



GEA Farm Technologies

Trailer Super Pump

PTO pumps

Instruction Manual / Installation Instructions
2010-9015-008
09-2009

GEA Farm Technologies - The right choice.

Contents

1	Preface	4
1.1	Information on the instructions	4
1.2	Manufacturer's address	5
1.3	Customer service	5
1.4	Guidelines, Laws, Standards	6
1.4.1	Manufacturer's declaration	7
1.5	Warranty and Exclusions	8
1.5.1	Warranty	8
1.5.2	Warranty exclusions	8
1.5.3	Limited warranty	8
2	Safety	9
2.1	Owner's obligation of care	9
2.2	Explanation of the safety symbols used	10
2.3	Basic safety instructions	11
2.4	Personnel qualification	11
2.5	Protective devices	12
3	Description	14
3.1	Correct applications	14
3.2	Changes to the product	14
3.3	Design of the equipment	15
3.4	Functional description	15
3.5	Technical Data	16
3.6	Main view	18
3.7	Options	19
4	Transport	21
4.1	Special personnel qualification required for transport	21
4.2	Safety instructions for transport	21
4.3	Permissible devices and aids for transportation	21
4.4	Transport	22
4.5	Includes	22
4.6	Information on disposing of packing material	23
5	Installation	24
5.1	Special personnel qualification required for installation	24
5.2	Safety instructions for installation	24
5.3	Assembly preparations	25
5.4	Pump assembly	26
5.5	Information on disposing of installation material after installation is finished.	30
6	Initial Commissioning	31
6.1	Special personnel qualification required for initial commissioning	31
6.2	Safety instructions for initial commissioning	31
6.3	Checks before initial commissioning	31
6.4	First start	32
6.5	Checks after initial commissioning	32
6.6	Handing over to the owner	33

7	Operation	34
7.1	Special personnel qualification required for operation	34
7.2	Safety instructions for operation	34
7.3	Workplaces for operating personnel	37
7.4	Description of the operating elements	38
7.4.1	Manual controls	38
7.4.2	Hydraulic controls (optional)	39
7.5	Operating	41
7.5.1	Moving the pump	42
7.5.2	Positioning the pump	43
7.5.3	Installation of an additional PTO on draw bar (optional)	46
7.5.4	Agitation mode	47
7.5.5	Manure transfer mode	48
8	Operating faults	50
8.1	Special personnel qualification required for troubleshooting	50
8.2	Safety instructions for troubleshooting	50
8.3	Troubleshooting possible faults	51
9	Maintenance	52
9.1	Special personnel qualification required for maintenance work	52
9.2	Safety instructions for maintenance	52
9.3	Inspection and preventive maintenance	55
9.3.1	After emptying each pit	55
9.3.2	Every 5 hours	56
9.3.3	Every 10 hours	56
9.3.4	Every 50 hours	56
9.3.5	Every 75 hours	56
9.4	Repairs	58
10	Decommissioning	59
10.1	Special personnel qualification required for decommissioning	59
10.2	Safety instructions for decommissioning	59
10.3	Temporary decommissioning	60
10.4	Final decommissioning/disposal	61
11	Appendix	62
11.1	Label position	62
11.2	Abbreviations	65
11.3	Consistency test	66
11.4	Hydraulic diagrams	67

1 Preface

1.1 Information on the instructions

These instructions are supplied with the product.

- It is designed modular and is only in relation to the mentioned product. For details of the components which are relevant to the product, please refer to the appropriate manuals. This applies especially for safety information!
- They should be kept close at hand and remain with the equipment even if the equipment is sold.
- This manual is not subject to an amendment service. The most recent version at any time can be obtained through the technical dealer or directly from the manufacturer.

We reserve the right to make changes due to technical developments in the data and images given in this manual.

Reproductions, translations and copies of any kind, even of extracts, require written authorization from the manufacturer.

Abbreviations, units, specialist terms, special names or specialist terminology are explained in more detail in the "Appendix".

Pictograms used



This pictogram indicates information that will help towards a better understanding of the working processes.



This pictogram indicates a special tool required for installation.



A correction bar in the margin indicates changes to the previous edition.



This pictogram refers to another document or chapter.

If a manual number is given, the middle 4 figures indicate the language, as follows:

	Language		Language		Language
-9000-	German	-9013-	Dutch	-9032-	Serbian
-9001-	English (Great Britain)	-9015-	English (America)	-9034-	Slovakian
-9002-	French (France)	-9016-	Polish	-9036-	Lithuanian
-9003-	Italian	-9021-	Danish	-9038-	Portuguese (Brazil)
-9004-	Romanian	-9022-	Hungarian	-9039-	French (Canada)
-9005-	Spanish	-9023-	Czech	-9040-	Latvian
-9007-	Swedish	-9024-	Finnish	-9041-	Estonian
-9008-	Norwegian	-9025-	Croatian	-9043-	Spanish (North America)
-9009-	Russian	-9027-	Bulgarian		
-9010-	Greek	-9029-	Slovene		

Possibly not all above-mentioned languages are available.

1.2 Manufacturer's address

GEA Houle Inc.
4591 boul. St-Joseph
Drummondville, Qc, J2A 0C6 (Canada)

 +1 819 477 - 7444

 +1 819 477 - 5565

 geahoule@geagroup.com

 www.gea-farmtechnologies.com

1.3 Customer service

If necessary, please contact your nearest authorized technical dealer.

1.4 Guidelines, Laws, Standards

The content and instructions of the following guidelines and regulations have been observed in the design and construction of this machine:

RL 98/37 EC	Machinery Directive
RL 93/68 EC	CE Marking
EN 12100-1	Machine safety, basic terms, general design guidelines. Part 1: Basic terminology, methods
EN 12100-2	Machine safety, basic terms, general design guidelines. Part 2: Technical guidelines and specifications
EN 294	Safety distances to prevent upper limbs from reaching dangerous points
EN 349	Minimum distances to prevent pinching parts of the body
EN 809	Pumps and pump units for fluids - general safety requirements
EN 953	Safety of machinery - General requirements for the design and construction of guards (fixed, movable)
EN 1050	Machine safety guidelines on risk assessment
EN 1152	Tractors and machinery for agricultural and forestry - Guards for power take-off (PTO) drive shafts - Wear and strength tests
EN 1553	Agricultural machinery - Agricultural self-propelled mounted, semi-mounted and trailed machines - Common safety requirements
NF X 08-003	Graphic and pictographic symbols - colors and safety signs

1.4.1 Manufacturer's declaration

in accordance with Appendix II B of the EC Machinery Directive (98/37/EC)

Manufacturer:	GEA Houle Inc. 4591 boul. St-Joseph Drummondville, Qc, J2A 0C6 (Canada)
Product category:	PTO pumps
Name / Model:	Trailer Super Pump
The named product is in conformity with the requirements of the following European directives: Machinery Directive 98/37/EC amended, CE Marking 93/68/EEC amended.	
Conformity with the requirements of these directives is testified by complete adherence to the following standards: Harmonized European standards: RL 98/37 EC, RL 93/67 EC, EN 12100-1, EN 12100-2, EN 294, EN 349, EN 809, EN 953, EN 1050, EN 1152, EN 1553, NF X 08-003 National Standards:	
Attention! We would point out that start-up is not permitted until it has been established that the machine/installation in which this product is installed, meets the requirements of the guideline on which it is based.	
Drummondville, 01.09.2009	 Yann Desrochers (Head of Research and Development)
The undersigned is acting by virtue of power of attorney from the management of: GEA Houle Inc., 4591 boul. St-Joseph, Drummondville, Qc, J2A 0C6 (Canada)	
This declaration certifies compliance with the guidelines indicated, but does not establish any guarantee in the sense of paragraphs 443, 444 BGB.	

1.5 Warranty and Exclusions

**Note!**

GEA Houle Inc. reserves the right to improve, change or modify the construction of equipment or any parts thereof without incurring any obligation to make the same changes on GEA Houle equipment previously sold.

1.5.1 Warranty

The company GEA Houle Inc. guarantees to the original buyer the parts of the equipment sold under the trademark GEA Houle for a period of twelve months from the date of original purchase. The written warranty in this manual has priority over any other publication previously made by GEA Houle Inc. The company, through its dealers, reserves the right to either repair or replace all parts deemed defective under the following conditions:

- 1 The equipment is installed, operated and maintained as per the company directives;
- 2 The buyer uses the equipment under normal conditions in accordance with the purpose for which the equipment was manufactured and as per operating instructions;
- 3 Defective parts must be returned prepaid to GEA Houle Inc.;
- 4 The buyer does not modify or try to repair the equipment or parts of the equipment without authorization;

The liability of the company GEA Houle Inc. and its dealers, in pursuance of this warranty, consists only in repairing or replacing the defective parts. GEA Houle Inc. and its dealers cannot be held responsible for indirect cost, damages or loss of production, freight expenses and any other expenses that may arise.

1.5.2 Warranty exclusions

- 1 Damage caused by lack of lubrication.
- 2 Damages caused by high speed traveling and / or long distance towing.
- 3 Operation that does not respect the company's instructions.
- 4 Damages caused by excessive horsepower or excessive PTO RPM, a misaligned PTO, a damaged or modified PTO (ie. modified shear bolts).
- 5 Wear caused by sand bedding or any other abrasive matter.
- 6 Damages caused by foreign matter in manure (ie. wood, steel, rock, concrete, twine, etc.).

1.5.3 Limited warranty

Any equipment used for custom pumping, rental or intensive work is guaranteed for a period of 30 days only.

2 Safety

2.1 Owner's obligation of care

The product has been designed and constructed while taking account of a potential risk analysis and after careful selection of the harmonized standards and other technical specifications to be complied with. It therefore guarantees a maximum level of safety.

This safety can only be achieved in practice on the farm however when all of the necessary measures have been taken. It is part of the owner's obligation of care to plan these measures and check that they are carried out.

In particular, the owner must ensure that

- Everyone who works with or performs activities in connection with the product must carefully read the instructions (especially the safety instructions and warnings) and sign to confirm that they have understood them and will act in accordance with them!
- A full set of legible instructions is always kept by the product.
- Anyone who has to carry out work on the product can look at the instructions at any time.
- The instructions in the section entitled "Basic safety instructions" are observed.
- The legal requirements are observed.
- The owner has to produce operating instructions for the farm which are especially adapted to the conditions of his business, once again expressly taking account of the safety aspects.
- The product
 - Should only be used for its intended purpose.
 - Should only be used if it is in perfect operating condition and, in particular, the safety equipment should be regularly checked to make sure it is in perfect operating condition.
- The work to be carried out is performed by a sufficiently qualified person!



In this respect, please also read the section on "Personnel Qualification".

- These personnel will be regularly instructed in all relevant matters of safety at work and protection of the environment and be familiar with the manual, particularly the safety instructions it contains.
- Operating personnel who require training may only work on the product under the supervision of an experienced person. The successful completion of training is to be confirmed in writing.
- All safety or warning instructions applied are not removed and remain legible.
- A DANGER! TOXIC GASES sign is posted at the eye level, at the entry of the pit area. Make sure this sign remains visible all the time.

- Escape routes are marked by means of signs in accordance with national regulations!
- The personal protective equipment required for personnel carrying out operation, maintenance and repairs is made available and used.
- No one must enter into a manure pit at any time.
- The “Safety Procedures for Confined Spaces” are always followed before operating or maintaining the pump. These safety procedures clearly explain the risks associated with manure, procedures for a safe access to work spaces and the minimum ventilation requirements to ensure the safety of humans and livestock. Find local safety procedures for confined spaces using Web Site below.

Location	Administrated by	Web Site
In Canada	Canadian Centre for Occupational Health and Safety	www.ccohs.ca
In USA	Occupational Safety and Health Administration	www.osha.gov
In European Union	European Agency for Safety and Health at Work	www.europe.osha.eu.int

- Unauthorized persons (e.g. children) are not allowed in hazardous areas and do not have access to cleaning agents or disinfectants.
- All guard are kept in place.
- Hands, feet and clothing are kept away from all moving parts.
- No one stands close to moving parts before starting the equipment.
- Never allow bystanders to stay close to the pump when it is lifted and / or in operation.
- The equipment is stopped before lubricating, maintaining and adjusting.

2.2 Explanation of the safety symbols used

Safety symbols draw attention to the importance of the adjacent text.

Safety symbols and signaling word

 **Danger!**
 Manure produces toxic gases that can cause a loss of conciousness, asphyxia or death in a few seconds.

 Manure agitation can produce toxic gases in buildings built above the pit. Toxic gases can also emanate in buildings situated by the pit and / or connected to the pit by an evacuation line.

 **Danger!**
 The word "Danger" together with a symbol signals a danger to people's and/ or animals' lives and health.

 **Attention!**
 The word "Attention" together with a symbol signals a danger for product, material or the environment.

2.3 Basic safety instructions



Danger!

There are warnings about specific residual dangers in the corresponding chapters.



Attention!

If the work requires special qualifications, these are described in the corresponding chapters!

- There are risks involved in the operation and maintenance of equipment for dairy farms. For your own safety, read and follow the operating manual carefully (especially the section entitled "Safety information")!
- The chapter on "Technical data" gives the permissible working conditions (pressure ranges, temperature ranges, airflow quantities etc.) and these must be observed!
- Do not open or dismantle devices (risk of injury)!
- Do not remove any protective devices (risk of injury)!
- When working with products from other manufacturers always observe the warnings from the safety data sheets and operating instructions from the product manufacturer!
- Do not stand underneath suspended loads.

2.4 Personnel qualification

All personnel who perform work on or with the product must carefully read and understand the instructions and act in accordance with them!

- Participation in corresponding product training is necessary.
- In principle, any work on hydraulic and pneumatic equipment may only be carried out by specialist personnel who have received the necessary training.

In addition, special qualifications are required for the following activities:

- Transport
- Cleaning
- Installation
- Commissioning
- Operation
- Maintenance / servicing
- Troubleshooting
- Repairs
- Shut-down



Attention!

Particular qualifications are described in the corresponding chapters!

2.5 Protective devices

- Protective devices

Protective guard for power take off driveline
(part no.) European

Safety cap
(part no. 2010-7704-670)



- Safety symbols, warnings, warning signs and labels



Danger! - Toxic gases (American model)

Manure produces toxic gases that can cause loss of consciousness, asphyxia or death in few seconds.
(part no. 2099-4720-010)



Danger!

Rotating driveline. Keep away!
(part no. 2099-4720-020)



Danger! (American model)

Before removing this cap, stop the pump.
Actuate directional valve cylinder a few times in order to relief pressure from the discharge pipe.
(part no. 2099-4720-070)



Danger! (European model)

Before removing this cap, stop the pump.
Actuate directional valve cylinder a few times in order to relief pressure from the discharge pipe.
(part no. 2099-4725-090)



Warning!

Always stop the equipment before servicing and maintenance.
Never adjust the equipment while it is running.
Keep all shields and guards in place.
Keep hands and loose clothing away from moving parts.
Make sure everyone is clear from moving parts before starting the equipment.
Refer to the owner's manual for operating and maintenance instructions.
(part no. 2099-4721-020)



Warning!

Always stop the equipment before service and maintenance.
Read the operator's manual for safety information and for operating, servicing and maintenance instructions.
(part no. 2099-4725-110)

540 rpm

Maximum 540 RPM
(part no. 2010-4703-430)

1000 rpm

Maximum 1000 RPM
(part no. 2010-4703-440)

3 Description

3.1 Correct applications

GEA Houle products and equipment are designed exclusively for agricultural livestock farms.

Trailer Super Pump is exclusively designed for:

- To homogenize and transfer liquid manure that may contain limited chopped bedding, minimal water with bottom sediments.
 - Maximum consistency for agitation is 2¼" [57 mm]
 - Maximum consistency for transfer is ¾" [19 mm]

Any applications that are not listed here are not part of the intended purpose and are therefore considered as improper use!

We would like to point out that the following in particular are prohibited:

- Processing substances other than manure and water through the pump.

The manufacturer/supplier is not liable for any resulting damage. The user alone bears the risk.

