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Operating Instructions

Furrow Mounted Presses
FUPA 700
FUPA 900

Target Group for These Operating Instructions

These operations instructions are designed for trained agriculturists and persons who are otherwise qualified to perform agricultural work and who have been instructed in the use of this implement.

For Your Safety
Read carefully through these operating instructions before operating or installing the implement for the first time. This will ensure best work results and safe operation.

To the Employer
Any personnel must be trained regularly, and at least once per year. Untrained or unauthorized persons must not use the implement.

Symbols used in these instructions

These operating instructions use the following symbols:

Instructions in this manual accompanied by this symbol are used to indicate danger, as is the warning symbol on the implement.

This symbol indicates safety precautions that must be observed to prevent danger to the implement or its functions.

This symbol indicates specific procedures that must be observed to ensure the smooth and trouble-free operation of the implement.

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For Your Safety

In this chapter, you will find general safety information. The chapters in these operating instructions will include additional safety notes that are not mentioned here. Observe all warnings
• for your own safety
• for the safety of others
• to ensure safe operation
When using agricultural machines and implements, unsuitable behaviour may result in a number of dangers. For this reason, you should work with special care and never hurry.

To the Employer
Inform those working with the implement regularly about these safety instructions and in keeping with any statutory regulations.

Safety Symbol Explanation

The implement is equipped with stickers for your safety. These stickers must not be removed. If these stickers have become illegible, you may order new ones to apply them to the respective places.

Read the Operating Instructions before Use
Observe safety information.
Observe transport and installation information.

Risk of Injury
Risk of injury due to pinch and shear points.

Risk of Injury
Risk of injury when standing in the side parts' swing range.

Who May Operate the Implement?

Only Qualified People
The implement may only be operated, maintained or repaired by people who are qualified for this type of work and who have acquainted themselves with the risks relating to operating this implement. These people have usually obtained agricultural training or been similarly instructed.

Always Wear Tight Clothes
The operator's clothes should be tight. Avoid loose clothing.

Coupling

FUPA is equipped with a mounting class II three-point mounted attachment. To this end, two coupling points are provided for the upper linkage, and three possible coupling points are provided for the lower linkage for immobile implements. These may be varied by shifting the lower guide pivots. The hydraulically foldable version is equipped with a movable lower linkage shaft to expand the swing range.

- Before coupling power lifts with a quick coupler implement, the provided coupling pieces (balls / cartridges) must always be installed first.
- The upper linkage position that results when the implement is parked on level ground should be kept when the implement is in operation as well.
- After decoupling, lift the implement and bring the support legs into the upper position.

Safety Note:

- Tractor and implement mounting categories must be consistent for the three-point attachment.
- The three-point linkage poses a risk of injury because of its pinch and shear points.
- When using the Power Lift, no one may stand between the tractor and the implement.
- The steering gear poses a risk of injury because of its pinch and shear points.
- Hydraulic implements are under high pressure!

When connecting hydraulic tubes, make sure that the hydraulic system is free of pressure on the tractor and implement sides!

- Unobstructed movement must be obtained for the hydraulic tubes in all implement positions. Correct tube lengths where necessary.
- Coupling points for upper and lower linkage must be secured with the respective pins.

Uncoupling

- The implement must be parked on level, firm ground and secured against rolling before uncoupling.
- Hydraulically foldable versions may be parked folded in or out. When folded in, however, the transport lock must be engaged.
- Before decoupling, bring the support legs into the lower position and secure them.
- Do not forget to decouple the hydraulic tubes!

Safety Note:

- Depressurize the hydraulic system before decoupling the hydraulic tubes!
- Never set the implement down hard, especially on firm ground, otherwise splinters may break off and be catapulted!

