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Sp. z o.o.

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MOUNTED FIDEL SPRAYER
GOLIAT PLUS
P356/1 KTM 0823-113-435-612
2500/18/PHB
2500/20/PHB
2500/21/PHB

INSTRUCTION OF USE

SPARE PARTS CATALOQUE

WARIANTY CARD

KEEP TO FUTURE USE

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Issue I 2010

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INTRODUTION

INSTRUCTION IS INTEGRAL PART OF ARTICLE.

IMPORTANT – Before first startup the sprayer read carefully this instruction. It will help you optimally use the machine.Its carefully reading permits safe and efficient work and ensure efficiency about which you count.Only precise complying with rules and clues warranty using machine without disturbances and accidents and long-term exploration of sprayer.

Sprayer can be use, conserve and activate only by people, who get acquainted with machine and were informed about possible dangers. It`s necessary to comply with SAFETY WORK regulations and remaining rules related to technology, industrial medicine and traffic regulations.

CAUTION – THIS SIGN INDICATE INFORMATION ABOUT YOUR SAFTY, OTHER PEOPLE AND SAFE RUNNING OF THE MACHINE.

Sprayer can be use only according to its purpose. Otherwise, in case of damages, one loses guaranteed rights. Using sorter according to purpose regard to obeying work conditions and conserve, and also using only original spare parts.

IMPORTANT – PRODUCER STIPULATES FOR ITSELF LAW TO INTRODUCE HARDWARE CHANGES WHICH CULTIVATE WARES,.WHICH NOT ALWAYS WOULD BE TAKE UP TO THE USING INSTRUCTION. IT`S NOT CONNECTED WITH OBLIGATION THAT IT WILL BE INTRODUCED ALSO TO ALREADY DELIVERED MACHINES.

IMPORTANT – PRODUCER DO NOT TAKE REPONSABILITY FOR CHANGES MADE BY USER.

IMPORTANT – THE OWNER, LENDING SPRAYER SHOULD PASS IT IN CONJUNCTION WITH THE INSTRUCTION MANUAL.

IMPORTANT – THERE IS ALWAYS AN ELEMENT OF RISK, RISK GROUPS, WHICH WILL NOT BE ELIMINATED UNTIL THE END. THEREFORE, PLEASE USE CAUTION WHEN WORKING THE MACHINE (EG CRUSHING, LOSS OF STABILITY, HITCH).

IMPORTANT – DURING OPERATION, THERE IS INCREASED NOISE. THE OPERATOR STAYS ON THE TRACTOR, NOISE AND VIBRATIONS DO NOT CAUSE HEALTH RISKS.

IDENTIFICATION OF MACHINE

Identification data of sprayer 2500 l are insert on front frame of machine on left side. (Draw. 1.)

IMPORTANT - WE WOULD BE GRATEFUL IF YOU CAN INSCRIBE BELOW : TYPE, NR. OF MACHINE AND THE YEAR OF PRODUCTION. THIS DATA MAY BE READ FROM SYMPTOMATIC TABLET;THEY WILL BE NEED BY ORDER THE SPARE PARTS FROM PRODUCER.

Type Nr. machine The year of

Draw. 1. Place where the symptomatic tablet can be insert.

OUTLINES TO WARRANTY

- In delivery moment of machine be sure to check if there is no damage during transport, if on symptomatic tablet occur fabric number,
- Claims arrising out of warranty may be stay acclaimed only when producercomplied with the conditions provided for in the contract.,
- Warranty expires, when accordingly willful repair by the purchaser, mounting not original spare parts, device is changed and possible damage staying in direct relation to cause and effect of these changes.

IMPORTANT - RULES OF WARRANTY AND RIGHTS ARRISING THERE FROM RIGHTS ARE GIVEN IN WARRANTY CARD POSTED IN SERVICING INSTRUCTION.

1. SAFETY USAGE

1.1. GENERAL INFORMATION FOR THE BUYER

Sprayer is designed according to the present state of the art and recognized safety rules, although it can occur during operation of the user or third persons, threats to cut or injure yourself.
Sprayer should be operated only when it is fully operational, in accordance with the principles of safety recommended in the manual. In the event of a failure of any equipment that may endanger the safety, remove them immediately, or have removed.
Sprayer can be operated only by persons who have been trained and familiar with the safety manual.
Original spare parts and accessories for the sprayer designed and assembled by KFMR Not supplied by us are not spare parts that we tested and approved for use. Erection or use of foreign products may adversely alter the technical characteristics of the sprayer and thereby damage the machine and compromise the safety of the operator.
For damages that arose as a result of non-original parts and do not comply with the user KFMR Company not responsible.

1.2. BASIC RULES

CAUTION - USING THE MACHINE BE SURE TO SERVE IT BY SERVICING INSTRUCTION AND DURING THE PREPARATORY ACTIVITIES AND OPERATING MANAGMENT ABSOLUTELY OBSERVE THE POLLOWING RULES AND REGULATIONS.

1. Incidental people who didn`t famailiazire with sprayer operating are not allowed to using machine.
2. Operators at work sprayer should follow the recommendations listed on the packages of measures for protection, the recommendations of this manual and the relevant provisions of plant protection.
3. People under influence of alcohol, ill and minor people, women in preagnet are not allowed to use the sprayer.
4. Spray must not employ individuals with even minor injuries because of its high toxicity and concentration of chemicals. During operation and after is not allowed to drink beverages containing alcohol.
5. In any case do not proceed to work on an empty stomach.
6. During operation, do not smoke, drink and eat. After work or during breaks, wash hands and face with warm soapy water and rinse your mouth with fresh water [especially before eating].
7. Operations involve the handling of the sprayer and the liquid preparation should be carried out in protective clothing, with his head covered and protective glasses, rubber gloves on and half masce.
8. Prepare for spraying liquid at a distance of 50 m from wells or other container of water intended for food purposes.
9. Prepared liquid stored in a place where children have no access and domestic animals and breeding.
10. In places where the chemicals used do not graze cattle and gather crops earlier than after the grace period. This period is indicated on the packaging of plant protection products and agronomic service sets it.
11. It should be noted that the spraying is not was done by the wind, that is that sprayed liquid does not fall on the operator.
12. When aggregating the machine to the tractor, no one may stand between the tractor and sprayer.
13. By attaching the sprayer to the tractor is changed load the front axle. Sprayer can be attached only to tractors class 0.9 and higher, which guarantee controllability of aggregate tractor + machine.
14. Before moving from place to make sure that in the immediate vicinity of the tractor and the machine does not stay any person (including children). Start the audio signal.
15. Be very careful during passes of the sprayer. Not be carried of the seat side of the tractor and the machine (platform, ladder steps, etc.).
16. Operation without guards or with broken cover take-off shaft, PTO and WPM is prohibited.
17. Before you turn on the tractor PTO drive, run a sound signal at least twice.
18. Use only recommended by the manufacturer shaft pivotally - Telehandler (see p.1.9. Technical) – marked in security symbol „B”.

19. Before you begin, inspect all the control devices and their activity.
20. Lifting and lowering of the boom, should be done only with distributed arms of the beam.
21. In case of damage to the sprayer causing poisonous leak, turn off the sprayer and stop work until the removal of damaged.
22. All repairs performed only after turning off the drive. and removing the key from the ignition tractor.
23. Never leave the tractor with attached machine without supervision - with the engine running
24. In case of damage to the sprayer, before putting into service, it should be thoroughly cleaned of toxic substances.
25. The liquid remaining in the tank after spraying the spill according to the manual. In appropriate cases, failure to follow instructions, pour liquid out of reach of humans and animals, away from the farm buildings, ponds, rivers, etc. In choosing where to remove residual liquid, you should adhere to the guidelines plant protection service. Observe the force of the Minister of the Environment, and Minister of Agriculture and Food Economy on occupational safety and health associated with the use of chemicals in agriculture.
26. Clothing used while working, remove as soon as possible after the spraying, and wash with plenty of soap and water.
27. sprayer must be storage in clean condition.
28. Maintenance operations, in particular, welding must be performed after rinsing the sprayer.
29. Disconnected from the tractor leave the machine on a flat, hard surface set in the transport position and resting on the support pole. Wheels and brake hand brake wedge to plant primers.
30. Sprayer transportation passes, must be set in the transport position, the arms must be closed of beams and protected from unfolding, drawbar support open.

31. On public roads, sprayer must be equipped with an efficient electrical system, efficient pneumatic system (brake) mounted on the rear of the machine distinctive triangular array (Fig. 2 and 3).

IMPORTANT - POINT 25 RELATED TO FURTHER PROCEEDINGS THE WATER AFTER FLUSHING CONTAINER AND OTHER PARTS OF THE SPRAYER.

1.3. RULET OF SAFETY WORK

1. Sprayer can be used after reading the manual and after training by an employee or work colleague K FMR Sp. z o.o.
2. Sprayer can be run only when the devices were tested (cover: WPM, shaft pivotally - telescoping, etc.).
3. Regularly check all nuts and bolts and tighten loosened ones.
4. Regularly check the pressure gauge (manometers).
5. Inspect the tire pressure. In the event of machine failure should immediately be shut down and secured.
6. Defects repaired or repaired adequate to company specialized in.

1.3.1. GENERAL SAFETY IN THE USE OF THE HYDRAULIC SYSTEM

	**NOTE -** HYDRAULIC HOSES HAVE HIGH PRESSURE.

HYDRAULIC HOSES :

• should be checked periodically and if damaged or expiration of the period of use (old) replaced. Replaced the hydraulic lines should meet the technical requirements of the manufacturer.

• Before performing maintenance work on the hydraulic system, turn off the engine and remove the ignition key.

	**NOTE -** TIME USE OF HOSES SHOULD NOT EXCEED 5 YEARS (INCLUDING A POSSIBLE TWO-YEAR PERIOD OF STORAGE); ENVIRONMENTALLY AFFECTED HOSES AGING. WHY IS A LIMITED PERIOD OF USE AND STORAGE.

	**NOTE** – THE POWER HOSE IS MARKED BY RED CLAMP THE HOSE FOR RETURN IS MARKED BY BLUE CLAMP. .

• When searching for leaks with caution because the leaking hydraulic fluid under pressure, can burn skin and cause injury. Pay attention to your eyes. In the event of an accident to go to the doctor!

• Hydraulic and pneumatic lines should be attached to special holders.

• Electrical cables should be mounted on a special bracket.

	**NOTE** - USED OIL, FILTERS CONTAIN SUBSTANCES HARMFUL TO ENVIRONMENT AND PLEASE SEND THEM TO BUSINESS RECYCLING PURCHASERS OR RETURN FOR RE- PROCESSING AND USE.

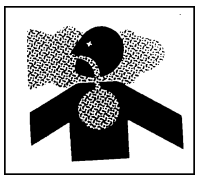
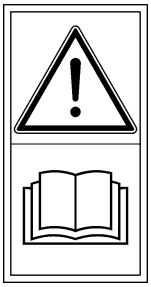
IMPORTANT - DO NOT OIL TO EARTH DRAIN, DRAINS, INTO RIVERS, OR INTO THE LAKE. FOR TEMPORARY STORAGE OF WASTE OILS USE SEALED CONTAINERS ONLY. DO NOT USE FOR THE PURPOSE OF CONTAINERS AFTER FOODS, BEVERAGE, OR OTHER EASY TO CONFUSION BETWEEN THE CONTAINERS.

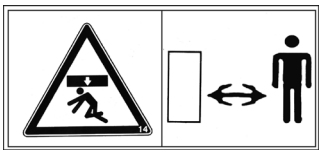
1.3.2. GENERAL SAFETY RULES FOR OPERATING SHAFT ARTICULATED - TELESCOPIC

1. For the pump sprayer should be used with telescopic jointed shaft as recommended by the manufacturer.
2. Assembly and disassembly of the PTO shaft, it should be done only with the engine off and ignition key taken out from the ignition of the tractor.
3. Pay attention to the proper protection for take-off shaft from slipping out of the WPM tractor and PTO machine.
4. After removing the PTO shaft - telescopic machines for PTO must establish a protective sleeve.
5. Cleaning and lubrication of the shaft, should be carried out after removal of the WPM tractor and PTO machine.
6. WPM always turn off when there are a large deviation angle take-off shaft.
7. During berthing and storage articulated telescopic shaft should be on a special bracket.

1.4. WARNING SIGNS AND INSCRIPTIONS AND THE INFORMATION PROVIDED ON THE MACHINE

Table 1.

	Basic warning sign – at front side of tank
	Poisonous fumes or toxic gases, suffocation
	Before starting work, read the instructions and rules of safe operation
	Riding on machine is prohibitet.
	Turn off the tractor before servicing.
	Speed limit to 20km/h

	Lubrication points
	Keep safety distance from machine
Zakaz wchodzenia do zbiornika opryskiwacza	Description on the tank - prohibition on entering into the sprayer tank
	The obligation to use clean water: After each contact with chemicals used to wash their hands!
	Obligation to use protective masks: They should be worn when preparing and working with the spraying.
	Mandatory application of protective shoes: They should be worn when preparing and working with spraying to protect the lower limbs.
	Mandatory application of protective gloves: These should be worn to protect hands from possible abrasion.
	Mandatory application of protective clothing: You wear them during the preparation and operation of spraying to protect the lower limbs.
	The obligation to use clean water used to fill tank with clean water.

	Marking head: Shows where the device should be used forklifts.
	Marking head: Shows the location to install the lifting hook.

JAZDA NA WZNIESIENIACH Z PEŁNYM ZBIORNIKIEM BEZ ZAŁOŻONYCH NA CIĄGNIKU OBCIĄŻNIKÓW KÓŁ PRZEDNICH I OSI PRZEDNIEJ ZABRONIONA	RIDING ON HILLS WITH A FULL TANK WITHOUT WEIGHTS AFFIXED TO THE TRACTOR FRONT AND FRONT AXLE PROHIBITED
JEDZENIE, PICIE, PALENIE TYTONIU PODCZAS PRACY WZBRONIONE PO PRACY ZMIENIĆ UBRANIE, RĘCE UMYĆ MYDŁEM, USTA PRZEPŁUKAĆ	FOOD, DRINK, SMOKE WHILE JOB PROHIBITED AFTER WORK TO CHANGE CLOTHES, HANDS WASH WITH SOAP, WASH MOUTH
DOPUSZCZALNA JEST PRACA NA WZNIESIENIACH W KIERUNKU JAZDY DO 10%	WORK IS ALLOWED ON SLOPES THE DIRECTION OF TRAVEL UP TO 10%
OSTRZEŻENIE NIE PRZEŁĄCZAĆ ZAWORU WODY CZYSTEJ GDY POMPA NIE PRACUJE	WARNING DO NOT CLEAN WATER VALVE SWITCH WITHOUT PUMP
JEDZENIE, PICIE, PALENIE TYTONIU PODCZAS PRACY WZBRONIONE PO PRACY ZMIENIĆ UBRANIE, RĘCE UMYĆ MYDŁEM, USTA PRZEPŁUKAĆ	FOOD, DRINK, SMOKE WHILE JOB PROHIBITED AFTER WORK TO CHANGE CLOTHES, HANDS WASHED WITH SOAP, WASH MOUTH
DO PRZEJAZDÓW TRANSPORTOWYCH I PRZECHOWYWANIA OPRYSKIWACZA BELKA POLOWA MUSI BYĆ USTAWIONA W NAJNIŻSZYM POŁOŻENIU I ZABLOKOWANA	TO TRAVEL TRANSPORT STORAGE AND SPRAYERS BOOM MUST BE SET TO THE LOWEST POSITION AND LOCKED

IMPORTANT - IF THE SIGNS ARE DAMAGED, OR IS NOT POSSIBLE TO READ ALWAYS OLD SIGNS REPLACED BY NEW ONES. FOR THIS PURPOSE, CONTACT K.F.M.R. SP. Z O.O.

IMPORTANT - ALL SIGNS TO BE PLACED ON THE SPRAYER TO KEEP CLEAN. WHEN REPLACING THE COMPONENT ON WHICH MARK IS NEW INFORMATION BE INCLUDED.

1.5. RULES OF MOVING OF SPRAYER ON PUBLIC ROADS.

	NOTE - WHEN DRIVING ON PUBLIC ROADS MUST SPRAYER BE EQUIPPED WITH LIGHTS AND FUNCTIONING ELECTRICAL APPLIANCES MARKING PLATES NOT FOR VEHICLES MOVING (TRIANGLE). SPRAYER CAN MOVE ON PUBLIC ROADS ONLY AS PART OF SPEED ACCEPTABLE.COFNIJ ZMIANY

The triangular array of distinctive for slow moving vehicles (Figure 3) is installed the handle (Fig. 2, item 1.) on the back of the sprayer boom.

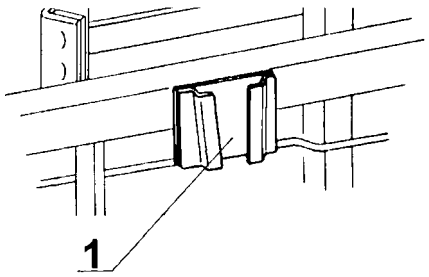


Figure 2 Brackets for mounting : 1st distinctive table

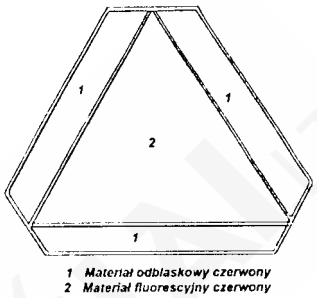


Figure 3 Marking plates for slow moving vehicles.

