

FRONT FRAME

FF



Symbolic representation



READ THE INSTRUCTIONS PRIOR TO PERFORMING ANY TASK!

Original operating manual

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EC Declaration of Conformity

according to Machinery Directive 2006/42/EC



Manufacturer: **APV - Technische Produkte GmbH**
Dallein 62
AT - 3753 Hötzelstdorf

Implement: **Front Frame** Model series: **FF**

Year of manufacture: from 2025 Serial number: Starting from 10001-01000

The manufacturer hereby declares that the implement complies with all applicable requirements of the following EC Directives and Regulations in terms of its concept and design as well as the versions put on the market:

2006/42/EC Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (recast)

This declaration loses its validity if there are any changes to the implement that are not approved by **APV - Technische Produkte GmbH**.

Reference to the applied harmonised standards:

EN ISO 12100:2010	Safety of machinery – General principles for design; risk assessment and risk reduction
EN ISO 4254-1:2015	Agricultural machinery – Safety – Part 1: General requirements
EN ISO 13854:2019	Safety of machinery – Minimum gaps to avoid crushing of parts of the human body
EN ISO 13857:2019	Safety of machinery – Safety distances to prevent hazard zones being reached by upper and lower limbs
EN ISO 5721-1:2013	Agricultural tractors – Requirements, test procedures and acceptance criteria for the operator's field of vision – Part 1: Field of vision to the front

The special technical documents belonging to the implement in accordance with Appendix VII, Part A have been prepared.

Responsible for the technical documentation: APV - Technische Produkte GmbH, Development and Design department

Dallein / Hötzelstdorf, 07/2025



Ing. Karl Heinz Steindl
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1 About these instructions

1.1 Introduction

Basic information

This operating manual applies for the following implement model series and implement types:

- **Front Frame**
FF

The precise product and type identification can be found on the type plate.

➔ *Chapter 4.2 'Implement identification' on page 38*

The operating manual must be read and understood by anyone who works on or with the implement.

The "Safety" chapter must be read and understood before the implement is used for the first time.

If there are any questions regarding this operating manual or the implement, please contact the Service department.

➔ *Chapter 1.2 'Contact data' on page 9*

Follow the specified steps.

Clarify questions of understanding with the manufacturer's sales partner before carrying out the steps.

Terminology

- For better legibility, the Front Frame is referred to as the "implement" in this operating manual.
The full product name will be mentioned in legally relevant sections or when a distinction is required.
- Vehicles intended to drive the implement in question are referred to as "tractors".
- The storage location of components or parts when not in use is referred to as the parking position.

Scope of validity

- This operating manual is part of the implement.
- This operating manual must be kept for the entire service life of the implement and be accessible to personnel at all times.
- Instructions based on existing national regulations on accident prevention, road traffic regulations and environmental protection must also be observed.
- When passing on the implement, hand over these instructions to the new owner, train them and inform them of the listed regulations.
- This manual describes the combination of the implement with a tractor. The description can also be used where the requirements for the tractor are also fulfilled by other implements or vehicles.
- Operating the tractor and its functions are not part of this operating manual. It is the operator or the user of the tractor's responsibility to adhere to the operating manual.

1.2 Contact data

Service

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service@apv.at

www.apv.at

1.3 Equipment variants

- The implements can be equipped differently at the factory.
- Standard components, special equipment or optional accessories are not labelled separately.
- The contents of this operating manual may differ from the actual equipment of the implement.
- Illustrations with pictures that are different are to be understood as illustrative examples.
- Further documents may be required to operate the implement, depending on the equipment.
➔ *Chapter 1.8 'Other applicable documentation' on page 12*

1.4 Target groups

The target groups for this operating manual are

- Operators
- Users
- Service personnel

for the implement.

The target groups must meet the qualification requirements for staff.

➔ *Chapter 2.7.1 'Personnel requirements' on page 22*

1.5 Warranty

Basic information

- Check for transport damage when handing over the implement. Later claims regarding transport damage can no longer be considered.
➔ *Chapter 4.4 'Checking the equipment' on page 39*
- Provided that the warranty has been activated, the factory warranty applies for 6 months after initial operation.
➔ *Chapter 4.5 'Registering the implement' on page 40*
- The invoice serves as a warranty certificate.

Warranty validity

- The warranty covers material defects and construction errors.
- The warranty does not cover wear parts.

Warranty exclusion

Warranty claims are not accepted for:

- Damage is caused by obvious external forces
- Operating errors due to non-observance of the operating manual
- Unauthorised modifications and conversions without written approval by the manufacturer
- Non-use of original spare parts or parts approved by the manufacturer

1.6 Liability and warranty

- The Product Liability Act obliges the manufacturer as well as the dealer to provide and operating manual when selling implements and to train the customer on the implement while referring to the safety, operating and maintenance instructions.
- Every self-employed person and farmer is an entrepreneur for the purposes of the Product Liability Act. Entrepreneurial property damage within the meaning of the Product Liability Act is therefore excluded from liability of APV. Material damage within the meaning of the Product Liability Act is damage caused by an implement, but not to it.
- Liability and warranty are excluded if personal injury and damage to property are due to improper use or failure to observe the operating manual.

→ Chapter 2.5.1 'Intended use' on page 19

1.7 Representation of information

1.7.1 Symbols and labels

Symbol, label	Meaning
▶	<ul style="list-style-type: none"> ■ Instruction ■ Measures to prevent danger in safety instructions and warnings
1. 2.	<ul style="list-style-type: none"> ■ Sequence of actions ■ Sequence of steps
➔	Result of action
⊙	Purpose
✓	Requirements
✂	Required components, tools and materials
■	List, first level
□	List, second level
🔧	Activities for which service personnel is required

Symbol, label	Meaning
①	Position numbers
A	Storage position of components or parts
Example: <i>'Settings'</i>	Display text
Example: <i>"Settings"</i>	Software element
Example: <i>[OK]</i>	Button, key, switch
↗	Cross reference
Example: [ha]	Unit
Components coloured light grey	Irrelevant components made visible for orientation purposes
Components coloured dark grey	Relevant components

1.7.2 Directions

The directions

- left
- right
- front
- rear

used in the text refer to the forward direction of travel of the tractor.

Orientation information on a picture of an implement detail refers to this picture itself and is only to be understood as relative to the direction of travel in some cases. The meaning of the orientation information can be clearly seen in the accompanying text.

1.7.3 Implement positions

The terms

- working position and
- transport position

used in the text are explained in this section.

Working position

- The working position is the configuration or position in which the implement is ready for operation and performs the intended task.
- In the working position, the implement is usually in a position that is suitable for the application or use. This may mean that it is placed at a certain height, orientation or configuration to do the job effectively.
- All necessary settings, safety precautions and functions are activated in the working position to enable safe and efficient use.

About these instructions

Transport position

- The transport position is the configuration or position that the implement is placed in to move, transport or store it.
- In the transport position, the implement is folded, lowered, secured or moved into a more compact form to facilitate transport and minimise possible damage during transport.
- Safety devices can be activated in transport position to prevent unintentional operation or injuries during transport.

1.8 Other applicable documentation



INFORMATION

In other documents and parts of this operating manual, the implement also referred to as an appliance.

Documents that are required and must be observed for operation:

- Tractor operating manual
- Operating manual for the Pneumatic Seeder
- For partially assembled or disassembled delivery:
 - ☐ Conversion instructions
 - ☐ Assembly instructions
 - ☐ Installation instructions
- Spare parts list

1.9 Current version of documentation



INFORMATION

The documentation is regularly revised and brought up to date.

The current versions of the documents can be found in the download area of the APV website (www.apv.at).

1.10 Change index

Version	Reason for change	Chapter changed	Date	Name
V1.0	First edition	First edition	2025-07-03	AHA

2 Safety

2.1 Explanation of safety instructions and warnings

The operating manual contains instructions and information for your safety, for safe operation and for proper operation of the implement. Moreover, the following chapters contain further information, in particular warnings, that must also be observed.

The basic safety instructions contain information for safe use of the implement.

Action-related warnings warn against residual dangers and are placed in front of dangerous actions or are embedded in actions.

All safety information on components from suppliers can be found in the respective manufacturer documents and supplier documentation.

- ▶ Follow all of the instructions to prevent personal injuries, material damage or environmental damage.

2.2 Basic safety instructions

Purpose

These instructions are intended to ensure that the target group is sufficiently and thoroughly informed about dangers and safety measures and observes safety instructions.

If the safety instructions are not followed, there is a risk of personal injury and damage to property.

Transport of the implement

When lifting and setting down the implement, there is a risk of crushing due to its weight.

- ▶ Only have the implement transported by a forwarding agent in accordance with these instructions.
- ▶ The implement may only be transported with a forklift truck or pallet truck by qualified personnel in accordance with these instructions.

Operating the implement

- ▶ Only use the implement for the intended purpose.
➔ *Chapter 2.5.1 'Intended use' on page 19*
- ▶ Never use the implement for other purposes that may seem similar.
➔ *Chapter 2.5.2 'Reasonably foreseeable misuse' on page 19*
- ▶ Only operate the implement with the safety devices mounted and in the protective position.
- ▶ Observe all of the safety measures that are specified in this operating manual and on the implement.
- ▶ Only operate the implement if it is in perfect technical condition.
➔ *Chapter 2.5.6 'Technically perfect condition' on page 20*

Improperly installed and defective implement parts can all off during operation

- ▶ Check the implement before each use in accordance with the specifications in this operating manual.
➔ *Chapter 5.1.3 'Checking implement requirements' on page 43*

Individual parts of the implement rotate during operation.

- ▶ Make sure that all covers on the implement are closed during operation.

There is a risk of slipping, stumbling and falling when handling the implement.

- ▶ Work must be performed on sturdy steps with personal protective equipment.
→ *Chapter 2.8 'Personal protective equipment' on page 23*
- ▶ The implement may not be operated in the rain or in a thunderstorm.
- ▶ Nobody may be standing in the danger area when commissioning the implement.
- ▶ Use personal protective equipment.
- ▶ Only use original spare parts or parts approved by the manufacturer.
- ▶ Only use the listed auxiliary and operating materials.
- ▶ Dispose of auxiliary and operating materials in an environmentally friendly manner.

Persons working with the implement

- ▶ Only sufficiently qualified persons may handle the implement.
→ *Chapter 2.7.1 'Personnel requirements' on page 22*

Operator obligations toward the operating personnel

- ▶ The operating personnel fulfils the requirements corresponding to their work.
- ▶ The operating personnel must have read and understood this operating manual before handling the implement.
- ▶ The regulations applicable in your country for safety at work are being observed.

Tractor

- ▶ Only use the implement with a suitable tractor.
→ *Chapter 5.1.1 'Checking tractor requirements' on page 41*

There is a risk of slipping, tripping and falling when mounting the implement on the tractor.

- ▶ Work must be performed on sturdy steps with personal protective equipment.
→ *Chapter 2.8 'Personal protective equipment' on page 23*



INFORMATION

The manufacturer is not liable for damage caused by incorrect installation and improper operation of the implement.

Stored mechanical energy

- The implement is equipped with components which have stored mechanical energy, e.g. springs.
- Uncontrolled mechanical energy accelerates components like a bullet.
- This can result in death, serious injury or damage to the implement.
- ▶ Never remove or open components that store mechanical energy.

Road handling

- Mounted or trailed implements change the driving characteristics of the tractor.
- The driving characteristics depend on the operating status, the load and the surface.
- This can cause accidents if the driver does not take changed driving characteristics into account.
- ▶ Pay attention to changed road handling.
➔ *Chapter 6.1 'Driving on roads' on page 50*
- ▶ If necessary, adapt your speed accordingly.
- ▶ Pay particular attention to driving behaviour when driving on gradients.

The implement/tractor combination falling over

The implement/tractor combination can fall over in these situations:

- Folding
- Unfolding
- Driving across slopes
- Driving around tight corners

This can result in death, serious injury or damage to the implement.

- ▶ When folding or unfolding the implement, make sure that it is positioned on a flat, stable surface.
- ▶ Be careful when driving on slopes.
- ▶ Adapt your speed accordingly before driving around tight corners.

Switching the implement off

An inadequately secured and unattended implement/tractor combination is a danger to people in the vicinity.

- ▶ Secure the implement/tractor combination before leaving it.
 - Apply the parking brake.
 - Switch off the engine.
 - Remove the ignition key.
- ▶ Check that the implement/tractor combination again to ensure it is safe before continuing the journey.
➔ *Chapter 6.1 'Driving on roads' on page 50*

Maintenance and servicing

In restricted lighting conditions, such as darkness, there is a risk of incorrectly or poorly performed maintenance and servicing work.

- ▶ Carry out maintenance and servicing work with the aid of lighting equipment if necessary.

2.3 Specific warnings

2.3.1 Representation and layout of warnings

	1
2	
3	
4	

	Symbol: warning
1	Signal word: severity of the danger
2	Type and source of danger
3	Consequences of non-observance
4	Escaping: measures to avert the danger

2.3.2 Danger classification of warnings

Warnings are classified according to the severity of the danger. The danger levels with the associated signal words and warning symbols are explained in the following.

Warning of personal injury

DANGER
Type and source of danger

Consequences of non-observance.

► Measures to avert the danger.

Indicates a hazard with a high degree of risk that will result in death or serious injury if not avoided.


