



Forage transport wagon

TX 460

TX 560

TX 460 D

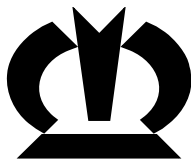
TX 560 D

(from serial no.: 953 785)

Order no.: 150 000 111 05 en



15.09.2016



EC Declaration of Conformity



We

Maschinenfabrik Bernard Krone GmbH & Co. KG

Heinrich-Krone-Str. 10, D-48480 Spelle

hereby declare as manufacturer of the product named below, on our sole responsibility,
that the

Machine: **Forage transport wagon**

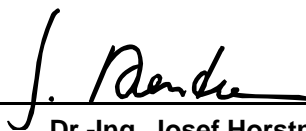
Type: **TX 460, TX 460 D, TX 560, TX 560 D**

to which this declaration refers is in compliance with the following relevant provisions of:

- **EC Directive 2006/42/CE (machines),**
- **EU Directive 2014/30/EU (EMC). Within the meaning of the Directive the harmonised standard EN ISO 14982:2009 was taken as a basis.**

The signing Managing Director is authorised to compile the technical documents.

Spelle, 20.04.2016



Dr.-Ing. Josef Horstmann

(Managing Director, Design & Development)

Year of manufacture:

Machine no.:

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To this Document

2 To this Document

2.1 Validity

These operating instructions are valid for forage transport wagon TX of types:

TX 460	TX 560
TX 460 D	TX 560 D

2.2 Re-Ordering

If this document should become wholly or partially unusable, you can request a replacement document by stating the order number mentioned on the cover sheet.

2.3 Further applicable documents

To ensure that the machine is used safely and as intended, observe the following further applicable documents:

- Operating instructions of universal shaft(s)

2.4 Target group of this document

This document aims at the operators of the machine fulfilling the minimum requirements of personnel qualification; refer to chapter entitled Safety "Personnel Qualification".

2.5 How to use this document**2.5.1 Directories and References****Table of contents/headers:**

The table of contents as well as the headers in this instruction are used for quick navigation in the chapters.

Index directory:

In the index directory, you can find information on the desired subject via catchwords which are in alphabetical order. The index directory can be found on the last page of this instruction.

Cross references:

Cross references to another place in the operating instructions or to another document are in the text and specify the chapter and subchapter or section. The designation of subchapters or sections is presented in quotation marks.

Example:

Check that all screws on the machine are tight, refer to chapter Maintenance, "Tightening Torques".

The subchapter or the section can be found via an entry in the table of contents and in the index directory.

2.5.2 Direction Information

Direction information in this document such as front, rear, right and left always applies in the direction of travel.

2.5.3 Term "Machine"

Throughout the rest of this document, the "forage transport wagon" will also be referred to as the "machine".

2.5.4 Figures

The figures in this document do not always represent the exact machine type. The information which refers to the figure always corresponds to the machine type of this document.

To this Document

2.5.5 Scope of Document

In addition to standard equipment, accessories kits and versions of the machine are described in this document. Your machine may deviate from this document.

2.5.6 Means of representation

Icons in the text

In this document, the following means of representation are used:

Action step

A bullet point (•) designates an action step you have to perform, as for example:

- Set the left outside mirror.

Sequence of actions

Several bullet points (•) located in front of a sequence of action steps identify a sequence of actions to be performed step by step, as for example:

- Loosen counter nut.
- Set the screw.
- Tighten counter nut.















List

Dashes (-) identify lists such as, for example:

- Brakes
- Steering
- Lighting

Symbols in figures

To visualize parts and actions steps, the following icons are used:

Icon	Explanation
	Reference sign for part
	Position of a part (e.g. move from pos. I to pos. II)
	Dimensions (e.g. B = width, H = height, L = length)
	Action step: Tighten screws with torque key with specified tightening torque
	Direction of motion
	Direction of travel
	opened
	closed
	enlargement of display detail
	Framings, dimension line, dimension line limitation, reference line for visible parts or visible mounting material
	Framings, dimension line, dimension line limitation, reference line for covered parts or covered mounting material
	Laying routes
	Left-hand machine side
	Right-hand machine side

To this Document

Warning signs

Warning



WARNING! - Type and source of hazard!

Effect: Injuries, serious material damage.

- Measures for hazard prevention.

Caution



CAUTION! - Type and source of hazard!

Effect: Damage to property.

- Measures for risk prevention.

Notes with information and recommendations

Note



Note

Effect: Economic benefit of the machine.

- Measures to be performed.

3 Safety

3.1 Intended use

The forage transport wagon is designed for use in agriculture.

It is an agricultural work machine that can be hitched onto a tractor or towing machine. The purpose of the forage transport wagon is to transport chopped forage crops.

The forage transport wagon collects chopped forage crops in its loading area. In this process, the forage transport wagon is filled from above by a forage harvester. After filling is complete, the forage transport wagon transports the material loaded to the unloading point or onto a silo. The loading area is discharged via floor conveyor or optionally via a dosing unit.

The term “chopped forage crops” includes crops like grass, lucerne, straw of cereals as well as cultivated cereals and legume crops (whole crop silage) such as wheat, rye, barley, oats or maize.

Intended use also includes compliance with the operating, cleaning, maintenance and repair conditions set by the manufacturer.

3.2 Reasonably foreseeable misuse

Any usage outside of intended use (as described above) constitutes non-intended use and therefore represents misuse as defined by the Machinery Directive. The manufacturer shall not be held liable for any resulting damages. The user alone shall be liable.

Such misuses are for example:

- Transport of goods that do not belong to foraged crops, such as topsoil or waste
- Transport of persons
- Transport of goods
- Exceedance of the permissible technical total weight
- Non-observance of warning instructions on the machine and in the operating instructions.
- Use of surfaces and rooms that are not described in the operating instructions as a workplace or maintenance place.
- Performance of setting work, cleaning work, repair and maintenance work contrary to the indications in the operating instructions
- Performance of fault clearance, setting work, cleaning work, repair and maintenance work when the drives are in operation
- Performance of setting work, cleaning work, repair and maintenance work by untrained personnel.
- Unauthorized changes on the machine
- Mounting not approved / not released additional equipment
- Using non-original KRONE spare parts

Unauthorised modifications to the machine may have a negative effect on the machine characteristics or safe and reliable use of the machine or may interfere with proper operation. Unauthorised modifications shall therefore release the manufacturer of any liability for consequential damage.

3.3 Service life of the machine

- The service life of this machine strongly depends on proper use and maintenance as well as the operating conditions.
- Permanent operational readiness as well as long service life of the machine can be achieved by observing the instructions and notes of these operating instructions.
- After each season of use, the machine must be checked thoroughly for wear and other damage.
- Damaged and worn parts must be replaced before placing the machine into service again.
- After the machine has been used for five years, carry out full technical inspection of the machine. According to the results of this inspection, a decision concerning the possibility of reuse of the machine should be taken.
- Theoretically, the service life of this machine is unlimited as all worn or damaged parts can be replaced.

3.4 Basic safety instructions

Non-compliance with the safety instructions and warnings

Non-compliance with the safety instructions and warnings may result in injuries and damage to the environment and property.

3.4.1 Importance of the operating instructions

The operating instructions are an important document and a part of the machine. They are aimed at the user and contain safety-relevant information.

Only the procedures indicated in the operating instructions are reliable. If the operating instructions are not observed, people may be seriously injured or killed.

- Before using the machine for the first time, read and follow all the “Basic Safety Instructions” in the Safety chapter.
- Before working, also read and observe the respective sections in the operating instructions.
- Keep the operating instructions ready to hand for the user of the machine.
- Hand over the operating instructions to subsequent users.

3.4.2 Personnel qualification

If the machine is not used properly, people may be seriously injured or killed. To avoid accidents, each person who works with the machine must satisfy the following minimum requirements:

- He is physically capable of controlling the machine.
- He can work safely with the machine in accordance with these operating instructions.
- He understands the method of operation of the machine within the scope of his work and can identify and avoid the dangers associated with the work.
- He has read the operating instructions and can implement the information in the operating instructions accordingly.
- He is familiar with driving vehicles safely.
- For road travel he has adequate knowledge of the highway code and has the stipulated driving licence.

3.4.3 Children in danger

Children cannot assess danger and behave unpredictably.
As a result, children are especially at risk.

- Keep children away from the machine.
- Keep children away from consumables.
- Especially before starting up and moving the machine, ensure that there are no children in the danger zone.

3.4.4 Connecting front attachments or trailers

When tractor and machine are not correctly connected, there is a risk of causing serious accidents.

- Observe all operating instructions when connecting:
 - The operating instructions of the tractor
 - The operating instructions of the machine
 - The operating instructions of universal shaft
- Observe the changed driving behaviour of the combination.

3.4.5 Structural changes to the machine

Structural changes and enhancements may impair the functionality and operational safety of the machine. Thus there is a risk of serious injuries or death.
Structural changes and enhancements are not permitted.

3.4.6 Additional equipment and spare parts

Additional equipment and spare parts which do not comply with the requirements of the manufacturer may impair the operational safety of the machine and cause accidents.

- To ensure operational safety, use original parts or standard parts which correspond to the requirements of the manufacturer.

3.4.7 Workstations on the Machine**Control of the moving machine**

The moving machine requires the driver to react quickly at any time. Otherwise, the machine may move in an uncontrolled manner and seriously injure or kill people.

- Start the engine from the driver's seat only.
- Never leave the driver's seat while the machine is moving.
- Never climb in or out of the machine while it is moving.

Passengers

Passengers may be seriously injured by the machine or fall off the machine and get run over. Ejected objects may strike and injure passengers.

- Never let people ride on the machine.

3.4.8 Operational safety: Technically perfect condition

Operation only when the machine has been started up correctly

If the machine is not started up correctly according to these operating instructions, the operational safety of the machine is not ensured. As a result, accidents may occur and people may be seriously injured or killed.

- Do not use the machine unless it has been started up correctly, see chapter Start-up.

Technically perfect condition of the machine

Improper maintenance and adjustment may affect the operational safety of the machine and cause accidents. As a result, people may be seriously injured or killed.

- Perform all maintenance and adjustment work according to the chapters Maintenance and Adjustment.
- Before performing any maintenance or adjustment work, shut down and safeguard the machine, see chapter Safety "Shutting down and safeguarding the machine".

Danger resulting from damage to the machine

Damage to the machine may impair the operational safety of the machine and cause accidents. As a result, people may be seriously injured or killed. The following parts of the machine are particularly important for safety:

- Brakes
- Steering
- Safety devices
- Connecting devices
- Lighting
- Hydraulic system
- Tyres
- Universal shaft

If there are doubts about the operational safety of the machine, for example due to leaking consumables, visible damage or an unexpected change to the driving behaviour:

- Shut down and safeguard the machine, see chapter Safety, "Shutting down and safeguarding the machine".
- Immediately eliminate potential causes of damage, for example heavy soiling, or tighten slack screws.
- Determine the cause of damage according to these operating instructions, see chapter Malfunctions – Cause and remedy.
- If possible, repair the damage according to these operating instructions.
- In the case of damage which may affect operational safety and cannot be repaired according to these operating instructions: Have damage repaired by a qualified service centre.

Technical limit values

When the technical limit values of the machine are not met, the machine may be damaged. Thus there is a risk of accidents, serious injuries or death. With regard to safety, it is of special importance to comply with the following technical limit values:

- Gross vehicle weight
- Maximum axle loads
- Maximum load capacities
- Maximum trailing load
- Maximum supported load
- Maximum transport height
- Maximum permissible speed
- Comply with limit values, refer to chapter "Technical Data".

3.4.9 Danger zones

When the machine is switched on, a danger zone may be created around this machine.

To avoid getting into the danger zone of the machine, maintain at least the safety distance.

If the safety distance is not followed, people may be seriously injured or killed.

- Do not switch on the drives and the engine until you are sure that no one has ignored the safety distance.
- If people ignore the safety distance, switch off the drives.
- Stop the machine in the shunting operation and field mode.

If the danger zone is not observed, people may be seriously injured or killed.

- Keep people away from the danger zone of the tractor and the machine.
- Do not switch on the drives and engine until there is nobody in the danger zone.

The safety clearance is:

- 3 metres on either side of the machine.
- 5 metres behind the machine.
- Before working in front of and behind the tractor and in the danger zone of the machine: •
Shut down and safeguard the machine, see chapter Safety, "Shutting down and safeguarding the machine". This also applies to brief inspection work. Many serious accidents in front of and behind the tractor and the machine occur due to negligence and running machines.
- Consider the information in all relevant operating instructions.
 - The operating instructions for the tractor
 - The operating instructions for the machine
 - The operating instructions for the universal shaft

Danger zone between tractor and machine

People standing between the tractor and machine may be seriously injured or killed if the tractor rolls away or by carelessness or machine movements:

- Before working between tractor and machine: Shutdown and safeguard the machine, refer to chapter Safety "Shutting Down and Safeguarding the Machine". This also applies to brief inspection work.
- If the power lifter has to be actuated, keep all people away from the range of movement of the power lifter.

Danger zone when drive is switched on

When the drive is switched on, there is a danger to life caused by rotating machine parts. There must be nobody in the danger zone of the machine.

- Before starting the machine, direct all people out of the danger zone of the machine.
- If hazardous situations arise, switch off drives immediately and instruct people to leave the danger zone.

Danger zone quick coupler

People may be caught, pulled in or seriously injured by quick coupler and driven parts. Before switching on the quick coupler:

- Mount all safety devices and move them to protective position.
- Ensure that nobody is in the danger zone of the machine or the universal shaft.
- Switch off the drives if they are not necessary.

Danger zone universal shaft

People may become caught by the universal shaft, pulled in and seriously injured.

- Observe the operating instructions of the universal shaft.
- Provide the section tube and universal shaft guards with adequate cover.
- Allow the universal shaft locks to engage.
- Attach the chains to prevent the universal shaft guards from rotating with the shaft.
- Ensure that there is nobody in the danger zone of PTO shaft and universal shaft.
- Make sure that the universal shaft guards are attached and functional.
- If the angles between universal shaft and PTO shaft are too large, switch off the PTO shaft.
The machine may be damaged. Parts could be hurled up and hurt people.

Danger zone due to coasting machine parts

When the drives have been switched off, the following machine parts will coast:

- Universal shaft
- Conveyor drum
- Drive belt
- Pick-up
- Discharge rollers

When machine parts are coasting, people may be seriously injured or killed.

- Do not touch machine parts until they have come to a standstill.

3.4.10 Keeping safety devices functional

If safety devices are missing or damaged, people may be seriously injured or killed by moving machine parts.

- Replace damaged safety devices.
- Remount dismounted safety devices and all other parts before start-up and move them to protective position.
- If it is doubtful whether all safety devices have been correctly installed and are functional, have a service centre check them.

3.4.11 Personal Protective Equipment

The wearing of personal protective equipment is an important safety measure. Missing or unsuitable personal protective equipment increases health risks and injuries.

Personal protective equipment is for example:

- Suitable protective gloves
- Safety boots
- Wear tight-fitting protective clothing
- Hearing protection
- Protective goggles
- Specify and provide personal protective equipment for the particular job.
- Use only personal protective equipment which is in proper condition and offers effective protection.
- Adjust personal protective equipment to the person, for example the size.

3.4.12 Safety signs on the machine

Safety stickers on the machine warn of hazards in danger areas and are an important component of the safety equipment of the machine. Missing safety stickers increase the risk of serious and fatal injuries.

- Clean dirty safety stickers.
- After cleaning, always check that safety stickers are complete and legible.
- Immediately replace missing, damaged and unrecognisable safety stickers.
- Provide spare parts with the designated safety stickers.

Description, explanation and order numbers of the safety stickers, see chapter Safety, "Safety stickers on the machine".

3.4.13 Traffic safety**Danger when driving on road and field**

Hitched or mounted machines change the handling characteristics of the tractor. The handling characteristics depend for instance on operating state and ground. If changed handling characteristics are not considered, the driver may cause accidents.

- Follow procedures for driving on roads and in fields, refer to chapter "Driving and Transport".

Dangers if machine is not prepared properly for road travel

If the machine is not prepared properly for road travel, serious accidents may occur with traffic.

- Before driving on roads, prepare the machine for road travel, refer to chapter Driving and Transport, "Preparations for Road Travel".

Risk of tipping on slopes

The machine may overturn when driving on slopes. As a result, accidents may occur and people may be seriously injured or killed. The risk of tipping over depends on many factors.

- Observe procedures for driving, see chapter "Driving and Transport".

3.4.14 Parking the machine safely

An improperly parked machine may move uncontrollably or overturn. People may be crushed and killed.

- Park the machine on a stable and even ground.
- Before adjusting, repairing, servicing or cleaning the machine, ensure that it is securely positioned.
- Observe section "Parking the Machine" in chapter Driving and Transport.

Unattended parking

Adults and especially children are at risk from an inadequately secured and unattended parked machine.

- Before leaving the machine: Shutdown and safeguard the machine, refer to chapter Safety "Shutting Down and Safeguarding the Machine".

3.4.15 Consumables

Unsuitable operating materials

Operating materials that do not correspond to the requirements of the manufacturer may impair the operational safety of the machine and cause accidents.

- Only use operating materials which meet the requirements.

For information on requirements relative to operating materials, refer to chapter Technical Data, "Operating Materials".

Environmental protection and disposal

Consumables such as diesel fuel, brake fluid, frost protection agent and lubricants (e. g. gearbox oil, hydraulic oil) may damage the environment and the health of people.

- Do not release consumables into the environment.
- Fill consumables in a liquid-tight labelled container and dispose of according to the official regulations.
- Absorb leaked consumables with an absorbent material, fill them in a liquid-tight labelled container and dispose of them according to the official regulations.

3.4.16 Dangers associated with the operational environment

Danger of fire

Life-threatening electric shock from overhead lines

The machine may reach the height of overhead lines when the loading area cover is folded out and folded in. This may cause voltage to flash over to the machine and cause a fatal electric shock or fire.

- When folding the loading area cover in and out, maintain an adequate distance from power transmission lines.
- Never fold the loading area cover out or in near pylons or power lines.
- When the loading area cover is folded out, maintain an adequate distance from power transmission lines.
- To avoid a potential electric shock caused by a flashover, never exit from or climb into the tractor under overhead lines.

Behaviour in the case of voltage flashover of overhead lines

High electric voltage may be applied to electrically conducting parts of the machine due to voltage flashover. In case of voltage flashover, a voltage drop where major voltage differences are present is created on the ground around the machine. Due to major voltage differences in the ground, people may be killed by electric shocks when making big steps, laying on the ground or supporting themselves with their hands.

- Do not leave the cabin.
- Do not touch metal parts.
- Do not make a conductive connection to earth.
- Warn people: Do not approach the machine. Electrical voltage differences on the ground may lead to severe electric shocks.
- Wait for help from professional rescue teams. The high-voltage line must be switched off.

If people have to leave the cabin despite the voltage flashover, for example because there is an imminent danger to life due to fire:

- Avoid simultaneous contact with machine and ground.
- Jump away from the machine. Jump into a safe standing position. Do not touch the machine from the outside.
- Move away from the machine with very small steps. In doing so, make sure that your feet are close to one another.

3.4.17 Sources of danger on the machine

Electric shock from the electrical system

If damaged live parts are touched, people may be injured or killed by a severe electric shock.

- Immediately have damaged insulation and components of the electrical systems repaired by technicians.

Noise may damage your health

The noise development of the machine during operation may cause health damage such as hardness of hearing, deafness or tinnitus. When using the machine at high rotational speed, the noise level also increases.

- Before starting up the tractor/machine combination, estimate the risk caused by noise. Depending on the ambient conditions, working hours and the working and operating conditions of the machine, specify and use suitable hearing protection. In doing so, consider airborne noise emission, refer to chapter Technical Data.
- Specify rules for the use of hearing protection and for the working time.
- During operation, keep the windows and doors of the cabin closed.
- Remove hearing protection for road travel.

Vibrations may damage your health

Vibrations generated by the combination of the tractor and machine may seriously damage your health and have long-term consequences. The type of work and the connected devices, working hours, speeds, tyre pressure and ground conditions also affect the loads.

- Observe the maintenance intervals for the seat, see the chapter "Maintenance plan".
- Adjust the driver's seat to the operator, see chapter "Adjusting driver's seat".
- If necessary, measure the vibrations caused by the combination of the tractor and work machine. Select suitable measures to reduce the vibrations. Restrict the level of personal working time.

Liquids under pressure

The following liquids are under high pressure:

- Hydraulic oil

Liquids under high pressure may penetrate the body through the skin and cause serious injuries.

- If a damaged pressure system is suspected, immediately contact a qualified service centre.
- Never search for leaks with bare hands. Even a pin-sized hole may cause serious injuries.
- Keep body and face away from leaks.
- If liquids penetrate the body, immediately consult a doctor. The liquid must be removed from the body as quickly as possible. Danger of infection!

Hot liquids

If hot liquids are drained, people may burn and/or scald themselves.

- When draining hot consumables, wear personal protective equipment.
- If required, leave liquids and machine parts to cool down before performing repair, maintenance and cleaning work.

Damaged compressor unit

Damaged compressed air hoses of compressor unit may tear off. Flailing hoses may hurt people seriously.

- If it is suspected that the compressor unit is damaged, immediately contact a specialist workshop.
- Shut down and safeguard the machine, refer to chapter "Shutting Down and Safeguarding the Machine".

Toxic exhaust gases

Exhaust gases may seriously damage your health or be fatal.

- While the engine is running, provide adequate ventilation to prevent prolonged exposure to exhaust gases.
- Do not leave the engine running in a closed room unless there is a suitable exhaust gas extraction system.

3.4.18 Dangers associated with certain activities: Climbing up and down**Climbing up and down safely**

People who behave carelessly when climbing up and down may fall off the ladder. People, who climb onto the machine without using the designated ladders, may slip, fall and seriously injure themselves.

Dirt as well as operating fluids and lubricants may cause you to lose your footing.

- Always keep the steps and platforms clean and in a proper condition to prevent people from losing their footing.
- Never climb up and down while the machine is moving.
- Face the machine when climbing up and down.
- When climbing up and down, maintain a three-point contact with the steps and hand rails (always two hands and one foot or two feet and one hand on the machine).
- When climbing up and down, never use the controls as handles. Inadvertent activation of the controls may cause functions to be unintentionally actuated which could be hazardous.
- When climbing down, never jump off the machine.
- Climb up and down using only the steps and platforms designated in these operating instructions, see chapter Description of machine, "Ladders".

3.4.19 Dangers associated with certain activities: Work on the machine**Work on the machine only when it has been shut down**

If the machine is not shut down and safeguarded, parts may move unintentionally or the machine may move. Thus there is a risk of serious injuries or death.

- Prior to all repair and maintenance work, setting and cleaning work on the machine, shut down and safeguard it, refer to chapter Safety "Shutting Down and Safeguarding the Machine".

Maintenance and repair work

Incorrect maintenance and repair work will endanger operational safety. As a result, accidents may occur and people may be seriously injured or killed.

- Only perform work which is described in these operating instructions. Before performing any work, shut down and safeguard the machine, see chapter Safety, "Shutting down and safeguarding the machine".
- All other maintenance and repair work may be performed by a qualified service centre only.

Raised machines and machine parts

The raised machine or raised machine parts may accidentally drop or overturn. Thus there is a risk of serious injuries or death.

- Do not stay under the raised machine or raised machine parts which are not supported, refer to chapter "Safely Supporting Raised Machine and Machine Parts".
- Before working on raised machines or machine parts, lower the machine or machine parts.
- Before performing any work on or under raised machines or machine parts, secure the machine or machine parts with rigid safety support, hydraulic shut-off device or by supporting them against lowering.

Danger associated with welding work

Improper welding work will endanger the operational safety of the machine. As a result, accidents may occur and people may be seriously injured or killed.

- Before performing welding work on the machine, obtain the consent of KRONE customer service and, if required, identify alternatives.
- Have welding work performed by experienced technicians only.

3.4.20 Dangers associated with certain activities: Working on wheels and tyres

Improper assembly or disassembly of wheels and tyres may endanger operational safety. As a result, accidents may occur and people may be seriously injured or killed.

The fitting of wheels and tyres requires adequate knowledge and approved tools.

- If there is a lack of knowledge, have the wheels and tyres fitted by the KRONE dealer or by a qualified tyre service.
- When fitting tyres on the wheel rims, never exceed the maximum permitted pressure specified by KRONE. The tyre or even the wheel rim could explode and/or burst, see chapter "Technical Data".
- When fitting the wheels, tighten the wheel nuts to the stipulated torque, see chapter Maintenance, "Tyres".

3.4.21 Behaviour in hazardous situations and when accidents occur

Neglected or incorrect procedures in hazardous situations may obstruct or prevent the rescue of people in danger. Difficult rescue conditions will impair the chances of helping and healing the injured.

- In principle: Switch off the machine.
- Gain an overview of the hazardous situation and identify the cause of the hazard.
- Safeguard the accident location.
- Rescue people from the danger zone.
- Withdraw from the danger zone and do not enter again.
- Alert rescue teams and, if possible, fetch help.
- Take immediate life-saving measures.

3.5 Safety routines

3.5.1 Stopping and securing the machine



WARNING!

Crush hazard due to movement of the machine or machine parts!

If the machine has not been shut down, the machine or machine parts may move unintentionally. As a result, people may be seriously injured or killed.

- Before leaving the machine: Shut down and secure the machine.

To park the machine securely:

- Park the machine on a stable and even surface.
- Switch off the drives and wait until coasting parts have come to a standstill.
- Switch off the tractor engine, remove the ignition key and take it with you.
- Use the parking brakes to secure the machine and tractor from rolling away.

3.5.2 Supporting lifted machine and machine parts securely



WARNING!

Risk of injury due to movement of the machine or machine parts

If the machine is not supported securely, the machine or machine parts may roll, fall or drop. As a result, people may be seriously injured or killed.

- Before working on or under raised components: Securely support machine or machine parts.

To securely support the machine or machine parts:

- Shut down and safeguard the machine, see chapter Safety, "Shutting down and safeguarding the machine".
- Before performing any work on or under raised machine parts, lower the machine parts or secure them mechanically with rigid safety supports (e.g. support stand, crane) or with a hydraulic shut-off device (e.g. stop cock) to prevent them from dropping.
- Never support the machine or machine parts with materials which can buckle.
- Never support the machine or machine parts with hollow blocks or bricks. Hollow blocks or bricks may break under continuous load.
- Never work under the machine or machine parts which are held up by a car jack.

3.5.3 Coupling the machine safely

**WARNING!****Risk of injury when coupling the machine**

The machine or machine parts may move unintentionally while the machine is coupled to the tractor. As a result, people may be seriously injured or killed.

- When coupling the machine, perform the following steps:
- Never stand between the tractor and the machine while coupling the machine to the tractor.
- Depressurise the tractor hydraulics.
- Switch off the electronic systems.
- Shut down and safeguard the machine, see chapter Safety, "Shutting down and safeguarding the machine".
- Only couple the hydraulic hoses if the hydraulic systems on the tractor and the machine are depressurised.
- Couple the compressed air braking system, depending on the version of the machine.
- Couple the hydraulic brake, depending on the version of the machine.
- Couple and secure the universal shaft.
- Connect the lighting cable.
- Connect the power cable.
- Connect the terminal.

3.5.4 Uncoupling the machine safely

**WARNING! - Danger to life due to unexpected movements of the machine**

If the machine is put down on the support jack when it is loaded, it may occur that the support jack yields. As a result, persons may get hurt due to the tilting machine.

- Make sure that the machine is only put down on the support jack when it is unloaded.

**WARNING!****Risk of injury when uncoupling the machine**

The machine or machine parts may move unintentionally while the machine is being uncoupled. As a result, people may be seriously injured or killed.

- When uncoupling the machine, perform the following steps:
- Shut down and safeguard the machine, see chapter Safety, "Shutting down and safeguarding the machine".
- Lower the support jack.
- Depressurise the tractor hydraulics.
- Switch off the electronic systems.
- Only uncouple the hydraulic hoses if the hydraulic systems on the tractor and the machine are depressurised.
- Uncouple the compressed air brake, depending on the version of the machine.
- Uncouple the hydraulic brake, depending on the version of the machine.
- Disconnect the lighting cable from the tractor.
- Disconnect the power cable from the tractor.
- Uncouple the universal shaft and place it on the holder provided.
- Never stand between the tractor and the machine when uncoupling the machine from the tractor.

3.5.5 Preparing the machine for repair, maintenance and adjustment work



WARNING!

Risk of injury during repair, maintenance and adjustment work on the machine.

If the machine has not been shut down, the machine or machine parts may move unintentionally. As a result, people may be seriously injured or killed.

If the machine is not supported securely, the machine or machine parts may roll, fall or drop. As a result, people may be seriously injured or killed.

- Before starting repair, maintenance and adjustment work, perform the following steps:

- Shut down and safeguard the machine, see chapter Safety, "Shutting down and safeguarding the machine".
- The raised machine or machine parts must be securely supported, see chapter Safety "Securely supporting the raised machine and machine parts".

3.5.6 Starting the machine safely



WARNING!

Risk of injury when starting up the machine

If the machine has not been safely placed in operation, the machine or machine parts may move unintentionally. As a result, people may be seriously injured or killed.

- Before starting up the machine, ensure that the following prerequisites are met:

- The hydraulic lines are connected.
- The compressed air brake is coupled (depending on equipment).
- The hydraulic brake is connected (depending on equipment).
- The universal shaft is coupled and secured.
- The lighting system is connected.
- The terminal is connected.
- The safety chain is attached (not stipulated in all countries).
- All safety equipment is in place, is proper condition, and in the protective position.
- The PTO speed of 1000 rpm is not exceeded.
- The universal shaft prescribed by the manufacturer is used.
- The hoses, cables and ropes are laid so that they do not scrape, come under tension or become jammed or come in contact with other parts (such as the tractor tyres).
- The parking brake is released.
- Machine parts of the tractor do not come into contact with parts of the machine (especially when turning).
- There are no persons in the machine danger zone.

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3.6 Safety stickers on the machine

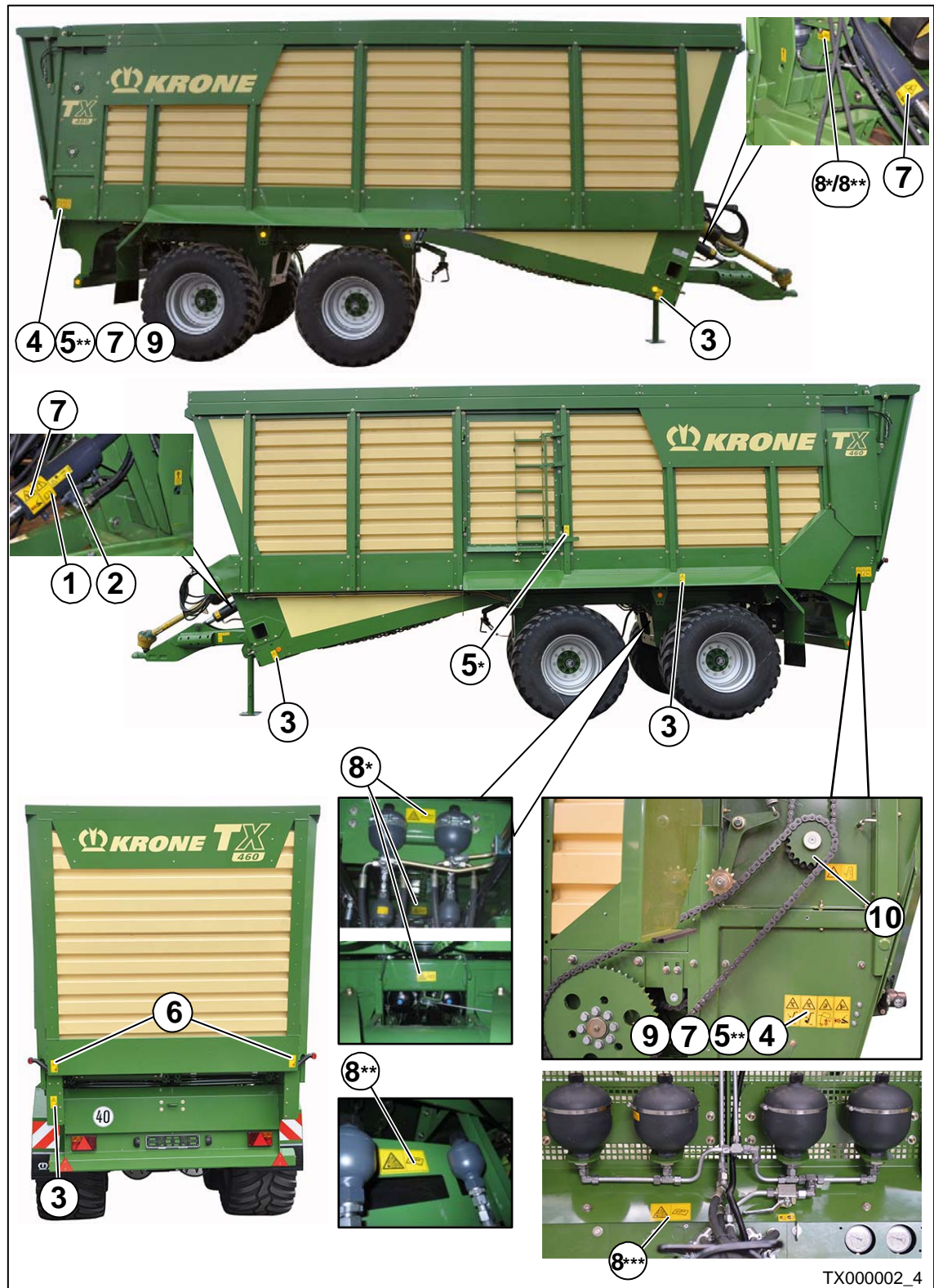
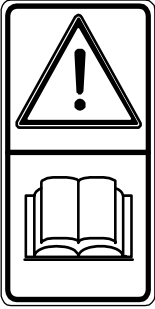
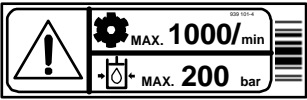


Fig.1


1) Order no. 939 471 1 (1x)

	<p>Danger due to incorrect operation and lack of knowledge</p> <p>Incorrect operation and lack of knowledge of the machine as well as incorrect behaviour in hazardous situations is risking the life of the operator and third parties.</p> <ul style="list-style-type: none"> Before starting up the machine, read and follow the operating instructions and safety instructions.
---	---


2) Order no. 939 101 4 (1x)

	<p>Danger due to exceeding the maximum permissible PTO speed or the maximum permissible operating pressure.</p> <p>If the permissible PTO speed is exceeded, machine parts may be destroyed or flung out.</p> <p>If the maximum permissible operating pressure is exceeded, hydraulic components may be damaged.</p> <p>As a result, people may be seriously or fatally injured.</p> <ul style="list-style-type: none"> Observe the permissible PTO speed. Observe the permissible operating pressure.
---	---

3) Order No. 942 200 1 (4x)

	<p>Danger due to rotating machine parts.</p> <p>When approaching the danger zone, there is a risk of being drawn in by the rotating machine parts.</p> <ul style="list-style-type: none"> Keep a sufficient distance from rotating machine parts.
---	---

4) Order No. 27 014 048 0 (2x)

	<p>Danger from shock and crush</p> <p>Danger to life due to sagging tailgate.</p> <ul style="list-style-type: none"> Make sure that there is no one under the raised tailgate. Do not stay under the raised tailgate until the tailgate is secured via stop cock against accidental lowering.
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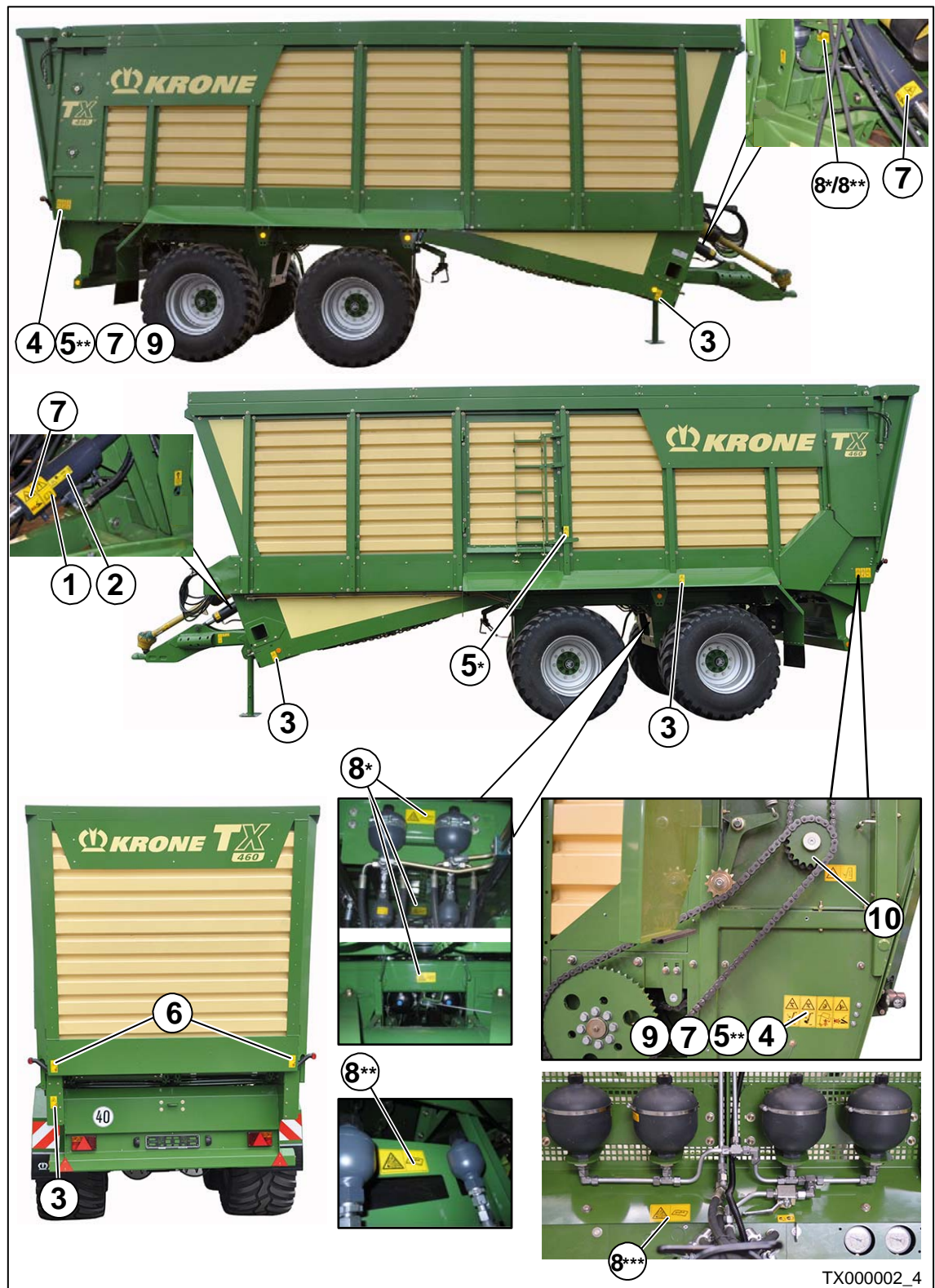
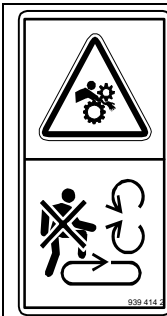


Fig.2

5) Order No. 939 414 2

*) version with discharge rollers (1x)

**) version without discharge rollers (2x)



Danger from rotating machine parts

When getting on the machine while the PTO shaft is running, there is a danger of being pulled in due to turning machine parts.

- Turn off the PTO shaft and the engine before getting on the machine.

6) Order No. 939 412 2 (2x)

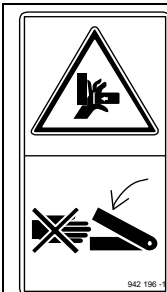


Danger from shock and crush

Crushing hazard for persons in the danger zone between tailgate and a fixed obstacle when opening the tailgate.

- Make sure that there is no one between the tailgate and a fixed obstacle.

7) Order no. 942 196 1 (4x)



Danger due to crushing or shearing

Risk of injury due to crushing or shearing points on moving machine parts.

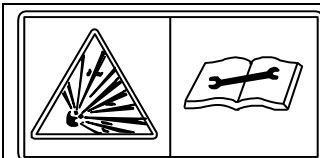
- While parts are moving, never reach into areas where there is a risk of being crushed.

8) Order No. 939 529 0

*) version with tridem unit (4x)

*) version with tandem unit (2x)

***) version with hydraulic unloading unit (+1x)



Danger due to high-pressure liquid.

The accumulator is under gas and oil pressure. If the accumulator is not removed or repaired properly, there is a risk of injury.

- Before removing and repairing the accumulator, follow the information in the operating instructions.
- The accumulator may be removed and repaired by a service centre only.

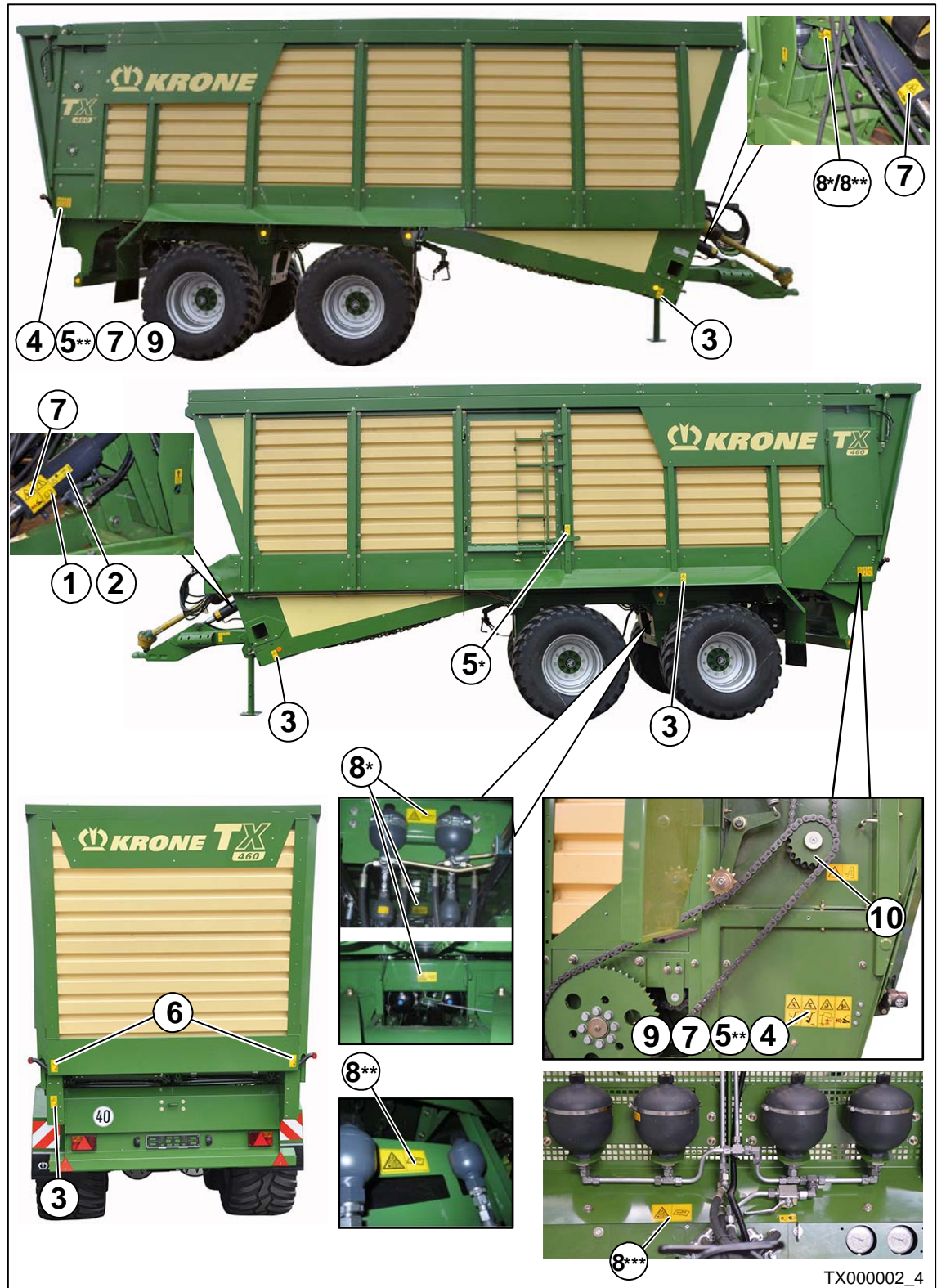
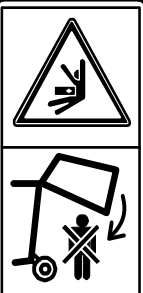


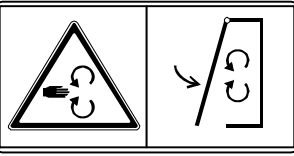
Fig.3

9) Order No. 939 521 1 (2x)

	<p>Danger from shock and crush</p> <p>Danger to life due to sagging tailgate.</p> <ul style="list-style-type: none"> • Make sure that there is no one under the raised tailgate. • Do not stay under the raised tailgate until the tailgate is secured against accidental lowering.
---	--

10) Order No. 942 002 4

version with discharge rollers (1x)

	<p>Danger due to rotating machine parts.</p> <p>When the machine is running, there is a risk of injury due to rotating machine parts.</p> <ul style="list-style-type: none"> • Before starting up, move the guards into their protective position.
---	--

Safety

3.6.1 Re-Ordering Safety Labels and Information Labels



Note

Each safety and information label is provided with an order number and can be ordered directly from the manufacturer or from authorised dealer (refer to chapter "Contact Person").

3.6.2 Attaching Safety Labels and Information Labels



Note - Attaching a label

Effect: Adhesion of label

- The attachment area must be clean, dry and free from dirt, oil and grease.
-

3.6.3 Contact

Maschinenfabrik Bernard Krone GmbH & Co. KG
Heinrich-Krone-Strasse 10
D-48480 Spelle (Germany)

Telephone: + 49 (0) 59 77/935-0 (Head Office)
Fax.: + 49 (0) 59 77/935-339 (Head Office)
Fax.: + 49 (0) 59 77/935-239 (Spare parts - domestic)
Fax.: + 49 (0) 59 77/935-359 (Spare parts - export)
Email: info.ldm@krone.de

3.7 Safety Equipment

3.7.1 Parking Brake

**WARNING!****Unexpected movement of the machine!**

The machine may move unintentionally if the parking brake is not activated when parking the machine. Thus there is a risk of serious injuries or death.

- Always apply the parking brake when the tractor is left or the machine is switched off.

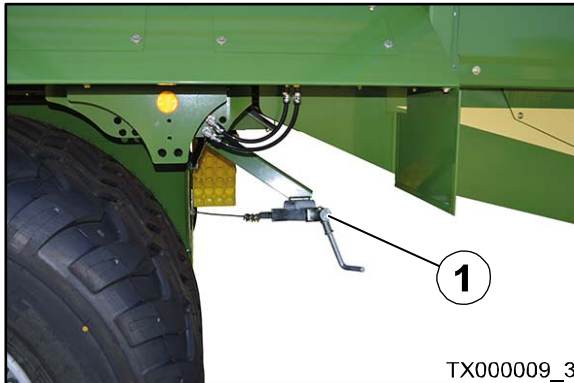


Fig. 4

The crank handle (1) of the parking brake is on the right-hand machine side in front of the tandem or tridem axle.

The parking brake is used to secure the machine from rolling away accidentally, especially when the machine is disconnected from the tractor.

To apply the parking brake:

- Turn the crank handle clockwise until the resistance grows noticeably greater.

To release the parking brake:

- Turn the crank handle anti-clockwise until the brake cable is slightly slack.

**Note**

To prevent the machine from rolling away, use the wheel chocks in addition to the parking brake.

3.7.2

Support Jack



WARNING! - Danger to life due to unexpected movements of the machine

If the machine is put down on the support jack when it is loaded, it may occur that the support jack yields. As a result, persons may get hurt due to the tilting machine.

- Make sure that the machine is only put down on the support jack when it is unloaded.

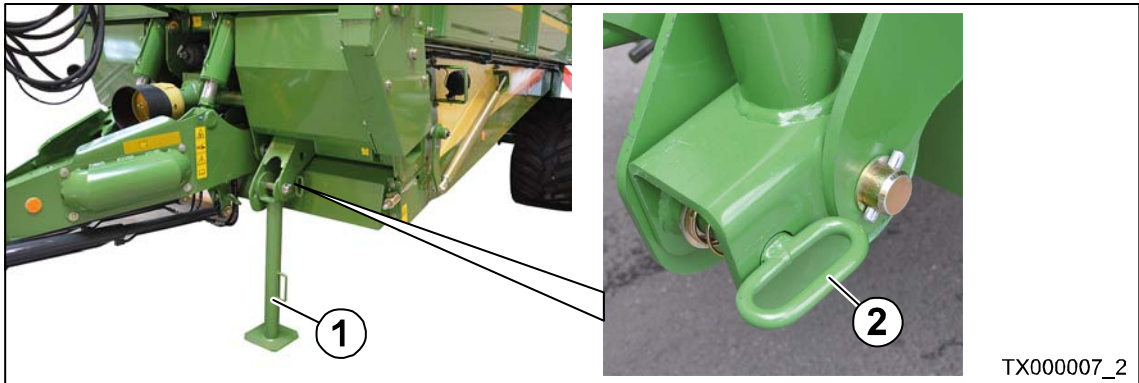


Fig. 5

The support jack (1) is designed for the stability of the machine when it is not connected to the tractor.



Note

In order to increase the base of the support jack when the ground is soft, use a suitable support.

3.7.3

Wheel chocks



Fig. 6

The wheel chocks (1) are located centred in front of the front axle.

- Place one wheel chock in front of the wheel and one behind a wheel of the front axle to secure the machine against rolling.

3.7.4

Ladder

For the TX 460 D/TX 560 D version



WARNING!

Danger of injury when climbing or descending.

Persons who behave carelessly when getting on and off the machine may fall down from the ladder. Persons getting on the machine without using the ladders intended for that purpose may slip or fall or they may get hurt seriously. Dirt as well as operating fluids and lubricants may impair surefootedness and stability.

- Just use ladders intended for this purpose.
- Always keep ladder steps and platforms clean and in proper condition so that you can step and stay safely.
- Do not get on and off when the machine is moving.
- Always get on and off with the face towards the machine.
- When getting on and off, ensure three-point contact with steps and handrails (both hands and one foot are in contact with the machine or both feet and one hand).
- When getting on and off the machine, never use control elements as a handle. An accidental activation of control elements may cause functions to be activated unintentionally. This holds a danger.
- When getting off the machine, never jump.

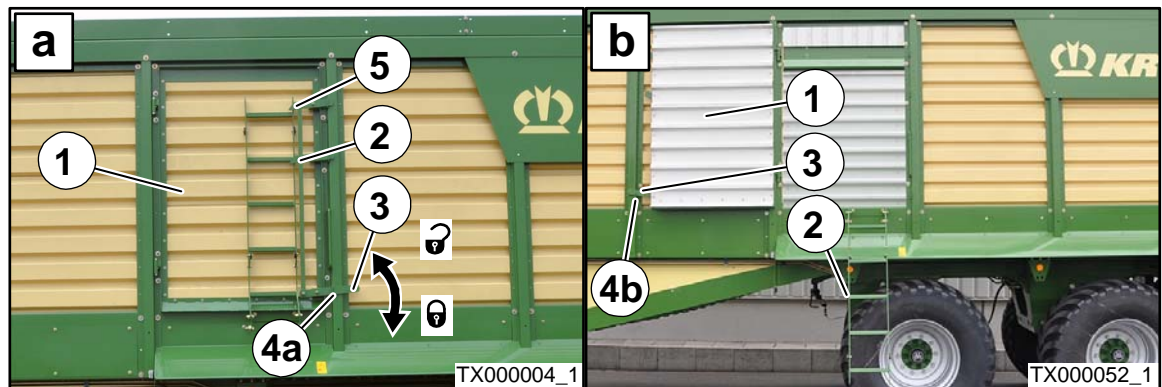


Fig. 7

a) Road position

b) Position for ascending and descending

There is a ladder (2) on the left-hand side of the machine. When you enter through the loading area you will reach this ladder (e. g. for maintenance work) via an access hatch (1).

Ladder

To get into the loading area, the ladder (2) must be folded down.

- Swivel locking lever (3) upwards and fold down ladder.

Road travel/field work



WARNING! – Ladder not folded in!

Effect: Danger to life, serious injuries or serious damage to the machine.

- When travelling on the road or working in the field, always ensure that the ladders have been folded in (a) and secured by the lock (2).

When driving on roads and during the work on the field, the ladder (2) must be folded in and secured in the road position (a).

- Swivel locking lever (3) upwards, fold in ladder and swivel locking lever downwards.

3.7.5 Shut-off valve for tailgate



WARNING!

Crushing hazard due to the sagging tailgate

When performing maintenance work, it may occur that the tailgate lowers unexpectedly. As a result, persons may get hurt.

- When doing maintenance work in the area of the tailgate, close the stop cock for tailgate.



Fig. 8

Lock the stop cock (1) on the right-hand side of the machine to secure the tailgate against lowering when carrying out work under the opened tailgate.

Version with hydraulic unloading unit (optional)



WARNING!

Danger of injury from a jumping up tailgate

When performing maintenance work, there is a risk that the tailgate jumps up unintentionally. As a result, persons may get hurt.

- When performing maintenance work in the area of the tailgate, close the stop cock near the hydraulic accumulators first and then the stop cock near the tailgate.

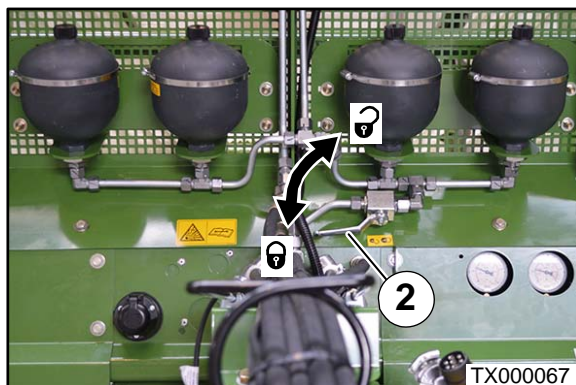


Fig.9

When performing maintenance work on the tailgate, close the stop cock (2) near the hydraulic accumulators first and then the stop cock (1) near the tailgate.

4**Data memory**

A variety of electronic components of the machine contains data memories that save temporarily and permanently technical information on machine condition, events and errors. This technical information generally documents the condition of a part, module, system or of the environment:

- Operating states of system components (e.g. filling levels)
- Status messages of the machine and its single components (e.g. number of revolutions of wheel, wheel speed, retardation of movements, lateral acceleration)
- Malfunctions and defects in important system components (e.g. light and brakes)
- Reactions of machine in special driving situations (e.g. actuation of airbag, installing stability control systems)
- Ambient conditions (e.g. temperature)

These data are exclusively of a technical nature. They are used to detect and remedy errors as well as to optimize machine functions. There is no possibility to create motion profiles on driven routes from these data.

If services are occupied (e.g. repair services, service processes, warranty cases, quality assurance), this technical information can be read by employees of service network (including manufacturer) from the event and error data memory by means of special diagnostic units. There you receive further information, if necessary. After the error has been remedied, the information in the error storage is either deleted or overwritten continuously.

When using the machine, situations are possible in which these technical data in connection with other information (accident protocol, damage to the machine, testimonies etc.) could become transferable to people - if applicable in consultation with an expert.

Additional functions regulated by a contractual agreement with the customer (e.g. remote maintenance) permit the transmission of certain machine data from the machine.

Machine Description

5 Machine Description

5.1 Machine overview

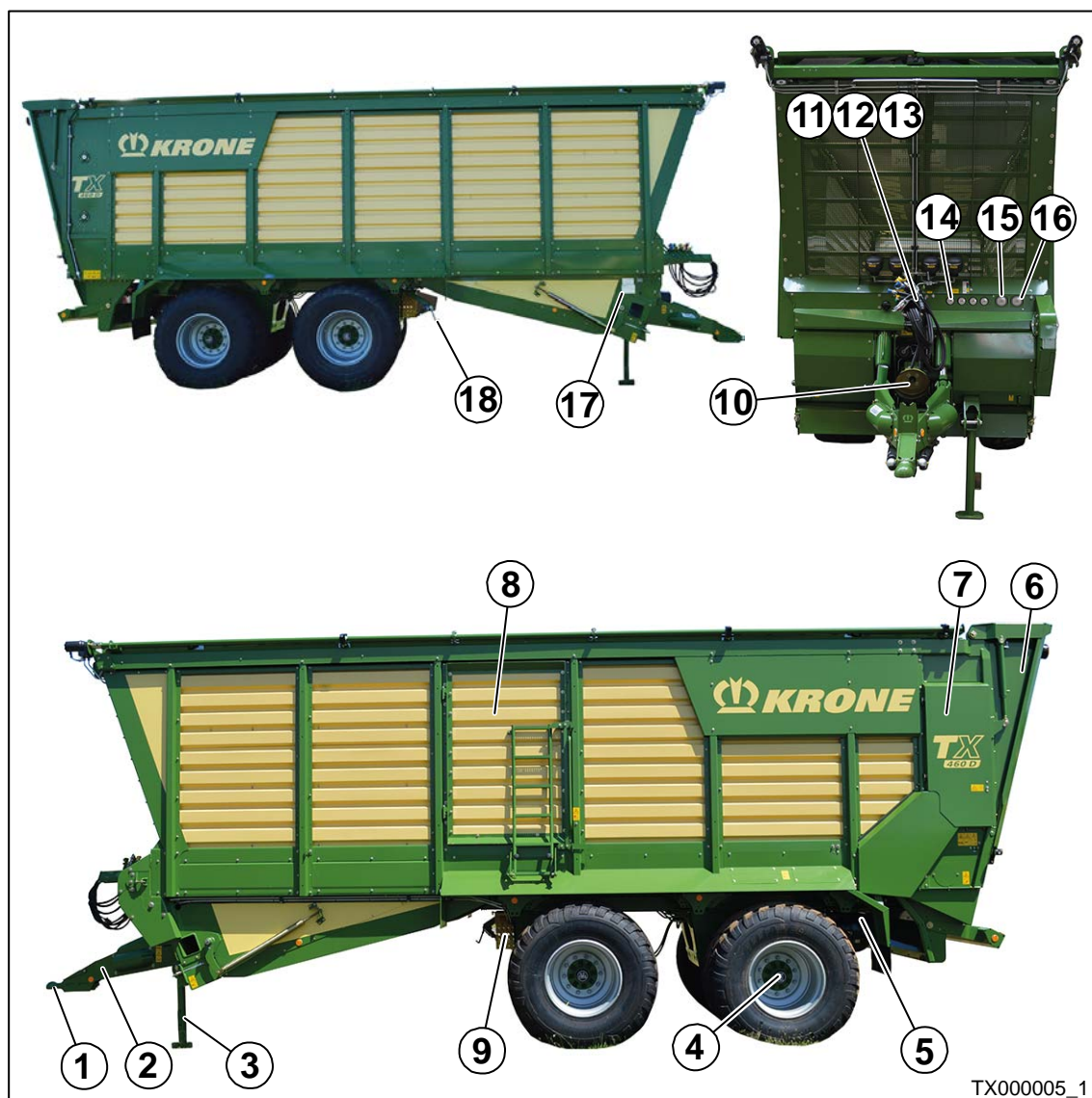


Fig. 10 Tandem axle assembly

1) Ball-head attachment	2) Drawbar	3) Support jack
4) Steering axle	5) Compressed air reservoir	6) Tailgate
7) Discharge roller unit	8) Hatch	9) Wheel chocks
10) Input gearbox	11) Electrical connection	12) Hydraulic connection
13) Compressed air brake connection	14) Pressure display forced steering	15) Pressure display drawbar
16) Pressure display chassis	17) Type plate	18) Parking brake

5.2 Ladders

Access to the loading area:

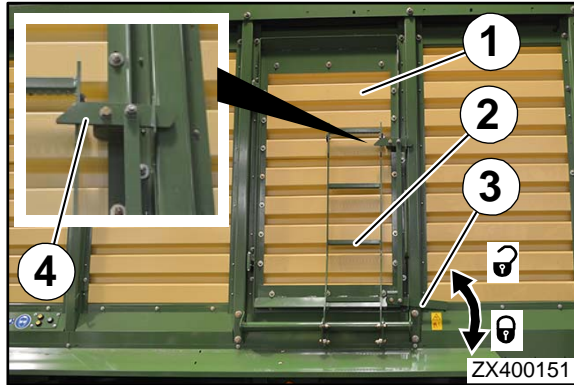


Fig. 11

- For maintenance and repair work in the loading area, enter the loading surface through access hatch (1).
- After having carried out maintenance work or repair work, close access hatch (1), fold up ladder (2) and lock by using locking levers (3) and (4).

5.3 Identification Plate

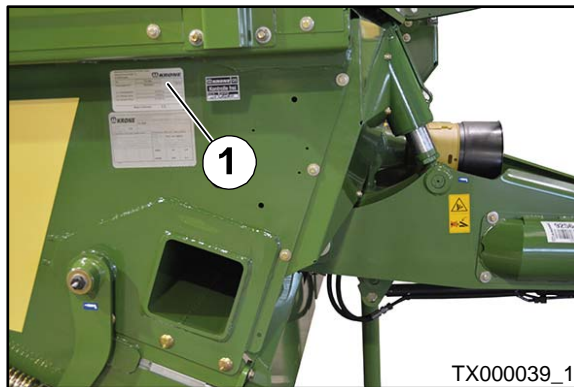


Fig. 12

The machine data can be found on type plate (1). It is located on the right-hand side of the machine at the front of the frame.

Machine Description

5.4 Information Required for Questions and Orders

Type	
Year of manufacture	
Vehicle ID number	



Note

The entire identification plate represents a legal document and should not be altered or rendered illegible!

When asking questions concerning the machine or ordering spare parts, be sure to provide type designation, vehicle ID number and the year of manufacture : To ensure that these data are always available, we recommend that you enter them in the fields above.



Note

Authentic KRONE spare parts and accessories authorised by the manufacturer help to ensure safety. The use of spare parts, accessories and other devices which are not manufactured, tested or approved by KRONE will result in the revoking of the liability for damages resulting thereof.

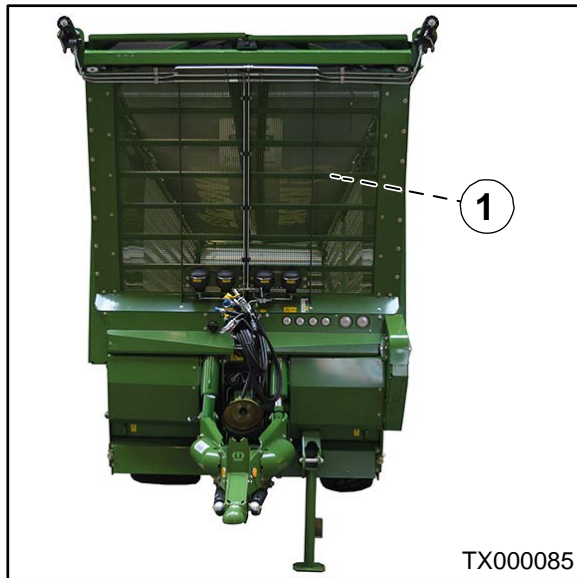
5.5 Hydraulic Front Wall

Fig. 13

The functions of the hydraulic front wall (1) are as follows:

- Optimizing the unloading process
- Serves as unloading aid

Machine Description

5.6 Loading Area Cover

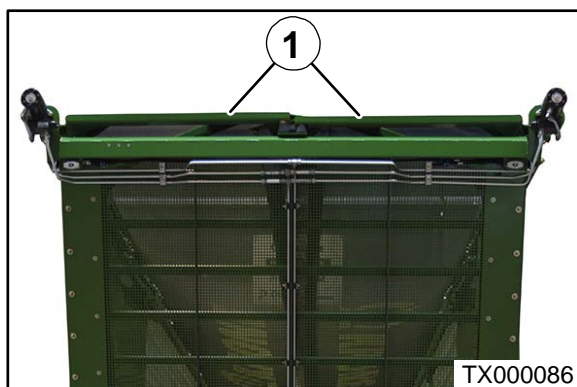


Fig. 14

1) Loading area cover

The forage transport wagon can optionally be equipped with loading area cover. The loading area cover prevents that load is caught by wind during transport and blown from the forage wagon.

The hydraulics is opened or closed via tractor hydraulics. To prevent the machine from damage, the loading area cover must be opened before loading process or unloading process is started.

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6 Technical data

All information, illustrations and technical data in these operating instructions correspond to the latest state at the time of publication. We reserve the right to make design changes at any time and without notification of reasons.

TX 460 / TX 460 D

Dimensions		TX 460	TX 460 D
Total height*	approx. mm	4000	
Platform height*	approx. mm	1700	
Length	mm	10100	
Width	approx. mm	2950	
Track width	approx. mm	2050	
Capacity (DIN 11741)	approx. m ³	46	
Discharge rollers		-	2
Ground clearance of hydraulic articulated drawbar	mm	600	
Unloading time	seconds	45	45

* Basic equipment, depending on tyres and axle assembly

Weights		kg
Permissible supported load		4000
Permissible axle load	Tandem unit 20 to.	20000
	Tridem unit 27 to.	(27000)
Permitted gross weight		24000 (31000)

() optional

The permissible weights (total weight, axle load and supported load) stated on the type plate are significant and must not be exceeded.

Minimum tractor requirements	
Power requirement	117/160 kW/HP
PTO speed	max. 1000 rpm
Lighting voltage	12 V - 7-pin plug
Voltage control unit (optional)	12 V - 3-pin plug
Max. operating pressure of hydraulic system	200 bar
Hydraulic connections	1x single-action control unit
	2x double-action control unit
Additionally for hydraulic loading area cover design	1x double-action control unit
Compressed air brake	2 connections for compressed air brake
Hydraulic brake (optional)	1x connection for hydraulic brake
Max. permissible transport speed (depending on authorisation)	40 km/h
	60 km/h optional

TX 460

Overload protection	
Cam-type clutch (drive universal shaft)	1300 Nm

TX 460 D

Overload protection	
Cam-type clutch (drive universal shaft)	1600 Nm

Machine equipment (country-specific requirement)	
Safety chain	min. 311 kN (70.000 lbf)

Airborne Sound Emission	
Equivalent continuous pneumatic level recorder	less than 70 d B(A)

Ambient temperature	
Temperature range for machine operation	-5 to +45°C

Technical data

TX 560 / TX 560 D

Dimensions		TX 560	TX 560 D
Total height*	approx. mm	4000	
Platform height*	approx. mm	1700	
Length	mm	11840	
Width	approx. mm	2950	
Track width	approx. mm	2050	
Capacity (DIN 11741)	approx. m ³	56	
Discharge rollers		-	2
Ground clearance of hydraulic articulated drawbar	mm	600	
Unloading time	seconds	50	50

* Basic equipment, depending on tyres and axle assembly

Weights		kg
Permissible supported load		4000
Permissible axle load	Tridem unit 30 to.	30000
Permitted gross weight		34000

() optional

The permissible weights (total weight, axle load and supported load) stated on the type plate are significant and must not be exceeded.

Minimum tractor requirements	
Power requirement	138/190 kW/HP
PTO speed	max. 1000 rpm
Lighting voltage	12 V - 7-pin plug
Voltage control unit (optional)	12 V - 3-pin plug
Max. operating pressure of hydraulic system	200 bar
Hydraulic connections	1x single-action control unit
	2x double-action control unit
Additionally for hydraulic loading area cover design	1x double-action control unit
Max. permissible transport speed (depending on authorisation)	40 km/h 60 km/h optional

TX 560

Overload protection	
Cam-type clutch (drive universal shaft)	1300 Nm

TX 560 D

Overload protection	
Cam-type clutch (drive universal shaft)	1600 Nm

Machine equipment (country-specific requirement)	
Safety chain	min. 311 kN (70.000 lbf)

Airborne Sound Emission	
Equivalent continuous pneumatic level recorder	less than 70 d B(A)

Ambient temperature	
Temperature range for machine operation	-5 to +45°C

Technical data

6.1 Consumables



CAUTION!

Environmental damage caused by incorrect storage and dispose of consumables!

- Store consumables in suitable containers according to statutory provisions.
- Dispose of used consumables according to statutory provisions.

Designation		Order number
Drive chains	High-performance chain spray KLÜBER CM 1-220 spray	27 014 495 0 (400 ml)
Grease nipple steering axle	EP long-term grease NLGI 2	926 045 0 (400 grams)
All the other grease nipples	Multi-purpose grease	

6.2 Filling Quantities and Lubrication Designations for Gearboxes

Machine component	Filling quantity	Specification	Initial filling ex works
Input gearbox	2.1 l	SAE 90	Violin ML 4 SAE 90

Biodegradable consumables on request.



Note - Observe maintenance intervals

Effect: Long expected service life of machine

- With bio-degradable oils always observe the change intervals because of the ageing of the oils.

6.3 Tyres

Tyre designation	Minimum pressure [bar] Vmax≤ 10km/h	Maximum pressure [bar]	Recommended tyre pressure*
710/50-R26.5 TL 170 D	2.0	4.0	2.8
750/45-R26.5 TL 170 D	2.1	4.0	2.8
800/45 R26.5 TL 174 D	1.8	4.0	2.8

The data stated in the table apply to the factory provided tyres.

- *) The recommendation applies in particular to the usual agricultural mixed operation (field/road) with the max. permitted axle loads (see type plate) and the permitted maximum speed of the loading wagon (40 km/h).

The tyre pressures must be adjusted up to the indicated maximum pressures for any other use (e.g. different axle loads, higher driving speed and a lot of road travel).

If necessary, the tyre air pressure can be reduced to the minimum air pressure. However, the permitted maximum speed (Vmax≤ 10km/h) must then be observed.

7 Control and Display Elements

7.1 Hydraulic Pressure Gauge

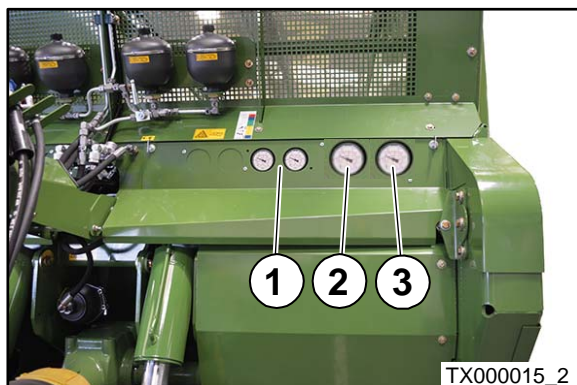


Fig. 15

The hydraulic pressure gauges (1) display the current system pressure of forced steering.

Tandem axle: 2 pressure gauges

Tridem axle: 4 pressure gauges






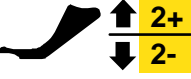


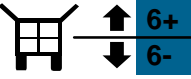
Optional:

The hydraulic pressure gauge (2) shows the current system pressure of the drawbar suspension.

The hydraulic pressure gauge (3) shows the current system pressure of the chassis.

