



GEA Farm Technologies

Trailer Super Pump for 20-Foot Above Ground Tank

PTO pumps

Instruction Manual / Installation Instructions / Parts List
2010-9015-011
08-2009

GEA Farm Technologies - The right choice.

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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 894	Safety of machinery - Ergonomics requirements for the design of displays and control actuators
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
EN 12162	Liquid pumps - Safety requirements - Procedure for hydrostatic testing
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 for 20-Foot Above Ground Tank
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.

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.

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.
Damage caused by defective, modified or overrated motor.
- 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.).

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 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!

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)



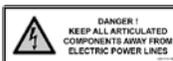
Danger! (American model)

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. 2099-4725-070)



Danger!

Keep all articulated components away from electric power lines.
(part no. 2099-4725-070)



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)
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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 for 20 -Foot Above Ground Tank 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]
- The pump is designed to be used with an above ground manure tank.
- The tank can be up to 20 feet [6 m] above ground.

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 for 20 -Feet Above Ground Tank consists of:

- a vertical pump mounted on a trailer with an articulating joint to allow the pump to be raised up and over the side of an above ground manure tank.
- two adjustable nozzles to homogenize manure.
- a directional valve to divert the flow to either the agitation nozzle or the discharge line.
- hydraulic controls to operate components.

Drive

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

3.4 Functional description

Trailer Super Pump for 20 -feet above ground tank

- 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 above ground manure storage tank.
- The pump assembly has an articulating joint to allow the pump to be raised up and over the side of an above ground manure tank.
- The pump is driven with a PTO shaft connected to the tractor.
- The pump will agitate, and transfer manure from an above ground manure tank.
- The pump has two adjustable nozzles to homogenize manure.
- 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

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.

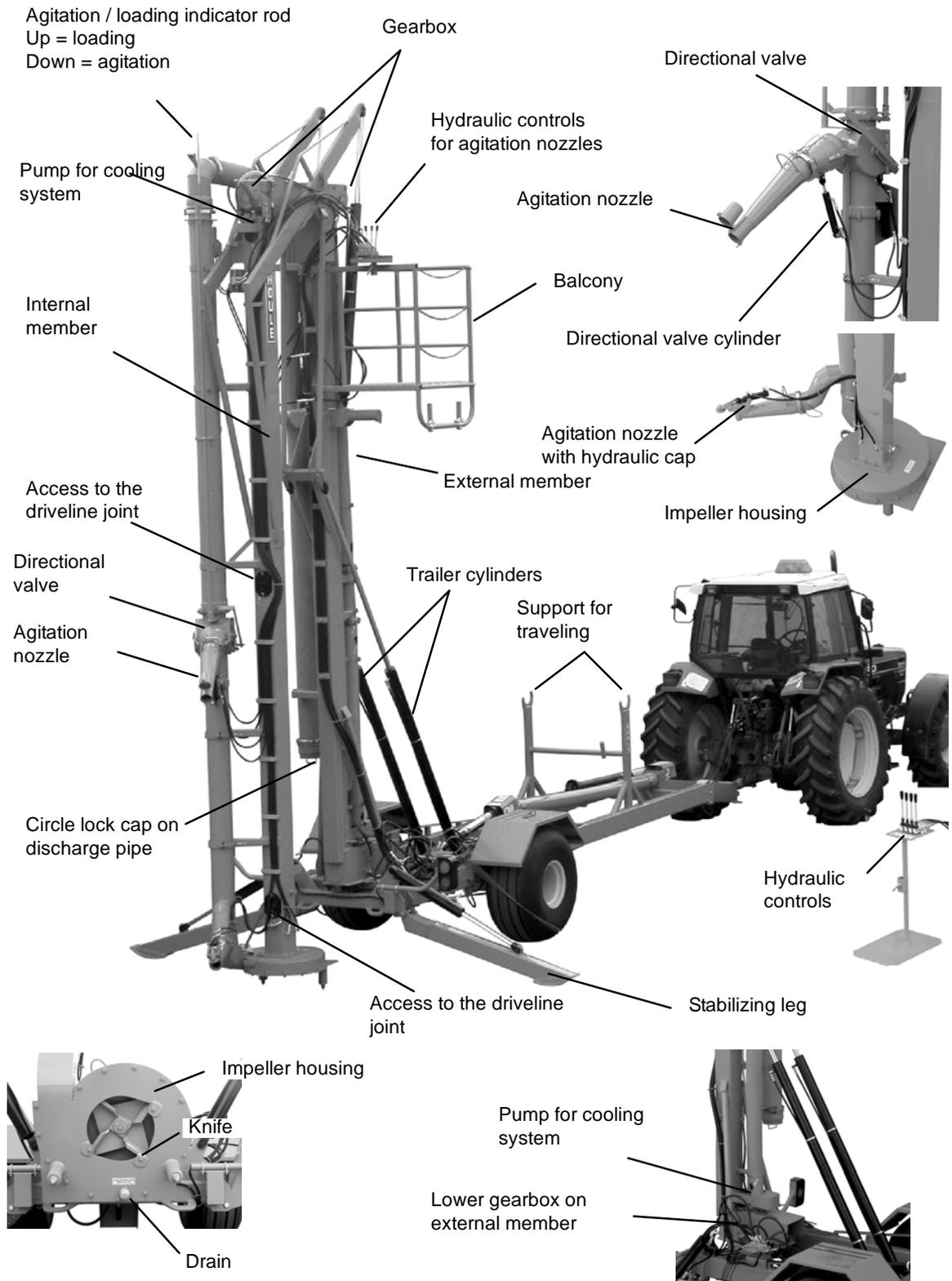
Hydraulic hoses

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	21.5L X 16.1	14	26	1.8	43.7/1110	21.9/556	145	66

3.6 Main view



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

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".

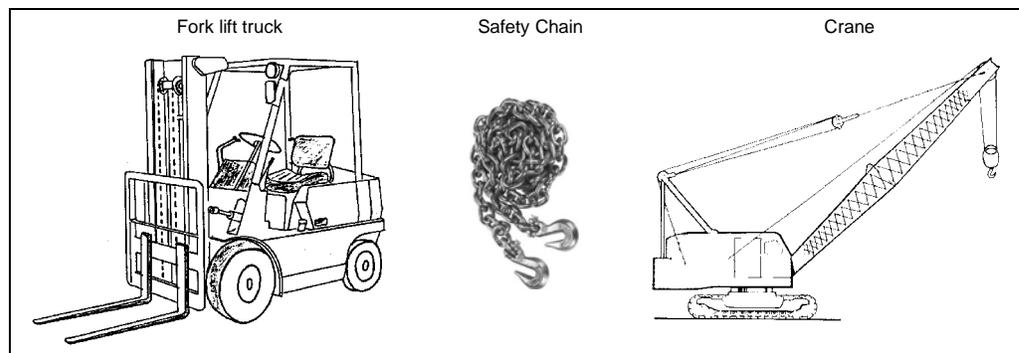
Special transport hazards:

- 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!

