

TPF 6 - 8
Serial No. TPF0003318 -



*Thank you for choosing Väderstad as your supplier!
We hope that our products will increase your profitability
and contribute to you having successful crops on your farm.*

*Warm regards,
The Stark Family*

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1 Declaration of conformity and machine identity

1.1 Declaration of conformity



EC declaration of conformity

Väderstad AB, Box 85, 590 21 Väderstad, SWEDEN

hereby declares that the products named below have been manufactured in conformance with the Council's directive

2006/42/EC

and

2014/30/EU

The declaration above covers the following machines:

Tempo F 6, Tempo F 8 serial

no:TPF0003318- TPF0010000

Väderstad 2022-04-04

A handwritten signature in black ink, appearing to read 'Markus Sjöberg'. The signature is written in a cursive, flowing style.

Markus Sjöberg

Technical Product Manager Precision Drilling

Väderstad AB

Box 85, 590 21 Väderstad

The undersigned is authorised to provide technical documentation for the machines named above.

Declaration of conformity and machine identity

1.2 UK Declaration of conformity

Applicable for machines with UKCA marking



UK declaration of conformity

Vaderstad AB, PO Box 85, SE-590 21 Vaderstad, SWEDEN

hereby declares that the products named below have been manufactured in conformance with

The Supply of Machinery (Safety) Regulations 2008

and

Electromagnetic Compatibility Regulations 2016

The declaration above covers the following machine:

Tempo F 6, Tempo F 8

Serial no: TPF0003318– TPF0010000

Vaderstad 2022–04–04

A handwritten signature in black ink, appearing to read 'Markus Sjöberg', is written over a light grey signature line.

Markus Sjöberg

Technical Product Manager Precision Drilling

Vaderstad AB

The undersigned is authorised to provide technical documentation for the machines named above.

1.3 Nameplate

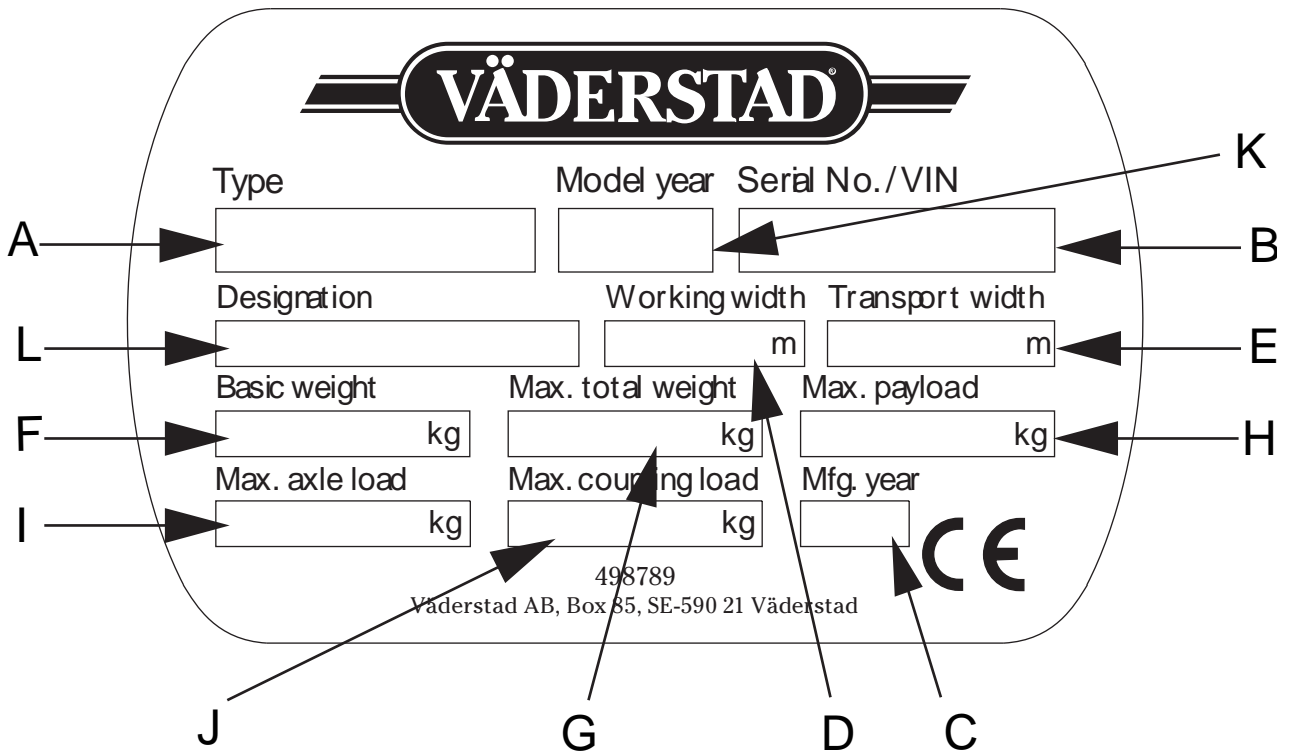


Figure 1.1

- A. Machine type
- B. Serial number (always quote your serial number when ordering spare parts or when you are having your machine serviced or making a complaint)
- C. Year of manufacture
- D. Working width
- E. Transport width
- F. Tare weight of the basic machine
- G. Maximum total weight
- H. Maximum permitted payload
- I. Maximum permitted axle load
- J. Maximum coupling load (at the tractor's hitching point)
- K. Model year
- L. Use

1.4 Machine plate; specific for TPF type-approved according to EU 167/2013

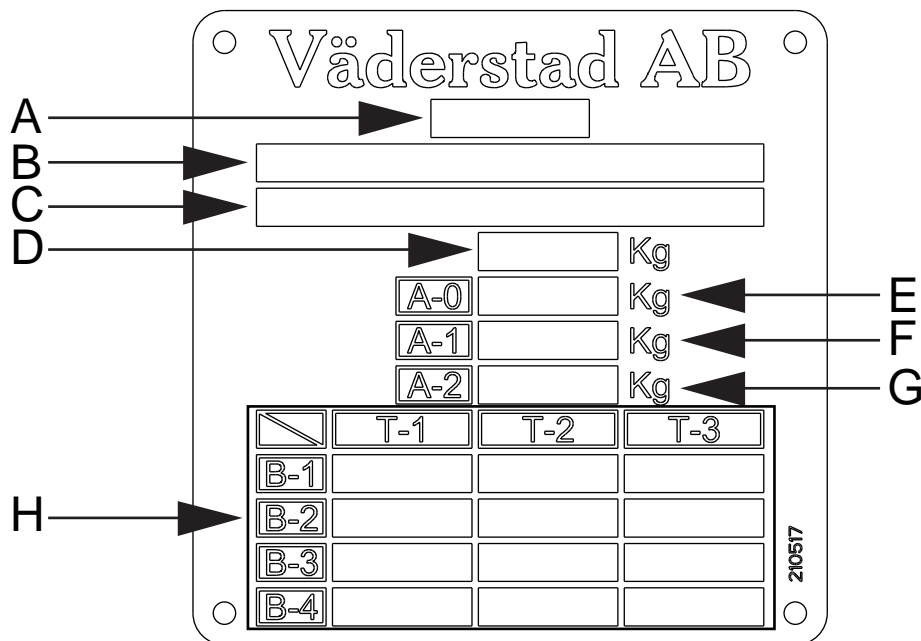


Figure 1.2

- A. Machine category
- B. Type-approval number
- C. VIN-number
- D. Total weight (excluding coupling load, empty seed hopper)
- E. Weight at hitching point
- F. Weight at wheel row 1
- G. Weight at wheel row 2
- H. Approved weights for machine-towed equipment

1.5 Technical Data

Table 1.1

Tempo F	TPF 6	TPF 6	TPF 8	TPF 8
Row spacing(mm)	700, 750, 762	800	700, 750, 762	800
Number of row units	6	6	8	8
Transport width (m)	3,0	3,3	3,0	3,3
Transport height (m)¹	4,0	4,0	4,0	4,0
Seed hopper volume (litres)	70	70	70	70
Volume, micro-granulate hopper (litres)	17	17	17	17
Volume fertiliser hopper (litre)	1275	1275	1700	1700
Max. implement load on hitching hook, seed only (kg)	600	600	800	800
Max. implement load on hitching hook, combi (kg)	900	900	1300	1300
Machine weight when empty (kg) , Seed only (kg)	2700	2700	3400	3400
Machine weight when empty (kg), Combi (kg)	3300	3300	4200	4200
Machine weight maxload, Seed only (kg)	3100	3100	4000	4000
Machine weight maxload, Combi (kg)	5000	5000	6500	6500
Power requirement (hp)	100 – 200	100 – 200	140–250	140–250
Machine width when extended (m)	4,2 – 4,6	4,8	5,6 – 6,1	6,4

1. Inclusive bout marker arm (optional)

Declaration of conformity and machine identity

1.6 Technical data; specific to TPF type-approved according to EU 167/2013



The type-approval becomes invalid should the machine be modified to such an extent that the data in the table below is no longer applicable.

The table below specifies technical data specific to TPF type-approved according to EU 167/2013. Otherwise, general Technical Data applies to the basic machine, see “1.5 Technical Data”

Table 1.2

Tempo F	TPF 6	TPF 6	TPF 8	TPF 8
Permissible total weight during conveyance by road (excluding coupling load, empty seed hopper)	3500 kg	3500 kg	3500 kg	3500 kg
Max. coupling load during conveyancing by road	1300 kg	1300 kg	1300 kg	1300 kg
Permissible axle load during conveyancing by road	3500 kg	3500 kg	3500 kg	3500 kg
Tyre load capacity at 40 km/h	3500 kg	3500 kg	3500 kg	3500 kg
Rear hitching point	—	—	—	—
Number of row units	6	6	8	8
Row spacing (mm)	700	750/762	700	750/762
Permissible tyre dimensions	10.0–75–15.3	11.5–80–15.3	10.0–75.15.3	11.5–80.15.3
Min. load and speed index	127A8	127A8	127A8	127A8

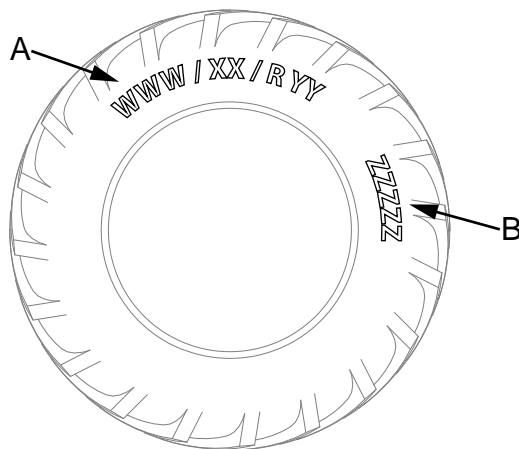


Figure 1.3

- A. Permissible tyre dimensions
- B. Min. load and speed index

2 General safety regulations

2.1 Obligations and responsibilities

These instructions are to be regarded as for guidance only and entail no responsibility whatsoever on the part of Väderstad AB and/or its representatives. Full responsibility for the use, transportation, maintenance and servicing of the machine lies with the owner/driver. These instructions cover a large number of machine configurations.

Local conditions affecting crop rotation, soil type, climate, etc. may require procedures different to those mentioned in these instructions.

It is the full responsibility of the owner/driver to ensure that the machine is used correctly in all respects. The owner is also responsible for ensuring that all individuals who use the machine have read and understood this instruction manual and that they work in accordance with all valid provisions and regulations.

If an individual working with the machine detects any safety defects, these must be addressed immediately.

All Väderstad machines have passed quality assurance inspections and operational tests prior to delivery. However, the user/owner shall bear full responsibility for the machine functioning correctly when in use in the field. In the event of a complaint, please refer to the "General delivery provisions for the Väderstad Group".

Design modifications form a part of the continual improvement of our machines. Descriptions of the machine therefore refer to the form and design of the machine at the time of writing. The user manual may contain images that show a machine that does not look exactly like the one you have received, depending on which optional additions have been fitted, the model, or whether any updates have been carried out. Some descriptions in these instructions may not be relevant to your machine.

The operating instructions are designed according to the guidelines of the ISO 3600 standard.

2.2 Before using the machine

- A. Carefully read through these instructions and ensure that you have understood their content.
- B. Learn to use the machine correctly and carefully! In the wrong hands or if carelessly operated, the machine can become a dangerous implement.
- C. The machine will form a part of your workplace and the workplace of your colleagues. It is therefore important to ensure that everyone is protected and that functioning safeguards are in place.

2.3 How to read these instructions

Letters within brackets refer to corresponding letters in the image and are used as a reference in a text.

- A. Reference (A)
- B. Reference (B)

Information for which the order is important is indicated using numbered action instructions.

When referring to images, figures are also used in the same way as the alphabetical list if the references outnumber the letters in the alphabet.

1. Start by...
2. Then ...

2.4 Description of Safety Symbols



Always pay extra attention to texts or figures indicated by this symbol. The symbol indicates dangers that **may result in** death, serious bodily harm or considerable material damage if actions are not taken to avoid them



Always pay extra attention to texts or figures indicated by this symbol. The symbol indicates dangers that **may result in** death, serious bodily harm or considerable material damage if actions are not taken to avoid them



A signal word used to indicate a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. However, such distinctions can be too subtle to affect behaviour (or to be translated). In certain circumstances, signal phrases such as "DANGER OF DEATH", "RISK OF BLINDING", or "BEWARE OF FUMES" can be more effective at drawing greater attention to some instructions or safety information than signal words.



This indicates a special situation or an activity required for proper machine handling. Failure to follow these instructions may cause disruption to the machine or to its surroundings.



Information marked with this symbol may be worth noting as it relates to a useful tip or a particularly useful piece of information that will help you handle the machine properly.



Used to clarify information.

General safety regulations

- Used to present information in the form of bullet points. The order in which the information is set out is not indicative of any particular order of precedence which must be followed.

2.5 Warning decals

2.5.1 Locations of warning decals

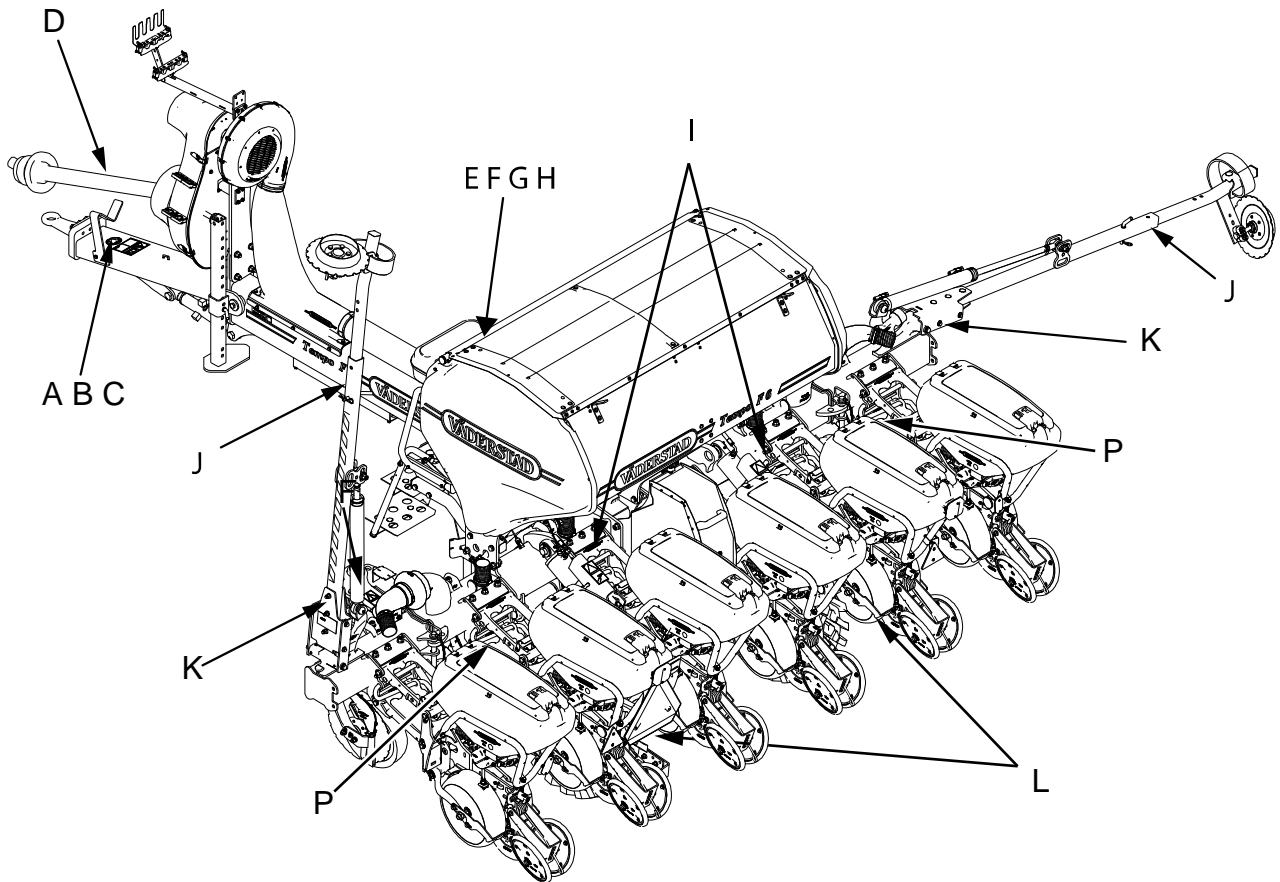


Figure 2.1

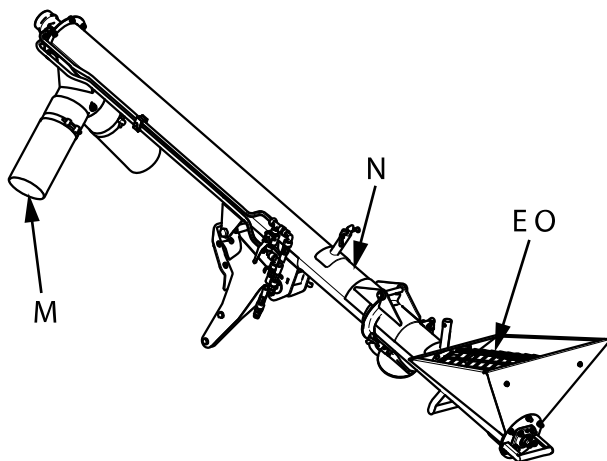
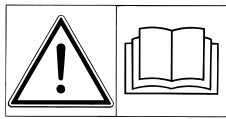


Figure 2.2

General safety regulations

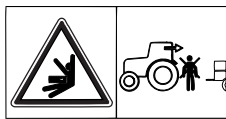
2.5.2 Content of warning decals

A.



Carefully read through these instructions and ensure that you have understood their content. Refer to these instructions and safety provisions as needed when working.

B.



Do not stand between the tractor and the machine when the tractor is being reversed for hitching

C.



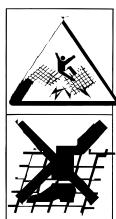
Use ear protection

D.



Risk from rotating transmission. Do not step over or remain in the vicinity of rotating transmission. Disconnect the power take-off, turn off the tractor engine and take out the key before you approach it. Do not use the protective cone as a step. Make sure that the protective cone is securely in place and that the safety device provided is correctly connected to the tractor and protective plate. If the protective cone gets damaged, replace it immediately.

E.



Do not stand on the machine grating

F.



Make sure nobody is on the drill during operation.

G.



Make sure nobody is on the seed drill when front loading seed and/or fertiliser.

H.



The machine's ladder, step and platform are not intended to be used for manual loading from small seed bags.

I.



Never work under the machine unless it has been properly secured with jack stands or other strong supports on a firm surface. Lock the lifting cylinders using the appropriate yellow locking device.

J.



Warning tape: Beware of a crush or shock hazard. Also used on safety components.

K.



Always make sure that the working areas of the bout markers are free from obstructions. Bear in mind that there is a risk of injury when the bout markers are being unfolded and a risk of crushing between the seed drill and the bout markers when they are being retracted. .

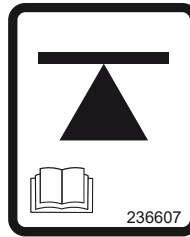
NOTE: The bout markers are always retracted when the machine is lifted no matter what is shown on the control unit. The indicated bout markers are always extended when the machine is lowered. For this reason always switch off the control unit when the machine is not in the field. Settings and machine data are saved when the control unit is switched off.

O.



Beware of rotating screws.

P.



Jack point.

L.



Following 10–15 km of transport on the road, re-tighten the wheel nuts. Re-tighten the nuts in the same way after changing wheels. Tighten the nuts using a torque wrench.

M.



Beware of rotating screws.

N.



Crushing risk warning.

General safety regulations

2.6 Safety instructions

2.6.1 Safety during installation and maintenance



Always park the machine on a level and stable surface.



Do not stand between the tractor and the equipment when the tractor is reversing for hitching or unhitching.



For all servicing and repair work on the hydraulic system, the wheel carriers must be locked with the yellow safety catches mounted on the piston rods, and the machine must be in the lowered position, standing on a flat, stable surface..



The machine is hydraulically pressurised when the tractor is connected and in operation. Always shut down the tractor and disconnect the feed's electrical system when carrying out service and maintenance on the seed drill.



Any welding work on the machine must be carried out to a professional standard. Note that poor welding may result in serious personal injury or fatality. If you are unsure, contact a professional welding technician for instructions.



Replace the towing eye when it has been worn down to the wear limit.



Regularly inspect the tractor's hitch device and the machine's towing eye for wear.



Prior to connecting the hydraulic hoses, always make sure the seed drill's and the tractor's couplings are clean and free of dirt.



Watch out for hanging power lines when the machine is being transported.



To maintain the machine's high level of quality and operational safety, use only Väderstad genuine spare parts. The warranty and any claims under it will become void if parts other than genuine parts are used.

2.6.2 Safety instructions during transport



National regulations relating to road transport and safety should always be followed!



The owner/operator has sole responsibility when transporting the seed drill on a public road.



Ensure that at least 20% of the tractor's weight is still being carried by its front wheels when the seed drill has been connected loaded. This is to ensure that the steering ability of the whole vehicle is maintained.



Good judgement and extreme caution should be exercised when transporting the seed drill on public roads. We recommend the use of a tractor with a gross weight that is at least equal to the gross weight of the seed drill, if the seed drill is not equipped with brakes. Always comply with national legislation concerning brake equipment.



When transporting the machine on public roads, show good judgement and drive carefully. Pay close attention to the machine's width and turning circle of the implement during transport. The rear view is very restricted. Check the positioning of the tractor's rear-view mirrors.



Use the lights on the seed drill in accordance with local traffic regulations..



In order to avoid any risks arising from mistakes during road transport, all electronic control equipment inside and outside of the tractor cab must be switched off before commencing transport on the road.



Use the yellow locking device to block the lifting cylinder when transporting the drill on the road over longer distances.



This machine and its tyres are designed for a maximum speed of 40 km/h during transport on a public highway at tyre pressure. When operating with a lower or higher tyre pressure, it is necessary to exercise caution, particularly if the total weight of the machine is high, if you are covering long distances or if you are driving at high speeds. Always comply with national legislation concerning speed limits.



During transport with filling auger and when the auger is not in use, the lever must always be set to position B. See “12.13 Maintenance and service of the filling auger”. Check that the protective cover of the upper tube covers the feeding screw when the filling funnel is folded up. The protective cover must NOT be removed. Faulty protective covers must be replaced.

To prevent damage to the filling auger, the funnel must be folded up when the seed drill is being transported or driven.



Never fill the tyres to a pressure higher than tyre manufacturer’s recommendations! This may result in great danger on the roads.

2.6.3 Safety instructions during work



Do not stand on the platform during operation.



The platform and ladder on the machine must be kept clean to prevent any risk of slipping.



Ensure that people who are near the seed drill when the tractor’s engine is in operation maintain an adequate safety distance from a suspended load and from raised or moving machine parts.



Do not work with the machine during thunderstorms and when there is a risk of lightning strikes. Do not stand on or next to the machine.

2.6.4 Safety instructions during work with filling auger



Avoid wearing loosely fitting clothes within the working area.



Maintain a safe distance from rotating parts.



Do not insert any foreign objects through the grating of the filling funnel or outlet.



Avoid coming into contact with or inhaling fertiliser. Always use protective equipment – protective glasses, mask, gloves, ear defenders and protective clothing – wherever there is a risk of contact with fertiliser.



Before starting the filling auger, check that all safety-related parts, gratings, etc. are in place and properly installed.



Where possible, a second person who is familiar with the equipment should oversee the work from a distance so that they can immediately intervene if anything unexpected should occur.



Whenever carrying out cleaning or dealing with flow stoppages, the tractor must always be stopped and the key removed from the ignition.

2.6.5 Design changes

The user/owner is liable for design changes, e.g. additions or modifications, that have not been approved by Väderstad AB.

Design changes can affect wear and may therefore cause the machine to no longer comply with the legislative requirements in accordance with which it has been approved.

2.6.6 Configuration changes

The user/owner is solely responsible for any configuration changes that have not been approved by Väderstad AB.

Conversion of the machine, such as changing the number of rows or wheel configuration, invalidates the type approval of the machine.

2.7 Moving the machine when not hitched to a tractor



If the machine is to be moved when not hitched to a tractor, it must be transported on a machine trailer or lorry flatbed. The machine must be lifted onto and off of the transport vehicle using a crane.



For the TPF 6 machine variant, with row spacing of 900-1000, the drawbar must be removed before transporting on a machine trailer or flatbed truck.

Contact a Väderstad authorised service technician for instructions.



For information on the machine's dimensions and weight, see "1.5 Technical Data"



Always take into account national regulations in respect of transport dimensions, escort vehicle requirements or similar.

1. Fold up the machine into its transport position; see "6.3.1 Switching to the work position, machine"



Does not apply to TPF 6 with 900–1000 row spacing which cannot be retracted.

2. Reverse the machine up onto a specially designed trailer or a flatbed trailer or lift the machine using a crane. When using a flatbed trailer, a ramp, loading platform or similar will be required.



Exercise extreme caution when loading the machine. Check that no parts of the machine are damaged in the process.

3. Prevent the machine's transport wheels from rolling using chocks or similar.
4. Secure the tarpaulin for transport using tension straps or similar (only applies to machines with a fertiliser hopper).
5. Adjust and secure the parking supports so that the machine is resting on its wheels and against the supports.

6. Unhitch the tractor from the machine. Alternatively, if the machine has been lifted on using a crane, unhitch the lifting devices.
7. Secure the machine using suitable lashing equipment in accordance with applicable regulations. The lashing equipment must be attached to the machine at the locations indicated by the decals. Mount special lashing plates, which are supplied with the machine, on the wing sections; see

2.8 Lifting using a crane



Use lifting devices that are dimensioned for the weight of the machine.



For information on the machine's dimensions and weight, see "1.5 Technical Data"



Put safety first: never stand under a suspended load.

If a fully assembled TPF 6 or TPF 8 is to be lifted using a crane, it must be lifted in special lifting plates supplied with the machine; the lifting plates are to be fitted in the designated places according to the instructions below.



The lifting plates are marked with the  decal.

1. Fold up the machine into its transport position; see "6.3.1 Switching to the work position, machine".
2. Lower the parking stays and unhitch the machine from the tractor.

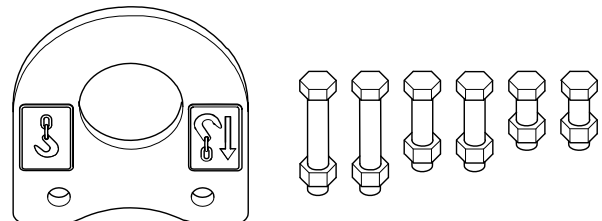


Figure 2.3 Lifting plate

3. Fit the lifting plates according to "2.8.1 Lifting points" (depending on the machine model) and connect the lifting devices to the lifting points. The plate is fitted using a bolt suitable for the material thickness of each lifting point. There are two alternatives for the rear lifting point depending on whether or not the machine is equipped with a fertiliser hopper.