7.2

Control units of the tractor

	
	<p>Connection for control block</p> <ul style="list-style-type: none"> – Red P: Pressure line
	<p>Connection for control block</p> <ul style="list-style-type: none"> – Red T: Return line
	<p>Connection for control block</p> <ul style="list-style-type: none"> – Green LS: Load Sensing line <p>For further information, see operating instructions of tractor manufacturer.</p>
	<p>Single-action control unit (green 1+):</p> <p>Green 1+:</p> <ul style="list-style-type: none"> – Pressure: Lift tailgate – Float position: Lower tailgate
	<p>Double-action control unit (yellow 2+ / 2-):</p> <ul style="list-style-type: none"> – Yellow 2+: Raise drawbar – Yellow 2-: Lower drawbar
	<p>Single-action control unit (yellow 3+):</p> <p>Yellow 3+:</p> <ul style="list-style-type: none"> – Pressure: Lock steering axle – Float position: Release steering axle
	<p>Single-action control unit (yellow 3+):</p> <p>Yellow 3+:</p> <ul style="list-style-type: none"> – Pressure: Raise lift axle – Float position: Lower lift axle
	<p>Double-action control unit (blue 6+ / 6-):</p> <ul style="list-style-type: none"> – Blue 6+: Open loading area cover – Blue 6-: Closing loading area cover

8 Commissioning



WARNING!

Risk of accident or damage to the machine due to an incorrect initial operation!

Only an authorized service technician is permitted to carry out the initial operation.

The following work steps are described in this chapter:

- Preparing the tractor for the operation with the machine.
- Removing transport lock on the sensor cylinder of the steered axle(s).
- Preparing the machine for driving around curves.
- Moving the steered wheels into the correct lane.
- Setting the driving height.
- Checking universal shaft length and shorten, if necessary.

8.1 Prerequisites on the Tractor

Forced steering tandem unit

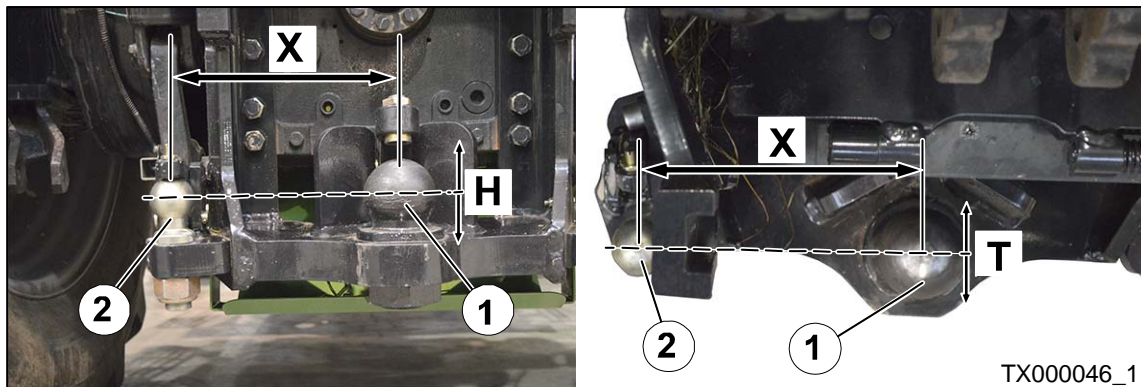


Fig. 16

- The lower links of the tractor are removed, see operating instructions of tractor.
- In direction of travel left, the tractor is equipped with an approved coupling ball (2) Ø50 mm with holding-down device.

The distance (X) is 250 mm, measured between coupling ball (1) Ø 80 mm and coupling ball (2) Ø 50 mm.

The height distance (H) is 0 mm.

The depth distance (T) is 0 mm.

Forced steering tridem unit

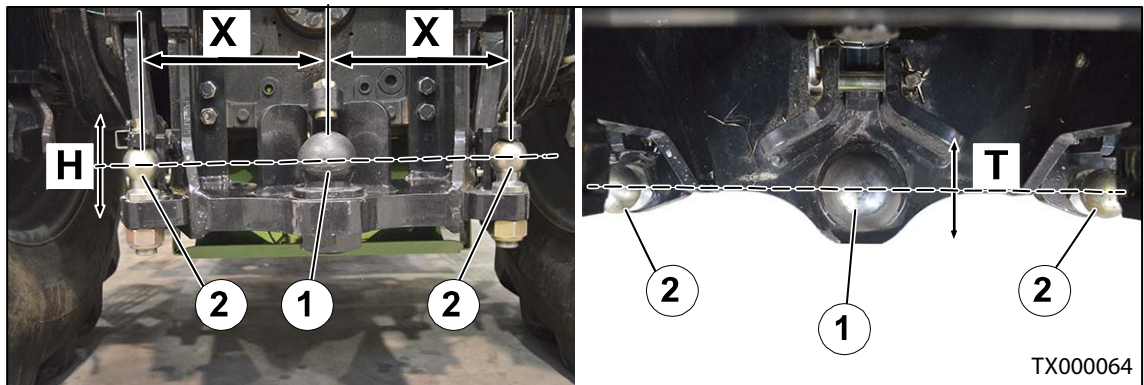


Fig. 17

- The lower links of the tractor are removed, see operating instructions of tractor.
- In direction of travel left and right, the tractor is equipped with an approved coupling ball (2) Ø50 mm with holding-down device.

The distance (X) is 250 mm, measured between coupling ball (1) Ø 80 mm and coupling ball (2) Ø 50 mm.

The height distance (H) is 0 mm.

The depth distance (T) is 0 mm.

8.2

Removing Transport Lock of Forced Steering

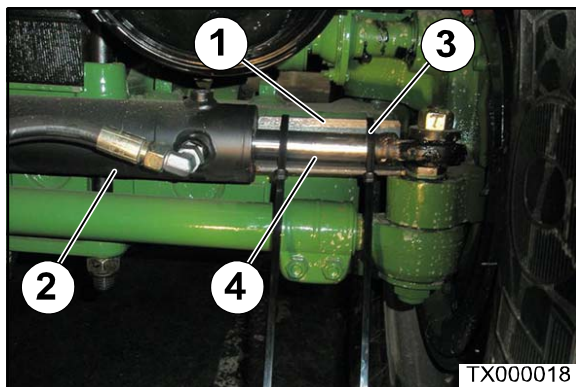


Fig. 18

For the transport on a low loader, the forced steering on the sensor cylinders (2) is secured by a metal bracket (1) that is fastened with cable ties (3) on the piston rod (4).

Removing transport lock:

- Separate cable ties (3). In doing so, make sure that the piston rod (4) is NOT damaged.
- Remove metal bracket (1) and dispose of it.
- Check piston rod (4) for damages.

8.3 Setting the unit (tractor/ machine) for turning

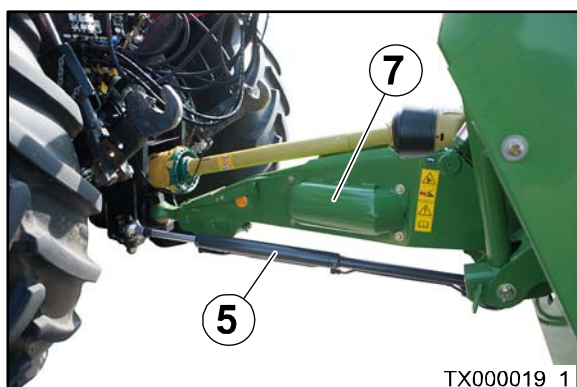


Fig. 19

Setting with hydraulic tandem unit:

- Turn tractor steering to full to the left and carefully make a left turn with the attachment. On the tightest curve, the tractor wheel must not touch the track rod (5). Spacer washers must be placed under the collision guard (7) if the tractor wheel touches the track rod (5).
- Turn tractor steering to full to the right and carefully make a right turn with the attachment. On the tightest curve, make sure that the track rod (5) does not touch the drawbar. If the track rod (5) touches the drawbar, mount an additional collision guard (7) with spacer washers in direction of travel right.

To place spacer washers under the collision guards:

- Loosen the fastening screws of the collision guards.
- Place so many spacer washers under the collision guards so that the track rods cannot be touched by tractor wheel or drawbar.
- Tighten the fastening screws of the collision guards.

The spacer washers for the broadening of the collision guards can be ordered directly from the manufacturer or from an authorised dealer (refer to chapter "Contact Persons") by stating order no. 9106420.



Note

Only specialist workshops are permitted to adjust the collision guards (7) to the tractor. Each time the tractor is changed, the adjustment of the collision guards (7) must be checked and changed as necessary.

Setting in case of tridem axle:

- Turn steering of tractor to full and carefully make a right or left turn with the attachment. The tractor wheels must not touch the track rods (5) on the tightest curve. If the tractor wheels touch the track rods (5), place spacer washers under the collision guards (7).

To place spacer washers under the collision guards:

- Loosen the fastening screws of the collision guards.
- Shim so many spacer washers so that it is ensured that the track rod cannot be touched by the tractor wheels.
- Tighten the fastening screws of the collision guards.

The spacer washers for the broadening of the collision guards can be ordered directly from the manufacturer or from an authorised dealer (refer to chapter "Contact Persons") by stating order no. 9106420.



Note

Only specialist workshops are permitted to adjust the collision guards (7) to the tractor. Each time the tractor is changed, the adjustment of the collision guards (7) must be checked and changed as necessary.

Commissioning

8.3.1 Electronic Forced Steering

**Note**

When changing the tractor, the straight-ahead driving should be recalibrated, refer to chapter ISOBUS Terminal KRONE "Menu "Calibrating Straight-ahead Driving".

**Note**

The initial operation of the forced steering is only allowed to be carried out by a specialist workshop.

**Note**

If electronic forced steering (e.g. machine pulls to one side) shows malfunctions, the straight-ahead driving on drawbar sensor must be recalibrated, refer to chapter KRONE ISOBUS terminal, menu "Calibrating Straight-ahead Driving".

**Note**

If the malfunction cannot be eliminated by calibrating the drawbar sensor, the machine must be recalibrated by an authorized specialist workshop.

8.4

Tracking



Danger! - Unexpected movements of the machine

Effect: Danger to life, injuries or damage to the machine.

- Setting tasks must only be performed when the drive is switched off and the engine is at a standstill!
- Bring the machine to a complete stop.
- Switch off the engine, remove the ignition key and turn off the electrical system on the control box
- Secure the machine and tractor against rolling.



Warning

The machine must only be placed in use with the shut-off valves closed

Hydraulic tandem unit design

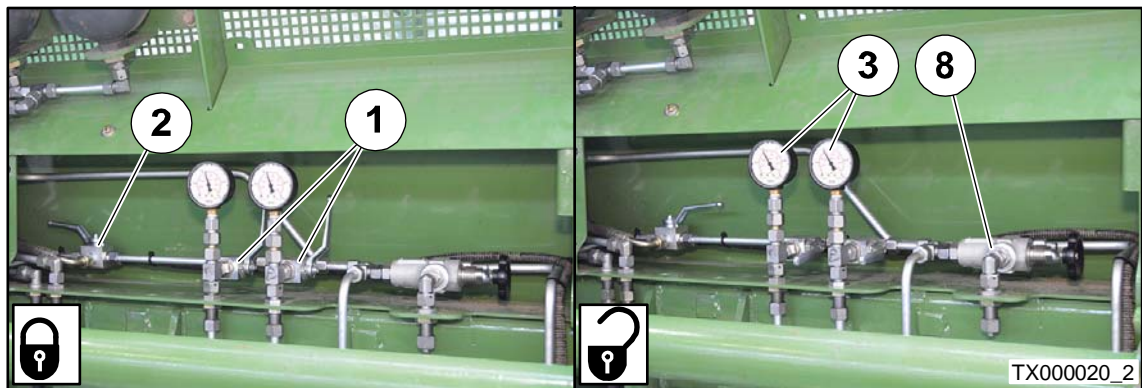


Fig. 20

- Open stop valves (1), lever to the front.
- Open main valve (2), lever to the right.
- Move the tractor and attachment straight forward until the wheels have straightened out (move along approx. 20 m).
- Activate the control unit (yellow 2+) for "Raising drawbar" until a value of 80 bar is displayed on the pressure gauge.
- Close stop valves (1) while simultaneously activating the control unit (yellow 2+) for "Raise drawbar", lever up.
- Change direction of flow on main valve (2), lever to the left.

After filling is complete, check the system pressure (3). The system pressure (3) must read 80 bar. If this is not the case, the process must be repeated as described above.



Note

If the system pressure cannot be adjusted to 80 bar, it must be preset again with the pressure limiting valve (8), see chapter Maintenance "Setting the Pressure Limiting Valve".

Version with hydraulic tridem unit

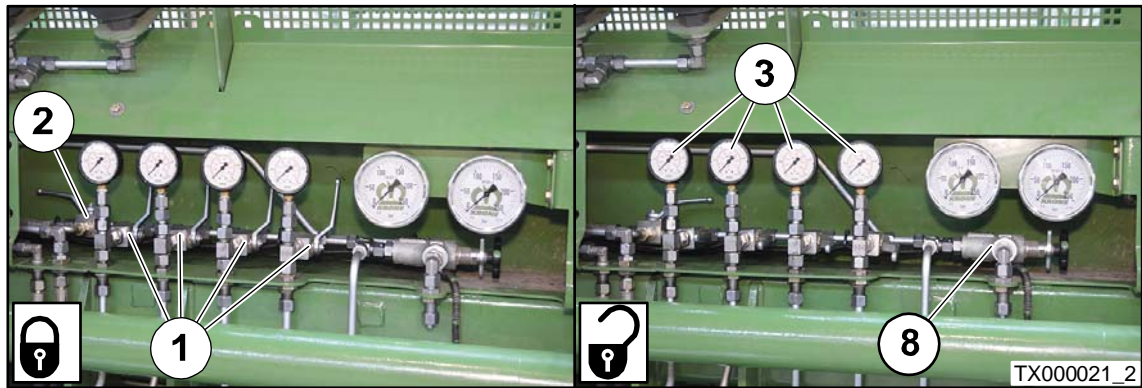


Fig. 21

- Open stop valves (1), lever to the front.
- Open main valve (2), lever to the right.
- Move the tractor and attachment straight forward until the wheels have straightened out (move along approx. 20 m).
- Activate the control unit (yellow 2+) for "Raising drawbar" until a value of 80 bar is displayed on the pressure gauge.
- Close stop valves (1) while simultaneously activating the control unit (yellow 2+) for "Raise drawbar", lever up.
- Change direction of flow on main valve (2), lever to the left.

After filling is complete, check the system pressure (3). The system pressure (3) must read 80 bar. If this is not the case, the process must be repeated as described above.



Note

If the system pressure cannot be adjusted to 80 bar, it must be preset again with the pressure limiting valve (8), see chapter Maintenance "Setting the Pressure Limiting Valve".

8.5

Setting the Driving Height

For version with tandem unit with hydraulic compensation

18 resp. 20 tons axle load / cylinder Ø 90 mm / version 3944/3945/3968/3969/3970



WARNING!

Risk of injury and damage to machine caused by improper setting

An improper setting of driving height could damage the machine or cause accidents.

- The setting of the driving height must only be performed by authorized dealer.

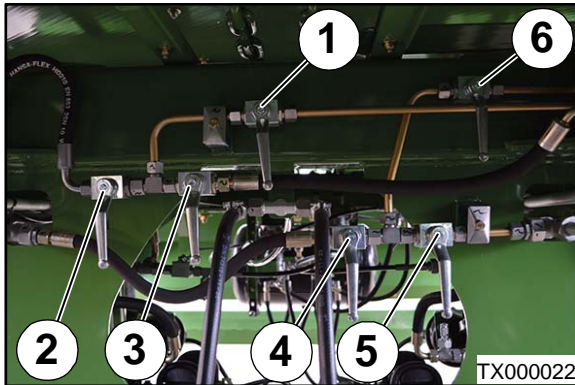


Fig. 22

The cylinders of the unit are retracted completely in the supplied condition. The six shut-off valves (1 to 6) are closed (lever perpendicular to the direction of line). The position of the shut-off valves must be checked and, if required, changed. Set the driving height before putting the machine into operation.

Precondition for the setting:

- Tractor and machine are on level, secure and firm ground.
- Connect the machine to the tractor, except universal shaft.
- Align the frame of the transport wagon horizontally via drawbar height.
- The setting of the driving height must always be performed by two persons who are looking at each other:
 - The tractor is operated by one person.
 - One person makes sure that there is no one in the danger zone of the machine.

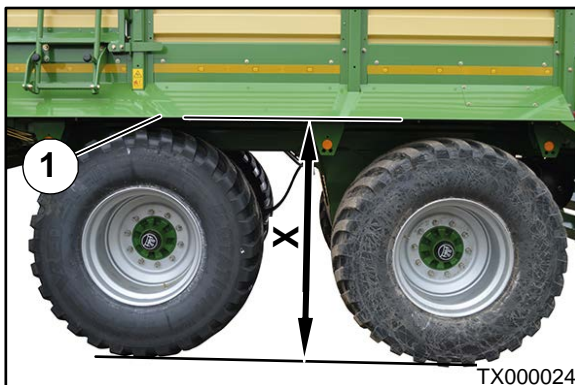


Fig. 23

- 1 Determine dimension "X" in the lowered state (measured between ground and lower edge of mudguard).

8.5.1 Setting Driving Height to X+140 mm



Caution!

Function for lifting/lowering drawbar

Effect: Serious injuries

The frame moves due to the "Lift/lower drawbar" function. Make certain there is no one in the danger zone of the frame.



Note

For raising the unit, approx. 4-5 l of oil are taken out of the tractor supply. Check the hydraulic oil level of the tractor; top up the oil, if necessary.

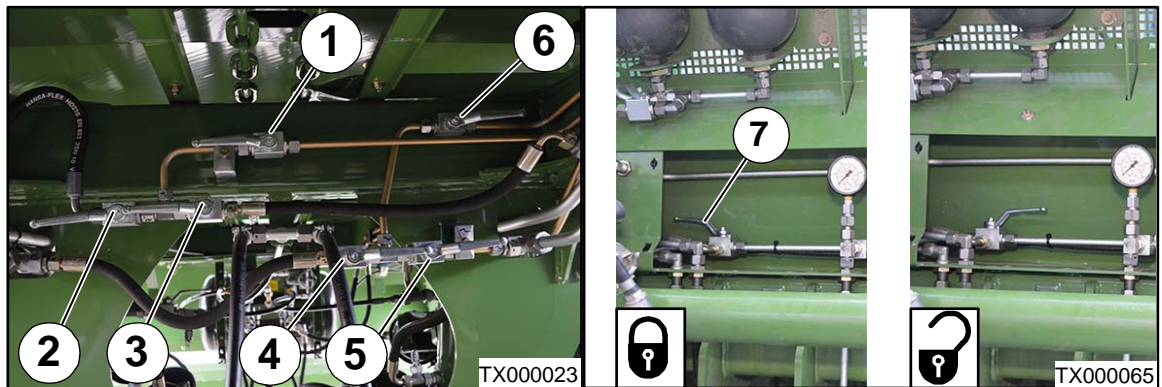


Fig. 24

- 2 To open the stop cock (7), turn lever by 180°, the lever shows to the right in the direction of line.
- 3 To open the stop cocks (1 to 6), turn lever by 90°, the levers show in the direction of line.
- 4 To vent the cylinders of the unit, lift the unit three times via "Lifting/lowering drawbar" (yellow 2) function and lower it again.
Caution! The frame moves when carrying out "Lift/lower drawbar" function. Crushing hazard. Make certain there is no one in the danger zone.
- 5 To raise the unit to the dimension „X+160 mm“, activate "Raise drawbar" function (yellow 2+).
- 6 Check dimension „X+160 mm“, right and left sides of the machine.
If the dimension „X+160“ is different on the right and left side, the appropriate side must be readjusted. The corresponding stop cocks (2 and 4 or 3 and 5) remain open for the side that has to be corrected. The other ones are closed.
 - Retract or extend the unit until the cylinders of the unit are extended at the same distance (X+160).
 - Open the closed stop cocks (2 and 4, or 3 and 5).
- 7 Close stop cock 6, turn lever by 90°, the lever shows transversely to the direction of line.
- 8 To lower the transport wagon by 20 mm to the dimension X+140 mm, activate "Raise/lower drawbar" function and make certain that the transport wagon remains laterally in horizontal position.
- 9 To close the stop cock (7), turn lever by 180°, the lever shows to the left in the direction of line.
- 10 Activate "Lift/lower drawbar (yellow 2)" function until the frame of the machine is aligned in parallel to the ground.
- 11 Measure the maximum vehicle height. Lower vehicle height to the maximum permissible vehicle height of 4 m, if necessary. To do this, repeat this process as described above.
- 12 To close the stop cocks (1 to 5), turn lever by 90°, the levers show transversely to the direction of line.

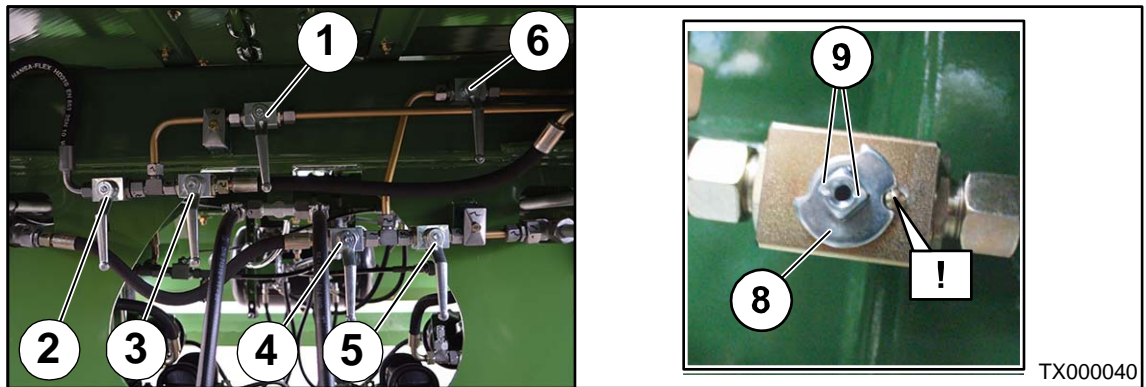


Fig. 25

13 To secure the unit against unintended activation, secure the actuation lever of the six stop cocks (1 to 6) against turning

To do this:

- Dismount the actuation levers of the six stop cocks (1 to 6)
- Turn the intermediate plate (8) on the square head until the levers can no longer be actuated
- Mount actuation levers in the direction of the notch (9) on the square head

8.5.2 Venting the Hydraulic Circuit of the Unit



WARNING!

Air in the hydraulic circuit of the unit causes a function limitation of the brake system and endangers the traffic safety.

Brake force control is only ensured if

- the driving height is adjusted correctly
- the hydraulic system is vented

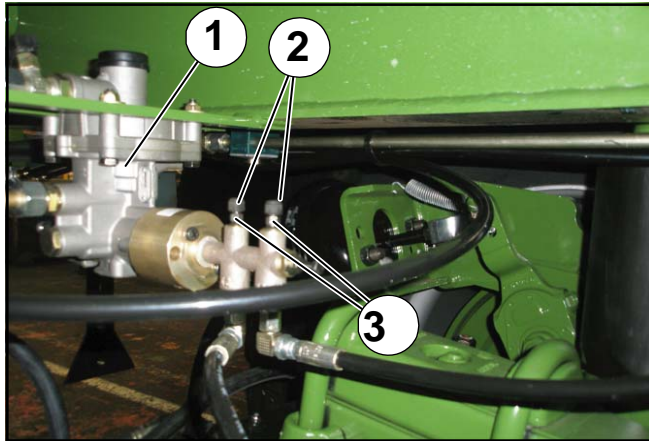


Fig. 26

1. Vent the supply lines to the ALB valve (1)

To do this:

- Remove the protective caps (2)
- Attach a transparent hose piece



Note

Collect escaping hydraulic oil in a suitable container and dispose of it correctly.

- Loosen the venting screws (3)
 - Lock venting screws (3) once the escaping hydraulic oil is free of bubbles
 - Remove the hoses
 - Attach protective cap
- 2 After venting, the required dimension (X+140 mm) must be checked and readjusted, if necessary (refer to chapter entitled Initial Operation "Setting Driving Height to Dimension X+140 mm")

8.6 Setting the Driving Height

8.6.1 Tridem Unit with Hydraulic Compensation

(27 tons axle load / cylinder Ø 110 mm / version 3990/3991)



WARNING!

Risk of injury and damage to machine caused by improper setting

An improper setting of driving height could damage the machine or cause accidents.

- The setting of the driving height must only be performed by authorized dealer.

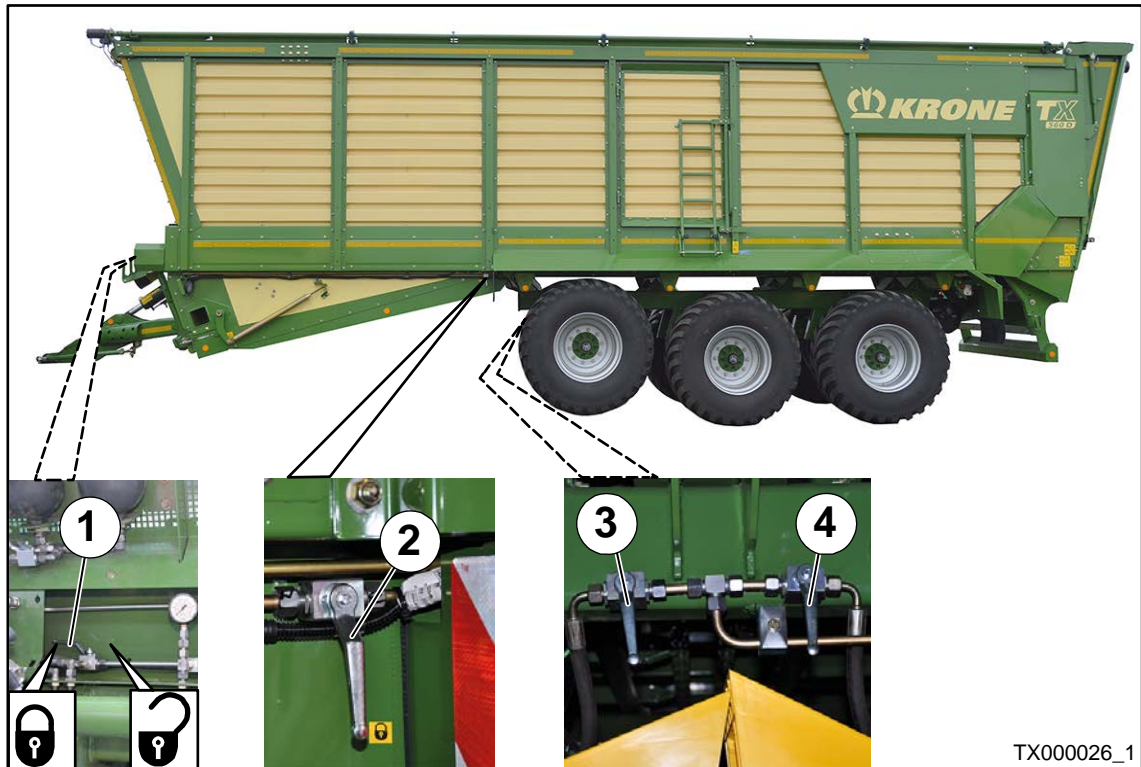


Abb. 27

The cylinders of the unit are completely retracted in the supplied condition.
The stop cocks (1 to 4) are closed (levers are perpendicular to the direction of the line).
The position of the stop cocks must be checked and, if required, changed.
Set the driving height before putting the machine into operation.

Precondition for the setting:

- Tractor and machine are on level, secure and firm ground.
- Connect the machine to the tractor, except universal shaft.
- Align the frame of the transport wagon horizontally via drawbar height.
- The setting of the driving height must always be performed by two persons who are looking at each other:
 - The tractor is operated by one person.
 - One person makes sure that there is no one in the danger zone of the machine.
- The lift axle is lowered.

Commissioning

8.6.2 Setting Driving Height to X+140 mm

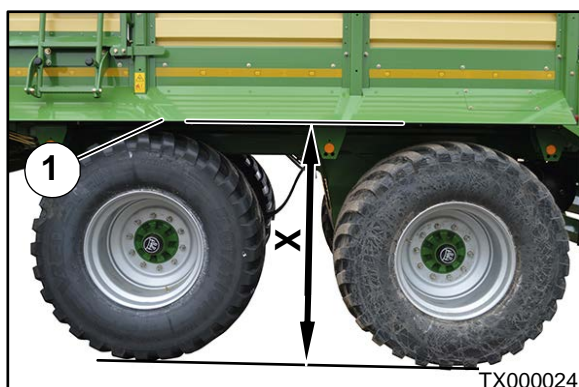


Fig. 28

- 1 Determine dimension "X" in the lowered state (measured between ground and lower edge of mudguard).



Note

For raising the unit, approx. 4-5 l of oil are taken out of the tractor supply. Check the hydraulic oil level of the tractor; top up the oil, if necessary.

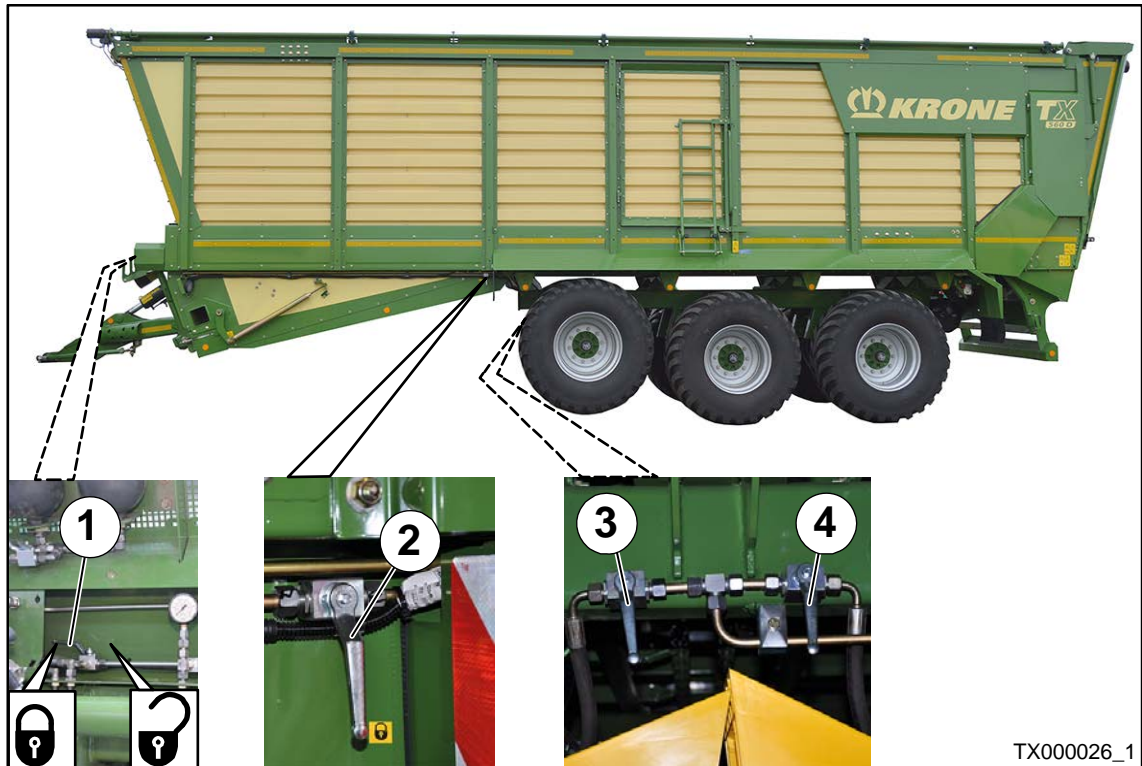


Abb. 29

- 21 To open the stop cock (1), reverse the lever by 90°. The lever shows in the direction of travel.
 - 3 To open the stop cocks (2 to 4), reverse the levers by 90°. The levers show in the direction of line.
- Caution!** When carrying out function "Lift/lower drawbar", the frame moves. This means there is crushing hazard. Make certain there is no one in the danger zone.
- 4 To vent the cylinders of the unit, completely lift and lower the unit three times via function "Lift/lower drawbar (yellow 2+/2-)". Switch to float position to lower the control unit.
 - 5 To lift the unit to the dimension "X+140 mm", activate the function for "Lift drawbar" (yellow 2+).
 - 6 Check whether the dimension "X+140 mm" is present on both machine sides.
 - Close stop cock (3) if the dimension on the left-hand machine side deviates.
 - Close stop cock (4) if the dimension on the right-hand machine side deviates.
 - Retract or extend the unit via function "Lift/lower drawbar (yellow 2+/2-)" until the cylinders of the unit are extended equally. Switch to float position to lower the control unit.
 - Open the closed stop cock (3 or 4).
 - 7 To close the stop cock (1), reverse lever by 90°. The lever shows in the direction of line to the left.
 - 8 Actuate the function "Lift/lower drawbar (yellow 2+/2-)" until the frame of the machine is aligned in parallel to the ground.
 - 9 Measure vehicle height. If necessary, lower vehicle height to maximum permissible vehicle height of 4 metres. To do this, repeat this process as described above.
 - 10 To close the stop cocks (2, 3, 4), reverse the levers by 90°. The levers show transversely to the direction of line.

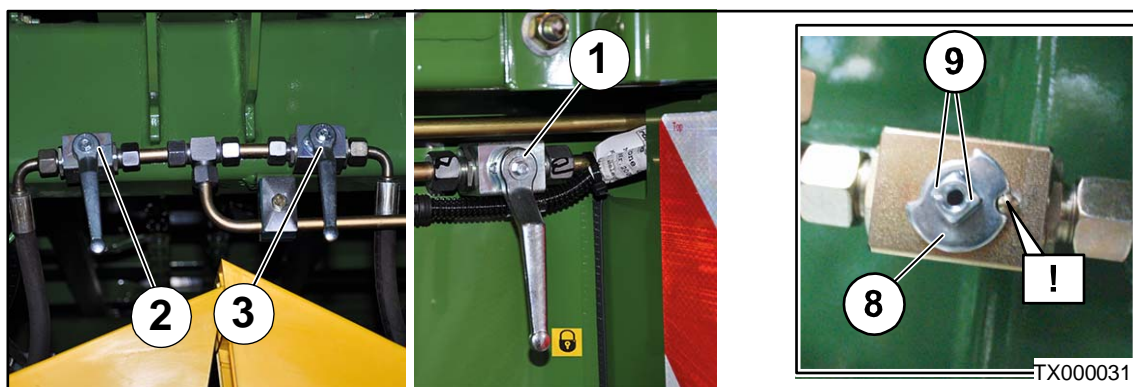


Fig. 30

11 To secure the unit against being activated unintentionally, secure the actuation levers of the three stop cocks (1 to 3) against turning

To do this:

- Dismount the actuation levers of the three stop cocks (1 to 3)
- Turn the intermediate plate (8) on the square head until the levers can no longer be actuated
- Mount actuation levers in the direction of the notch (9) on the square head

8.6.3 Venting the Hydraulic Circuit of the Unit



WARNING!

Air in the hydraulic circuit of the unit causes a function limitation of the brake system and endangers the traffic safety.

Brake force control is only ensured if

- the driving height is adjusted correctly
- the hydraulic system is vented

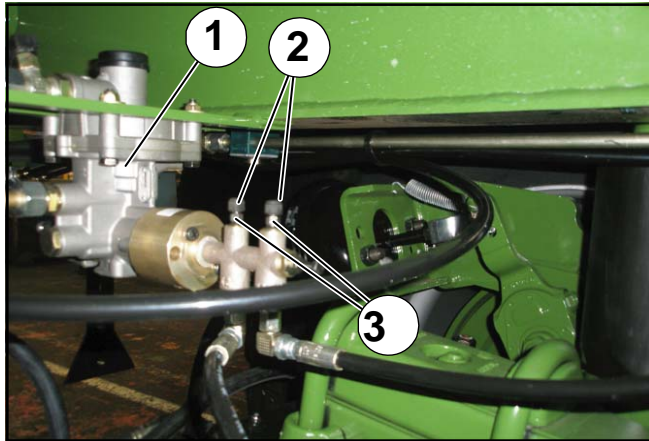


Fig. 31

1. Vent the supply lines to the ALB valve (1)

To do this:

- Remove the protective caps (2)
- Attach a transparent hose piece



Note

Collect escaping hydraulic oil in a suitable container and dispose of it correctly.

- Loosen the venting screws (3)
 - Lock venting screws (3) once the escaping hydraulic oil is free of bubbles
 - Remove the hoses
 - Attach protective cap
- 2 After venting, the required dimension (X+140 mm) must be checked and readjusted, if necessary (refer to chapter entitled Initial Operation "Setting Driving Height to Dimension X+140 mm")

8.7 PTO shaft



Danger! - Rotating PTO shaft

Effect: Danger to life or serious injuries

- Install or detach the PTO shaft only with the engine switched off and the ignition key removed.
- Secure the tractor against rolling.
- Make sure that the PTO shaft is coupled properly (the lock of the PTO shaft must have snapped in).

8.7.1 Length adjustment

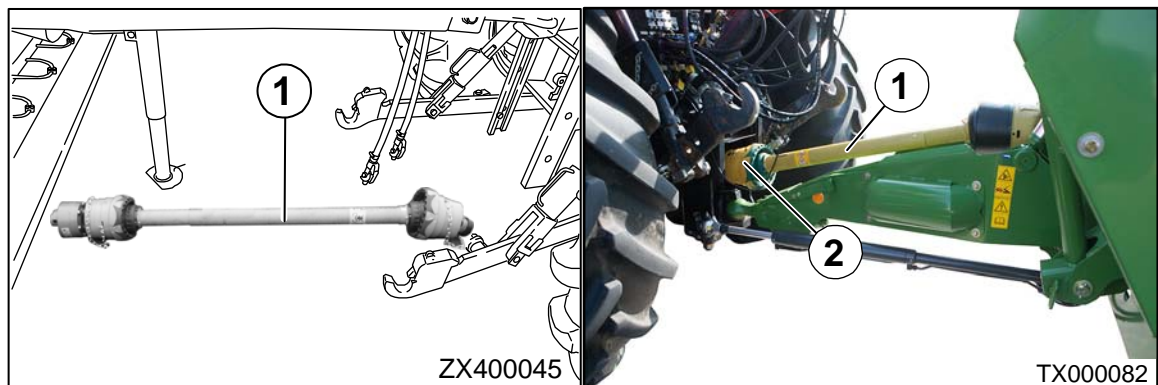


Fig. 32

The length of the PTO shaft (1) must be adjusted.

- Attach the machine to the tractor.
- Arrange the shortest operating position for the PTO shaft.



Note

The shortest operating position can be reached either with maximum turning or when driving straight ahead (depending on the type of tractor)



Note

Take into account the lift of the drawbar when braking.



Note

The minimum overlap of the PTO shaft must also be ensured when the offset drawbar is raised.

- Pull the PTO shaft apart
- Push a PTO shaft half (1) onto the PTO of the tractor
- Push on a PTO shaft with overload protection (2) on the machine side
- Measure the overlap and make the length adjustment as described in the enclosed operating instructions of the PTO shaft manufacturer

9

Start-up

**WARNING! – Accidental start-up of the machine, moving machine parts and / or unexpected movement of the machine!**

Effect: Danger to life, injuries or damage to the machine.

- Special caution is required when mounting and removing the machine on and from the tractor. As a result:
- Park tractor and machine on a firm, secure and level ground
- Secure tractor against rolling, switch off engine and remove the ignition key
- No one may stay between the tractor and the machine
- The machine may be operated with a maximum PTO speed of 1000 rpm
- Only use the universal shaft prescribed by the manufacturer
- Lay hoses and connection cables so that they are not tensioned when cornering or come into contact with the tractor wheels.
- Start up machine only when all safety devices have been attached and set in the required position

9.1

Check before Start-up

Prerequisites:

- The lower links of the tractor are removed.
- The universal shaft is adapted.
- The collision guards are adapted.

With forced steering for tandem unit, optional:

- In direction of travel left, the tractor is equipped with an approved coupling ball Ø50 mm with holding-down device at a distance of $X = 250$ mm from the coupling point.

With forced steering for tridem unit, optional:

- In direction of travel left and right, the tractor is equipped with two approved coupling balls Ø50 mm with holding-down device at a distance of $X = 250$ mm from the coupling point.

The following work steps are described in this chapter:

- Connecting ball attachment Ø80 mm.
- Connecting forced steering (ball attachment(s) Ø50 mm), optional.
- Connecting hydraulic hose lines.
- Connecting universal shaft.
- Connecting lighting.
- Connecting compressed air brake.
- Connecting hydraulic brake, optional.
- Swivelling in support jack.
- Releasing parking brake.
- Setting drawbar suspension.

9.2 Mounting onto the Tractor

**Caution!**

Damage to the machine due to tractor change.

If the tractor is changed, the following needs to be checked and adjusted, if necessary:

- Length adjustment of universal shaft (refer to chapter Initial Operation "Universal Shaft")
- Forced steering (refer to chapter Initial Operation "Initial Operation with Forced Steering")

**Danger! - Support and hitching loads of tractor not observed!**

Effect: Danger to life, injuries or damage to the machine.

- Observe the maximum permissible support and hitching loads for the tractor!
- Hitch and secure the machine to the tractor hitch in accordance with specifications.

**Danger! - Connection cables not laid properly.**

Effect: Danger to life, injuries or damage to the machine

- Lay the connection cables between the tractor and machine so that the cables are not tight when cornering or using the offset drawbar and do not come in contact with the tractor wheels.

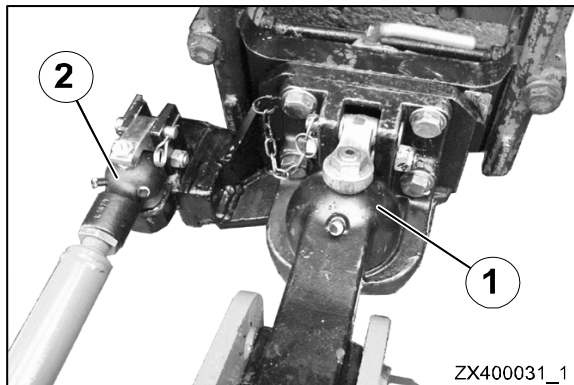
9.2.1
Coupling
Forced steering tandem unit


Fig. 33

- Reverse the tractor backwards onto the drawbar of the loading wagon and move the Ø 80 mm coupling ball under the towing ring for the Ø 80 mm ball-head attachment (1).
- Connect hydraulic lines.
- To lower the towing ring onto the coupling ball, run the "Lower drawbar" function.
- Connect and secure the towing ring for the Ø 80 mm ball-head attachment (1).
- Connect and secure the towing ring for the Ø 50 mm ball-head attachment (2).

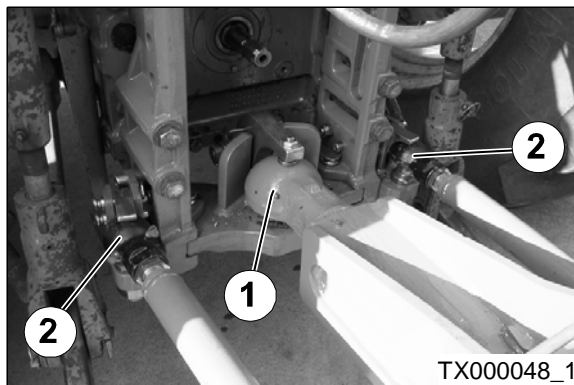
Forced steering tridem unit


Fig. 34

- Reverse the tractor backwards onto the drawbar of the loading wagon and move the Ø 80 mm coupling ball under the towing ring for the Ø 80 mm ball-head attachment (1).
- Connect hydraulic lines.
- To lower the towing ring onto the coupling ball, run the "Lower drawbar" function.
- Connect and secure the towing ring for the Ø 80 mm ball-head attachment (1).
- Connect and secure the towing ring for the Ø 50 mm ball-head attachment (2).

9.2.2 Hinging Track Rod

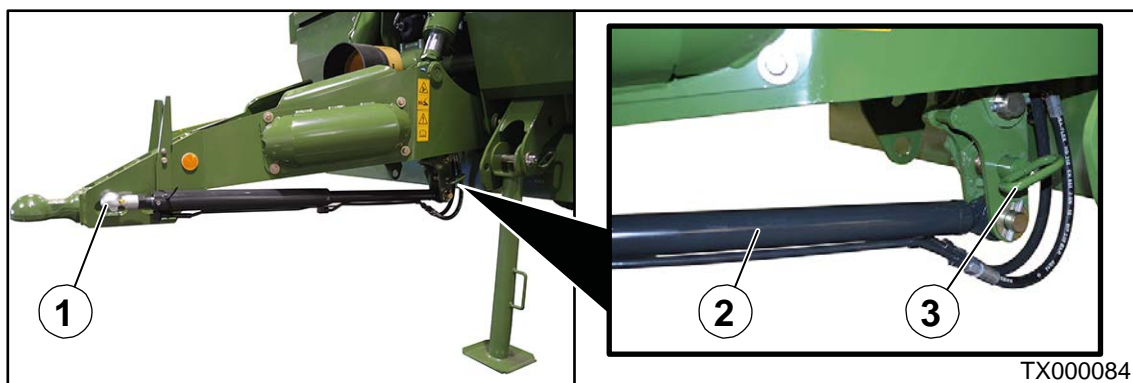


Fig. 35

Prerequisite:

- The drawbar eye for ball-head attachment Ø 80 mm is connected and secured, refer to chapter Start-up “Connecting”.

- Pull the lever (3).
- Move track rod (2) until the drawbar eye for ball-head attachment Ø 50 mm (1) can be connected.
- Secure ball-head attachment Ø 50 mm.
- Slowly drive with the tractor to the left or right until the lever (3) engages.

9.3 Hydraulics

9.3.1 Special Safety Instructions



Warning ! - Connection of the hydraulic line

Effect: severe injuries due to penetration of hydraulic oil under the skin.

- When connecting the hydraulic hoses to the hydraulic system of the tractor, the system must be relieved of the pressure on either side.
- Due to the risk of injury when searching for leaks, always use suitable tools and wear protective goggles.
- Seek medical help immediately should injuries occur! Danger of infection.
- Depressurise prior to uncoupling the hydraulic hoses and working on the hydraulic system!
- Check the hydraulic hose lines at regular intervals and replace them if damaged or worn! The replacement hoses must fulfil the technical requirements set by the equipment manufacturer.



Caution! - Soiling of the hydraulic system

Effect: Damages to the machine

- When connecting the quick couplings, ensure that these are clean and dry.
- Note chafing areas or points of contact.



Note

Connect hydraulic hoses correctly.

- The hydraulic hoses are marked with numbers and coloured dust caps.

9.3.2 Connecting the hydraulic lines

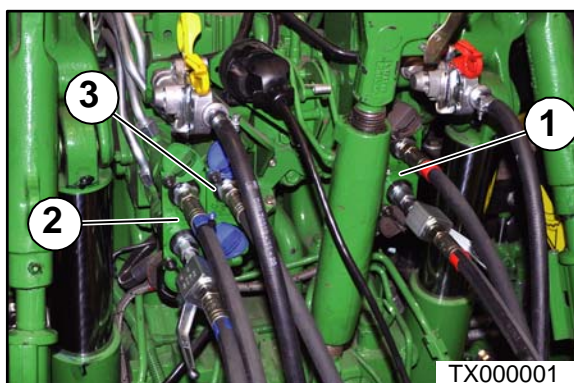


Fig. 36

Depending on the version supplied a varying number of control units are required on the tractor to operate the machine.

- Set the single-action control units of the tractor to float position.
- Turn off the tractor and secure it against the possibility of rolling back.
- Connect the hydraulic coupling (green 1+) of the machine to a single-action control unit of the tractor.
- Connect the hydraulic couplings (yellow 2+ / yellow 2-) of the machine to a double-action control unit of the tractor.
- Connect the hydraulic coupling (yellow 3+) on the machine to a single-acting control unit on the tractor.
- Connect the hydraulic couplings (blue 6+ / blue 6-) of the machine to a double-action control unit of the tractor.

9.4

PTO shaft

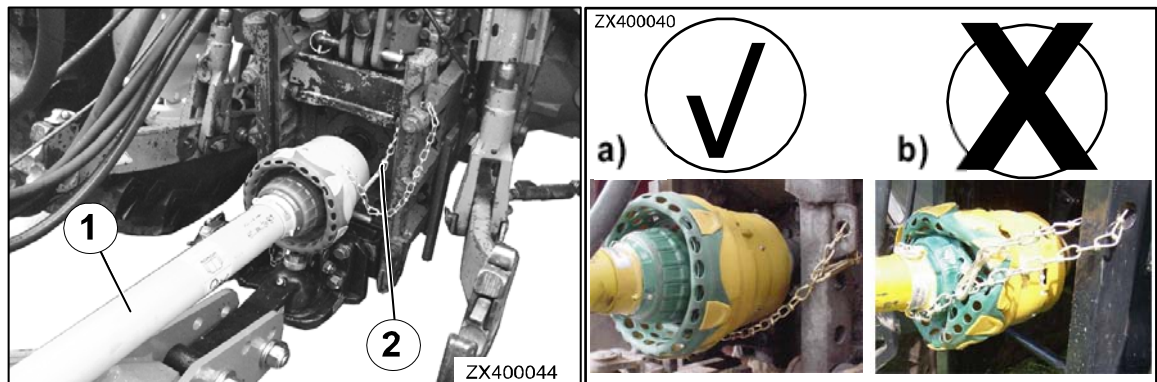


Figure 37

- Push on the PTO shaft (1) with overload protection on the machine side until the protection mechanism locks into place (see PTO shaft manufacturer's operating instructions).
- Secure the PTO shaft guard retaining chains (2).
- For length adjustment on the tractor see Section on Initial Start-up "PTO Shaft".

Make certain the chain connection is ideal:

- The chain guide should be as close as possible to perpendicular to the PTO shaft. (see view (a))
- The chain guide should never be diagonally connected via the guard cone. (see view (b))

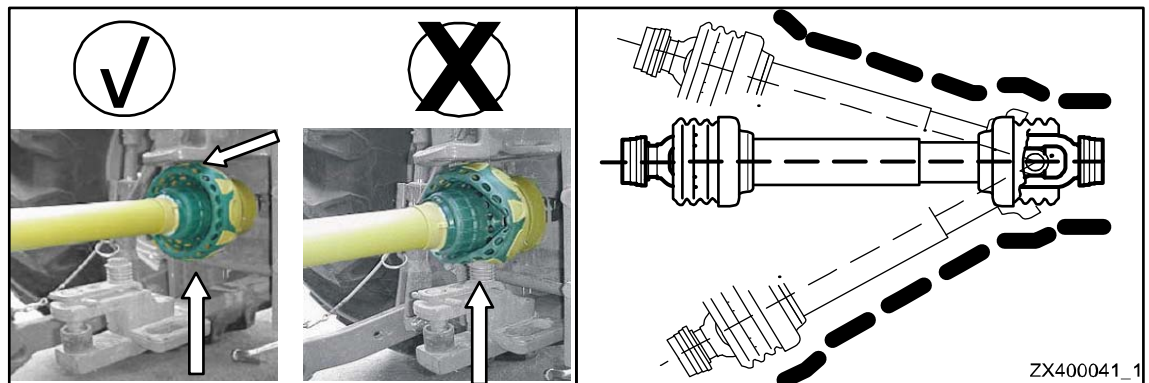


Figure 38

- Make certain there is sufficient free room in the swivel range of the PTO shaft in all operating states. Contact with parts of the tractor or device may result in destruction.



Fig. 39

- Hook supporting chain (1) on machine side into borehole (2).

9.5 Using the safety chain



WARNING!

When using a wrongly dimensioned safety chain, the safety chain may tear if the machine loosens unintentionally. This can result in serious accidents.

- Always use a safety chain with a minimum tensile strength of 311 kN (70.000 lbf).



Note

Using the safety chain

Attachment of the safety chain is not stipulated in all countries.

The safety chain is used as an additional safety precaution for trailed devices, should they become detached from the drawbar during transport. Attach the safety chain with the respective mounting parts to the hitching device on the tractor or to another specified connection point. The safety chain should have just enough play to be able to go around curves.

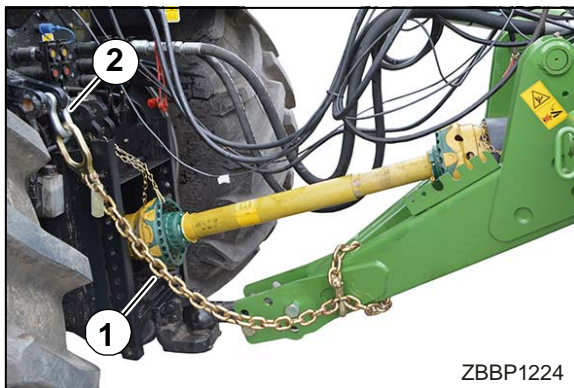


Fig. 40

- Shut down and safeguard the machine, see chapter Safety -> Safety routines, "Shutting down and safeguarding the machine".
- Install safety chain (1) with shackle (2) on the tractor.
- Install safety chain (1) on the loading wagon.

9.6

Lighting connection

**Danger! - Connection cables not laid properly.**

Effect: Danger to life, injuries or damage to the machine

- Lay the connection cables between the tractor and machine so that the cables are not tight when cornering or using the offset drawbar and do not come in contact with the tractor wheels.

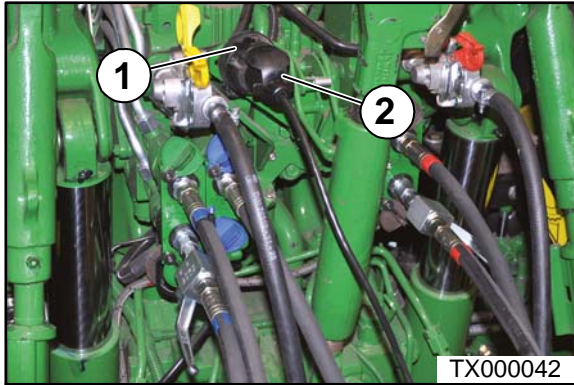


Fig. 41

The lighting system is connected via the 7-pin connection cable (2).

To do this:

- Insert the 7-pin connection cable plug (2) into the appropriate socket (1) of the machine.
- Insert the 7-pin connection cable plug (2) into the appropriate socket of the tractor.
- Position the cable so that it will not come in contact with the wheels.

**Note**

Before inserting the plugs, make certain the plugs and sockets are clean and dry. Dirt and moisture may result in short circuits!

9.7 Compressed Air Connections for the Compressed Air Brake

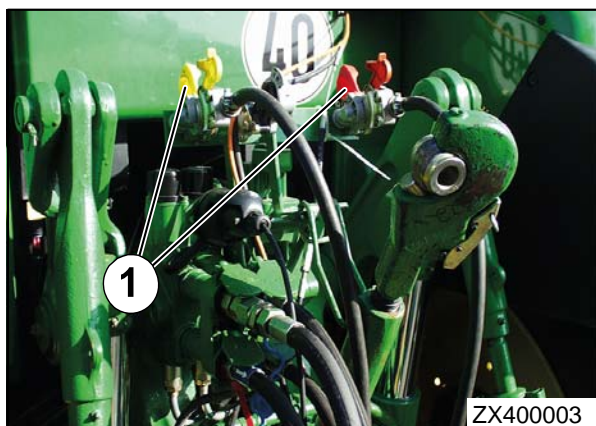


Figure 42

Insert the coloured compressed air hose couplings (1) into the correspondingly coloured couplings on the tractor.



Note

Always connect the yellow coupling head first, then the red one. Detach the couplings in reverse order.

9.8

Hydraulic brake (Export)

A hydraulic brake is provided for certain export versions. In this version, the corresponding hydraulic hose is connected with the control valve on the tractor side. The brake is activated by actuating the tractor brake pedal.



WARNING!

Risk of injury and serious material damages due to unintentional braking of the machine. If the safety chain is too short, it may tear off and lead to an emergency braking.

- Make sure that the length of the safety chain is adapted to the tractor.
- Consult a specialist workshop (service technician) for the adjustment of the safety chain length.
- When changing the tractor, make sure that the length of the safety chain remains appropriate.



WARNING!

When the safety valve of the hydraulic brake is not functioning, there is a risk of injury and serious property damage.

To ensure the function of the safety valve for the hydraulic emergency brake,

- the safety chain must be fastened on the tractor so that it is free of tension. A safety chain that is wrapped too strong around the hydraulic hose prevents the function of the safety valve.
- the brake pedal of the service brake must be actuated completely once before starting to drive. The pressure accumulator on the safety valve is pressurised by actuating the service brake.

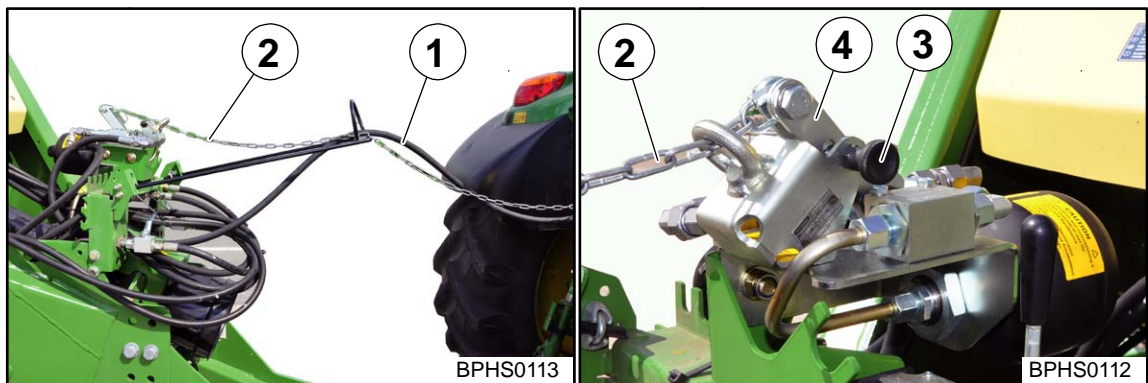


Fig. 43

- Connect the hydraulic hose (1) of the hydraulic brake to the connection for the hydraulic brake on the tractor.
- Fasten the safety chain (2) securely on the tractor.

The safety chain contains a predetermined breaking point (weaker chain link). If the machine detaches unintentionally, the safety valve triggers the emergency brake and the safety chain tears off on the weaker chain link. The chain link is destroyed in this process and must be replaced.

Unlocking the safety valve:

- Keep the safety chain (2) under tension and release the safety valve by pulling on the locking bolt (3). In this process, move the locking lever (4) slowly in its initial position by means of spring force.

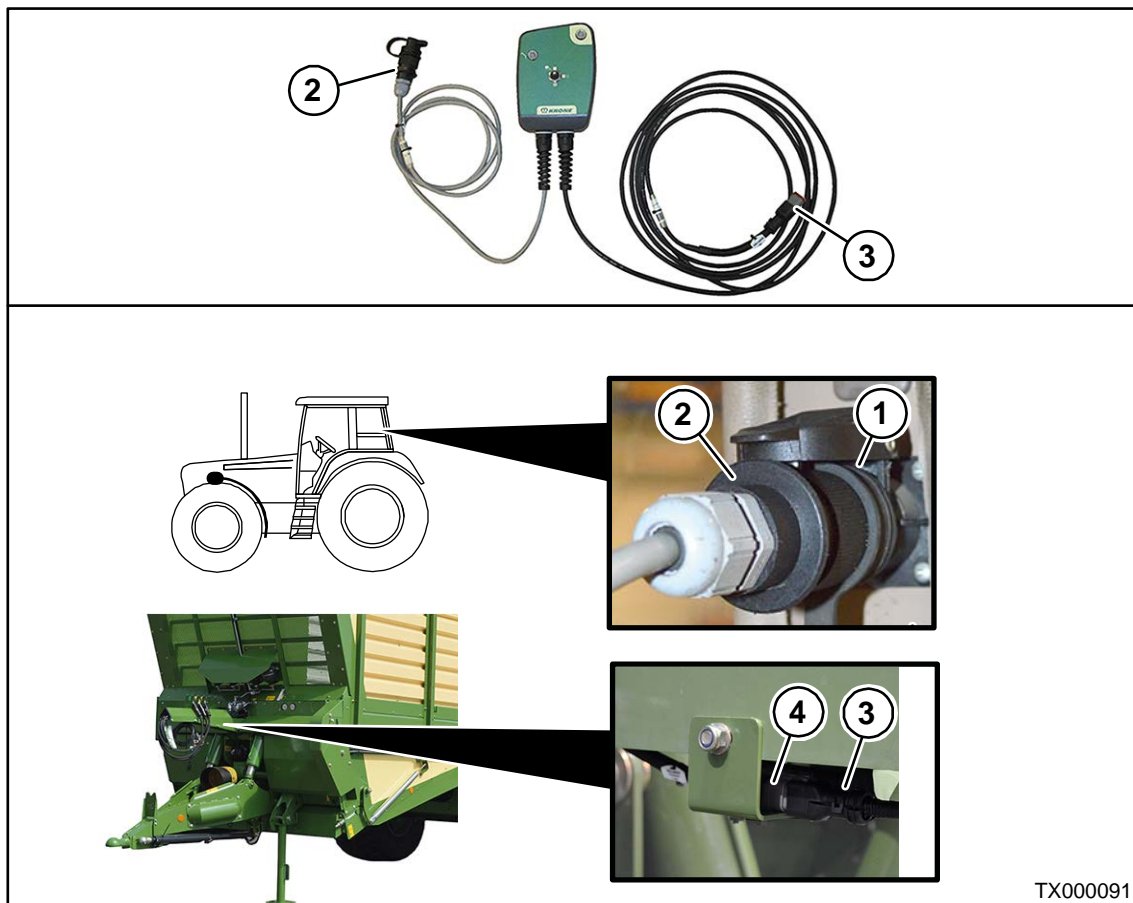
9.9 Connecting KRONE Operation Panel



Caution! - Connecting the electrical controls

Effect: Damage to the control unit

Before inserting the plugs, make certain the plugs and sockets are clean and dry. Dirt and moisture may result in short circuits!



TX000091

Fig. 44

Prerequisite:

- Shut down and safeguard the machine, see chapter Safety, "Shutting down and safeguarding the machine".

Connecting operation panel to tractor

- Connect the 2-pole plug (2) to the 2-pole socket (1) of the tractor.

Connecting operation panel to machine

- Connect the 6-pole plug (3) to the 6-pole socket (4) of the machine.

9.10 Connecting KRONE ISOBUS-Terminal

**Caution! - Connecting the electrical controls**

Effect: Damage to the control unit

Before inserting the plugs, make certain the plugs and sockets are clean and dry. Dirt and moisture may result in short circuits!

**Note**

For the installation of the terminal in the tractor cabin, observe the provided operating instructions of the terminal.

**Note****Failure of terminal.**

If the connection cables of the terminal are tensioned or if they touch the tractor wheels, then they could tear off. Therefore the terminal may fail and the machine can no longer be operated.

- Lay the connection cables so that they are not tensioned and do not touch the tractor wheels.
-

Tractors with integrated ISOBUS system**Prerequisite:**

- Shut down and safeguard the machine, see chapter Safety, "Shutting down and safeguarding the machine".

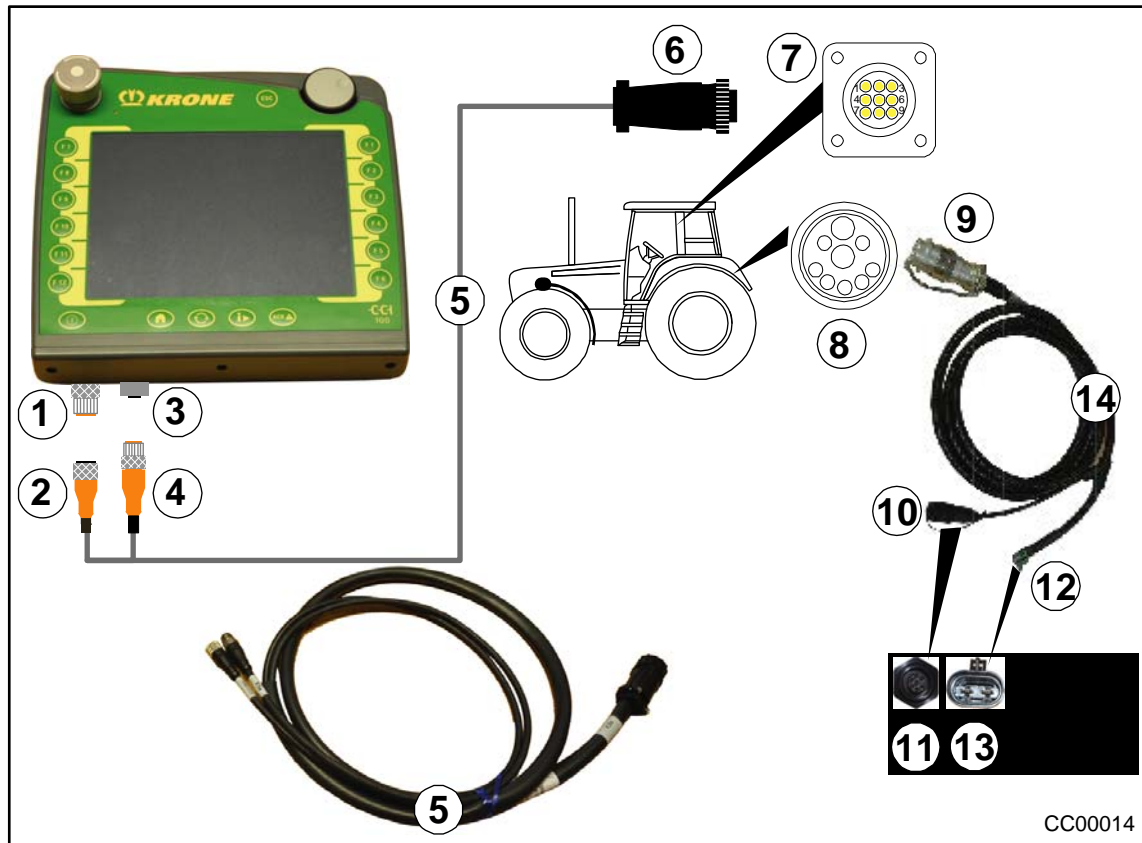


Fig. 45

Connecting terminal to tractor



Note

The terminal is connected to the tractor via a special cable set (5) which can be ordered by stating the KRONE article no. 20 081 223 0.

- Connect the plug (2) of the cable set (5) with the socket (1) (CAN1-IN) of the terminal.
- Connect the plug (4) of the cable set (5) with the socket (3) (CAN1-out) of the terminal.
- Connect ISOBUS plug (6) (9-pole) of cable set (5) with the ISOBUS socket (7) (9-pole) located in the tractor cabin.

Connecting tractor to machine



Note

The tractor is connected to the machine via cable set (14) which can be ordered by stating KRONE article no. 20 080 384 0.

- Connect ISOBUS plug (9) (9-pole) of cable set (14) with the outer ISOBUS socket (8) (9-pole) on tractor side.
- Connect plug (10) (7-pole) of cable set (14) with socket (11) (7-pole) of the machine.
- Connect plug (12) (2-pole) of cable set (14) with socket (13) (2-pole) of the machine.

Tractors without ISOBUS system

Prerequisite:

- Shut down and safeguard the machine, see chapter Safety, "Shutting down and safeguarding the machine".

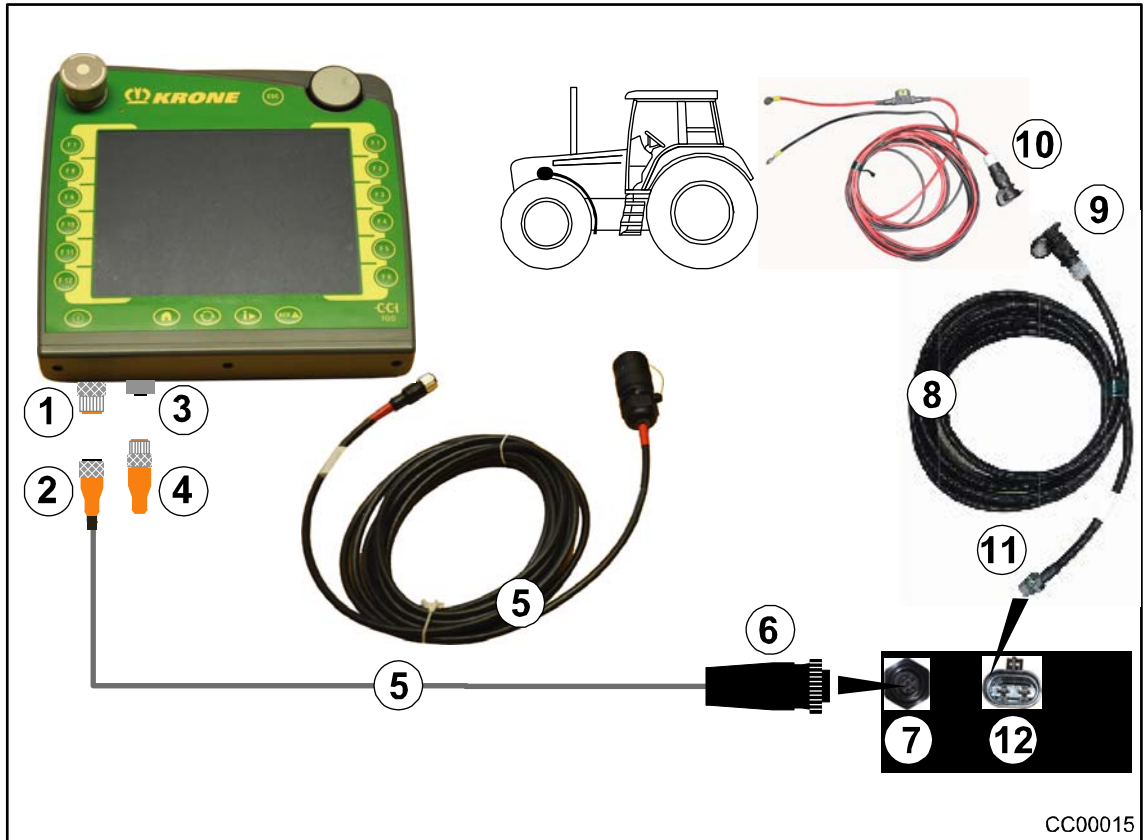


Fig. 46

Connection terminal to machine



Note

The connection of terminal to machine takes place via a provided cable set (5) (article no. 20 081 224 0).

- Connect plug (2) of cable set (5) with socket (1) (CAN1-IN) of the terminal
- Connect plug (6) (7-pole) of cable set (5) with socket (7) (7-pole) of the machine
- Connect connector plug (4) (article no. 00 302 300 0 included in scope of delivery) with socket (3) (CAN1-OUT) of the terminal

2-pole) of the machine

Connection tractor to machine



Note

The connection of tractor to machine takes place via a provided power cable (8) (article no. 20 080 601 0).

- Connect plug (9) of power cable (8) with continuous current socket (10) of the tractor
- Connect plug (11) (2-pole) of power cable (8) with socket (12) (2-pole) of the machine

9.11 Connecting External ISOBUS-Terminal



Caution! - Connecting the electrical controls

Effect: Damage to the control unit

Before inserting the plugs, make certain the plugs and sockets are clean and dry. Dirt and moisture may result in short circuits!



Note

For the installation of the terminal in the tractor cabin, observe the provided operating instructions of the terminal.

Prerequisite:

- Shut down and safeguard the machine, see chapter Safety, "Shutting down and safeguarding the machine".

Connection terminal to tractor

To get information as to how to connect terminal to tractor, please refer to the enclosed operating instructions of the terminal.

