

Operation and adjustment

Trailed field sprayers

Primus 25, 35, 45

- EN -



Safety is our concern!

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Dear customer!

We would like to thank you for your confidence in buying this implement.

The advantages of this implement will be shown, only, when operated and used with due care and attention.

When handing over this implement your dealer will have already instructed you with regard to operation, adjustment and maintenance. But this short introduction requires an additional detailed study of the instruction book.

Therefore read this instruction book carefully <u>before</u> the first use. Please pay attention to the safety instructions mentioned in this instruction book.

Any changes and modifications carried out not being mentioned expressly in this instruction book, may only be carried out with a written agreement of the manufacturer.

Ordering spare-parts

When ordering spare-parts please state type and serial No. of the implement. This information will be found on the identification plate. Put down this data on the following table so that it is always available.

Type of implement:	
Serial No.:	

Only use genuine LEMKEN spare-parts. Spurious parts negatively influence the function of the implement, show a shorter lifetime and increase in nearly all cases the maintenance effort.

We trust that you will understand that LEMKEN is unable to guarantee poor operation and damage caused by using spurious parts!

DEFINDED USE



- Please familiarise yourself with the LEMKEN-implement and its operations before putting the implement to work. Therefore use this instruction book with the 'General Health- and Safety precautions'!
- Your LEMKEN-field sprayer has been designed purely for the spraying of insecticides, fungicides, herbicides in the form of suspensions, elmusions and mixtures as well as of liquid fertilizers for the agricultural use.

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- The relevant accident prevention advices as well as the plant protection rules as well as the generally accepted safety technical, working, medical and road traffic rules must be adverted too!
- The LEMKEN-implements have been designed purely for the agricultural use! Any use beyond the one stipulated above is no longer considered as defined use!
- Under "defined use" the manufacturer's prescribed operation-, maintenanceand repair conditions are to be adhered to!
- The LEMKEN-implement may only be operated, maintained and repaired by such persons who have been made acquainted with it and who have been advised about the dangers!
- The applicable accident prevention advices as well as the generally accepted safety technical, working, medical and road traffic rules should be adhered to!
- Own modifications at the implement exclude the manufacturers' liability for damages caused by the modifications.

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1 EFFECTS OF CERTAIN PESTICIDES ON THE FIELD SPRAYER

At the time of manufacture of the machine, the manufacturer is aware of some of the authorised pesticides and mixtures which can have damaging effects on the field sprayer materials. These are usually solvent-based pesticides and mixtures such as BETANAL with TRAMAT, (BETANAL-TANDEM), ELANCOLAN, ILOXAN, LASSO, MUDECAN, RACER, RIPCORD 40, TERIDOX, STOMP, liquid manure (AHL) but also

Mixtures with AHL: ALANDAN, or liquid NEXID 100.

Damaging effects can also occur with the subsequent products of the above materials and mixtures.

IMPORTANT! For mixtures not "covered" by any equipment application, it is recommended to test the materials mentioned above with several hours of submersion tests before starting work. Pesticides or other substances which tend to harden or stick must not be used with the machine.

<u>ATTENTION!</u> The usage instructions of the respective pesticide manufacturer must be strictly followed before starting work.

The equipment parts which can be affected by the pesticides mentioned above are usually hoses, spray lines, seals, tanks and pump diaphragms.

If hoses become particularly soft or seals or diaphragms swell, these are signs of damaging effects. The affected parts must then be replaced immediately. These damaging effects can often be avoided if the machine is intensively flushed immediately after dispensing the materials and mixtures shown above (e.g. rinsing and disposal of the technical residues on the field).