	IMPORTANT - YOU SHOULD HAVE SPRAYERS KITE MARKING PLATES NOT MOVING VEHICLES. DO NOT PUT ON THE TRANSPORT TIME MAY RESULT IN ACCIDENT.

	NOTE - FOR ANY DAMAGE CAUSED DURING AN ACCIDENT RESPONSIBILITY OF THE USER MACHINE.

Moving on a public road, follow the width and height of the transport. Check the lights, warning devices, reflective and protective. Fold boom features set in the transport position and secure it against self unfolding. Drawbar support switch in the transport position. While driving, transport, pay attention to the length of the protrusions, not to exceed the load capacity of the total weight of the sprayer. The carrying on a third party machine.

1.5.1. DELIVERY

Manufacturer of sprayer delivers a complete, assembled, ready to use, with basic equipment. Spraying can be transferred to a truck, tractor, or rail, in accordance with applicable rules on loading and transport.

1.5.2. SPRAYER EQUIPMENT

1.5.2.1. LIST OF BASIC EQUIPMENT OF SPRAYER

Table 1.

Sin.	**Name of part**	**Symbol**	**Units**		
			18 m	**20m**	**21m**
1.	5 position heads		36+4	40+4	42+4
2.	Manometer 0÷2,5 MPa (0÷25 bar)		1		
3.	PTO shaft Lubelskiej Fabryki Maszyn Rolniczych	C- 40210	1		
4.	Clean water tank 200 L – tank washer		1		
5.	Clean water tank 15 L		1		
6.	The diaphragm of pump		5		
7.	Streight plug		2		
8.	Anglez plug		2		
9.	Warianty card		1		
10.	Instruction of use		1		

IMPORTANT - ITEMS 1,4,5 ARE MOUNTED ON THE SPRAYER OTHER EQUIPMENT PACKED, PROTECTED FROM DAMAGE AND SECURED MACHINE TO THE PLATFORM.

1.5.2.2. LIST OF SPECIAL EQUIPMENT OF SPRAYER P356/1

Tabl 2.

Sin.	**Name of part**	**Symbol**	**Units**		
			18 m	**20m**	**21m**
1.	Computer BRAVO 300		1		
2.	Control device BRAVO 101		1		
3.	Electro hydraulic control		1		
4.	Foam markers		1		
5.	Device for filling the sprayer tank on the suction side		1		
6.	Electrical control pressure and the sections		1		

IMPORTANT - SPECIAL EQUIPMENT SPRAYERS IS AVAILABLE FOR SALE THE MANUFACTURER, THE MANUFACTURER PARTS AND STORES SPECIALIST I AGROMACH BRANCHES IN ANY POLISH ACCESSORIES DEVICE HAS A MANUAL PERMIT THE PROPER USE OF A GIVEN DEVICE.

1.6. FIRST START UP OF SPRAYER

The following describes the basic steps to be taken during the first run the sprayer to avoid the error, and consequently damaging the sprayer, which can decide about the loss of rights to guarantee.

REMEMBER - BY A TRACTOR TRAILER SPRAYERS FOR CHANGING THE LOAD FRONT AXLE (CONTROLLABILITY). SPRAYER CAN BE ATTACHED JUST THE TRACTOR WHICH GUARANTEES THE CONTROLLABILITY OF THE (STEERING) TRACTOR SPRAYER UNIT + SHOWN IN SUMMARY TECHNICAL P. 1.9.

1st Remove unnecessary items from the tank and connect the sprayer to the tractor hydraulic cable included.
2nd Install PTO shaft - telescopic.
3rd Check the oil level in the pump.
4th Check the drive shaft. Do not under any circumstances remove the protections.
5th PTO pump drive up to 540 rev / min.
6th Fill the the sprayer tank approximately 100l of clean water.
7th Dismantle and mount boom sprayers.
8th Lower the boom at a height of about 50 cm from the surface.
9th Start the pump, open valves working sections lever beam power [the power valve induction hopper should be kept closed] and set the pressure on the manometer.
10th Spray a liquid whole checking the stability of pressure and stirring work, check for leaks and hoses. Any leaks by tightening the clamp removed.
11th If the attempt was successful, prepare a working fluid of the desired concentration using a chemical induction hopper and ready to spray

REMEMBER - TO AVOID MISTAKES YOU SHOULD CAREFULLY READ THE NAMES AND DISTRIBUTION OF PARTICULAR PARTS OF THE SPRAYER:

• POWER VALVE LEVER CHEMICALS INDUCTION HOPPER ONLY OPEN THE TIME REQUIRED FOR LEACHING THE POWDER THROUGH SITO INDUCTION HOPPER (PRESSURE DILUTING OK. 0.3 MPA [3 BAR]).

• TO READ THE CORRECT PRESSURE SPRAY, WAIT FOR OK. 10 SEC. ESPECIALLY IF YOU START SPRAYERS AFTER A LONG STANDSTILL, RETAINING CLOSED VALVES (OF PROBATION).

• TO INCREASE THE PRESSURE SPRAY, TURNING THE KNOB SHOULD CONTROL VALVE RIGHT (CLOCKWISE CLOCK) - TO REDUCE THE CONTRARY.

• AT LEAST 10-15 MIN. BEFORE SPRAYING RUN MIXERS HYDRAULIC. MIXERS SHOULD WORK ALREADY IN THE ROAD TO THE PLACE SPRAYING.

• DO NOT TRAVEL ON PUBLIC ROADS WITHOUT LIGHTING COMPLYING WITH THE REQUIREMENTS OF THE HIGHWAY CODE.

IMPORTANT - DUE TO THE BOOM LINE CONTAMINATION BY PLANT PROTECTION AND FERTILIZERS RECOMMENDED CLEANING EQUIPMENT:

• AFTER EACH USE SPRAYER SPRAYING.

• CASES AFTER THE SEASON BEFORE SPRAYING OR LONGER BREAK IN THE SPRAYING.

• FOR SECURITY REASONS, BEFORE SERVICING, AND REPAIR.

1.7. USING ACCORDINGLY WITH PURPOSE

The machine is designed exclusively for conservation measures in agricultural crops, vegetables, herbs, and fertilization with mineral fertilizers dissolved in water, such as urea and UAN solutions of various nutrients. You can also use the sprayer for washing machine water, plant watering, etc. Use it for other purposes shall be construed as improper use. The fulfillment of the requirements for use of the machine, the maintenance and repair according to the manufacturer and strict compliance is a condition for intended use. The machine should be operated, maintained and repaired only by persons familiar with its specific characteristics and are familiar with the rules of conduct for security. Provisions concerning the prevention of accidents and all the basic safety regulations and occupational health and road

traffic regulations must always be respected. Changes in the machine without the consent of the manufacturer may exempt a manufacturer from liability for damage or injury arising.

1.8. GENERAL DESCRIPTION OF MACHINE - PURPOSE

Trailed field sprayers with a capacity of 2500l are designed to perform operations in protected crops, agricultural, vegetable, herb and mineral fertilizers fertilizer dissolved in water, such as urea and UAN solutions of various nutrients. You can also use the sprayer for washing machine water, plant watering, etc. Pesticides must be used in concentrations and doses, according to information given on the packaging, in the recommendations and instructions. Doses of plant protection products shall be generally in liters or kg per hectare. For some crops and small areas when spraying individual plants or plantations often increasing their mass green during the growing season, given the concentration of the liquid spray.

REMEMBER - DO NOT FORGET ABOUT DIRECT PROHIBITION ABSOLUTE FILLING SPRAYERS WITH NATURAL BODIES OF WATER AS LAKES, PONDS STREAMS AND RIVERS.

1.8.1. CONSTRUCTION OF SPRAYER P356/1

Trailed sprayer P 356/1 consists of the following basic components:

• welded frame made of steel (Fig. 4, p 1), equipped with a platform with stairs entrance stairs of the distance between 200 mm and the distance between the first steps300 mm and the substrate (Fig. 4, point 3) and uniaxial chassis equipped with brakesmachines;

• receiver (Fig. 5, p 1) armed with accessories, along with induction hopper meanschemicals (Fig. 5, p 5), the suction filter (Fig. 5, p 6), drain valve (Fig. 5, p 14th)filler wire (Fig. 5, p 13th) and a liquid level indicator. The tank is equipped with two hydraulic agitator (Fig. 5, p 9) embedded within, in the front and rearand in the washer reservoir.

• 18/20/21m boom (Fig. 4, p 13th), hydraulically folding with passive stabilization, the height of the beam during operation is determined by the hydraulic actuator;

• ARAG's control valve (Fig. 5, p 3), equipped with inter alia the filterself-cleaning, levers transfer, fluid flow regulator, the constant pressure control valve

• electric control valve,• three-way valve - Shut-off (Fig. 5, section 8)

• pressure gauge indicating the pressure of the fluid,

• a diaphragm pump COMET-BP 235 or alternatively used Annovi Reverberi AR 230 bp (Fig. 4, p 5), located on the rotary coupling, driven by the tractor PTO shaft articulated telescopic, splined pump shaft is protected with an approved cover plastics company Bondioli & PAVESI a 21 903,

• the section of the spray heads triple (special order from the head pięciodrogowymi) equipped with three types of slot nozzles of different expenditure (Fig. 4, p 9), in the colors blue, red and yellow, in luminaires equipped with anti-drip valves , filters and caps with bayonet mount;

• Tag spray width, consisting of air distributor, wytwornika polyethylene foam canister in preparation foam, with foam ejectors, and air duct pressure,

• Fresh water tank capacity 200 l (Fig. 5, p second) with a flexible cable terminated with tap water to drain,

• the hydraulic system,• Installation of a pneumatic

• lighting (Fig. 4, p 12th),

- Rear lamp units,
- Reflective rear triangle,
- Front side marker lamps,
- The white glare of the front,
- Yellow side reflectors fixed to the handles on the chassis.

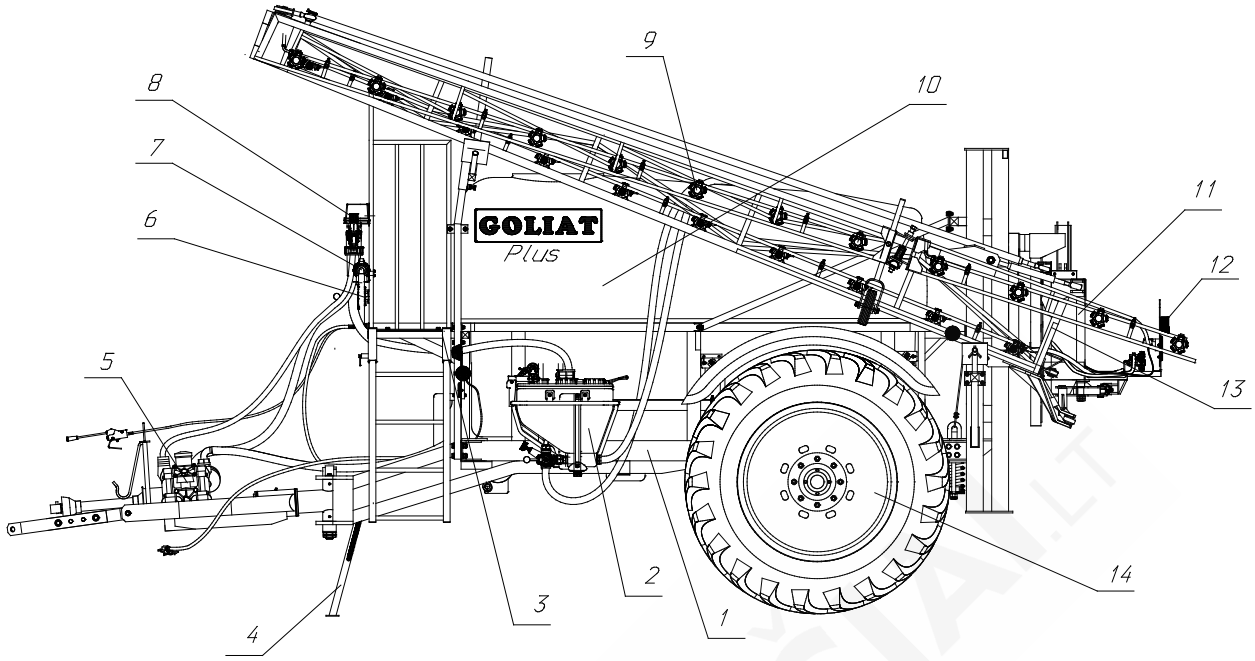


Figure 4 Trailed field sprayer P356 / 1
1 Frame, 2 The team induction hopper, 3 Platform with stairs, 4 The support foot, 5 Pump, 6 Fiveway valve, 7 Ball valve 3-way, 8 The main valve constant pressure, 9 Sprayers, 10 Tank, 11 Beam center, 12 Lighting installation, 13 Beam sets, 14 driving wheel.

1.8.2. FLOW DIAGRAM AND FLUID CIRCULATION

In Figure 5 a diagram of the action and the circulation of the liquid sprayers. When you turn on the PTO drive and run the circulation pump starts working fluid in the sprayer. The pump (Fig. 5, step 4) draws fluid from the reservoir through the suction filter (Fig. 5, p 6) and pumps it through a filter-stand pipe to shut-off valve to the section which is mounted a constant pressure regulating valve and pressure gauge. The liquid valve is fed to the nozzles of different expenses, embedded in the heads of the three outputs (on special equipment with five outputs). At the same time leads the liquid is supplied to hydraulic mixers, used for thorough mixing of the preparation The excess fluid through the bleed valve control valve, liquid line back into the tank. Tank (Fig. 5, p 1) shall be filled with water pouring through a sieve (Fig. 5, p 13th), and the utility of liquid chemical induction hopper (Fig. 5, p 5). For quick draining of the liquid drain valve is used (Fig. 5, p 14th) placed under the tank. Rinsing and cleaning the tank, and the induction hopper flushing liquid used to clean the tank water (Fig. 5, p 2). Washer reservoir must be run through a control valve (Fig. 5, p 3) and shift changeover valve (Fig. 5, p 11) in the position of a clean water supply.

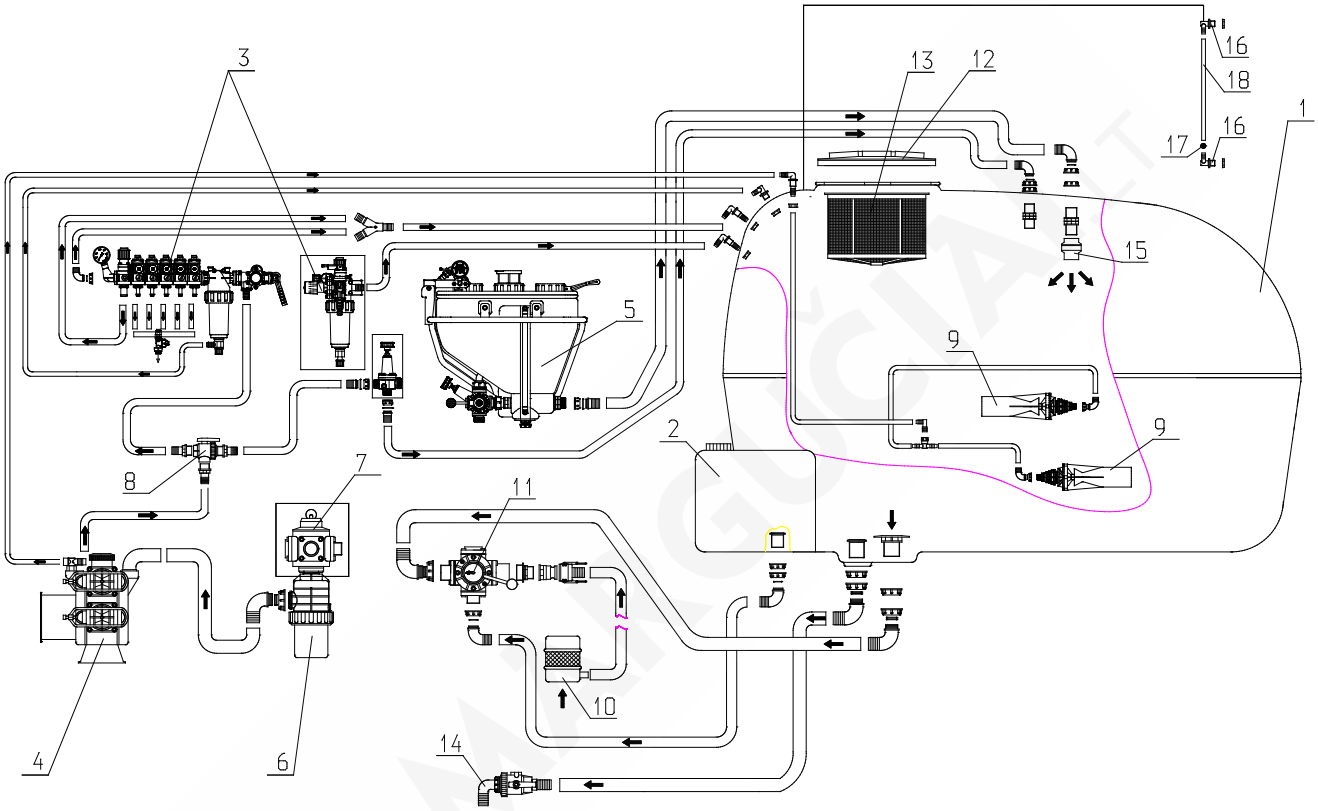


Figure 5 And circuit diagram of the liquid.