Folding in and out

FUPA front packers with a working width over 300 cm are generally comprised of two side parts connected to a common middle frame. They are hydraulically foldable to reduce transport width. This requires a double-acting control unit on the tractor that can be locked in the centre position. To avoid ground contact and damage to the side parts, folding must always occur when the implement is fully lifted. We suggest that a second person ensures that there is sufficient free space while folding before the first use. Where the front power lift's stroke range is not sufficient, the lower coupling points for the three-point attachment must be corrected by shifting the lower linkage pins. When folding, the hydraulic cylinders must always be in the highest or lowest position. This is also true for implements with an integrated pressure reservoir.
The foldable version has a mechanical locking implement for the folded-in side parts in addition to a permanent hydraulic lock. It is activated automatically on folding in if the lock hooks are brought into a catching position beforehand. This is done by resetting the hydraulic cylinder locking lever. To fold out the side parts, the lock hooks must be pushed out of their catching position and be secured to the hydraulic cylinders using the locking levers. This may require bringing the side parts into their final position first by applying pressure in order to be able to move the lock hooks.

Safety Note:

- Be especially careful when folding the side parts in and out.
- Never stand in the folding area or below the side parts.
- There is a risk of injury because of pinch and shear points in the whole folding area and in the area of the folding mechanism.
- All hydraulic functions must be operated carefully. Sudden operation of the control lever will overload the hydraulic system and mechanism.
- The implement's lowering throttles must not be shifted without consultation.

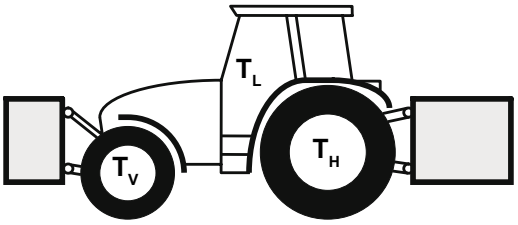
Balance Point Distance

Important additional information for mounting heavy equipment.
Equipment mounted on the front and back three point leverage must not lead to the tractor's permissible total weight, the axle load limits and wheel bearing strength being exceeded. The tractor's front axle must always be loaded with at least 20% of the tractor's empty weight.

Make sure that these prerequisites are fulfilled before buying an implement by conducting the following calculations or by weighing the tractor and implement together.

How to determine the total weight, axle load, wheel bearing strength and required minimum load.

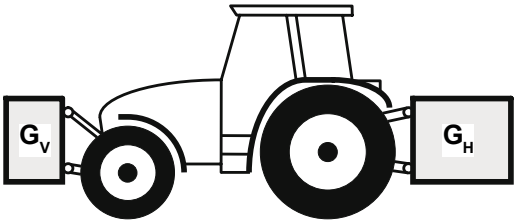
From the tractor's operating instructions



Please take the following information, in kg, from your tractor's operating instructions

Letter	Information
T_L	Empty weight of tractor
T_V	Empty tractor front axle load
T_H	Empty tractor rear axle load
T_G	Permissible total tractor weight

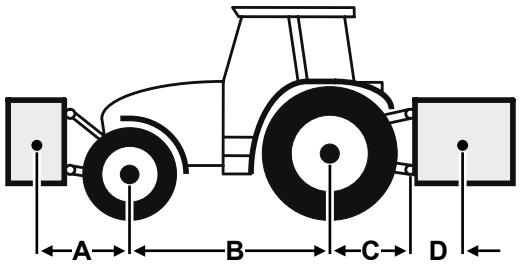
From the implement's operating



Please take the following information, in kg, from your implement's operating instructions

Letter	Information
G_H	Total weight rear accessory equipment / rear ballast
G_V	Total weight front accessory equipment / front ballast

Determining/gauging weight



Determine the following information by weighing or gauging:

Letter	Information
A	Distance between front accessory equipment/front load balance point and middle of front axle
B	Tractor's wheelbase
C	Distance between centre of rear axle and centre of lower linkage ball
D	Distance between lower linkage ball centre and balance point read accessory equipment/rear load

Calculate minimum front load

Calculate minimum front load GV min.
Enter the calculated minimum load in the table:

$$G_{V\,min} = \frac{G_H \times (C + D) - T_V \times B + 0{,}2 \times T_L \times B}{A + B}$$

