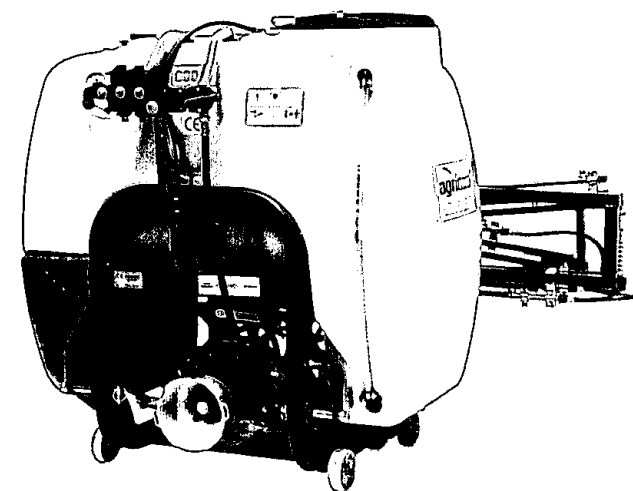


MOUNTED FIELD SPRAYER

USER MANUAL



DELTA

400-600-800-1000 LT

 agrional

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INSURES THE FUTURE



USER MANUAL SPARE PART LISTS



WELCOME

Dear customer,

We would like to thank you for the purchase of this machine.

We welcome you among our clients and are confident that this product will give you many years of reliable use and will fulfill your needs.

This "Use and Maintenance" manual applies to all versions of the series of mounted sprayers.

Remember that any machine can work well and profitably only if it is used correctly and kept in efficient working conditions. So please read this instructions manual carefully and check with it whenever difficulties arise.

Should you need any assistance, our technical department is at your disposal with information and service.

We remind you that, as manufacturer, we have the right to change, at any time, any part, detail or accessory of the machine, either to improve it or for marketing necessities. However, the changes made will not affect the main technical features of operation and safety.

The symbols given below are safety warnings and indicate that the instructions must be followed in order to avoid harms and/or damages to persons, animals and environment.

Failure to comply with the instructions may cause personal injury, in some cases even death.

Attached to this manual you will find also the operator's instructions of engine, pump, pressure regulator valve, drive shaft etc. made by other manufactures, as well as the breakdown and list of parts of the machine you purchased.



INTRODUCTION

This manual provides all the necessary information concerning the use and maintenance of the machine as well the breakdown drawing and the list of spare parts.

Our sprayers can be mounted on any tractor having a three point hitch of the category 1 or 2 and an input shaft running at a maximum speed of 540 R.P.M. (revolution per minute).

The horsepower required to run the sprayer is connected to the type of pump which is mounted, the capacity of the tank and the type of the spraying boom.

The sprayers are machines to spraying the chemical for the plants protection crop, open fields, gardening and disinfection.

All our machines have been designed and manufactured for the use in open fields as well as for work between the rows of orchards, vineyards, open fields, etc...

Therefore **NEVER RUN THE SPRAYER INDOOR!**

Regular and adequate operation of the machine depends on correct use and maintenance.

The technical instructions that are contained in this manual must be therefore strictly complied with, to prevent any problem which could obstacle the correct use of the machine and reduce its life.

Compliance to the safety requirements mentioned herein is also essential to prevent accidents or injuries to the operator and the parties.

ANY USER OF THIS MACHINE IS WARMLY REQUIRED TO READ CAREFULLY AND UNDERSTAND ALL THE INSTRUCTIONS OF THIS MANUAL BEFORE STARTING TO USE THE MACHINE.

Should these instructions, or even one of them, not be complied with, then the Manufacturer can not be held liable for any damages whatsoever that are caused to the machine itself, to things or to persons.

Please refer to the Manufacturer's Engineering Dept. should you need any technical details or any information on how to improve the machine operation and efficiency.

The sprayers have been designed and manufactured to atomize and nebulize everywhere and for the application of plant and crop protection products and disinfections.

WARNING: misuse or abuse of the equipment can cause severe damages and/or injures. It is therefore recommended to strictly follow the directions given herewith.

This handbook is part of the machines and must be carefully keep on file as long as the machine is operative.

Any repair have to be carried out only by skilled technicians, either of a dealer authorized by the manufacturer, or by the distributor.

For the repairs, only original spare parts can be used. Failing this the manufacturer shall not be held liable for incorrect operation of the machine and nor the user will then be entitled to any guarantee.

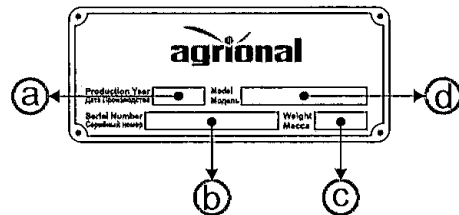
Should any doubt arise on the meaning of any part of this manual, the Italian texts shall be considered as the valid reference text.

MARKING AND IDENTIFICATIONS

On receiving the sprayer, check that the markings are identical to those shown below in fig. and applied on the frame of the machine.

On the machine the user will find the following plates or decals:

1. Marking plate containing the name of the Manufacturer, the year of construction, the model, the serial number.



a- Production Year
b- Serial No
c- Weight
d- Model

2. Decals with general maintenance and lubrication instructions.
 3. Decals indicating of how to engage the propeller. (turbine on mist blowers).
 4. Danger, warning and marking signals.
- Plates, decals and signals on the machine are parts of the machine itself and can not be removed.
- The operator must comply with the instructions affixed on the machine and keep them in clean and legible condition as long as the machines is operative.

DELIVERY OF THE MACHINE

The machine must be checked immediately on delivery to ensure that it is complete with all its components; should not be the case, our competent office must be informed at once.

The sprayer is supplied either wrapped with nylon or packed in a carton and all the components are appropriately protected for shipment. In order to save space and reducing risks of damages during transportation, some parts are supplied loose and need to be assembled before using the machine. You need to follow these

instructions:

- refill oil to the engine (see the manual book of engine for oil refill);
- refill fuel to the engine (see the manual book of engine for fuel refill);
-
- check the assembling of the hoses of suction, batch and return;
-
- connect the hoses of nozzles or sprayguns;

Check the correct funzionamento of the sprayers with clean water.

DESCRIPTION OF THE COMPONENTS OF THE MACHINE

PUMP

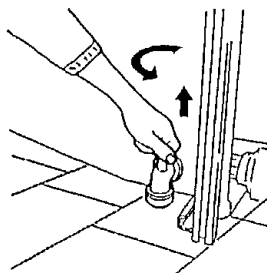
The pump is diaphragm type, it pushes the liquid to the circuit and it is of vital importance for the machine and need of particular care.

TANK

The tank of the sprayer is made either of fiberglass or of polyethylene. Inside the tank there is a system studied for agitating the liquid and keeping the chemical product mixed uniformly. The agitation system can be either mechanical or jet. Be sure that the agitation system works always properly as it is essential for the correct use of the chemical and for avoiding possible damages to the crops or injuries to people.

DRENAGE OF THE TANK

One important operation to learn is how and where to drain the tank. All the tanks are provided with a bottom valve which can be operated in a safe way, without that the hands of the operator may get in touch with the chemical. The drained liquid has never go into the ground, but only in appropriate containers.



BOOM SPRAYERS

The sprayers can be provided of mechanical spraying boom mod. BD, BV, BI or hydraulic spraying boom mod. BDIP. The boom is provided of painted, zinc plate or hot galvanised steel frame, stainless steel tube, nozzles with diaphragm antidrip device with cone or fan tips and filter.

SPRAYGUN

The machine can be provided of spraygun which are of different models. Every spraygun is provided of the tips which can be replaced in the time for the maintenance or to vary the delivery output of the liquid.

The delivery can vary with the pressure value of the pump, it must be changed turning the knob of the relief valve.

The tips are available with various holes which determine with the pressure the delivery of the spraygun.

Attached herewith please find the rate chart of the different tips available for sprayguns.

The tips of the sprayguns either in stainless steel or ceramic can wear out with the use and consequently need to be changed time to time because the delivery of the liquid will increase when the hole would have been enlarged by the long use.

When the delivery of the spraygun increases without a justified reason and the spraygun has a spraying not uniform, it means that the tips must be replaced.

Attached herewith please find the rate chart of the different tips available for sprayguns (see the paragraph of calibrating and rate chart).

FILTERS

The sprayer is equipped with 3 systems of filtering.

1. A large basket filter is located under the main cover, the purpose of which is to

prevent that any impurity or foreign objects could get into the tank during the operation of filling it with water.

2. A main strainer is located under the tank, connected to the inlet system. The liquid is filtered before getting into the pump, which therefore will work with no risk of damages. Before the main strainer there is a shut-off valve which allows to clean the cartridge of the strainer when the tank is full.

3. More other filters are placed one for each nozzle to prevent the clogging of the tips.

All the filters are of easy access and easy to clean.

STRAINER

The sprayers is equipped with two strainers. A large filter screen is located under the tank cover and the main strainer located under the tank.

When cleaning main strainer screen, make sure to remove yellow filter shut-off valve before removing filter housing ring nut.