2.8.1 Lifting points

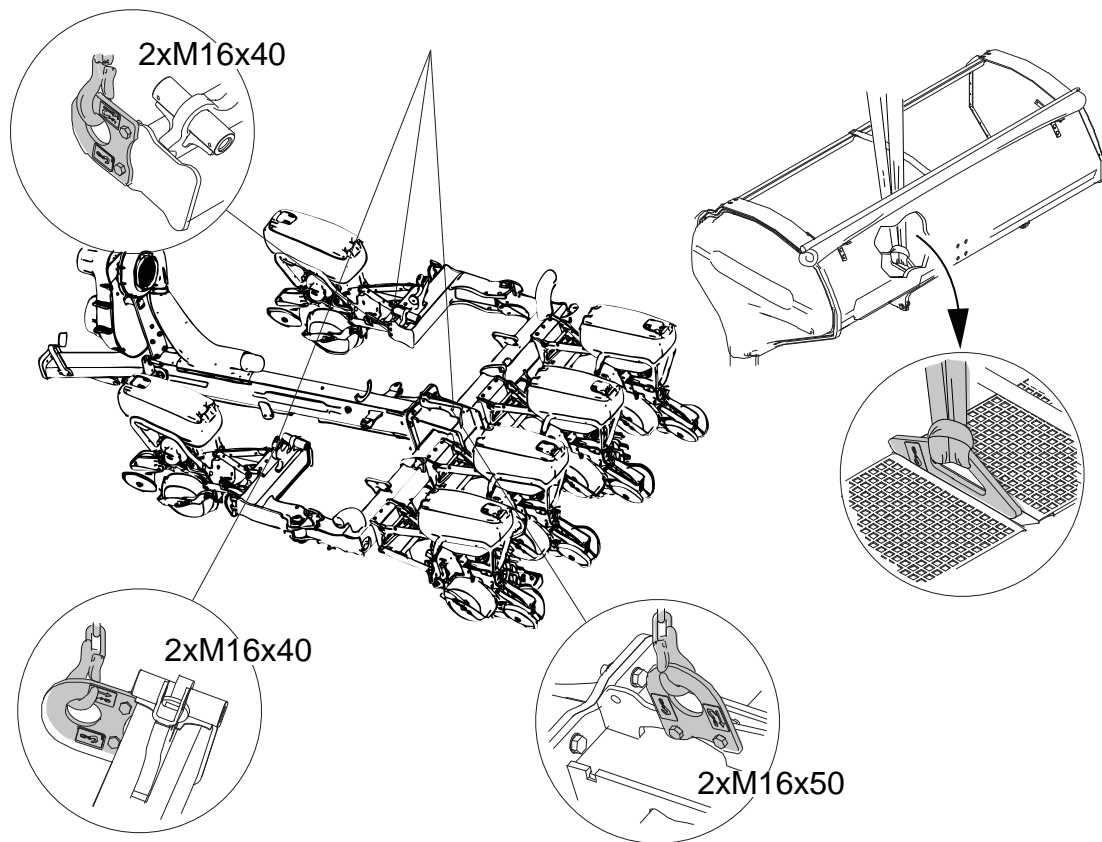


Figure 2.4 Lifting points TPF 6

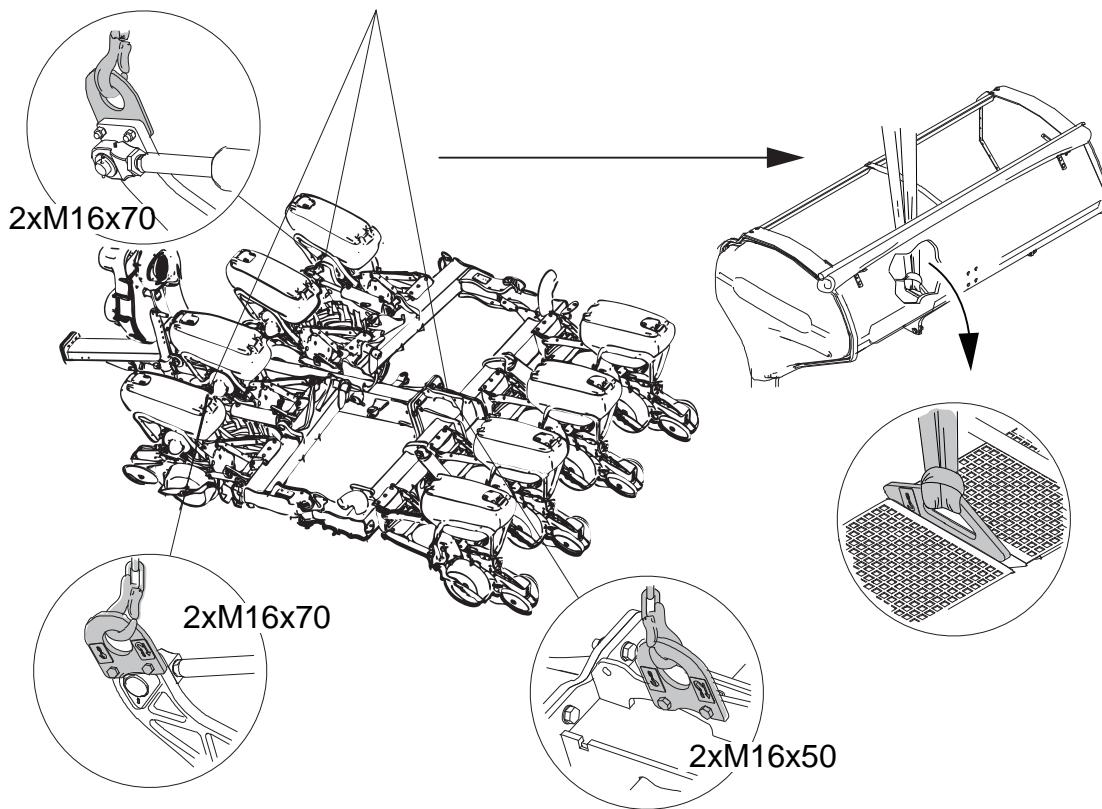


Figure 2.5 Lifting points TPF 8

2.8.2 Lashing points

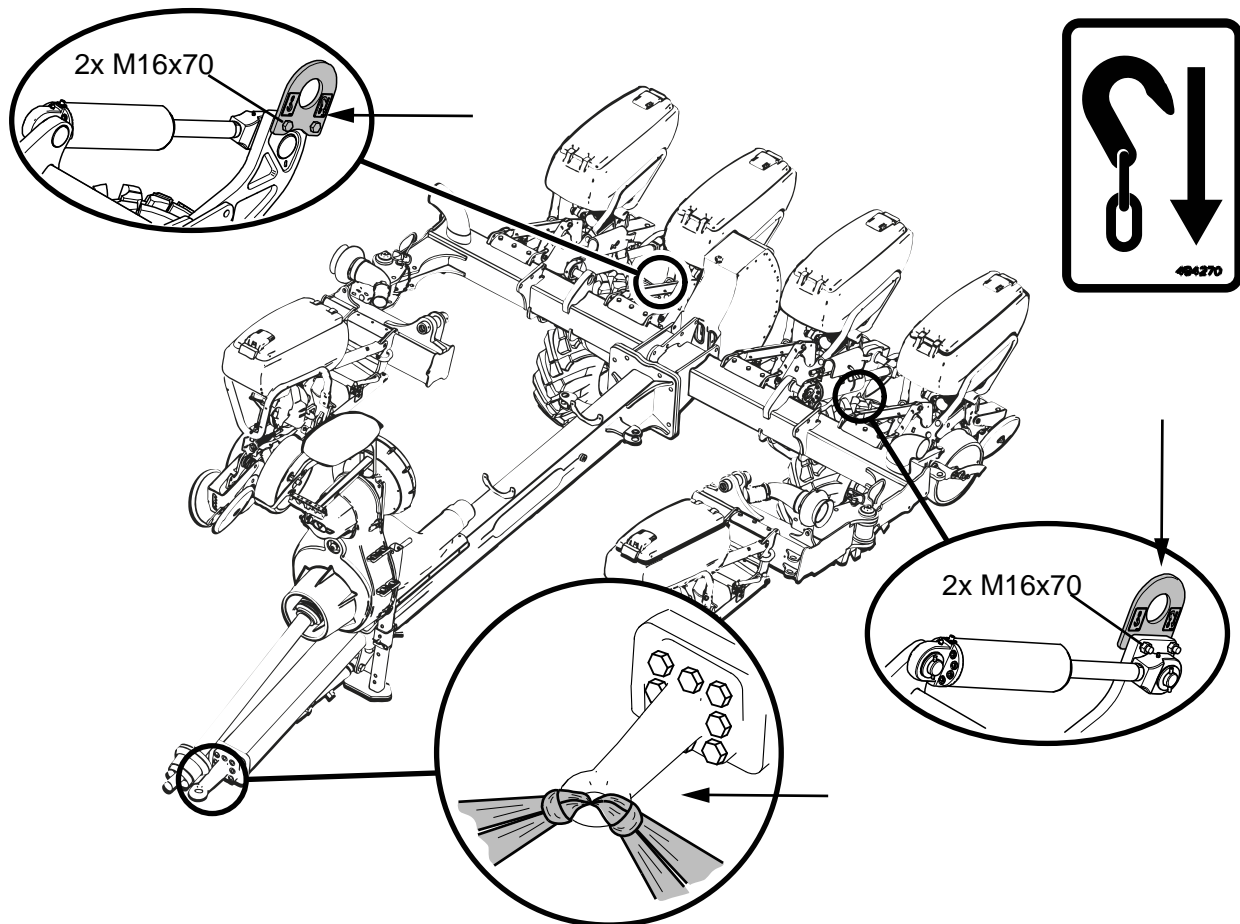


Figure 2.6

2.9 Scrapping and recycling

When the machine or any of its parts are worn out, Väderstad AB recommends that scrapping be carried out according to applicable regulations in order to avoid toxic and environmentally hazardous materials ending up in the environment.

During its lifespan:

- Replaced wear parts in steel should be sent to metal scrapping companies.
- Replaced wear parts in rubber, plastic or the like should be sent to the appropriate recycling facility.
- Oil, oil filters, batteries, and other electrical components may have a negative impact on the environment and should be sent to the appropriate recycling facilities.

In the case of scrapping:

- The machine mostly consists of steel that is suitably scrapped by an authorised metal scrapping company.
- Other components should be taken care of according to local recycling regulations.

REACH Art. 33

- REACH is a regulation adopted to improve the protection of human health and the environment from the risks that can be posed by chemicals. For more information on how Väderstad AB follows REACH Article 33. Visit www.vaderstad.com/reach

Always follow current local recycling regulations and applicable ordinances.

3 Overview of the machine

3.1 General



Assembly on delivery may only be carried out by personnel with basic technical know-how.

Seed drills that are delivered directly from our factory should be assembled in accordance with the separate assembly instructions that are delivered with the machine. The following instructions assume that this assembly has already been completed. All optional additions can be retrofitted to the basic machines.

3.2 Control system

All machine functions are controlled and monitored from the tractor cab using a control unit. Väderstad offers options for controlling and monitoring the machine using an iPad. Read more in the separate manuals for E-Services.

3.3 Overview of the basic machine

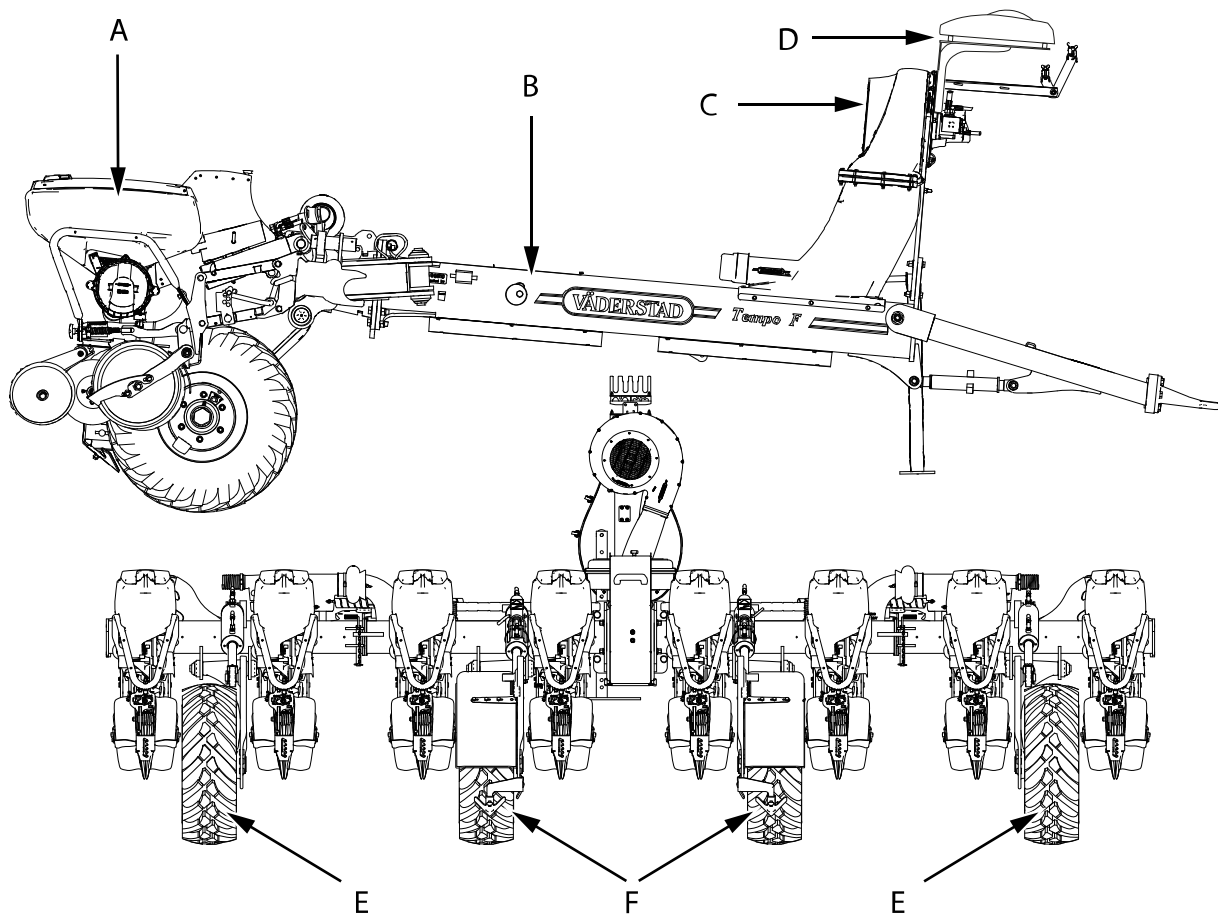


Figure 3.1

The basic Tempo model consists of a framework construction with a fan and generator unit. The seed unit consists of 6 or 8 row units which are controlled and monitored individually from the tractor cab using the Virtual Terminal (ISOBUS) control unit or iPad (E-Control). The drilling depth, coulter pressure, etc. is set individually on each row unit. The machine is raised and lowered by controlling the transport wheels hydraulically. The folding and unfolding of the wing sections takes place manually or by means of hydraulics.

- A. Row unit
- B. Frame
- C. Fan with generator unit. (The illustration shows a fan and generator with hydraulic operation).
- D. Gateway (ISOBUS/ E-Control)
- E. Extra support wheel on the wings (TPF 8, optional on TPF 6)
- F. Transport wheels

3.4 Overview of optional additions

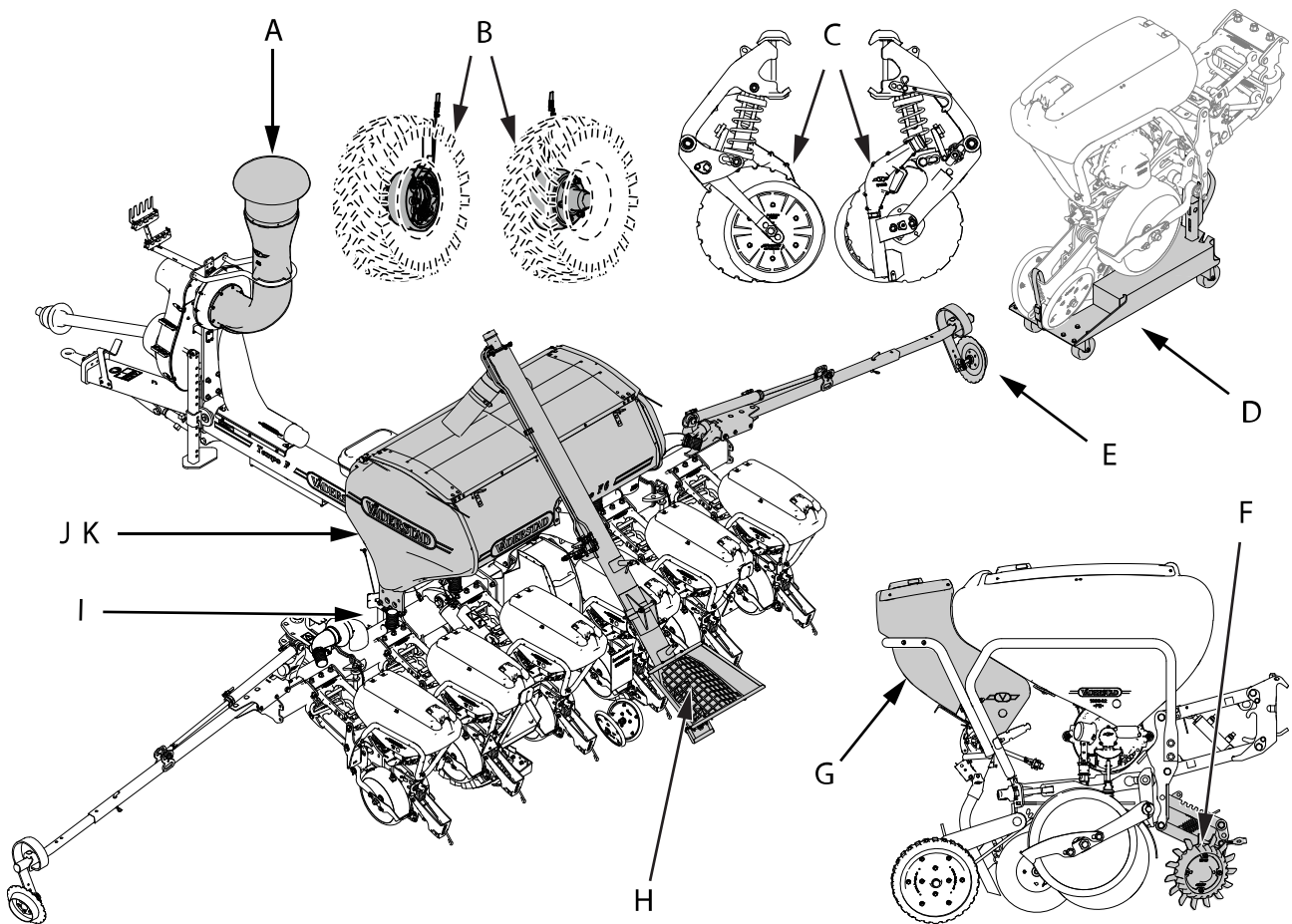


Figure 3.2

The basic Tempo machine can be retrofitted with the following optional additions:

- A. Raised air intake
- B. Brakes (does not apply to TPF 6 with 900–1000 row spacing which cannot be retracted)
- C. Fertiliser unit (optional for Combi)
- D. Row unit carriage
- E. Bout markers
- F. Row cleaner
- G. Micro granulate unit
- H. Auger (optional addition for Combi)
- I. Hydraulic wing folding (does not apply to TPF 6 with 900–1000 row spacing which cannot be retracted)
- J. Combi function (fertiliser) with or without agitator
- K. Agitators (optional for Combi)

3.5 Transport wheels and support wheels

The standard model of the machine is equipped with two sturdy carrier wheels. These are to be used during transport on roads, as well as for lifting and lowering the machine in the field.

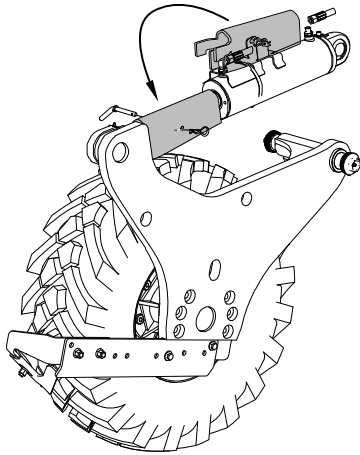


Figure 3.3

The gauge wheels are equipped with a safety catch in order to secure the machine in a raised position during servicing. See “12.2 Securing the machine for servicing”.

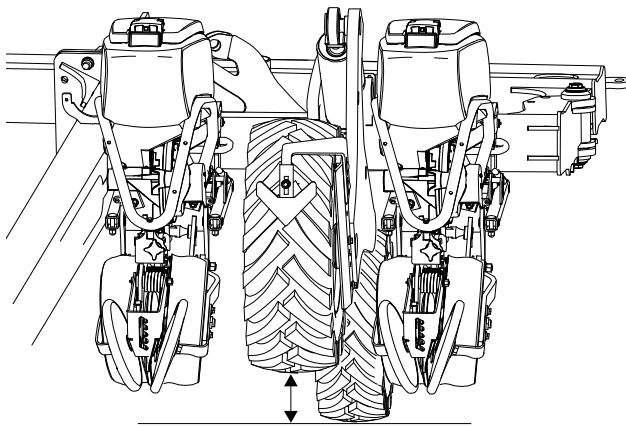


Figure 3.4

By default, TPF has support wheels on the wings for increased stability. Support wheels are also optionally available for TPF 6.

3.6 Filling auger

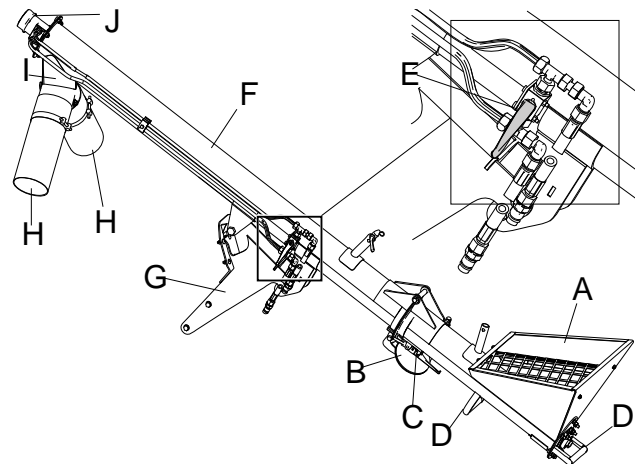


Figure 3.5

Component parts

- A. Filling funnel
- B. Protective cover
- C. Eccentric lock
- D. Handle for operation
- E. Lever for switching filling auger operation on and off
- F. Screw
- G. Bracket for screw
- H. Outlet with hose
- I. Distribution flap
- J. Hydraulic motor

4 Installation

4.1 Tractor requirements



The tractor cab must be designed so that it protects the operator from debris and dust which is hazardous to health. Refer to local provisions regarding the design of the tractor cab. This relates to protection against dangerous substances in the form of pesticides



The tractor may not be hitched to the machine if the maximum permitted total weight or axle load for the tractor is exceeded.



The load on the tractor's front axle may not be less than that specified.



If re-installation of a free return is required, only DN20 dimensions should be used – e.g. Ø 25 x 2.5 or 3/4" hose.

The power requirement starts from 15 hp per row unit.

Power take-off (PTO) shaft

- In order to power the fan and the generator, the tractor needs to be equipped with a 6 spline or a 21 spline 1-3/8" PTO connector axle with 1000 rpm.

4.1.1 Tractor hydraulic system requirements

Hydraulic connectors

The tractor must have:

- 1-4 piece double-acting hydraulic connectors, depending on the equipment options.
- One (1) free return

See chapter for more detailed information.

Oil temperature

Väderstad recommends that the temperature of the hydraulic oil during operation be kept between 40 and 60° C for best performance and longevity.

Table 4.1

Hydraulic oil temperature				
0°C	40°C	60°C	80°C	
3	2	1	2	3

1. Recommended temperature range for hydraulic oil.

2. Outside the recommended temperature range for the hydraulic oil.
3. Hydraulic oil temperature without guaranteed function and with reduced life expectancy.

Viscosity

Väderstad recommends that the viscosity of the hydraulic oil during operation is kept between 20 and 50 cSt for best performance and longevity.

Table 4.2

Viscosity				
400 cSt	50 cSt	20 cSt	10 cSt	
3	2	1	2	3

1. Recommended viscosity range for hydraulic oil.
2. Outside the recommended viscosity range for the hydraulic oil.
3. Hydraulic oil viscosity without guaranteed function and with reduced life expectancy.

Purity

Väderstad AB recommends a hydraulic oil purity of 18/16/13 according to ISO 4406 for best performance and longevity.

Oil quality

Väderstad AB recommends that mineral oil be used in accordance with ISO VG 46–68.

Pressure levels

Väderstad AB recommends a maximum pressure level of 200-210 bar. The pressure will drop slightly when continuous hydraulic power is taken out, however it should not drop below 190 bar in order to maintain the best performance

The free return connection must have a maximum pressure of 6 bar.

4.2 Re-tightening of screw unions



Tighten the row unit and fertiliser unit's clamp connection to the frame after the first day of use. The screw unions must be tightened to a torque of 240 Nm. Use a torque wrench.

When the machine is new, it is particularly important to check that the flanged joint between the drawbar and frame, the wheel nuts and the clamp joint on the wheel undercarriage are tight. Re-tightening of screw unions is very important for ensuring the machine functions safely without any problems and will have a long service life.

Re-tighten the wheel nuts on the gauge wheels after the first day of operation. Re-tighten the nuts in the same way whenever a wheel is changed. Wheel nuts must be tightened crosswise using a torque wrench.

Re-tighten the flanged joint between the drawbar and frame after approx. 100 ha. The flanged joint must be tightened to a torque of 520 Nm.

Tightening torque:

- Support wheels: 330 Nm
- Gauge wheel 10 bolts: 700 Nm
- Flanged joint: 520 Nm

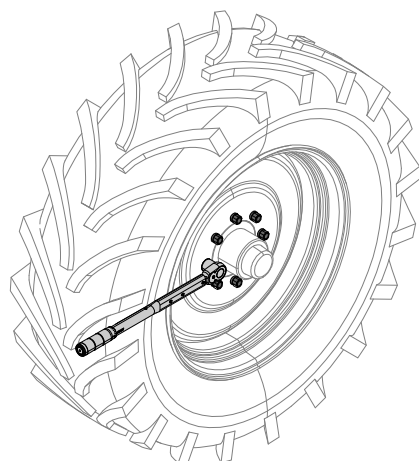


Figure 4.1

4.3 Installation of the PTO system



The surface of the PTO cooler gets very hot.



Carefully read the separate instruction manual supplied with the PTO by the manufacturer.

4.3.1 Installation of the power take-off shaft



Prior to installation, carefully read and comply with the instructions for the power take-off shaft provided by the manufacturer.



Make sure the tractor lifting arms are not positioned where they might obstruct the power take-off shaft or the machine's drawbar.

Check the length of the power take-off shaft under all operating conditions before using the implement for the first time.



During operation, the maximum working angle of the front universal joint (80°) may not be exceeded.



Ensure that all safety devices following the transmission shaft are mounted correctly.



The power take-off shaft has always be to placed in the parking position when the machine is unhitched.

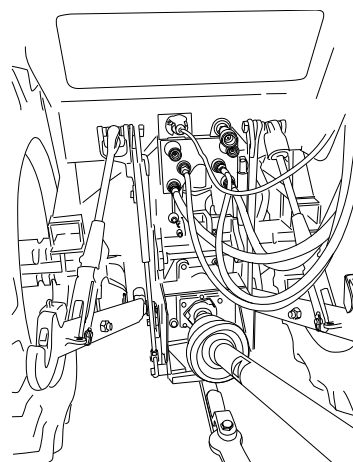


Figure 4.2

The assembly and any necessary changes in length of the transmission shaft should occur according to the instructions that accompany the transmission shaft.



Switch off the tractor/power take-off socket when unhitching.

4.3.2 Checking the transmission oil



Always use a SAE 75W-140 Synthetic Long Life transmission oil.

Installation

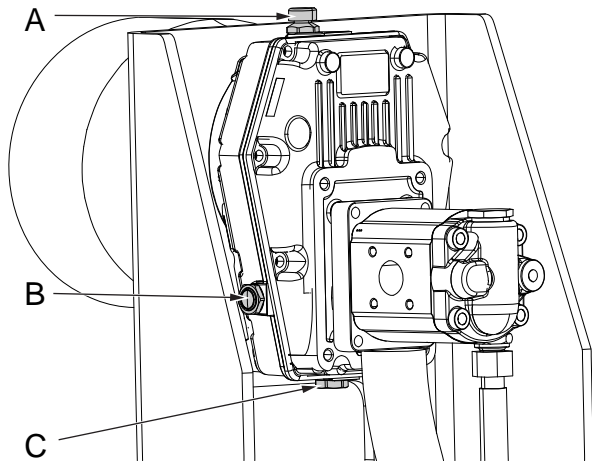


Figure 4.3

- A. Lid
- B. Oil level window
- C. Bottom plug

1. Check that the surface is visible in the level glass (B).
2. If the oil level is too low.
 - a. Open the cover (A) on the gearbox and place the cover on a clean paper towel.
 - b. Pour in transmission oil until the surface is visible in the level glass (B). Always use SAE 5W-140 Synthetic Long Life transmission oil
3. Make sure the cover (A) is completely closed.

4.3.3 Checking the hydraulic oil



Always use hydraulic oil that meets the oil requirements.



Always handle hydraulic oil systems in a clean environment.

- B. Lid
- C. Flow valve

1. Check that the oil level is between Min and Max.
2. If the oil level is too low, follow the instruction in "12.12.2 Replacing the hydraulic oil" step 5–9.

4.4 Installation of ISOBUS/E-Control in the tractor



For ISOBUS/E-Control, please refer to the separate user guide.

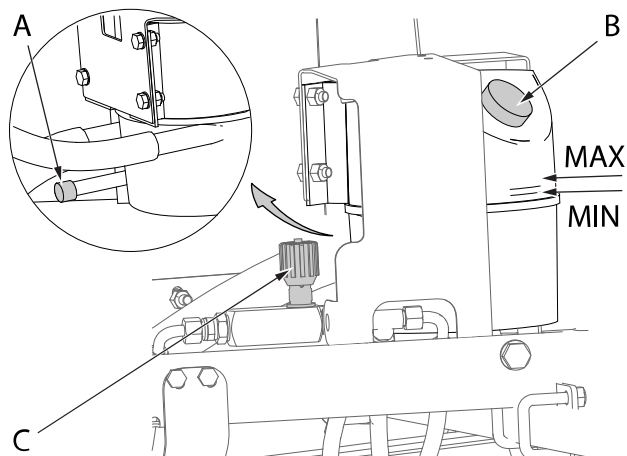


Figure 4.4

- A. Bottom plug

5 Hitching and unhitching

Depending on the equipment option, the machine's fan and generator are either driven by the power take-off (PTO) shaft or operated hydraulically.

5.1 Hitching

1. Connect the seed drill to the tractor's hitching hook. Make sure that the tractor's hitching device is locked so that the towing eye can not detach from the hitch. Alternatively, connect the seed drill to the tractor's agricultural drawbar device.
2. Lift and secure the machines's parking support.
3. Connect the hydraulic hoses. Always connect Free return first.
4. Connect the electrical wiring.
5. Fit the PTO shaft (applies to machines with PTO-driven fan and generator only). Connect the PTO shaft to the tractor according to "4.3.1 Installation of the power take-off shaft"

5.2 Connecting the hydraulic hoses



Always begin by connecting the free return and, where appropriate, the Case drain.



Carefully clean the connectors and sockets! This is a good way to avoid unnecessary problems and wear in the hydraulic system.



Make sure that the hoses are connected in pairs to the correct hydraulic couplings on the tractor.