1 Tank, 2 Fresh water, 3 The control valve 5-sec. Compensation, 4 Pump, 5 Chemical induction hopper, 6 Suction filter, 7 Pięciodrożny valve, 8 Three-way ball valve, 9 Agitator tank, 10 Ejector, 11 Reduction, 12 Tank filler cap, 13 Filling a sieve, 14 Drain valve, 15 One-way valve, 16 Elbow with nut liquid ratio, 17 Swimmer, 18 Rate of fluid hose.

1.9. SPRAYER TECHNICAL CHARACTERISTIC

Table 3.

Sin.	Description	Unit	18m	20m	21m
1	**2**	**3**	**4**	**5**	**6**
1	- symbol of machine	-	P 356/1		
	- symbol SWW	-	0823-113		
	- symbol KTM	-	0823-113-435-612		
	- symbol PKWiU	-	28.30.60.0		
2	Transport dimensions :				
	- lenght	mm	6645		
	- width	mm	2960		
	- hight	mm	3300		
	Working dimesions :				
	- lenght	mm	6645	6645	6645
	- width	mm	18000	20000	21000
	- hight	mm	3300	3300	3300
3	Total weight of machine	kg	4635	4665	4680
4	Pump				
	Manufacturer	-	COMET Annovi Reverberi		
	Type	-	COMET BP 235 lub AR 215 bp		
	Flow rate for: - 0.0 MPa and 540 rev / min	dm^3/min	Comet 226 Annovi Reverberi 215		
	Max working pressure	MPa	2 MPa		
	Working rotation	rev/min	540		
	Pump placed	-	Central at front parto f frame		
5	Tank				
	Capacity	dm^3	2500		
	Max capacity	dm^3	2640		
	Filling hole diameter	mm	382		
	Fill pointer	-	Float		
	Scale	dm^3	0- 2600		
	Depta guage	-	-		
	Float	-	-		
	Elementary graduation	dm^3	50		
6	Liquid residue from the unstable operation	dm^3	- abort 3,7		
7	Capacity of the solvent detergent	dm^3	45		
8	Clean water tank to wash main tank	dm^3	200		
9	Clean water tank to wash hands	dm^3	15		
10	Kind of miner				
	Type	-	Hydraulic		
	Kind	-	Ejektor		
11	Control valve				
	Type	-	ARAG		
	Manometr range	bar	0-2,5		
	The accuracy of manometer scale	bar	0,01 (at range 0-0,5) 0,1(at range 0,5-2,5)		
	Number of connections in the receiving	pc	5		
12	The drain valve				
	Kind	-	Ball valve		

	Placed	-	At the bottom of tank		
13	Number of stages of filtration	pc	3		
14	Fill sieve	mm	0,6 x 0,6		
15	Filters				
	- suction filter	mm	0,4 x 0,4		
	- discharge filter	mm	0,3 x 0,3		
	- filter In nozzle holder	mm	0,2 x 0,2		
16	Beam				
	- working width	m	18	20	21
	- section working width	m	2- 4,5	2- 4	2- 4,5
	- distance between nozzles	mm	500		
	- nozzle height adjustment range above the ground	mm	500- 1700		
	The lift mechanism of the beam	-	hydraulic		
17	Nozzles				
	- type	-	Slotted		
	- color at ISO	-	yellow, blue, red		
	- symbole	-	LU 120-0,2 LU 120-0,3 LU 120-0,4		
	- manufacturer	-	LECHLER		
18	Aggregate with tractor :				
	- class	-	0,9		
	- pulling power	kN	9		
	- power demand	kW	45		
19	Transport clearence	cm	43		
20	Working speed	km/h	about 10		
21	Max transport speed	km/h	to 20		
22	Hydraulic hoses				
	- marked	-	WUG GM-144/96		
	- allowed pressure	MPa	90		
23	Liquid hoses				
	- marked	-	TX 12,5 x 3 Guttasyn		
	- allowed pressure	MPa	2		
24	Wheels and tires				
	Numer of axles	pc	1		
	Track of wheels	mm	1650 i 1800		
	Tires marked	-	9.5x 42, 10PR		
	Air pressure in tires	kPa	160		
25	PTO shaft				
	- manufacturer	-	Lubelska Fabryka Maszyn Rolniczych		
	- type	-			
	- symbol	-	C-40210		
	- size	-			
	- nominal torque	Nm	250		
	- nominal transmitted power	kW	14		
	- shaft lenght	mm	510		

	- PTO working rotation	[rev/min]	540
	- tip of side of the tractor (inlets)	-	Connection 6 - exhaust $1^3/_8$'' Z6
	- tip of side of the machine (inlets)	-	Connection 6 - exhaust $1^3/_8$'' Z6
	- the type of clutch	-	-
	Information about the use of the shaft bearing the trade mark "B"	-	Marked by safety sign **„B"**

1.9.1. DIMENSIONS

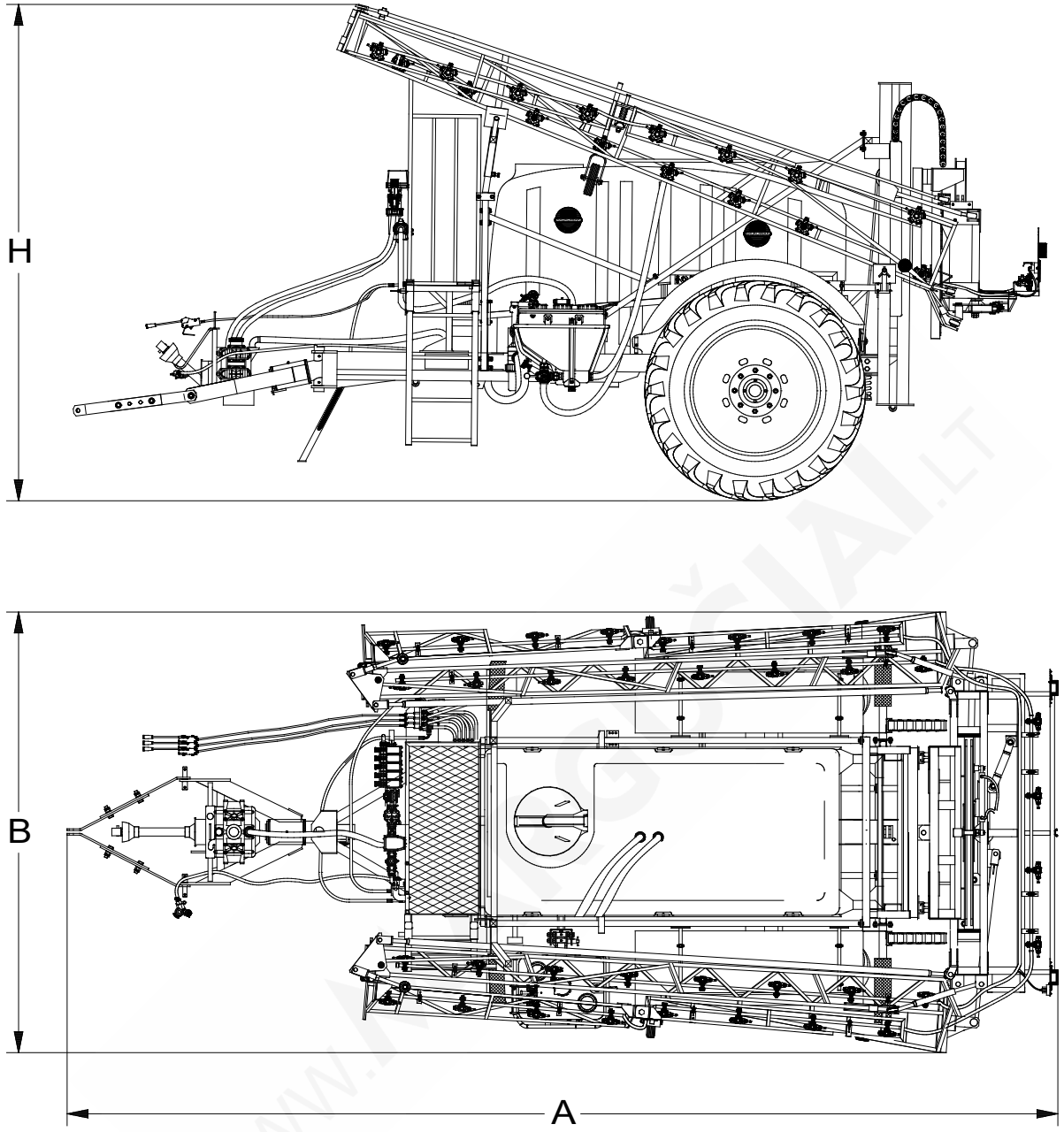


Fig. 6. Dimensions in transport position

Table 4.

Description	Unit	Value		
		P356/1		
		18	20	21
Transport dimensions: - A (lenght) - B (width) - H (hight)	 m m m	 6,64 2,96 3,30		

2. INSTRUCTION OF USE

User of sprayer operating must carefully read the instruction guide and follow its recommendations, and must also comply with all recommendations and guidelines cultivation. It is recommended to use the experience and advice workers Agricultural Advisory Centres established in each province.

2.1. BASIC INFORMATION

To keep balance of the traktor it is needed to put all set of weights on front of tractor.

NOTE - THE MAXIMUM PERMISSIBLE TORQUE SHAFT ARTICULATED THROUGH WHICH THE PUMP IS DRIVEN IS 270 NM. DUE TO THE POSSIBILITY MOTOR SHAFT, SHOULD NOT BE USED TO DRIVE THE OTHER MACHINES. JOB CARDAN SHAFT WITHOUT COVER OR WITH A DAMAGED HEAT SHIELD IS PROHIBITED.

Befort working it is need to:

- prepare a working fluid at a concentration as recommended on the packaging of the chemical or set amount of water and a chemical agent to be delivered to the spray tank and there mixed,
- determine the required dose of the fluid in liters per hectare,
- according to the required dose of liquid per hectare, then select a tip and set the required pressure and speed during spraying, using the tables while spraying costs.

IMPORTANT - DOSAGE LIQUID DEPENDS ON THE OPERATING SPEED, WORKING PRESSURE NATURE AND NOZZLE. HERE IS A VERY IMPORTANT MAINTAINING A CONSTANT SPEED, CONSTANT PRESSURE AND PROPER TIRE PRESSURE, IN CARRYING OUT THE SPRAYING.

2.2. PREPARATION SPRYER TO WORKING

User of sprayer operating must carefully read the instruction guide and follow its recommendations, comply with all instructions and safety regulations cultivation. Spraying gives proper effect only if it is done in favorable weather conditions and at the right time. Before operating the sprayer, it should be a general review and remove any glitches that may occur during storage, or during delivery.

- Prior to every use the sprayer run control state of the machine and check that the sprayer tank is not unnecessary items,
- Pay attention to the purity of the liquid level gauge wire, if it is dirty, clean or replace it,
- All parts and assemblies that require grease lubrication in accordance with the recommendations contained in paragraphs. 4.4,
- Always check the following: the oil level in the pump and if necessary complete,
- Make sure bolted connections (tighten the nuts).
- Check assurance and tightness of hydraulic connections and pneumatic of sprayer ,
- Check tire pressure of vehicles and possibly adjust,
- check the purity of all the filters in the sprayer, namely:
  - Filling a sieve,
  - Suction filter,
  - Self-cleaning filter in the valve control,
  - Enclosed spray filters.

The preparatory activities should also be the selection and creation of appropriate nozzles, spray type and selection of parameters determine the sprayer by the manufacturer of the preparation and the type of protected cultivation.

IMPORTANT - PLEASE NOTE THAT IN ALL CAPITALS TRIPLE (THE ENTIRE LENGTH OF THE BEAM) WAS SET TO THE SAME TYPE OF NOZZLE (SCHEDULED FOR SPRAYING).

2.3. AGGREGATION SPRAYER WITH TRACTOR

2.3.1. TRACTOR PREPARING FOR COOPERATION WITH SPRAYERS

Preparation of the tractor is mainly based on the total efficiency has been declared in accordance with the instruction manual of the tractor. In addition, the tractor remove those elements that interfere in conjunction with a tractor sprayer.

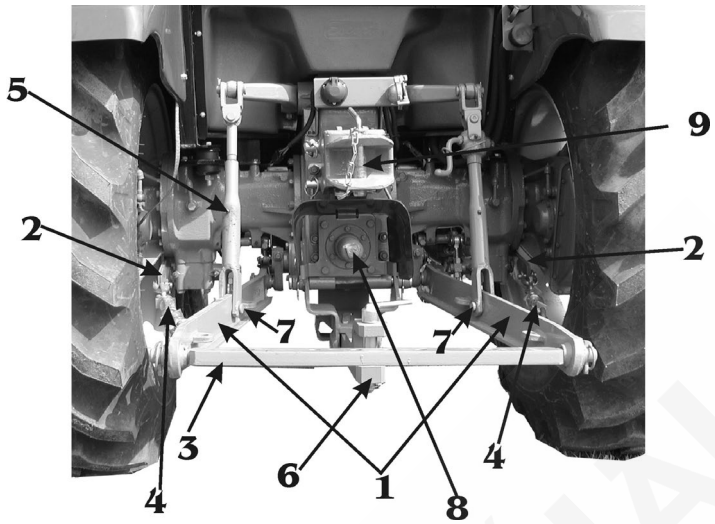


Figure 7 Tractor prepared to work with sprayer.
1st Hanger tractor hydraulic lift, 2 Bracket, 3 Beam coupling agricultural 4th Stabilizer, 5 Hanger, 6 Drawbar, 7 Hanger bolt, 8 Tractor PTO shield removed, 9th Cargo hook.

The tractor must always be removed items such as: protection of agricultural PTO coupling beam and snap belt if the tractor is not equipped. Should be mounted on a tractor bracket in the case of cooperation with the cardan shaft full covered hood or canopy cover, where PTO shaft half covered guard

2.3.2. AGGREGATION SPRAYER WITH TRACTOR

Prepared to work sprayer should be hooked to previously prepared tractor, to do this it is need to :

- Slide the hanger ball joints (Fig. 8, p 1 - right and left) on the tractor pins (Fig. 8, p 2nd) rotary hook (Fig. 8, point 3) and secure with split pin (Fig. 8, step 4),
- increase the use of tractor hydraulic lift and move the front boom support (Fig. 8, p 5) the location of transport-work
- Set the sprayer frame at ,
- connect the brackets (Fig. 8, p 6) respectively of the pins (Fig. 8, p 7) and hook fastener top (Fig. 8, section 8) using a pin (Fig. 8, p 9), then secure the connection split pin (Fig. 8, step 4),

	**WARNING** - DO NOT USE AS OR PINS PINS RANDOMLY GENERATE SCREW, WIRE, ETC. OFTEN RISK DETACHMENT AND DAMAGING THE SPRAYER IN OPERATION AND TRANSPORT.

	**WARNING** - DO NOT WORK WITHOUT SHAFT GUARD TEUTON ARTICULATING - TELESCOPE.

- stiff in the transverse direction (to drive) hangers (Fig. 8, p 1) by the tension of the chains or wedging,
- connect the PTO shaft by sliding it to the tractor PTO shaft so that the shaft guards came into the ear bracket and secure the shaft guards stoppers, windproof, or if it is a shaft with cover półkrytą, so that the latch worked nasuwanym wrist,
- Connect electrical connectors, hydraulic and pneumatic.

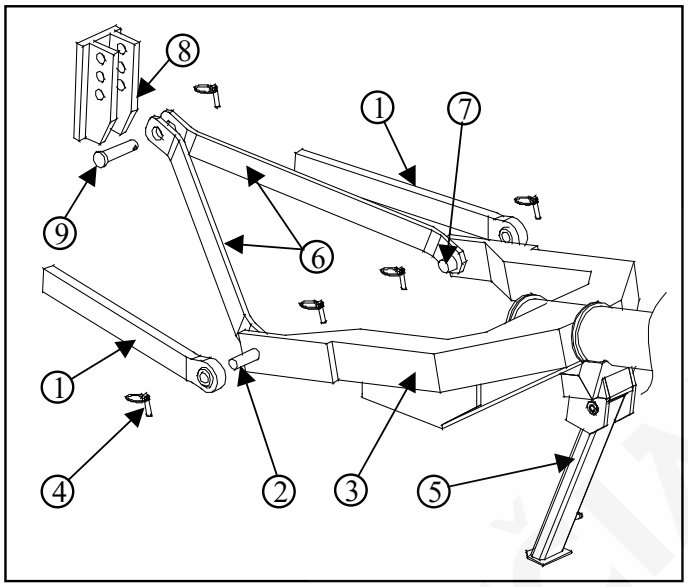


Figure 8 Aggregating the tractor with sprayer
1st Hanger tractor hydraulic lift, 2 Rotary coupling pin, 3 Rotary hook, 4 Cotter, 5th Support, 6th Bracket, 7 Bolt the bracket, 8 Attach the upper connector, 9th bolt.

