



Version: 3.0 EN / Item no.: 00601-3-634

Operating instructions

PS 300 M1 D TWIN

Please read carefully before initial operation!

ORIGINAL OPERATING MANUAL



Table of Contents

1	General information.....	4
1.1	About this operating manual.....	4
1.2	Identification of the implement.....	5
1.3	Service.....	6
1.4	EC Declaration of Conformity.....	6
2	Description.....	7
2.1	Layout and functioning of the seed drill.....	7
2.2	Layout and function of the hydraulic fan (HG 300 M1).....	9
2.3	Layout and function of the fill level sensor.....	10
2.4	Scope of delivery.....	10
2.5	Technical data.....	11
3	Safety.....	12
3.1	Safety instructions in this document.....	12
3.2	Basic safety regulations.....	12
3.3	Intended use.....	13
3.4	Personnel requirements.....	13
3.5	Personal protective equipment.....	14
3.6	Safety devices.....	15
3.7	Dangers and safety measures.....	17
4	Transport, installation and commissioning.....	20
4.1	Attaching the seed drill to a soil tillage implement.....	20
4.2	Attaching the seed drill to a tractor.....	21
4.3	Installing the dispersion plates on the soil tillage implement.....	22
4.4	Connecting the hoses.....	24
4.5	Connecting the hydraulic fan (HF).....	25
5	Operation.....	27
5.1	Setting the hydraulic fan (HF).....	27
5.2	Setting and adjusting the spread rate.....	29
5.3	Regulating the seed flow rate (calibration test).....	30
5.4	Preparing the seeding shaft.....	31
5.5	Selecting the right seeding shaft.....	32
5.6	Changing the seeding shaft.....	32
5.7	Checking the ease of motion of the seeding shaft.....	35
5.8	Setting the brush pressure.....	35
5.9	Setting the air control flaps.....	36
5.10	Setting the fill level sensor.....	37
5.11	Filling the spreading material tank.....	38

5.12	Deactivating the agitator.....	39
6	Faults	41
6.1	Fault overview	41
7	Cleaning, maintenance, and repairs	41
7.1	Disconnecting the seed drill from the power supply.....	41
7.2	Emptying the seed tank.....	42
7.3	Cleaning the seed drill.....	43
7.4	Checking the hydraulic hoses	44
7.5	Repairs and service.....	44
8	Decommissioning, storage and disposal.....	45
8.1	Decommissioning the seed drill.....	45
8.2	Storage of the seed drill	45
8.3	Disposal.....	45
9	Accessories.....	46
9.1	HG 300 M1	46
9.2	Top link mounting kit for PS 120-500	46
10	Appendix.....	47
10.1	My idea	47
10.2	Connection diagram	48
10.3	Hydraulic diagram.....	50
10.4	Seeding tables.....	52
11	Index.....	57

1 General information

This section contains information on your seed drill and about this operating manual.

1.1 About this operating manual

Validity and purpose

This operating manual is valid for seed drills manufactured by APV with the type designation PS 300 M1 D TWIN.

This operating manual provides anyone who will be handling the seed drill with the required information to be able to perform the following tasks properly and safely:

- Installation
- Start-up
- Operation
- Maintenance
- Repairs
- Decommissioning, dismantling, recommissioning, storage and disposal

Target group

This operating manual is aimed at all those who will be handling the seed drill:

- Transporter
- Assembly personnel
- Operating personnel
- Maintenance and repair personnel

Parts of the document that must absolutely be read

To prevent injuries and damage to the implement, it is absolutely necessary to have read and understood the **Basic safety instructions** On page 12 section before handling the implement.

Copyright

The copyright for this operating manual remains with the manufacturer:

APV - Technische Produkte GmbH

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This operating manual contains regulations and technical drawings that may not, as a whole or in part, be reproduced, distributed or used in any unauthorised way for competitive purposes or passed on to others.

Passing on or reproduction of this operating manual, evaluation and communication of its contents are not authorised unless explicitly agreed. Contraventions shall result in an obligation to provide compensation for damages.

Information on manufacturer liability

The manufacturer is not liable for damage and malfunctions resulting from non-compliance with this operating manual.

1.2 Identification of the implement

Clear identification

The seed drill can be clearly identified by the following information on the rating plate:

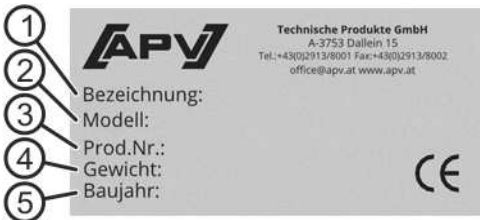
- Designation
- Model
- Production number

Position of the rating plate

The rating plate is located on the steel frame on the left side, near the handle over the motor cover.

Figure with the rating plate

The image shows the layout of the rating plate:



The data on the rating plate have the following meaning:

No.	Meaning
1	Designation
2	Model
3	Production number
4	Weight
5	Year of manufacture

1.3 Service

Service

Please contact our service address in the following cases:

- If you still have questions regarding the handling of the seed drill despite the information provided in this operating manual
- For spare parts orders
- To order maintenance and repair work

Service address

APV - Technische Produkte GmbH

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A-3753 Hötzelstdorf

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Telephone: +43 (0) 2913 8001

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1.4 EC Declaration of Conformity

Manufacturer

APV - Technische Produkte GmbH

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Implement

This Declaration of Conformity is valid for the following implement:

Pneumatic seeder of type

- PS 300 M1 D TWIN
- HG 300 M1

Observed guidelines

The implement and the optional devices fulfil the requirements of the following European Directives:

- 2006/42/EC Machinery Directive
- 2014/30/EU EMC Directive
- 2014/35/EU Low Voltage Directive

Applied standards

The following standards were applied:

- EN 14018 Agricultural and forestry machinery – Seeders – Safety
- EN 349 Safety of machinery – Minimum gaps to avoid crushing of parts of the human body
- EN 60204-1 Safety of machinery – Electrical equipment
- EN 953 Safety of machinery – Guards
- ISO 12100 Safety of machinery; General principles for design; Risk assessment and risk reduction
- ISO 13857 Safety of machinery – Safety distances

2 Description

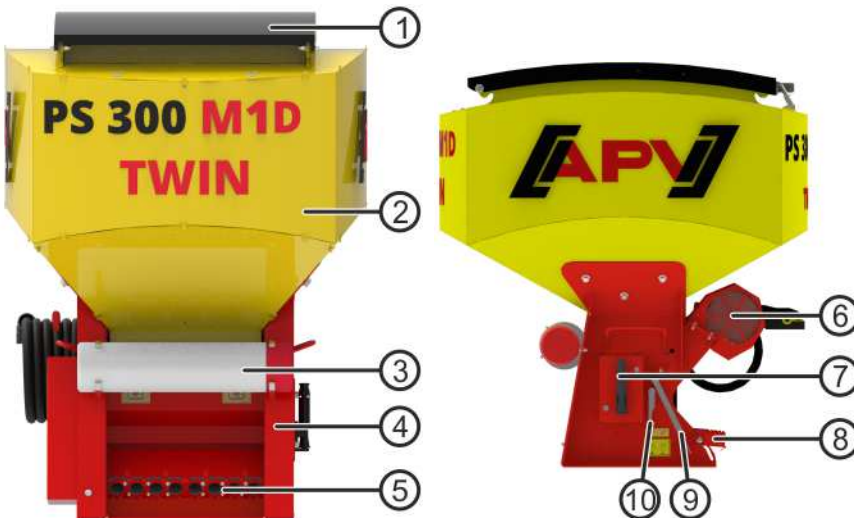
This section provides an overview of the technical characteristics of the seed drill.

2.1 Layout and functioning of the seed drill

The seed drill PS 300 M1 D TWIN

The seeder with the type designations PS 300 M1 D TWIN is a pneumatic seeder with electric seeding shaft drive. It is used to spread seed on grassland and cropland.

Seed drill layout



No.	Designation	Function
1	Seed tank cover	<ul style="list-style-type: none"> • Covering the seed tank. • Protecting the seed from moisture and foreign objects.
2	Seed tank	<ul style="list-style-type: none"> • Carrying the seed. • Conveying the seed to the agitator and seeding shaft.
3	Operating manual tube	<ul style="list-style-type: none"> • Storing the operating manual
4	Steel frame	<ul style="list-style-type: none"> • Hanging and connecting components of the seed drill.
5	Hose clamping plate	<ul style="list-style-type: none"> • Clamping the seed tube hoses onto the steel frame.
6	Electric fan	<ul style="list-style-type: none"> • Producing compressed air for conveying the seed.
7.1	Bearing cover	<ul style="list-style-type: none"> • Covering the access to the agitator and seeding shaft.
7.2	Hexagon key	<ul style="list-style-type: none"> • Tool for use on the implement
8	Calibration slide	<ul style="list-style-type: none"> • The seed flows from the seeding shaft through the calibration slide into the calibration bag.
9	Brush adjustment lever	<ul style="list-style-type: none"> • Pressing the brush more or less onto the seeding shaft.
10	Air regulation lever (on both sides)	<ul style="list-style-type: none"> • Increasing or reducing the opening of the air control flaps.