WARNING
Type and source of danger

Consequences of non-observance.

► Measures to avert the danger.

Indicates a hazard with a moderate degree of risk that could result in death or serious injury if not avoided.


CAUTION
Type and source of danger

Consequences of non-observance.

► Measures to avert the danger.

Indicates a hazard with a low degree of risk that could result in serious or minor injury if not avoided.

Warning of material damage
NOTICE
Type and source of danger

Consequences of non-observance.

► Measures to avert the danger.

Indicates a potentially hazardous situation which, if not avoided, could result in material damage.

Other notes and information



INFORMATION

Explanation of the recommendations and advice for the user.

Marks special user tips and other particularly useful or important information for efficient work and economical use.



ENVIRONMENT

Explanation of the notes and measures for environmental protection.

Marking special user tips and other particularly useful or important information on environmental protection.

2.4 Actions in emergency situations



INFORMATION

Observe your company guidelines regarding accidents.

The implement is designed and built in such a way that the persons using it can work with it without risk.

Despite all safety measures taken, however, unforeseeable emergencies can still occur under certain circumstances.

Perform the following steps immediately in case of emergency:

1. Park the implement/tractor combination.
2. Switch off the drives and motors.
3. Remove the ignition key.
4. Assume a safe position.
 - Remove yourself from the working area of the implement.
 - Make sure that nobody else is standing in the working area of the implement.
5.  Contact a specialist workshop or the Service department.
 ➔ 'Service' on page 9

2.5 Implement limits

2.5.1 Intended use

- The **Front Frame FF** is used to mount Pneumatic Seeders according to the manufacturer specifications and is optionally equipped with a seeding rail, which enables precise spreading of seed on agricultural fields.
- The following Pneumatic Seeders are approved by the manufacturer for mounting on the Front Frame FF:
 - PS 120 M1
 - PS 200 M1
 - PS 300 M1
 - PS 500 M2
 - PS 800 M1
- The implement is designed solely for normal use in agricultural operations.
- The implement may only be operated within the specified performance limits.
- The conditions for operation, maintenance, and servicing stipulated by the manufacturer must be adhered to.
- The applicable accident prevention regulations as well as the other general safety-related, road-safety related and occupational health regulations must also be observed by operators and users.
- The manufacturer is not liable for any damage resulting from unauthorised modifications to the implement.
- Any other use is considered to be non-intended. The manufacturer is not liable for any resulting damage. The operator alone bears the associated risk.

2.5.2 Reasonably foreseeable misuse

Possible cases of misuse of the **Front Frame FF** are described in the following:

- Operating the implement mounted at the rear.
- Operating the implement for snow and ice removal.
- Operating the implement with corrosive agents.
- Non-observance of the operating manual.
- Non-observance of the conditions for operation, maintenance, and servicing stipulated by the manufacturer.
- Operating the implement without the protective devices provided.
- Bridging or modifying the protective devices.

2.5.3 Spatial boundaries

The dimensions of the implement must always be considered in combination with the tractor.

The dimensions of the implement differ in the working position and transport position.

Information on the actual dimensions of the implement can be found in
 ➔ *Chapter 13.1 'Technical data' on page 64*

2.5.4 Time limits

The actual service life of the implement is at least 10 years, as long as the implement is kept in perfect technical condition as per the operating manual during this time.

Technically perfect condition essentially depends on the operating conditions and proper maintenance in accordance with the operating manual.

2.5.5 Thermal limits

The functionality of the implement may be permanently impaired if it is operated outside the specified ambient temperature range.

- ▶ Ensure that the implement is only operated at an ambient temperature between +5°C and +40°C.

2.5.6 Technically perfect condition

Expert preparations

The operational safety of the implement is only guaranteed if it has been properly prepared in accordance with this operating manual.

- ▶ Only use the implement after expert preparation.
 ➔ *Chapter 5.1.1 'Preparing for mounting' on page 41*

Technical limits

If the technical limits of the implement are not complied with, the safety equipment may not work properly and the machine may be damaged.

- ▶ Comply with implement-specific limits.
 ➔ *Chapter 13.1 'Technical data' on page 64*

Damage to the implement

Damage to the implement can impair the operational safety of the implement and cause accidents.

Take the following measures to ensure that the implement is safe to use:

- ▶ Inspect the implement according to the maintenance schedule.
 ➔ *Chapter 11.1 'Maintenance and servicing' on page 58*
- ▶ Eliminate damage and causes of damage immediately.
- ▶ Remove any coarse dirt.
- ▶ 🛠 Have safety-related damage repaired by qualified specialist personnel if it cannot be repaired in accordance with this operating manual.

Modifications to the implement

Any structural modifications and additions could prevent the implement from working properly and safely.

Additional equipment and spare parts that do not meet the manufacturer's requirements can impair the operational safety of the implement and cause accidents.

- ▶ Modifications and conversions may only be carried out with the written consent of the manufacturer.
- ▶ Structural modifications and additions may only be carried out by an authorised specialist workshop.
- ▶ Only use original spare parts or parts approved by the manufacturer.

Welding

Improper welding work jeopardises the operational safety of the implement.

- ▶ Only have welding work carried out by qualified specialists.

2.6 Danger areas

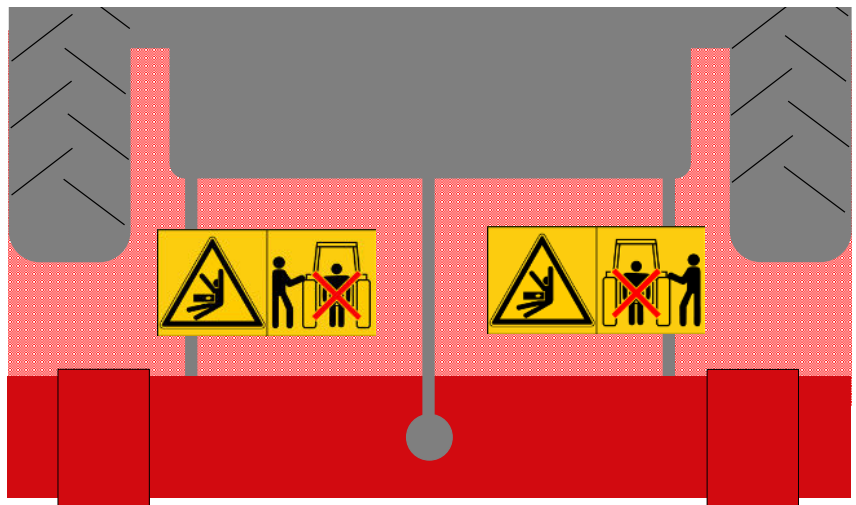
Failure to observe the danger zones can result in death or serious injury.

- ▶ Only switch on the drives and engines/motors when all persons have left the danger areas.

Any work required with the engine/motor or drive running in a danger area requires special attention and precautionary measures.

- ▶ Follow the instructions in this operating manual exactly.

Area between tractor and implement



Standing between the tractor and the implement is dangerous in case of tractor movements or sudden machine movements.

- ▶ Secure the tractor against rolling away.
- ▶ Before operating the three-point linkage, keep all persons away from the movement range of the three-point linkage.

Parked implement

An incorrectly parked implement can tip over.

- ▶ Only park the implement on a flat and stable surface.

Raised implement

An implement with a high net weight can move down independently.

- ▶ Never stand underneath unsecured implements.
- ▶ Secure implements against moving down using suitable measures.

Implement in operation

The danger area extends across the entire working width of the implement and the resulting area in the direction of travel.

No one should stand in the danger area. People in the danger area could result in death or serious injury.

- ▶ Maintain an additional 2 m safety distance from the danger area.
- ▶ While driving on the area to be worked, keep an eye on the entire danger area. Come to a stop if necessary.
- ▶ Never climb out of the tractor while driving.
- ▶ Never let other people climb on or off while driving.

2.7 Personnel requirements

2.7.1 Operator

Operators within the meaning of this manual are obliged to instruct all users in the handling of the implement and the dangers that may arise. This can be done on the basis of this operating manual.

Operators are responsible for ensuring that the operating manual is available with the implement at all times and that users observe the operating manual.

Operators must also provide users with the required personal protective equipment.

2.7.2 User

For the purposes of these instructions, users are persons who drive, adjust, operate or maintain the implement. Users must be able to use the implement safely.

That means:

- Users understand how the implement works.
- Users are aware of and avoid any danger.
- Users are physically capable of controlling the implement.

In order to use the implement correctly and in accordance with its intended use, users must have specialised, i.e. agricultural, knowledge.

Unless labelled otherwise, users may carry out all activities described in this operating manual themselves.

2.7.3 Service personnel

 For the purposes of this manual, service personnel are all persons who maintain and service safety-relevant components.

 Service personnel are qualified for these activities due to their training and experience, e.g. agricultural machinery mechanics.

2.7.4 Required personnel qualifications

Persons who will be handling the implement must meet the following requirements:

Personnel	Category	Activities	Required qualification
Forwarder	-	<ul style="list-style-type: none"> ■ Transporting the implement from business to business 	<ul style="list-style-type: none"> ■ Experience with transport of machinery ■ Qualification of a transport specialist for machinery
Transport provider	Operators Users	<ul style="list-style-type: none"> ■ Transporting the implement within the business 	<ul style="list-style-type: none"> ■ Forklift driver ■ Experience with handling the suitable lifting gear
Installer	Service personnel	<ul style="list-style-type: none"> ■ Installing and commissioning the implement 	<ul style="list-style-type: none"> ■ Trained mechanic
Setter	Operators Users Service personnel	<ul style="list-style-type: none"> ■ Implement configuration 	<ul style="list-style-type: none"> ■ Experience in the agricultural field ■ Experience with handling the implement
Operator	Users	<ul style="list-style-type: none"> ■ Operating the implement while in use ■ Cleaning the implement 	<ul style="list-style-type: none"> ■ Trained assistant ■ Suitable driving licence
Maintenance personnel	Service personnel	<ul style="list-style-type: none"> ■ Performing maintenance work ■ Performing servicing work 	<ul style="list-style-type: none"> ■ Trained mechanic
Disposer	Service personnel	<ul style="list-style-type: none"> ■ Disposing of implement 	<ul style="list-style-type: none"> ■ Disposal specialist

2.8 Personal protective equipment

Carrying and wearing protective equipment is an essential part of safety.

Missing or unsuitable protective equipment increases the risk of damage to health and injury to persons.

Appropriate protective clothing is required when handling the implement. Apart from that, the following protective equipment is necessary for certain work:

- Protective clothing
- Hearing protection
- Safety shoes with non-slip soles
- Safety gloves

Use protective equipment as follows:

- ▶ Only use protective equipment that is in good condition.
- ▶ Only use protective equipment that provides effective protection.
- ▶ Adjust protective equipment to suit the person, e.g. size.

2.9 Workplaces and accompanying persons

Workplaces

The main workplace for handling the implement is the driver's seat on the tractor. Other workplaces are described in the respective instructions.

Dangerous situations can arise if several people operate functions of the implement at the same time.

- ▶ Pay attention to the danger areas.
- ▶ Watch out for other people in the vicinity of the implement.

Ascent

Careless behaviour when climbing up and down can cause people to fall from the ladder. Anyone who climbs onto the implement outside the intended access points can slip, fall and be seriously injured.

Dirt and operating fluids also increase the risk of slipping.

- ▶ Only use designated access points.
- ▶ Always keep access areas clean and in good condition.
- ▶ Only climb onto the implement if it has been prepared for climbing in accordance with its operating manual.
- ▶ Always maintain 3-point contact with steps and handrails when climbing up and down: Two hands and one foot or one hand and two feet on the implement at the same time.
- ▶ Never use controls as handles. Controls could be inadvertently actuated and trigger functions that could be dangerous.
- ▶ Climb on and off facing towards the implement.
- ▶ Never climb onto a moving implement.
- ▶ Never jump off the implement.

Platform

Careless behaviour on platforms can cause people to fall and injure themselves seriously.

Dirt and operating fluids also increase the risk of slipping.

- ▶ Only use designated platforms on the implement.
- ▶ Always keep platforms on the implement clean and in good order.
- ▶ Only access platforms if the implement has been prepared for this in accordance with its operating manual.
- ▶ Never carry out activities on the platform for which the platform is not intended according to the operating manual.
- ▶ Never jump off the implement.

Accompanying people

Accompanying people could fall off the implement and suffer serious injury.

Objects thrown up can hit and injure accompanying people.

- ▶ Never carry people on the implement.

2.10 Safety devices

The implement is equipped with special safety devices to protect the user, other persons and the implement:

- Transport lock

The actual equipment of the implement with safety devices depends on the country-specific rules and regulations.

Keeping safety devices in good working order

Fitted and functional safety equipment protects people.