When you have prepared the tractor and the sprayer and then aggregated test run of its activities, which should precede the rinsing liquid of the entire system with clean water. To this end, unfold the boom into position, remove the nozzles, in order to facilitate the removal of any impurities from the pipes. Then fill the tank with clean water in an amount of about 150 l, open the flow of the liquid to the nozzles in the boom, turn on the pump drive and work for about 1 min. These steps are based on the first run after the purchase of the sprayer. After rinsing, replace the removed parts with that kind of spray should be no longer suitable for the intended treatments and all the filters cleaned. Run the pump and use the description of the control valve adjustment, set the appropriate pressure, then work for a few minutes. During this test, please note the correct spray nozzle and the liquid from the stability of the set pressure. Check also: labor agitator in the tank, chemical induction hopper operation, the operation of valves for fluid flow of individual sections of the boom or individual valves close again after turning off the flow of liquid to the nozzles and no dropping of them (the limit drops can not exceed 2 ml/10min, the time measured between the time the flow of fluid to the section). After the above steps, perform the test lifting beams to the appropriate height. To this end, a hydraulic cylinder controlled by an external divider tractor hydraulic system. Also check the efficiency of the electrical system and regularity interaction sprayer tractor with lights lights sprayer.

2.4. IMPORTANT AGROTECHNICAL INSTRUCTIONS

2.4.1. ECOLOGICAL RECOMMENDATION

Environmental risk can be avoided by using pesticides rationally, carefully, and according to the instructions on the label instructions for use. Using them incorrectly in place of the benefits of these treatments should bring - increased risk to the environment and measurable damage. Everyone who uses pesticides should be on this particularly sensitive aspect of the case, thus making its contribution to environmental protection.

- preparing the of the liquid spray:
  - nie not be around wells and water intake protection zones to perform any operations with plant protection products
  - to accurately calculate the amount of preparation needed to perform the surgery in a defined area possessed apparatus. The exact calculation - not only financial savings, but also eliminate problem associated with the development of excess prepared of the liquid spray

- Use pesticides carefully at a specified time and try to combine them with other methods of plant protection. Pests (pest - unwanted organism, insect, bacteria, fungus, nematode, weed, virus, rodent, harmful to crops, animals, products manufactured or natural products) to identify exactly and chemical treatments carried out only if they are necessary, using the lowest dose necessary to eradicate the pestprzestrzegać zaleceń zawartych w etykiecie – instrukcji stosowania preparatu,
- Plant protection equipment must be carefully calibrate and often uncontrollable. During the calibration of test equipment for possible leaks and improper operation,
- Be careful to avoid sudden ejections of preparations, but if the accident occurred - you can quickly gather and remove and clean up contaminated sites.
- Waste Disposal :
  - with all the waste of plant protection products, including packaging material, must be in conformity with regulations deriving from the laws and local ordinances. Avoid waste pose a threat,
  - triple rinse container, and pour the washings into spray tank and used during treatments,
- Do not place plant protection products or containers near sources of water in wells or in abandoned wells,
- Residual of the liquid spray and water after cleaning the apparatus must be diluted and then re-entering the field using a high velocity spray a tractor in order to reduce the dose of liquid per hectare.

2.4.2. CALIBRATION PROCESS

The calibration process consists of:

1) Selection of parameters of the sprayer ,
2) Calibration of the dose of the liquid.

IMPORTANT - The operator shall place or update each name of the pesticide in a special place assigned to the machine.

Selection of parameters of the sprayer

A) NOZZLES AND THE SPRAY RATE

Nozzles determine the uniformity of spray distribution. Poor quality or poorly matched sprays may ruin the whole effort and financial outlay invested in the implementation of the procedure. In the protection of field crops are used almost exclusively płaskostrumieniowe pressure sprayers. The table below presents the basic principles of selecting nozzle size, spray rate, depending on the type of surgery.

Selection of nozzle, depending on type of treatment

Table 5.

Treatment against	Kind of treatment	Symbol / Nozzle color	Pressure (bar)	Liquid dose (l/ha)
Fungal diseases (fungicides)	Small drops Middle drops	02/yellow 03/blue	2,0 – 5,0	150 – 300
Pests (pesticides)	Middle drops	03/blue	2,0 – 5,0	150 – 300
Weeds (systemic herbicides)	Small drops Middle drops	02/yellow 03/blue	1,5 – 3,0	100 - 300
Weeds (soil herbicides)	Large drops	04/large drops	1,5 – 3,0	150 - 300
Liquid fertilizers	Large drops	Specialistic nozzles	1,0 – 5,0	200 - 500

The vast majority of spraying against diseases and pests should be performed with a slotted nozzle. You will notice that the pesticide treatments carried out with small drops. The biggest drops are used and when controlling weeds with herbicides doglebowymi. The dose range for liquids except liquid fertilizers is very close to each other. The basis for determining the liquid dosage recommendations are always included in the labeling of plant protection. Sometimes there are no such recommendations. You can then use the data contained in Table 5 Smaller doses of the liquid should be used when spraying smaller plants, and vice versa in the upper range of doses to be used while protecting larger and more compact fiefs plants. Higher doses (larger drops) should also apply during windy weather, to reduce spray drift. It is also the use of antidrift sprays.

NOTE - PROTECTION OF FLAT FIELD CROPS USE ONLY TYPE SPRAYERS OF THE SAME AND FLOW.

b) the height of the boom

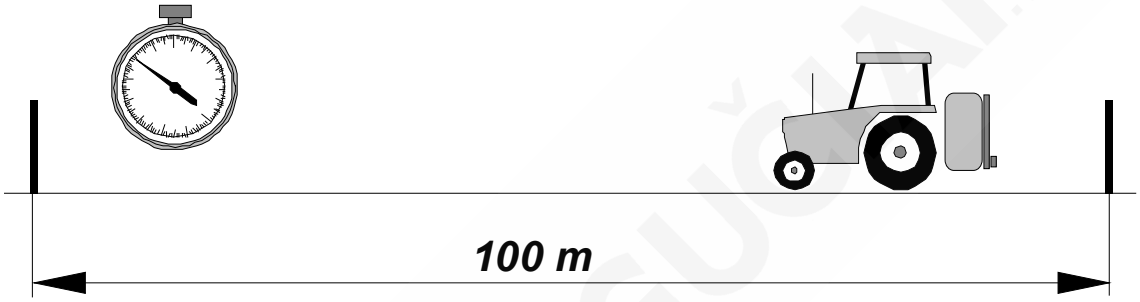
The need for overlap between fluid streams emitted by the nozzles require the boom placement on a specific area of the ground. The height of the beam can not be too low, but it can not be too high, because it increases the volume of lived-liquid. Boom height depends mainly on the angle of spray liquid. The most commonly used spray nozzles with an angle of 110o, the optimal height of the nozzle above the surface is sprayed with 0.5 (m). It is also admissible height of 0.4 - 0.6 (m).

Calibration of liquid dosage

In order to obtain a pre-existing spray dose (see table above) should begin with the designation of the operating speed. Expenditure is then calculated per unit (flow rate) spray and set pressure of the liquid, which allows for the expenditure.

a) working speed

Working speed for conventional sprayers should be between 4,5-8,0 km / h. Higher operating speed allows, it is true for higher operating efficiency, but it also entails an increased risk of drift. More difficult terrain, wind, or the density of the protected crop plants require lower rates of movement of the sprayer. Different size tires and wheel slippage makes the speed indicated by the tractor tachometer is often far from reality. It is therefore necessary to check the speed in conditions similar to those that perform the procedure. In order to determine the operating speed of the unit (tractor & sprayer) to be measured section 100 (m) and measure the travel time. Then calculate the velocity from the formula or read Table 6.



$$\text{Speed (km/h)} = \frac{3{,}6 \times 100\ \text{m}}{\text{Way time(s)}}$$

Table 6. Way time of control section – working speed

Sec/100m	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84
km/h	9,0	8,6	8,2	7,8	7,5	7,2	6,9	6,7	6,4	6,2	6,0	5,8	5,6	5,5	5,3	5,1	5,0	4,9	4,7	4,6	4,5	4,4	4,3

b) nozzles expense

Single nozzle flow rate can be calculated from the formula set below:

$$\text{Nozzle expanse (l/min)} = \frac{\text{Liqiud dose (l/ha)} \times \text{working width (m)} \times \text{working speed (km/h)}}{600 \times \text{numer of nozzles}}$$

Foe example:

Liquid dose	*-*	*300*	*(l/ha)*
Working width	*-*	*18*	*(m)*
Working speed	*-*	*6,4*	*(km/godz)*
Numer of nozzles	*-*	*36*	*(pieces)*

$$\textit{Nozzle expanse} = \frac{300\ \text{(l/ha)} \times 18\ \text{(m)} \times 6{,}4\ \text{(km/h)}}{600 \times 36\ \text{(pieces)}} = 1{,}6\ \text{(l/min)}$$

Then spray the table, select the spending pressure corresponding calculated wydatkowi. In the absence of a table of expenditure for a particular nozzle, you can use arrays (see 2.5.1.). In the absence of a table of expenditure should be chosen by successive approximations, the pressure that will match the calculated. When the correct pressure will already be determined, using a stopwatch and measuring vessel, check the cost for at least ¼ spray.

NOTE - CALIBRATION OF SPRAY RATE IS CARRIED OUT ON CLEAN WATER.

C) CALIBRATION OF THE APPLICATION OF DOSE OF LIQUID FERTILIZER LIQUID

Liquid fertilizers are characterized by a higher density (specific gravity), so expenditure per unit achieved during the calibration with the use of clean water will be lower than in reality.

Table 7. Pressure corrected depending on the density of the fertilizer solution.

Pressure (bar)	**Corrected pressure** (bar)				
1,0	1,1	1,2	1,2	1,3	1,4
1,5	1,7	1,7	1,8	2,0	2,1
2,0	2,2	2,3	2,4	2,6	2,8
2,5	2,8	2,9	3,0	3,3	3,5
3,0	3,3	3,5	3,6	3,9	4,2
3,5	3,9	4,0	4,2	4,6	4,9
4,0	4,4	4,6	4,8	5,2	5,6
5,0	5,5	5,8	6,0	6,5	7,0
1,0	1,1	1,15	1,2	1,3	1,4
Density (g/cm^3)					

For example:

If it is determined during calibration using pure water pressure of the liquid for a particular nozzle is eg 1.6 l / min at 3.0 bar pressure, and the procedure is performed using a spray with a density of 1.3 g/cm3, the new corrected pressure is expected to be 3.9 bar. This follows from the intersection of values: the density of 1.3 g/cm3 and pressure of 3.0 bar.

2.4.3. BASIC INFORMATION

A basic condition for properly executed plant spraying with chemicals is a thorough coverage of plants or pest evenly spaced droplets of an appropriate chemical agent. This requires the separation of liquids on as fine droplets, which thus allows covering a larger area with the same volume of liquid. Because of the resulting spray droplet size can be divided into the following ranges:

- Large drops spraying, liquid droplets with a diameter above 150 μm,
- Small drops spraying, the diameter of the droplets in the 50-150μm,
- Misting, at which the droplet diameter is less than 50 μm.

NOTE - KFMR COMPANY O.O. WARNS THAT SUCH MEANS HOW TO "LASSO", AND "COMMANDO", WHICH INCLUDES IN ITS COMPOSITION TYPE ALKOCHOL SOLVENTS AND CAUSES CHLOROMANZAN BOOM LINE DAMAGE SPRAYERS WHERE THESE MEASURES MUST BE IMMEDIATELY MAKE A FLUSH TANK AND INSTALLATION LIQUID SPRAYER LEAST TWICE PRODUCER NOT RESPONSIBLE FOR DAMAGES AFTER APPLYING THE LIQUID SYSTEM W / W CASH

The droplet size has a significant impact not only on the quality of cover crops, but also the range and accuracy of the liquid stream of referrals. Large drops fall relatively easily and can be directed exactly where you need a hair spray. While small droplets remain in the air much longer and can be worn by wind over long distances.An important factor in the high efficacy of the procedure is to determine an appropriate period of spraying. The concept of an appropriate period of spraying the optimum time to be understood due to the development of protected plants, developmental phase, the number

and severity of pest incidence and time of surgery. Appropriate time limit shall be determined based on the information signal, or service of their own biological observations.Treatments performed too early or too late can not guarantee the potency, are impracticable from an economic point of view, and harmful to the environment. In order to fully carry out the procedure is also suitable weather.Do not spray directly perform operations against the rain and immediately after rain before obeschnięciem plants. Important are also appropriate air temperature during the treatments, which vary depending on the type of preparation and are referred to in the text labels - instructions for use. It is recommended to perform operations on open spaces in the morning or evening because of the favorable temperature and lower wind speed. In agricultural practice for the wind speed limit shall be 5 m / sec.By joining the spraying, remember to karencyjnych periods (days from last spray to harvest), depending on the plants, and chemical.Control of insects is most effective in sunny weather, because in these conditions, insects exhibit biological activity.Is not allowed to spray plants during flowering.Sequence of plant protection treatments, their timing and the dose and concentration of chemicals should be determined by specialists (agronomists). In case of mass occurrence of pests, diseases or weeds, as well as during the biological susceptibility of pests, as soon as possible to do the right treatment over the entire surface of the crop.Forward speed during spraying should be constant to the entire surface evenly distribute the fixed dose of liquid. Boom is set at a height such that the nozzles were located (90 º) 0.6 - 0.9 m, (120 º) 0.4 - 0.7 m above the tops of sprayed plants.Spraying should be done so that the chemical was not transferred to adjacent, do not spray the fields covered by the plan.

Prior to spraying, determine proper operating parameters::

- concentration of the fluid,
- way of making spraying,
- liquid output in liters per hectare

In the case of remain in the reservoir fluid remains after the completion of spraying, it is recommended:

- refill the fluid around 100 liters of clean water and spray it again entering into the field, running boom,
- carry out the above spray at high speeds of the tractor, ie, 10 to 12 km / h, in order to achieve a minimum spray rate.

2.4.4. TABLE OF CONCENTRATION

The amount of chemical per tank

with capacity [l] calculated using the formula: $$A = \frac{V}{100} \cdot K, [kg, or.l],$$

where:

A - amount of chemical in kg or liters,
K - liquid concentration in%,
V - capacity of sprayer tank.

For your convenience, is shown in Table 1, the quantities of the chemical (in kg or l), which is mixed with a certain amount of water to obtain the required concentration of the liquid.

For example: for a liquid having a concentration of 0.8% in 400 liters of water, add 3.2 kg (or liter) of a chemical.

If the amount of water required is given in Table 2, and we want to obtain a liquid with a specific concentration, add the appropriate dose of a chemical agent, given the right amounts of water.

For example, to obtain a liquid with a concentration of 0.8% in 1100 liters of water, add a dose of a chemical listed in the table for 100 and 1000 liters. We then obtain 0.8 + 8.0 = 8.8 kg (or liter) of this measure.

Table 2.

Liquid concentration [%]	**The Mount of prepared water In liters**						
	100	**1000**	**1500**	**2000**	**2500**	**3000**	**3500**
	Dose in kg or liters						
0,1	0,1	1,0	1,5	2,0	2,5	3,0	3,5
0,2	0,2	2,0	3,0	4,0	5,0	6,0	7,0
0,3	0,3	3,0	4,5	6,0	7,5	9,0	10,5
0,4	0,4	4,0	6,0	8,0	10,0	12,0	14,0
0,5	0,5	5,0	7,5	10,0	12,5	15,0	17,5
0,6	0,6	6,0	9,0	12,0	15,0	18,0	21,0
0,7	0,7	7,0	10,5	14,0	17,5	21,0	24,5
0,8	0,8	8,0	12,0	16,0	20,0	24,0	28,0
0,9	0,9	9,0	13,5	18,0	22,5	27,0	31,5

1,0	1,0	10,0	15,0	20,0	25,0	30,0	35,0
2,0	2,0	20,0	30,0	40,0	50,0	60,0	70,0
3,0	3,0	30,0	45,0	60,0	75,0	90,0	105,0

To obtain the required amount of liquid per hectare find the right speed, pressure, ejaculatory bore disc (for the type of vortex nozzles), or the size of the slot nozzle.

2.4.5. CORRECTION SPRAY LIQUID DEPENDING ON THE DENSITY OF THE CHEMICAL

Given in the tables (2.5.1.) The dosing fluid l / ha, depending on the pressure and speed, deal with new nozzles. These values are given in relation to water.

In the case of the use of liquids of different specific gravity, make the appropriate conversions.

The conversion factors depend on the density of the chemical

Table 3.

Density , [kg/l]	0,84	0,96	**1,00** ***water***	1,08	1,20	1,28	1,32	1,44	1,68
Conversion factor	0,92	0,98	**1,00**	1,04	1,10	1,13	1,15	1,20	1,30

To determine the right size for a given spraying nozzle, the desired performance [l / min], or [l / ha] multiplied by the conversion factor corresponding to the density of the chemical agent used.