Connection tractor to machine

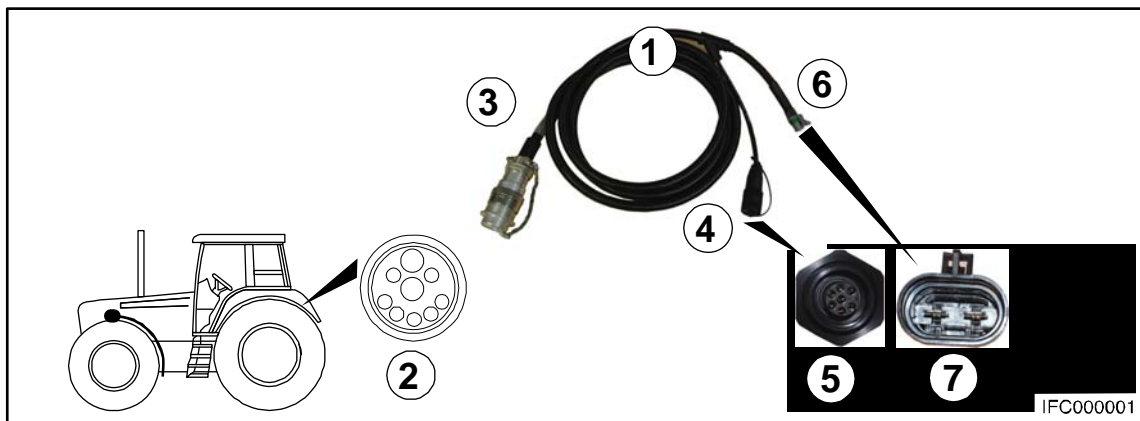


Fig. 47

- Connect ISO-plug (3) (9-pole) of cable set (1) with outer ISO-socket (2) (9-pole) on tractor side
- Connect plug (4) (7-pole) of cable set (1) with socket (5) (7-pole) of the machine
- Connect plug (6) (2-pole) of cable set (1) with socket (7) (2-pole) of the machine

9.12

Connecting the Joystick



Note

Observe the provided operating instructions of the joystick for the installation of the joystick in the tractor cabin.

KRONE ISOBUS-Terminal for tractors with integrated ISOBUS system

Prerequisite:

- Shut down and safeguard the machine, see chapter Safety, "Shutting down and safeguarding the machine".

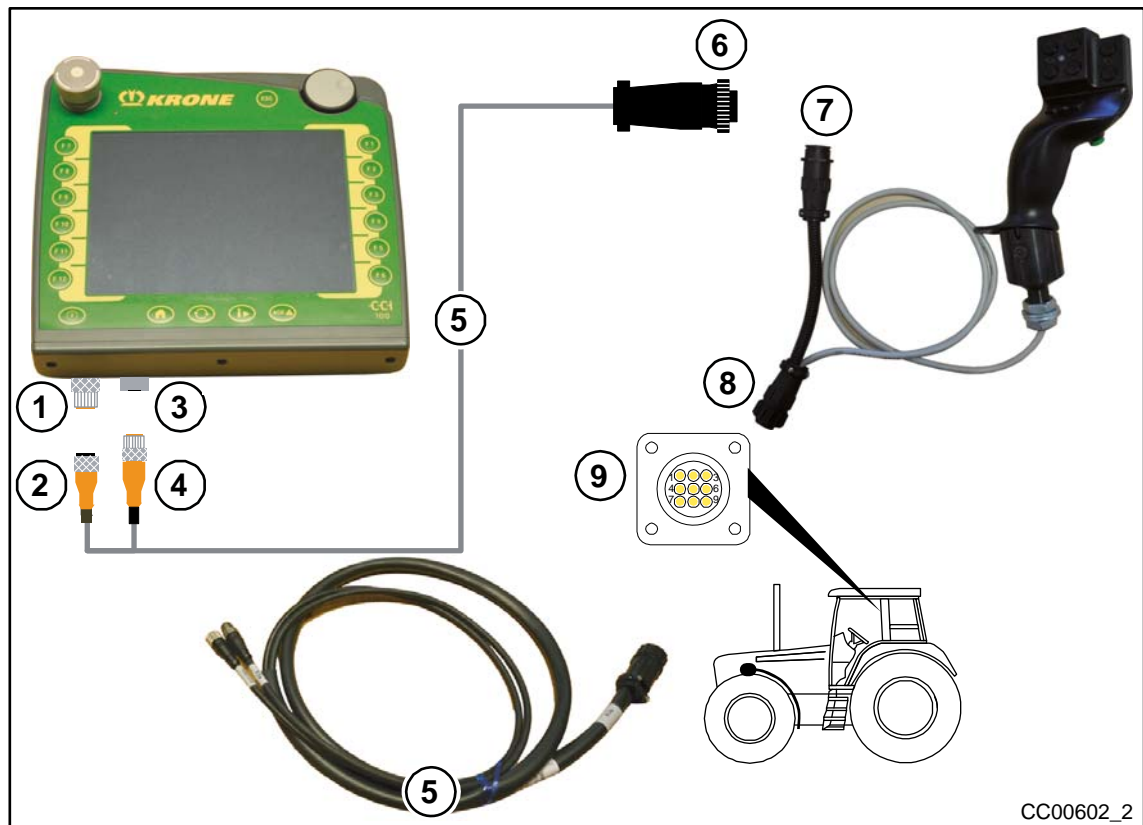


Fig. 48



Note

The terminal is connected to the tractor via special cable set (5) which can be ordered by stating the KRONE article no. 20 081 223 0.

- Connect the plug (2) of the cable set (5) to the socket (1) (CAN1-IN) of the terminal.
- Connect the plug (4) of the cable set (5) to the socket (3) (CAN1-out) of the terminal.
- Connect the ISOBUS plug (6) (9-pin) of the cable set (5) to the ISOBUS socket (7) (9-pin) of the control lever.
- Connect the ISOBUS plug (8) (9-pin) of the control lever to the ISOBUS socket (9) (9-pin) located in the cabin.

KRONE ISOBUS-Terminal for tractors without ISOBUS system

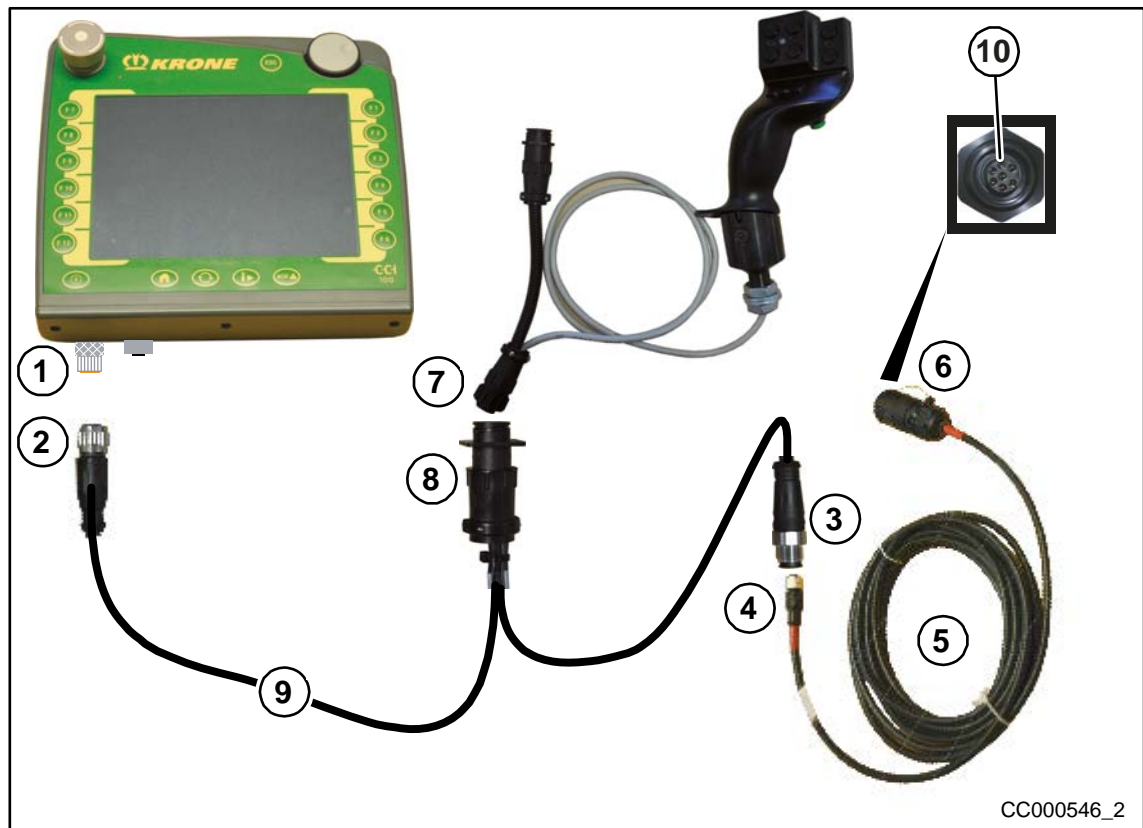


Fig. 49



Note

The terminal is connected to the multi-function lever via a special cable set (9) which can be ordered by stating the Krone product no. 20 081 676 0.

Prerequisite:

- Shut down and safeguard the machine, see chapter Safety, "Shutting down and safeguarding the machine".
- Connect the plug (2) of the cable set (9) to the socket (1) (CAN1-IN) of the terminal.
- Connect the plug (3) of the cable set (9) to the plug (4) of the cable set (5).
- Connect the 9-pole plug (8) of the cable set (9) to the 9-pole socket (7) of the joystick.
- Connect the 7-pole plug (6) of the cable set (5) to the 7-pole socket (10) of the machine.

9.13 Swivel parking jack into transport position

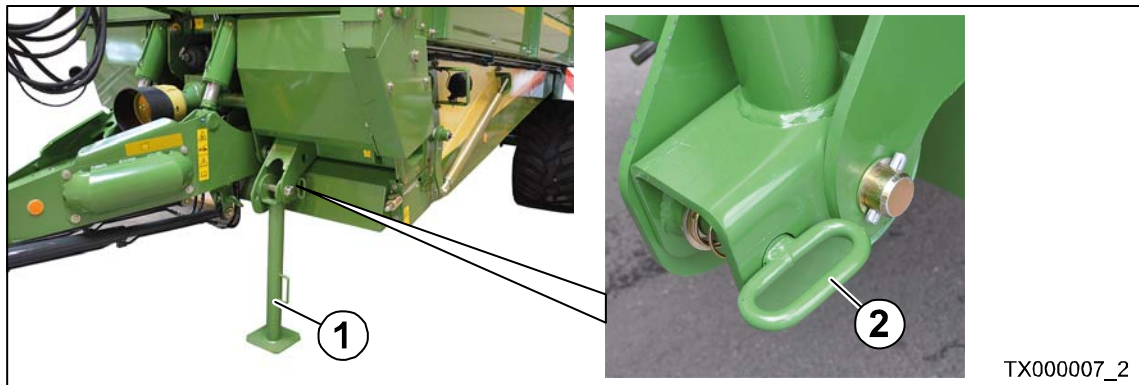


Fig. 50

After connecting the machine, swing up support jack.

To do this:

- Actuate the double-action control unit (raise/lower drawbar) and slightly raise the drawbar.
- Turn off the tractor and secure it against the possibility of rolling back.
- Pull locking bolt (2) on the support jack (1) and swing support jack into transport position.
- Secure support jack by using locking bolt (2).

9.14 Parking Brake

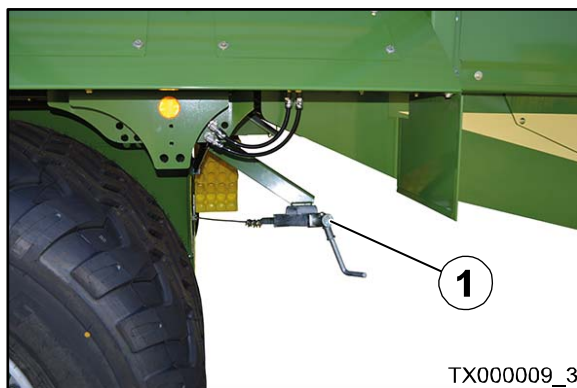


Fig. 51

To release the parking brake:

- Turn crank counter-clockwise until the brake cable sags slightly.

9.15 Drawbar Suspension

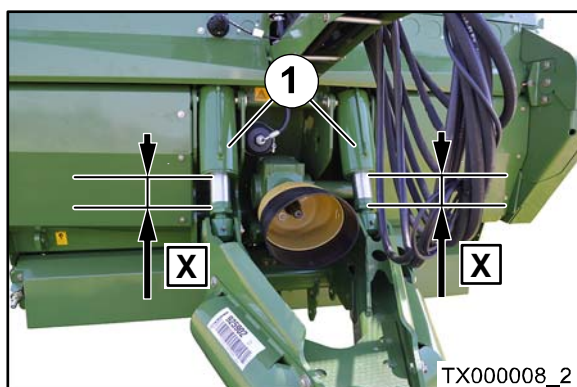


Fig. 52

To improve the handling characteristics for driving in transport mode, the machine is equipped with drawbar suspension. Pressure peaks in the hydraulic cylinder are absorbed by pressure accumulators.

To activate drawbar suspension, extend piston rods of hydraulic cylinders (1) at least $X=30$ mm.

- Actuate double-action control unit (raise/lower drawbar) and extend the piston rods of the hydraulic cylinders (1) at least $X=30$ mm.

9.16 Discharge Roller Unit

9.16.1 Removing Discharge Roller Unit



WARNING!

Risk of injury due to suspended load!

There is a danger for persons due to falling load.

- To mount and dismount parts, only use suitable, approved and intact hoists.
- Pay attention to sufficient carrying load of the hoist.
- To mount and dismount parts, only use suitable, approved and intact slings.
- Pay attention to the valid period of use of the sling.
- Do not stay under the suspended load.

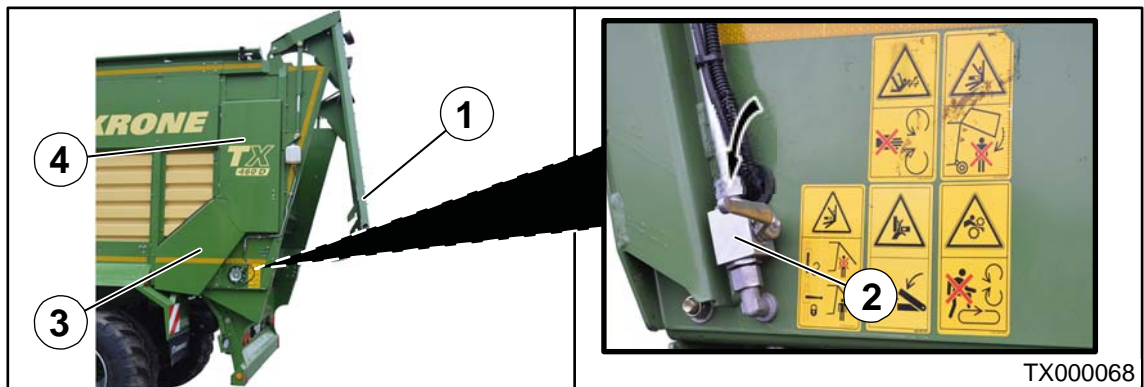


Fig. 53

- Open tailgate (1) approx. 50 cm.
- Open loading area cover via tractor control unit so that disassembly of discharge roller unit is not impeded and the chain drive of discharge rollers is not covered.
- Switch tractor control unit to float position so that the brake in the hydraulic motor prevents unintentional lowering of loading area cover.
- Switch off tractor engine, remove the ignition key and carry it with you.
- Secure stop cock (2) and tailgate (1) against unintentional lowering.
- Dismount chain guard (3) and (4).

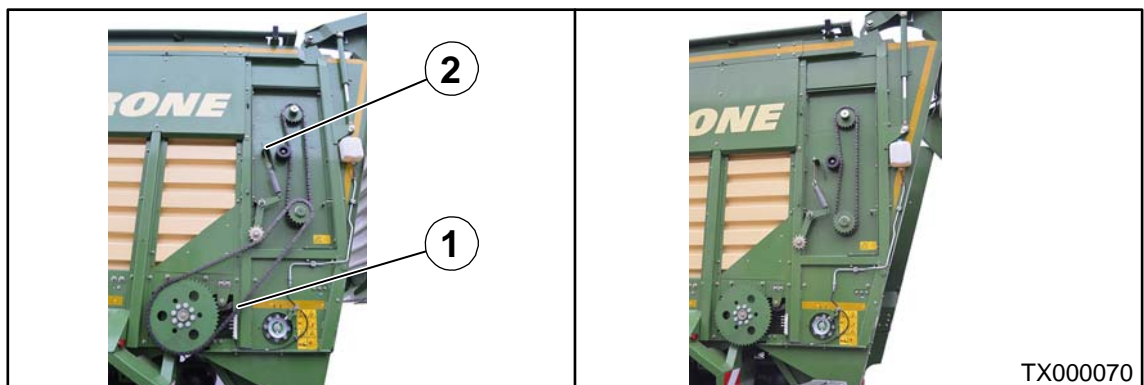


Fig. 54

- To release the drive chain (1), loosen the screw of the tension spring (2).
- Dismount drive chain (1).

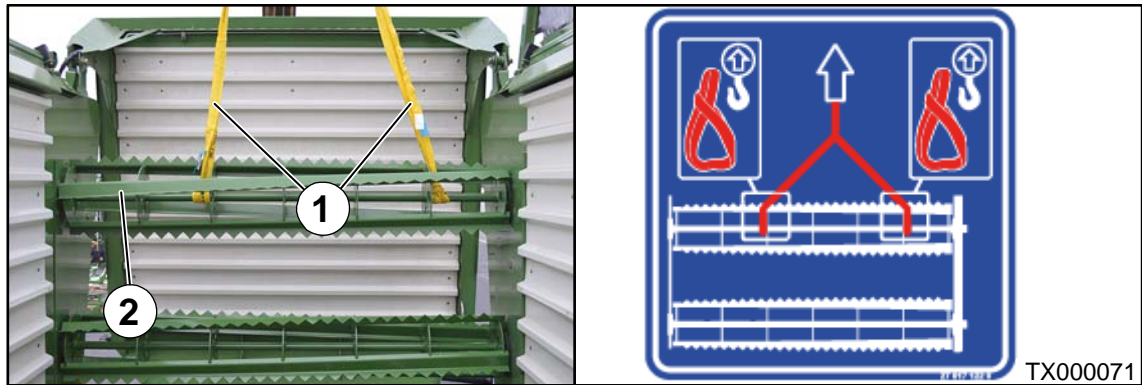


Fig. 55

The weight of the discharge roller unit is approx. 350 kg.



Note

Due to the centre of gravity, the sling must be mounted eccentrically on the discharge roller unit so that the discharge roller unit is suspended horizontally when lifting it out.

- Hook sling (1) into upper discharge roller (2).

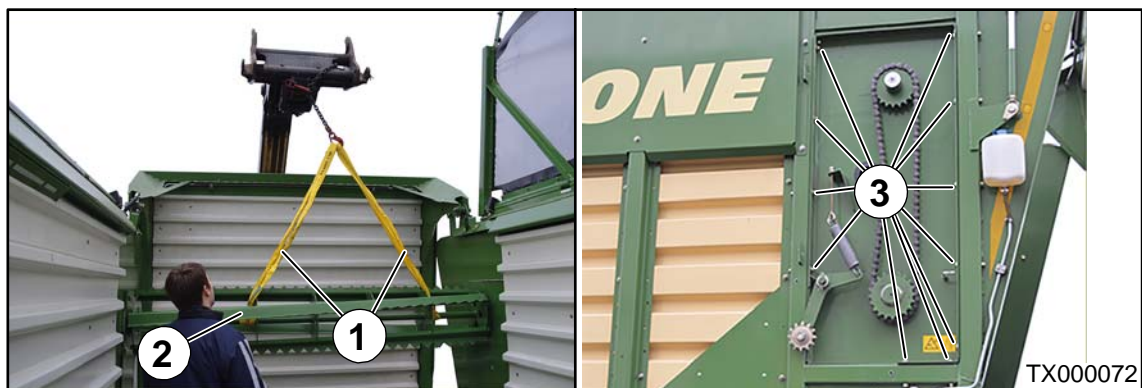


Fig. 56

- Keep sling (1) slightly tensioned to secure the position of the discharge roller unit (2).
- Dismount screw connections (3) on the sidewalls.

The discharge roller unit (2) hangs freely in the hoist after all screws have been unscrewed.

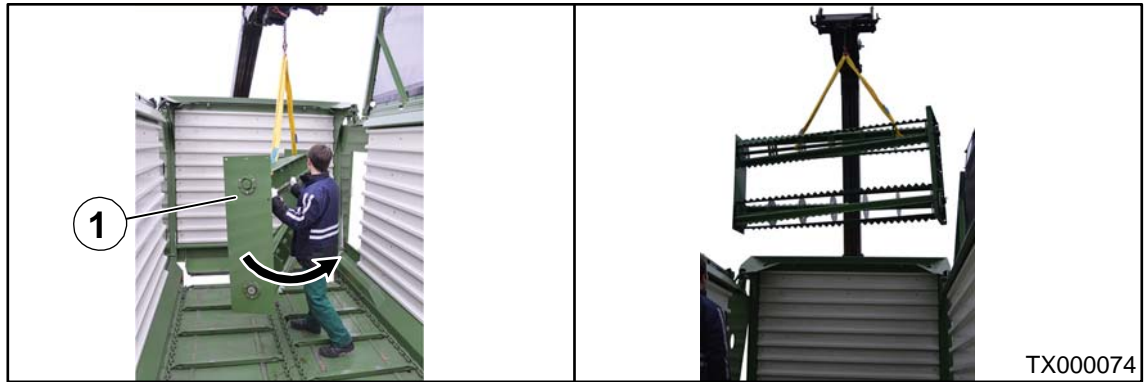


Fig. 57

- Rotate discharge roller unit (1) in the sling and lift it upwards out of the forage wagon.



Fig. 58

- Put discharge roller unit (1) down on firm and level ground.
- Secure discharge roller unit (1) against overturning.

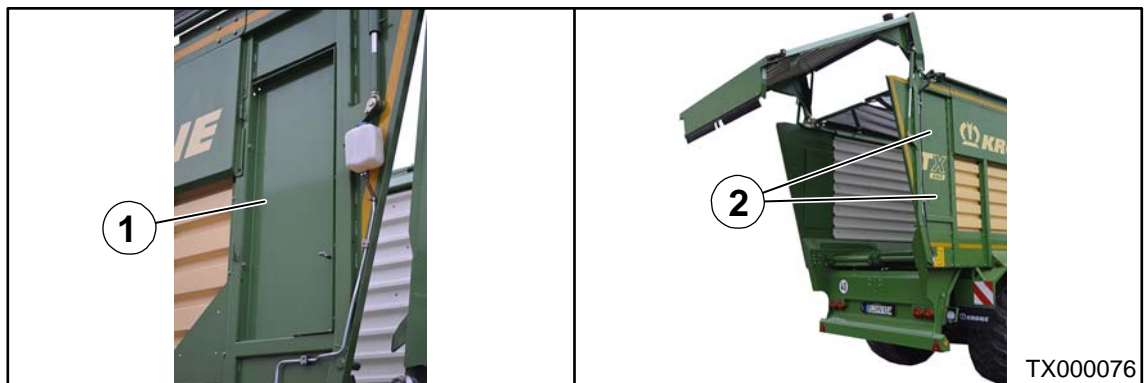


Fig. 59

- To close the openings in the loading area, mount covering panel (1) and (2).

9.16.2 Installing Discharge Roller Unit



WARNING!

Risk of injury due to suspended load!

There is a danger for persons due to falling load.

- To mount and dismount parts, only use suitable, approved and intact hoists.
- Pay attention to sufficient carrying load of the hoist.
- To mount and dismount parts, only use suitable, approved and intact slings.
- Pay attention to the valid period of use of the sling.
- Do not stay under the suspended load.

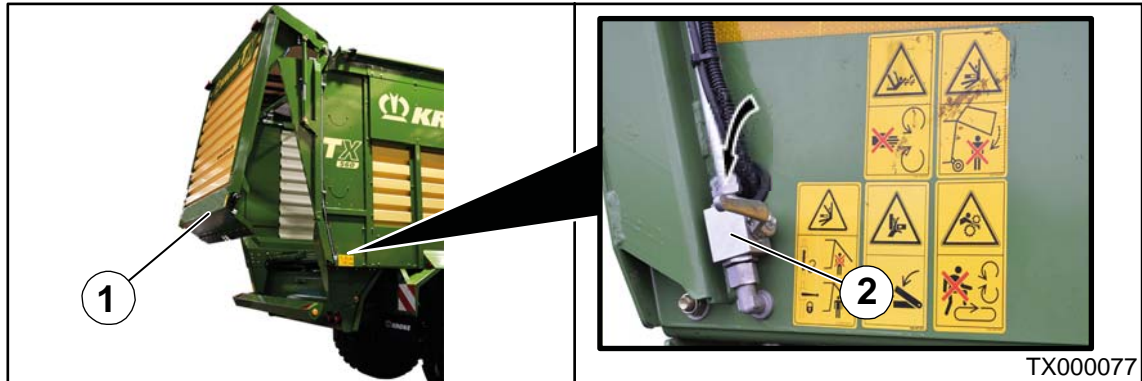


Fig. 60

- Open tailgate (1) approx. 50 cm.
- Open loading area cover via tractor control unit so that assembly of discharge roller unit is not impeded and the chain drive of discharge rollers is not covered.
- Switch tractor control unit to float position so that the brake in the hydraulic motor prevents unintentional lowering of loading area cover.
- Switch off tractor engine, remove the ignition key and carry it with you.
- Secure stop cock (2) and tailgate (1) against unintentional lowering.

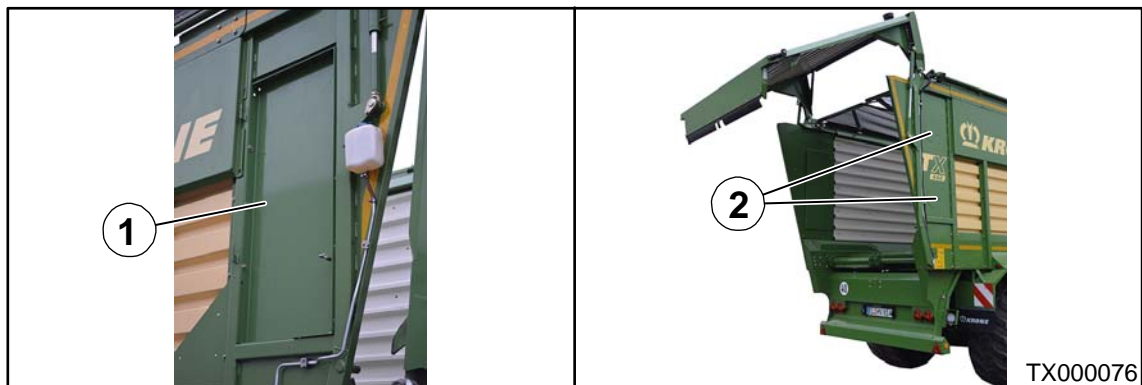


Fig. 61

- Dismount covering panel (1) and (2).

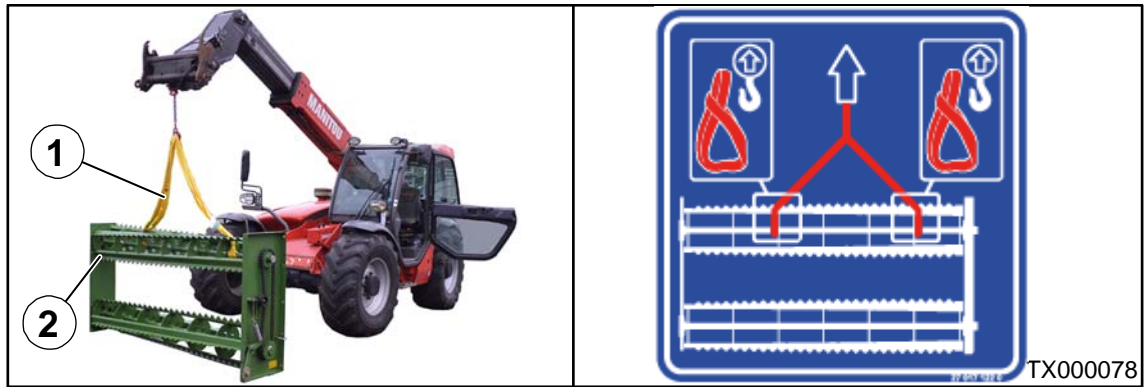


Fig. 62

The weight of the discharge roller unit is approx. 350 kg.



Note

Due to the centre of gravity, the sling must be mounted eccentrically on the discharge roller unit so that the discharge roller unit is suspended horizontally when lifting it out.

- Hook sling (1) into upper discharge roller (2).

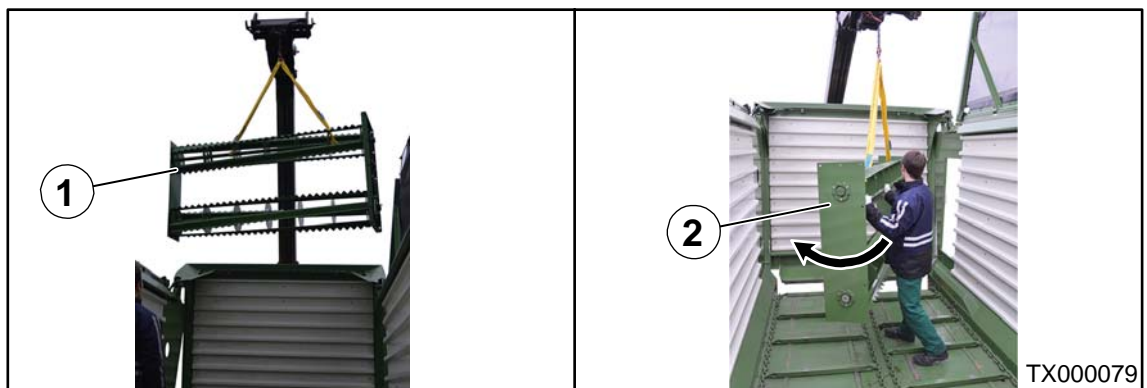


Fig. 63

- Lift the discharge roller unit (1) into the forage wagon.
- Position discharge roller unit (2) in the loading area openings. To do this, rotate it in the sling. Make sure that the drive side is on the left-hand machine side.



Fig. 64

- Keep sling (1) slightly tensioned to secure the position of the discharge roller unit (2).
- Mount screw connections (3) on the side walls.
- Remove sling (1) from the discharge roller unit.

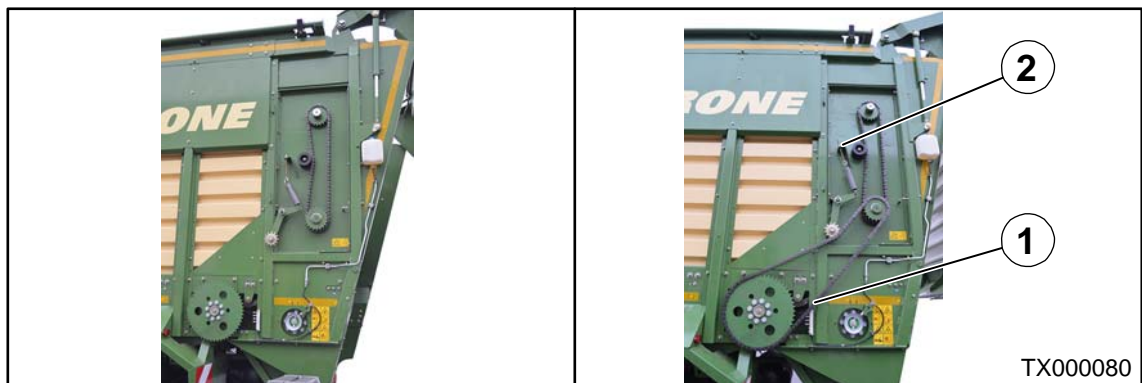


Fig. 65

- Mount drive chain (1).
- To tension the drive chain (1), tighten screw of tension spring (2).



Fig. 66

- Mount chain guard (1) and (2).
- To test functionality, perform test run, refer to chapter Operation "Unloading Process".

10

Operation

**WARNING!****Risk of injury to people or animals by the machine or machine parts!**

If people or animals remain in the danger zone of the machine or enter the danger zone during operation, there is an increased risk to the health of these people.

- Do not start the machine until all safety devices have been fitted and are in sound condition.
- Ensure that there are no people or animals in the danger zone of the machine (safety distance: 3 m at the side, 5 m behind the machine).

If there are people or animals in the danger zone:

- Stop the machine immediately.
- Switch off the PTO shaft.
- Instruct persons to leave the danger zone.
- Do not restart the machine until there are no persons or animals in the danger zone.

The following work steps are described in this chapter:

- Activating machine parts via hydraulics
- Determining the payload weight
- Avoid overload by using weight display (optional)
- The loading process
- The unloading process
- Putting down the machine

10.1 Activating Parts by Using Hydraulics

Raising tailgate:

- To raise the tailgate, activate the single-action control unit (green 1+).

Lowering tailgate:

- To lower the tailgate, move single-action control unit (green 1+) into float position.

Raising drawbar:

- Activate double-action control unit (yellow 2+) to raise the drawbar.

Lowering drawbar:

- Activate double-action control unit (yellow 2-) to lower the drawbar.

Locking the steering axle (optional):

- Activate the single-action control unit (yellow 3) to lock the steering axle.

Releasing the steering axle (optional):

- Move single-action control unit (yellow 3) into float position to release steering axle.

Raising lift axle (optional):

- Activate the single-action control unit (yellow 3) to raise the lift axle.

Lowering lift axle (optional):

- Move single-action control unit (yellow 3) into float position to lower the lift axle.

Opening loading area cover (optional):

- Activate the double-action control unit (blue 6+) to open the loading area cover.

Closing loading area cover (optional):

- Activate the double-action control unit (blue 6-) to close the loading area cover.

10.2 Avoiding Overload

Make certain when loading the loading wagon that all materials in the load have the same density.

To avoid overloading the loading wagon when forage is heavy, follow these steps:

1 Determining payload weight

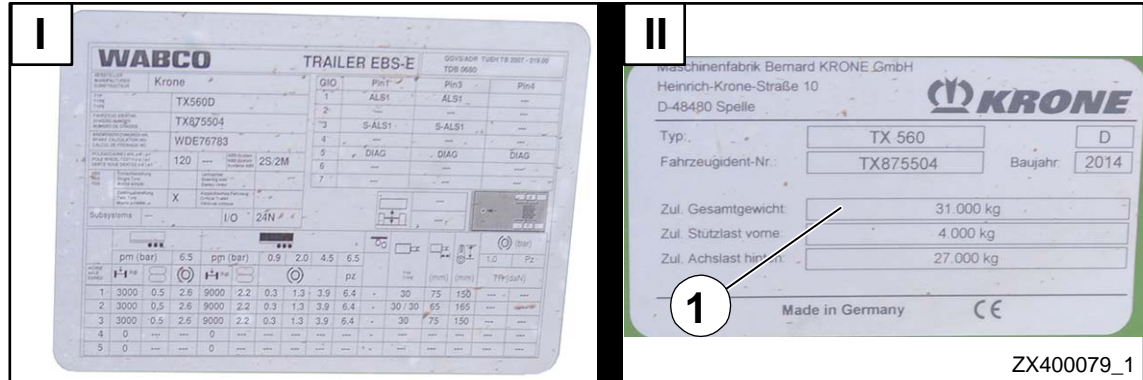


Fig. 67

Payload weight = Gross vehicle weight (1) - tare weight of vehicle

- The information on the gross vehicle weight (1) can be found on type plate (II) (also refer to chapter Technical Data of Machine "Technical Data").
- The information on axle load can be found on the ALB sign (I) (also refer to chapter Technical Data of Machine "Technical Data").

2 Determining the Specific Weight of Loaded Goods

The following table values provide rough approximations for the specific weights of common loading goods.

	Grass silage "dry"	Grass silage "moist"	Maize silage
DS content	approx. 40%	approx. 30%	approx. 30%
Specific weight of the loaded goods	approx. 250 kg/m ³	approx. 400 kg/m ³	approx. 400 kg/m ³

DS= Dry substance of loaded goods

3 Calculating the permissible loading volume

Max. permissible loading volume = payload weight : specific weight of the loaded goods



Note

The loading volume of the respective machine type (according to DIN) can be found in chapter Technical Data.

Once you have calculated the permissible loading volume, fill the forage wagon up to that loading volume as a maximum.

As you do so, observe general conditions (tractor size, position on slope, supporting surface, etc.).

10.3 Avoiding Overload with Weight Display (optional)

To avoid overload of the machine, the loading weight can be checked during loading process with weight display (optional) on the pressure gauges (2, 3).

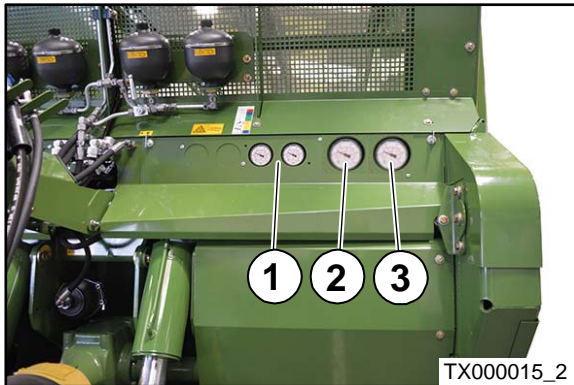


Fig. 68

The pressures in the hydraulic systems of drawbar suspension and axle unit are respectively displayed on a pressure gauge (2, 3). With increasing loading weight, the pressures will also rise.

To become familiar with pressure gauge display, the pressures displayed on the pressure gauges (2, 3) must be determined first once the machine is loaded with the payload weight.

Determining payload

- Weigh the attachment consisting of tractor and unloaded forage transport wagon and write down the weight.
- Load the machine
- Weigh the attachment consisting of tractor and loaded forage transport wagon and write down the weight.
- Calculating the loading weight:
Loading weight = weight of the loaded attachment - weight of the unloaded attachment

If the loading weight falls below the maximum payload weight:

- Write down the displayed pressures on the pressure gauges (2, 3).

If the loading weight exceeds the maximum payload weight:

- Load forage transport wagon with a smaller quantity of loading material and weigh the attachment again. If necessary, repeat this process until the maximum payload weight is no longer exceeded.
- Write down the displayed pressures on the pressure gauges (2, 3).

The loading weight must not exceed the maximum payload weight!

- Only load forage transport wagon until the noted pressures on the pressure gauges (2, 3) are reached.
This ensures that the loading weight does not exceed the maximum payload weight.

10.4

Loading process

**Danger! - Driving response changes**

Effect: Danger to life, injuries or damage to the machine.

Make certain during road travel that the loading area is loaded evenly along its entire length. Other loading states can change driving response.

Precondition for loading:

- The tailgate is closed.
- The self-steering axle is unlocked, optional.
- The lift axle of the tridem axle is lowered, optional.
- The loading area cover is opened, optional.
 - Move the double-action control unit (6+/6-) into float position to activate the hydraulic motor brake of the loading area cover.

Starting the loading process:

- Turn on the tractor.
- Make certain there is no one in the working range of the machine.
- Lower the front part of the transport wagon with drawbar while the tractor attachment drives behind the forage harvester.
- Align transport wagon with drawbar horizontally if the tractor attachment drives next to the forage harvester.
- Choose driving speed and distance to the vehicle driving alongside so that the transport wagon is loaded safely and correctly.

10.5 Unloading Process



Danger! - Driving over silos

Effect: Danger to life, injuries or damage to the machine.
Steering axle must be locked while driving over.
No persons may remain in the danger zone.



Warning! - Opening the tailgate

Effect: Injuries or damage to the machine

- No one is permitted in the swivel range when opening the tailgate.



Note

The PTO shaft of the tractor must only be activated when the tailgate is opened and the PTO shaft is operating on idle.

For the “without discharge rollers” version

Unloading process:

- For the “self-steering axle” version: Lock the self-steering axle via single-acting control unit (yellow 3+) of the tractor.
- For the “without hydraulic unloading aid” version: Actuate the single-acting control unit (green 1+) of the tractor until the tailgate is open.
- For the “hydraulic unloading aid” version: To ensure that the front wall is swivelled back automatically when unloading, actuate the single-acting control unit (green 1+) of the tractor for approximately 20 s.
- Switch on the PTO shaft of the tractor at idle.

At the start of the unloading process a large amount of loading material is unloaded.

- Move forward quickly so that the loading material can fall freely.

At the end, the amount of material unloaded reduces due to construction.

- If the loading material does not completely fill the tailgate opening, reduce the speed of the tractor while keeping the scraper conveyor speed at a constant level.

After unloading:

- Switch off the PTO shaft of the tractor.

The scraper conveyor switches off automatically when the PTO shaft is switched off.

- Move the single-acting control unit (green 1+) of the tractor to the float position until the tailgate is closed.

For the “hydraulic unloading aid” version: When closing the tailgate, the front wall is swivelled forward automatically due to the spring force.

- For the “self-steering axle” version: Unlock the self-steering axle via single-acting control unit (yellow 3+) of the tractor.

For the “with discharge rollers” version**Unloading process:**

- For the “self-steering axle” version: Lock the self-steering axle via the single-acting control unit (yellow 3+) of the tractor.
- For the “without hydraulic unloading aid” version: Actuate the single-acting control unit (green 1+) of the tractor until the tailgate is open.
- For the “hydraulic unloading aid” version: To ensure that the front wall is swivelled back automatically when unloading, actuate the single-acting control unit (green 1+) of the tractor for approximately 20 s.
- Switch on the PTO shaft of the tractor at idle.

At the start of the unloading process a large amount of loading material is unloaded.

- Move forward quickly so that the loading material can fall freely.

At the end, the amount of material unloaded reduces due to construction.

- In case there are swirls visible on the upper discharge roller, reduce the tractor speed while keeping the scraper conveyor speed at a constant level.

After unloading:

- Switch off the PTO shaft of the tractor.

The scraper conveyor and the discharge rollers switch off automatically when the PTO shaft is switched off.

- Move the single-acting control unit (green 1+) of the tractor to the float position until the tailgate is closed.

For the “hydraulic unloading aid” version: When closing the tailgate, the front wall is swivelled forward automatically due to the spring force.

- For the “self-steering axle” version: Unlock the self-steering axle via the single-acting control unit (yellow 3+) of the tractor.

m

10.6 Parking



Danger! - Unexpected movements of the machine

Effect: Danger to life, serious injuries

- No persons may remain in the danger zone.
- The machine must not be loaded while it is parked.
- Park the machine on a solid surface.
- You should uncouple the machine only when the engine has been switched off and the ignition key has been removed.
- Secure the tractor against rolling.
- Use extreme caution when attaching implements to or detaching them from the tractor! The accident prevention regulations must be complied with absolutely.
- When connecting the hydraulic hose to and disconnecting it from the hydraulic system of the tractor, the tractor system as well as the machine system must be depressurised! Move the appropriate control valves into the flow position.

Compressed air braking system:

- Always disconnect the red coupling head first (reserves line) and then the yellow coupling head (brake line).

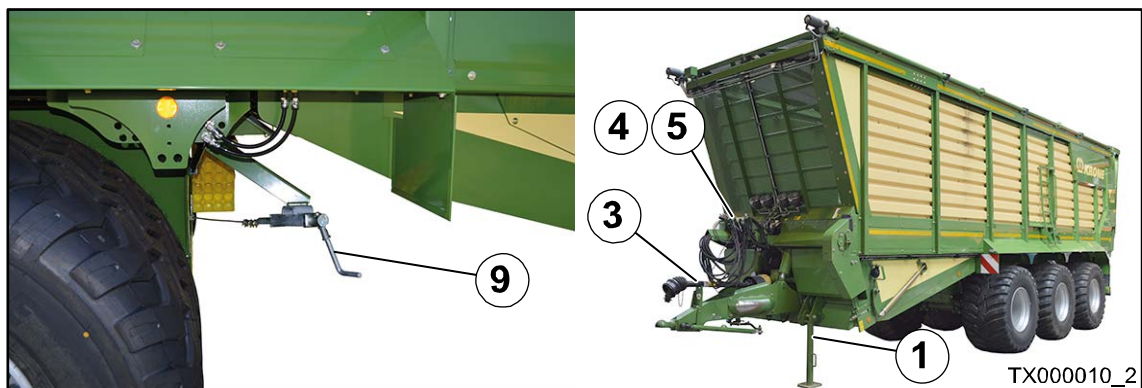


Fig. 69

When parking the machine, proceed as follows:

- Secure the machine with parking brake (9).
- Slightly lift the wagon front over the drawbar.
- Swivel support (1) down and secure it.
- Carefully lower the articulated drawbar until the support (1) is resting on the ground.
- Disconnect drawbar eye for ball attachment Ø50.
- Loosen the locking for drawbar eye for ball attachment Ø80.
- Lower the drawbar via the double-action control unit (yellow 2-) until the ball attachment of the tractor is free.
- Relieve all pressure from the hydraulic system
- Disconnect hydraulic hoses (4) from the tractor
- Disconnect compressed air hoses (5)



Note

Insert the disconnected hydraulic hoses (4) into the designated hose supports on the gearbox to prevent dirt from getting into the coupling pieces. Use cover caps to close off the hose ends.

- Disconnect the electrical connections
- Disconnect universal shaft (3) on tractor side and set it down on the machine.

10.6.1 Wheel chocks



Fig. 70

The wheel chocks (1) are located centred in front of the front axle.

- Place one wheel chock in front of the wheel and one behind a wheel of the front axle to secure the machine against rolling.

11 KRONE Operation Panel



CAUTION! - Protect operation panel

Water, high air humidity and overvoltage may damage the operation panel.

- Protect the operation panel from water.
- If the machine is not used for an extended period of time (for example during the winter), the operation panel must be stored in a dry place.
- For mounting and repair jobs, especially for welding jobs on the machine, disconnect the power supply to the operation panel. Overvoltage may damage the electronics of the operation panel.




The operation panel is for machines without control. By means of the operation panel, the LED working lights are switched on and off via toggle switch. The LEDs show the status of operation panel, LED working lights and tailgate.

11.1 Overview



Fig. 71

Toggle switch

Pos.	Position of toggle switch	Meaning
2	 (bottom)	Operation panel off
	 (centre)	Operation panel on (tailgate control active)
	 (top)	Operation panel on (tailgate control active, working lights on)

Status LEDs

Pos.	Status	Meaning
1	The status LED is not lit.	Operation panel off
	The status LED lights up red.	Operation panel on (tailgate control active)
	The status LED lights up yellow.	Operation panel on (tailgate control active, working lights on)
3	The status LED is not lit.	Tailgate closed
	The status LED lights up red.	Tailgate not locked/open
	The status LED lights up yellow.	Tailgate fully open

11.2

Switching Operation Panel ON/OFF

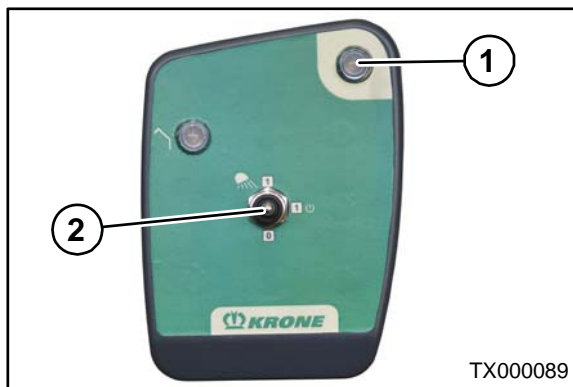




Fig. 72

Switching on

- Switch the toggle switch (2) from  to .
- The status LED (1) lights up red. The operation panel is switched on. The tailgate control is activated.

Switching off

- Switch the toggle switch (2) from  to .
- The status LED (1) goes out. The operation panel is switched off. The tailgate control is deactivated.

11.3 Switching LED Working Lights On/Off

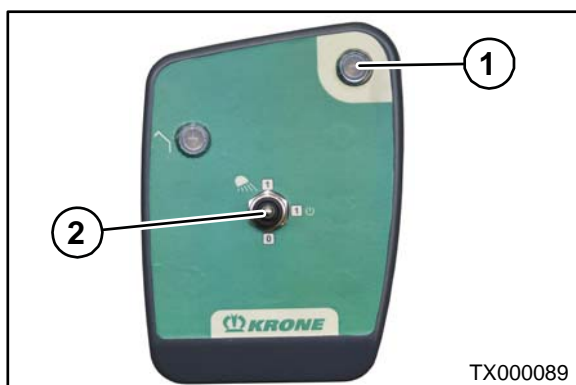



Fig. 73

Prerequisite:

- The operation panel is switched on, refer to chapter KRONE Operation Panel, “Switching Operation Panel On/Off”

Switching on

- Switch the toggle switch (2) from  to . The status LED (1) lights up yellow. The LED working lights are switched on.

Switching off

- Switch the toggle switch (2) from  to . The status LED (1) lights up red. The LED working lights are switched off.

11.4

Status LED Tailgate



Fig. 74

Opening tailgate

- Open the tailgate via tractor hydraulics, refer to chapter Operation “Actuating Parts via Hydraulics”.

The status LED (3) lights up red. The tailgate is not locked/open.

The status LED (3) lights up yellow. The tailgate is fully open.

Closing tailgate

- Close the tailgate via tractor hydraulics, refer to chapter Operation “Actuating Parts via Hydraulics”.

The status LED (3) lights up red. The tailgate is not locked/open.

The status LED (3) goes out. The tailgate is closed.

12 KRONE ISOBUS Terminal



CAUTION! Protect the terminal

Water, high air humidity and overvoltage can cause damage to the terminal.

- Protect the terminal from water.
 - If the machine is not used for an extended period of time (for example in winter), the terminal must be stored in a dry place.
 - For mounting and repair jobs, especially for welding jobs on the machine, disconnect the power supply to the terminal. The electronics of the terminal may be damaged due to overvoltage.
-

12.1 General Information on ISOBUS



Note

KRONE ISOBUS systems are regularly subject to ISOBUS COMPATIBILITY TEST (AEF Conformance Test). The operation of this machine at least requires implementation level 3 of ISOBUS system.

The ISOBUS system is an internationally standardized communication system for agricultural machines and systems. The designation of the related series of standards is: ISO 11783. The agricultural ISOBUS system makes an information and data exchange between tractor and device of different manufacturers possible. To this end, both, the necessary plug connections and the signals are standardized which are necessary for the communication and command transmission. The system also enables the operation of machines with control units (terminal) which are already existent on the tractor or have been attached in the tractor cabin. The relevant details can be found in the technical documentation of the control unit or on the device itself.

Those KRONE machines which are ISOBUS equipped are adapted to this system.

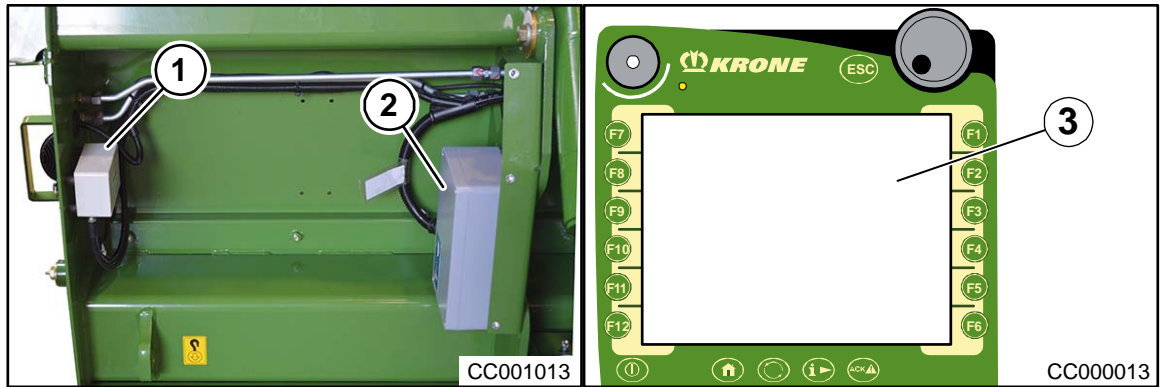


Fig. 75

The electronic equipment of the machine consists essentially of the job computer (2), the electronics for the weighing device (1) as well as the terminal (3) and the control and function elements.

The job computer (2) and the electronics for the weighing device (1) are at the front right of the machine under the guard sheet. Their functions are:

- Weighing device control
- Wagonload counter
- Control of the actuators installed on the machine
- Transfer of alarm messages
- Diagnostics of sensors/actuators

The terminal (3) communicates information to the driver and performs settings to operate the machine. This information is received and further processed by the job computer.

12.2 ISOBUS Shortcut Button



WARNING!

The ISOBUS Shortcut Button is not an EMERGENCY STOP switch. If the ISOBUS Shortcut Button is mistaken for the EMERGENCY STOP switch, there is danger to life.

When actuating the ISOBUS Shortcut Button, activated machine functions are deactivated. Process oriented procedures are executed until the end. Therefore machine parts may continue to run after ISOBUS Shortcut Button is actuated. This may lead to injuries.

In no event the ISOBUS Shortcut Button intervenes in tractor functions. This means that neither the universal shaft function nor the hydraulic function is affected. Therefore the machine can continue to run after ISOBUS Shortcut Button is actuated. This may lead to injuries.

- Never use the ISOBUS Shortcut Button as an EMERGENCY STOP switch.

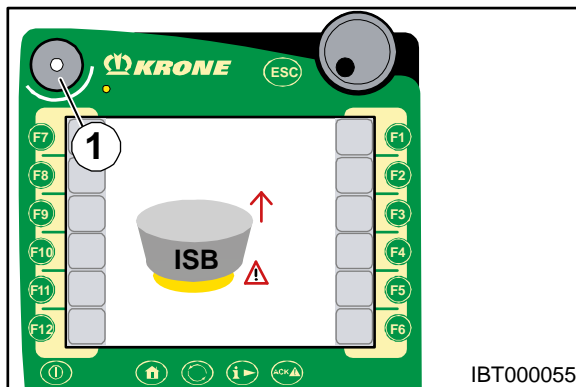


Fig. 76

When actuating the ISOBUS Shortcut Button (1) of the terminal which is of the pushbutton design, a stop command is sent to the ISOBUS. This instruction is evaluated by the connected ISOBUS machine in order to deactivate activated machine functions. Process oriented procedures are executed until the end.

Actuating ISOBUS Shortcut Button

- Press the ISOBUS Shortcut Button (1).

The above message appears in the display. The job computer blocks all hydraulic functions on machine side as well as the electronic tying device.

The job computer blocks the following functions on machine side:

- Lighting

Releasing ISOBUS shortcut button

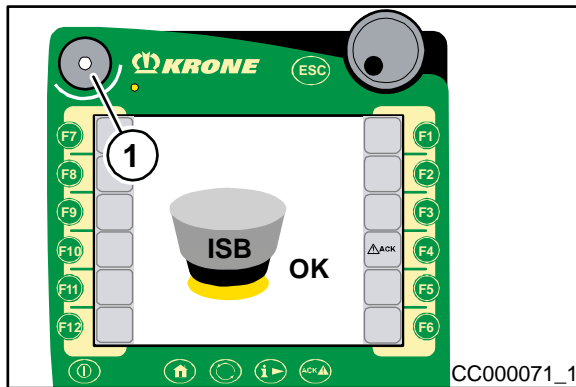




Fig. 77

- Turn the ISOBUS shortcut button (1) clockwise.
The display shows the above message.
- Press the  key.
(Alternatively  or the adjacent key can be pressed.)
All functions of the machine are available again.

12.3

Touch Sensitive Display

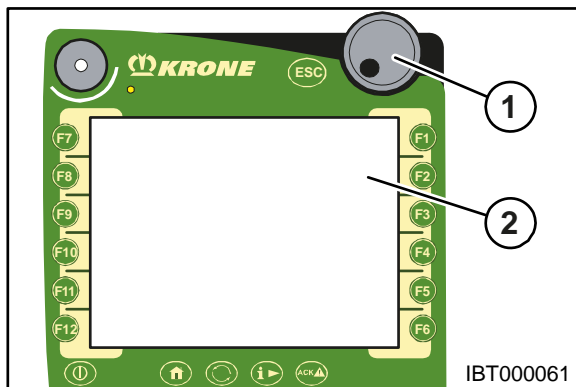


Fig. 78

The terminal is equipped with a touch screen (2) for menu guidance and entry of values/data. Functions can directly be called and values can be changed by touching the display.

12.4 Switching Terminal On or Off

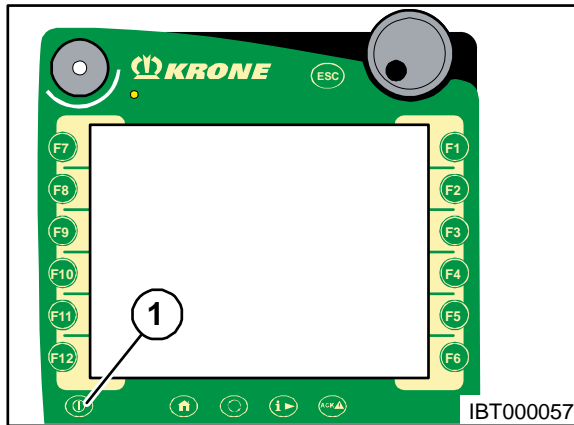



Fig. 79

Switching on

- Press  and hold it down.


When the machine is not connected, the display shows the main menu after it was switched on.

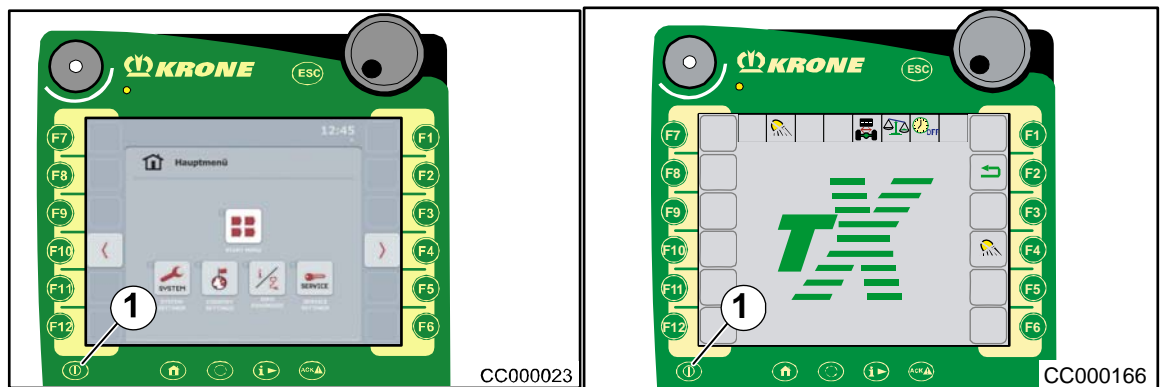
When the machine is connected, the display shows the road travel screen after it was switched on.

The terminal is ready to work.

m

Switching off

- Press and hold .



When machine is not connected

When machine is connected (road travel)

Fig. 80



Note

For more details on how the terminal functions, please refer to the supplied terminal operating instructions.



Note - Before first use with connected machine

When the terminal is switched on for the first time, the configuration of the machine is loaded into the terminal and saved in the terminal memory. The loading process may take several minutes.

12.5 Display Design

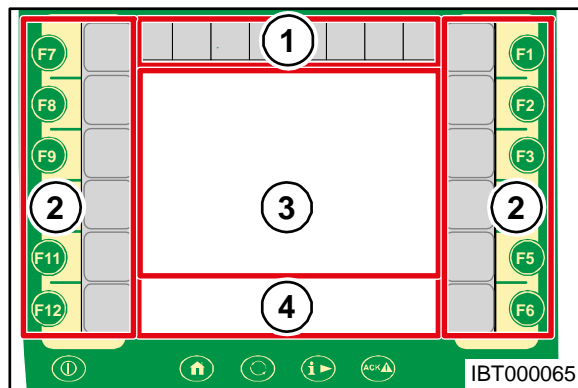


Fig. 81

The display of the terminal is divided into the following areas:

Status line (1)

The status line shows the current states of the machine (depending on how it is equipped).

Keys (2)

The machine is operated by actuating the keys (2) or by tapping the adjacent icons.

Main window (3)

Blue values (numbers) in the main window can be selected via touch function.

There are the following main window screens:

- Road travel screen
- Working screen (see chapter “Terminal - Machine Functions”)
- Menu level (see chapter “Terminal- Menus”)

Information bar (4)

The information bar (4) displays information about the working screen.

13 External ISOBUS Terminal

13.1 General Information on ISOBUS



DANGER!

When using terminals and other operation units which have not been delivered by KRONE mind that the user:

- has to assume responsibility for use of KRONE machines when using the machine on operation units that have not been delivered by KRONE (terminal/other operating elements).
- must check before using the machine whether all machine functions are executed just like they are described in the enclosed operating instructions.
- connects if possible only those systems with each other that have passed AEF Conformance test (so-called ISOBUS COMPATIBILITY TEST) beforehand.
- has to follow the operating and safety instructions of the supplier of ISOBUS operation unit (e.g. terminal).
- must ensure that the used operating elements and machine controls concerning the IL ((IL = Implementations Level; describes compatibility levels of different software versions) are compatible with each other (condition: IL equal or greater).



Note

KRONE ISOBUS systems are regularly subject to ISOBUS COMPATIBILITY TEST (AEF Conformance Test). The operation of this machine at least requires implementation level 3 of ISOBUS system.

The ISOBUS system is an internationally standardized communication system for agricultural machines and systems. The designation of the related series of standards is: ISO 11783. The agricultural ISOBUS system makes an information and data exchange between tractor and device of different manufacturers possible. To this end, both, the necessary plug connections and the signals are standardized which are necessary for the communication and command transmission. The system also enables the operation of machines with control units (terminal) which are already existent on the tractor or have been attached in the tractor cabin. The relevant details can be found in the technical documentation of the control unit or on the device itself.

Those KRONE machines which are ISOBUS equipped are adapted to this system.

13.2 ISOBUS Shortcut Button not Available

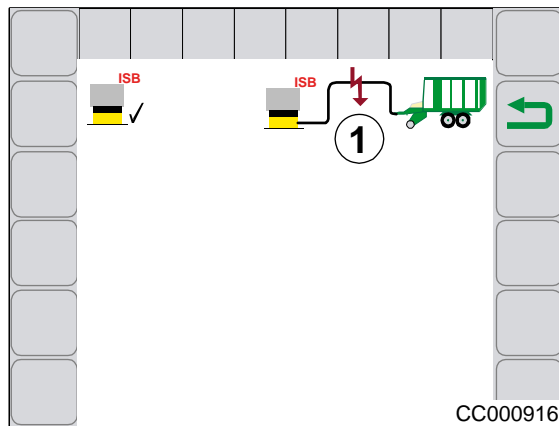


Fig. 82

If no ISOBUS Shortcut Button is available on ISOBUS terminals of other manufacturers, the icon (1) is shown in the display. It is not possible to switch off machine functions via ISOBUS Shortcut Button.

13.3 Deviating Functions from KRONE ISOBUS Terminal

By means of ISOBUS operation unit, information and control functions of the machine are provided on the display of the external ISOBUS terminal. The operation with an external ISOBUS terminal is similar to the KRONE ISOBUS terminal. Before start-up, the functionality of KRONE ISOBUS terminal is to be read in the operating instructions.

A significant difference to the KRONE ISOBUS terminal is the arrangement of icons and the number of keys, which are determined by the selected external ISOBUS terminal.

The functions which deviate from KRONE ISOBUS terminal are described in the following.



Note

The contrast for the KRONE terminal cannot be called up on other ISO terminals. Adjustment is performed directly via the ISO terminal, see the operating instructions supplied by the manufacturer of the ISO terminal.

If necessary, acoustic signals must be enabled from the terminal, see the operating instructions supplied by the manufacturer of the ISO terminal.



Note

The values which are set via scroll wheel on the KRONE ISOBUS terminal must be set on the foreign ISOBUS terminal by means of the selection key specified by the ISOBUS terminal (refer to operating instructions of ISOBUS terminal manufacturer).

14 Terminal – Machine Functions



WARNING!

Injury and/or machine damage due to failure to observe error messages!

When error messages are ignored by failing to correct the error, people may be injured and/or the machine may be damaged seriously.

- If an error message is displayed, correct the error.
 - For possible cause and remedy, refer to chapter “Error Messages.”
 - Contact KRONE customer service if the error cannot be corrected.

14.1 Status line

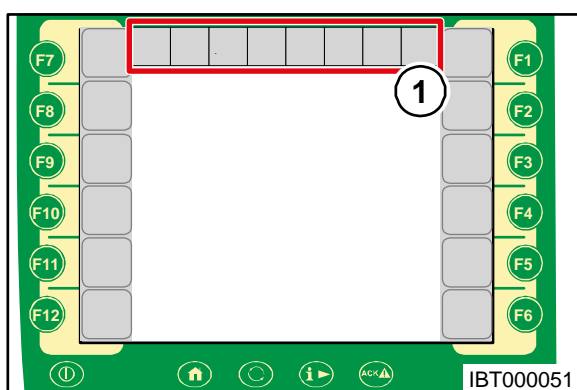

















Fig. 83

The status line (1) in the display shows current states of the machine (depending on equipment):

Icon	Designation	Explanation
	Alarm message present	– Touch sensitive, a mask with the present alarm messages opens.
	Working lights off	– Manual mode – Touch sensitive
	Working lights on	
	Working lights off	– “Automatic working lights” mode if the tractor control unit (T-ECU) provides data for lighting. – Touch sensitive
	Working lights on	
	Payload reached	
	Lift axle lowered	
	Lift axle raised	
	Operating hours counter deactivated	– Touch sensitive
	Operating hours counter activated	

With electronic forced steering design

Icon	Designation	Explanation
	Road mode	In road mode, the tandem axles are steered by the electronic system so that they follow the track of the tractor when driving forward and backward.
	Field mode	In field mode, manual changes can be carried out on the steering angle of forced steering.
	Forced steering has no oil supply	
	Error on the forced steering	
	Straight-ahead driving is calibrated	

14.2 Weight Control Basic Screen

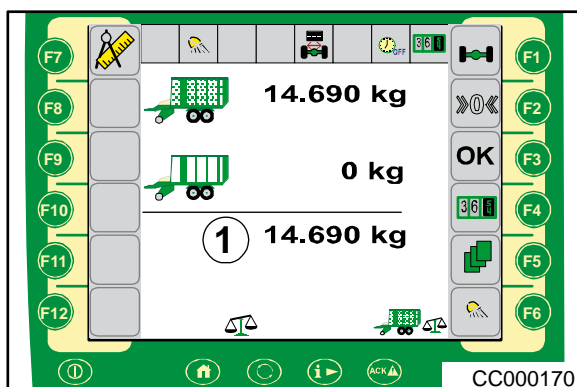











Fig. 84

Description of the symbols (II) for the function keys (F1 to F12)



Note

Which icons are available, depends on the equipment of the machine. The following represented icons are not always available.


Softkey	Meaning	Information
	Bringing up "Electronic Forced Steering" menu	
	Resetting the payload to zero	
	Saving payload	
	Bringing up customer counter menu	
	Bringing up menu level of the machine	
	Switching off working lights	The automatic working lights mode can be switched on when the tractor control unit (T-ECU) provides data for lighting.
	Switching on working lights	
	Switching off automatic working lights mode	The working lights of the machine are switched on or off from the tractor.
	Bringing up "Calibration" menu	Will appear only if payload is saved.

14.2.1 Bringing up the “Electronic Forced Steering” Menu

- Press the function key for softkey  to bring up the “Electronic Forced Steering”, the “Forced Steering” menu is displayed.


For information regarding settings, please refer to “Electronic Forced Steering” menu.

14.2.2 Bringing up a Menu Level

- To bring up the menu level of the machine, press the function key for softkey , the menu level of the machine is displayed.

If you need any further information, refer to chapter “Bringing up Menu Level”.

14.3 Calling menu “Counter/Detail Counter”


- Press  for calling the menu “Detail Counter”.



The menu “Detail Counter” is displayed.

14.3.1 Switching Working Floodlights On and Off

Activating the automatic working lights:



- As a prerequisite, the tractor control unit (T-ECU) must provide data for lighting.

- Press  to activate automatic loader.

The display either shows  **A** or  **A**.

Deactivating the automatic working lights:

- Press  **A** or  **A** in order to deactivate the automatic loader.

The display either shows  or .

14.4 Weight Control

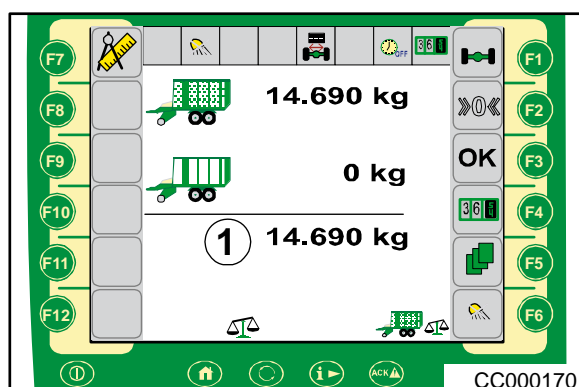










Fig. 85

Symbol	Meaning	Information
	Current payload	
	Tare weight	
1)	Unloading weight	The value will only be displayed when the payload is saved.
	Weight is determined.	
	Value is saved	
	“Weight control” basic screen	
	Steering angle drawbar	
	Steering angle forced steering / tridem axle	
	Steering angle lift axle (tridem axle)	

14.4.1 Saving Payload

Precondition for saving:

- The loading wagon is loaded and it is aligned horizontally to the ground.
- The brakes on loading wagon and tractor are released.
- The right customer counter is selected, refer to menu 13-1 “Customer Counter”.

With “tridem axle” design

- The lift axle is lowered, leave valve in float position.




CAUTION!

Each time the **OK** key is pressed without having unloaded before, the weight of the displayed payload is written in the customer counter. This results in wrong entries in the counters.

- Only press **OK** key when the payload weight should be saved and the transport wagon is unloaded afterwards.

If the attachment is at a standstill:


- Press **OK** for approx. three seconds to save the payload.

The symbol  appears and a signal sounds.


If the attachment drives:

- Press **OK** key for approx. 0.5 seconds to save the payload.

The system determines the weight. While the system determines the weight, the symbol (2) appears for approx. 20 seconds. The determined weight is saved after approx. 20 seconds.

The symbol  appears and a signal sounds.


Bring up “Customer Counter” menu on which the weight should be saved.

- Press  to bring up the “Customer Counter” menu

For the remainder of the procedure, refer to sub-menu 13-1 “Customer Counter”.

Setting the payload to zero

The payload must be set to zero if it shows a value that is greater than zero when it is unloaded.

- Press  to reset the payload to zero.

14.5

“Electronic Forced Steering” Menu

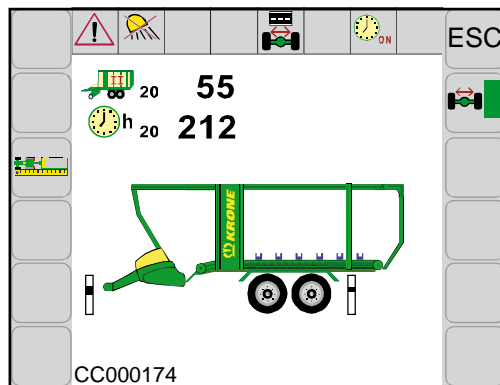





Fig. 86

Softkey	Description
	Closes the menu currently displayed.
	Changes to the “Forced Steering Field Mode” menu.
	Changes to the “Calibrating Straight-Ahead Driving” menu.

14.6 “Calibrating Straight-Ahead Driving” Menu

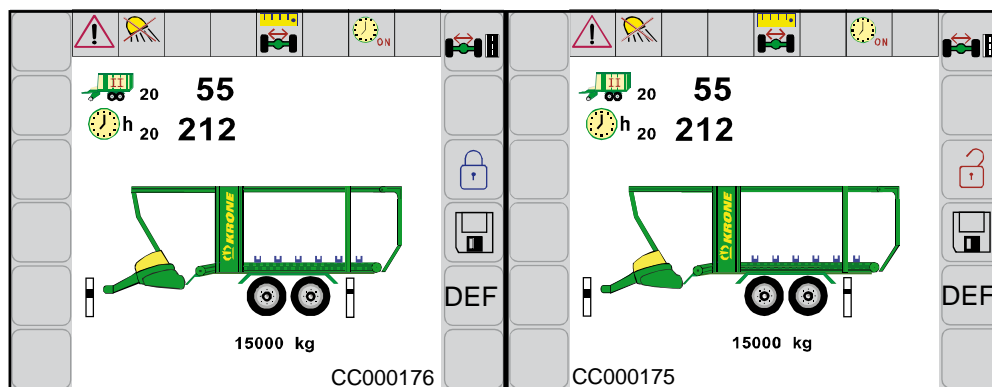











Fig. 87

Softkey	Description
	Changes to the „Electronic Forced Steering“ menu
	Switches the steering axle to guided coast-down
	Leave the menu without saving
	Save the calibration
	Reset to factory setting

Calibrating the tractor for straight-ahead driving:

- Press function key for softkey .
- The tractor must drive forward with a speed of less than 5 km/h until the loading wagon is straight behind the tractor.
- Press the function key for softkey  to save the calibration.
- Press the function key for softkey  so that the calibration is not saved.
- Press the function key for softkey  to bring up the factory setting.