NOZZLES

The boom sprayer is provided of nozzles which can be adjusted to spray to different angulations.

The sprayers which are equipped with double or triple nozzles are normally used for interpolate diluted and concentrated works as are mounting one tip with large hole and one tip with smaller hole.

All the nozzles, either single, double, or triple are provided of plastic, stainless steel or ceramic tips, at cone and fan spraying: the holes and the angulations of the tips are available in different sizes.

The tips can wear out with the use and consequently need to be changed time to time because the delivery of the liquid will increase when the hole would have been enlarged by the long use.

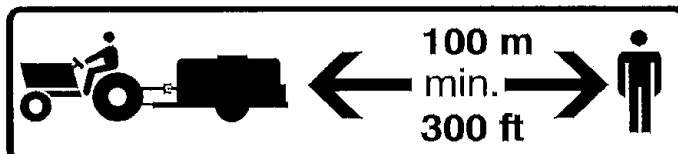
Each nozzle has a filter of stainless steel and an anti-drip device to prevent leaks at the end of the work.



DANGER AND CAUTION SIGNALS



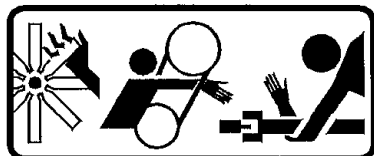
Please carefully read and understand the operating instruction of the operator's manual before using the machine.



DANGER: the machine blows possibly dangerous chemical. Keep at a safe distance from the machine.



DANGER: never get near to the PTO shaft when it is in operation.



DANGER: keep hands, feet and clothes away from the moving parts.



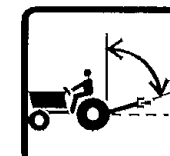
The machine must be used only by qualified personnel.



Never run the power take-off at speed exceeding 540 R.P.M. (revolutions per minute).

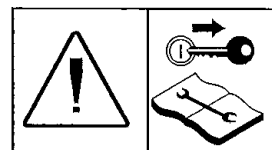


Use only drive shaft with certified safety shields.

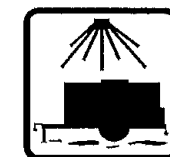


Avoid sharp angulation of drive line as this can damage the pump or the PTO shaft of the tractor.

To stop the PTO shaft during the steering operation.



Before performing any service, stop both the machine and the tractor, verify that both are still on the ground in a stable position and read the instructions of this manual in the section referred to the service.



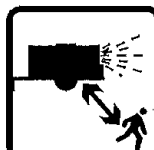
Wash the machine with plenty of water after each working phase.



If the chemical products gets in contact with eyes, hands, skin or clothes, neutralize them with suitable products and rinse with plenty of water.



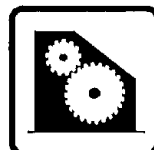
Keep clear of the machine when it is in operation.



Hitching point for lifting the machine.
Make sure that the capacity of the vehicle used for transport is sufficient to lift the maximum weight of the machine.



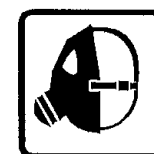
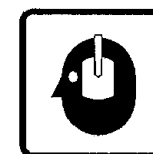
Never remove safety shields when the machine is running.



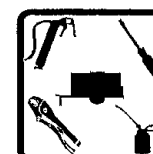
Get a thorough knowledge of the chemical products used and how it must be neutralized in case of contact with skin or eyes.



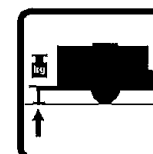
Use special goggles, boots, , overall working clothes, gloves, dust proof mask or certified helmets with filter when you spray with the sprayers.



Carry out all the maintenance operations before starting to use the machine.



Use an additional support if the stand leg of the machine lays on soft ground.



SAFETY RULES

Before using the machine, please carefully read the safety rules and the recommendations of how to prevent accidents which are described in this manual.

These rules must be strictly complied with to ensure safety of the operators and other people as well as the environment.

The Manufacturer and its Sales network will not be considered liable in the case that such rules are not complied with.

The sprayers are machines designed and built for the use of chemical products which could be very dangerous if handled or just touched by persons with no adequate skill.

Before using such chemicals, read and understand all the warnings and directions given by the manufacturer of the chemical and:

LEARN OF HOW TO ACT IF ACCIDENTALLY THE CHEMICAL WOULD BE TOUCHED BY SOMEONE OR WOULD BE SPREAD IN THE ENVIRONMENT.

BEWARE: the sprayers are machines where some parts are rotating at a very high speed, which, even if protected, are still potentially dangerous.

-Pay careful attention to warning, danger and marking signals which are both contained in this handbook and affixed to the machine.

-Any time the machine need to be serviced, the motor of the tractor must be off, the gear engaged, the hand brake pulled and the machine must be firmly parked on the ground.

-Never touch parts while they are in motion.

-It is forbidden to allow use of the machine by people under eighteen years of age or who are not competent in use of the machine.

When in operation, the sprayer blows chemical products.

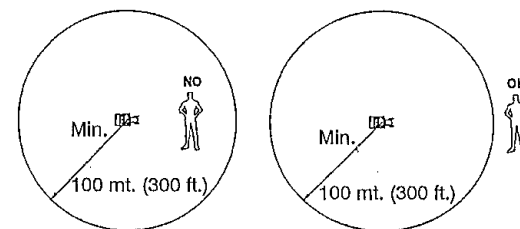
Therefore, always make sure that no persons or animals are within the reach of the machine. When making this evaluation, consider also possible wind.

Minimum distance between persons and working place: 100 Mt. (300 ft.).

Never work when persons are in areas at risk.

The machine must be used by one person only who must operate it from the tractor's driver seat.

Nobody else is necessary, therefore no other persons must approach the dangerous area (Min. distance from the machine while in operation: 100 Mt. (300 ft.).



Should someone come too close to the machine, then immediately stop any operation you are carrying out and warn these persons with acoustic and light signals until they leave the dangerous area, where they could be contaminated by chemicals, overrun by the tractor or be injured by machine mechanisms. Risks due to parts that are in motion and from sudden change of the wind's direction could be unavoidable.



Warning: It is strictly forbidden to stay between the tractor and the machine when the engine is on. This can cause your death.

The operator must have a good visibility in order to check if somebody is within the dangerous area (Minimum 100 Mt.: 300 ft.). Should this happen however, then EVERY MACHINE OPERATION MUST BE STOPPED until the dangerous area is free.

The spraying of chemicals need the use of: GLOVES, GOGGLES, DUST PROOF MASK OR HELMENTS, OVERALL WORKING CLOTHES. Never wear clothes with free ends (such as belts, scarves, heads-squares, long skirts, etc.) which could drag you towards the machine parts while they are in motion.

The operator should keep all shields, of which the machine is equipped, in steady and sound conditions. After any service or repair, all the shields must be put in the original place.

When replacing any worn out pieces or during any other operation on the machine (which must be carried out by skilled technicians) please proceed as follows:

- make sure the engine is stopped;
- make sure that the lever of regulator valve is in by-pass position;
- in case of the need of servicing the machine from underneath, make sure that this would rest safely on proper supports, in order to prevent any accidental fall which would seriously injure someone;
- every intervention must be carried out on a clean horizontal floor.
- It is forbidden to allow use of the machine by people under eighteen years of age or who are not competent in use of the machine.
- Chemicals means danger and must be kept in containers suited for the purpose.



-Always fill the tank in the open air. Never smoke when carrying out these operations.

-Never remove caps of the tanks if the motor is running or still warm.

-If there has been any leakage of chemical, do not start the motor but shift the machine, with the motor turned off, to an area free from gas and combustible liquids before carrying out the operation.

-Never run the motor in enclosed areas. The exhaust gases contain carbon monoxide, which is an odourless and deadly poison.

-Never use the motor in thick woods, among bushes or other areas with uncultivated vegetation.

-When the machine is being used there must be no other people within a radius of 100 metres from the work area.

-Prevent involuntary switching on of the motor by removing the spark plug before carrying out maintenance jobs.

-Pull the start cord slowly until you feel a certain resistance; then pull the cord rapidly so as to avoid recoil and prevent injury to the hands and arms.

-Use freshly blended fuel. Old petrol may cause rubbery deposits in the fuel and lead to leakage.

-Check the feeding system and connections frequently to ensure there are no leaks or cracks; if necessary, replace any damaged parts.

-Never remove protection devices and guards even for a time, in particular the protective grid on the fan and protective casing on the silencer.

-Always wear suitable protective clothing, especially during preparation of the product, treatment, when cleaning the jets and filters, emptying the tank and washing the machine.





-Avoid inhaling the gases produced inside tanks.

-During treatments it is advisable to use overall working clothes, goggles, gloves, dust proof must or helmets and boots resistant to the chemicals.

-Our machines are suitable to spray the chemical to the plants and cultivations: the constant use of the chemical products ... the machine dangerous if particular care is not taken in consideration.

-Before open the package of the chemicals product to be sprayed, read carefully all the safety rules indicate in the box from the manufacturer.

GET A THOUGH KNOWLEDGE OF THE CHEMICAL PRODUCTS USED AND HOW IT MUST BE NEUTRLIZED IN CASE OF CONTACT WITH SKIN OR EYES.

