USER MANUAL

RAPTOR MIST

400L, 600L, 800L, 1000L
Ø 75 cm Fan - Gearbox System
Turbo Atomizer

SWIFT

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INTRODUCTION

This booklet contains the usage rules and maintenance information of "SWIFT RAPTOR MIST SERIES MODEL".

This book is also a part of the machine and provides information and a resource you can consult for safe and efficient use throughout its entire life cycle. Therefore, it should always be kept carefully in a safe place.

Plant protection activities against diseases and pests are an essential matter in the plant production cycle. These activities, which are also referred to as agricultural struggle, affect the whole society and the environment directly or indirectly. Since a complete alternative has not been revealed yet, the importance of product plant protection continues to a great extent.

Product products used in the most important part of product plant protection works and the machines used in their application constitute. The improvements in the efficiency and application doses of the plant protection products, the awareness about environmental and human health have also led to significant improvements in the machines used in the applications made with this method.

In the face of the rapidly increasing world population, the increase in agricultural products is not at the same rate. It is known by researchers that product loss has reached 35% due to insufficient plant protection measures in the world. Choosing the right medicine, the right equipment and the right method is of great importance for a successful agricultural struggle.

Since the tanks used in the sprayers are made of polyethylene or reinforced fiberglass, they are resistant and lightweight against corrosion caused by product and external conditions. With the support we receive from you, our continuous development policy, the importance we attach to R&D and our services will continue.

The user must carefully read and apply for safety and protection from possible accident rules specified for their own safety. Therefore, under all circumstances, it should be used by experts who have sufficient knowledge, who completely and carefully read the technical information and accident precautions contained in this book.

It should not be forgotten that it is the user's responsibility to monitor and control that the machine is used under the most appropriate conditions for human and environmental health and safety.

DISCLAIMER:
While additional model information is available in the manual, current machine availability for the Australia/NZ region is available via swiftagriculture.com.au

1.1 MACHINE DESCRIPTION

Swift RAPTOR MIST SERIES is the most innovative machine among the models. Thanks to years of experience, RAPTOR MIST SERIES models will provide you higher profit.

Atomizers are used in the production of garden crops to reduce the effects of diseases and pests and to kill weeds. They are agricultural control machines that deliver the effective substance of the chemical in the form of drops in a liquid carrier to the target plant surfaces. Modern atomizer are generally mounted or trailed on the tractor and are driven from the tractor tail shaft. As well, there are also self-propelled field sprayers.

It is especially important to prevent product losses caused by diseases, pests and weeds in obtaining more and higher quality products per unit area. The main purpose of agricultural spraying is to protect the plant product from the effects of diseases, pests and weeds in economic measures, to minimize product losses and to increase quality. Various agricultural methods are applied as the most effective and fastest solution against diseases and pests, which are the main factors that limit the yield of agricultural products. These methods can be listed as cultural, physical, biological quarantine and chemical methods. Although, in modern plant protection, the methods mentioned above are applied together in a balanced and conscious manner with the view of integrated control. The basis of chemical methods is the application of pesticides. Generally, herbicides are used as pesticides, fungicides for weeds, insecticides for bacteria and fungi.

We can examine the atomizer operating with the pressure energy provided by the pump in two ways as main and auxiliary parts. We can show the main part as chassis, tank, pump, regulator, spraying boom, auxiliary part strainer, filter pipes, hoses, nozzles, and spray guns.

1.2 TECHNICAL INFORMATION

MAIN PARTS

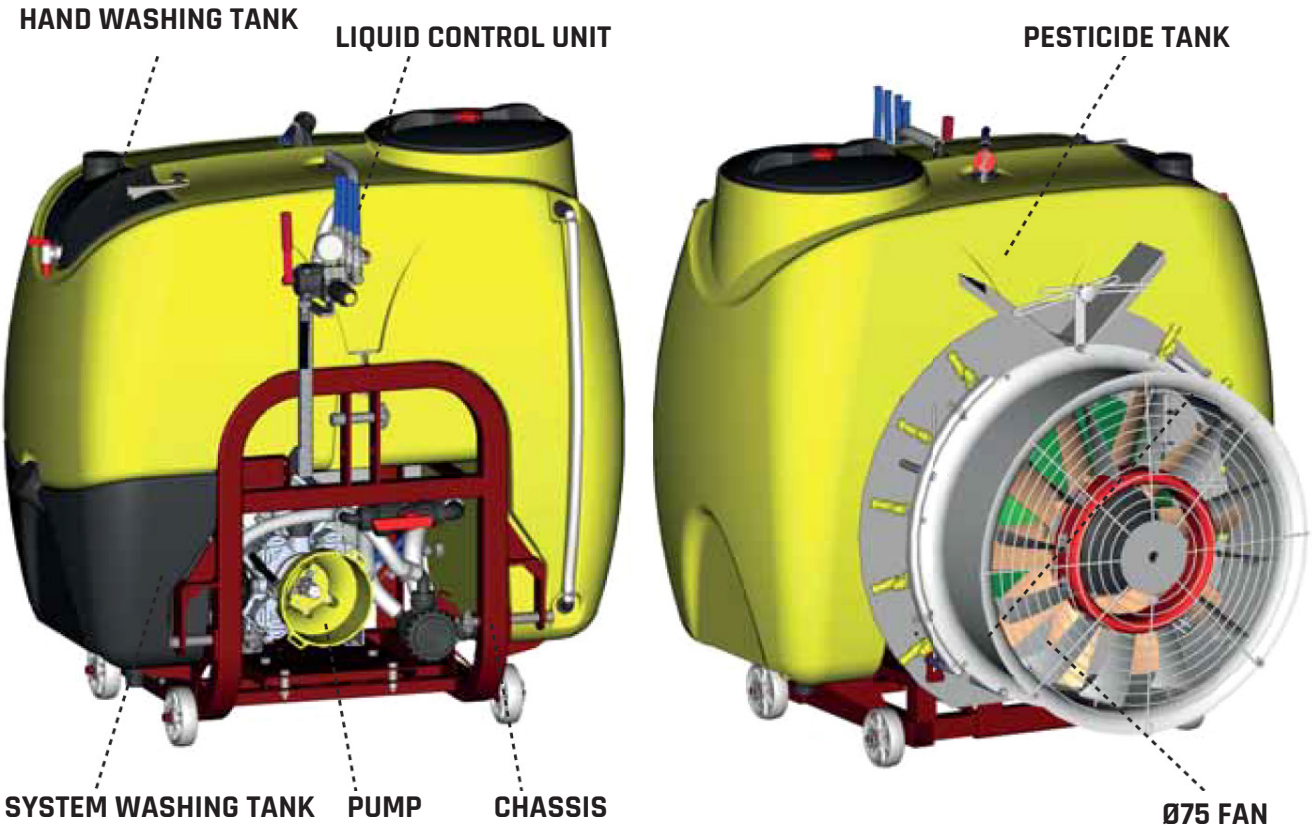


Figure 1

The dimensions of the machine vary depending on the capacity of the tank.

The indicated nominal volume is at least 5% less than the actual volume.

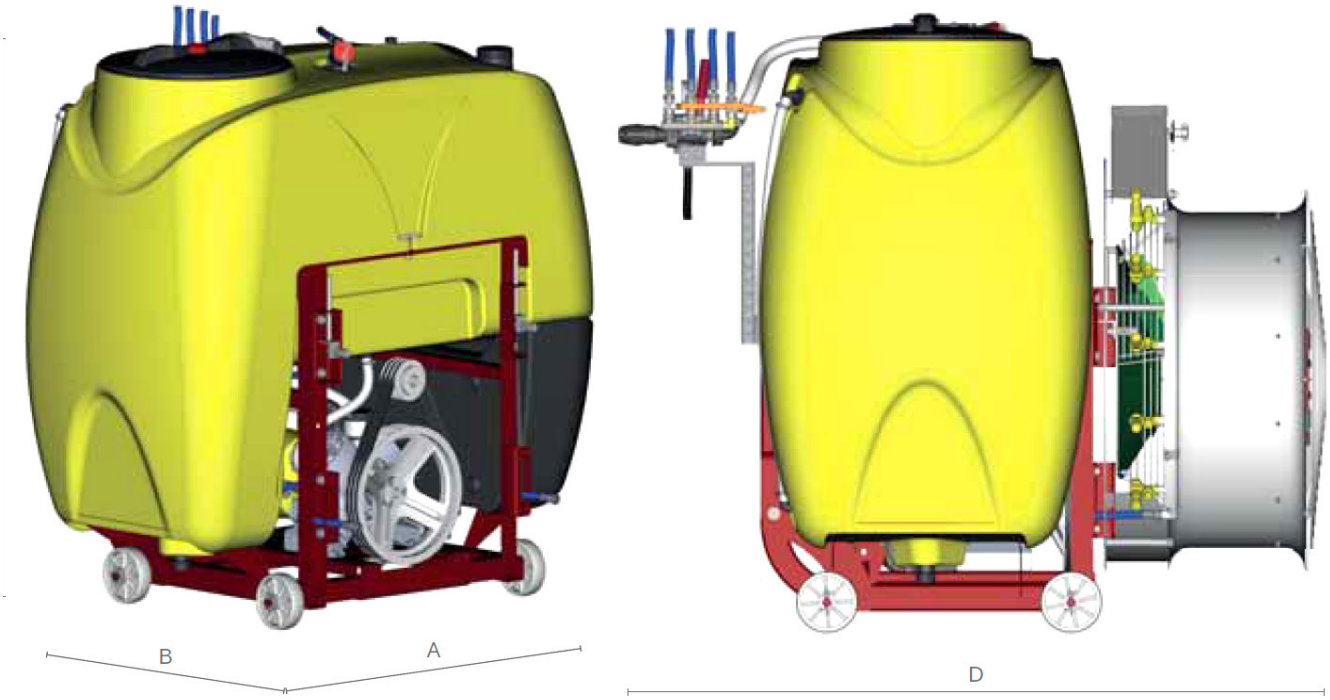


Figure 2

Model	Capacity (L)	Size (MM)				Weight (KG)
		A	B	C	D	
RAPTOR MIST 400	400	1373	750	1468	1563	128
RAPTOR MIST 600	600	1373	750	1502	1563	138
RAPTOR MIST 800	800	1774	750	1502	1563	150
RAPTOR MIST 1000	1000	1774	750	1747	1563	160

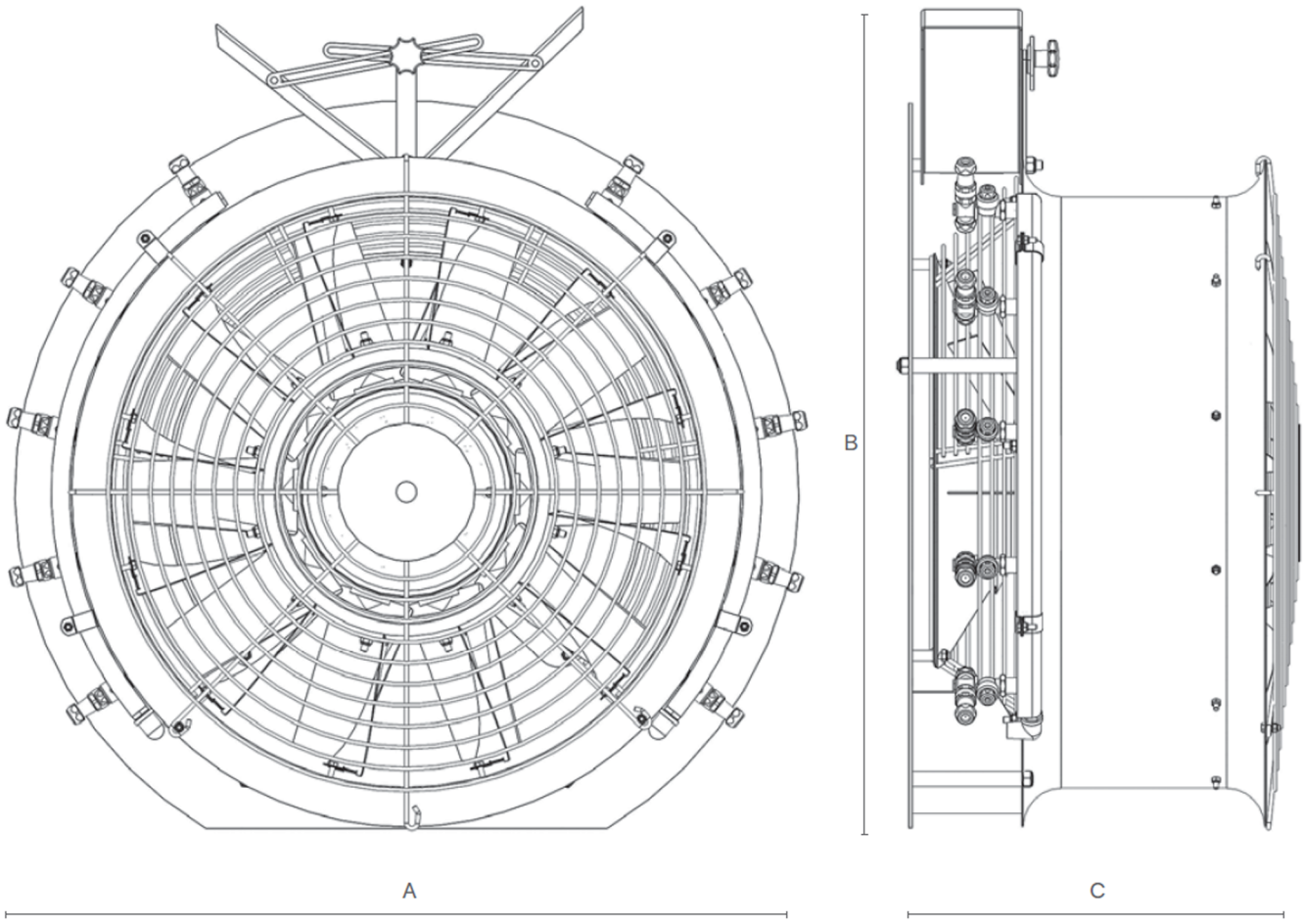


Figure 3

Model	Size (MM)			Weight (KG)
	A	B	C	
Ø 75 Fan	1018	1050	513	35

1.3 MACHINE INTRODUCTION LABEL

Each machine has an identification label on it (Figure 4).