Correct use also includes reading the instructions and observing the inspection and maintenance conditions.

- The manufacturer expressly points out that only original parts and original accessories have been adapted, tested and authorized for use with the product.
- The installation or use of products from other manufacturers may affect the specified properties of the original parts and lead to injury to people and animals.
- The manufacturer does not accept any liability for injury to people or animals, or damage to the product, caused by the use of products from other manufacturers.

3.2 Changes to the product

For safety reasons, do not carry out any unauthorized changes!

Any planned changes must be approved by the manufacturer in writing.

Parts and special equipment which have been obtained elsewhere must be expressly authorized by GEA Houle, in writing, for use in GEA Houle components and installations.

3.3 Design of the equipment

Design

The Trailer Super Pump consists of:

- a vertical pump fixed on a trailer attached to a farm tractor tow bar.
- a hydraulic cylinder tilting the pump on a pivot hinge point from a horizontal to vertical position and an additional hydraulic cylinder to lift and lower pump in a sliding rail frame mechanism.
- an adjustable nozzle to homogenize manure.
- a directional valve to divert the flow to either the agitation nozzle or the discharge line.

Drive

The pump is driven with a PTO shaft connected to the tractor.

3.4 Functional description

Trailer Super Pump

- A farm tractor is used to move the pump.
- Hydraulic hoses from the pump assembly are connected to the tractor to operate the cylinders and motors as well as the hydraulic controls.
- The pump is positioned adjacent to an in ground manure storage pit.
- The pump assembly is mounted to a sliding frame on a trailer.
- The pump is tilted up and lowered into the pit.
- The pump is driven with a PTO shaft connected to the tractor.
- The pump will agitate, homogenize and transfer manure from the manure pit.
- The agitation nozzle is adjusted up and down plus rotated side to side to homogenize the manure in the pit.

3.5 Technical Data

Performance data

6" Super pump with impeller 20" x 6 blades and 12" intake.

RPM/ ratio	Hp	Nozzle diameter	Nozzle pressure	Shut-off pressure	Maximum head *
540 / +10%	70	3" [76 mm]	20 psi [1.4 bar]	22 psi [1.5 bar]	36 ft [11.0 m]
540/ +26%	85	3" [76 mm]	26 psi [1.8 bar]	28 psi [1.9 bar]	45 ft [13.7 m]
540/ +26%	100	(2) x 3" [76 mm]	22 psi [1.5 bar]	28 psi [1.9 bar]	45 ft [13.7 m]
1000/ -35%	95	3" [76 mm]	30 psi [2.1 bar]	33 psi [2.3 bar]	53 ft [16.2 m]
1000/ -35%	120	(2) x 3" [76 mm]	25 psi [1.7 bar]	33 psi [2.3 bar]	53 ft [16.2 m]
1000/ -26%	110	3" [76 mm]	35 psi [2.4 bar]	38 psi [2.6 bar]	61 ft [18.6 m]
1000/ -26%	135	(2) x 3" [76 mm]	28 psi [1.9 bar]	38 psi [2.6 bar]	61 ft [18.6 m]

8" Super pump with impeller 21" x 4 blades and 14" intake.

RPM/ ratio	Hp	Nozzle diameter	Nozzle pressure	Shut-off pressure	Maximum head *
1000/ -26%	145	3¼" [83 mm]	35 psi [2.4 bar]	40 psi [2.8 bar]	65 ft [19.8 m]
1000/ -26%	155	4" [102 mm]	32 psi [2.2 bar]	40 psi [2.8 bar]	65 ft [19.8 m]
1000/ -26%	160	(2) x 3" [76 mm]	30 psi [2.1 bar]	40 psi [2.8 bar]	65 ft [19.8 m]
1000/ -26%	170	(2) x 3¼" [83 mm]	28 psi [1.9 bar]	40 psi [2.8 bar]	65 ft [19.8 m]

8" Super pump with impeller 22" x 4 blades and 14" intake.

RPM/ ratio	Hp	Nozzle diameter	Nozzle pressure	Shut-off pressure	Maximum head *
1000/ -26%	170	4" [102 mm]	34 psi [2.3 bar]	43 psi [3.0 bar]	70 ft [21.3 m]
1000/ -26%	175	(2) x 3" [76 mm]	32 psi [2.2 bar]	43 psi [3.0 bar]	70 ft [21.3 m]
1000/ -26%	185	(2) x 3¼" [83 mm]	30 psi [2.1 bar]	43 psi [3.0 bar]	70 ft [21.3 m]
1000/ -26%	195	(2) x 3½" [89 mm]	28 psi [1.9 bar]	43 psi [3.0 bar]	70 ft [21.3 m]

8" Super pump with impeller 22" x 4 blades and 14" intake.

RPM/ ratio	Hp	Nozzle diameter	Nozzle pressure	Shut-off pressure	Maximum head *
1000/ -26%	190	(2) x 3" [76 mm]	34 psi [2.3 bar]	46 psi [3.2 bar]	74 ft [22.6 m]
1000/ -26%	200	(2) x 3¼" [83 mm]	32 psi [2.2 bar]	46 psi [3.2 bar]	74 ft [22.6 m]
1000/ -26%	210	(2) x 3½" [89 mm]	30 psi [2.1 bar]	46 psi [3.2 bar]	74 ft [22.6 m]

* Maximum pumping head permitted.

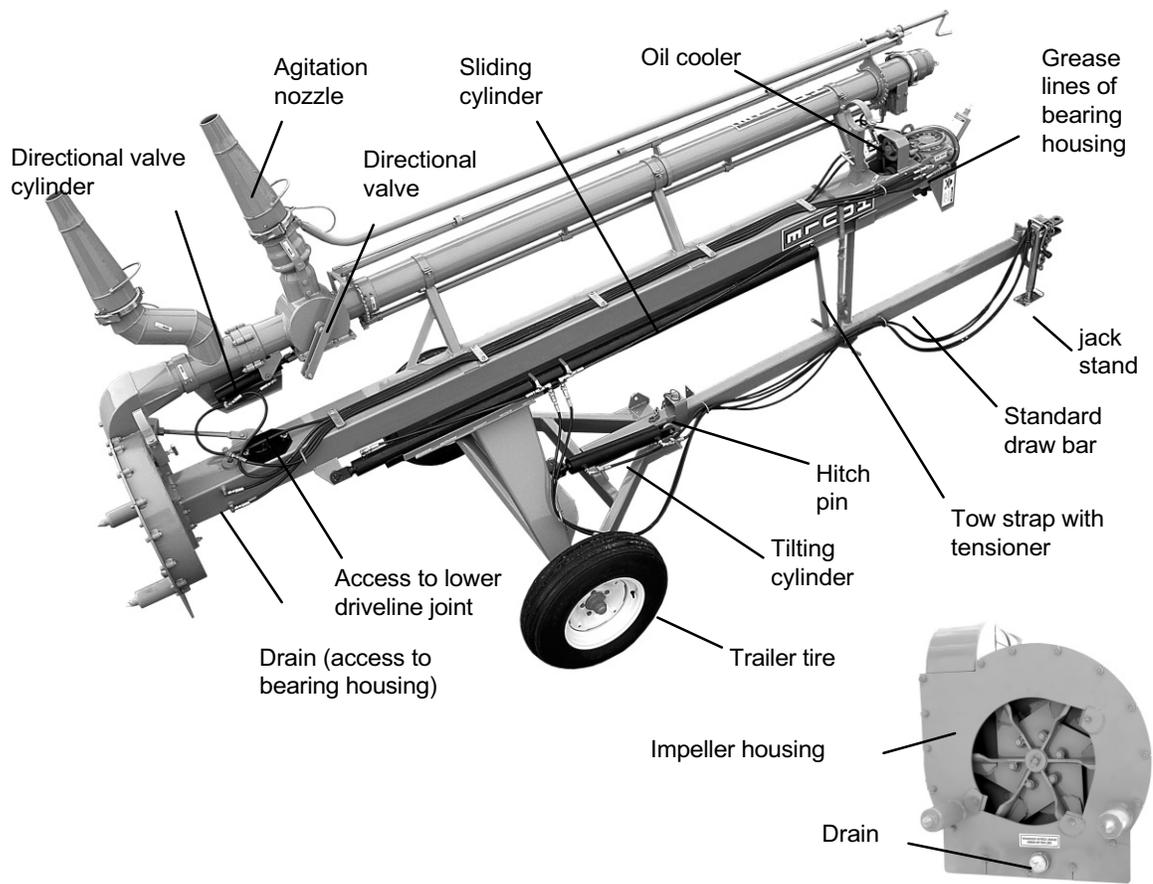
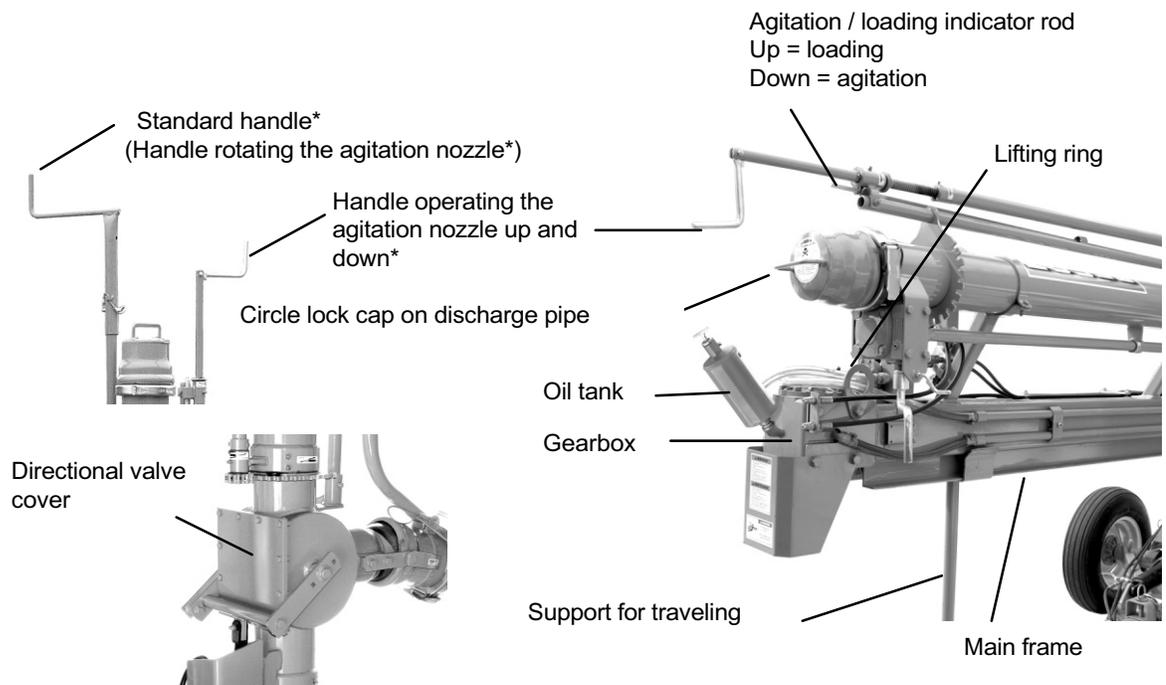
Hydraulic hoses

I.D.	1/4"	1/2"	3/4"
O.D.	0.58"	0.86"	1.10"
Quantity of braids	2	2	1
Service pressure	400 bar (5,800 psi)	276 bar (4,000 psi)	105 bar (1,525 psi)
Service temperature	-40°C to 100°C (-40°F to 212°F)		

Tire

Tire brand	Tire model	Ply	Pressure		Tire dimensions (inches/mm)		Weight (tire without rim)	
			psi	bar	Diameter	Width	Lbs	Kg
Goodyear	16.5L X 16.1	8	26	1.8	30.3/770	10.7/272	31	14

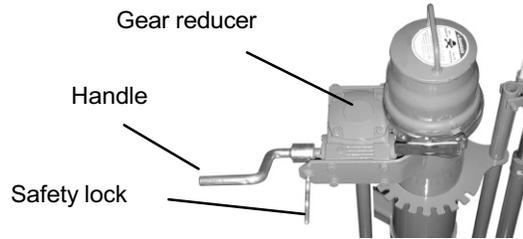
3.6 Main view



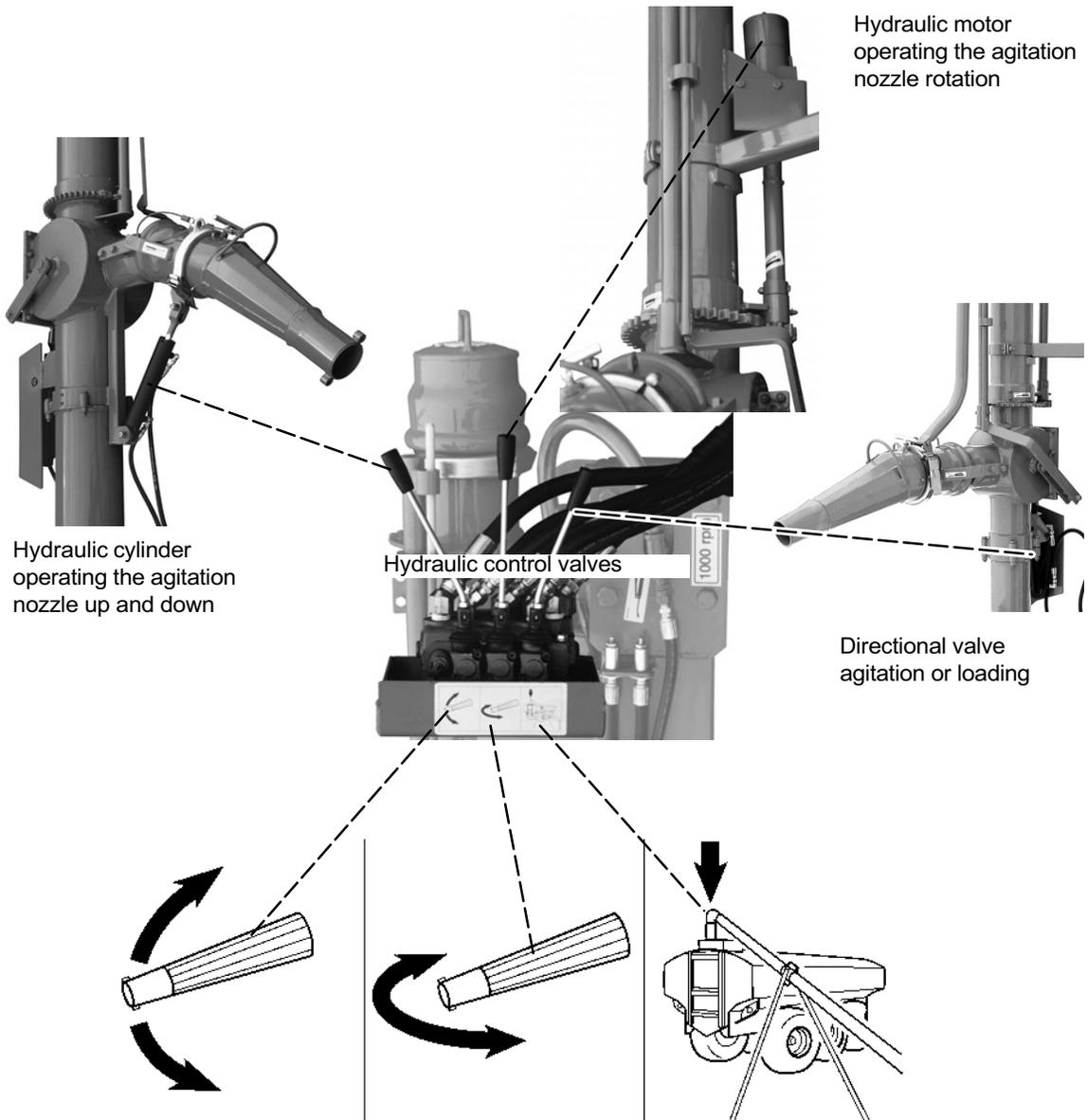
* Manual controls of the agitation nozzle and the rotation of the propeller can be replaced by optional hydraulic controls.