Note

The track rod must be adjusted if the calibration cannot be saved.

14.7 “Forced Steering Field Mode” Menu

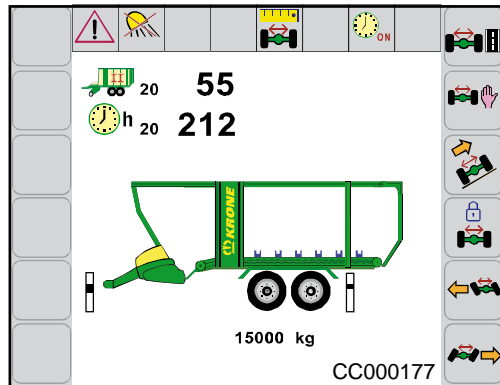















Fig. 88

Softkey	Description	Information
	Switches to the "Electronic positive steering" menu.	
	Positive steering "manual mode"	The wheels remain in the set position and no longer follow the track of the tractor.
	Positive steering on slopes	The wheels follow the track of the tractor, with the changed steer angle.
	Lock positive steering	Depending on their position, the wheels straighten themselves when moving and no longer follow the track of the tractor when they have straightened themselves.
	Set steer angle to left.	
	Set steer angle to right.	
	Closes the menu which is currently open.	


Positive steering manual mode

- To activate positive steering "manual mode", press .
- To adjust the steer angle to the right, press .
- To adjust the steer angle to the left, press .

Positive steering on slopes

- To activate positive steering on slopes, press .
- The softkey flashes.
- To adjust the steer angle to the right, press .
 - To adjust the steer angle to the left, press .











Lock positive steering



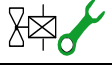



- To lock positive steering, press .
- The softkey flashes.

Terminal – Menus












15 Terminal – Menus

15.1 Menu level

Main menu	Sub-menu	Designation
7 		Weight Control
13 		Counters
	13-1 Σ_n 	Customer Counter
	13-2 Σ_{all} 	Total Counter
14 		ISOBUS Settings
	14-1 	Diagnostics Auxiliary (AUX)
	14-2 	Driving Speed Display Diagnostics / Motion Direction Display Diagnostics
	14-3 	Setting the Background Colour
	14-7 	Virtual Terminal (VT)
	14-9 	Switching Between the Terminals

15 		Settings
	15-1 	Sensor Test
	15-2 	Actuator Test
	15-4 	Error List
	15-5 	Information
	15-6 	Technician

15.2 Recurring Icons

Symbol	Designation	Explanation
	Up arrow	Move up to select something.
	Down arrow	Move down to select something.
	Right arrow	Move right to select something.
	Left arrow	Move left to select something.
	OK	Save the setting.
	ESC	Leave the menu without saving. The previously selected work screen is selected by holding down the key.
	DEF	Reset to factory setting.
	Plus	Increase the value. Display next mode.
	Minus	Reduce the value. Display previous mode.
	Sensor test	Quick access to the sensor test of the sensors responsible for this menu.
	Actuator test	Quick access to the actuator test of the actuators responsible for this menu.

15.3 Calling up the menu level

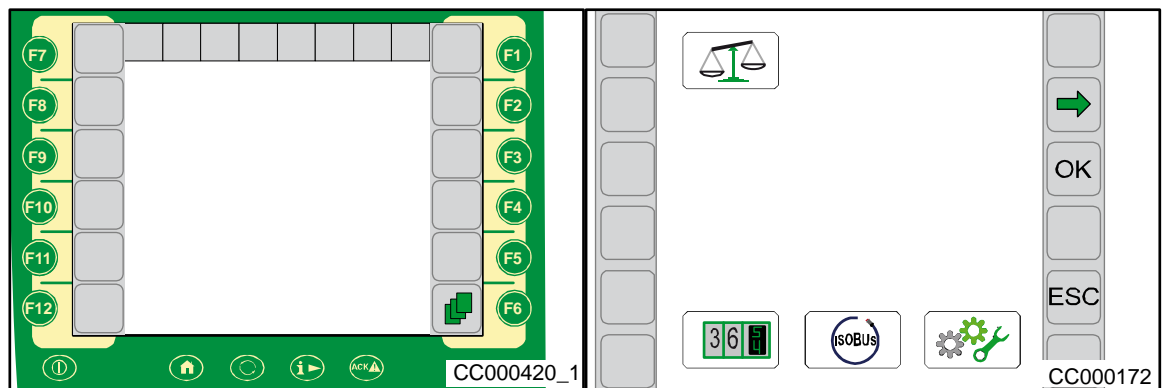









Fig. 89

- Press  to bring up the menu level from the basic screen.

Depending on how the machine is equipped, main menu level is divided into the following main menus:

Main menu	Description
	Main menu 7 "Weight Control"
	Main menu 13 "Counters"
	Main menu 14 "ISOBUS Settings"
	Main menu 15 "Settings"

Symbol	Meaning
	Selecting the previous menu
	Selecting the next menu
OK	Opening menu
ESC	Leaving menu

15.4 Changing the value

Values must be entered or changed for the settings in the menus.

There are three options for doing this:

- Using the scroll wheel.

- Press on  or .

- By tapping on the blue value on the display.

If a numerical value is tapped, an input mask opens. For further information on entering values see the supplied terminal operating instructions.

Examples:

Using the scroll wheel

- Select the required value using the scroll wheel.

The value is highlighted in colour.

- Press the scroll wheel.


An input mask opens.


- To increase or reduce the value, turn the scroll wheel.
- To save the value, press the scroll wheel.


The setting is saved and the input mask closes.


Using Plus/Minus

The  symbol in the upper line indicates that the value has been saved.


- To increase the value, press .

- To reduce the value, press .

The  symbol in the upper line disappears.

- To save the value, press .

The set value is saved.

The  symbol is displayed in the upper line.

Using the value

- Tap the value.

An input mask opens.



- Increase or decrease the value.
- To save the value, press **OK**.


The setting is saved and the input mask closes.


15.5 Changing mode

It is possible to select between different modes in individual menus.


The  symbol in the upper line indicates that the displayed mode is saved.

- To open the next mode, press .
- To open the previous mode, press .

The  symbol in the upper line disappears.

- To save the mode, press .

The set mode is saved and the  symbol is displayed in the upper line.

- To leave the menu, press .

15.6 Main Menu 7 “Weight Control”

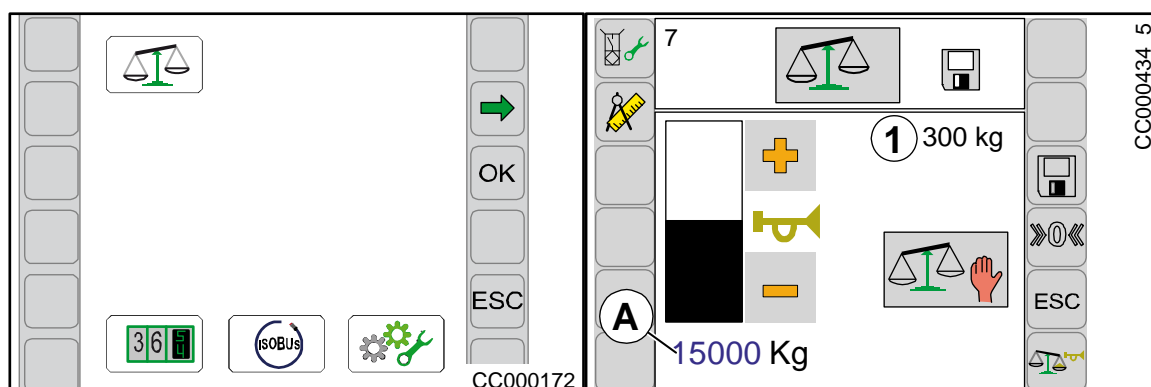









Fig. 90

Prerequisite: The menu level is called.

- Press  to open the menu.
The display shows “Weight Control” menu.

Graphic	Meaning	Information
	Saved mode	

Softkey	Meaning	Information
	Resetting the payload to zero	The current payload is reset to zero.
ESC	Leaving menu without saving	
	Activating warning message	<ul style="list-style-type: none"> – Can be activated in each mode. – When the payload weight has been reached, a warning message appears in the display.
	Deactivating warning message	<ul style="list-style-type: none"> – Can be deactivated in each mode.
	Bringing up “Calibrating Weight Control” menu	

Symbol	Meaning	Information
	Displaying “Sensor Test” menu	In the “Sensor Test” menu, only the corresponding sensors for this menu are displayed.

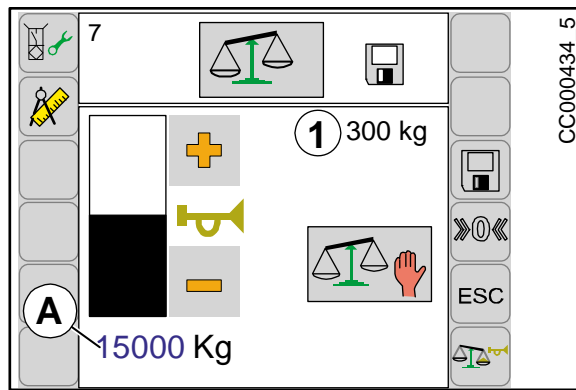






Fig. 91

Activating warning message

- Press  to activate the warning message.

In the display, the symbol changes from  to .

Deactivating warning message

- Press  to deactivate the warning message.

In the display, the symbol changes from  to .

Setting the payload



Note

Only set the maximum payload in such a way that the permitted gross weight of the machine (observing the permitted axle loads) will not be exceeded.

For information regarding permitted total weight and axle load, please refer to the type plate of the machine (also see chapter "Identification").

– As a pre-condition, the payload must be activated.

- Press value (A) in the touch screen to change the payload. The input mask opens.
- Increase or reduce value (A).
- Confirm the entry with "OK".

Setting the payload to zero

- Press function key for softkey  to set the payload to zero.

15.6.1 Calibration

Calibration total weight

To achieve a high accuracy of the weight control (total weight), it is necessary to calibrate the system on first use or in case of occurring continuing measuring differences (display to scale). In doing so the correction values for the sensors axle load are being adapted to the loading wagon.

Calibration must be effected at least once a year before the beginning of harvest.

15.6.1.1 Calibrating Load Bolt for Axle Load

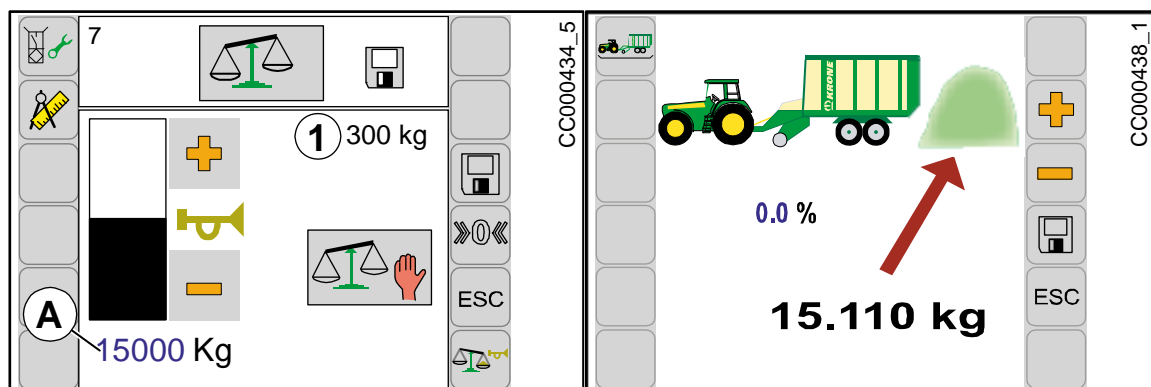






Fig. 92

- Determine the unloading weight of the wagonload by control weighing.
- Call up menu 7 "Weight Control", refer to chapter Terminal - Menus, menu 7 "Weight Control".
- To call up the calibration menu, press .
- To increase or reduce the determined unloading weight in the display, press  or .
- To save the new correction value, press .
- To leave the input mask without saving, press **ESC**.

15.6.1.2 Calibrating the force measuring bolt for supported load and axle load


Note

The individual weighing of supported load / axle load is only required if the drawbar force measuring bolt is not calibrated.

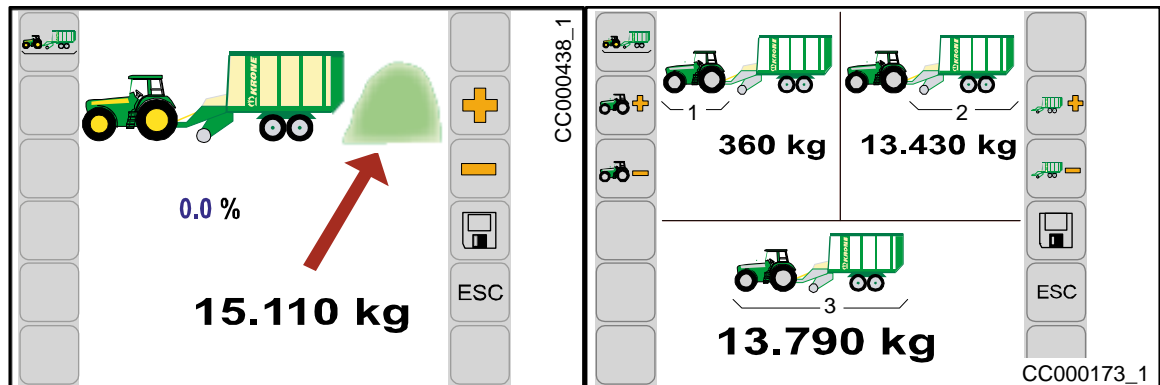










Fig. 93

Icon	Meaning
	Increase axle load
	Reduce axle load
	Increase drawbar load
	Reduce drawbar load
	Save value
	Call up the "Calibrate load bolt for drawbar load/axle load" working screen
ESC	Leave menu

- Call up menu 7 "Weight Control", refer to chapter Terminal - Menus, menu 7 "Weight Control".

- To call up the "Calibrate weight control" working screen, press .
- To call up the "Calibrate load bolt for drawbar load/axle load" working screen, press


Procedure for calibration:

- Fill loading wagon.
- To save the payload weight, press .

Determine and write down the values for drawbar load and axle load of the loaded forage wagon.

Drive to the scale and

- Determine and write down the drawbar load (1) (full weight).
- Determine and write down the axle load (2) (full weight).

Determine and write down the values for drawbar load and axle load of the unloaded forage wagon.

- Unload the forage wagon completely.

Drive to the scale and


Terminal – Menus

- Determine and write down the drawbar load (1) (tare weight).
- Determine and write down the axle load (2) (tare weight).

Determining difference value drawbar load

- Determine and write down the difference value between drawbar load (1) (full weight) and drawbar load (1) (tare weight).

Determining difference value axle load

- Determine and write down the difference value between axle load (2) (full weight) and axle load (2) (tare weight).
- To call up the “Calibrate weight control” working screen, press .

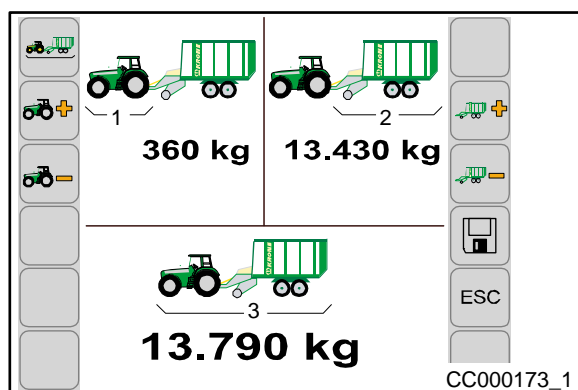












Fig. 94

Setting the correction value of axle load (2):

- To increase the correction value, press  .
- To reduce the correction value, press  .
- To save the value, press .

Setting the correction value of drawbar load (1):

- To increase the correction value, press  .
- To reduce the correction value, press  .
- To save the value, press .
- To leave the menu, press **ESC**.

15.7

Main Menu 13 “Counters”

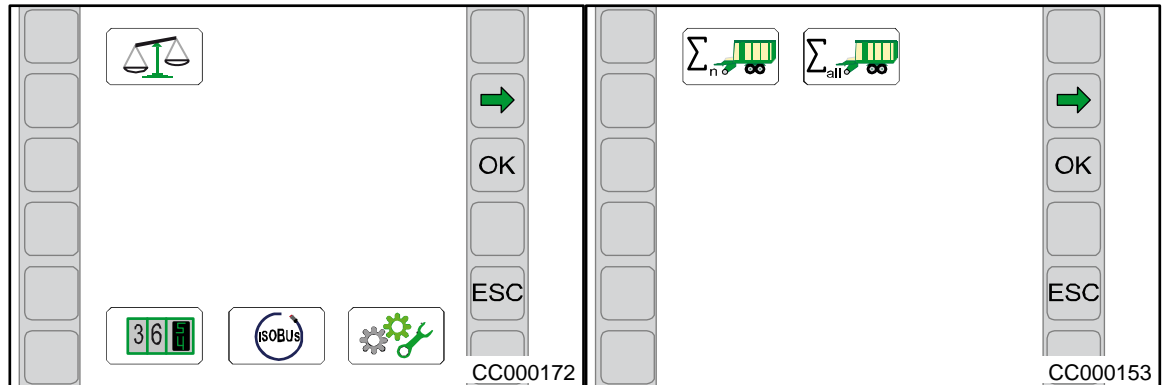




Fig. 95

Prerequisite: The menu level is called.

- Press  to open the menu.

The display shows “Counters” menu.

Depending on how the machine is equipped, main menu “Counters” is divided into the following sub-menus:

Sub-menu	Description
	Sub-menu 13-1 “Customer Counter”
	Sub-menu 13-2 “Total Counter”

15.7.1 Sub-Menu 13-1 “Customer Counter”

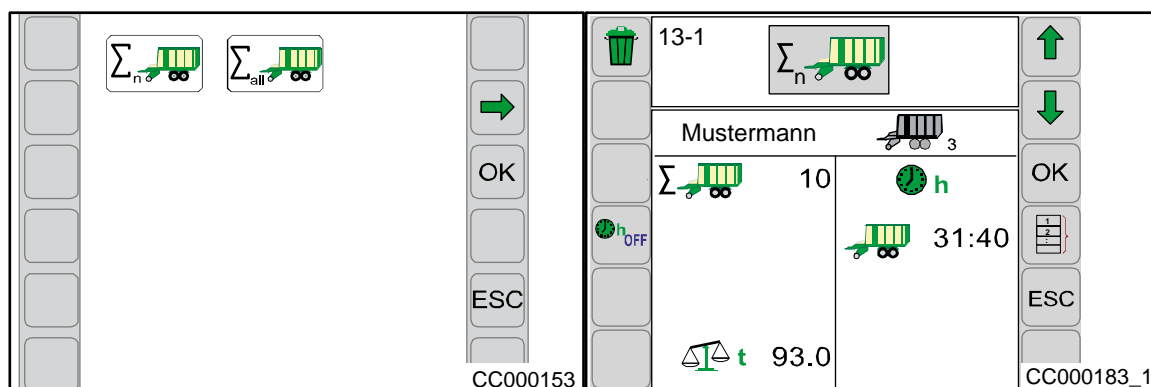














Fig. 96

Prerequisite: Main menu 13 “Counters” is called.

- Press  to open the menu.
The display shows “Customer Counter” menu.

Symbols	Meaning	Information
	Scrolling up	
	Scrolling down	
OK	Confirming the selection	
	Displaying customer counter	
ESC	Leaving menu	– Pressing the key and holding it down brings up the basic screen.
	Delete the values for the selected customer counter.	– The selected customer counter must not be activated.
 h on	Deactivating operating hours counter	– The operating hours counter is activated.
 h off	Activating the operating hours counter	– The operating hours counter is deactivated.

Symbol	Meaning	Information
	Selected customer counter	– Here customer counter 3
	Counter for total wagonloads	<ul style="list-style-type: none"> – Added wagonloads (loading mode and cutting mode). – Counting a wagonload depends on the set counter mode.
	Operating hours counter	– The operating hours counter counts if the electronics is turned on and the operating hours counter is activated.
	Weight of the crop	– Sum of loading mode and cutting mode
	Operating hours counter	– The operating hours counter counts if the electronics is turned on and the operating hours counter is activated.
Name	Add a name for customer counter	<ul style="list-style-type: none"> – Touch sensitive, the name can be changed. – The input is limited to 15 characters.

Counter overview

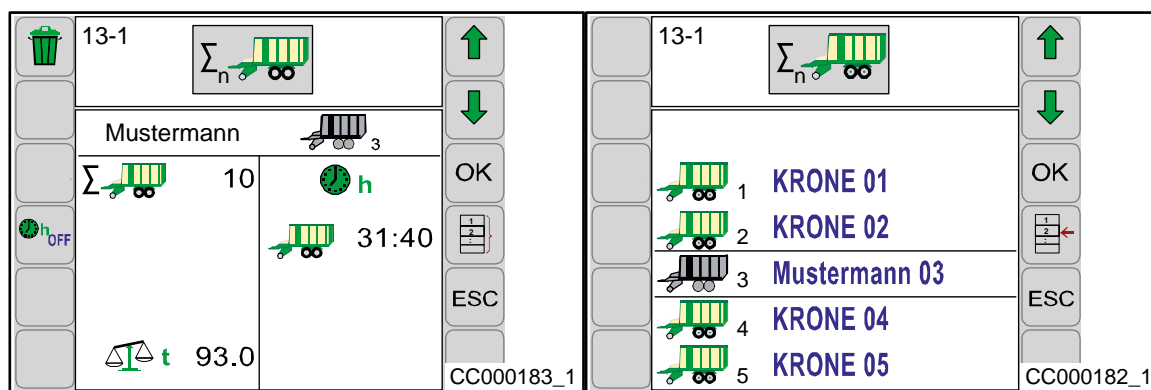




Fig. 97

Prerequisite: The menu 13-1 "Customer Counter" is active.

- To call up the customer counter, press .
- To call up the detail counter, press .

Symbol	Meaning	Information
Mustermann	Customer counter	<ul style="list-style-type: none"> – Touch sensitive – 1 to 20 customer counters. – The activated customer counter is highlighted in grey.



Applying or changing a new name for the customer counter

- Press "name".

An input dialogue appears.

- Enter the name via keyboard.
- Press **OK** to save the name.
- Press **ESC** to leave the input dialogue without saving.



Activating the Customer Counter

- Select the desired customer counter by pressing the function key for softkey  or .
- Press the function key for softkey **OK** to activate the customer counter.


The newly activated customer counter is highlighted in grey.



Activating the Operating Hours Counter

- Press the function key for softkey  h off to activate the operating hours counter.

In the display, the softkey changes from  h off to  h on.




Deactivating the Operating Hours Counter

- Press the function key for softkey  h on. to deactivate the operating hours counter.

In the display, the softkey changes from  h on to  h off.

Deleting the customer counter

The customer counter, which is to be deleted, does not have to be activated.

- To select the customer counter to be deleted, press  or .
- To reset the customer counter to zero, press .

15.7.2 Sub-Menu 13-2 “Total Counter”

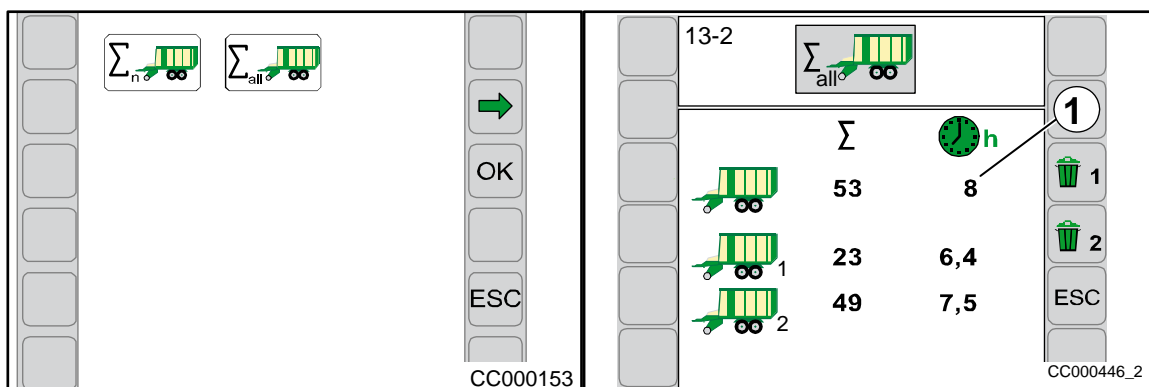






Fig. 98


Prerequisite: Main menu 13 “Counters” is called

- Press  to open the menu.
The display shows “Total Counter” menu.


Display area

Graphic	Description
Σ	Total number of wagonloads
 h	Operating hours counter
	Total wagonload counter (cannot be deleted)
	Season counter 1 (can be deleted)
	Daily counter 2 (can be deleted)

Deleting season counter

- To delete the season counter, press  1.
The season counter is set to zero.

Resetting daily counter

- To delete the daily counter, press  2.
The daily counter is set to zero.



Note

The total operating hours counter (1) is running as soon as the electronics is turned on. The total operating hours counter (1) cannot be deleted.

15.8 Main Menu 14 “ISOBUS Settings”

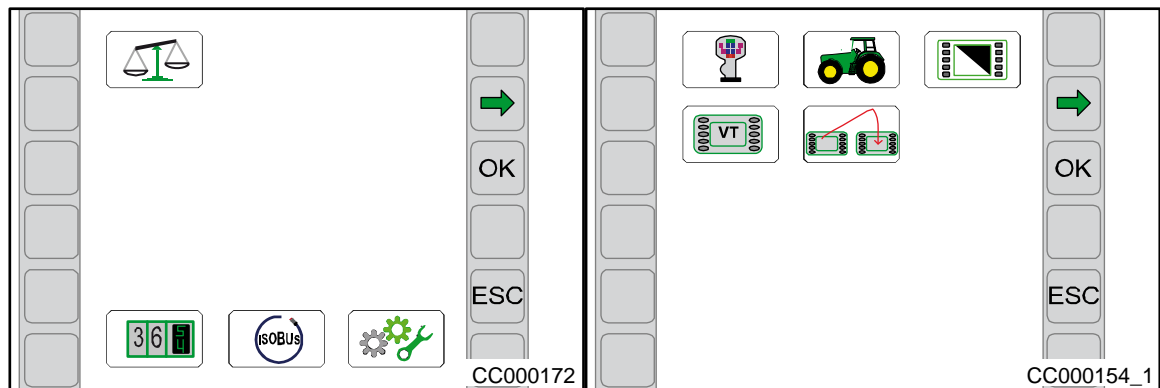








Fig. 99

Prerequisite: The menu level is called.

- Press  to open the menu.
- The display shows “ISOBUS Settings” menu.

Depending on how the machine is equipped, main menu “ISOBUS Settings” is divided into the following sub-menus:

Icon	Designation
	Menu 14-1 “Diagnostics Auxiliary (AUX)”
	Menu 14-2 “Driving Speed Display/Direction Display Diagnostics”
	Menu 14-3 “Setting the Background Colour”
	Menu 14-7 “Virtual Terminal (VT)”
	Menu 14-9 “Switching Between the Terminals”

15.8.1 Sub-Menu 14-1 Diagnostics Auxiliary (AUX)

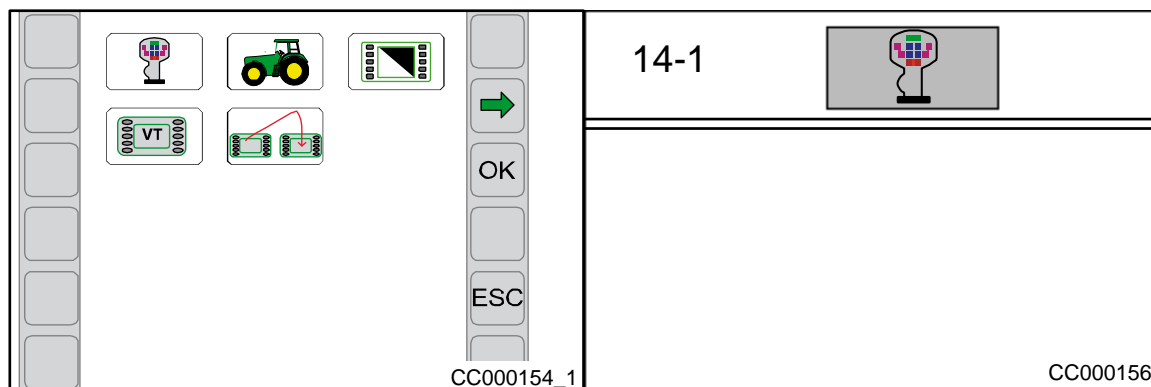



Fig. 100

Prerequisite: Main menu 14 “ISOBUS” is called

- Press  to open the menu.

The display shows menu 4-7 “Diagnostics Auxiliary (AUX)”.

A figure of the multi-function lever appears in the display. When activating a function on the multi-function lever, only the assigned symbol will appear in the display. The function itself is not performed.

15.8.2

Menu 14-2 “Driving Speed Display Diagnostics/Direction Display Diagnostics”

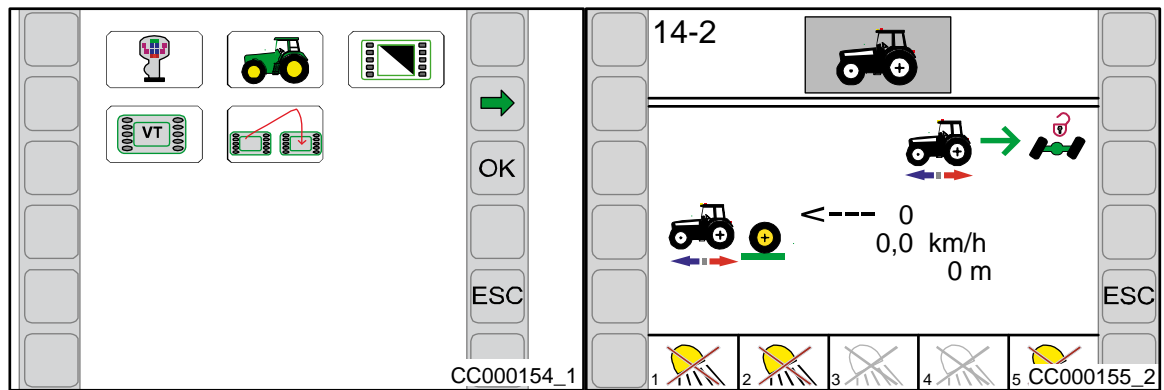










Fig. 101

Prerequisite: Main menu 14 “ISOBUS” is called.

- Press  to open the menu.

The display shows “Driving Speed Diagnostics Display / Motion Direction Display”.

Icon	Meaning	Information
	Wheel-based speed	
<--- 0	Forward travel	
0 --->	Reverse travel	
	Parameter selected	ISOBUS evaluation
	Parameter not selected	
1 	Rear tractor working lights top left/right	
2 	Lateral tractor working lights top left/right	
3 	Tractor working light 1	Optional
4 	Tractor working light 2	
5 	Tractor parking light	

15.8.3 Sub-Menu 14-3 Setting the Background Colour

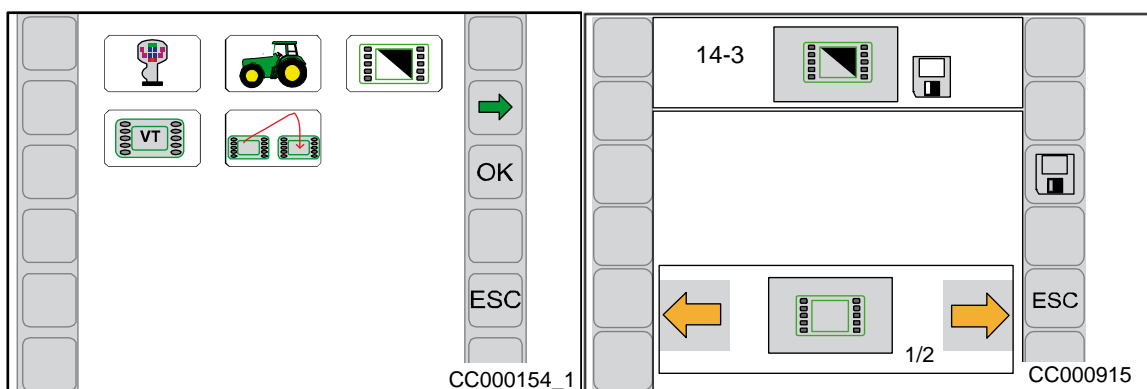




Fig. 102



Prerequisite: The menu 14 „ISOBUS Settings” is called.

- Press  to open the menu.
The display shows menu “Setting the Background Colour”.



Function keys

Softkey	Meaning	Information
	Save	
ESC	Leave menu	– Without saving

Display area



Softkey	Meaning	Information
	Display next mode	– Touch-sensitive
	Display previous mode	– Touch-sensitive


You can select between two modes.


Icon	Designation	Explanation
	Background colour white	– Recommended for day.
	Background colour grey	– Recommended for night

Calling and saving a mode

The  icon in the upper line indicates that the displayed mode is saved.

- To open the next mode, press .
- To open the previous mode, press .

The  symbol in the upper line disappears.

- To save, press .

The set mode is saved and the  symbol appears in the upper line.

- To leave the menu, press **ESC**.

15.8.4 Sub-Menu 14-7 “Virtual Terminal (VT)”

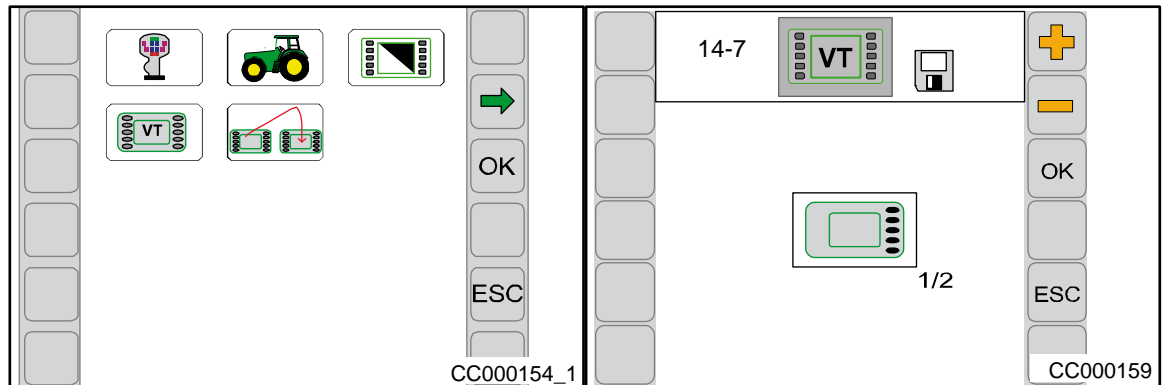


Fig. 103

Prerequisite: Main menu 14 “ISOBUS” is called.

- Press  to open the menu.
The display “Virtual Terminal (VT)” menu.





Note

This menu only appears on ISO terminals with less than 8 keys.


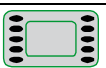
For ISO terminals with less than 8 keys, an additional ISO joystick is recommended for the convenient operation of the attached machines. For the assignment of the joystick, please refer to chapter “Example of joystick assignment”.

ISO terminal with less than 8 keys

In this menu, the basic screen is set to 5 softkeys or 8 softkeys. During the change-over to 8 softkeys, additional softkeys will be virtually included and can be reached by scrolling.

Graphic	Meaning	Information
	Display the next mode	
	Display the previous mode	
	Saved mode	
OK	Save the selected setting	
ESC	Leave the menu without saving	


The current status is displayed as a graphic

Graphic	Meaning
	Terminal with 5 softkeys without virtual softkey
	Terminal with less than eight keys and utilization of virtual softkeys


Terminal – Menus

Changing and saving status

- Press the function key for softkey  or  to change the status.

The symbol  in the upper line disappears.

- Press function key for softkey **OK** to save the status.

The symbol  appears in the upper line.

- Press function key **ESC** to leave the menu.
- Press function key **ESC** multiple times in succession to bring up the basic screen.

15.8.5 Sub-Menu 14-9 “Switching Between Terminals”

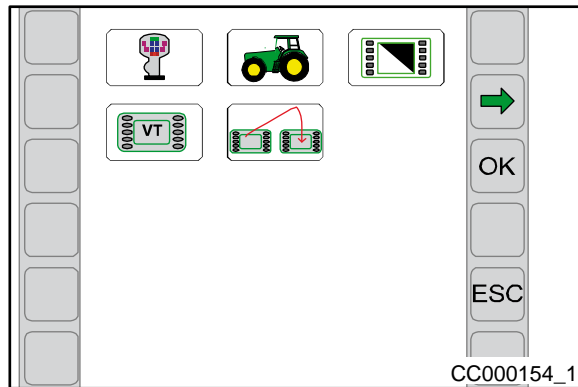


Fig. 104

Prerequisite: Main menu 14 “ISOBUS” is called.

- Press   to open the menu.

The display shows “Switching between the Terminals” menu.



Note

- The sub-menu appears only if several ISO terminals are connected.
- Depending on how many terminals are connected, you can switch to the next connected terminal.
- When switching for the first time, the configuration of the machine is loaded into the next terminal. The loading process may take a few minutes. The configuration is stored in the accumulator of the next terminal.



Note

Up to the next call, the machine is no longer available in the previous terminal.



Note

In case of a restart, the system first tries to start the last used terminal. If the last used terminal is not available any longer (if it is removed for example), the restart is delayed as the system is searching for a new terminal and loads the specific menus into the terminal. The loading process may take a few minutes.

15.9 Main Menu 15 “Settings”

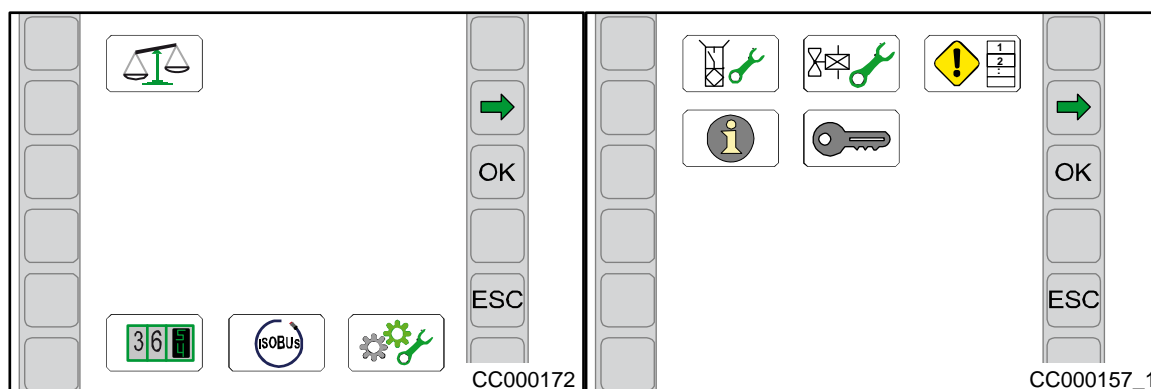







Fig. 105

Prerequisite: The menu level is called.

- Press  to open the menu.
The display shows “Settings” menu.

The main menu "Settings" is divided into the following submenus depending on the machine configuration:

Sub-menu	Description
	Submenu 15-1 Sensor test
	Submenu 15-2 Actuator test
	Submenu 15-4 Error list
	Submenu 15-5 Info
	Submenu 15-6 Fitter

15.9.1 Sub-Menu 15-1 “Sensor Test”

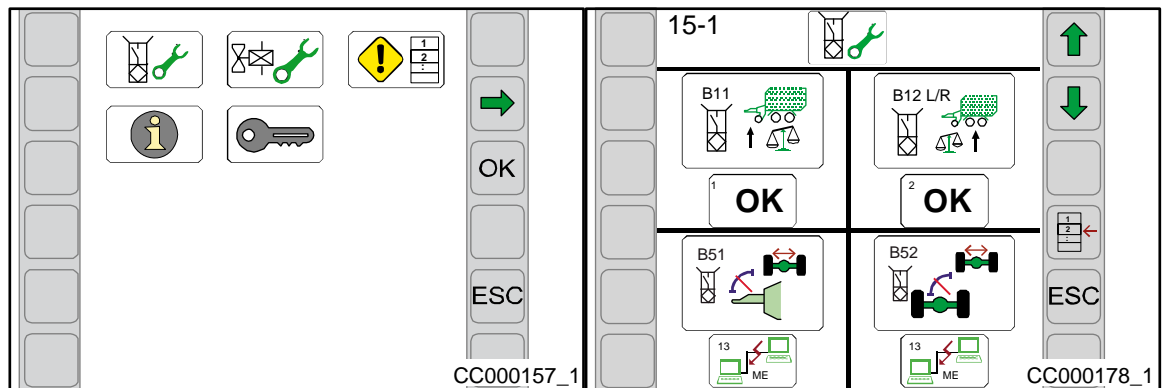





Fig. 106

Prerequisite: Main menu 15 “Settings” is called.

- Press  to open the menu.
The display shows “Sensor Test” menu.

In the sensor test the sensors installed on the machine are checked for errors. Furthermore, the sensors can be correctly adjusted by means of the sensor test. There is no guarantee that the machine will work correctly until the sensors have been adjusted.

Icons	Meaning	Information
	Scroll up	
	Scroll down	
	Open “Sensor test” mask	The “Sensor test” mask opens.
ESC	Leave menu	

Testing the sensor

- Press on the symbol of the sensor to test a sensor.
- The “Sensor test” mask appears.

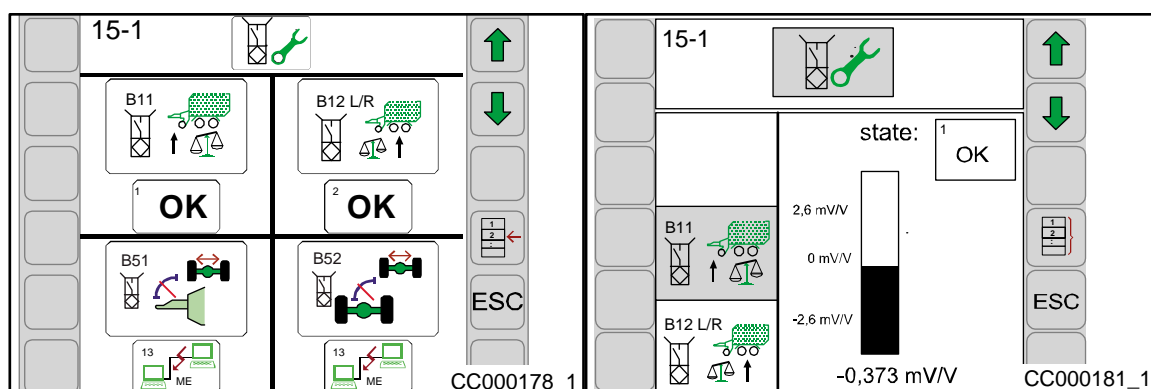





Fig. 107



Caution!

Make sure the PTO shaft is not rotating while is sensor test is performed.

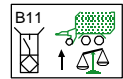
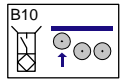
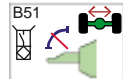
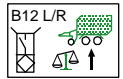
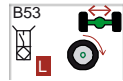
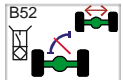
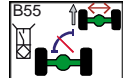
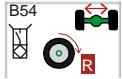
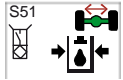
Icons	Meaning	Information
	Choose next sensor	
	Choose previous sensor	
	Close “Sensor test” mask	The “Sensor Test” menu opens.
ESC	Leave menu	

Setting values:

The minimum and maximum setting values with the sensor alive (metal in front of the sensor) are shown in the upper part of the bar display. The current setting value (actual value) is displayed under the bar display.

The distance from the sensor to the metal must be adjusted so that in the alive state the bar is in the upper mark. Next check whether the bar is in non-alive state in the lower marked area.




Possible sensors (depending on how the machine is equipped)




No.	Symbol	Description	No.	Symbol	Description
B11		Load bolt drawbar	B10		Lift axle
B51		Steering angle drawbar	B12		Load bolt axle
B53		Speed wheel left	B52		Steering angle rear axle
B55		Steering angle front axle	B54		Speed wheel right
			S1		Pressure supply forced steering

State:

- | | | | |
|---|--------------|---|---------------------|
| 1  | Alive (iron) | 2  | Not alive (no iron) |
| 3  | Broken cable | 4  | Short circuit |

State of load bolt:

- | | | | |
|---|---------------------------------------|---|---|
| ① OK | Sensor OK | ③  | Connection to force measurement amplifier (KMV) interrupted |
| ⑦  | Cable break / short circuit on sensor |  | Failure of communication with force measurement amplifier (KMV) |

- | | |
|---|---|
|  | Communication error with steering computer (ME) |
|  | Communication error with KRONE-PIC-IO1 computer |
|  | Communication error with KRONE-PIC-IO2 computer |

State:

- | | | | |
|---|-----------------------------------|---|-------------------------------|
| ①  | Pressure threshold is not reached | ②  | Pressure threshold is reached |
|---|-----------------------------------|---|-------------------------------|

Diagnostics power supply voltages

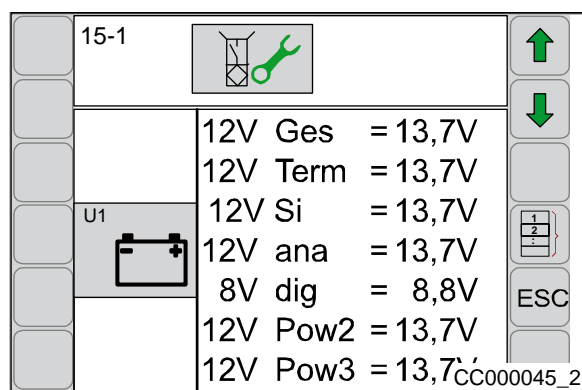
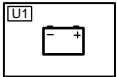


Fig. 108

No.	Symbol	Description
U1		Power supply voltage

Nominal voltages

Designation	Function	Protection	Setpoint value	Measurement point
12V tot.	Main voltage supply	Fuse 30 A	12 - 14.5 V	Input X1_28
12V V term	Power supply terminal	Self-resetting fuse	12 - 14.5 V	Output X1_14
12V fuse	Internal power supply	Self-resetting fuse	12 - 14.5 V	Output X1_31
12V ana	Power supply analogue sensors	Self-resetting fuse	12 - 14.5 V	Input analogue sensors
8V dig	Power supply digital sensors	Self-resetting fuse	8.5 - 9.1 V	Input digital sensors
12 V Pow2	Power supply Pow2	Self-resetting fuse	12 - 14.5 V	Output X2_28
12 V Pow3:	Power supply Pow3	Self-resetting fuse	12 - 14.5 V	Output X2_25

15.9.2 Sub-Menu 15-2 “Actuator Test”


WARNING!

The functions are directly executed by energizing the actuators. As a result, machine parts may start to move unexpectedly, persons may be captured and seriously hurt.

- Switch off PTO shaft.
- Deactivate tractor hydraulics.
- Only persons familiar with the machine are permitted to perform the actuator test.
- The person performing the test must know the machine parts being actuated by controlling the actuators. If necessary, secure actuated machine components from unintentional lowering.
- Only perform the sensor test from a safe position outside the moving machine parts.
- Make sure that there is no one in the danger zone.

The actuator test is used to test the actuators installed on the machine. An actuator can only be tested when it is powered. Therefore the actuator must be controlled manually for a short time in the actuator test in order to determine possible errors in the actuator system.


CAUTION! - Unexpected actions on the machine.

The P.T.O. shaft must not be turning during the actuator test. The tractor hydraulics must be deactivated.


Note

The actuators cannot be set, only the status can be checked.

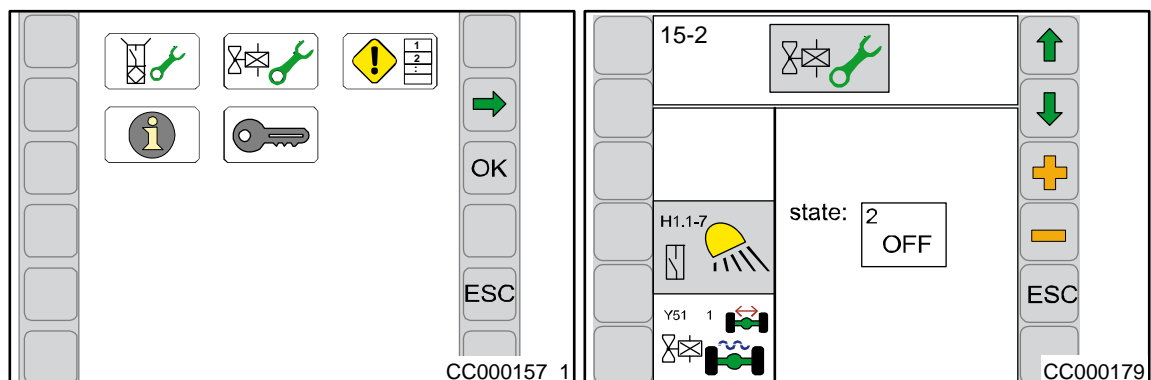






Fig. 109


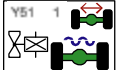
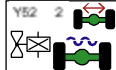
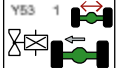
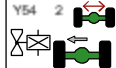
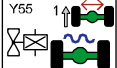
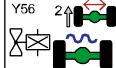
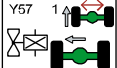
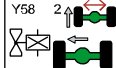
Prerequisite: Main menu 15 “Settings” is called.

- Press  to open the menu.
The display shows “Actuator Test” menu.



Terminal – Menus

Symbols	Meaning	Information
	Selecting the next actuator	
	Selecting the previous actuator	
ON	Activating actuator	– Digital actuators The function is directly executed.
OFF	Deactivating actuator	
	Increasing value	– Analogue actuators – In case of motors, the function of the motor is directly executed.
	Reducing value	
ESC	Leaving menu	

Possible actuators (depending on how the machine is equipped)

No.	Symbol	Description	No.	Symbol	Description
H1		Machine lighting			
Y51		Release rear axle 1	Y52		Release rear axle 2
Y53		Control rear axle 1	Y54		Control rear axle 2
Y55		Release front axle 1	Y56		Release front axle 2
Y57		Control front axle 1	Y58		Control front axle 2

State:

- 1 **ON** Actuator ON 2 **OFF** Actuator OFF
- 3   No power supply; fuse is probably defective

15.9.3 Menu 15-4 "Error List"

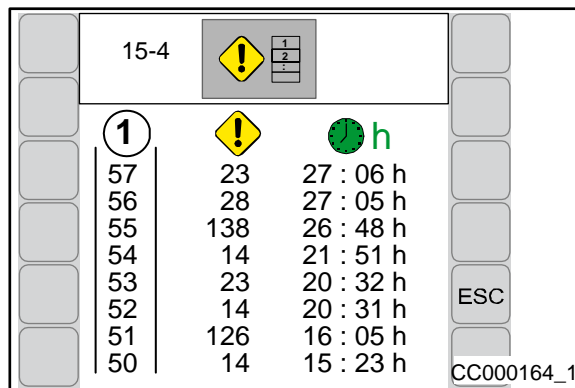







Fig. 110

Prerequisite: The menu 15 „Settings” is called.

- In order to open the menu, press . The display shows menu "Error List".

Softkey	Meaning	Information
	Scrolling up	
	Scrolling down	
ESC	Leaving menu	

No./icon	Designation	Explanation
1)	Consecutive numbering	
	Error number	– Description of errors, see "Alarm Messages".
 h	Incoming time	– According to the total operating hours counter

15.9.4 Menu 15-5 “Software Information”

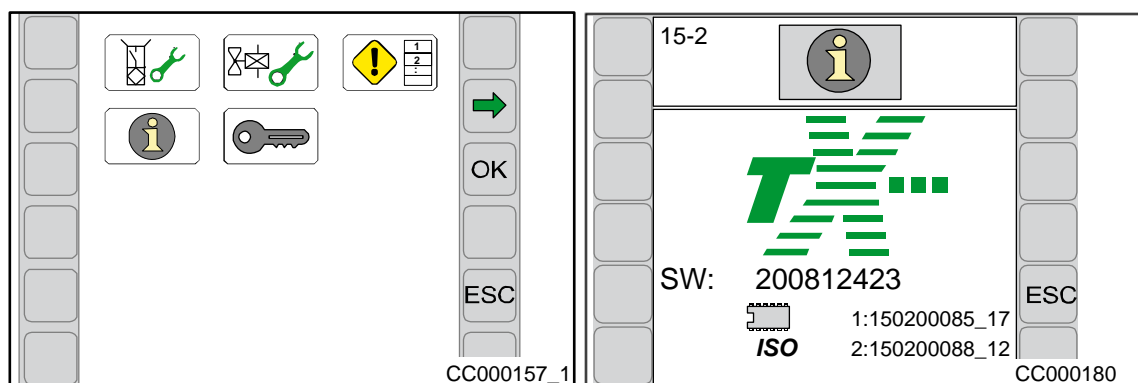




Fig. 111

Prerequisite: Main menu 15 “Settings” is called.

- Press  to open the menu.
The display shows “Information” menu.

SW	Complete software version of the machine
	Version of the job computer
ISO	ISO software version

15.9.5 Sub-Menu 15-6 Technician

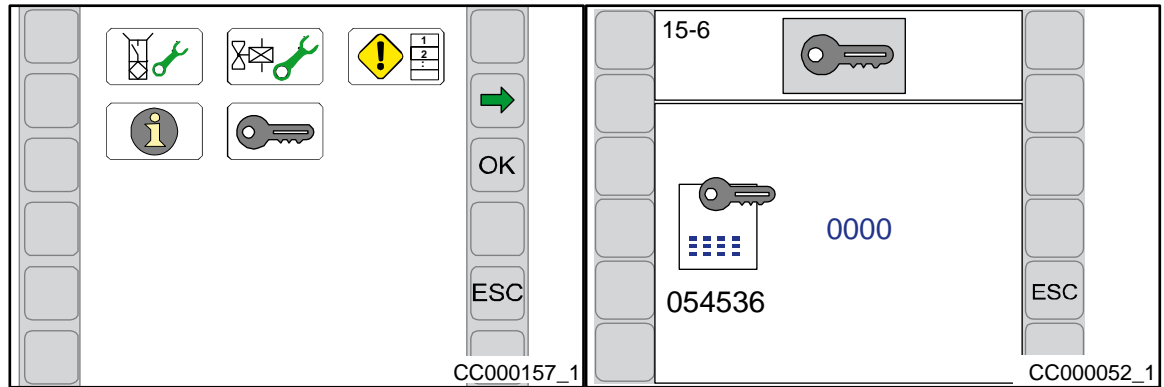



Fig. 112

Prerequisite: Main menu 15 “Settings” is called.

- Press  to open the menu.
The display shows the “Technician” menu.

The “Technician” sub-menu is protected by password.
The display shows the password query.

15.10 Error Messages



WARNING!

Injury and/or machine damage due to failure to observe error messages!

When error messages are ignored by failing to correct the error, people may be injured and/or the machine may be damaged seriously.

- If an error message is displayed, correct the error.
 - For possible cause and remedy, refer to chapter “Error Messages.”
 - Contact KRONE customer service if the error cannot be corrected.

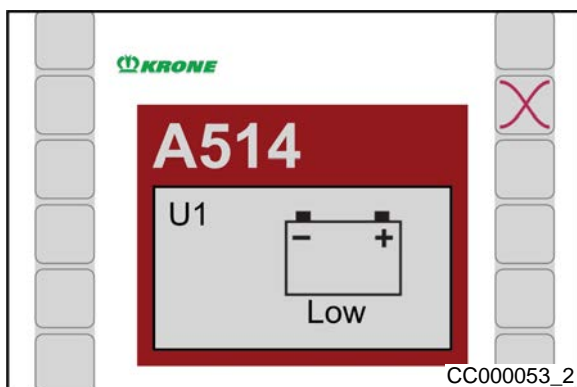



Fig. 113



The display shows an alarm message if a malfunction occurs on the machine. At the same time an audio signal will be heard (continuous horn sound). For description, possible cause and remedy, refer to chapter Terminal - Menus, “Alarms”.

Acknowledging the alarm:

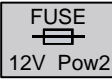
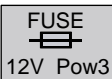
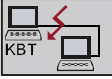
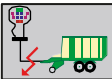
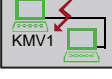
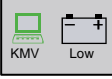
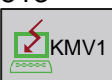
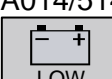

- Press  in order to acknowledge the alarm.

The acoustic signal stops.

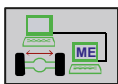
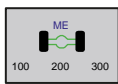
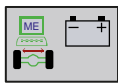
If the malfunction occurs again, the alarm message will also appear again.

Softkey	Description	Information
	Acknowledge alarm	– The alarm message will appear again if the malfunction occurs again
	Delete message	– This message is not shown until the operation terminal is started the next time.


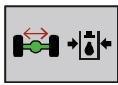

15.10.1 General Messages

No./icon	Possible cause	Remedy
A01/501 	<ul style="list-style-type: none"> – The plug-in fuse in the job computer is defective. – Short circuit on electrical outputs +12V2FU_L 	<ul style="list-style-type: none"> – Check the connection for short circuit and replace the fuse.
A02/502 	<ul style="list-style-type: none"> – Fuse in the job computer defective – Short circuit on electrical outputs +12V3FU_L 	<ul style="list-style-type: none"> – Check the connection for short circuit. – The fuse resets itself after the unit has cooled down.
A03/503 	<ul style="list-style-type: none"> – CAN error The CAN bus between operation and machine was interrupted. – Loose contact in the connection to the display. 	<ul style="list-style-type: none"> – Check the display line.
A04/504 	<ul style="list-style-type: none"> – The connection to joystick is interrupted. – The joystick is not connected properly. 	<ul style="list-style-type: none"> – Check the wiring of joystick.
A011/511 	<ul style="list-style-type: none"> – CAN error – The connection force measurement amplifier (KMV) to the machine is interrupted. 	<ul style="list-style-type: none"> – Check wiring.
A013/512 	<ul style="list-style-type: none"> – Undervoltage – The tractor battery is defective. – The alternator of the tractor is too weak. – The 12 volts power supply is too weak on tractor side or not correctly connected to the battery. 	<ul style="list-style-type: none"> – Connect KRONE connection cable directly to the battery of the tractor.
513 		
A014/514 		
A015/515 	<ul style="list-style-type: none"> – Overvoltage – The alternator of the tractor is defective. 	<ul style="list-style-type: none"> – Check alternator.

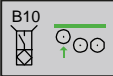
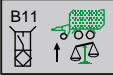

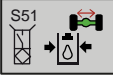
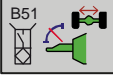
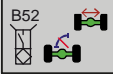

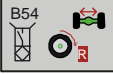
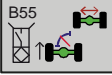
Terminal – Menus

No./icon	Possible cause	Remedy
A30/530 	<ul style="list-style-type: none"> – CAN error – The connection between forced steering computer and machine is interrupted 	<ul style="list-style-type: none"> – Check wiring.
A31/531 	<ul style="list-style-type: none"> – Error on the steering 	<ul style="list-style-type: none"> – Note the numbers and contact KRONE customer service.
A32/532 	<ul style="list-style-type: none"> – Incorrect voltage – The tractor battery is defective. – The alternator of the tractor is too weak. – The 12V power supply is too weak on tractor side or is not connected correctly to the battery. 	<ul style="list-style-type: none"> – Connect KRONE connector cable directly to the tractor battery

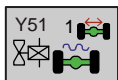
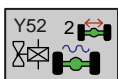
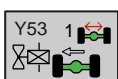
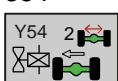


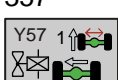
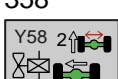
15.10.2 Logical Errors

No./icon	Possible cause	Remedy
6 	<ul style="list-style-type: none"> – The payload is reached. 	<ul style="list-style-type: none"> – Complete the loading process.
31 	<ul style="list-style-type: none"> – The forced steering is not supplied with pressure – Pressure cannot be supplied because of speeding. 	<ul style="list-style-type: none"> – Establish pressure supply.
34 	<ul style="list-style-type: none"> – Speed difference between left and right wheel sensor – Sensor or supply line defective 	<ul style="list-style-type: none"> – Perform sensor test – Check sensor and supply line for damage

15.10.3 Physical messages

No./icon	Sensor	Possible cause	Remedy
110 	Lift axle	Sensor or supply line defective	<ul style="list-style-type: none"> - Perform sensor test - Check sensor and supply line for damage
111 	Loadpin drawbar (optional)		
112 	Loadpin axle (optional)		
150 	Pressure supply forced steering		
151 	Steering angle drawbar		
152 	Steering angle rear axle		
153 	Speed left wheel		
154 	Speed right wheel		
155 	Steering angle front axle		

Terminal – Menu

No./icon	Actuator	Possible cause	Remedy
351 	Release rear axle 1	Actuator or supply line defective	<ul style="list-style-type: none"> - Perform actuator test - Check sensor and supply line for damage
352 	Release rear axle 2		
353 	Control rear axle 1		
354 	Control rear axle 2		
355 	Release front axle 1		
356 	Release front axle 2		
357 	Control front axle 1		
358 	Control front axle 2		

16 Driving and Transport



DANGER! - Road travel, carrying passengers, driving conduct

Effect: Danger to life, injuries or damage to the machine.

- The machine must be fully and correctly hitched.
- Do not exceed the maximum permissible speed (see type plate).
- It is forbidden to carry passengers on the machine.
- The traffic safety of the machine, especially lighting, tyres, closed tailgate and lowered articulated drawbar must be checked before driving on public highways.
- Before driving on public highways, make certain the entry ladder is folded up and fastened securely together with the access hatch.
- Before starting, ensure that you have perfect visibility on and around the tractor and the machine.
- When driving straight ahead at speeds over 30 km/h with the wagon loaded, the steering axle (special equipment) must be locked to improve driving stability.



WARNING! - Transport / road travel

Risk of accident due to non-locked stop cocks.

Machine components can be activated unintentionally when the stop cocks are not locked during transport travel. This may result in serious accidents.

- To prevent functions from being triggered accidentally, always close the hydraulic stop cocks in the transport position.



WARNING! – Danger of injury resulting from unintentional movement of machine parts

An unintentional activation of control levers may lead to movements of machine parts that endanger persons if the control levers of the control units are not locked when driving on the road.

- During road travel, lock the control levers of the control units.

16.1 Handling the self steer (Special Equipment)

The self steer system is delivered from the factory at a pre-charged pressure of 80 bar. If the pre-charge pressure falls below 80 bar when driving in a straight line, or if the steering becomes flaccid, it means that the tractor's steering movements are not being transferred to the steering cylinder on the steering axle, and you will need to check the pre-charge pressure (80 bar) and/or vent the hydraulic system. See Maintenance Section "Venting the Self Steering" for information on how to vent and make other adjustments

16.2 Handling the hydraulic compensation unit



Danger! - No control provided by brake force

Effect: Danger to life, injuries or damage to the machine

If the cylinder is completely lowered, the brake force can no longer be controlled!

Driving and Transport

Before road travel, make certain that

- the PTO drive is switched off.
- the machine is fully and correctly hitched to the tractor.
- all guards are closed and locked.
- the folding ladder is folded in.
- the frame of the forage transport wagon is aligned horizontally via drawbar.
- the tailgate is closed.
- the loading area cover is folded in, with loading area cover design.
- the stop cocks are closed.
- the control units of the tractor are in neutral position.
- the tyres do not show any cuts or breaks.
- the tyres have the correct tyre pressure.
- the machine is free from crop residues and gross soilings.
- the support jack is folded in.
- the lighting system functions properly.
- the brake is functioning properly.
- the cables and lines are laid so that they are not tight during cornering and that they do not come in contact with wheels of the tractor.
- the self-steering axle is locked.

16.3 Handling the Lift Axle



CAUTION!

Damages to machine and axle assembly

- Only raise the lift axle in unloaded state
- When the lift axle is lowered, switch single-acting control unit (raise/lower lift axle) to float position



CAUTION!

Risk of injury on the lift axle!

People staying in the danger zone of the lift axle may be injured because the lift axle lowers automatically.

- Make sure that there is no one in the danger zone of the lift axle during loading.

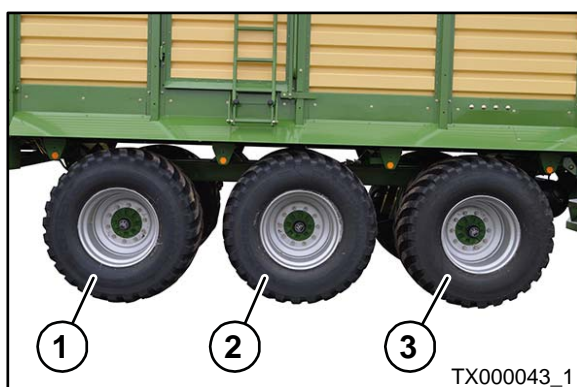


Fig. 114

For the “tridem axle” version the front axle (1) is designed as a lift axle.

The single-acting control unit (raise/lower lift axle) raises or lowers the lift axle.

16.4 Handling the Coaster/Steering Axle (Special Equipment)

Before reversing, move coaster/steering axle to a straight position and lock.



Note

On the coaster/steering axle, the rear wheels are turned in by friction between the wheels and the soil. In critical driving situations (e.g. driving over a bunker silo, reversing or driving on slopes) where a straight line cannot be maintained, the wheels must be prevented from turning in by locking the locking cylinder.

Critical driving situations could include:

- Driving on steep slopes
- On soil that is not solid enough
- Driving over a bunker silo
- Driving straight ahead at speeds above 30 km/h with the wagon loaded.

Locking the coaster/steering axle

To lock the coaster/steering axle:

With single action hydraulic connection

- Pressurise the single action control unit and drive the tractor a short distance straight forward until the steered wheels are straight
- Leave the single action control unit for the coaster/steering axle pressurised (the locking cylinder prevents the wheels from turning in)

Unlocking the coaster/steering axle with a single action hydraulic connection

When driving forwards, the locking cylinder for the coaster/steering axle can be released:

- Depressurise the single action control unit for the coaster/steering axle (locking cylinder) and set the hydraulic control lever to "Lower"

This can largely prevent scraping of the tyres when cornering.

16.5 Preparing the machine for transportation



CAUTION!

Risk of machine damage due to unsecured moving machine parts

When transporting the machine on transportation vehicles (e.g. trucks or trains), excessive bursts of air may damage it.

- Carry out the following measures to secure moving machine parts.

The machine must be lowered completely to transport the machine on a low loader.

Hydraulic tandem unit design

16.5.1 Lowering the Machine

When lowering the machine, the following must be observed:

- Lower an empty wagon only, otherwise there is a risk of tipping over
Ensure that the oil tank of the towing vehicle can hold approx. another 4 to 5 litres of oil before it is full (Consider inadmissible oil mixture!)

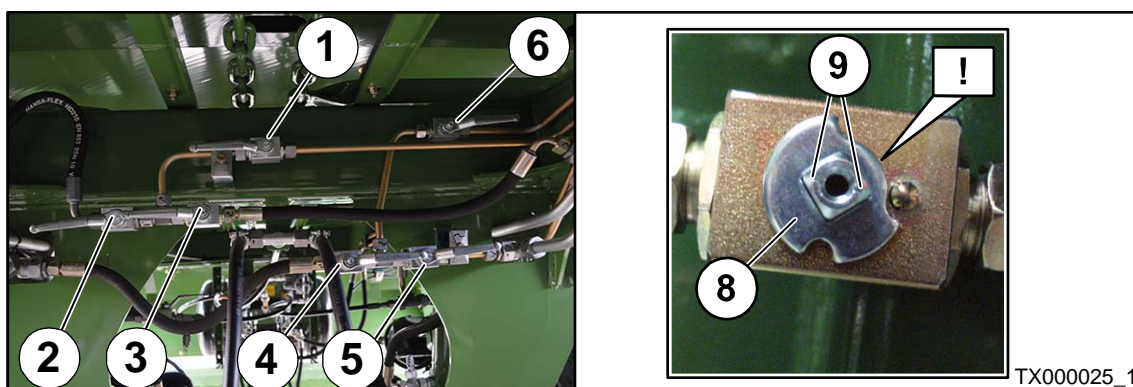


Fig. 115

- 1 Open the six stop cocks (1 to 6) on the unit carefully (lever in direction of line)



Note

If the shut-off valves cannot be opened, they are prevented from turning by the intermediate plate (8).

Unlocking the Shut-Off Valves:

- Remove the actuation lever of the six shut-off valves (1 to 6)
- Rotate the intermediate plate (8) on the square head until the actuation levers can be turned
- Install the actuation lever in the direction of the notch (9) on the square head

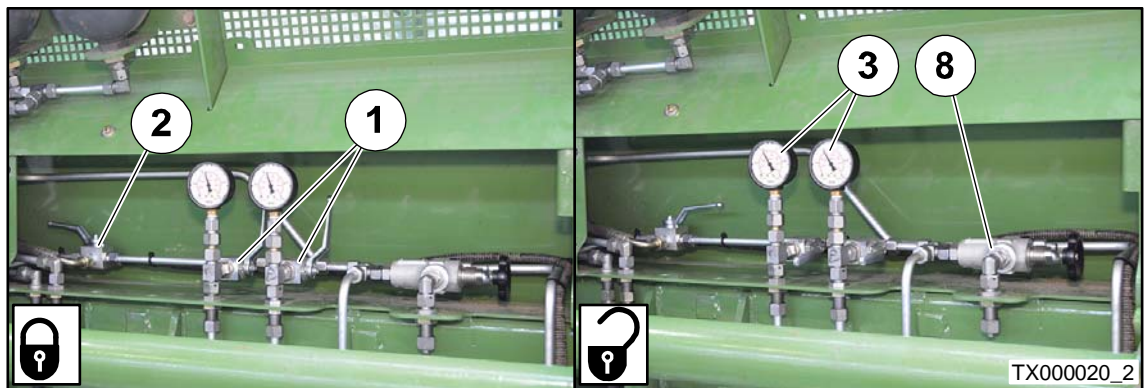


Fig. 116

- To open main valve (2), rotate lever by 180° to the right.
- Lower unit via function "Lift/lower drawbar (yellow 2+/2-). Switch to float position to lower the control unit.

If the machine is put into operation again after transporting the machine on a low loader, the driving height must be set again, refer to chapter Initial Operation "Setting the Driving Height to X+140".

Version with hydraulic tridem unit

16.5.2 Lowering the Machine

When lowering the machine, the following must be observed:

- Lower an empty wagon only, otherwise there is a risk of tipping over
Ensure that the oil tank of the towing vehicle can hold approx. another 4 to 5 litres of oil before it is full (Consider inadmissible oil mixture!)