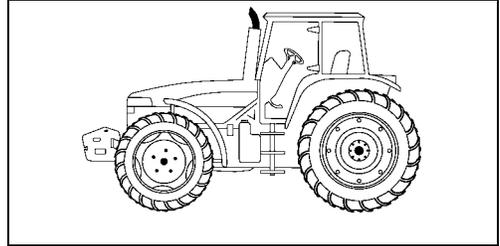
Do not stand underneath suspended loads.
Suspended loads may fall, so there is a danger of death!

Travel (short distances)

The pump must be moved with a farm tractor.

Minimum towing capacity of;
9,250 lb [4195 kg]

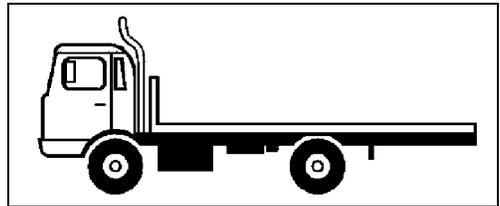
Maximum speed;
25 mph [40 km/h]



Travel (long distances)

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

Minimum towing capacity of;
9,250 lb [4195 kg]

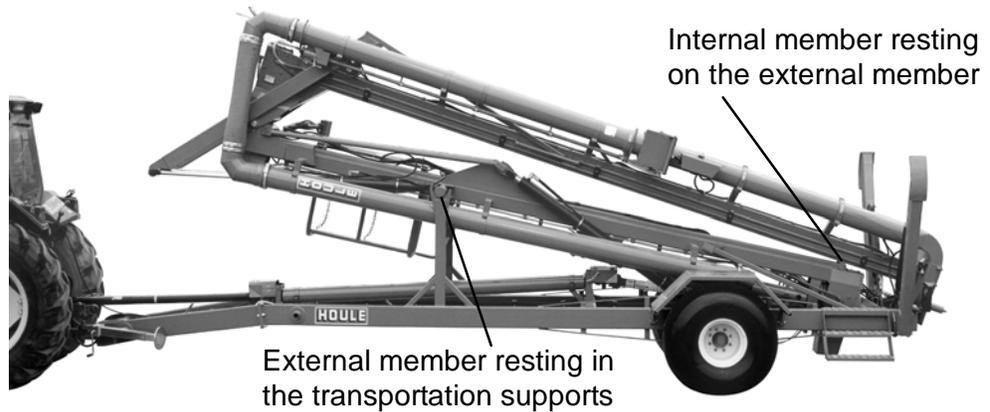


4.4 Transport



Attention! Moving the pump

- Lower the main frame completely and set the outside member on the supports for traveling.



Attention! Moving the pump

- The pump must be moved on a farm tractor with a minimum towing capacity of 9,250 lb [4195 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.
-

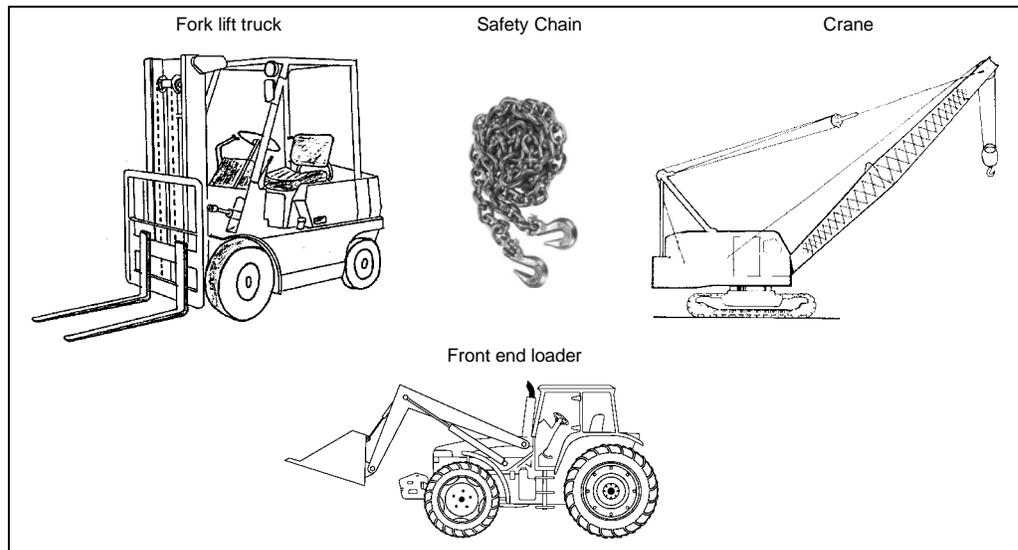
5.3 Assembly preparations

Special tools



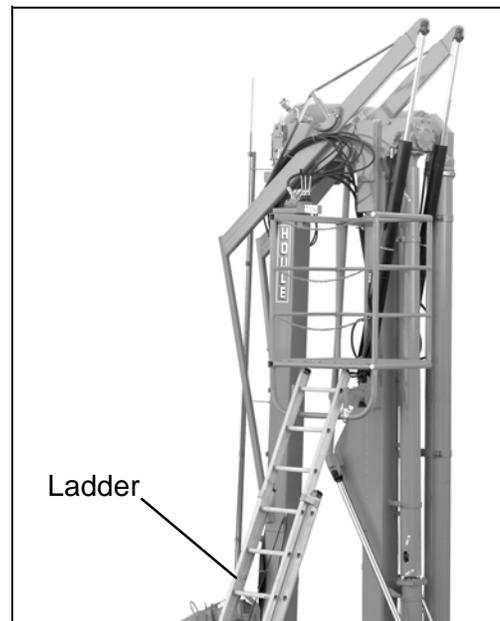
Attention!

To lift the pump and steady in place when assembling, use a lifting device with a minimum capacity of;
9,250 lb [4195 kg].