1) Type of machine
2) Machine model
3) Machine license date and number
4) Machine serial number
5) Machine manufactured year
6) CE emblem

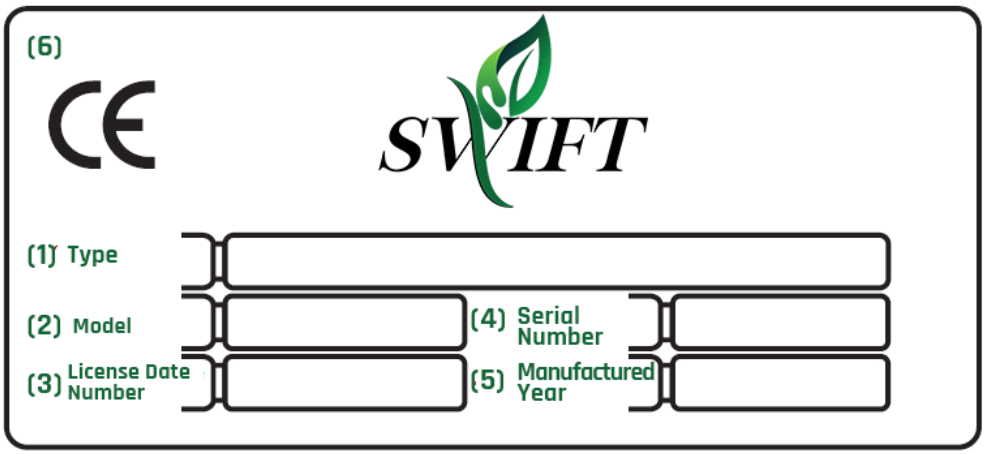


Figure 4

1.4 RAPTOR MIST SERIES MODELS

RAPTOR MIST 400

RAPTOR MIST 600

RAPTOR MIST 800

RAPTOR MIST 1000

1.5 SAFETY WARNING LABELS

Where all warnings are located on the machine is shown in Figure 5. Always keep these labels clean. Replace unreadable or worn labels with new ones. Read the descriptions carefully and memorize what each label means.

1. Never operate your machine without reading and understanding the machine's manual.

2. Please also read the pump manual of the machine.

3. Do not operate the machine indoors.

4. Take necessary safety precautions against accidents during operation.

5. Do not neglect to use a protective mask or glasses while setting the machine before starting the operation.

6. When maintenance and repair are required, wear protective clothing.

7. Never leave near the machine while it is working.

8. Do not remove any part on your machine.

9. Do not keep the pump pressure above the maximum pressure specified in the instruction.

10. Do not use the machine tank for the transportation and pulverization of flammable and explosive materials.

11. Do not operate the pump without oil by checking the oil level.

12. Do not use the machine on an unsuitable steep and sloping field.

13. Do not change the original parts of the machine. Do not have it repaired by persons other than authorized service. Otherwise, all problems arising from the use of sub-industrial parts and out-of-service repairs, under the user's responsibility.

14. Do not operate your machine when the tank is empty. the pump will take in air.

15. In starting and stopping the machine, adjust the pump pressure to zero with the regulator or turn off the driving shaft.

16. Do not remove the safety valve on the pump. This valve is activated when the maximum pressure of the pump is exceeded by 20 and sends the excess liquid back to the tank by the bypass, thus preventing the machine and pump from being damaged. In this way, it acts as a pump fuse.

17. Do not use the machine in windy weather due to the spraying mechanism. It will be harmful in terms of health and economy.

18. The optional hand washing tank in the machine is for hand cleaning. It should not be drunk or used for other purposes.

19. The provisions of the current legislation regarding the transportation, use, and disposal of pesticides should be learned and should be followed.

20. The information on the product label and the application instructions should be read carefully and should be followed.

21. Nothing should be eaten or drunk during the preparation and application stages of spraying.

22. The product should not be transported in a container other than its own packaging, especially with food and beverage containers.

23. This machine is used as a spraying machine in line with the definitions and safety instructions stated in the manual. SWIFT AGRICULTURE, is not responsible for any damages that may arise from other uses. the responsibility belongs entirely to the user.


20
BAR
Max 20 bar
540
Dk
Otherwise, it may cause damage.
Check whether the shaft length is suitable for the tractor. If the shaft is long, shorten it according to the tractor.

Figure 5

2.0 SAFETY INSTRUCTIONS AND ACCIDENT PRECAUTIONS

Pay attention to the signs indicated by the yellow symbol in the book.

There are 3 different levels of danger.

DANGER :
This sign warns that if the specified procedures are not followed and applied correctly, it will cause serious injuries, death and long-term health risks.

ATTENTION :
This sign warns that the specified procedures may cause serious injuries, death and long-term health risks if the procedures are not followed and applied correctly.

WARNING :
This sign shows a warning that serious injuries, death, and long-term health risks may occur if the specified procedures are not followed and applied correctly.

Read all instructions carefully before using the machine. If you have uncertainty at any point, contact the technicians of the our dealer. The manufacturer does not accept any responsibility for the consequences that may arise from failure to comply with the following safety and accident precautions and rules.

GENERAL RULES

1) Close attention should be paid to danger labels on the machine and in this manual.

2) The instruction sticking on the machine. Safety labels are essential recommendations to prevent accidents.

3) Safety and accident prevention rules should be carefully studied with the help of instructions.

4) Please, do not touch mobile parts with any form or any purpose.

5) In order to make any operation or adjustment on the machine, the engine must be turned off and the tractor must be in a fixed position.

6) Do not transport under any circumstances people or animals on the machine.

7) It is strictly forbidden to use or let the tractor be used by an unqualified, non-expert, or compromised person while the equipment is mounted.

8) Before starting the tractor and equipment, make sure that all transport and handling equipment is working without missing parts.

9) Before operating the equipment, make sure that there are no obstacles, especially people, children or animals, and that you have a clear view.

10) Wear appropriate clothing for your job. Avoid wearing loose or loose clothing that could be caught in the moving parts of the tractor or equipment.

11) Be sure to check all control devices before starting work.

12) Do not start working with the equipment until you are sure that all guards are in good condition, in place, intact and safe.

13) Do not stay inside the working area where the machine has moving parts.

14) The use of equipment without tank covers and guards is strictly prohibited.

15) The driver's seat should never be left while the tractor is running.

16) Before operating the equipment, make sure that all parts are correctly assembled, adjusted, and in good working condition.

17) Do not load to the tank beyond its capacity.

TRACTOR LINKAGE

18) Mount the equipment to the tractor with sufficient power, hydraulic lifting capacity, and connections that comply with the standards.

19) Equipment tips must be in the same category as tractor hydraulic lift tips.

20) Remember that the working area of the hydraulic lifting arms during the landing and taking off of the equipment is the danger zone.

21) Be extremely careful when connecting and disconnecting equipment to the tractor.

22) It should be remembered that there are moving parts between the equipment and the tractor, and it is strictly forbidden to stay in this area. (Figure 5)

23) It is strictly forbidden to stand in the area between the tractor and the implement while the engine is running and the cardan shaft is connected. (Figure 5) It is only possible to work in this area after the handbrake is pulled, the wheels are chocked and all the equipment and tractor parts are blocked.

24) The equipment to be connected to the tractor changes the load distribution of the axles. Check whether the load brought by the machine to the 3-point suspension system is suitable for the tractor load capacity. It is recommended to add appropriate weights to the front of the tractor to balance the load on the axles.

25) Consider the Maximum transportable capacity for axles, total load distribution, transport instructions and rules.

26) Do not connect any equipment behind the machine. **(Figure 7)**

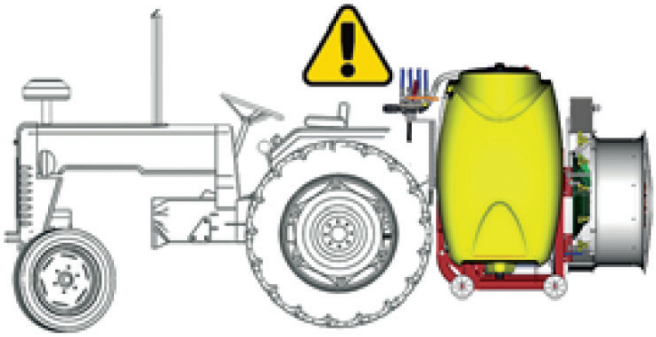


Figure 6

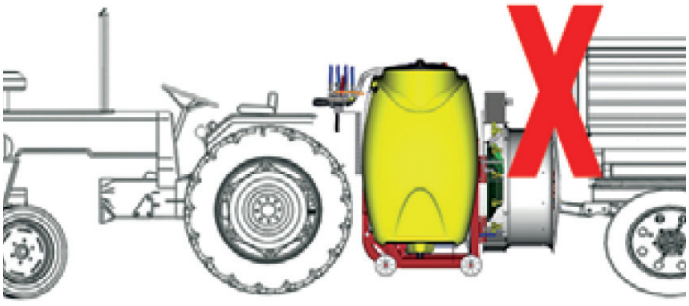


Figure 7

27) The machine can be mounted to any tractor of suitable power with a 3-point suspension system. Bring the lower hydraulic lifting arms of your tractor by maneuvering in a way that they will approach the lower connecting pins of the machine. Get off the tractor and attach the safety pins by connecting the lifting arms on the right and left to the pins. **(Figure 8)**

28) Attach the adjustable upper arm of the tractor to the appropriate level of the upper suspension points on the machine chassis and attach the safety pin. **(Figure 9)**

Check that the connection and safety pins are connected in the correct position.

Connecting the machine to the tractor is a step that requires extreme attention. For this, you should pay close attention to all the following points and make sure that no person comes near the machine.

Restrict the swinging of the lower arms with the help of the adjustment lever (Figure 10), and at the same time make sure that the ground heights are equal.

Bring the machine to the same axis with the tail shaft of the tractor with the hydraulic arms of the tractor, and mount the P T O shaft in this position.

Our company is not responsible for problems arising from such malfunctions.

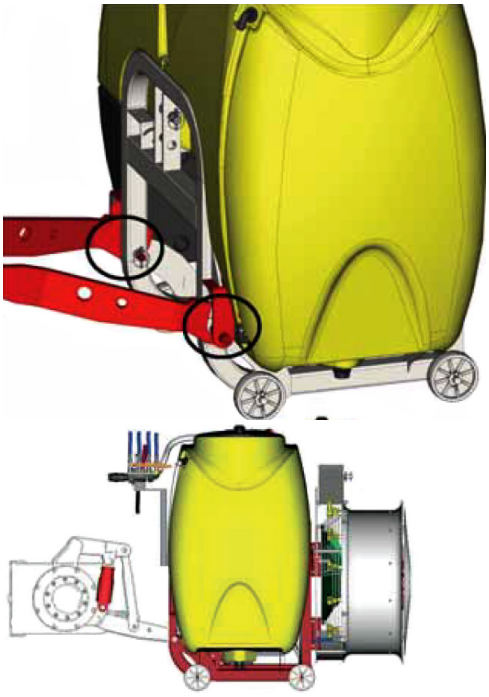


Figure 8

Figure 9

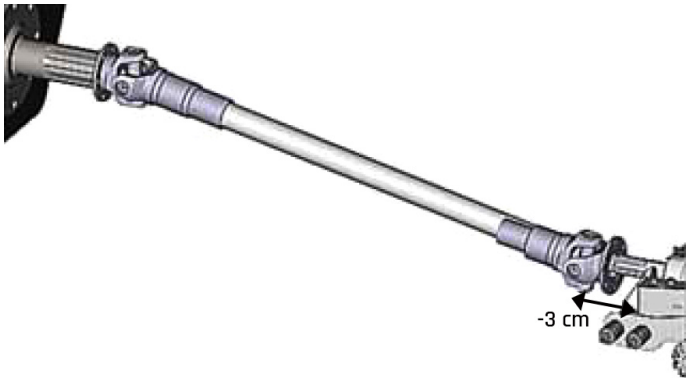


Figure 10

P.T.O. SHAFT (ARTICULATED SHAFT)

Connect the transmission shaft properly between the tractor PTO shaft and the pump crankshaft.

ATTENTION

29) Pay attention to the following points while connecting the shaft.

While A-the shaft mounted, make sure that the guards fixed to the tractor and the machine for all working angles, horizontal and vertical, are long enough to cover all rotating parts.

B-Check that the guards, rotating parts are fully covered when the shaft is at the maximum working angle.

C-Make sure that the joint heads of the shaft are correctly fixed to the tractor and the machine, taking care to attach the side of the tractor mark on the shaft guard to the tractor tail axle.

D-Fasten the casing of the shaft to the tractor and the machine with a suitable chain preventing rotation. **(Figure 11)**

E-Never under any circumstances use the shaft without a guard and fastening with chains. When the angle of the joint exceeds 35 degrees, stop the tractor. **(Figure 12)**

F-When not in use, do not leave the shaft uncovered or protect it in a closed place against weather influences.

G-Check all parts are working properly and lubricate joints before use.

H-Shaft spindle has 6 keyways. The suitable operating speed is 540 rpm. **(Figure 13)**

30) Start your tractor and lift the equipment using the lower hydraulic lift arms.

31) Adjust the length of your tractor's upper link arm until the implement stands parallel to the ground.

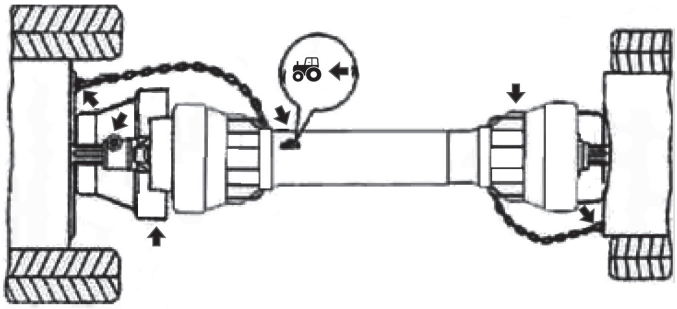


Figure 11

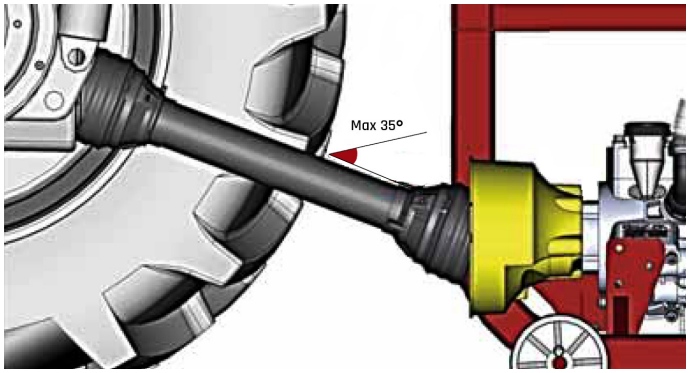


Figure 12

Figure 13

32) The equipment should only be used with a P.T.O shaft with the necessary safety equipment and protections connected with suitable chains against overloads.

33) Only the P.T.O shaft supplied by the manufacturer should be used.