Calculate minimum read load

Calculate minimum rear load GH min.
Enter the calculated minimum load in the table:

$$G_{H\,min} = \frac{G_V \times A - T_H \times B + X \times T_L \times B}{B + C + D}$$

Calculate actual front axle load

Calculate the actual front axle load Ttat.
Enter the calculated front axle load in the table:

$$T_{V\,tat} = \frac{G_H \times (A + B) + T_V \times B - G_H \times (C+D)}{B}$$

Calculate actual total weight

Calculate the actual total weight
Enter the calculated total weight in the table:

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

Calculate the actual rear axle load

Calculate the actual rear axle load.
Enter the calculated rear axle load in the table.

$T_{H\,tat} = G_{TAT} - T_{V\,tat}$

Wheel bearing strength

Enter the wheel bearing strength for two wheels into the table.

Table

The table gives all calculated and measured values. The permissible value must:
• be larger than the actual value
• be smaller than twice the permissible wheel bearing strength.

	Actual value according to calculation			Permissible value according to calculation			Twice permissible wheel bearing strength (2 wheels)	
$G_{V\,min}$ / $G_{H\,min}$	/	kg		-			-	
G_{tat}		kg	≤		kg		-	
$T_{V\,tat}$		kg	≤		kg	≤		kg
$T_{H\,tat}$		kg	≤		kg	≤		kg

Road Transport

During road transport, the front accessory equipment steering gear must be locked by turning the locking lever at the three-point attachment. Foldable implements must be folded in for transport. Make sure that the transport lock is engaged.

When using public roads, observe the required regulations! This is especially true for warning signs and lighting.

Larger earth adhesions are possible especially in the levelling rail area and must be removed before using public roads.

Note: According to § 23 StVZO and § 31 StVZO, the responsibility for operation while using mounted or coupled working equipment is assumed by the vehicle's driver and owner. Please check your local highway code for equivalent stipulations.

First Use

Check before First Use

- Before use, activate the steering gear by turning the locking lever.
- The steering gear makes it possible to follow the tractor's steering movements as they occur within the usual progress of a drive. Avoid sharp bends. Raise the implement for extremely narrow bends and at the forward furrow. The same is true for driving backwards, because the steering gear is not effective in this case.
- To retain the tractor's steering ability, put the front power lift's steering gear into the "floating" setting.
- Do not load the packer with the front power lift, because this would compromise its steering behaviour and hasten wear.
- When driving with the raised implement on uneven ground and at the front furrow, adjust your speed to the great inertia especially in case of very wide working widths. Sudden forces may expose the floating limit to extremely high loads for short times when driving through a furrow.

Hydraulics

High Pressure

Hydraulic implements are under high pressure.

Take Care to Choose the Right Connection

When connecting hydraulic cylinders, make sure that the hydraulic tubes are connected correctly. Wrong connections may lead to faulty operation and result in severe injury or death.

a) Greasing

The front packers have the following lubrication points with lubrication nipples:
- Three-point attachment guide rolls; in the bearing pin
2 x

- Packer shaft bearing; Underside of bearing case
2-6 x

- For the folding version, in the joint pin's folding joints:
6x

Depending on operational conditions, we suggest re-lubricating with standard SO2-free bearing grease (e.g. lithium soap grease) in the following intervals:

- Shaft bearings after each 50-100 ha, and at least once per season
- Three-point attachment guide rolls after every 20 ha and at least once a day
- Folding joints as necessary and at least once a week
- Before and after winterizing and after the implement has been cleaned, clean all lubrication points with a high-pressure water jet

The lubrication points must never run dry at any time. Never press in excess amounts of grease. One or two grease gun shots are usually sufficient. Where seals on shaft bearings are undamaged, grease demand is very low. No grease should come out of the bearing.