Mode of action of the seed drill

For the spreading of seeds, the following process takes place:

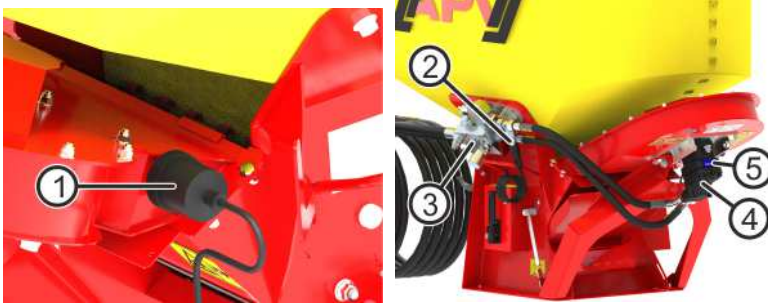
Phase	Description
1	The operator sets the implement up for operation and fills the seed tank with seed.
2	<p>The operator activates the seed drill using the controls. Result:</p> <ul style="list-style-type: none"> • The seeding shaft rotates. • The agitator rotates. • The fan produces compressed air.
3	The seed flows from the seed tank through the seeding shaft and is transported with compressed air through the hoses to the dispersion plates.
4	The seed is spread.

2.2 Layout and function of the hydraulic fan (HG 300 M1)

Task

The hydraulic fan serves to produce compressed air for conveying the seed.

Layout of the fan



No.	Designation	Function
1	Fan sensor (pressure monitor)	<ul style="list-style-type: none">• Preventing the seeding shaft from being switched on as long as the fan is not switched on.• Preventing blockage of the seed drill due to unintentional or early switching on of the seeding shaft.
2	Pressure switch	<ul style="list-style-type: none">• Reporting to the control box if the pressure is too high (> 10 bar) in the tank line.
3	Hydraulic block	<ul style="list-style-type: none">• Limiting the oil quantity to the hydraulic motor.
4	Hydraulic motor	<ul style="list-style-type: none">• Driving the fan.
5	Temperature measuring strips	<ul style="list-style-type: none">• Displaying the temperature of the hydraulic motor.

Functioning of the sensors

The fan sensor monitors the air pressure on the pressure side of the fan.

The pressure switch monitors the pressure in the tank line of the hydraulic motor.

As soon as one of the sensors reports an error, the message "Fan error" appears on the control box.

Functioning of the temperature measuring strip

The segments of the temperature measuring strip turn black when the respective temperature range has been reached or exceeded.

Temperatures above 80° C cause destruction of the gaskets in the hydraulic motor.

2.3 Layout and function of the fill level sensor

Task

The fill level sensor monitors the seed level in the seed tank for each seeding shaft.

Layout of the sensor



No.	Designation	Function
1	Fill level sensor	<ul style="list-style-type: none">• Reporting to the control box when the minimum fill level has been reached.
2	Assembly plate	<ul style="list-style-type: none">• Fastening point for the fill level sensor• Defines the minimum seed level.

Functioning of the sensor

As soon as the sensor detects seed, a signal is sent to the control box. If the signal is not sent, the minimum fill level has been reached.

2.4 Scope of delivery

The scope of delivery includes all assembly groups and components that are delivered as a standard by APV - Technische Produkte GmbH.

Pos.	Rate	Designation
1	1	Basic implement
1.1	1	Steel frame
1.2	1	Seed tank
1.3	1	Extra seeding shaft (standard accessory)
2	1	Counter plate
3	8	Dispersion plate along with fastening material
4	4	Hexagonal bar
5	1	Hose roll (25 m)
6	2	Calibration bag
7	1	Calibration scale
8	1	Hexagon key (fastened on the steel frame)

2.5 Technical data

Mechanical data

Implement version	Size	Value
PS 300 M1 D TWIN	Max. tank content	150 l / 150 l
	Weight	100 kg
	Dimensions (H x W x D in cm)	110 x 77 x 100

Hydraulic fan (HF)	Weight	23 kg
	Dimensions (H x W x D in cm)	27 x 46 x 40

Hydraulic lines	Length of the pressure line	6 m
	Length of the motor line	< 1 m
	Length of the tank line	6 m

Electrical data

Values for supply from the electric fan:

Size	Value
Supply voltage	12 V
Supply current	40 A
Power consumption of the electric fan	25 A when starting

Hydraulic data

Values for supply from the hydraulic fan:

Size	Value
Maximum pressure	180 bar
Maximum oil quantity	38 l/min

Spreading widths

Recommended spreading width: 1 - 6 m

Maximum spreading widths:

Drive type	Maximum spreading width
Electric fan	6 m
Hydraulic fan	12 m (with 16 outlets)
PTO shaft blower fan	12 m (with 16 outlets)

Mounting categories

CAT I – III (only with three-point linkage)

3 Safety

This section contains all requirements and measures that ensure safe operation of the seed drill.

3.1 Safety instructions in this document

What are safety instructions?

Safety instructions are information that serve to prevent personal injuries. Safety instructions contain the following information:

- Type of danger
- Possible consequences in case of non-compliance with the instructions
- Measures to prevent personal injury

3.2 Basic safety regulations

Target group for these regulations

These regulations are aimed at all those who will be handling the seed drill.

Purpose of these regulations

These regulations aim to ensure that all persons who will be handling the seed drill are thoroughly informed about the dangers and safety measures and observe the safety instructions in the operating manual and on the seed drill. If you do not follow these regulations, you are at risk of injury and material damage.

Handling the operating manual

Observe the following regulations:

- Read the Safety section and the section relating to your work completely. You must understand these contents.
- Always keep the operating manual close to the seed drill for reference purposes. There is a container for this installed on the seed drill.
- When passing on the seed drill, be sure to pass on the operating manual.

Handling the seed drill

Observe the following regulations:

- Only persons who fulfil the requirements defined in this operating manual may handle the seed drill.
- Only use the seed drill for the intended purpose.
- Never use the seed drill for other purposes that may seem similar.
- Observe all of the safety measures that are indicated in this operating manual and on the seed drill.
- Do not make any modifications to the seed drill, e.g. by removing parts or mounting unauthorised parts.
- When replacing defective parts, only use original spare parts or standard parts

approved by the manufacturer.

Operator obligations toward the personnel

As the operator, you have to ensure the following:

- The personnel fulfils the requirements corresponding to his work.
- The personnel has read and understood this operating manual before handling the seed drill.
- The regulations applicable in your country for safety at work are being observed.

Procedure in case of accident

The seed drill is designed and built so that the personnel can work without risk. Despite all precautions, however, unforeseeable accidents can still occur under unfavourable circumstances.

Always observe your company's guidelines regarding accidents.

More information on the subject of

- **Intended use of the seed drill** On page 13
- **Personnel requirements** On page 13
- **Dangers and safety measures** On page 17

3.3 Intended use

The pneumatic seeders of types PS 300 M1 D TWIN are used to spread seed with different properties and grain sizes on open fields.

The implements are designed solely for normal use in agricultural operations. Only cereal varieties that are intended by the manufacturer and listed in the operating manual may be used. Different seeding shafts are designed for the different cereal varieties, which must be used and replaced if necessary. The seed drill can also be used to spread fertiliser with a seeding shaft designed for this purpose (intended use).

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.

Intended use also includes compliance with the conditions for operation, maintenance, and repairs prescribed by the manufacturer.

The applicable accident prevention regulations as well as the other general safety-related and occupational health regulations must also be observed.

The manufacturer is not liable for any damage resulting from unauthorised modifications and the use of components and auxiliary parts.

3.4 Personnel requirements

The implement may only be used, maintained and repaired by persons who have relevant experience and were instructed on the risks. The safety instructions must also be handed over to other users.

Qualification

Persons who will be handling the seed drill must fulfil the following requirements:

Personnel	Activities	Required qualification
Forwarder	<ul style="list-style-type: none">• Transport of the seed drill from one business to another	<ul style="list-style-type: none">• Experience with transport of machinery• Qualification of a transport specialist for machinery
Transporter	<ul style="list-style-type: none">• Transport of the implement within the farm	<ul style="list-style-type: none">• Forklift driver• Experience with handling the suitable lifting gear
Installer	<ul style="list-style-type: none">• Installation and commissioning of the seed drill	<ul style="list-style-type: none">• Trained mechanic
Setter	<ul style="list-style-type: none">• Setting up the seed drill	<ul style="list-style-type: none">• Experience in the agricultural field• Experience with handling the seed drill
Operator	<ul style="list-style-type: none">• Operating the seed drill on the farm• Cleaning the seed drill	<ul style="list-style-type: none">• Trained assistant
Maintenance personnel	<ul style="list-style-type: none">• Performing maintenance work• Performing repair work	<ul style="list-style-type: none">• Trained mechanic
Disposer	<ul style="list-style-type: none">• Disposal of the seed drill	<ul style="list-style-type: none">• Disposal specialist

3.5 Personal protective equipment

The personnel must be equipped with the following personal protective equipment and wear it if necessary:

- Hearing protection
- Mask
- Safety shoes with non-slip soles

3.6 Safety devices

Meaning of the safety devices

The seed drill has safety devices that protect the user from danger. All safety devices must be equipped and functional when operating the seed drill.

Location of the guards

The picture shows the location of the safety devices:



Function of the safety devices

The safety devices have the following function:


No.	Designation	Function
1	Bearing cover	Protection against reaching into the running agitator.