3.7 Options

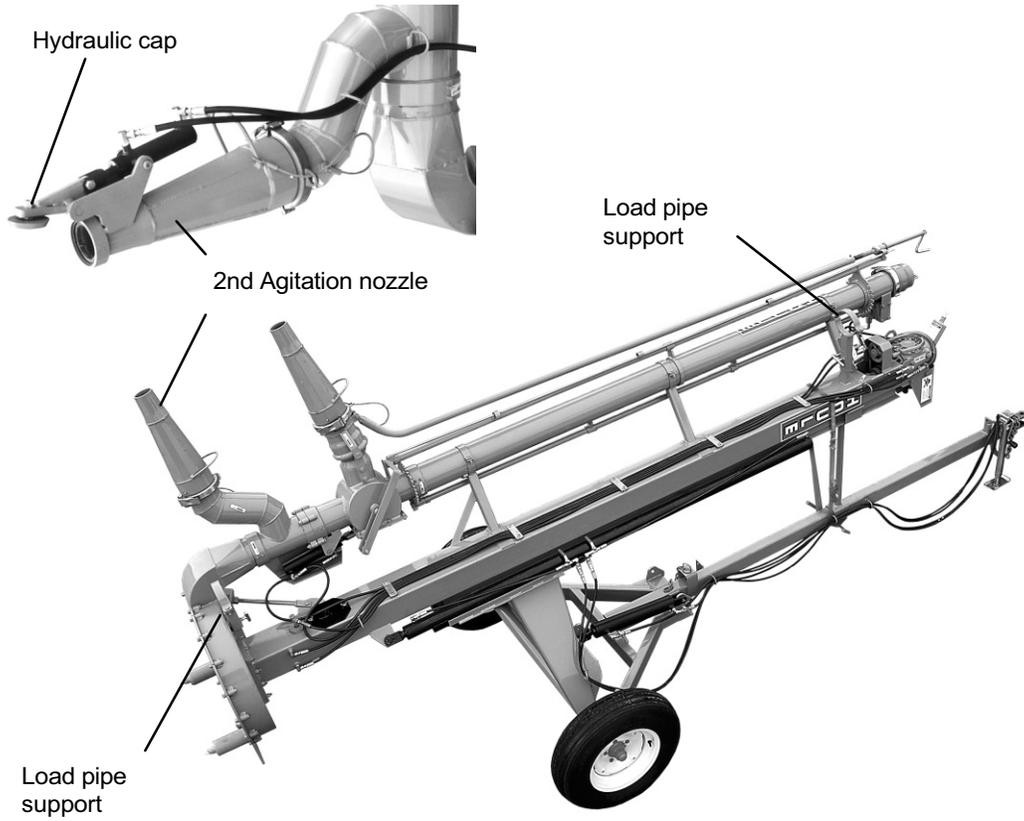
Gear reducer to rotate the agitation nozzle



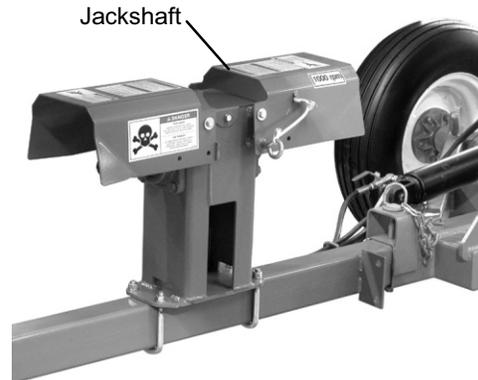
Hydraulic controls



2nd agitation nozzle and loading pipe supports



Draw bar with additional PTO



4 Transport

4.1 Special personnel qualification required for transport

Transport may only be performed by specially qualified personnel in accordance with the safety instructions.

- National driver's licence for drive-on machines, stackers and other trucks.



Also see the section on "Personnel qualification".

4.2 Safety instructions for transport

To prevent damage to property and/or life-threatening injury to personnel always observe the following:

- Only the load suspension and support equipment indicated here should be used, at the specified support points, for transport.



Also read the chapter on "Safety".

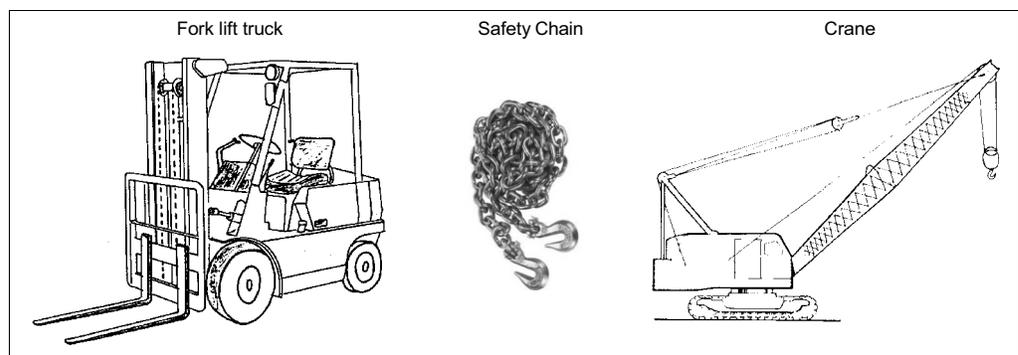
Special transport hazards:

- Projecting sharp edges may cause cuts.
- Suspended loads can fall and then there will be a risk of death - do not stand underneath suspended loads!
- Parts which are stacked too high can collapse.
- If load suspension devices other than those indicated here are used, this may lead to serious damage to property and/or life-threatening injury to people.
- There is a fire hazard due to the highly inflammable packing material - naked flames and smoking prohibited!
- If lubricants, preservatives, ... are not kept upright during transportation they can leak out and there is a risk of irritation if they come into direct contact with the skin.

4.3 Permissible devices and aids for transportation

The Pump is made up of heavy components.

Appropriate lifting gear and carrying devices such as, chain hoist, safety chain, fork lift truck or front loader is to be provided.





Danger!

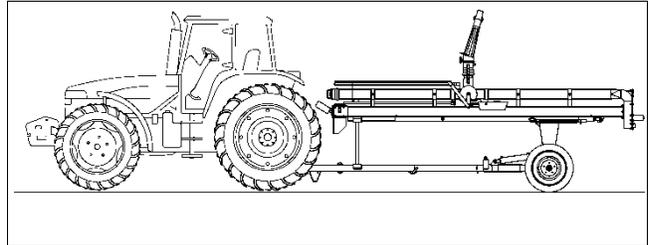
Do not stand underneath suspended loads.
Suspended loads may fall, so there is a danger of death!

Travel (short distances)

The pump must be moved with a farm tractor.

Minimum towing capacity of;
3,300 lb [1,500 kg]

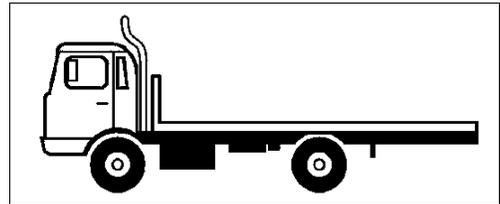
Maximum speed;
25 mph [40 km/h]



Travel (long distances)

For long distance transportation, use a truck or truck and trailer approved for public roads.

Minimum towing capacity of;
3,300 lb [1,500 kg]



4.4 Transport



**Attention!
Moving the pump**

- The pump must be moved on a farm tractor with a minimum towing capacity of 3,300 lb [1,500 kg].
- The hitch, tires, wheels, hubs and axles of the pump are designed for agricultural use only. They are not approved to be towed at any speed above 25 mph [40 km/h].
- For long distance transportation, use a truck and trailer approved for public roads.
- The pump has no braking system. It is designed to be towed strictly by a farm tractor.
- If a pump needs to be towed on a public road, use a farm tractor strong enough to easily tow and safely brake under the weight of the pump. The pump must be equipped with signal lights and reflectors recommended by the Standard ANSI/ASAE S279.12 or better if required by local laws.

4.5 Includes

Check the goods supplied against the packing list enclosed for completeness and damage.

4.6 Information on disposing of packing material

After unpacking, the packing material is to be handled properly and disposed of carefully in accordance with the valid local regulations on waste disposal and utilization.

5 Installation

If necessary, please contact your nearest authorized technical dealer.

5.1 Special personnel qualification required for installation

Installation may only be carried out by specially qualified personnel in accordance with the safety instructions.



Also see the section on "Personnel qualification".

5.2 Safety instructions for installation



Danger!

Read Instructions First! To prevent serious injury or death, do not operate or service this machine without first reading and understanding the operator's manuals for all of the equipment. If these manuals are lost, contact your nearest dealer or the manufacturer for replacements.

To prevent damage to property and/or life-threatening injury to personnel always observe the following:

- Before installation, look for any damage caused during transport. Do not use damaged components!
 - Use only the special tool indicated for assembly.
 - In particular, make sure that the tightening torques specified are complied with.
-



Also read the chapter on "Safety".

Special hazards during installation:

Any on/off or emergency stop switches are to be fitted with a lock to immobilize them in the open position and a warning sign is to be put up.

- Components which have not been removed correctly may fall off or twist
 - Parts loosely placed on top of each other can slip and fall off.
 - Components with sharp edges which are still open and accessible represent a source of injury.
 - Depressurize hydraulic/pneumatic components before working on them!
 - Faulty pressure pipes and connections can lead to serious physical injury.
 - Cleaning and disinfecting agents which are not connected properly may lead to caustic burns and the formation of gas.
 - Leaking lubricants, solvents, preservatives, can cause injury if they come into direct contact with the skin.
 - Serious injury to personnel or damage to property can be caused if the incorrect torque is applied when tightening screws.
-

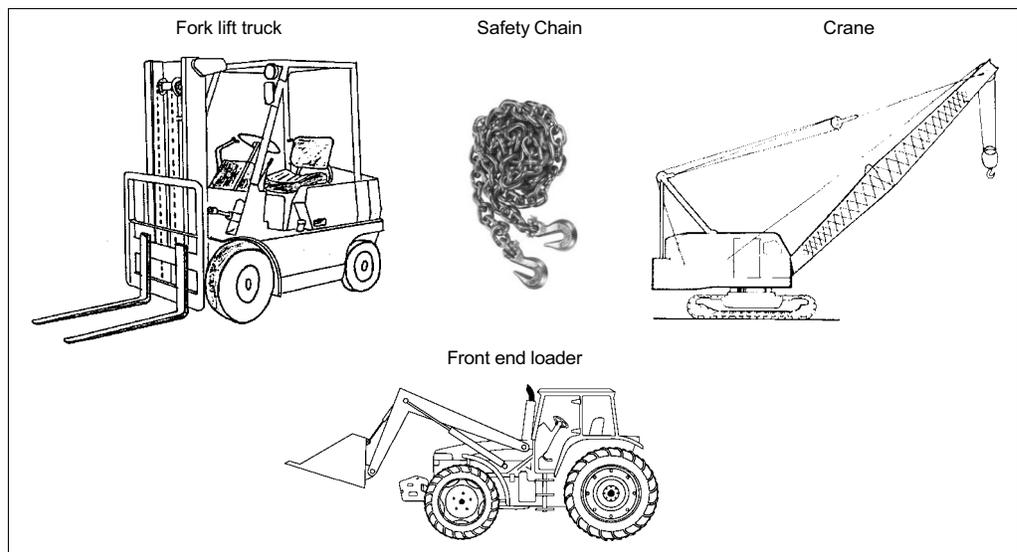
5.3 Assembly preparations

Special tools



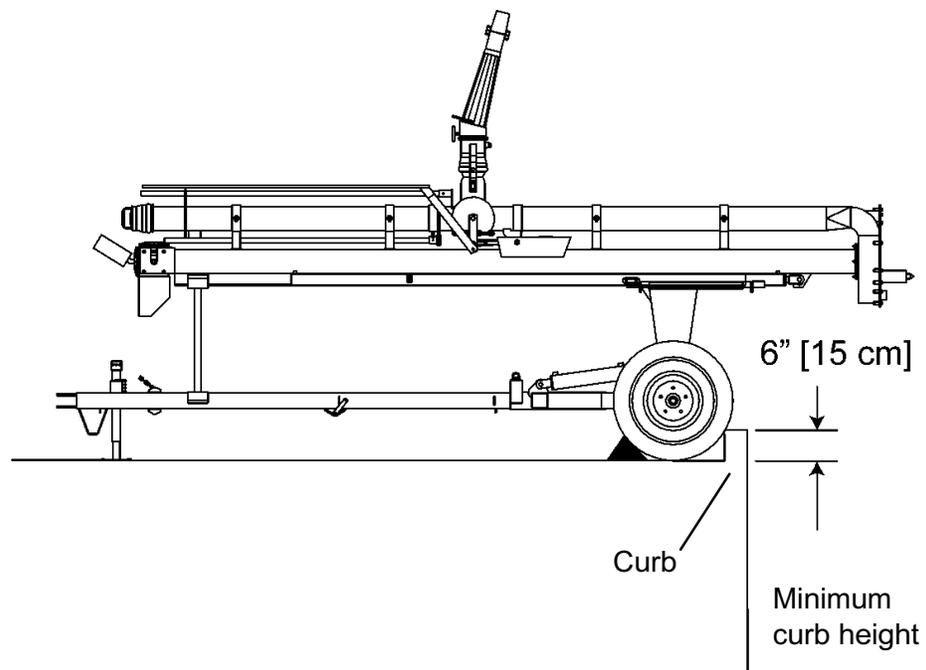
Attention!

To lift the pump and steady in place when assembling, use a lifting device with a minimum capacity of;
3,300 lb [1,500 kg].



Local purchased items

A curb must be constructed along the edge of the pit to stop the trailer wheels and position the pump to be lowered into the pit.



5.4 Pump assembly



Attention!

To lift the pump and steady in place when assembling, use a lifting device with a minimum capacity of;
3,300 lb [1,500 kg].

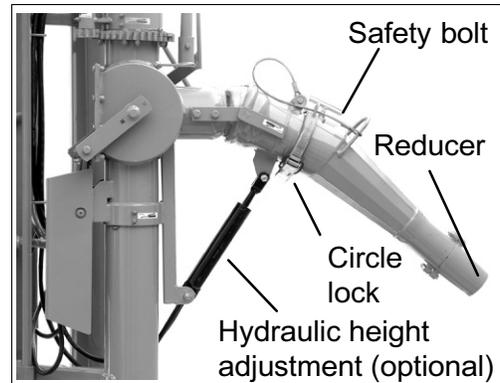
Agitation nozzle

Install the nozzle on the directional valve.

Point the nozzle towards the ground.

Install the circle lock and tighten the safety bolt to secure the nozzle;

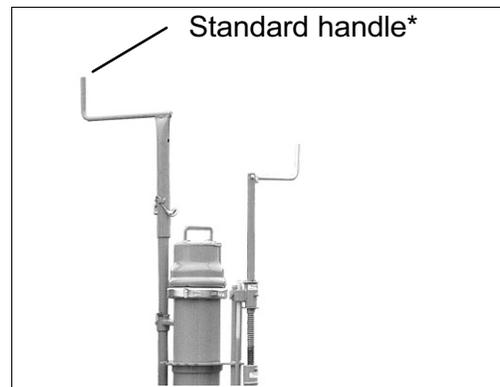
If required, install the reducer at the tip of the nozzle.



Note!

On certain pump models, the reducer is used to increase the pressure of the nozzle to reach farther, cut through thick floating crust material more effectively and/or to decrease tractor horsepower required.

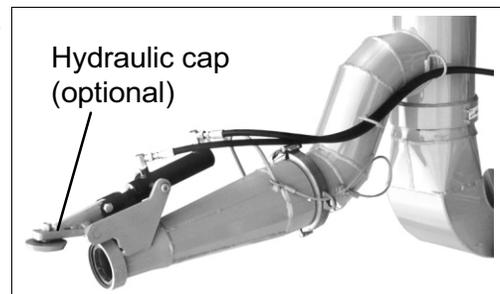
Install the handle rotating the agitation nozzle;



2nd agitation nozzle (optional)

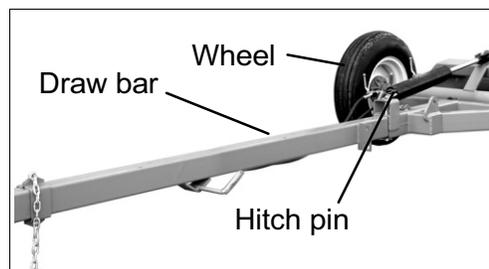
Install the 2nd agitation nozzle using the circle lock;

If the nozzle has a hydraulic cap (optional), set the nozzle so that the cylinder is on top.



