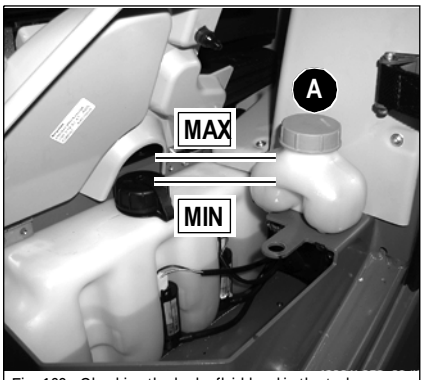


Fig. 169: Checking the brake fluid level in the tank

Danger!

An incorrect brake fluid grade or an insufficient brake fluid level may impair the safety of the brake system –

Danger of accidents!

☞ *Check the brake fluid in the tank at regular intervals*

☞ *The brake fluid must comply with the SAE specification – see Fluids and lubricants on page 5-49*

☞ *Contact an authorised workshop immediately if the brake fluid level is lower than allowed*

☞ *The brake fluid must be replaced every 2 years by an authorised workshop*

If the fluid level is below the **MAX** mark:

☞ *Clean the area around the cover*

☞ *Open tank cover **A***

☞ *Fill up brake fluid up to the **MAX** mark*

☞ *Close the tank cover*

☞ *Check the brake system for leaks and correct function*

5.18 Maintenance: trailer coupling

Trailer coupling (option)

Maintenance:

☞ *Apply tough water-proof grease (EP3) to the coupling pin, the base ring and the draw-bar eye after heavy use and before taking the coupling into service*

☞ *Apply tough waterproof grease (EP3) to the lower bearing of the coupling jaw*

Caution!

Make sure the coupling pin is engaged in the trailer coupling before cleaning with high-pressure equipment!

☞ *Apply a little more grease to the coupling pin and the base ring once cleaning is over*

☞ *Apply grease to the grease nipple on the joint*

Danger!

Worn coupling pins, too much play in the bearing or a worn base ring –

Danger of accidents!

☞ *Check the trailer coupling once a day for wear and play*

☞ *Apply grease to the base ring*

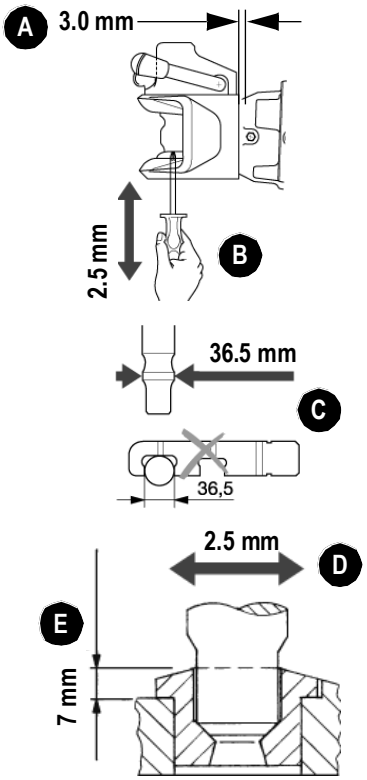


Fig. 176: Rockinger trailer coupling

Checking the bearing and longitudinal play A of the coupling head

☞ *Move the uncoupled coupling head with force in driving direction*

Checking the height-wise play of the coupling head

☞ *Open the coupling*

☞ *Move the coupling head up and down with a suitable tool (mounting lever)*

➥ Play **A** in the centre axis of the coupling head = **max. 3 mm**

Checking the coupling pin C/D

☞ *Measure wear by means of a slide gauge on the thickest section of the coupling pin **C***

➥ Diameter **C** may **not drop below 36.5 mm**

➥ Height-wise play **B max. 2.5 mm**

☞ *Otherwise have the coupling pin replaced by an authorised workshop*

☞ *Check pin play **D** in the base ring and thickness **E** of the base ring*

➥ Pin play **D max. 2.5 mm**

➥ Thickness **E** of base ring **min. 7 mm**

Caution!

Repair work on the trailer coupling must be carried out by an authorised workshop only

5.22 Maintenance plan (overview)

For service and maintenance work on the attachment, please refer to the operation and maintenance manual of the attachment manufacturer as well.

	Delivery inspection	Maintenance work (once a day)	Every 50 s/h once a week	"A" 1st Inspection[1] at 100 s/h	"B" every 500 s/h[2] 2nd Inspection	"C" every 1500 s/h once a year
Lubrication service[13] ()						
• Rear axle oscillating bearing	●		●	●	●	●
• Front and rear axle planetary drive bearings (left and right)	●		●	●	●	●
• Hinges, joints and fittings (e.g. door arrester)	●	●	●	●	●	●
• Trailer coupling (option)	●	●	●	●	●	●
• Telescopic boom – *see Lubricating the telescopic boom* on page 5-24						
• Telescopic boom slide plates	●	●	●	●	●	●
• Compensating ram bearing	●	●	●	●	●	●
• Telescopic ram bearing (push-out ram)	●	●	●	●	●	●
• Boom bearing	●	●	●	●	●	●
• Tilt lever bearing and tilt rod bearing	●	●	●	●	●	●
• Lift ram bearing	●	●	●	●	●	●
• Tilt ram bearing	●	●	●	●	●	●
• Quickhitch facility: bearing on boom	●	●	●	●	●	●
Functional check ():						
Check the function of the following assemblies/components. Rectify if necessary:						
• Service and parking brake	●	●	●	●	●	●
• Compressed-air brake system (option)	●	●	●	●	●	●
• Steering system: steering column adjustment, synchronous position of wheels	●	●	●	●	●	●
• Lights and electric system	●	●	●	●	●	●
• Drive interlock (option)	●	●	●	●	●	●
• Safe load indicator of telescopic boom	●	●	●	●	●	●
• Seat adjustment, seat belt	●	●	●	●	●	●
• Control lever lock (joystick) for road travel	●	●	●	●	●	●
• Hose burst valve safety feature	●	●	●	●	●	●
• Load stabiliser (option)	●	●	●	●	●	●
• Additional control circuits (option)	●	●	●	●	●	●

6.9 Work hydraulics

Hydraulic pump

Telehandler model	400-01/401-03/402-03	402-03/403-03
Hydraulic pump	**44 cm³/rev**	**60 cm³/rev**
Design	Fixed displacement pump	Variable displacement pump (LS)
Displacement	110 l/min at 2400 rpm	150 l/min at 2400 rpm
Location on diesel engine	88 kW	88 kW and 103 kW
Control valve	4 – 7-fold pilot control	
Hydraulic oil filter	Reflux filter	

Hydraulic ram protection

Telehandler model	400-01/401-03/402-03	403-03
Max. service pressure	210 bar	250 bar
Tilt ram		
Secondary protection:		
Rod side	260 bar	300 bar
Base side	260 bar	300 bar
Lift ram		
Secondary protection:		
Base side	260 bar	300 bar
Push-out ram		
Secondary protection:		
Rod side	260 bar	300 bar
Base side	200 bar	200 bar
Quickhitch ram (3rd control circuit)		
Max. service pressure	210 bar	250 bar