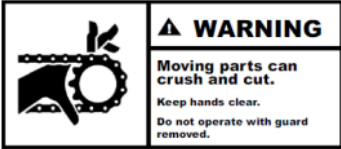





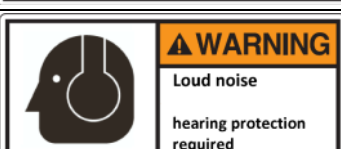

Purpose

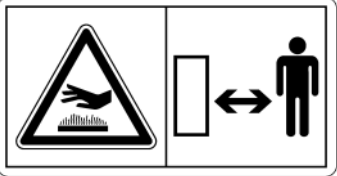



Warning signs on the seed drill warn about danger points. The warning signs must always be present and legible.

Overview

The table shows all warning signs that are installed on the seed drill and their meaning.

Appearance of the sign	Meaning of the sign
	Risk of injury due to thrown parts! Maintain a safe distance from the implement during operation.

Appearance of the sign	Meaning of the sign
 <p>▲ WARNING Moving parts can crush and cut. Keep hands clear. Do not operate with guard removed.</p>	Risk of injury due to moving parts! Only work with mounted covers.
 <p>▲ WARNING Do not operate without guards in place</p>	Risk of injury due to rotating parts! Only operate the implement when the cover is installed.
 <p>▲ WARNING Do not start, operate or service machine until you read and understand operator's manual.</p>	Read and observe the operating manual before operating the implement!
 <p>▲ WARNING Read and understand operator's manual before using this machine. Failure to follow operating instructions could result in death or serious injury.</p>	Read and observe the operating manual before working with the implement! Operating errors can lead to serious injuries.
 <p>▲ WARNING Moving parts present. Serious injury to hands or fingers. Keep hands away from moving parts. Disconnect and lock-out power before servicing.</p>	Risk of injury due to rotating parts! Do not reach into rotating parts. When working on the implement, switch these off and disconnect from the power supply.
 <p>▲ WARNING Injection Hazard High pressure fluid injection into body.</p>	Be careful with escaping high-pressure liquids!
 <p>▲ WARNING Loud noise hearing protection required</p>	Use hearing protection!
 <p>▲ CAUTION Burn hazard. Hot surface. Do not touch.</p>	Hot surface! Do not touch!

Appearance of the sign	Meaning of the sign
	Maintain a safe distance from hot surfaces!
	Risk of injury due to rotating parts! Maintain a safe distance from rotating parts.
	Risk of injury due to rotating parts! When the implement is running, keep the guards closed.
	Use hearing protection!

3.7 Dangers and safety measures

Overview

The seed drill is designed such that the user is protected from all avoidable dangers that are practical in design terms. Due to the purpose of the seed drill, however, there are residual dangers that require precautionary measures to be avoided.

In the following, you will be informed about the types of these residual dangers and their effects.

Transport

Danger	Where and in which situations does the danger occur?	Countermeasure
Risk of crushing due to the weight of the implement	When lifting and lowering the implement	The implement may only be transported by personnel trained for this task.

Installation

Danger	Where and in which situations does the danger occur?	Countermeasure
Risk of crushing due to the weight of the implement	When lifting and lowering the implement	The implement may only be transported with a forklift or lift truck by personnel trained for this task.
Risk of slipping, stumbling and falling	When mounting the implement on a soil tillage implement or on the tractor	Work must be performed on sturdy steps with non-slip safety shoes.

Set-up

Danger	Where and in which situations does the danger occur?	Countermeasure
Risk of injury due to moving parts	When setting the spread rate, which must be done with the seeding shaft cover removed	The spread rate may only be adjusted exactly according to the operating manual by trained personnel.
Risk of injury due to moving parts when the implement is accidentally switched on	When the agitator is activated, which must be done with the seeding shaft cover removed	Make sure that the implement is disconnected from the power supply to prevent sudden start-up of the implement.
Danger due to defective implement parts	When operating the implement	Before operating the implement, always check for fractures, cracks, chafe marks, leaks, loose bolts, vibrations, sounds and function.

Operation

Danger	Where and in which situations does the danger occur?	Countermeasure
Risk of injury due to rotating parts	When handling the implement during operation	Make sure that the covers for the agitator are closed during operation.
Risk of injury due to seed being thrown out	While spreading seed.	Always ensure that there is nobody standing in the spreading range of the implement.

Danger	Where and in which situations does the danger occur?	Countermeasure
Risk of slipping, stumbling and falling	When handling the implement during operation	Only enter the implement area using sturdy steps with non-slip safety shoes.
Hearing damage due to implement noise	When operating the implement	Use hearing protection.
Risk of poisoning due to toxic seed types	While spreading seed.	Wear a mask when handling toxic seed types.

Cleaning

Danger	Where and in which situations does the danger occur?	Countermeasure
Risk of poisoning with toxic seed types	When cleaning the implement with compressed air	Wear a mask when handling toxic seed types.

Maintenance and repairs

Danger	Where and in which situations does the danger occur?	Countermeasure
Incorrectly or inadequately performed maintenance work with limited visibility	Under poor light conditions	If necessary, maintenance must be performed with additional lighting.

4 Transport, installation and commissioning

In this section, you will learn which work steps must be performed for the installation and commissioning of the seed drill, and what must be done and observed.

4.1 Attaching the seed drill to a soil tillage implement

Purpose

For operation on the field, the seed drill can be attached to a soil tillage implement, such as a cultivator or a harrow. The attachment must be installed individually.

Requirements

The following requirement must be fulfilled for this work step:

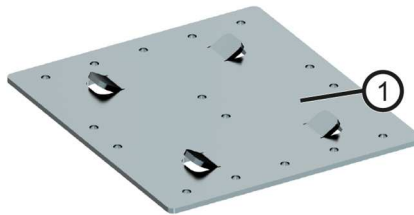
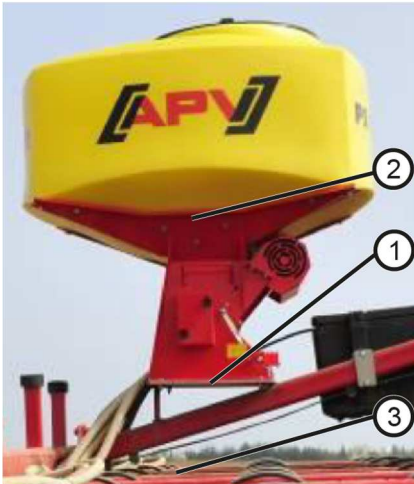
- The implement is disconnected from the power source, see **Disconnecting the seed drill from the power source** On page 41.

Required components, tools and materials

For this work step, the following components, tools and materials are required:

- Counter plate
- Bolts with $\text{Ø} > 10 \text{ mm}$, strength class 8.8 or higher
- Self-locking fastenings (nuts)
- Lifting gear that is suitable for the respective implement version, see **Technical Data** On page 11 for more information.

Overview



No.	Designation
1	Counter plate
2	Seed drill
3	Soil tillage implement

Procedure

To attach the seed drill on a soil tillage implement:

Step	Description
1	Fasten the counter plate (1) on the soil tillage implement (3). The counter plate must be parallel to the ground.
2	Use the lifting gear to place the seeder (2) on the counter plate (1).
3	Fasten the seeder (2) with bolts and nuts on the counter plate (3).

4.2 Attaching the seed drill to a tractor

Purpose

For operation on the field, the seed drill can be attached directly to a tractor.

Requirements

The following requirement must be fulfilled for this work step:

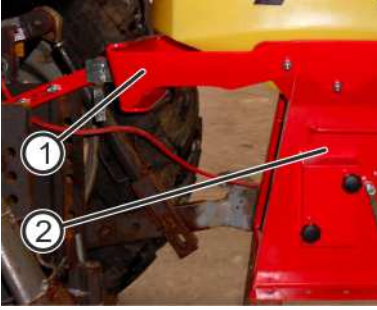
- The implement is disconnected from the power source, see ***Disconnecting the seed drill from the power source*** On page 41.

Required components, tools and materials

For this work step, the following components, tools and materials are required:

- Suitable component for attachment (e.g. top link mounting kit, pallet fork or three-point loader)
- Bolts M 12, strength class 8.8 or higher
- Self-locking fastenings (nuts)
- Lifting gear that is suitable for the mass of the respective implement version, see ***Technical Data*** On page 11 for more information

Overview



No.	Designation
1	Top link mounting kit
2	Seed drill

Procedure

To attach the seed drill to a tractor using the top link mounting kit:

Step	Description
1	Fasten the top link mounting kit (1) with bolts and nuts onto the seed drill (2).
2	Fasten the top link (1) with the bolts onto the tractor.
3	Using lifting gear, move the seed drill (2) close to the tractor and mount the top link in the top link bracket. Using the counter plate, clamp the seeder onto the tractor linkage drawbar.

4.3 Installing the dispersion plates on the soil tillage implement

Purpose

The dispersion plates serve to fix the hoses, through which the spreading material flows, at the right spot and spread the seed.

Requirements

The following requirement must be fulfilled for this work step:

- None

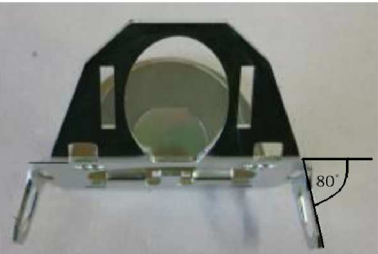
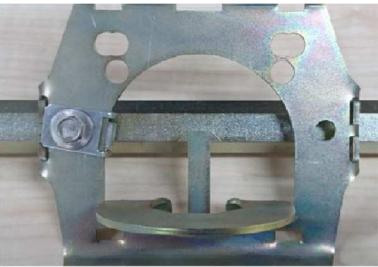
Required components, tools and materials

For this work step, the following components, tools and materials are required:

- Dispersion plates
- Hexagon shaft
- Bolts
- Washers
- Pliers
- Hexagon key

Procedure for mounting with hexagon shaft

This is how to install the dispersion plates on the soil tillage implement.