34) When inserting or removing the P.T.O Shaft from the tractor, the engine must be turned off.

35) Pay attention to the correct mounting and safety of the P.T.O shaft.

36) Pay attention to the movable universal connection points.

37) Clean and grease the P.T.O shaft only when the P.T.O shaft is disabled, the engine is turned off, the handbrake is on, and the key is removed.

38) Put the P.T.O shaft protection cover again after removing the P.T.O shaft.

39) If you are going to use your machine on a different tractor, check the length of the P.T.O shaft.

THE ADJUSTMENT OF P.T.O. SHAFT

40) The P.T.O shaft supplied with the machine has standard dimensions. Therefore, it may be necessary to adapt the P.T.O shaft to the tractor or machine. In this case, consult the manufacturer for the necessary adjustment before doing anything.

• First, bring the shaft to its shortest position and mark the cut size To adjust the length of the P.T.O shaft. (Figure 14).

• Cut the protectors of both male and female parts of the shaft to the same size. (Figure 14)

• Cut the shafts to be the same size as the guard. (Figure 14)

• Remove burrs D, Figure 14 and lubricate the shafts. (Figure 14)

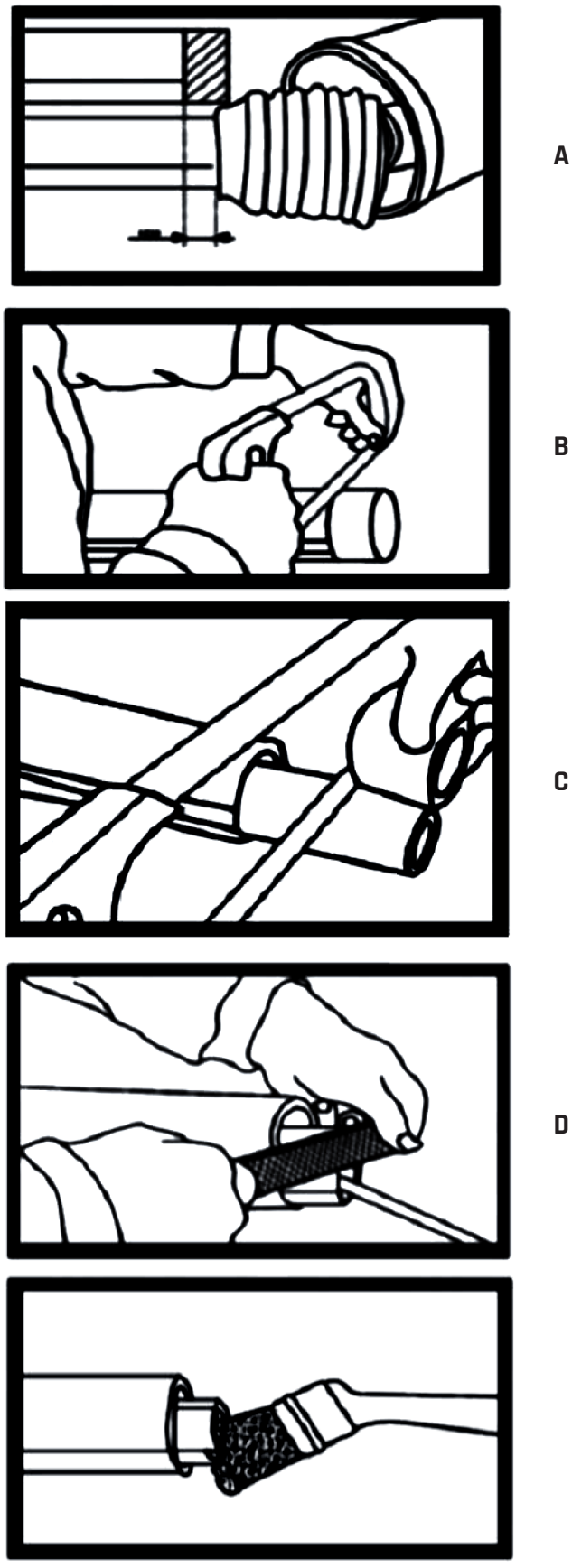


Figure 14

POST-OPERATION MAINTENANCE OF P.T.O. SHAFT

- After the operation of the shaft, check whether there is any breakage or deterioration in the housing and parts of the shaft. If a problem is observed, the shaft is not operated until the problem is solved.
- The shaft is lubricated within the hours indicated in the Figure shown below. (Figure 14)

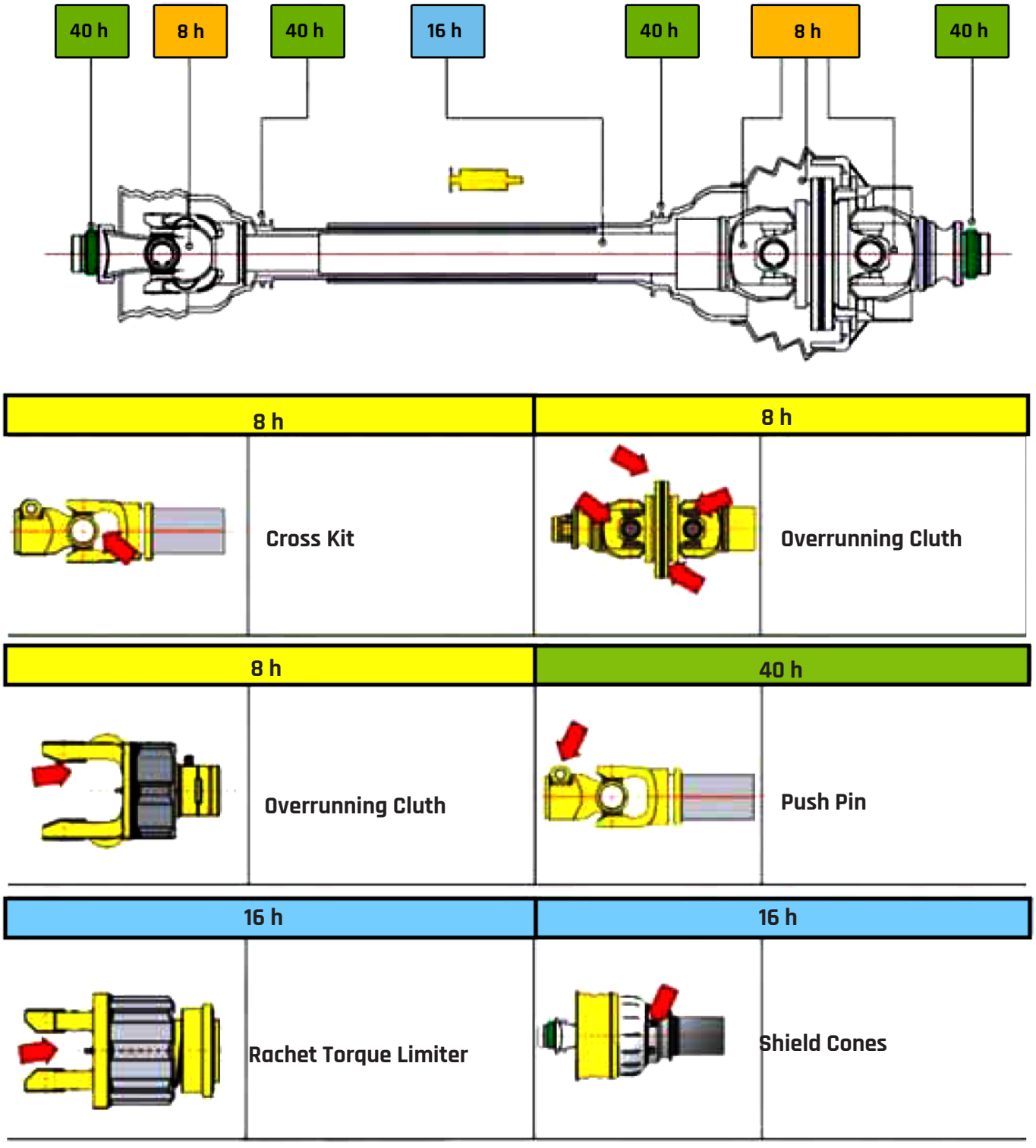


Figure 15

TRANSPORT ON THE ROAD

If the machine needs to be transferred, it should be carried out with a suitable lift of sufficient capacity after the specified connection points are connected with suitable hooks. Since accidents may occur if these procedures are not done properly, they must be done by authorized and trained people.

41) When transporting on public roads, follow the road and traffic rules of your region.

42) It should be kept in mind that the transported or trailed equipment has different load distribution in the road position, increases in braking and steering distances, and sometimes even lateral deviations may occur.

43) It is necessary to consider potholes and bends on the road. It is necessary to be very careful about the deviations in the center of gravity that the centrifugal force can cause. The same attention should be paid on rough roads and grounds, with or without equipment.

44) For transportation, the tension chains of the tractor's side drawbars must be tensioned, move the hydraulic control lever to the locked position.

45) If requested, the factory will be able to supply signaling devices to carry equipment.

TRACTOR-MACHINE BALANCE DURING TRANSPORT

When the machine is attached to a tractor, it becomes a part of it. Due to imbalances, difficulties can be experienced on the road, while driving. In order to ensure a balanced weight distribution on the tractor, weight can be loaded at the front.

When the machine is attached to a tractor, it becomes a part of the overall machine weight. Due to imbalances, difficulties can be experienced on the road, while driving. In order to ensure a balanced weight distribution on the tractor, weight can be loaded at the front.

These factors are summarized with the formula below.

Z≥ [Mx(s1+s2)]−(0.2xTxi) / (d+i)

The symbols used in the formula can be seen in Figure 16.

M : (KG) Weight of the fully loaded machine
T : (KG) The weight of the tractor
Z : (KG) The front Weight
İ : (M) Distance between wheel axes
d : (M) Distance between the center of The front Weight and the front wheel axis
s1 : (M) Distance between rear wheel axis and the point where the machine is mounted
s2 : (M) Distance between the center of gravity of the machine and the point where the machine is mounted

The result with the formula gives us the minimum value of the preload. Preload can be increased for better performance. For the maximum value of the preload, refer to your tractor's manual.

A negative value indicates that no preload is required. Check whether the wheels of your tractor are suitable for loading.

During Transport

Do not allow to climb on the machine during transport or operation.

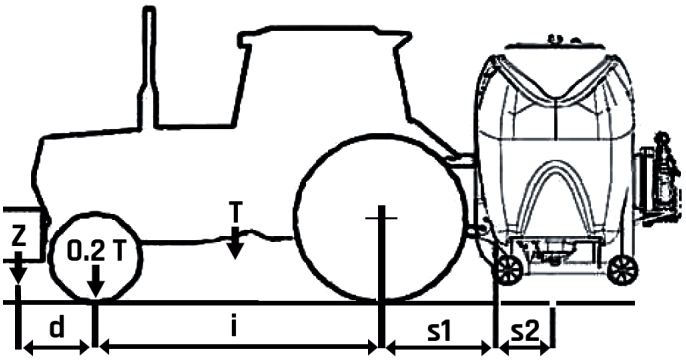


Figure 16

Take the PTO shaft in neutral while moving on the road position. Attach the "Heavy Load" warning sign. Please obey the traffic rules while on the road.

Carrying out the transportation of the machines with the help of wheels mounted on the chassis.

Carrying out the transportation of the machines with the help of wheels mounted on the chassis.

Carry the machine with the help of a hoist and crane by lifting the rope under the chassis.

Make sure that the pump and tank are not damaged during transportation.

2.1 LOADING PROCEDURE

Lifting and handling should be carried out while the tank is empty and using appropriate equipment by qualified personnel specialized in this type of operation.

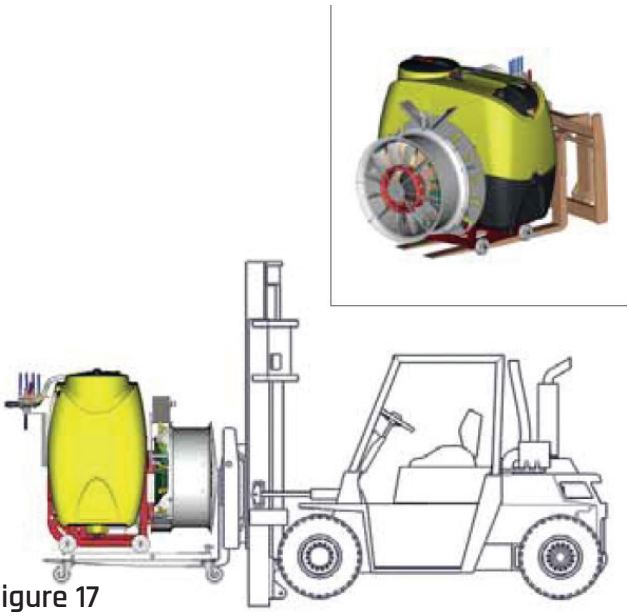


Figure 17

Place the forklift's forks under the machine.

3.0 OPERATING INSTRUCTIONS

To get the best performance from the equipment, carefully follow the instructions given below.

All maintenance, adjustment and preparation operations should be done while the PTO shaft is disabled, the tractor should not be running, the wheels should be blocked and the ignition should be turned off.

3.1 ISSUES TO BE CONSIDERED BEFORE STARTING WORK

1.) The level in the oil bottle should be between the lower and upper limit. (Figure 17)

If the level is lower than the lower limit, add No 20 W 50 engine oil.

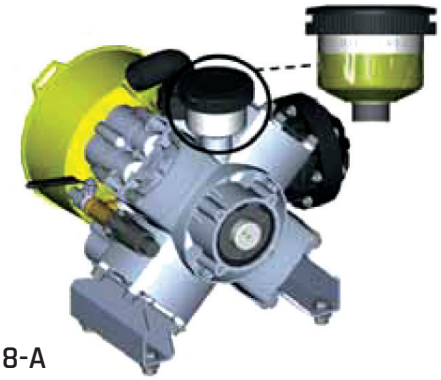


Figure 18-A

Figure 18-B

2.) There should be no air leakage in the suction circuit. Elbow nut. (Figure 18) hose clamps. (Figure 19) gaskets and o rings should be checked and tightened. Otherwise, the efficiency of the pump will decrease due to air leakage.