It is forbidden to touch the lever of the II point hitch when you are sit down to the tractor's seat.

It is forbidden to operate with the lever of the II point hitch when you are in the position between the sprayers and the wheel of the tractor.

Should the machine accidentally bump into an obstacle, then proceed as follows:

-stop immediately the machine and following all the above-mentioned safety instructions.

-check the machine carefully, to be sure there are no damages.

In the case of doubts please check with the service department of an authorized dealer.

From tests made with the sprayers it resulted that the noise level close to the machine can reach 92 decibel. This means that the operator has to use appropriate noise canceling headset.

-Never use any flammable or explosive liquid, such gas or diesel fuel, oil or other hydrocarbons.



- The pump is built only for liquids foreseen for agricultural use. Running any other liquid in the pump may damage it as well as the sprayer and the environment.

Refer to the manual of the pump for more information about the liquids which are allowed.

-Never exceed the maximum pressure foreseen for the pump.

-The temperature of the liquid has to be between 10 and 30 Centigrade (44° to 86° Fahrenheit).

-Before performing any service to the sprayer or to the pump, be sure to discharge all the pressure by opening the main valve so that the liquid will by-pass to the tank

-Verify that the liquid runs fluently through the by-pass hose.

-Before performing any service to the sprayer or to the pump, be sure to discharge all the pressure by opening the main valve so that the liquid will by-pass to the tank

- Verify that the liquid runs fluently through the by-pass hose.

- Never run the sprayer indoor, as both the exhaust gas of the tractor and the chemicals could pollute and poison the air, CAUSING SEVERE INJURIES OR DEATH.

- Any part to be replaced such hoses, valves, connectors etc. which are subject to pressure, must be original or the type approved by the manufacturer.

- Never use the pump of the sprayer for running water for human or animal use.

ATTACHMENT OF THE MACHINE TO THE TRACTOR

The attachment of the machine to the tractor is a dangerous operation. It is recommended that such operation is carried out strictly complying with the following instructions and paying careful attention.

BEWARE: In order to attach or set the machine, any operations must be carried out with the machine laid flat, tractor on standstill, engine off, pulled parking brake and low gear inserted. Only the machine operator and the technical staff authorized by the Dealer can be there.

When working on the machine make sure nobody else is coming too close. Make sure the tractor power is appropriate for the machine is going to be attached.

Never use tractors whose power exceeds that foreseen for the machine, as this has been tested with such power, exceeding which all machine members could suffer serious damages which are not covered by the guarantee.

The correct position of the tractor and of the machine to be attached, is established by setting the implement at such a distance from the tractor so that the PTO shaft would result extended between 5 to 10 cm (2 to 4 in.) from its maximum closed position.

Make sure that the pull capacity of the tractor, as well as its weight, are sufficient to draw the machine when this is fully loaded of liquid and ready to work. For these important safety instructions please refer to the owner's manual of the tractor.

Make sure that the tractor's draw hitch is provided with its original pin and that this fits perfectly in the hole of the draw bar of the sprayer. Make sure also that the pin is provided with a locking system to prevent possible disconnection of the machine from the tractor while it is operated or driven.

Consider that the mounted sprayers have a considerable weight so particular care has to be taken when driving it down hill as well if it is necessary to take a sharp curve.

In these cases the speed of the tractor has to be the lowest possible.

Check that the input shaft of the tractor would have the same size, type and number of splines as the yoke of the drive shaft on the tractor side.

Check if the RPM of the tractor's PTO are the same foreseen for the machine to be attached (normally 540 RPM).

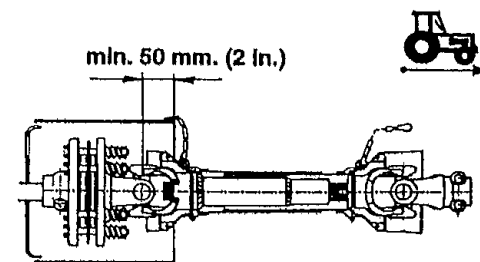
Check if the tractor's PTO rotates clockwise (please look at it from behind).



Use only the drive shaft supplied or recommended by the Manufacturer.

When mounting the drive shaft to the input shaft of the machine pay attention if there is any mark showing the tractor side and machine side (for example any limiting device like a shear bolt or a slip clutch are to be mounted on the side of the machine).

Lay the drive shaft to the appropriate holding hook to prevent that the sliding half would drop to the floor.



Link to the machine the chain which is attached to the guard of the shaft, which prevents it from rotating.

Drive the tractor close to the machine which has to be parked on flat ground, with the stand leg firmly locked and with the wheels stopped with wedges.

Check that the draw bar of the sprayer and the hitch of the tractor are on the same level.

If not, act on the handle of the stand leg to reach the same level.

Drive the tractor on reverse until the draw bar of the sprayer and the hitch of the tractor do match.

Switch the motor off, pull the hand brake and leave a low gear engaged. Insert the pin of the hitch into the hole of the draw bar and lock it.

Connect the drive shaft to the input shaft of the tractor, double checking again that a minimum distance of 5 to 10 cm (2 to 4 in.) is allowed to the completely closed position of the drive shaft.

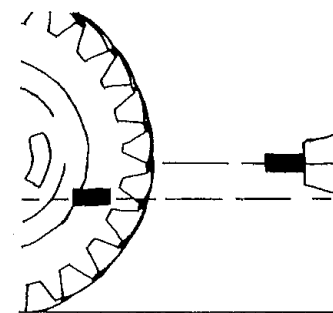
Connect the anti rotation chain of the shaft guard to the tractor-side.

Make sure that the weight of the machine on the hitch of the tractor would not exceed the one shown on the label on the draw bar of the sprayer.

Make sure to have lifted and stored any stand leg of which the machine could be provided before moving the tractor.

CORRECT USE OF THE DRIVE SHAFT

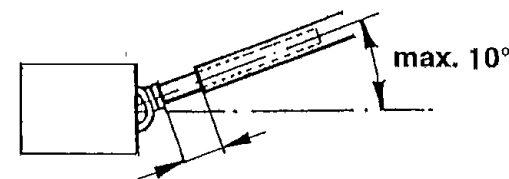
Check the working angles of the drive shaft making sure, in working position, that both input shafts of the tractor and of the machine are parallel.



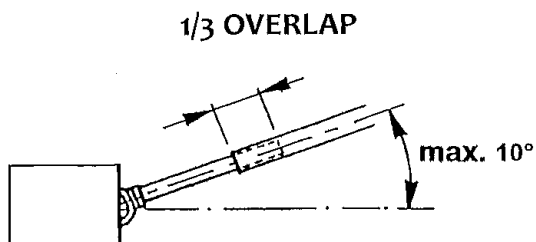
Make sure that the drive shaft's angles do not exceed 10° in working position bearing in mind that wider is the angle, shorter is the life of the shaft.

In the case the sprayer needs to be used in orchards or vineyards where sharp angles have to be taken, it will be necessary to provide the machine with a constant velocity drive shaft which permits to take such sharp angles without risking to damage any transmission part.

In its shortest position the shaft must allow at least 5 more cm (2 in.) to get to the completely closed position in order to avoid any possible damage.



In its longest position the two halves of the telescoping tubes of the shaft must overlap of at least $\frac{1}{3}$ of the their length. In the case that the drive shaft would result too short, get from an authorized dealer a new one of the same type approved by the manufacturer.



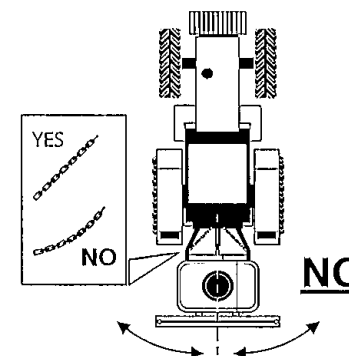
Should it be necessary to change the length of the drive shaft, it is essential, for safety reasons, that the operation is carried out by skilled technicians. Safety devices must comply with the new length.

Proper equipment must be used to keep rotating parts coaxial and yokes in their original angle position.

FOR OTHER IMPORTANT INFORMATION REFERRED ABOUT THE DRIVE SHAFT, PLEASE SEE ALSO THE MANUAL SUPPLIED WITH IT BY THE SHAFT'S MANUFACTURER.

BEWARE: incorrect use of the drive shaft may cause damages to it. Such damages are excluded from warranty, event though they are caused within the warranty period. The misuse and/or abuse to the drive shaft can cause damages to the tractor, to the machine or injuries to people.

Fix lifting arms so that the machine is on the centerline and has no side oscillation.



Adjust lifting arms height: when lifted, the machine must be parallel to the ground.



Make sure at least 20% of total weight (tractor+machine working condition) lays on front axle. If not add proper ballast. However, never exceed tyres capacity. Make sure to have lifted and stored any stand leg of which the machine could be provided.

BEFORE OPERATING WITH NEW MACHINE

1. Inspect for damage and loose or missing parts. Make sure all fittings and drive components are secure.
2. Lubricate. See Lubrication Section for details.
3. Check tank for any foreign objects.
4. Fill tank 1/2 full with clean water. DO NOT add and spray chemicals until the sprayer is started, adjusted and calibrated.