Step	Description	Explanation/illustration
1	Using the pliers, bend the tabs on the sides of the dispersion plates down by 80°.	Result:  A photograph showing a black dispersion plate being bent downwards. A white line indicates the angle of the bend, which is labeled as 80°.
2	Distribute the dispersion plates evenly across the entire working width of the soil tillage implement. Maximum spacing of the dispersion plates: 75 cm	
3	Push the hexagon shaft through the two hexagonal holes in the tabs on the sides of the dispersion plate intended for this purpose.	
4	Using the supplied bolts and washers, fasten the dispersion plates onto the hexagon shaft.	Result:  A photograph showing a metal dispersion plate with a central hole and two side holes. A hexagonal shaft is inserted through the side holes, and a bolt and washer are used to secure it.
5	Fasten the hexagon shaft equipped with the dispersion plates onto the soil tillage implement at a distance of 40 cm from the ground.	

Step	Description	Explanation/illustration
6	Connect the hoses to the dispersion plates, see Connecting the hoses On page 24 for more information.	

4.4 Connecting the hoses

Purpose

The hoses convey the seed from the seed drill onto the field. Before initial operation, the hoses have to be cut to the required length and installed on the dispersion plates and the seed drill.

Requirements

The following requirement must be fulfilled for this work step:

- None

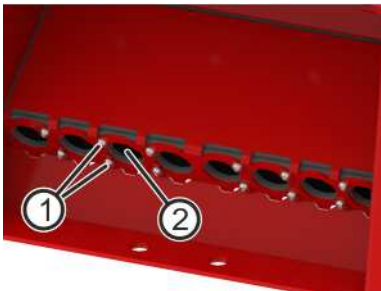
Required components, tools and materials

For this work step, the following components, tools and materials are required:

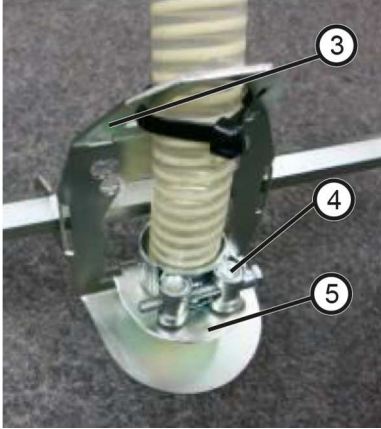
- Hose roll
- Cutting tool
- Torx screwdriver TX 30
- Silicone spray

Procedure

This is how you connect the hoses to the seed drill:

Step	Description	Illustration
1	Using the cutting tool, cut off pieces from the hose roll in the required length for each transition piece.	
2	Slightly loosen the clamping screws (1) on the clamping plate using a Torx screwdriver.	
3	Insert the ends of the hoses into the transition pieces (2) up to the stop. NOTE: If it is too difficult to insert the hoses, use silicone spray on the outside of the hose.	
4	Tighten the clamping screws (1).	

This is how to connect the hoses to the soil tillage implement and dispersion plates:

Step	Description	Illustration	
1	Push the end of the hose through the opening in the large tab (3) on the dispersion plate.	 A close-up photograph of a mechanical assembly. A yellow corrugated hose is inserted into a large tab (3) on a metal dispersion plate. A fastening clip (4) is used to secure the hose. The clip is held in place by a holding finger (5) which is hooked onto the plate. The entire assembly is mounted on a white plastic base.	
2	Fix the end of the hose with the fastening clip (4).		
3	Install the fastening clip (4) on the dispersion plate (5). In doing so, install the fastening clip so that <ul style="list-style-type: none">the holding finger is positioned between the hose and the fastening clip.it is fixed by the hooks on the holding finger.		

4.5 Connecting the hydraulic fan (HF)

Purpose

The hydraulic fan is used for operation with working widths up to 12 m or for higher spread rates of e.g. wheat.

Requirements

The following requirement must be fulfilled for this work step:

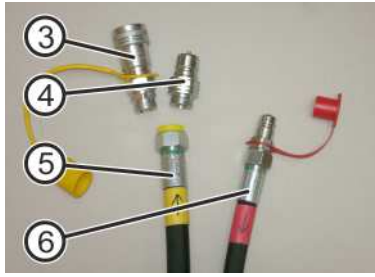
- The hydraulic system is depressurized both on the tractor and implement side.

Required components, tools and materials

For this work step, the following components, tools and materials are required:

- Coupling connector or coupling sleeve (for initial operation)

Overview



No.	Designation
1	Hydraulic block
2	Flow control valve
3	Coupling sleeve (alternative)
4	Coupling connector
5	Return line
6	Pressure line

Procedure

This is how to connect the hydraulic fan:

Step	Description
1	Completely close the flow control valve (2) on the hydraulic block (1).
2	Connect the return line (5) (marked in yellow, BG4) without reduction to the return flow connection of the tractor hydraulic system. For initial operation: Remove the plastic plug on the return line and connect the coupling plug (4) or the coupling sleeve (3) with the return line.
3	Connect the pressure line (6) (marked in red, BG3) with a pressure connection of the tractor hydraulic system.

5 Operation

In this section, you will learn how to properly configure the seed drill and the seed flow rate, and how to adjust it during operation.

5.1 Setting the hydraulic fan (HF)

Purpose

The hydraulic fan produces an air current that carries the seed through the hoses to the dispersion plates.

The required air pressure and air quantity depend strongly on the seed (type and weight), the spread rate, working width and speed. For this reason, it is not possible to give precise specifications for the correct fan settings, it must be determined in field trials! Reference values for the fan setting can be found in the setting table for the flow control valve.

Requirements

The following requirement must be fulfilled for this work step:

- The hydraulic fan is connected, see also **Connecting the hydraulic fan (HF)** On page 25.

Required components, tools and materials

For this work step, the following components, tools and materials are required:

- None

Overview



No.	Designation
1	Hydraulic block
2	Flow control valve

Procedure

This is how to set the hydraulic fan:

Version 1 (Constant pump – non-adjustable oil quantity on the tractor)

Step	Description
1	Completely close the flow control valve (2) on the hydraulic block (1).
2	Start up the blower fan (tractor engine speed as in field operation).
3	Adjust the fan speed using the flow control valve (2) on the control block.

Version 2 (Variable pump - oil quantity adjustable on the tractor):

Step	Description
1	Completely open the flow control valve (2) on the hydraulic block (1).
2	Completely close the flow control valve on the tractor (set the oil quantity to zero).
3	Start up the fan and run up to the desired fan speed (slowly increase the oil quantity).

Setting table for the flow control valve

(valid for approx. 50°C oil temperature)

Working width 3 m			
Seed	Rate	Pressure	Speed
Fine seed	5 kg/ha	5 bar	1400 rpm
Fine seed	30 kg/ha	15 bar	2900 rpm
Coarse seed	50 kg/ha	18 bar	3000 rpm
Coarse seed	100 kg/ha	19 bar	3100 rpm
Working width 6 m			
Fine seed	5 kg/ha	8 bar	1550 rpm
Fine seed	30 kg/ha	20 bar	3300 rpm
Coarse seed	50 kg/ha	21 bar	3400 rpm
Coarse seed	100 kg/ha	22 bar	3500 rpm
Working width 12 m			
Fine seed	5 kg/ha	10 bar	1650 rpm
Fine seed	30 kg/ha	35 bar	4000 rpm
Coarse seed	50 kg/ha	39 bar	4200 rpm
Coarse seed	100 kg/ha	41 bar	4300 rpm

5.2 Setting and adjusting the spread rate

Purpose

The setting for the spread rate, which is spread by the seed drill during the seeding process, has a significant effect on the seeding results.

Requirements

The following requirement must be fulfilled for this work step:

- None

Procedure

This is how to set and adjust the spread rate:

Step	Description
1	Perform a calibration test to determine the current spread rate, see Performing a calibration test On page 30 for more information.
2	If necessary, take measures to adjust the spread rate. Suitable measures are: <ul style="list-style-type: none">• Selection of the seeding shaft, see Selecting the right seeding shaft On page 32 for more information.• Selection of the brush pressure, see Setting the brush pressure On page 35 for more information.• Adjustment of the working width, see Installing dispersion plates on the soil tillage implement On page 22 for more information.• Adjusting the tractor speed.

Calculating the spread rate

The spread rate can be calculated using the following formula:

$$StM = \frac{m_{gew} \times v_{Traktor} \times b_{Arbeit}}{600}$$

SpR: spread rate in kg/min

m(wgt): desired spread rate in kg/ha

v(tractor): speed of the tractor in km/h

w(working): working width in m

5.3 Regulating the seed flow rate (calibration test)

Purpose

During the calibration test, the seed quantity for a specific area is defined.

Requirements

The following requirement must be fulfilled for this work step:

- The implement is disconnected from the power source, see **Disconnecting the seed drill from the power source** On page 41.