Figure 19

Figure 20

3.) Open one of the taps by placing the regulator's by-pass handle to the pressure position and let all the air out by operating the pump at zero pressure for 1, 2 minutes. (On FPR regulators) (Figure 20)

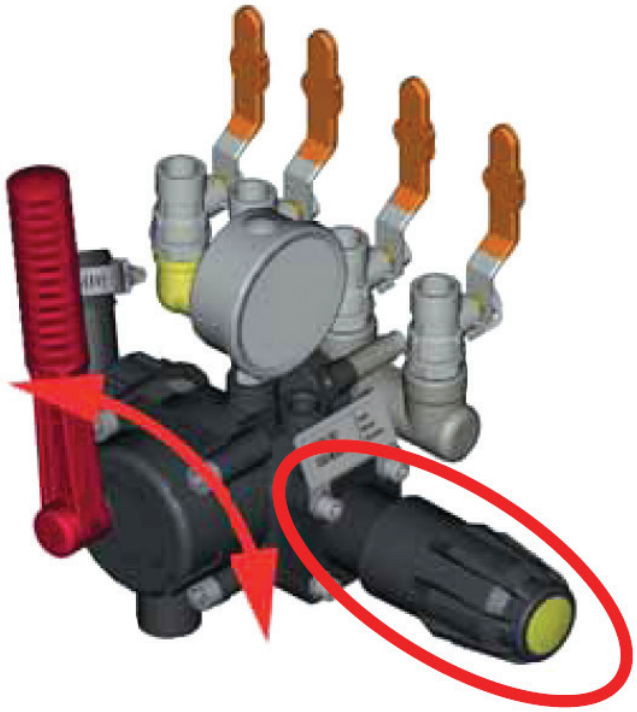


Figure 21: OSR Regulator

3.) Open one of the taps by placing the regulator's by-pass handle to the pressure position and let all the air out by operating the pump at zero pressure for 1, 2 minutes. (On FPR regulators) (Figure 21)

The rotational speed of the pump should never exceed 540 rpm. In this period, the specific fuel consumption of the tractor is the lowest.

In addition, an increase in pressure and efficiency cannot be achieved above this cycle. There is only unnecessary wear and tear.

The user is responsible for damages resulting from usage at increased rotation speeds.

3.2 PROHIBITED USES

1. Do not operate without oil and under high pressure.

2. Do not damage the pump during transportation.

3. Do not perform the spraying process by connecting the boom to the front of the tractor.

4. Do not enter the tank under any circumstances.

5. Do not park the machine on an incline [park on level ground].

6. Do not operate shaft without safety guard.

7. Do not stand between the tractor and the machine while working. Otherwise, serious injuries can be caused by the shaft

3.3 RAPTOR MIST USAGE INFORMATION

You must comply with the following points to achieve success throughout the lifetime of the machine.

1. The efficiency and life of the agricultural machine depends on careful maintenance.

2. Select the product recommended by your agronomist.

3. Find out how much water will be mixed with the product you will use and how much it will be applied per hectare.

4. Determine the application time well, taking into account the climatic conditions, paying attention to rainy and windy days.

5. Any repair, maintenance and adjustment should be made after the machine has been stopped and never remove the safety devices.

6. Following down below points while connecting the sprayer to the tractor.

7. Connect the drive transmission shaft between the tractor PTO shaft and the pump shaft. The shaft should be in the same axis as the horizontal as possible. Whatever happens, it should not make an angle of more than 35 ° with the horizontal.

8. If the shaft length is long, it should be cut or adjusted as necessary. Do not increase the power take-off speed above 540 rpm.

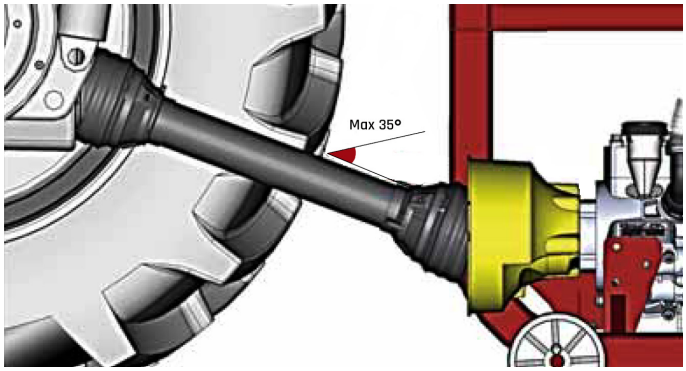


Figure : 22
Connecting the Shaft Between the Tractor and the Machine and Its Angle.

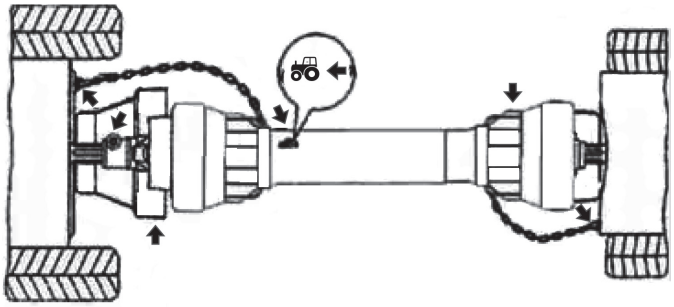


Figure : 23
Attaching the shaft chain to a fixed part of the tractor

3.4 USE OF THE MACHINE

3.4.1 TANK FILLING

3.4.1.1 CHEMICAL TANK FILLING

The machine can be attached to any tractor of suitable power with a 3-point mounted system.

3.4.1.1 (A) OSR CONTROLLED SYSTEM

3.4.1.1 (A:1) FILLING FROM THE TANK LID

Fill the water required for filling from an external water source located higher than the tank cap. (Figure : 24)

The cap filter must be installed İnside the tank cover during the filling process.

Figure 24

Figure 25

3.4.1.1 (A.2) FILLING WITH QUICK FILLER

Connect the equipment and transmission shaft to the tractor as described in the manual.

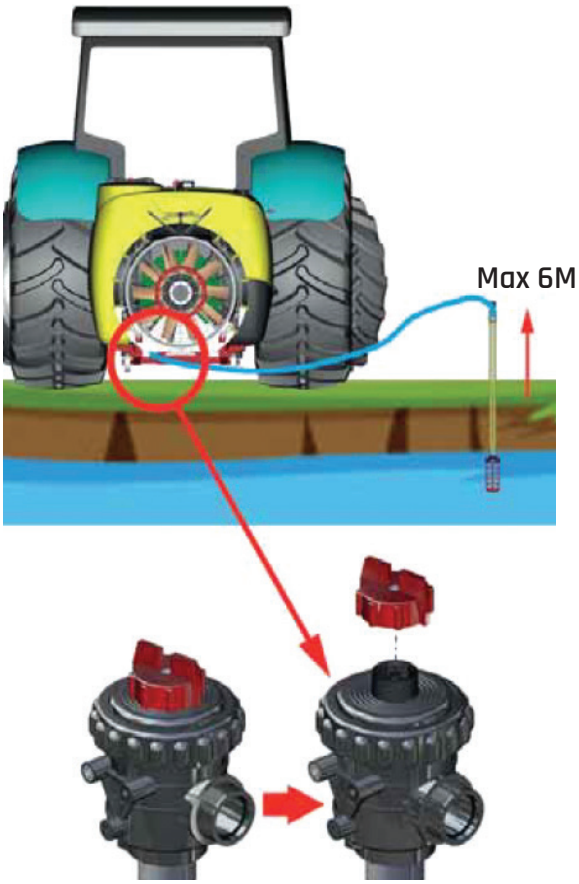


Figure 25

Move the regulator by-pass handle to the tank return position.

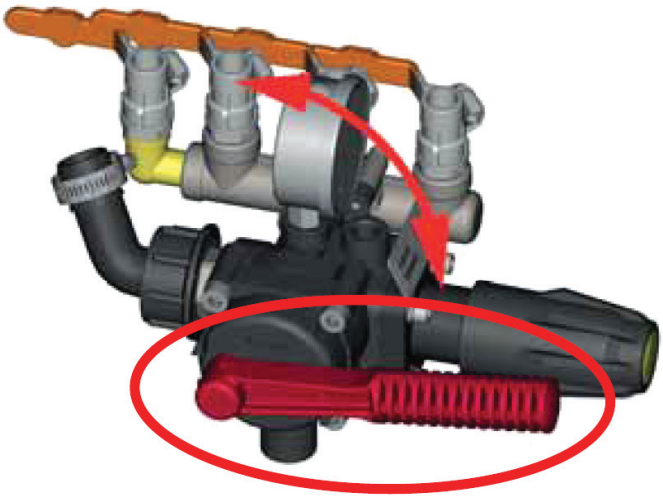


Figure 26

Start your tractor and run the PTO.
Raise tractor gas until suction starts from the external suction hose and make sure that suction starts.

Thanks to this special system, the tank will be filled in a short time.

You can track how many liters of water are filled with the transparent hose, colored ball and embossed level markers on the tank. (Figure 27)

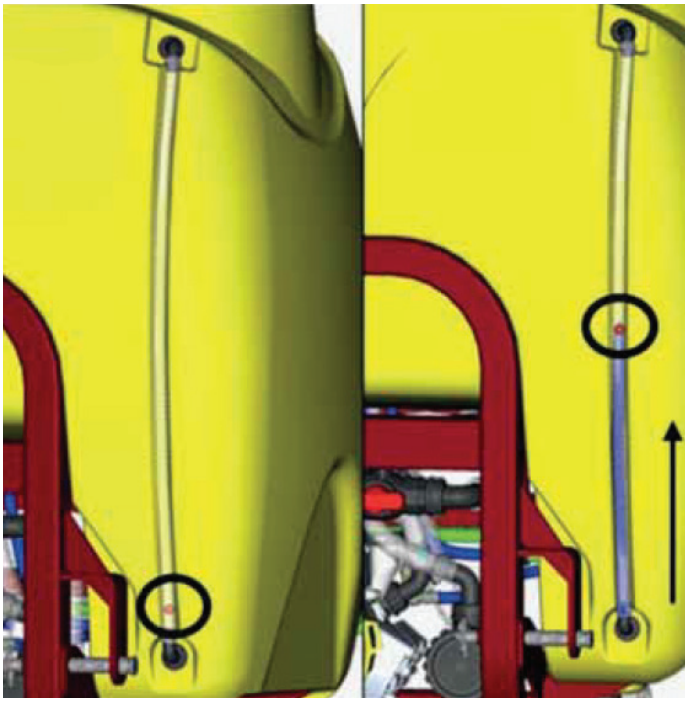


Figure 27

When the tank filling is finished, lower the tractor gas(to idle position) and stop the PTO shaft.
Then remove the stream taker hose (Figure 28) and replace the cover of the check valve filter. (Figure 29)

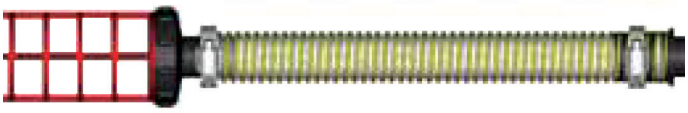
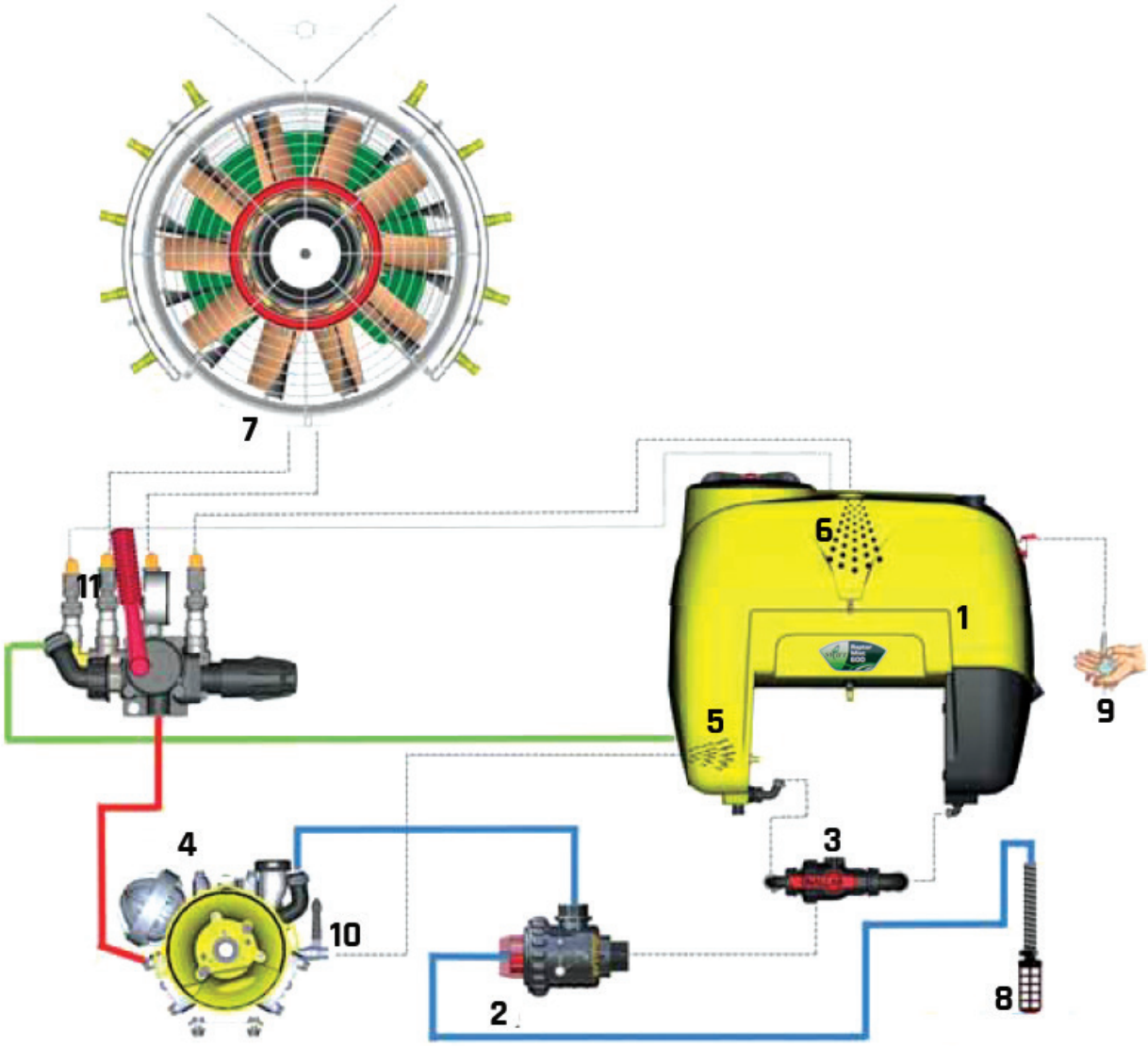


Figure 28

Figure 29

3.4.1.1 (A2) FILLING WITH 3 WAY CHECK VALVE SUCTION FILLER



PRESSURE LINE

SUCTION LINE

RETURN LINE

NO	PART NAME
1	Tank
2	Filter
3	3 Way Valve
4	Pump
5	Hydraulic Mixer
6	Tank Washing System
7	Fan
8	External Suction Hose
9	Hand washing
10	Filler
11	Regulator

Connect the filter end of the external suction hose to the external water source and the other end to the quick filler on the machine.