Trailer

Install the draw bar using the hitch pin;



Install the wheels;

Tighten the wheel nuts by following the sequence illustrated using a pressure of 122 N/m (90 lbs/foot).



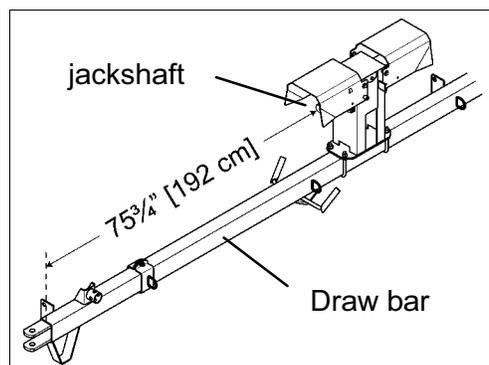
Option: Draw bar with additional PTO



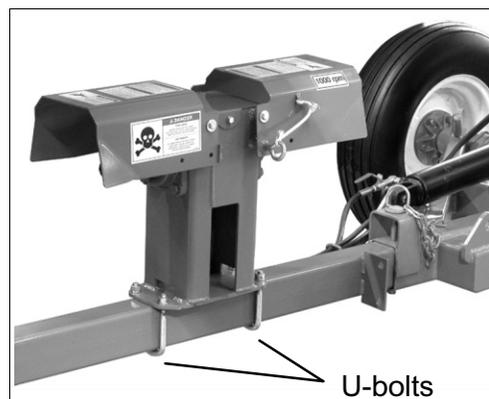
Note!

The option allows to operate the pump without removing the draw bar.

Position the jackshaft on the draw bar;



Fasten the jackshaft using the "U"- bolts;



Installation of lifting cylinder



Attention!

Before connecting hydraulic hoses to the tractor, check the oil level of the tractor hydraulic system.



Note!

The trailer can be equipped with 1 or 2 tilting cylinders. Assembly instructions are the same in both cases.

Before installing the cylinder of the tilting 3-point hitch, connect it to the tractor.

Open the cylinder safety valves.

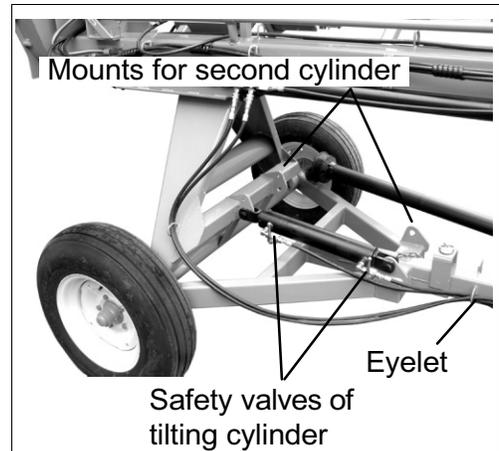
Operate the cylinder many times at full stroke in order to fill it with oil.

Close the cylinder;

Install the tilting cylinder on the trailer.

Pull the hydraulic hoses through the eyelets welded on the draw bar.

Shut off the cylinder safety valves;



Mounting the pump on the trailer

Grease the slides of the trailer.

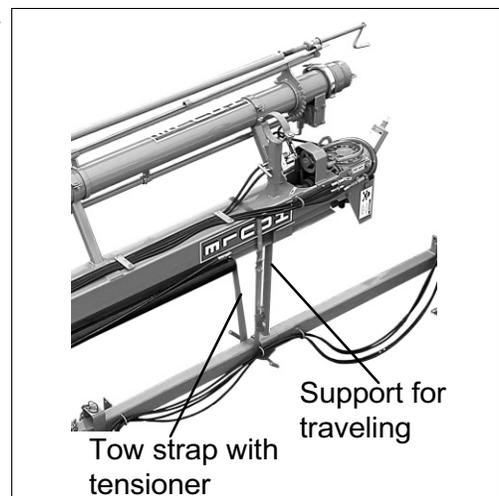
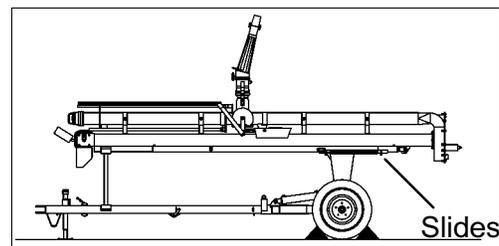
Hook up both ends of the pump main frame to the lifting device and lift the pump.

Slide the trailer into the guides of the pump;

Set the support for traveling on the draw bar under the top of the pump.

Lower the pump on the support;

Install the tow strap with tensioner;



Installation of sliding cylinder

Before installing the sliding cylinder on the main frame and the trailer, connect it to the tractor.

Open the safety valves of the cylinder.

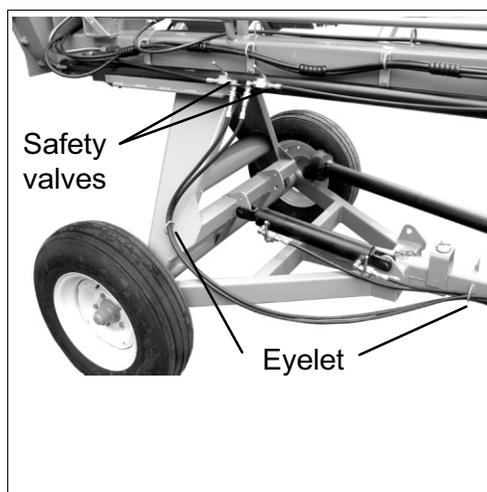
Operate the cylinder many times at full stroke in order to fill it with oil.

Close the cylinder;

Install the sliding cylinder on the main frame and the trailer.

Shut off the safety valves of the cylinder.

Feed the hydraulic hoses through the eyelets welded on the trailer and on the draw bar.



Note!

Now check the hydraulic oil level of the tractor.

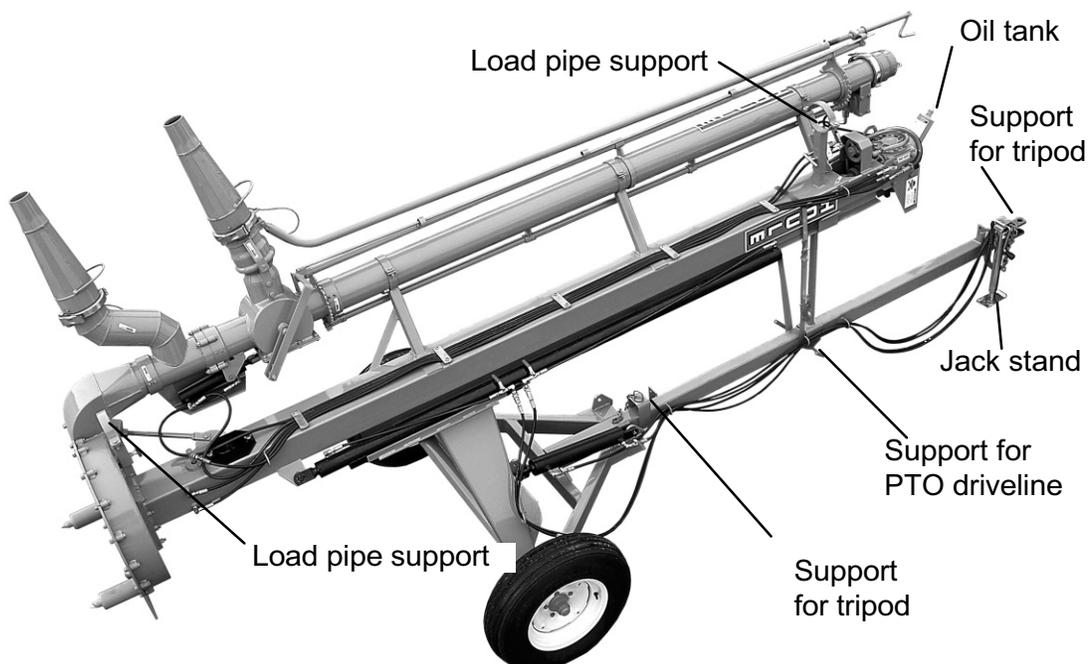
Accessory supports

Install the jack stand on the draw bar;

Install the loading pipe supports;

Install the PTO driveline on its supports;

If applicable, install the legs of the loading pipe tripod in their supports.

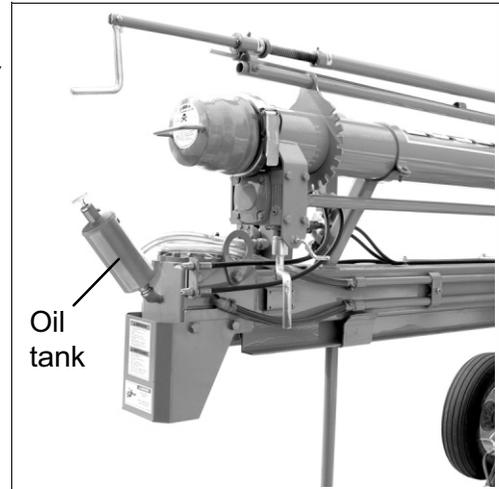


Installation

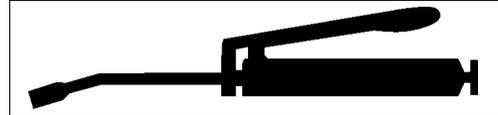
Information on disposing of installation material after installation is finished.

Oil tank and lubrication

Install the oil tank on the gearbox;
Fill up the oil tank with SAE 80W90 gear
oil to the indicated level;



Grease all parts labeled with.



5.5 Information on disposing of installation material after installation is finished.

Handle unused installation material properly and dispose in accordance with current valid local regulations on waste disposal and utilization.

6 Initial Commissioning

6.1 Special personnel qualification required for initial commissioning

Initial commissioning may only be performed by specially qualified personnel in accordance with the safety instructions.



Also see the section on "Personnel qualification".

6.2 Safety instructions for initial commissioning



Danger!

Read Instructions First! To prevent serious injury or death, do not operate or service this machine without first reading and understanding the operator's manuals for all of the equipment. If these manuals are lost, contact your nearest dealer or the manufacturer for replacements.

To prevent damage to property and/or life-threatening injury to personnel always observe the following:

- Before starting for the first time, check that all tools and other parts have been removed from the danger area.
- Are all of the operating media suitable, present and connected?



Also read the chapter on "Safety".

Special risks involved in initial commissioning:

- If the connections for cleaning and disinfecting agents are mixed up this may cause special dangers
- Check all pressure areas for leaks.

6.3 Checks before initial commissioning

The owner should ensure that:

- Oil in the oil tank is at proper level.
 - Add SAE 80W90 gear oil if necessary.
- All grease zerk have been lubricated.
- Check the product for visible damage; immediately remove any faults that are found (note personnel qualification required) or send to the specialist dealer - the product may only be used if it is perfect condition.
- Check and make sure that only authorized personnel are in the work area of the machine and no other people will be endangered by the machine starting.
- Check and make sure that there are no objects or materials in the working area if they are not necessary for operation.
- Make sure the hydraulic circuit of the tractor contains sufficient hydraulic oil to safely articulate the pump up and down.

- PTO driveline
 - Make sure the driveline guards turn freely;
 - Secure both ends of the driveline;
 - Keep all guards in place.

6.4 First start



Danger!

Manure produces toxic gases that can cause a loss of consciousness, asphyxia or death in a few seconds.



Manure agitation can produce toxic gases in buildings built above the pit. Toxic gases can also emanate in buildings situated by the pit and / or connected to the pit by an evacuation line.



Danger!

Rotating driveline keep away!



Danger!

Hydraulic line under pressure

Escaping fluid can penetrate skin causing serious injury or death. Never use your hand to feel for leaks. Hold a scrap of cardboard to feel around for leaks. Relieve pressure prior to servicing.

Once the pump has been fully assembled in accordance with instructions and the operating instructions have been read carefully, the pump can be put into operation.

Activate the pump and check the functions.



Attention!

PTO driveline must always be activated when the impeller of the pump is immersed into the manure/water. Activating the pump out of manure is only allowed for testing without exceeding one minute of operation. Running the pump impeller out of manure for more than one minute may result in damage.



Refer to the Operation section for proper procedures.

6.5 Checks after initial commissioning

Check for;

- Signs of leaks.
- Loose or damaged equipment.
- Oil in the oil tank is at proper level.
 - Add SAE 80W90 gear oil if necessary.

6.6 Handing over to the owner

Declaration of conformity and CE mark

(only necessary for European Union member states)

A declaration of conformity must be produced and a CE mark applied if a total operational installation is assembled from individual components.

If several directives apply to the total installation, the CE mark means that the requirements of all relevant directives have been met.

The technical centre/specialist dealer performing the installation work must:

- perform the installation work in accordance with the installation and safety information given in the relevant operating and installation manuals
- complete the hand-over report and have it signed
- produce the declaration of conformity for the total installation being handed over
- apply the CE mark so that it is clearly visible on the installation.

7 Operation

7.1 Special personnel qualification required for operation

Operation may only be performed by specially qualified personnel in accordance with the safety instructions.



Also see the section on "Personnel qualification".

7.2 Safety instructions for operation



Danger!

Read Instructions First! To prevent serious injury or death, do not operate or service this machine without first reading and understanding the operator's manuals for all of the equipment. If these manuals are lost, contact your nearest dealer or the manufacturer for replacements.

To prevent damage to property and/or life-threatening injury to personnel always observe the following:

- Only fit or use the product for its intended purpose.
- If the correct procedure is not followed in case of an emergency, this can result in serious injury to personnel and damage to property - therefore familiarize yourself with the instructions on what to do in an emergency.



Also read the chapter on "Safety".

Special dangers involved in operation and normal operation:

- Incorrect use may lead to serious damage to property and/or life-threatening injury to people.
- The careless use of personal protection equipment can result in serious physical injury.
- If the hydraulic connections to the tractor are mixed up this may cause unexpected movements.

Before operating, make sure you are adequately familiar with the following:

- the operating and control elements
- the equipment
- The method of operation
- The immediate environment
- The safety devices



Danger!

Manure produces toxic gases that can cause a loss of consciousness, asphyxia or death in a few seconds.



Manure agitation can produce toxic gases in buildings built above the pit. Toxic gases can also emanate in buildings situated by the pit and / or connected to the pit by an evacuation line.



Danger!
Rotating driveline keep away!



Danger!
Hydraulic line under pressure
Escaping fluid can penetrate skin causing serious injury or death. Never use your hand to feel for leaks. Hold a scrap of cardboard to feel around for leaks. Relieve pressure prior to servicing.

Carry out the following checks before every start:

- Check the product for visible damage; immediately remove any faults that are found (note personnel qualification required) or send to the specialist dealer - the product may only be used if it is perfect condition.
- Check and make sure that only authorized personnel are in the work area of the machine and no other people will be endangered by the machine starting.
- Check and make sure that there are no objects or materials in the working area if they are not necessary for operation.
- Make sure the hydraulic circuit of the tractor contains sufficient hydraulic oil to safely articulate the pump up and down.
- PTO driveline
 - Make sure the driveline guards turn freely;
 - Secure both ends of the driveline;
 - Keep all guards in place.

In normal operation:

- The product may only be started from the location specified.
- During operation, operating personnel may only stand at the specified workplaces.



See section on "Work stations for operating personnel"

- No safety equipment may be removed or put out of operation during operation.
- Do not remove the guards located on the PTO driveline of the tractor and on the pump.
- Keep hands, feet and clothing away from all moving parts.
- Make sure that no one stands in close proximity to any moving parts before engaging the PTO.
- Never leave the pump in operation without the supervision of a skilled operator.