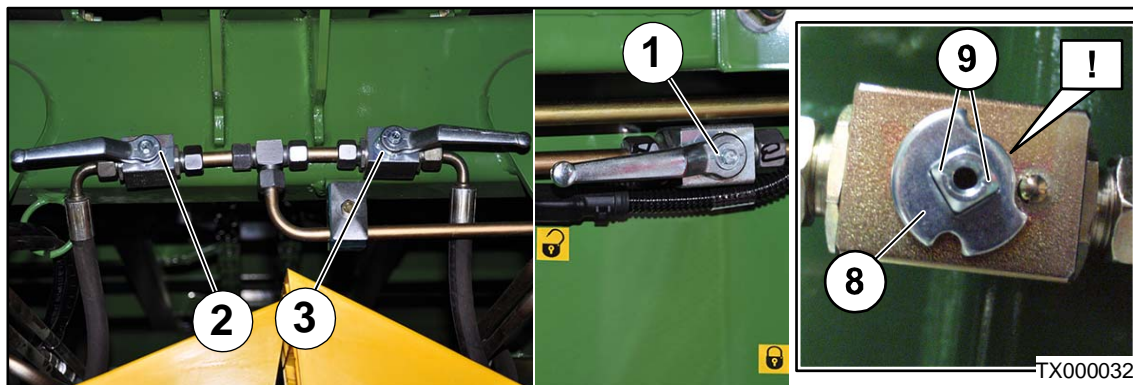


Fig. 117

- 1 Open the three stop cocks (1 to 3) on the unit carefully (lever in direction of line)



Note

If the shut-off valves cannot be opened, they are prevented from turning by the intermediate plate (8).

Unlocking the Shut-Off Valves:

- Remove the actuation levers of the three shut-off valves (1 to 3)
- Rotate the intermediate plate (8) on the square head until the actuation levers can be turned
- Install the actuation levers in the direction of the notch (9) on the square head

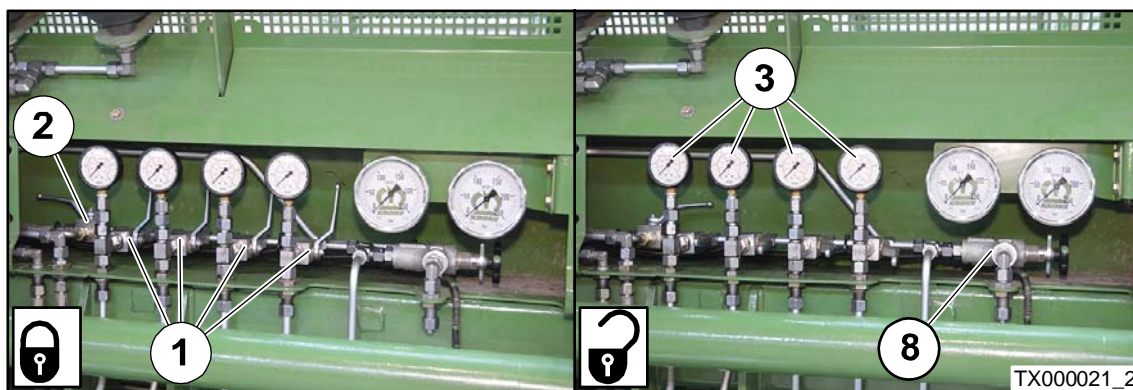


Fig. 118

- To open main valve (2), rotate lever by 180° to the right.
- Lower unit via function "Lift/lower drawbar (yellow 2+/2-). Switch to float position to lower the control unit.

If the machine is put into operation again after transporting the machine on a low loader, the driving height must be set again, refer to chapter Initial Operation "Setting the Driving Height to X+140".

16.5.3 Securing the Forced Steering

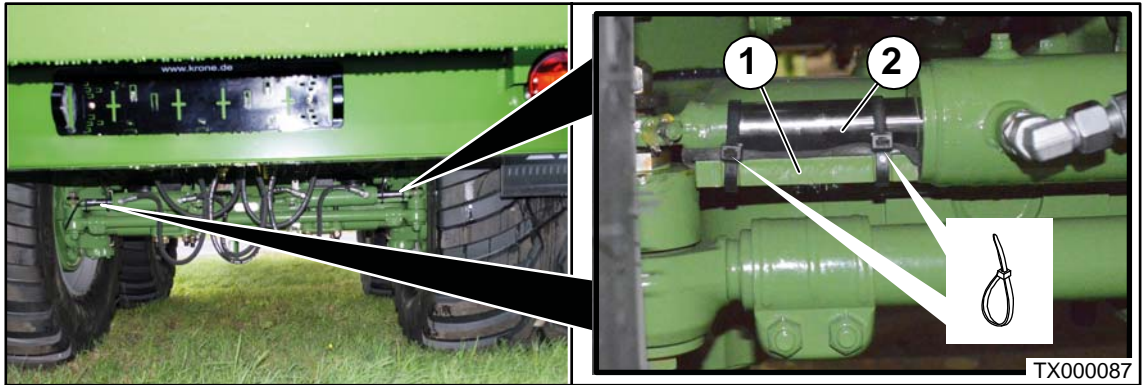


Fig. 119

On right-hand and left-hand machine side:

- Lay an angle (1) with cable ties around the cylinder of the forced steering (2) and tighten it.

17 Maintenance

17.1 Special Safety Instructions



WARNING! - When performing repair, maintenance or cleaning work on the machine, or in the case of technical intervention, drive elements may start moving.

Effect: Danger to life, injuries or damage to the machine.

- Switch off engine, remove the ignition key and carry it with you.
- Secure machine and tractor against rolling.
- Turn off PTO shaft.
- After the repair, maintenance, cleaning work or technical modifications are completed, mount all protective covers and safety devices properly again.
- Avoid skin contact with oils, greases, cleaning agents and solvents.
- In the event of injuries or burns due to oils, cleaning agents or solvents, contact a physician immediately.
- All other safety instructions must also be followed to avoid injuries and accidents.

17.2 Test run.



Warning! - Using non-approved spare parts.

Effect: Danger to life, serious injuries or loss of warranty claims as well as exclusion of liability

- Use only authentic KRONE spare parts and accessories authorised by the manufacturer. The use of spare parts, accessories or additional equipment not manufactured, tested or approved by KRONE will exclude any liability for consequential damage.



Note

To ensure problem-free operation of the machine and to reduce wear and tear, specific maintenance and upkeep intervals must be observed. These include cleaning, greasing, lubricating and oiling parts and components.

17.3

Access to Loading Area



WARNING!

Crushing hazard due to the sagging tailgate

When performing maintenance work, it may occur that the tailgate lowers unexpectedly. As a result, persons may get hurt.

- When doing maintenance work in the area of the tailgate, close the stop cock for tailgate.

TX 460 and TX 560



Fig. 120

The loading area can be entered via the opened tailgate:

Prerequisite to enter the loading area:

- The tailgate is opened.
- PTO shaft and tractor engine are switched off, the ignition key is removed and you carry it with you.
- Machine and tractor are secured against rolling away.

To enter the loading area:

- Lock the stop cock (1).
- Enter the loading area by using a suitable ladder.
- After working, leave loading area by using the ladder and unlock the stop cock (1).

TX 460 D and TX 560 D

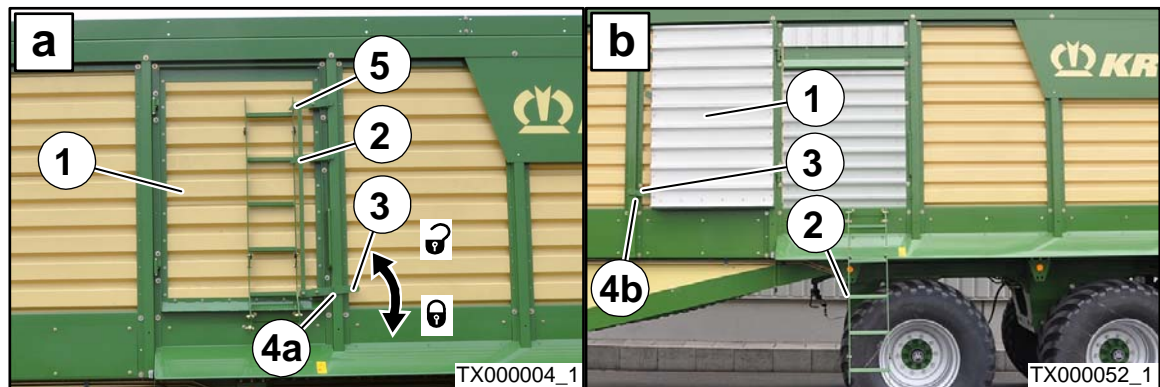


Fig. 121

Enter the loading area via the opened access hatch (1) on the left-hand side of the machine:

Prerequisite to enter the loading area:

- PTO shaft and tractor engine are switched off, the ignition key is removed and you carry it with you.
- Machine and tractor are secured against rolling away.

To enter the loading room:

- Pull locking lever (3) out of the guidance (4a) and fold down the ladder (2).
- Open the access hatch (1) by 180 degrees and insert the locking lever (3) into the guidance (4b).
- Enter the loading area by using ladder and access hatch.

To leave the loading area:

- Leave the loading area by using the ladder and close the access hatch.
- Swivel locking lever upwards, fold in ladder and insert locking lever downwards into the guidance (4a) to secure ladder and access hatch.

Make sure that

- the locking lever is pushed into guidance (4a).
- the locking lever (5) is located in front of the ladder.

Version with hydraulic unloading unit (optional)**WARNING!****Danger of injury from a jumping up tailgate**

When performing maintenance work, there is a risk that the tailgate jumps up unintentionally. As a result, persons may get hurt.

- When performing maintenance work in the area of the tailgate, close the stop cock near the hydraulic accumulators first and then the stop cock near the tailgate.

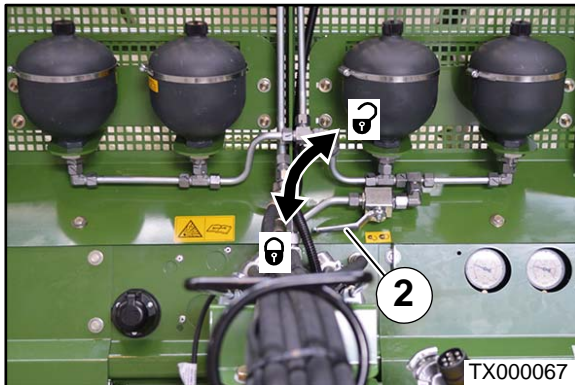


Fig.122

When performing maintenance work on the tailgate, close the stop cock (2) near the hydraulic accumulators first and then the stop cock (1) near the tailgate.

17.4 Maintenance Table

Maintenance work	Maintenance interval							
	Once after 10 hours	Before the beginning of the season	Every 10 hours but at least 1x daily	Once after 50 hours	Every 50 hours	Every 200 hours	Every 500 hours	After every season
Tighten screws/nuts								
All screws		X			X			
Gearbox								
Oil level check		X			X			
Oil change		X		X			X	
Tyres								
Tighten wheel nuts	X	X				X		
Check tyre pressure	X	X			X			
Visually inspect tyres for cuts and breaks		X			X			
Axle								
Check spring mounting	X					X		
Check spring pin	X	X					X	
Brake								
Check the brake system for malfunctions			X					
Drain compressed air reservoir		X	X					
Check slack adjuster	X					X		
Check brake pad		X						
Check air filter for pipes		X						
Hydraulics								
Check hydraulic hoses	X				X			
Ball-head attachment								
Check wear limit		X						
Check/retighten drive chains								
Main drive chain	X	X			X			X
Drive chain scraper conveyor	X	X			X			X
Drive chains discharge rollers	X	X			X			X
Tighten scraper conveyor chain	X	X			X			X
Calibrate weight control		X						
Lubrication	according to lubrication chart, refer to chapter Maintenance - Lubrication, "Lubrication Chart"							

17.5 Tightening torques

17.5.1 Metric Thread Screws with Control Thread



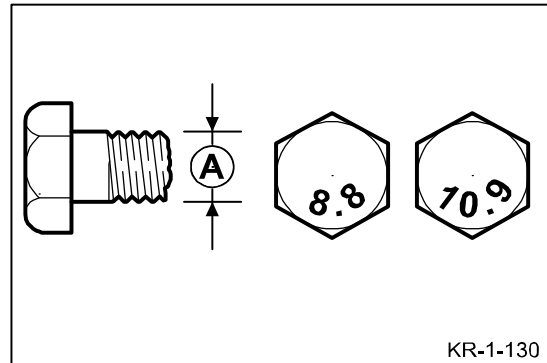
NOTICE

The table does not apply to countersunk screws with hexagonal socket in case the countersunk screw is tightened via hexagonal socket.

Tightening torque in Nm (unless otherwise stated)

A	Stability class			
	5.6	8.8	10.9	12.9
	Tightening torque (Nm)			
M4		3.0	4.4	5.1
M5		5.9	8.7	10
M6		10	15	18
M8		25	36	43
M10	29	49	72	84
M12	42	85	125	145
M14		135	200	235
M16		210	310	365
M20		425	610	710
M22		571	832	972
M24		730	1050	1220
M27		1100	1550	1800
M30		1450	2100	2450

A = thread size
(stability class can be seen on screw head)



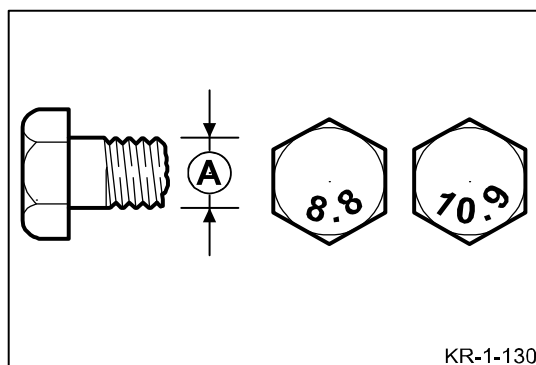
17.5.2 Metric Thread Screws with Fine Thread

Tightening torque in Nm (unless otherwise stated)

A	Stability class			
	5.6	8.8	10.9	12.9
	Tightening torque (Nm)			
M12 x 1.5:		88	130	152
M14 x 1.5		145	213	249
M16 x 1.5		222	327	382
M18 x 1.5		368	525	614
M20 x 1.5		465	662	775
M24 x 2		787	1121	1312
M27 x 2		1148	1635	1914
M30 x 1.5		800	2100	2650

A = thread size

(stability class can be seen on screw head)



17.5.3 Metric Thread Screws with Countersunk Head and Hexagonal Socket



NOTICE

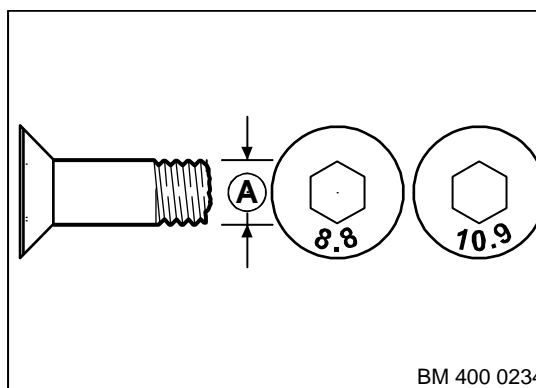
The table applies only to countersunk screws with hexagonal socket and metric thread which are tightened via hexagonal socket.

Tightening torque in Nm (unless otherwise stated)

A	Stability class			
	5.6	8.8	10.9	12.9
	Tightening torque (Nm)			
M4		2.5	3.5	4.1
M5		4.7	7	8
M6		8	12	15
M8		20	29	35
M10	23	39	58	67
M12	34	68	100	116
M14		108	160	188
M16		168	248	292
M20		340	488	568

A = thread size

(stability class can be seen on screw head)



17.5.4
Tightening Torques for Locking Screws and Bleed Valves on the Gearboxes

NOTE

The tightening torques only apply to assembly of locking screws, viewing glasses, ventilation and breather filters and bleed valves in gearboxes with cast housings or aluminium or steel housings. The term "locking screw" includes the drain plug, the inspection screw as well as the ventilation and breather filters.

This table applies only to locking screws with external hex in connection with copper seal ring for bleed valves made of brass with shaped seal ring.

Thread	Locking screw and viewing glass with copper ring*) Ventilation/breather filter made of steel		Bleed valve made of brass Ventilation and breather filter made of brass	
	Steel and cast	Aluminium	Steel and cast	Aluminium
	Maximum tightening torque (Nm) ($\pm 10\%$)			
M10x1			8	
M12 x 1.5			14	
G1/4"			14	
M14 x 1.5			16	
M16 x 1.5	45	40	24	24
M18 x 1.5	50	45	30	30
M20 x 1.5			32	
G1/2"			32	
M22x1.5			35	
M24x1.5			60	
G3/4"			60	
M33x2			80	
G1"			80	
M42x1.5			100	
G1 1/4"			100	

*) Always replace copper rings


Note

Regularly check that nuts and bolts are tightly in place (approx. every 50 hours) and tighten them if necessary.

17.6 Hydraulics



WARNING!

Risk of injury from incorrect handling of liquids under high pressure. Escaping high-pressure liquids may penetrate the skin and cause serious injury.

- Repair work on the hydraulic system may only be performed by authorised KRONE professional workshops.
- Depressurise the system before disconnecting lines.
- When working on the hydraulic system, wear personal protective equipment (protective goggles and protective gloves).
- High-pressure liquid that is escaping from a small opening is virtually invisible. Therefore use a piece of cardboard or something similar when searching for leaks.
- If liquid penetrates the skin, consult a doctor immediately. The liquid must be removed from the body as quickly as possible. Danger of infection! Physicians who are not familiar with this area must consult appropriate information from a competent medical source.
- Check the hydraulic hoses at regular intervals and replace them if damaged or worn! Only original KRONE spare parts are permitted to be used as replacement lines as they correspond to the technical requirements of the manufacturer.
- Before the pressure in the system builds up again, ensure that all line connections are tight.

17.6.1 Hydraulic circuit diagram

The hydraulic diagrams can be found in the appendix.

17.7

Tyres



Warning! - Tyre fitting incorrect

Effect: Injuries or damage to the machine

- Fitting tyres requires sufficient knowledge and the availability of proper tools!
- If tyres are not correctly fitted, it could explode when pumped up. This can cause serious injury. If you do not have sufficient experience of fitting tyres, have tyres fitted by the KRONE dealer or a qualified tyre specialist.
- When fitting tyres on the wheel rims, the maximum pressure given by the tyre manufacturer must not be exceeded. The tyre or even the wheel rim could explode and/or burst.
- If the tyre heels do not fit properly when the maximum permitted pressure is reached, let out the air, align tyres, lubricate the tyre heels and pump up the tyre again.
- Detailed information about how to fit tyres onto agricultural machinery can be obtained from the tyre manufacturers.

Tightening Torque

Threading	Key size in mm	Number of bolts per hub - pieces	Max. tightening torque	
			black	galvan.
M12 x 1.5	19	4/5	95 Nm	95 Nm
M14 x 1.5	22	5	125 Nm	125 Nm
M18 x 1.5	24	6	290 Nm	320 Nm
M20 x 1.5	27	8	380 Nm	420 Nm
M20 x 1,5	30	8	380 Nm	420 Nm
M22 x 1.5	32	8/10	510 Nm	560 Nm
M22 x 2	32	10	460 Nm	505 Nm

17.7.1 Checking and maintaining tyres

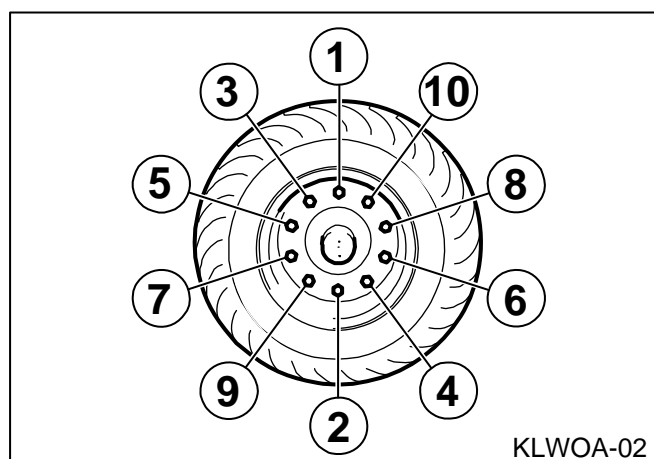


Fig. 123

When loosening and tightening the wheel nuts, observe the order indicated in the illustration.

Check the wheel nuts: According to the maintenance table

Check the tyre air pressure: According to the maintenance table

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18 Maintenance – lubrication

18.1 Special Safety Instructions







WARNING! - When performing repair, maintenance or cleaning work on the machine, or in the case of technical intervention, drive elements may start moving.

Effect: Danger to life, injuries or damage to the machine.

- Switch off engine, remove the ignition key and carry it with you.
- Secure machine and tractor against rolling.
- Turn off PTO shaft.
- After the repair, maintenance, cleaning work or technical modifications are completed, mount all protective covers and safety devices properly again.
- Avoid skin contact with oils, greases, cleaning agents and solvents.
- In the event of injuries or burns due to oils, cleaning agents or solvents, contact a physician immediately.
- All other safety instructions must also be followed to avoid injuries and accidents.

The information on maintenance intervals is based on average load of the machine. If the load is heavier or under extreme working conditions, the time periods must be reduced.

The types of lubrication are marked in the lubrication chart by symbols, for information about their meaning, refer to the table.

Type of lubrication	Lubricant	Note
Greasing 	Multi-purpose grease	– Grease nipples/approx. two strokes from grease gun – Remove superfluous grease from grease nipple
Lubricating  	Unless otherwise prescribed, use oils based on vegetable matter	– Sliding surface/apply thin with brush or aerosol – Remove old and superfluous oil
Oiling 		– Distribute evenly

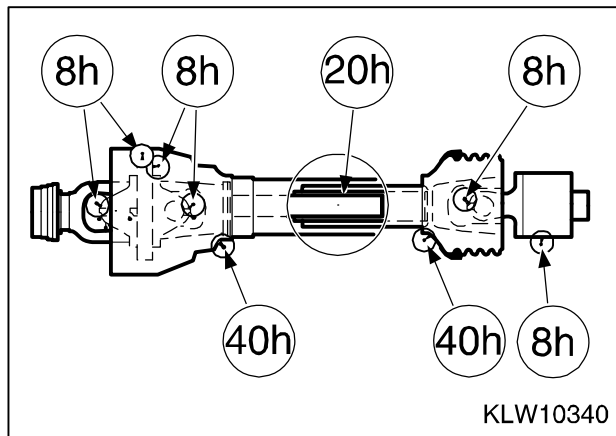
18.2 PTO shaft

Figure 124

All other lubrication points on the PTO shafts must be lubricated as shown in the illustration.

18.3 Lubrication Chart (TX)

Used lubricants: refer to chapter Technical Data, “Consumables”

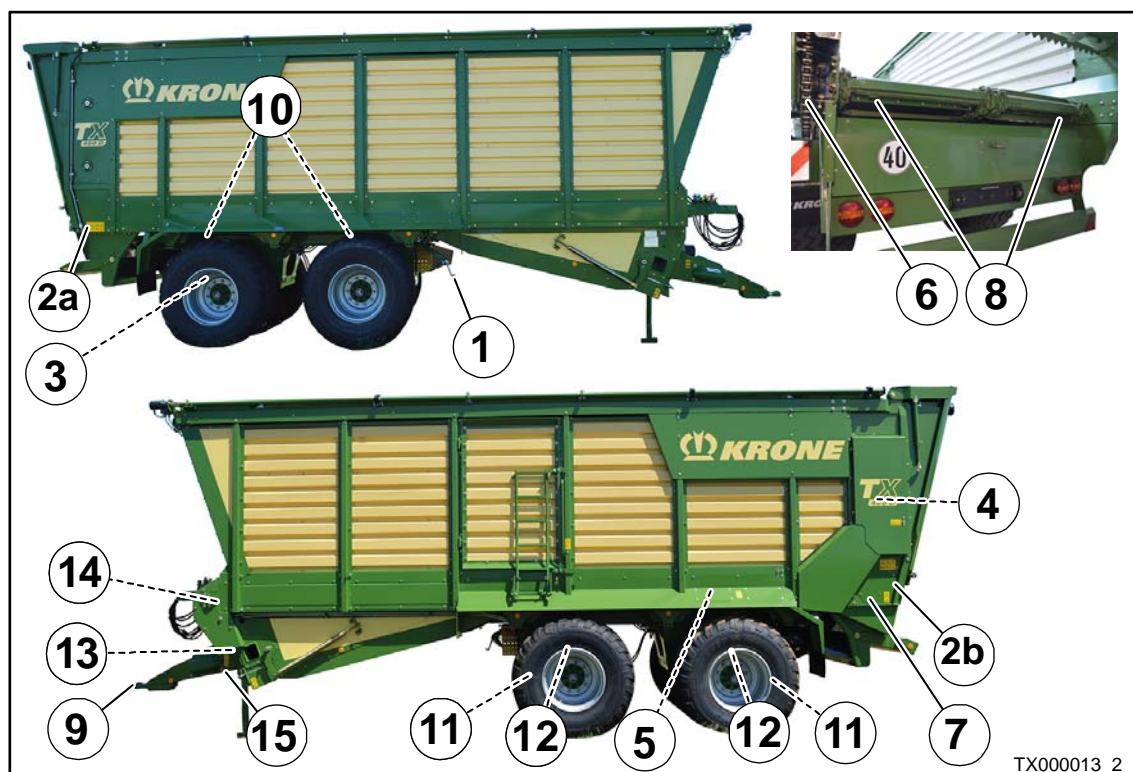
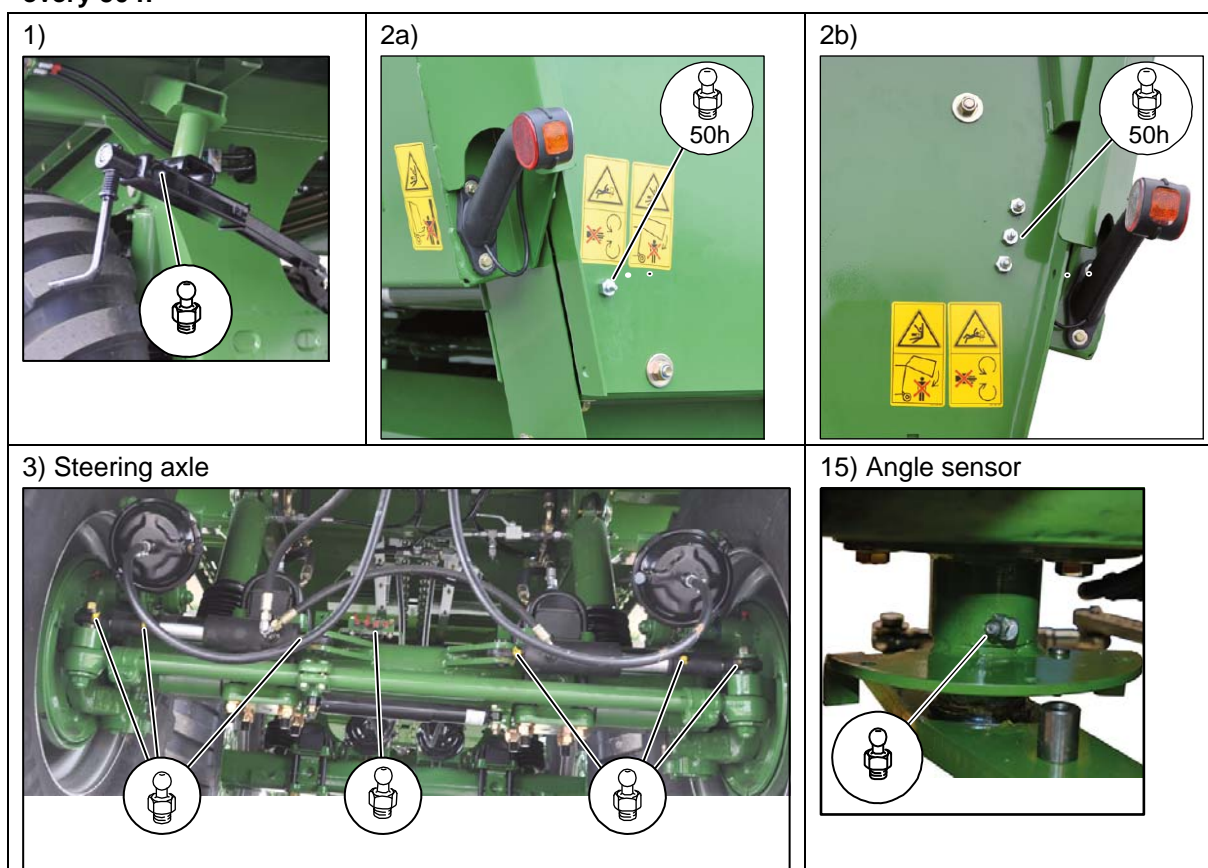


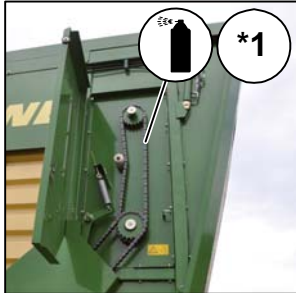
Fig. 125

every 50 h



every 200 wagonloads

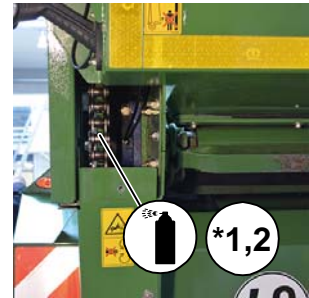
4) For the discharge roller version



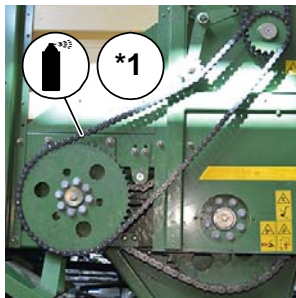
5)



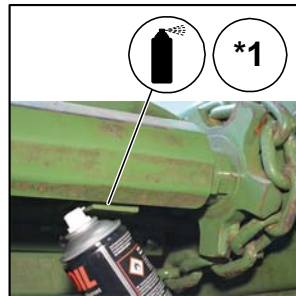
6)



7) For the discharge roller version



8)

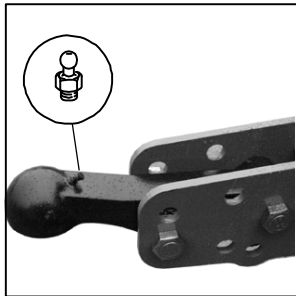


*1) Use high-performance chain spray, refer to Technical Data, “Consumables”.

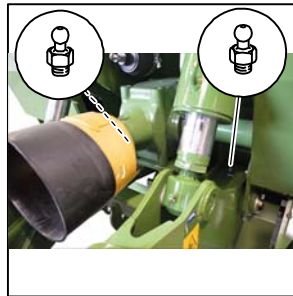
*2) Refer to chapter Maintenance - Lubrication, “Oiling Drive Chain”.

every 100 h

9)

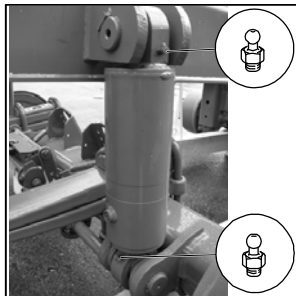


13)



every 200 h

10) For hydraulic suspension/hydraulic compensation



Used lubricants: refer to chapter Technical Data, “Consumables”

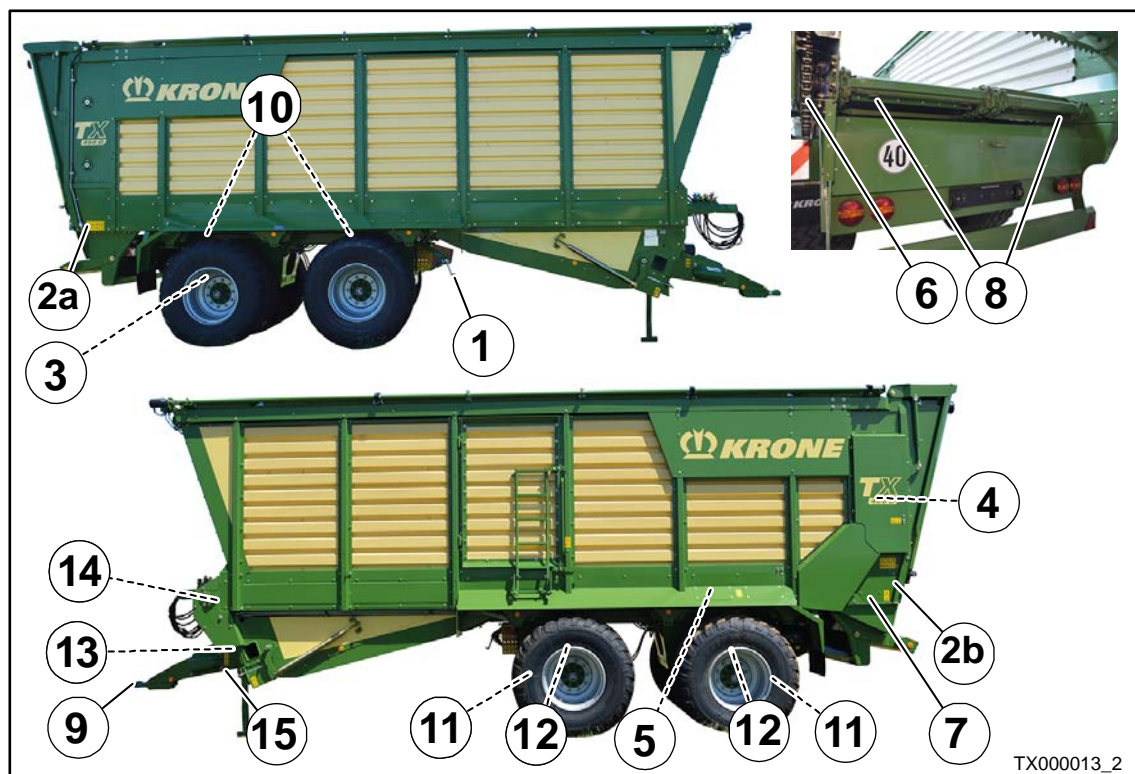
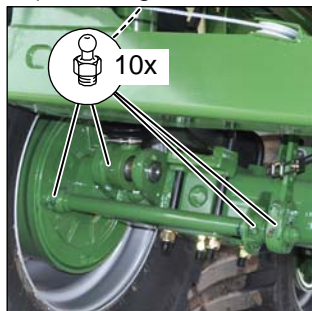


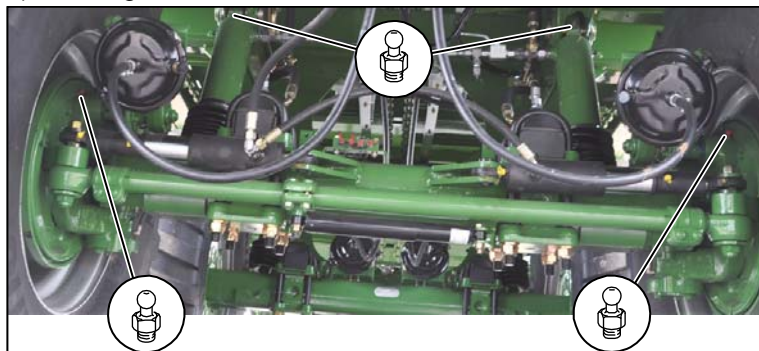
Fig. 126

every 250 h

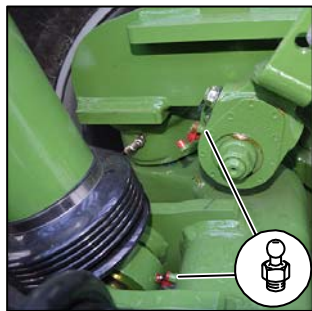
11) Steering axle



3) Steering axle

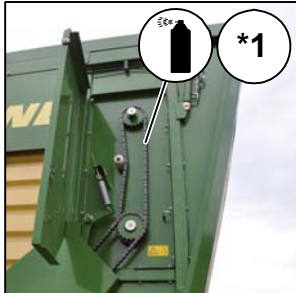


12) Steering axle

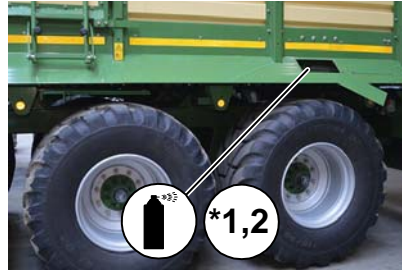


Before the season

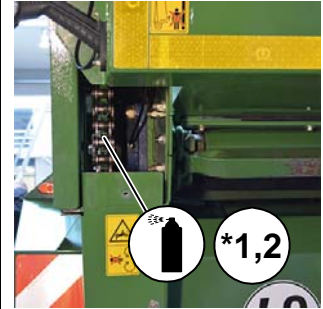
4) For the discharge roller version



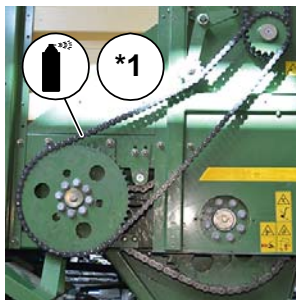
5)



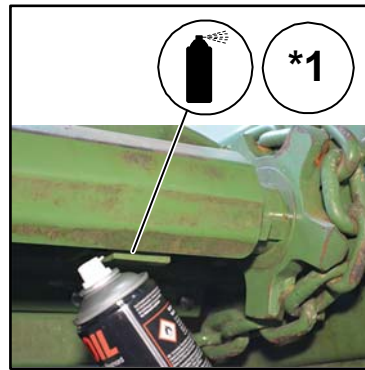
6)



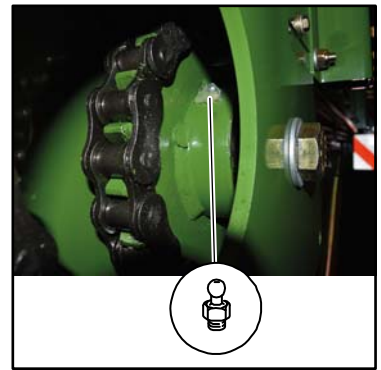
7) For the discharge roller version



8)



14)

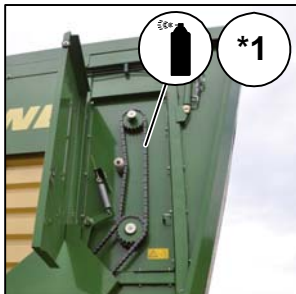


*1) Use high-performance chain spray, refer to Technical Data, "Consumables".

*2) Refer to chapter Maintenance - Lubrication, "Oiling Drive Chain".

After the season

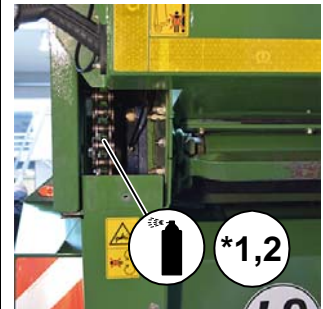
4) For the discharge roller version



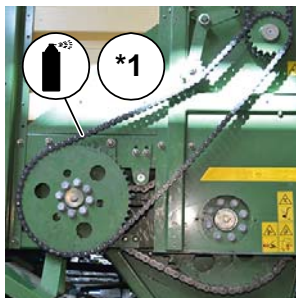
5)



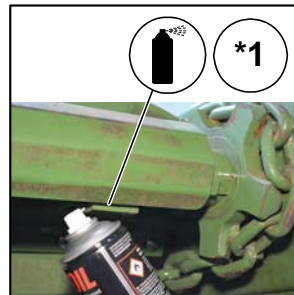
6)



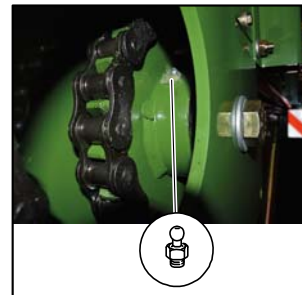
7) For the discharge roller version



8)



14)



*1) Use high-performance chain spray, refer to Technical Data, "Consumables".

*2) Refer to chapter Maintenance - Lubrication, "Oiling Drive Chain".

18.4 Oiling the Drive Chains



WARNING! – Danger of being drawn in resulting from the unprotected running drive chain.

The drive chains are oiled determined by the system when the drive chain is running and the guards are partly removed. Persons may get hurt as the chain is open when it is running.

- Tighten the parking brake of the tractor and secure the transport wagon against the possibility of rolling back by using wheel chocks.
- If two persons work on the machine at the same time, it is absolutely necessary to proceed very carefully. While carrying out work, both persons must keep visual contact and they must fulfil the personnel requisitions, refer to chapter Safety “Target Group of these Operating Instructions”.
- Allow the PTO shaft to turn with the lowest speed.
- Make sure that there are no further persons in the danger zone of the machine.
- The running chain must be oiled with special care.

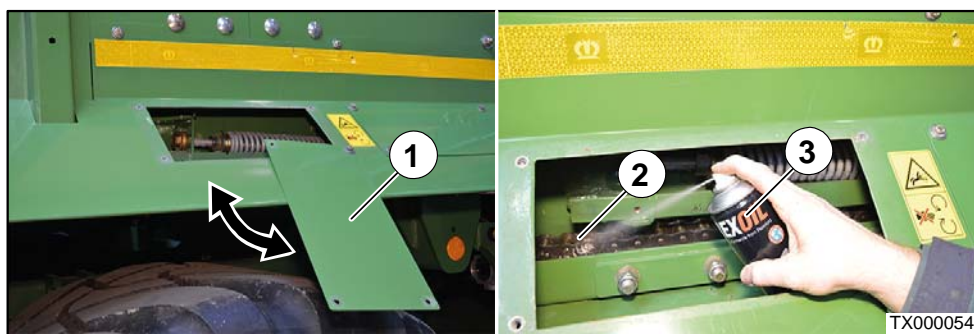


Fig. 127

First oil the drive chain from the wheel cover:

- Remove the three screws of the front cover (1) of the left wheel cover and swivel the cover away.
- Start tractor engine and actuate the drive chain (2) with the lowest PTO speed of the tractor.
- Spray the drive chain (2) with chain guard oil that is in the aerosol (3) until all chain links are completely oiled.
- Stop tractor engine, remove the ignition key and carry it with you.
- Mount the front cover (1) of the left wheel cover again.

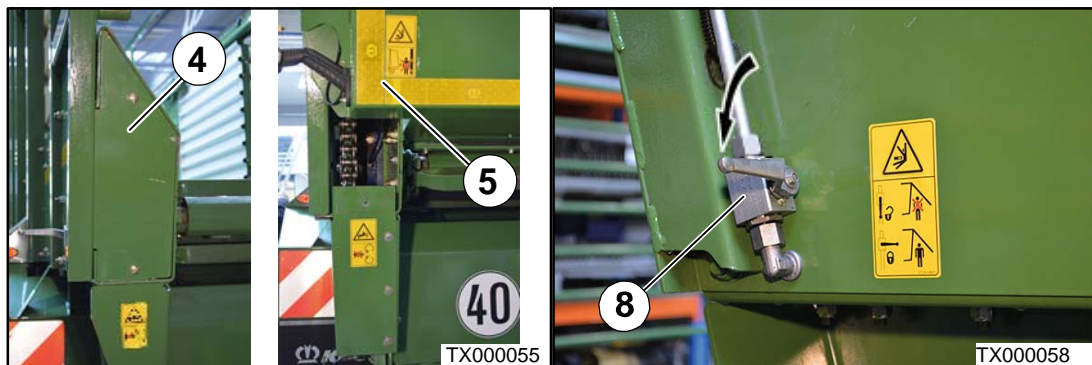


Fig. 128

Then oil the drive chain from the rear:

- Start tractor engine and open tailgate (5).
- Stop tractor engine, remove the ignition key and carry it with you.



WARNING!

Danger of injury from jumping up or sagging tailgate

When performing maintenance work, there is a risk that the tailgate jumps up unintentionally. As a result, persons may get hurt.

- When performing maintenance work in the area of the tailgate, open or close the stop cock near the hydraulic accumulators first and then the stop cock near the tailgate.

- In case of version with hydraulic unloading unit, close the stop cock near the hydraulic accumulators first (refer to chapter Safety "Safety Equipment").
- Close stop cock on the tailgate (8).
- Remove cover (4).
- In case of version with hydraulic unloading unit, close stop cock near the hydraulic accumulators first.
- Open stop cock of tailgate (8).
- Start tractor engine.
- Close tailgate via tractor hydraulics.



Fig. 129

- Actuate the drive chain (6) with the lowest PTO speed.
- Spray drive chain (6) with chain guard oil that is in the aerosol (7) until all chain links are completely oiled.
- Open tailgate via tractor hydraulics.
- Stop tractor engine, remove the ignition key and carry it with you.
- In case of version with hydraulic unloading unit, close the stop cock near the hydraulic accumulators first (refer to chapter Safety "Safety Equipment").
- Close stop cock on the tailgate (8).
- Mount cover (4).
- In case of version with hydraulic unloading unit, close stop cock near the hydraulic accumulators first.
- Open the stop cock on the tailgate (8) again.
- Start tractor.
- Close tailgate (5) via tractor hydraulics.

19 Maintenance - Gearbox

19.1 Input gearbox

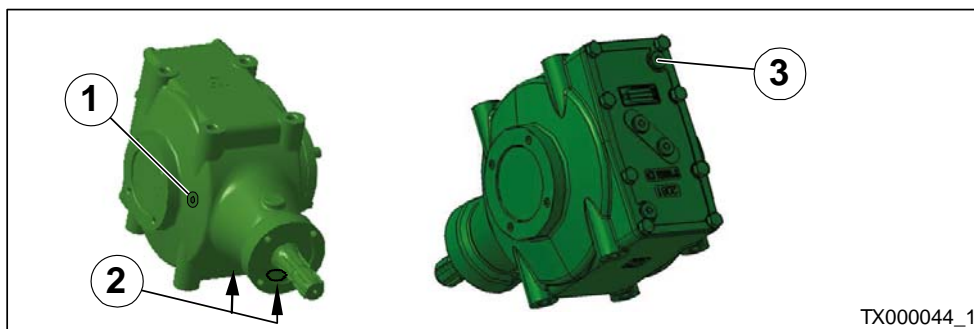


Fig. 130

1)	Inspection screw / control hole	2)	Drain plug
3)	Filler plug / filling hole		

Interval for oil level check and oil change: refer to chapter Maintenance "Maintenance Table"

For information regarding oil quality / amount of oil, refer to chapter Technical Data "Lubricants"

Oil level check:

- Unscrew the inspection screw.
- The oil level must reach up to the inspection hole.

If the oil reaches the inspection hole:

- Mount the inspection screw with the specified tightening torque, refer to chapter Maintenance "Tightening Torques for Locking Screws and Bleed Valves on the Gearboxes".

If the oil does not reach the inspection hole:

- Unscrew the filler plug.
- Top up oil via the filling hole up to the inspection hole.
- Mount the inspection screw and the filler plug with the specified tightening torque, refer to chapter Maintenance "Tightening Torques for Locking Screws and Bleed Valves on the Gearboxes".

Oil change:

Collect escaping oil in a suitable container.

- Screw out oil drain plug and drain the oil.
- Screw out inspection screw and filler plug.
- Screw in oil drain plug and tighten it securely.
- Top up new oil via oil filling hole until the control hole is reached.
- Screw in the inspection screw and the filler plug and tighten them securely.

19.2 Checking / Setting Chain Tension

19.2.1 Floor Conveyor Chain

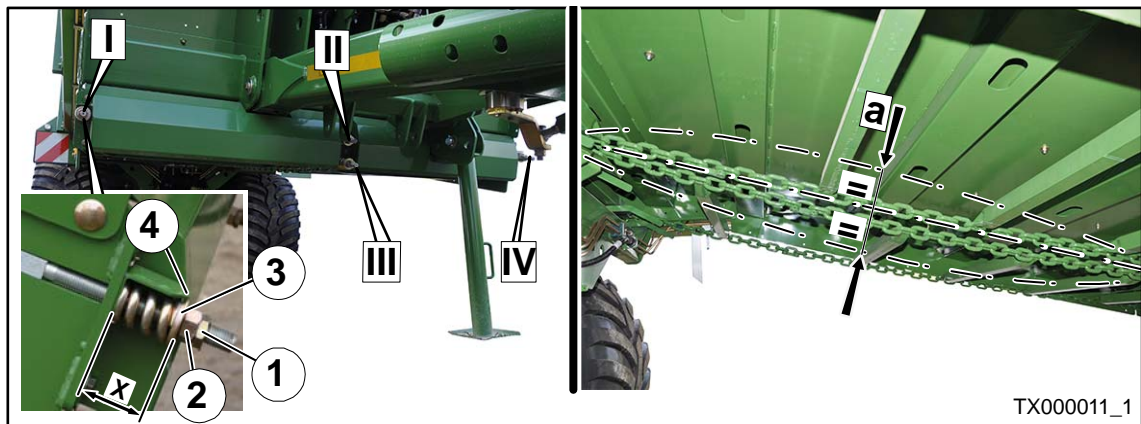


Fig. 131

The floor conveyor is divided into two parts. It consists of a left and a right floor conveyor half. Each floor conveyor half consists of two floor conveyor chains. Each floor conveyor chain can be set via a chain tensioner (I-IV).

Assignment of the chain tensioners:

- I and II : right floor conveyor half
- III and IV : left floor conveyor half

In case of the factory default setting of the floor conveyor chain tension, the washer (3) is at the height of the tip of the setting plate (4).

Before starting to work, check the floor conveyor chain tension and readjust it, if necessary.

Checking floor conveyor chain tension:

- Check the floor conveyor chain tension by pressing in.

The pretension is right if the press-in depth is $a = 30-60 \text{ mm}$.

If the dimension a is not $30-60 \text{ mm}$, the chain tension must be set.

Perform this process for all chains.

Setting the floor conveyor chain tension:



Note

The floor conveyor chain must not be pretensioned too tightly. The floor conveyor chain must indicate a press-in depth of at least $a = 30 \text{ mm}$.

To do this:

- Loosen the counter nut (1).
- Tighten/loosen nut (2) until the dimension $a = 30-60 \text{ mm}$ is set.
- Tighten counter nut (1).

Perform this process for all chains.

19.2.2 Main Drive Chain

Tightening main drive chain

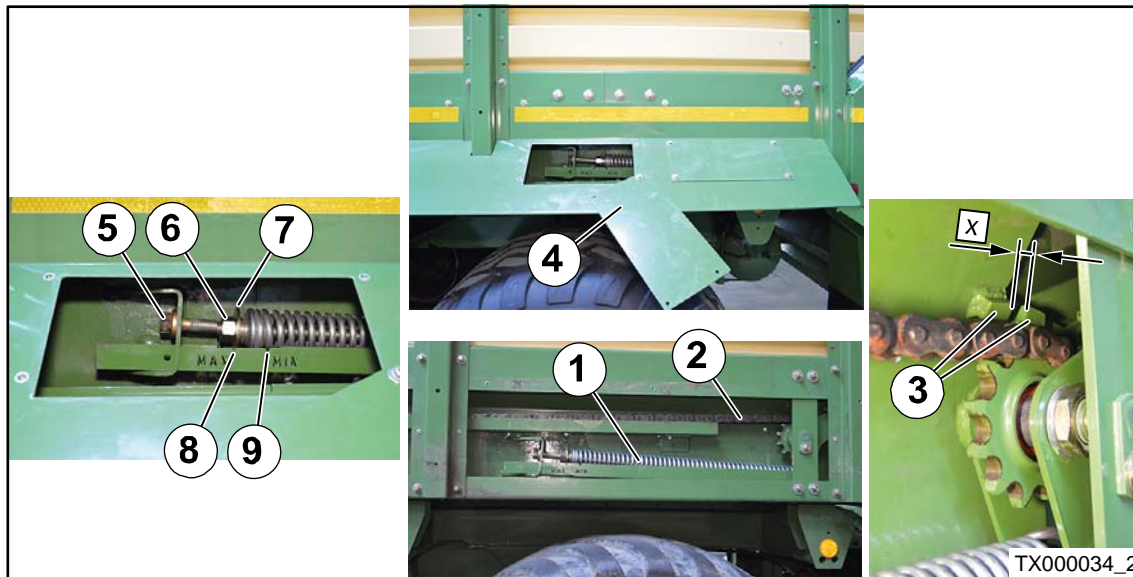


Fig. 132

The tension spring (1) for main drive chain (2) is located behind the left wheel cover.

The gap between the stops (3) is set to $x = 20$ mm ex works. The position disc (7) is located at the MAX marking (8).

If the main drive chain (2) lengthens and the position disc (7) has reached the MIN marking (9), the tension spring must be retightened:

- Remove the front cover (4) of the left wheel cover.
- Loosen counter nut (6).
- Screw in the screw (5) until the position disc (7) has reached the MAX marking (8).
- Tighten counter nut (6) again.
- Mount the front cover (4) of the left wheel cover again.

If the main drive chain (2) cannot be retightened any longer by the chain tensioner via screw (5) and the position screw (7) falls below the MIN marking (9) at the same time, the both chain links from the drive chain (2) must be removed, refer to chapter Maintenance - Gearbox "Removing Chain Links from the Main Drive Chain".

Removing chain links from main drive chain

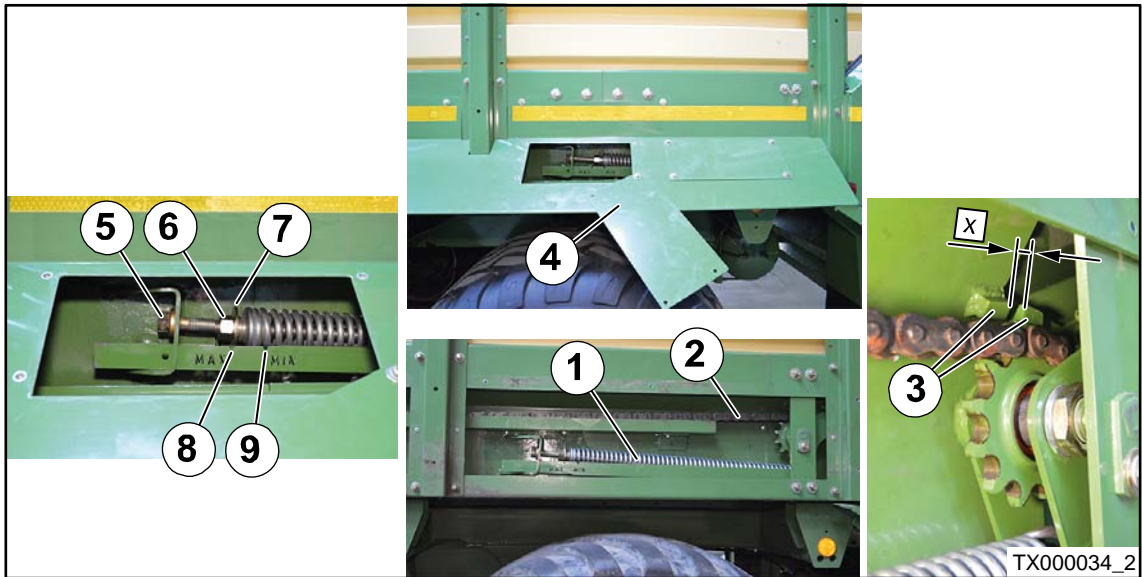


Fig. 133

If the main drive chain (2) cannot be retightened any longer via screw (5) of the chain tensioner and the position disc (7) is below the MIN marking (9) at the same time, the both chain links must be removed from the drive chain (2):

- Remove front cover (4) of left wheel cover.
- Loosen counter nut (6).
- Unscrew the screw (5) until the tension spring (1) is completely relieved.

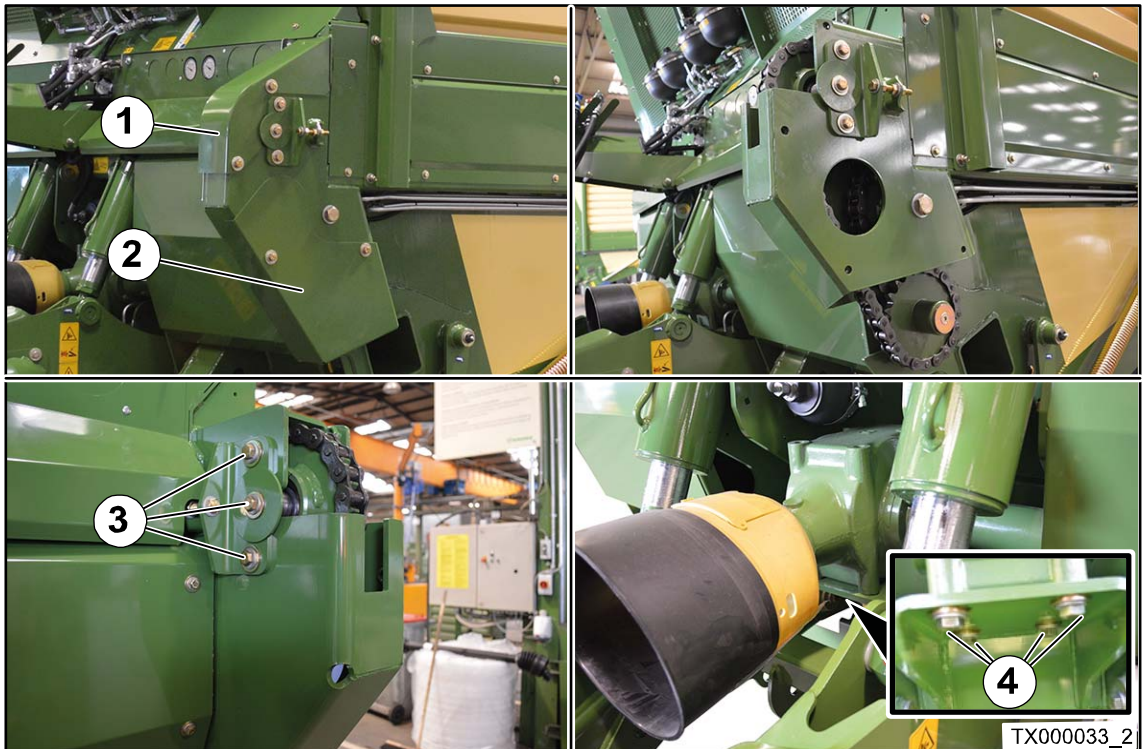


Fig. 134

The drive wheel for the main drive chain is located on the left-hand side at front on the vehicle behind the guards (1, 2).

- Remove guards (1, 2).
- Mark gearbox position and sprocket wheel position for resetting.
- Unscrew the screws (3).
- Unscrew the screws (4).

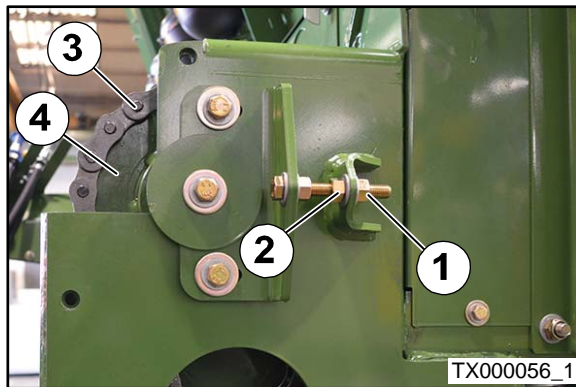


Fig. 135

- Loosen counter nut (1).
- Loosen nut (2) to release the tension on the nuts (2).
- Open the chain lock from the released main drive chain and remove two chain links. Connect the chain with the chain lock again.
- Tighten nut (2) until gearbox and sprocket wheel reach the markings.
- Make sure that the sprocket wheel (4) is in alignment with the main drive chain.
- Tighten counter nut (1) again.



Fig. 136

- Tighten screws (1).
- Tighten screws (2).

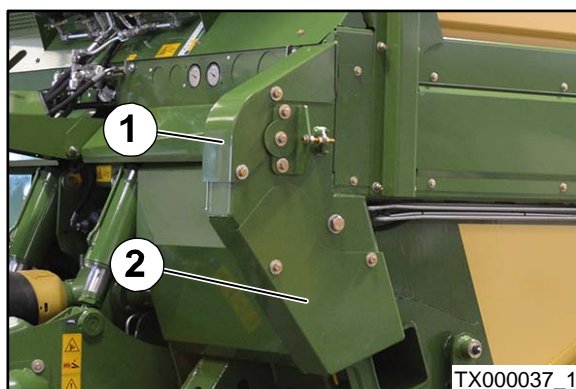


Fig. 137

- Mount guards (1, 2).

After the chain links have been removed, the main drive chain must be tensioned.

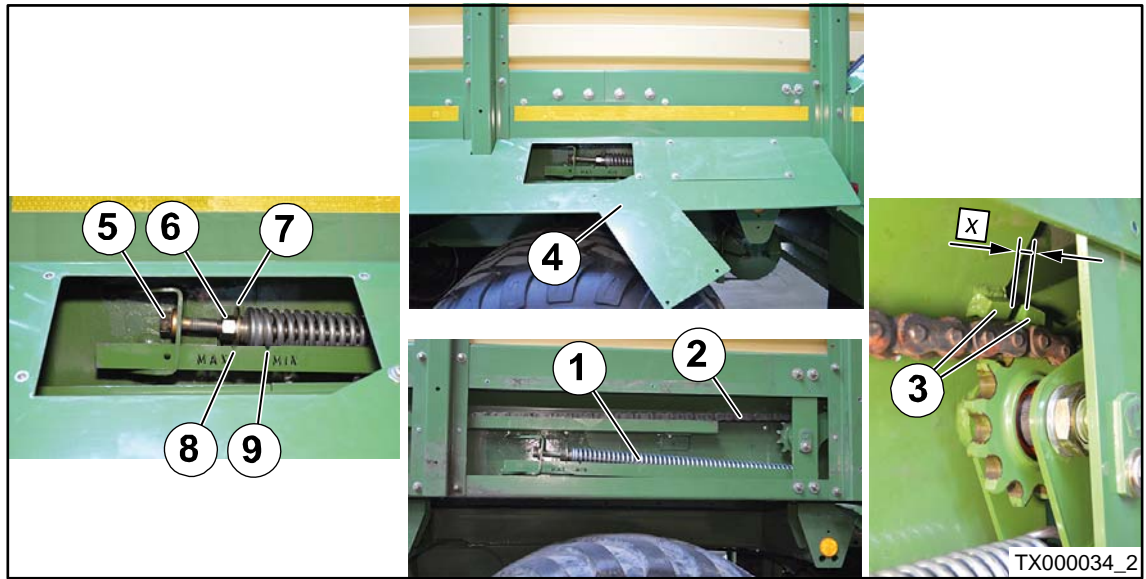


Fig. 138

- Screw in the screw (5) until the position disc (7) has reached the MAX marking (8).
- The dimension "X" should be approx. 10 – 20mm.
- Tighten counter nut (6) again.
- Mount front cover (4) of left wheel cover.

19.2.3 Discharge Roller Chain

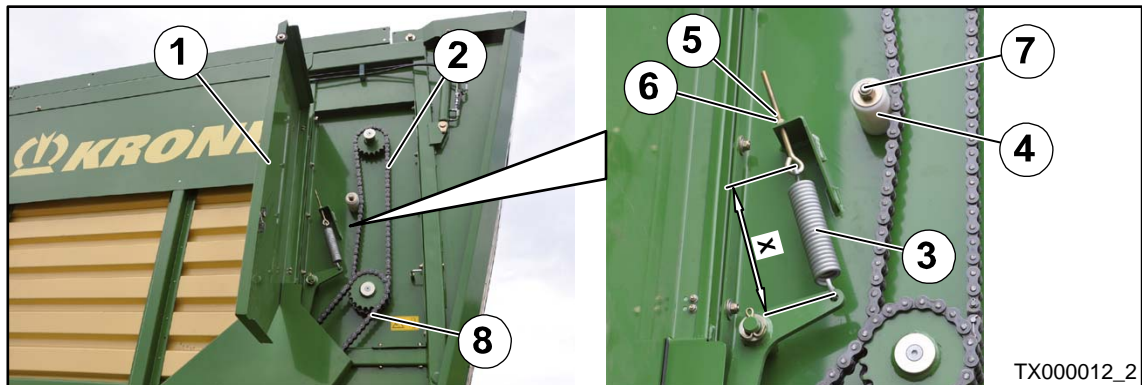


Fig. 139

The chain drive of the discharge rollers is located on the rear left part of the machine behind the guard (1). Discharge roller drive chain (2) is tensioned with clamping elements (4) and discharge roller drive chain (8) is tensioned with clamping element (3).

When the chain tension of the discharge roller drive chain (8) decreases:

- Open protection (1).
- Loosen counter nut (5).
- Tighten nut (6) until dimension X=280 mm is reached on the tension spring (3).
- Tighten counter nut (5).

When the chain tension of the discharge roller drive chain (2) decreases:

- Loosen nut (7).
- Move the tension roll (4) in the oblong hole until it rests slightly against the discharge roller drive chain.
- Tighten nut (7).
- Close protection (1).

20**Maintenance - Brake System****WARNING!****Risk of injury resulting from damage to the brake system**

Damage to the brake system may impair the operational safety of the machine and cause accidents. As a result, people may be seriously injured or killed.

- Adjustment and repair work on the brake system must only be performed by authorised professional workshops or recognised brake services.
- Have the brakes checked regularly by a specialist workshop.
- Have damaged or worn brake hoses replaced immediately by a specialist workshop.
- Irregularities or malfunctions in the brake system must be rectified immediately by a specialist workshop.
- Only a machine with an intact brake system may be used for work in the field or for travelling on roads.
- No changes may be made to the brake system without the approval of KRONE.
- KRONE is not responsible for natural wear, defects caused by overload or changes made to the brake system.

20.1**Brake setting**

Depending on how the machine is used, the wear on and proper functionality of the brakes must be checked regularly and reset if necessary.

An adjustment is required when about 2/3 of the max. cylinder stroke is used to achieve full braking.

Set the axle on blocks and prevent it from being moved unintentionally.

20.2 Adjusting the transfer mechanism

After the first few kilometres of driving, the transfer mechanisms and the brake linings of the brake drum will have adjusted. The play resulting from this must be compensated for.

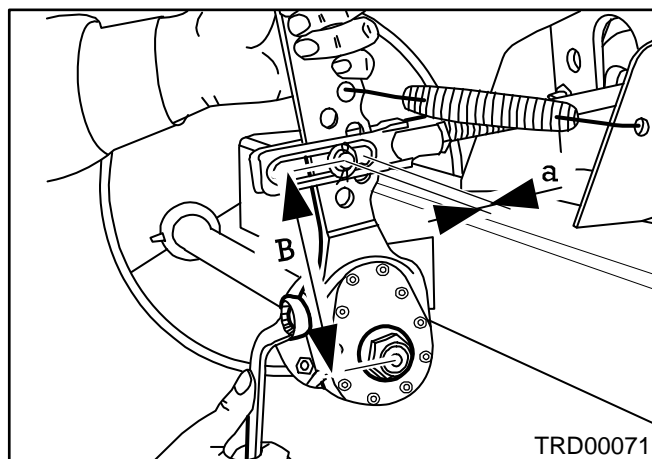


Fig. 140

Damping cylinder, top and bottom

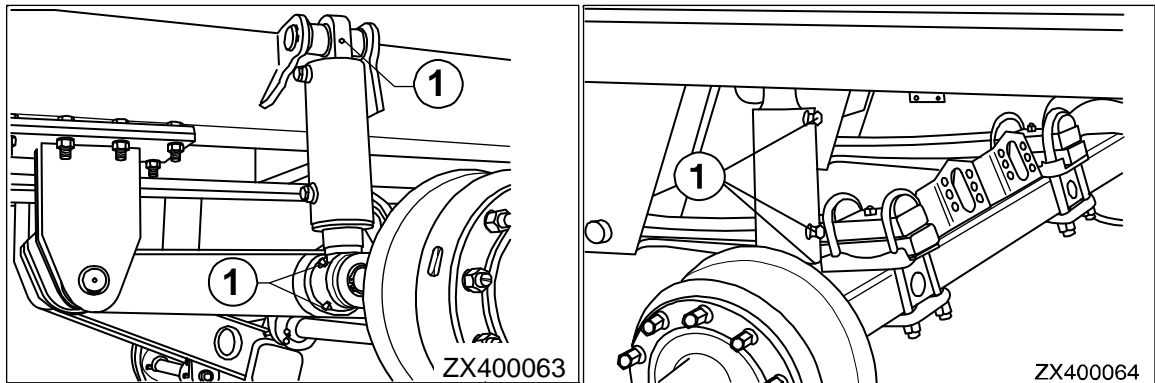


Fig. 141

- **Every 200 operating hours**

Lubricate the lubrication points (1) with long-term grease (ECOLi 91) until fresh grease emerges from the bearing points. In addition to this lubrication tasks, care must be taken to ensure the cylinder and line are always vented.

Visual check

- **every 200 operating hours**

Check all components for damage and wear.

Check the damping cylinder for condition and leaks

- **Every 500 operating hours, at least annually**

Check damping cylinder fastening

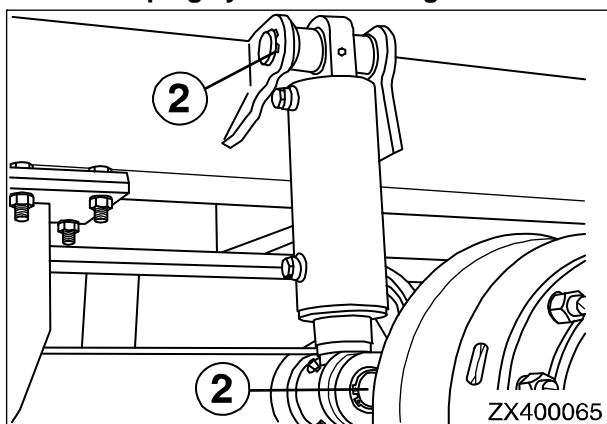


Fig. 142

- **Every 500 operating hours, at least annually**

Check fastening (2) of damping cylinders for wear and to ensure snug fit.

Retightening spring mounting nuts

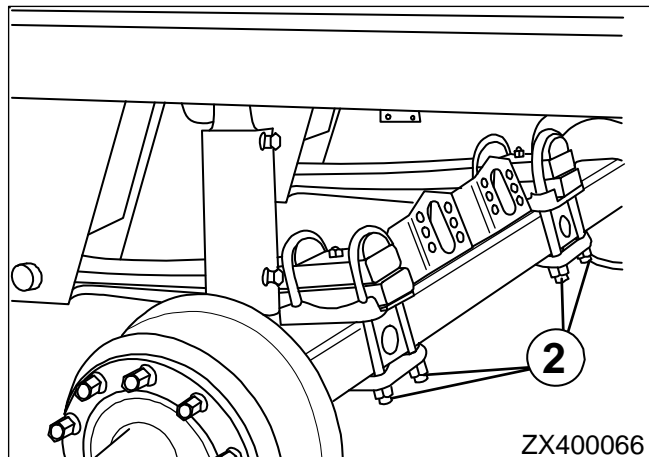


Fig. 143

- **For the first time after initial operation (approx. 10 operating hours)**
- **Every 200 operating hours**

Check locknuts (2) of spring clips to ensure they are properly seated.

If the screw connection is loose, tighten the nuts on alternate sides in several steps. Do not weld on the suspension link! Tightening torque with torque wrench:

M24 = 650 Nm (605 - 715 Nm)

Service oil reserve container on the damping cylinder

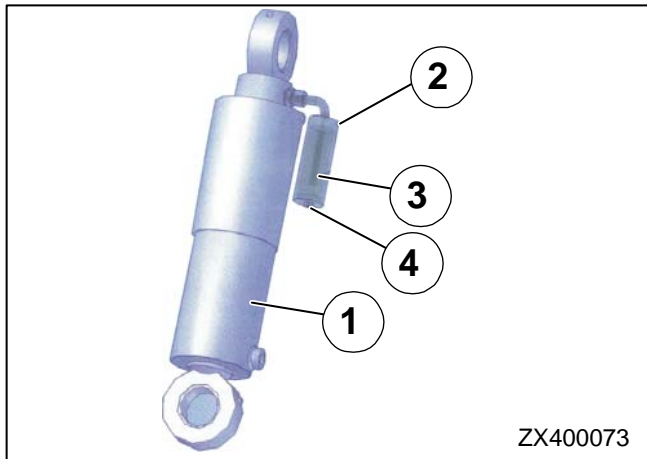


Fig. 144

- 1) Suspension cylinder 2) Breather and exhaust filter 3) Oil reserve container
4) Filling and draining screw

The oil reserve container (1) ensure that the plunger rod is always supplied with oil mist.