2 SAFETY INSTRUCTIONS



General Safety Instructions

- Before using the machine, always check both it and the tractor for roadworthiness and operational safety!
- As well as the notes in these instructions the operator is advised to comply with the generally applicable safety at work regulations and those relating to use of the public highway!
- When driving on public roads with a raised machine the lifting control lever should be locked against unintentional lowering!
- The fitted warning and advisory plates give important information for safe operation; adhering to these increases your own safety!
- When using public roads adhere to applicable traffic rules!
- The operator should familiarise him-/herself with all controls and their functions before starting work. During work could be too late!
- The clothing of the operator should fit tight. Avoid wearing any loose clothing!
- To avoid danger of fire keep the implement clean!
- Before beginning to drive check surroundings area (children)!
- Sitting or standing on the implement during operation or during transport is not permissible.
- Attach implements as advised and only to the stipulated positions!
- Special care should be taken when the implement is coupled to or uncoupled from the tractor.
- When coupling or uncoupling the implement bring the supporting stands into the corresponding position (standing safety)!
- Fit weights only to the fixing points provided for those purposes!
- Adhere to the maximum permissible axle loads, total weights and transport width!
- Fit and check transport gear, road lights and warning guards!
- The release ropes for quick coupler latches should hang freely and in the

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lowered position must not release the quick coupling by themselves.

- Never leave the driver's seat whilst in motion!
- Handling behaviour, steerability and braking are influenced by mounted implements, trailers and ballast weights. Check for sufficient steerability and braking!
- When driving round bends note the width of the machine and/or changing centre of gravity of the implement.
- Put implement into operation only when all guards are fixed in position!
- Never stay or allow anyone to stay within the operating area!
- Never stay in the turning and slew area of the implement!
- Do not operate any hydraulic controls while anybody is in the operating area!
- On all pivoting parts actuated by power assistance (e.g. hydraulics) exists danger of injury by bruising and crushing!
- Before leaving the tractor lower the machine to the ground. Apply the parking brake, stop the engine and remove the ignition key!
- Do not allow anybody between the tractor and implement if the parking brakes are not applied!
- Swing attachment arm to transport position and secure!



Trailed implements

- Secure machine and tractor against unintended rolling away!
- Never exceed the maximum permissible load of the drawbar or hitch!
- When fitting the implement to a drawbar or hitch, ensure sufficient movement at the hitch-point!





Brakes

- Check the function of the brakes before starting work!
- The brake systems must be checked thoroughly at regular intervals!
- Adjustment and repairs to the brake system must only be carried out by approved workshops or approved brake service shops. Only use the specified brake fluid and renew as specified.



Hydraulic equipment

- The hydraulic equipment is under high pressure!
- When connecting hydraulic rams and motors, the hydraulic hoses must be connected as directed!
- Always release hydraulic pressure from both tractor and machine before connecting the hydraulic hoses.
- Coupling sleeves and connectors for hydraulic functional connections between the tractor and machine should be marked in order to rule out operator errors. If the connections are reversed, the opposite function is carried out (e.g. raising/lowering) and there is a risk of accidents!
- Check the hydraulic hoses regularly and replace them in the event of damage or signs of ageing! The replacement hoses must comply with the technical specification as laid down by Lemken!
- When searching for leaks, appropriate equipment should be used because of the danger of injury!
- Hydraulic oil escaping at high pressure can penetrate the skin and cause serious injury! Consult a doctor immediately in the case of injury. Danger of infection!
- Before working on any hydraulic equipment, lower all implements/attachments, release hydraulic pressure where possible and switch off the tractor engine!





<u>Tyres</u>

- When working on the tyres, make sure that the machine has been placed on the ground safely and that it is secured by chocks against unintentional rolling away!
- Fitting tyres requires knowledge and special tools!
- Repair work on the tyres and wheels must only be carried out by trained personnel and with suitable tools!
- Check the air pressure regularly. Adhere to the advised air pressure!



Maintenance

• Repair-, maintenance- and cleaning operations as well as adjustments and remedy of function faults should principally be conducted with engine stopped and brakes applied. Remove ignition key!

- Check and tighten nuts and bolts regularly!
- When conducting maintenance work on a lifted implement always place suitable supports underneath!
- For replacing any tools with cutting edges always use suitable tools and gloves!
- Dispose of old oils, grease and filters as prescribed by law.
- Before working on the electric gear disconnect battery cables!
- When conducting electrical welding operations on the tractor or on the mounted implement remove cable from the generator and the battery!
- Any spare parts fitted must meet with the implement manufacturer's fixed technical standards! This is for example ensured by using genuine spare parts!
- To avoid danger of explosion only use nitrogen for filling up gas tanks!