Operation

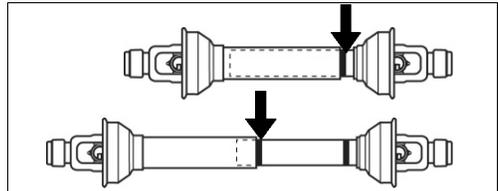
Safety instructions for operation

- Make sure that no one stands in close proximity to the pump when lifted and / or in operation.
- During operation, it is strictly forbidden to remain within the hazard area!
- The following checks should be performed at least once a day:
 - Visual checks for any damage that can be seen on the outside.
 - check that all safety devices are working
 - check that all pneumatic and hydraulic hoses are leaktight and connected correctly
 - Never use the pump if parts of the equipment appear damaged or showing signs of abnormal wear

PTO driveline

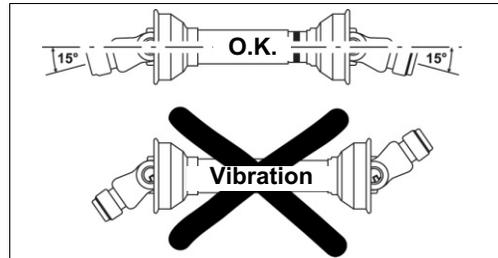
Maximum Extension and Retraction

- While operating the pump, never exceed the maximum points indicated by the adhesive tapes on the male guard.
- The minimum retraction indicator must never disappear underneath the female guard.
- The maximum extension indicator must never be completely visible.



Maximum Angle of PTO joints = 15°

- Both PTO joints must be at the same angle (maximum 15°).
- Joints must always be directed towards the same side of the driveline.

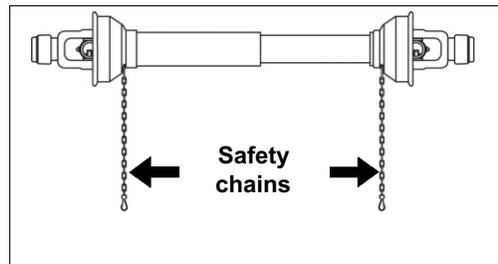


Lubrication

- On universal joints, use a high quality grease formulated specifically for intensive use. Refer to section 9.3 for grease specification.

Safety Chains (on European model only)

- Safety chains must be in place at all times to prevent the driveline guards from rotating.
- Make sure that the safety chains do not restrict the movement of the driveline when operating or transporting the equipment.



- Never use the safety chains to secure the PTO when disconnected from the tractor.
- Replace any damaged chain.

7.3 Workplaces for operating personnel



Danger!

Manure produces toxic gases that can cause a loss of consciousness, asphyxia or death in a few seconds.



Manure agitation can produce toxic gases in buildings built above the pit. Toxic gases can also emanate in buildings situated by the pit and / or connected to the pit by an evacuation line.

Do not enter into a manure pit at any time.

Always follow the "Safety Procedures for Confined Spaces" before operating or maintaining the pump. These safety procedures clearly explain the risks associated with manure, procedures for a safe access to workplaces and the minimum ventilation requirements to ensure the safety of humans and livestock.



Refer to section 2.1

"Safety Procedures for Confined Spaces"



Danger!

Rotating driveline keep away!

Do not climb or stand on the trailer to operate the pump.



Danger!

Do not climb or stand on the trailer to operate the pump.

Do not lean out over the pit to operate the pump.

7.4 Description of the operating elements

7.4.1 Manual controls

Nozzle rotation

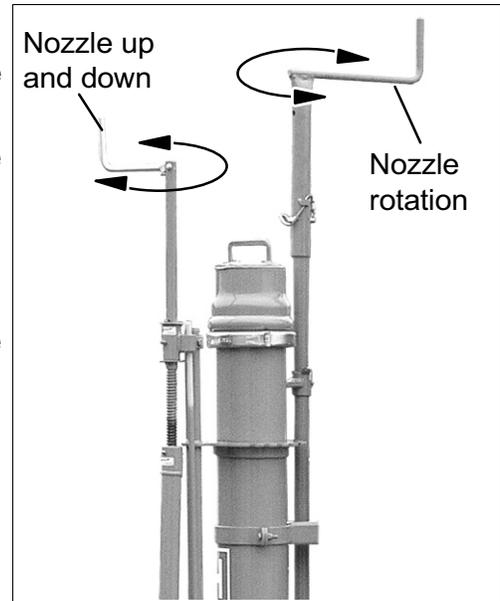
To rotate the nozzle CW turn the handle CCW.

To rotate the nozzle CCW turn the handle CW.

Nozzle rotation

To raise the nozzle turn the handle CW.

To lower the nozzle turn the handle CCW.



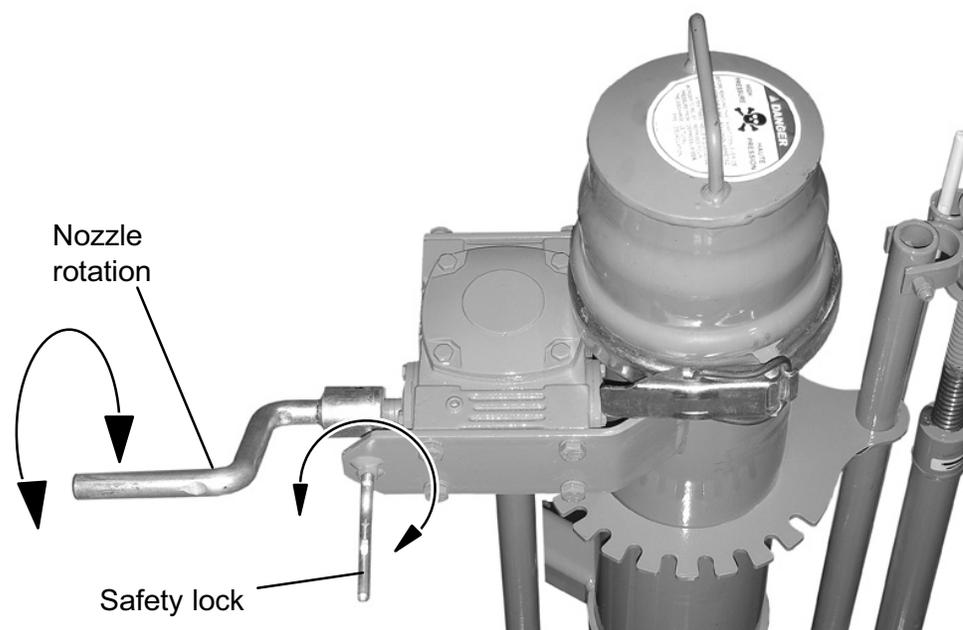
Optional speed reducer control

Turn the safety lock CW to lock the handle.

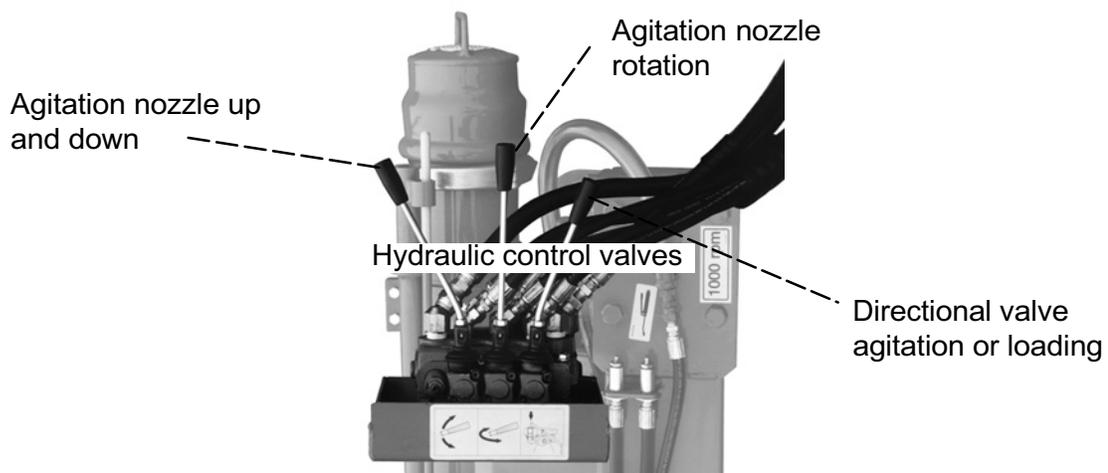
Turn the safety lock CCW to unlock the handle.

To rotate the nozzle CW turn the handle CCW.

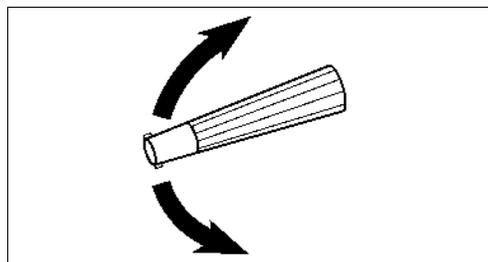
To rotate the nozzle CCW turn the handle CW.



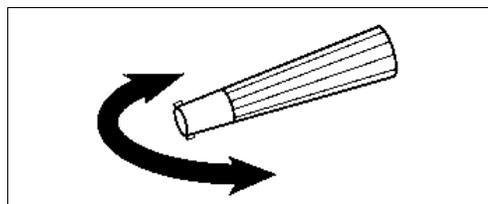
7.4.2 Hydraulic controls (optional)



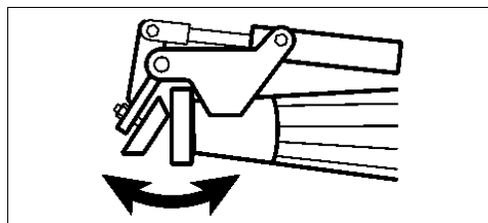
Agitation nozzle up / down



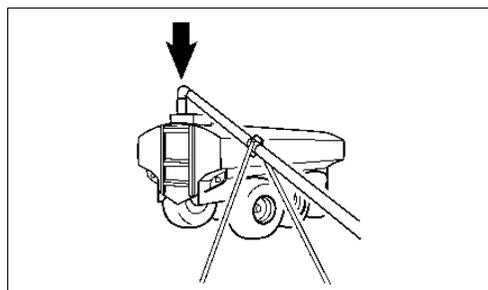
Agitation nozzle rotation



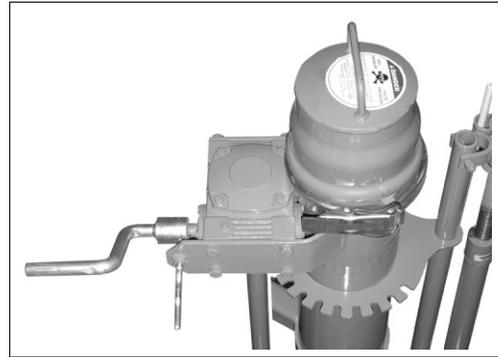
Hydraulic cap on agitation nozzle



Directional valve agitation/ loading



Circle lock cap on discharge pipe



Danger!

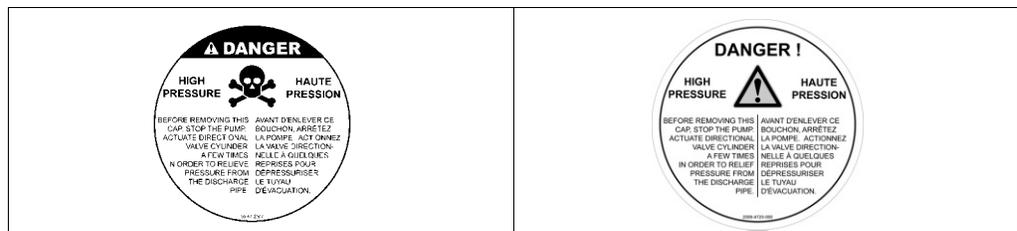
Never unlock a circle lock cap under pressure!

Unlocking a circle lock cap under pressure could cause serious injuries to anyone standing near the cap. The compressed air inside the pump discharge pipe would propel the cap with force.

Before removing the cap of the discharge pipe, stop the tractor PTO. Actuate the directional valve a few times in order to relieve pressure from the discharge pipe. Then switch the directional valve to the loading position by setting the indicator rod at its highest position

Carefully read the instructions on the circle lock cap

Before removing the cap, carefully read the instructions on the cap. The instructions require to stop the pump and actuate the directional valve cylinder a few times in order to relieve pressure from the discharge pipe.



Function of the circle lock cap

When agitating manure, the loading pipe is usually not connected to the pump discharge. If the directional valve is accidentally activated, the operator could be blasted by manure projected with force. The circle lock cap is meant to eliminate the risk of being blasted by manure projected with force if the directional valve is accidentally activated.

Compressed air under the circle lock cap

If the directional valve changes position while agitating a pit, the impeller of the pump will force manure into the discharge pipe, compressing the air inside the pipe.

7.5 Operating



Danger!

Manure produces toxic gases that can cause a loss of consciousness, asphyxia or death in a few seconds.



Manure agitation can produce toxic gases in buildings built above the pit. Toxic gases can also emanate in buildings situated by the pit and / or connected to the pit by an evacuation line.



Danger!

Do not enter into a manure pit at any time.

Always follow the *Safety Procedures for Confined Spaces* before operating or maintaining the pump. These safety procedures clearly explain the risks associated with manure, procedures for a safe access to work spaces and the minimum ventilation requirements to ensure the safety of humans and livestock.



See Safety section to find *safety procedures for confined spaces*.



Danger!

Rotating driveline keep away!

Turn off the tractor before installing or removing the PTO driveline.



Attention!

Make sure all control levers are locked at desired position before operating the pump.

7.5.1 Moving the pump



Attention! Moving the pump

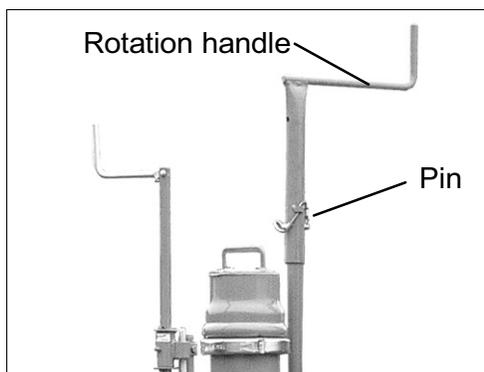
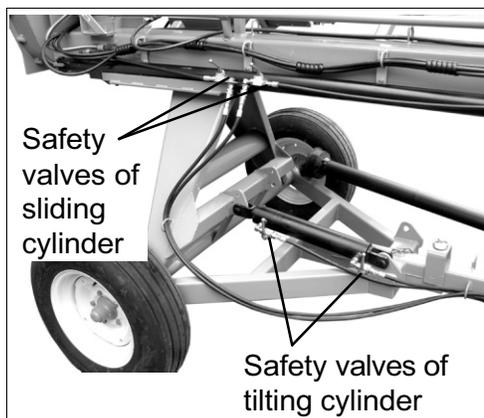
- The pump must be moved on a farm tractor with a minimum towing capacity of;
3,300 lb [1,500 kg].
- The hitch, tires, wheels, hubs and axles of the pump are designed for agricultural use only. They are not approved to be towed at any speed above 25 mph [40 km/h].
- Do not hook the PTO driveline to the tractor when traveling. The PTO driveline is hooked to the tractor only when agitating or transferring manure.
- For long distance transportation, use a truck and trailer approved for public roads.
- The pump has no braking system. It is designed to be towed strictly by a farm tractor.
- If a pump needs to be towed on a public road, use a farm tractor strong enough to easily tow and safely brake under the weight of the pump.
- The pump must be equipped with signal lights and reflectors recommended by the Standard ANSI/ASAE S279.12 or better if required by local laws.

Make sure that the tilting cylinder, the sliding cylinder and the tractor hydraulic circuit have enough oil to safely raise and lower the pump.

The support for traveling and the tow strap with tensioner must be installed when traveling.