The oil reserve container must be filled to at least half capacity with hydraulic oil.

- Check the oil quantity once a month with the cylinder pushed in and add oil as necessary. (To do this the oil reserve container must be rotated 180°.)

Condensation water may collect in the oil reserve container during operation. This condensation water must be emptied out of the oil reserve container at regular intervals.

To do this:

- Unscrew the drain screw (4) let the condensation water drain out and then screw the drain screw back in.
- Check the hydraulic oil level and add oil if necessary.

Spring bolts

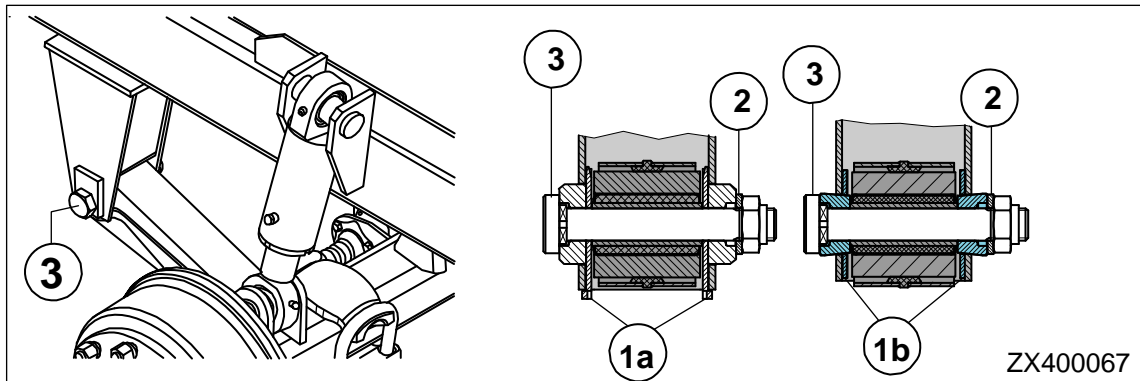


Fig. 145

- Every 500 operating hours but at least annually, beginning after the first time driving with load

Check the bushings, move the vehicle slightly forward and back with the brake engaged, or move the spring eyes with a mounting lever. There must be no discernable play in the spring eye. If the fastening is loose, the spring bolt (3) can be damaged.

- Check the side wear plates in the support.
- Check the M 30 locknut on the spring bolts (3) to ensure it is snugly seated.

Tightening torques with torque wrench:

M 30 M = 900 Nm (840 - 990 Nm)

Secure fastening of the inner steel bushing determines the service life of the rubber/steel bushing bearing.

1a Loose wear plate

1b Side wear plate

2 Plate

3 Spring bolt with twist lock groove

20.3

Air Filter for Pipe

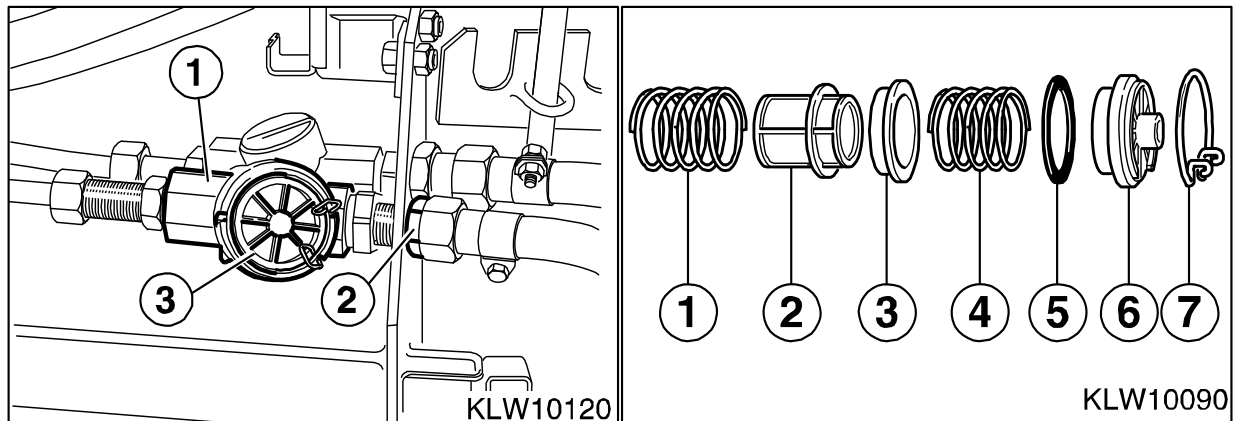


Figure 146

- | | | |
|------------|------------------|------------------------|
| (1) Spring | (4) Spring | (7) Clasp locking ring |
| (2) Filter | (5) Sealing ring | |
| (3) Spacer | (6) Cover cap | |

The air filter is installed in front of the brake valve. It cleans the compressed air, thereby protecting the brake system from malfunctions.



Note

The brake system is ready for operation even when the filter insert is clogged in both direction of flow.

Removing the air filter

- Unscrew the nut (2).
- Rotate the air filter (1).
- Loosen the clasp locking ring (3).
- Remove the filter insert.

Maintenance of the air filter

Clean the air filter before the beginning of the season.

Installation of the air filter

Installation is in reverse order to removal.



Note

Observe the correct sequence when assembling the filter insert.

20.4 Compressed-air reservoir

The compressed-air reservoir stores the compressed air that is pumped by the compressor. Therefore condensation water may settle in the compressed air reservoir during operation. The compressed-air reservoir must be emptied regularly. Specifically, it must be emptied:

- daily in winter (when being used),
- otherwise weekly and
- at least after 20 operating hours.

The drain valve on the bottom of the compressed-air reservoir is used for draining.

- Switch off and secure the machine.
- Open the drain valve and allow the condensation to run out.
- Check the drain valve, clean it and screw it back in.



Note

If the drain valve has a heavy accumulation of dirt or is leaking, it must be replaced by a new one.

20.5

Moving



Danger! - Transport / road travel

Effect: Danger to life, serious injuries or serious damage to the machine.

Moving the machine in public road traffic without the compressed air brake connected is prohibited.



WARNING!

If the release valve of a machine not secured against rolling away is not actuated, the machine may start to move unintentionally. Thus there is a risk of serious injuries or death.

- Secure the machine against rolling away before actuating the release valve or letting off the air pressure from the storage tank.

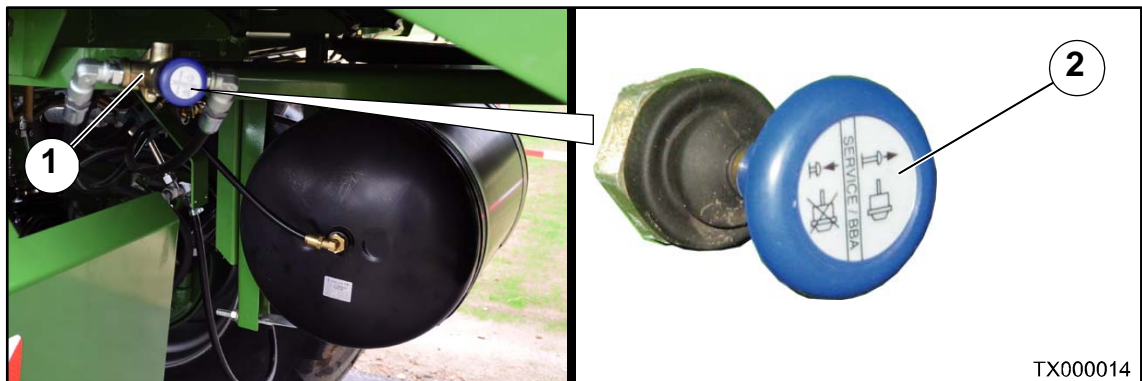


Fig. 147

It is not easy to move the machine if the hoses of the compressed air brake are not connected to a brake system.

Tandem axle

The release valve (1) is located rear left on the machine next to the compressed air reservoir.

Tridem axle

The release valve (1) is located on the frame on the left-hand side of the machine in front of the last wheel of the Tridem axle.

Pressing the pushbutton (2) on the release valve (1) releases the compressed air brake. When the compressed air hoses are reconnected to a compressed air brake system, the push button is automatically pushed back into its starting position.

20.6

Upkeep after Daily Use



Note

After daily operation, the areas around the conveyor and cutting system and adjacent areas must be cleaned and preserved regularly.

21 Maintenance - Self Steering

21.1 Tracking / Setting the System Pressure



Danger! - Unexpected movements of the machine

Effect: Danger to life, injuries or damage to the machine.

- Setting tasks must only be performed when the drive is switched off and the engine is at a standstill!
- Bring the machine to a complete stop.
- Switch off the engine, remove the ignition key and turn off the electrical system on the control box
- Secure the machine and tractor against rolling.



Warning

The machine must only be placed in use with the shut-off valves closed

Hydraulic tandem unit design

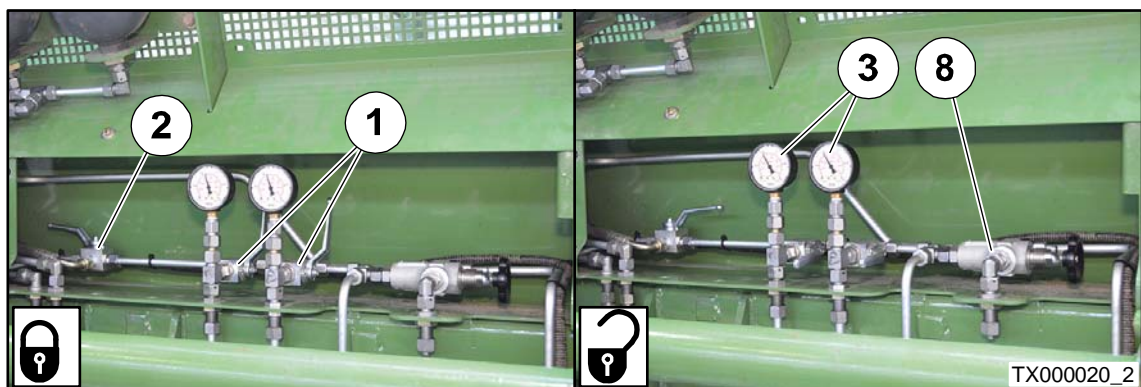


Fig. 148

- Open stop valves (1), lever to the front.
- Open main valve (2), lever to the right.
- Move the tractor and attachment straight forward until the wheels have straightened out (move along approx. 20 m).
- Activate the control unit (yellow 2+) for "Raising drawbar" until a value of 80 bar is displayed on the pressure gauge.
- Close stop valves (1) while simultaneously activating the control unit (yellow 2+) for "Raise drawbar", lever up.
- Change direction of flow on main valve (2), lever to the left.

After filling is complete, check the system pressure (3). The system pressure (3) must read 80 bar. If this is not the case, the process must be repeated as described above.



Note

If the system pressure cannot be adjusted to 80 bar, it must be preset again with the pressure limiting valve (8), see chapter Maintenance "Setting the Pressure Limiting Valve".

Version with hydraulic tridem unit

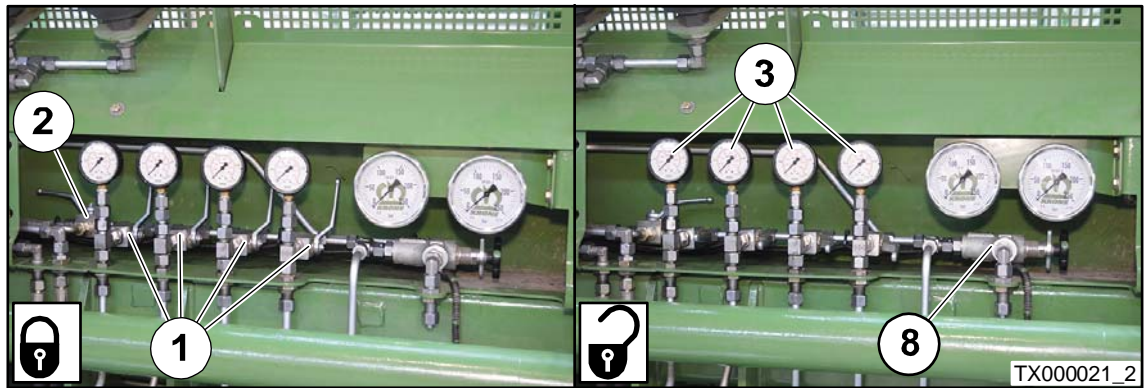


Fig. 149

- Open stop valves (1), lever to the front.
- Open main valve (2), lever to the right.
- Move the tractor and attachment straight forward until the wheels have straightened out (move along approx. 20 m).
- Activate the control unit (yellow 2+) for "Raising drawbar" until a value of 80 bar is displayed on the pressure gauge.
- Close stop valves (1) while simultaneously activating the control unit (yellow 2+) for "Raise drawbar", lever up.
- Change direction of flow on main valve (2), lever to the left.

After filling is complete, check the system pressure (3). The system pressure (3) must read 80 bar. If this is not the case, the process must be repeated as described above.



Note

If the system pressure cannot be adjusted to 80 bar, it must be preset again with the pressure limiting valve (8), see chapter Maintenance "Setting the Pressure Limiting Valve".

21.1.1 Adjusting the Pressure Limiting Valve

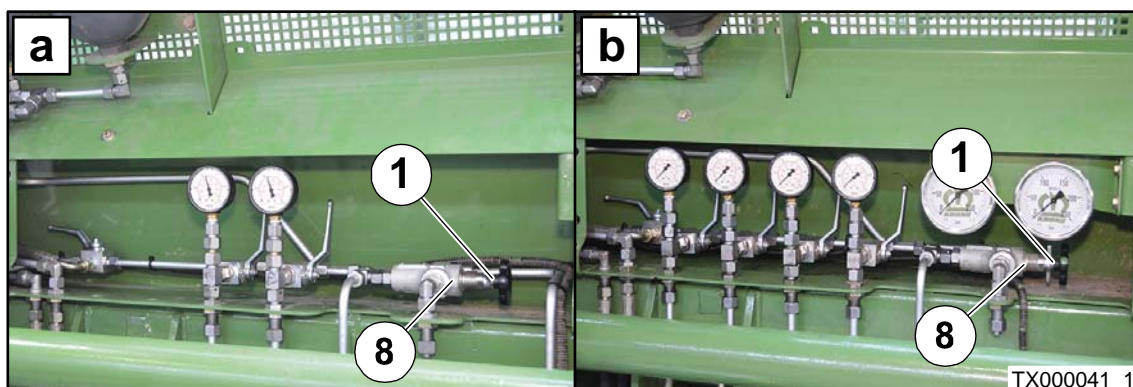


Fig. 150

The pressure limiting valve (8) is preset in the factory to 80 bar.

Increasing / Reducing the Pressure

- Release the locking lever (1)
- Turn the handwheel to increase or reduce the presetting of the system pressure.

Clockwise = increase the pressure

Anticlockwise = decrease the pressure

- Close the locking lever (1)

21.2 Maintenance and repair work in the loading area



DANGER! – Unexpected switching on of the floor conveyor / dosing rollers!

Effect: Danger of injury or death.

Do not step onto the loading area if the tractor engine is running and the PTO shaft is switched on.

- Switch off the engine and PTO and remove the ignition key.
- Secure the machine against the possibility of rolling back.

Access to the loading area:

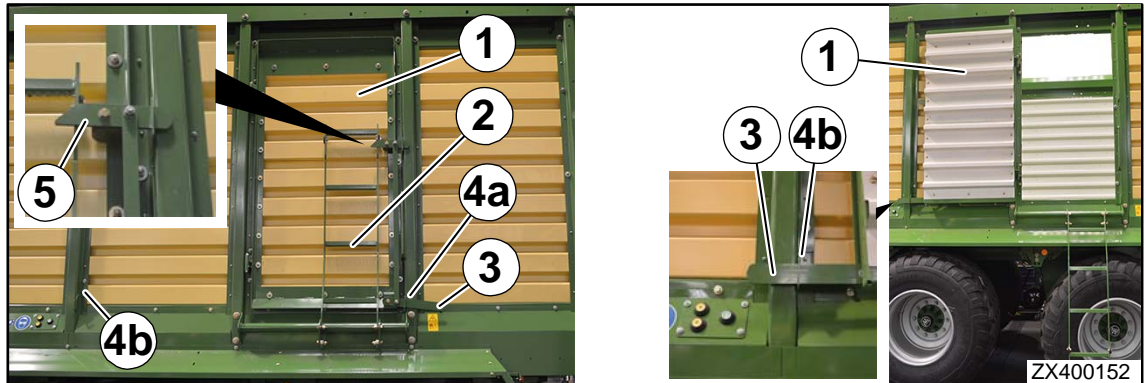


Fig. 151

Enter the loading area via the opened access hatch (1) on the left-hand side of the machine:

Prerequisite to enter the loading area:

- PTO shaft and tractor engine are switched off, the ignition key is removed and you carry it with you.
- Machine and tractor are secured against rolling away.

To enter the loading room:

- Pull locking lever (3) out of the guidance (4a) and fold down the ladder (2).
- Open the access hatch (1) by 180 degrees and insert the locking lever (3) into the guidance (4b).
- Enter the loading area by using ladder and access hatch.

To leave the loading area:

- Leave the loading area by using the ladder and close the access hatch.
- Swivel locking lever upwards, fold in ladder and insert locking lever downwards into the guidance (4a) to secure ladder and access hatch.

Make sure that

- the locking lever is pushed into guidance (4a).
- the locking lever (5) is located in front of the ladder.

22 Malfunctions - Causes and Remedies



WARNING!

If the basic safety instructions are not followed, people may be seriously injured or killed.

- To avoid accidents, the basic safety instructions in the chapter Safety must have been read and followed, see chapter Safety "Basic safety instructions".



WARNING!

If the safety routines are not adhered to, people may be seriously injured or killed.

- To avoid accidents, the safety routines in the chapter Safety must be read and followed, see chapter Safety "Safety routines".

22.1 Malfunctions on Job Computer

Malfunction: The LED flashes red.

Possible causes	Remedy
The job computer has a malfunction.	<ul style="list-style-type: none"> • Contact customer service.

Malfunction: The LED flashes red/yellow.

Possible causes	Remedy
No software is installed on the job computer.	<ul style="list-style-type: none"> • Contact customer service.

Malfunction: The LED flashes blue.

Possible causes	Remedy
The polarity of the job computer's power supply is reversed.	<ul style="list-style-type: none"> • Contact customer service.

23

Placing in Storage

**WARNING!**

If the basic safety instructions are not followed, people may be seriously injured or killed.

- To avoid accidents, the basic safety instructions in the chapter Safety must have been read and followed, see chapter Safety "Basic safety instructions".

**WARNING!**

If the safety routines are not adhered to, people may be seriously injured or killed.

- To avoid accidents, the safety routines in the chapter Safety must be read and followed, see chapter Safety "Safety routines".

Placing in Storage

23.1 At the End of the Harvest Season

Placing the machine in storage at the end of the harvest season is the best possible way to preserve the machine.

- Park the machine in a weatherproof and dry place which is far away from corrosive substances.
- Jack up the machine so that the total weight does not rest on the wheels.



CAUTION!

Damage to the machine by jacking it up incorrectly

The machine may be damaged if it is raised incorrectly. Furthermore, the machine may tip over if it is not jacked up correctly.

- Only jack up the machine using a suitable car jack.
- Make certain that the machine is stable and safe when it is on blocks.

-
- Protect the tyres against external influences such as oil, grease and direct sunlight, etc.
 - Thoroughly clean the machine.
Chaff and dirt attract moisture which causes steel parts to start rusting.



CAUTION!

Damage to the machine caused by water from a high-pressure cleaner

If the water jet from a high-pressure cleaner is aimed directly at bearings and electrical/electronic components, these components may be damaged.

- Do not aim the water jet from a high-pressure cleaner at bearings and electrical/electronic components.

-
- Lubricate the machine according to the lubrication chart. Do not wipe off any grease that comes out of bearing points as the hardened grease will provide additional protection against moisture.
 - Grease the threads of the setting screws and similar items.
 - Relieve the springs.
 - Disassemble the universal shaft. Lubricate the inner tubes with grease.
 - Lubricate the grease nipples on the universal joint of the universal shaft as well as on the bearing rings of the guard tubes, refer to chapter Maintenance - Lubrication "Lubricating Universal Shaft".
 - Thoroughly lubricate the uncoated piston rods of all hydraulic cylinders and retract them as far as possible.
 - Wet all lever joints and bearing points which cannot be lubricated with oil.
 - Repair places with damaged paint and preserve all bare metal places thoroughly with rust protection agent.
 - Check all moveable parts to make certain they move easily. Dismount, clean, grease and remount, if necessary.
 - If parts have to be replaced, only use KRONE original spare parts.



Note

Write down all repair jobs which must be performed by the next harvest and arrange for them to be done with sufficient lead time. Your KRONE dealer is better able to perform maintenance service and any required repairs outside of harvest season.

23.2

Before the Start of the New Season

**WARNING!**

If the basic safety instructions are not followed, people may be seriously injured or killed.

- To avoid accidents, the basic safety instructions in the chapter Safety must have been read and followed, see chapter Safety "Basic safety instructions".

**WARNING!**

If the safety routines are not adhered to, people may be seriously injured or killed.

- To avoid accidents, the safety routines in the chapter Safety must be read and followed, see chapter Safety "Safety routines".
- Grease all lubrication points and oil the chains. Wipe away grease that emerges from lubrication points.
- Check the oil level in the gearbox(es) and top up if necessary.
- Check hydraulic hoses and lines for leaks and replace them if necessary.
- Check the air pressure in the tyres and refill if necessary.
- Check all screws to make certain they are tight or retighten them if necessary.
- Check all electrical connection cables and the lighting. Repair or replace it if necessary.
- Check all attachments of the machine.
- Check the entire setting of the machine and correct if necessary.

24 Disposal of the machine

24.1 Disposal of the machine

After the service life of the machine has expired, the individual components of the machine must be disposed of properly. The applicable country-specific, current waste disposal guidelines and the legal laws must be observed.

Metal parts

All metal parts must be brought to a metal recycling centre.

The components must be freed from operating fluids and lubricants (gear oil, oil from hydraulic system, ...) before being scrapped.

The operating fluids and lubricants must be brought separately to an environmentally friendly disposal point or recycling centre.

Operating fluids and lubricants

Operating fluids and lubricants (diesel fuel, coolant, gear oil, oil from hydraulic system, ...) must be brought to a disposal point for waste oil.

Synthetic materials

All synthetic materials must be brought to a recycling centre for synthetic materials.

Rubber

Rubber parts (hoses, tyres, ...) must be brought to a rubber recycling centre.

Electronic scrap

Electronic parts must be brought to a disposal point for electronic scrap.

25	Appendix
25.1	Hydraulic circuit diagram

1)
OPTION



3)

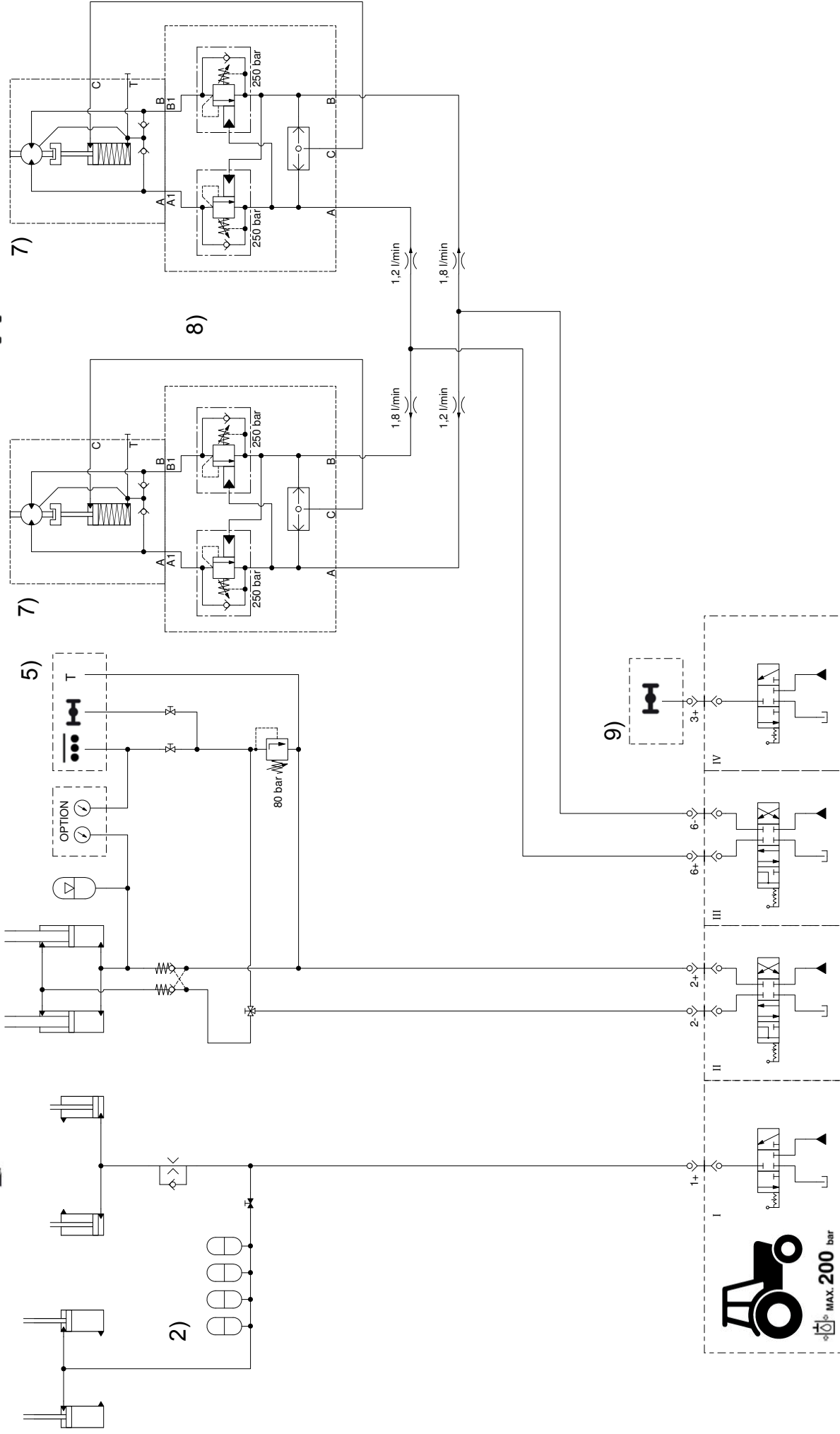


4)



6)

OPTION



MAX. 200 bar

Appendix

1	Unloading aid	6	Hydraulic loading area cover
2	Hydraulic accumulator	7	Hydraulic motor
3	Tailgate	8	Lowering brake valve
4	Drawbar	9	Hydraulics axle assembly
5	Pipe axle assembly T		

1+ (green)

2 - (yellow)

2+ (yellow)

3+ (yellow)

6+ (blue)

6+ (blue)

25.2 Circuit Diagram

The circuit diagram can be found in the Appendix.



Circuit diagram

document no.:	D24	version:
150101251	EN	02

forage transport wagon

TX460, TX460D, TX560, TX560D

from year of manufacture 2016



Document type		Sheet	description				
Cover sheet	1	forage transport wagon					
Legend	1	informations					
Equipment list	1	Equipment list					
Equipment list	2	Equipment list					
Location plan	1	variant TX 460 comfort					
Location plan	2	variant TX 560 comfort					
Location plan	3	accessories kit working lights with operation panel					
Location plan	4	accessories pack weight measurement					
Location plan	5	accessories pack additional camera, accessories pack camera connection cables					
Location plan	6	traffic lighting					
Circuit diagram	1	variant TX 460 comfort: control terminal Delta					
Circuit diagram	2	variant TX 460 comfort: control terminal CCI200					
Circuit diagram	3	variant TX 460 comfort: Joystick					
Circuit diagram	4	variant TX 460 comfort: power supply: accessories pack control terminal, Accessories kit: joystick ISOBUS					
Circuit diagram	5	variant TX 460 comfort: power supply: accessories pack control terminal, accessories pack ISOBUS Breakaway Connector, main computer, force measurement amplifier, safety steering computer					
Circuit diagram	6	variant TX 460 comfort: power supply: safety steering computer					
Circuit diagram	7	variant TX 460 comfort: CAN bus CAN 1					
Circuit diagram	8	variant TX 460 comfort: CAN bus CAN 2					
Circuit diagram	9	variant TX 460 comfort: overview main computer					
Circuit diagram	10	variant TX 460 comfort: work lighting					
Circuit diagram	11	variant TX 460 comfort: overview force measurement amplifier weight measurement					
Circuit diagram	12	variant TX 460 comfort: weight measurement					
Circuit diagram	13	variant TX 460 comfort: electr. forced steering: overview safety steering computer					
Circuit diagram	14	variant TX 460 comfort: electr. forced steering: interface RS232					
Circuit diagram	15	variant TX 460 comfort: electr. forced steering: system pressure steering, steering angle tractor/drawbar					
Circuit diagram	16	variant TX 460 comfort: electr. forced steering: Sensors axle area					
Circuit diagram	17	variant TX 460 comfort: electr. forced steering: Valves					
Circuit diagram	18	variant TX 560 comfort: control terminal Delta					
Circuit diagram	19	variant TX 560 comfort: control terminal CCI200					
Circuit diagram	20	variant TX 560 comfort: Joystick					
Circuit diagram	21	variant TX 560 comfort: power supply: accessories pack control terminal, Accessories kit: joystick ISOBUS					
Circuit diagram	22	variant TX 560 comfort: power supply: accessories pack control terminal, accessories pack ISOBUS Breakaway Connector, main computer, force measurement amplifier, safety steering computer					
Circuit diagram	23	variant TX 560 comfort: power supply safety steering computer					
Circuit diagram	24	variant TX 560 comfort: CAN bus CAN 1					
Circuit diagram	25	variant TX 560 comfort: CAN bus CAN 2					
Circuit diagram	26	variant TX 560 comfort: overview main computer					
Circuit diagram	27	variant TX 560 comfort: sensor lift axle top					
Circuit diagram	28	variant TX 560 comfort: work lighting					
Circuit diagram	29	variant TX 560 comfort: overview force measurement amplifier weight measurement					
Circuit diagram	30	variant TX 560 comfort: weight measurement					
Circuit diagram	31	variant TX 560 comfort: electr. forced steering: overview safety steering computer					
Circuit diagram	32	variant TX 560 comfort: electr. forced steering: interface RS232, Ground					
Circuit diagram	33	variant TX 560 comfort: electr. forced steering: system pressure steering, steering angle tractor/drawbar					
Circuit diagram	34	variant TX 560 comfort: electr. forced steering: angle sensors axle area					
Circuit diagram	35	variant TX 560 comfort: electr. forced steering: Sensors driving speed					
Circuit diagram	36	variant TX 560 comfort: electr. forced steering: Valves					
Circuit diagram	37	variant TX 560 comfort: electr. forced steering: Valves					

1		2		3		4		5		6		7		8	
Document type		Sheet		description											
Circuit diagram		38		accessories kit working lights with operation panel up to year of manufacture 2017											
Circuit diagram		39		accessories kit operation panel working lights + tailgate control from year of manufacture 2017											
Circuit diagram		40		accessories pack weight measurement: control terminal Delta											
Circuit diagram		41		accessories pack weight measurement: control terminal CCI 200											
Circuit diagram		42		accessories pack weight measurement: Joystick											
Circuit diagram		43		accessories pack weight measurement: power supply: accessories pack control terminal, Accessories kit: joystick ISOBUS											
Circuit diagram		44		accessories pack weight measurement: power supply: accessories pack control terminal, accessories pack ISOBUS Breakaway Connector, main computer, force measurement amplifier											
Circuit diagram		45		accessories pack weight measurement: CAN bus CAN 1											
Circuit diagram		46		accessories pack weight measurement: CAN bus CAN 2											
Circuit diagram		47		accessories pack weight measurement: overview main computer											
Circuit diagram		48		accessories pack weight measurement: sensor lift axle top											
Circuit diagram		49		accessories pack weight measurement: work lighting											
Circuit diagram		50		accessories pack weight measurement: overview force measurement amplifier weight measurement											
Circuit diagram		51		accessories pack weight measurement: weight measurement											
Circuit diagram		52		accessories pack camera system: overview monitor											
Circuit diagram		53		accessories pack camera system, accessories pack camera connection cables, accessories pack additional camera											
Circuit diagram		54		traffic lighting: overview, Ground											
Circuit diagram		55		traffic lighting: side marker lights left											
Circuit diagram		56		traffic lighting: working light, accessories pack LED loading area lighting											
Circuit diagram		57		traffic lighting: three-chamber lamps rear left, clearance lamp rear left											
Circuit diagram		58		traffic lighting: side marker lights right											
Circuit diagram		59		traffic lighting: three-chamber lamps rear right, clearance lamp rear right, licence plate lamp											
Circuit diagram		60		traffic lighting: three-chamber lamps flashing light											
Circuit diagram		61		traffic lighting: three-chamber lamps brake light											

@1 = variant TX 460 comfort
@2 = variant TX 560 comfort

@2 = variant TX 560 comfort

@3 = accessories kit working lights with operation panel (up to year of manufacture 2017)

@4 = accessories pack weight measurement

@5 = accessories pack Bed.+LED Scheinw.+Heckkl. auf/zu (from year of manufacture 2017)

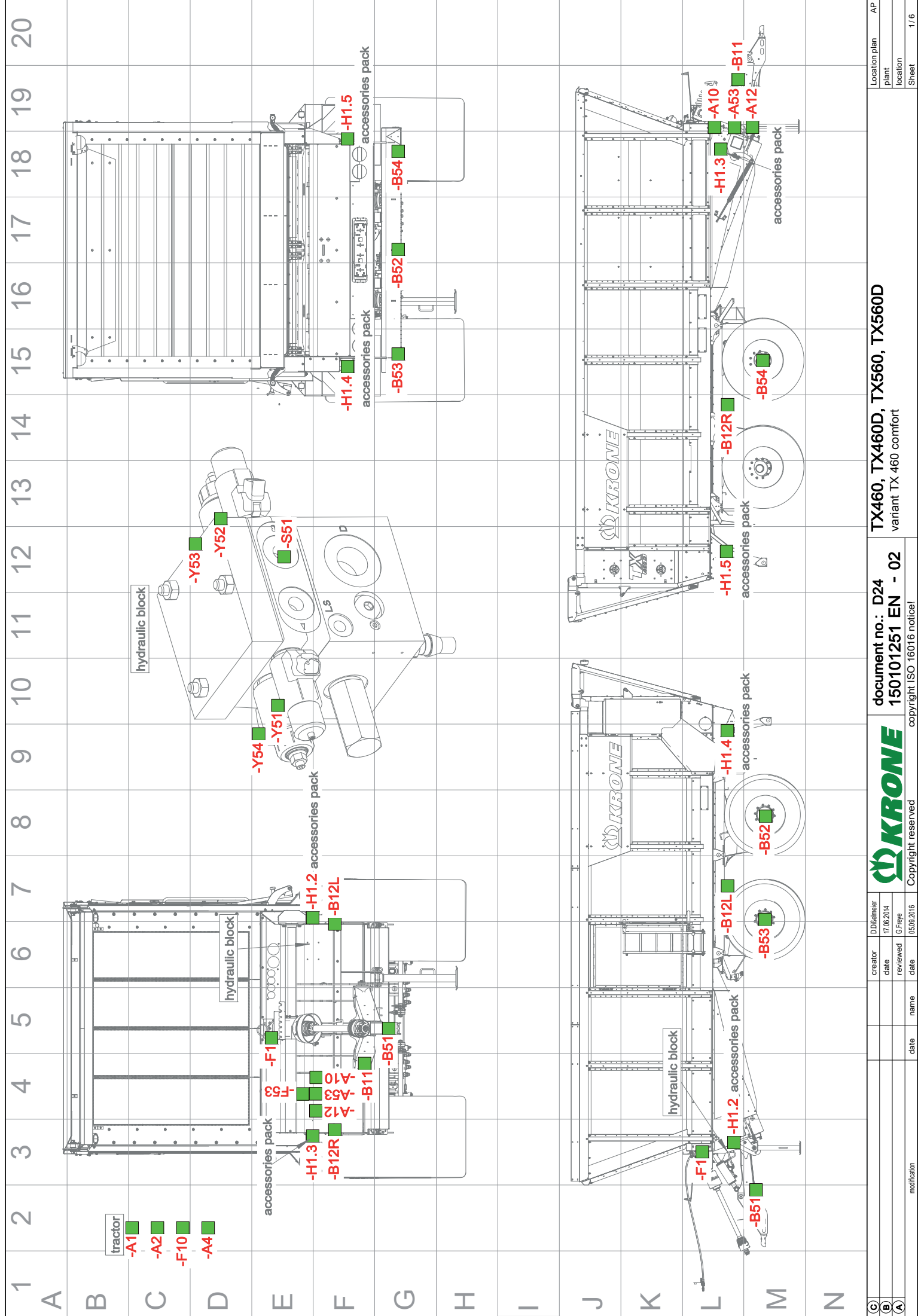
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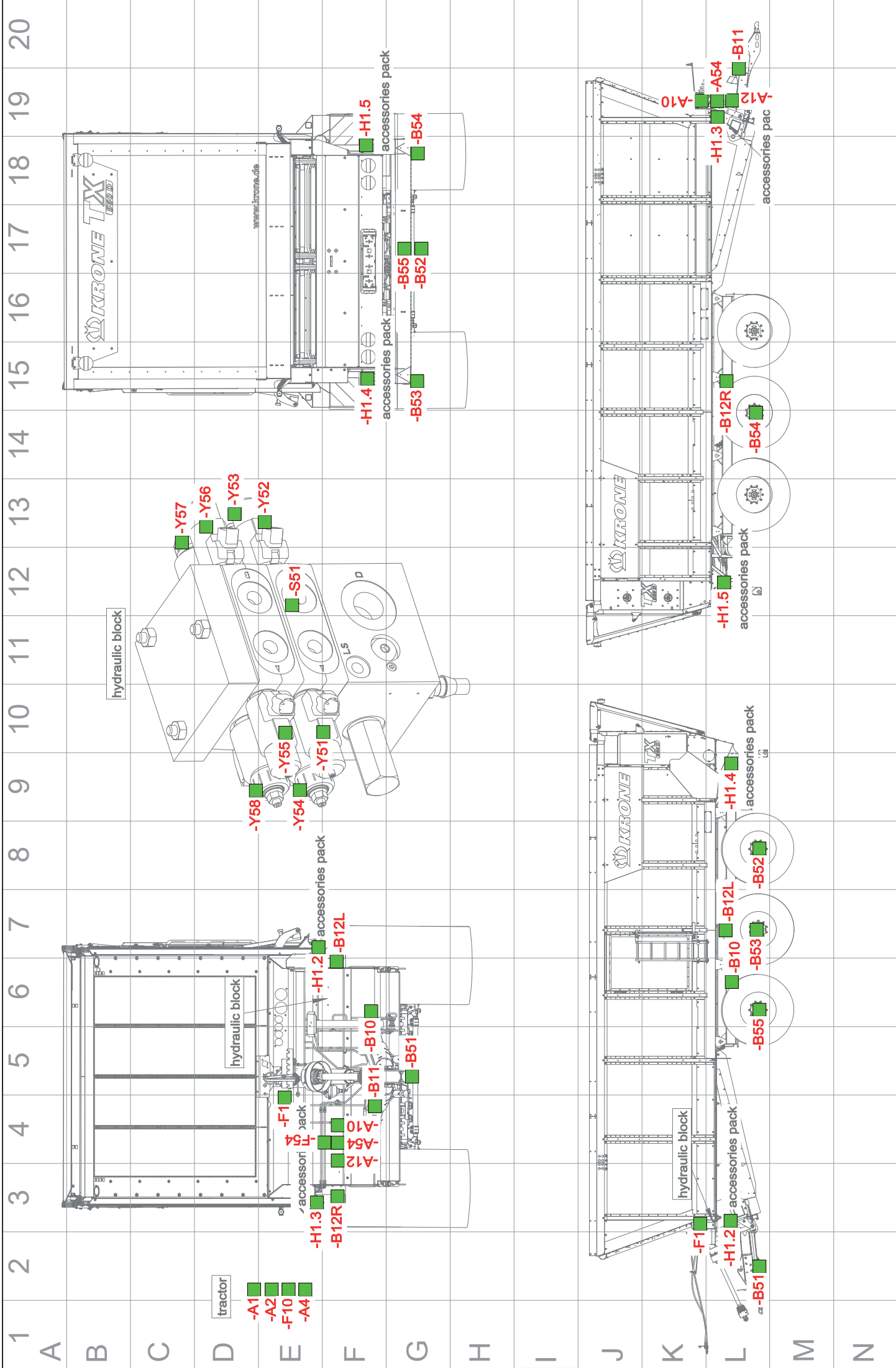
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BN
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RD
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GY
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WH
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PK
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TQ
turquoise

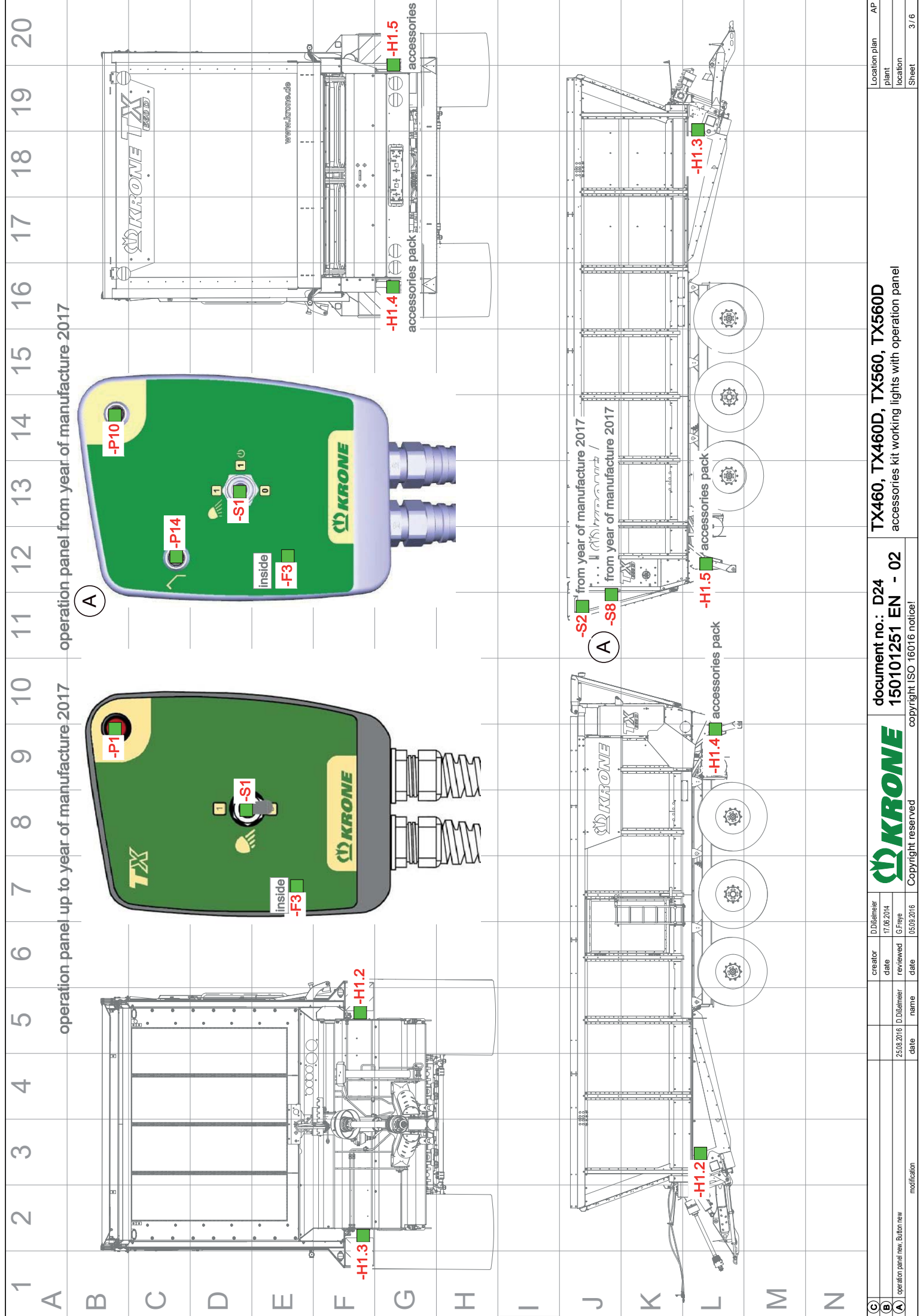
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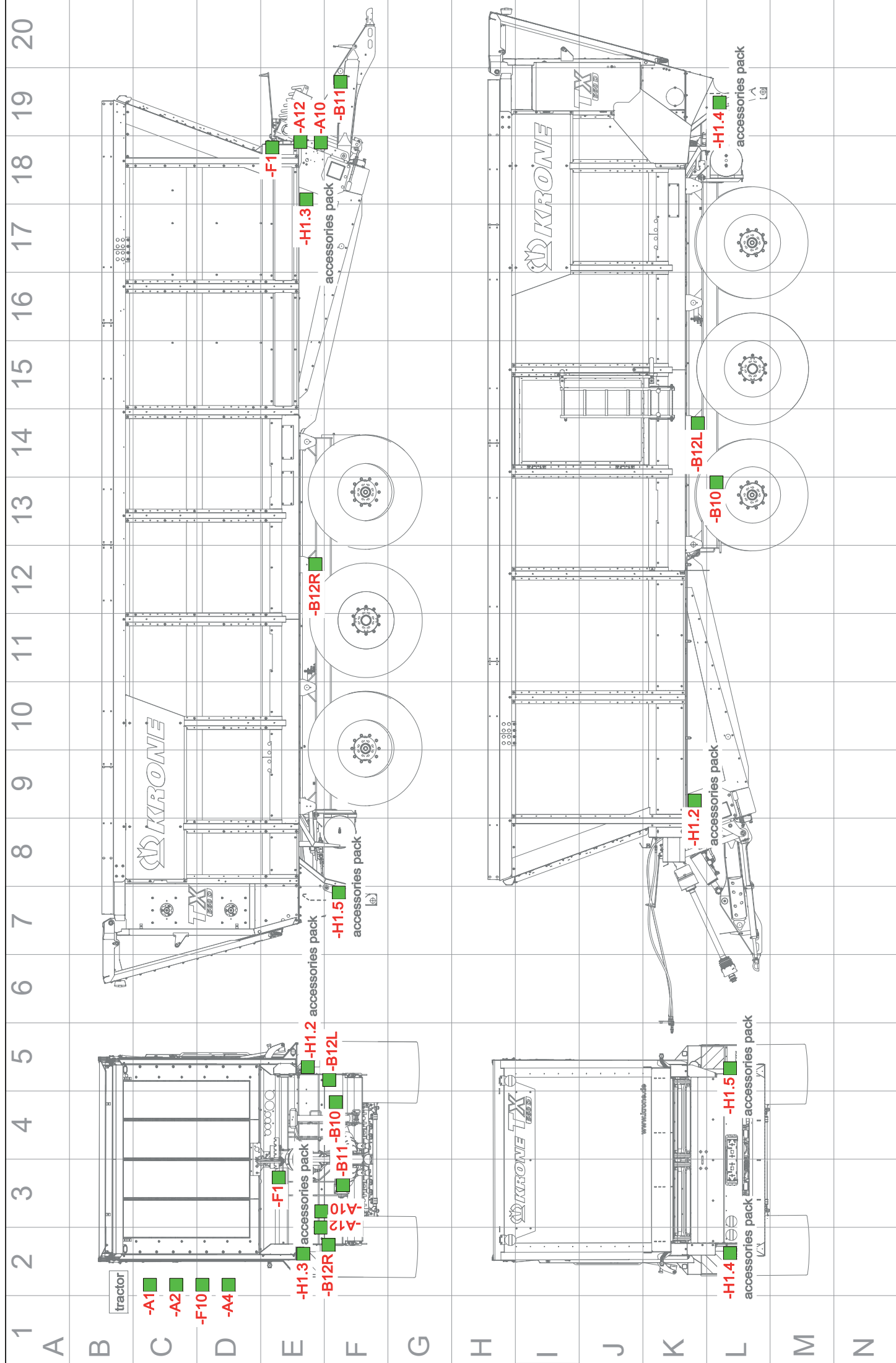
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	-A1@2	control terminal		/18.B1		-H1.2@1	working light 2	/10.C6							
	-A1@4	control terminal		/40.B1		-H1.2@2	working light 2	/28.C6							
	-A2@1	control terminal		/2.B1		-H1.2@3	working light 2	/38.D5							
	-A2@2	control terminal		/19.B1		-H1.2@4	working light 2	/49.C6							
	-A2@4	control terminal		/41.B1		-H1.2@5	working light 2	/39.C5							
	-A4@1	joystick MFG		/3.B3		-H1.3@1	working light 3	/10.C8							
	-A4@2	joystick MFG		/20.B3		-H1.3@2	working light 3	/28.C8							
	-A4@4	joystick MFG		/42.B3		-H1.3@3	working light 3	/38.D6							
	-A10@1	main computer		/9.A1		-H1.3@4	working light 3	/49.C8		B					
-A10@2	main computer		/26.A1		-H1.3@5	working light 3	/39.D6								
-A10@4	main computer		/47.A1		-H1.4@1	working light 4	/10.C4								
-A12@1	force measurement amplifier weight measurement		/11.A3		-H1.4@2	working light 4	/28.C4								
-A12@2	force measurement amplifier weight measurement		/29.A3		-H1.4@3	working light 4	/38.D7								
-A12@4	force measurement amplifier weight measurement		/50.A3		-H1.4@4	working light 4	/49.C4								
-A53	safety steering computer tandem		/13.B1		-H1.4@5	working light 4	/39.C6								
-A54	safety steering computer tridem		/31.A1		-H1.5@1	working light 5	/10.C5								
-A100	monitor camera system		/52.B2		-H1.5@2	working light 5	/28.C5	C							
-B10@2	lift axle top		/27.C2		-H1.5@3	working light 5	/38.D8								
-B10@4	lift axle top		/48.C2		-H1.5@4	working light 5	/49.C5								
-B11@1	weight measurement drawbar		/12.B2		-H1.5@5	working light 5	/39.D7								
-B11@2	weight measurement drawbar		/30.B2		-H1.6	light strip 1	/56.C4								
-B11@4	weight measurement drawbar		/51.B2		-H1.7	light strip 2	/56.C5								
-B12L@1	weight measurement axle left		/12.C4		-H10.E1	side marker light front wall top left	/55.E3								
-B12L@2	weight measurement axle left		/30.C4		-H11.E1	side marker light front wall top right	/58.E3								
-B12L@4	weight measurement axle left		/51.C4		-H12.E1	side marker light mudguard front left	/55.E5								
-B12R@1	weight measurement axle left		/12.C8		-H13.E1	side marker light mudguard front right	/58.E5								
-B12R@2	weight measurement axle left		/30.C8		-H14.E1	side marker light mudguard rear left	/55.E7								
-B12R@4	weight measurement axle left		/51.C8		-H15.E1	side marker light mudguard rear right	/58.E7								
-B51@1	steering angle tractor/drawbar		/15.C4		-H20.E1	clearance lamp rear left	/57.E7	D							
-B51@2	steering angle tractor/drawbar		/33.C4		-H21.E1	clearance lamp rear right	/59.E7								
-B52@1	steering angle rear axle		/16.C2		-H30	three-chamber lamp top rear left	/54.B7								
-B52@2	steering angle rear axle		/34.C2		-H31	three-chamber lamp top rear right	/54.A7								
-B53@1	driving speed 1		/16.C5		-H32	three-chamber lamp rear left	/54.B4								
-B53@2	driving speed 1		/35.C4		-H33	three-chamber lamp rear left	/54.B5								
-B54@1	driving speed 2		/16.C6		-H34	three-chamber lamp rear right	/54.A4								
-B54@2	driving speed 2		/35.C2		-H35	three-chamber lamp rear right	/54.A5								
-B55@2	steering angle front axle		/34.C6		-H40.E1	licence plate lamp	/59.E5								
-B100	camera 1		/53.A3		-P1	control unit ON	/38.D2								
-B102	camera 2		/53.A5		-P10	control unit ON, working lights	/39.E2	E							
-F1@1	work lighting		/10.D1		-P14	Position tailgate	/39.E3								
-F1@2	work lighting		/28.D1		-S1@3	work lighting	/38.B3								
-F1@4	work lighting		/49.D1		-S1@5	control unit ON / working light	/39.A3								
-F3@3	main fuse		/38.A2		-S2	tailgate closed	/39.C7								
-F3@5	main fuse		/39.A2		-S8	tailgate fully opened	/39.D8								
-F10	main fuse		/4.B2		-S51@1	system pressure steering	/15.D2								
-F53	fuse distributor Tandem		/6.C4		-S51@2	system pressure steering	/33.D2								
-F54	fuse distributor Tridem		/23.C5		-Y51@1	release rear axle 1	/17.C2								
C										TX460, TX460D, TX560, TX560D				Equipment list	
B									Equipment list				plant		
A									Equipment list				location		
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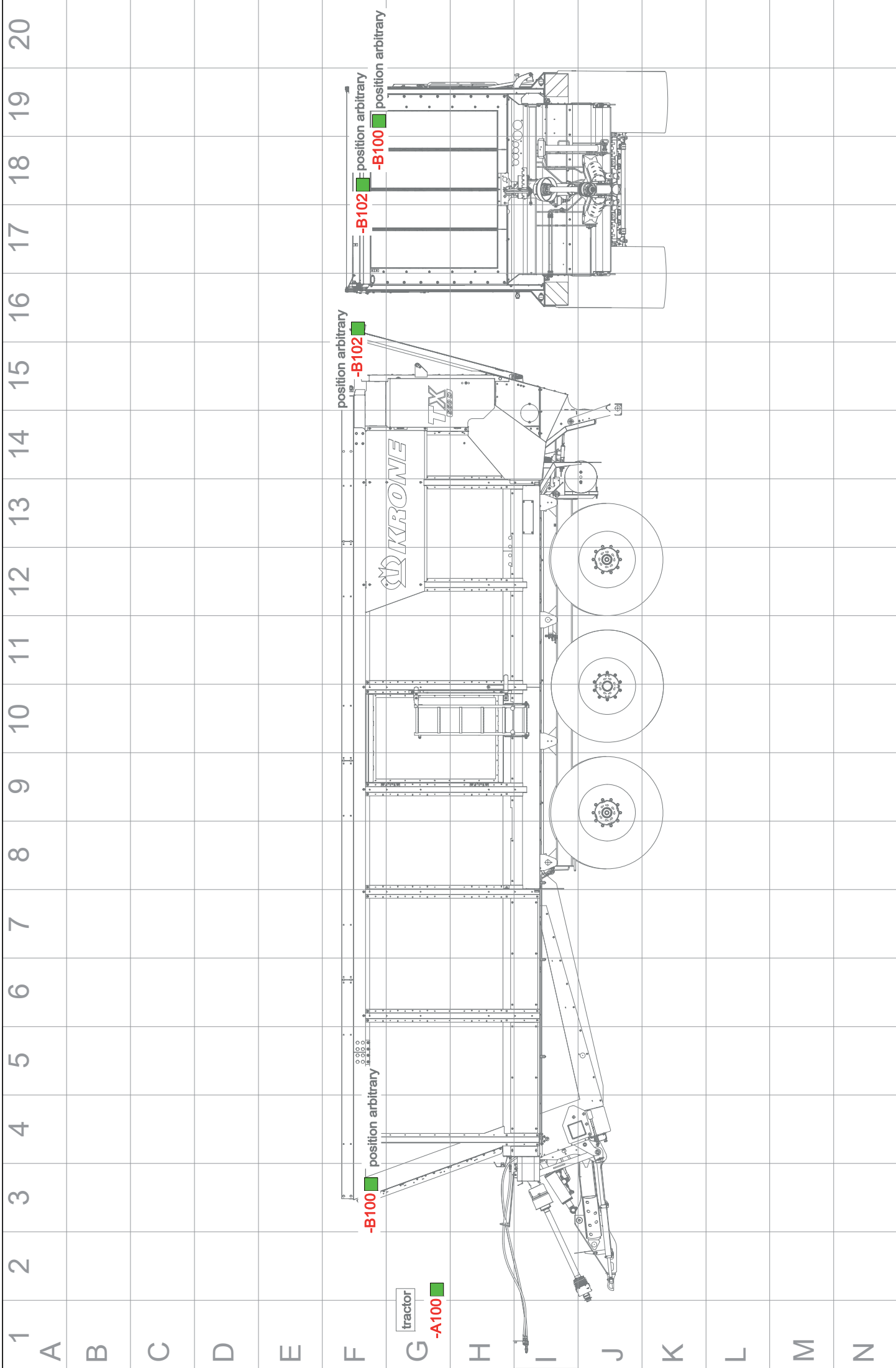
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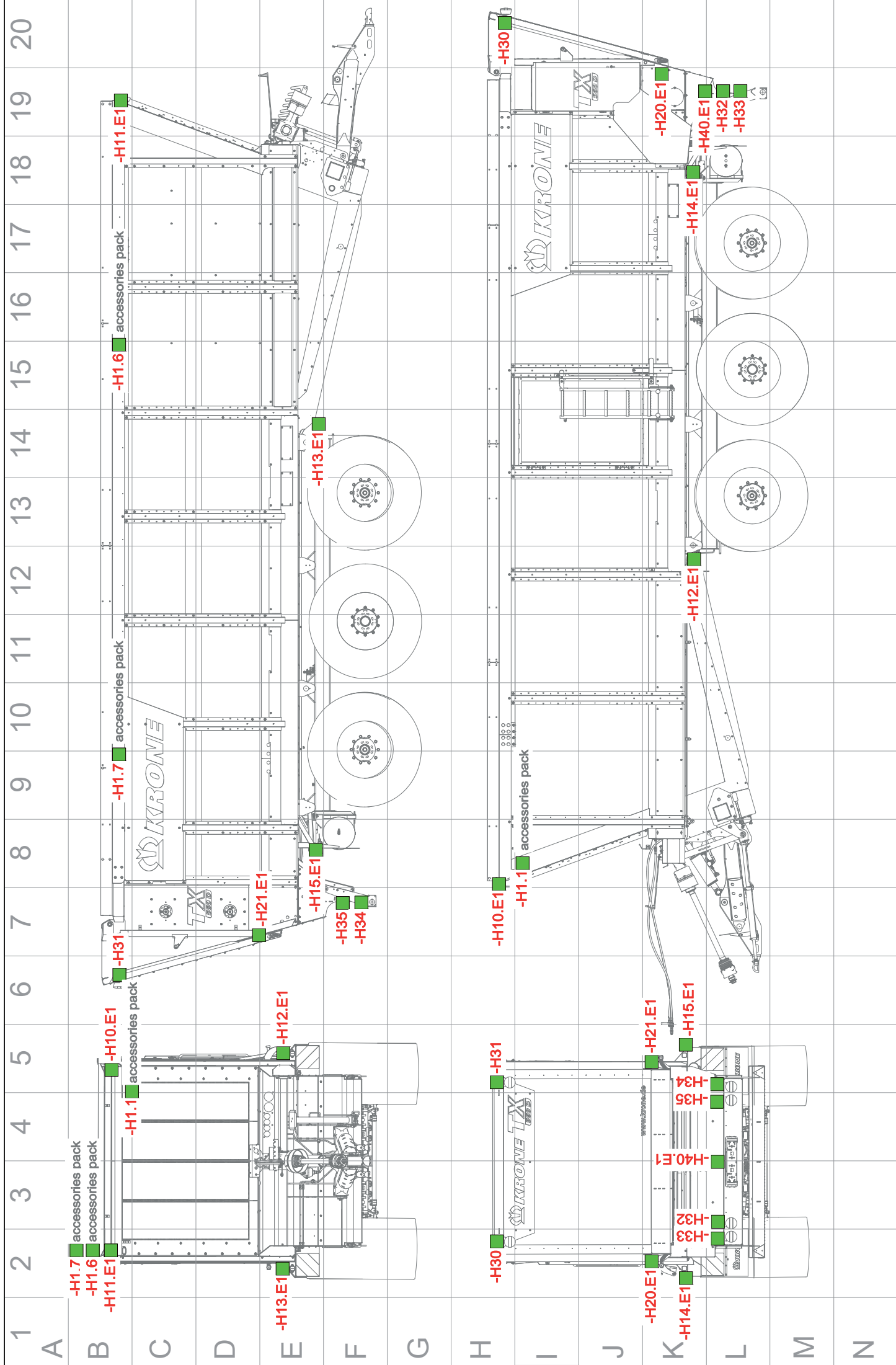












DELTA

A






B

C

D

E

F

-A2	-X1	-X2	-X3	-X4	-X5	-X6	<div><div></div><div>USB</div></div> <div><div></div><div>Bluetooth</div></div> <div><div></div><div>WLAN</div></div> <div><div></div><div>LIN</div></div> <div><div></div><div>video-IN</div></div>							
CCI200														
control terminal														
API1.C2														

Plug	connection	description	cross-reference
supply in general			
-X1	1	supply (supply)	+12V/+24V
-X2	1	supply (supply)	+12V/+24V
-X1	3	switch-on signal	+Uon
-X2	3	switch-on signal	+Uon
-X1	6	GND	GND
-X2	6	GND	GND
emergency stop			
-X1	2	emergency stop input	NOT_AUS_B
-X1	4	emergency stop supply	NOT_AUS_V
-X2	2	emergency stop output	NOT_AUS_A
-X2	4	emergency stop supply	NOT_AUS_V
CAN 1 - Interface			
-X1	7	CAN_1-H	CAN1_IN
-X2	7	CAN_1-H	CAN1_OUT
-X1	5	CAN_1-L	CAN1_IN
-X2	5	CAN_1-L	CAN1_OUT
-X1	8	shield	
-X2	8	shield	

Plug	connection	description	cross-reference
RS232/signal			
-X3	1	supply interconnected	+12V/+24V
-X3	2	GND	GND
-X3	3	ISO11786 "PTO shaft speed"	SMFQ_IN 2
-X3	4	ISO11786 "Lifting unit position"	SAN_IN0
-X3	5	ISO11786 "Wheel speed"	SMFQ_IN 3
-X3	6	direction of travel	SMFQ_IN 4
-X3	7	ISO11786 "Speed slip free"	SMFQ_IN 1
-X3	8	RS232 1 RxD (input)	COM0_RxD_IN
-X3	9	RS232 1 TxD (output)	COM0_TxD_OUT
-X3	10	ignition signal / terminal 15	IGN
-X3	11	RS232 2 RxD	COM1_RxD_IN
-X3	12	RS232 2 TxD	COM1_TxD_OUT
Video			
-X4	1	video signal	VIDEO_IN
-X4	2	RS485B	
-X4	3	RS485A	
-X4	4	supply interconnected	+12V/+24V
-X4	5	RS485A	
-X4	6	supply interconnected	+12V/+24V
-X4	7	GND	GND
-X4	8	shield	
LIN - interface			
-X5	1	supply interconnected	+12V/+24V
-X5	2	N.C.	
-X5	3	GND	GND
-X5	4	LIN	

CCI200

C

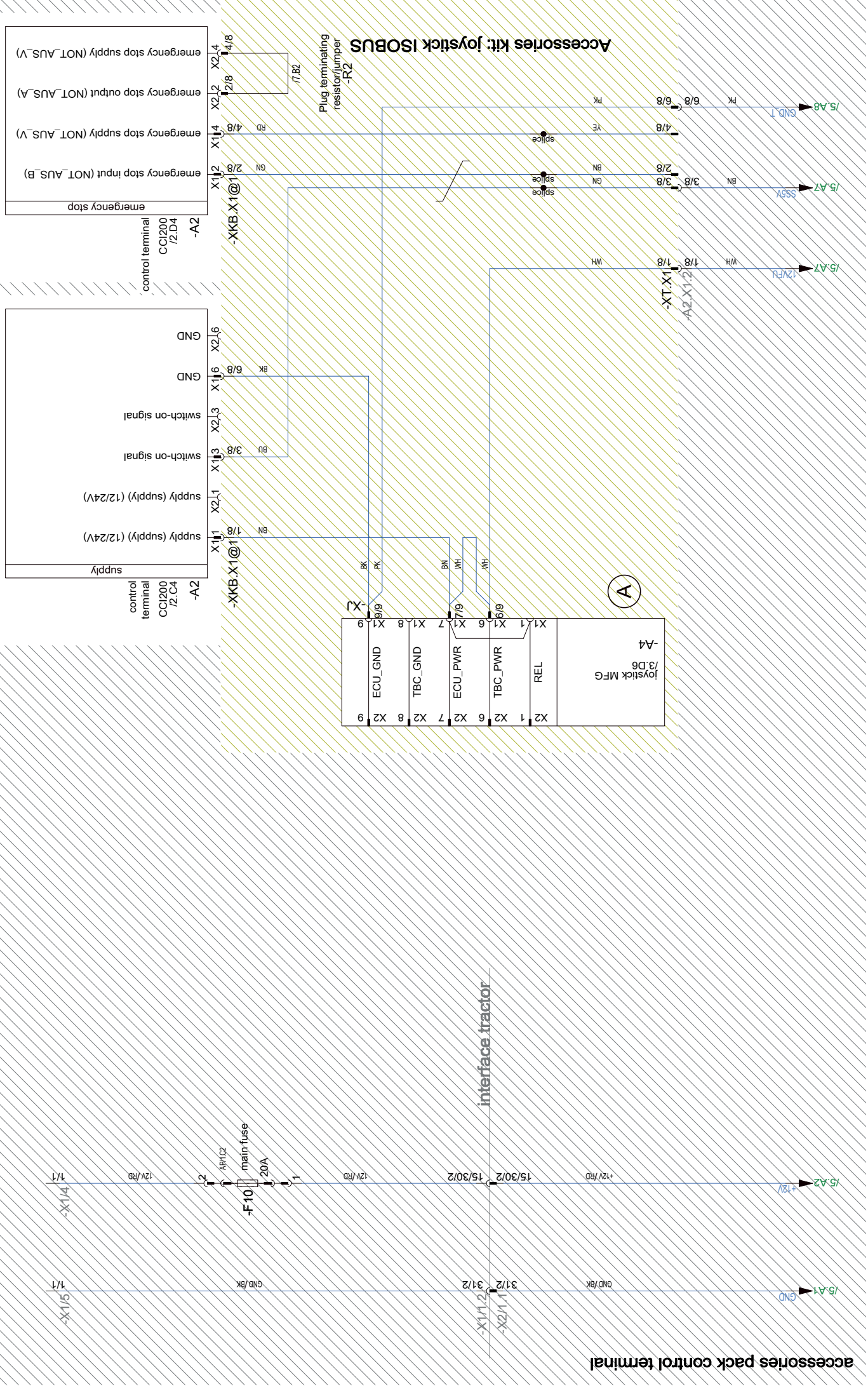
B

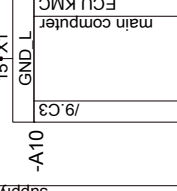
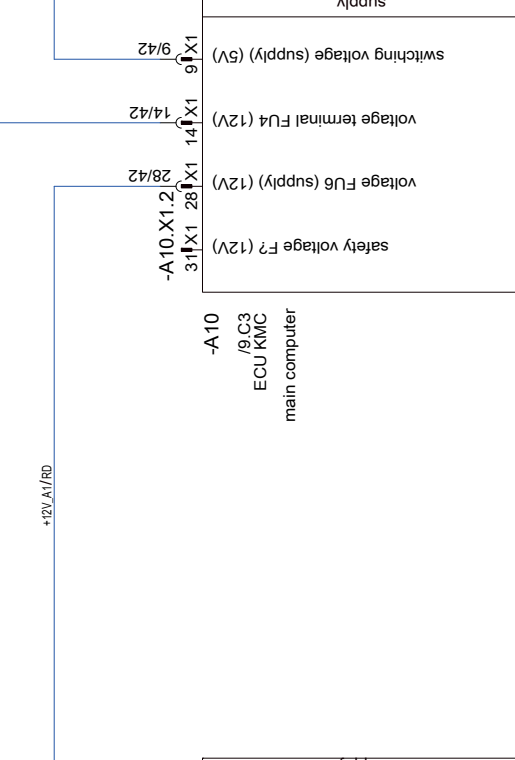
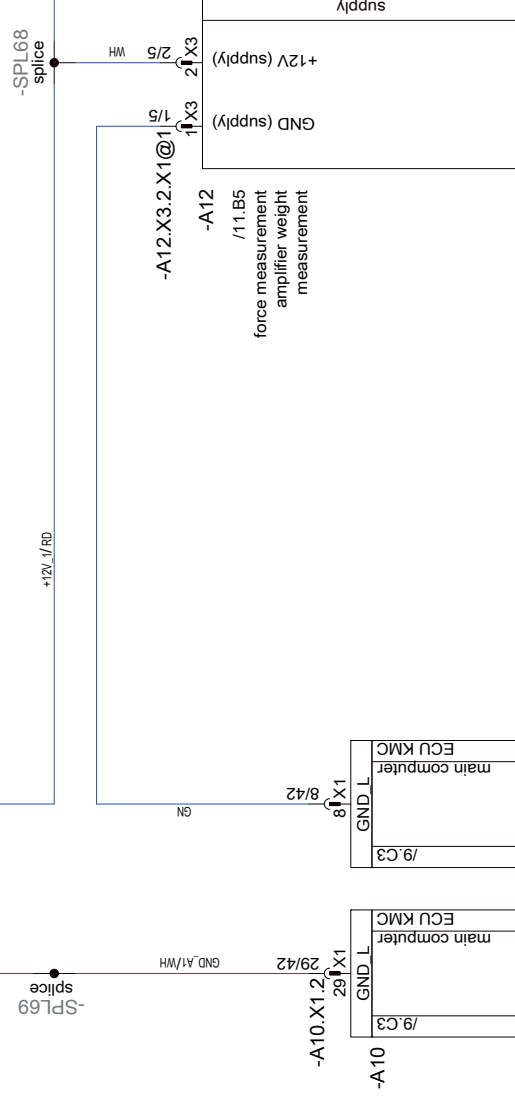
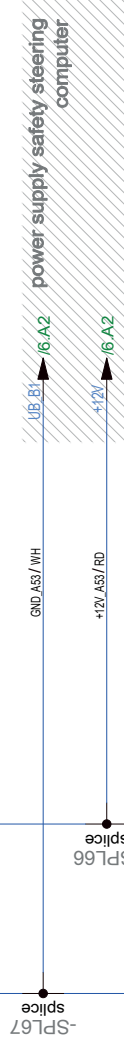
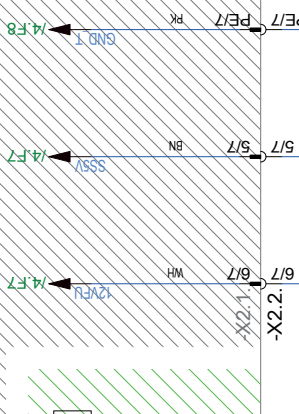
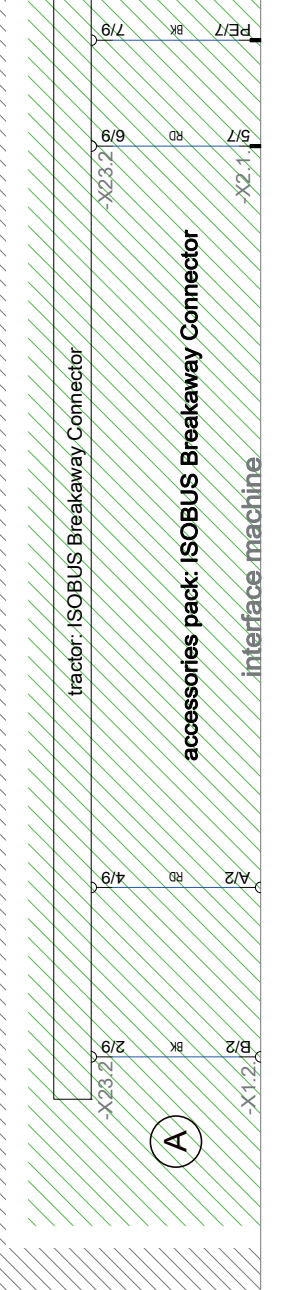
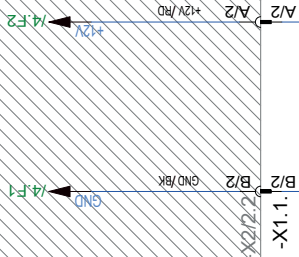
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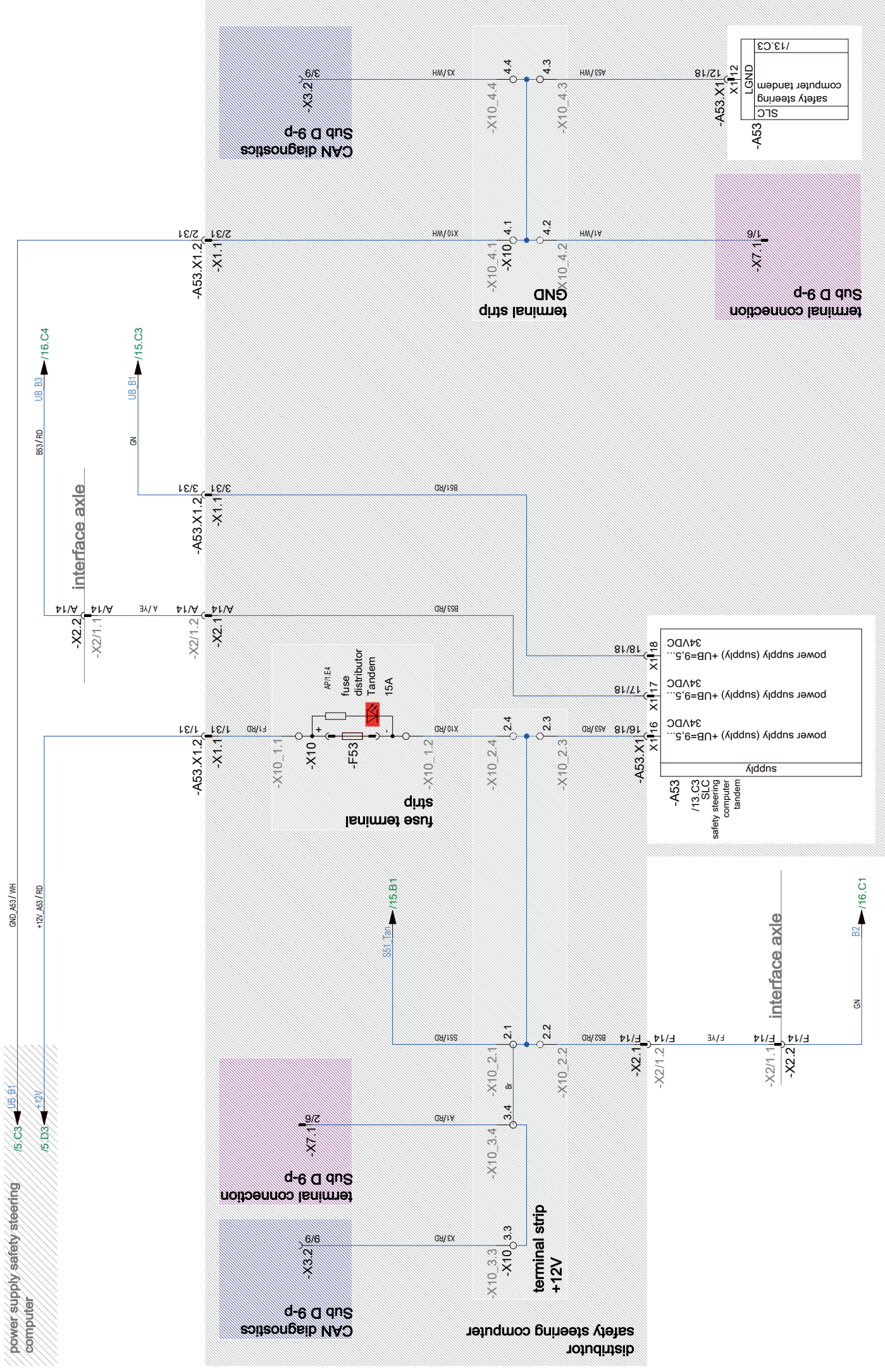
modification		date	name	date	reviewed	creator	D.Didmeter
					G.Feye		04.04.2014