Locally purchased items

A ladder must be provided to access the operator balcony when the pump is in position over the tank wall.



5.4 Environmental prerequisites for setting up



Danger! **Unexpected movement!**

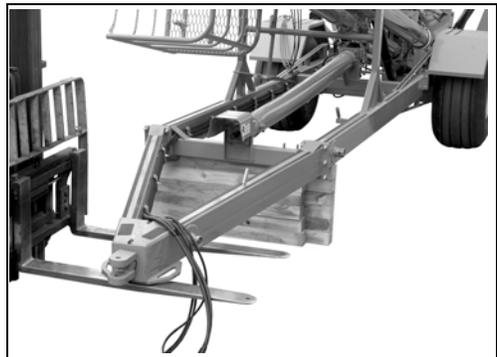
Before assembling the pump, make sure the trailer is on a flat and firm surface and that the rear wheels are blocked.

Chock the wheels to prevent the trailer from rolling ahead or back.



Use the hand jack or a suitable lifting device to raise the front of the trailer.

Install wooden blocks underneath to stabilize the front end of the trailer.



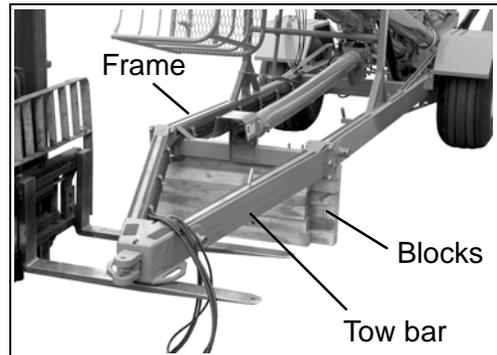
5.5 Pump assembly

Tow bar assembly

Raise the trailer frame using the proper lifting device.

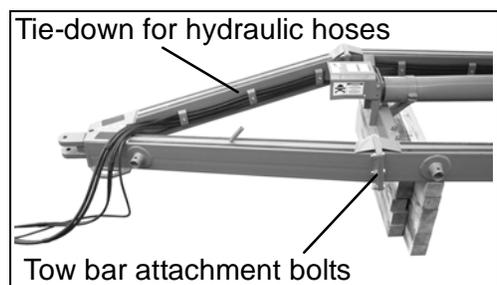
Position the blocks underneath the frame and rest the frame on the blocks.

Hold up and position the tow bar using the proper lifting device.



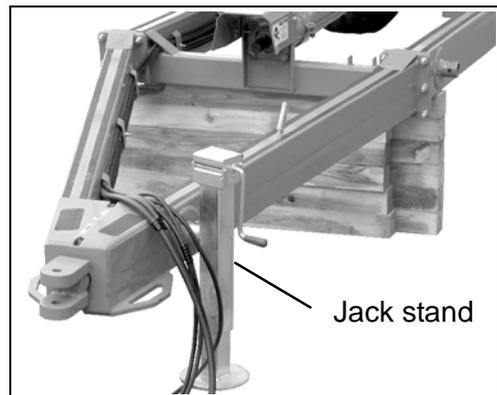
Bolt the tow bar.

Install the hydraulic hoses on the tow bar.



Install the jack stand on the tow bar.

To remove the blocks, raise the tow bar using the jack stand.



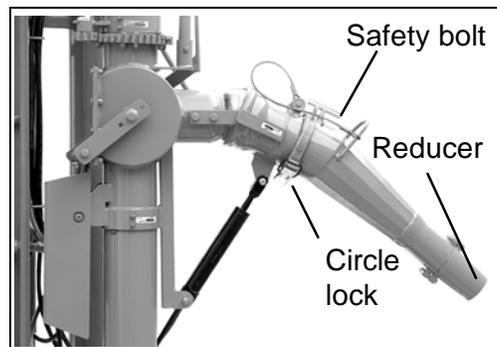
Agitation nozzle

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.



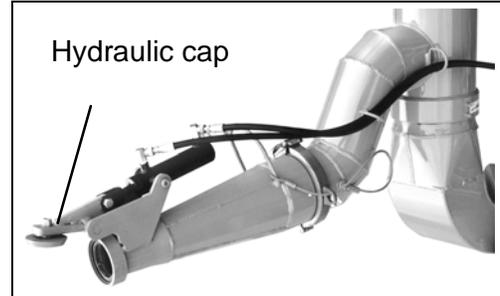
**Note!**

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.

2nd agitation nozzle

Install the 2nd agitation nozzle using the circle lock;

Install the nozzle with the cylinder for the hydraulic cap on top.

**Oil and lubrication**

Check the oil level in the internal and external members.



Refer to the maintenance section for instructions.

Grease all parts labeled with.

**5.6 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 hydraulic connections to the tractor are mixed up this may cause unexpected movements.
- 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.

Ordering details

0024-6053-000	CE mark sticker	28 x 50
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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"

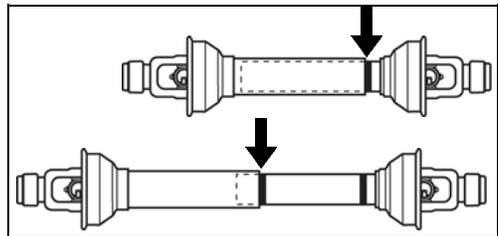
- No safety equipment may be removed or put out of operation during operation.
- Do not remove the guards located on the PTO driveline of the tractor and on the pump.
- Keep hands, feet and clothing away from all moving parts.
- Make sure that no one stands in close proximity to any moving parts before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

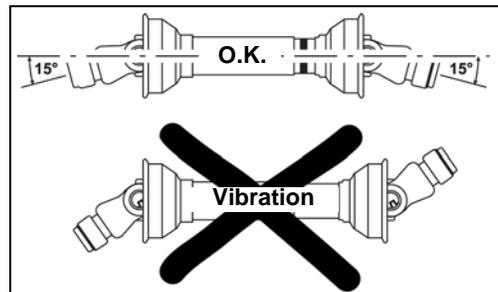
Maximum Extension and Retraction

- 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.

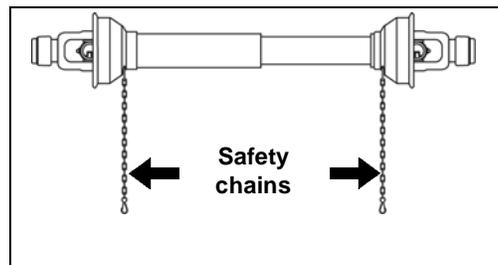


Lubrication

- 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!