Power take-off shaft operation

- Only drive shafts stipulated by the manufacturer may be used!
- Both halves of the protective tube of the PTO shaft must be anchored to prevent rotation and be in working order!
- At PTO shafts always see to the advised tube overlapping in transport- and working position!
- Fit and remove the PTO shaft only when the power take-off drive is disconnected, the engine is switched off and the ignition key has been removed!
- Always ensure the correct assembly and safety of the PTO shaft!
- Prevent PTO guard from spinning by fixing the provided chain to a nearby static part!
- Before engaging the power take-off drive, ensure that the selected speed of the tractor's power take-off shaft matches the permissible speed of the power harrow!
- When using the speed-related PTO shaft take into account that the PTO speed depends on the driving speed and that the turning direction is reversed when driving backwards!
- Before engaging the power take-off drive, ensure that nobody is standing in the hazard area of the power harrow!
- Never connect the power take-off shaft when the engine is switched on!
- When working with the power take-off shaft, nobody must stand in the area of the rotating power take-off shaft.
- Always disengage the power take-off drive if excessive angular displacements occur.
- Caution: After disengaging the power take-off drive, the rotors take a few seconds to come to rest. Do not approach the power harrow too closely during this time. Work must not be carried out upon it until it comes to a complete standstill!
- Clean, lubricate or adjust the appliance driven by the power take-off shaft only

when the power take-off shaft is disconnected, the engine is switched off and the ignition key has been removed!

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- Retain the uncoupled PTO shaft on the mount provided!
- After removing the PTO shaft replace the screw-on guard over the tractor PTO.
- In the event of damage, rectify it prior to continuation of work.



Plant protection

As well as the general safety and accident prevention regulations for tractors, machine and work process which <u>always</u> apply, the recommendations and instructions of the pesticide manufacturers must be observed.

- Wear protective clothing
- Pay attention to warnings
- Observe metering, application and cleaning regulations

Do not open pressurised lines

Only suitable hoses for the maximum permitted operating pressure which also resist the chemical, mechanical and thermal load are permitted as replacement hoses. As a matter of principle, only suitable hose clamps must be used during installation. The regulations for marking and connecting hoses must be observed.

Repair work in the spray tank must only be done after thorough cleaning and while wearing a respirator. For safety reasons, a second person outside the tank must supervise the work.

The following must be observed for the repair of spray equipment which is used for liquid fertilisation with urea ammonium nitrate solutions:

Residues of urea ammonium nitrate solutions can form salt on or in the equipment due to evaporation: This produces pure ammonium nitrate and urea. In pure form, ammonium nitrate in combination with organic substances e.g. urea is explosive if the critical temperatures are reached during repair work (e.g. welding, grinding, filing). The salt of the urea ammonium nitrate solution can be dissolved in water; this means that this danger is resolved by thorough washing of the machine or parts for repair with water. Therefore, always clean the machine thoroughly with water before a repair.



3 VALVES

3.1 Valve overview

The field sprayer is fitted with manually operated valves which cover all required work functions depending on the switching position.



- 1. Filling valve(s)
- 2. Selection valve
- 3. Valve for the internal cleaning
- 4. Distribution valve
- 5. Induction valve
- 6. Rinsing valve

- 7. Valve block of the chemical inductor
- 8. Valve for the agitator nozzle
- 9. Valve for the boundary wetting
- 10. Valve for the canister rinsing
- 11. Valve for the outside cleaning



3.2 Valve description

3.2.1 Filling valves

Using the filling valve (1) or the filling valves (2), liquid is drawn in externally via a filling hose or internally from the selection valve.



(a) Suction from the selection valve; liquid is drawn internally from the suction valve.

(b) External suction; liquid is suctioned externally for filling.

- (a) SPRAYING
- (b) SUCTION

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3.2.2 Selection valve

The selection valve (2) is used to select the tank from which the liquid should be suctioned internally by the pump.