- ▶ Replace any damaged safety devices.
- ▶ Install any safety devices that have been removed BEFORE commissioning.
- ▶ Move the safety devices to the protective position.
- ▶ If in doubt as to whether all safety devices are properly installed and functional:
 - ✂ Contact a specialist workshop or the service address.
 - ➔ *Chapter 1.2 'Contact data' on page 9*

2.10.1 Lighting system

The implement must be equipped with the following components for use on public roads in accordance with the relevant national regulations:

- Lighting system

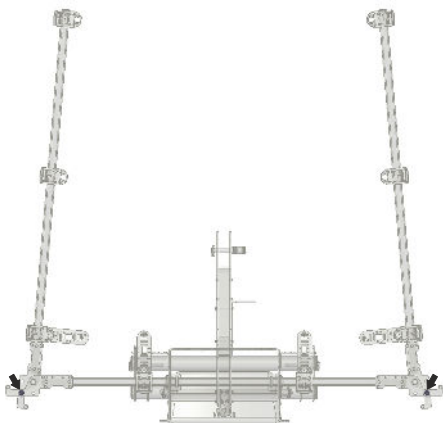
2.10.2 Transport lock

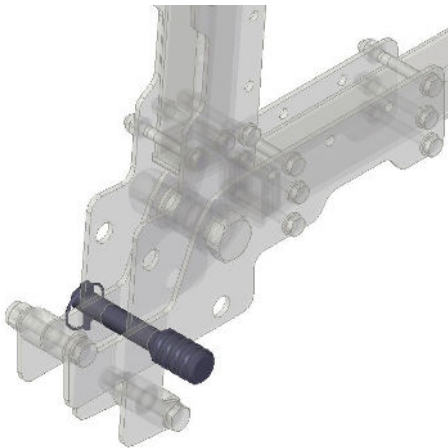
Folding lock

The folding lock ensures a secure transport position for implements with a folding seeding rail.

The folding lock consists of:

- Pin with linch pin.





2.11 Safety stickers

Keep stickers in good condition

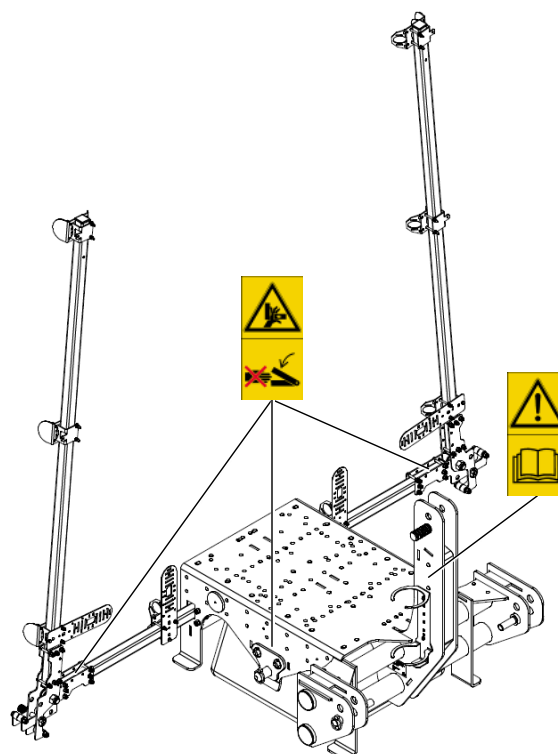
Stickers on the implement warn of hazards in danger areas and are part of the implement's safety equipment.

Missing stickers increase the risk of danger for people.

- ▶ Keep the stickers clean and visible.
- ▶ Replace damaged, unrecognisable or lost stickers immediately.
- ▶ Apply designated stickers to spare parts.

2.11.1 Position of stickers

Front Frame FF



2.11.2 Meaning of stickers

Pay attention to operating manual



Incorrect use or operation of the implement can lead to death or serious injury.

Before commissioning:

- ▶ Read and comply with the operating manual.
- ▶ Follow instructions.

Crushing area



There are crushing areas between moving implement parts. This can result in death or serious injury.

- ▶ Never reach into the crushing area as long as implement parts can still move!

2.12 Mandatory signs

To reduce the risk of serious and fatal injuries, it is essential to observe the mandatory signs in this operating manual.

Follow instructions



Incorrect use or operation of the implement can lead to death or serious injury.

Before commissioning:

- ▶ Read and comply with the operating manual.
- ▶ Follow instructions.

Using protective clothing



Failure to wear protective clothing when handling the implement can result in death or serious injury.

Wear tight-fitting protective clothing:

- ▶ During maintenance and servicing.
- ▶ When working in a dusty environment.

Using hearing protection



Failure to wear hearing protection when operating the implement can result in moderate or serious injuries.

- ▶ Put on hearing protection before operating the implement.
- ▶ Wear hearing protection while operating the implement.

Using a protective mask



Failure to wear a protective mask when handling the implement can lead to minor or moderate injuries.

Wear mouth and nose protection:

- ▶ When working in a dusty environment.
- ▶ When cleaning and maintaining the implement.

Using eye protection

Lack of eye protection when handling the implement can lead to minor or moderate injuries.

Wear safety glasses:

- ▶ When working in a dusty environment.
- ▶ When cleaning the implement.

Using foot protection

Lack of foot protection when handling the implement can lead to minor or moderate injuries.

Wear safety shoes with non-slip soles:

- ▶ When operating the implement.
- ▶ During maintenance and servicing.

Using hand protection

Lack of hand protection when handling the implement can lead to minor or moderate injuries.

Use safety gloves:

- ▶ When manually moving parts.
- ▶ During maintenance and servicing.

2.13 Noise

The implement itself does not produce any significant noise emissions.

During operation with a mounted Pneumatic Seeder, noise pollution of more than 80 dB(A) can occur.

Frequent use of the implement can cause health problems such as hearing loss, deafness or tinnitus.

- ▶ Assess the noise hazard before commissioning the implement/tractor combination:
 - Tractor noise
 - Implement noise
 - Sound insulation in the tractor cab
- ▶ Observe the operating manual for the mounted implement.
- ▶ Wear suitable hearing protection as described in this operating manual.

3 Implement description

3.1 Implement overview



INFORMATION

Different designs of the implement can have different equipment fitted.

→ Chapter 1.3 'Equipment variants' on page 9

The implement is available in the following model series.

- **Front Frame FF**
- **Front Frame FF PS 120 M1**
- **Front Frame FF PS 200 M1**
- **Front Frame FF PS 300 M1**
- **Front Frame FF PS 500 M2**
- **Front Frame FF PS 800 M1**

Different types of the parts are available.

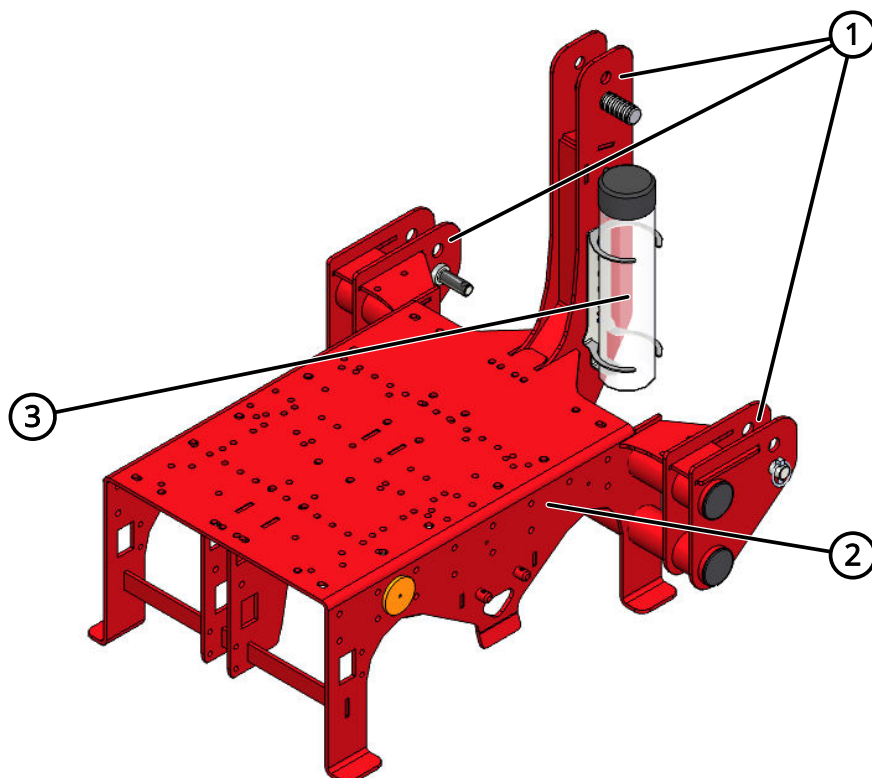
The types differ in:

- Front Frame FF
- Front Frame FF with seeding rail
- Front Frame FF with additional weight
- Front Frame FF with seeding rail and additional weight

3.2 Layout of the implement

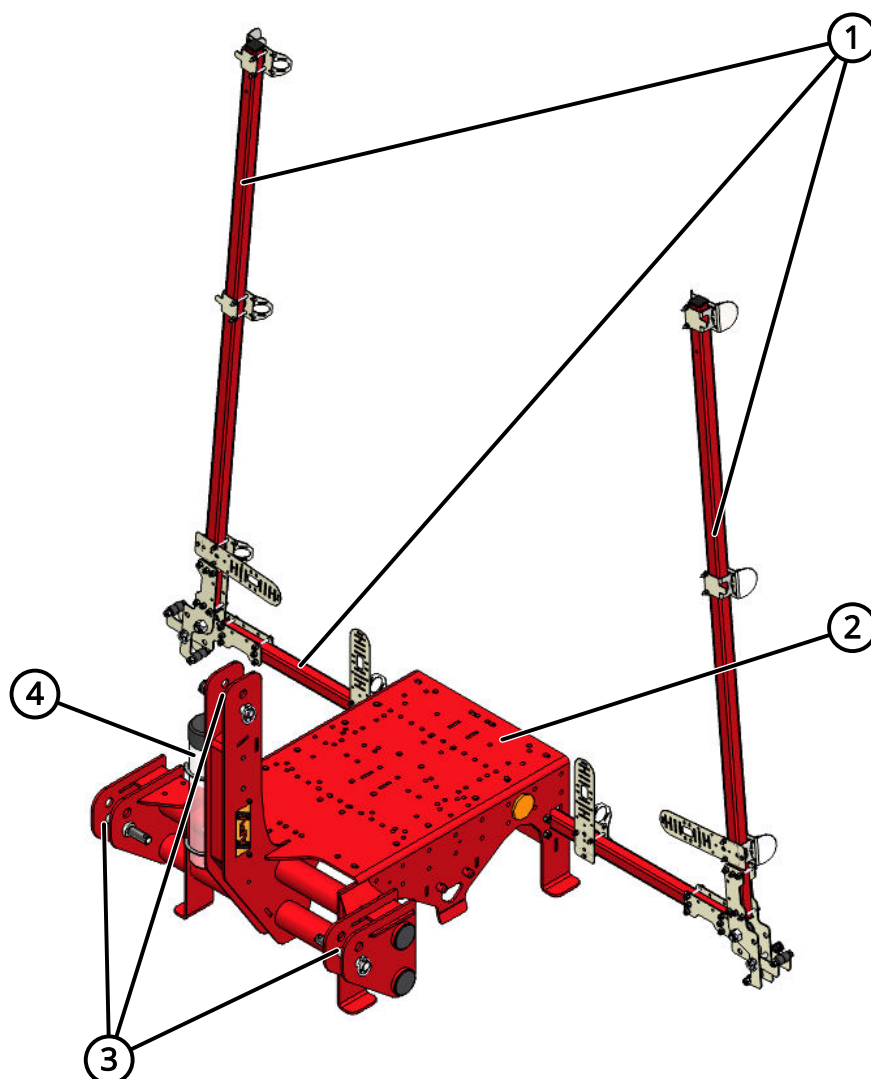
Type overview

Type	Pneumatic Seeder				
	PS 120 M1	PS 200 M1	PS 300 M1	PS 500 M2	PS 800 M1
Front Frame FF	FF 120	FF 200	FF 300	FF 500	FF 800
Front Frame FF with seeding rail	FF 120 SB	FF 200 SB	FF 300 SB	FF 500 SB	-
Front Frame FF with additional weight	FF 120 ZG	FF 200 ZG	FF 300 ZG	FF 500 ZG	FF 800 ZG
Front Frame FF with seeding rail and additional weight	FF 120 SB ZG	FF 200 SB ZG	FF 300 SB ZG	FF 500 SB ZG	-

Front Frame FF

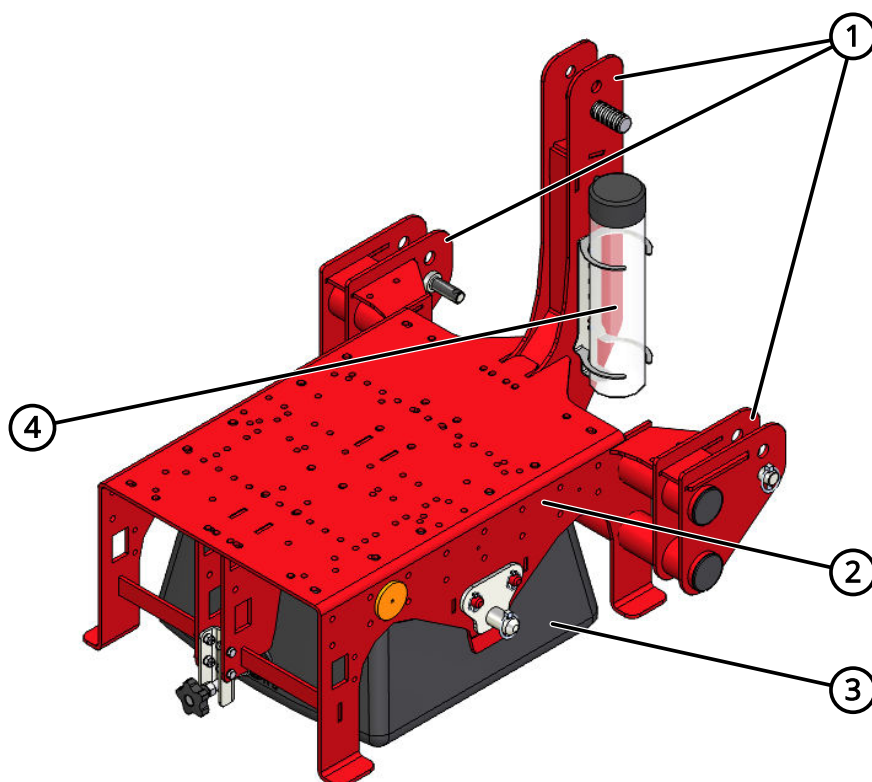
- 1 Three-point linkage
- 2 Frame
- 3 Document holder