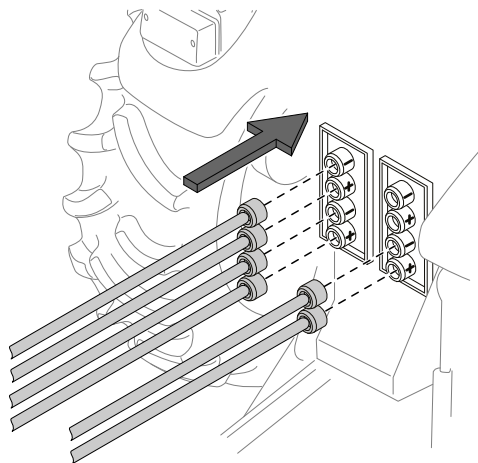
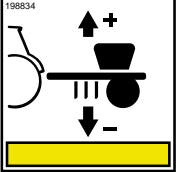
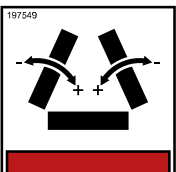
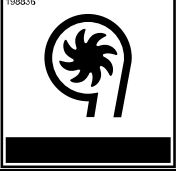


Figure 5.1

Hitching and unhitching

5.2.1 Dimensions and colour coding on the hydraulic hoses

The hydraulic hoses on the machine have colour-coded quick-release couplings and there are illustrative decals on the frame to help avoid incorrect connection.

Decals	Colour	Function	Dimensions	Tractor requirements (l/min)
Unmarked	–	Free returns for return flow below 50 l/min.	3/4" female connector ISO 7241–1 Series A	–
	Yellow	Raising/Lowering	1/2" male connector ISO 7241–1 Series A	50
	Red	Wing folding	1/2" male connector ISO 7241–1 Series A	20
	Black	Seed delivery fan	1/2" male connector ISO 7241–1 Series A	40
no decal	without colour-coding	Filling auger	1/2" ISO7241–1 Series A	20

5.2.2 Hose holder

The number of hydraulic hoses varies depending on how the machine is equipped.

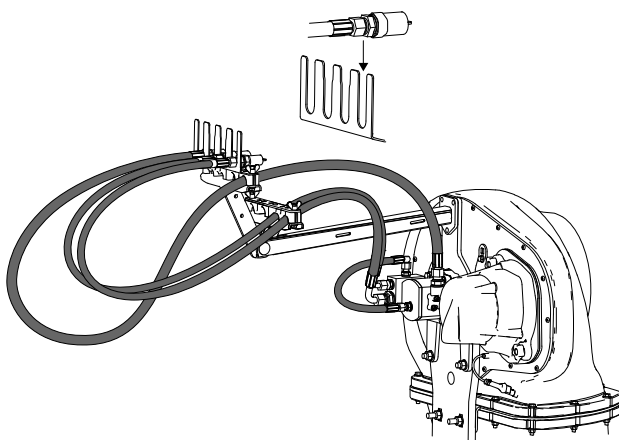


Figure 5.2

When the hydraulic hoses are disconnected from the tractor, they should be secured using hose holders as per the image.

5.3 Lights



Make sure to check before road transport that the lighting connections are properly attached and that all lights are working. Check that the cables are not at risk of being crushed.

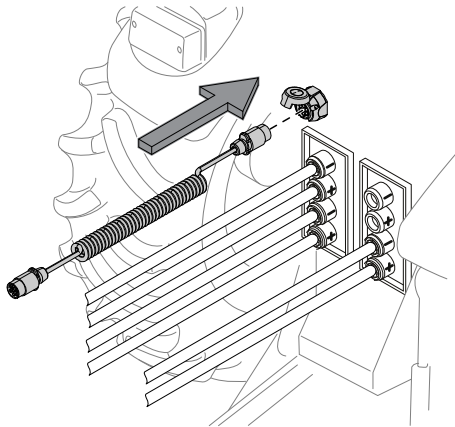


Figure 5.3

The male connector for the machine lights is connected to the standard external 7-pole trailer connector on the tractor.

To improve the reliability of the lighting and ensure a long lifespan, use modern LEDs.

The low power requirements of LED lights may mean that the tractor's monitoring system does not recognise that the lights are connected to the external trailer connector. This means that no alert will be issued if the lighting stops working for any reason, such as e.g. a damaged cable harness.

5.4 Connection of radar signal and lifting position cable, ISO 11786 connector (optional)

The cable has two functions:

A. Lift position

The cable connection to the tractor's 3-point mounting replaces the machine's own height sensor and provides a more detailed operating switch. Available only for mounted machines. The cable is connected to the tractor's outlet and via another cable to the cabling of the machine.

B. Radar

Connecting a cable to the tractor's radar replaces the machine's own radar signals. The cable is connected to the machine's cabling and to the tractor's outlet.

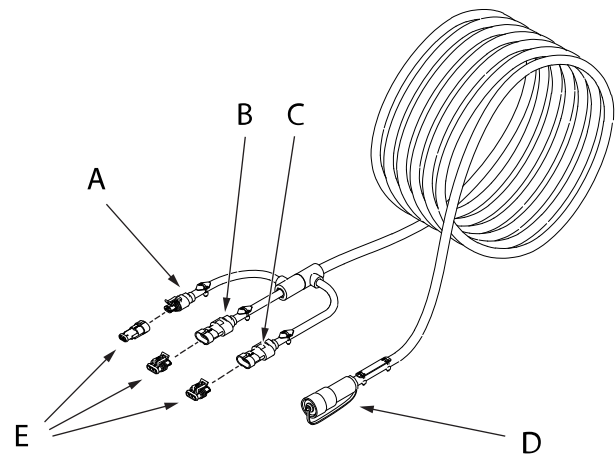


Figure 5.4

- A. Lift position. Only available on mounted machines, TPR, TPT and TPV.
- B. Speed, Radar, No Slip
- C. Speed, Drive Wheels, Slip
- D. Connection to the tractor's ISO 11786 connector.
- E. Cover to protect unused connectors.

Lift position



This function requires the basic settings to be adjusted in the iPad.



It is important to mount the cable (F) on the left-hand side of the machine.

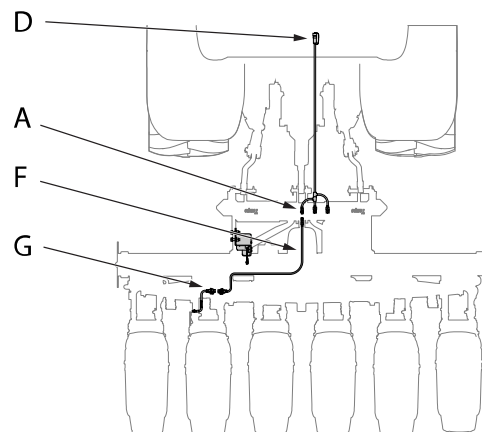


Figure 5.5

1. Connect the connector (A) via cable (F) in place of the machine's own height sensor (G) on the left-hand side of the machine.
2. Connect the connector (D) to the tractor's ISO 11786 connector.
3. Seal the unused connections with the cover (E).

Hitching and unhitching

4. Adjust the basic settings on the iPad if this has not already been done.



For ISOBUS/E-Control, please refer to the separate user guide.

Radar

1. Disconnect the machine's radar from the cable connector located immediately behind the radar (if one is fitted and connected).
2. Connect connector (B) or (C) to the machine's cabling, depending on the No Slip or Slip tractor function.
3. Connect the connector (D) to the tractor's ISO 11786 connector.
4. Seal the unused connections with the cover (E).

6 Transport

6.1 Transport on public roads



Please be aware that if the machine is running on very steep and/or rough terrain, there is a risk that the machine may overturn.

There is a maximum permissible axle load and drawbar load during transport on public roads. Axle load weight must not exceed 10,000 kg and the load on the drawbar must not exceed 3,000 kg.

6.2 Brakes

Tempo can be supplied with pneumatic or hydraulic brakes. In both cases an emergency brake/parking brake is also included.

The braking force is regulated according to the pressure applied to the tractor's brake pedal.

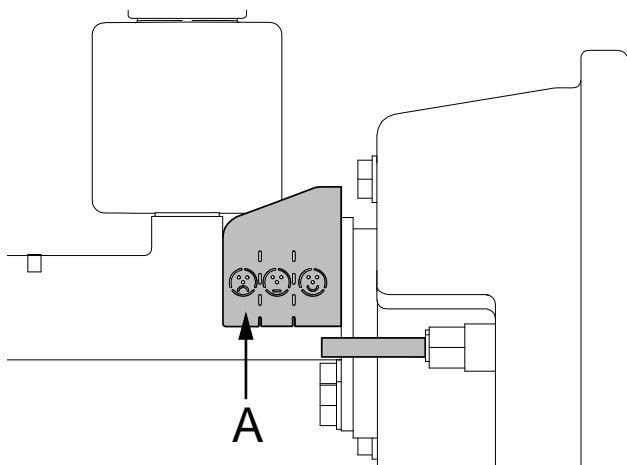


Figure 6.1 Indicator plate for level of wear

The level of wear on the brakes is indicated on an indicator plate located next to the brake cylinder. The indicator pin (A) shows when it is time to check and service the system.

6.2.1 Pneumatic brakes

The pneumatic brakes are linked to the tractor's compressed air couplings and are controlled by the pressure applied to the tractor's brake pedal. The pneumatic brakes have compressed air in the brake pipes, but the last section out towards the brake drum consists of a closed oil system. When the tractor's brakes are applied, the braking effect is proportionally transferred to the machine and ensures an effective braking effect.

On machines equipped with pneumatic brakes, it is possible to adjust the brake pressure according to whether the machine is loaded or empty. Turn the lever on the control panel to the desired position.

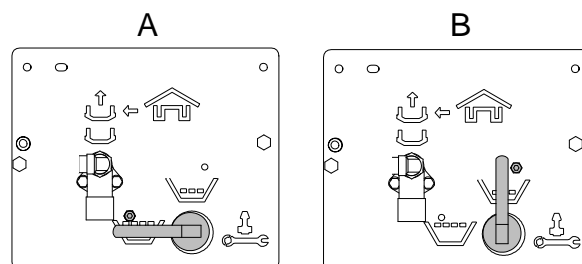


Figure 6.2 Justering av bromstrycket

- Adjusting the brake pressure when the machine is loaded
- Adjusting the brake pressure when the machine is empty

6.2.1.1 Connecting the pneumatic brakes

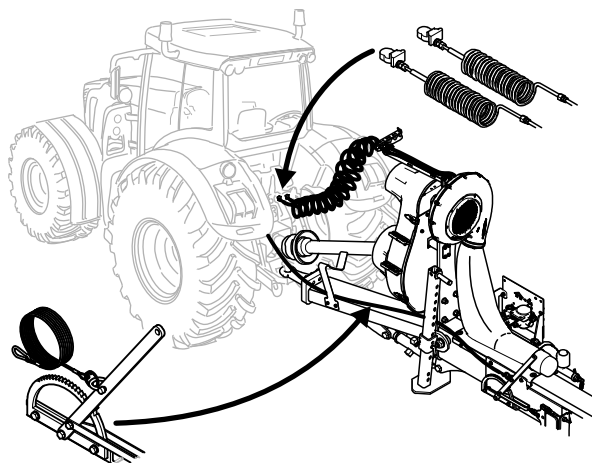


Figure 6.3

- Connect the brake system's compressed air line and steering links to the tractor's brake fittings.
- Attach the emergency brake's wire to a suitable secure hitching point on the tractor. Make sure the wire cannot get entangled.
- Release the parking brake before starting.

6.2.1.2 Disconnecting the pneumatic brakes



Unhitching and parking must always take place on a flat, firm surface.

- Disconnect the brake hoses and electric cables from the tractor and hang them on the hose holder.

- Engage the parking brake. See section “6.2.3 Emergency brake and parking brake”.

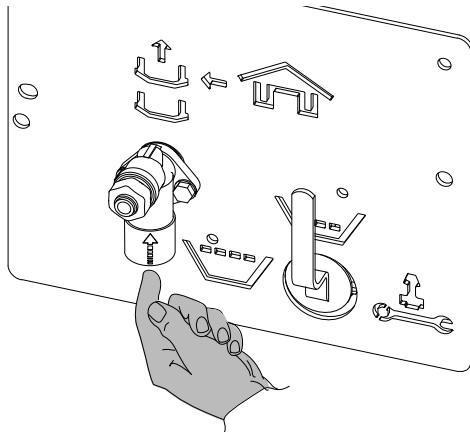


Figure 6.4

- Release the brakes by pressing in the retarder valve. See “Figure 6.4”.
- Lower and secure the parking support.
- Undo the power take-off (PTO) shaft.
- Disconnect the hitching hook/agricultural drawbar device.

Draining the accumulator tank

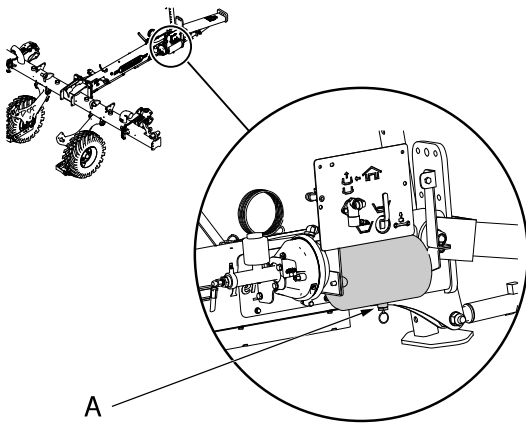


Figure 6.5

Drain the accumulator tank of condensation water prior each use and long-term storage by pulling the drain valve (A) to the side while the tank is pressurised.

6.2.2 Hydraulic brakes

Hydraulic brakes require the tractor hydraulics to be equipped with a special brake valve and brake coupling. The hydraulic brakes have oil in the brake pipes. When the tractor's brakes are applied, the braking effect is proportionally transferred to the machine and ensures an effective braking effect.

6.2.2.1 Connecting the hydraulic brakes



Please note that the hose must only be connected to a brake coupling that is controlled by the tractor's brake pedal and provides a maximum pressure of 150 bar.

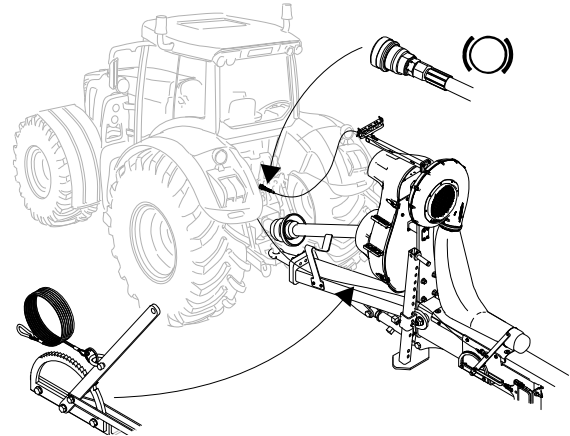


Figure 6.6

- Connect the hydraulic hose of the brake system to the brake coupling on the tractor.
- Attach the emergency brake's wire to a suitable secure hitching point on the tractor. Make sure the wire can not get entangled.
- Release the parking brake before starting.

6.2.2.2 Disconnecting the hydraulic brakes



Unhitching and parking must always take place on a flat, firm surface.

- Make sure that the hydraulic system is depressurised.
- Disconnect the hydraulic hoses, brake hoses and electric cables from the tractor and hang them on the hose holder.
- Engage the parking brake. See section “6.2.3 Emergency brake and parking brake”.
- Lower and secure the parking support.
- Undo the power take-off (PTO) shaft.
- Disconnect the hitching hook/agricultural drawbar device.

6.2.3 Emergency brake and parking brake



In order for the emergency brake to function, the wire in the parking brake lever must be secured to the tractor. The emergency brake is activated if the machine is set to come loose from the tractor.



Always park on a flat, firm surface.



If the machine has to be parked on or close to a public road, the machine must also be secured with chocks under the transport wheels.

If the machine is to be parked for a longer period of time, the parking brake should be disengaged. The machine should instead be secured with chocks.

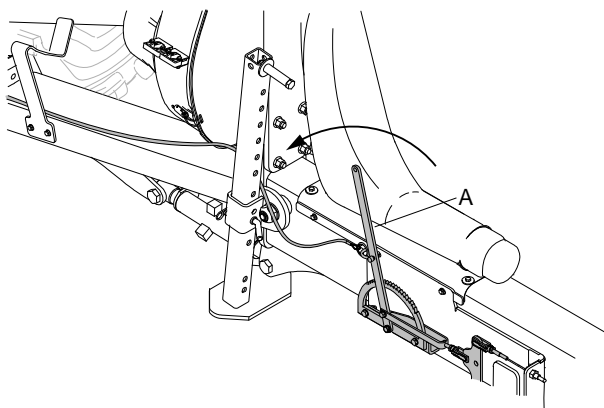


Figure 6.7 Engaging the parking brake

Engage the parking brake by setting the lever (A). Release the parking brake by moving the lever slightly forwards and then to the upright position.

6.3 Switching between transport and working position

Switching between transport position and working position must take place on level ground with an even surface.

The basic Tempo model is adjusted manually. Tempo with extra equipment can be adjusted hydraulically.

6.3.1 Switching to the work position, machine

1. Raise the machine to its topmost position.

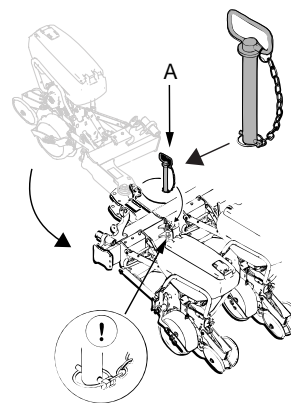


Figure 6.8

2. Undo the locking pin from position (A).
 - If the machine is equipped with hydraulic wing folding, undo pin (A) on both sides.
3. Turn the wing section by hand into the drilling position.

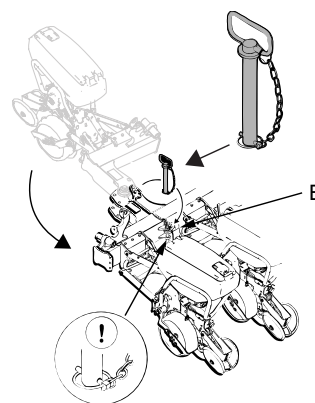


Figure 6.9

4. Fit the locking pins in position (B) on both sides.
5. TPF 6: With the machine in the top position and with the tractor idling, hold in the hydraulic lever for lifting until all movement has stopped.

TPF 8: Lower the machine to working position in order to open the hydraulic valve for the support wheels. Then raise the machine to the top position and, with the tractor idling, keep the hydraulic lever in this position until all movement has stopped. Holding the hydraulic lever in synchronises the wheels' lifting cylinders. The cylinders allow seepage when in their top and bottom positions so that the oil can overflow through the system and expel any air. Always repeat this when hitching the tractor, before adjusting the machine and several times during the working day.

6. Lower the machine while moving forward slowly.

6.3.2 Switching to the working position, filling auger



Park the seed drill on a horizontal, stable surface.



Take care to ensure that neither the filling auger nor machine parts get damaged.

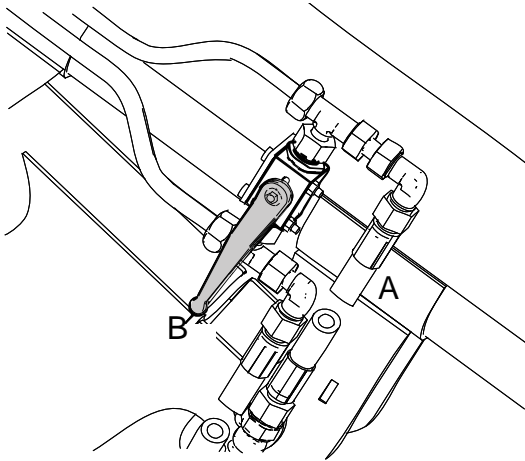


Figure 6.10



Check that the lever is in position B so that the filling auger is disconnected from the hydraulic circuit.

To fold the filling funnel down into its working position, proceed as follows:

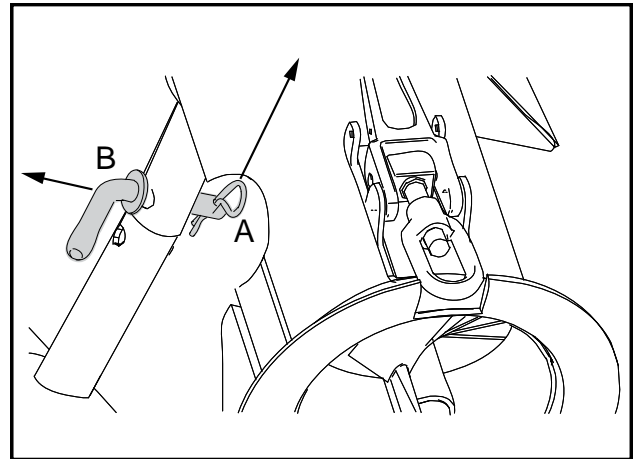
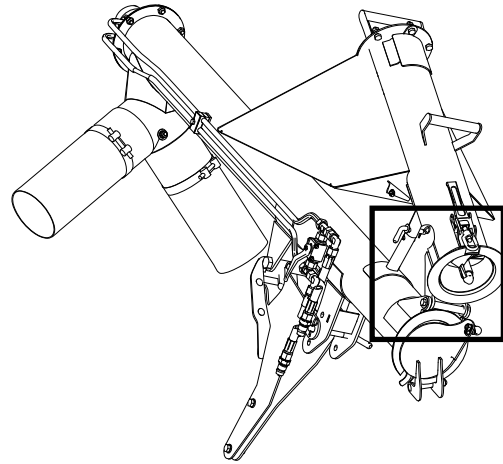


Figure 6.11

1. Undo the pin (A) and pull out the locking device (B).

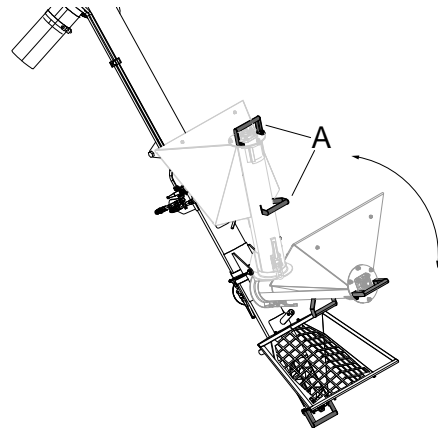


Figure 6.12

2. Use the handles (A) on the bottom part of the filling auger to fold the filling funnel down/up.



Avoid pinch point injuries. Make sure no one is under the filling auger when it is folded down/up.

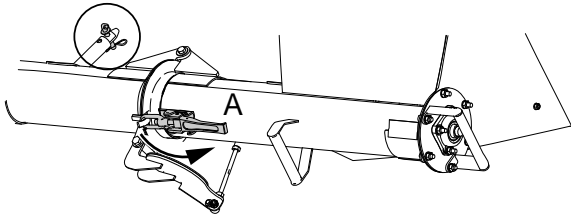


Figure 6.13

3. Lock the filling funnel in position using the eccentric lock (A) and refit the locking device and pin.
4. Connect the hydraulic hoses to the tractor and start the hydraulic output in question.

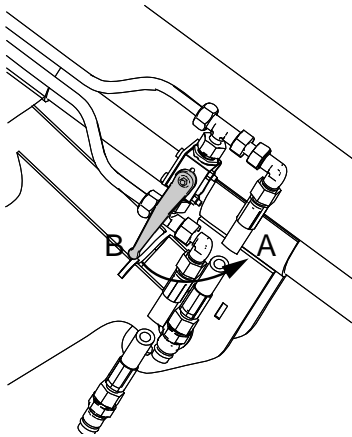


Figure 6.14

5. Turn the lever of the valve to position A. The filling auger is connected to the hydraulic circuit.
6. For filling the seed hopper, see "9.4 Filling with filling auger".

6.3.3 Switching to the transport position, machine

1. Switch off the fan.
2. TPF 6: Raise the machine to its topmost position.
TPF 8: Set the support wheels in the retracted position by lowering the machine fully. Raise the machine to its top position using the tractor's hydraulic lever.

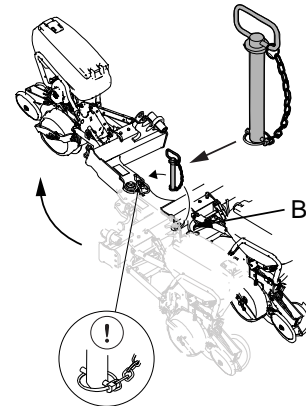


Figure 6.15

3. Undo the locking pin from position (B).
If the machine is equipped with hydraulic wing folding, undo pin (B) on both sides.
4. Turn the wing section forward by hand into the transport position.

If the machine is equipped with hydraulic wing folding, turn the wings to the transport position using the hydraulic lever for wing folding.

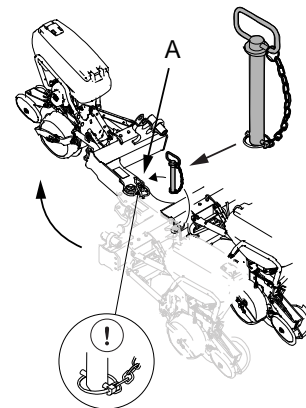


Figure 6.16

5. Lock the wings in the retracted position with the locking pins in position (A) on both sides.

6.3.4 Switching to the transport position, filling auger

Switching from work to transport position, filling auger, is the reverse of switching between transport position and working position.

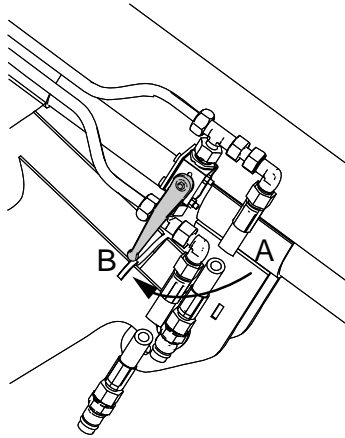


Figure 6.17

1. Turn the lever of the valve to position B. The filling auger is disconnected from the hydraulic circuit.

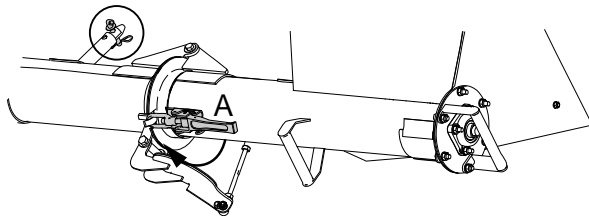


Figure 6.18

2. Undo the eccentric lock (A) and remove the locking device and pin.
3. Use the handles (A) on the bottom part of the filling auger to fold the filling funnel down/up.



Avoid pinch point injuries. Make sure no one is under the filling auger when it is folded down/up.

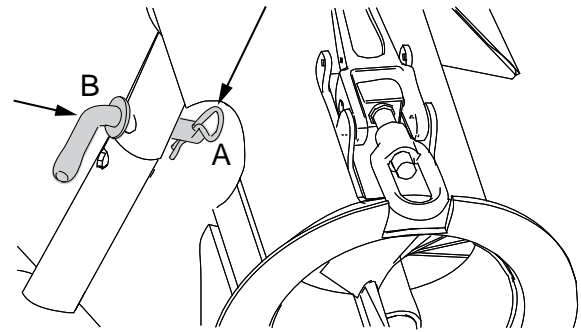


Figure 6.19

4. Insert the locking device (B) and lock with the pin (A).



Check that the pin for locking in the folded up position is in place before transporting.



Check that the protective cover of the upper tube covers the feeding screw when the filling funnel is folded up. The protective cover must NOT be removed. Faulty protective covers must be replaced.

7 General settings

7.1 Horizontal alignment



Basic setup of horizontal alignment can be done in the yard. The setup should be completed in the field.

- The draw tube should be adjusted so that it is parallel with the ground.
- The linkage in the row units must be adjusted so that it is parallel with the ground in the working position.

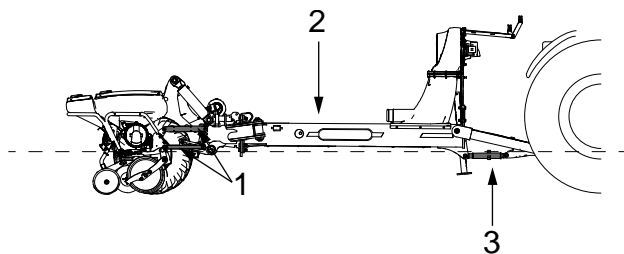


Figure 7.1

1. Drive the machine into position and lower it to an approximate drilling depth.
2. Turn the adjustment screw (3) so that the draw tube (2) is parallel with the ground. The ground parallelism of the drawbar tube may vary depending on the tractor used, as the drawbar height may vary.
3. Adjust the height of the row unit using the tractor's hydraulics until the linkage (1) is parallel to the ground. Confirm with E-control, see separate E-Services manual.
4. Check the set value by raising and lowering the machine again.

7.2 Scales



The entire scale must always be in a vertical position when used, to ensure it gives a correct result when performing the calibration test.



To make sure not to affect the precision of the scale, it is recommended that you weigh *at least* 2 kg of selected seed or fertilizer.



The scales' battery is recommended to be changed once a year.



The scales automatically shut off after approximately 5 minutes. It is therefore advisable to note the empty bag's weight.



Whilst driving, the scales are kept in the tool box



Regularly check the scales against a known weight and always prior to the start of the season.



Replace the battery (9V/6LR61 type) when the battery indicator shows one bar or less.

Weighing of a calibration sample should be carried out as follows:

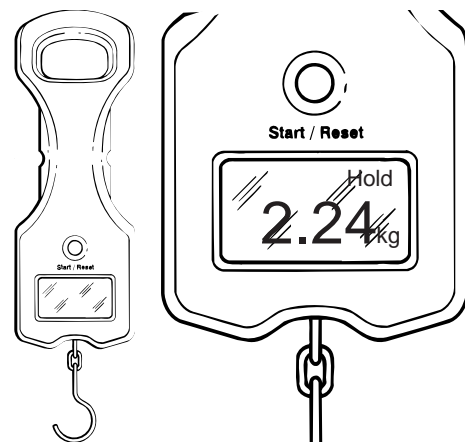


Figure 7.2

1. Press the Start/Reset button.
2. Hang the empty calibration bag on the scale's hook.
3. The weight of the bag is displayed. Wait until "Hold" is shown on the display.
4. Press the Start/Reset button.
5. Remove the bag and fill it with the calibration sample.
6. Weigh the filled bag. The scales show the net weight of the sample.