Move the regulator by-pass handle to the tank return position.

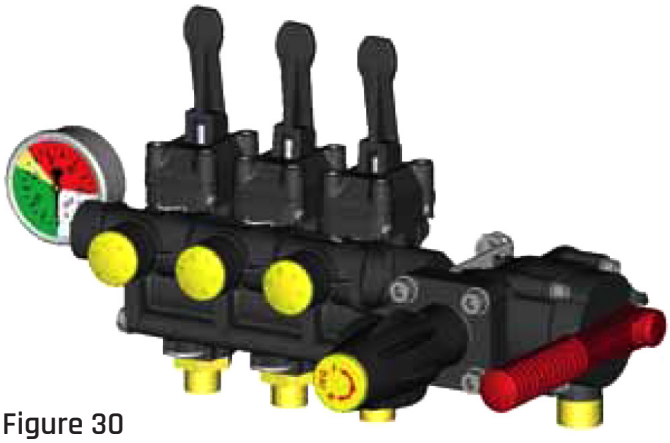


Figure 30

Start your tractor and move the PTO shaft.

Raise tractor gas until suction starts from the external suction hose and make sure that suction starts.

Thanks to this special system, the tank will be filled in a short time.

You can track how many liters of water are filled with the transparent hose, colored ball and embossed level markers on the tank. (Figure 31)

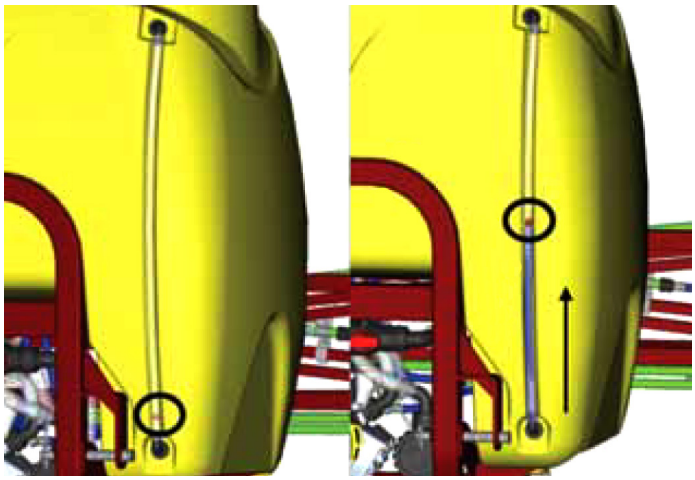


Figure 31

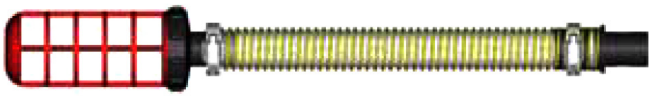


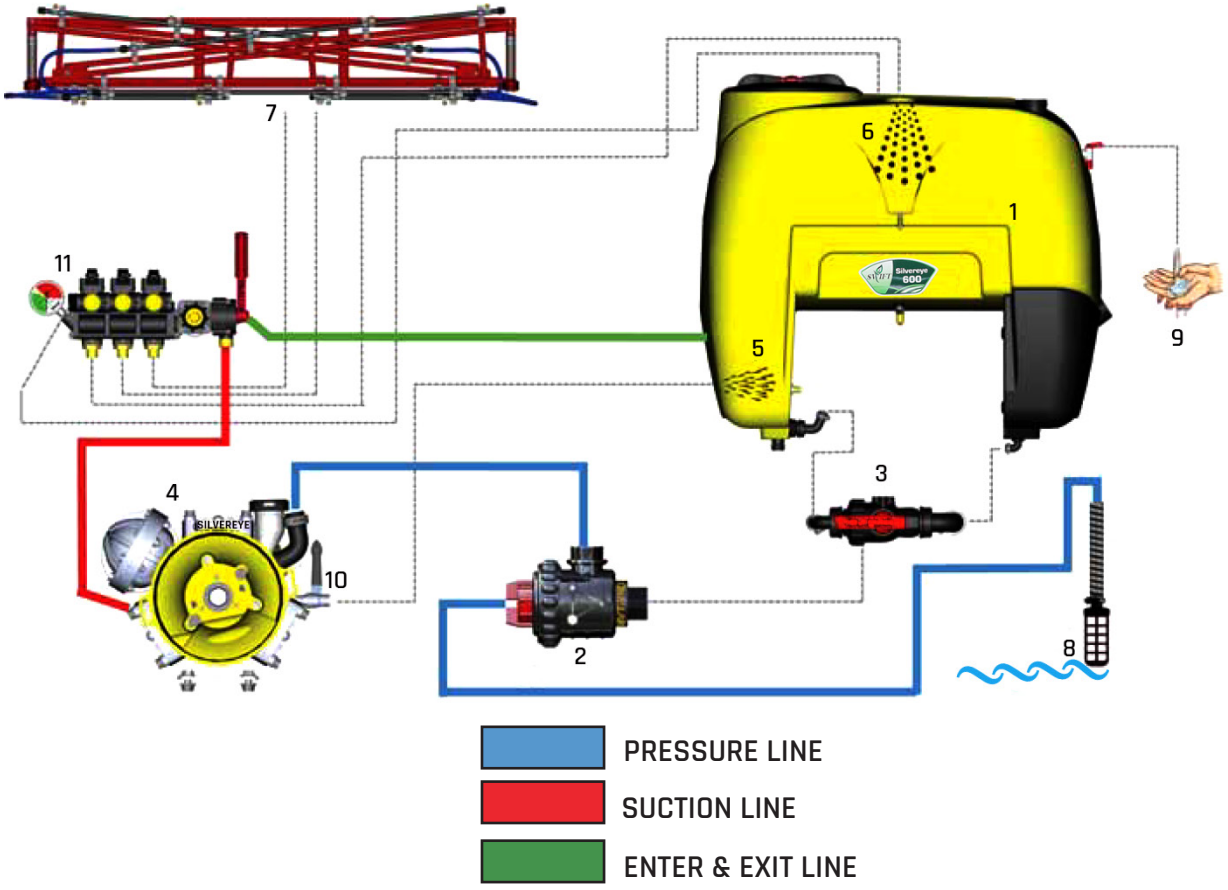
Figure 32

Figure 32

When the tank filling is finished, lower the tractor gas(to idle position) and stop the PTO shaft.

Then remove the external suction hose (Figure 32) and replace the cover of the check valve filter. (Figure 33)

3.4.1.1 (B.3) FILLING WITH CHECK VALVE SUCTION FILLER DIAGRAM



NO	PART NAME
1	Tank
2	Filter
3	3 Way Valve
4	Pump
5	Mixer Hydraulic
6	Cricut Tank
7	Boom
8	External Suction Hose
9	Hand washing
10	Filer
11	Regulator
12	Cricut Tank

3.4.1.2 FILLING OF THE SYSTEM SOLUTION TANK

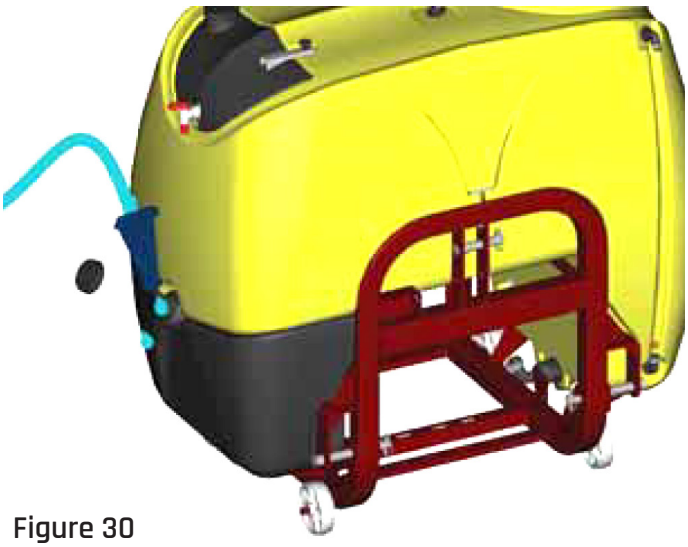


Figure 30

3.4.1.3 FILLINGTHE HAND WASHING TANK

Fill the hand wash tank with clean water through the filling cap via an external hose.

Figure 31

WARNING

Warning Do not drink the water in the handwashing tank.

3.4.2 PRODUCT PREPARATION AND MIXING

WARNING

Before starting the preparation of the chemical product, take all necessary precautions to prevent contamination to humans, animals and the environment.

Reminders

- Wear protective clothing to avoid direct contact with body parts, especially in the presence of wounds.
- Wear personal protective equipment, rubber gloves, dust masks, goggles and helmets to protect your face, head and hands.
- Do not use protective equipment that is not in perfect condition, especially check the condition of the gas mask and cabin filters.
- Keep product products out of the reach of unauthorized persons (especially children and persons with disabilities).
- Arrange all the necessary equipment to handle the product product and mixture during preparation, filling, emptying and cleaning of the tank, as well as product distribution, adjustment, replacement or addition of plant protection products and maintenance operations.
- Calculate the exact amount of the product to be mixed according to the application surface according to the instructions given by the manufacturer. Do not mix different products.

Do not dispose of the product, mixture or other contaminating material into the environment. Disposal should be done in accordance with current waste regulations.

WARNING

If the product or mixture accidentally comes into contact with the skin, wash your skin immediately with clean water. Seek emergency medical assistance in case of illness.

3.4.2.1 HYDRAULIC MIXING

1. Connect the equipment and your transmission shaft to the tractor as specified in the manual. (page 17).

2. Start your tractor and run the PTO shaft.

3. Add from the tank cover of the mixture you have prepared in the ratio specified by the manufacturer (Figure 32).

Figure 32

4. Open the hydraulic mixer valve wich is on the pump (Figure 33)

WARNING

During the product mixing process open the valve connected to the hydraulic agitator wich is on the pump. Before opening the valves put the three 3-way valve of the suction line in the spraying tank position.

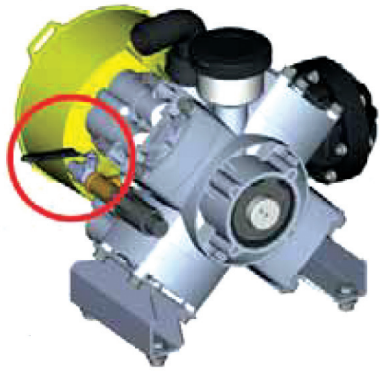


Figure 33

5. Make sure that the by-pass of regulator is in the regulator input lever position. (Figure 34 For Optional FPR Control).

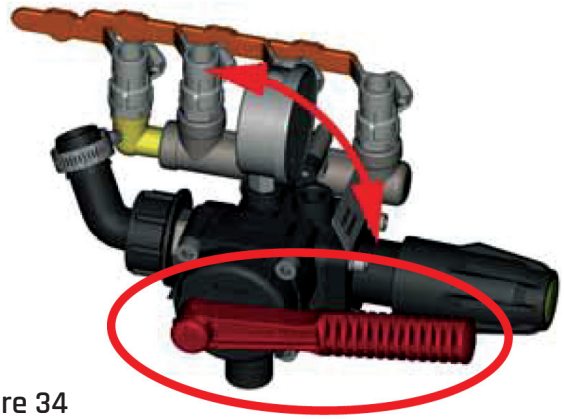


Figure 34

6. To adjust the speed of the hydraulic mixer change the pressure setting of your regulator. (Figure 35).

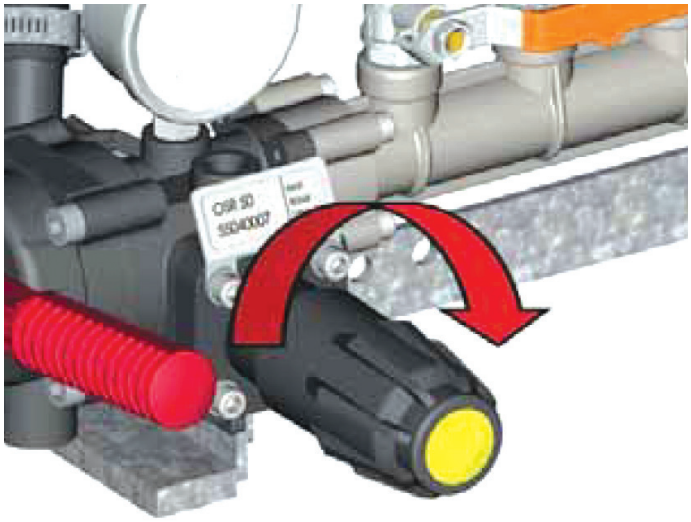
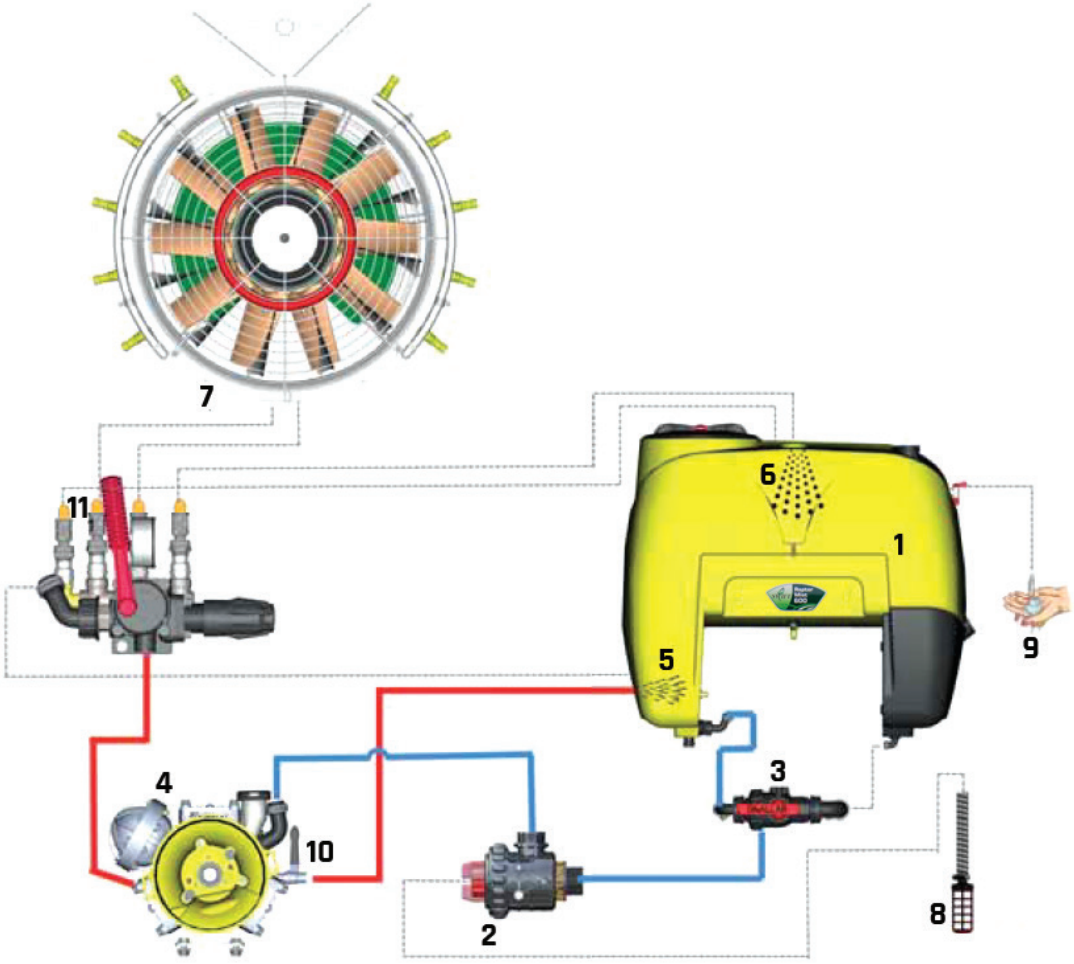


Figure 35

3.4.2.1 HYDRAULIC MIXER

3.4.2.1 (A) OSR CONTROLLED SYSTEM



PRESSURE LINE

SUCTION LINE

NO	PART NAME
1	Tank
2	Check Valve Filter
3	3 Way Valve
4	Pump
5	Hydraulic Mixer
6	Tank Washing System
7	Fan
8	External Suction Hose
9	Hand washing tank
10	Mixer Valve
11	Regulator

3.4.3 CAUTION

Consider the following requirements.