(a) Clean water tank; clean water is suctioned from the clean water tank.

(a) Main tank; spray liquid is suctioned from the main tank.

- (a) CLEAN WATER
- (b) SPRAYING



3.2.3 Valve for the internal cleaning

The internal cleaning valve (3) must be set to "Internal cleaning ON" for cleaning the inside of the main tank. The intensity of the internal cleaning can be increased if the distribution valve is set to the "chemical inductor".





- (a) Internal cleaning ON.
- (b) Internal cleaning OFF.

- (a) INTERNAL TANK CLEANING ON
- (b) INTERNAL TANK CLEANING OFF



3.2.4 Distribution valve

In combination with a chemical inductor, the liquid conveyed by the pump is delivered via the distribution valve (4) either to the spray boom or to the chemical inductor. If no chemical inductor is present, the valve is usually in the "spraying" position.





- (a) Chemical inductor
- (b) Spraying

- (a) INJECTOR ON
- (b) INJECTOR OFF



3.2.5 Induction valve

The liquid from the chemical inductor is delivered into the main tank by activating the induction valve (5). The induction valve operates proportionally. It should therefore only be activated insofar as there is always sufficient water remaining in the chemical inductor for dissolving the medium.





- (a) Induction ON
- (b) Induction OFF

- (a) INDUCTION ON
- (b) INDUCTION OFF



3.2.6 Valve block of the chemical inductor

All filling and cleaning functions of the chemical inductor as well as the functions of the outside cleaning are performed using the individual valves of the valve block (7). The distribution valve must be switched to "chemical inductor".





Valve swivelled up = ON Valve swivelled down = OFF

- (8) Agitation of the liquid in the chemical inductor
- (9) Filling the chemical inductor using boundary wetting
- (10) Canister rinsing (only with clean water)
- (11) Outside cleaning (only with clean water)

- (8) AGITATION NOZZLE
- (9) BOUNDARY WETTING
- (10) CANISTER RINSING
- (11) OUTSIDE CLEANING



3.2.7 Rinsing valve for cleaning the pressure filter



The self-cleaning of the pressure filter is performed with the rinsing valve (6). This can be infinitely adjusted from 0 % to 100 %.

The rinsing valve (6) must be closed for system cleaning when the main tank is partially filled. When the rinsing valve is completely open, the system pressure can drop to 1 bar. If necessary, the rinsing valve must be less widely opened accordingly.

3.2.8 Settings table

Function	Filling valve	Selection valve	Valve for the internal cleaning	Main switch of the on-board computer/ Operating terminal	Distributi on valve	Induction valve	Rinsing valve	Attention!
Filling the main tank with suction hose	External suction	Main tank	Off	Off	Spraying	Induction, OFF	Open (50 %)	Pump speed max. 540 rpm.
Induction of spray mixture using chemical inductor (suction from the main tank when the tank is filled)	Suction from selection valve	Main tank	Off	Off	Chemical inductor	Induction, ON	Open (50 %)	Pump speed max. 540 rpm.
Induction of spray mixture using chemical inductor (suction with suction hose)	External suction	Main tank	Off	đ	Chemical inductor	Induction, ON	Open (50 %)	Pump speed max. 540 rpm.
Agitating	Suction from selection valve	Main tank	Off	Off	Spraying	Induction, OFF	Open (50 %)	Pump speed max. 540 rpm.
Spraying	Suction from selection valve	Main tank	Off	б	Spraying	Induction, OFF	Open (50 %)	Pump speed max. 540 rpm.
Internal cleaning of the empty main tank	Suction from selection valve	Clean water tank	чŌ	Off	Spraying	Induction, OFF	Open (50 %)	Pump speed 400 – 540 rpm.
System cleaning when main tank is partially filled *	Suction from selection valve	Clean water tank	Off	Ŋ	Spraying	Induction, OFF	Closed (0 %)	low pump speed
System cleaning when main tank is empty	Suction from selection valve	Clean water tank	Off	ő	Spraying	Induction, OFF	Open (50 %)	low pump speed
Outside cleaning	Suction from selection valve	Clean water tank	Off	Off	Chemical inductor	Induction, OFF	Open (50 %)	low pump speed