General settings

7.3 Radar angle

If the machine is equipped with a radar, the radar angle should be set.

7.3.1 Setting the radar angle



Never look into the radar window while it is operating. Risk of eye injury.



The radar must be calibrated before operating.



Regularly clean the radar!



Ensure that the radar's operating radius is clear from disruptive elements such as hoses or cables!

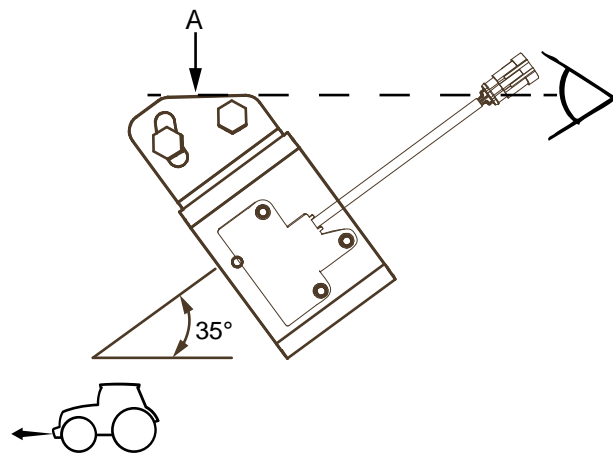


Figure 7.3

The angle of the radar unit should be adjusted. It should be set at an angle of 35° +/- 1° in relation to the ground surface. The angle of the radar is optimal when the surface (A) is parallel to the ground and when (A) is parallel to the machine's frame after adjustment as described in "7.1 Horizontal alignment".

Remove the screws and adjust the bracket along the oblong hole.

7.4 Bout markers

7.4.1 General



In the folded up position, the bout markers should always be blocked mechanically with a cotter pin when they are not intended to be used. For example during transportation, service and storage.

Note that the bout markers on both sides - right and left - should be blocked!



Marker selection is made with buttons in E-control. For E-Control, see the separate E-Services manual.

7.4.2 Settings for bout markers

Adjustment of bout markers should be made in the field. Adjust the markers according to the illustration below.

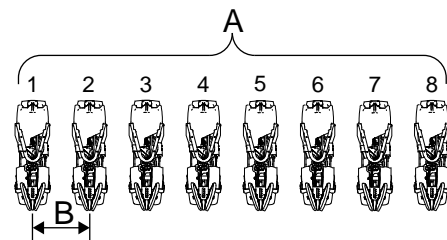


Figure 7.4

A = number of row units, B = distance between rows (mm), C = (A x B x 0.5) + (B x 0.5)

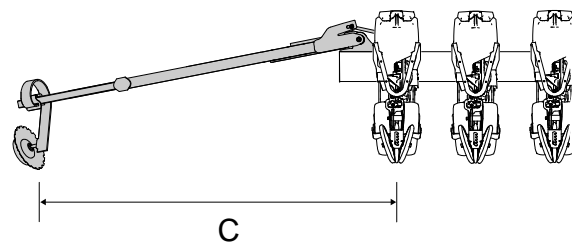


Figure 7.5 Settings for bout markers

Example: 8 row units, 750 mm between rows

$$C = (8 \times 750 \times 0.5) + (750 \times 0.5) = 3375 \text{ mm.}$$

8 Control system



For ISOBUS/E-Control, please refer to the separate user guide.

9 Filling and emptying

9.1 Filling and emptying of seed



Avoid contact with and inhalation of seed dressing.

Before the cover on the seed hopper or seed meter is opened, the fan must be switched off because the drilling system is pressurised.

9.1.1 Filling with seed



Put safety first: never stand under a suspended load



Avoid contact with and inhalation of seed dressing.



When filling the seed hoppers it is a good idea to put slightly less in the hopper with the level sensor in order to be able to check when it is time to fill with seed and prevent the seed being used up in one of the seed hoppers.



When performing calibration there must be seed in all row units. The calibration is done on one seed meter, but the air pressure in the seed meters is affected if not all the seed discs in seed meters are filled.



We always recommend mixing talc in the seed to reduce the friction between the seeds and between seeds and seed meter. This is particularly important when sowing sunflower seed. Talc and seed can be mixed directly in the seed hopper; approximately 50 ml of talc is recommended for a full seed hopper (70 litres).

Before the cover on the seed hopper or seed meter is opened, the fan must be switched off because the drilling system is pressurised.

When filling there should be more or less the same amount of seed in each seed hopper.

There is a level sensor to the left of centre in the seed hopper which is used to monitor the seed level and trigger an alarm if the level is low.

9.1.2 Emptying seed

Opening of the discharge hatch

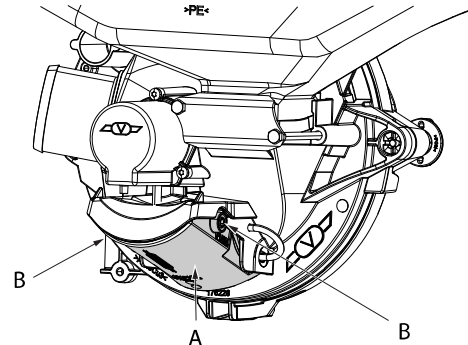


Figure 9.1

1. Open hatch (A) by pinching together (B) on both sides. Fold down the hatch.

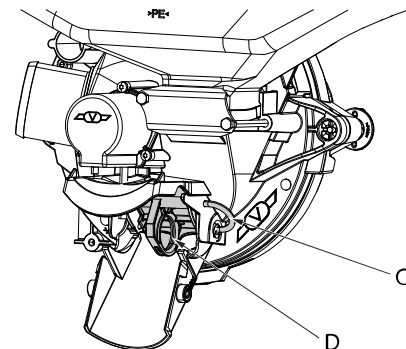


Figure 9.2

2. Pull out the shackle (C).
3. Hold a suitable container under the seed meter.
4. Get hold of the eye on the discharge door (D) and pull it out. There are two positions: the half-open and the fully open position. When the hatch reaches the half-open position, a click is heard.

Closing the discharge hatch



Avoid undesired emptying of the seed feed housing

Make sure that the outer hatch is locked into place.



If the outer hatch (A) will not close. Withdraw the clamp (C). The discharge hatch (D) must be completely closed for the outer hatch to be lifted up. Check that there is nothing preventing the discharge hatch (D) being closed.

1. Close the discharge hatch (D) completely.

- Lift up the outer hatch (A) so that the clamp (C) locks, it should click when in place.

9.2 Filling and emptying of fertiliser



The machine must be empty, clean and dry before filling.



The seed meters must be properly set and the right feed rollers must be selected before filling. See "17.2 Output settings for fertiliser".



Safety first! Avoid contact with and inhalation of fertiliser. Follow the instructions provided by the fertiliser supplier.



Do not remain on the machine while the fertiliser is running out.

9.2.1 Emptying out fertiliser

If the hopper only has a small amount of fertiliser remaining after the work is over, it can be emptied into calibration bags.

- Mount the calibration bags.
- Make sure the calibration flaps are in the calibration position.

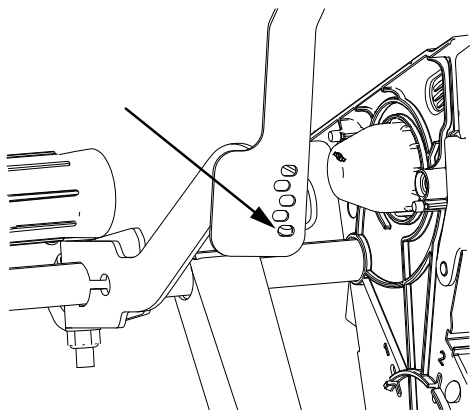


Figure 9.3 The bottom flaps

- Fully open the bottom flaps.
 - If there are large amounts over, the machine should be emptied onto a clean and dry surface or a tarpaulin. The removal of viscous fertiliser may need to be assisted by running the fertiliser motors with manual output.
 - Clean the machine thoroughly at the end of the season!

- Never leave fertiliser in the machine for any length of time!



Turn off the fan and output from the micro-granulate unit when the fertiliser motors only are to be to run (micro-granulate unit is optional and can be turned ON/OFF from home screen).

9.3 Filling and emptying of micro-granulate



Safety first! Avoid contact with and inhalation of micro-granulate and fertiliser. Always follow current environmental and safety legislation for work with hazardous substances. Always read and adhere to the instructions given by the granulate supplier. When working with fertilisers and pesticides there is often a requirement for protective masks and gloves.

9.3.1 Filling of micro-granulate



Safety first! Avoid contact with and inhalation of micro-granulate and fertiliser. Always follow current environmental and safety legislation for work with hazardous substances. Always read and adhere to the instructions given by the supplier. When working with fertilisers and pesticides there is often a requirement for protective masks and gloves.

It is important to keep in mind when filling Tempo hoppers that there should be about the same amount of micro-granules in each hopper.

9.3.2 Emptying of micro-granulate



Clean the machine thoroughly at the end of the season!



Never leave fertiliser in the machine for any length of time!

The micro-granulate hopper can be emptied out easily by raising the machine so that the container can be placed under the coulter.

When emptying, the remaining volume should be drained into a bag.

If emptying are large amounts, the machine should be emptied onto a clean and dry surface, or a tarpaulin.

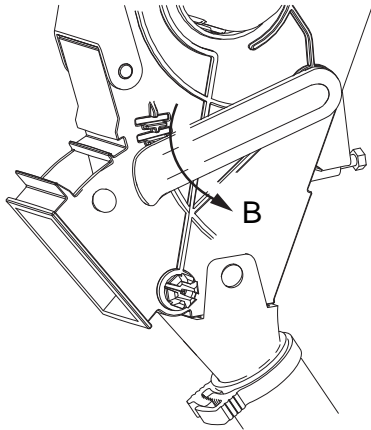


Figure 9.4

1. Fully open the bottom flaps (B) on the microgranulate hopper.

9.4 Filling with filling auger

The filling auger is there to help when filling the fertiliser hopper with fertiliser.

The auger is intended to be permanently mounted on the fertiliser hopper and is powered by the tractor hydraulics. A hydraulic lever switches the hydraulic motor for the auger on and off. The filling funnel folds down for refilling. In folded up position, the protective cover is closed.



Installation is described in a separate set of assembly instructions and may only be performed by a qualified installer.



Read the instructions carefully and make sure you understand their implications.



Read the safety precautions carefully before using the filling auger.



The machine must be empty, clean and dry before filling.



Make sure that no one is in the working area when fertiliser is being brought up to it!

Do not stand on the filling funnel grating!

Never attempt to use your hands to remove foreign objects or deal with flow stoppages when the filling auger is in operation.

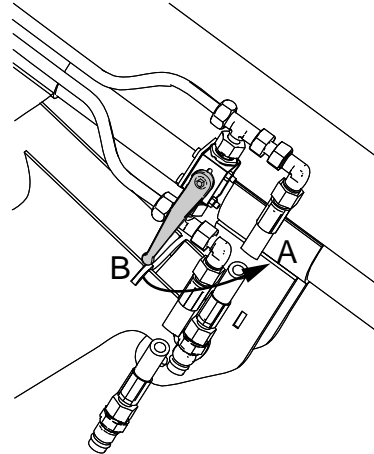


Figure 9.5

1. Check that the lever is in the position (A) for operating the filling auger.
2. Position the bag of fertiliser over the filling funnel and empty its contents into the funnel.

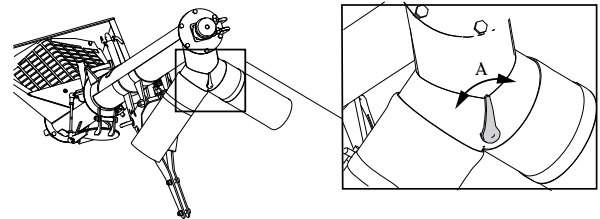


Figure 9.6 Distribution flap

3. Check that refilling progresses evenly from the two outlets. Adjust if necessary using the distribution flap (A).

10 Settings for seed drilling

10.1 Fertiliser

10.1.1 Calibration

Before the coulter is filled with fertiliser and calibration has begun a roller must be mounted.

1. Fill the hopper. There should be fertiliser to a minimum depth of 15 cm in the hopper.
2. Set the bottom flaps to the correct position, as per "17.2 Output settings for fertiliser". If output is sluggish, open the bottom flaps one more setting.
3. The output rate can be adjusted using the sliding hatches at the bottom of the fertiliser hopper. Normally, the hatches are set to position 2, see below. Make sure the sliding hatches are firmly locked into each position.
4. Place the calibration bag under the seed tube to the sowing unit to be calibrated.

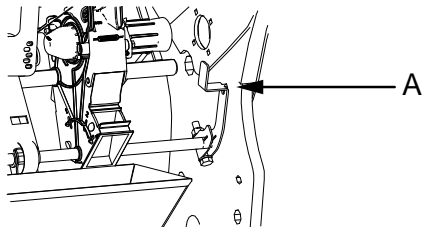


Figure 10.1

5. Set the calibration flaps to the calibration position (position A).

10.1.2 Calibration, E-Control



For ISOBUS/E-Control, please refer to the separate user guide.

10.1.3 Calibration flaps to position B for sowing

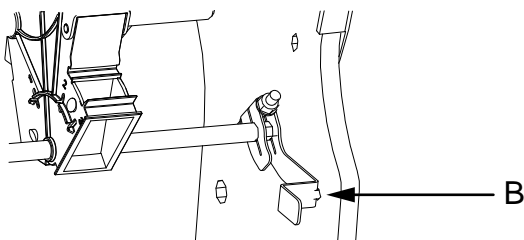


Figure 10.2 Calibration flaps to position B for sowing.

10.1.4 Depth setting of the fertiliser disc

Adjustment of the fertiliser disc depth is made with the machine raised.

There are eight depth settings.

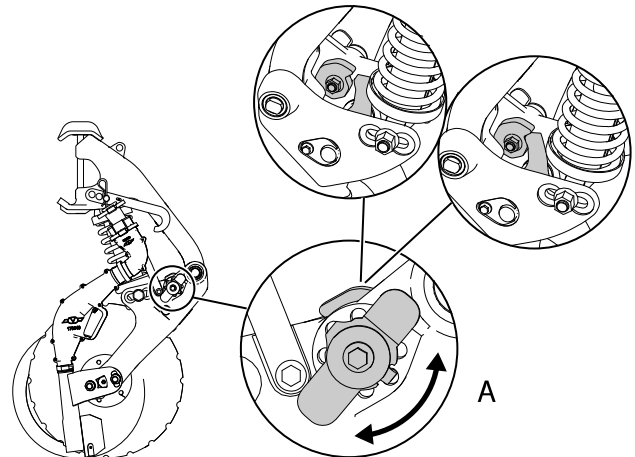


Figure 10.3 Depth setting in the deepest position

1. Pull out and turn the handle (A) to the desired position.

10.1.5 Adjusting the spring force

The spring force may need to be adjusted (up to 160 kg) for variable soil conditions. The adjustment is made with the machine raised.

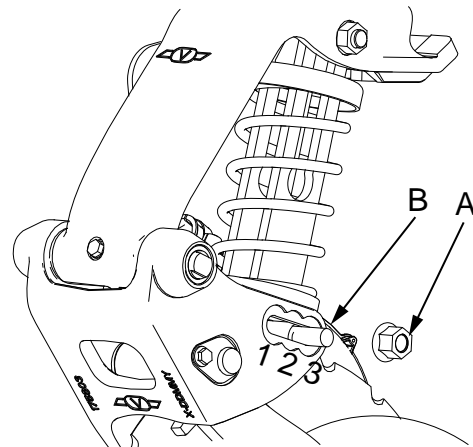


Figure 10.4

Adjusting the spring force

- Position 1: Low spring force.
 - Position 3: High spring force.
1. Loosen the nut (A).
 2. Slide the shaft (B) to one of the three selectable positions.
 3. Tighten the nut (A) to 196 Nm.

10.1.6 Raised position

When the machine is run without depositing fertiliser, the fertiliser coulter may be parked in a raised position.

Settings for seed drilling

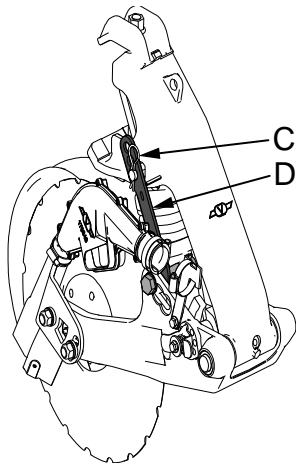


Figure 10.5

1. Compress the fertiliser spring by, for example, driving the fertiliser disc onto a wooden plank.
2. Unscrew the locking pin (C).
3. Secure the fertiliser coulters in the up position with the catch (D).
4. Tighten the locking pin (C).

11 Description of fertiliser

11.1 Combi function

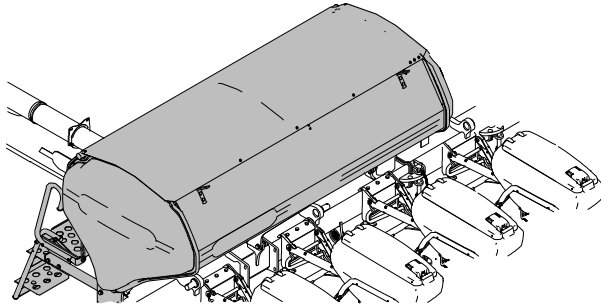


Figure 11.1

A Tempo with combi function is equipped with a large fertiliser hopper and fertiliser unit for each seed row. The centrally located fertiliser hopper can be easily filled from the platform in front of the hopper. The tarpaulin covering the hopper protects against rain. It should be secured with rubber straps during transport.

The same fan which pressurises the seed meter is used to transport the fertiliser to the fertiliser unit. The air goes through a separate tube that is positioned up on the tool and on to a distributor. Thanks to the ejector effect, the air sucks the fertiliser with it through the fertiliser hose to the fertiliser unit.

11.1.1 The output system

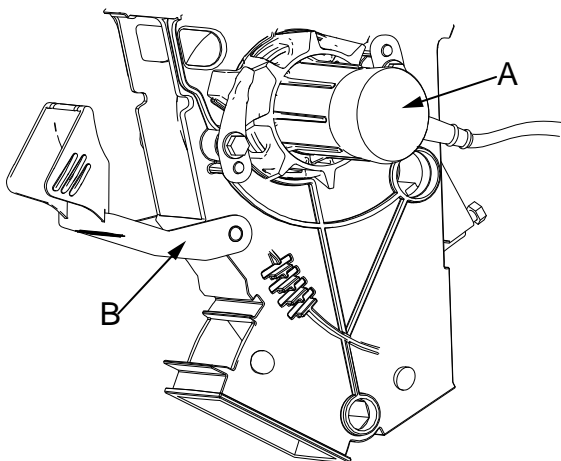


Figure 11.2 Output unit

- The plastic shutters (B) can be folded down for easy cleaning and inspection.
- During sowing, the plastic shutters **should always** be kept closed.

On the underside of the fertiliser hopper there is a output unit containing a cell wheel output unit or a scratchy

roller output unit to each output unit. Every output unit is driven by a separate electric motor (A).

11.1.1.1 Setting the bottom flaps, sliding hatches and calibration flaps

Bottom flaps, sliding hatches and calibration flaps are attached to each output unit.

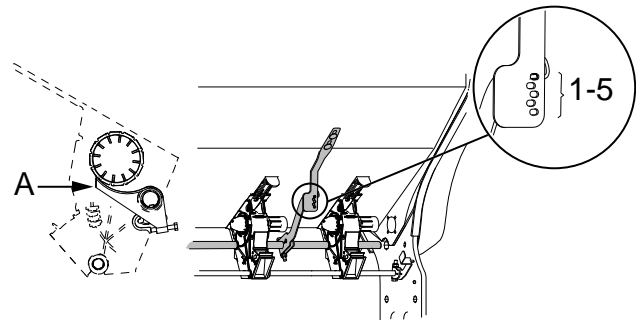


Figure 11.3 The bottom flaps

The bottom flaps can be set up so that the distance (A) is adjusted to fit different types of fertiliser. The settings lever is placed on the front side of the fertiliser hopper. The lever affects all output units. Certain fertilisers can be very coarse. If you use a flap opening that is too small, you can damage the motor!

The table in section “17.2 Output settings for fertiliser” shows how the bottom flaps should be set.

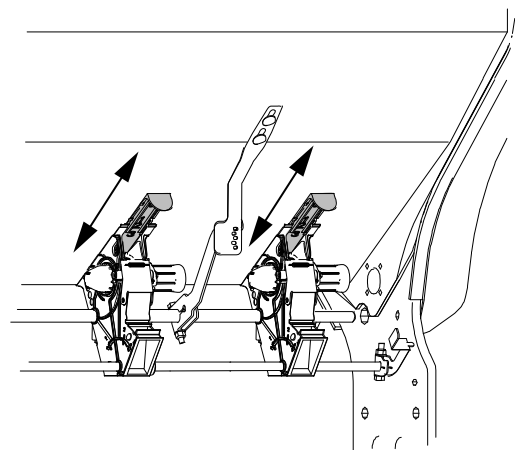


Figure 11.4 Sliding hatches

The output rate can be adjusted using the sliding hatches at the bottom of the hopper. Each output unit has its own sliding hatch. Depending on the physical properties of the fertiliser, it may be necessary to adjust the flow to the output boxes with the sliding hatches in the bottom of the fertiliser hopper.

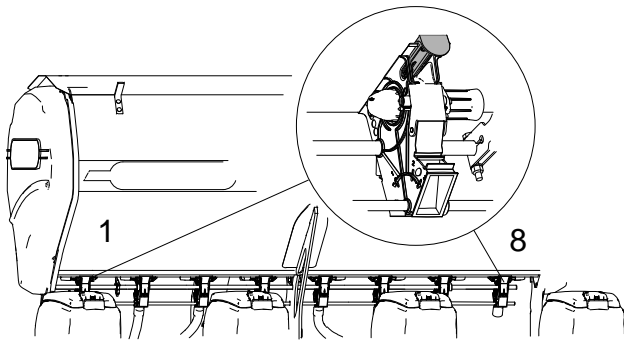


Figure 11.5 Machine with row spacing 900–1000

Drilling using every second line unit is made possible by completely closing every second hatch (position 0). By closing half the sliding hatches on the fertiliser hopper, you can also get half machine shut-off for fertiliser.



For machines with row spacing of 900-1000, sliding hatches 1 and 8 should always be closed! These output units are not used.

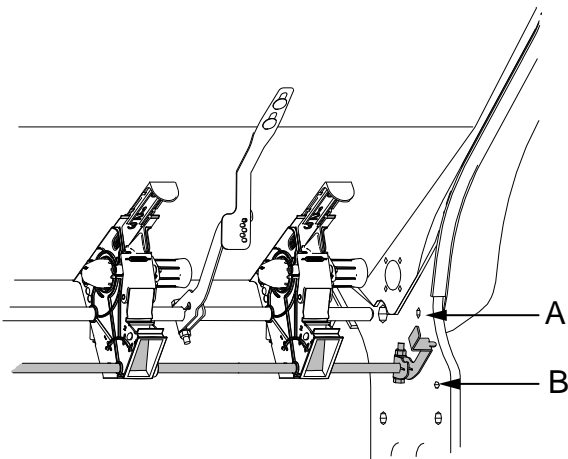


Figure 11.6 Calibration flaps

Calibration flaps are adjusted with a lever on the left side of the fertiliser hopper and have two position settings: A for calibration and B for sowing.

The lever for the calibration flaps affects all output units.

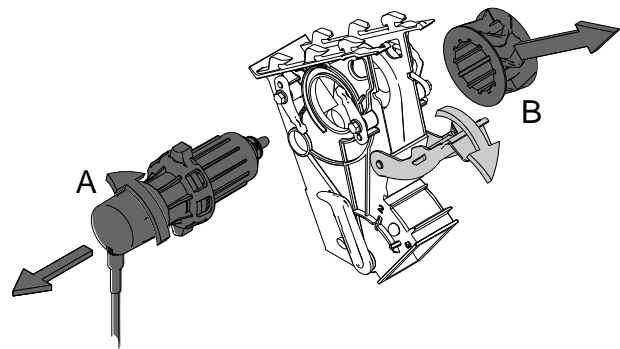


Figure 11.7 Output rollers

In order to adapt the output unit to suit different types and qualities of fertiliser, there are different rollers to choose from, see “17.1 Output settings for sowing”.

Changing a output roller

1. Remove the motor (A) by twisting it and pulling it out by the hub.
2. Open the hatches of the output units and lift out the feed rollers (B).
3. Fit the new rollers and reassemble the motor.
4. Close the hatches of the output units.
5. Change to the same type of roller for all units.

11.1.2 Agitators

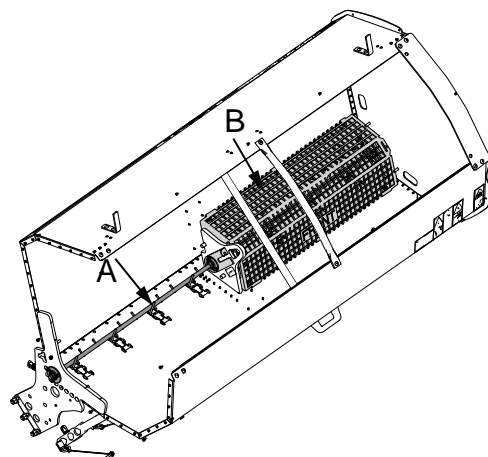


Figure 11.8 Agitators

The function of the agitators (A) is to stop the fertiliser from forming into clumps. It is placed at the bottom of the fertiliser hopper and is hydraulically driven from the fan circuit. The agitator twists back and forth using a reversing valve located in the hydraulically driven fan. To allow maintenance, two removable protective gratings (B) are fitted above the agitator.

11.1.3 Fertiliser units equipped with fertiliser discs

Fertiliser units are designed to deposit the fertiliser with high precision, at high sowing rates. The pressure can be regulated.

The fertiliser units are mounted on the frame and can be adjusted laterally relative to the row units. Their positioning on the frame ensures that soil conditions or other disturbances from the fertiliser units do not affect the row unit. The default factory setting is that the fertiliser is placed about 5 cm to the side of the seed furrow.

The depth of the fertiliser disc and the fertiliser coulter is set using the gauge wheel.

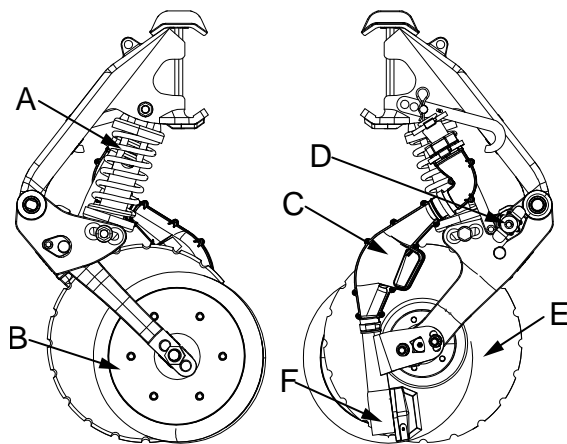


Figure 11.9 Fertiliser unit

- A. Power transmission spring
- B. Gauge wheel
- C. Diffuser
- D. Depth control
- E. Fertiliser disc
- F. Fertiliser coulter

11.1.3.1 Setting and adjusting a gauge wheel



Make sure that the gauge wheel is free of implements mounted on the row unit.

To avoid excessive flow of soil the gauge wheel can be set to three different positions.

Position 3 allows a minimum flow of soil.

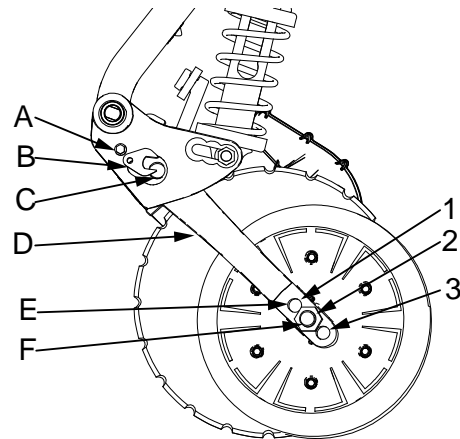


Figure 11.10 Gauge wheel

1. Release the bolt (A). Remove the rotation lock and washer (B).
2. Draw out the shaft (C) to release the arm (D).
3. Loosen the nut (E).
4. Screw out the shaft (F).
5. Place the gauge wheel in the required position.
6. Replace the arm (D) on the shaft (C) but without tightening the nut (E).
7. Adjust the gauge wheel in relation to the seed disc by rotating the shaft (F) until the wheel rests on the disc.
8. Tighten the nut (E).

12 Maintenance and service

12.1 Safety when servicing



The machine must always be secured before any type of service or maintenance work is commenced.



Always shut down the tractor and take out the ignition key in conjunction with work in the seed hopper and when carrying out work on the machine.



Never work under the machine during maintenance or service work unless it has been secured with trestles and the lifting cylinder has been blocked.



Never stand near hydraulic hoses under pressure. Recover all spilled oil after servicing the hydraulics system.



Note that poor welding may result in serious personal injury or fatality. If you are unsure, contact a professional welding technician for instructions.



Exercise extreme caution when undertaking any kind of work with the machine's hydraulic system. Wipe with clean paper or cloths. Place parts on a clean surface (not directly on the work bench) Rinse before assembly, for example with a decreasing agent.



Never rinse the bearings with a high pressure water supply! It is important to grease the bearings after washing in order to remove any water that has remained behind.



Never clean bearings directly with a high-pressure water jet. Clean electrical components by blowing them with air or by wiping them with a slightly dampened cloth.



To maintain the machine's high level of quality and operational safety, use only Väderstad genuine spare parts. The warranty and any claims under it will become void if parts other than genuine parts are used.

1. Lubricate the machine according to the intervals specified in the lubrication schedule, and always before and after winter storage and after high-pressure water cleaning.
2. Before operation, ensure that all nuts and bolts have been tightened (does not apply to bolts in flexible joints).
3. During the season, check periodically that the nuts and bolts have not worked loose and inspect joints and hydraulic ram mountings for wear.