Front Frame FF with seeding rail



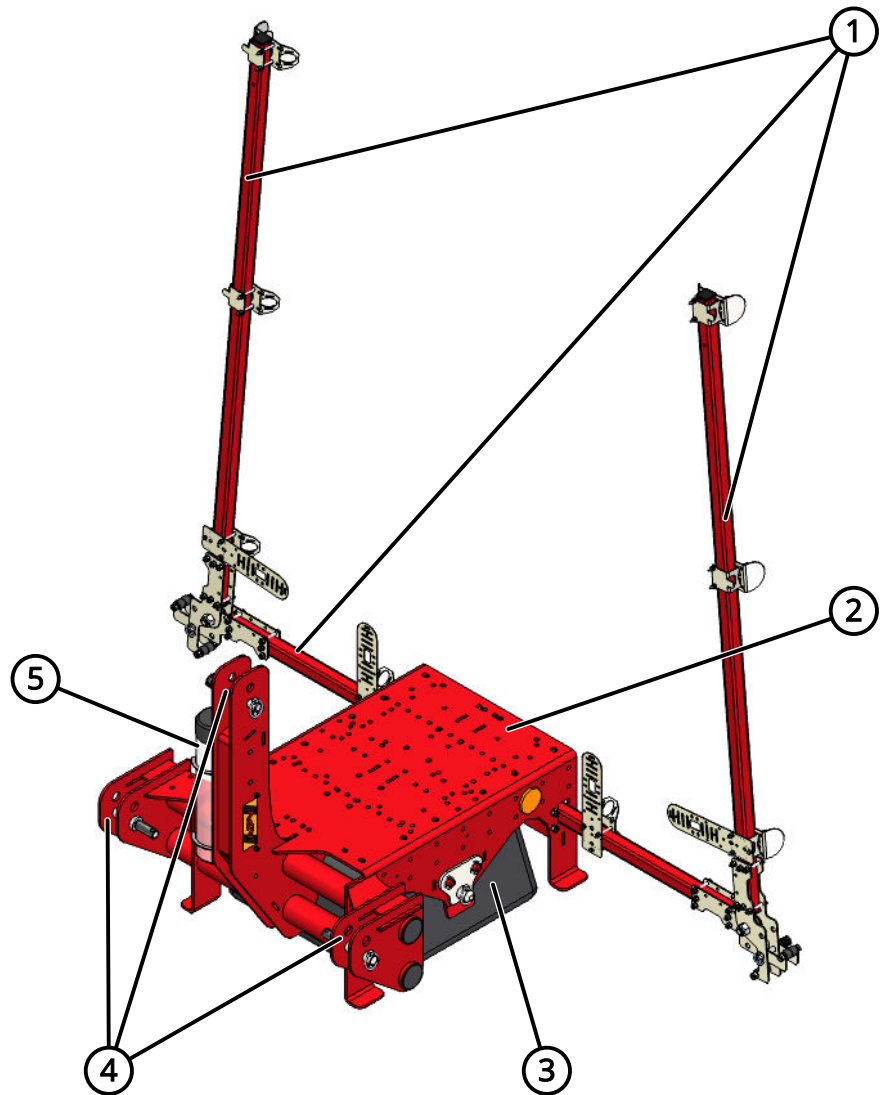
- 1 Spreading elements
- 2 Frame
- 3 Three-point linkage
- 4 Document holder

Front Frame FF with additional weight



- 1 Three-point linkage
- 2 Frame
- 3 Additional weight
- 4 Document holder

Front Frame FF with seeding rail and additional weight



- 1 Spreading elements
- 2 Frame
- 3 Additional weight
- 4 Three-point linkage
- 5 Document holder

3.3 Functional description

Front Frame

Support frame for a Pneumatic Seeder according to the manufacturer specifications for mounting at the front of a tractor.

The mode of operation of the implement is characterised by the following features:

- **Carrier and connection unit**

The support frame provides a sturdy support structure for the Pneumatic Seeder.

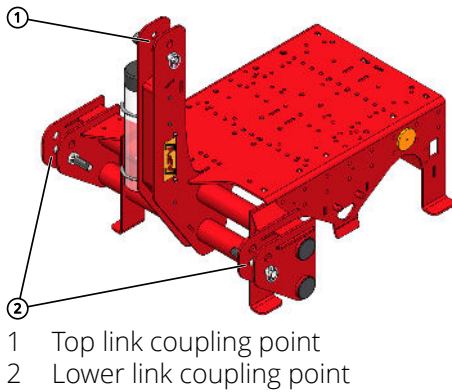
- **Front mounting with weight transfer**

The support frame is attached to the front power lift of the tractor, whereby the weight of the Pneumatic Seeder is shifted to the front. This improves driving stability, traction and reduces soil compaction.

3.4 Three-point linkage

The three-point linkage is used to connect the implement to the tractor's three-point linkage.

For authorised options for connecting the implement to the tractor, see ➔ *Chapter 13.5 'Direction of connection on the implement' on page 67*

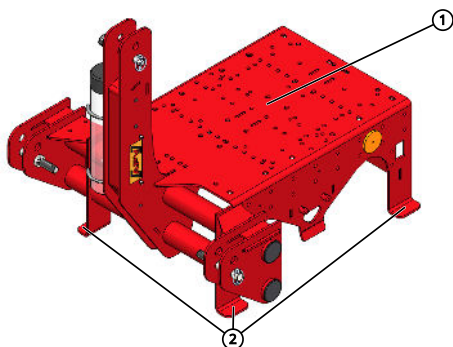


- 1 Top link coupling point
- 2 Lower link coupling point

3.5 Frame

The frame is used as the central support element of the implement.

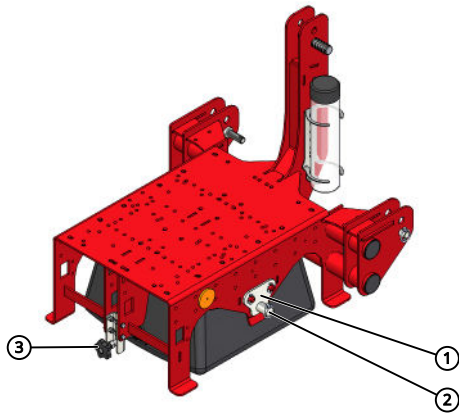
The Pneumatic Seeder, as well as the optional seeding rail and additional weight, are mounted on the mounting platform of the frame according to the manufacturer specifications.



- 1 Mounting platform
- 2 Support legs

3.6 Additional weight

The additional weight is used for additional ballast at the front.

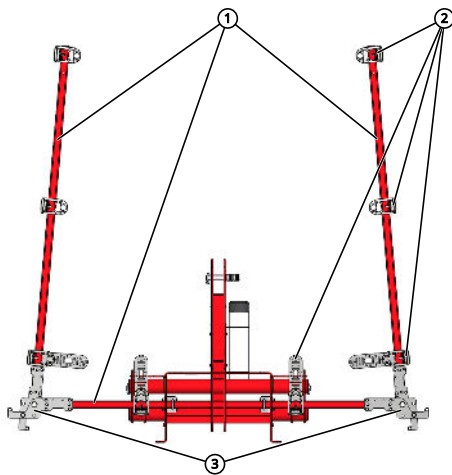


- 1 Fixing plate
- 2 Locating pin
- 3 Fixing bolt

3.7 Spreading elements

The spreading elements consist of a mechanically folding seeding rail with dispersion plates.

The spreading elements are used to fasten the seed hoses as well as to spread the seed.



- 1 Seeding rail
- 2 Baffle plate
- 3 Folding hinges

3.7.1 Seeding rail

The three-part seeding rail can be mechanically folded and is used to fasten the dispersion plates.

When mechanically folded into working position, the seeding rail has a working width of 6 metres.

3.7.2 Baffle plate

The dispersion plates are used to distribute the seed and are fastened onto the seeding rail.

3.8 Document holder



The document holder is used to store:

- Implement documentation

4 Implement handover

4.1 Handing over implement

▶ Locate the type plate and identify the implement.	➔ Chapter 4.2 'Implement identification' on page 38
▶ Check the scope of delivery for completeness and compare it with the scope of the order.	➔ Chapter 4.3 'Scope of delivery' on page 39
▶ Check the equipment of the implement.	➔ Chapter 4.4 'Checking the equipment' on page 39
▶ Register the implement and activate the warranty.	➔ Chapter 4.5 'Registering the implement' on page 40
▶ If there are any problems, contact the dealer or manufacturer.	➔ Chapter 1.2 'Contact data' on page 9

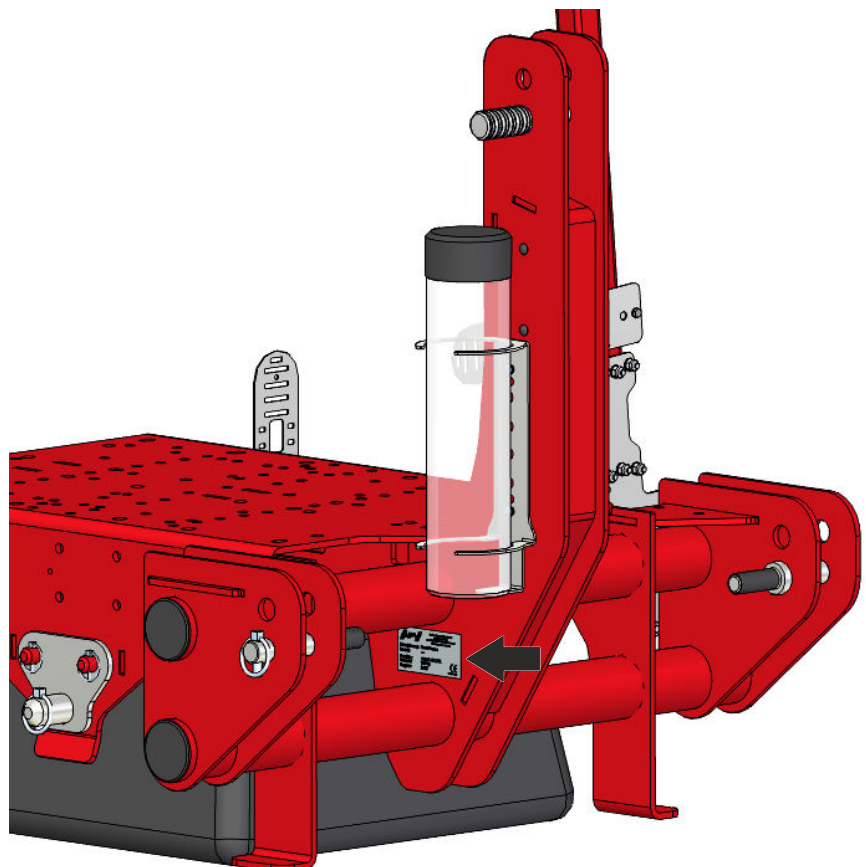
4.2 Implement identification

The implement is labelled with a type plate.

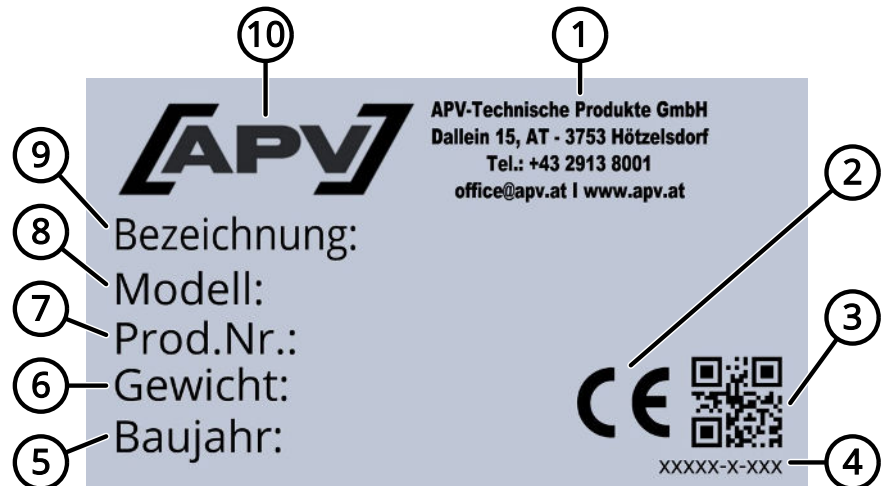
The implement can be clearly identified by the following information on the type plate:

- Designation
- Production number

Position



Meaning



- 1 Manufacturer's address
- 2 CE mark
- 3 QR code
- 4 Item number of type plate
- 5 YoM
- 6 Weight
- 7 Production number / serial number
- 8 Model
- 9 Designation
- 10 Manufacturer, company logo

4.3 Scope of delivery

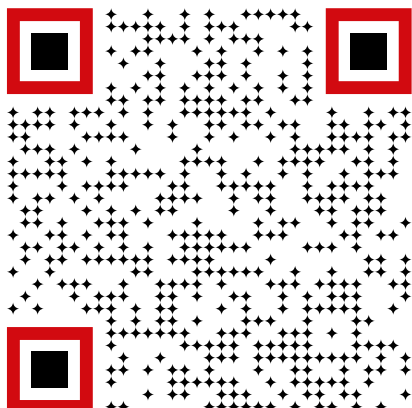
The scope of delivery includes all assembly groups and components that are delivered as a standard by the manufacturer.