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* Set manual pressure-limiting valve to maximum pressure, increase spray pressure to maximum

4 OPERATION

4.1 Filling the main tank with water

4.1.1 Filling via the dome cover

Open the dome cover and fill using a filling hose

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4.1.2 Filling with suction hose (external suction)







- Remove sealing cap (1) of the filling connection
- Connect filling hose (2)
- The main switch (4) on the on-board computer or operating terminal must be in the "spray boom off" position.
- Switch on the power takeoff of the tractor or hydraulic pump drive at idling speed.
- Increase pump speed to 400 maximum 540 rpm
- Switch the filling valve or filling valves (5) to "external suction".
- When the main tank is filled, remove the filling hose from the suction medium (e.g. water transporter) and wait until the pump is drawing air.





- Put selection valve (6) in the "main tank" position
- Only then put the filling valve or filling valves (5) into the "suction from selection valve" position when the pump is running.
- Remove filling hose (2) and replace the sealing cap (1).



IMPORTANT!

In combination with a chemical inductor, pesticides can already be inducted during the filling process after the main tank has already been filled with 100 litres of clean water. Empty canisters should be rinsed and the inside of the chemical inductor, the agitation nozzle and the canister rinsing nozzle should be cleaned during the filling process. The externally drawn in clean water can be used for cleaning purposes during the filling of the main tank. The limited capacity of the clean water tank can then mainly be used for the internal cleaning of the main tank, the outside cleaning and the system cleaning of the field sprayer.

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4.1.3 Filling via the external filling connection



- The filling rate is 500 l/min at maximum 8 bar.
- The integrated non-return valve (5) should prevent the main tank running dry in the case of operator error or technical defect. Ensure the non-return valve is functioning properly.
- Open the dome cover for venting purposes.







The external filling connection is intended for filling using an external pump.

- Place a suitable collection container under the external filling connection.
- Open the dome cover.
- Some liquid can escape when removing the blind plug (1) and when connecting and disconnecting the filling hose (2).
- Put the stop valve (3) in the "closed" position.
- Remove the blind plug (1).
- Connect the external filling hose (2) with a 2" Kamlok female connector.
- The stop valve (3) must be put in the "open" position before filling.
- The stop valve (3) must be put in the "closed" position after filling and switching off the external pump.
- Disconnect filling hose (2)
- Replace the blind plug (1).
- Close the dome cover again.



4.2 Filling pesticides in the main tank

4.2.1 Filling via the dome cover



- Fill the container with water according to the pesticide manufacturer instructions
- Open the dome cover (1).
- Switch on pump
- Fill pesticides via the filling sieve (2) and close the dome cover (1) afterwards
- Agitate the content of the main tank.



4.2.2 Filling via the chemical inductor with internal cleaning afterwards







Liquid can be suctioned from the main tank or externally for filling spray mixture with the chemical inductor. We recommend filling with a filling hose due to the better cleaning effect using the canister rinsing nozzle and the cleaning of the induction system.

- The main switch of the on-board computer or operating terminal must be in the "spray boom off" position and the distribution valve (5) must be in the "chemical inductor" position.
- Put selection valve in the "main tank" position
- Connect the filling hose (1) to the filling connection and put the filling valve in the "external suction" position.
- Undo the lock (2) and swivel the chemical inductor (3) downward.
- Open the cover (4) and swivel up the canister rinsing nozzle (10).
- Activate the pump drive and operate the pump at 400 rpm to maximum 540 rpm.
- Fill the main tank with at least 100 litres of water or ammonium nitrate urea solution according to the instructions of the pesticide manufacturer.









 Keep the lever (6) in the "boundary wetting" position until the chemical inductor is half-filled.

ATTENTION! Never operate the lever (11) of the canister rinsing if there is no canister pushed over the canister rinsing nozzle. The canister must only be rinsed with clean water.