12.2 Securing the machine for servicing

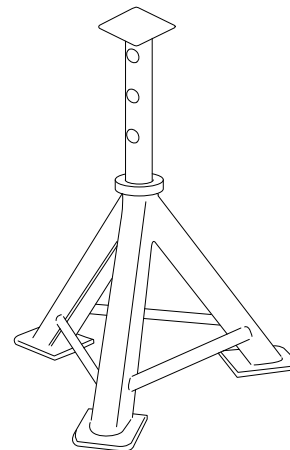


Figure 12.1



For all work underneath the seed drill or when there is a risk of pinch point injury, the machine must be supported safely on stands. Placing yourself under the machine when it is not properly secured is dangerous and can lead to fatalities. **Secure the seed drill using trestles or similar, and lock all the lifting cylinders in a fully raised position using the appropriate yellow locking devices.**



Make sure that the surface beneath the trestles is stable enough.

Always switch off the iPad (E-Control) when performing maintenance and service work on the machine.

12.3 Tools

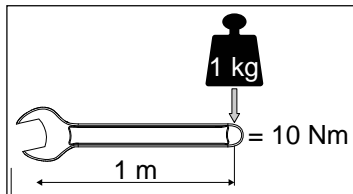
To make maintenance and service work easier, the machine's mounting elements are standardised. No special tools are required for the daily maintenance of the Väderstad Tempo.

Recommended tools

- 2 Torx screwdrivers T20 and T25 (delivered with the machine)
- 1 Socket wrench no. 24 (delivered with the machine)
- 1 Socket spanner no. 10 (delivered with the machine)
- Brush for cleaning the seed meter's sensor (delivered with the machine)
- Cabinet screwdriver
- Small Allen keys
- Ring-open-end spanners in the following size: 12, 13, 16, 17, 18, 19, 22, 24 and 30.
- Torque wrenches with a torque range of 1-500 Nm



If a torque wrench is not available, the example below may be of use.



12.4 Periodic maintenance

- Lubricate the implement according to the intervals in the lubrication schedule, and always prior to and after winter storage and after washing with high-pressure equipment; see "12.18 Lubrication points".
- Regularly check the oil level in the gearbox and oil tank on the PTO system.

12.5 Regular maintenance

- Before operation, ensure that all nuts and bolts have been tightened (does not apply to bolts in flexible joints).
- Regularly check throughout the season that screws and bolts are tightly fitted and inspect for wear in the joints and hydraulic cylinder mountings.
- Following 10–15 km of transport on the road or 2 hours of driving in fields, re-tighten the wheel nuts on the gauge wheels and support wheels. Retighten the nuts in the same way after any wheel changes.
- Retighten the gauge wheels regularly after 500 working hours, 6800 ha or one year.
- The clamp joints on the row units must be re-tightened after the first day of operation.

- The clamp joints on the fertiliser units must be re-tightened after 100 ha.
- Check the air pressure in the support wheels regularly.
- Check that hoses and couplings have not been damaged.
- Regularly clean the radar!

12.6 Inspecting the seed drill's towing eye

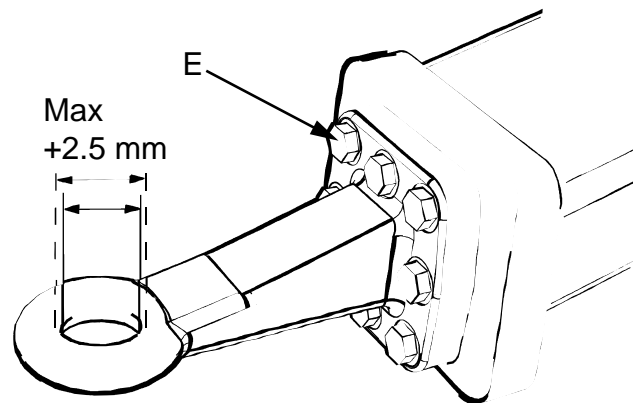


Figure 12.2

12.6.1 Re-tightening of screw unions

The towing eye's screw unions (E) must be re-tightened at regular intervals. Tightening torque 277 Nm.

12.6.2 Wear limit



Never weld a towing eye, as this can drastically reduce its durability.

When the diameter of the hole in the towing eye has increased by 2.5 mm, it has reached its wear limit and it is time to change the towing eye.

When fitting a new towing eye, new bolts must be used. Screw unions (E) must be tightened to 277 Nm. Use a torque wrench.

12.7 Maintenance and service and of the combi function



Safety first! Avoid contact with and inhalation of fertiliser. Follow the instructions provided by the fertiliser supplier.



No service or maintenance work should be performed before the tractor has stopped and the key removed from the ignition switch!



No service or maintenance work should be performed on the pressurised hydraulics system!

12.7.1 Cleaning the output system

The fertiliser hopper and its output system should be cleaned regularly and always when the season has come to an end. Fertiliser residues absorb moisture and stick to things.

Agitators



Check that the grilles are intact. A damaged grille should be replaced.

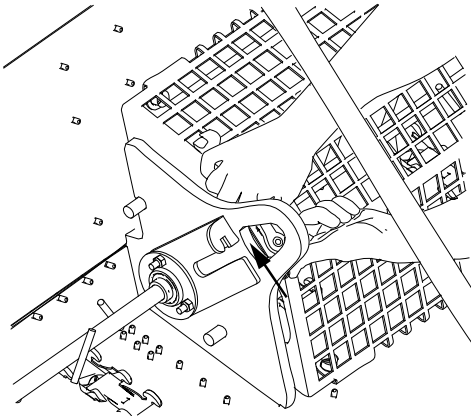


Figure 12.3

1. Loosen the nut with a spanner (13).
2. Slide the screw and the nut in the direction of the arrow.

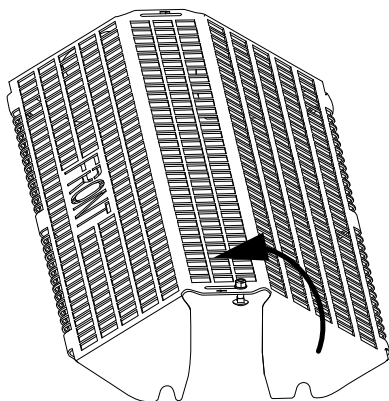


Figure 12.4

3. Lift and slide the grille to the side to be able to lift it out of the fertiliser hopper. Remove the second grille in the same way.
4. Clean and remove any fertiliser residues.
5. Reinstall the grilles.

Seed meters

1. Clean the parts of the output system that can be accessed from outside.

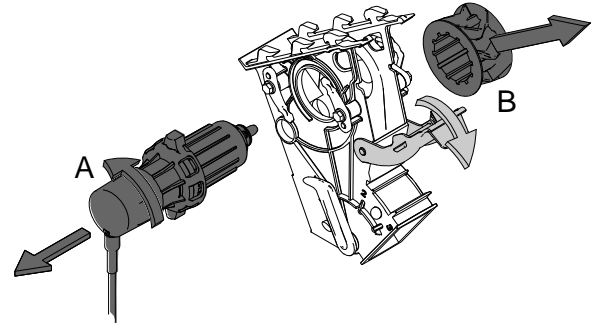


Figure 12.5

2. Remove the motor (A) from each output unit by twisting it and pulling it out by the hub.
3. Open the hatches of the output units and lift out the feed rollers (B). Clean the rollers and output units.
4. Fit the rollers and remount the motors.
5. Close the hatches of the output units.
 - Never leave fertiliser in the machine for any length of time!
 - Check the fertiliser hoses to ensure that they are empty.

12.7.2 Adjustment of the bottom flaps

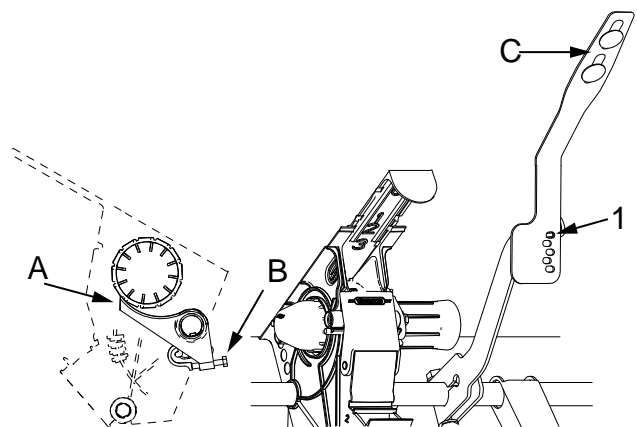


Figure 12.6

In the bottom flap position 1, the play (A) between the output roller and the bottom flaps should be 0.2 mm. The distance should be checked at the outer edge of the bottom flap. If necessary, adjust the settings screws (B) where appropriate.

Adjustment of all flaps can be effected by moving the lever index (C). After moving the index, make sure that the bottom flap lever fits in its index positions.

12.7.3 Setting and changing the fertiliser coulters

Fertiliser coulters are elastically mounted on two bolts. It is important that the coulter does not rest too firmly against the disc. Do not tighten the nuts to hard, it should be possible to rock the coulter with the hand.

When drilling in very loose soil, the nuts may need to be loosened somewhat.

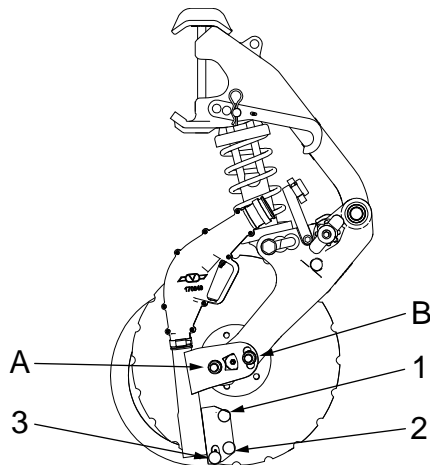


Figure 12.7

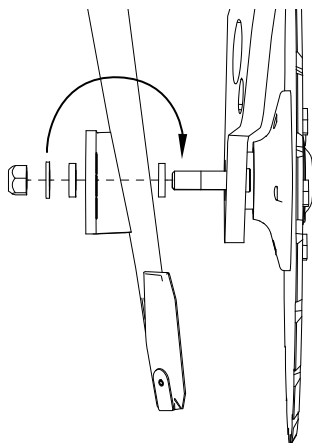


Figure 12.8

When new fertiliser coulters are mounted, the width of the gap between the disc and the coulter needs to be checked. It should be wider at the top. If the coulters are not correctly positioned, adjust by moving the metal discs at positions A and B inside or outside the bracket, see illustration above. The point of contact can also be moved somewhat by tightening the front nut more than the rear one.

Table 12.1

Position	Reference measurements between the disc and the seed coulter
1	> 0 mm
2	0 mm
3	> 0 mm

12.7.4 Changing a spring on the fertiliser coulter

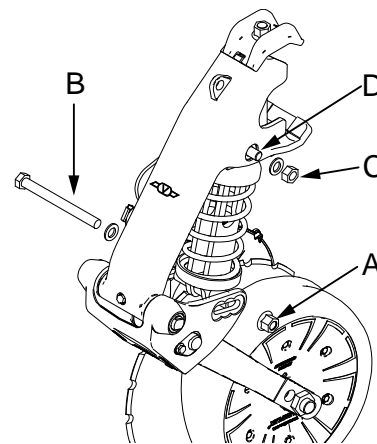


Figure 12.9

1. Loosen the nut (A).
2. Pull out the shaft (B), taking care of the washer.
3. Loosen the nut (C).
4. Pull out the shaft (D) and remove the spring.



When the shaft is removed, the tension from the spring holding up the fertiliser coulter and the gauge wheel is released. If the machine is raised, this part will swing forward and hang in the front pivot point.

5. Insert a new spring and refit the shaft (D). Check that catch is in place.
6. Tighten the nut (C).
7. Refit the shaft (B) in the desired position.
8. Tighten the nut (A) to 196 Nm.

12.7.5 Replacing the fertiliser disc



The discs are sharp - wear gloves!

- Ensure that the seed drill is safely supported on stands.
- A spanner should be used when replacing discs.
- Tighten the nuts crosswise when assembling.

12.7.6 Replacing the bearings on a fertiliser disc

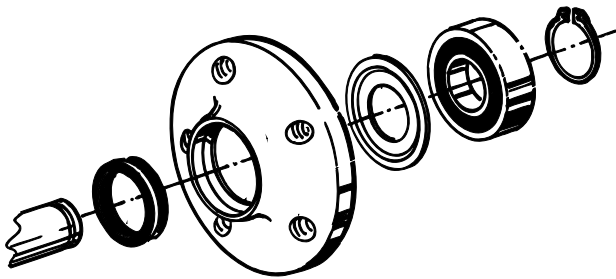


Figure 12.10

The discs have a ball bearing which is firmly pressed onto the shank of the shaft and locked with a locking ring. A puller should be used when removing. This tool can be ordered from Väderstad AB.

All the seals and washers should be replaced at the same time as replacing the bearings. Grease the seals before reassembly and round off replacement of the bearings by lubricating them through the grease nipple.

Check the figure to see how the seals should face. The bearing needs to sit tight on the shank.

12.8 PTO-driven belt drive

12.8.1 Extra belt pulley for belt transmission (optional addition)

The power take-off (PTO) shaft drives the fan and generator via a belt drive. In the standard model, the belt drive has a belt pulley designed for tractors with 540 or 1000 rpm on the PTO shaft, depending on the selection.

In order to adapt the belt transmission to different tractor types, or to reduce the power requirement, alternative belt pulleys can be ordered as optional additions:

- A. PTO 440, alternative belt pulley for adapting to tractor type. For a tractor with 540 rpm on the PTO shaft, the fan already reaches working speed at 440 rpm, which is equivalent to a tractor engine speed which is approximately 20% lower.
- B. PTO 880, alternative belt pulley for adapting to tractor type. For a tractor with 1000 rpm on the PTO shaft, the fan already reaches working speed at 880 rpm, which is equivalent to a tractor engine speed which is approximately 20% lower

Contact your dealer to order an alternative belt pulley.



The maximum fan speed is 5000 rpm. Do not over-rev the fan.

12.8.2 Maintenance and service of the power take-off shaft

Lubrication of grease nipples and other maintenance must be performed in accordance with instructions that accompany the power take-off shaft. Check that the power take-off shaft is intact. Put safety first – change when necessary.

12.8.3 Maintenance and service of the belt drive

After 500-700 hectares' operation, we recommend a careful check of the fan, fan belt, bottom belt pulley bearing and the shaft.

Make sure the belt is properly tensioned in accordance with the recommendations. The belt must be tensioned correctly in order to ensure an optimal lifespan. Insufficient or excessive belt tension will reduce belt life. See "12.9 Hydraulic belt drive".

Never use excessive force to get the belts into the belt grooves, e.g. by prising them with a screwdriver. Make sure the pulley sides are perfectly level with each other. Regular checking of the belt tension will result in optimum belt service life.



A spare drive belt should always be available.

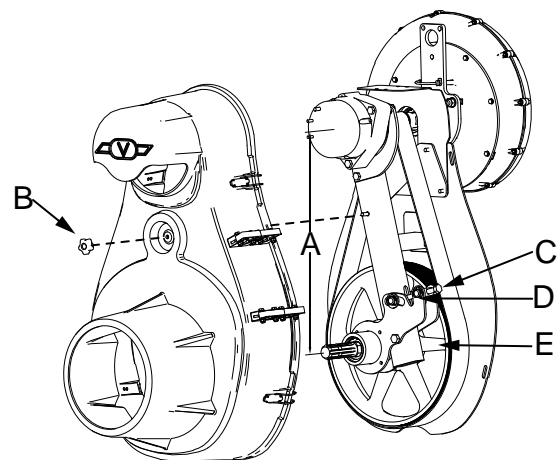


Figure 12.11

- A. Pulley sides that must be level with each other
- B. Fixing screw, cover
- C. Adjusting screw
- D. Counter-nut
- E. Belt wheel

12.8.3.1 Replacing the fan belt

1. Remove the cover (B).
2. Remove the + (plus) terminal from the battery before working on the generator.

- Remove the cables to the generator.



Risk of short-circuit! Protect the cables against accidental contact.

- Undo the adjusting screw so that the belt hangs loose.
- Change the belt.
- Adjust the belt tension.

12.8.3.2 Tension the belt

To adjust the belt:

- Remove the cover.
- Undo the counter-nut.
- Adjust the belt tension using the adjusting screw.
- Tighten the counter-nut.
- Refit the cover.

Check the belt tension with the twist test method

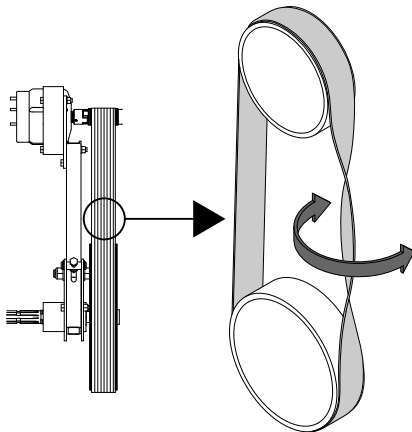


Figure 12.12

Grip the belt in the centre between the belt wheel shafts and twist. You should be able to twist the belt through 90°.

Check the belt tension with the Extension method

- Place the belt in the pulley groove without tensioning it.
- Draw two lines across the rear side of the belt with a distance between them approx. 80% of the distance between the shafts (or one metre if there is a big distance between the shafts).
- Increase the distance between the two lines by 0.5 to 0.75% by tightening the belt.
- Run the drive under load for approximately 10 minutes.

- Check the belt tension by measuring the distance between the lines and adjust if necessary.

Example

The shaft distance (A) is approximately 550 mm.

- Draw two lines on the slack belt with a distance between them of $550 \text{ mm} \times 0.8 = 440 \text{ mm}$.
- Tighten the belt so that the distance between the two lines is between $(440 \text{ mm} \times 0.005 \text{ and } 440 \text{ mm} \times 0.0075)$ 2.2–3.3 mm longer, i.e. 442.2–443.3 mm.
- Run the fan for approximately 10 minutes and check that the distance is still between 442.2 and 443.3 mm. If not, adjust the tension.

12.8.3.3 Fan noise

Noise level: 82.6 dB(A)

Sound output: 105.9 dB(A)

Microphone positioning according to standard EN ISO 4254-1, measuring uncertainty $\pm 2 \text{ dB(A)}$

12.9 Hydraulic belt drive

12.9.1 Maintenance and service of the hydraulic motor

- After operating for 500-700 hectares, we recommend a careful check of the fan and the fan belt.
- Make sure the belt is properly tensioned in accordance with the recommendations. The belt must be tensioned correctly for optimum life. Insufficient or excessive belt tension will reduce belt life.
- Also make sure that the belt shows no signs of wear.



Never use force to tension the belt, e.g. prying it with a screwdriver. Regular checking of the tensioning of belts ensures their optimum working life.



A spare drive belt should always be available.

12.9.2 Checking for tension and wear of the belt

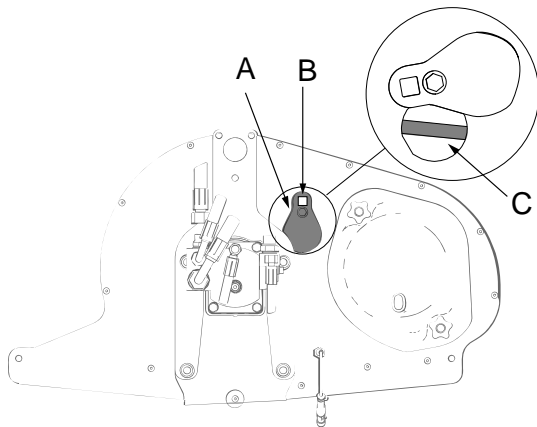


Figure 12.13

1. Using a ½ inch breaker bar in the square hole (B), rotate the cover (A) to the side so that the strap (C) is visible.
2. Check the tensioning of the belt. Adjust if necessary.

12.9.3 Adjusting the tension of the belt

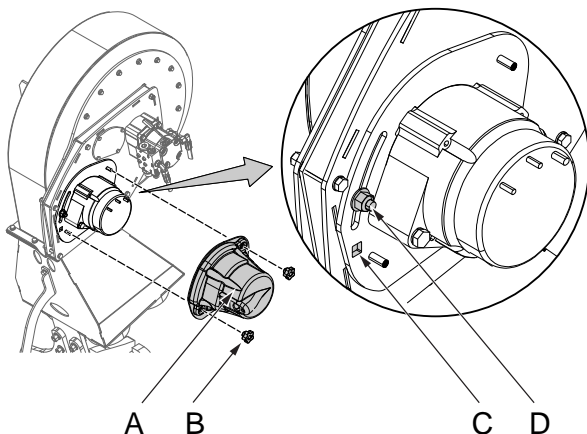


Figure 12.14

1. Use the handles (B) to remove the cover (A).
2. Loosen the screw (D) in the long narrow hole.
3. Insert a ½ inch breaker bar into the square hole (C) and rotate the generator to increase the tensioning on the belt.

For TPL 24–32:

- Push the belt in 7mm.
- Measure the force F of the new belt: $F = 50 \text{ N}$

For other Tempo models:

- Push the belt in 4.2 mm.
- Measure the force F of the new belt: $F = 21.3 \text{ N}$

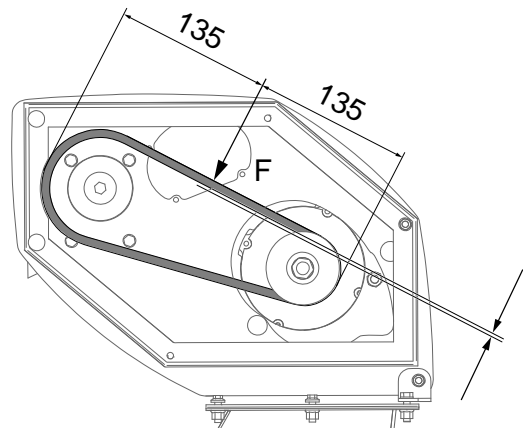


Figure 12.15

4. Tighten the screw (D).
5. Using the handles (B), replace the cover (A).

12.9.4 Replacing the sensor

The function of the sensor (C) is to detect the fan speed on the control box and that the electronics are operating properly. The sensor displays lights up or blinks yellow. If the display does not flash yellow, it needs to be replaced.

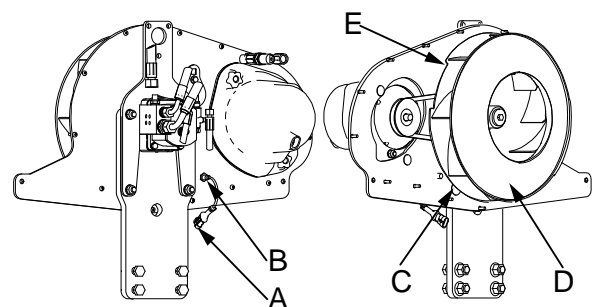


Figure 12.16 The picture shows a disassembled fan cover

1. Disconnect the sensor connector (A).
2. Loosen the lock nut (B).
3. Unscrew the sensor (C).
4. Rotate the fan wheel (D) manually so that the notches (E) on it are not directed towards the sensor (C) whilst making the adjustment.
5. Fit a new sensor by gently screwing it in until it touches the fan wheel (D) and then screw it two turns backward. The distance between the sensor (C) and the fan wheel (D) should not exceed 3 mm.
6. Replace the lock nut (B).

7. Reconnect the sensor connector (A) and check that the sensor flashes. If the new sensor does not flash, it may be too far away from the fan disc so that it fails to detect it. Carefully adjust the distance between the sensor (C) and fan disc (D).

12.9.5 Fan noise

Noise level: 83.6 dB(A)

Sound output: 104.4 dB(A)

Microphone positioning according to standard EN ISO 4254-1, measuring uncertainty ± 2 dB(A)

12.9.6 Replacing the belt

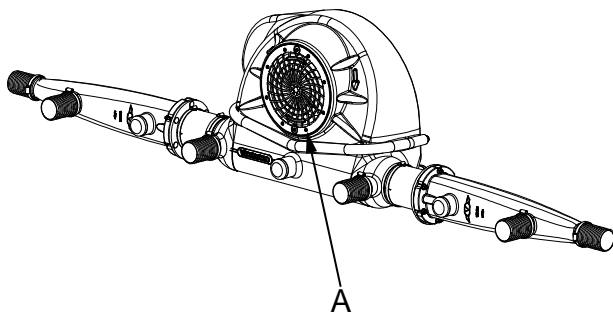


Figure 12.17

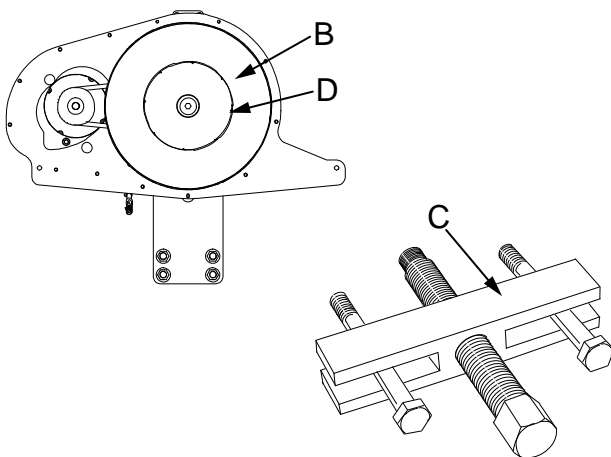


Figure 12.18

1. Release the belt tension in accordance with "12.9.3 Adjusting the tension of the belt".
2. Remove the fan housing (A) by undoing the screws holding it in place.
3. Remove the screw (B).
4. Use the puller (C) to loosen the fan wheel (D). Then pull the fan wheel off its shaft.
5. Change the belt.
6. Push the fan wheel back onto the shaft.

7. Replace the centre screw (B).
8. Adjust the belt tension in accordance with "12.9.3 Adjusting the tension of the belt"

12.10 Maintenance and service of the wheels



Consider your safety and do not crawl under the machine.

See also "12.2 Securing the machine for servicing".

12.10.1 Changing wheels



If the tractor is connected, make sure the parking brake on it is activated. Place a wedge underneath the wheels that are not to be changed.

Changing wheels must be done on a stable and level surface.

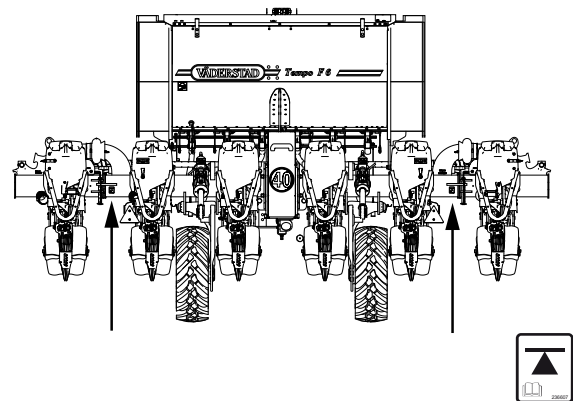


Figure 12.19

1. Lift the machine using the jack in the marked positions, see the jacking points in "2.5.2 Content of warning decals" until the tyre is about 1 cm above the ground.
2. Place a trestle under the centre frame in such a way that the machine is kept well balanced if it should need to rest on it.
3. Undo the wheel nuts.
4. Change the wheel.
5. When reassembling, tighten the wheel nuts crosswise. Correct torque is 330 Nm.
6. Retighten the nuts after the first 10km and after 500 working hours, 6800 ha or after one year; whichever comes first.

Maintenance and service

12.10.2 Wheel bearing adjustment

Check for play in the wheel hub. If considerable play can be felt, the bearings should be tightened.

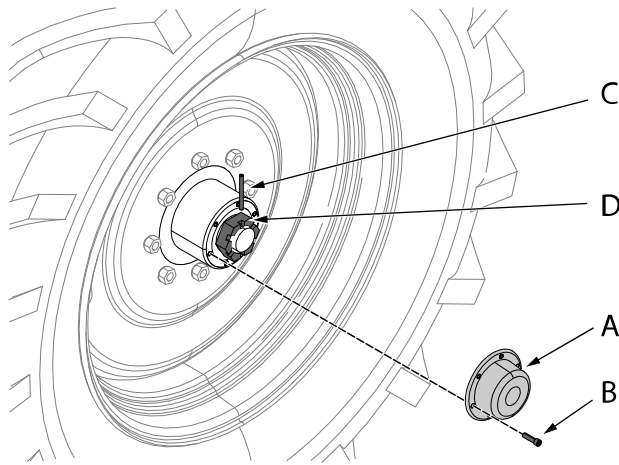


Figure 12.20

1. Remove the hub cap (A) by loosening the six screws (B).
2. Loosen the roll pin (C) that holds the castle nut (D) in place.
3. Tighten the castle nut (D) to 200 +/-20 Nm.
4. Loosen the castle nut (D) by at least 90°.
5. Tighten again to 51 +/-5 Nm and lock the castle nut with the cotter pin.

If you cannot get the cotter pin into the hole in the shaft, the nut can be adjusted slightly. Always check that the hub can be rotated by hand.

12.10.3 Tyres and air pressure



Risk of explosion in case of tyre overfilling.

Check the tyre pressure in support and gauge wheels. See recommendations in "Table 12.2".

Table 12.2

Row spacing	Wheel dimensions	Air pressure	
		bar	kPa
700	10,0/75–15,3"	5,2	520
750, 762, 800	11,5/80–15,3"	4,5	450

12.11 Maintenance and service of brakes



Incorrect handling can result in the brakes not working. Risk of great danger in road traffic! In case of any uncertainty, contact professional service personnel.

The brake shoes must not be changed separately. All brake shoes on the same shaft must be changed at the same time. The same applies to brake cylinders, which must also be changed in pairs.