The safety valves of the tilting cylinder and of the sliding cylinder must be shut off when traveling.

Remove the handle rotating the agitation nozzle (standard handle only);



Hook the draw bar to the tractor.

Set the jack stand parallel to the draw bar;

Shut off the safety valves of the tilting cylinder and of the sliding cylinder.

7.5.2 Positioning the pump



Danger!

Make sure the trailer wheels are on a flat and firm surface before operating the articulation and lifting cylinders.



Attention!

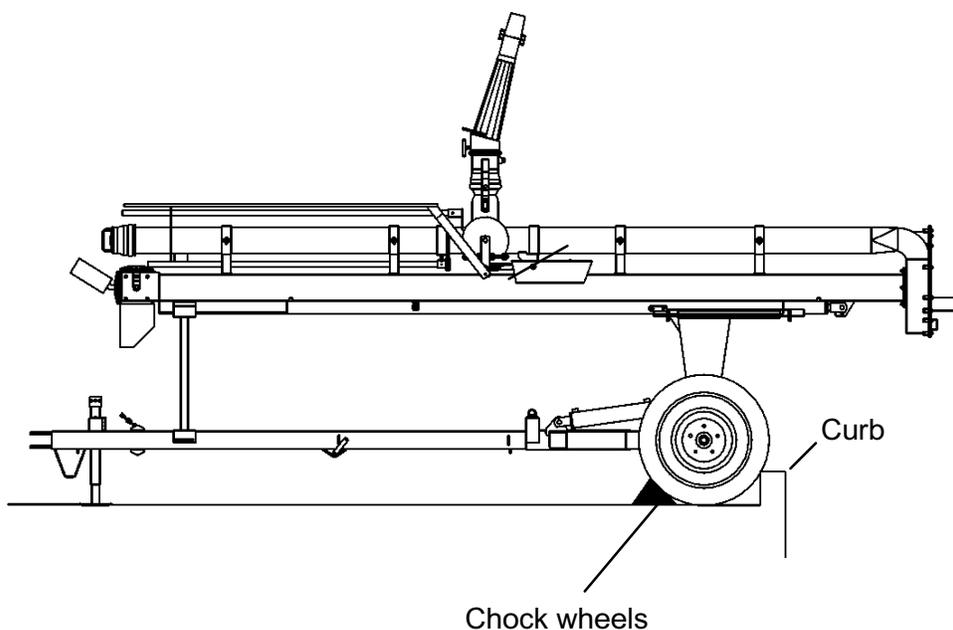
Make sure the hydraulic circuit of the tractor contains sufficient hydraulic oil to safely articulate the pump up and down.



Note!

To speed up the agitation time, it is recommended to install the pump in liquid near solid masses.

Back up the trailer so that the wheels are blocked against the curb of the pit;



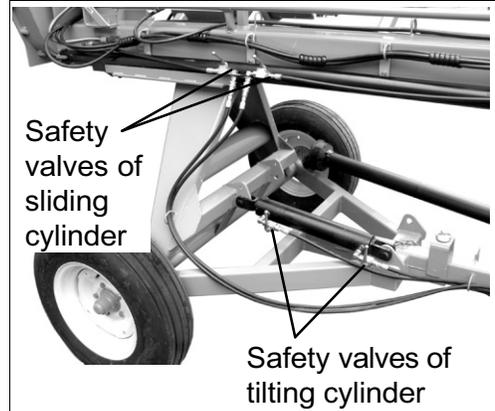
Attention!

Before removing the tow strap with tensioner, rest the trailer wheels against the curb of the pit and place blocks in front of the wheels.

Connect the hydraulic hoses of the tilting cylinder and the sliding cylinder to the tractor.

Open the safety valves of the tilting cylinder and the sliding cylinder.

Remove the tow strap with tensioner;



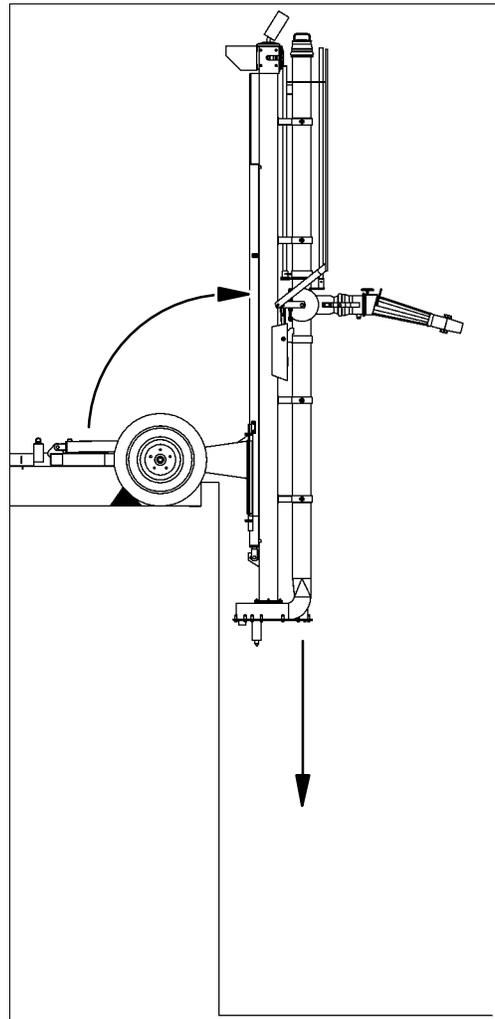
Let the motor of the tractor idle.

Operate the tilting cylinder until the pump is parallel to the wall of the pit.

Remove the support for traveling;

Operate the sliding cylinder to lower the pump to the bottom of the pit.

Shut off the safety valves of the sliding cylinder;

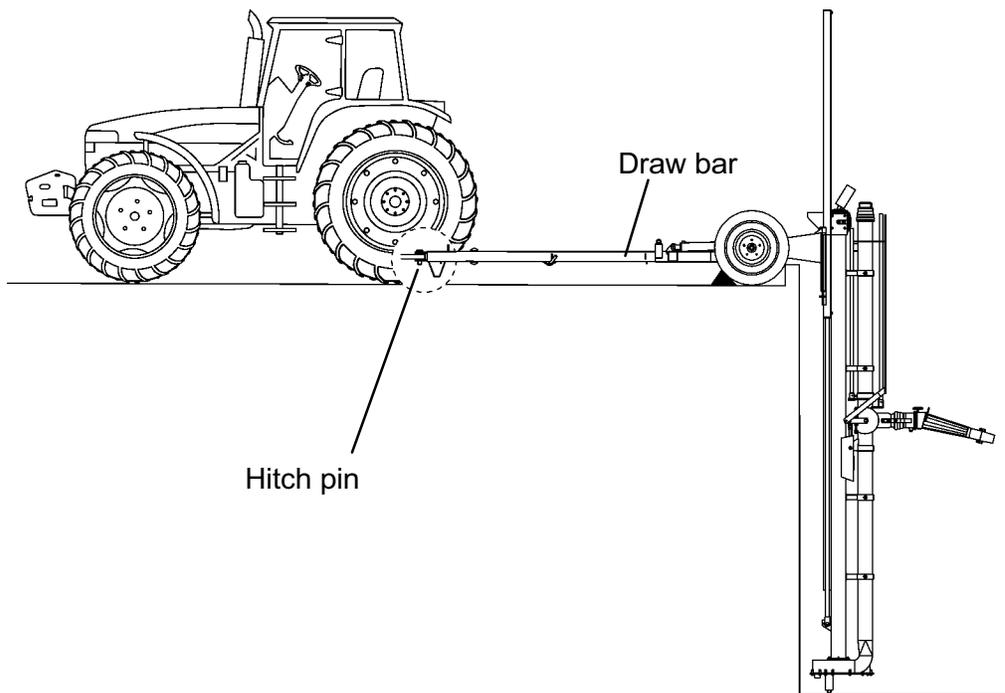


Note!

If the trailer has a draw bar with additional PTO (optional), shut off the safety valves of the tilting cylinder, stop the motor of the tractor and go to;

Installation of an additional PTO on draw bar (optional)

Operate the tilting cylinder to relieve tension on the draw bar.
Remove the hitch pin from the tractor draw bar;

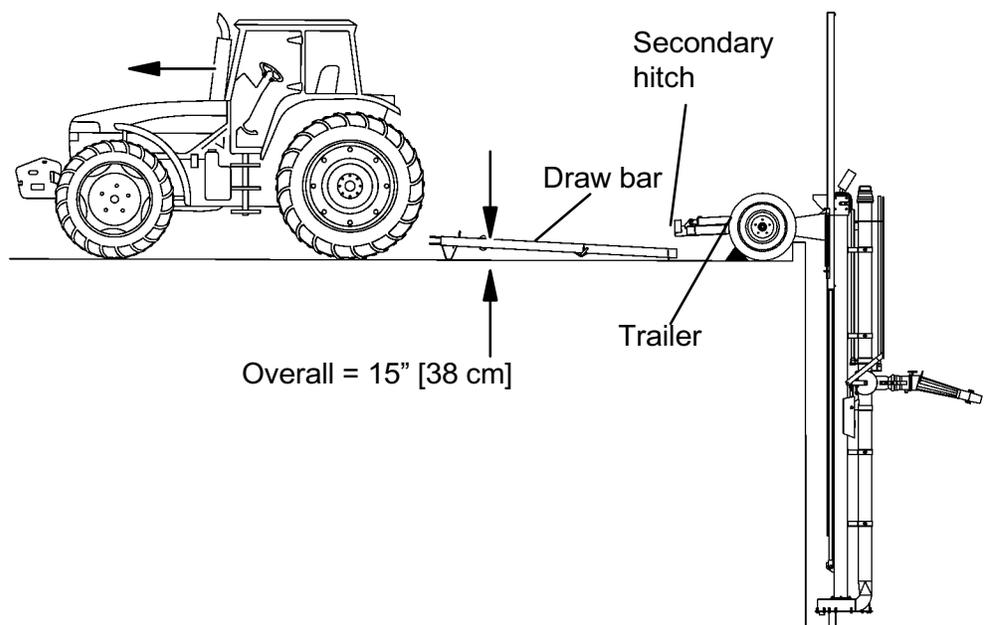


Move the tractor forward.

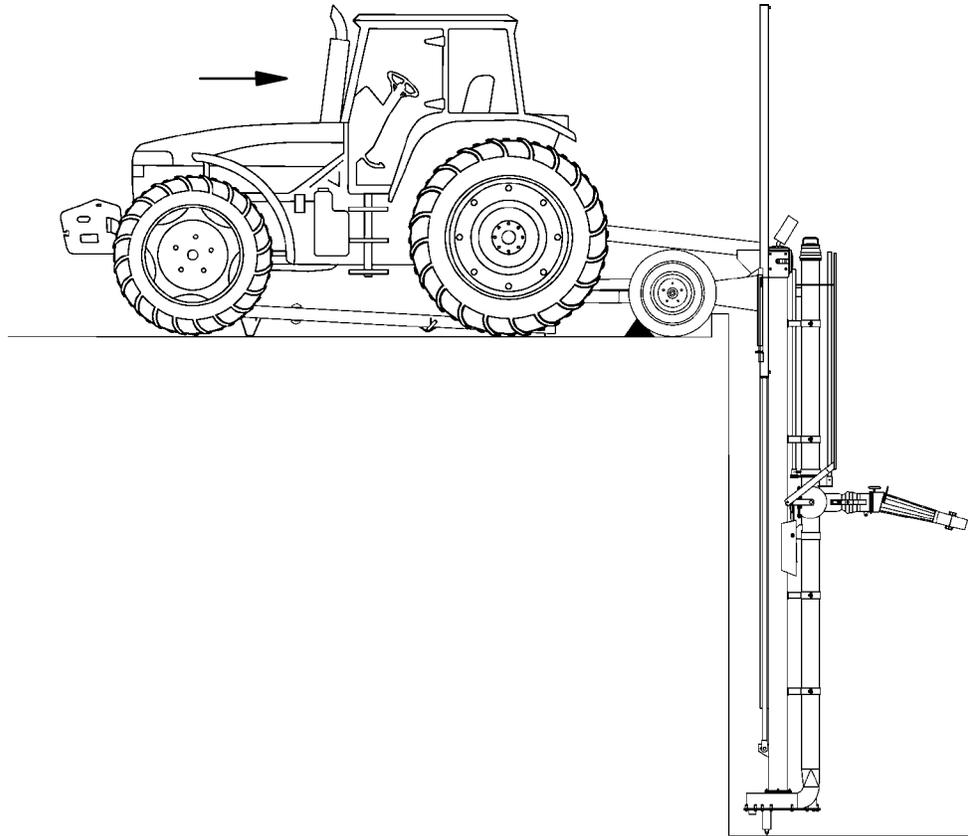
Unhook the draw bar from the trailer and set it on the ground;

 **Note!**

If clearance under the tractor exceeds 15" [38 cm], you can leave the draw bar attached to the trailer and simply lower it to the ground.

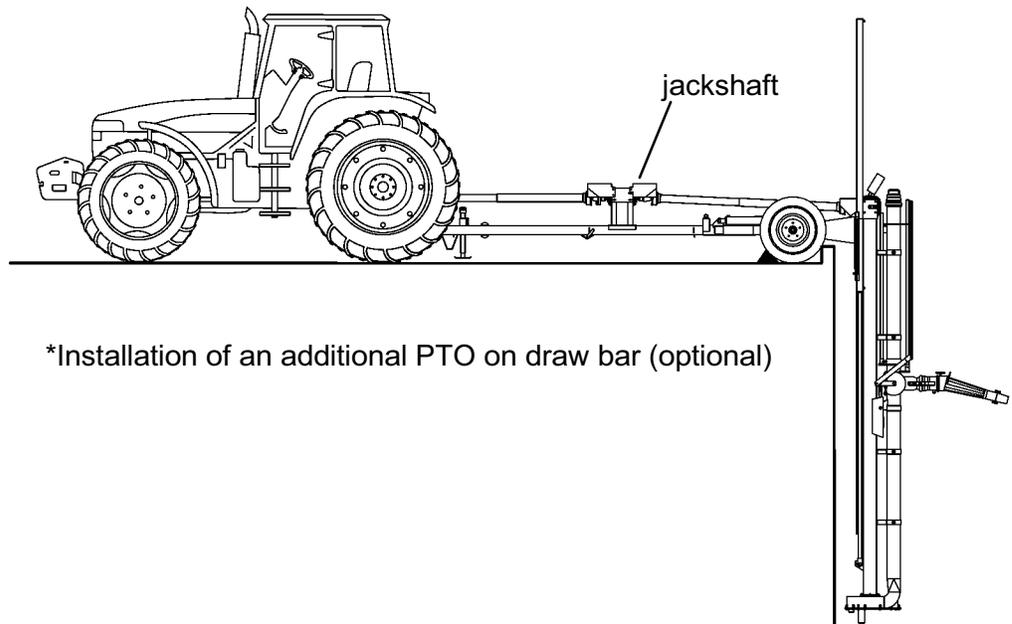


Back up the tractor.
Hook the tractor to the secondary hitch of the trailer using the hitch pin.
Shut off the safety valves of the tilting cylinder and install the PTO shaft.
Jump to instructions for; **Agitation mode**



7.5.3 Installation of an additional PTO on draw bar (optional)

Install both PTO shafts;



7.5.4 Agitation mode



Danger!

Rotating driveline keep away!

Turn off the tractor before installing or removing the PTO driveline.



Note!

The hydraulic cap on the bottom nozzle may be used to shut off flow to bottom nozzle and therefore increase pressure and flow to the top nozzle.



Attention!

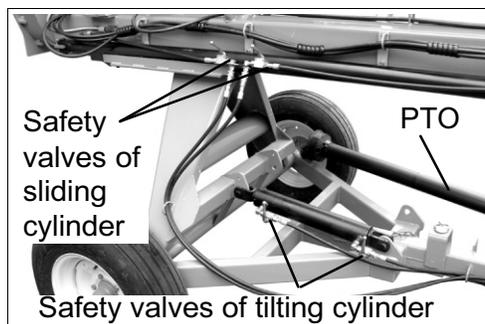
The safety valves of the 3-point hitch cylinder must be shut off when agitating and transferring manure.