For example, if the desired dose is 100 l / ha, and the density of the chemical agent used 1.28 kg / l, is the right dose is equal to:

Tabula dose [l/ha]	**X**	**Conversion factor (from table)**	**=**	**Right dose of spray liquid [l/ha]**

It is 100 l/ha x 1,13 = 113 l/ha.

Now with an array of expenditure provided by the manufacturer for the aerosol type, select the spray, which at the desired pressure, provide expense 113 l / ha. When operating nozzles wear and therefore increases, according to their consumption, the amount of liquid them (at the same pressure), the results of which may be an overdose of liquid. Therefore, it is advisable to carry out systematic monitoring of the dosage of the liquid, after every 100 hours. worked by the nozzles, or always during the operation if you notice that the amount of liquid wypryskiwanej per hectare is higher than assumed. Permissible deviation in dosage should not exceed 7.5%.

2.4.6. CHECKING EXPENSE OF NOZZLES AND DEGREE OF THEIR WEAR.

An inspection of the nozzle flow rate (dosage) should be performed:

- At the beginning of the agrotechnical season,
- After each period of 100 h. work,
- After each change of the tractor (or pressure in the wheels),
- After changing a nozzle, or pressure.

To do this:

- Fill the sprayer with clean water,
- Check of liquid filtering system (compression filter mesh size must be smaller than the smallest diameter of the outflow nozzle),
- Check pressure gauge performance (best glycerine, graduated 0.2 or 0.5 bar, in the 0 -5 bars),
- Prepare the measuring vessel with a scale at 0.002 l, with a capacity of 1 l (eg buret) and a stopwatch or watch with central second hand,
- Using the table 2.5.1., Determine the parameters of the applied spray-type nozzles; eg for nozzle Lechler LU 120-03 and set up a dose of liquid 250 l / ha and adopted the working speed of 6 km / h the required operating pressure should be at 0.33 MPa
- Randomly select the boom sprayers, which will be carried out measurements (it is recommended to perform measurements on at least one spray on each section of hose-powered one, expenditure should not be measured on the tip placed near the supply hose section, or in a place farthest from it),
- Turn on the pump drive, open the flow of the liquid to the nozzles on the boom, check and adjust the desired pressure, eg, 0.33 MPa (3.3 bar)
- Place a container under the spray measuring accurately, so that the atomized liquid stream was captured and start the timer (or use a watch with central second hand),
- After 60 seconds (1 minute) discontinued the collected liquid from the pot and set it on level ground,
- Read on the scale of the vessel and save the amount of collected fluid from the nozzle l / min.

Flow control accuracy depends on the number of nozzles tested and the number of repetitions performed measurements for the same nozzle.

In the case of of mechanical damage to the sprayer filter may be clogged nozzles. In the event of a bad job nozzles (uneven fluid decomposition, condensation or lack of flow), stop treatment and make them purge by the following sequence:

1. Set lever of sectional valve of boom on position „no work”.
2. Set leser of main valve on position „overflow”.
3. Stop the pump by turning off the PTO drive.

NOTE - ALL WORK IN WHICH OPERATOR MAY BE EXPOSED TO THE SPRAY SOLUTION PERFORM IN PROTECTION MASC AND WEARING GLOVES.

4. take off frames mounting caps contaminated nozzles
5. removing contaminated purge nozzles and using a special brush
6. nozzles mounted on the beam
7. wash hands and face with clean water

An example of measurements and calculations:

Table 8.

Measurement 1			Measurement 2		
		Expense , l/min			Expense, l/min
Nozzle nr	1	1,35	Nozzle nr		
Nozzle nr	8	1,30	1	1,40	
Nozzle nr	15	1,25	8	1,35	
Nozzle nr	22	1,35	15	1,30	
			22	1,35	

Expense of the results, calculate the average expenditure is defined as:

$$\frac{1,35+1,30+1,25+1,35+1,40+1,35+1,30+1,35}{8}=1,33[l/\min]$$

For the parameters adopted above the nominal expense of the liquid spray from one nozzle should be:

$$\frac{250 \cdot 6}{1200} = 1{,}25[l / \min]$$

The calculation of allowable, maximum flow rate of nozzle

Given the allowable 10% deviation from the nominal flow rate of liquid from the spray, the maximum acceptable cost will be:

$$\frac{1{,}25 \cdot 110\%}{100} = 1{,}38[l / \min]$$

Comparing the costs obtained in the example of the liquid: the measured average of the nozzles tested equal to 1.33 l / min, the calculated allowable 1.38 l / min (taking into account the 10% deviation) - found that use of spray nozzles located on the beam is significant.

Adjusting the parameters

In case of any significant use of spray, with no possibility of exchange and if the conditions allow it, it must be corrected speed sprayer, or the working pressure, to prevent overdose fluid. We recommend that the correct dosage of the liquid by reducing the pressure. After the correct dosage of the liquid by reducing the pressure to perform re-check the expense of spraying. Conducting Dose correction by changing the operating speed when spraying is to calculate a new, higher speed, in proportion to the increased (due to the use of sprays) of the liquid flow rate, according to the formula:

$$\frac{q \cdot 1200}{Q} = V, [km / h]$$

where:

q - average expenditure of the liquid from the spray obtained from measurements, [l/min],
Q- established the dose of the liquid, [l/ha],
1200 - constant value.

Thus, after inserting the values from the example we have:

$$\frac{1{,}33 \cdot 1200}{250} = 6{,}38$$

namely, to get a dose of liquid 250 l / ha, taking into account consumption of nozzles, spraying should be performed at a speed of 6.38 km / h instead of the assumed 6 km / h.

2.5. SPRAYING TECHNIC

Performance of plant protection products, or fertilizer, is applied pesticides, or fertilizers evenly in the form of finely divided liquid droplets of different sizes of the protected area - the soil, or foliar

.

Spraying in soil is applied chemical or fertilizer over the entire surface around the plant.
Foliar treatment is applied directly to the plant preparation.

IMPORTANT - BEING GUIDED BY DATA ABOVE, AND TYPES OF THE CHEMICAL TREATMENT FIND THE RIGHT SPRAYERS, FOLLOWING THE FOLLOWING GUIDELINES AND THE GUIDANCE AVAILABLE IN THE TABLES (2.5.1).

Recommendations for selection of nozzles:

• spraying of herbicides in to soil and mineral fertilizers requires large droplets. large drops they are not worn by the wind and give even distribution of product on the whole surface of the soil. It is recommended to perform them slit nozzles with larger openings such as Lechler LU 120-04 (red),

• foliar spraying of herbicides requires applying the product evenly on the plants. Drops can not be too large, as staczałyby the leaves into the soil. It is recommended to perform them, eg slotted nozzles Lechler LU 120-02 and LU 120-03 (yellow or blue),

• Spraying with insecticides (insecticides) should be made small drops, the drops were falling not from plants. It is recommended to perform them slotted nozzles Lechler LU 120-02 (yellow), or vortex nozzles (with holes with a diameter of 1.2 - 1.5 mm),

• Spraying fungicides (fungicides) should be made nozzles that produce small droplets (swirled). These drops should go into the underside of leaves. It is recommended to perform them whirling nozzles (with holes with a diameter of 1.2 mm).

NOTE - AFTER SPRAYING HERBICIDES, DUE TO VERY AGGRESSIVENESS, IT IS IMPERATIVE THOROUGHLY RINSE SPRAYER SYSTEM AND ALL LIQUID, THE GOAL IS NOT MIX-UP ADMISSION OF HERBICIDE CHEMICALS OTHER EFFECTS, FOLLOWING WHAT MAY BE DAMAGED CROPS.

Precise selection spraying parameters to achieve the desired dose of fluid l / ha, depending on the pressure in MPa, and the operating speed in km / h, are presented in tables, for example, spending for selected types of nozzles.

2.5.1. LIQUID DOSAGE TABLES FOR VARIOUS TYPES OF SPRAY

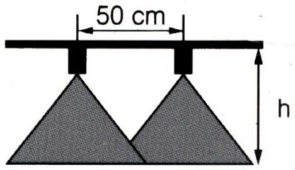
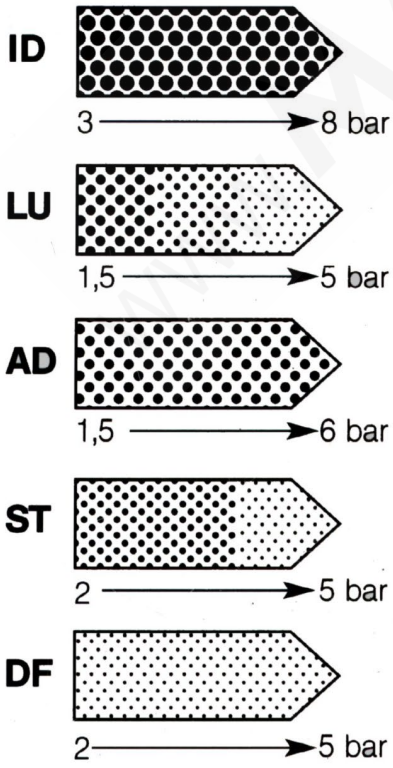
Table 4.

	 (bar)	l/min	l/ha								
			5,0 Km/h	6,0 km/h	7,0 km/h	8,0 km/h	10,0 km/h	12,0 km/h	14,0 km/h	16,0 km/h	18,0 km/h
-01 ID (60M) LU ST (80M)	1,5	0,28	67	56	48	42	34	28	24	21	19
	2,0	0,32	76	64	55	48	38	32	27	24	21
	2,5	0,36	85	72	62	54	43	36	31	27	24
	3,0	0,39	94	78	67	59	47	39	33	29	27
	3,5	0,42	101	84	72	63	50	42	36	32	29
	4,0	0,45	108	90	77	68	54	45	39	34	30
	4,5	0,48	115	96	82	72	58	48	41	36	32
	5,0	0,51	121	102	87	77	61	51	44	38	34
	6,0	0,57	137	114	98	86	68	57	49	43	38
	7,0	0,61	146	122	105	92	73	61	52	46	41
	8,0	0,65	156	130	111	98	78	65	56	49	43
-015 ID (60M) LU AD ST (80M)	1,5	0,42	99	84	72	63	50	42	36	32	28
	2,0	0,48	114	96	82	72	58	48	41	36	32
	2,5	0,53	128	106	91	80	64	53	45	40	35
	3,0	0,59	141	118	101	89	71	59	51	44	39
	3,5	0,63	152	126	108	95	76	63	54	47	42
	4,0	0,68	163	136	117	102	82	68	58	51	45
	4,5	0,72	173	144	123	108	86	72	62	54	48
	5,0	0,76	182	152	130	114	91	76	65	57	51
	6,0	0,84	199	168	144	126	101	84	72	63	56
	7,0	0,90	216	180	154	135	108	90	77	68	60
	8,0	0,96	231	192	165	144	115	96	82	72	64
-02 ID LU AD ST (60M)	1,5	0,55	132	110	94	83	66	55	47	41	37
	2,0	0,63	152	126	108	95	76	63	54	47	42
	2,5	0,71	171	142	122	107	85	71	61	53	47
	3,0	0,78	188	156	134	117	94	78	67	59	52
	3,5	0,85	203	170	146	128	102	85	73	64	57
	4,0	0,90	217	180	154	135	108	90	77	68	60
	4,5	0,96	231	192	165	144	115	96	82	72	64
	5,0	1,01	243	202	173	152	121	101	87	76	67
	6,0	1,11	266	222	190	167	133	111	95	83	74
	7,0	1,19	286	238	204	179	143	119	102	89	79
	8,0	1,27	306	254	218	191	152	127	109	95	85
-025 ID (60M)	3,0	0,99	238	198	170	149	119	99	85	74	66
	3,5	1,07	257	214	183	161	128	107	92	80	71
	4,0	1,15	276	230	197	173	138	115	99	86	77
	4,5	1,22	293	244	209	183	146	122	105	92	81
	5,0	1,28	307	256	219	192	154	128	110	96	85
	5,5	1,34	322	268	230	201	161	134	115	101	89
	6,0	1,40	336	280	240	210	168	140	120	105	93
	6,5	1,46	350	292	250	219	175	146	125	110	97
	7,0	1,52	365	304	261	228	182	152	130	114	101
	7,5	1,58	379	316	271	237	190	158	135	118	105
	8,0	1,62	389	324	278	243	194	162	139	122	108

	 (bar)	l/min	l/ha								
			5,0 Km/h	6,0 km/h	7,0 km/h	8,0 km/h	10,0 km/h	12,0 km/h	14,0 km/h	16,0 km/h	18,0 km/h
-03 ID LU AD ST DF (60M)	1,5	0,82	197	164	141	123	98	82	70	62	55
	2,0	0,95	228	190	163	143	114	95	81	71	63
	2,5	1,06	255	212	182	159	127	106	91	80	71
	3,0	1,17	280	234	201	176	140	117	100	88	78
	3,5	1,26	303	252	216	189	151	126	108	95	84
	4,0	1,35	325	270	231	203	162	135	116	101	90
	4,5	1,44	345	288	247	216	173	144	123	108	96
	5,0	1,52	364	304	261	228	182	152	130	114	101
	6,0	1,64	395	328	281	246	197	164	141	123	102
	7,0	1,79	430	358	307	269	215	179	153	134	119
	8,0	1,91	460	383	328	288	230	191	164	143	127
-04 ID LU AD ST DF (60M)	1,5	1,09	262	218	187	164	131	109	93	82	73
	2,0	1,26	303	252	216	189	151	126	108	95	84
	2,5	1,42	340	284	243	213	170	142	122	107	95
	3,0	1,55	373	310	266	233	186	155	133	116	103
	3,5	1,68	404	336	288	252	202	168	144	126	112
	4,0	1,80	432	360	309	270	216	180	154	135	120
	4,5	1,91	459	382	327	287	229	191	164	143	127
	5,0	2,02	484	404	346	303	242	202	173	152	135
	6,0	2,21	530	442	379	332	265	221	189	166	147
	7,0	2,37	569	474	406	356	284	237	203	178	158
	8,0	2,53	608	507	434	381	304	253	217	190	169
-05 ID LU AD ST DF (60M)	1,5	1,36	327	272	233	204	163	136	117	102	91
	2,0	1,57	378	314	269	236	188	157	135	118	105
	2,5	1,77	424	354	303	266	212	177	152	133	118
	3,0	1,94	466	388	333	291	233	194	166	146	129
	3,5	2,10	504	420	360	315	252	210	180	158	140
	4,0	2,25	539	450	386	338	270	225	193	169	150
	4,5	2,39	573	478	410	359	287	239	205	179	159
	5,0	2,48	595	496	425	372	298	248	213	186	165
	6,0	2,83	679	566	485	425	340	283	243	212	189
	7,0	3,06	734	612	525	459	367	306	262	230	204
	8,0	3,27	785	654	561	491	392	327	280	245	218
-06 ID LU ST DF (60M)	1,5	1,63	391	326	279	245	196	163	140	122	109
	2,0	1,88	452	376	322	282	226	188	161	141	125
	2,5	2,11	508	422	362	317	253	211	181	158	141
	3,0	2,32	557	464	398	348	278	232	199	174	155
	3,5	2,51	603	502	430	377	301	251	215	188	167
	4,0	2,69	646	538	461	404	323	269	231	202	179
	4,5	2,86	686	572	490	429	343	286	245	215	191
	5,0	3,01	723	602	516	452	361	301	258	226	201
	6,0	3,39	814	678	581	509	407	339	291	254	226
	7,0	3,67	881	734	629	551	440	367	315	275	245
	8,0	3,92	941	784	672	588	470	392	336	294	261

2.5.2. TABLE OF NOZZLES PERFORMANCE

Table 5.