12.11.1 Maintenance of pneumatic brake systems

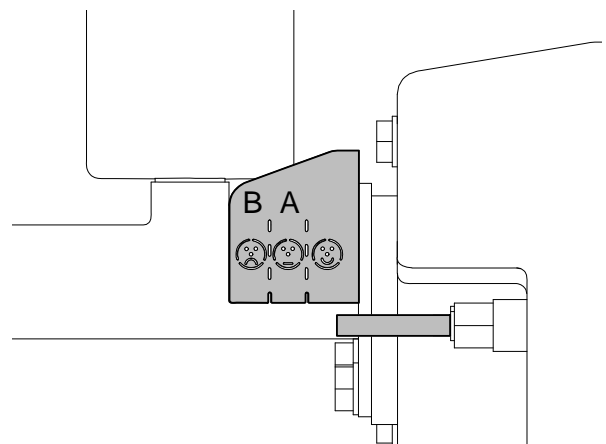


Figure 12.21 Indicator plate

1. Check the wear on the brakes on the indicator plate. When the indicator pin moves from (A) to (B), it is time to check and service the system.
2. Check that the fluid level in the brake fluid reservoir does not fall below the minimum indicator line.
3. Check that all lines, hoses and brake cylinders are undamaged and that they are not leaking.
4. If the brake action is slow, remove the line filters on the air pipes and clean or replace the filters as necessary.

12.11.2 Bleeding the pneumatic brakes

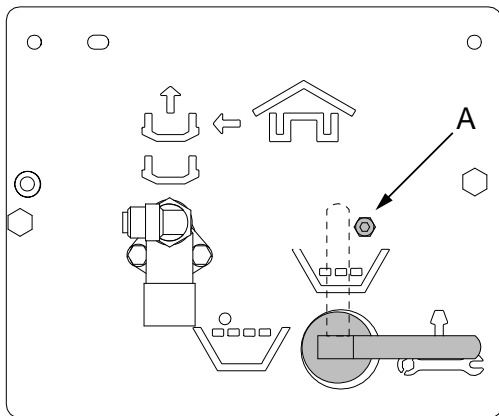


Figure 12.22 Control panel

1. Remove the screw (A) on the control panel to turn the lever to the service position.

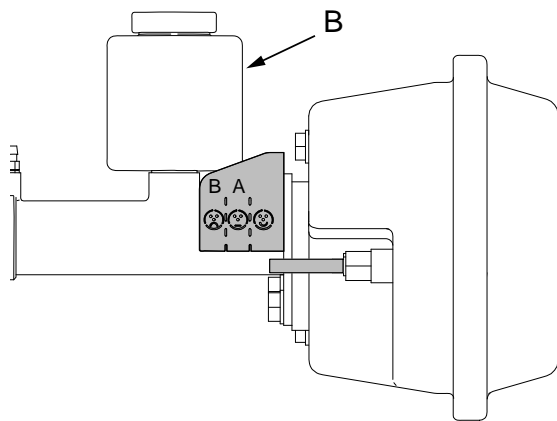


Figure 12.23 Container for brake oil

2. Top up the brake oil in the reservoir (B) to the max. mark. Only use mineral-based brake oil, type **ISO 7308** or equivalent. Connect a transparent hose to the nipple (C) and allow any excess oil to run into a suitable container. Close the nipple when no more air bubbles can be seen in the hose.



If the oil is not topped up when the level is below the Min. marking, there is a risk of air penetrating the system.

3. Connect a brake bleeding tool (max. 1 bar) to the main cylinder – or connect the compressed air line and the control line to the tractor and apply the brakes – or connect the compressed air line and the control line to an external compressed air source (max. 6 bar).

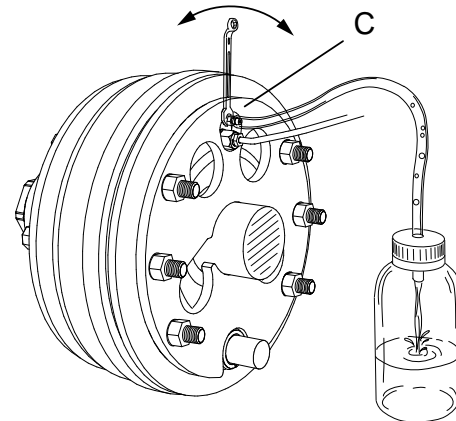


Figure 12.24 Air-bleeding nipple

4. Bleed the system using the nipple (C), which is located adjacent to the brake line connections on each wheel. Be careful! First bleed one wheel and then the second before continuing to bleed the left/right wheel until all air has been forced out of the lines.
5. When there is no air left in the system, the indicator tine should have a length of 35 mm or shorter and should indicate figure D.

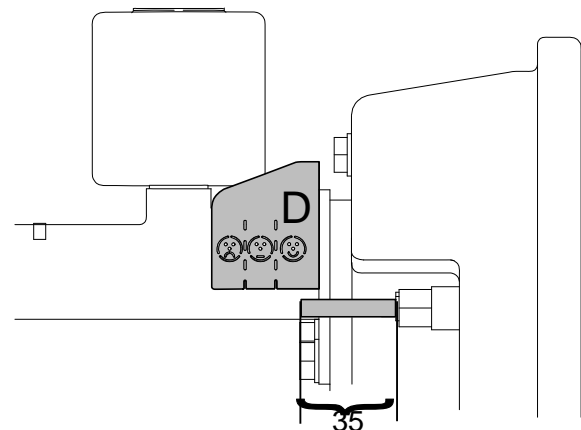


Figure 12.25 Indicates that the air has been emptied from the system

6. Press in the indicator pin. Turn the lever on the control panel back to half-full hopper and apply the brakes. Check that the indicator pin still points to (D). If not, turn the lever to the maintenance position and repeat from step “4.”.
7. Replace the screw (A) on the control panel.

12.11.3 Maintenance of hydraulic brake systems

1. Check the wear on the brakes at regular intervals. Service the system as needed.
2. Check that all lines, hoses and brake cylinders are undamaged and not leaking.

12.11.4 Bleeding the hydraulic brakes

1. Connect the brake system’s hydraulic hoses to the tractor and apply the brakes.

- Use the nipple, see “*Figure 12.24 Air-bleeding nipple*” (C) to bleed the system. First bleed one wheel and then the second before continuing to bleed the left/ right wheel until all air has been forced out of the lines. Connect a transparent hose to the nipple and allow surplus brake fluid to run into a suitable container. Close the nipple when no more air bubbles can be seen in the hose.

12.12 Maintenance and service of the PTO system

12.12.1 Changing the gearbox oil



Always use a SAE 75W-140 Synthetic Long Life transmission oil.

Change interval:

- After 50 h (the first time)
- After 1000 h, or every two years

To change the oil:

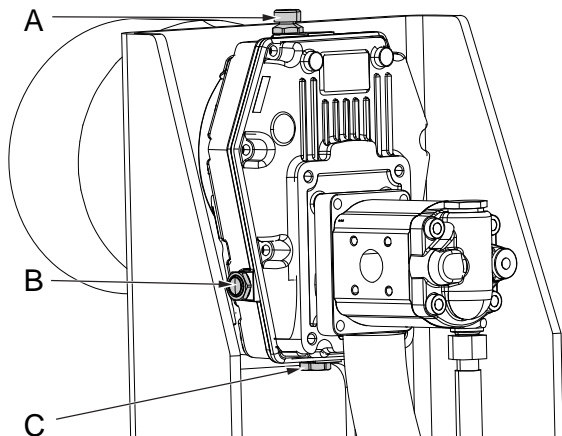


Figure 12.26

- A. Lid
- B. Oil level window
- C. Bottom plug

- Switch off the tractor.
- Place a spill container, of approx. 1 litre, under the gearbox.
- Unscrew the bottom plug (A) and place the cover on a clean paper towel.
Collect the oil and dispose of it according to the relevant local regulations.
- Screw the bottom plug (C) back onto the gearbox.
- Open the cover (A) on the gearbox and place the cover on a clean paper towel.

- Pour in transmission oil, approx. 1/3 litre, until the surface is visible in the level glass (B). Always use SAE 75W-140 Synthetic Long Life transmission oil.
- Make sure the cover (A) is completely closed.

12.12.2 Replacing the hydraulic oil



Always use hydraulic oil that meets the oil requirements.

Change interval:

- After 500 h, or every two years

To change the oil:

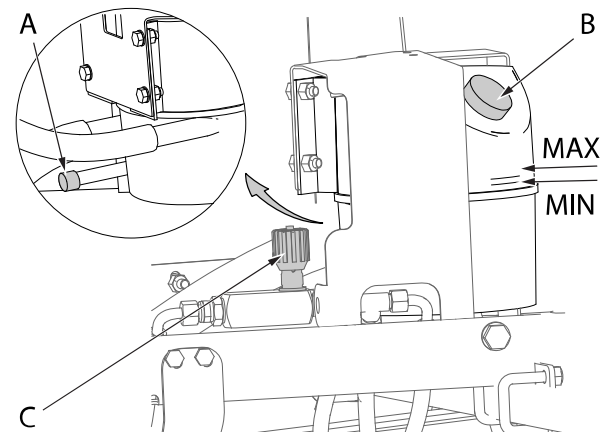


Figure 12.27

- A. Bottom plug
- B. Lid
- C. Flow valve

- Switch off the tractor.
- Place a spill container, greater than 7 litre, under the oil tank.
- Unscrew the bottom plug (A) and place the cover on a clean paper towel.
Collect the oil and dispose of it according to the relevant local regulations.
- Screw the bottom plug back onto the oil tank.
- Open the cover (B) on the oil tank and place the cover on a clean paper towel.
- Pour new oil into the oil tank. Always use an oil equivalent to “*4.1.1 Tractor hydraulic system requirements*”.
The oil level has to be between the max and min level.
- Start the tractor and PTO.

8. Monitor the oil level.
 - If the oil level drops below the minimum level, turn off the PTO and repeat from step “6.”
 - When the level is constantly between the max and min level for 10 minutes, the oil change is complete.
9. Make sure the cover is completely closed.

12.12.3 Replacing the hydraulic oil filter



Always depressurise the system before changing the filter.



Make sure that service and maintenance work to the hydraulic system is done in clean surroundings.

The hydraulic oil filter has to be changed when the indicator (C) on the filter indicates that it is time for replacement, see “Figure 12.28”.

How to change the filter

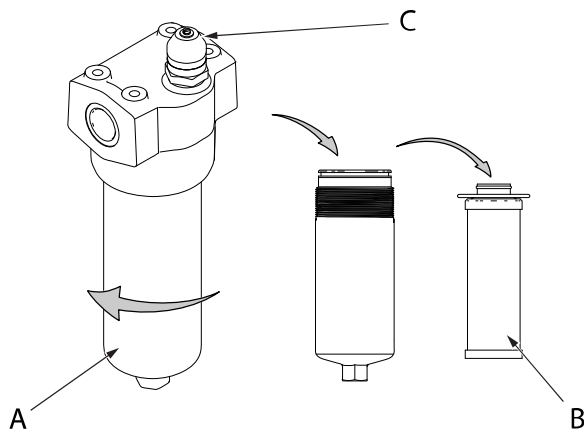


Figure 12.28

1. Unscrew the cover (A) counterclockwise and place it on a clean surface.
2. Take off the old filter element and fit a new one (B).
3. Replace the cover (A). Tighten to 25 Nm.

12.12.4 Maintenance and service of the hydraulic oil cooler



Never use a high-pressure jet cleaner on the hydraulic oil cooler, because this may damage the fins on the radiator fan.

- Inspect the hydraulic oil cooler every day, to detect any damage or dirt.
- Blow clean with compressed air.

- If necessary, rinse gently with lukewarm water.
- If the radiator fins are bent, they can be carefully straightened out using a small screwdriver or a small pair of pliers.

12.13 Maintenance and service of the filling auger



Before starting any service or maintenance work, the tractor must first be stopped and the key removed from the ignition.



No service or maintenance work should be performed on the pressurised hydraulics system!

General care of the filling auger

Apart from general care, see “12.5 Regular maintenance”, the following maintenance is needed:

- A. Before each instance of operation, check that the hoses on the outlet are secure and intact. If there are holes in the hose walls, the hose must be replaced.
- B. Clean the filling auger with compressed air prior to longer storage and as needed.



Always use protective equipment – protective glasses, mask, gloves, ear defenders and protective clothing – wherever there is a risk of contact with fertiliser.

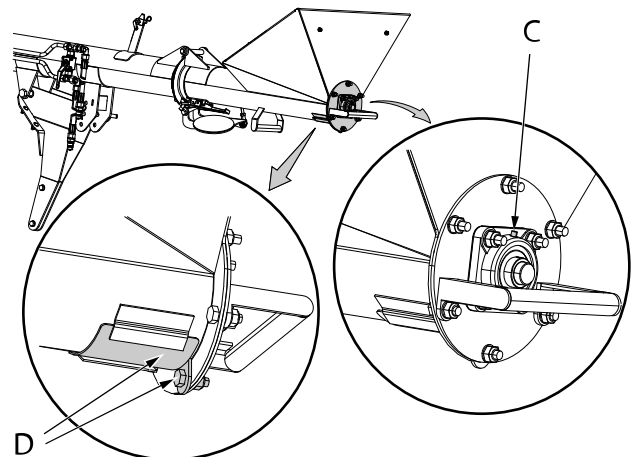


Figure 12.29

- C. Apply grease to the grease nipple (C) on the filling auger. Lubrication is performed with the auger in the transport position.
- D. Clean the filling funnel. If fertiliser gets stuck, cleaning can be performed via a hatch at the bottom of the filling funnel (D). Undo the bolt and pull the hatch out of the way.

12.14 Cleaning the frame's air ducts

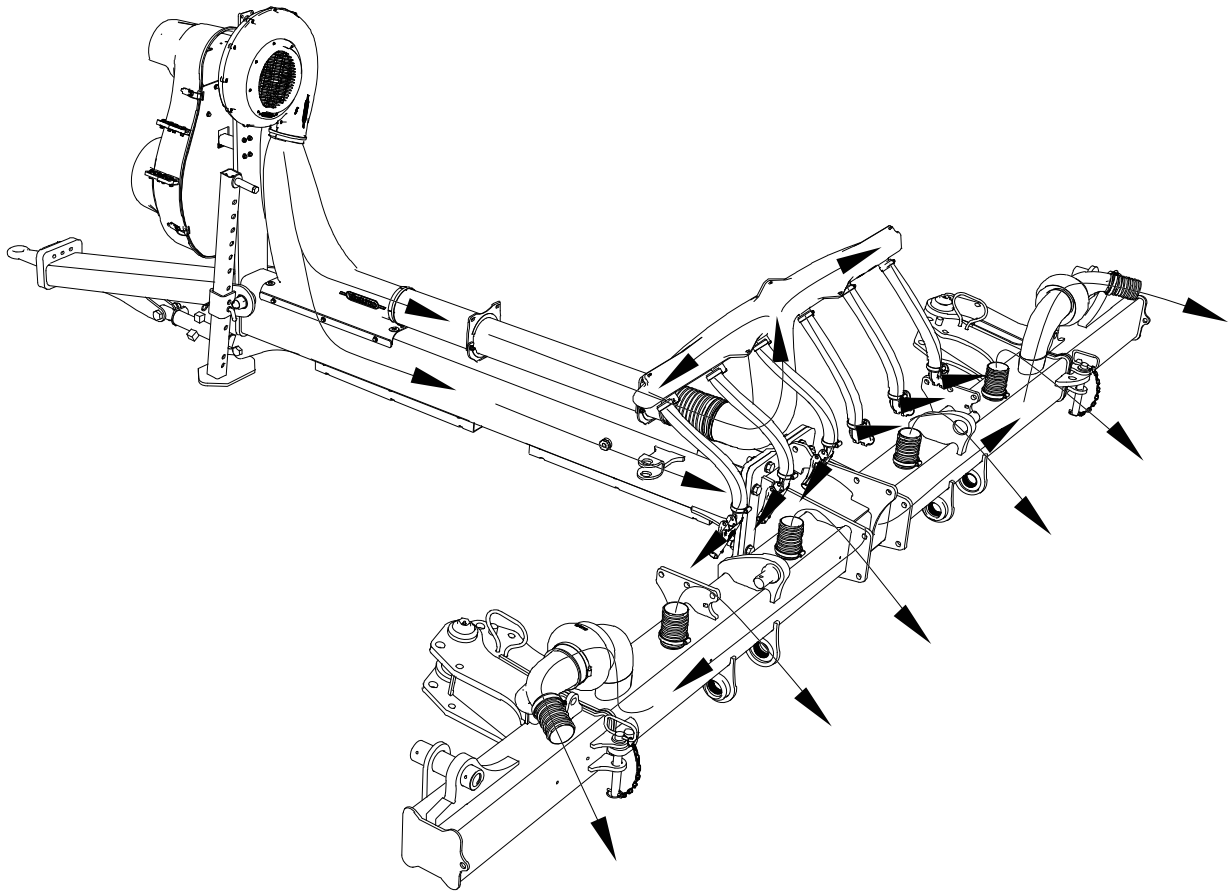


Figure 12.30 Illustration of air flow in the frame

Tempo is equipped with an innovative air system in which the frame is used for air transport. This reduces the number of hoses and pipes on the machine and guarantees long and problem-free operation.

To clean the air ducts, the fan can be started when the machine is retracted to transport position. The powerful fan then blows the air ducts clean.

12.15 Hydraulics

12.15.1 Emptying of the accumulators before servicing the hydraulic system



Warning for sharp oil jets. The hydraulics system contains accumulators. Before undertaking servicing or repair work, all oil must be emptied from the accumulators. Be very careful if it is necessary to remove hydraulic couplings from the machine. Always use protective eye wear when opening up hydraulic components. Hydraulic couplings that are being disassembled should never be directed towards any part of the body.

Ensure that the machine's working area is clear and that nobody is standing in the vicinity of the machine when manoeuvring its hydraulic components as per the instructions below.

- When disassembling hydraulic hoses connected to the hydraulic cylinder, the coupling at the hydraulic block should be removed first
- Make sure that you understand how the tractor's hydraulic system functions.

12.15.2 Removing pressure from the hydraulic folding cylinders.



The wing folding hydraulics contains check valves which can cause high internal oil pressure. Disassemble the hydraulic system carefully.

The machine should be connected to the tractor, folded down into working mode and resting on a level and stable surface.

1. Initiate wing folding until these have lifted slightly (5cm) at the outer edge.

2. Place the hydraulic control valve which controls the outlet connected to the machine's wing folding (hoses marked with red) into float position.
3. If the machine has hydraulic wing lock, activate the wing lock to open the locking valves to relieve the pressure in the cylinders.



The wing folding hydraulics contains check valves and an accumulator tank which can cause high internal oil pressure. Disassemble the hydraulic system carefully.

12.15.3 Service of hydraulic components



During servicing of the hydraulic system, the machine must always be folded out and lowered to the ground. The hydraulic circuit must be depressurised.



Never stand near hydraulic hoses under pressure. Drain the system's accumulators before servicing the hydraulic system.



All work and repairs must be carried out in line with qualified procedures.

The highest possible level of cleanliness should be observed when replacing sealing kits. Be careful not to damage any surface of the hydraulic components while working and that all gaskets are mounted correctly. Check the components for abnormal wear and tear, for example burrs or scratches which may indicate the presence of dirt in the hydraulic system or wrongly-weighted components.

12.15.4 Inspection of hydraulic hoses

Check the hydraulic hoses every three months or every 400-600 working hours, whichever comes first.

12.15.5 Date marking and max pressure on hydraulic hoses

The hose ends are marked with the date of manufacture (year and month) and max pressure.

12.15.6 Bleeding of the hydraulic system for folding

The hydraulic system must always be bled after servicing.

Manoeuvre the folding cylinders into their outer and inner end positions a few times until all air has been flushed out of the system.

12.15.7 Bleeding of the hydraulic system for row unit pressure

The system must be bled after any work to the hydraulics system.

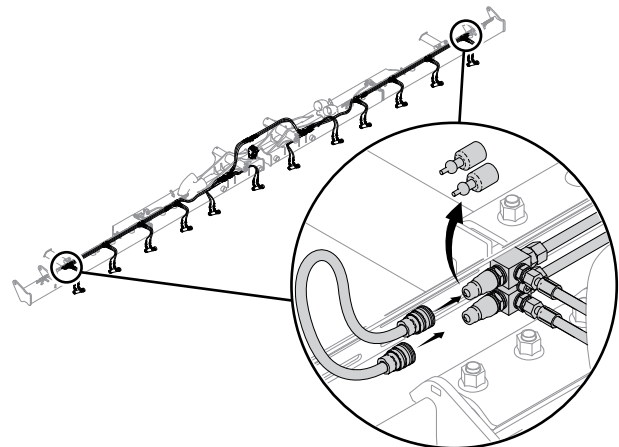


Figure 12.31

1. Connect a hose between the two quick couplings at the far end of each wing.
2. Start the seed fan circuit and set the correct fan rpm.
3. Use the iPad to set the maximum pressure in one direction and wait 10 seconds.

Then set the maximum pressure in the other direction and wait 10 seconds.

Repeat at least three times.

12.16 Battery maintenance



A battery contains corrosive sulphuric acid. Be careful when working with the battery.



The battery must not be disconnected when the machine or generator is in operation, since the sparks may ignite the gas created during charging. Risk of explosion!



Short-circuited batteries may give off sparks that can ignite dust. Ensure that all flammable material in the vicinity of the battery is kept away.

1. Release the clamp from the negative terminal. Use an open-ended spanner. If the clamp has become stuck fast due to oxidation, use a puller or try to twist it loose. Never strike the battery's poles as this can cause internal damages.
2. Inspect the condition of the terminal clamps. Clean or change them if necessary.

3. Check the attachment point of the grounding cable. If it has been affected by oxidation, it must be cleaned to maintain good contact.
4. Install the battery and connect the cables. Always start with the positive cable. Lubricate the terminals and the terminal clips with terminal grease or copper paste.

If the battery has been left discharged over a longer period, there is a risk that it will not recharge.

12.17 When storing for longer periods

When the machine is not being used, it should be stored indoors. This is very important given that the machine has electronic instruments.

Disconnect the battery to prevent current leakage discharging from the battery.

Braked machines should not have the parking brake applied, but be secured with chocks. With pneumatic brakes, the brakes are released by pressing the retarder valve in.

The control box and the battery should be stored at room temperature when stored for long periods.

Machine parts with a bright finish, such as piston rods and wearing parts, should be treated with rust protection before longer storage periods.

Make sure that the machine has been emptied and thoroughly cleaned.

The feed rollers should be completely dry before being put into storage and should be kept in a dry, dark and rodent-free place when the machine is not in use.

If you have tight-fitting covers with rubber seals, they must be stored open to relieve pressure and thus prevent deformation.

12.18 Lubrication points



Safety first! Do not crawl under the machine, but rather lubricate from above or support the machine securely on trestles.

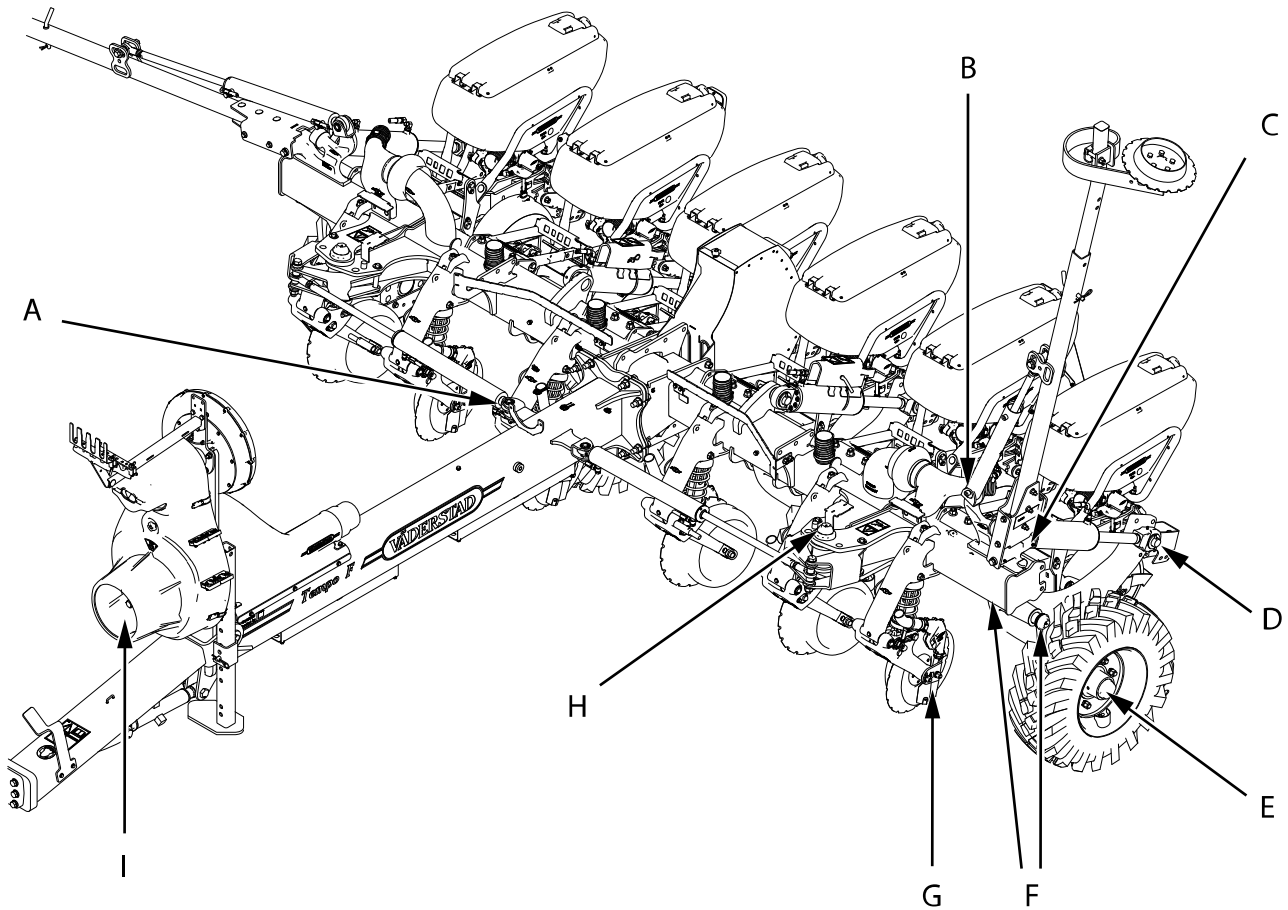


Figure 12.32

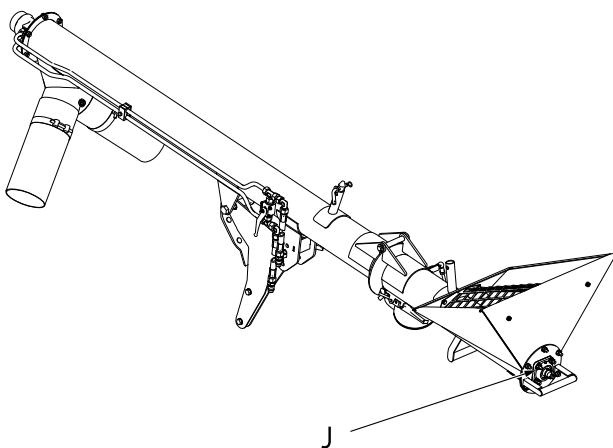


Figure 12.33 Filling auger

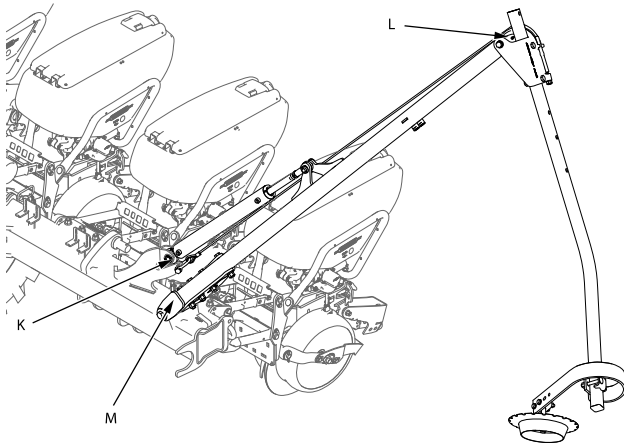


Figure 12.34 Bout marker arm, TPF 8

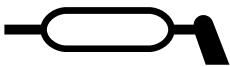
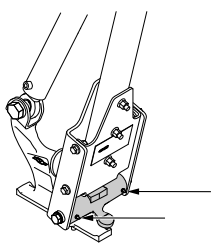


Figure 12.35

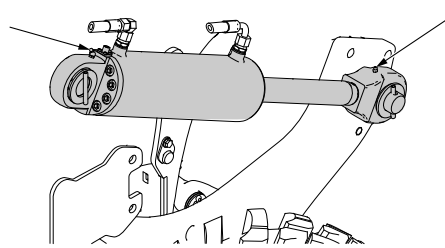
- Lubricate according to the intervals in the schedule below and always after washing with high-pressure equipment and at the end of a season. If any other lubricant than grease is to be used, this will be indicated at the respective lubrication point.
- The lubrication points are marked with green plastic caps (applies to machines type-approved according to EU 167/2013)
- The fertiliser unit's disc bearings and wheel bearings should be lubricated until the grease appears; rotate the discs during lubrication. Other lubrication points should be greased using 2–3 pump strokes per nipple.
- Heat resistant grease should be used in the wheel hub.
- Braked wheels do not have a grease nipple, but are lubricated by removing the hub cap. The grease in the hub is wiped out and replaced with new grease. If grease gets into the brakes, this will lead to impaired braking.