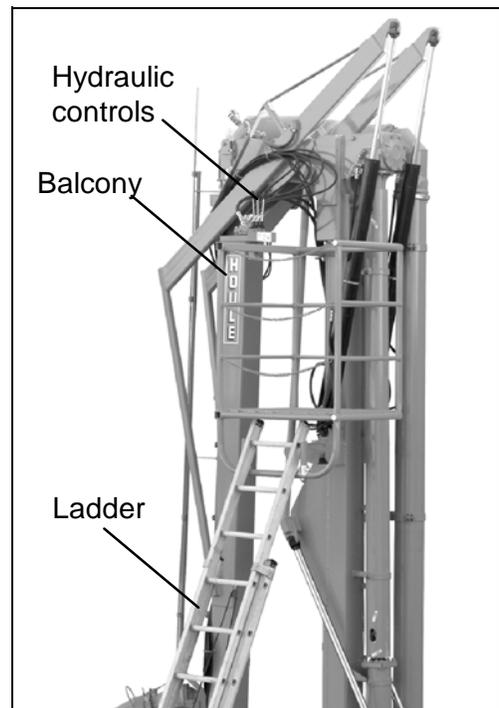
Danger!

Do not climb on the trailer, outside member or any other part of the pump assembly to reach the control levers.

The operator must stand on the balcony in order to safely operate the control levers and observe the inside of the tank.

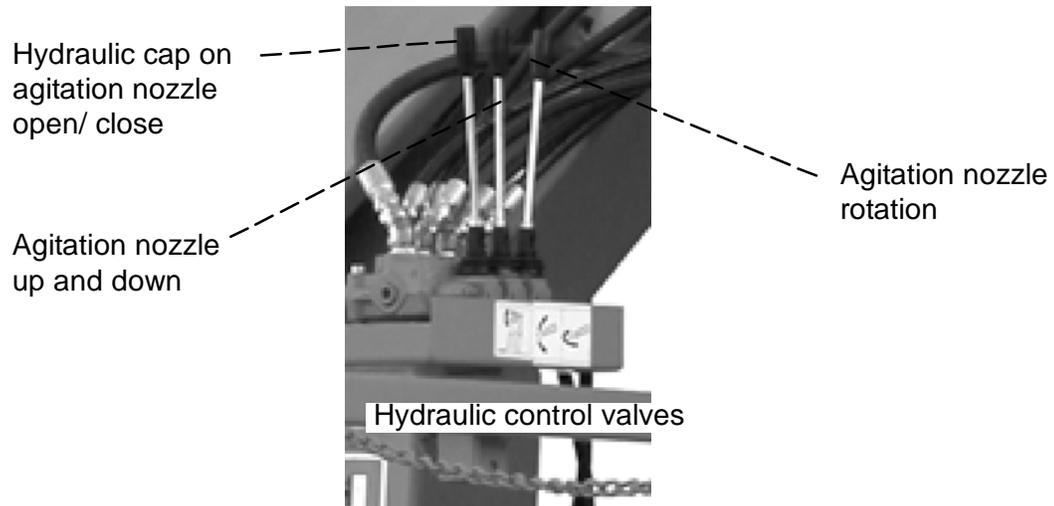
The operator must stand within the balcony to operate the hydraulic controls for the agitation nozzle.

A ladder must be supplied to access the balcony.

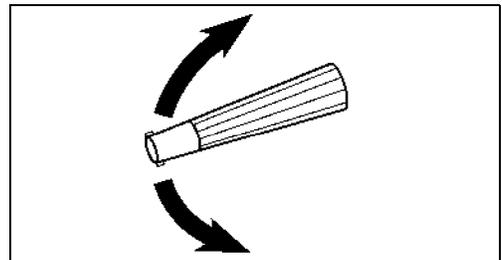


7.4 Description of the operating elements

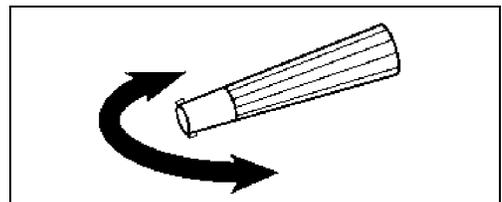
7.4.1 Hydraulic controls on the balcony



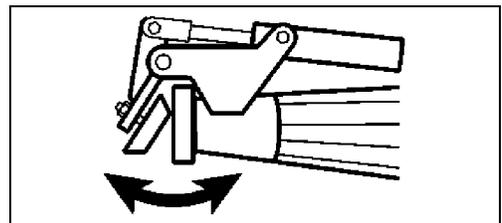
Agitation nozzle up / down



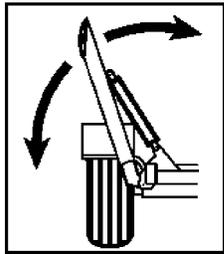
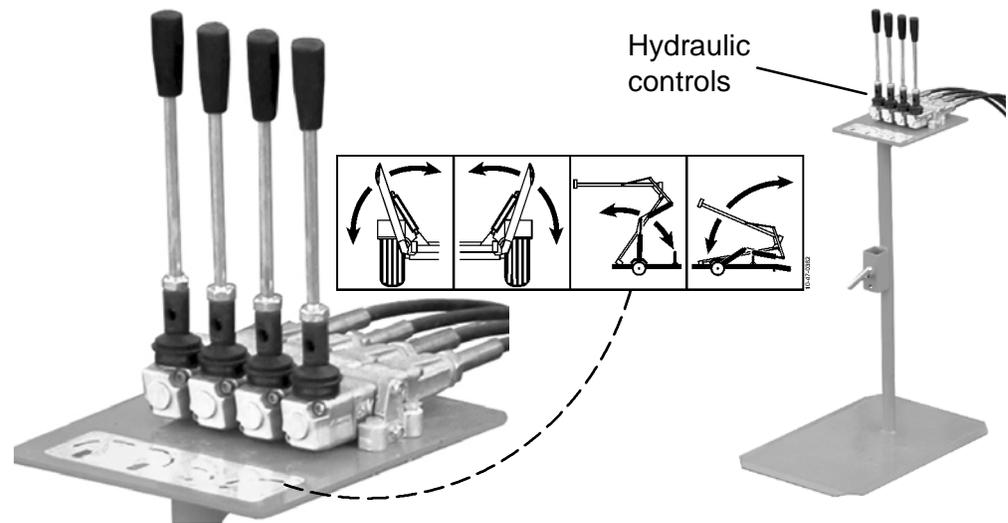
Agitation nozzle rotation