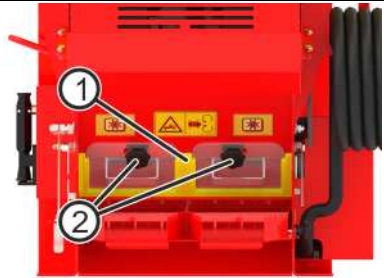

Required components, tools and materials

For this work step, the following components, tools and materials are required:

- Calibration bags

Procedure

This is how to perform a calibration test:

Step	Description	Explanation
1	Loosen the star knob screws (2) on the seeding shaft cover (1) and remove the seeding shaft cover.	
2	Loosen the star knob screw (3) on the calibration slide (4). Pull the calibration slide to the front, lift the rear part and push it up towards the seeding shaft. Retighten the star knob screws (3) on the calibration slide (4).	
3	Hook the calibration bags onto the calibration slide.	
5	Select a suitable brush pressure, see Setting the brush pressure On page 35.	
6	Switch on the seed drill.	
7	Start the seeding program of the seed drill, refer to the control box operating manual for more information.	

5.4 Preparing the seeding shaft

Purpose

Preparation of the seeding shaft serves to prepare for changing the seeding shaft.

Requirements

The following requirements must be fulfilled for this work step:

- The right seeding shaft is selected, see **Selecting the right seeding shaft** On page 32 for more information.

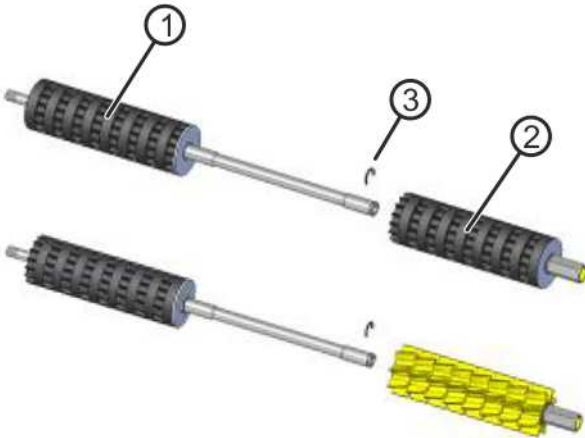
Required components, tools and materials

For this work step, the following components, tools and materials are required:

- None

Overview

Divided seeding shaft:



No.	Designation
1	Inner seeding shaft
2	Outer seeding shaft
3	Locking ring

Procedure

This is how to prepare the seeding shaft:

Step	Description
1	Pull the locking ring (3) off of the inner seeding shaft (1).
2	Pull the outer seeding shaft (2) off of the inner seeding shaft (1).

Step	Description
3	Put the new outer seeding shaft (2) onto the inner seeding shaft (1).
4	Put the locking ring (3) back onto the inner seeding shaft (1).

5.5 Selecting the right seeding shaft

Purpose

By selecting the right seeding shaft, which is suitable for the seed type, the seeding results are significantly improved.

Requirements

The following requirement must be fulfilled for this work step:

- None

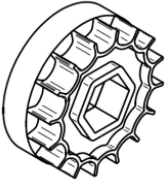

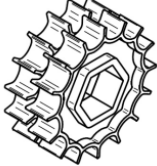
Required components, tools and materials

For this work step, the following components, tools and materials are required:

- None

Table of available seeding shafts

From the following tables, select the seeding shaft that is suitable for your purposes:

Standard equipment		Available as an option
		
fb-f	Flex20	f-f
<ul style="list-style-type: none"> • Mustard • Clover • Phacelia • Micro granules 	<ul style="list-style-type: none"> • Cereals • Fertiliser • Buckwheat 	<ul style="list-style-type: none"> • Grass • Cereals • Cress

5.6 Changing the seeding shaft

Purpose

By installing the right seeding shaft, the seeding results are significantly improved.

Requirements

The following requirements must be fulfilled for this work step:

- The implement is disconnected from the power source, see **Disconnecting the seed drill from the power source** On page 41.

- The seed tank is empty, see **Emptying the seed tank** On page 42 for more information.
- The right seeding shaft is selected and ready, see **Selecting the right seeding shaft** On page 32 for more information.

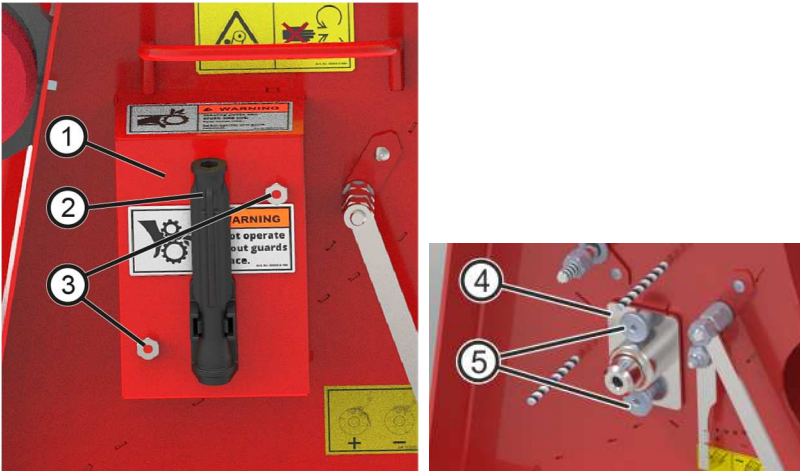
Required components, tools and materials

For this work step, the following components, tools and materials are required:

- Hexagon key

Overview

Access to the agitator and the required tool:





No.	Designation
1	Bearing cover
2	Hexagon key holder
3	Cover nuts
4	Bearing flange
5	Knurled nuts

Procedure

This is how to change the seeding shaft:

Step	Description	Explanation
1	Take the hexagon key from the holder (2).	
2	Loosen the cover nuts (3) on the bearing cover (1).	
3	Remove the bearing cover (1).	

Step	Description	Explanation
4	Loosen the knurled nuts (5).	
5	Remove the bearing flange (4).	<p>Result:</p> 
6	<p>Screw the bearing flange turned by 180° onto the seeding shaft and pull out the seeding shaft.</p> <p>NOTE: Residual seed can fall out in the process.</p>	
7	Insert the new seeding shaft.	
8	Turn the seeding shaft until the fitted key of the gearbox motor engages in the groove of the seeding shaft.	
9	Slide the bearing flange onto the seeding shaft.	
10	Tighten the knurled nuts on the bearing flange by hand.	
11	Fit the bearing cover on the two threaded rods and tighten the cover nuts with the hexagon key.	
12	Check the seeding shaft for ease of motion, see Checking the ease of motion of the shaft On page 35 for more information.	

5.7 Checking the ease of motion of the seeding shaft

Purpose

Each time the seeding shaft is installed or replaced, it must be checked for ease of motion. This check is performed by a hearing test.

Requirements

The following requirement must be fulfilled for this work step:

- The seed tank is empty, see **Emptying the seed tank** On page 42 for more information.

Required components, tools and materials

For this work step, the following components, tools and materials are required:

- None

Procedure

This is how to check the ease of motion of the seeding shaft:

Step	Description
1	Switch on the seed drill.
2	Perform the hearing test.
3	If the sound of the running seeding shaft is noticeably loud or irregular, contact the maintenance and repair service, see Contact service On page 6 for more information.

5.8 Setting the brush pressure

Purpose

The brush pressure on the seeding shaft is regulated using the brush adjustment lever.

Requirements

The following requirement must be fulfilled for this work step:

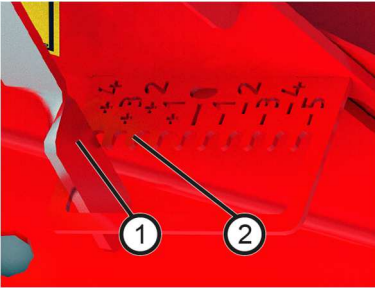
- None

Required components, tools and materials

For this work step, you need the following components, tools and materials:

- None

Overview



No.	Designation
1	Brush adjustment lever
2	Setting scale

Procedure

This is how to set the brush pressure:

Step	Description
1	Pull the brush adjustment lever (1) out of the setting scale.
2	Move the brush lever to the desired position and engage it in the appropriate notch of the setting scale. The following orientation rules apply here: <ul style="list-style-type: none">• For fine seed, increase the brush pressure up to -5.• For coarse seed, reduce the brush pressure up to +4.

5.9 Setting the air control flaps

Purpose

The air control flaps regulate the air supply to the seeding shaft.

Requirements

The following requirement must be fulfilled for this work step:

- None

Required components, tools and materials

For this work step, you need the following components, tools and materials:

- None

Overview



No.	Designation
1	Air regulation lever
2	Setting scale

Procedure

This is how to set the air control flaps:

Step	Description
1	Pull the air regulation lever (1) out of the setting scale.
2	<p>Move the air regulation lever to the desired position and engage it in the appropriate notch of the setting scale.</p> <p>The following orientation rules apply here:</p> <ul style="list-style-type: none">• Increase the air current in the + direction. The normal setting is completely open.• Reduce the air current in the - direction. For coarse seed types, to have a greater distance from the seeding shaft and therefore avoid damage to the seeding shaft; if short, descending hoses are used on one side and more air is required on the other side.• If less air is required for both seeding shafts, reduce the fan speed on the control box.

5.10 Setting the fill level sensor

Purpose

The setting of the fill level sensor determines the minimum fill level and adjusts the sensor for the seed type.