- Check whether there is or no power lines and / or tree-like objects in the field and evaluate the contact risk with spraying bars.
- Check the slope of the land to evaluate the optimal conditions for a safe work. Always remember the maximum slopes allowed.
- When spraying while moving across the slope follow the instructions with the utmost care.
- Before you start spraying an area, check if there is enough liquid in the tank.
- While spraying being aware of the weather conditions it's important.

Figure 36

Figure 36: Regulator spraying pressure position and adjustment of the pressure.

Prevent people to approaching the working area of the equipment while the equipment is in use. If necessary, stop spraying immediately and send out people from risk area.

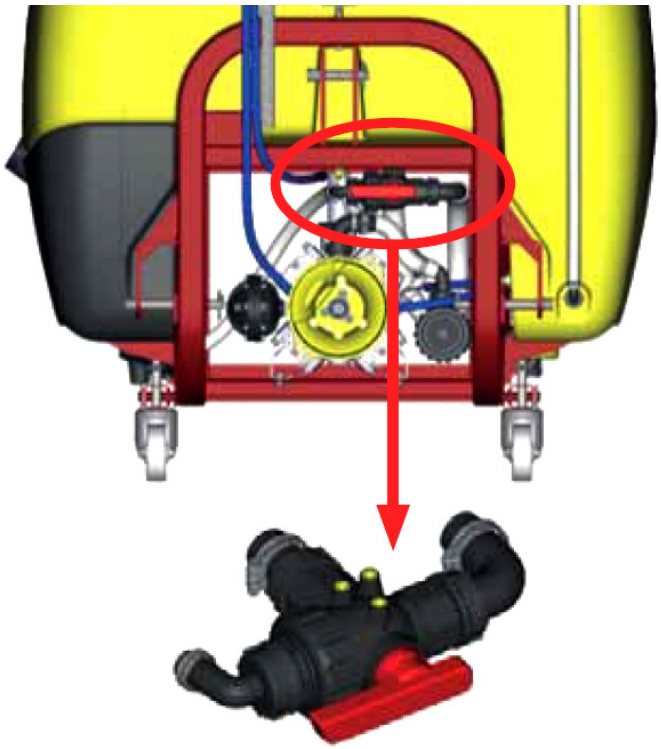


Figure 37

Before opening the valves in the chemical mixing process, turn the 3-way valve on the suction line to the spraying tank position.

Regulator must be in the spraying position and pressure adjustments must be made.

Pressure adjustment is made by turning regulator pressure adjustment knob. If desired to obtain the required flow and pressure the mixing valve can also be turned off.

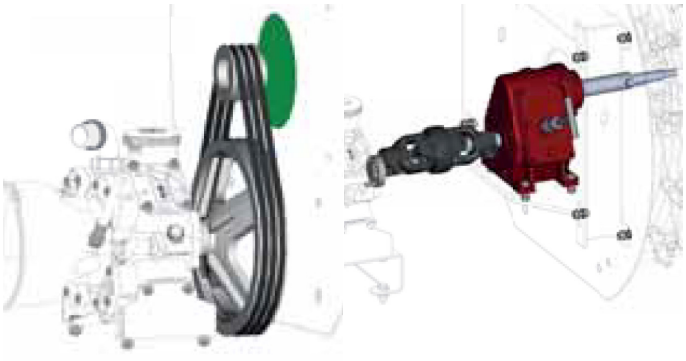
The chemical to be spray norm is determined by looking at the nozzle feature from the chart and according to required tractor speed. (see spraying norm (flow rate) setting section).

3.4.3.1 ATOMIZER FAN

1. The spraying fan (Figure 38) is connected from the center in a balancing way and is tensioned by springs from the right and left sides.

Figure 38

2. Movement between pump and fan is done by the gearbox. Thus, when the crankshaft starts the pump, the turbo fan also works. (Figure 39)



Pulley-belt System **Gearbox System**

1. Moreover, when operating the suspended equipment on the road, it is mandatory to display an Attention label in accordance with traffic and safety regulations. (Figure40)

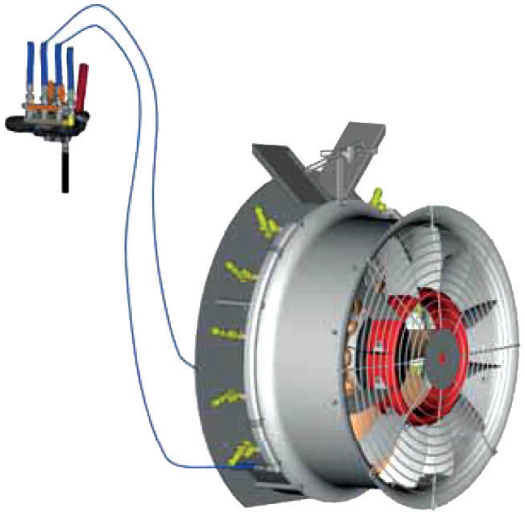
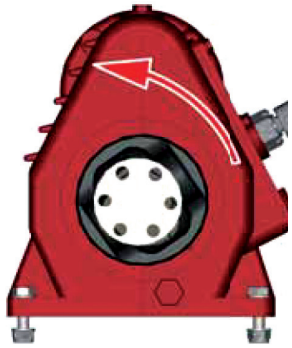


Figure 40

Turbo atomizer with gearbox rotates counterclockwise.



Rotates counterclockwise Gearbox System

Figure 41

3.4.3.2 CALIBRATION

Adjustment of the deflectors

In turbo atomizers, deflectors are used to optimally regulate the air flow towards the area to be sprayed.

To reach the correct air curtain, gently pull or push the deflector on the turbo atomizer to the desired position. (Figure 42)

Figure 42

Adjustment of the Pulley-Belt

The belt may loosen after the fan has been running for a while. This can be detected by an abnormal sound, rubber smell and vibration of the machine at first start-up. For belt adjustment, loosen the bolts on both sides of the chassis (Figure 43A) and lift the fan up and tighten the nuts again. (Figure 43B)

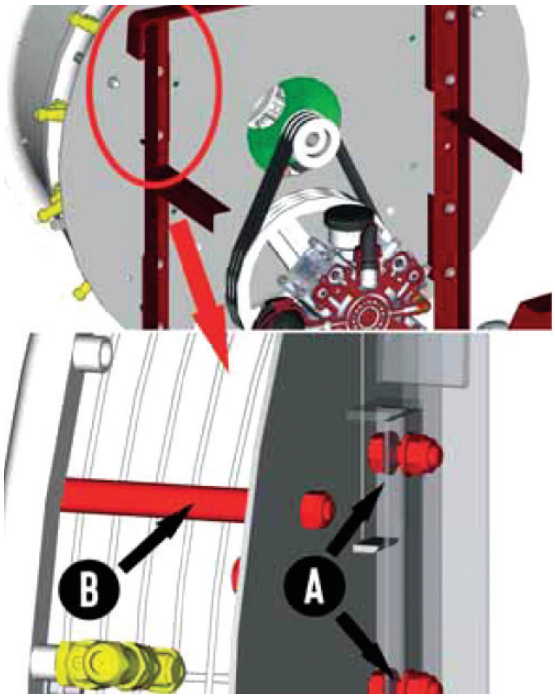


Figure 43

Gearbox shift lever

When you want to increase or decrease the air flow, you can increase it by turning the transmission gear lever on the transmission atomizer to the right, and decrease it by turning it to the left.

It is given 4.5 horse power when the gear lever on the left position
It is given 3.5 horse power when the gear lever on the right position

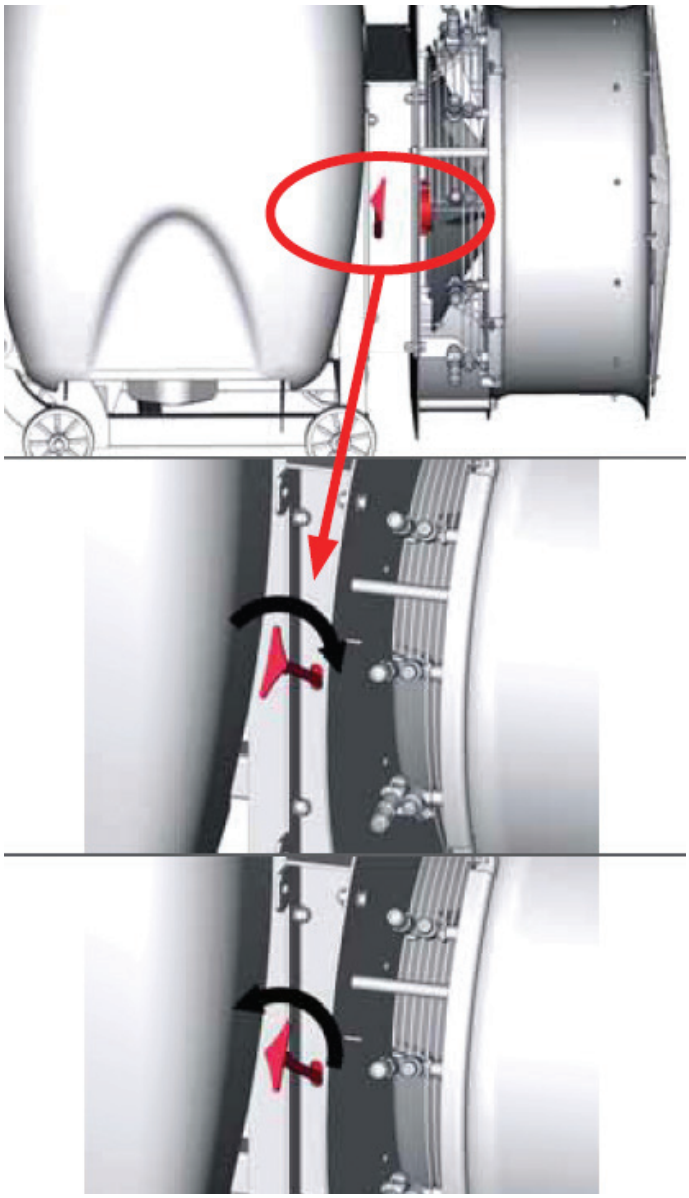


Figure 44

Adjustment of the Fan Blade

If the tractor's power is not enough for the machine or you want to increase or decrease the air flow, you can adjust the fan angles.

Fan blades have 3 adjustable positions. Fans are in 3rd position by default. Follow the steps below to change the fan angles.

1. Remove the protective metal plate located in front of the fan

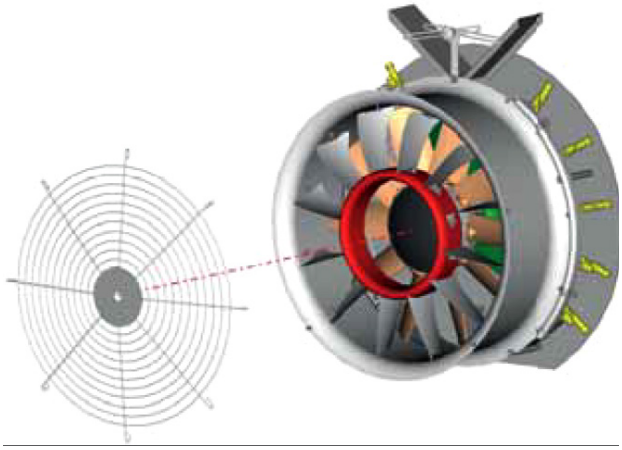


Figure 45

2. Remove the bolts of the metal fan that is bolted to the pulley. (Figure 46)

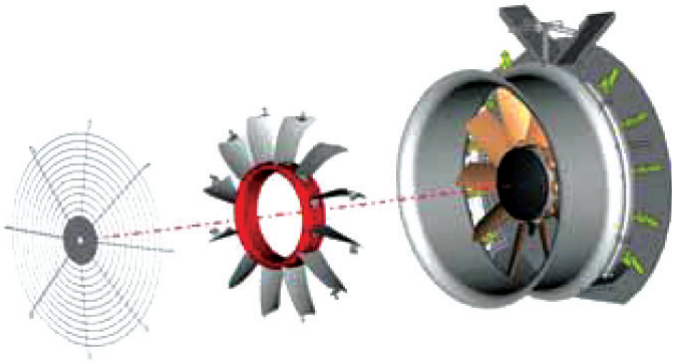


Figure 46

3. Remove the black part in the middle of the fan (Figure 47)

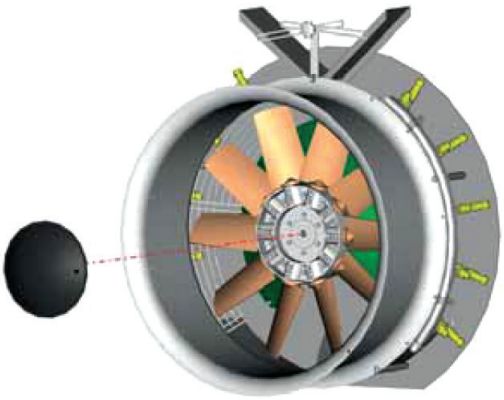


Figure 47

4. The hole under each blade corresponds to a blade angle of 45°, 30°, 15° from top to bottom. (Figure 48)

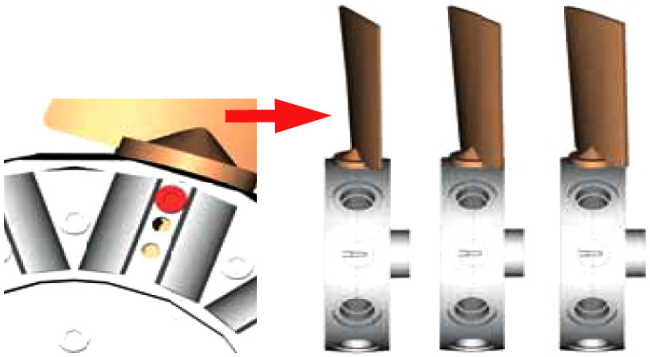


Figure 48 **45°** **30°** **15°**

Reassemble the fan after adjusting the fan angle suitable for you. (Figure 49)