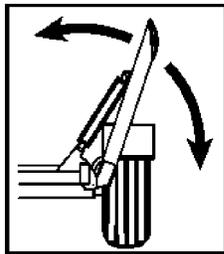
Hydraulic cap on agitation nozzle



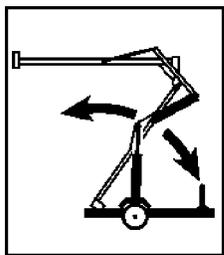
7.4.2 Trailer hydraulic controls



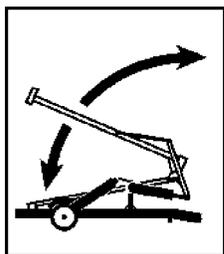
Left stabilizing leg Up/Down



Right stabilizing leg Up/Down



External member Up/Down (Trailer cylinders)

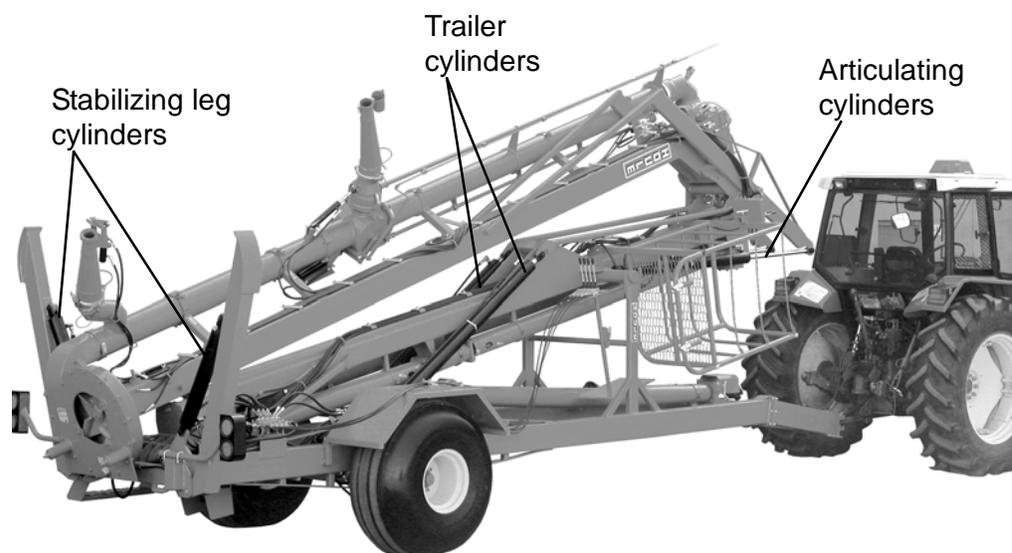
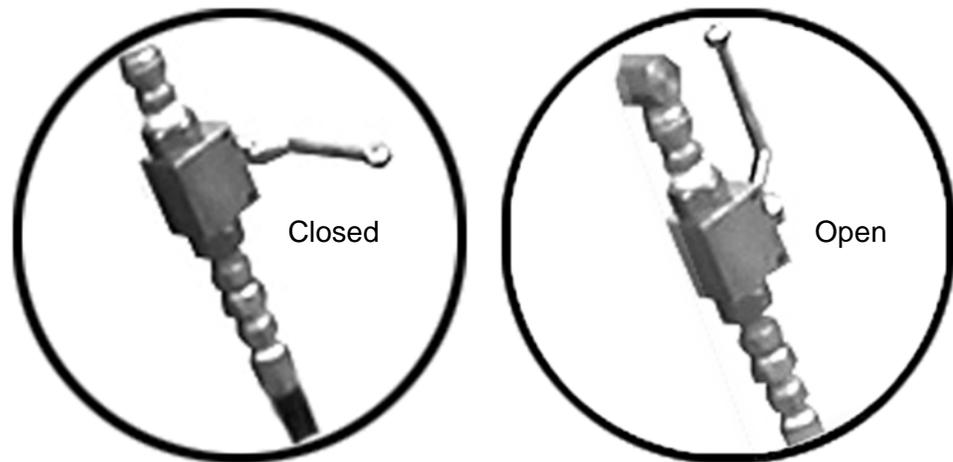


Internal member Up/Down (Articulating cylinders)

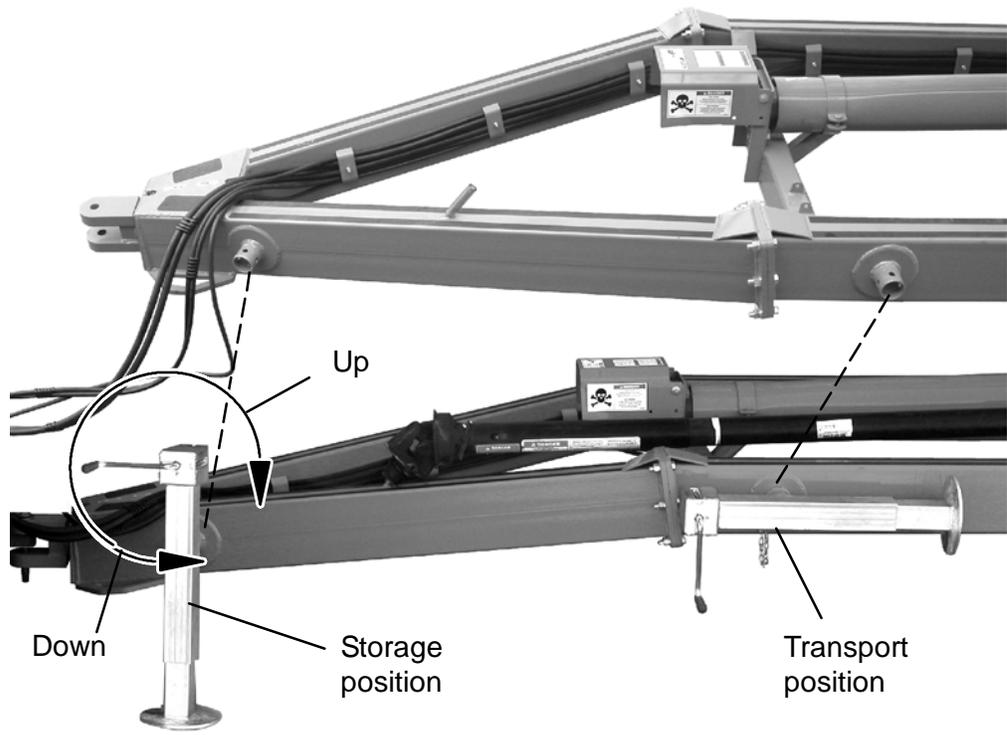
7.4.3 Trailer to tractor connections



7.4.4 Ball valves on the stabilizing legs, articulating and trailer hydraulic cylinders



7.4.5 Jack stand



7.4.6 Circle lock cap on discharge pipe

If the transfer hose is not connected, install the circle lock on discharge pipe.