Requirements

The following requirement must be fulfilled for this work step:

- The seed tank is empty, see **Emptying the seed tank** On page 42 for more information.

Procedure

This is how to set the minimum fill level:

Step	Description
1	Loosen the nuts on the sensor.
2	Move the sensor on the assembly plate to the desired height and tighten the nuts.

Setting the intensity

The intensity of the sensor can be adjusted using the potentiometer (small slotted screw) on the rear side of the sensor to adapt it to the respective seed type. To check the sensor and the setting, cover the front side of the sensor with your hand. The sensor is functional and correctly set when the LED on the rear side of the sensor then lights up.

5.11 Filling the spreading material tank

Purpose

The seed tank stores the seed to be spread.

Requirements

The following requirement must be fulfilled for this work step:

- The implement is disconnected from the power source, see **Disconnecting the seed drill from the power source** On page 41.

Required components, tools and materials

For this work step, the following components, tools and materials are required:

- Seed

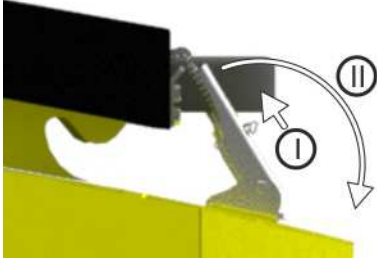
Overview



No.	Designation
1	Seed tank cover
2	Seed tank
3	Flap fastener with lock

Procedure

This is how to fill the seed tank:

Step	Description	Explanation
1	Unlock the lock (I) and open (II) the flap fasteners (3).	
2	Open the cover (1). CAUTION: Starting at a certain opening angle, the cover opens automatically by means of a gas pressure spring.	
3	Fill the seed into the corresponding part of the seed tank.	
4	Close the cover (1).	
5	Push the the flap fasteners (3) closed until the lock engages.	

5.12 Deactivating the agitator

Purpose

With light and fine seed, the agitator prevents bridging and therefore ensures continuous seed flow in the seed drill.

Requirements

The following requirements must be fulfilled for this work step:

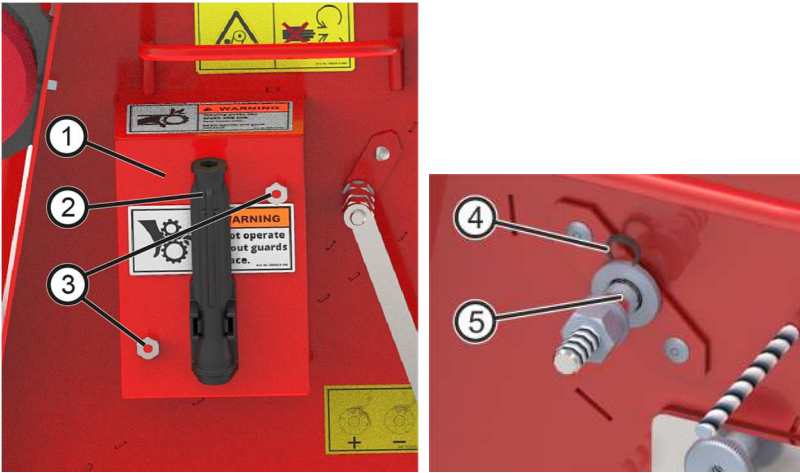
- The implement is disconnected from the power source, see **Disconnecting the seed drill from the power source** On page 41.

Required components, tools and materials

For this work step, the following components, tools and materials are required:

- Hexagon key
- Locking ring

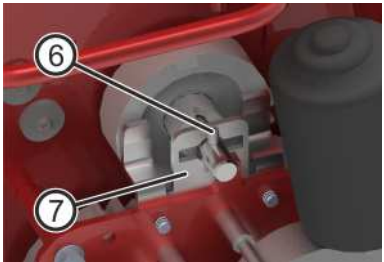
Overview



No.	Designation
1	Bearing cover
2	Hexagon key holder
3	Cover nuts
4	Locking ring
5	Agitator shaft

Procedure

This is how to deactivate the agitator:

Step	Description	Explanation
1	Open the bearing cover (1). To do so, loosen the cover nuts (3) with the hexagon key.	
2	Pull the locking ring (4) off of the agitator shaft (5) and put it aside.	
3	Push in the agitator shaft.	
4	With a rotating movement, push the female pin (6) through the guide duct (7) on the motor side and turn clockwise up to the stop.	Result: 
5	Close the bearing cover (1).	

6 Faults

In this section, you will find information for eliminating faults that may occur during operation.

6.1 Fault overview

Problem	Cause	Remedy
The seeding shaft does not rotate when the drive shaft of the gearbox motor is rotating	<ul style="list-style-type: none">• The fitted key fell out of the drive shaft	<ul style="list-style-type: none">• Stick on a new fitted key
The seed hoses get clogged	<ul style="list-style-type: none">• Fan speed is too low	<ul style="list-style-type: none">• Check the fan speed and increase if necessary

You can find more information on other faults in the operating manuals for the respective control boxes.

If the problem could not be fixed, please contact the manufacturer. You can find information for this under **Contact Service** On page 6.

7 Cleaning, maintenance, and repairs

In this section, you will learn how to clean and maintain the seed drill, and what to do in case of damage or failure of the implement.

7.1 Disconnecting the seed drill from the power supply

Purpose

Setup and maintenance work often require that the seed drill is disconnected from the power supply.

Requirements

The following requirements must be fulfilled for this work step:

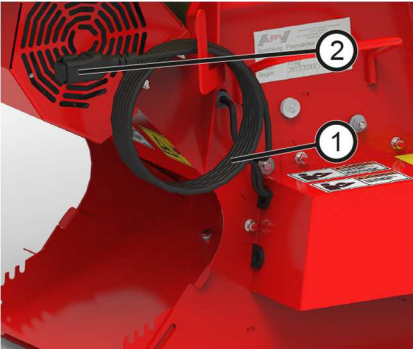
- None

Required components, tools and materials

For this work step, the following components, tools and materials are required:

- None

Overview



No.	Designation
1	Implement cable
2	Main plug of the implement cable

Procedure

This is how to disconnect the seed drill from the power supply:

Step	Description
1	Pull out the power supply plug from the control box or Pull out the implement cable plug from the control box or Switch off the control box

7.2 Emptying the seed tank

Purpose

Before cleaning or decommissioning, the seed remaining in the seed drill must be removed from the seed tank.

Requirements

The following requirement must be fulfilled for this work step:

- The implement is disconnected from the power source, see ***Disconnecting the seed drill from the power source*** On page 41.

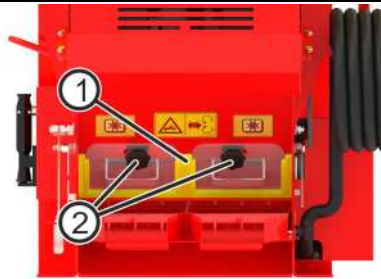

Required components, tools and materials

For this work step, the following components, tools and materials are required:

- None

Procedure

This is how to empty the seed tank:

Step	Description	Explanation
1	Loosen the star knob screws (2) on the seeding shaft covers (1) and remove the seeding shaft cover.	
2	Loosen the star knob screw (3) on the calibration slide (4). Pull the calibration slide to the front, lift the rear part and push it up towards the seeding shaft. Retighten the star knob screws (3) on the calibration slide (4).	
3	Start the emptying program of the control box, refer to the control box operating manual for more information.	

7.3 Cleaning the seed drill

Purpose

The seed drill must be cleaned inside and out on a regular basis to ensure long-term proper functioning. If not cleaned properly, germs can form inside the seed drill due to seed residues.

Requirements

The following requirements must be fulfilled for this work step:

- The implement is disconnected from the power source, see **Disconnecting the seed drill from the power source** On page 41.

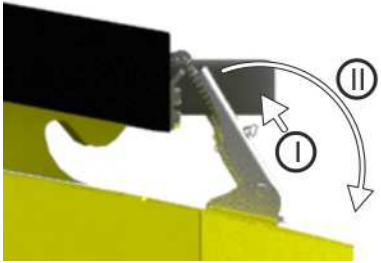
Required components, tools and materials

For this work step, the following components, tools and materials are required:

- Air compressor
- Moist cloth

Procedure

To clean the seed drill:

Step	Description	Explanation
1	Empty the seed tank, see Emptying the seed tank On page 42 for more information.	
2	Unlock the lock (I) and open (II) the flap fasteners (3).	
3	Open the cover (1). CAUTION: Starting at a certain opening angle, the cover opens automatically by means of a gas pressure spring.	
4	Clean the inside of the seed drill and the seed paths with compressed air.	
5	Clean the outside of the seed drill with a moist cloth.	

7.4 Checking the hydraulic hoses

Have the hydraulic hoses checked annually by a qualified technician. The inspection intervals to be observed may be regulated by regional laws and regulations.

According to DIN 20066, all hydraulic hoses must be replaced after 6 years at the latest.

7.5 Repairs and service

In case of failure or damage to the seed drill, please contact the manufacturer. You can find information for this under **Contact Service** On page 6.

8 Decommissioning, storage and disposal

In this section, you will learn how to decommission the seed drill, store it for longer periods of time, and dispose of it.

8.1 Decommissioning the seed drill

Purpose

To ensure that the seed drill remains fully functional even if it is out of operation for longer periods of time, it is important to take precautions for storage.