Install the PTO driveline.

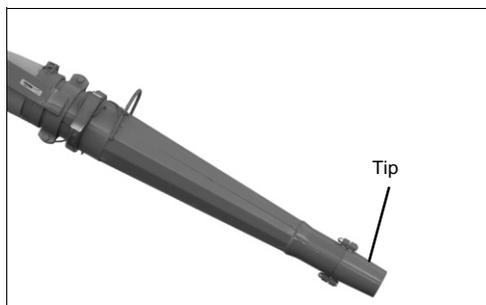
Disconnect the hoses of the sliding cylinder.

Use the hoses to connect the directional valve to the tractor.

Install the handle rotating the agitation nozzle (standard handle only).



- Install the handle rotating the agitation nozzle (standard handle only);
- Set the directional valve to the agitation mode at its lowest position.
- Engage the PTO at minimum RPM.
- Gradually increase the PTO to 540 or 1000 RPM, depending on the PTO model.
- Using the nozzle controls (rotation, up/down) to agitate the content of the pit.
- Operate the agitation nozzle to break chunks and direct them towards the pump intake.
- A boltable tip may be installed on the nozzle to improve thick crust cutting. The tip should be removed when crust has been broken up or when there is a thin crust.



- To speed up agitation, move the agitation nozzle from liquid to solids.



Note!

Never allow the nozzle to operate in the same direction for long periods of time without supervision.

Agitate the pit thoroughly before transferring.

- When the whole content of the pit is mixed, gradually decrease the PTO to minimum RPM and turn off the pump.
- Turn off the pump.

Install the circle lock cap on the discharge pipe.

7.5.5 Manure transfer mode



Danger!

Rotating driveline keep away!

Turn off the tractor before installing or removing the PTO driveline.



Note!

Thoroughly agitate the content of the reservoir before transferring the manure.



Note!

The hydraulic cap on the bottom nozzle must be closed when transferring manure to other storage or spreader.



Danger!

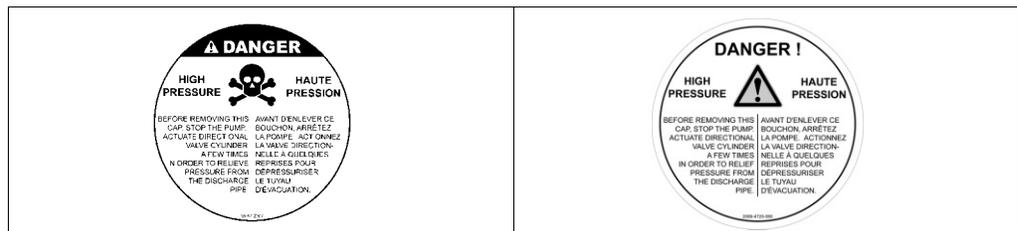
Never unlock a circle lock cap under pressure!

Unlocking a circle lock cap under pressure could cause serious injuries to anyone standing near the cap. The compressed air inside the pump discharge pipe would propel the cap with force.

Before removing the cap of the discharge pipe, stop the tractor PTO. Actuate the directional valve a few times in order to relieve pressure from the discharge pipe. Then switch the directional valve to the loading position by setting the indicator rod at its highest position

Carefully read the instructions on the circle lock cap

Before removing the cap, carefully read the instructions on the cap. The instructions require to stop the pump and actuate the directional valve cylinder a few times in order to relieve pressure from the discharge pipe.



Function of the circle lock cap

When agitating manure, the loading pipe is usually not connected to the pump discharge. If the directional valve is accidentally activated, the operator could be blasted by manure projected with force. The circle lock cap is meant to eliminate the risk of being blasted by manure projected with force if the directional valve is accidentally activated.

Compressed air under the circle lock cap

If the directional valve changes position while agitating a pit, the impeller of the pump will force manure into the discharge pipe, compressing the air inside the pipe.

- Remove the cap of the discharge pipe;
- Install the loading pipe using the circle lock.
- Stabilize the loading pipe according to the instructions supplied with the loading pipe.
- Set the directional valve to the transfer mode (indicator rod at the highest position);
- Engage the PTO at minimum RPM;
- Gradually increase the PTO RPM until the desired transfer capacity is reached.
- Before loading is completed;
 - Gradually decrease the PTO RPM to minimum.
 - Stop the PTO.
 - Set the directional valve to the agitation mode.



Note

When the PTO RPM is at minimum, the directional valve can be switched from the loading mode to the agitation mode between two spreader loads.

8 Operating faults

If necessary, please contact your nearest authorized technical dealer.

8.1 Special personnel qualification required for troubleshooting

Troubleshooting may only be performed by specially qualified personnel in accordance with the safety instructions.



Also see the section on "Personnel qualification".

8.2 Safety instructions for troubleshooting



Danger!

Read Instructions First! To prevent serious injury or death, do not operate or service this machine without first reading and understanding the operator's manuals for all of the equipment. If these manuals are lost, contact your nearest dealer or the manufacturer for replacements.

To prevent damage to property and/or life-threatening injury to personnel always observe the following:

- First of all, prevent the product from being restarted accidentally.
- Ensure that safe disconnection can be carried out by a second person at any time.
- Secure the range of action for any moving parts.



Also read the chapter on "Safety".

Special dangers involved in troubleshooting:



Danger!

Manure produces toxic gases that can cause a loss of consciousness, asphyxia or death in a few seconds.



Manure agitation can produce toxic gases in buildings built above the pit. Toxic gases can also emanate in buildings situated by the pit and / or connected to the pit by an evacuation line.



Danger!

Do not enter into a manure pit at any time.

Always follow the *Safety Procedures for Confined Spaces* before operating or maintaining the pump. These safety procedures clearly explain the risks associated with manure, procedures for a safe access to work spaces and the minimum ventilation requirements to ensure the safety of humans and livestock.



Danger!

Rotating driveline keep away!

Turn off the tractor before working on the equipment.



Danger!

Hydraulic line under pressure

Escaping fluid can penetrate skin causing serious injury or death. Never use your hand to feel for leaks. Hold a scrap of cardboard to feel around for leaks. Relieve pressure prior to servicing.

8.3 Troubleshooting possible faults

Symptom	Possible cause	Remedy
Pump is not working properly or not at all	PTO driveline has a defective joint or is disconnected.	Inspect the drive line.
	Lack of lubrication	Refer to section; 9.3
	Obstruction in the impeller intake.	Lift the pump and clear the obstruction.
	Manure too thick	Refer to section; 11.3
Vibration in the driveline	The PTO joints are out of alignment.	Refer to section; 7.2
The pump will not tilt or slide properly	Safety valve is closed.	Open valve.
	Lack of lubrication	Refer to section; 9.3
	The hydraulic hoses are not connected properly.	Verify connections.
	There is a leak in the hydraulic system.	Look for signs of fluid. Repair defective parts.
	Hydraulic fluid level in the tractor is low.	Add fluid as required in the tractor's manual.
	Cylinder is defective.	Replace defective part.
	Tow strap is still attached.	Remove tow strap.

9 Maintenance

If necessary, please contact your nearest authorized technical dealer.

9.1 Special personnel qualification required for maintenance work

Maintenance work may only be performed by specially qualified personnel in accordance with the safety instructions.



Also see the section on "Personnel qualification".

9.2 Safety instructions for maintenance



Danger!

Read Instructions First! To prevent serious injury or death, do not operate or service this machine without first reading and understanding the operator's manuals for all of the equipment. If these manuals are lost, contact your nearest dealer or the manufacturer for replacements.

To prevent damage to property and/or life-threatening injury to personnel always observe the following:

- Only use original spare parts / original wearing parts / original accessories. In the case of products by other manufacturers it cannot be ensured that they have been designed and produced from the point of view of loads and safety.
 - All of the steps involved in the maintenance work must be worked through in the order specified.
 - The maintenance work specified in the instructions (adjustment, cleaning, lubrication, inspection, etc.) must be performed at the times specified.
 - Maintenance work should only be performed with the tools envisaged for this purpose.
 - Also note the special information in this manual for the individual components.
 - Only use the media specified.
 - All warnings and warning signs must be present and legible.
 - Immediately replace any components that are not in perfect condition.
-



Also read the chapter on "Safety".

Before carrying out any maintenance work, make sure of the following:

- The area for the maintenance work and access to the working area should be secured over a wide area and there should not be any unauthorized people in the working area.
- Disconnect all pressure units from the pressure source and make sure they cannot be switched back on again unintentionally.
- There are suitable hoists and load suspension devices available for changing larger parts.
- Suitable collection vessels are available for all substances that might be harmful to the ground water (oils, coolants, cleaning and disinfecting agents, etc.).

Special risks involved in maintenance work:

- Serious damage to property may occur if incorrect replacement or wearing parts are installed.
- If energy sources are switched on unintentionally, this may lead to serious bodily injury or damage to property.
- There is a risk of injury from components/tools... with accessible sharp edges.
- Injury can be caused by contact with leaking liquids (describe in more detail if necessary).



Danger!

Hydraulic line under pressure

Escaping fluid can penetrate skin causing serious injury or death. Never use your hand to feel for leaks. Hold a scrap of cardboard to feel around for leaks. Relieve pressure prior to servicing.

-
- Serious injury to personnel or damage to property can be caused if the incorrect torque is applied when tightening screws.
 - Unsecured manual operation means a higher risk of injury due to crushing/shearing/being pulled in/...

After completing the maintenance work, check the following:

- The installation values set before the work are not altered by the work (report).
- Any screwed connections that were loosened earlier have been tightened.
- Any guards, cover, lids, sieves, filters, ... that were removed earlier have been put back again correctly.
- All safety equipment is working perfectly again.
- Have all of the tools, materials and other equipment that were used been removed from the working area again?
- The working area has been cleaned.
(possibly to remove any fluids or similar substances that came out of the machine)

- Operation has been checked after maintenance work has been completed or parts replaced. Produce a full test report if necessary.
- Follow the maintenance and safety instructions on the labels affixed to the pump.



Refer to section 2.5 Protective devices Maintenance and Safety Labels

- Do not remove the labels at any time.
- Stop the PTO before lubricating, maintaining and adjusting.
- Lubricate, maintain and store the pump according to instructions in this Manual.

9.3 Inspection and preventive maintenance

Lubrication



Danger!

Manure produces toxic gases that can cause a loss of consciousness, asphyxia or death in a few seconds.



Manure agitation can produce toxic gases in buildings built above the pit. Toxic gases can also emanate in buildings situated by the pit and / or connected to the pit by an evacuation line.

Never attempt to change the oil or to grease the lower joint of the pump driveline while the pump is in the reception pit.



Danger!

Rotating driveline keep away!

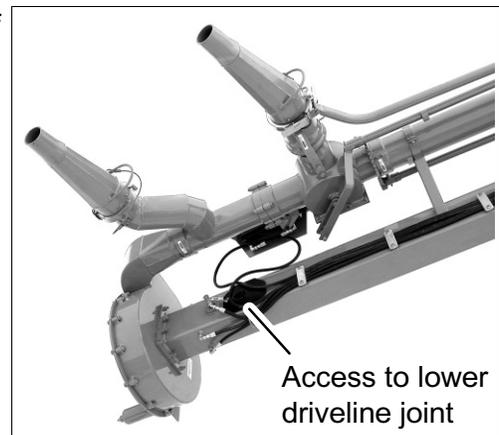
Turn off the tractor before lubricating or cleaning the pump.

Oil level

- The oil tank must be filled to the indicated level when the pump is operating. Add oil when required;
- Add SAE 80W90 gear oil if necessary.

9.3.1 After emptying each pit

- Grease the upper and lower joints of the pump driveline;
- Grease the bearing housing and lower driveline joint located inside the main frame.
- Grease the slides of the trailer.



9.3.2 Every 5 hours



Note!

Use specified grease or equivalent:
Red Texas 880 crown and chassis® grade 0
(2010-4300-790)

- Grease joints and sliding section of PTO driveline.
On universal joints, use a high quality grease formulated specifically for intensive use.



9.3.3 Every 10 hours

- Grease the rotation pivots of the agitation nozzle;
- Grease the directional valve.

9.3.4 Every 50 hours

- Check the tension of the oil coolers belts.

9.3.5 Every 75 hours

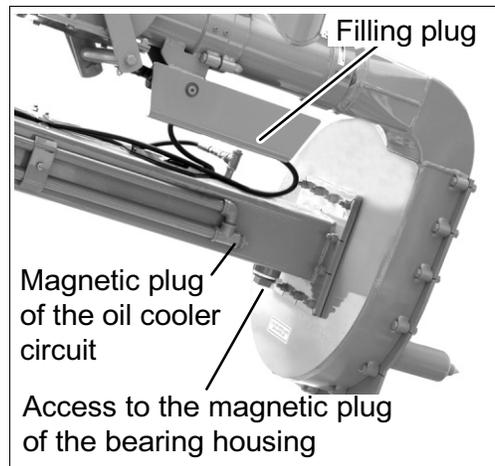
To change the oil of the pump main frame:



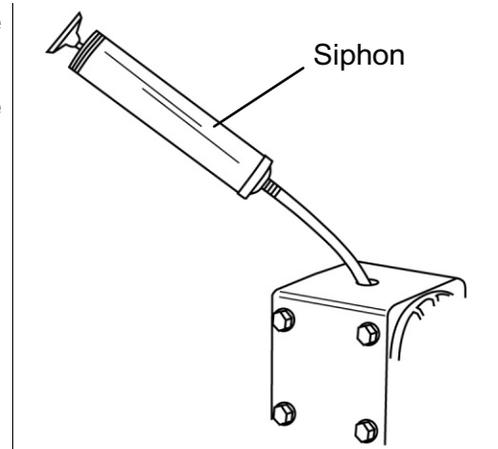
Note!

Use gearbox oil SAE 80W90.

- Remove the magnetic plug located at the bottom of the oil cooler pipes.
- Remove the access plug to the bearing housing located under the pump main frame
- Remove the magnetic plug of the bearing housing.
- Remove the filling plug located on the pump frame,
This allows air to enter at the top of the gearbox and the oil to drain from the bottom.



- Remove the oil tank located on the top gearbox;
- Use a siphon to complete the drainage of the gearbox;



- Clean and reinstall both magnetic plugs;
- Reinstall the access plug to the bearing housing.
- Through the hole of the filling plug, fill the bearing housing with oil and reinstall the filling plug;
- Fill the top gearbox with oil and reinstall the oil tank;
- Fill up the oil tank to the indicated level.

**Attention!**

After an oil change, run the pump for 1 minute only. Stop the pump and check the oil level. Add oil if necessary.

**Attention!**

Wipe out any oil spill. Safely dispose of used oil by following local and/or state regulations concerning the proper handling of dangerous goods.

Cleaning the pump

**Attention!**

Pressure washer may damage the paint if it is not used properly. Use pressure washer not exceeding 2000 psi [105 bar]. Only use cold water when cleaning with a pressure washer. Keep the pressure washer nozzle at least 1 ft [30 cm] from the surface to be cleaned.

- Pressure wash the entire pump.



9.4 Repairs

PTO driveline shear bolts

Tractor PTO	Part No.	Dimensions	Grade	Quantity
1-3/8" - 6 splines	10-24-0467	3/8"-16NC x 1	8	2
1-3/8" - 21 splines	10-24-0401	3/8"-16NC x 1	2	2
1 3/4" - 20 splines	10-24-0467	3/8"-16NC x 1	8	2

10 Decommissioning

10.1 Special personnel qualification required for decommissioning

Decommissioning may only be performed by specially qualified personnel in accordance with the safety instructions.



Also see the section on "Personnel qualification".

10.2 Safety instructions for decommissioning



Danger!

Read Instructions First! To prevent serious injury or death, do not operate or service this machine without first reading and understanding the operator's manuals for all of the equipment. If these manuals are lost, contact your nearest dealer or the manufacturer for replacements.