 **ID** : 3,0 - 8,0 bar **LU** : 1,5 - 5,0 bar **AD** : 1,5 - 6,0 bar **ST** : 2,0 - 5,0 bar **DF** : 2,0 - 5,0 bar	**INTENDED PRESSURE OF OPERATING EACH NOZZLES**
 **90°** : h = 60 - **75** - 90 cm **120°** : h = 40 - **50** - 70 cm	**THE HEIGHT OF THE BOOMS DURING THE SURGERY. RECOMMENDED HEIGHT OF LIFTING BEAMS DURING SURGERY DEPENDING ON THE ANGLE FLOW**
 **ID** 3 → 8 bar **LU** 1,5 → 5 bar **AD** 1,5 → 6 bar **ST** 2 → 5 bar **DF** 2 → 5 bar	**THE DROPLET SIZE OBTAINED ON EACH INDIVIDUAL NOZZLE**

Nozzles

Nozzles are one of the most important components of the sprayer, from well-chosen types of spray, build quality and degree of wear depends mostly on the final biological effect spraying operation. Depending on the structure and process for producing sprays of droplets distinguished: pressure (hydraulic), pneumatic, pressurized pneumatic and rotary. Greatest importance in crop protection, however, play sprayers equipped with hydraulic nozzles, including a flat jet nozzles, swirl. Other types of sprays are of limited use. Płaskostrumieniowe Sprayers are manufactured in both versions of single and Dual Stream, symmetric and asymmetric, and in a wide range of spray angle (30-120 °).In the protection field crop sprayers are mainly used for symmetric płaskostrumieniowe spray angle of 110 °, which are mounted spray beams of 0.5 m, and positioned nozzles can produce almost perfect transverse distribution through "from taking place" fluid streams produced by the adjacent nozzles . the same time, the liquid flows from adjacent nozzles should not collide with each other. Thus, commonly used for bayonet nut, which automatically set the desired tilt angle of liquid stream (5-10 °).Universal płaskostrumieniowe nozzles produce a large number of small droplets, which are very susceptiblethe drift caused by the movement of wind or spray. To prevent this have been developed in recent years, sprays przeciwznoszeniowe (antydryftowe) and Induction produce droplets of larger diameter.The first of them are equipped with an additional calibrated nozzle, which lowers the pressure of the liquid before it reachesto the correct nozzle płaskostrumieniowej. Thus far has been a limited number of small droplets most prone to drift. The ejector nozzles with the air intake opening to the chamber formed in a specially mixed and aerated fluid. Droplets filled with air bubbles burst hitting the plant, thereby increasing the coverage of plants. Larger droplets produced by the ejector nozzles przeciwznoszeniowe and give less coverage and therefore should not be abused. They are recommendedto perform procedures doglebowymi and systemic herbicides and other means of protection, since the use of conventional spray is not possible, and the treatment must be made within a specified period.Centrifugal atomizers are now increasingly rare use in crop protection field.The need for higher pressures, more of the beam, much higher non-uniformity of transverse distribution and production of large quantities of small droplets undergoing drift compared with sprays płaskostrumieniowymi makes should not be used in modern crop protection field. However, they have several advantages that make them very useful in crop protection space such as trees and shrubs or growing hops. Thus, in modern orchard sprayers sprayers should be used in the vortex liquid emitting hollow cone.Pressure sprayers are made of materials not only corrosion resistant but also to wear erosion. Slurry and solid protection of water pollution require the production of specially selected materials. Low cost and high durability have made the basic material used to manufacture plastic nozzles are specially selected chemical composition. They replaced the previously used almost entirely of copper alloys and stainless steel. The highest wear resistance are characterized by ceramic materials. However, their high production cost limits their use mainly to swirl atomizers usedsprayers in the orchard, where higher than in field crops pressures (5-20 bar) require high-quality materials.

Check if power is turned off boom there is no leaking from nozzles.

Method of assessment: visual.
The criterion of evaluation: when power boom diaphragm valves in the nozzle fittings should also close the flow of the liquid to the nozzles. The maximum leakage of fluid from single nozzle can not be greater than 2 ml (30 drops). No more than 10% of the spray can show leaks. Przeciwkroplowe valves must be uniform for the entire length of the boom.

Nozzles test

Prepare to control

You should have prior to the spray nozzles make sure that all operate without interference. Nozzles and filters removed prior to the test, clean and flush the boom without nozzles. Next, install the nozzles and perform a visual check their proper functioning. Cones sprayed liquid should be the same. In the case of slit-shaped nozzles should pay attention to the uniformity of forming a film of water (you can check the liquid cone illuminating beam of light such as a flashlight), and the setting angle of the boom - the angle 5-8 degrees. You should also check whether the nozzles are not rozkalibrowane. To do this measure the output from a single nozzle with a measuring vessel. When differences in the expenditure of more than ± 10% from the value given in the tables, at a given pressure, nozzles replaced. Sprayers can not drip.

Check the uniformity of nozzles

Method of assessment: visual.
The criterion of evaluation: in the field sprayer nozzles, filterki (if any) and valves przeciwkroplowe should be uniform across the boom. Nozzles must be the same type and size, and spray the liquid at the same angle.
Note: This requirement does not apply to bars for special applications (eg, row crops). The uniformity of orchard nozzles equipment need not be preserved, while the required symmetry for the left and right.

2.6. BEAM WORKING POSITION

The task is to cover the boom box with an even layer fluid. Unfolding and folding boom is hydraulically operated by a lever in the tractor cab. After spreading the beam must be set to the required height, and if surgery is done on the protective slope, lay it parallel to the field, the hydraulic control lever stabilization. If it is found that the arms are composed of beams automatically while you work or are too large swings, adjust the spring pressure on the claw clutches by turning the screw (Fig. 9, p 1), which tensioning spring (Fig. 9, section 2 .), pressed against the upper clutch (Fig. 9, p 3) to the bottom (Fig. 9, step 4). Both change the angle of the boom arm to the ground, and adjust its height is hydraulically driven actuators using the tractor cab.

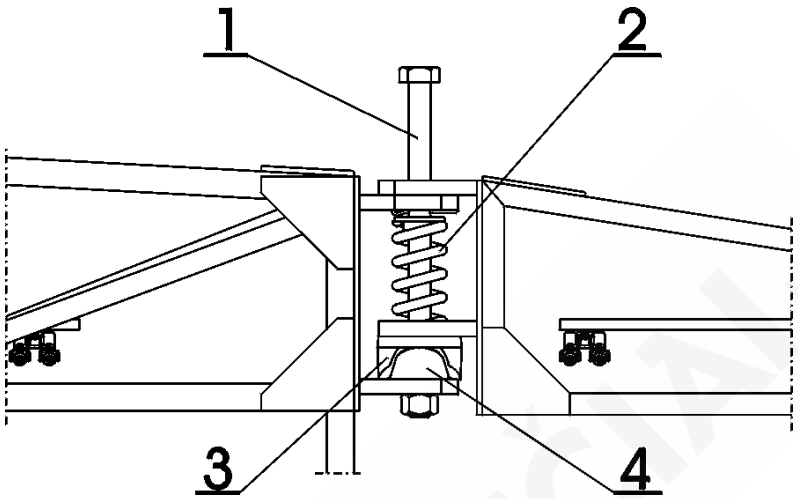


Figure 9 General view of the coupling segments
1 Bolt, 2 Spring, 3 Upper clutch, 4 coupling the lower.

In order to spread the boom, observe the following order:

- Raise the boom to maximum height and level,
- Boom arms spread (all wings are distributed simultaneously)
- Lower the boom to the desired height,
- When spraying, the stabilization of the boom must be open.

In order to make the boom to the transport position, keep the following order submission:

- Raise boom to maximum height and to level,
- Submit a boom arm (all wings are composed at the same time),
- Lower the boom on the bed support to the transport position and turn off the hydraulics,
- During transport, stabilization of the beam must be closed.

After unfolding the booms and preparation for work, spraying operations shall be tested, followed by rinsing of the entire system with clean water liquid. In order to facilitate removal from washing any impurities from the pipes, must first remove the filters and nozzles. After washing liquid and the tank system, install the previously removed parts. Sprayers should already be selected as appropriate for the intended treatment.

Operation Test should be performed as follows:

- Start the pump by turning the PTO shaft - telescopic
- Control valve (see Figure 13) to set the proper pressure, and then work for a few minutes,
- Perform the valve adjustment by manual control valve, as set out in section 2.9,
- during the attempt to draw attention to an even spray of liquid through the nozzles and check the stability of the set pressure,
- Check the extent of mixing by the mixer, hydraulic,
- Test the electrical system and regularity interaction sprayer tractor with lights lights sprayer
- In the event of irregularities in the operation, determine the cause and remove it.

2.7. CHEMICALS INDUCTION HOPPER

Induction hopper (Figure 10) is designed to pre-dilute chemicals before they are placed in the main tank sprayer. After filling the spray tank with water to 1/3 full, pour into the reservoir chemical induction hopper up to 5 kg (depending on the required concentration of the liquid) and open the valve lever control valve, giving liquid. During this time, should be closed valves Lever, off the liquid from the boom. After washing the chemical agent, completes the induction hopper tank with water the projected level. To shorten the watering time, preparations lumpy, you should thoroughly before pouring in the crush.

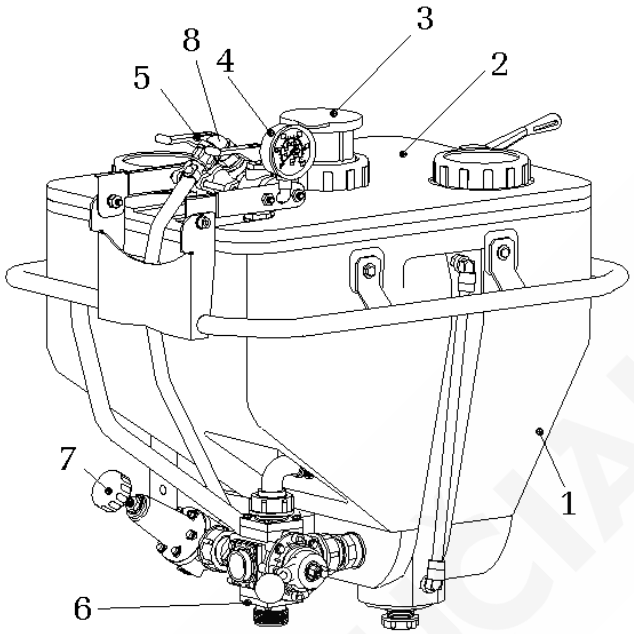


Figure 10 General view of the chemical induction hopper.

1. Induction hopper tank.
2. Cover.
3. Chemical dispenser.
4. Manometer.
5. Valve to washing container after chemicals.
6. Lever to fill tank with water.
7. Valve to set pressure.
8. Lever for transfer of chemical induction hopper to the spray tank.

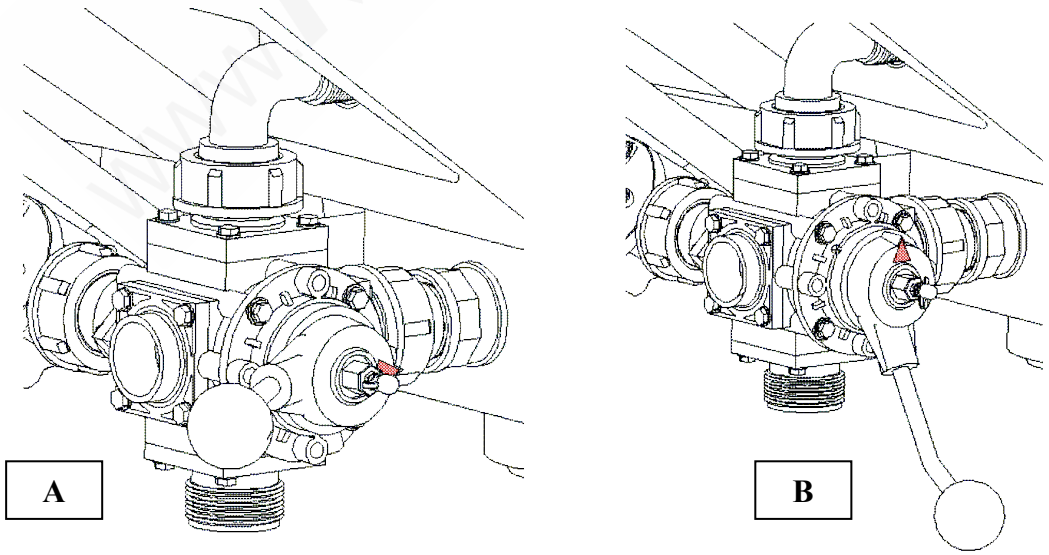


Figure 11 position A and position B chemical induction hopper.

Preparation of the working liquid:

• Pre-fill the tank with water to about 1/3 full,
• Enable the tractor PTO speed of 540 rev / min, in order to run the pump
• Overhead valves close,
• Open the main valve (bypass valve work - set ok.0 pressure, 3 MPa),
• Open the induction hopper section,
• Check and correct the induction hopper system pressure - pressure to determine the gauge (Fig. 10, step 4) (0.2 MPa) valve adjustment (Fig. 10, p 7),
• Move the lever ball valve (Fig. 10, p 6) in position B (Figure 11),
• Induction hopper fill to 1/4 volume (closed valve Figure 10, section 8),
• Move the lever ball valve (Fig. 10, p 6) in position A (Figure 11),
• Add to the chemical induction hopper,
• Move the lever ball valve (Fig. 10, p 6) in position B (Figure 11),
• Clean container in the middle of the chemical - including empty container to the filler opening to slide the nozzle washing so that the rinse nozzle was inside the container, at the same time open the valve (Fig. 10, p 5),
• Move the lever ball valve (Fig. 10, p 6) in position A (Figure 11),
• After filling, induction hopper and open valve transfer of chemical induction hopper tank sprayer (Fig. switch valve 10, section 8 in position B, Figure 11),
• Measure is automatically sucked into the main tank,
• At the end of pouring to enable the valve (Fig. 10, p 7) to flush the tank,
• After sucking close the valve (Fig. 10, p 7) and the transfer valve (Fig. 10, p 8) switch in position A (Figure 11),
• Turn off the induction hopper section,
• For a period of approximately 10 to 15 min. mix the working fluid in the tank (this step can be performed in time directions on the box).

After you complete the induction hopper, it should be thoroughly cleaned and rinsed of residual chemicals. Contaminated screen can cause the leaching fluid will escape outside through the cover. Extraction of the liquid on the outside may also be made when the chemical poured into the wet container is not rinsed immediately. This will seal the induction hopper grid and stops working. We must in this case, manually clean the chemical agent with water, taking care not to damage the sieve.

2.8. DIAPHRAGM PUMP

Purpose

Used as an alternative production of membrane pumps and ANNOVI Reverberi COMET Italian production (Figure 12) are designed primarily for equipment protection products. Sprayer P356 / 1 Comet pump is mounted on the BP 235 or Annovi Reverberi AR 230 bp. The pumps provide high resistance to the aggressive action of plant protection products. Pumps are designed to drive the tractor PTO with the take-off shaft.

Table 9.

Technical data	COMET-BP 235	AR 230 bp
WPM Revolutions	540 rev/min	
Performance at 540 rev / min	226 l/min	240 l/min
Max working pressure	2 MPa	
Power consumption at a pressure of 20 bar	8,6 kW	
Weight of pump	32 kg	36 kg
Dimensions: L × W × H	282×365×413 mm	364x458x316 mm

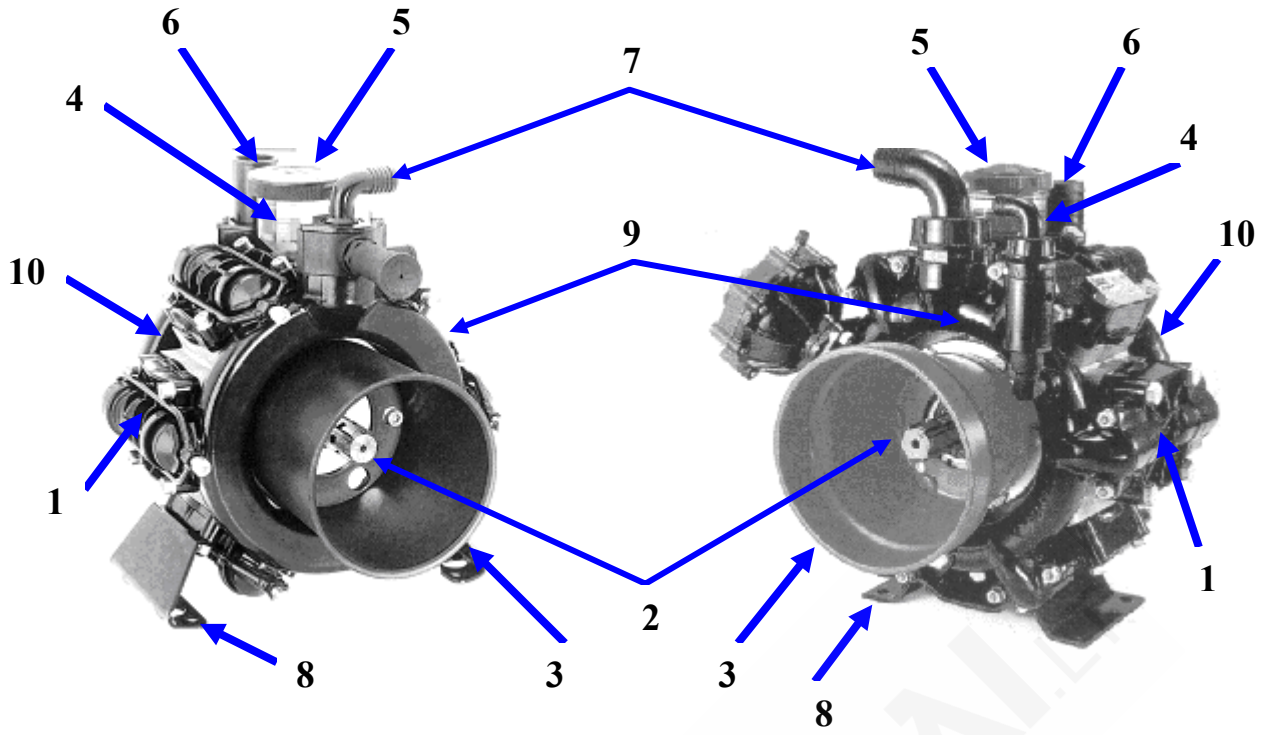


Figure 12 Comet Diaphragm Pump BP 235 and 230 bp Annovi Reverberi.

The list of pump parts BP 235 i AR 230.