Note: Carefully insert grease in shaft bearings to avoid damage to the bearing seal.

b) Check-ups / Maintenance

Regularly conduct the following checks:
- Check occasionally that all screws hold firm. In case of new implements and after repairs, tighten all screws after the first 10 ha.
- Check pin retainers (clamp sleeve, splint pins) for completeness and damage, replace where necessary.
- Check upper and lower linkage rods and splint chains for damage.
- Check side parts' steering and transport locks for proper operation and keep them functional.
- Check removable elements on support legs for damage.
- Check bearings, and especially seals, for damage. Where seals are damaged, replace bearing.
- Check bearings for wrappings. Remove wrappings at once and lubricate bearing afterwards.
- Keep warning signs on the implement legible.

c) Hydraulic System Control

- Check hydraulic system for leak-tightness, tighten screws where necessary.
- Have tube connections examined by an expert for operational safety before first use and at least annually thereafter.
- Check hydraulic cylinders for leaks, and especially examine piston rods for damage.
- Check coupling plug dust boots for damage and replace where necessary. Remove dirt at each coupling.
- Replace damaged hoses at once. Only use approved hoses. Note: Hose connections should not be used longer than six years. This includes a storage time of two years.

Safety Note:

- Conduct maintenance work only when the implement is properly parked!
- Fold up side panels completely before maintenance and lock them, or fold them down until they are seated completely!
- Any position in between poses great danger and must be avoided at all costs. Risk of damage due to uncontrolled self-propulsion!
- Where an intermediate position cannot be avoided in a special case, all parts at risk must be secured with suitable support elements. Using only the implement's hydraulics for support is not permissible!
- When working with the levelling rail, remember that the spring preload is a crushing hazard!
- Always depressurise the hydraulic system before conducting any work! Risk of injury due to oil being discharged at high pressure!
- After repairs, ensure that the hydraulic system is completely filled with oil; deaerate, if required.
- Collect any oil or grease that may be discharged and dispose of it in the proper manner!

Safety

Only Use Original Replacement Parts
Only original replacement parts may be used for this implement.

Disconnect Power
Before working on the electric system and when conducting any electrical welding at the tractor or the attached implement, disconnect wires from the generator and the battery.

	Tightening torque in Nm			Spanner size
Measure	**8.8**	**10.9**	**12.9**	(mm)
M4	2,8	4,1	4,8	7
M5	5,5	8,1	9,5	9
M6	9,6	14	16	11
M8	23	34	40	13
M10	46	67	79	17
M12	79	115	135	19
M14	125	185	220	22
M16	195	290	340	24
M18	280	400	470	27
M20	395	560	660	30
M20x1,5	-	680	-	30
M22	540	760	890	32
M24	680	970	1150	36
M27	1000	1450	1700	41
M30	1350	1950	2300	46

Tightening Screws

Regularly check all screws for tightness and tighten if required.

Getting to Know Your Implement

This chapter includes general information concerning your implement and information about:
- Area of application
- Features
- Building class descriptions
- Technical data

Implement Area of Application

Intended Use

The implement is only intended for standard use in agricultural work. Any other use is deemed a not intended use. The manufacturer shall not be liable for damage resulting from this. The risk is assumed solely by the user.

Intended use also includes observing the manufacturer's operation, maintenance and repair instructions.

Ensure that all relevant accident-prevention regulations are observed, along with generally accepted safety procedures, health and safety regulations and road-traffic legislation.

Unauthorized changes to the implement void the manufacturer's liability for damage resulting from such changes.

Implement Features

Rabe FUPA are front mounted presses designed specifically for attaching them to front power lifts. They are intended for use in land re-packing and clod crushing on soil that has been ploughed up or pre-treated in a similar way.

The linkage to the roll guided three-point attachment on the packer frame's front is used to draw and steer the packer in the wake of the tractor. This makes it possible to drive through bends where the tractor has unhindered traction. An integrated, pre-tensioned spring package is used for steering dampening to ensure smooth motion of the packer even where the ground structure has large clods.

Cleaning chains are situated between the packer rings to ensure operation without obstruction.

For better levelling and clod crushing, a spring-loaded tine levelling bar with tines or a crumbling bar with knifes or tines may be installed.

All FUPA front mounted presses with a working width over 3 m are hydraulically foldable (two parts) and come with hydraulic and mechanic transport locks.