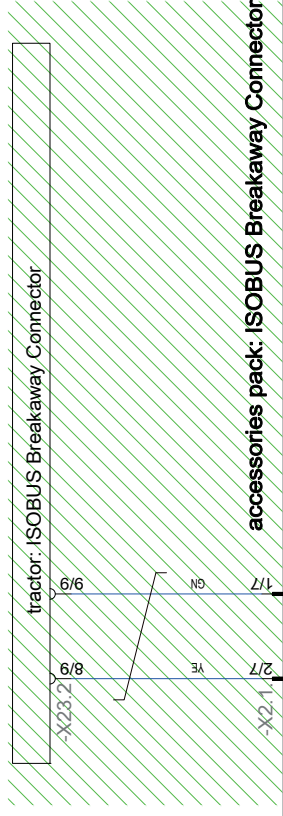
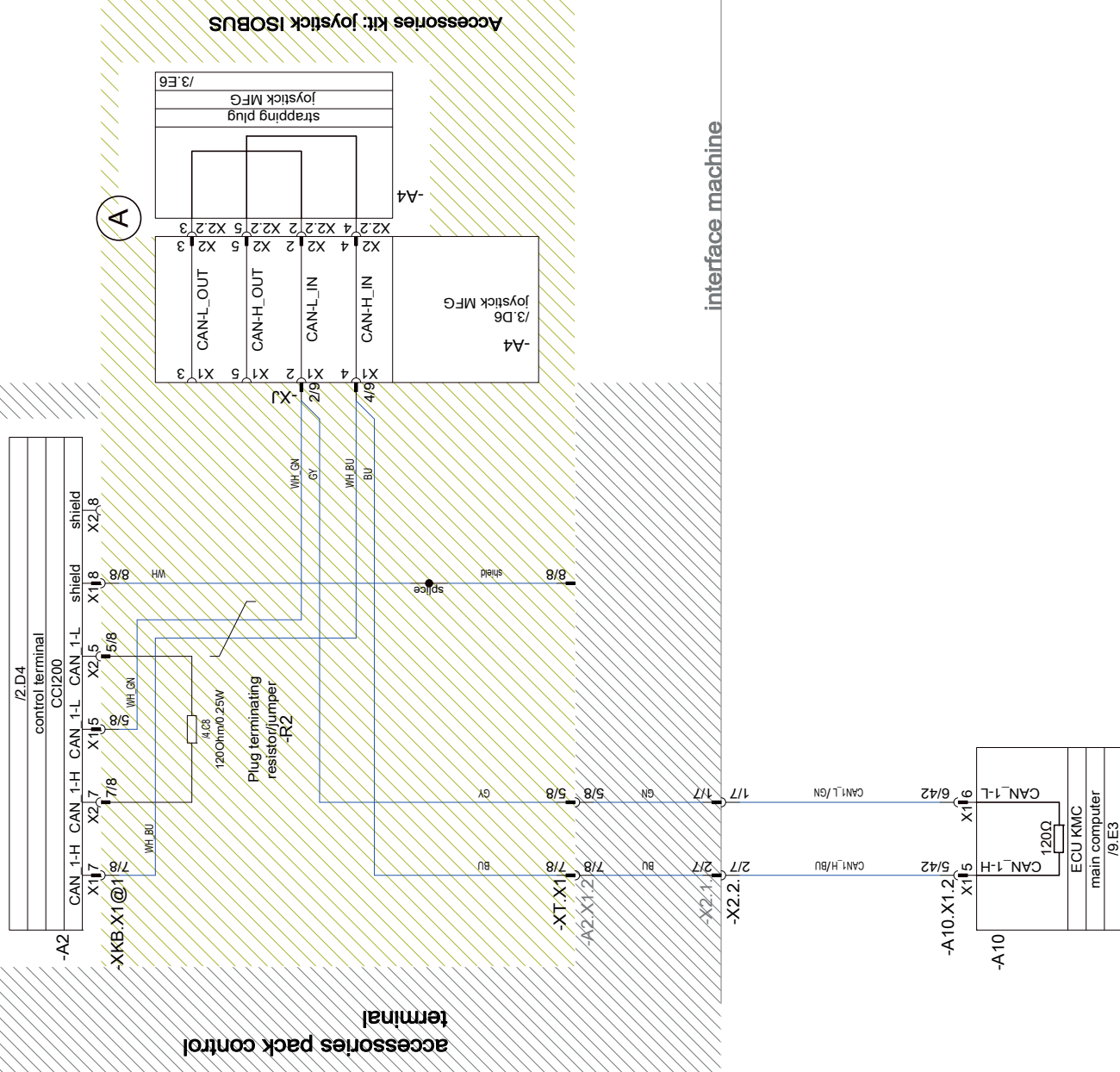
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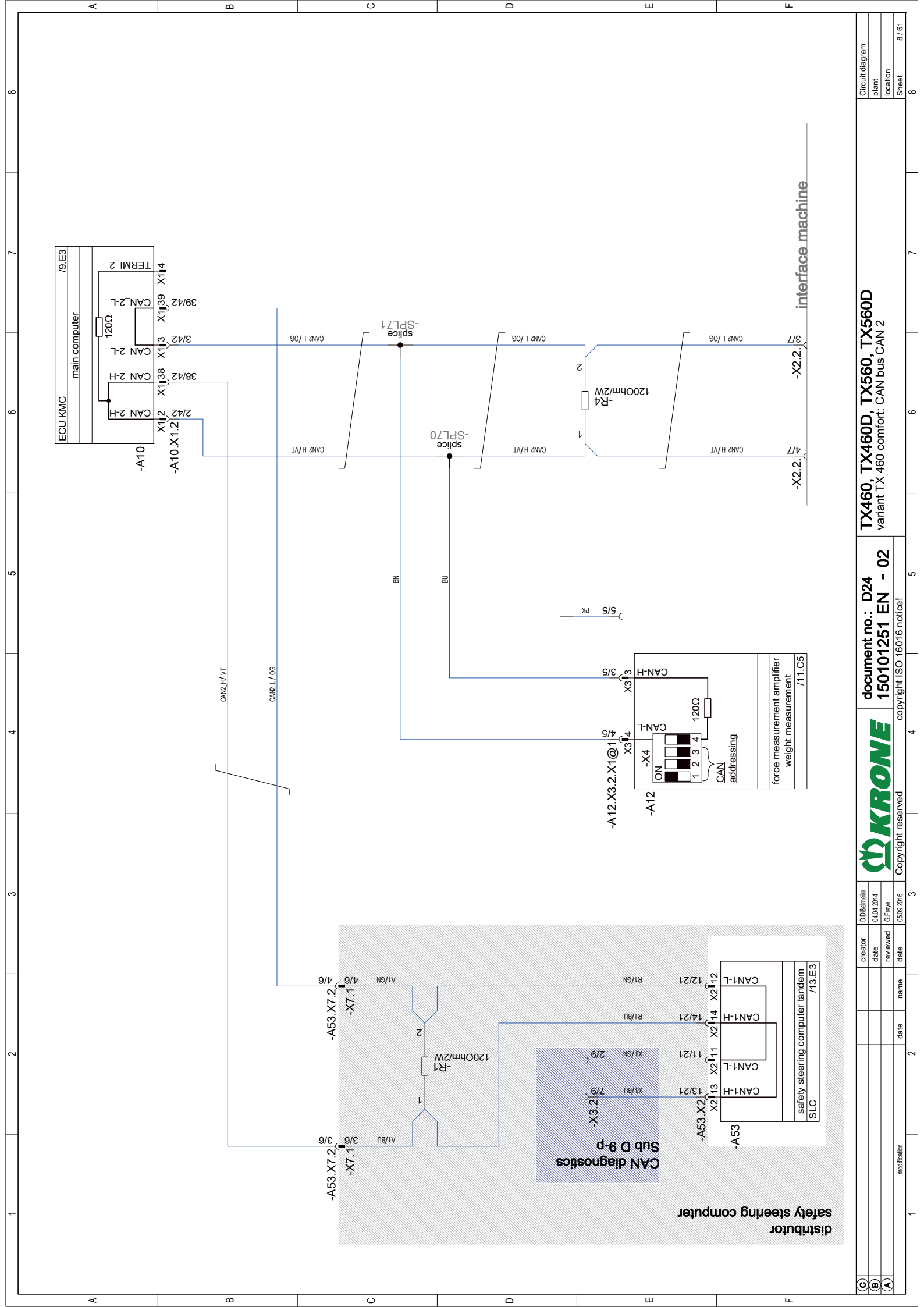
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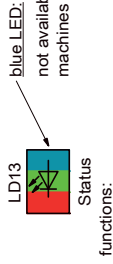


A

-A10

ECU KMC
main computer

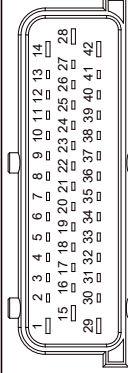
API119
API1F4



LD13
blue LED:
not available for self-propelled
machines

Status
functions:

-X1



B

Plug	connection	description	cross-reference	
supply in general				
-X1	9	switching voltage (supply)	+5V_SS	LD31
-X1	14	voltage terminal	+12VFU_TERM	FU4 , 5A
-X1	28	voltage (supply)	+12V_EIN	FU6 , 30A
-X1	31	safety voltage	+12VL_SI	LD1
-X1	8	GND power	GND_L	LD2
-X1	15	GND power	GND_L	/5.F2
-X1	26	GND power	GND_L	/5.F8
-X1	27	GND power	GND_L	
-X1	29	GND power	GND_L	/5.F1
-X1	37	GND power	GND_L	/10.F2
supply digital sensors				
-X1	11	GND sensor 1	DIG_GND_1	F1 , 0.5A
-X1	23	GND sensor 2	DIG_GND_2	F2 , 0.5A
-X1	25	GND sensor 3	DIG_GND_3	F3 , 0.5A
-X1	13	GND sensor 6	DIG_GND_6	F6 , 0.5A
-X1	21	GND sensor 7	DIG_GND_7	F7 , 0.5A
-X1	17	GND sensor 10	DIG_GND_10	F10 , 0.5A
-X1	19	GND sensor 11	DIG_GND_11	F11 , 0.5A
supply analog sensors				
-X1	34	voltage sensors	+12V_ANA	LD32
-X1	32	GND sensors	GND_ANA	FU7 , 1.1A
-X1	35	GND sensors	GND_ANA	F20 , 0.5A
CAN 1 - interface				
-X1	5	CAN 1-H		/7.F2
-X1	6	CAN 1-L		
CAN 2 - interface				
-X1	2	CAN 2-H		
-X1	38	CAN 2-H		
-X1	3	CAN 2-L		/8.A7
-X1	39	CAN 2-L		
-X1	4	TERM_2		

Plug	connection	address	equipment	function	cross-reference
Inputs					
-X1	10	DIGHFRQ_1			
-X1	12	DIGHFRQ_6			
-X1	20	DIGFRQ_7			
-X1	16	DIGFRQ_10			
-X1	18	DIGFRQ_11			
-X1	22	DIG_2			
-X1	24	DIG_3			
-X1	30	ANAHFRQ_1			
-X1	33	ANAHFRQ_2			
-X1	41	G_STROM_1			
outputs					
-X1	1	HBPWMSTR_1			
-X1	42	HBPWMSTR_2			
-X1	40	PWMLA_1			
-X1	7	PWMLA_8			
-X1	36	LA_1	H1	work lighting	/10.A2

fuses

the fuse FU6 is pluggable. the others are self-resetting.

internal supply ICs:

FU5
LD30
+5V Vcc
+5V Vcc

battery

B1

-|+|

F

C

B new symbol

modification

25.08.2016

D.Didmeier

date

name

date

reviewed

G.Feye

05.09.2016

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3

document no.: D24

150101251 EN - 02

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4

TX460, TX460D, TX560, TX560D

variant TX 460 comfort: overview main computer

6

7

8

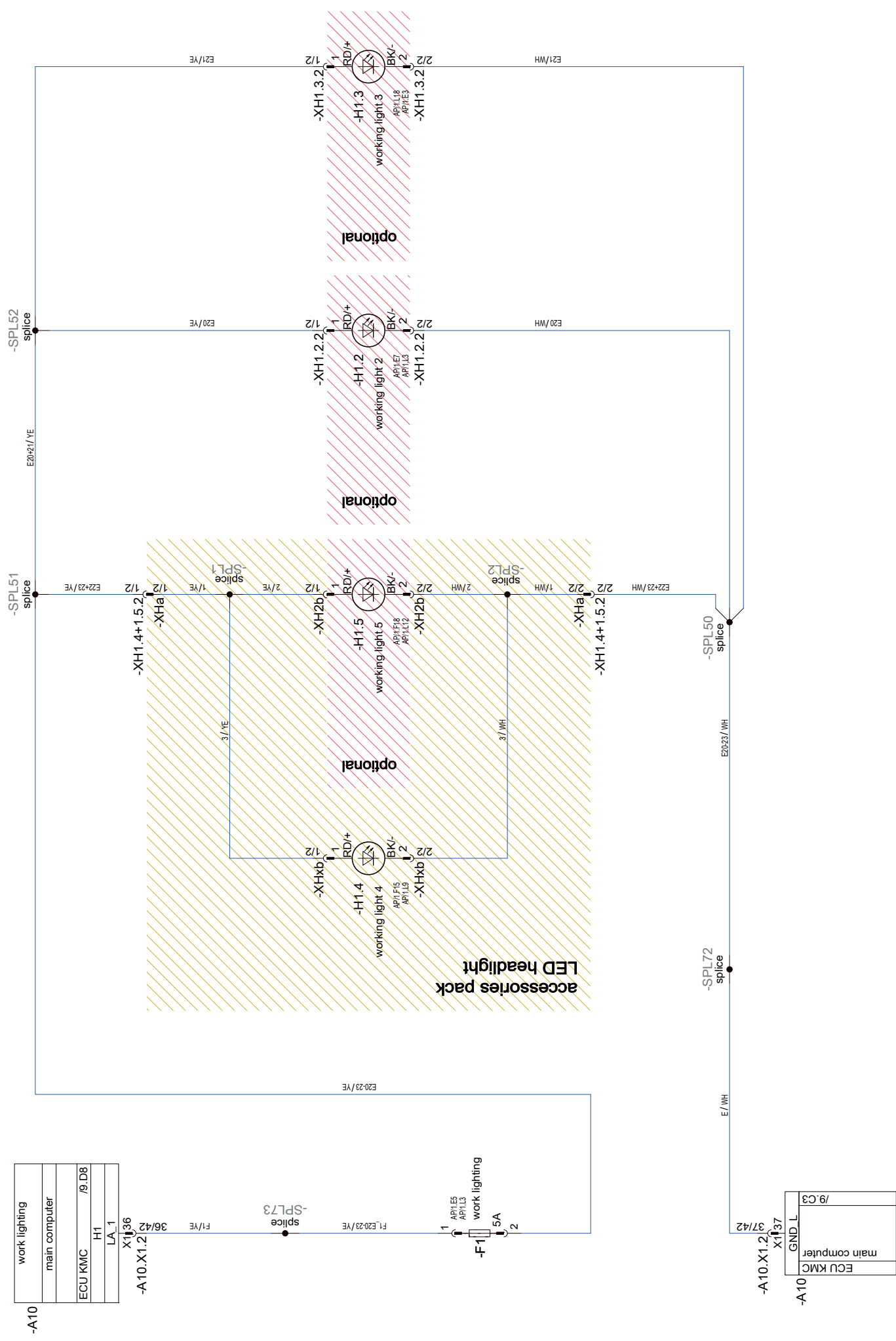
Sheet


location

plant

Circuit diagram

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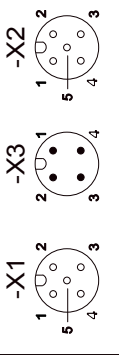
(C)				creator	D.Dielemeier		document no.: D24 150101251 EN - 02	copyright ISO 16016 notice!	TX460, TX460D, TX560, TX560D variant TX 460 comfort: work lighting		Sheet	10 / 61	8	7	6	5	4	3	2	1	modification
(B)				date	04.04.2014																
(A)				reviewed	G.Fiege																
				date	05.09.2016																

A

-A12

force measurement amplifier
weight measurement

API1.F4
API1.M19



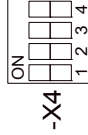
Plug	connection	description	cross-reference
supply in general			
-X3	1	GND (supply)	/5.E4
-X3	2	+12V (supply)	
CAN - interface			
-X3	3	CAN-H	/8.F4
-X3	4	CAN-L	
port 1			
-X1	1	0V	
-X1	2	+12V	
-X1	3	signal -	/12.E1
-X1	4	signal +	
port 2			
-X2	1	0V	
-X2	2	+12V	
-X2	3	signal -	/12.E5
-X2	4	signal +	

Status

D8 D9



CAN addressing and scheduling
(switch position see CAN overview)



functions of the status LEDs D8 / D9:

- | | |
|--|---|
| | - no power supply |
| | - power supply reversed |
| | - force measurement amplifier defective |
| | - is booted up |
| | - machine not set correctly |
| | - no CAN connection |
| | - CAN bus short-circuited/reversed |
| | - ready for operation |

C

B

A

new symbol

modification

creator

date

reviewed

D.Didmeter

04.04.2014

G.Feye

25.08.2016

D.Didmeter

05.09.2016

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document no.:

D24

150101251 EN - 02

TX460, TX460D, TX560, TX560D

variant TX 460 comfort: overview force measurement amplifier weight measurement

Circuit diagram

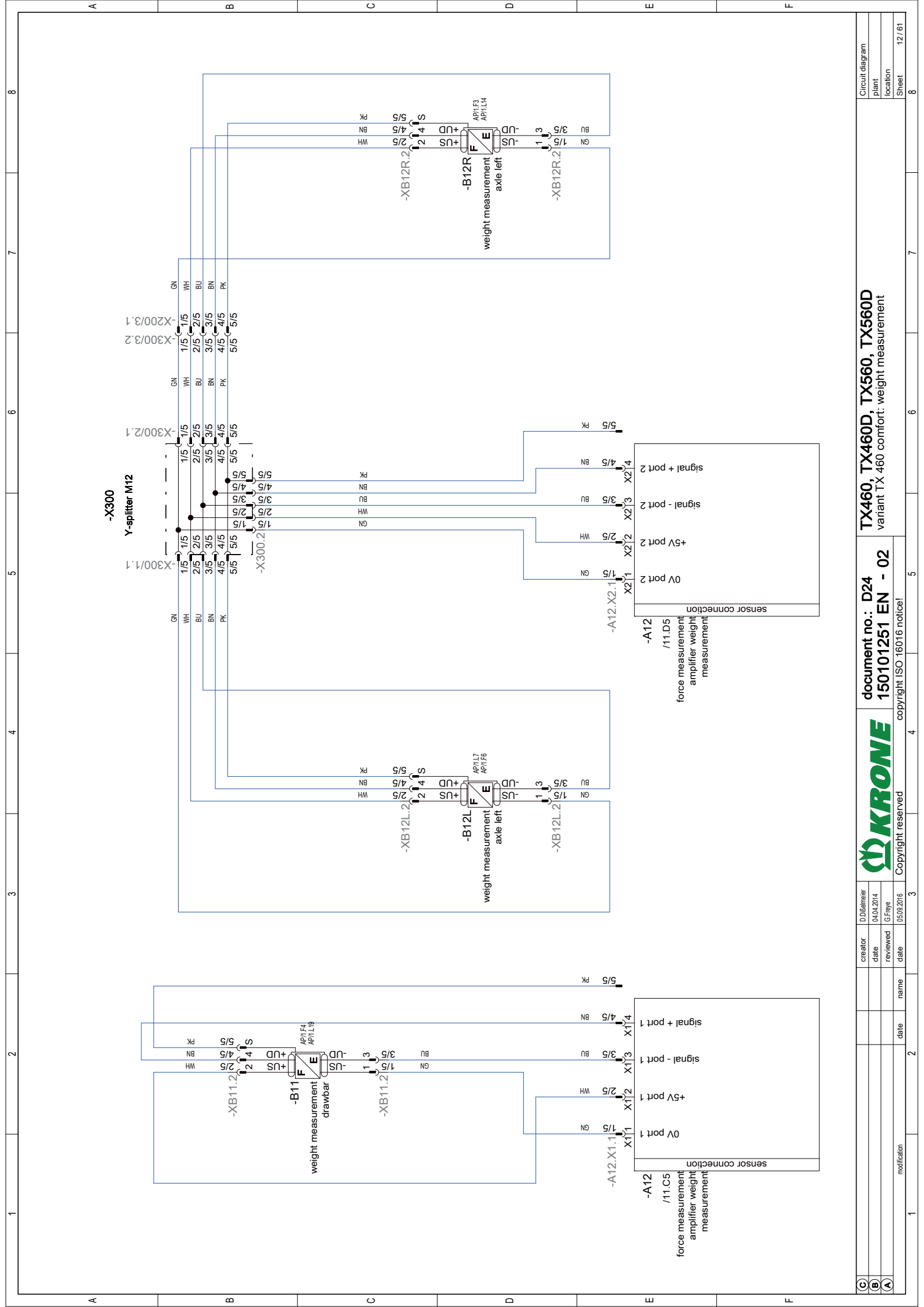
plant

location

Sheet

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8



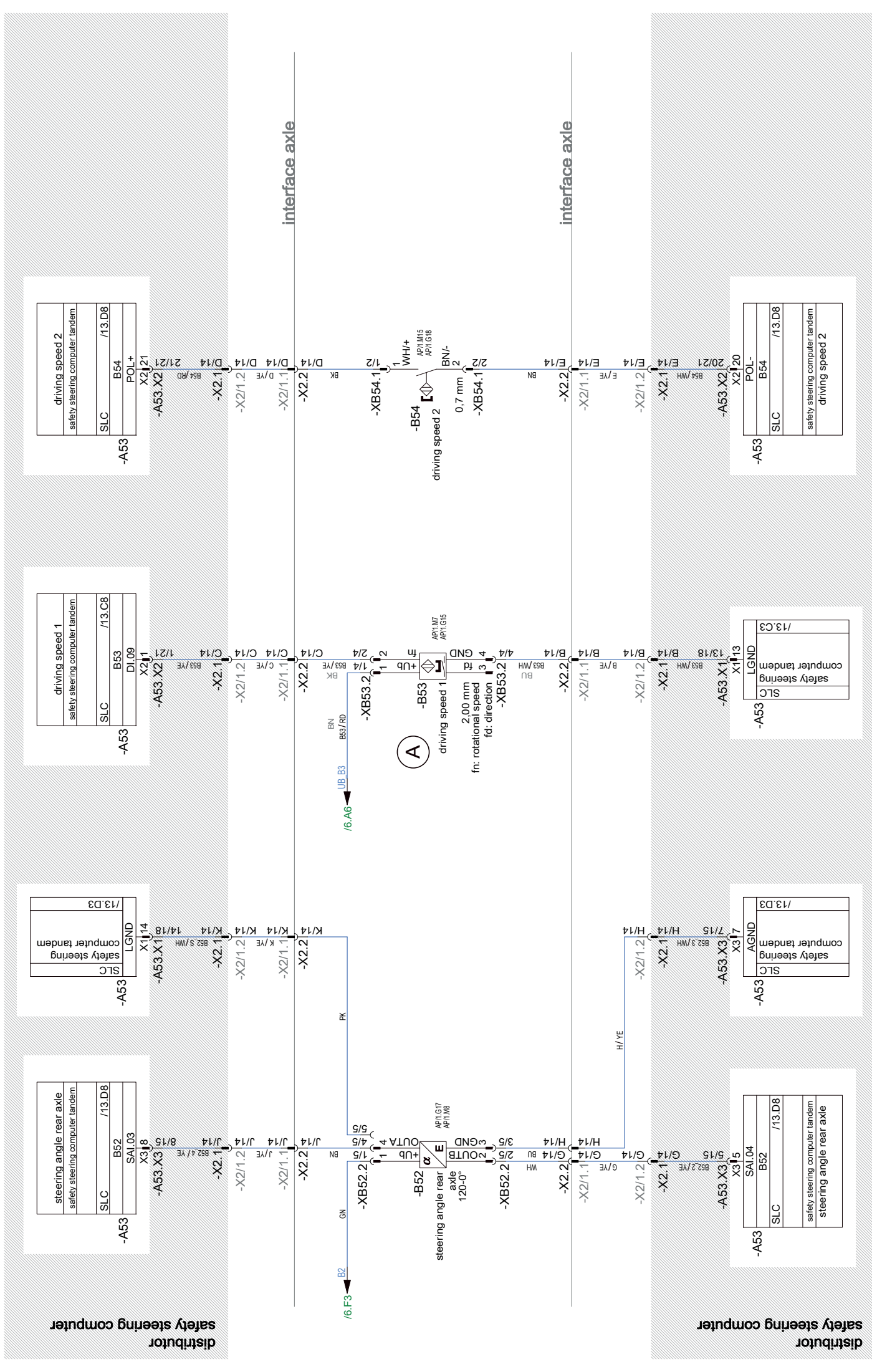
creator	DDIdometer	date	name	date
		04.04.2014		
reviewed	G Faye	date	date	date
		05.09.2016		

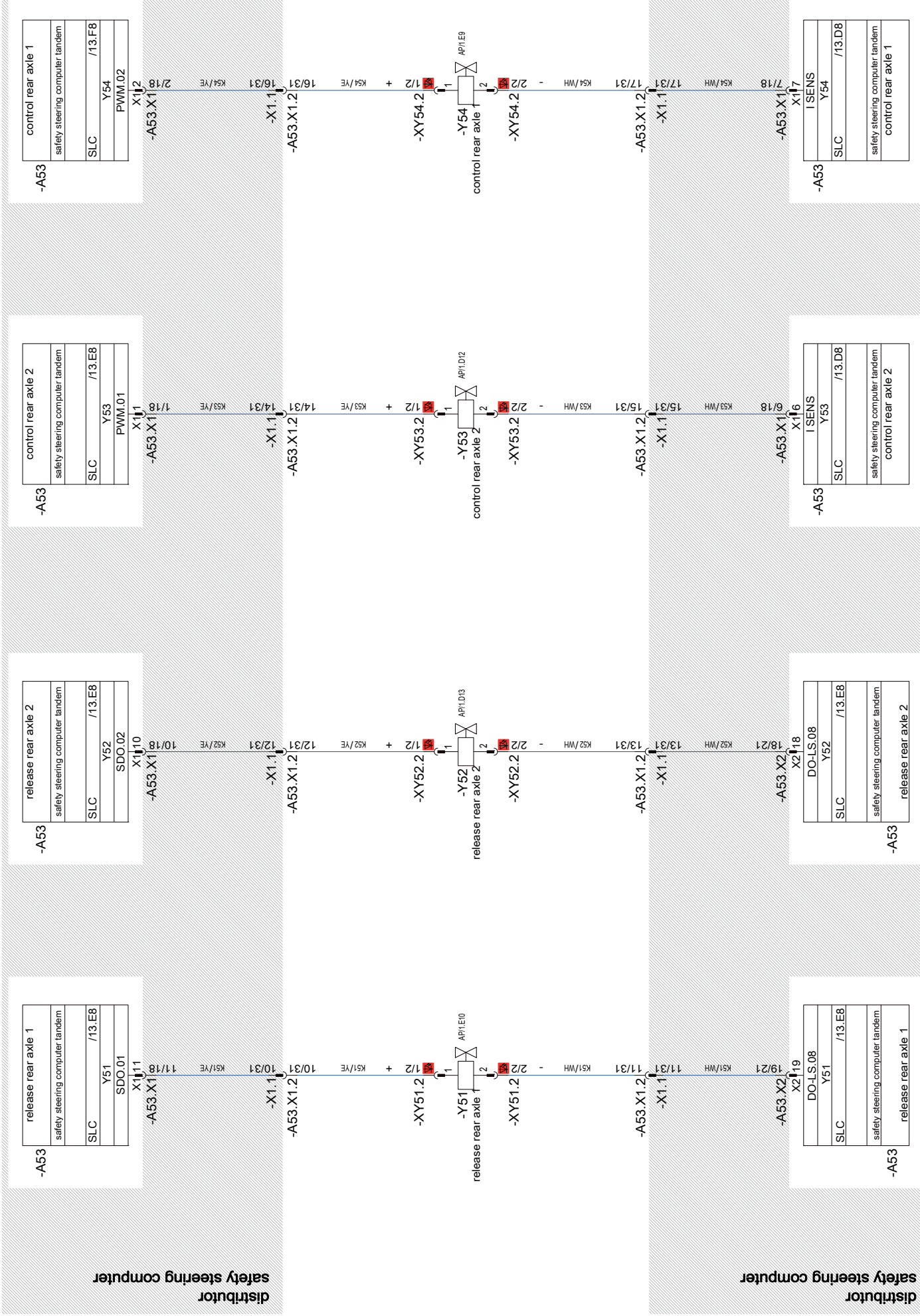


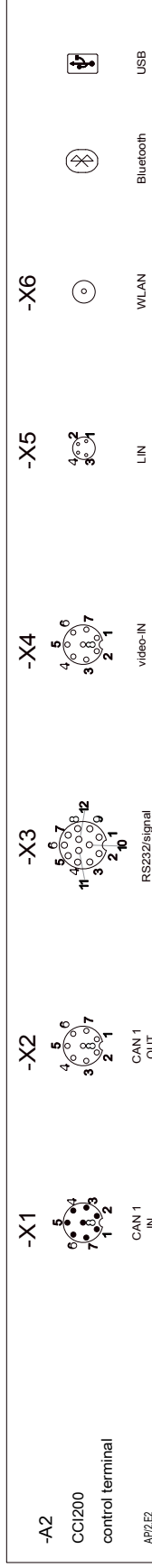
document no.: D24
150101251 EN - 02

TX460, TX460D, TX560, TX560D
variant TX 460 comfort: weight measurement

Circuit diagram	plant	location	Sheet	12 / 61
			8	



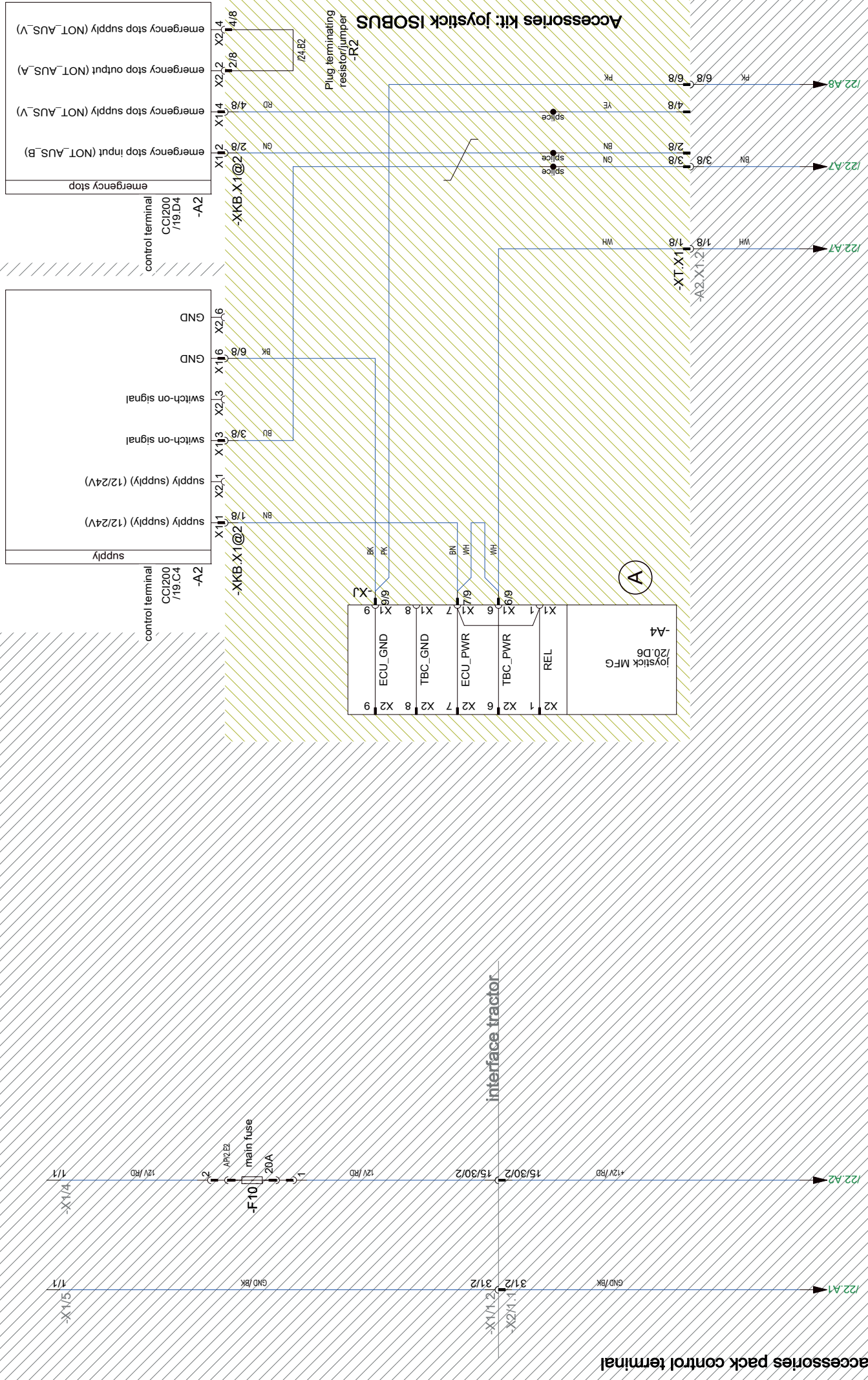


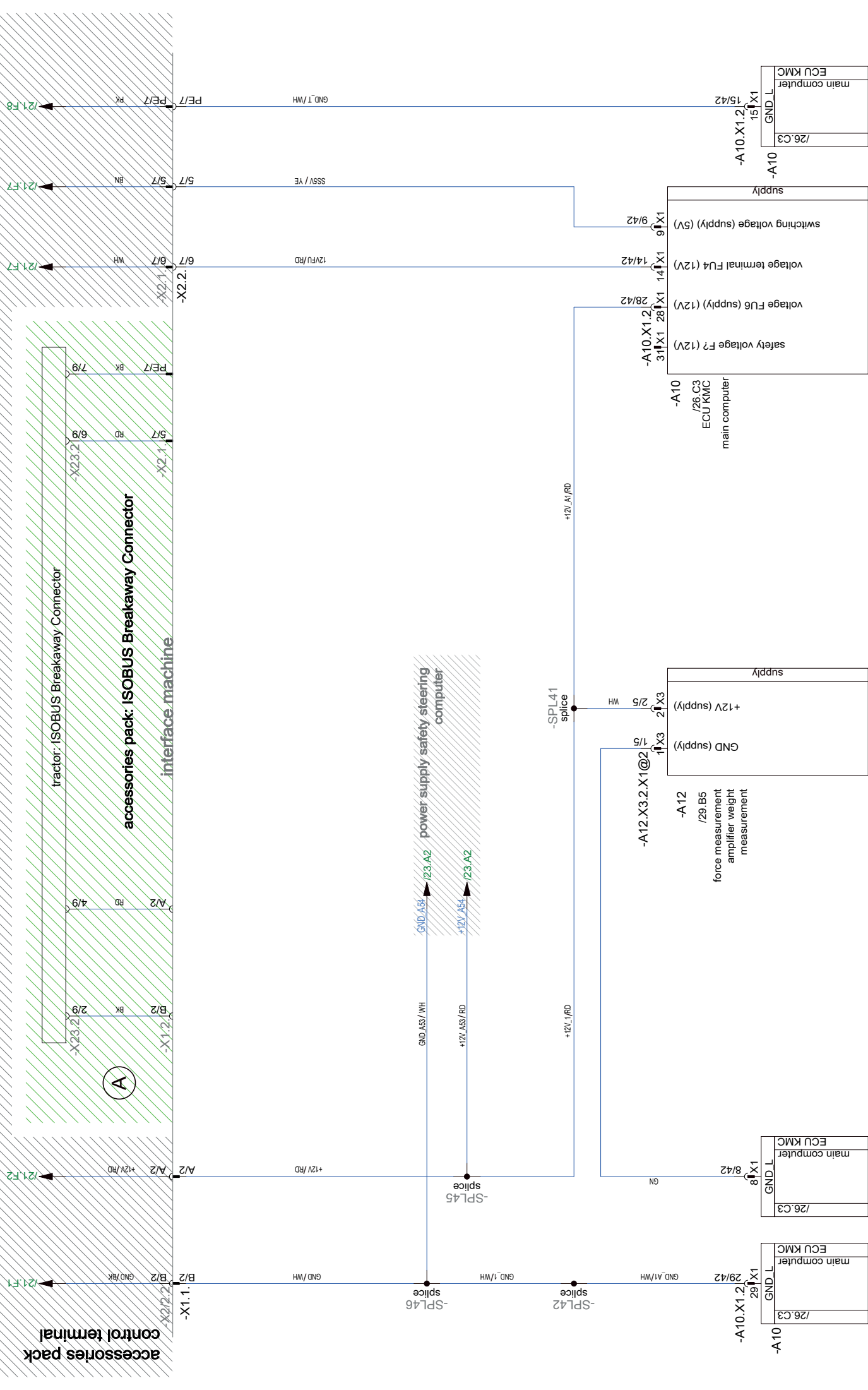


Plug	connection	description	cross-reference
supply in general			
-X1	1	supply (supply)	+12V/+24V
-X2	1	supply (supply)	+12V/+24V
-X1	3	switch-on signal	+Uon
-X2	3	switch-on signal	+Uon
-X1	6	GND	GND
-X2	6	GND	GND
emergency stop			
-X1	2	emergency stop input	NOT_AUS_B
-X1	4	emergency stop supply	NOT_AUS_V
-X2	2	emergency stop output	NOT_AUS_A
-X2	4	emergency stop supply	NOT_AUS_V
CAN 1 - interface			
-X1	7	CAN 1-H	CAN1_IN
-X2	7	CAN 1-H	CAN1_OUT
-X1	5	CAN 1-L	CAN1_IN
-X2	5	CAN 1-L	CAN1_OUT
-X1	8	shield	
-X2	8	shield	

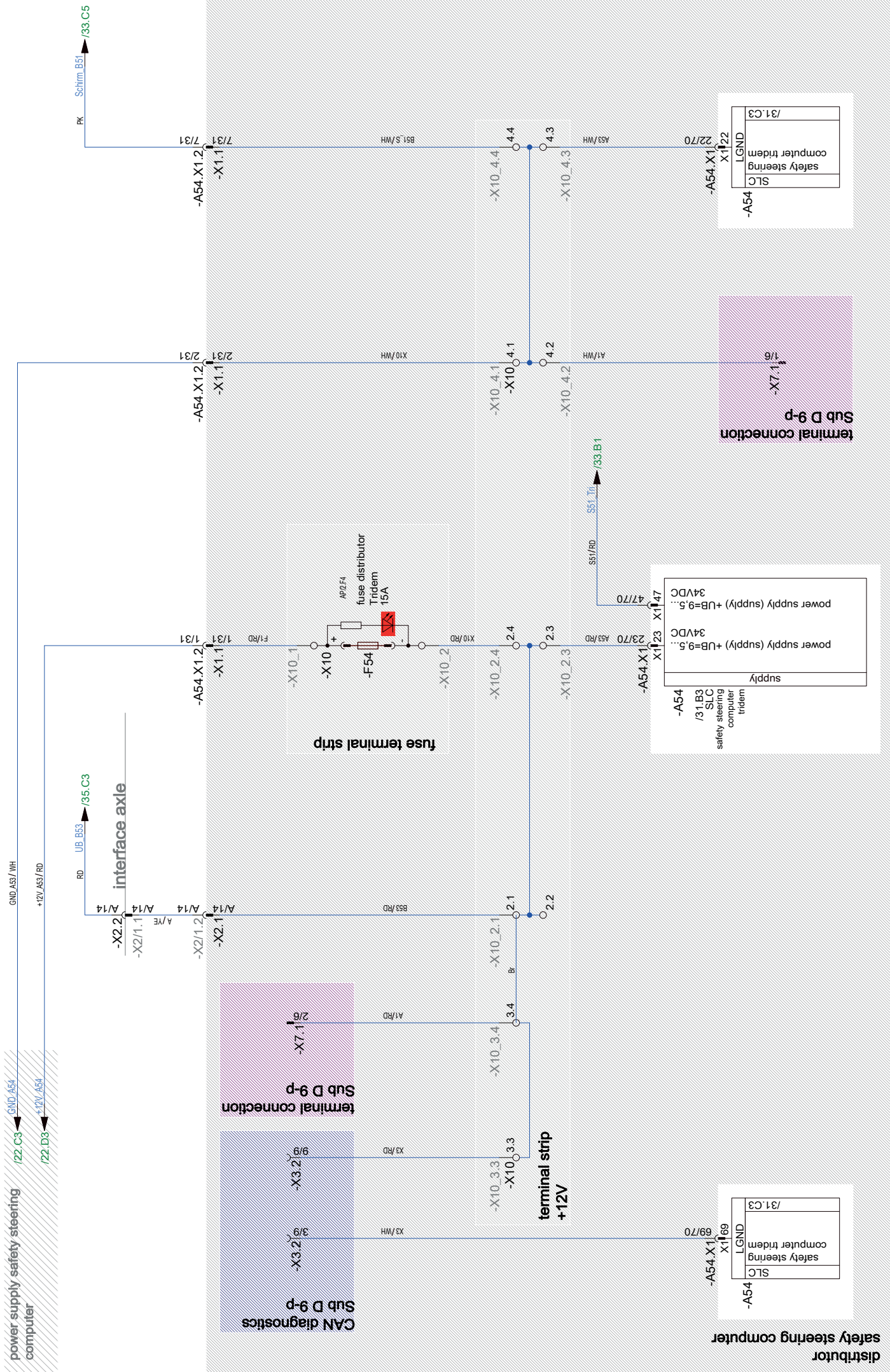
Plug	connection	description	cross-reference
RS232/signal			
-X3	1	supply interconnected	+12V/+24V
-X3	2	GND	GND
-X3	3	ISO11786 "PTO shaft speed"	SMFQ_IN 2
-X3	4	ISO11786 "Lifting unit position"	SAN_IN0
-X3	5	ISO11786 "Wheel speed"	SMFQ_IN 3
-X3	6	direction of travel	SMFQ_IN 4
-X3	7	ISO11786 "Speed slip free"	SMFQ_IN 1
-X3	8	RS232 1 RxD (input)	COM0_RxD_IN
-X3	9	RS232 1 TxD (output)	COM0_TxD_OUT
-X3	10	ignition signal / terminal 15	IGN
-X3	11	RS232 2 RxD	COM1_RxD_IN
-X3	12	RS232 2 TxD	COM1_TxD_OUT
Video			
-X4	1	video signal	VIDEO_IN
-X4	2	RS485B	
-X4	3	RS485A	
-X4	4	supply interconnected	+12V/+24V
-X4	5	RS485A	
-X4	6	supply interconnected	+12V/+24V
-X4	7	GND	GND
-X4	8	shield	
LIN - Interface			
-X5	1	supply interconnected	+12V/+24V
-X5	2	N.C.	
-X5	3	GND	GND
-X5	4	LIN	

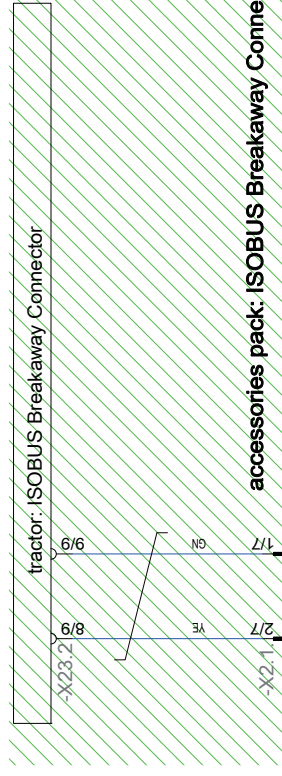
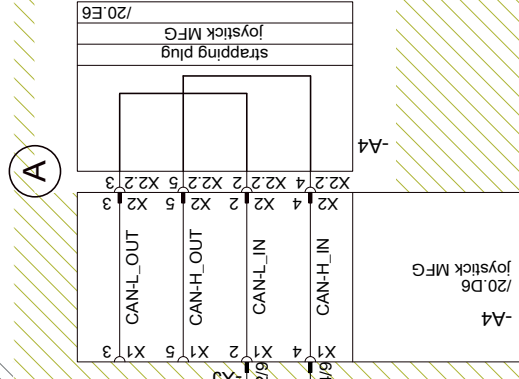
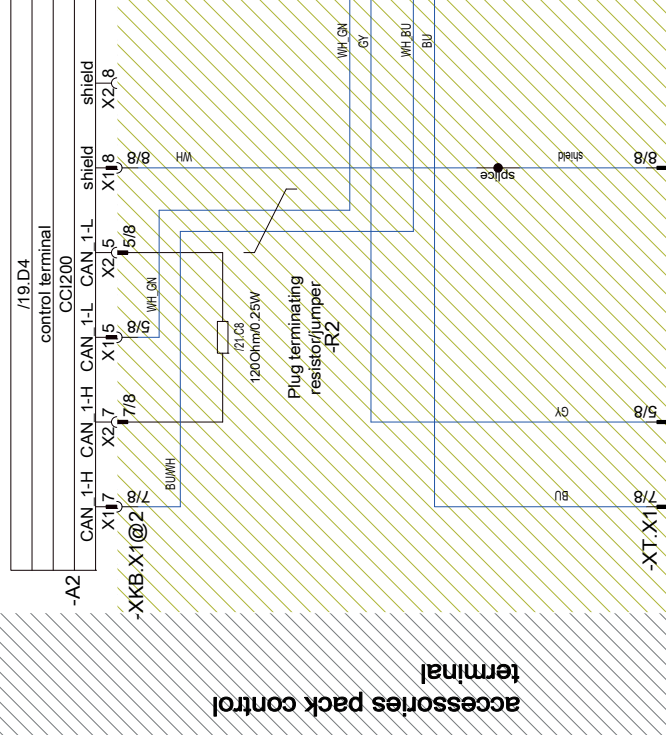
CCl₂200





C								KRONE	document no.: D24 150101251 EN - 02	TX460D, TX560D, TX560D	
B										variant TX 560 combort: power supply: accessories pack control terminal, accessories pack ISOBUS Breakaway Connector, main computer, force measurement amplifier, safety steering computer	
A	new view	modification	date	D.Dilemmer name	reviewed date	G.Flege date	D.Dilemmer date	creator date			circuit diagram plant location sheet
			01.09.2016	D.Dilemmer	revised	G.Flege					Sheet 22 of 61
									copyright reserved	copyright ISO 16016 notice!	





A

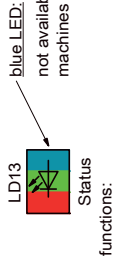
A

-A10

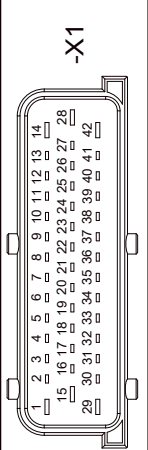
ECU KMC

main computer

AP2.F4
AP2.K19



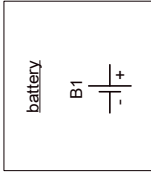
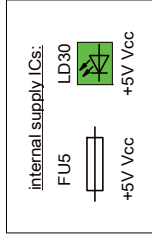
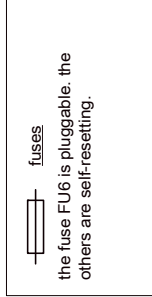
-X1



B

Plug	connection	description	cross-reference	
supply in general				
-X1	9	switching voltage (supply)	+5V_SS	LD31
-X1	14	voltage terminal	+12V_FU_TERM	FU4 , 5A
-X1	28	voltage (supply)	+12V_EIN	FU6 , 30A
-X1	31	safety voltage	+12V_L_SI	LD1
-X1	8	GND power	GND_L	LD2
-X1	15	GND power	GND_L	/22.F2
-X1	26	GND power	GND_L	/22.F8
-X1	27	GND power	GND_L	
-X1	29	GND power	GND_L	/22.F1
-X1	37	GND power	GND_L	/28.F2
supply digital sensors				
-X1	11	GND sensor 1	DIG_GND_1	F1 , 0.5A
-X1	23	GND sensor 2	DIG_GND_2	F2 , 0.5A
-X1	25	GND sensor 3	DIG_GND_3	F3 , 0.5A
-X1	13	GND sensor 6	DIG_GND_6	F6 , 0.5A
-X1	21	GND sensor 7	DIG_GND_7	F7 , 0.5A
-X1	17	GND sensor 10	DIG_GND_10	F10 , 0.5A
-X1	19	GND sensor 11	DIG_GND_11	F11 , 0.5A
supply analog sensors				
-X1	34	voltage sensors	+12V_ANA	LD32
-X1	32	GND sensors	GND_ANA	FU7 , 1.1A
-X1	35	GND sensors	GND_ANA	F20 , 0.5A
CAN 1 - interface				
-X1	5	CAN 1-H		
-X1	6	CAN 1-L	/24.F2	
CAN 2 - interface				
-X1	2	CAN 2-H		
-X1	38	CAN 2-H		
-X1	3	CAN 2-L	/25.A7	
-X1	39	CAN 2-L		
-X1	4	TERMI_2		

Plug	connection	address	equipment	function	cross-reference
Inputs					
-X1	10	DIGFRQ_1			
-X1	12	DIGFRQ_6			
-X1	20	DIGFRQ_7			
-X1	16	DIGFRQ_10	B10	lift axle top	/27.F2
-X1	18	DIGFRQ_11			
-X1	22	DIG_2			
-X1	24	DIG_3			
-X1	30	ANAFRQ_1			
-X1	33	ANAFRQ_2			
-X1	41	G_STROM_1			
outputs					
-X1	1	HBPWMSTR_1			
-X1	42	HBPWMSTR_2			
-X1	40	PWMLA_1			
-X1	7	PWMLA_8			
-X1	36	LA_1	H1	work lighting	/28.A2



D

E

F

C

B

A

new symbol	modification
25.08.2016	D.Didemer
date	name

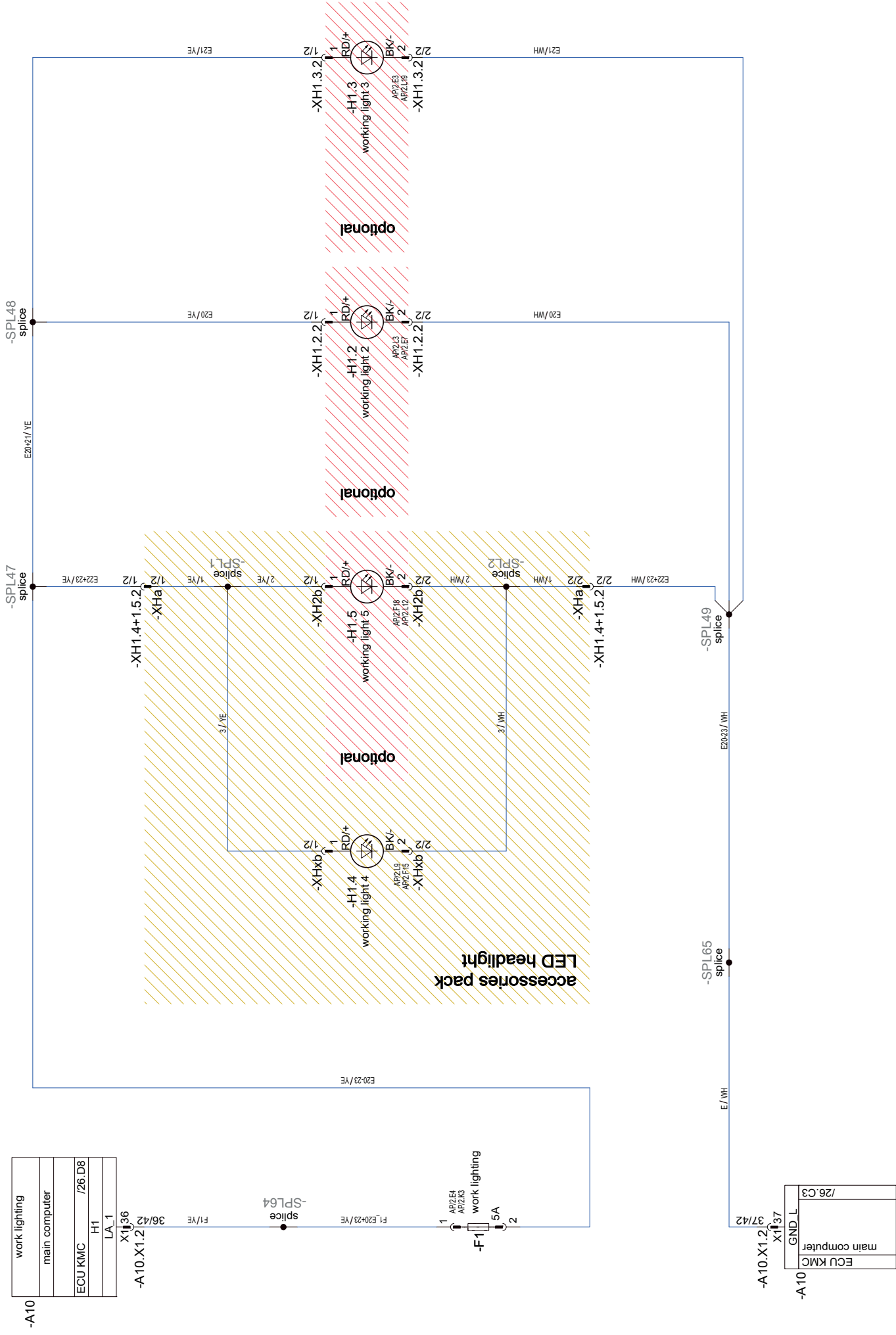
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date	04.04.2014
reviewed	G.Faye
date	05.09.2016



document no.: D24
150101251 EN - 02

TX460, TX460D, TX560, TX560D
variant TX 560 comfort: overview main computer

Circuit diagram	plant
location	Sheet
26 / 61	8



(C)	
(B)	
(A)	modification

		creator	D.Dübelmeier
		date	04.04.2014
		reviewed	G.Freye
date	name	date	05.09.2016



document no.: D24
150101251 EN - 02

TX460, TX460D, TX560, TX560D
variant TX 560 comfort: work lighting

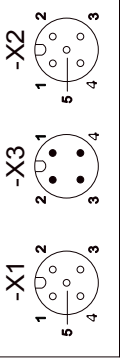
Circuit diagram
plant
location
Sheet 28 / 61

A

-A12

force measurement amplifier
weight measurement

AP2 F4
AP2 L19



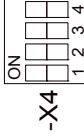
Plug	connection	description	cross-reference
supply in general			
-X3	1	GND (supply)	/22. E4
-X3	2	+12V (supply)	
CAN - interface			
-X3	3	CAN-H	/25. F4
-X3	4	CAN-L	
port 1			
-X1	1	0V	/30. E1
-X1	2	+12V	
-X1	3	signal -	
-X1	4	signal +	
port 2			
-X2	1	0V	/30. E5
-X2	2	+12V	
-X2	3	signal -	
-X2	4	signal +	

Status

D8 D9

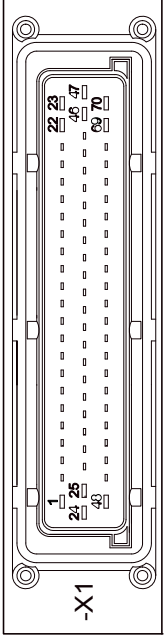


CAN addressing and scheduling
(switch position see CAN overview)



functions of the status LEDs D8 / D9:

- no power supply
- power supply reversed
- force measurement amplifier defective
- is booted up
- machine not set correctly
- no CAN connection
- CAN bus short-circuited/reversed
- ready for operation



-A54

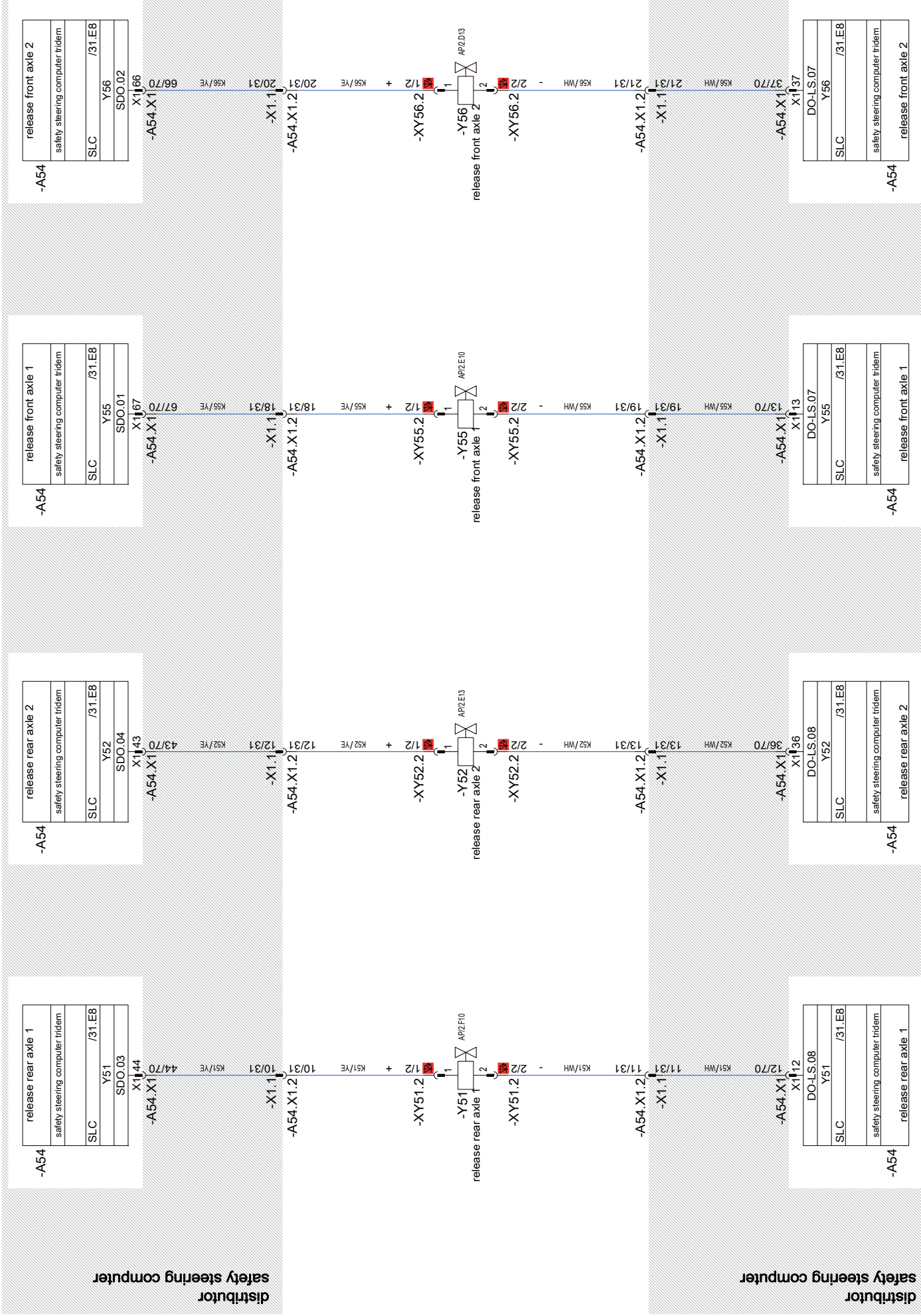
SLC

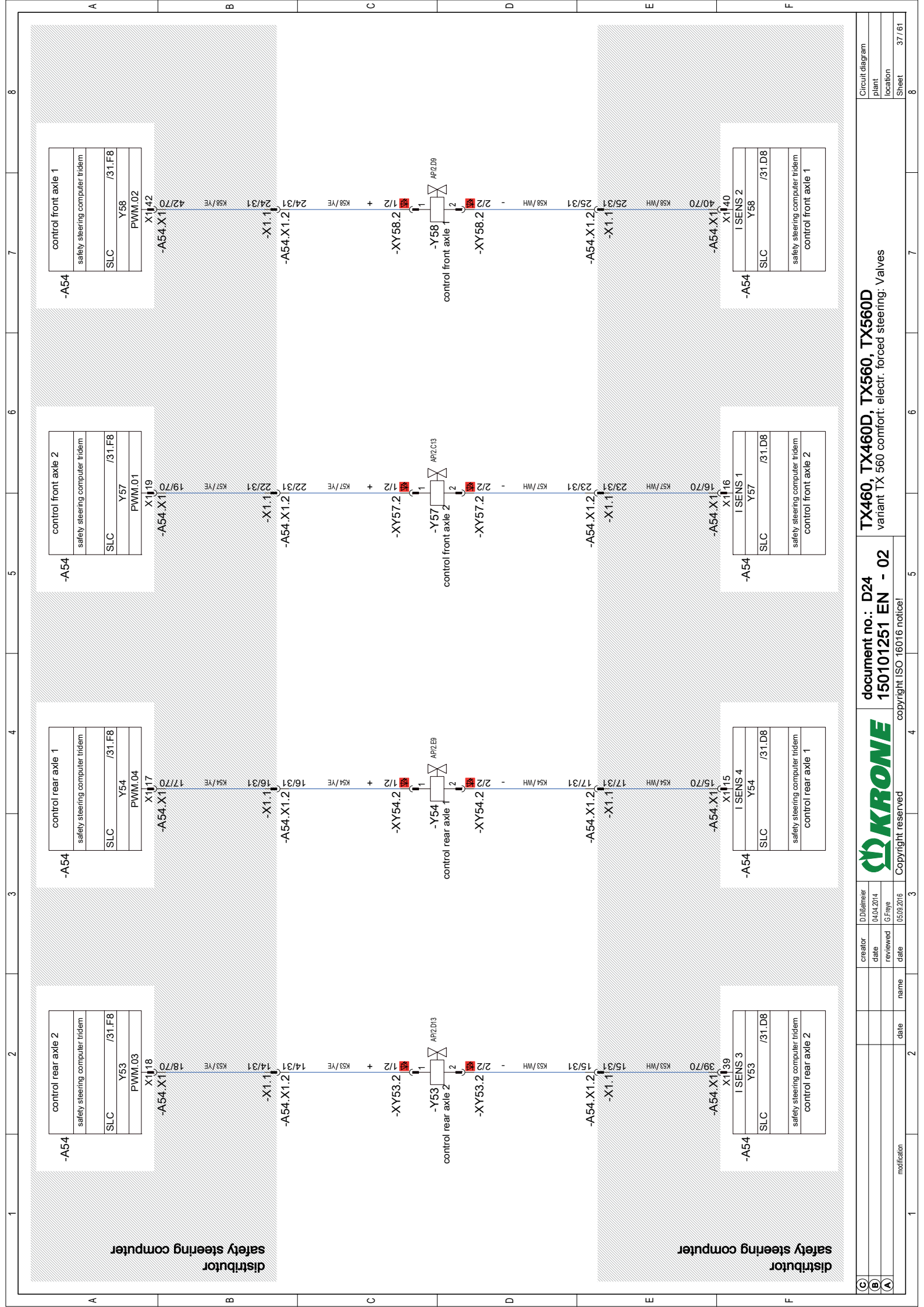
safety steering computer tridem
ECU SLC 16bit 1ST 2007/25