4.4 Checking the equipment

The equipment of the implement varies depending on the configuration of the order.

1. Check that all original APV parts are present as ordered.
2. Check that all parts are undamaged and correctly fitted.
3. Check whether all implement documents are available in the right language.
 ➔ Chapter 1.8 'Other applicable documentation' on page 12

4.5 Registering the implement



- ▶ Scan the QR code and follow the instructions.
 - ➔ The implement is registered.
 - ➔ The claim for warranty services is activated.

5 Initial operation

5.1 Preparing for mounting

5.1.1 Checking tractor requirements



WARNING

Risk of accidents caused by unsuitable tractor

If the tractor is not suitable for the implement, it could be overloaded by implement components. This means that the implement cannot be operated safely in combination with the tractor.

This could result in accidents resulting in serious injury or death and damage to the implement.

- ▶ Before mounting, ensure that the tractor is suitable for operation with the implement.
- ▶ Follow the tractor operating manual.

Check list

Tractor performance

The tractor power must be within the permissible power range. The tractor power must be sufficient for the consumers on the connected implement.

→ Chapter 13.3.1 'Power data' on page 66

Three-point linkage

The category of the tractor's three-point linkage and the implement's three-point linkage must match.

If the categories don't match:

- ▶ Adapt tractor's three-point linkage.

→ Chapter 13.5 'Direction of connection on the implement' on page 67

Field of vision

The clear view of the tractor driver to the bearing point may not be obstructed.

→ Chapter 5.5 'Checking the field of vision' on page 48

Axle loads

Determine axle loads and required ballasting.

→ Appendix A 'Axle load and ballasting for mounted implements' on page 70

Load-bearing capacity of tyres

The load index of the tyres must be compatible with the weight of the implement and the speed being driven.

→ Further information on page 12

5.1.2 Preparing the tractor



WARNING

Risk of accident caused by implement tipping over

If the lifting struts of the tractor are not set rigidly and the slotted holes are not locked, the implement may tip over.

This could result in accidents resulting in serious injury or death and damage to the implement.

- ▶ Set the lifting struts to be rigid before mounting.
- ▶ Lock the slotted holes before mounting.

Check list

Tyres

- ▶ Check the air pressure of tractor tyres.
- ▶ Ensure the same air pressure in all tyres on one axle.
- ▶ Comply with the information provided by the tractor manufacturer.

Lifting struts

- ▶ Check the length of the lifting struts.
- ▶ Set the lifting struts of the tractor to the same length.
- ▶ Ensure that the lifting struts can move vertically during operation.
- ▶ Comply with the information provided by the tractor manufacturer.

Stabilisers

- ▶ Check that the stabilisers can move.
- ▶ Ensure lateral stability of the lower links during road travel.
- ▶ Ensure lateral stability of the lower links during operation.
- ▶ Ensure that the implement is centred in front of the tractor when driving on the road.
- ▶ Comply with the information provided by the tractor manufacturer.

Top link

- ▶ Check mounting position of the top link.

For tractors with several mounting positions:

- ▶ Link top link at a slight incline to the implement.

Top link balls and lower link balls

- ▶ Mount lower link balls on the lower link pins.
- ▶ Ensure lateral clearance-free fit between lower link balls and lower link pins, e.g. with enclosed washers.
- ▶ Mount top link balls on the top link pins.

5.1.3 Checking implement requirements

Check implement for:

- visible damage, e.g. corrosion, frost or animals
- condition of the operating equipment

Check list

✓	The tractor is suitable for operation with the implement.	→ Chapter 5.1.1 'Checking tractor requirements' on page 41
✓	The tractor is ready.	→ Chapter 5.1.2 'Preparing the tractor' on page 42
✓	The implement is ready for operation and in perfect technical condition.	→ Chapter 2.5.6 'Technically perfect condition' on page 20
✓	The operator and user have been instructed in the function, operation and safety of the implement.	
✓	Tractor and implement are positioned on a level and stable surface.	
✓	The implement is prepared for operation.	→ Chapter 5.1.4 'Preparing the implement' on page 43

5.1.4 Preparing the implement

Check list

✓	The ground is level and load-bearing.
✓	The implement is mounted on the tractor.
✓	The implement/tractor combination is secured against rolling away.
✓	The tractor engine is switched off.
✓	The ignition key is removed.

5.2 Mounting the implement

5.2.1 Mounting options

The implement has a three-point linkage that is connected to the three-point linkage at the front of the tractor.

5.2.2 Mounting the implement at the front of the tractor

- ✗ Top link
- ✗ Top link ball
- ✗ Lower link balls

1. Switch the linkage hydraulics on the tractor to position control.

2. Mount the top link ball on the top link pin on the implement.
3. Mount the lower link balls on the lower link pins on the implement.
4. Secure all pins and balls with linch pins.
 - Top link ball and lower link ball are mounted on the implement's three-point linkage.
5. If applicable, adjust the lifting struts to the same length, lock and secure.
6. Drive the tractor straight forwards towards the implement.
 - Lower links are positioned in front of the lower link coupling points of the implement.
7. Drive the tractor forwards close enough to the implement, so that the lower links are under the lower link coupling points of the implement.
8. Connect the lower link of the tractor with lower link balls.
9. Secure the tractor against rolling away.
10. Select mounting position for top link.
 - Align the top link parallel to the ground up to a slight incline to the implement.
11. Set the top link to the correct length.
12. Connect the top link to the top link ball.
 - Implement is mounted at the front of the tractor.

5.3 Mounting the Pneumatic Seeder on the implement

Mounting options

Depending on the implement type, the Pneumatic Seeder must be mounted longitudinally or laterally to the direction of travel.

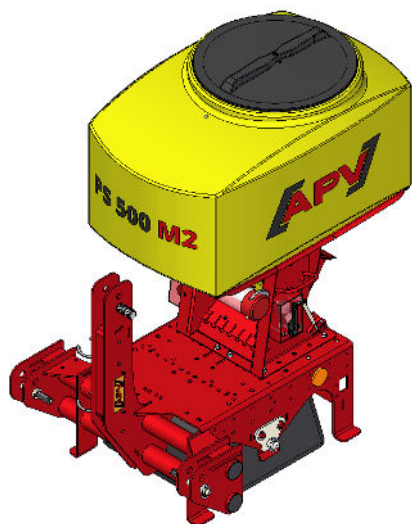


Fig. 1: Longitudinal mounting of the PS 500 M2 on the Front Frame FF with additional weight

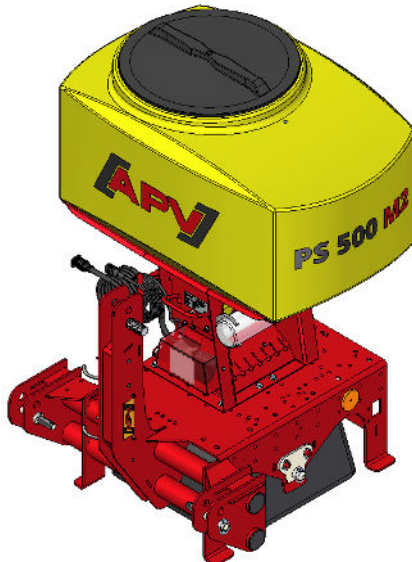


Fig. 2: Lateral mounting of the PS 500 M2 on the Front Frame FF with additional weight

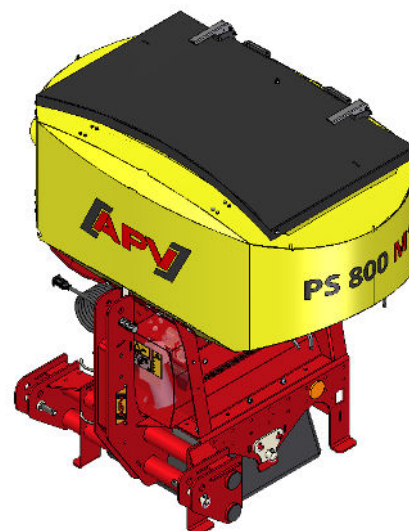
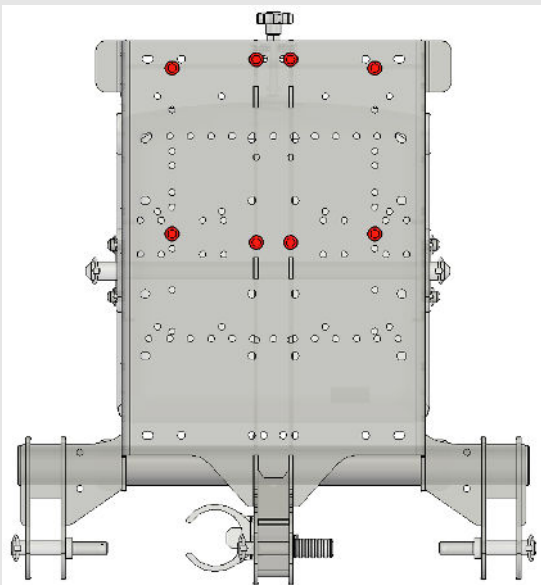
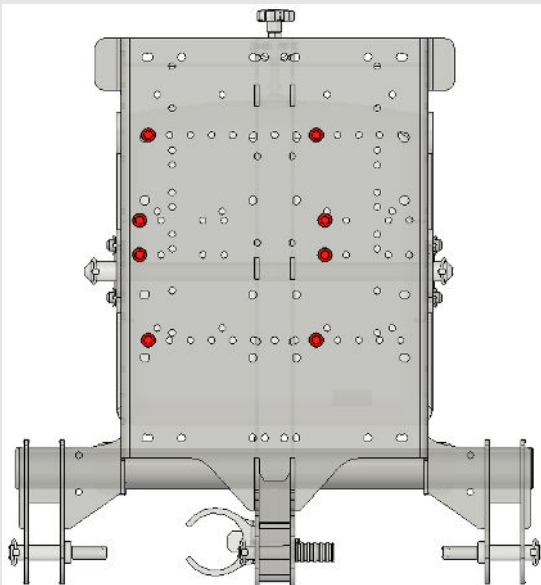
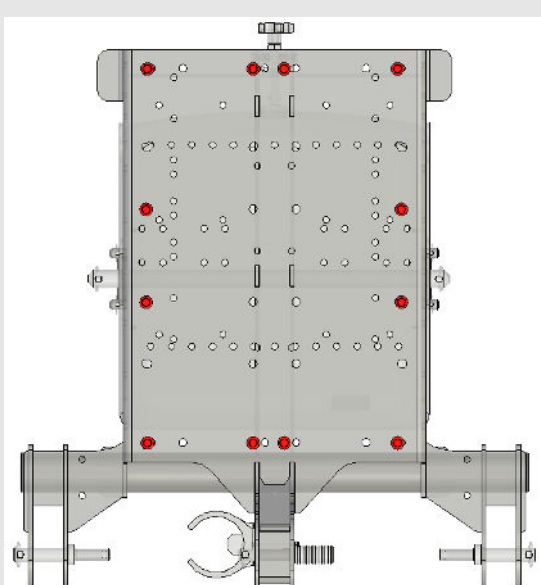


Fig. 3: Lateral mounting of the PS 800 M1 on the Front Frame FF with additional weight

Type	Pneumatic Seeder				
	PS 120 M1	PS 200 M1	PS 300 M1	PS 500 M2	PS 800 M1
Front Frame FF	Longitudinal mounting Lateral mounting	Longitudinal mounting Lateral mounting	Longitudinal mounting Lateral mounting	Longitudinal mounting Lateral mounting	Lateral mounting
Front Frame FF with seeding rail	Longitudinal mounting	Longitudinal mounting	Longitudinal mounting	Longitudinal mounting	-
Front Frame FF with additional weight	Longitudinal mounting Lateral mounting	Longitudinal mounting Lateral mounting	Longitudinal mounting Lateral mounting	Longitudinal mounting Lateral mounting	Lateral mounting
Front Frame FF with seeding rail and additional weight	Longitudinal mounting	Longitudinal mounting	Longitudinal mounting	Longitudinal mounting	-

Bolting positions

► Bolt the Pneumatic Seeder onto the positions as shown in the overview.

	PS 120 M1 PS 200 M1 PS 300 M1 PS 500 M2	PS 800 M1
Longitudinal mounting		
Lateral mounting		

General procedure



INFORMATION

Observe the operating manual for the respective Pneumatic Seeder.