Tine levelling bar

Tine bar

Knife bar

Ancillary equipment: Levelling rail with tines:

The levelling rail may be mounted for clod crushing and approximate levelling of ground to smooth the packer's motion. Exchangeable ripping teeth lead to an additional crushing of ground at half of the standard packer's line clearance.

The following adjustments can be made:

- Height adjustment through a plough beam matrix
- Applied pressure at the crank shaft

The implement's setting is correct if the slightly spring-deflected rail always pushes a small mound of earth before it without any larger amounts of earth flying over it. Please note that the mound's size is adjusted through the rail's spring tension. Because of this, contact pressure should be reduced to the minimum required.

Where there is no earth mound or where it cannot be reduced by reducing contact pressure, the height must be adjusted.

Technical Data

Front three-point attachment, cat. 2, roll-guided, guidable, with shock absorption. Beginning at a working width of 400 cm, 2 parts hydraulically foldable, adjustable lower linkage shaft.

Front mounted press basic implement						Levelling bar		Tine bar / Knife bar	
Type	Working width in cm, approx.	Transport width in cm, approx.	Ring-Ø	Num-ber of rings	Weight in kg, approx.	Num-ber of tines	Weight in kg, approx.	Number of tines / knifes	Weight in kg, approx.
FUPA 20/700-300	300	300	700	20	870	19	150	19	170
FUPA 26/700-400 D	400	255	700	26	1330	24	240		
FUPA 28/700-450 D	450	255	700	28	1425	26	250		
FUPA 38/700-600 D	600	255	700	38	1800	36	300		
FUPA 8/900-150	150	170	900	8	815				
FUPA 15/900-300	300	300	900	15	1360	19	145	19	170
FUPA 20/900-400 D	400	275	900	20	2100	24	230		

Maximum Oil Pressure Permissible : 200 bar
Operating noise: < 70 dB(A)

Subject to change!

Sizes and weights for basic configuration.

RING PROFILES

Whereas re-packing is the first target for light soil, crushing clods is more important for heavy soil. This leads to different rings for different conditions.

- The FUPA 700 series with its ring diameter of 700 mm and shoulder width of 33 mm has a small contact area. Because its properties are closer to cutting, this ring type is best used for medium to heavy soil.

- The FUPA 900 series with its ring diameter of 700 mm and flaring shoulder width of 65 mm has a large contact area. Because its properties are better for packing, this ring type is best used for light to medium soil.

Checking the Scope of Delivery

The implement is delivered with:
- Operating instructions
- List of replacement parts

Please inform your trader, importer or the manufacturer immediately in writing of any missing pieces and pieces that were damaged during transport.

Attaching the Implement

Safety

Never Stand Between the Tractor and the Implement
No one must stand between the tractor and the implement while coupling. Non-compliance may lead to severe or lethal injury.

Crushing Hazard – Three-Point Power Lift
The three-point attachment poses a risk of injury because of its pinch and shear points. Non-compliance may lead to severe or lethal injury.

Secure Rods
Retaining pins for upper and lower linkage must be secured with the included pins.

Before coupling

Make sure that the tractor and implement have the same mounting category before coupling.

Tractor: See manufacturer's operating instructions.

Implement: See section "technical information".

Coupling – Lower Linkage

Lower linkage must be level and have little side clearance after coupling.

Secure the coupling implement properly. Lock lower linkage in a centred position.

Coupling – Upper Linkage

Attach upper linkage to the upper hole. Secure connector plug against twisting. Secure connector with clip pin.

Disposing of the Implement

After the end of its life cycle, your implement must be disposed of in the proper manner.
Please observe any currently valid waste disposal regulations.

Metal Parts

Take metal parts to an authorized waste management company.

Plastic Parts

Detach plastics parts and forward for recycling.

Hydraulic Oil

Take hydraulic oil to an authorized waste management company.

Electronic Components

Detach electronic parts and forward for recycling.

Rubber Parts

Detach rubber parts and forward for recycling.