Pos.	Lubrication point	Interval	Number/unit
A	Cylinder head, wing joint (2 pcs)	200 ha	1

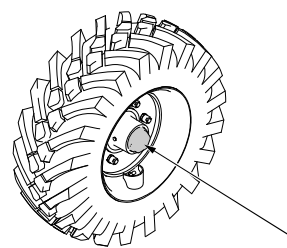
Pos.	Lubrication point	Interval	Number/unit
B	Cylinder, marker arm (TPF 6) (2 pcs)	200 ha	1



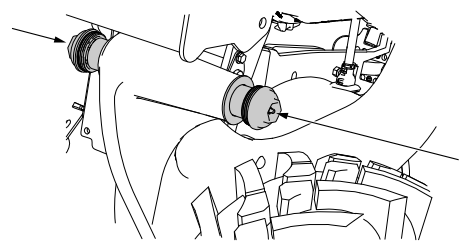
Pos.	Lubrication point	Interval	Number/unit
C	Pivot bearings, marker arm (TPF 6) (2 pcs)	200 ha	2



Pos.	Lubrication point	Interval	Number/unit
D	Cylinder head wheel undercarriage (2-4 pcs)	200 ha	2

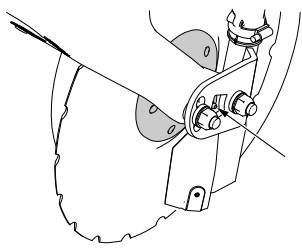


Pos.	Lubrication point	Interval	Number/unit
E	Wheel hubs (4 pcs)	2000 ha	1

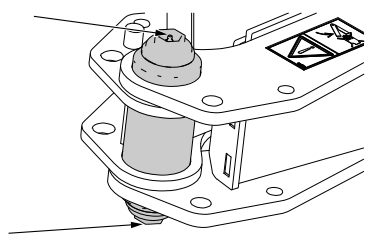


Pos.	Lubrication point	Interval	Number/unit
F	Pivot bearings, undercarriage (4 pcs)	200 ha	2

Maintenance and service



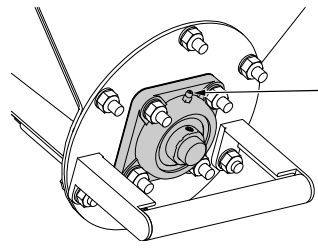
Pos.	Lubrication point	Interval	Number/unit
G	Disc bearings, fertiliser unit (6-8 pcs)	200 ha	1



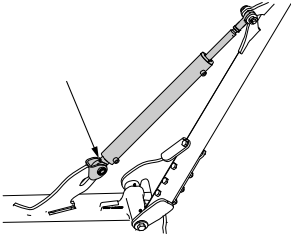
Pos.	Lubrication point	Interval	Number/unit
G	Pivot bearings, wing joint (2 pcs)	200 ha	2

See the accompanying instruction manual

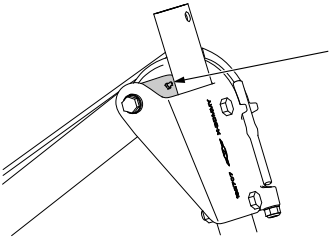
Pos.	Lubrication point	Interval	Number/unit
I	Power take-off shaft	–	–



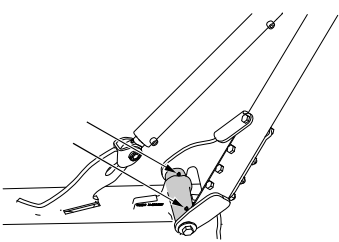
Pos.	Lubrication point	Interval	Number/unit
J	Filling auger (1 piece)	200 ha	1



Pos.	Lubrication point	Interval	Number/unit
K	Cylinder, marker arm (TPF 8) (2 pcs)	200 ha	1



Pos.	Lubrication point	Interval	Number/unit
L	Pivot bearings, marker arm (TPF 8) (2 pcs)	200 ha	1



Pos.	Lubrication point	Interval	Number/unit
M	Pivot bearings, marker arm (TPF 8) (2 pcs)	200 ha	2

13 Hydraulics system diagram

13.1 Wheels, bout markers

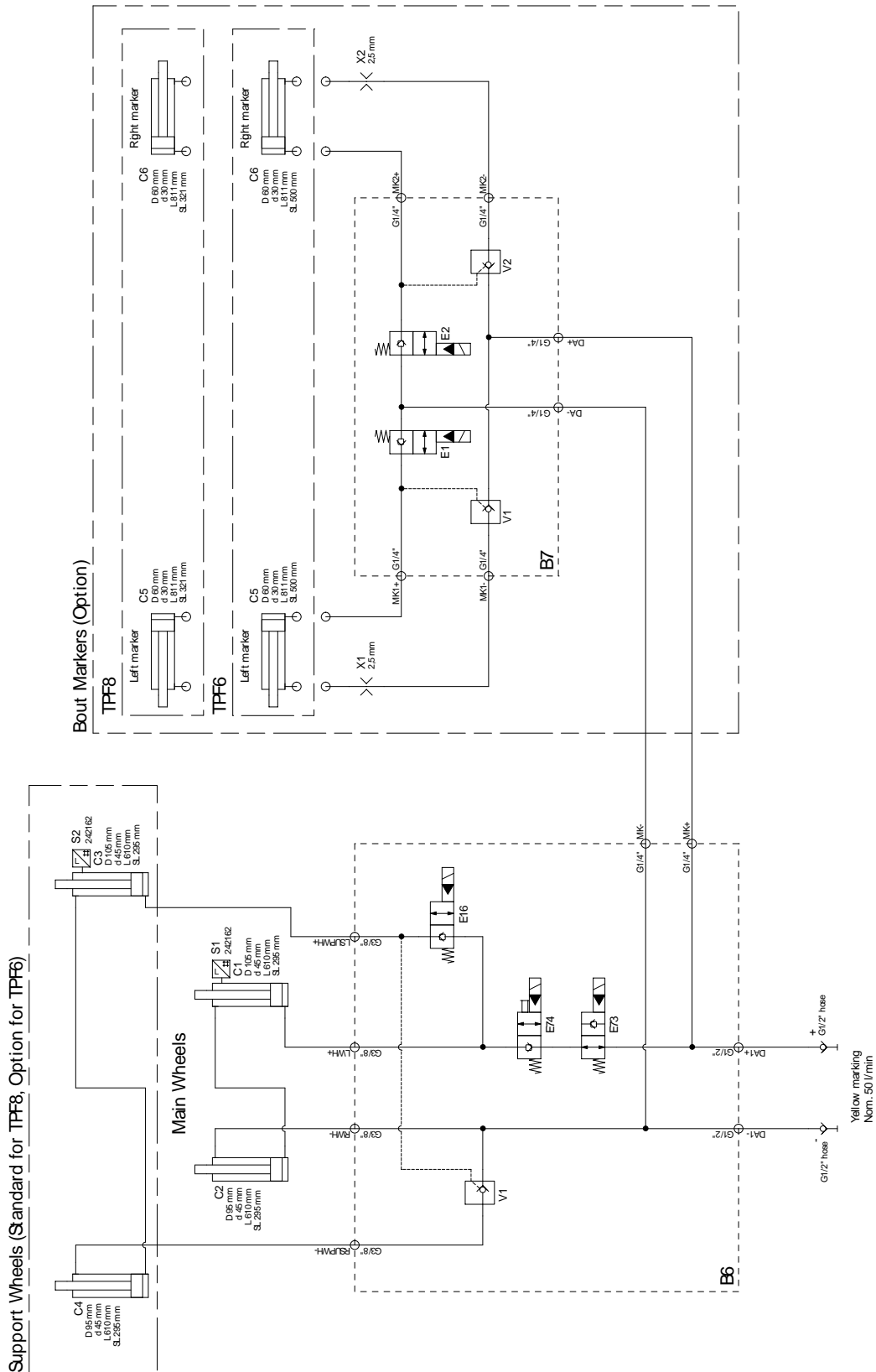


Figure 13.1

13.2 Wing folding, fill auger, fertiliser agitator, hydraulic seed fan

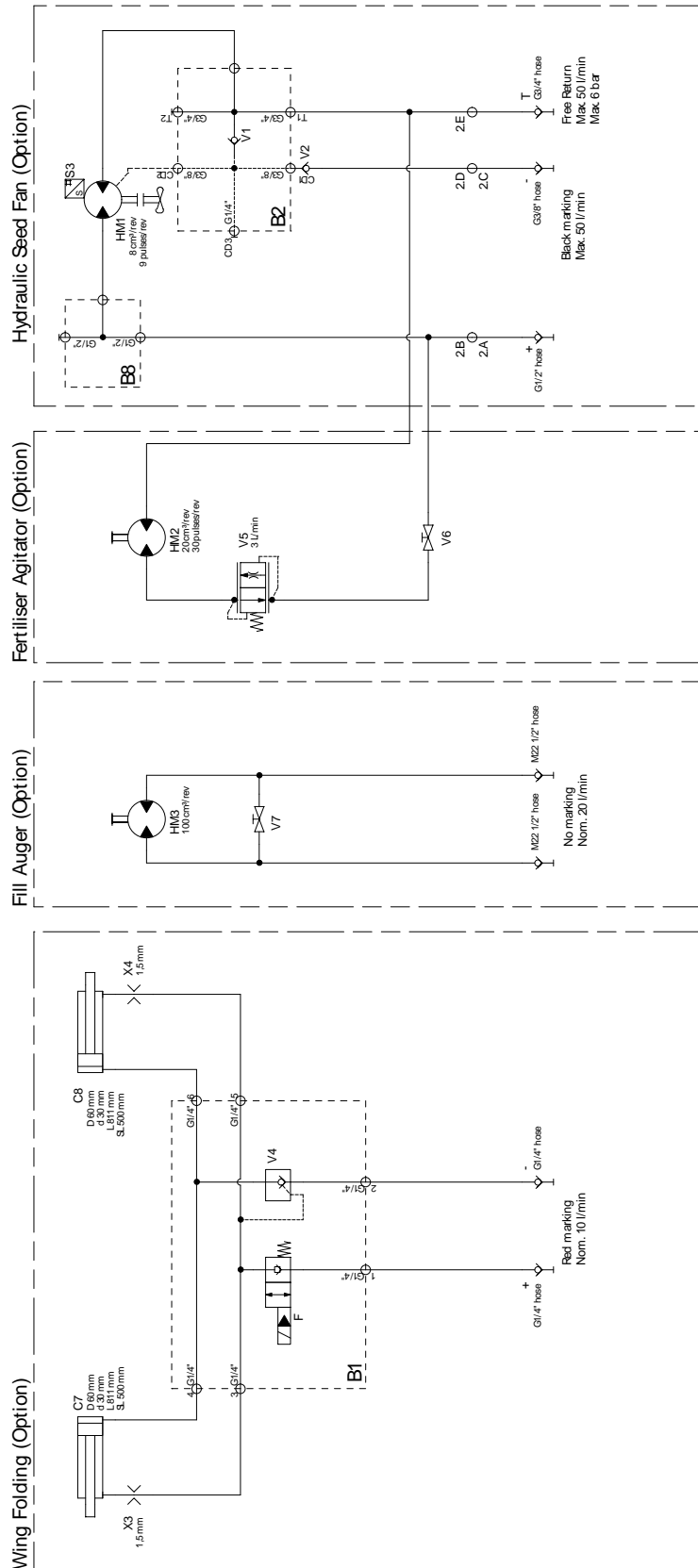


Figure 13.2

13.3 Row unit weight transfer

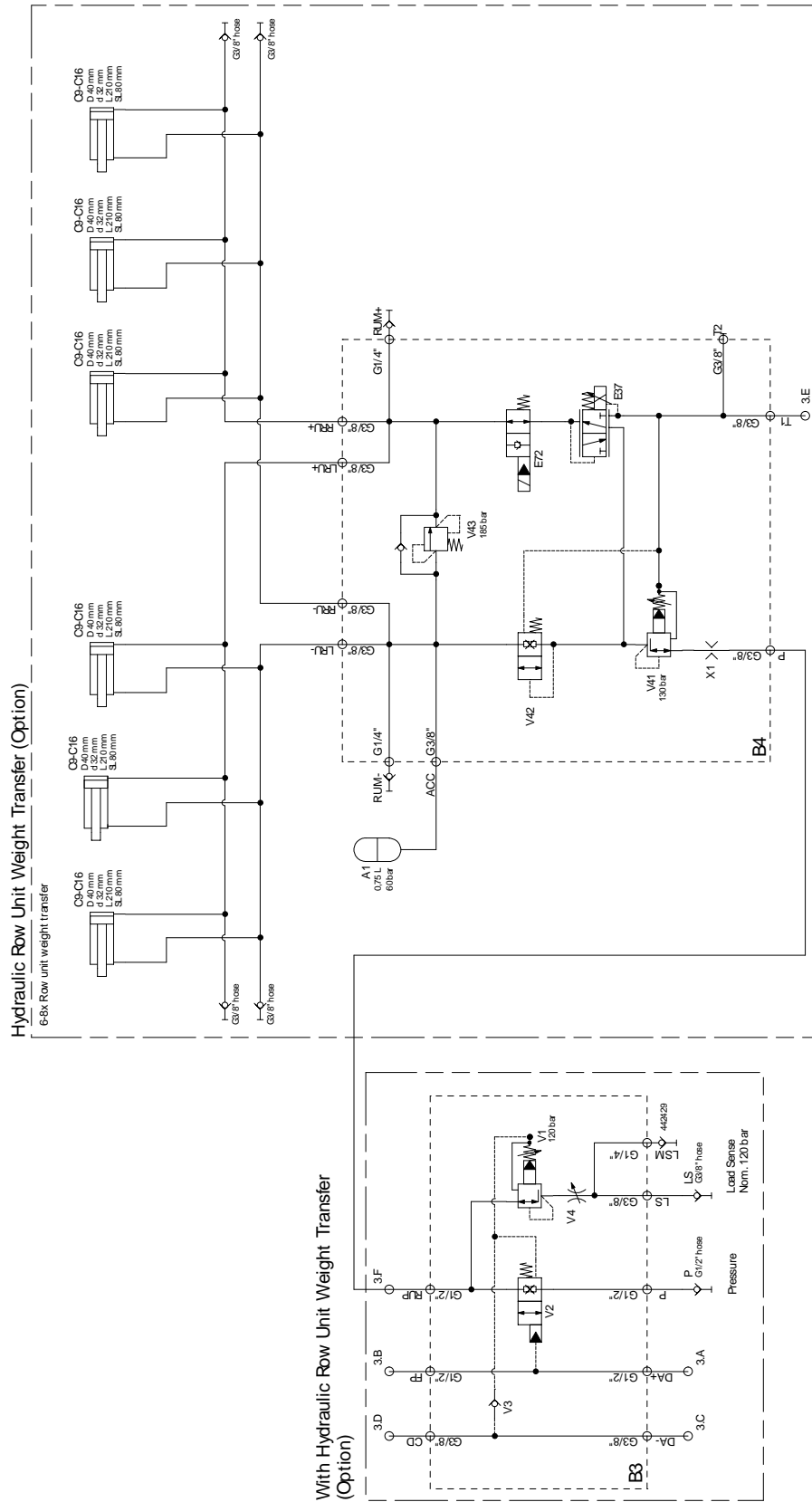


Figure 13.3

13.4 Individual row unit weight transfer

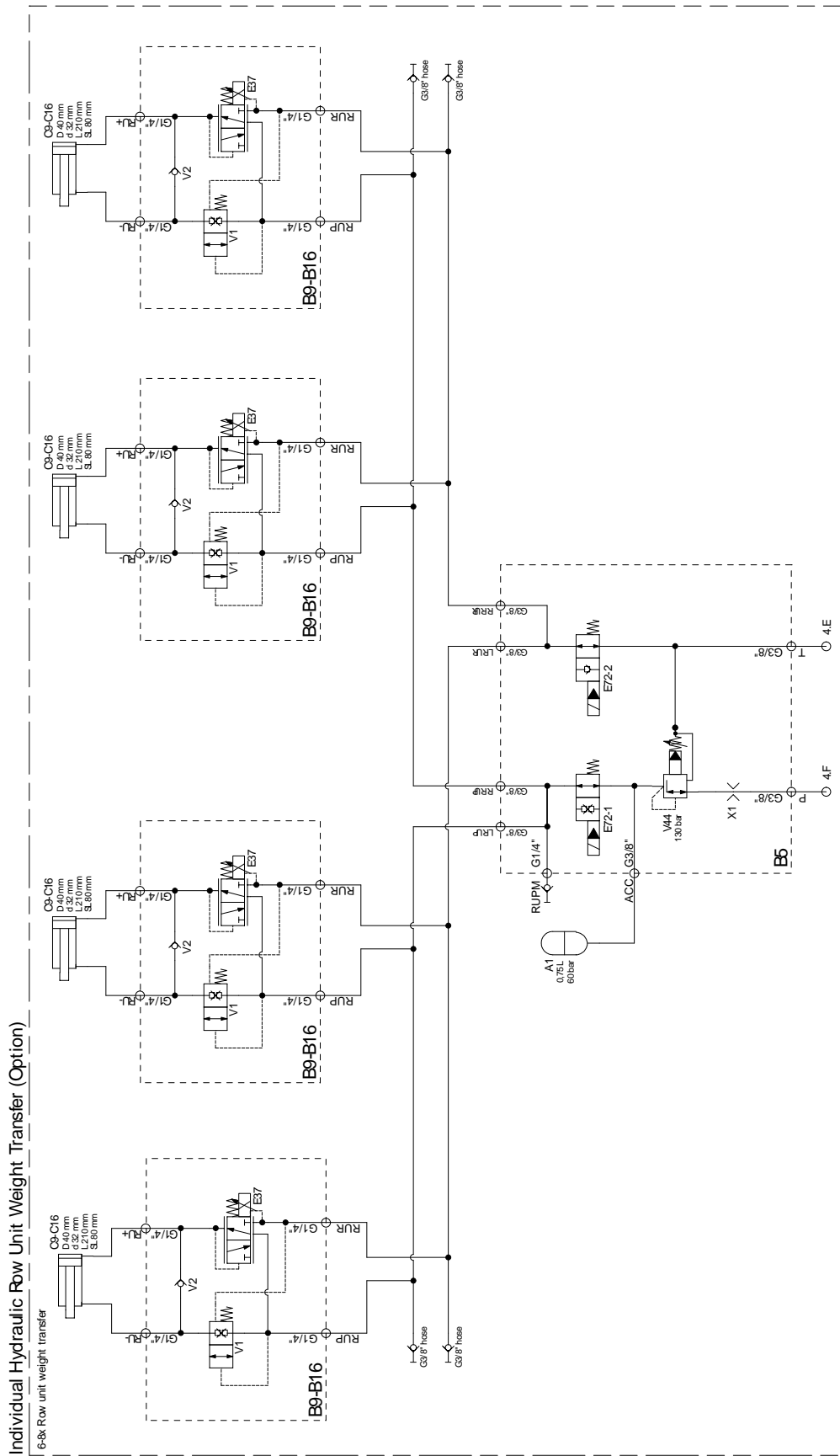


Figure 13.4

Hydraulics system diagram

13.5 Hydraulic diagram function descriptions

Parent	Label	Type	Function
	A1	Accumulator	Row unit pressure
	B1	Manifold	Wing fold
	B2	Manifold	Drain line connection on hydraulic motor
	B3	Manifold	Tractor power beyond control
	B4	Manifold	Central row unit pressure control
	B5	Manifold	Individual row unit pressure supplying manifold
	B6	Manifold	Low lift, sink stop. support wheel left
	B7	Manifold	Bout markers
	B8	Manifold	Fan motor connection
	B9–B16	Manifold	Individual row unit pressure
	C1	Hydraulic cylinder	With linear sensor, support wheel left
	C2	Hydraulic cylinder	Main wheel right
	C3	Hydraulic cylinder	With linear sensor, support wheel left
	C4	Hydraulic cylinder	Support wheel right
	C5	Hydraulic cylinder	Bout marker
	C6	Hydraulic cylinder	Bout marker
	C7	Hydraulic cylinder	Wing fold
	C8	Hydraulic cylinder	Wing fold
	C9–C16	Hydraulic cylinder	Weight transfer row unit
	HM1	Hydraulic gear motor	Seed fan
	HM2	Hydraulic orbital motor	Fertiliser agitator
	HM3	Hydraulic orbital motor	Fill auger
	V2	Check valve	Mounted on B2 drainage though tractor to prevent pressuring of motor case
	V5	Constant flow valve	Maintains constant speed of hydraulic motor
	V6	Ball valve	Fertiliser agitator on/off
	V7	Ball valve	Fill auger on/off
	X1	Orifice	Restrict right bout marker speed
	X2	Orifice	Restrict left bout marker speed
	X3	Orifice	Restrict wing fold speed
	X4	Orifice	Restrict wing fold speed
B1	F	2/2 valve normally closed	Electronically controlled, dual-command for unfolding wings
B1	V4	Pilot operated check valve	Prevent underpressure wing folding
B2	V1	Check valve	Allow for drainage to flow in return line
B3	V1	3-way pressure reducing valve	Defines pressure to tractor LS port
B3	V2	2/2 valve normally closed	Allows flow to RUP once FP is pressurized
B3	V3	Check valve	Prevent pressurizing V1 & V2 spring chamber
B3	V4	Variable needle valve	Create pressure drop to tractor LS if pulsations occur

Hydraulics system diagram

Parent	Label	Type	Function
B4	E37	3-way pressure reducing valve	Electrically controlled, removes weight from row unit
B4	E72	2/2 Valve normally open	Prevent row units to sink during headland turns
B4	V41	3-way pressure reducing valve	Fixed manual setting, transfer weight to row unit
B4	V42	2/2 Valve normally closed	Lock row units during transport
B4	V43	Relief and anti-cav valve	Prevents pressure build up in RU- and let row units sink to transport position
B4	X1	M6 orifice cavity	Empty
B5	E72-1	2/2 Valve normally closed	Electrically controlled, prevent row units to sink during headland turns. Activated together with E72-2.
B5	E72-2	2/2 Valve normally open	Electrically controlled, prevent row units to sink during headland turns. Activated together with E72-1.
B5	V44	3-way pressure reducing valve	Fixed manual setting, transfer weight to row unit
B5	X1	M6 orifice cavity	Empty
B6	E16	2/2 Valve normally closed	Electrically controlled, activate support wheels
B6	E73	2/2 Valve normally open	Electrically controlled, Stops lifting motion when lowlift level is reached
B6	E74	2/2 Valve normally closed	Electrically controlled with manual override, Stops lowering motion when working position is reached
B6	V1	Pilot operated check valve	Prevent underpressure lowering of support wheel
B7	E1	2/2 Valve normally closed	Electrically Controlled. Extends left bout marker
B7	E2	2/2 Valve normally closed	Electrically Controlled. Extends right bout marker
B7	V1	Pilot operated check valve	Prevent underpressure unfolding left bout marker
B7	V2	Pilot operated check valve	Prevent underpressure unfolding right bout marker
B9-B16	E37	3-way pressure reducing valve	Electrically controlled, removes weight from row unit
B9-B16	V1	2/2 Valve normally closed	Lock row units during transport
B9-B16	V2	Check valve	Let row units sink to transport position
C1	S1	Linear sensor	Integrated
C3	S2	Linear sensor	Integrated
HM1	S3	Speed sensor	Integrated

14 Electrical system

14.1 Wiring diagram, front section

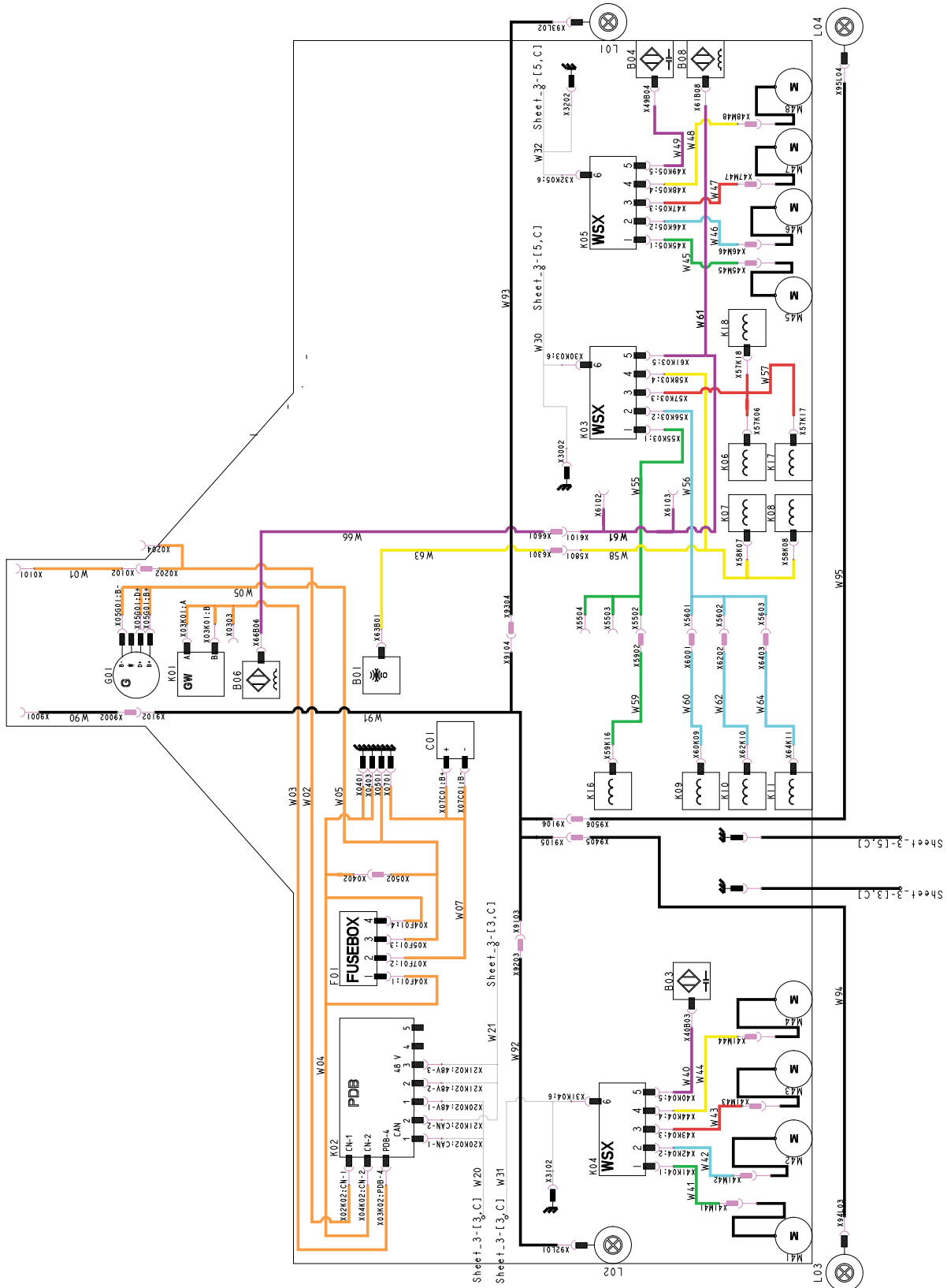


Figure 14.1

14.2 Wiring diagram, wing section

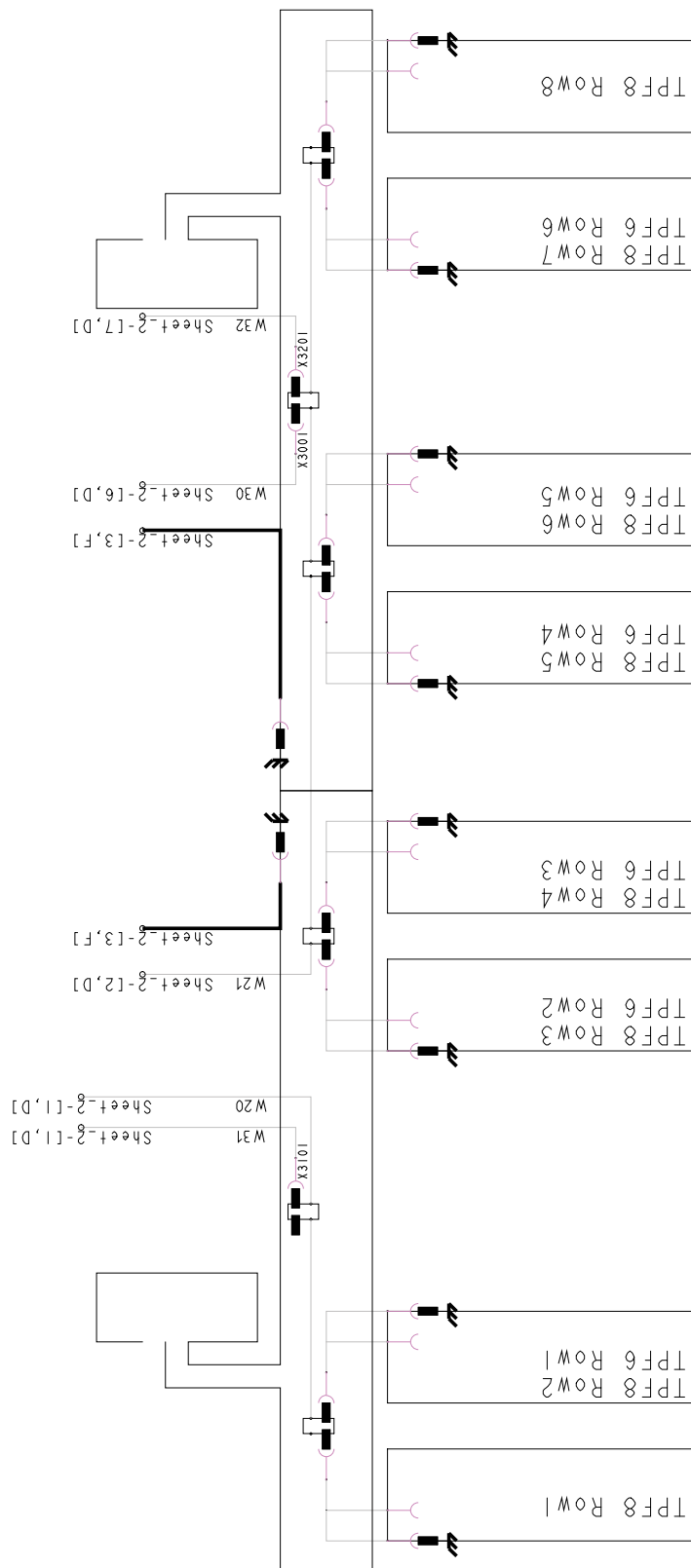


Figure 14.2

14.3 Wiring diagram, row unit

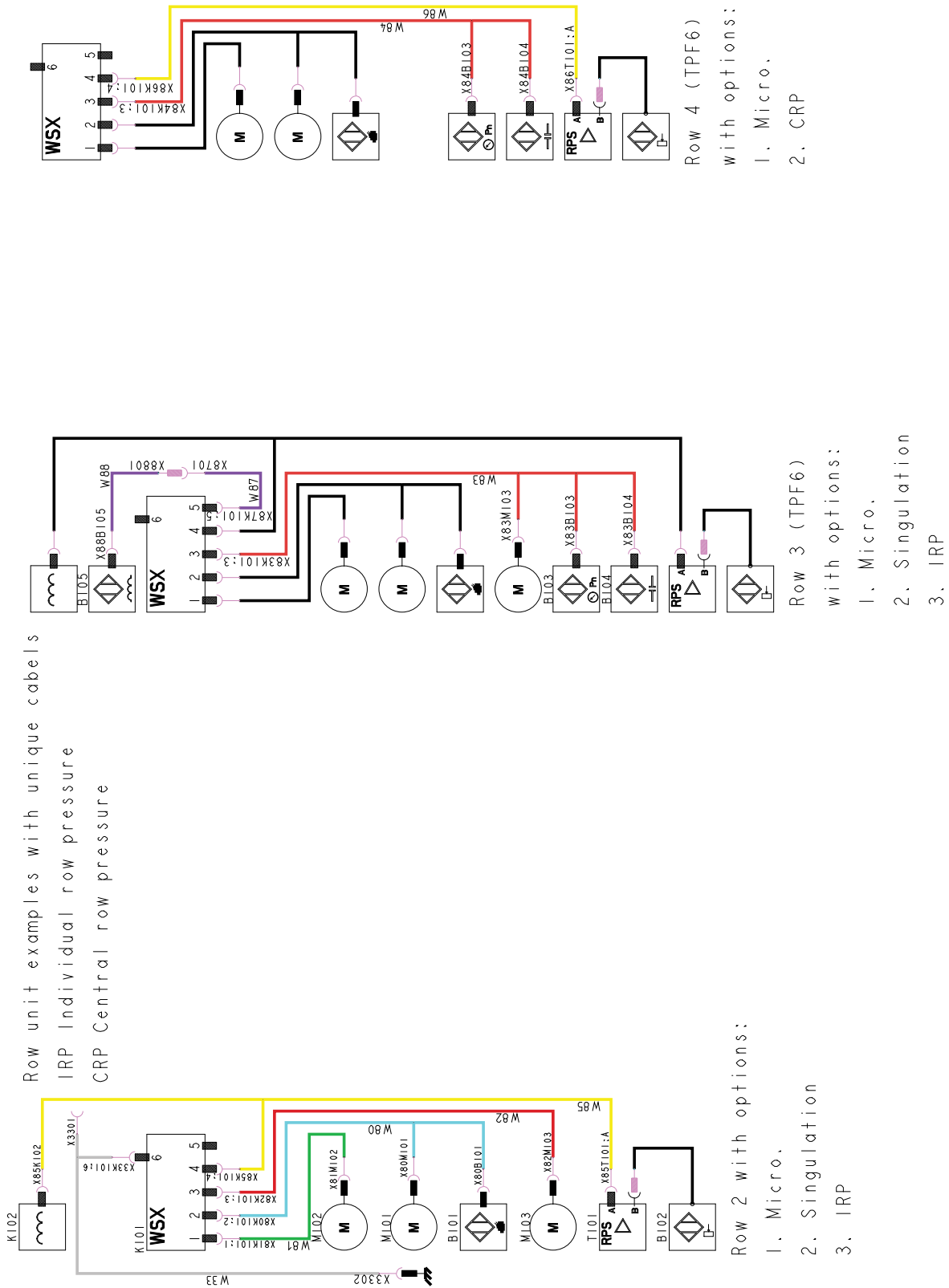


Figure 14.3

14.4 ISO11783 Power supply, Gateway

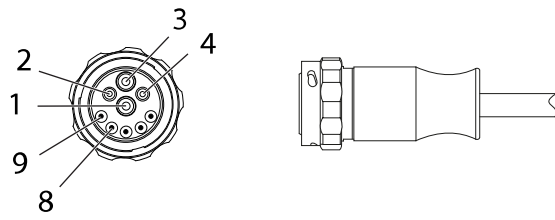


Figure 14.4 ISO11783

Tine	Function
1	Electrical earthing
2	Electrical control unit, earthing
3	Voltage 12 V
4	Electrical control unit 12 V
8	CAN high
9	CAN low

15 Troubleshooting

Electrical, hydraulic and mechanical components are used to control the machine. Work methodically and, step by step, eliminate possible sources of error using the troubleshooting page.