- Put the lever (9) in the "agitator ON" position.
- Put the lever (6) in the "boundary wetting OFF" position.
- Put the metered induction valve (8) in the "induction ON" position so that the chemical inductor remains 50 % full.
- Fill pesticide into the chemical inductor.
- Rinse empty canister if necessary after induction of the pesticide is complete.
- For this, swivel up the canister rinsing nozzle, push the canister over it, put the lever (11) for the canister rinsing in the "ON" position and rinse the canister.
- Put the lever (11) for the canister rinsing in the "OFF" position.
- Put the lever (6) in the "boundary wetting ON" position in order to clean the chemical inductor.
- Put the induction valve (8) completely into the "induction ON" position.
- Remove the canister from the canister rinsing nozzle.





- Swivel down the canister rinsing nozzle (10).
- Close the cover (4) and put the lever (11) in the "canister rinsing ON" position.
- Put the agitation nozzle, boundary wetting and canister rinsing in the "OFF" position.
- Put the induction valve (8) in the "induction OFF" position when all the liquid from the chemical inductor has been inducted.
- Put the distribution valve (5) in the "spraying" position.
- When the main tank has been filled as required, put the filling value in the "suction from selection value" position.
- Agitate the content of the main tank.



4.3 Separate internal cleaning of the chemical inductor







Internal cleaning of the chemical inductor (1) must be performed after the induction of spray mixtures and also after a canister rinsing. If the filling is done using a filling hose, this is done already during the filling of the main tank with clean water. If the chemical inductor should be cleaned with clean water from the clean water tank, all valves must first be adjusted as follows and the pump must not be switched on until afterwards:

- Put the selection valve (2) in the "clean water tank" position (lever pointing up).
- Put the filling valves (3) in the "suction from selection valve" position.
- Put the distribution valve (7) in the "chemical inductor" position.
- Put the induction valve (4) in the "induction ON" position.





- Switch on the boundary wetting with the lever (6), the agitating nozzle with the lever (9) and the canister rinsing with the lever (11).
- Close the cover.
- Operate the pump(s) at low speed for a short time.
- Put the induction valve (8) in the "induction ON" position.
- After the cleaning is completed:
- Put the levers for the agitating nozzle (9), canister rinsing (11) and boundary wetting (6) in their respective "OFF" positions.
- Put the induction valve (8) in the "induction OFF" position the and distribution valve (7) in the "spraying" position (crosswise lever).
- Agitate the content of the main tank.

It must be ensured that the internal cleaning of the chemical inductor is done at low pump speed otherwise too much clean water will be taken from the clean water tank in a short time. This has the result that there is not enough clean water in the clean water tank for a system cleaning, internal cleaning of the main tank and outside cleaning.

ATTENTION! Never operate the lever (11) of the canister rinsing if there is no canister pushed over the canister rinsing nozzle. The canister must only be rinsed with clean water.



4.4 Agitating





- After filling with spray mixture, the content of the main tank must be agitated using transfer pumping.
- Put the main switch in the "spray boom OFF" position.
- Put the filling valve or filling valves (1) in the "suction from selection valve" position.
- Put selection valve (2) in the "main tank" position
- Put the distribution valve (3) in the "spraying" position.
- Put the internal cleaning valve (4) in the "internal cleaning OFF" position.
- Operate the tractor power takeoff or hydraulic pump drive at 400 rpm to maximum 540 rpm.

ATTENTION! Do not start spraying until the content has been sufficiently agitated.





4.5 Spraying







- Switch on the pump(s).
- Thereby, it must be ensured that the power takeoff of the tractor operates smoothly at low engine speed.
- The maximum permitted pump speed is 540 rpm.
- Unfold the spray boom and adjust it to the specified spacing before starting spraying.
- Put the filling valve or filling valves (1) in the "suction from selection valve" position.
- Put selection valve (2) in the "main tank" position
- Put the distribution valve (3) in the "spraying" position.
- Put the internal cleaning valve (4) in the "internal cleaning OFF" position.
- Start spraying using the operating terminal or on-board computer according to the desired programming and set values. Put the main switch in the "spray boom ON" position.
- Switch off the boom before turning on the headlands. Put the main switch in the "spray boom OFF" position.
- If pressure fluctuations or reduction of the dispensed quantity occur when the main tank is almost empty, stop the spraying and refill or clean the machine.
- After the last spraying of the day or before long breaks in spraying, spray until the tank is empty and rinse the field sprayer with clean water.