1 Head, 2 Splined shaft, 3 Wielowypustowego drum cover, 4 Oil tank with level indicator, 5 Nut oil reservoir, 6 Suction, 7 Suction and pressure line, 8 Pump base, 9 Manifold pressure line, 10 intake manifold

Prepare pump for work

Before starting the pump to work, check the oil level in the tank. In case of shortage of oil, up to the required level. Check the seal must also be connected hoses suction and embossing.

Technical Suport

In order to ensure long and reliable operation of the pump:

- At the completion of the work system of liquid rinse with clean water,
- After operating season and frosts during spring - autumn, drain excess water from the pump.

NO DROOPING WATER MAY FREEZE,IN RESULTING MAY DAMAGE TO THE PUMP.

- Before each new season the oil exploitation in the new, the first oil change done after 50 hours of pump operation,
- Once a year, preferably before the start of the season and tear include: diaphragm pumps and valves back to new,
- The first 16 hours, the teams arrive at the pump and do not exceed the working pressure of 1.5 MPa.

	**NOTE -** DO NOT EXCEED THE MAXIMUM WORK PRESSURE. SHELTER MATERIAL MAY BE PROTECTED AGAINST MECHANICAL DAMAGE.

Draining the remaining water from the pump

To do this, remove the connector from the collector pump embossing, then run it at the time of 2-3 minutes at 540 rev / min PTO.

Oil changing

To change the oil in the pump, it should be removed, unscrew the filler plug and rotate 180o drain pump waste oil filler cap. Drain the engine oil with hot pump. After draining the oil pump mount and pour oil 20W/40 with parameters to the required level. After starting the pump, make up the potential loss of oil.

The exchange of feedback valves on the pump and diaphragms

Before replacing the return valves, remove suction and discharge hose and drain the remaining water from the head. Then unscrew the nuts and remove the collector return valves and gaskets. To replace the diaphragms, an additional drain oil and remove the head by unscrewing the nuts. Reinstall in reverse order, but first need to tighten the head nuts, then tighten the nuts securing the collector, and finally tighten the head nuts.

Symptoms and causes of disability in the pump

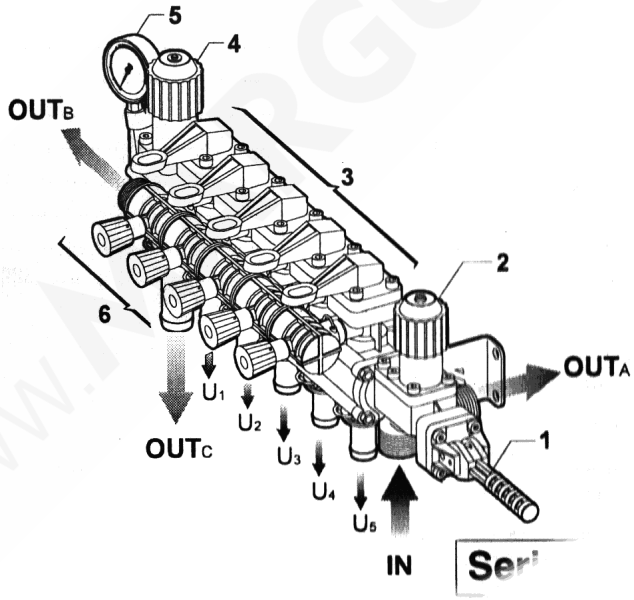
Table 6.

Symptoms	Reason	Fix way
Leak of oil mixed with water by indicator oil	Rupture of the diaphragm of pump	Replace for new diaphragm
Pressure drop	Damaged feedback valves (discharge)	Replace for new
Drop in performance	Damaged feedback valves (suction)	Replace for new
Pumps or pump gives no liquid	Leakage of the suction system	Check condition of the suction system seals, damaged, replace them with new
	Too high resistance to flow in the suction system	Clean the suction filter

In the event of major damage (eg damage the bearings), the pump should be sent to repair facility.

2.9. CONTROL VALVE

2.9.1. THE CONTROL VALVE WITH PRESSURE COMPENSATED USED IN SPRAYER



Rys. 13 A. The control valve with pressure compensated ARAG series 461.

1 The control lever "work - Transfer", 2nd Maximum pressure valve (green knob), 3 Working sections of the control valve, 4 Proportional pressure valve (yellow knob), 5 Manometer (pressure gauge), 6 Control valves compensation section (adjustable, red knob).

IN - power outlet of control valve.

OUT$_A$- transfer valve maximum pressure.

OUT$_B$- transfer of compensation section.

OUT$_C$- proportional valve transfer.

U1..U5- output outlet of on the working section.

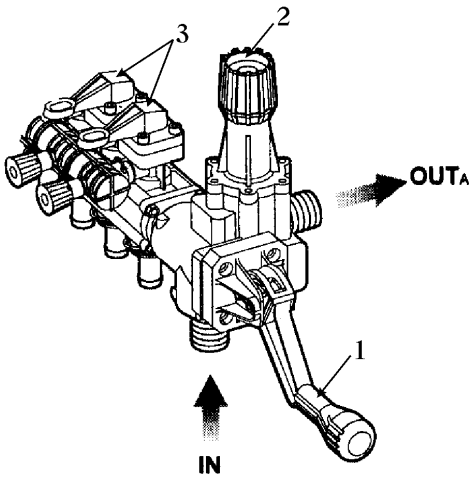


Figure 13 b. The control valve with pressure compensation.

1. Control lever „work – overflow", **2.** Max pressure valve (green knob),
3. Working sections of the control valve.

IN - Power outlet of the control valve.
OUT$_A$- overflow of maximum pressure valve.

Description and function of the control valve ARAG

The control lever "operation - transfer" (Fig. 13 A, p 1), giving the liquid to flow into sections - "work" (lever down), or causes the free flow of liquid into the tank - "transfer" (lever up) . maximum pressure valve valve (Fig. 13 A, p 2nd) - is responsible for it, not to exceed a maximum working pressure. If the pressure rises above the maximum shall be an additional transfer. The valve set pressure of 6 bar for slotted nozzles (universal). Crane valves section (Fig. 13 A, p 3) supply the appropriate section of the working beam or activate compensatory overflow of fluid to the tank. Proportional pressure valve (Fig. 13 A, step 4) regulates the pressure in the sprayer. Gauge (Fig. 13 A, p 5) indicates the pressure when the control lever is in the "work". Equalizing the pressure compensating valves for off / on the working section.

NOTES:

When installing the valve and sprayer calibration, observe the following rules:

1. Carefully regulate.
2. Maintain a constant pressure at the closure of one or more working sections.
3. For any treatment (surgery), which provides for changes to the configuration of the hydraulic connection is recommended to go to a company or an individual service.
4. For better valve functioning we recommend to connect to valve return _ with the tank in an independent way.
5. Do not connect return lines in any part of the tank with the intent to improve the effect (mixing), but only connect the upper parts of the tank.

Working of valve :

At the first use and following calibrations follow the simple instructions below.

NOTES:

a) Set lever of valve to "overflow" - the lever at the top (Fig. 14 A);

b) Completely open the overflow valve to maximum pressure by turning the knob counter-clockwise (Fig. 14 A);

c) Proportional valve fully open by unscrewing the knob in the opposite direction clockwise;

d) Lever valves of section set in the closed position.

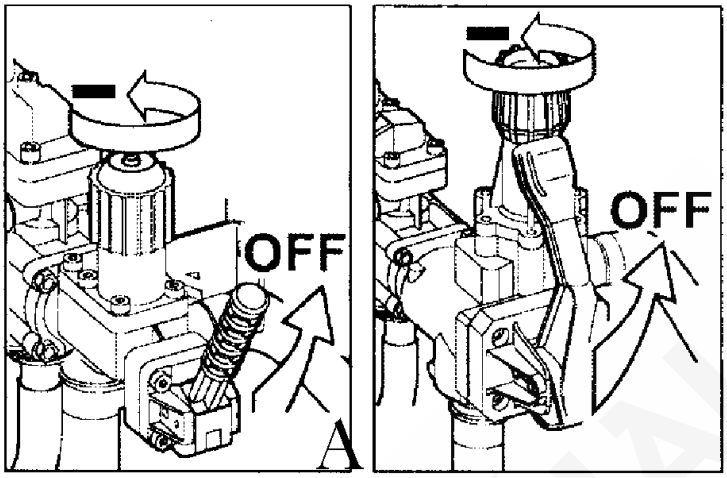


Figure 14 A. The max. pressure valve and work-overflow lever.

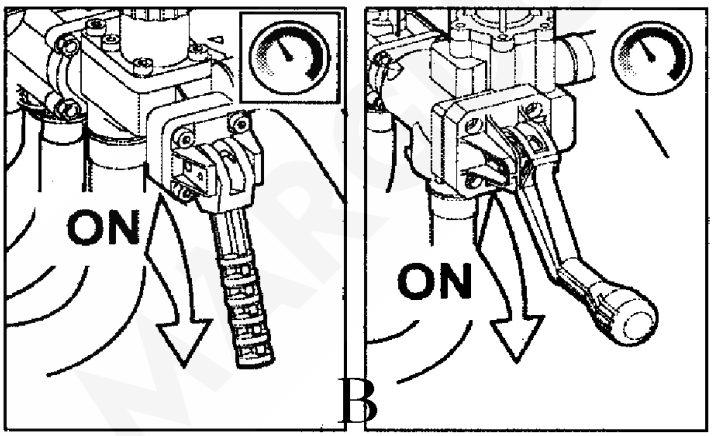


Figure 14 B. The max. pressure valve and work-overflow lever.

	**NOTE -** TO ADJUSTMENT USE ONLY CLEAN WATER-FREE OF CHEMICALS PRODUCTS.

Valve regulation :

	**NOTE** - TO ADJUSTMENT VALVE MADE, WITH CLOSED FLOW OF THE LIQUID TO INDUCTION HOPPER.

a) Start pump ;
b) Set the control lever to "work" - the lever at the bottom; manometer starts to work - to show the pressure (Fig. 15 B);
c) Close completely overflow valve to the proportional valve in the direction according to the clockwise (Fig. 15 B). If the pressure rises above an upper limit on the manometer, make sure that the valve of max pressure is fully open;

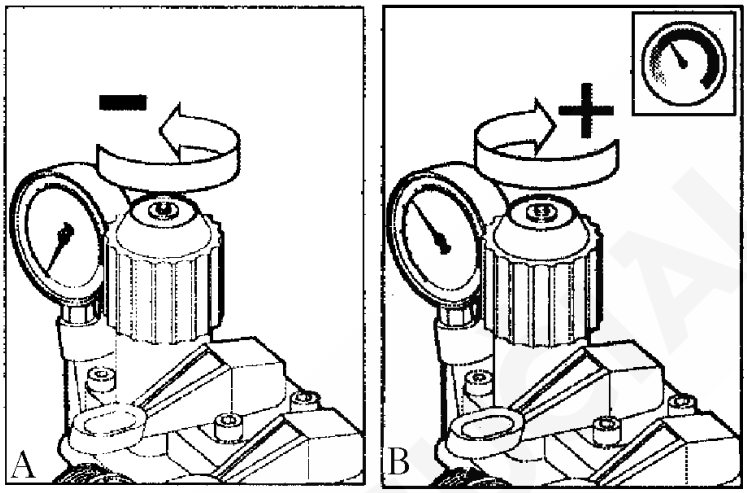


Figure 15 (A, B). Proportional pressure valve.

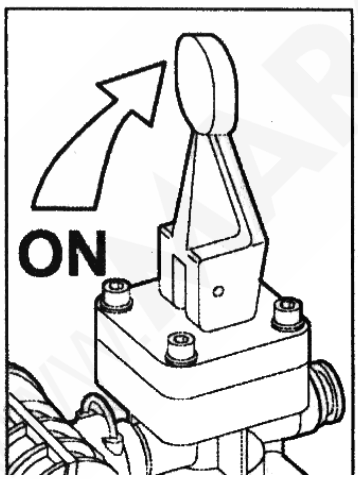


Figure 16 The sectional valve.

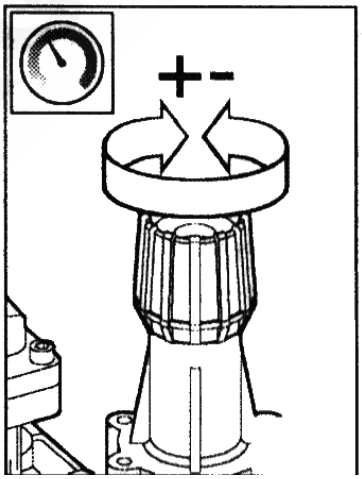


Figure 17 Maxpressure valve.

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d) Open all the valves of lifting section (position, ON "lever at the top, Figure 16);
e) With maximum pressure valve set the maximum pressure in the range of 6 atmospheres for standard nozzles 8 atmospheres for the injector nozzle (Figure 17). The movement in the opposite direction to clockwise- pressure drop. The movement consistent with a clockwise-pressure increases;

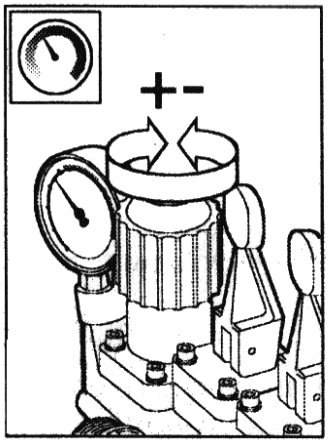

Fig 18. Proportional pressure valve

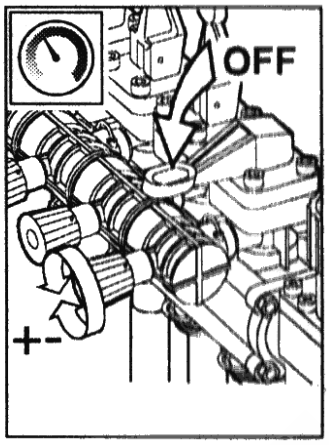

Figure 19 Working sections of the control valve (valves, sectional)

f) With proportional pressure valve, to set the proper pressure depending on the dose, type of nozzle, the speed and perform the treatment (Figure 18);

g) Close the section with a valve lever - position, OFF "(Figure 19);

h) Open and close the valve on the sections and check that the pressure is solid (constant);
i) Repeat operations (g and h) for all valves in the sections. If will not be changed the type of nozzle arrangements can guarantee a constant pressure for the liquid - solid as the pressure of work.

3. TRANSIT OF TRANSPORT

Ridding on roads (a machine coupled to the tractor) can be made only after setting the machine in transport position, that is:

- Support the drawbar must be flipped up,
- The boom must be submitted,
- Platform ladder must be lifted up and secured from falling.

For transport driving on public roads is a need for spraying the exterior lights, namely:

- Rear lights left and right (position, braking, "stop" and turn signals)
- 2 triangular rear reflectors,
- Front position light white (right and left),
- White front reflector (right and left),
- 2 yellow side reflectors (right and left along the machine),

Have efficiently installation of pneumatic brake, and behind the handle-mounted triangular array distinguished (Fig. 3). Adjust driving speed to road conditions. Avoid sharp turns. Turn off the tractor PTO drive.

	**NOTE**: • DO NOT TRANSPORT IF THE BEAM IS CLOSING SYSTEM DAMAGED • NOT BE CARRIED PERSONS OR ANIMALS ON THE TRACTOR OR MACHINE. • WHEN YOU TRAVEL ON PUBLIC ROADS, DRIVER OF THE TRACTOR MUST EXERCISE CAUTION AND COMPLY WITH APPLICABLE LAW TRAFFIC. MUST HAVE SPRAYER EFFICIENT ELECTRICAL SYSTEM (LIGHT OUTDOOR) AND REAR BRAKE FITTED A KITE MARKING PLATES. LIGHTS AND SIGNBOARDS MUST BE CLEAN. • TRAVEL SPEED MUST NOT EXCEED 20 KM / H.

4. MAINTENANCE

The basic steps for the maintenance of individual units to control the sprayer, cleaning and lubrication of the deadlines, the use of appropriate lubricants and removal of faults that occur during operation, and can be removed on their own.

Table 7.

FAILURE	REASON	WAY TO FIX
Low pressure in the manifold	- Green manifold knob (screwed).	- If it is a valve of constant pressure after adjustment the green knob to adjust made only a yellow knob.
Pulsating work	- Pollution filter on the system suction; - Clogging the suction hoses; - Taking the air on the system suction; - Check the air downloads non-return valve of on the pump.	- Cleaning the filters and self-cleaning filters the suction system; - Check the tightness of all connectors on the system suction.
No ressure in manometer	- Too tightly screw the manometer.	- Screw the manometer manually without use the key.
Low pressure in the hydraulic system	- Blockage of hoses hydraulic systems; - Low pressure on the manifold or of the tractor; - Damage of cap on the actuator.	- patency using air compressors; - adjusting the pressure valve on the manifold hydraulic. - checking the pressure of the hydraulic system of tractor; - defective plumbing parts replaced.
The contracting of oil through the pump, or push the upper oil reservoir oil expansion	- Damage to the membrane pump.	- When damage to one of the drivers in the pump, replace all.
Blocked filter self-cleaning	- Źle wyregulowany przepływ przez zawór regulacyjny filtra samoczyszczącego.	- adjust the flow.

Distribution of lubrication points and frequency of and type of lubricant provided in the paragraph. 4.5.1.