PREPARE THE SPRAYER

THE AIR BLAST SPRAYER IS A MACHINE WHICH CAN BE OPERATED ONLY BY SKILLED PEOPLE AS ARE POTENTIALLY DANGEROUS BOTH FOR THE OPERATOR AND FOR THE ENVIRONMENT IN THE CASE SOME SPECIFIC RULES WOULD NOT BE RESPECTED.

Look at the gauge placed on the pressure regulator for adjusting the pressure required.

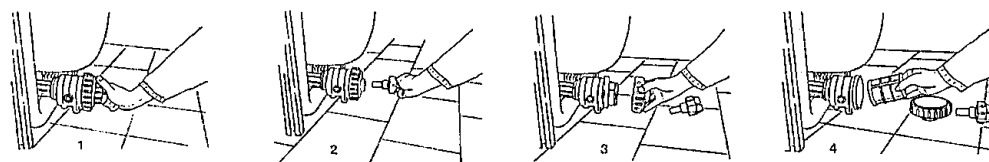
Choose the pressure following the charts provided with the chemical and according to the quantity of product you plan to spray.
When adjusting the pressure, operate the valve very slowly to avoid possible damages on the system, like pump, hoses, connectors etc.

While using the sprayer, it could be necessary re-adjust the pressure to the required level, because some tractors may loose some power during work.

Note: the pressure varies according to the tip mounted on the nozzle

Before starting any work, it is advisable to test the unit with clean water, in order to get used to it and to the handgun and for making the fine tuning. After having attached the machine to the tractor, make sure, once again, that the 3 Point hitch is in a vertical position and, If not, adjust it accordingly with the top link.

Close the valve (1) placed between the tank and the filter (3) and check if the cartridge (4) needs to be cleared or eventually replaced if the mesh would be damaged.



Then open the valve of the filter to allow the suction from the tank.

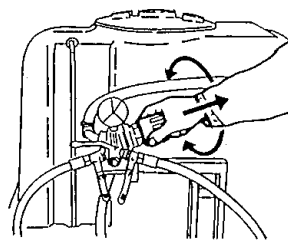
Do not forget to place the cartridge into its lodging after having cleaned the filter.

Now you can start the motor of the tractor and engage with care the PTO, accelerating slowly and being sure of not exceeding the 540 rpm.

By adjusting the pressure valve, find on the gauge the pressure you want to work with, referring to the chart herewith. It is important that the adjustment of the pressure would be made by turning the valve slowly. In fact, a sudden change of pressure could damage some component of your sprayer. once you will start to work, it may be necessary to re-adjust slightly the pressure, as some tractors, when in motion, loose some power at the PTO.

Note : the pressure varies according to the type of the tips on nozzles used.

The main valve placed by the control assembly allows either to put the system under pressure or to activate the by-pass of the liquid which will return into the tank.

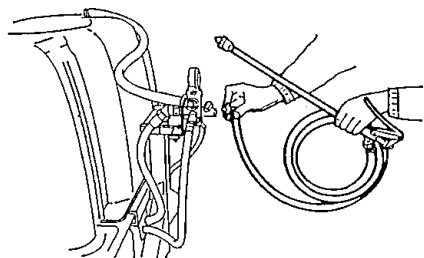


Note : Please refer also to the PUMP SECTION OF THE PUMP as the main valve may change on design.

Before using the handgun, be sure that the hose, the connectors and the handgun self, can work at the maximum pressure of the pump. The lack of respecting this rule could be very dangerous.

Check periodically the handgun, the hose and the connectors and replace immediately the parts which are defective (cracks, leaks etc.). This is very important for the safety of the operator and the environment.

It is absolutely forbidden to use hoses fixed with straps as they could easily blow out. Use only hoses with self-locking or threaded connectors. The lack of respecting these rules could cause severe damages and/or injuries.



INSTRUCTION FOR USE

1. Ensure that the pressure regulator valve is in position of by-pass in order that the liquid return to the tank, et that the cocks valve are closed.
2. Before starting the motor, check the oil level. A sensor prevents the engine to start if the oil level is too low.
3. Ensure that the engine contain fuel for starting.
4. The sprayer must be placed on a horizontal surface.
5. Fill the tank with the chemical product compound which has been prepared beforehand, until it reaches a height about 3 cm below the bottom of the loading strainer.
6. Start the engine, following the instructions given in the chapter "Operator's instructions" on use with the engine.
7. Increase the number of motor revs by turning the throttle; for first 30 working hours do not exceed $\frac{3}{4}$ of the opening distance.
8. Lock the lever of the regulator valve at the required pressure level and check periodically if this level is maintained. Should the pressure have varied, readjust it accordingly.
9. Open the cocks valve of the nozzles or sprayguns and increase the pressure which allows perfect adjustment of the liquid flow; depending on the type of the crops: the operator must adjust the pressure in the most suitable position.
10. To stop the spraying, open the lever of the regulator valve in by-pass position and after close the cocks valves.

TEST OF USE : It is advisable spray the first treatment with clean water to check the following:

- correct work of the machine;
- correct calibration in lt/hectare of the machine;
- train yourself to become confident to all the operations you have to perform when using the machine.

CALIBRATION AND RATE

**FORMULA AND RATE
CHART FOR CALIBRATING**

The following data must be known:

- 1) Tree spacing (swath width) in metres (m).
- 2) Tractor speed in (Km/h).
- 3) Litres per hectare desired (Lt/h).

Note: 1 hectare = 10.000 m²

[Tree spacing _ (m)] x [Speed _ (km/h) x Litres per hectare desired _ (Lt/ha)]: 600 = _ (Lt/min).

Next: _ Lt/min. _ nr. of tips = _ Lt/min each tips.

Now choose the appropriate tip and pressure setting.

•Delivery chart for single tip (Lt per minute) [Lt/min]

540 R.P.M.	CONE TIPS		Ø	BAR	3	4	5	6	10	15
	ISO ORANGE	1.0		Lt/min.	0.33	0.37	0.41	0.44	0.53	0.63
	ISO GREEN	1.2		Lt/min.	0.35	0.41	0.44	0.48	0.59	0.68
	ISO YELLOW	1.6		Lt/min.	0.47	0.53	0.59	0.63	0.76	0.89
	ISO BLUE	2.0		Lt/min.	0.72	0.82	0.91	0.98	1.3	1.5
	FAN TIPS		MOD.	BAR	1.5	2.0	2.5	3.0	3.5	4.0
	ISO YELLOW	02		Lt/min.	0.56	0.64	0.72	0.79	0.85	0.91
	ISO BLUE	03		Lt/min.	0.84	0.97	1.08	1.18	1.28	1.37
	ISO RED	04		Lt/min.	1.12	1.29	1.44	1.58	1.71	1.82

Note: any difference between values measured in the field and the values indicated in the tables may be due to various factors: viscosity of the chemical products used, differences in the tractor speed, filter not perfectly clean. It is advisable to verify capacity and consumption with clean water before the treatment. The above values are for reference only.

PREPARING THE CHEMICALS

WARNING: keep the products in ventilated premises with a door fitted with a lock inaccessible to children and to unauthorized persons. Place warning notices on the outside indicating the danger zone.

Before preparing the mixture to be sprayed:

1. Calculate the exact amount of the chemical product needed for the area to be treated, so as to be able to prepare the exact quantity of product to the sprayed. The chemical product must be kept in their original package, supplied with their own labels.

2. Ensure that the machine has been correctly set up and calibrated.
3. Carefully read the instruction concerning:

-the use of the chemical product to be applied, especially as regards conditions of use and the correct preparation of the dose as shown on the package;
-operation of the sprayer;

WARNING: when mixing the chemical products it is always necessary to check that they are physically, chemically and biologically compatible with one another;

4. During preparation of the mixture, ensure that there are no children, unauthorized persons or animals in the vicinity, or anyone without suitable protection. Always wear protective clothing: gloves, goggles, dust proof mask or helmets, overall working clothes and boot resistant to the chemicals; do not eat, drink or smoke;

5. After preparing of the mixture, carefully wash your hand and face;

6. As soon as package that contained chemicals products have been emptied they must be washed and rinsed with clean water; the waste water must be poured into the distribution tank (tank for chemicals);

7. The empty packages must be kept inside the premises used for storing chemicals products until they can handed over the authorized collection service.

GENERAL MAINTENANCE

In order to grant a long life to the sprayer, it is very important to grant particular care to the maintenance.

The sprayer is a machine which has some components running at a very high number of revolutions per minute. The fast speed may accelerate damages if the following important points would not be respected:

- 1) DAILY check if all the bolts and nuts are tight.
- 2) DAILY check if there is any leak and repair it promptly if it is necessary.
- 3) DAILY check the tension of drive belts.
- 4) NEVER run the sprayer without having first checked that all shields are in place.
- 5) BEFORE starting to work verify if all the lubrications have been made according to the instructions.
- 6) DAILY rinse the hydraulic circuit of the sprayer with clean water to avoid sediments which could damage the pump, the valves etc.