4.6 System cleaning when the main tank is empty







Before cleaning the system when the main tank is empty, first carry out the internal cleaning of the main tank and afterwards the internal cleaning of the chemical inductor. The internal cleaning of the chemical inductor is not necessary if it has already been done as recommended during the external filling of the main tank with the suction hose.

- Put the filling valve or filling valves (1) in the "suction from selection valve" position.
- Put selection valve (2) in the "clean water tank" position
- Put the distribution valve (3) in the "spraying" position.
- Put the main switch (5) of the on-board computer or operating terminal in the "spray boom OFF" position.

Operate pump(s) at maximum speed of 540 rpm.

- Draw in approx. 1/3 of the content of the clean water tank in the stand into the main tank.
- Put selection valve (2) in the "main tank" position
- Agitate the content of the main tank.
- Put the main switch (5) of the on-board computer or operating terminal in the "spray boom ON" position.
- Distribute the content of the main tank in small quantities on the field.





 After spraying the contents of the main tank, the cleaning process described above must be repeated twice.



4.7 System cleaning when main tank is partially filled







If the filled or partially filled main tank cannot be sprayed until it is empty or transfer pumped, a system cleaning must be performed.

- Switch off pump.
- Close the rinsing valve (1) of the pressure filter (2).
- Put the internal cleaning valve (3) in the "internal cleaning OFF" position (crosswise lever).
- Put selection valve (5) in the "clean water tank" position
- Put the filling valve (6) or filling valves
 (6) in the "suction from selection valve" position.
- Put the distribution valve (7) in the "spraying" position.
- Put the controller (8) on the on-board computer or operating terminal in the "MAN" (manual) position.
- Increase the spraying pressure to the maximum value using the pressure adjustment of the on-board computer or operating terminal.
- Put the main switch (10) of the on-board computer or operating terminal in the "spray boom ON" position.
- Activate the switch for the boom sections (9).









- Switch on the pump and operate at low speed until clean water discharges from the nozzles.
- Switch off pump.

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- Put the main switch on the on-board computer in the "spray boom OFF" position.
- Use the pressure adjustment to put the spraying pressure back in the middle position.
- Put the controller in the "automatic" position.
- Put selection valve in the "main tank" position

ATTENTION!

During the spraying of the cleaning fluid at the end of the field or before turning on the headlands, only switch off the pump(s) and switch on again after the turn. The switches (9) of the boom sections and the main switch (10) must stay in the spraying position during the turn otherwise liquid can get into the main tank and the concentration of the spray mixture would be changed.



4.8 Emptying the machine



ATTENTION!

Pesticides must not be left on the side of paths or introduced into the sewer system under any circumstances. Collected pesticides must be taken to the specified waste disposal location (ask for the responsible place) or recycled (after consultation with the respective pesticide manufacturer).

If the machine is fitted with a pump out valve, pump out the contents of the tank. Afterwards:

- Place a collecting container under the outlet connection (1) of the main tank.
- Unscrew the blind plug (2) of the outlet connection (1).
- Open the drain valve (3).
- Close the drain valve and refit the blind plug (2) after the emptying.



4.9 Volumetric measurement and calibration

4.9.1 General

The actual spraying pressure and nozzle wear are determined with the volumetric measurement.

A volumetric measurement is always necessary if the output quantity of the machine deviates from the output quantity in the spraying table of the nozzles used.

The volumetric measurement must be done during first use, before every spraying season or in the case of nozzle wear or replacement.

It is recommended to have the equipment checked annually by a specialist.

The pulse values of the speed sensor and the flow meter are determined with the calibration. - see the operating instructions of the on-board computer or operating terminal for this.

ATTENTION! The fitting type 1, e.g. 1.99, must be input for the Spraydos on-board computer.