- ✘ Pneumatic seeder
- ✘ Bolts M12 x 35, min. strength 8.8
- ✘ Nuts, self-locking
- ✓ The implement is parked.

- ✓ The implement is standing on a level and load-bearing surface.
- ✓ The lifting gear is suitable for the weight of the respective Pneumatic Seeder.
- 1. Using the lifting gear, position the Pneumatic Seeder on the mounting platform of the implement.
 - Pay attention to longitudinal or lateral mounting.



WARNING

Risk of accident due to the Pneumatic Seeder tipping over

If the bolting positions as per the specifications are not observed, the implement can tip over.

This could result in accidents resulting in serious injury or death and damage to the implement.

- ▶ Observe the bolting positions as per the specifications in this operating manual.
- ▶ Check the bolting positions before putting the implement into operation.

- 2. Fasten the Pneumatic Seeder with bolts and nuts on the mounting platform.
- 3. If applicable, connect the hydraulic hoses and lines.
 - ➔ The Pneumatic Seeder is mounted on the implement.

5.4 Installing the additional weights on the implement



CAUTION

Risk of crushing from the additional weight

When the additional weight is installed or removed, there is a risk of injury for hands and fingers.

- ▶ Make sure that nobody is standing in the mounting area when installing or removing the additional weight.
- ▶ Never touch the additional weight in the crushing area.



INFORMATION

The additional weight is used as a ballasting aid to compensate for the weight of implements mounted at the rear of the tractor.

- ▶ Install the additional weight only when an implement is mounted at the rear of the tractor.
- ▶ Never install the additional weight with PS 800 M1 equipment and a granulate density of more than 1.0 kg/litre.

- ✘ Fixing plates incl. lynch pin
- ✘ Mounting pin incl. lynch pin
- ✓ The implement is mounted at the front of the tractor and is lifted.

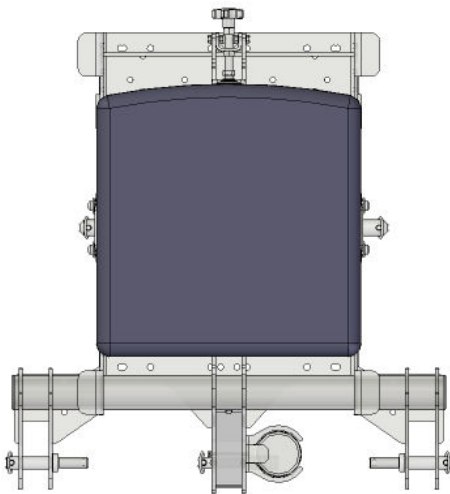


Fig. 4: View on the additional weight from below



Fig. 5: Through hole on the additional weight

- ✓ The fixing bolt is unscrewed up to the stop.
- ✓ The additional weight is standing on a level and load-bearing surface.



INFORMATION

- If necessary, ask a second person to help with the work steps.

1. Drive the tractor straight ahead towards the additional weight.
2. Drive the tractor straight ahead towards the additional weight until the implement is positioned under the additional weight.
 - Pay attention to the correct orientation as shown in Fig. 4 .
3. Lower the implement until the through hole of the additional weight as shown in Fig. 5 is within the triangular through hole of the implement.
4. Secure the tractor against rolling away.
5. Insert the mounting pin through the through hole and secure on both sides with linch pins.
6. Lift the implement and remove the linch pins on the mounting pins on both sides.
7. Install the fixing plate on both sides and secure it on the implement with 2 linch pins.
8. Secure the mounting pins on both sides with linch pins.
9. Tighten the fixing bolt hand-tight.

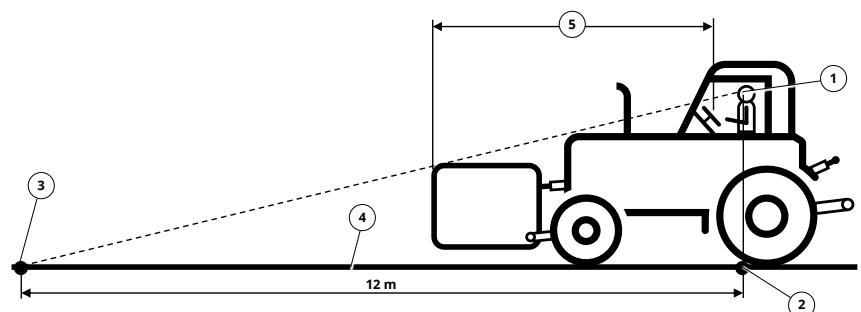


INFORMATION

Check this setting before operating in the field. Correct any settings where necessary.

- The additional weight is installed on the front of the tractor.

5.5 Checking the field of vision



- ✓ The front-mounted implement is mounted.
- ✓ The tractor/implement combination is standing on a level surface.
- ✓ The tractor driver is sitting at the workplace in the tractor cab.

NOTICE

The reference points [1] are the tractor driver's eyes.

1. Starting from the reference point [1], project a vertical line to the ground [2].
2. Mark the projection point [2].
3. Starting from the projection point [2], measure a distance of 12 m to the front in the direction of travel [3].
4. Mark the bearing point [3].
5. Take a bearing from the reference point [1] to the bearing point [3].
 - A clear view from the reference point [1] to the bearing point [3] must be ensured.
6. If necessary, lower the front-mounted implement until a clear view is ensured from the reference point [1] to the bearing point [3].
7. Maintain an adequate ground clearance [4] of at least 20 cm under the front-mounted implement.

NOTICE

If the road surface is clearly visible, a slight impairment of the field of vision is permissible.

**WARNING**

If the distance [5] from the front edge of the front-mounted implement to the centre of the steering wheel is more than 3.50 m:

Compensate for restrictions in the field of vision at farmyard exits, road intersections and crossings with suitable measures, e.g.:

- ▶ Another person as a guide
- ▶ Mirror
- ▶ A certified camera system

6 Driving on roads

6.1 Basic road safety instructions



INFORMATION

Laws on driving on public roads vary from country to country.

- ▶ Observe country-specific laws and regulations:
 - Driving on public roads
 - Maximum permissible transport width
 - Maximum permissible transport height
 - Maximum permissible transport weight
 - Lighting system
- ▶ Never exceed the maximum permissible transport speed of the implement.
 ➔ *Chapter 13.3.1 'Power data' on page 66*

6.2 Preparation for driving on the roads

- ▶ Work through the checklist before every journey on public roads.

Check list

Connection between implement and tractor

- ▶ Check that the top link pin is secure and secure if necessary.
- ▶ Check the connection between the lower link and the lower link coupling points and secure if necessary.

Folding the implement

- ▶ Make sure a folding implement is in transport position.
- ▶ Check the transport lock and activate if necessary.

Stabilisers

- ▶ Ensure lateral stability of the lower links during road travel.
- ▶ Ensure that the implement is centred in front of the tractor when driving on the road.
- ▶ Comply with the information provided by the tractor manufacturer.

Lighting system

- ▶ Make sure that the lighting system meets any country-specific requirements.
- ▶ Make sure that the lighting system is fully functional.

Tractor control units

- ▶ Lock tractor control units to avoid any unintentional implement movements.
- ▶ Comply with the information provided by the tractor manufacturer.

Field of vision

- ▶ Mount the implement on the tractor such that the clear view of the tractor driver to the bearing point is not obstructed by the implement.
➔ *Chapter 5.5 'Checking the field of vision' on page 48*

7 Operation

7.1 Basic information on operation

7.1.1 Requirements for successful operation

Check list

✓	For the purposes of this operating manual, the Pneumatic Seeder is mounted on the implement. → Chapter 5.3 'Mounting the Pneumatic Seeder on the implement' on page 45
✓	If applicable, the additional weight is mounted on the implement. → Chapter 5.4 'Installing the additional weights on the implement' on page 47
✓	The field of vision to the front is ensured according to the specifications in this operating manual. → Chapter 5.5 'Checking the field of vision' on page 48
✓	The ground clearance of the Front Frame is adapted to the agricultural field.

7.1.2 Driving on the headlands

1. Lift the implement completely before reaching the headlands.

NOTICE

If parts of the implement touch the ground, they can be damaged while driving on the headlands.

2. On the headlands, adjust the forward speed to the terrain and soil conditions.
3. After the headland, only lower the implement when travelling in a straight line.

7.2 Basic operation



INFORMATION

- If necessary, ask a second person to help with the work steps.

7.2.1 Folding the seeding rail



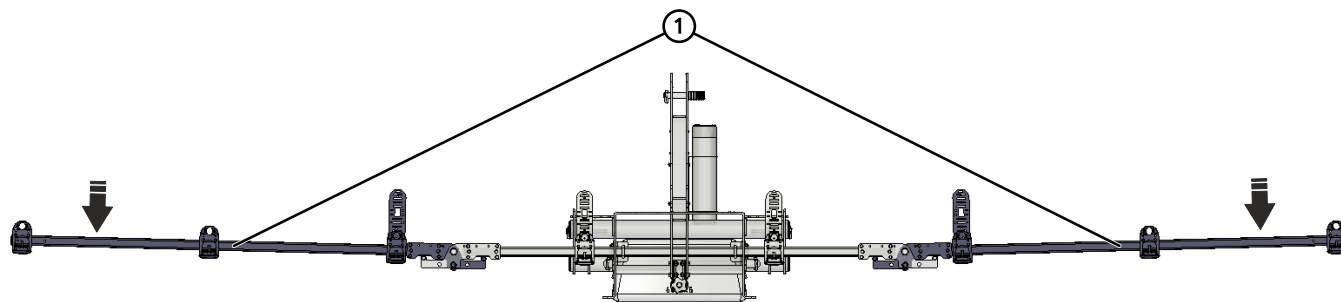
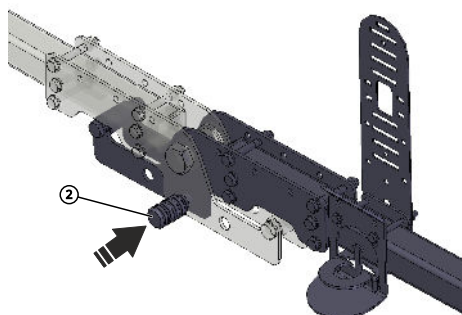
CAUTION

Risk of crushing when folding the seeding rail

When the seeding rail is being folded, there is a risk of injuries for hands and fingers.

- Make sure that nobody is standing in the hinged area when folding the seeding rail.
- Never touch the seeding rail in the hinged area when folding manually.

Moving the seeding rail into working position



- ✓ The implement is parked.
- ✓ The implement is standing on a level and load-bearing surface.

1. Remove the pin with the linch pin.
2. Unfold the seeding rail [1] up to the stop.
 - Make sure that the hoses are properly laid.

CAUTION

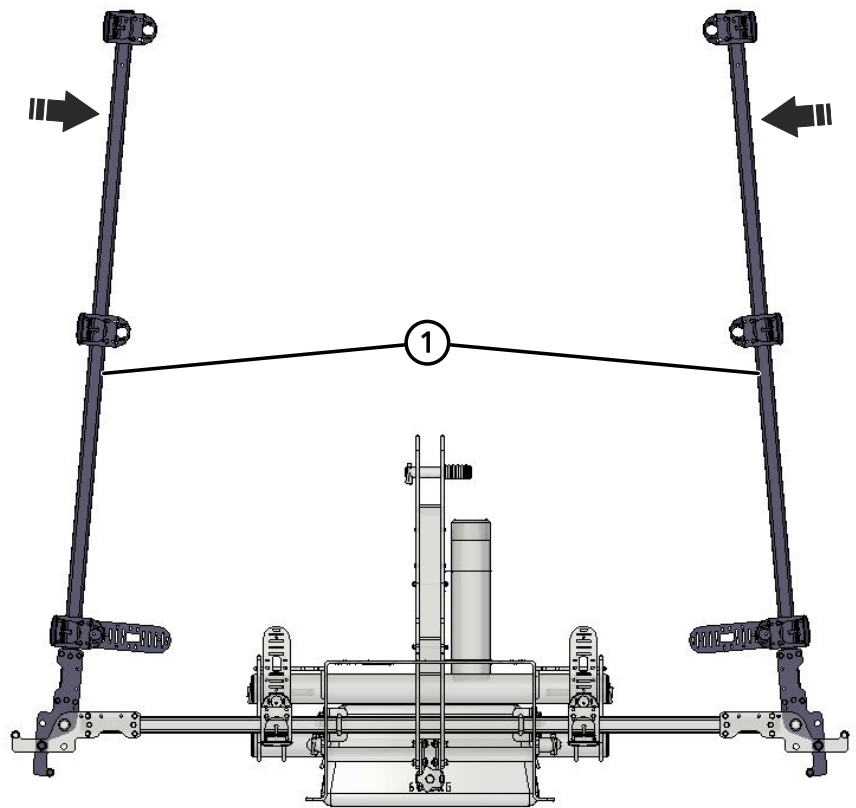
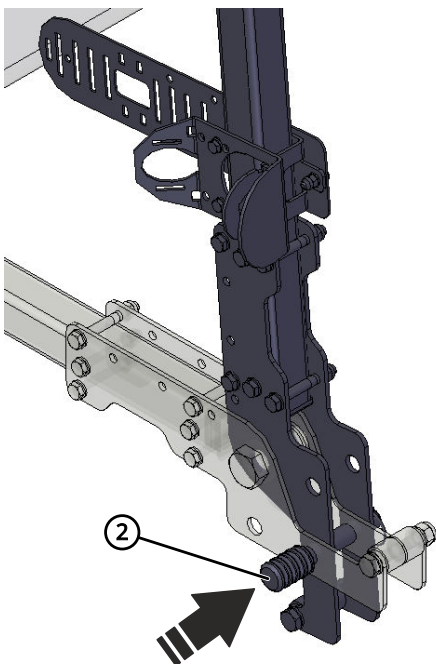
Risk of impact when folding the seeding rail

When the seeding rail is folded from transport position into working position, there is a risk of head injuries.