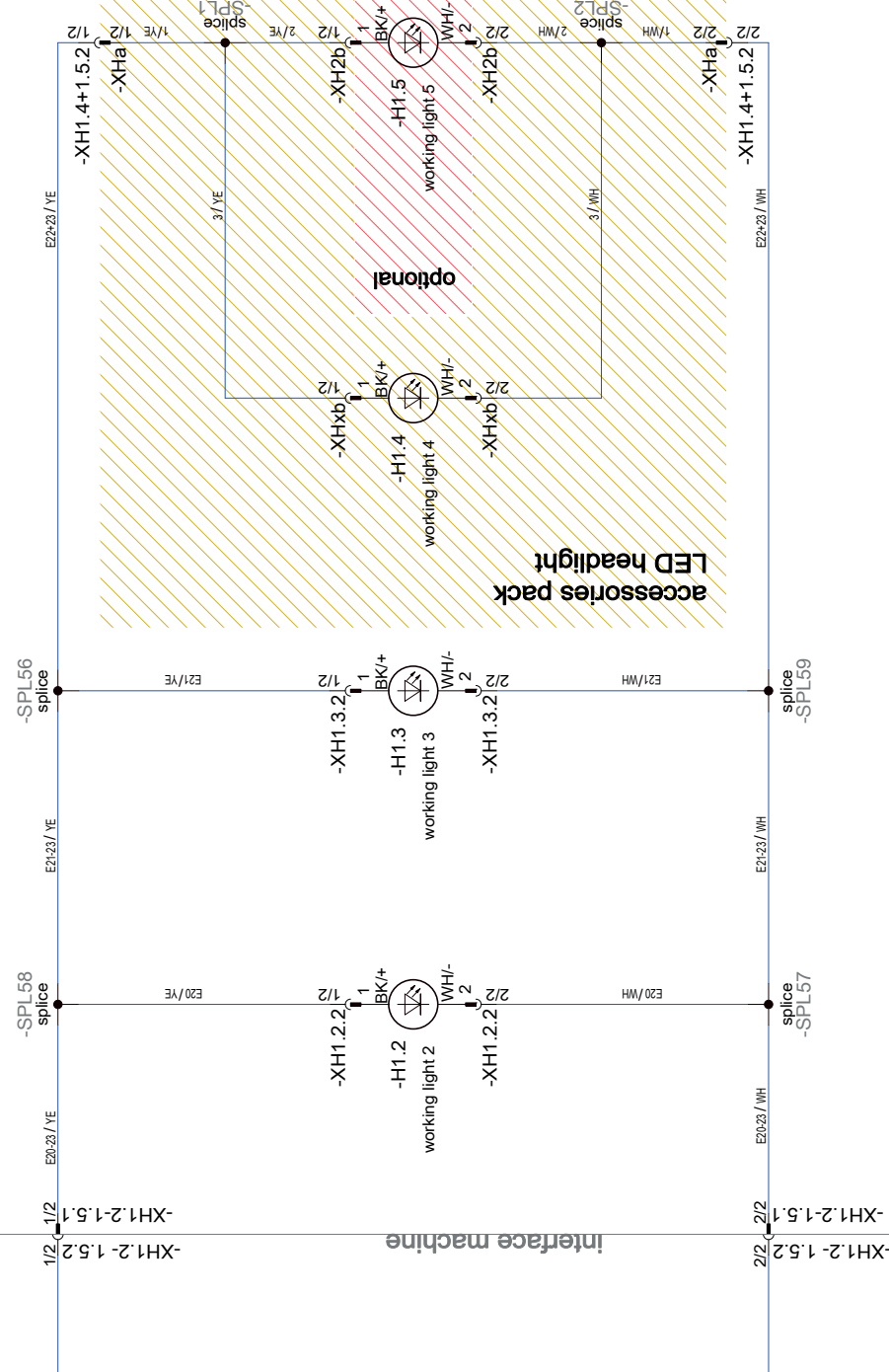
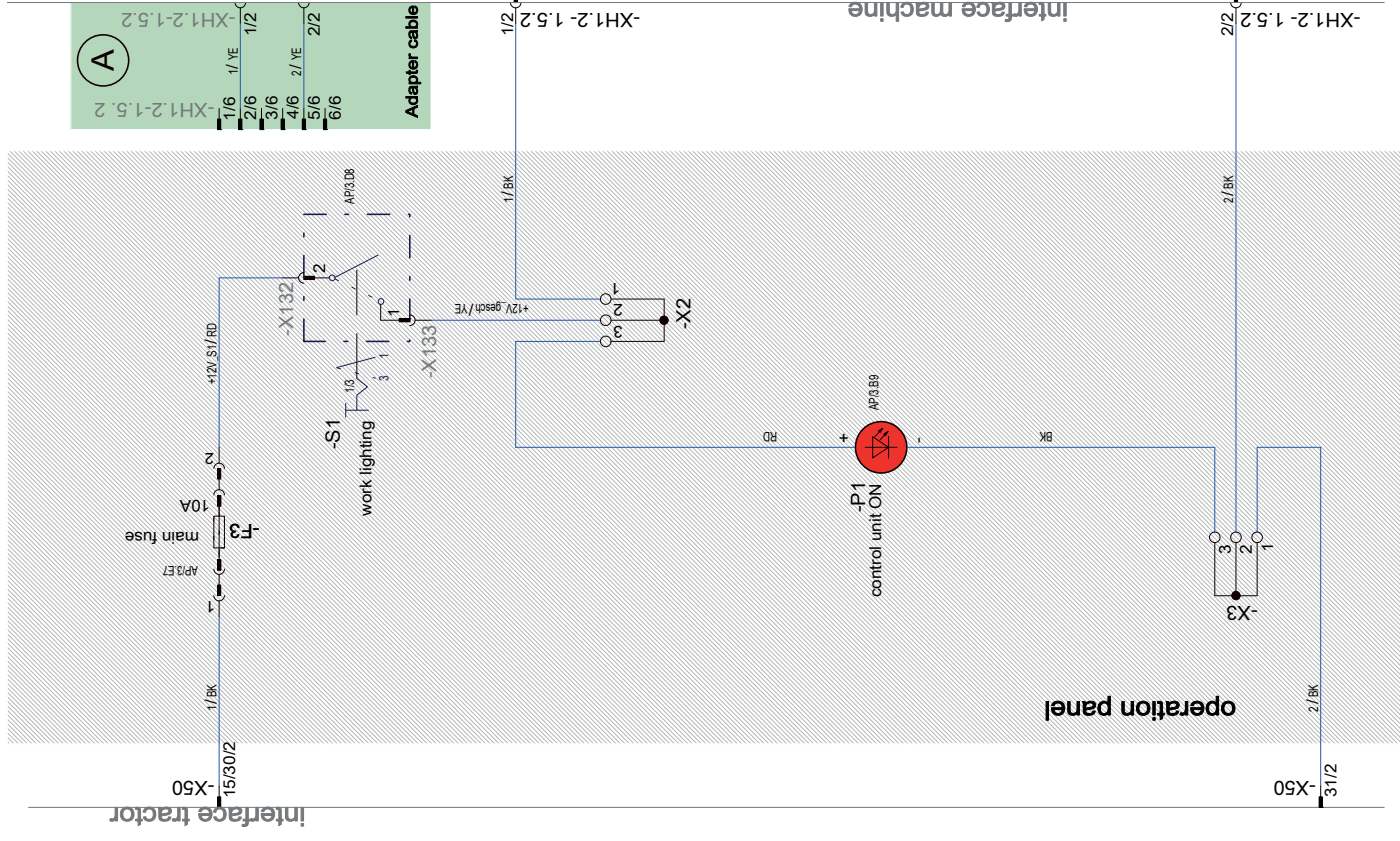
AP2 F4
APZ L19

Plug	connection	description		cross-reference	
supply in general					
-X1	23	power supply (supply)	+UB	/23.E4	
-X1	47	power supply (supply)	+UB		
-X1	3	reference voltage	5V REF EXT		
-X1	4	reference voltage	5V REF EXT		
-X1	5	reference voltage	5V REF EXT		
-X1	51	reference voltage	5V REF EXT		
-X1	2	reference voltage	5V EXT		
-X1	22	LGND			/23.E8
-X1	46	LGND			/35.F4
-X1	69	LGND		/23.E2	
-X1	70	power supply sensor 1	+UB SEN	/33.A4	
-X1	68	power supply sensor 2	+UB SEN	/34.A6	
-X1	45	power supply sensor 3	+UB SEN	/34.A2	
-X1	26	AGND			
-X1	49	AGND			/34.F3
-X1	50	AGND			
-X1	52	AGND			/33.F5
-X1	53	GND		/32.F3	
-X1	54	GND		/32.F5	
CAN 1 - interface					
-X1	61	CAN1-H		/25.F2	
-X1	63	CAN1-H			
-X1	60	CAN1-L			
-X1	62	CAN1-L			
CAN 2 - interface					
-X1	57	CAN2-H			
-X1	59	CAN2-H			
-X1	56	CAN2-L			
-X1	58	CAN2-L			
RS232 - interface					
-X1	65	RXD		/32.F2	
-X1	41	TXD			
-X1	64	GND			
bootloader					
-X1	11	bootloader			

Plug	connection	address	equipment	function		cross-reference
inputs						
-X1	33	DI.05				
-X1	9	DI.06				
-X1	35	DI.07				
-X1	32	DI.08				
-X1	8	DI.09				
-X1	31	SDI.01	S51	system pressure steering		/33.F3
-X1	34	SDI.02				
-X1	10	SDI.03				
-X1	55	SDI.04				
-X1	29	INK 1/A1	B53	driving speed 1		/35.A4
-X1	30	INK 1/B1	GND_1	GND		/32.A4
-X1	6	INK 2/A2				
-X1	7	INK 2/B2	GND_2	GND		/32.A5
-X1	28	SAI.01	B51	steering angle tractor/drawbar		/33.A6
-X1	27	SAI.02	B51	steering angle tractor/drawbar		/33.F4
-X1	48	SAI.03	B55	steering angle front axle		/34.A7
-X1	25	SAI.04	B55	steering angle front axle		/34.F6
-X1	1	SAI.05	B52	steering angle rear axle		/34.A3
-X1	24	SAI.06	B52	steering angle rear axle		/34.F2
-X1	38	POL+	B54	driving speed 2		/35.A2
-X1	14	POL-	B54	driving speed 2		/35.F2
-X1	16	I SENS 1	Y57	control front axle 2		/37.F6
-X1	40	I SENS 2	Y58	control front axle 1		/37.F8
-X1	39	I SENS 3	Y53	control rear axle 2		/37.F2
-X1	15	I SENS 4	Y54	control rear axle 1		/37.F4
outputs						
-X1	13	DO-L.S.07	Y55	release front axle 1		/36.F6
-X1	37	DO-L.S.07	Y56	release front axle 2		/36.F8
-X1	12	DO-L.S.08	Y51	release rear axle 1		/36.F2
-X1	36	DO-L.S.08	Y52	release rear axle 2		/36.F4
-X1	67	SDO.01	Y55	release front axle 1		/36.A6
-X1	66	SDO.02	Y56	release front axle 2		/36.A8
-X1	44	SDO.03	Y51	release rear axle 1		/36.A2
-X1	43	SDO.04	Y52	release rear axle 2		/36.A4
-X1	21	SDO.05				
-X1	20	SDO.06				
-X1	19	PWM.01	Y57	control front axle 2		/37.A6
-X1	42	PWM.02	Y58	control front axle 1		/37.A8
-X1	18	PWM.03	Y53	control rear axle 2		/37.A2
-X1	17	PWM.04	Y54	control rear axle 1		/37.A4







adapter necessary if cable harness 20083461* (up to YOM 2017) and operation panel 20086132* (from YOM 2017) have been installed

(C)				creator	D.Dilmieler
(B)				date	04.04.2014
(A)	Adapter cable new	25.08.2016	D.Dilmieler	reviewed	G.Freye
		modification	name	date	05.09.2016

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TX460, TX460D, TX560, TX560D

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Circuit diagram

plant

modification

1

name	d
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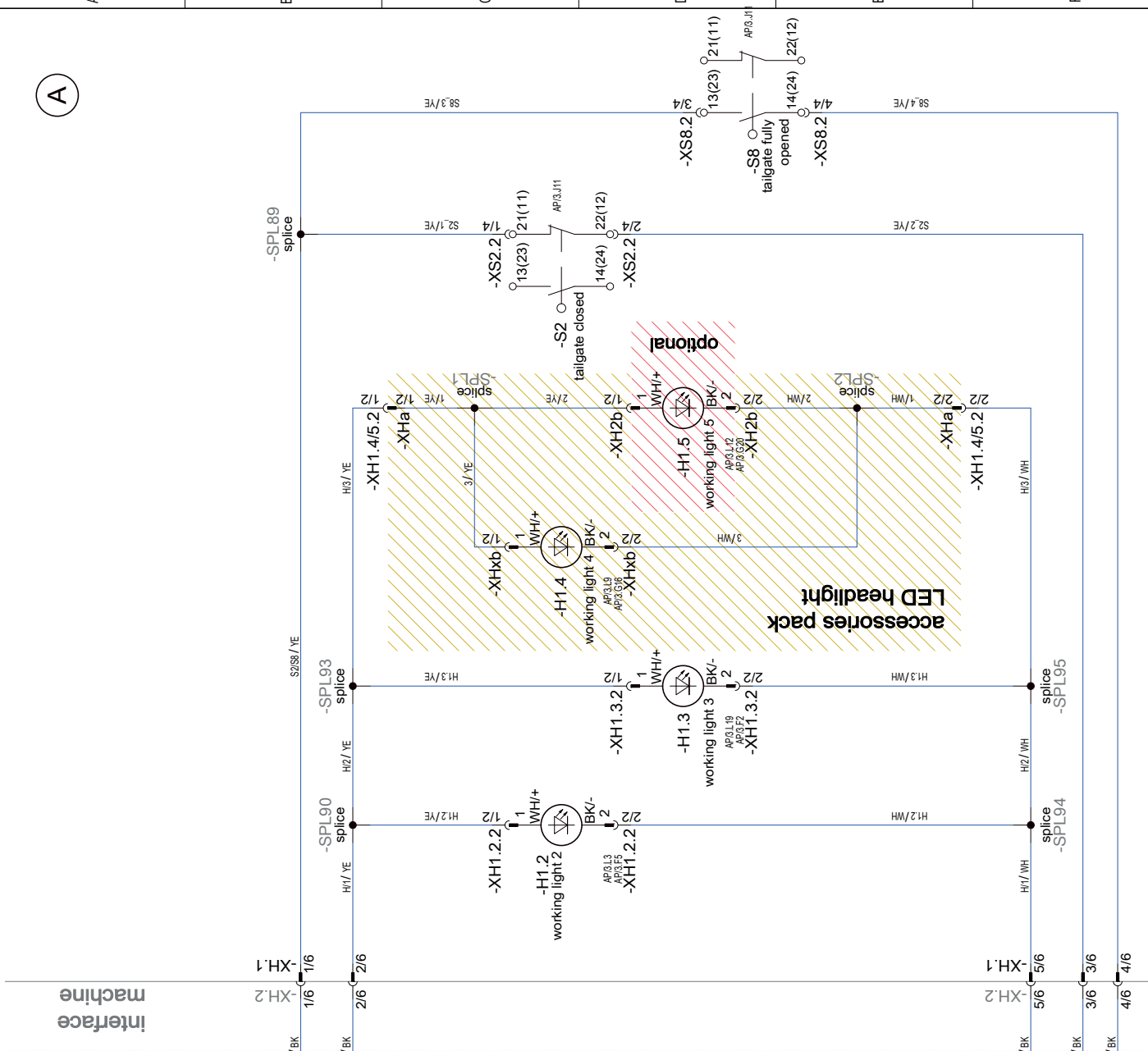
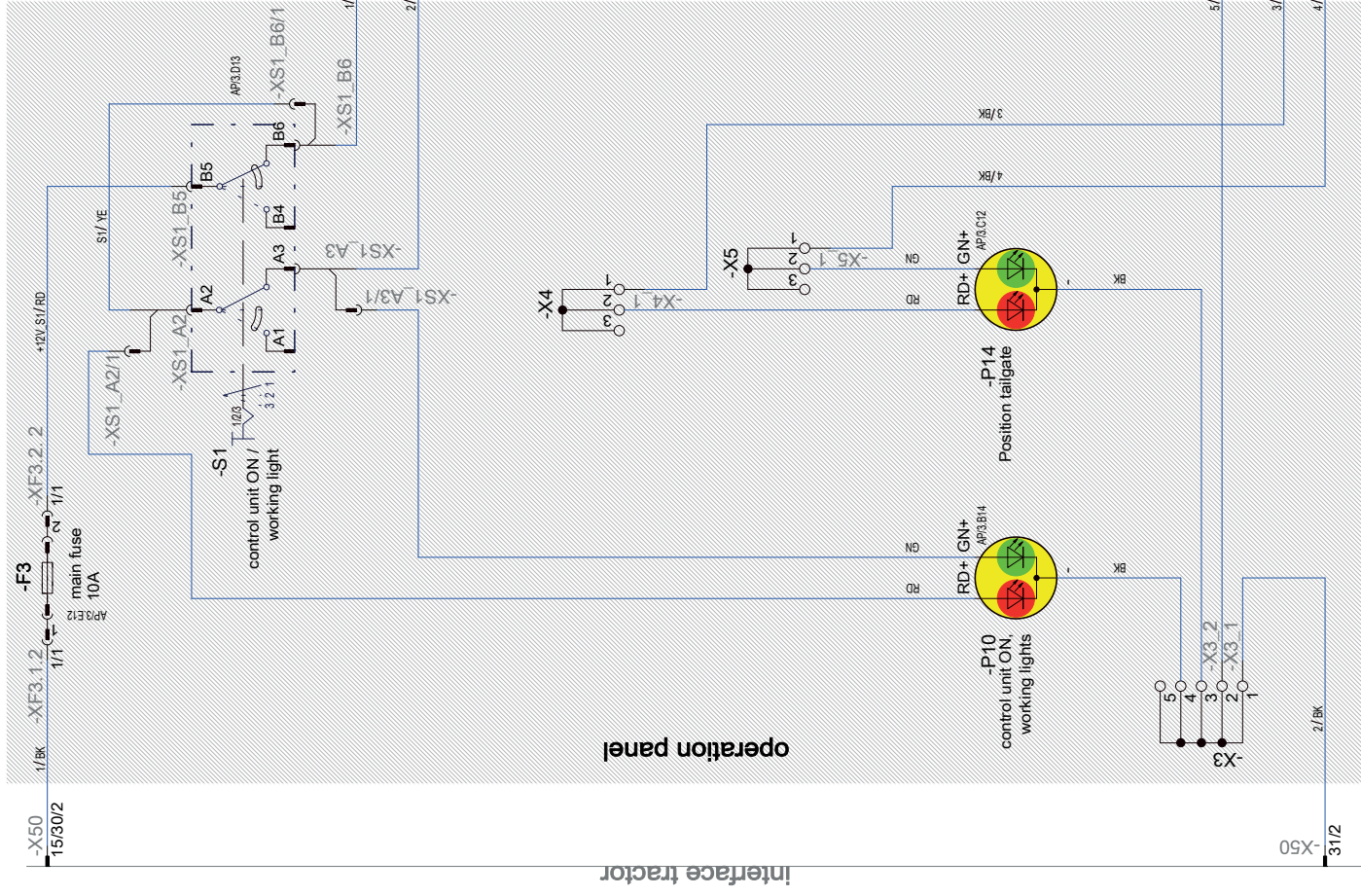
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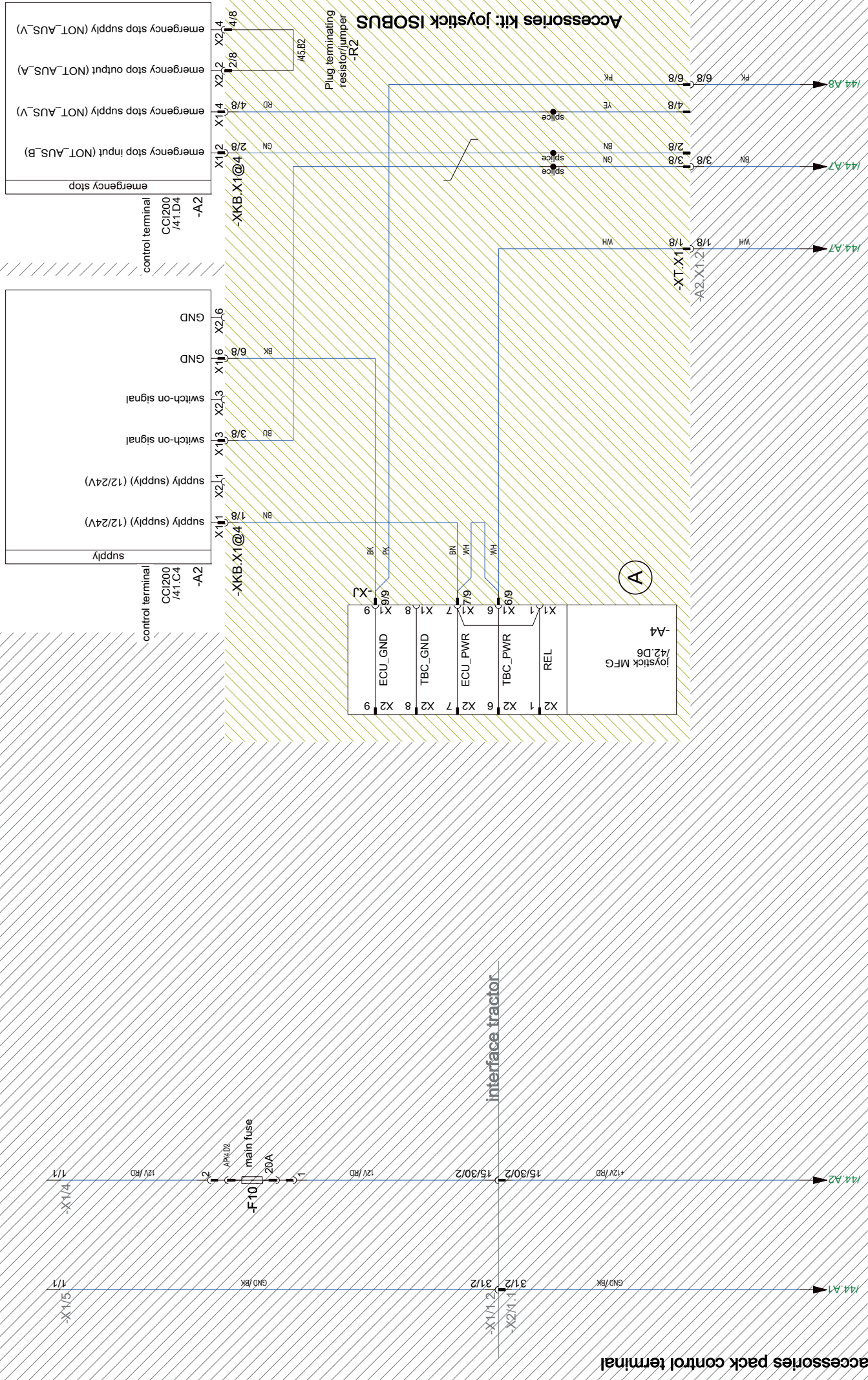
-A2	-X1	-X2	-X3	-X4	-X5	-X6
CCI200 control terminal	 CAN 1 IN	 CAN 1 OUT	 RS232/signal	 video-IN	LIN	WLAN
AP/4_C2					Bluetooth	USB

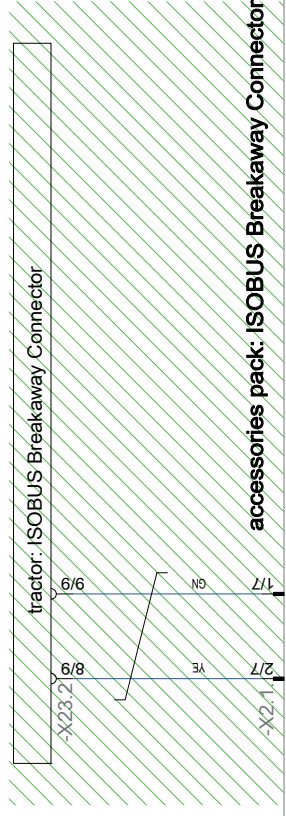
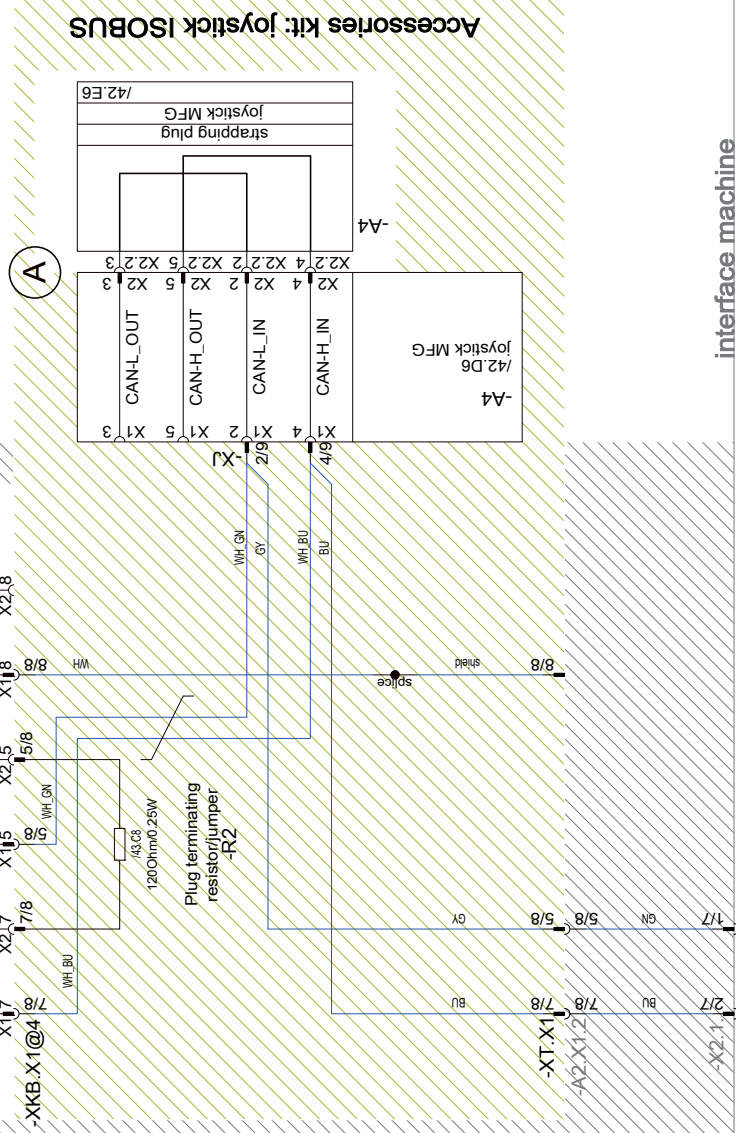
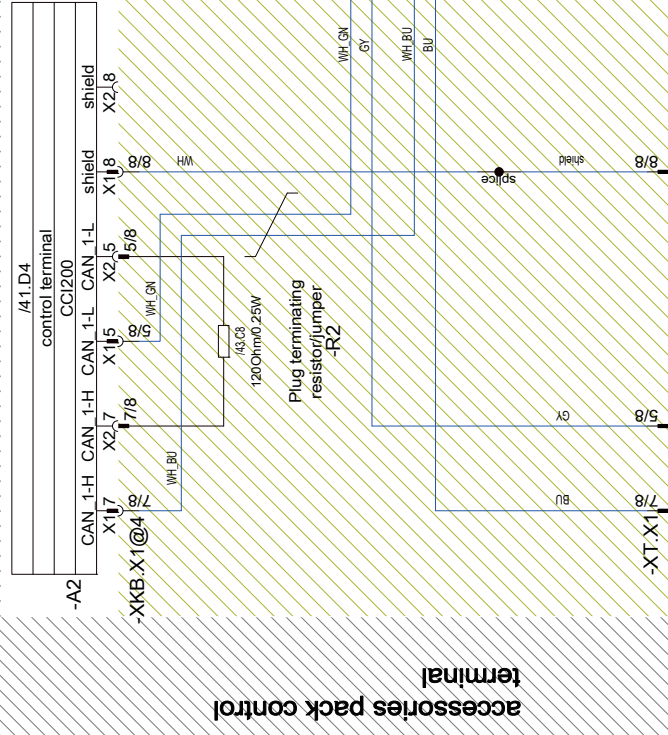
Plug	connection	description	cross-reference
supply in general			
-X1	1	supply (supply)	+12V/+24V
-X2	1	supply (supply)	+12V/+24V
-X1	3	switch-on signal	+Uon
-X2	3	switch-on signal	+Uon
-X1	6	GND	GND
-X2	6	GND	GND
emergency stop			
-X1	2	emergency stop input	NOT_AUS_B
-X1	4	emergency stop supply	NOT_AUS_V
-X2	2	emergency stop output	NOT_AUS_A
-X2	4	emergency stop supply	NOT_AUS_V
CAN 1 - Interface			
-X1	7	CAN_1-H	CAN1_IN
-X2	7	CAN_1-H	CAN1_OUT
-X1	5	CAN_1-L	CAN1_IN
-X2	5	CAN_1-L	CAN1_OUT
-X1	8	shield	
-X2	8	shield	

Plug	connection	description	cross-reference
RS232/signal			
-X3	1	supply interconnected	+12V/+24V
-X3	2	GND	GND
-X3	3	ISO11786 "PTO shaft speed"	SMFQ_IN 2
-X3	4	ISO11786 "Lifting unit position"	SAN_IN0
-X3	5	ISO11786 "Wheel speed"	SMFQ_IN 3
-X3	6	direction of travel	SMFQ_IN 4
-X3	7	ISO11786 "Speed slip free"	SMFQ_IN 1
-X3	8	RS232 1 RxD (input)	COM0_RxD_IN
-X3	9	RS232 1 TxD (output)	COM0_TxD_OUT
-X3	10	ignition signal / terminal 15	IGN
-X3	11	RS232 2 RxD	COM1_RxD_IN
-X3	12	RS232 2 TxD	COM1_TxD_OUT
Video			
-X4	1	video signal	VIDEO_IN
-X4	2	RS485B	
-X4	3	RS485A	
-X4	4	supply interconnected	+12V/+24V
-X4	5	RS485A	
-X4	6	supply interconnected	+12V/+24V
-X4	7	GND	GND
-X4	8	shield	
LIN - interface			
-X5	1	supply interconnected	+12V/+24V
-X5	2	N.C.	
-X5	3	GND	GND
-X5	4	LIN	

CCI200

[illegible]



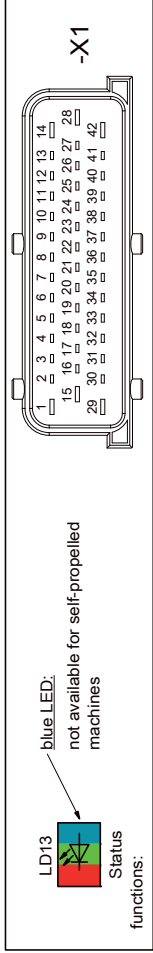


-A10

ECU KMC

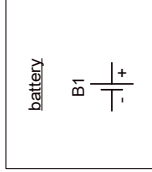
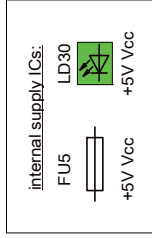
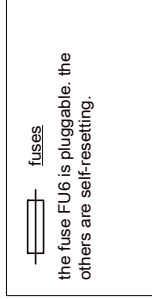
main computer

AP4LE3
AP4LE8



Plug	connection	description	cross-reference	
supply in general				
-X1	9	switching voltage (supply)	+5V_SS	LD31
-X1	14	voltage terminal	+12VFU_TERM	FU4 , 5A
-X1	28	voltage (supply)	+12V_EIN	FU6 , 30A
-X1	31	safety voltage	+12VL_SI	LD1
-X1	8	GND power	GND_L	LD2
-X1	15	GND power	GND_L	/44.F2
-X1	26	GND power	GND_L	/44.F8
-X1	27	GND power	GND_L	
-X1	29	GND power	GND_L	/44.F1
-X1	37	GND power	GND_L	/49.F2
supply digital sensors				
-X1	11	GND sensor 1	DIG_GND_1	F1 , 0.5A
-X1	23	GND sensor 2	DIG_GND_2	F2 , 0.5A
-X1	25	GND sensor 3	DIG_GND_3	F3 , 0.5A
-X1	13	GND sensor 6	DIG_GND_6	F6 , 0.5A
-X1	21	GND sensor 7	DIG_GND_7	F7 , 0.5A
-X1	17	GND sensor 10	DIG_GND_10	F10 , 0.5A
-X1	19	GND sensor 11	DIG_GND_11	F11 , 0.5A
supply analog sensors				
-X1	34	voltage sensors	+12V_ANA	LD32
-X1	32	GND sensors	GND_ANA	FU7 , 1.1A
-X1	35	GND sensors	GND_ANA	F20 , 0.5A
CAN 1 - interface				
-X1	5	CAN 1-H		/45.F2
-X1	6	CAN 1-L		
CAN 2 - interface				
-X1	2	CAN 2-H		
-X1	38	CAN 2-H		
-X1	3	CAN 2-L		/46.A7
-X1	39	CAN 2-L		
-X1	4	TERM_2		

Plug	connection	address	equipment	function	cross-reference
Inputs					
-X1	10	DIGFRQ_1			
-X1	12	DIGFRQ_6			
-X1	20	DIGFRQ_7			
-X1	16	DIGFRQ_10	B10	lift axle top	/48.F2
-X1	18	DIGFRQ_11			
-X1	22	DIG_2			
-X1	24	DIG_3			
-X1	30	ANAFRQ_1			
-X1	33	ANAFRQ_2			
-X1	41	G_STROM_1			
outputs					
-X1	1	HBPWMSTR_1			
-X1	42	HBPWMSTR_2			
-X1	40	PWMLA_1			
-X1	7	PWMLA_8			
-X1	36	LA_1	H1	work lighting	/49.A2



neus Symbol

modification

2

date

25.08.2016

D.Didmeier

date

04.04.2014

G.Freye

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3

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5

TX460, TX460D, TX560, TX560D

accessories pack weight measurement: overview main computer

6

7

8

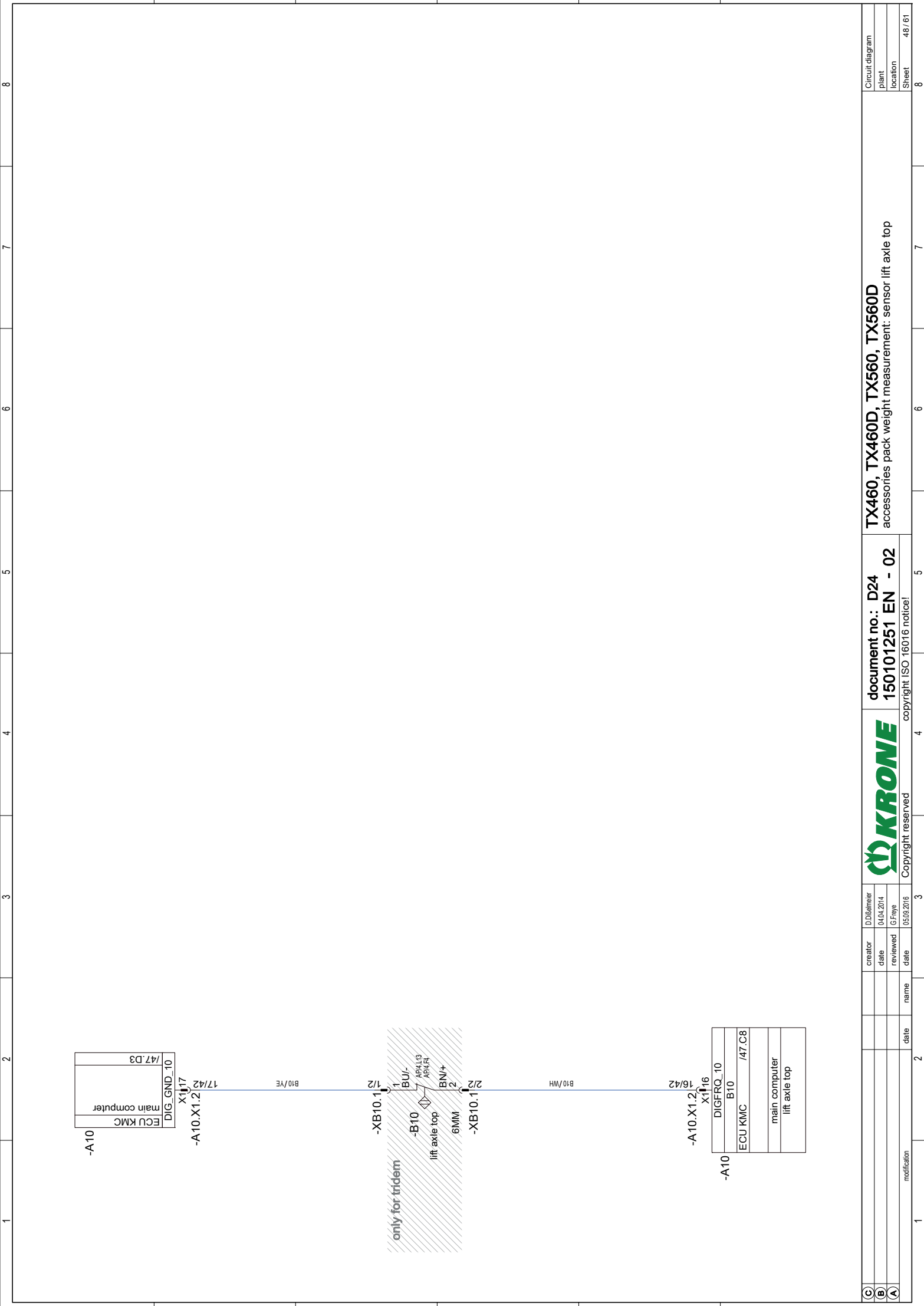
Circuit diagram

plant

location

Sheet

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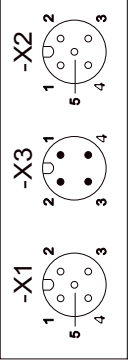


A

-A12

force measurement amplifier
weight measurement

APA4EZ
APA4ET8



Plug	connection	description	cross-reference
supply in general			
-X3	1	GND (supply)	/44.E4
-X3	2	+12V (supply)	
CAN - interface			
-X3	3	CAN-H	/46.F4
-X3	4	CAN-L	
port 1			
-X1	1	0V	/51.E1
-X1	2	+12V	
-X1	3	signal -	
-X1	4	signal +	
port 2			
-X2	1	0V	/51.E5
-X2	2	+12V	
-X2	3	signal -	
-X2	4	signal +	

Status

D8

D9

CAN addressing and scheduling
(switch position see CAN overview)

ON

-X4

1

2

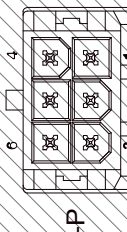
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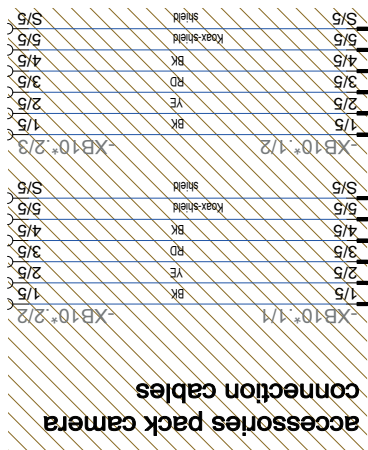
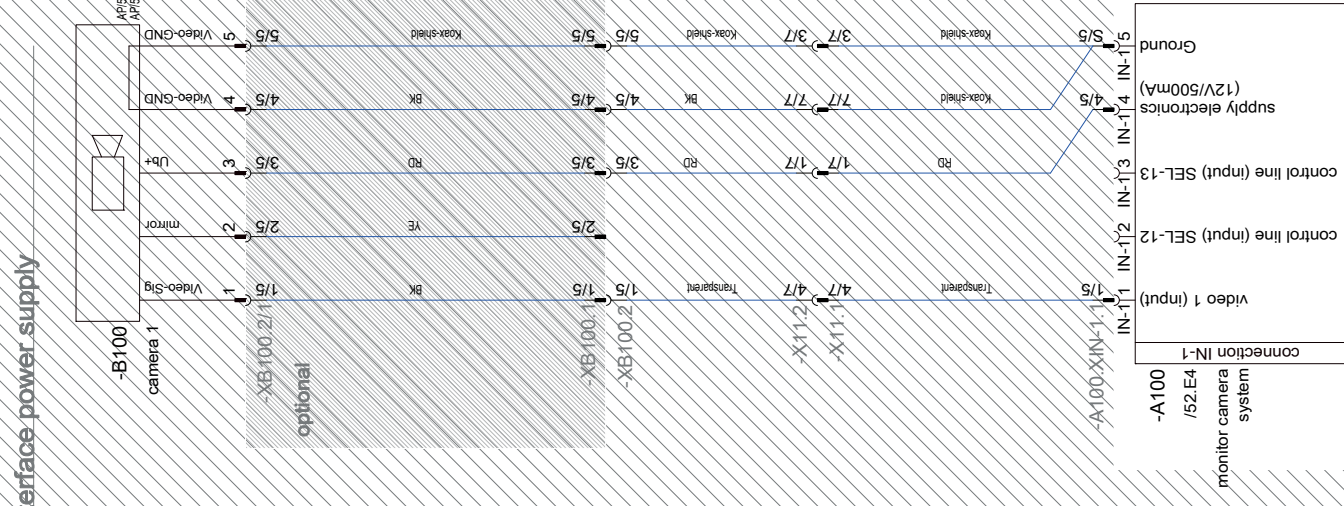
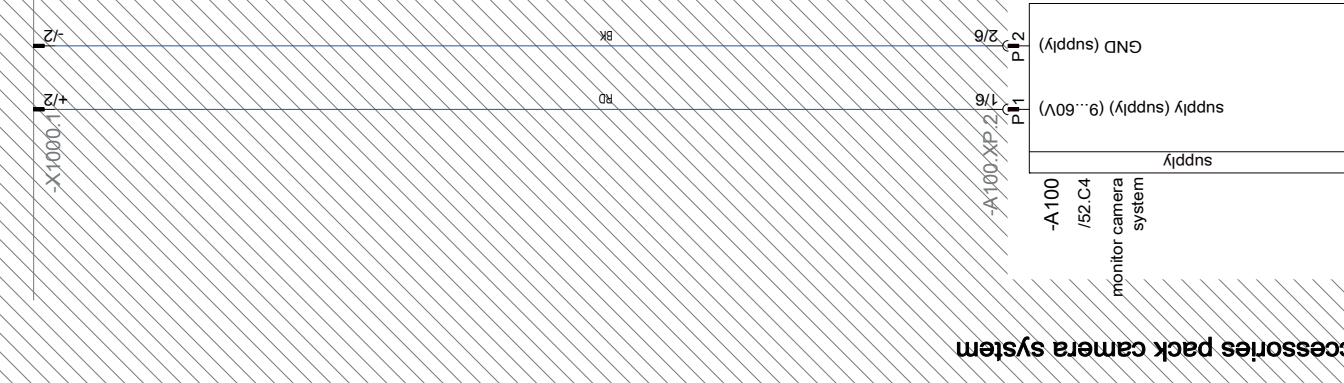
functions of the status LEDs D8 / D9:

- no power supply
- power supply reversed
- force measurement amplifier defective
- is booted up
- machine not set correctly
- no CAN connection
- CAN bus short-circuited/reversed
- ready for operation

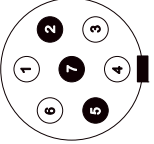
accessories pack camera system

-A100				monitor camera system		AP5.62	
Plug	connection	description		cross-reference			
supply in general							
-P	1	supply (supply)	+9...60V	/53.E1			
-P	2	GND (supply)	GND				
-IN-3	1	supply (supply)	+9...60V				
-IN-3	shield	GND (supply)	GND				
connection P							
-P	3	external switching output/control line (input)	CTRL-OUT/SEL-3				
-P	4	control line (input)	SEL-1				
-P	5	control line (input)	SEL-2				
-P	6	control line (input)	POC				
connection IN-1							
-IN-1	1	input	video 1				
-IN-1	2	control line (input)	SEL 12				
-IN-1	3	control line (input)	SEL 13	/53.F3			
-IN-1	4	supply electronics	+12V/500mA				
-IN-1	5 (shield)	Ground	Ground				

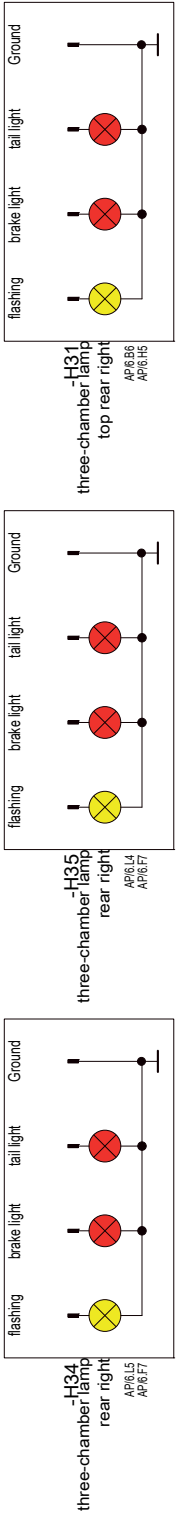
Plug	connection	description		cross-reference	
connection IN-2					
-IN-2	1	input	Video 2		
-IN-2	2	control line (input)	SEL 22		
-IN-2	3	control line (input)	SEL 23	/53.F5	
-IN-2	4	supply electronics	+12V/500mA		
-IN-2	5 (shield)	Ground	Ground		
connection IN-3					
-IN-3	2	control line mirroring (input)	HOR		
-IN-3	5	input	video 3		
-IN-3	6	GND	video 3		
-IN-3	7	external switching output/control line (input)	CTRL-OUT/SEL-3		
-IN-3	8	Service 1 (RS232)	RxD		
-IN-3	9	Service 2 (RS232)	TxD		
unused connections					
-IN-3	3				
-IN-3	4				



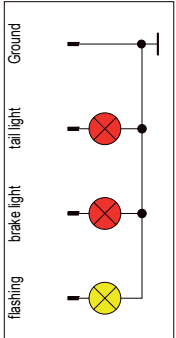
contact connection		description	cross-reference
1	L	direction indicator left	/60.A.1
2	54g	fog tail lamp	
3	31	Ground	/54.C.1
4	R	direction indicator right	/60.D.1
5	58R	tail lamp/side marker/licence plate lamp right	/58.A.1
6	54	brake lamp	/61.A.1
7	58L	tail lamp/side marker/licence plate lamp left	/55.A.1



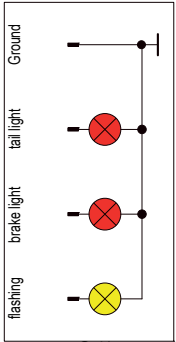
-X1.2
socket lighting



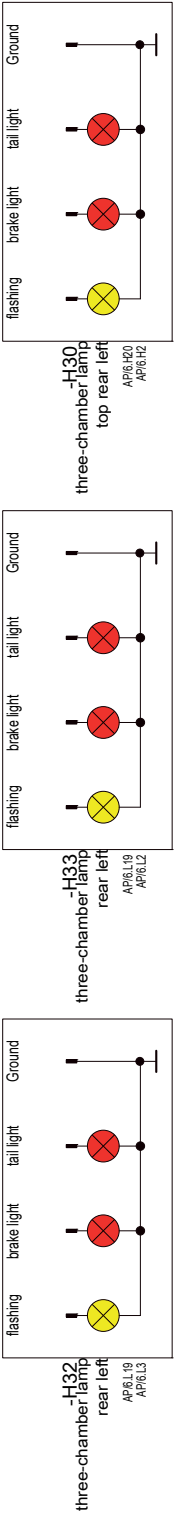
-H34
three-chamber lamp
rear right
AP6.L5
AP6.P1



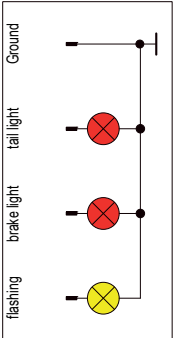
-H35
three-chamber lamp
rear right
AP6.L4
AP6.P1



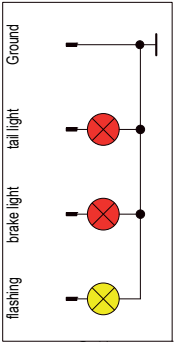
-H31
three-chamber lamp
top rear right
AP6.B6
AP6.H5



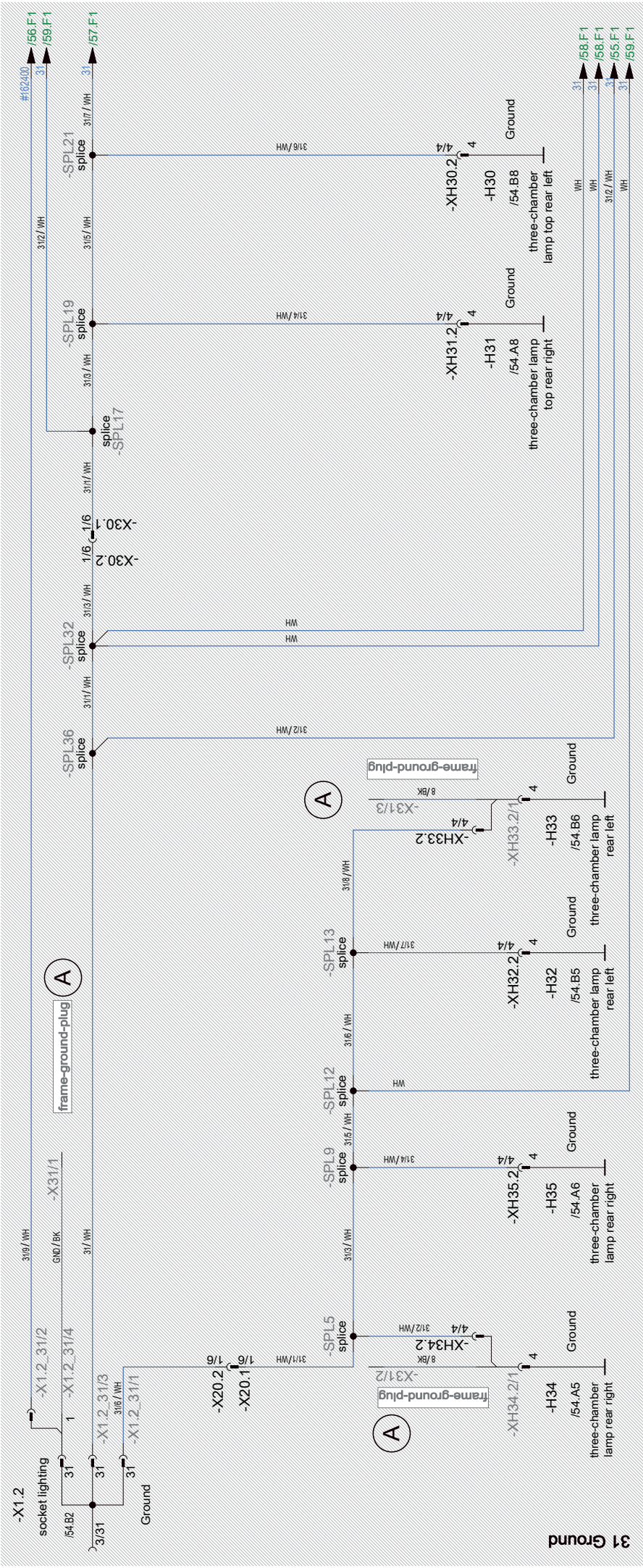
-H32
three-chamber lamp
rear left
AP6.L9
AP6.L3

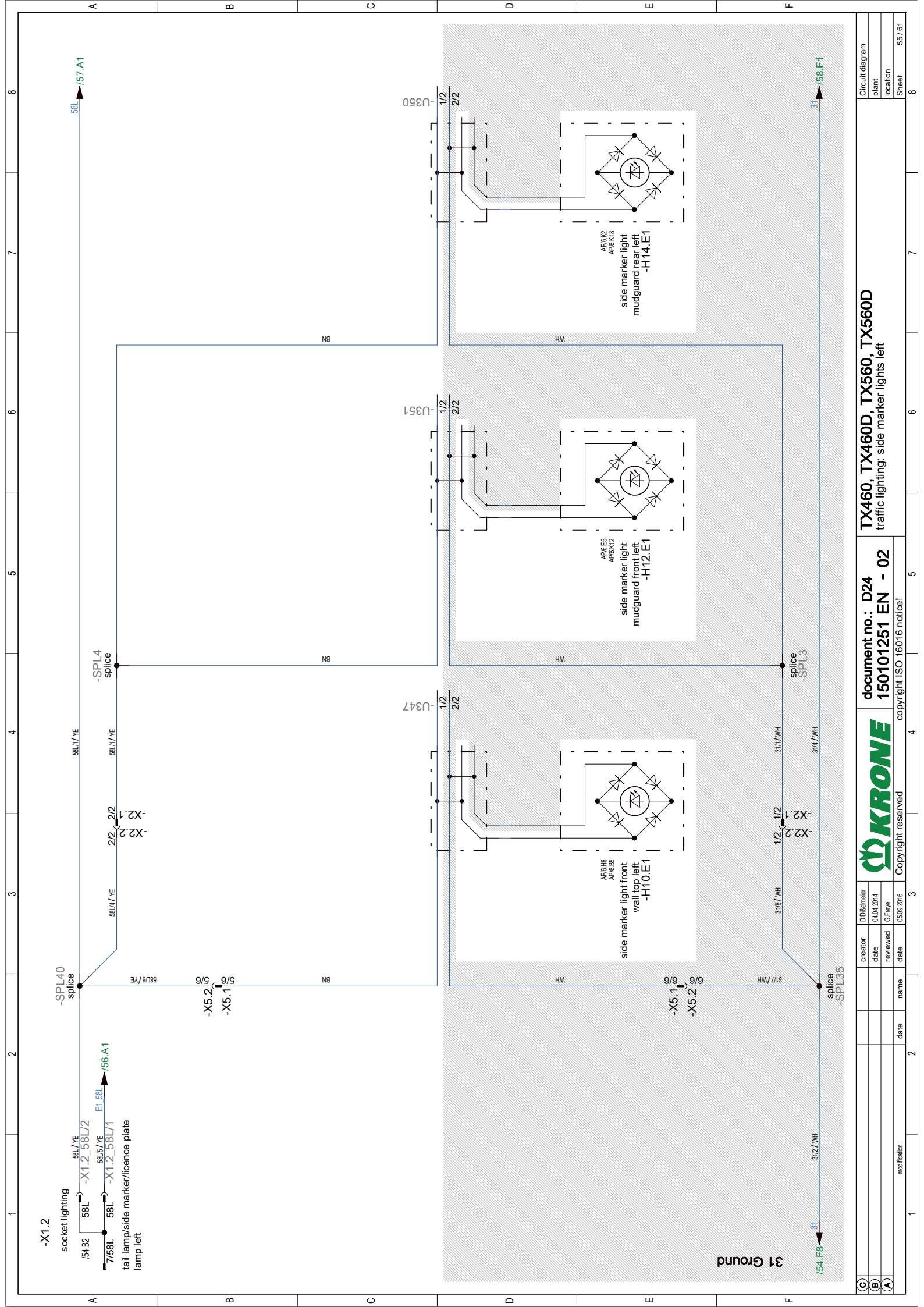


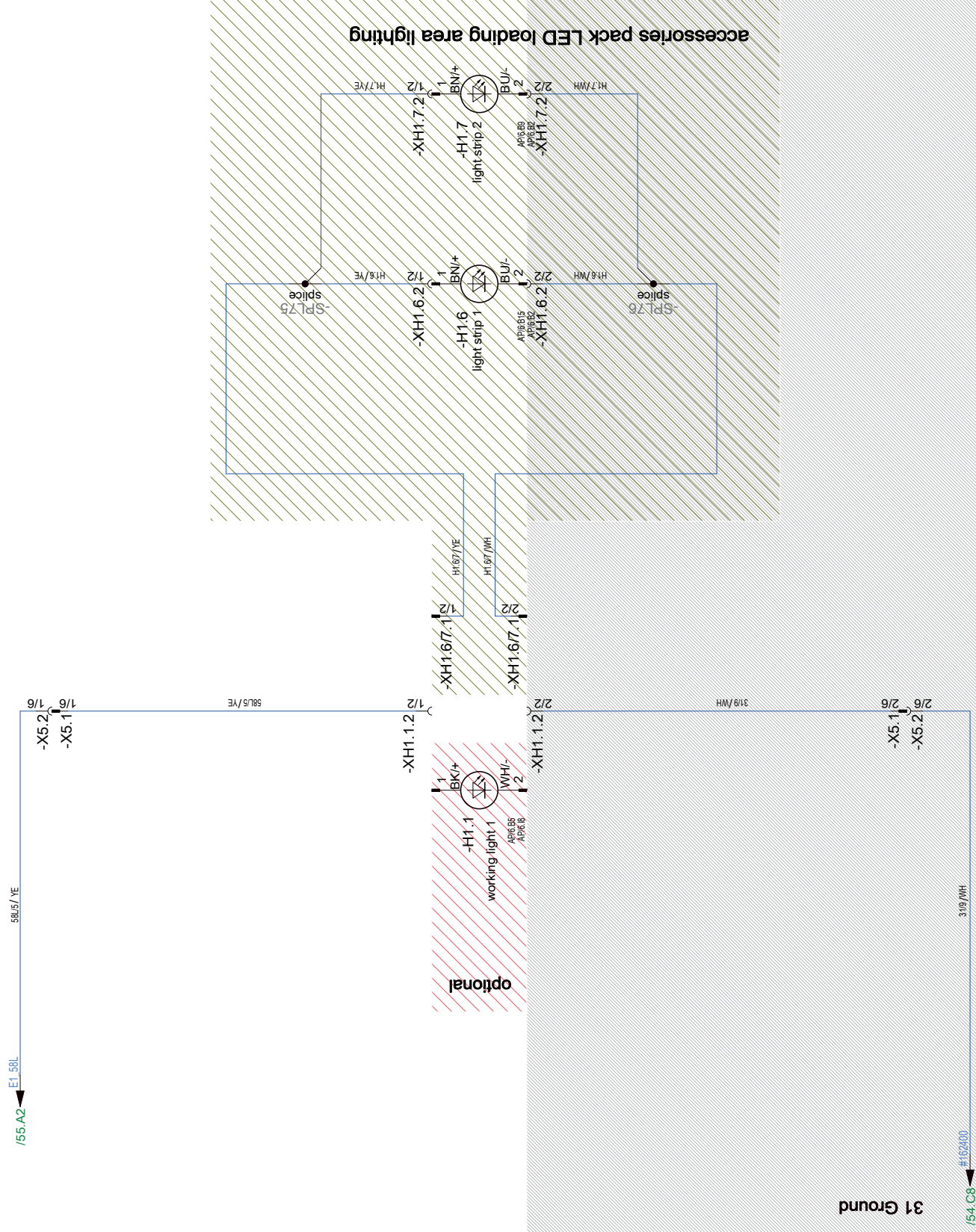
-H33
three-chamber lamp
rear left
AP6.L9
AP6.L2

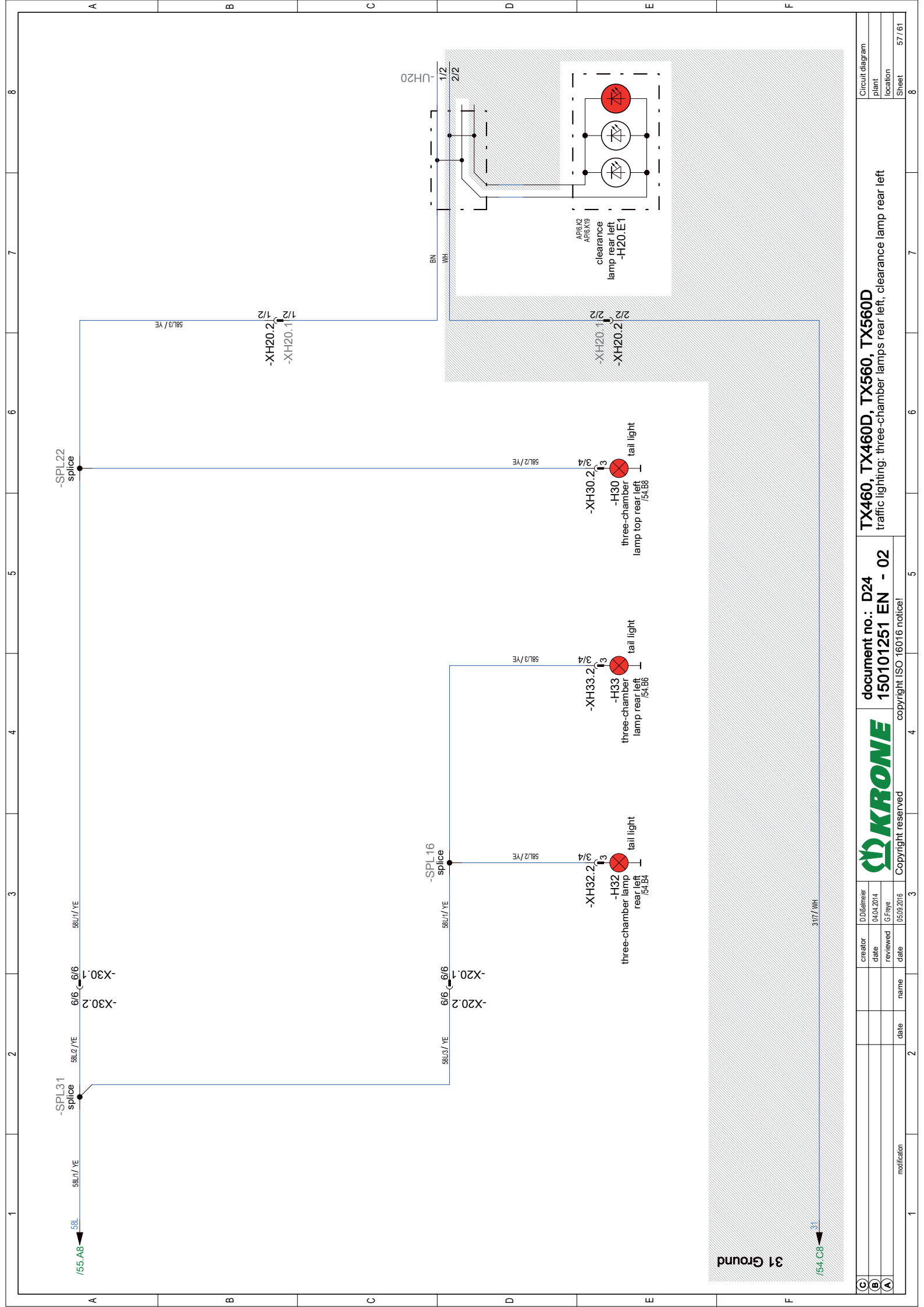


-H30
three-chamber lamp
top rear left
AP6.H20
AP6.H2





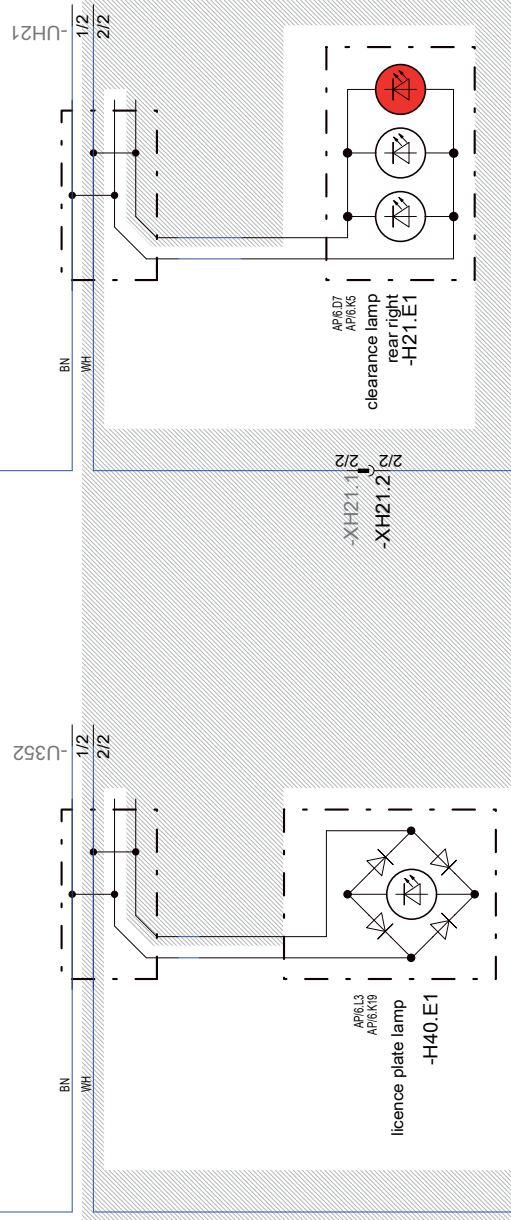
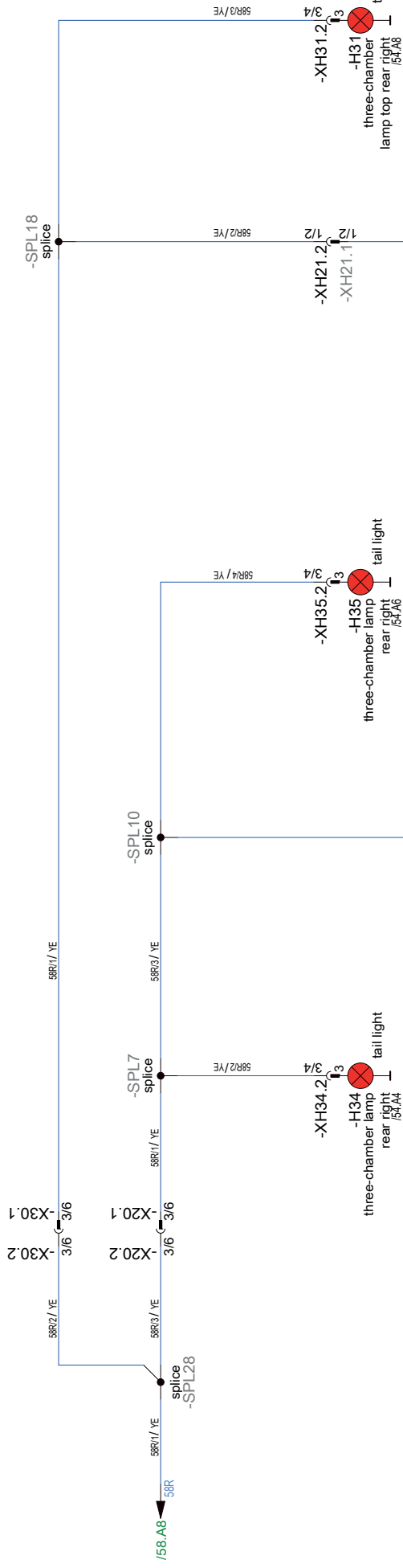


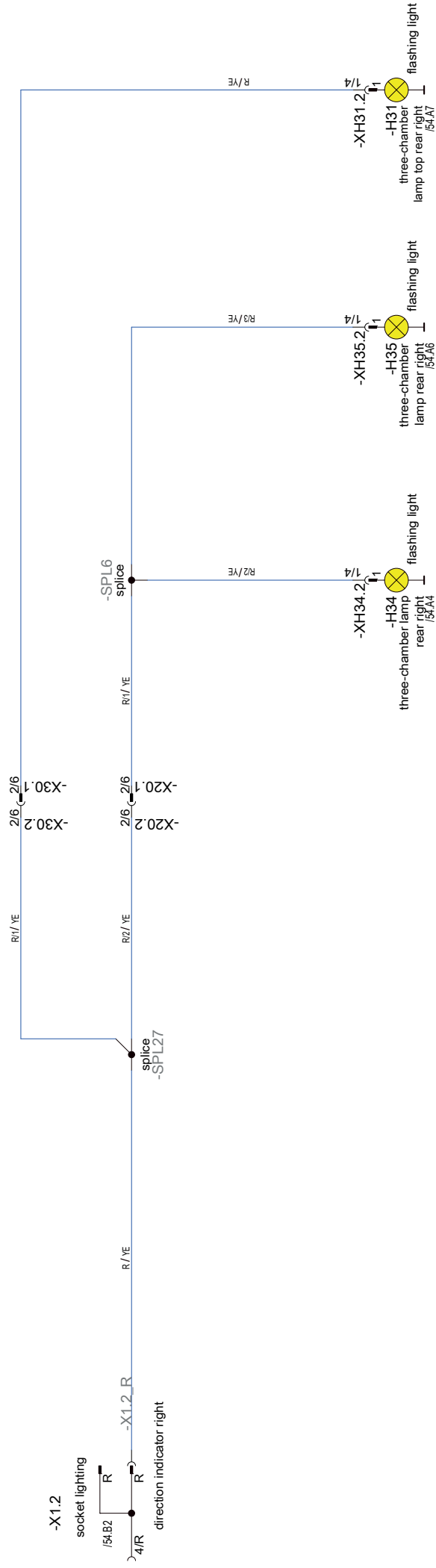
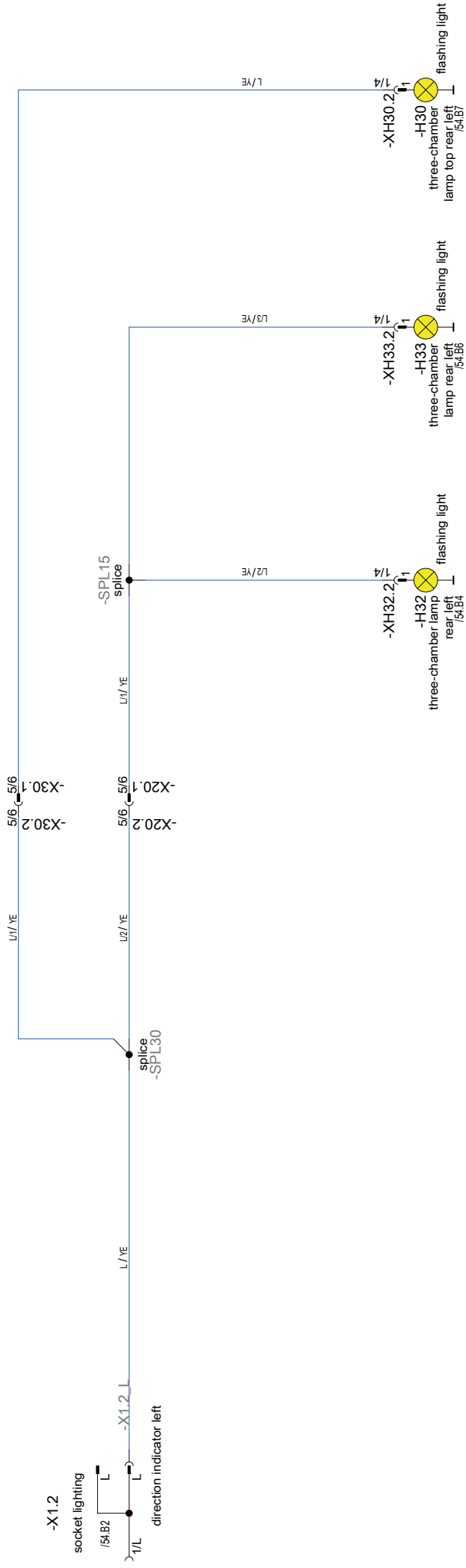


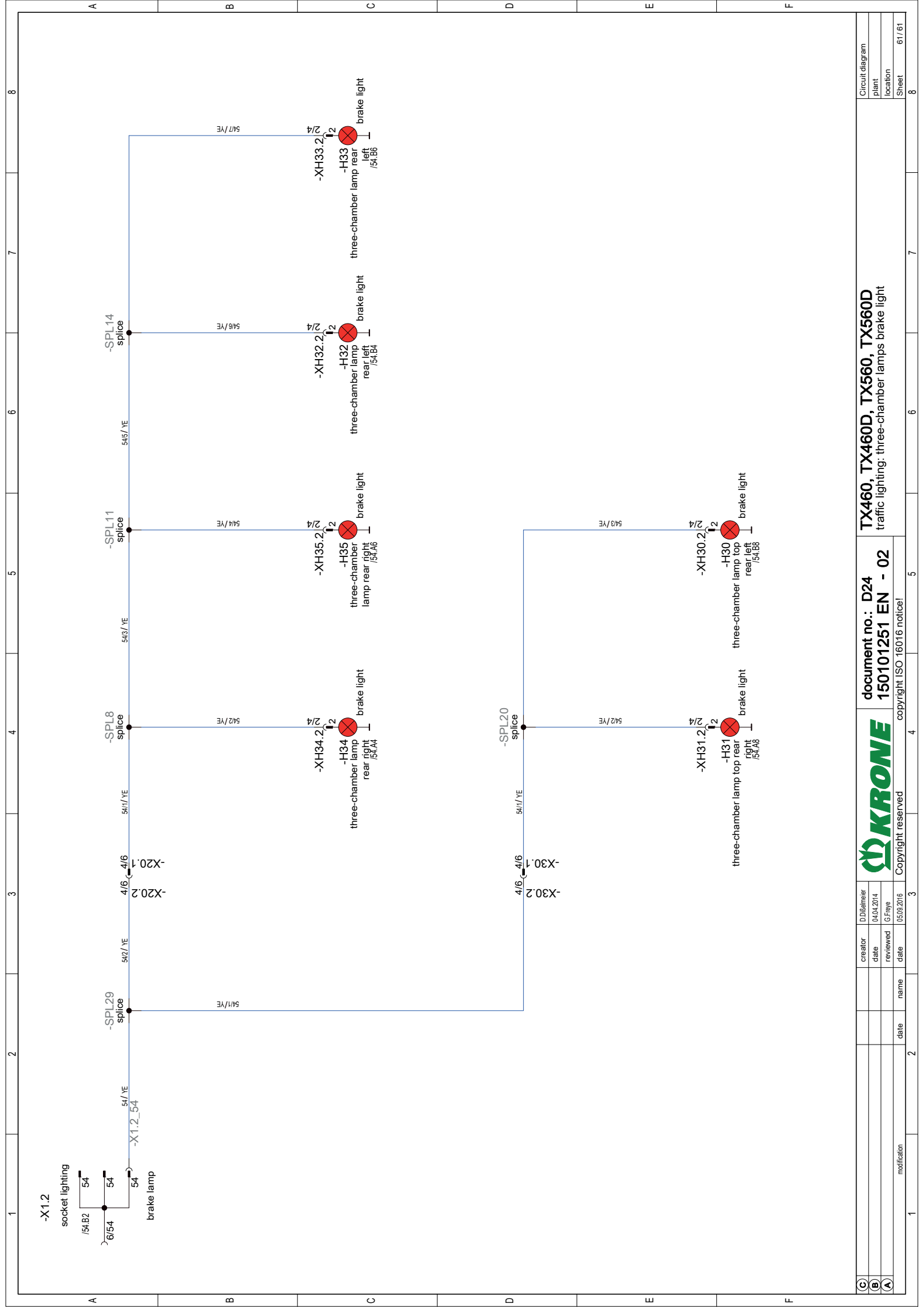
C
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THE POWER OF GREEN

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