Any of the above operations have to be performed only with the motor of the tractor off, a low gear engaged and the parking brake inserted.

CLEANING AND STORAGE

1. Wash and flush out sprayer after completion of each phase of your spraying program.
2. Flush out sprayer when changing chemicals if there is a possibility of incompatibility.

3. Clean sprayer very thoroughly before storing at the end of the spraying season.

If you are in a cold climate, final rinse should be with a sufficiently concentrated antifreeze to prevent freeze-up in areas that were not thoroughly drained.

4. Check sprayer over for needed repairs before time to spray again.

5. Preparing the sprayer for use in the Spring means to complete all the needed repairs, installation of all drain plugs and checking sprayer for leaks with a tank of water.

HOW TO AVOID ICE IN THE SPRAYER

- Never leave any liquid into the sprayer during the winter.

- Empty the tank by opening the bottom plug.

- Empty the pump and the hoses by blowing air under pressure from the suction hose, to allow the liquid to get out from the side of the bottom strainer (which will have been opened before).

Alternatively, if you do not have compressed air, run the pump for a few minutes to allow any liquid to get out.

- A further step to take to prevent ice, particularly in cold regions, is to fill the pump and all the hydraulic circuit, with anti freeze fluid.

CLEAN AND MAINTENANCE OF THE MACHINE

Since the sprayer is always in contact with chemical products, **BE SURE TO USE ALWAYS APPROPRIATE GLOVES, PROTECTIVE CLOTHING AND GOGGLES** to avoid burns or injuries when doing any work on the machine.

- After any day of work, the sprayer has to be appropriately washed and rinsed inside. When doing this operation be sure of not polluting the environment with the water used for washing.

- The tank need to be rinsed inside also when it is necessary to change the type of chemical to be sprayed.

- At the end of the working season, the machine has to be cleaned throughout and any part has to be checked accurately to verify the need of any repair or maintenance.

In areas where the winter may be cold, be sure that all the parts of the sprayer are completely dry to prevent the risk that ice could damage some components, particularly the pump and the valves.

- At the beginning of the new season. double check again the need of any repair, particularly double check if everything is tight and there are no leaks. Verify if the hoses are in good sound conditions. Should you note cracks, replace immediately the hoses with new ones, to prevent the risk of possible blow up when the sprayer will go under pressure.

- All the tests at the beginning of the season have to be carried with clear water.

LUBRICATION

The pump has been tested before getting out from the line of production and therefore it is ready to work. Before starting to work, it is anyhow advisable to check the oil level and all the fittings, as well as if the bolts which hold it to the sprayer are all tight.

The oil lever need to be verified daily, or more frequently if the sprayer would be working in heavy conditions.

The oil reservoir has never to be completely full. The oil level has to be about at the middle of the glass.

The oil to be used is of the type anti-foam SAE 20 W 40.

The oil of the pump needs to be replaced at the end of every season or at least every 500 hours of work.

Some pumps are provided with an accumulator to control the pressure, in order to avoid vibrations and pulsation.

The pressure of the accumulator has to be checked periodically with a gauge. The correct pressure setting of the accumulator is shown on the manual of the pump and, as reference it has to be the 10% of the pressure used for working. For any more information about the pump, read and understand the manual of the pump.

1. Valve and O-ring Replacement.

- Occasionally debris can cause the valves to not seat properly or damage the oring.

To check for this problem, follow these steps : remove the pump manifold (see parts list for your model), with manifold removed, valves can readily be removed and checked for debris or wear.

-To replace valves or O-rings, refer to parts list for appropriate kits.

2. Diaphragm Replacement.

-Drain the oil from the pump by removing drain plug. Rotate the shaft to remove excess oil.

-Remove the pump manifold according to step in Section 1: valve and O-ring Replacement.

-Remove pump heads to expose the diaphragms.

-Use a 13 mm box wrench to remove the diaphragm retaining bolt, support washer and diaphragm.

To replace diaphragms order appropriate repair kit. See parts list.

-Turn the crankshaft to bring the piston to its down stroke and seat the new diaphragm into the sleeve groove. Install retaining washer and tighten nut.

-Refill crankcase with SAE 20 W 40 oil. Rotate the shaft to distribute oil and fill to proper level.

PREPARING THE CHEMICALS

Particularly when the machines are used in dusty area, it may be necessary to clean and grease again frequently the rotating parts to prevent excessive wear.

The use of some chemical product may also require a particular attention to the lubrication because the oil and grease could be degraded.

DRIVE SHAFT

Even if the drive line is lubricate at the time when it is manufactured, it is advisable to grease it again before the use. The parts which need to be greased are the spiders and the telescoping tubes.

The spiders need to be greased every 8 hours of working and before a long period of inactivity as the grease could have dried out.

Particularly when the machine are used in dusty areas, it may be necessary to clean and grease again frequently the telescoping tubes to prevent excessive wear.

The use of some chemicals may also require a particular attention to the lubrication of the drive shafts as the grease could be degraded.

For any other information about the drive shaft, please refer to the manual supplied with it.

THE GREASE USED FOR LUBRICATING THE DRIVE SHAFT IS SAE 90.

SPRAYING BOOM

The mechanical or hydraulic boom are provided of point of articulation, gear, levers, etc... which must be lubricate periodically at least every 100 hours.

THE GREASE USED FOR LUBRICATING THE BOOM IS SAE 90.

MECHANICAL AGITATION

When the sprayer is provided of mechanical agitation, it is necessary to lubricate every 8 hours, the brass nut which holds the stainless steel shaft of the agitator.

The brass nut contains a gasket which prevents leaks along the shaft which needs to be greased periodically.

Where there is a leak also after the lubrication and the nut is been fixed a little bit and there is no seal, this means that the gasket needs to be replaced.

FOR LUBRICATING USE GREASE SAE 90.



ROAD CIRCULATION

Before driving the tractor with the machine on the road, make sure there no leaks of chemical products or water and take note as follows:

- ensure on the rules in force are complied with
- total length of the convooy (sprayers and tractor);
- overall width;
- axle load;
- lifting capacity;
- rear lights and refractive signals;
- brake efficiency;
- whatever else the rules of the road provide for;

It is strictly forbidden to transport persons, animals or goods on the machine.

Operators that are: not of age, without driving license, unskilled ad not in good physical or mental health conditions, cannot drive the tractor or be entrusted with driving it.

Please consider that a 3 point mounted implement can have serious influence on readability, drive and braking efficiency of a tractor. When tractor takes a curve, the side stress varies considerably as a function of the center of gravity.

Before parking the tractor, please proceed as follows:

- lower to the ground the machine attached to the 3 point hitch;
- turn off engine;
- set on parking brake;
- take the ignition key out of the console;

Farm machines are manufactured for field work.

Should they be driven on public roads, then they must be equipped as provided for by Rules in force.

During road transportation with the machine attached to the 3 point hitch, be sure that the hydraulic lift system would be in the stable locked position.



TRANSPORT

Check if the vehicle's capacity is adequate to the weight of the machine which is indicate in the serial label fitted to the frame of the sprayer.

WARNING: the weight indictaed in the serial nr. label is referred to the mchine a full load with the liquid.

Make sure to respect the limits foreseen by the rules of road circulation. Adequately fasten the machine and detached parts.

It is advisable to transport the sprayer always with the tank completely empty and clean. Make sure of not spilling anything on the truck and/or on the road. Make sure to respect the limits foreseen by the rules of road circulation.

When transporting the machine over short or long distances, it is advisable to drain the fuel tank and chemicals tank completely so as to avoid leakage.

During transport the machine should always be kept in a natural position, as there is always some residue of fuel in the tank which could leak out and impregnate and/or damage the components of the sprayer and in order to respect the enviroment.

WARNING: before transporting the machine, wait until the motor unit has cooled down so as to avoid burning yourself or damaging material in the vicinity of the machine.

It is advisable top avoid lifting the sprayer in other points such as the tank, pump, regulator valve or spraying units like nozzles, hoses, as this could break or damage some of the components.

Be careful to lock accurately the machine to the truck or pick-up to avoid unnecessary and/or dangerous movements during the transit. Check all the parts which may get loose and lock them accordingly.

TROUBLESHOOTING

PROBLEM	CAUSE	REMEDY
The pump does not draw water.	-One o r more v alves are seating improperly. -Suction line is plugged o r collapsed. -Clogged strainer.	-Examine t he v alve s eating and clean them. -Examine suction line. -Clean strainer.
Pressure gauge fluctuates excessively.	-The pump is sucking in air through the suction union. -Air h as n ot been e ntirely evacuated from the pump. -Locked valves. -Leaks from gasket.	-Examine t he s uction h ose and s uction u nion, make sure they are firmly secured. -Run t he p ump with t he outlet hose open to evacuate air from the pump. -Clean or replace the valves. -Clean o r replace the gaskets.
The liquid f low is irregular.	-One o r more v alves are seating improperly.	-Examine t he v alve s eating and c lean t hem o r r eplace them.
Output d rops and t he pump is noisy.	-Oil level is too low. -	Add oil to correct level (half way up the sight tube).
Oil comes out of t he discharge p ort and water in the oil tank.	-One o r more d iaphragms split.	-Drain t he p ump of o il. Dismantle the heads and fit new diaphragms. Fill t o correct oil level with motor oil (SAE 20W40 See pump suction).
Water is p umped a t little or no pressure.	-The s ealing v alve o n the pressure c ontrol v alve i s worn.	-Renew washer and, if necessary, the valve seat.