- Make sure that nobody is standing under the folding area when folding the seeding rail.

3. Secure the seeding rail with a pin and linch pin [2].
4. Repeat the step for the opposite side.
 - ➡ The seeding rail is moved into working position.

Moving the seeding rail into transport position



- ✓ The implement is parked.
- ✓ The implement is standing on a level and load-bearing surface.

 1. Remove the pin with the linch pin.
 2. Fold the seeding rail [1] until the holes for the linch pins are aligned.
 - Make sure that the hoses are properly laid.
 3. Secure the seeding rail with a pin and linch pin [2].
 4. Repeat the step for the opposite side.
 - ➡ The seeding rail is moved into transport position.

8 Decommissioning

8.1 Preparing to decommission the implement



WARNING

Risk of injury due to the implement tipping over

If the implement with mounted Pneumatic Seeder is not parked on a suitable surface, the implement can tip over.

- ▶ Park the implement only on a level and load-bearing surface.
- ▶ Use suitable lifting gear.
- ▶ Secure the implement and components appropriately for transport.

1. Move the implement to a parking area with a load-bearing and level surface.
2. Completely lower the implement.
3. Secure the implement/tractor combination against rolling away.
4. Clean the implement before long breaks or winter storage.

8.2 Decommissioning the implement

✓ The implement is prepared for removal.

➔ *Further information on page 55*

1. Take the weight off the top link.
2. Uncouple the top link from the three-point linkage.
3. Disconnect the lower link of the tractor from the lower link coupling points of the implement.
 - Follow the tractor operating manual.
4. Move the tractor a maximum of 50 cm away from the implement.
5. Depressurise the auxiliary control units of the hydraulic system.



WARNING

Hydraulic oil can spray out of the hydraulic lines under pressure when uncoupling.

6. Secure the tractor against rolling away.
7. Uncouple the hydraulic lines from the tractor.
8. Push the protective caps onto the hydraulic lines.
9. Hook the hydraulic lines into the line holder.
10. Uncouple the electric cables from the tractor.
11. Push the protective caps onto the electric cables.
 - ➡ The implement is removed.

9 Troubleshooting

9.1 Finding and rectifying faults

- ✓ Wear personal protective equipment.
- ✘ Suitable tools
- ✘ Climbing aids
- ✘ Support elements
- 1. Park the implement/tractor combination.
- 2. Secure the implement/tractor combination against rolling away.
- 3. When working on a folding implement, fold out the folding components of the implement or secure them against folding out.
- 4. When working on a raised implement, secure the implement against lowering.
- 5. Remove the ignition key.
- 6. Use lifting gear to remove and attach heavy components.
- 7. To prevent tools from slipping off:
 - Use aids to reduce the effort required, e.g. extensions.
 - Check nuts and bolt heads etc. for wear. If necessary, call in specialised personnel.
- 8. Follow the troubleshooting instructions.

10 Cleaning and care

Cleaning intervals

- After every use
- When changing seed types
- At the end of the season

10.1 Cleaning the implement



CAUTION

Risk of injury when cleaning with a high pressure cleaner

Cleaning with a high-pressure cleaner can lead to eye injuries and skin injuries.

- ▶ Wear safety goggles when cleaning with a high-pressure cleaner.

NOTICE

Material damage caused by cleaning with a high-pressure cleaner

Improper cleaning with a high-pressure cleaner can damage components.

- ▶ Set water temperature to max. 80 °C.
- ▶ Do not use round jet nozzles, dirt cutters or power cleaning nozzles.
- ▶ Maintain a minimum distance of 30 cm between the machine surface and the high-pressure nozzle.
- ▶ Always keep the water jet moving during the cleaning process.
- ▶ Note the position, meaning and condition of the stickers.
- ▶ Make sure that no water gets into electrical, electronic or hydraulic components.
- ▶ Do not aim the jet of the high-pressure cleaner directly at bearings or seals.

The user can clean the implement with a high-pressure cleaner.

✓ Implement/tractor combination is parked on a level, horizontal, and load-bearing surface.

✓ The implement/tractor combination is secured against rolling away.

✘ High pressure cleaner

1. Remove soil build-up from the implement.
2. Thoroughly clean the implement with a high-pressure cleaner.
3. Allow the implement to dry thoroughly after wet cleaning.
4. Check that stickers are complete and in good condition and replace if necessary.
 - ➡ Implement cleaned and dry.

11 Maintenance and servicing

11.1 Ensure maintenance is carried out correctly

Personnel

Some jobs are reserved exclusively for service personnel, e.g. working on the hydraulics.

- These jobs are marked with the symbol.
- Marking in the maintenance plan in the service personnel column.

11.1.1 Preparing maintenance



INFORMATION

Any necessary deviations from the following procedure are described in the respective maintenance chapters.

1. Switch off the engine.
2. Apply the tractor's parking brake.
3. Remove the ignition key.
4. Secure the implement/tractor combination against rolling away.
5. When working on folding implements:
Fold out the folding components of the implement or secure them against folding out.
6. When working on a raised implement:
Secure the implement against lowering e.g. using support elements.
7. Advise people in the vicinity that work is being carried out on the implement.

11.1.2 Performing maintenance

Observe the following during maintenance and servicing:

- ✓ Wear personal protective equipment.
- ✕ Suitable tools
- ✕ Climbing aids
- ✕ Support elements
 - ▶ Use lifting gear to remove and attach heavy components.
 - ▶ Check nuts and bolt heads for wear. If necessary, call in specialised personnel.
 - ▶ Follow the maintenance instructions.

11.2 Maintenance schedule

Chap.	Task to execute	Service personnel	Before each time the implement is used	Before the season	After cleaning	After the first 2 hours of operation	Every 10 hours of operation	Every 20 hours of operation	Every 50 hours of operation	Every 100 hours of operation	Annually	At the latest 6 years after the date of manufacture	Page
11.3.1	Checking top link pin and lower link pin on the three-point linkage			X					X				59
11.3.2	Checking the bolted connections of the Pneumatic Seeder					X				X			60
11.3.2	Checking the folding hinges					X				X			60
11.3.2	Checking the fixing bolt		X										60
11.3.2	Checking the bolted connections for the fixing bolt older			X		X	X						60
11.3.3	Check lighting system								X				60
11.3.3	Checking the transport lock							X					61
11.3.3	Check safety stickers								X				61

11.3 Maintenance work

11.3.1 Tractor connection

Checking top link pin and lower link pin on the three-point linkage

- Visual inspection of top link pins and lower link pins on the three-point linkage for:
 - damage
 - wear and tear

11.3.2 Bolted connections

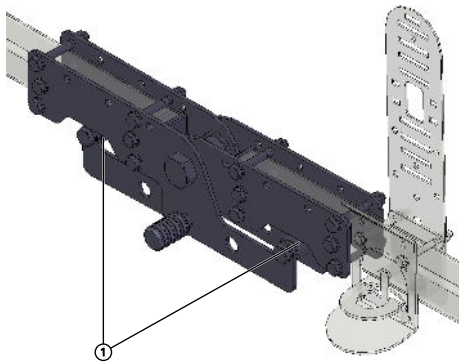
Checking the bolted connections of the Pneumatic Seeder

2. Replace damaged or worn pins.

The bolted connections between the Pneumatic Seeder and mounting platform must always be tight.

1. Check bolted connections.
2. Tighten bolts if necessary.

Checking the folding hinges

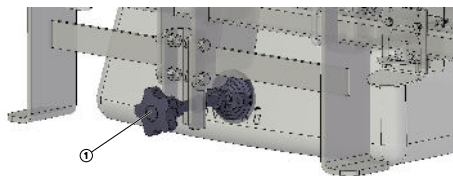


1 Damping elements

The folding hinges connect the elements of the seeding rail and are equipped with damping elements.

1. Check bolted connections.
2. Tighten bolts if necessary.
3. Check the damping elements.
4. Check moving parts for play.
5. If a folding hinge is too loose, retighten the bolts.
6. Replace damaged or worn parts immediately.

Checking the fixing bolt

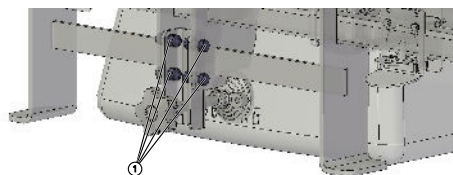


1 Fixing bolt

The fixing bolt holds the additional weight in position during operation.

1. Check the fixing bolt.
2. If a fixing bolt is too loose, retighten the fixing bolt.
3. Replace damaged or worn parts immediately.

Checking the bolted connections for the fixing bolt older



1 Bolted connections

The bolted connections between the frame and the bracket for the fixing bolt must always be tight.

1. Check bolted connections.
2. If a bolted connection is too loose, retighten the bolts.
3. Replace damaged or worn parts immediately.

11.3.3 Safety devices

Check lighting system

- Make sure it works properly.

Checking the transport lock

1. Visual check for
 - damage
 - wear and tear
2. Replace damaged or worn parts immediately.

Check safety stickers

- Make sure they are visible and in good condition.

12 Permanently decommissioning and disposal

ENVIRONMENT

Never expose implement components to the weather for long periods of time, as operating fluids may be released into the environment.

ENVIRONMENT

At the end of its service life, dispose of the implement in the country-specific legally regulated waste recycling system.

12.1 Permanently decommissioning

WARNING

Risk of injury due to discharge of stored energy

Springs are under pressure.

Hydraulic components are under pressure.

► Deploy qualified personnel for disassembly.

If the implement can no longer be used, it needs to be dismantled into its individual parts.

Special knowledge is required to dismantle the implement into its individual parts.

✓ Further use of the implement as described in these instructions is no longer intended.

✓ Call in qualified specialist personnel to permanently decommission the implement.

1. Empty and clean all existing hoppers and hoses.
 ➔ *Chapter 10 'Cleaning and care' on page 57*
 - All implement components are free from auxiliary materials, e.g. seeds.
2. Remove operating materials from the implement, e.g. grease.
3. Decommission the implement.
 ➔ *Chapter 8.1 'Decommissioning' on page 55*
4. Have the implement dismantled by specialised personnel.
5. Dispose of implement components and operating materials properly.
 ➔ *Chapter 12.2 'Disposal and recycling' on page 63*

12.2 Disposal and recycling

Special knowledge is required for the disposal of implement components and operating materials.

1. Call in qualified specialists to dispose of the implement.
2. Return implement components to the material cycle.
3. Dispose of auxiliary and operating materials in an environmentally friendly manner.



ENVIRONMENT

Never dispose of implement components and operating materials in the environment or in household waste.

13 Technical data

13.1 Dimensions

Front Frame FF

Data	Value				
	FF PS 120 M1	FF PS 200 M1	FF PS 300 M1	FF PS 500 M2	FF PS 800 M1
Frame width [cm]	98.5	98.5	98.5	98.5	98.5
External width in working position, maximum [cm]	118.1	118.1	118.1	124.7	169
Transport dimensions, height x width x depth [cm]	127.1 x 118.1 x 105	139.6 x 118.1 x 105	149.7 x 118.1 x 105	161.5 x 124.7 x 106.5	164.4 x 169 x 115

Front Frame FF with seeding rail

Data	Value				
	FF PS 120 M1	FF PS 200 M1	FF PS 300 M1	FF PS 500 M2	FF PS 800 M1
Frame width [cm]	98.5	98.5	98.5	98.5	-
External width in working position, maximum [cm]	599.5	599.5	599.5	599.5	-
Transport dimensions, height x width x depth [cm]	219 x 231.9 x 144.6	219 x 231.9 x 144.6	219 x 231.9 x 144.6	219 x 231.9 x 144.6	-
Seeding rail working width, [m]	6.00				

Front Frame FF with additional weight

Data	Value				
	FF PS 120 M1	FF PS 200 M1	FF PS 300 M1	FF PS 500 M2	FF PS 800 M1
Frame width [cm]	98.5	98.5	98.5	98.5	98.5
External width in working position, maximum [cm]	118.1	118.1	118.1	124.7	169

Data	Value				
	FF PS 120 M1	FF PS 200 M1	FF PS 300 M1	FF PS 500 M2	FF PS 800 M1
Transport dimensions, height x width x depth [cm]	127.1 x 118.1 x 110.4	139.6 x 118.1 x 110.4	149.7 x 118.1 x 110.4	161.5 x 124.7 x 110.4	165.9 x 169 x 115

Front Frame FF with seeding rail and additional weight

Data	Value				
	FF PS 120 M1	FF PS 200 M1	FF PS 300 M1	FF PS 500 M2	FF PS 800 M1
Frame width [cm]	98.5	98.5	98.5	98.5	-
External width in working position, maximum [cm]	599.5	599.5	599.5	599.5	-
Transport dimensions, height x width x depth [cm]	220.5 x 231.9 x 144.6	220.5 x 231.9 x 144.6	220.5 x 231.9 x 144.6	220.5 x 231.9 x 144.6	-
Seeding rail working width, [m]	6.00				


INFORMATION

To determine the actual dimensions:

- Measure the implement.