Before replacing the grease, or its complement, lubrication points should be cleaned of any contamination. The pump should maintain proper oil level.

NOTE:

• REVIEW, AS WELL AS CLEANING EMERGENCY REPAIRS PERFORM ONLY WHEN THE TRACTOR PTO AND TAKEN OUT TRACTOR IGNITION KEY FROM THE IGNITION.

• MAINTENANCE DURING THE EXTENDED KEEP BOOM SAFETY BY PLACING APPROPRIATE SUPPORTS THE BEAM.

- Spare parts must comply with the factory. The best use of the original company KFMR Sp. z o.o.
- Nuts and bolts checked regularly and if necessary tighten.

4.1. BREAKES

The new sprayer pneumatic brake (basic) and hand brake (parking) are set by the manufacturer. However, during operation, due to wear of brake pads or loose connections, hamowność spray may be insufficient. Therefore, periodically check the brakes. Checking the brake test is performed by braking on a level road. When you try to brake wheels should inhibit the same time, a sprayer should not complain. When a malfunctioning brake operation (eg, wear linings jaw) should do the adjustment clamp jaws. We do the gear lever rozpierakach deposited on the brake, turning the lever a few teeth in the axial direction. If the jaws are rubbing against the drum during normal driving, gear lever pivoted in the opposite direction. After the adjustment the brakes should be checked at an authorized service station.

IMPORTANT - PNEUMATIC BRAKE SYSTEM SHOULD NOT BE CARRIED (ON YOUR OWN) CONTROL VALVE CONTROL, BECAUSE YOU CAN DAMAGE IT. DEVICE IS NOT MAINTENANCE REQUIRED DURING OPERATION, WHEN IS FAULTY - REPLACE.

Adjusting the handbrake is to shorten the links (the strain), after loosening clamping plates.

4.2. POLYETHYLENE TANK REPAIR

The tank is made of polyethylene can be repaired by a specialist service KFMR Company o.o. Not recommended to repair a tank on their own.

4.3. CONSERVATION

After finishing work should be:

- Carefully clean sprayer and wash with water,
- When dry, damaged paint coating of a thin layer of oil.

As part of periodic reviews, monthly, or after working every 500 ÷ 1,000 hectares should:

- Perform all actions within the scope of review of the daily,
- Make a thorough external review of the machine and check the especially the transmission and chassis,
- All defects noted should be removed, and any shortcomings complete.

After finishing working season , before the period of storage, perform the following steps::

- Machine wash and thoroughly clean,
- Check the paint film, clean the damaged areas of corrosion and contamination, and then degrease and coat primer and topcoat,
- Unpainted metal parts covered with grease,
- Check the oil level in the pump diaphragm, if necessary up to the required level,
- Fill bearings with fresh grease,
- PTO shaft - telescopic cleaned and conserve,
- Under the wheels axle put a wooden support so that the wheels do not touch the ground,
- Clean wheels and pressure in tires reduced to 0,2 to 0,25 MPa.
- All parts damaged or excessively worn out should be repaired, or replaced with new.

4.4. LUBRICATION

NOTE - AFTER WORK SEASON OR SEASON OPERATING SPRAYER SHOULD BE CAREFULLY WASH, DRAIN THE WATER FROM THE RESERVOIRS WITH THE WHOLE LIQUID, THEN ENTIRE DRY.

All lubrication, fill with fresh grease or oil. It is a coating of diesel oil all metal parts unpainted. Places shabby with paint should be after cleaning, re-painted. Liquid lines must be cleaned and dried. They can Transfer the dry talc and wrap in large circles. Sprayers should be stored in a dry place.
Break between seasons, to be used to conduct a general review and repair. Provided for the replacement of parts must be ordered in advance of the season agrotechnic.
Before replacing the grease or its complement, lubrication points should be cleaned of any contamination. The pump should be maintain proper oil level.

4.4.1. LUBRICATION POINTS

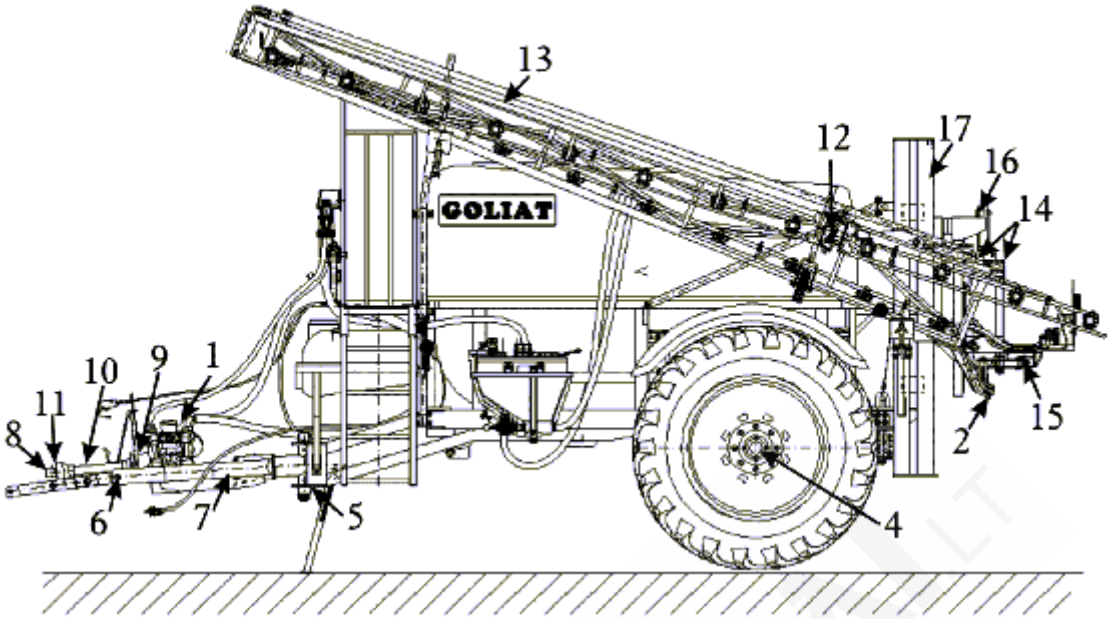

Figure 20 Marking of lubrication points.

Table 8.

Sin.	Lubrication points	The oil or grease	Frequency of exchange	Notes
1.	Diaphragm pump	Gear oil. SAE 90 oil strong. SAE 40, SELEKTOL SUPER SAE 2040	Every 100 hours of work. Once a year before the season agrotechnic	Fill the half of the oil level indication. The first oil change done after 50 hours of work.
2.	Beam hinge pin	Gear STP	Every 100 hours of work	Hand grease
3.	Roll actuator	Gear ŁT 42	Every 100 hours of work	Hand grease
4.	Wheel hubs	Gear ŁT 42	Once at year	Before storing the sprayer for a longer stay
5.	Vertical bushing of hitch	Gear ŁT 42	Every 200 hours of work	Hand grease
6.	Ball tip	Gear STP	Every 200 hours of work	
7.	Horizontal bushing of hitch	Gear ŁT 42	Every 200 hours of work	Hand grease
8.	Spline surfaces	Gear ŁT 42	Every 200 hours of work	Before storing the sprayer for a longer stay
9.	Pumps and a telescopic shaft	Gear ŁT 42	Every 200 hours of work	Hand grease
10.	PTO shaft Telescope	Gear ŁT 42	Before each start of operations at least every 8 hours of work	When fully moving out shaft and after the removal of pollutants
11.	Bearing joints of transmitter	Gear ŁT 42	Every 40 hours of work	Hand grease
12.	Claw coupling	Gear ŁT 42	Every 50 hours of work	
13.	Tensioner screw	Gear STP	Every 100 h	
14.	Rods bolt	Gear STP	Every 100 h	
15.	Actuator bolt	Gear ŁT 42	Every 200 h	Hand grease
16.	Stabilization bolt	Gear ŁT 42	Every 100 h	Hand grease
17.	Sleds sliding surfaces	Gear ŁT 42	Every 50 h	
18.	Brake rod axes	Gear ŁT 42	Every 100 h	Hand grease

4.4.2. HYGIENE

In general, lubricating materials used in maintenance work does not pose a health risk. However, with prolonged skin contact with lubricants may cause dryness and consequently to irritation.
Using oils with low viscosity is likely to irritation of the skin, so it is recommended that you use caution in work with used oil, since they are also contaminated.
Working through the use of maintenance (oil, grease) should always be carried out in compliance with all rules of hygiene.

4.4.3. STORAGE

- Storage of lubrication should be carried out of the reach of children.
- Materials lubrication should not be stored in open containers.

4.4.4. USAGE

New oil

- When applying the oil is new in principle, there is no special indication, apart from maintaining the general rules of hygiene when working with lubricate materials.

Used oil

- Used oil can contain harmful agents. Laboratory studies have shown that contact with used motor oil can cause skin cancer.

	**WARNING -** OIL IS POISONOUS. IF THERE HAS BEEN SWALLOWED OIL IMMEDIATELY CALL YOUR DOCTOR. USED OIL CONTAINS HARMFUL CONTAMINATION, WHICH MAY CAUSE SKIN CANCERS, SO IS RECOMMENDED EXERCISE EXTREME CAUTION WHEN WORKING WITH WASTE OIL. HANDS SPLASHES ON SKIN CREAM OR BY USING PROTECTIVE GLOVES. TRACES OF OIL ON THE SKIN THOROUGHLY WITH WATER MUST WITH SOAP AND WATER. NOT TO CLEAN THE SKINS OF OIL USE GASOLINE, OIL, OR PARAFFIN.

In order to remove oil from the skin should be used with these tips:

- Wash skin thoroughly with soap and water, • use a nail file nail,
- To clean the soiled area on the skin to use special cleaners,
- Do not remove oil stains from the skin on petrol, diesel, paraffin,
- Avoid skin contact with clothing contaminated with oil,
- Do not store in the pockets of oil-contaminated materials,
- Prior to use wash clothes soiled with oil,
- Used oil contaminated shoes leave in place for this type of waste.

4.4.5. . FIRST AID FOR INJURIES CAUSED BY OIL

Eyes:
In case of contact with eyes wash out oil for 15 minutes with water. When the irritation increases, consult a doctor.
Ingestion of oil:
In case of ingestion of oil should not be induced emesis reflex. Immediately contact your doctor.
Skin irritation:
After prolonged skin contact with oil, clean it with soap and water.

4.4.6. SPILLED OF OIL

Spilled oil should be be banked with sand or other absorbent. Then remove the contaminated absorbent agent.

4.4.7. FIRE COUSED BY OIL

Burning oilshould never be use water. It floats on water, causing the spread of fire. Oil lubricants can be extinguished using this powder or foam extinguishers. During the fighting action is necessary to wear respiratory protective mask.

4.4.8 REMOVAL OF OF WASTE OIL

Disposal of oil and waste oil must be in accordance with applicable regulations of local authorities. Never pour waste oil tank drains, drain the water or directly on the ground.

5. STORAGE & PROTECTION OF SPRAYERS IN WINTER

Both in commercial establishments as well as in user sprayer should be stored in a dry and covered place detached from the tractor. Outdoor spraying must not be stored longer than one month during the year. At the end of the season should be thoroughly cleaned sprayer, thoroughly drain the tank and the liquid system, and then dried. All filled with fresh lubricating oil or grease, wipe the metal parts are painted with diesel fuel, clean up damaged painted surfaces and paint again. Hoses to clean, dry and wipe the rubber hoses plus talc. In the winter must be removed nozzles, filters and remove residual fluid from the system liquid sprayer.

NOTE - WATER LEFT IN THE SPRAYER (THE PUMP) DURING THE PERIOD FROST BURST MAY RESULT IN PUMP, OR OTHER TEAMS DUE TO FREEZING.

Break between seasons to be used to conduct a general review and repair. Provided for repair parts must be ordered in advance directly from the manufacturer sprayer KFMR Sp. of o.o.

Protection of sprayer

1st Before securing the sprayer to spray a whole winter to be a liquid, which is us after flushing the system liquid - if something is in the tank must be drained to the drain valve (left open).

2nd Pump - Remove the connector from the collector embossing, then run the pump for 2 - 3 minutes at 540 rev / min PTO power (if the remaining liquid in the pump will be rolled out).

3rd Filters - Unscrew the settlers, and pour the remaining water

4th Antidrops spray fittings - Nuts, remove the nozzle housings antidrops at (that is, a valve cap with a red, rear or side of the frame), the fluid conduits also recommend separating the liquid and referral lines them down.

5th Control valve (solenoid) - Disconnect connectors with wires sectional (and so they leave) and disconnect the overflow,

6th Lateral induction hopper -induction hopper emptied of residual fluid

7th Computer control panel (control and measurement equipment, electrical control liquid) - Removed from the sprayer and keep it in warm, dry place.

NOTE - IN CASE THE OF THIS ACTIVITIES KFMR. NOT RESPONSIBLE FOR ANY DAMAGE OF SPRAYER.

6. DISASSEMBLY AND DISPOSAL

"Waste producer" - ie: you spray on dissolution (exchange) of worn parts or cpl. product should take the following actions:

• Parts suitable for further use or store the subject of regeneration,

• Metal waste transfer to the collection of scrap metal,

• Used oil transfer to companies with a collection of used oils and lubricants,

• Elements of plastics, rubber, etc. refer to the points lead recycling, or follow the local regulations on waste management metallic, inorganic, organic and mixed.

The information shall include:

1st Regulates the disposal of the Acts. Law No. 96/97 of 06.27.1997, item. 592

2nd Waste classification determines Acts. Law No. 162/97 of 12.24.1997, item. 1135 Regulation of the Minister of Environmental Protection, Natural Resources and Forestry

....
locality sale date

WARRANTY CARD

Surety's guarantee

for.....

living at.....
.....
for made by our factory tractor trailed sprayer
type.....
serial number....., year of production.....
during the first year of usage, it is.....
K.F.M.R. is not responsible for mechanical damage caused by the user. Any disability will be removed at our factory or, after notification by mail or telephone, we will repair service or replacement parts by mail within 14 days (during the season agrotechnic within 7 days) after notification.
1. The warranty applies to hidden defects caused by the fault of our plant as a result of material defects, poor machining or assembly and is free of charge repair or replacement of defective parts.
2. The warranty does not fall in those parts which wear occurs under normal operating.
3. A manufacturer may not be a complaint if:
- during the warranty period has been any change in equipment repair technicians or without the knowledge of the manufacturer
- equipment is stored or used at variance with the recommendations, instructions**.**
- the buyer can not find the original instructions to operate the equipment with the appropriate entries identifying the machine.
4. We assume no responsibility for any defects caused by the fault of third parties as a result of improper maintenance, transportation, use and storage.

WARNING!

- The manufacturer is not responsible for losses to crops caused by wrong adjustment of sprayers,
- Before starting the machine, sure that you understand the instruction.

....
stamp and signature of quality controller stamp & signature of seller

WARRANTY REPAIRS

Sin	Extent of the repair	Date of acceptance to repair	Date of end repairs	Stamp and signature of quality controller

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INFO@MARGUCIAI.LT

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Naudota technika iš Danijos: +370 656 24532

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Skandinaviškos technikos atsarginės dalys: +370 682 51607

Farmtrac atsarginės dalys: +370 626 19138

Chemikalų purkštuvai, patikra: +370 616 55819

Fermų įranga: +370 626 19138

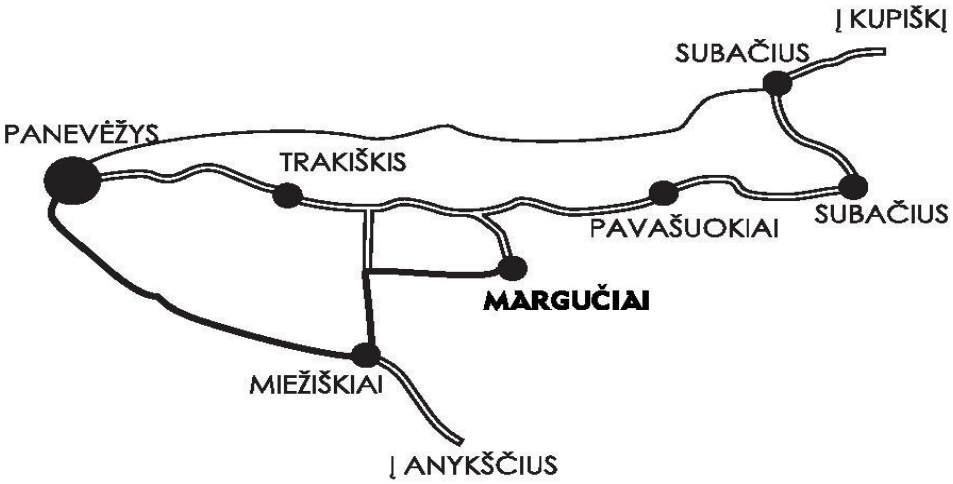
Servisas: +370 682 51607

Marketingas: +370 690 70226

Buhalterė: +370 616 55738

Direktorė: +370 699 73969

MARGUČIŲ G. 3, MARGUČIŲ K., MIEŽIŠKIŲ SEN., PANEVĖŽIO RAJ., LT-38100



Vieninteliai atstovai Lietuvoje