Procedure

This is how to prepare the seed drill for storage:

Step	Description
1	Completely remove all seed from the seed drill.
2	Clean the seed drill inside and out, see <i>Cleaning the seed drill</i> On page 43 for more information.
3	Set the brush adjustment lever to Position "+4".
4	Store the seed drill in a dry place to prevent the formation of germs inside the implement.

8.2 Storage of the seed drill

The seed drill must be stored in a dry place protected from weather conditions to ensure that it remains functional even if it is stored for a longer period of time.

8.3 Disposal

Disposal of the seed drill must be performed according to the local disposal regulations for machines.

9 Accessories

In this section, you will find a selection of possible accessories for your implement.

9.1 HG 300 M1

The HG 300 M1 is a hydraulically driven radial fan for working widths up to 12 m or for higher spread rates for e.g. wheat.

It is very resistant to dust and foreign objects, since these do not easily accumulate.

For mounting on the PS 120/200/300 M1 and PS 500 M2, a complete mounting kit including a transition piece and brace is available.



Scope of delivery:

- 1 HG 300 M1
- 1 Support
- 1 Flow regulator incl. hydraulic hoses

Order number:

Item no.: 08001-2-044

9.2 Top link mounting kit for PS 120-500

With the top link mounting kit (three-point linkage), you can attach the PS 120/200/300 M1, PS 500 M2 to a CAT 1 – CAT 3 three-point hitch.



Scope of delivery:

- 1 Three-point linkage

Order number:

Item no.: 04000-2-114

10 Appendix

10.1 My idea

The **PS 300 M1 D TWIN** was extensively developed and tested. It took a long time from the initial idea to serial production. It required lots of commitment from the entire development team.

Nonetheless, the most valuable experience is gained in practice. Our motto:
"Inspired by Farmers & realized by Professionals."

This is how customer proximity of the development department creates a leading edge for you and APV.

Tell us about the positive and negative experiences you have had with the implement. Share your suggestions for improvement and your ideas with us:

meineidee@apv.at

Take pictures or make hand-drawn sketches! We are open and grateful for any information, no matter in what form.

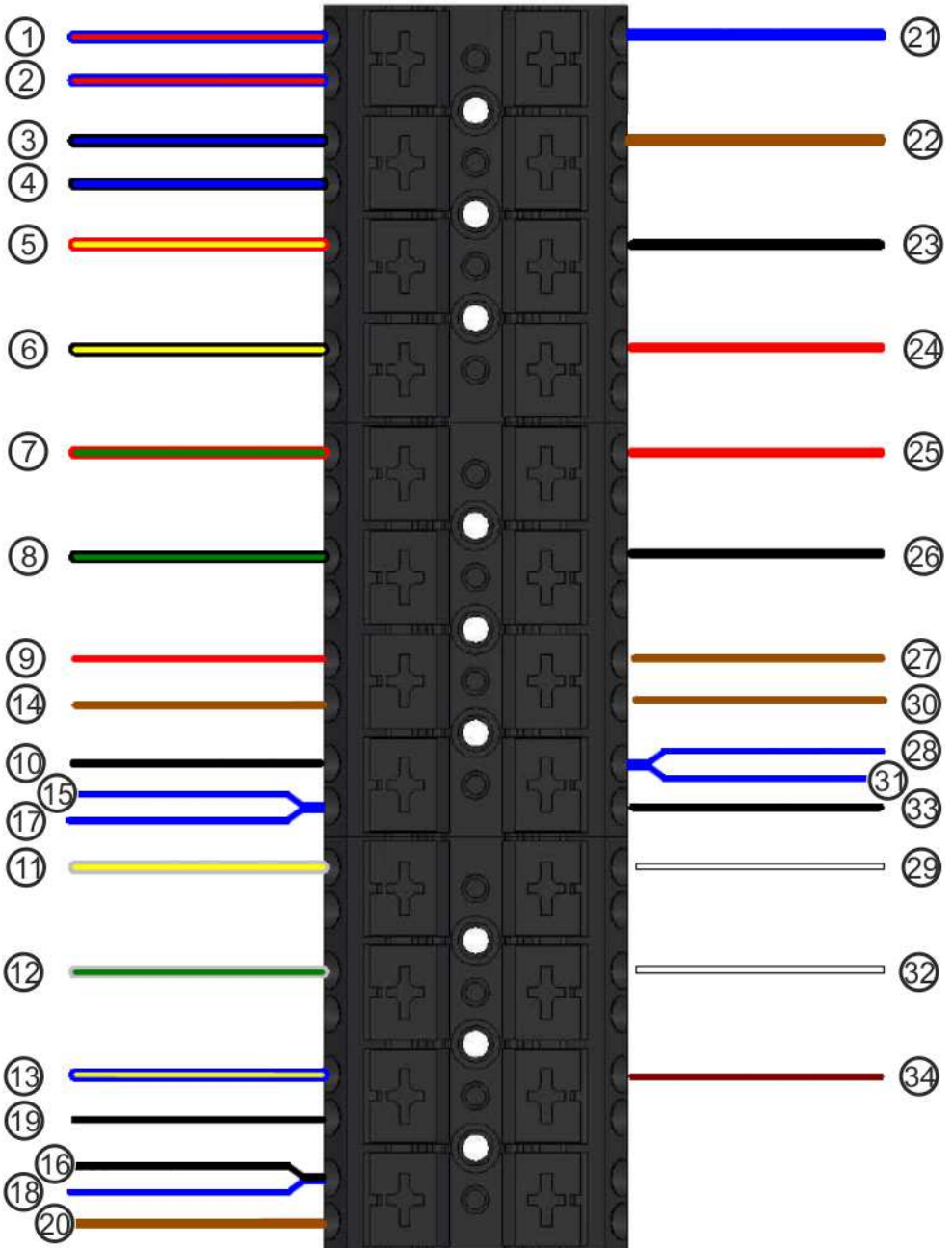
Your information goes directly to the leading developers at APV.

I would like to thank you in advance for your involvement and wish you lots of fun with your APV product!

Sincerely yours

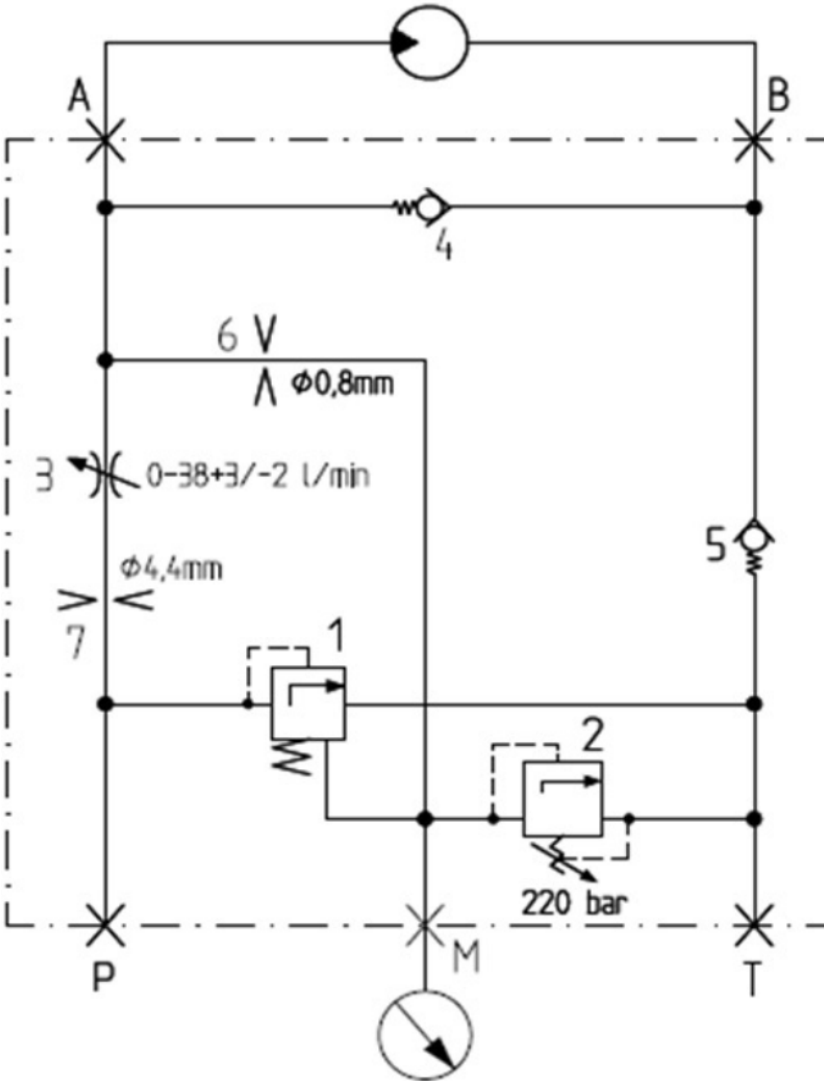
Your Head of Development & Customer Service