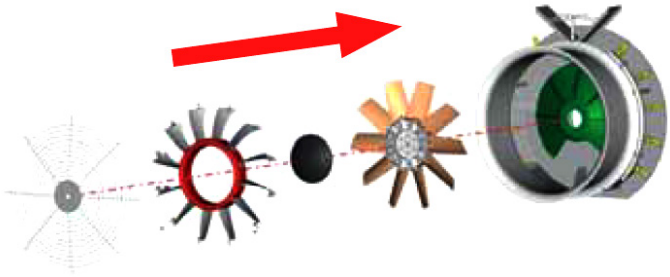


Figure 49

3.4.3.3 SPRAYING NORM (FLOW RATE) ADJUSTMENT

Sieve	Nozzle Diameter (mm)	Pressure Bar	Capacity L /Min	Spray Angle
40	Ø 0.08	10	0.98	40°
40	Ø 0.08	15	1.21	40°
40	Ø 0.08	20	1.40	40°
40	Ø 0.08	30	1.72	45°
40	Ø 0.08	40	1.98	45°
40	Ø 1.0	10	1.43	45°
40	Ø 1.0	15	1073	45°
40	Ø 1.0	20	1098	45°
40	Ø 1.0	30	2041	50°
40	Ø 1.0	40	2.80	50°
40	Ø 1.2	10	1.63	50°
40	Ø 1.2	15	2.00	50°
40	Ø 1.2	20	2.31	55°
40	Ø 1.2	30	2.83	55°
40	Ø 1.2	40	3.25	60°
40	Ø 1.2	10	2.75	45°
40	Ø 1.2	15	3.35	45°
40	Ø 1.2	20	3.90	45°
40	Ø 1.2	30	4.80	40°
40	Ø 1.2	40	5.50	40°
30	Ø 1.5	10	2.50	50°
30	Ø 1.5	15	3.60	50°
30	Ø 1.5	20	3.90	55°
30	Ø 1.5	30	4.40	55°
30	Ø 1.5	40	5.10	60°
30	Ø 1.5	10	3.58	55°
30	Ø 1.5	15	4.38	55°
30	Ø 1.5	20	5.05	50°
30	Ø 1.5	30	6.20	50°

Sieve	Nozzle Diameter (mm)	Pressure Bar	Capacity L /Min	Spray Angle
30	Ø 1.5	40	7.13	45°
30	Ø 1.5	10	4.35	45°
30	Ø 1.5	15	5.30	45°
30	Ø 1.5	20	6.10	45°
30	Ø 1.5	30	7.50	45°
30	Ø 1.5	40	8.60	40°
30	Ø 1.8	10	3.45	45°
30	Ø 1.8	15	4.22	50°
30	Ø 1.8	20	4.80	50°
30	Ø 1.8	30	5.95	50°
30	Ø 1.8	40	6.80	55°
30	Ø 1.8	10	5.31	55°
30	Ø 1.8	15	6.50	55°
30	Ø 1.8	20	7.50	50°
30	Ø 1.8	30	9.20	45°
30	Ø 1.8	40	10.60	45°
30	Ø 1.8	10	6.10	40°
30	Ø 1.8	15	7.45	40°
30	Ø 1.8	20	8.60	40°
30	Ø 1.8	30	10.50	40°
30	Ø 1.8	40	12.00	35°
30	Ø 2.0	10	4.15	45°
30	Ø 2.0	15	5.10	50°
30	Ø 2.0	20	5.87	50°
30	Ø 2.0	30	7.20	50°
30	Ø 2.0	40	8.30	55°
30	Ø 2.0	10	6.65	50°
30	Ø 2.0	15	8.15	50°
30	Ø 2.0	20	9.40	45°
30	Ø 2.0	30	11.50	40°
30	Ø 2.0	40	13.30	40°

3.4.3.4 WORKING PRINCIPLE

The spraying liquid passing from the tank outlet to the filter, comes to the pump by its suction hose.

The high pressure (0-40 bars) spraying liquid coming from the pump reaches the controller trough the pump pressure hose.

From here, part of the regulated spraying liquid pressure goes into the tank by coming to the circulation hose flows and allows the chemical in the tank to mix.

The other part of the regulated spraying liquid is sprayed with high pressure by coming to the spraying fan and nozzle heads through the spraying hoses.

3.4.3.4 (A) SPRAYING SYSTEM WITH OSR REGULATOR

1. Connect the equipment and transmission shaft to the tractor as described in the manual.

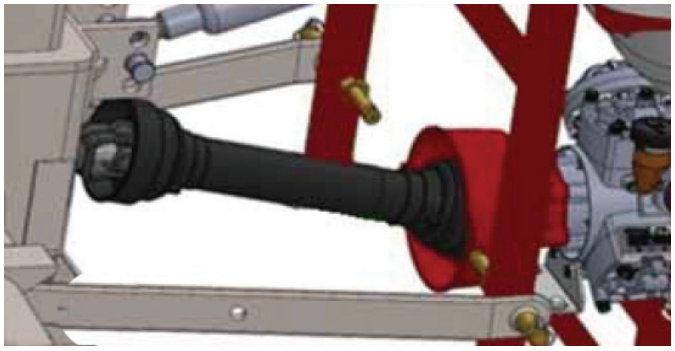


Figure 50

2. Start your tractor as described in the manual and move the PTO.

ATTENTION

To stop spraying suddenly, turn the bypass lever of the regulator towards the tank.

Figure 51

3. To change the pressure, change the pressure setting by turning the pressure knob on the regulator to the right and left.

Figure 52

4. You can start the spraying operation by opening the valves to the spraying fan from your regulator.

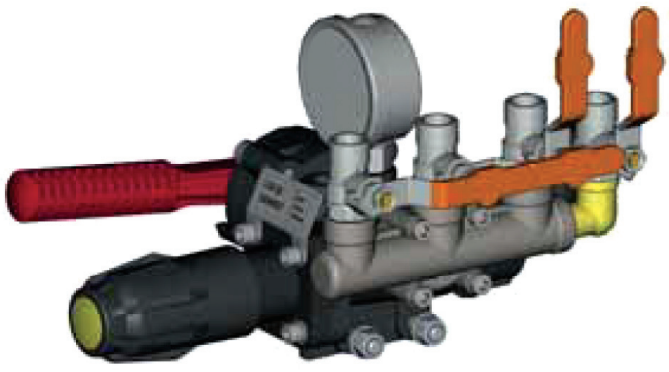


Figure 53

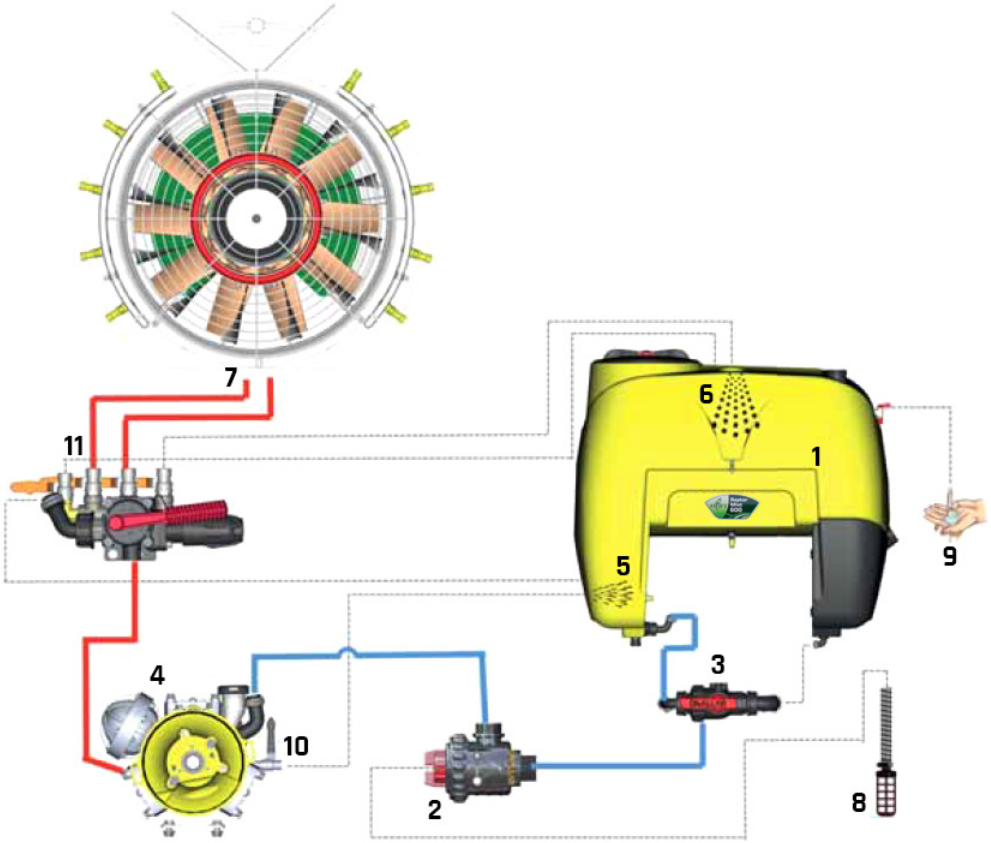
ATTENTION

In order to prevent the occurence of heterogeneous solution during the spraying operation you must leave the hydraulic mixer valve opened.

Keep the flushing valve for the nozzle closed during the spraying operation.

Before starting the spraying procedure you must do the calculations of spraying norm (calibration).

3.4.3.4 (B) SPRAYING SCHEME WITH OSR REGULATOR



PRESSURE LINE

SUCTION LINE

NO	PART NAME
1	Tank
2	Filter
3	3-way Valve
4	Pump
5	Hydraulic Mixer
6	Tank Washing System
7	Fan
8	External Suction Hose
9	Hand washing Tank
10	Filler
11	Regulator

3.4.4 TANK WASHING

3.4.4 WITH OSR CONTROLLER

1. Connect the equipment and transmission shaft to the tractor as described in the operator's manual.

2. Start your tractor and run the PTO.

3. Switch the 3-way valve in the suction line to the washing tank position. (Figure 54)

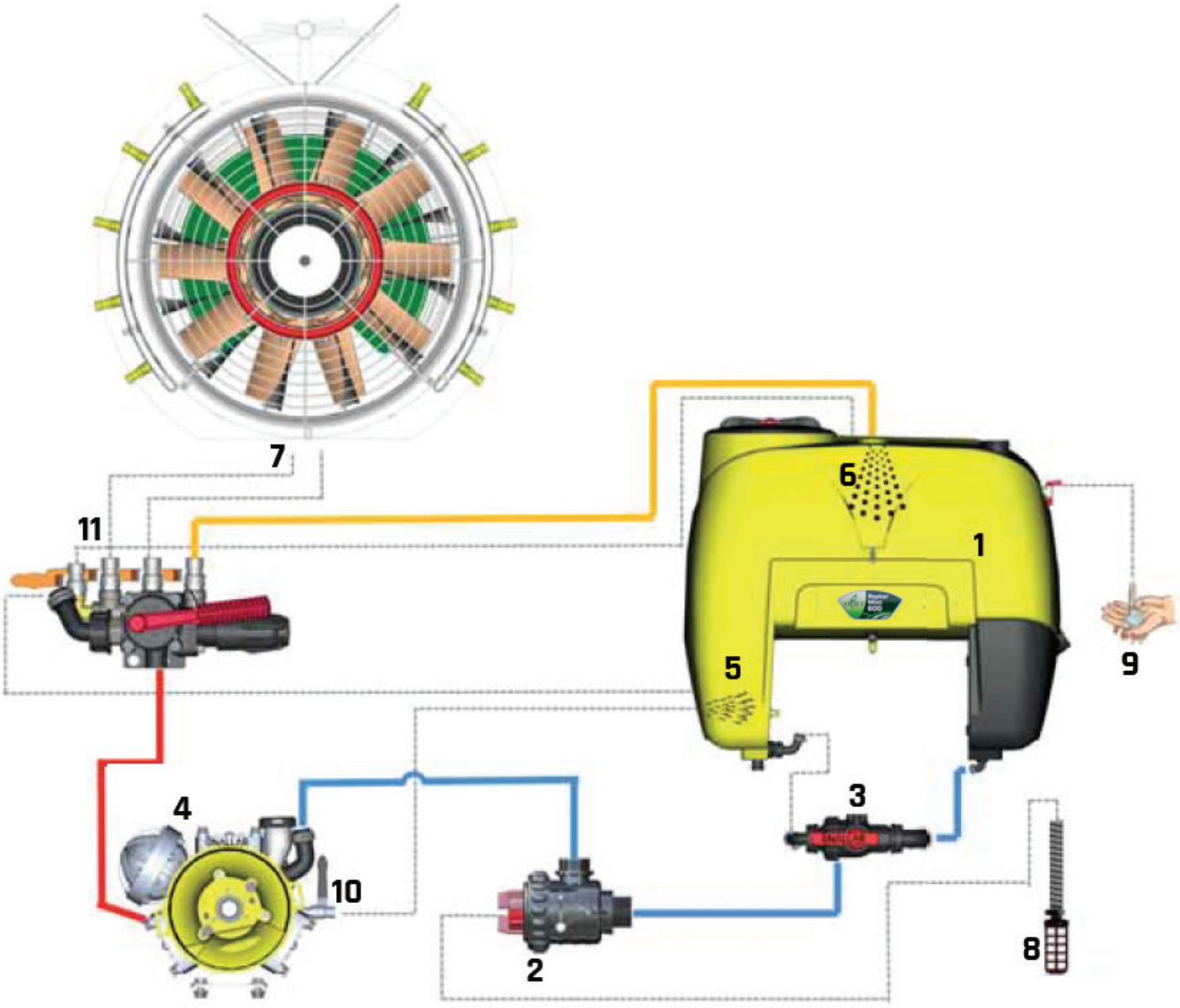
4. You can start system flushing process by turning on the valve to the system wash nozzle from your regulator. (Figure 55).