Danger!

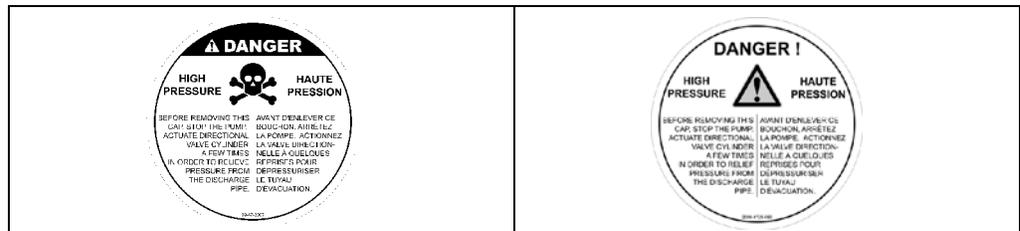
Never unlock a circle lock cap under pressure!

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

Lower the main frame completely and set the outside member on the supports for traveling.



Attention! Moving the pump

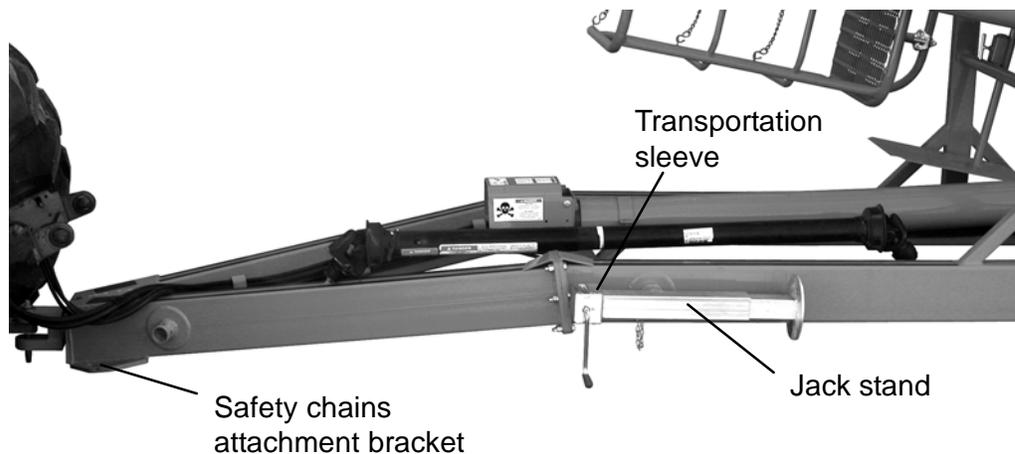
- The pump must be moved on a farm tractor with a minimum towing capacity of;
9250 lb [4195 kg].
- The hitch, tires, wheels, hubs and axles of the pump are designed for agricultural use only. They are not approved to be towed at any speed above 25 mph [40 km/h].
- For long distance transportation, use 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/SAE S279.12 or better if required by local laws.

Plug the electrical outlet to the tractor and make sure the signal lights function properly;



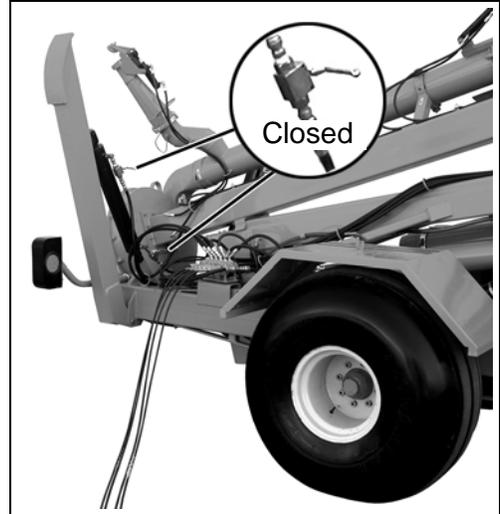
Install the safety chains between the tow bar and the tractor;

Position the jack stand on the transportation sleeve;



Make sure the stabilizing legs are locked in a raised position;

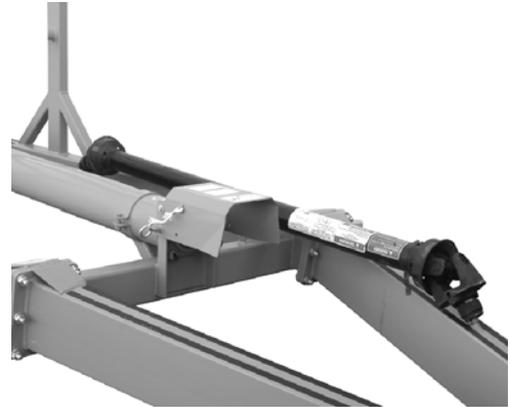
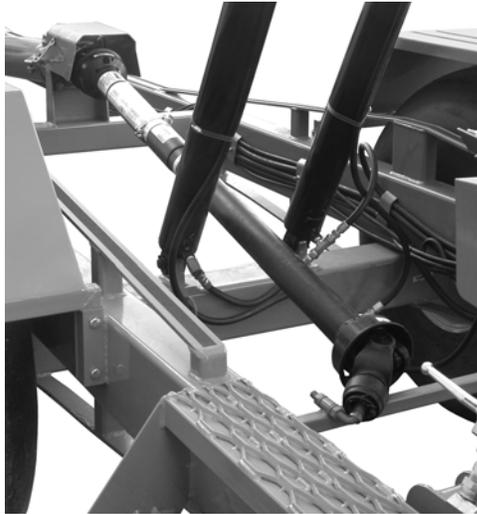
The ball valves must be closed to lock the legs.