13.2 Weight


INFORMATION

The weight of the implement in the state of delivery is given on the type plate.


WARNING
Risk of accidents due to incorrect ballasting

Depending on whether a seeding rail, additional weight and Pneumatic Seeder are mounted on the Front Frame, it can be lighter or heavier than in the state of delivery.

- Weigh the implement to determine the actual weight and for correct ballasting.

Data	Value				
	FF PS 120 M1	FF PS 200 M1	FF PS 300 M1	FF PS 500 M2	FF PS 800 M1
Total weight FF approx., maximum [kg]	193	208	218	241	379
Total weight FF with seeding rail approx., maximum [kg]	232	247	257	257	418
Total weight FF with additional weight approx., maximum [kg]	793	808	818	841	979
Total weight FF with seeding rail and additional weight approx., maximum [kg]	832	847	857	880	1018

13.3 Power data

13.3.1 Ambient conditions and operating conditions

Data	Value				
	FF PS 120 M1	FF PS 200 M1	FF PS 300 M1	FF PS 500 M2	FF PS 800 M1
Transport speed, maximum [km/h]	25				

13.3.2 Tractor power requirements

Data	Value				
	FF PS 120 M1	FF PS 200 M1	FF PS 300 M1	FF PS 500 M2	FF PS 800 M1
Tractor performance, minimum [HP]	25				30
Tractor performance, minimum [kW]	18				22

13.4 Noise, airborne noise emitted

Data	Value
Noise level of the implement in combination with the respective Pneumatic Seeder during operation, maximum [dB(A)]	80...85


INFORMATION

Observe the operating manual for the respective Pneumatic Seeder.

13.5 Direction of connection on the implement

Authorised mounting categories for lower link coupling points and upper link coupling points

Direction of connection	Value
Three-point linkage, Category	CAT 2

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15 Appendix

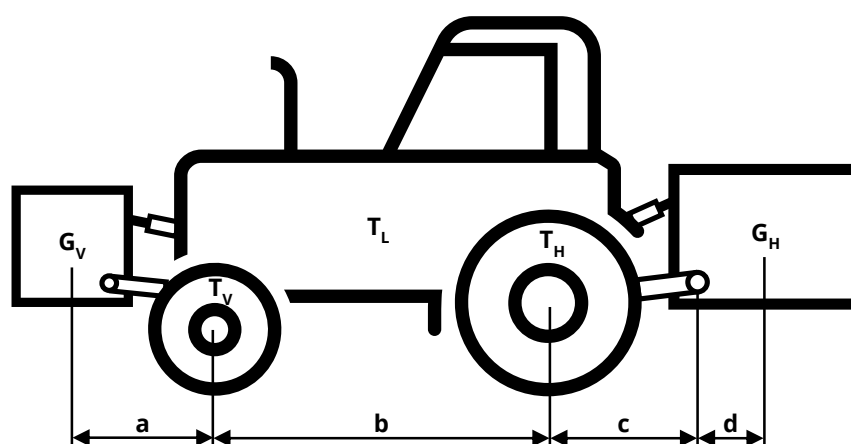
A Axle load and ballasting for mounted implements

Calculating the axle loads and the required ballasting is based on data from the operating manual for the tractor and the implement.

The calculation results in a guide value for the initial assessment of the axle loads and the required ballasting.

- For accurate results, weigh the tractor with and without the implement attached.
 - Tractor
 - Front axle
 - Rear axle

A.1 Calculation data



Data required to calculate the axle loads for each tractor used:

- Data from the tractor's operating manual
- Data from the implement's operating manual
- Data from measurements made on the tractor
- Data from measurements made on the implement/tractor combination

Data acquisition for axle load calculations

Abbreviation	Description	Value	Unit
Tractor data from the operating manual or determined by weighing			
T_{Tperm}	Permitted total weight of the tractor		[kg]
T_{Rperm}	Permitted front axle load		[kg]
T_{Fperm}	Permitted rear axle load		[kg]
T_L	Tare weight of the tractor		[kg]
T_F	Front axle load of the empty tractor		[kg]

Abbreviation	Description	Value	Unit
T _H	Rear axle load of the empty tractor		[kg]
Data from the tractor operating manual or from the tyre manufacturer's documentation			
	Permissible tyre load capacity, front axle per tyre		[kg]
	Permissible tyre load capacity, rear axle per tyre		[kg]
Implement data from the operating manual or determined by weighing Front weight or rear weight data determined from documents or by weighing			
G _H	Total weight of the rear-mounted implement or rear weight		[kg]
G _F	Total weight of the front-mounted implement or front weight		[kg]
d	Distance from the centre of the lower link ball to the centre of gravity of the rear-mounted implement or rear weight		[m]
Data from measurements made on the implement/tractor combination			
a	Distance between the centre of gravity of the front-mounted implement and the centre of the front axle		[m]
b	Wheelbase of the tractor		[m]
c	Distance between the centre of the rear axle and the centre of the lower link ball		[m]

A.2 Calculating the axle load and ballasting

► Perform calculations separately for each tractor used.

Minimum ballast Front G_{Fmin} for rear-mounted implement

$$G_{Vmin} = \frac{G_H \cdot (c + d) - T_V \cdot b + 0,2 \cdot T_L \cdot b}{a + b}$$

► Enter calculated value in the results table.

Minimum ballasting rear G_{Rmin} for front-mounted implement

$$G_{Hmin} = \frac{G_V \cdot a - T_H \cdot b + 0,45 \cdot T_L \cdot b}{b + c + d}$$

► Enter calculated value in the results table.

Actual total weight G_{act}

$$G_{tat} = G_V + T_L + G_H$$

- Enter calculated value in the results table.
- Enter total weight in the results table.
- Refer to the tractor operating manual.

Actual front axle load T_{Fact}

$T_{Vtat} = \frac{G_V \cdot (a + b) + T_V \cdot b - G_H \cdot (c + d)}{b}$	<ul style="list-style-type: none"> ▶ Enter calculated value in the results table. ▶ Enter total weight in the results table. <ul style="list-style-type: none"> ■ Refer to the tractor operating manual.
Actual rear axle load T_{Ract}	
$T_{Htat} = G_{tat} + T_{Vtat}$	<ul style="list-style-type: none"> ▶ Enter calculated value in the results table. ▶ Enter total weight in the results table. <ul style="list-style-type: none"> ■ Refer to the tractor operating manual.
Front axle load in percent $T_{F\%}$	
$T_{V\%} = \frac{T_{Vtat} \cdot 100}{T_L}$	<ul style="list-style-type: none"> ▶ Enter calculated value in the results table.
Tyre load capacity	
<ul style="list-style-type: none"> ▶ Determine the permissible tyre load capacity from the tractor manufacturer's or tyre manufacturer's documentation. ▶ Enter double value in the results table. <ul style="list-style-type: none"> ■ For 2 tyres. 	

A.3 Results of axle load and ballasting for implement/tractor combinations

▶ Create a separate results table for each tractor used.

Data	Actual value acc. to calculation or measurement			Permissible value acc. to tractor operating manual			Double permissible tyre load capacity	
							■ 2 tyres	
Minimum ballasting front ¹	G_{Fmin}		kg			-		-
Minimum ballasting rear ¹	G_{Rmin}		kg			-		-
Total weight ²	G_{act}		kg	≤		kg		-
Front axle load ^{2, 3}	T_{Fact}		kg	≤		kg		kg
Rear axle load ^{2, 3}	T_{Ract}		kg	≤		kg		kg
Front axle load in percent ⁴	$T_{F\%} 20 \leq$		%					-
¹ Positive values: ballast required, negative values: ballast sufficient. ² The actual values must be less than or equal to the permissible values. ³ The actual values must be less than or equal to twice the tyre load capacity. ⁴ The front axle load must be at least 20 % of the tractor's tare weight.								

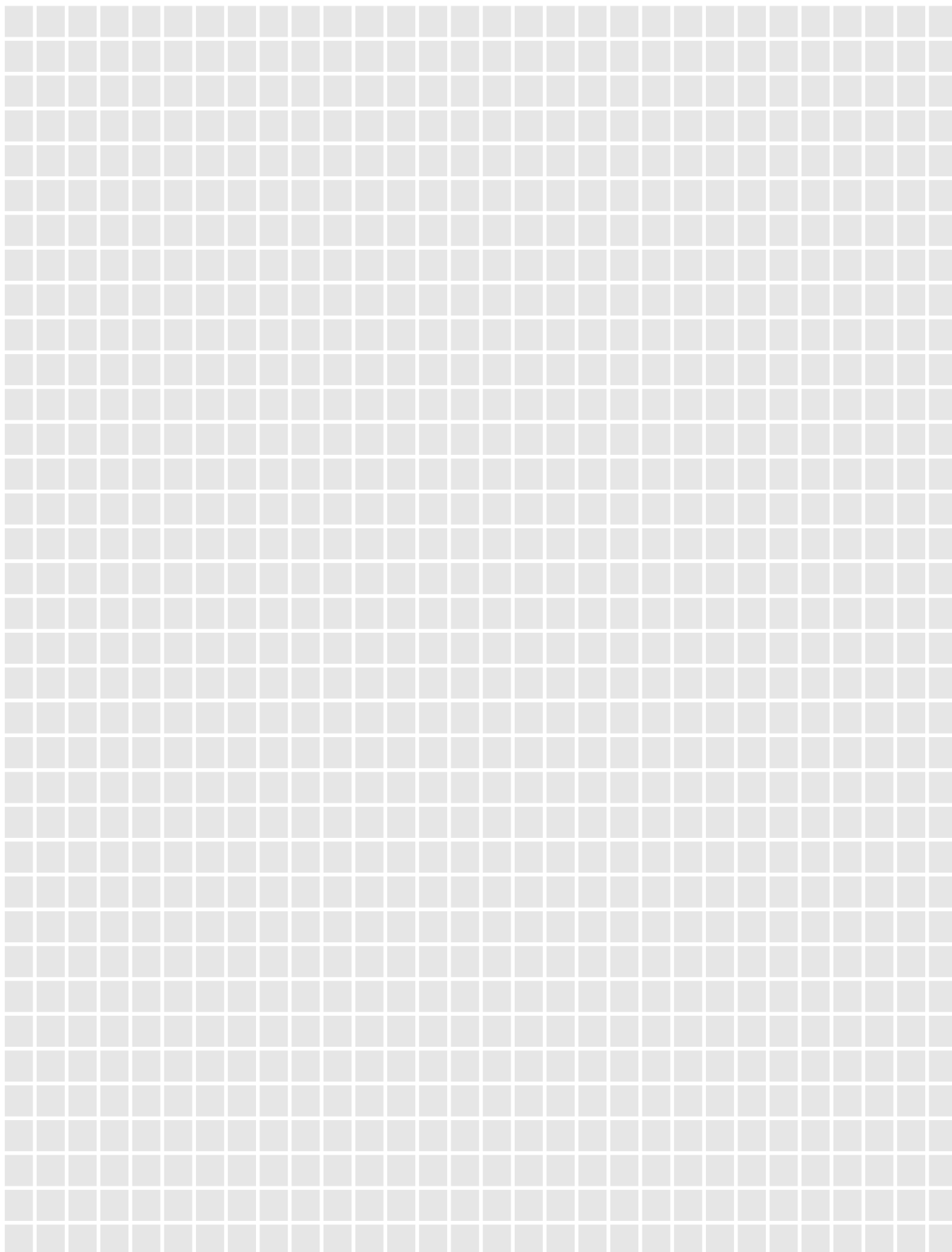
B Tightening torques for bolted connections

The following tightening torques and the corresponding preload forces apply to all bolted connections used without lubrication:

Diameter	Strength category		
	8.8	10.9	12.9
	Preload force [N] / Tightening torque [Nm]		
M4	3450 / 3,6	5050 / 5,3	5900 / 6,1
M5	5650 / 7,1	8250 / 10,0	9650 / 12,0
M6	7950 / 12,0	11700 / 18,0	13600 / 21,0
M8	14600 / 30,0	21400 / 44,0	25100 / 52,0
M10	23200 / 60,0	34100 / 87,0	39900 / 100,0
M12	33900 / 105,0	49800 / 151,0	58000 / 177,0
M14	46500 / 165,0	68500 / 240,0	80000 / 285,0
M16	64000 / 260,0	94000 / 380,0	110000 / 445,0
M18	80500 / 635,0	114000 / 520,0	134000 / 610,0
M20	103000 / 520,0	147000 / 740,0	172000 / 870,0
M22	129000 / 710,0	184000 / 1000,0	216000 / 1200,0
M24	149000 / 890,0	212000 / 1250,0	248000 / 1500,0
M27	196000 / 1350,0	279000 / 1900,0	327000 / 2200,0
M30	238000 / 1800,0	339000 / 2550,0	397000 / 3000,0

Friction value $\mu_{ges} = 0,20$

D Notes





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