Figure 54

You can wash the nozzles and the spraying pipes by opening the valves from your regulator to the booms.

Figure 55

3.4.4 (A) TANK WASHING SCHEME WITH OSR REGULATOR



PRESSURE LINE

SUCTION LINE

NO	PART NAME
1	Tank
2	Filter
3	3-way Valve
4	Pump
5	Hydraulic Mixer
6	Tank Washing System
7	Fan
8	External Suction Hose
9	Hand washing Tank
10	Filler
11	Regulator

3.4.5 TANK EMPTYING

Tank emptying can be done in 2 ways:

1. By adjusting the spraying process on the pressure line, you can empty the tank with the pump's pressure.

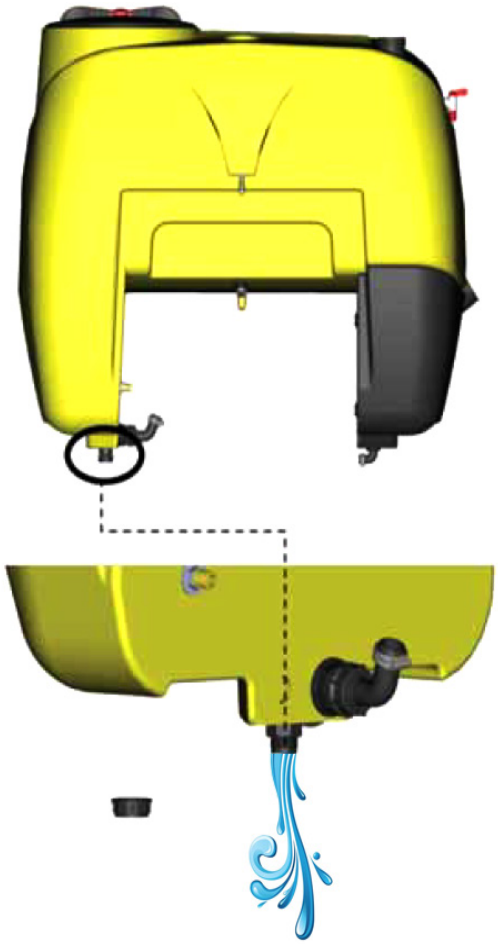
2. You can empty the remaining solution in the tank by opening the bottom plug or by opening the bottom valve.

Before starting the emptying of the product, take all necessary measure to prevent poisoning humans, animals and the environment.

Especially:

- **To avoid direct contact with body parts, specially wounds, wear protective clothes.**
- **To protect your face, head and hands wear personnal protective equipment, rubber gloves, dust proof mask, goggles, and a helmet.**
- **Do not use equipment that is not in perfect condition especially gas mask and check the condition of the cabin filters.**

İn case of accidental contact of the product or mixture with the skin, clean your skin immediately with clean water. Seek immediate medical assistance in case of illness.



3.4.5 SEPARATING THE MACHINE FROM THE TRACTOR

Separation process of the machine from the tractor is very dangerous and caution is required. Carefully read and follow the instructions below.

The machine tank can be placed on the ground when empty. Choose a smooth and horizontal surface for a proper separation.
1. Move the machine slowly until it has fully reached the ground.

2. Detach the PTO shaft from the tractor and hang it on its hanger.

3. Disconnect the hydraulic hoses from the tractor and fit the covers of the couplings.

4. Loosen up the middle pin and disconnect the three-point hitch from connection points.

3.5 CLEANING AND MAINTENANCE

3.5 CLEANING AND MAINTENANCE

Safe Maintenance

While performing the maintenance operations, be sure to put on the following clothes.

Before starting maintenance and cleaning operations, first disable the PTO shaft, stop the engine's motor, pull the handbrake and place the correct size wedge or stone under the wheels.

To ensure safety during assembly, maintenance, cleaning, etc. of your machine, it is important to use stand legs when lifting it.

The spare parts used must meet the manufacturer's specifications.

Use only original spare parts.

3.5.1 DAILY MAINTENANCE

Before starting to work:

1. Check and clean your machine's filters.
2. Pump oil level should be checked. Oil is added if it is below the specified limit.
3. Bolt, nut, elbow and clamps must be checked.
4. Check the spraying nozzles (the number of nozzles, laxity, congestion etc...).
5. Lubricate the tractor shaft.

3.5.2 INTERMEDIATE MAINTENANCE

1. If you are not going to use your machine for a while in spraying season, you should do these maintenance.
2. Check and clean your machine's filters.
3. Wash the inside of the tank. Fill the machine with a certain amount of water and run it, water will pass through the nozzles and clean so that no product residue remains in the tank and system.

3.5.3 END OF SPRAYING SEASON AND WINTER MAINTENANCE

1. Wash the machine completely.
2. Fill the tank with water and run the machine to clean it in such a way that there is no product residue remained in the tank, the pump, the pipes, the nozzles and all the other parts of the machine.
3. To prevent freezing in winter water should not be left into the machine and the pump. before the freezing reaches the pump apply antifreeze fluid, otherwise the pump may be damaged.

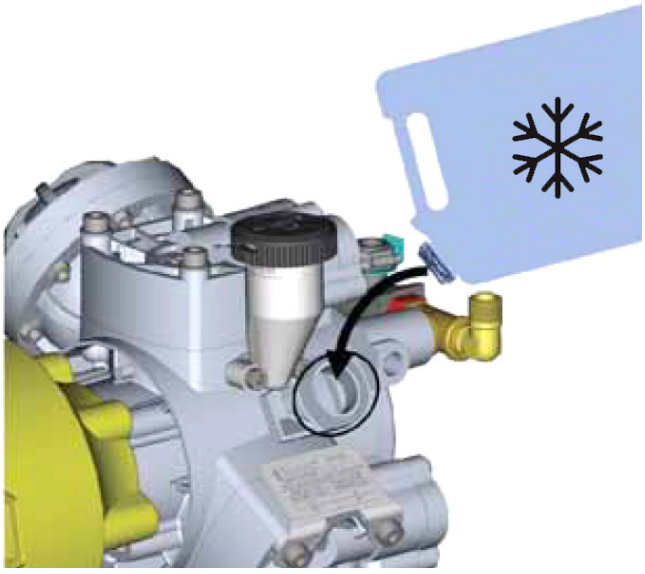


Figure 59
Adding Antifreeze to the pump

3.5.4 END OF WORK CLEANING

1. Do not run the machine when there is no water in the tank.

2. Wash all filters with clean water. Wash the filters by removing the nuts with the filter wrench provided with the machine.

3. Check the filter of the filling suction hose. By removing the nozzle filters on the spray arms, wash them in plenty of water. Nozzle filter is multi-valve, it does not drip. (For fan beam type).

4. Clean the joints of the transmission shaft and lubricate the grease points.

5. In order to keep the pump safe, water should not be left into it during winter. For this, turning the crankshaft would be is enough. Also, antifreeze should be added to avoid feezing.

6. It is very important to lubricate the pump. You have to change the pump's oil every 150 hours of work or at the end of every farming season. To drain the oil, remove the drain plug at the bottom of the pump. Open the cap of the oil bottle and turn the crank by hand until the oil is drained. Fill up the oil bottle with approx. 1 liter 20-50W engine oil.While doing this process, turn the crank left and right so that no air is trapped inside the pump. You should continue this process until you get bubble-free oil
.
7. Since the parts of the pump that come into contact with the chemical are made of durable material, no need to disassemble or change parts except for simple maintenance.

8. Bolts, nuts, elbows, clamps on the machine and nozzles should be checked. If there is any of them missing or loose the necessary should be done. The inside of the tank should be washed. Fill the machine with a certain amount of water and run it, water will pass through the nozzles for a while and clean so that no chemical residue remains in the tank and system.

Figure 58
Tank Outlet Filter Removal

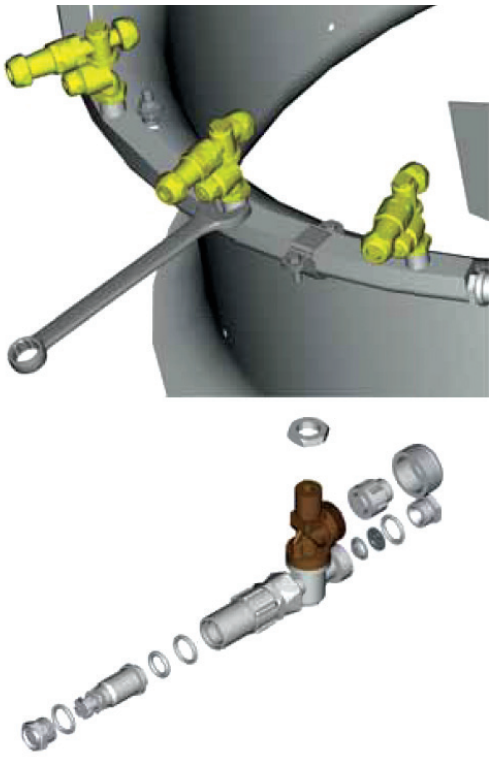


Figure 59
Conical jet nozzle removal and conical brass nozzle parts

3.5.5 MACHINE STORAGE

- Check the connections on the machine, keep your machine in a suitable place covered by a protective cover.
- Never leave water into the pump during winter in order to protect it.
- To protect the pump from moisture and rust be careful that it does not touch the ground.
- After washing the pump with water, fill with antifreeze and run the pump to allow antifreeze to flow inside.

Figure 60
Adding Antifreeze

4.0 FAULT PROBLEMS AND SOLUTIONS

PROBLEMS THAT MAY OCCUR DURING THE OPERATION OF THE SPRAYER, CAUSES AND RECOMMENDATIONS

PROBLEM/TROUBLE	CAUSES	RECOMMENDATIONS
During tank filling, the machine does not suction water or suction less	1. Filler nozzle clogged. 2. Filler hose strainer clogged. 3. Problems caused by the suction line 4. The filler valve is closed. 5. The priming suction hose is worn out or is getting air. 6. Regulator pressure may be unadjusted or low. (may vary by machine)	1. Clean the filler nozzle. 2. Unscrew and clean the filter at the end of the filling hose, put it back on. 3. Check the suction hose clamps, elbows and o-rings and tighten any loose ones. 4. Open the filler valve. 5. Replace the priming suction hose or check the o-rings, clamps. 6. Regulator pressure should be adjusted, if the pressure is low, it should be increased.
The pump makes too much noise when running.	1. Pump oil level too low 2. Valve's o-rings are worn 3. Loose bolt and nuts. 4. The pump may be getting air from the inlet connections. 5. Pump suction filter blocked. Pump valves broken or dirty etc. material may have clogged.	1. Oil filling must be done by looking at the mark level on the oil bottle. 2. Valve o-rings should be changed. 3. Check the bolts and nuts and tight the loosened ones or replace if they are broken. 4. The filter should be cleaned by removing the filter cover. Open the valve cover and change the damaged valves, or clean the blocked ones.
If the pump's oil is decreasing or if oily water comes out.	1. Membrane ruptured. 2. Oil gaskets burst or may leak	1. Drain the pump's oil and dismantle the corvers, replace the ruptured membrane with a new one. It should be filled with 20-50W oil as much as it can take,go to the nearest service. 2. Check the oil gaskets, if necessary, change them with new ones.
During tank filling, the machine does not suction water or suction less	1. Filler nozzle clogged. 2. Filler hose strainer clogged. 3. Problems caused by the suction line 4. The filler valve is closed. 5. The priming suction hose is worn out or is getting air. 6. Regulator pressure may be unadjusted or low. (may vary by machine)	1. Clean the filler nozzle. 2. Unscrew and clean the filter at the end of the filling hose, put it back on. 3. Check the suction hose clamps, elbows and o-rings and tighten any loose ones. 4. Open the filler valve. 5. Replace the priming suction hose or check the o-rings, clamps. 6. Regulator pressure should be adjusted, if the pressure is low, it should be increased.

4.0 FAULT PROBLEMS AND SOLUTIONS

PROBLEMS THAT MAY OCCUR DURING THE OPERATION OF THE SPRAYER, CAUSES AND RECOMMENDATIONS

PROBLEM/TROUBLE	CAUSES	RECOMMENDATIONS
Spraying arms nozzles don't spray, pressure is low or under the required.	1. Nozzle filter or plate blocked. 2. Filler or mixer tap open. 3. Tank outlet filter blocked	1. The nozzle cap, the filter and its plate. should be cleaned and replaced if necessary. 2. Turn off the filler or mixer tap. (without sharing power from the pump, almost all the power should be given to the arms). 3. Clean the tank outlet filter. (Note: The cleaning process should absolutely not be done by blowing with the mouth .It should be done by holding water or air).
Water leakage in the pressure hose connections.	1. Hose seals worn. 2. Loosed joint .	1. Worn seals must be replaced. 2. Loose parts should be tightened.
Manometer shows a different pressure value from the initial value.	1. Manometer is defective. 2. The suction strainer is dirty. 3. Nozzle holes enlarged. 4. Regulator pressure wedge worn.	1. The manometer should be changed. 2. The strainer must be cleaned 3. Check nozzles and replace as necessary 4. Replace the wedge.
Hydraulic lift system not working, arm can not be set at enough height level or moving slower than the way it should be.	1. The hydraulic hoses from the machine to the tractor hydraulic output are not connected. 2. Tractor hydraulic system oil level dropped. 3. hydraulic hose joints loose, hose frayed	1. Machine hydraulic hoses must be connected to tractor hydraulic outputs. 2. Tractor hydraulic system should be refilled with oil. 3. Loosening deteriorating joints or hoses must be changed.
Manometer shakes a lot.	1. It is taking air from the suction circuit or the air has not been completely evacuated from the pump. 2. It may be related to the pump valves.	1. Check the hose clamps and gaskets between the pump and filter. 2. Check the valves. Note : When the machine is idling and the regulator is evacuating let the machine run for a moment so the air in the system can be evacuated.
Water is pumped at low or no pressure.	1. Regulator thrust block is worn. 2. Manifold or another piece burst. 3. Blockage in the pump suction line. 4. Pump valves may be worn.	1. The pressure wedge should be changed. 2. The parts that are cracked must be replaced. 3. Filters must be cleaned. 4. Replace worn valves.

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