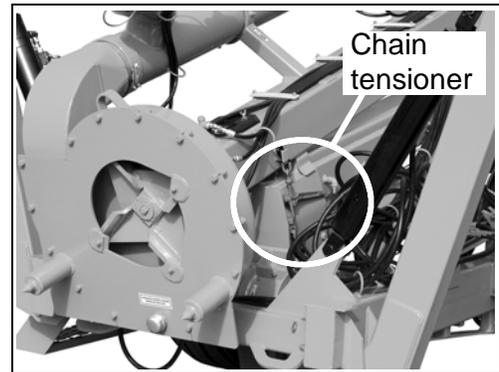
Attention!

The ball valves must be closed to lock the legs.

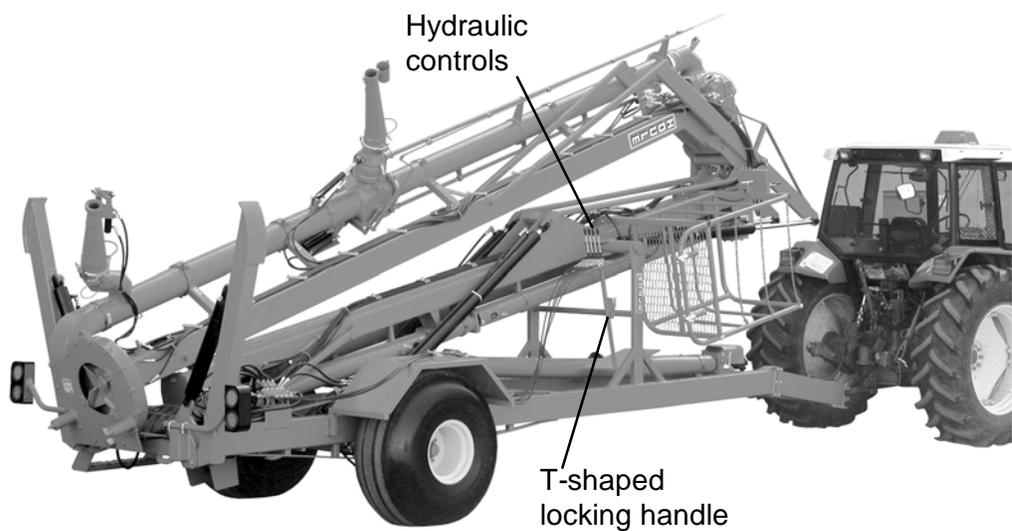
Rest the PTO drivelines onto their respective transportation supports;



Lock the pump using the chain or cable tensioner;



Secure the hydraulic system controls on the pump using the T-shape locking handle.



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.



Attention!

Always check the oil level before operating. If the oil is contaminated, change the oil.

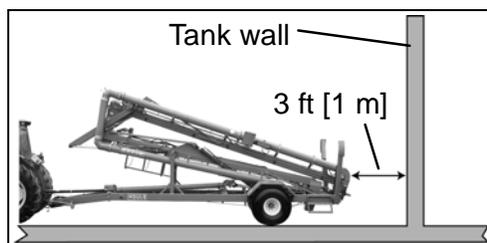
Follow the instructions in the maintenance section.



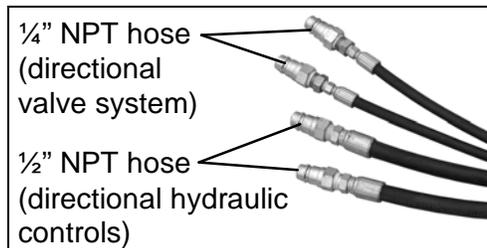
Note!

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

Back up the trailer to the wall of the tank into the position as shown.



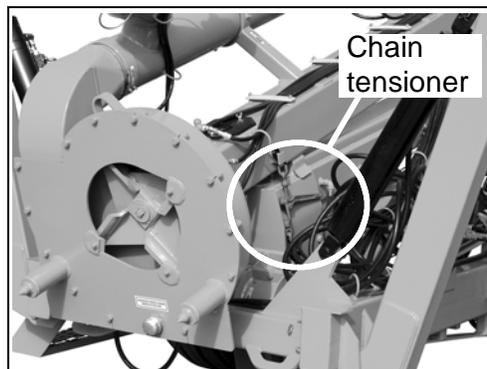
Connect the hydraulic hoses of the pump to the tractor.



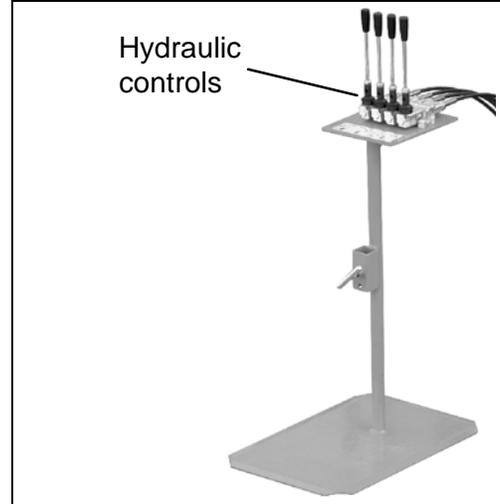
Refer to section 7.4

Description of the operating elements Hydraulic connections

Unlock the chain tensioner.

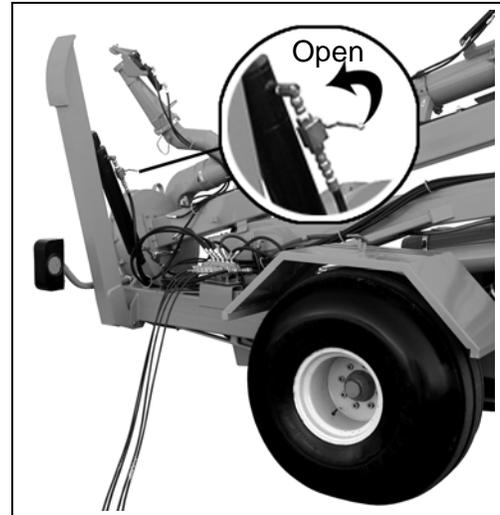


Position the controls near the pump.