Study the chapters, Hydraulic Circuits and Wiring Diagram, both of which can be very helpful in troubleshooting.

15.1 Electrical faults

General checks in the event of electrical faults:

- Have the +ve (brown) and earth (blue) been connected correctly?
- Is Gateway reliably connected to the tractor's connector? Loose contact(s)? Is there a voltage drop under load. Check that the pins and sockets are clean and undamaged.
- Is Gateway and WS9 in receipt of at least 12V?
- Check the 4-pin connector, that the pins and sockets are clean, undamaged and not pressed in. Lubricate the contacts with the contact treatment grease.
- In the event of the loss of one or more seeding, fertiliser or micro-granulate motors. Check the pins and sockets of the closest motor. Carry out a functional test of the motor by swapping it with another motor of the same type.
- Make sure that the cable and other cabling are not pinched or otherwise damaged.

15.2 Hydraulic electric valves

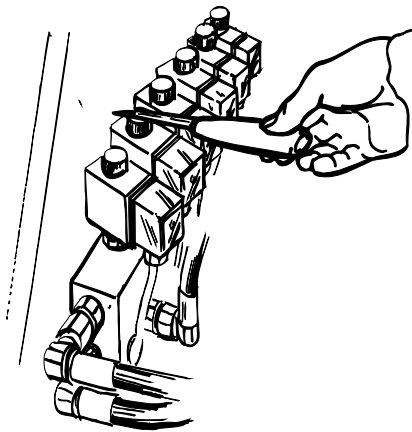


Figure 15.1

An electric valve has a coil which acts as an electromagnet when an electrical current is connected to the valve. It is easy to determine whether or not the power is on:

- The connecting contact's coil becomes warm after a few minutes. The top nut will also become magnetised.

- Use a small chisel or the side of a blade to determine whether or not the top nut has become magnetic. The nut is always weakly magnetic, so try both with and without power.

15.3 Hydraulic fault

General checks in the event of hydraulic faults:

- Check that the hydraulic hoses are connected to the correct socket on the tractor. Hoses with the same colour coding constitute a pair.
- Make sure the hydraulic quick couplers are designed for and suited to the tractor's couplings. There is a wide variety of connectors on the market, all standardised but still there are problems. Problems can manifest themselves so that female and male couplings operate as non-return valves, that is, that a machine can be raised but not lowered or vice versa. The problem may be aggravated by a large flow or worn couplings.

15.4 Inductive sensor

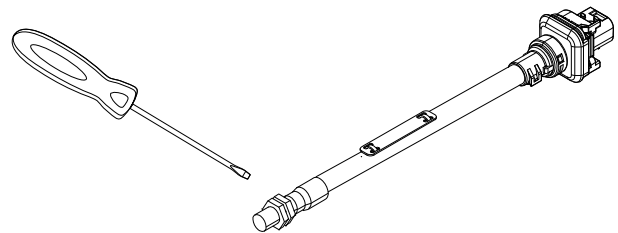


Figure 15.2

- Reacts to metal objects passing within a distance of 1-1.5 mm.
- Function testing can be carried out easily, since a diode at the rear of the sensor lights up each time an object is detected.

15.5 Capacitive sensor

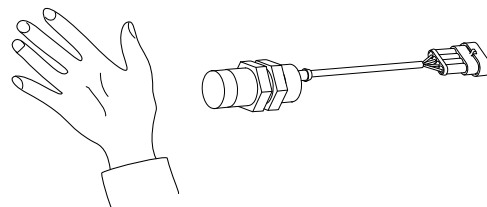


Figure 15.3

- Reacts to objects that contain moisture, for example grain or a hand, and so on.
- Function testing is easily carried out since a diode at the rear of the sensor lights up each time such an object is detected.

- The sensitivity of the sensor can be adjusted by use of the screw next to the LED. Various types of grain and fertiliser contain different amounts of moisture. For this reason, adjustment may be necessary under certain conditions.

15.6 Seed counter

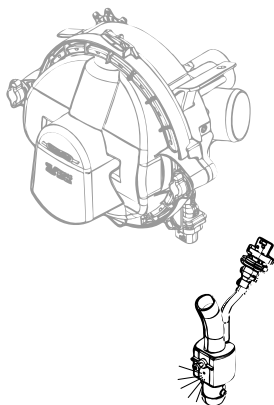


Figure 15.4 Seed counter sensor

- The seed counter is equipped with an LED.
- Using colours, the seed counter's sensor indicates different event situations.

Colour	Event
Steady green	No material passing
Blinking green	Seed passing
Steady yellow	1-10 sec longer steady light, dirty sensors. If necessary, clean the sensor, see “ ”.
Blinking yellow	Starting up or calibration
Steady red	Insufficient voltage or the cable may be incorrectly connected
Blinking red	The sensor is dirty and needs cleaning

15.7 List of conditions for seed output

The machine is in working mode

- If the machine has been raised above the ‘output start’ level, metering will not begin until the machine height comes under the ‘output start’ level.¹
- If the machine has been raised above the ‘output stop’ level, but not above the ‘output start’ level, output will begin when the machine height comes under the ‘output stop’ level.¹

1. For machines with ISOBUS cable 11783 and 11786.
2. Only for TPF

- The user has clicked on ‘exit transport mode’ on the dashboard.²
- Speed > 2km/h

Calibration

- Seed distance calibration is > 0 and feed rate is > 0
- The seed disc is set at > 0 holes

Other

- ‘Master feed’ seed is activated
- No critical alerts are active
- Row units are activated
- The WS9’s motor outputs are correctly mapped.

15.8 Troubleshooting list

The home screen does not show any air pressure although the fan is running	Check that the speed sensor to the fan is functioning.
The drilling depth is not constant in stiff and/or hard soil	Increase weight transfer on the row unit. Reduce the spring force of the fertiliser unit.
The seeds are lying very irregularly in the furrows	Check the position of the stop wheel on the row unit. Lower the wheel if necessary. Check for wear on the top of the seed sensor.
The seeds are being pressed too firmly in the furrows	Check the position of the stop wheel on the row unit. Raise the wheel if necessary. Do not adjust so much that the seeds “sneak in under” the wheel.
The furrow is not being closed properly	Increase the force on the closing wheels or adjust the working angle.
The seed is not lying on the bottom of the furrow	Check if the seed discs are badly worn and no longer have contact with each other. Adjust the seed discs.
The home screen displays lots of skips	Check that the air pressure is 3.5 kPa (0.035 bar). Check that the air grille in the seed meter (accessory for some models) is clean and free from dust and plant residue. Check that the seal on the cover of the seed meter is sitting properly and is not worn or leaking. Check the settings of the singulator.. Check that the singulator is not damaged. Check that the correct knock out wheel is installed. Check the functioning of the knock out wheel and that the hole in the seed disc is not clogged. Check that the correct seed disc is installed. Try using a seed disc with a larger hole. Check that the seed disc (electric motor) can be rotated relatively easily by hand. Check the position of the sliding hatch and, if necessary open it a little.
The home screen displays lots of doubles	Check that the air pressure is 3.5 kPa (0.035 bar). Check the settings of the singulator. Check that the seal on the cover of the seed meter is sitting properly and is not worn or leaking. Check that the singulator is not damaged. Check that the singulator rollers are not worn or difficult to turn. Check that the correct seed disc is installed. Try using a seed disc with a smaller hole. Check the position of the sliding hatch and, if necessary close it one or two steps.

The singulator must be set to a very low value

Check that the air pressure is 3.5 kPa (0.035 bar).

Check that the singulator is not damaged.

Check that the correct seed disc is installed.

Try using a seed disc with a smaller hole.

The singulator must be set to a very high value

Check that the air grille in the seed meter (accessory for some models) is clean and free from dust and plant residue.

Check that the air pressure is 3.5 kPa (0.035 bar).

Check that the singulator is not damaged.

Check that the correct seed disc is installed.

Try using a seed disc with a larger hole.

Check that the seed disc (electric motor) can be rotated relatively easily by hand.

Check that the seal on the cover of the seed meter is sitting properly and is not worn or leaking.

A seed meter is not outputting any seed

Check the setting on the iPad to ensure that the row unit is not shut off.

Make sure that the interior of the seed meter is free from contamination.

Make sure the outlet and seed tube are not blocked or clogged.

Check that the air grille is clear of dust and plant residues.

Check the settings of the singulator.

Check that the singulator is not damaged.

Check the functioning of the knock out wheel and that the hole in the seed disc is not clogged.

Check that the correct seed disc is installed.

Check that the seal on the cover of the seed meter is sitting properly and is not worn or leaking.

Check that the seed disc (electric motor) can be rotated relatively easily by hand.

Check that the connectors and cables are intact and undamaged.

Make sure that the sliding hatch is open and properly installed. If necessary, open the hatch a little more.

Pulsations occur in P or LS hose

Carefully turn V4 clockwise until the pulsations disappear. Tighten the counter nut.

16 Quick start guide

The Quick Start Guide is to be used as a “things-to-remember-list” to quickly get to work on the field. Each section contains references (in brackets) to the section of the book describing the event in detail.



If you have the slightest doubt, read the detailed description.

Hitching

- Connect the seed drill’s hitch device to the tractor. Raise and secure the seed drill’s parking support. See “5 Hitching and unhitching”
- Connect the PTO shaft to the tractor. See “4.3.1 Installation of the power take-off shaft”
- Depending on the equipment, connect one or two pairs of hydraulic hoses in pairs to their respective hydraulic couplings on the tractor. See “5.2 Connecting the hydraulic hoses”
- Connect the lighting connector. See “5.3 Lights”
- Attach the brake couplings and the emergency brake’s wire to the tractor; only applies to machines equipped with brakes. See “6.2 Brakes”

Switching to work position

- Raise the machine to its topmost position and start the terminal.
- Remove the pin that locks the wing section. If the machine is equipped with hydraulic wing folding, undo the pin on both sides.
- Fit the locking pins on both the wing sections.
- Move the yellow safety catches to their designated storage location.
- Raise the machine to its topmost position to synchronise the lifting cylinders of the wheels. Keep the hydraulic lever in this position with the tractor idling until all movement has stopped. Repeat a few times during the working day. If the machine is equipped with support wheels (applies to TPF8), first lower the machine to the working position in order to open the hydraulic valve for the support wheels.

Default setting

- Check the ground parallelism of the seed drill. Linkage in the row unit, drawbar tube and adjustment screw on front drawbar. See “7.1 Horizontal alignment”

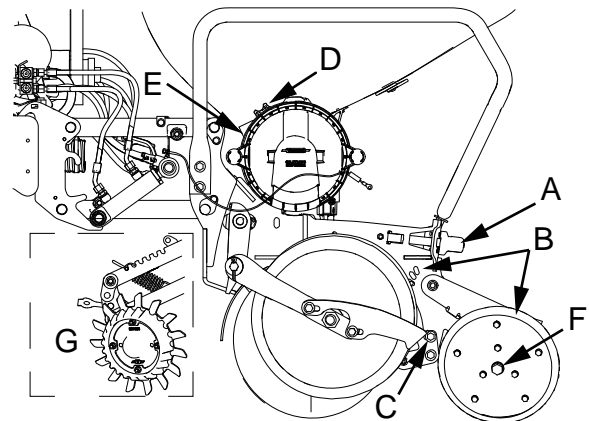


Figure 16.1 Other settings

Other settings

- A. Drilling depth. See “”
- B. Weight transfer, coulter pressure. See “”
- C. Closing wheel. See “”
- D. Press wheel. See “”
- E. Singulator. See “”
- F. Sliding hatch. See “11.1.1.1 Setting the bottom flaps, sliding hatches and calibration flaps”
- G. The angle of the wheels can be adjusted by changing the position of the wheel.
- H. Row cleaners, accessory. See “”

Air pressure in the seed feed housing can be adjusted using the fan’s rpm and it is controlled by the tractor. See “”

Weight transfer, refer to the separate instruction manual for E-Services.

Calibration of seed, calibration is performed on one output unit

See “10.1.1 Calibration”

For the selection of roller types and output unit settings, see “17.1 Output settings for sowing”

- Select the output roller intended for the preparation that is to be fed.
- Setting bottom flaps, sliding hatches and calibration flaps.
- Fit a calibration bag to the output unit that is to be calibrated.
- Go into the calibration menu and carry out the calibration.

Calibration of micro granulate; calibration is performed on one output unit

For the selection of roller types and output unit settings, see “17.3 Output settings for micro-granulate”

- Select the output roller intended for the preparation that is to be fed.
- Setting bottom flaps, sliding hatches and calibration flaps
- Fit a calibration bag to the output unit that is to be calibrated.
- Go into the calibration menu and carry out the calibration.



Return the lever for the calibration flaps into the position for sowing!



Check that all settings are the same on all row units.



Always test drill a short distance and check the result. Where necessary adjust the settings.

17 Drilling recommendations

17.1 Output settings for sowing

17.1.1 Output settings matrix

Explanation of seed disk type no.

Ex. **3255P-32**
 D E F

Figure 17.1

D. Number of holes, which gives 32 in the example.

E. The hole's diameter is given in 1/10 mm, which gives 5.5 mm in the example.

F. Number of agitators, which gives 32 in the example.

Table 17.1

Crop	TKW Thou- sand ker- nel weight (g)	Seed disc type & no	Clean- ing wheel	Position of sliding hatch	Position of sliding hatch, use CF ³	Insert Central Fill	Singula- tor basic setting	Seed feed housing pres- sure (kPa)	Tank pres- sure CF ³ (kPa)
Maize	-150	3240P-32	Grey/7	9	4	A	4	3,5	6,0
Maize	150-250	3250P-32	Grey/7	9	4	A	4	3,5	7,0
Maize	250-350	3255P-32	Grey/7	9	4	A	4	3,5	7,5
Maize	350- ⁴	3260P-32	Grey/7	9	4	A	4	3,5	8,0
Rapeseed	3-5	12112P- 32S	Red/9	2	1	B	7	2,3	4,5
Rapeseed	6-	12114P- 32S	Red/9	2	1 ⁵	B	7	2,3	4,5
Sugar beet	All	4125P-32S	Red/9	2	2 ²	B	7	2,8	5,5
Sunflower	-40	2125P-21	Yel- low/5	9	4	A	2	3,3	5,0
Sunflower	40-60	2130P-21	Yel- low/5	9	4	A	2	3,2	5,5
Sunflower	60-80	2135P-21	Yel- low/5	9	4	A	2	3,2	6,0
Sunflower	80- ¹	2140P-21	Yel- low/5	9	4	A	2	3,2	6,5
Soya	125-260	12040F-21	Blue/ 24	7	5	A	9	3,5	7,0
Sorghum	25-45	8323P-32	Red/9	7	4	B	6	3,5	7,0
Cotton	All	6535P-32	Grey/7	9	5	A	7	3,3	6,5

3. Central Fill

4. For kernels larger than 15 mm, use 22 mm sowing tubes.

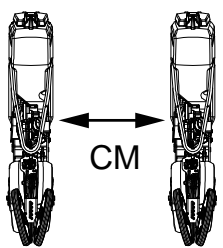



5. Use insert as described in section Seed Meter Central Seed Fill (option).

17.1.2 Theoretical maximum speed km/h



- Note that the speed indication is only a **theoretical** maximum speed.
- **Always adjust your speed to suit the prevailing field conditions!**

Table 17.2 Seed/ha

		21 					32 				
		45 cm	50 cm	70 cm	75 cm	80 cm	45 cm	50 cm	70 cm	75 cm	80 cm
	50 000					18,9					
	60 000			18,0	16,8	15,8					
	70 000			15,4	14,4	13,5					
	80 000		18,9	13,5	12,6	11,8					18,0
	90 000	18,7	16,8	12,0	11,2	10,5			18,3	17,1	16,0
	100 000	16,8	15,1	10,8	10,1	9,5			16,5	15,4	14,4
	110 000	15,3	13,7	9,8	9,2	8,6			15,0	14,0	13,1
	120 000	14,0	12,6	9,0	8,4	7,9		19,2	13,7	12,8	12,0
	125 000	13,4	12,1	8,6	8,1	7,6		18,4	13,2	12,3	11,5
	150 000	11,2	10,1	7,2	6,7	6,3	17,1	15,4	11,0	10,2	9,6
	175 000	9,6	8,6	6,2	5,8	5,4	14,6	13,2	9,4	8,8	8,2
	200 000	8,4	7,6	5,4	5,0	4,7	12,8	11,5	8,2	7,7	7,2
	225 000						11,4	10,2	7,3	6,8	6,4
250 000						10,2	9,2	6,6	6,1	5,8	

Drilling recommendations

Table 17.3 Seed/ha

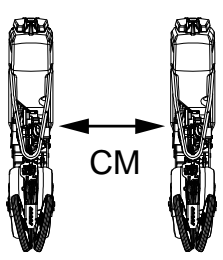

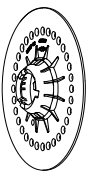

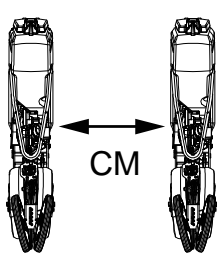
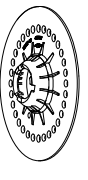


		41 					65 				
		45 cm	50 cm	70 cm	75 cm	80 cm	45 cm	50 cm	70 cm	75 cm	80 cm
	100 000				19,7	18,5					
	110 000			19,2	17,9	16,8					
	120 000			17,6	16,4	15,4					
	125 000			16,9	15,7	14,8					
	150 000		19,7	14,1	13,1	12,3					19,5
	175 000	18,7	16,9	12,0	11,2	10,5			19,1	17,8	16,7
	200 000	16,4	14,8	10,5	9,8	9,2			16,7	15,6	14,6
	225 000	14,6	13,1	9,4	8,7	8,2			14,9	13,9	13,0
	250 000	13,1	11,8	8,4	7,9	7,4		18,7	13,4	12,5	11,7
	300 000	10,9	9,8	7,0	6,6	6,2	17,3	15,6	11,1	10,4	9,8
	350 000	9,4	8,4	6,0	5,6	5,3	14,9	13,4	9,6	8,9	8,4
	400 000						13,0	11,7	8,4	7,8	7,3
	450 000						11,6	10,4	7,4	6,9	6,5
500 000						10,4	9,4	6,7	6,2	5,9	
600 000						8,7	7,8	5,6	5,2	4,9	

Table 17.4 Seed/ha

		83 					120 				
		45 cm	50 cm	70 cm	75 cm	80 cm	45 cm	50 cm	70 cm	75 cm	80 cm
	175 000										
	200 000					18,7					
	225 000				17,7	16,6					
	250 000			17,1	15,9	14,9					
	300 000		19,9	14,2	13,3	12,5				19,2	18,0
	350 000	19,0	17,1	12,2	11,4	10,7			17,6	16,5	15,4
	400 000	16,6	14,9	10,7	10,0	9,3			15,4	14,4	13,5
	450 000	14,8	13,3	9,5	8,9	8,3		19,2	13,7	12,8	12,0
	500 000	13,3	12,0	8,5	8,0	7,5	19,2	17,3	12,3	11,5	10,8
	600 000	11,1	10,0	7,1	6,6	6,2	16,0	14,4	10,3	9,6	9,0

17.2 Output settings for fertiliser

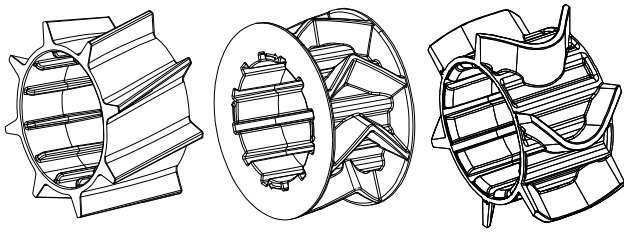


Figure 17.2 Roller type

Since the properties of fertilisers vary greatly with quality, a variety of rollers come with the machine. The rollers' output capacities are the same, but the design can make certain rollers particularly suitable for certain types of fertiliser. Test out and select the roller best suited to the fertiliser type and quality to hand.

17.2.1 Settings for the fertiliser dispensing

Fertiliser type	Flap position	Sliding hatch
Fine-grained fertiliser, smaller quotas.	1	1 — 2
Normal settings for fertiliser such as N28, PK and NPK	2	2
Large quotas or coarse fertiliser	3	2 — 3

17.2.2 Theoretical maximum speed km/h

	70 cm	75 cm	80 cm
200 kg/ha		20,0	18,7
225 kg/ha	19,0	17,7	16,6
250 kg/ha	17,1	16,0	15,0
275 kg/ha	15,6	14,5	13,6
300 kg/ha	14,3	13,3	12,5
325 kg/ha	13,2	12,3	11,5
350 kg/ha	12,2	11,4	10,7
375 kg/ha	11,4	10,6	10,0
400 kg/ha	10,7	10,0	9,4
425 kg/ha	10,1	9,4	8,8
450 kg/ha	9,5	8,9	8,3
475 kg/ha	9,0	8,4	7,9
500 kg/ha	8,6	8,0	7,5
550 kg/ha	7,8	7,3	6,8
600 kg/ha	7,1	6,7	6,2

- Fertiliser characteristics can vary enormously according to quality. The values in the table apply to fertilisers corresponding to **NPK 1 kg/litre**

17.3 Output settings for micro-granulate

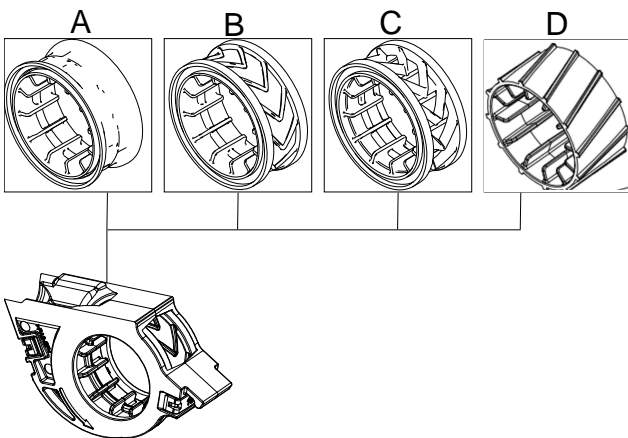


Figure 17.3 Roller type

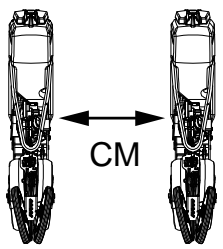


Drilling recommendations

17.3.1 Settings for micro-granulate

Roller	Micro-granulate	Fertiliser type	Flap position	Sliding hatch
A	Mesurol	Not used	1	1-2
A	Very fine granules and medium sized application rates	Not used	1	1-2
B	Fine granules and medium sized application rates	Fine-grained fertiliser, smaller application rates	1-2	1-2
C, D	Coarse granules and large application rates	Normal settings for fertiliser such as N28, PK and NPK	2	2

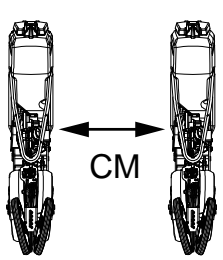


17.3.2 Theoretical maximum speed (km/h) for micro-granulate feed rate

Table 17.5 Mesurol and Force 1,5G Belem 0,8mg

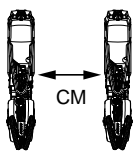


	Mesurol Roller type A					Force 1,5G Belem 0,8mg Roller type A				
	45	50	70	75	80	45	50	70	75	80
										
 kg/ha										
6			19,1	17,9	16,7					
8			14,4	13,4	12,6					
10	17,9	16,1	11,5	10,7	10,0					
12	14,9	13,4	9,6	8,9	8,4					
14	12,8	11,5	8,2	7,7	7,2					19,3
16	11,2	10,0	7,2	6,7	6,3			19,3	18,0	16,8
18	9,9	8,9	6,4	6,0	5,6			17,1	16,0	15,0
20	8,9	8,0	5,7	5,4	5,0			15,4	14,4	13,5
22	8,1	7,3	5,2	4,9	4,6		19,6	14,0	13,1	12,3
24	7,4	6,7	4,8	4,5	4,2	20,0	18,0	12,8	12,0	11,2
26	6,9	6,2	4,4	4,1	3,9	18,4	16,6	11,8	11,1	10,4
28	6,4	5,7	4,1	3,8	3,6	17,1	15,4	11,0	10,3	9,6
30	6,0	5,4	3,8	3,6	3,3	16,0	14,4	10,3	9,6	9,0
35	5,1	4,6	3,3	3,1	2,9	13,7	12,3	8,8	8,2	7,7
40	4,5	4,0	2,9	2,7	2,5	12,0	10,8	7,7	7,2	6,7

Drilling recommendations

Table 17.6 Force 1,5G Belem 0,8mg

	Force 1,5G Belem 0,8mg Roller type B					Force 1,5G Belem 0,8mg Roller type C				
	45	50	70	75	80	45	50	70	75	80
										
 kg/ha										
24					18,7					18,7
26			19,7	18,4	17,3			19,7	18,4	17,3
28			18,3	17,1	16,0			18,3	17,1	16,0
30			17,1	16,0	15,0			17,1	16,0	15,0
35			14,7	13,7	12,8			14,7	13,7	12,8
40	20,0	18,0	12,8	12,0	11,2	20,0	18,0	12,8	12,0	11,2

17.3.3 Theoretical maximum speed (km/h) for micro-granulate fertiliser rate

	Roller type B					Roller type C				
	45	50	70	75	80	45	50	70	75	80
										
										
20				20,0	18,7					
22			19,4	18,2	17,0					
24			17,8	16,6	15,6					18,7
26			16,5	15,4	14,4			19,7	18,4	17,3
28			15,3	14,3	13,4			18,3	17,1	16,0
30		20,0	14,3	13,3	12,5			17,1	16,0	15,0
35	19,0	17,1	12,2	11,4	10,7			14,7	13,7	12,8
40	16,6	15,0	10,7	10,0	9,4	20,0	18,0	12,8	12,0	11,2

- Fertiliser characteristics can vary enormously according to quality. The values in the table apply to fertilisers corresponding to **NPK 1 kg/litre**.

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