To prevent damage to property and/or life-threatening injury to personnel always observe the following:

- All of the steps involved in the decommissioning work must be worked through in the order specified.
- First of all, make the operating area for decommissioning completely safe.
- Make sure that operating media are disposed of without harming the environment.



Also read the chapter on "Safety".

Special dangers involved in decommissioning:

- Components which have not been removed correctly may fall off or twist.
- There is a risk of injury from open components / tools /... with sharp edges.
- Suspended loads can fall and then there will be a risk of death - do not stand underneath suspended loads!
- Using load suspension devices other than those specified here may result in serious injury to people and damage to property.

10.3 Temporary decommissioning



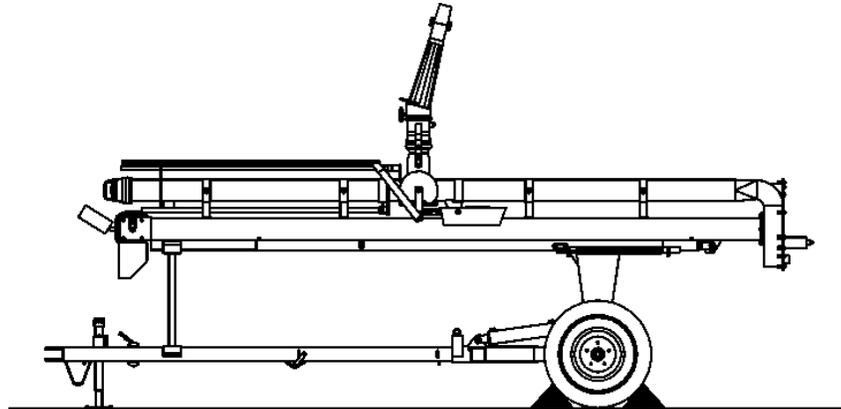
Danger!

Rotating driveline keep away!

Turn off the tractor before lubricating or cleaning the pump.

Storage

- Park the pump on a flat and firm surface.
- Block the wheels of the trailer.



Chock wheels

- Remove the cover of the directional valve and clean the housing. Be sure to clean out any accumulation of dry manure;



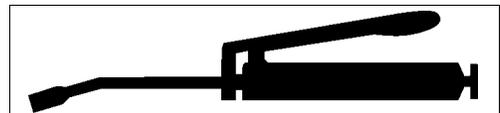
Attention!

Pressure washer may damage the paint if it is not used properly. Use pressure washer not exceeding 2000 psi [105 bar]. Only use cold water when cleaning with a pressure washer. Keep the pressure washer nozzle at least 1 ft [30 cm] from the surface to be cleaned.

- Pressure wash the entire pump.



- Drain the driveline guards (located on the main frame) and the impeller housing;
- Grease the driveline joints and all parts labeled with;





Refer to section 11.1 Label position

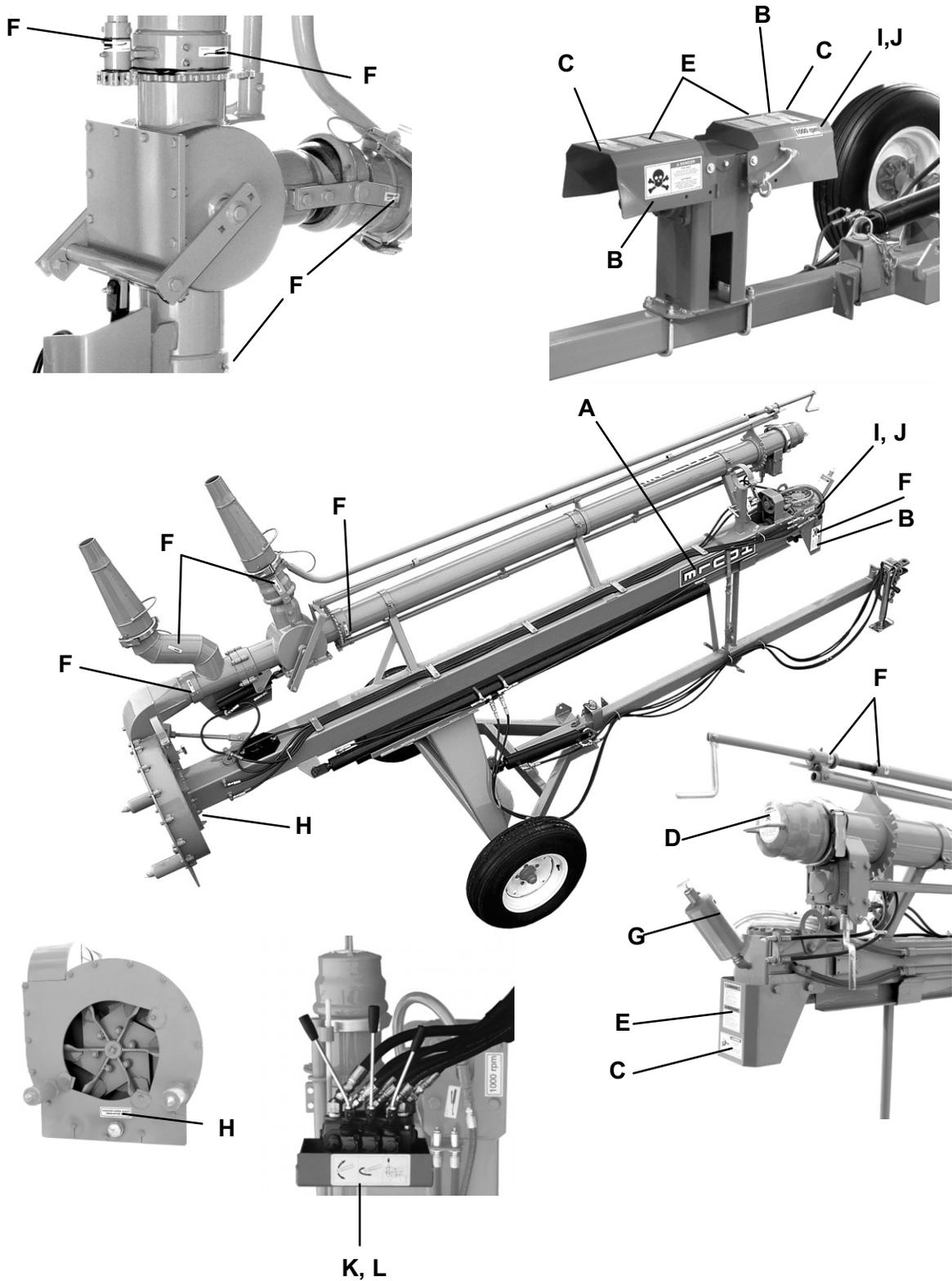
- To prevent corrosion, spread a film of oil on all moving parts.

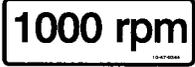
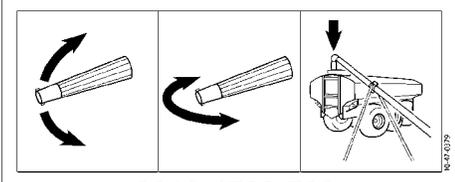
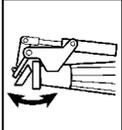
10.4 Final decommissioning/disposal

After final decommissioning, handle all components properly and dispose of them in accordance with valid local regulations on waste disposal and utilization.

11 Appendix

11.1 Label position



I	 <p>540 rpm <small>1047-0043</small></p> <p>2010-4703-430</p>
J	 <p>1000 rpm <small>1047-0044</small></p> <p>2010-4703-440</p>
K	 <p>2010-4703-790</p>
L	 <p>2010-4703-381</p>

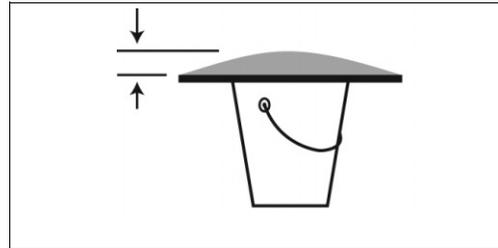
11.2 Abbreviations

Units	
@	at
°	Degrees (angles)
CE/ EC	European Union
cm	Centimeters
CW	Clockwise
CCW	Counterclockwise
gal	Gallon
Hp	Horsepower
" (in)	Inch (= 25.4 mm)
Inc	Incorporated
kg	Kilograms
km/h	Kilometers per hour
L	Left or liters
lbs	Pounds
m	Meter
mm	Millimeters
max	Maximum
min	Minimum
mph	Miles per hour
NC	National coarse thread
PTO	Power take-off
QC	Quebec (Canada)
R	Right
RPM	Revolutions per minute
SAE	Society of Automotive Engineers
us/ USA	United States of America
www	World wide web

11.3 Consistency test

The following test must be performed to find the viscosity of well-agitated slurry.

- Set a 24" (60cm) disc over a pail.
- Slowly pour enough slurry to get overflow all around the disc.
- After 1 minute of rest, measure the thickness of slurry at the center of the disc.



Ratio (Free stall manure vs Water added)	1 : 2	1 : 1 1/2	1 : 1	2 : 1
Approximate thickness on 24" (60cm) disc	1/8" (3mm)	1/4" (6mm)	1/2" (12mm)	3/4" (18mm)

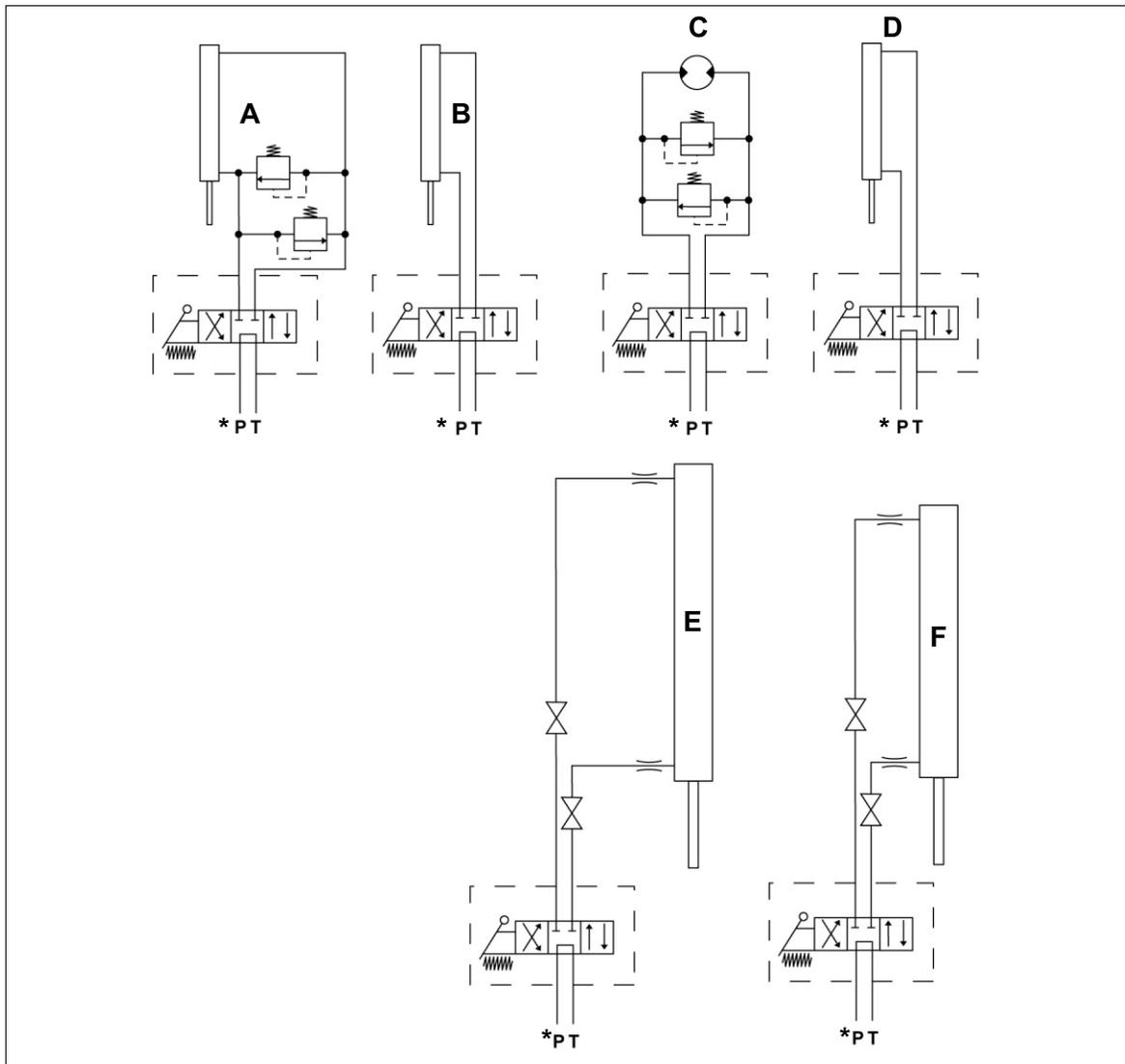
11.4 Hydraulic diagrams

Hydraulic controls



Note!

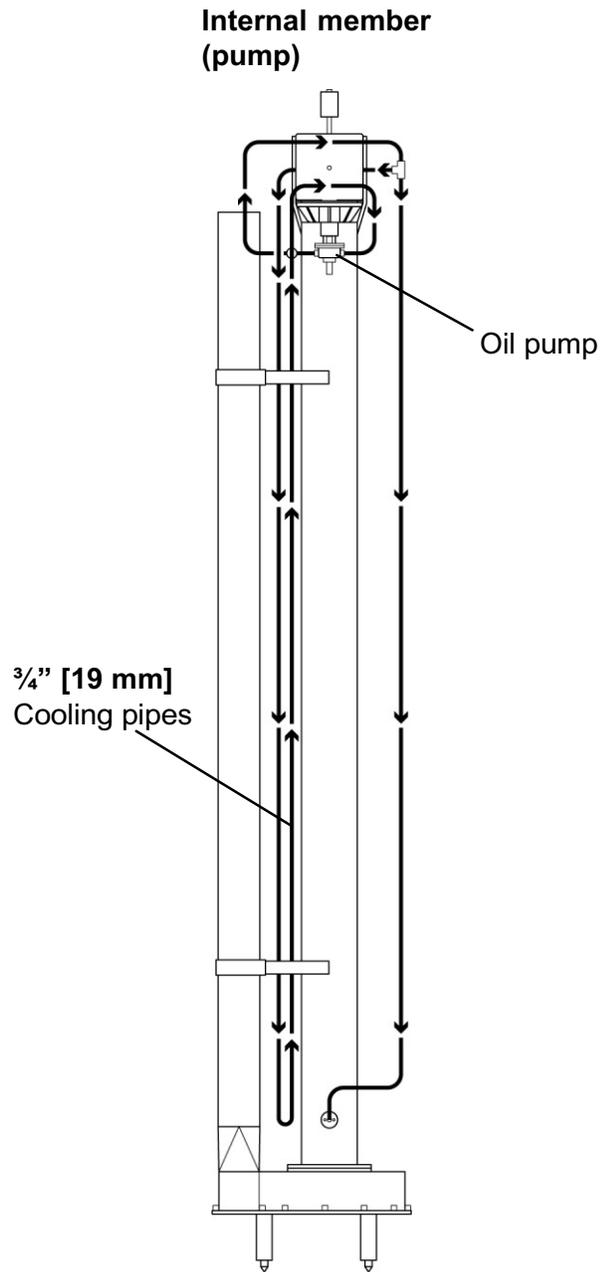
The diagram illustrates all hydraulic controls available on the pump. The dashed frame shows a component equipped with a control lever.



* All components equipped with a control lever may be connected together using the same tractor outlet.

A	Directional valve cylinder
B	Nozzle height cylinder
C	Nozzle rotation motor
D	Hydraulic cap on bottom nozzle
E	Sliding cylinder
F	Tilting cylinder

Cooling system



GEA Farm Technologies

The right choice.



GEA Farm Technologies

GEA Houle Inc.

4591 boul. St-Joseph, Drummondville, Qc, J2A 0C6 (Canada)
Tel. +1 819 477 - 7444, Fax. +1 819 477 - 5565
www.gea-farmtechnologies.com