10.2 Connection diagram



No.	Description	Colour	Cross-section (mm ²)
1	Implement cable (pin 59)	Red-blue	2.5
2	Implement cable (pin 59)	Red-blue	2.5
3	Implement cable (pin 62)	Black-blue	2.5
4	Implement cable (pin 62)	Black-blue	2.5
5	Implement cable (pin 57)	Red-yellow	2.5
6	Implement cable (pin 60)	Black-yellow	2.5
7	Implement cable (pin 58)	Red-green	2.5
8	Implement cable (pin 61)	Black-green	2.5
9	Implement cable (pin 41)	red	1.0
10	Implement cable (pin 49)	Black	1.0
11	Implement cable (pin 1)	White-yellow	0.5
12	Implement cable (pin 2)	White-green	0.5
13	Implement cable (pin 5)	Blue-yellow	0.5
14	Fan speed sensor (optional HF)	brown	0.75
15	Fan speed sensor (optional HF)	Blue	0.75
16	Fan speed sensor (optional HF)	Black	0.75
17	Pressure switch (only HF)	Blue	1.5
18	Pressure switch (only HF)	brown	1.5
19	Hydraulic switch (only HF)	Black	1.5
20	Hydraulic switch (only HF)	brown	1.5
21	Fan (not with HF)	Blue	4.0
22	Fan (not with HF)	brown	4.0
23	Seeding shaft motor I	Black	1.5
24	Seeding shaft motor I	red	1.5
25	Seeding shaft motor II	red	1.5
26	Seeding shaft motor II	Black	1.5
27	Fill level sensor I	brown	0.75
28	Fill level sensor I	Blue	0.75
29	Fill level sensor I	white	0.75
30	Fill level sensor II	brown	0.75
31	Fill level sensor II	Blue	0.75
32	Fill level sensor II	white	0.75
33	Calibration button (optional)	Black	0.75
34	Calibration button (optional)	brown	0.75

10.3 Hydraulic diagram



Pos.	Description
A	G 1/2" (bolted connection XGE 15 LR-ED) Max. hose length 1 m Motor-side connection B
B	G 1/2" (bolted connection XGE 15 LR-ED) Max. hose length 1 m Motor-side connection A

Pos.	Description
P	G ½" (bolted connection XGE 18 LR-ED) Max. hose length 6 m Coupling connector BG3 Marked in red Max. flow rate 80 l/min Max. pressure 220 bar
T	G ¾" (bolted connection XGE 22 LR-ED) Max. hose length 6 m Coupling connector (or coupling sleeve) BG4 Marked in yellow

10.4 Seeding tables

	Gras Grass Herbe Lolium perenne		Wheat Wheat Blé Triticum		Barley Barley Orge Hordeum		Blue lupine Blue Lupine Lupin Bleu Lupinus angustifolius
Rate	kg/min	kg/min	kg/min	kg/min	kg/min	kg/min	kg/min
Seeding shaft	f-f	Flex20	f-f	Flex20	f-f	Flex20	Flex20
2	0.03	0.14	0.07	0.34	0.09	0.27	0.21
5	0.11	0.31	0.08	0.58	0.24	0.44	0.56
10	0.25	0.59	0.10	0.99	0.49	0.71	1.13
20	0.52	1.15	0.14	1.79	0.98	1.26	2.28
30	0.69	1.71	0.79	2.59	1.48	1.81	3.44
40	0.78	2.28	2.06	3.39	1.97	2.36	4.60
50	0.86	2.84	3.32	4.19	2.47	2.91	5.76
60	0.97	3.40	3.64	4.99	2.56	3.80	6.72
70	1.07	3.96	3.97	5.80	2.66	4.69	7.69
80	1.17	4.53	4.29	6.60	2.76	5.58	8.65
90	1.27	5.09	4.62	7.40	2.86	6.48	9.62
95	1.34	5.37	4.93	7.80	2.90	6.92	10.86
100	1.41	5.65	5.24	8.20	2.95	7.37	12.10

	Oats Oats Avoine Avena		Mustard Mustard Moutarde Sinapis Alba		Alfalfa Alfalfa Alfalfa Medicago Sativa		Oil rape seed Rape Colza Brassica Napus
Rate	kg/min	kg/min	kg/min	kg/min	kg/min	kg/min	kg/min
Seeding shaft	fb-f	Flex20	fb-f	f-f	fb-f	f-f	fb-f
2	0.01	0.08	0.04	0.17	0.10	0.15	0.12
5	0.02	0.23	0.15	0.38	0.21	0.35	0.22
10	0.04	0.49	0.33	0.73	0.40	0.69	0.38
20	0.07	1.01	0.68	1.43	0.79	1.37	0.72
30	0.12	1.52	1.00	2.12	1.15	2.03	1.04
40	0.17	2.01	1.29	2.78	1.49	2.68	1.32
50	0.22	2.50	1.58	3.45	1.82	3.34	1.62
60	0.24	2.93	1.72	3.81	1.90	3.70	1.76
70	0.26	3.36	1.86	4.17	1.97	4.07	1.90
80	0.27	3.79	2.00	4.53	2.04	4.44	2.02
90	0.27	4.23	2.14	4.89	2.12	4.81	2.16
95	0.28	4.37	2.31	5.18	2.24	5.17	2.30
100	0.31	5.12	2.48	5.46	2.36	5.53	2.44

	Red clover Red Clover Trèfle Rouge Trifolium		Phacelia Phacelia Phavélie Phacelia tanacetigolia		Pea Pea Pois Pisum sativum	Horse gram Field beans Féveroles Macrotyloma uniflorum	Chia WHITE
Rate	kg/min	kg/min	kg/min	kg/min	kg/min	kg/min	kg/min
Seeding shaft	fb-f	f-f	fb-f	f-f	Flex20	Flex20	fb-f
2	0.04	0.28	0.14	0.17	0.46	0.46	0.05
5	0.15	0.69	0.31	0.39	0.68	0.66	0.12
10	0.33	1.36	0.61	0.75	1.02	1.00	0.24
20	0.70	2.71	1.19	1.47	1.72	1.68	0.47
30	1.06	3.50	1.52		2.42	2.36	
40	1.41	3.73	1.59		3.12	3.04	
50	1.76	3.96	1.66		3.84	3.71	
60	1.87	4.18	1.85		4.54	4.39	
70	1.98	4.41	2.04		5.24	5.07	
80	2.09	4.64	2.23		5.94	5.75	
90	2.20	4.87	2.42		6.64	6.43	
95	2.33	5.17	2.52		7.00	6.77	
100	2.46	5.47	2.62		7.34	7.11	

	Florex	DC 37 bulk	PHYSIOSTART		Force		
Rate	kg/min	kg/min	kg/min	kg/min	kg/min		
Seeding shaft	fb-f	Flex20	fb-f	Flex20	fb-f		
2	0.00	0.62	0.21	0.61	0.12		
5	0.08	0.93	0.30	0.93	0.19		
10	0.21	1.43	0.46	1.45	0.30		
20	0.46	2.45	0.78	2.51	0.54		
30	0.72	3.46	1.10	3.56	0.77		
40	0.98	4.48	1.41	4.61	1.00		
50	1.23	5.49	1.73	5.66	1.23		
60	1.49	6.51	20.5	6.72	1.46		
70	1.75	7.52	2.36	7.77	1.69		
80	2.00	8.46	2.65	8.83	1.93		
90	2.26	8.93	2.79	9.60	2.16		
95	2.39	9.16	2.87	9.98	2.27		
100	2.52	9.39	2.99	10.52	2.35		

11 Index

A

- About this operating manual • 4
- Accessories • 46
- Appendix • 47
- Attaching the seed drill to a soil tillage implement • 20
- Attaching the seed drill to a tractor • 21

B

- Basic safety regulations • 12

C

- Calibration test • 30
- Changing the seeding shaft • 32
- Checking the ease of motion of the seeding shaft • 34, 35
- Checking the hydraulic hoses • 44
- Cleaning the seed drill • 43, 45
- Cleaning, maintenance, and repairs • 41
- Connecting the hoses • 24
- Connecting the hydraulic fan (HF) • 25, 27
- Connection diagram • 48

D

- Dangers and safety measures • 13, 17
- Deactivating the agitator • 39
- Decommissioning the seed drill • 45
- Decommissioning, storage and disposal • 45
- Description • 7
- Disconnecting the seed drill from the power supply • 20, 21, 30, 32, 38, 39, 41, 42, 43
- Disposal • 45

E

- EC Declaration of Conformity • 6
- Emptying the seed tank • 33, 35, 37, 42, 44

F

- Fault overview • 41
- Faults • 41

- Filling the spreading material tank • 38

G

- General information • 4

H

- HG 300 M1 • 46
- Hydraulic diagram • 50

I

- Identification of the implement • 5
- Installing the dispersion plates on the soil tillage implement • 22, 29
- Intended use • 13

L

- Layout and function of the fill level sensor • 10
- Layout and function of the hydraulic fan (HG 300 M1) • 9
- Layout and functioning of the seed drill • 7

M

- My idea • 47

O

- Operation • 27

P

- Personal protective equipment • 14
- Personnel requirements • 13
- Preparing the seeding shaft • 31

R

- Regulating the seed flow rate (calibration test) • 29, 30
- Repairs and service • 44

S

- Safety • 4, 12
- Safety devices • 15
- Safety instructions in this document • 12
- Scope of delivery • 10
- Seeding tables • 52
- Selecting the right seeding shaft • 29, 31, 32, 33

Service • 6, 35, 41, 44

Setting and adjusting the spread rate •
29

Setting the air control flaps • 36

Setting the brush pressure • 29, 30, 35

Setting the fill level sensor • 37

Setting the hydraulic fan (HF) • 27

Storage of the seed drill • 45

T

Technical data • 11, 20, 21

Top link mounting kit for PS 120-500 •
46

Transport, installation and
commissioning • 20

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