GUARANTEE

GUARANTEE CONDITIONS

-the manufacturer guarantees that the machine described in the guarantee certificate is free from faults and defects deriving from materials and production.

-the wrong use of the machine, any unauthorized modification of it, the use by inexperienced persons, negligence, lack of servicing, the use of not original parts, etc..., will take off the guarantee right.

-the manufacturer guarantees the machine for 12 months from the date of delivery to the final consumer. Within this period the company undertakes to repair or replace free of charge any parts that present recognized defects in construction.

The absence of a sure demonstration of the purchase date brings the loss of the guarantee rights.

-All charges for labour and inspection are the buyer's expense, as are any costs incurred for sending spare parts. Any services requested from the manufacturer may be accepted or rejected at the company's discretion.

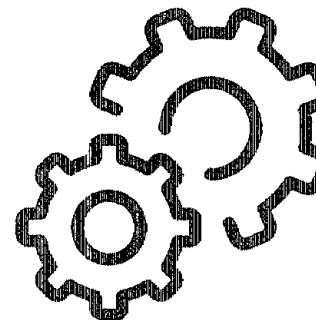
-All spare parts changed under guarantee must be sent, carriage paid, to the head office of the manufacturer within a maximum period of 30 days, on pain of invalidity of the guarantee.

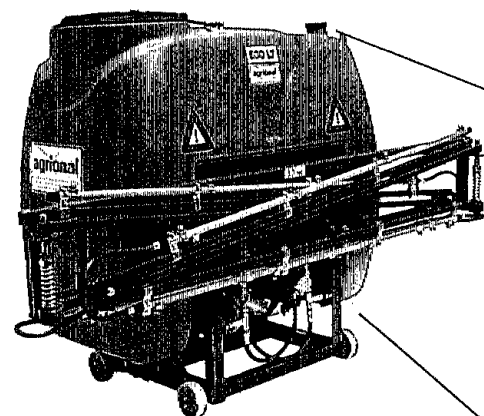
-Any repairs or replacement carried out or any tampering with the machine during the guarantee period without the authorisation of the manufacturer cause the guarantee to become invalid.

-The guarantee does not cover the parts which have been damaged due to insufficient maintenance or incorrect use. In no case may the buyer claim refunds for damages of any kind, arising in any way as result of use of the machine.

-Any replaced part claimed under guarantee will be regularly invoiced. The charge sum will be then credited later, after the part considered faulty will have been inspected by our technical department or by authorised personnel.

SPARE PARTS

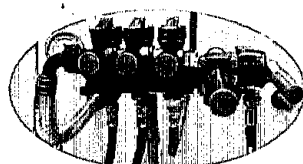




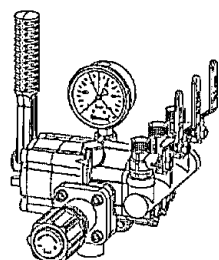
HAND WASHING

CIRCUIT TANK WASHING

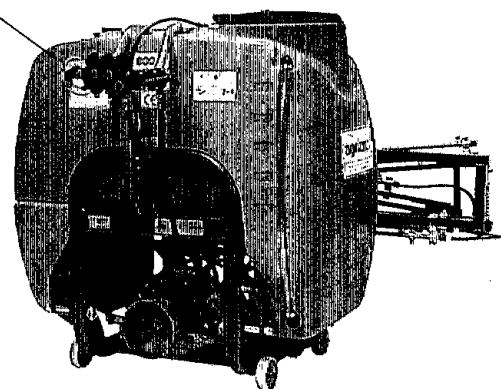
REGULATOR



FPR 20-3



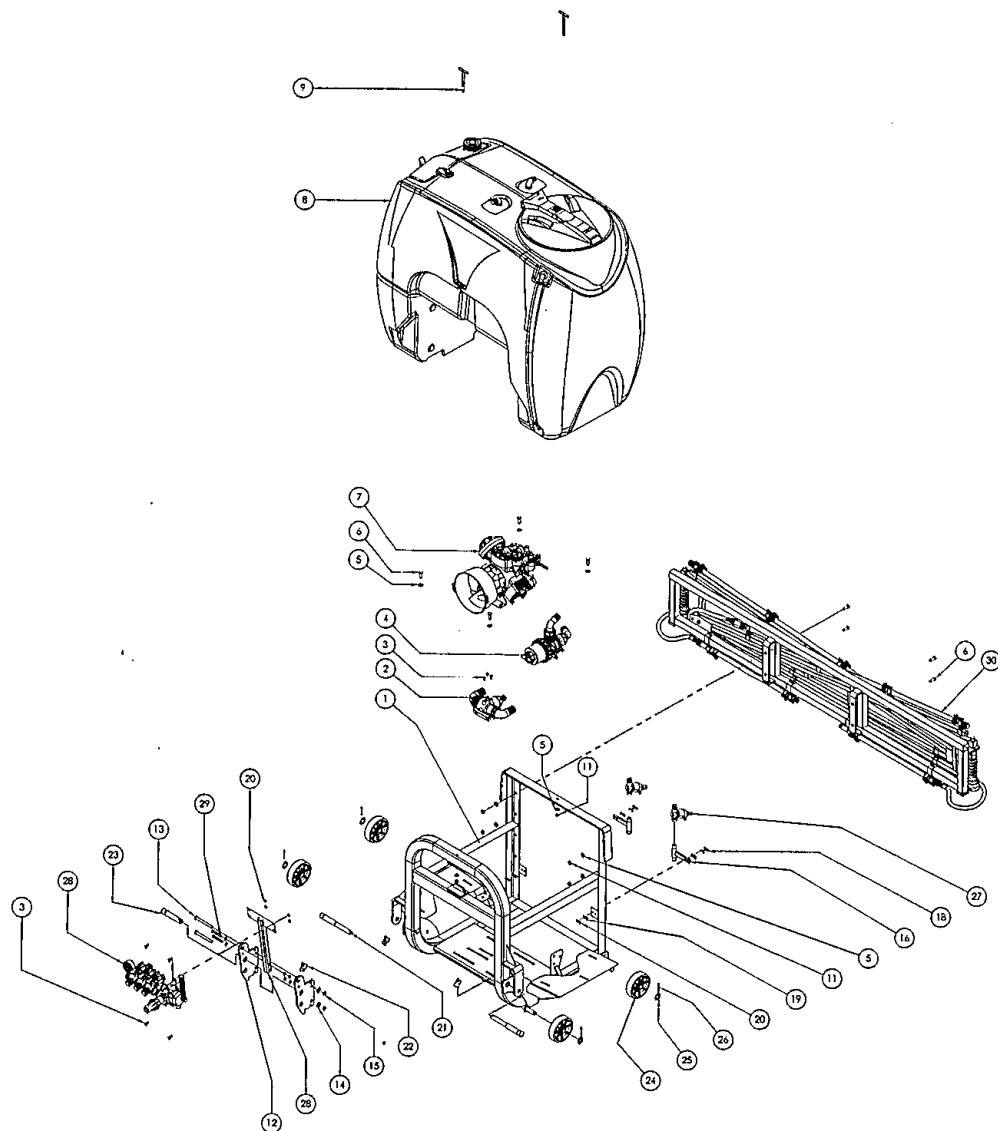
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PART LISTS