Only use clean water for the volumetric measurement and calibration.

4.9.2 Checking the nozzle output

Volumetric measurement:

Volumetric measurement of at least 3 nozzles must be carried out in order to determine a precise value of the nozzle output.

A hose can be pushed over the nozzle for collection or a suitable container can be held under the respective nozzle by a second person so that nothing can flow past the container.

Checking the nozzle output is done while stationary (on-board computer or operating terminal in the "**MAN**" position.

- Fill the machine with water.
- Operate the pump at the specified speed.
- Put the individual components in the spraying position.
- Adjust the specified spraying pressure using the regulator valve.
- Hold the collecting container under the collection hose or directly under the nozzle for one minute and pour into the measuring container; repeat the process for <u>at least</u> two nozzles.

- Switch off the machine.
- Divide the collected liquid by the number of measurements = I/min per nozzle (e.g. 4.5 I: 3 measurements = 1.5 I/min/nozzle).

EXEMPER

- If individual nozzles show deviations from each other, the nozzles must be checked on a tester and/or replaced.

The spraying pressure determined during the volumetric measurement is used as the reference point for the assessment and monitoring of the droplet spectrum and for adjustment of the spraying pressure on the on-board computer or operating terminal in the **"MAN"** position.

Calibration:

The total machine output should always be the multiple of the individual nozzle output.

Example:

Individual nozzle output 1.5 l/min/nozzle x 48 nozzles (24 m boom) = 72 l/min.

If the l/min value of the on-board computer or operating terminal deviates from the multiple of the individual nozzle output, the control unit must be recalibrated.

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4.9.3 Vehicle speed determination

Speed curve for 100 m distance according to the following table



- Measure 100 m test distance at usage location with a tape measure
- Cover the test distance at the constant, specified speed and measure the necessary travel time with a stopwatch
- Insert the value determined into the formula above
- e.g. 60 seconds = 100 / 60 x 3.6 = <u>6 km/h</u>

If the determined vehicle speed deviates from the vehicle speed of the control unit, the vehicle speed must be recalibrated.

5 CLEANING

5.1 Rough cleaning

The rough cleaning must be done as a <u>matter of principle</u> after completion of the spraying work on the field before "drying-in" of the remaining mixture can occur. See also the sections "System cleaning when the main tank is empty" and "Internal cleaning of the chemical inductor".

EXEMPER

Fill the empty field sprayer with 40 - 50 litres of water using the valve for the internal cleaning.

Flush the pump, main tank, lines, fittings, boom and nozzles well. Afterwards, spray the cleaning liquid in the final or not yet treated condition in manual operation at increased vehicle speed and reduced spraying pressure. The boom section valves, lines in the boom and the nozzles are also flushed here.

Repeat this procedure twice.

The intensity of the internal cleaning can be increased if the distribution valve is set to the "chemical inductor". Approved cleaning additives can be used for stubborn dirt.



5.2 Outside cleaning







The field sprayer must also be cleaned on the outside after the internal cleaning.

The external cleaning is used for care of the machine and also prevents the dripping or running-off of adhering spray mixtures.

The cleaning equipment hose can be connected to the connection with the GEKA coupling (1).

- Put the main switch of the on-board computer or operating terminal in the "spray boom OFF" position.
- The internal cleaning valve (4) must be in the "internal cleaning OFF" position.
- Put the filling valve (2) or filling valves
 (2) in the "suction from selection valve" position.
- Put selection valve (3) in the "clean water tank" position
- Put the distribution valve (4) in the "chemical inductor" position.
- Operate the pump(s) at low speed.
- Operate the lever of the metered external cleaning unit and clean the surfaces.
- If the pumps draw air (juddering), put the selection valve in the "main tank" position and clean the field sprayer until the clean water is used up.

ATTENTION!

- Only use clean water for the outside cleaning of the field sprayer.
- The outside cleaning of the field sprayer must be carried out on a not yet treated or the last treated area.
- In any case, the cleaning water with the spraying mixture residues must not get



into the receiving water courses or into the drainage system.