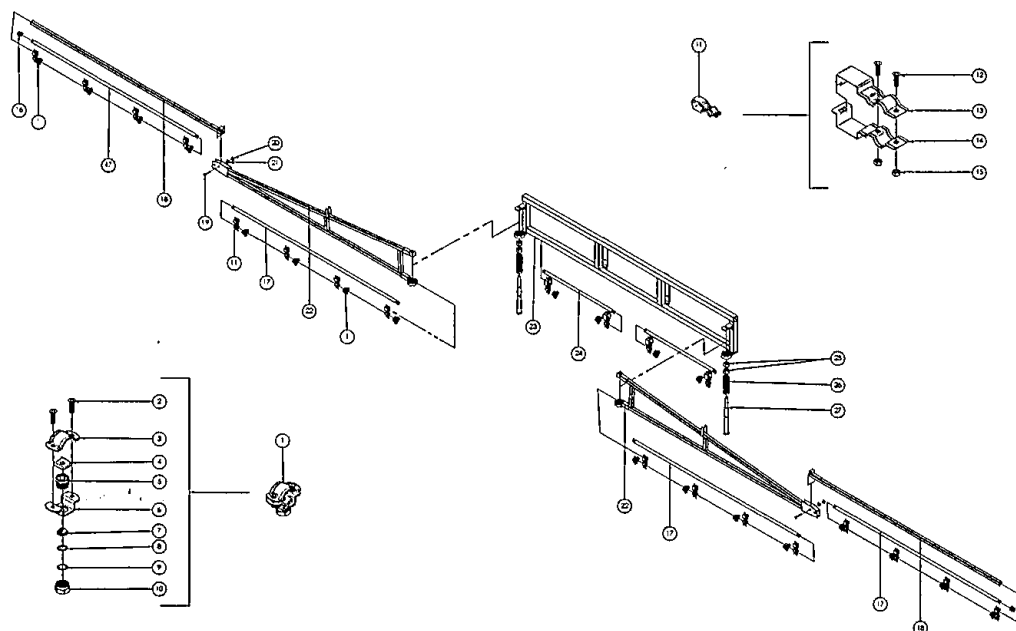


MAIN PARTS OF MACHINE



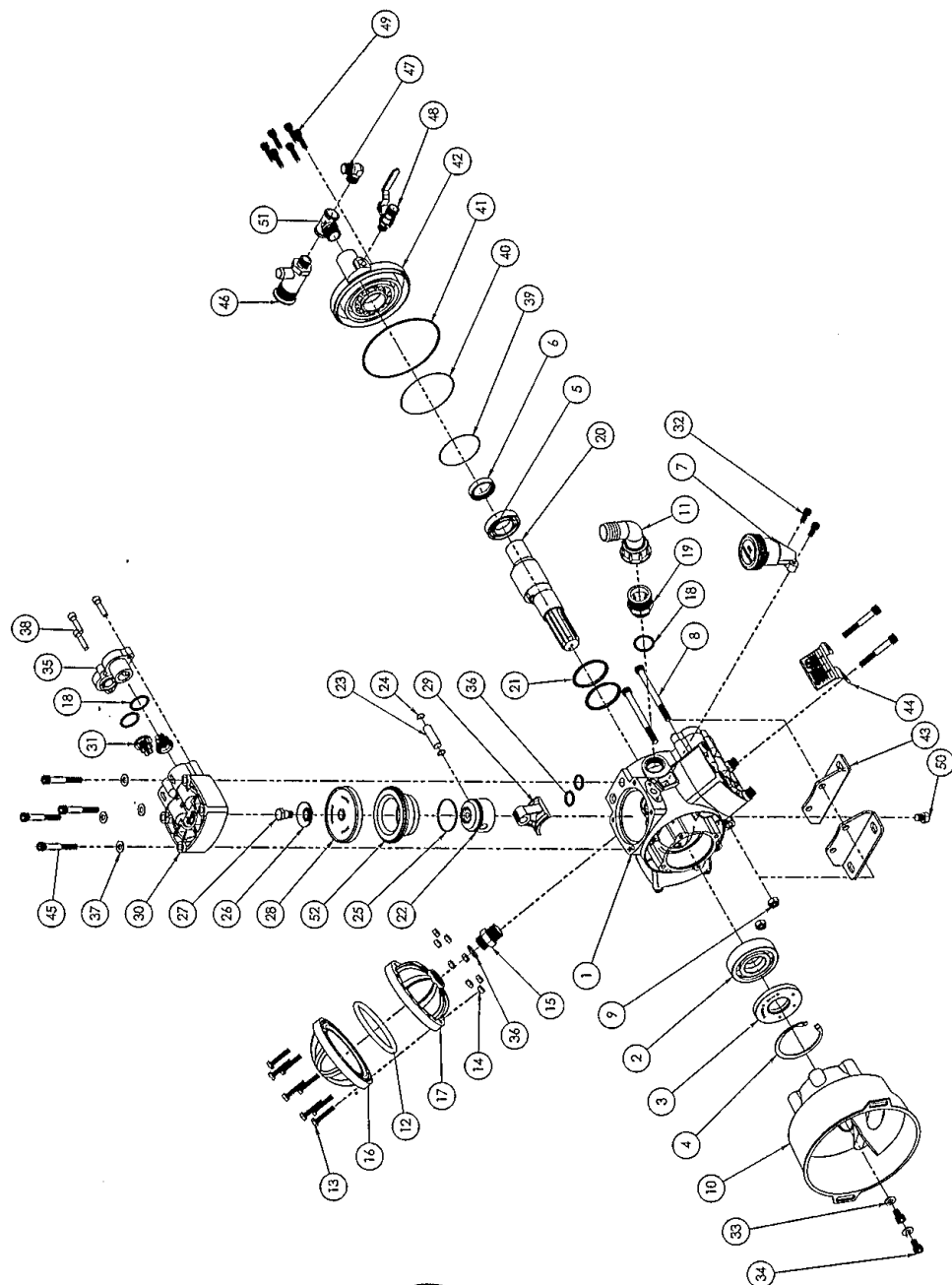
NO	REFERENCE	DESCRIPTION	QUANTITY
1		Main Chassis	
2		Router Valve	
3		M8 x 16 Bolt	
4		160 lt Check Valve Filter	
5		24x10,5x3 mm Washer	
6		M10x30 mm Bolt	
7		C71 Pump	
8		Delta Main Tank	
9		T Connection M10	
10		Angled Elbow Ø32	
11		Nut M10	
12		Tractor Shaft Connection	
13		M12x110 mm Bolt	
14		27x13,3x2,5 mm Washer	
15		M12 Nut	
16		Sheet Bar 20x10x100 mm	
17		Pipe 21,5x90 mm	
18		M8x30 mm Bolt	
19		18x8,5x1,5mm Washer	
20		M8 Nut	
21		Side Boom Pin Ø24,5x190mm	
22		Spring Pin	
23		Tractor Central Connection Pin Ø24x104 mm	
24		Movement Wheel	
25		Wheel Pin Washer	
26		Split Pin 6x32mm	
27		Mini Filter	
28		Regulator Connection	
29		M8x60 mm Bolt	
30		Boom	

10 MT BOOM PARTS



NO	REFERENCE	DESCRIPTION	QUANTITY
1		6-8-10 mt Standard Boom	
4		Brass Nozzle	
5		40x40 Clamp	
7		B20 Plastic Pipe 70 cm	
2		6-8-10 mt Standard Interboom	
4		Brass Nozzle	
6		25x25 Clamp	
8		B20 Plastic Pipe 165 cm	
3		10 mt Standard Boompoint	
4		Brass Nozzle	
6		25x25 Nozzle	
8		B20 Plastic Pipe 165 cm	
9		1/2" Plastic Plug	
10		M10x50 Bolt	
11		M10 Fibered Nut	
12		3/8 - 25x10x2,5 Washer	
13		M24x1,5 Nut	
14		10 mt Boom Spring	
15		Galvanized 10 mt Boom Wedge	
16		90 Bar Blue Hose 185 cm	
17		90 Bar Blue Hose 62 cm	
18		90 Bar Blue Hose 50 cm	

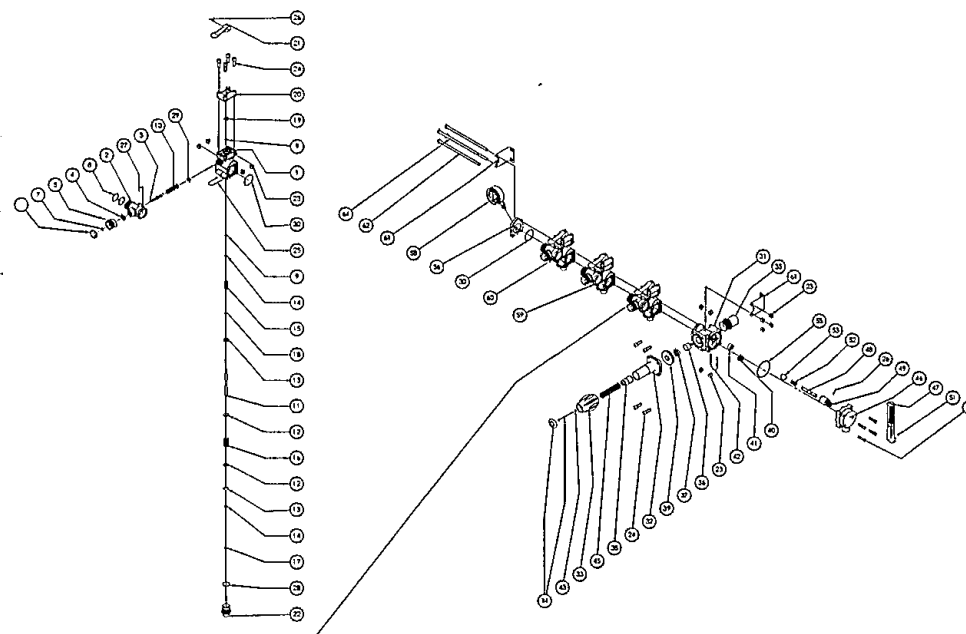
C71 PUMP PARTS



NO	REFERENCE	DESCRIPTION	QUANTITY
1	10700009	C71 Pump Body	
2	10000499	6308 Bearing	
3	10000508	40x90x10 Seal	
4	10000536	472x90 Oil Ring	
5	10000492	6007 Bearing	
6	10000506	35x47x10 Seal	
7	10001364	C71 Oil Bottle	
8	10000055	M10x120 Bolt	
9	10000551	M10 Fibered Nut	
10	10000462	Shaft Cover	
11	29.90.90.0047	C71 Plastic Connector With Nut	
12	10000531	95x9 Oring	
13	10000045	M8x40 Bolt	
14	10000546	M8 Nut	
15	10000085	3/4"E-3/4"E Metal Nipple	
16	10700017	C71 Airtube Top Cover	
17	10700016	C71 Airtube Bottom Cover	
18	10000523	30x3 Oring	
19	10000351	1 1/4"E-1"E Reducer Nipple	
20	10700021	Crank Shaft	
21	10000307	Connection Rod Ring	
22	10000259	Ø58 Piston	
23	10000308	Piston Pin	
24	10000537	472x14 Oil Ring	
25	10000538	58 mm Piston Ring	
26	10000647	C71 Diaphragm Thrust Washer	
27	10000225	C71 Diaphragm Thrust Bolt	
28	10000439	C71 Diaphragm	
29	10700019	C71 Piston Rod	
30	10700011	C71 Diaphragm Cover	
31	10000273	Ø32 Chrome Valve	
32	10000075	M8x25 Bolt	
33	10000476	M10 - 20x10x2 Washer	
34	10000056	M10x16 Bolt	
35	10700014	C71 Valve Cover	
36	10000518	21x3 Oring	
37	10000476	M10 - 20x10x2 Washer	
38	10000077	M8x35 Bolt	
39	10000530	75x2 Oring (Manifold)	
40	10000512	100x2 Oring (Manifold)	

NO	REFERENCE	DESCRIPTION	QUANTITY
41	10002680	142,5x3,53 Oring (Manifold)	
42	10700013	Manifold Cover	
43	29.80.83.0013	Galvanized Pump Support Sheet Metal	
44	29.00.03.0034	Machine Labels	
45	10000062	M10x70 Bolt	
46	10000458	Safety Valve	
47	10000191	1/2"E-1/2"E Street Elbow	
48	10000196	1/2"E-3/8"E Universal Valve	
49	10000076	M8x30 Bolt	
50	10000185	1/4" Metal Plug	
51	10004575	1/2"D T-3/4"E Elbow	
52	10700018	C71 Sleeve	

FPR 20-3 REGULATOR PARTS



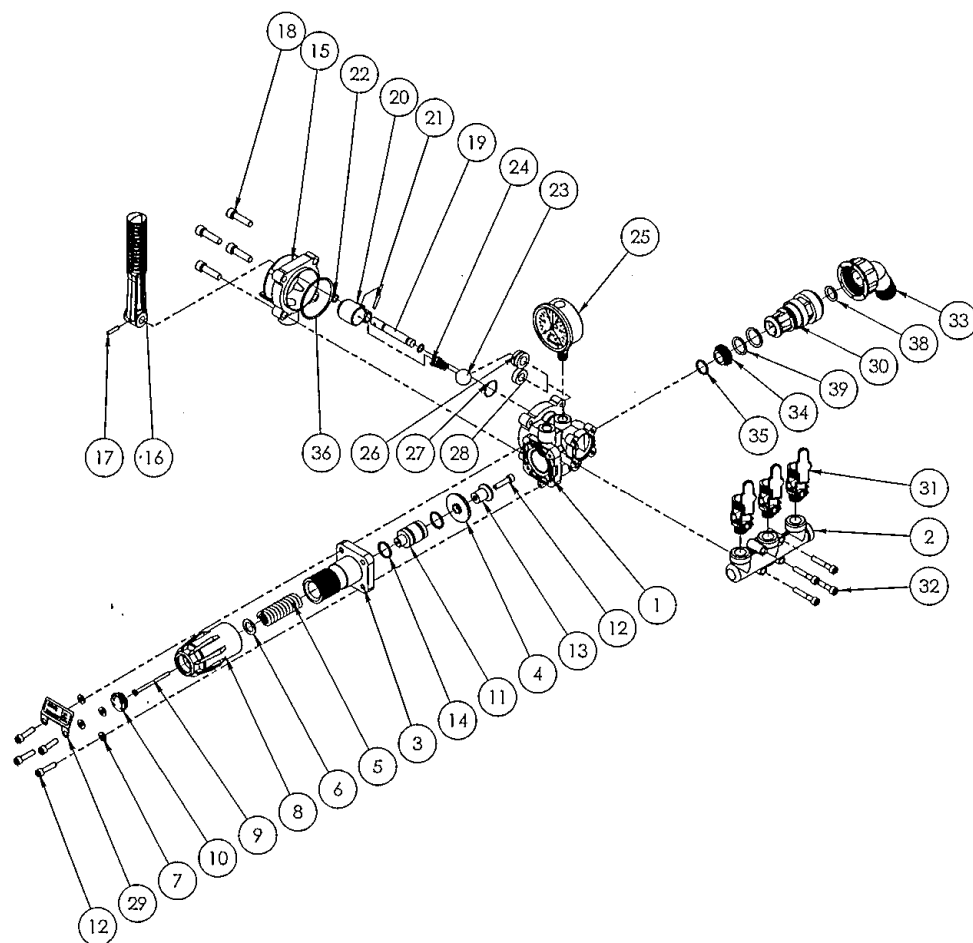


NO	REFERENCE	DESCRIPTION	QUANTITY
1		Main Body	
2		Body With O-Ring	
3		Piston	
4		Sensitivity Button	
5		Sensitivity Button Body	
6		Sensitivity Button Cover	
7		M6 Nut	
8		O-Ring 26,64x2,62 mm	
9		O-Ring 6,75x1,78 mm	
10		Sensitivity Button Spring	
11		Pin	
12		Ø19,5 Spring Pressure Bush	
13		Spring Gasket	
14		Chrome Washer	
15		Spring 3	
16		Spring 2	
17			
18			
19		O-Ring Pressure Gasket	
20		Cover 1	
21		Regulator Switch	
22		Ø26,5 Discharge Bush	
23		M8 Fibered Nut	
24		M8x25 Imbus Bolt	
25		Split Spring 2	
26		Tube Pin 5x1x30	
27		Split Spring 1	
28		O-ring 21,89x2,62 mm	
29		O-ring 12,37x2,62 mm	
30		O-ring 39,34x2,62 mm	
31		Inter-Connector	
32		Adjustment Bolt Body	
33		Adjustment Bolt Green Body	
34		Adjustment Bolt Green Body Cover	
35		Discharge Bush	
36		Pressure Adjustment Cover Bush	
37		Pressure Adjustment Cover	
38		Spring Pressure Pin	
39		Gasket	
40		Sealed Teflon	
41		Sealed Teflon 2	
42		Split Spring 3	



NO	REFERENCE	DESCRIPTION	QUANTITY
43		4,5x9x1 Washer	
44		M4x70 Imbus Bolt	
45		Spring 5	
46		Manifold Cover	
47		Regulator Switch	
48		Regulator Switch Pin	
49		Regulator Switch Assembly Plastic	
50		3/4 Brass Inlet	
51		4x1x25 Tube Pin	
52		Spring 4	
53		Bearing Ball	
54		M6x25 Imbus Bolt	
55		O-ring 61x3 mm	
56		Manometer Cover	
57		1/4 Brass Insert	
58		Manometer	
59		Open O-Ring	
60			
61		Connection Sheet Metal	
62		M8x210x30 Pin	
63		M8 Nut	
64		M8x203x30 Pin	

OSR 50-3 REGULATOR PARTS



NO	REFERENCE	DESCRIPTION	QUANTITY
1	29.60.61.0002	Regulator Body	
2	29.80.85.0004	Outlet Manifold	
3	10004054	Pressure Valve Plastic Body	
4	10000691	Diaphragm	
5	10003181	Pressure Spring	
6	10000480	22x14x1,5 Washer	
7	10000477	12x6x1,5 Washer	
8	10005118	Regulator Adjustment Nut	
9	10003639	M4x60 Civata	
10	10002641	Regulator Adjustment Nut Stopper	
11	10003496	Aluminum Pressure Valve	
12	10000693	M6x25 Inox Imbus	
13	10000692	Bush	
14	10003840	20,62x2,62 Oring	
15	29.80.85.0002	Regulator Cover	
16	10005714	Regulator Open-Close Bar	
17	10000699	Split Pin	
18	10000076	M8x30 Imbus	
19	10005111	Regulator Shaft	
20	10005522	Ø 20 Ball Socket	
21	10002968	Ø3x20 Inox Pin	
22	10000681	6,5x2 Oring	
23	10000503	Ø20 Ball	
24	10000683	Ø 20 Ball Socket Plastic	
25	10000212	Manometer	
26	10005382	Ø22,27x10,8x12 Ball Socket	
27	10001722	17x2 Oring	
28	10005383	Ø22,25x7,8x11 Ball Socket	
29	29.00.03.0034	Machine Labels	
30	10005119	Regulator Discharge Bush	
31	10000196	1/2" B-3/8" E Universal Valve Arm	
32	10002314	M6x35 Imbus	
33	29.90.90.0050	Regulator Discharge Elbow With Nut	
34	10005110	Ring	
35	10005454	29x2,5 Oring	
36	10005453	58,42x2,62 Oring	
37	10000667	28x3 Oring	
38	10000518	21x3 Oring	
39	10002948	25x3 Oring	