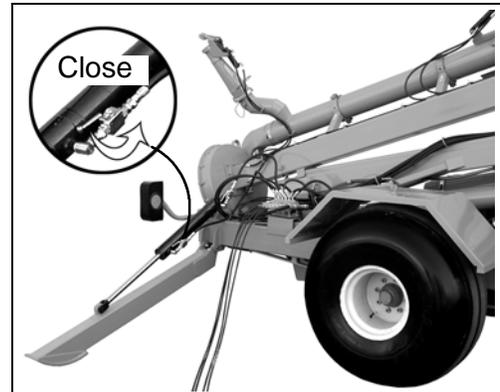


Open the ball valves on the stabilizing legs.

Activate the cylinders of the stabilizing legs so that the pump is leaning firmly in a horizontal position.



Close the ball valves of the stabilizing legs to secure the pump.



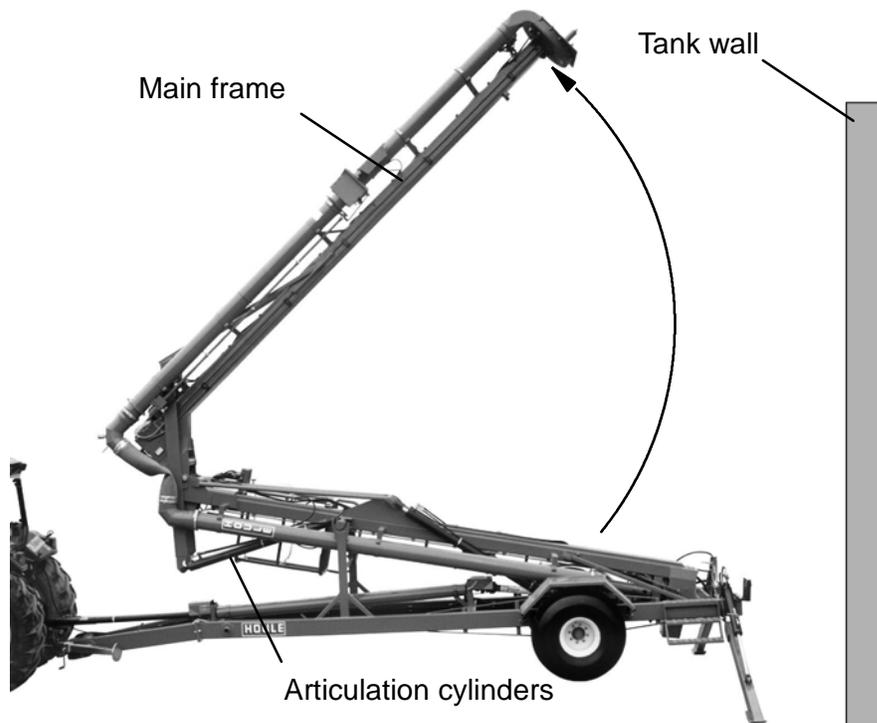
7.5.3 Raising the pump



Danger!

Keep all articulated components away from electric power lines.

Operate the articulation cylinder to lift the main frame to the maximum;



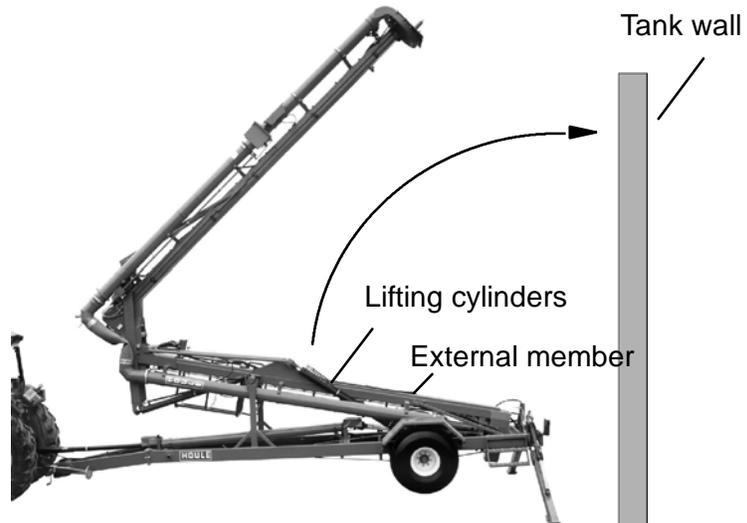
7.5.4 Lowering the pump



Danger!

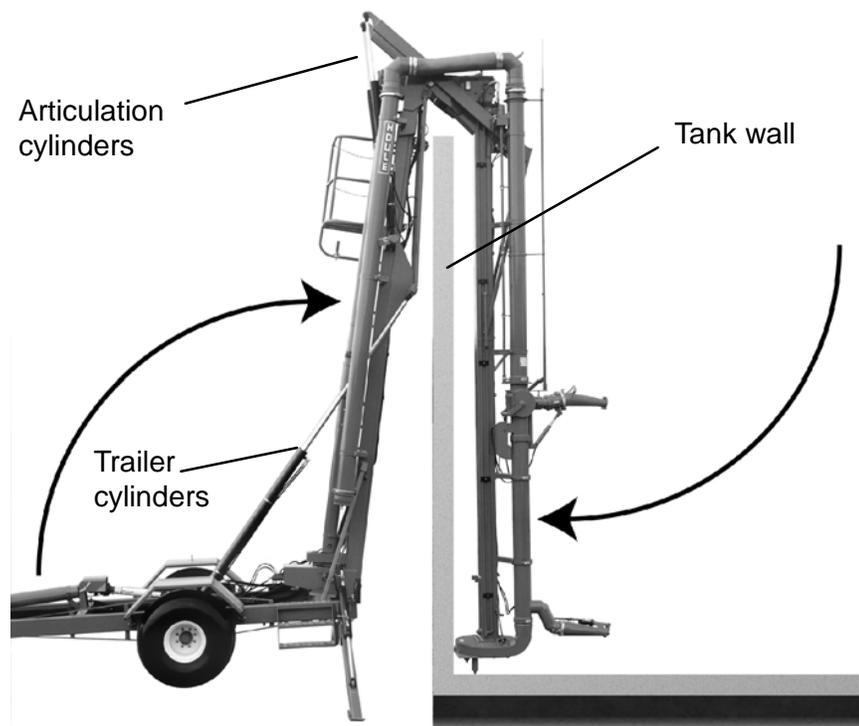
Keep all articulated components away from electric power lines

Operate the lifting cylinders to lift the outside member.



Operate the articulation and lifting cylinders to lower the pump inside the tank.

Set the main frame parallel to the wall of the tank



7.5.5 Agitation mode



Danger!

Rotating driveline keep away!

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



Note!

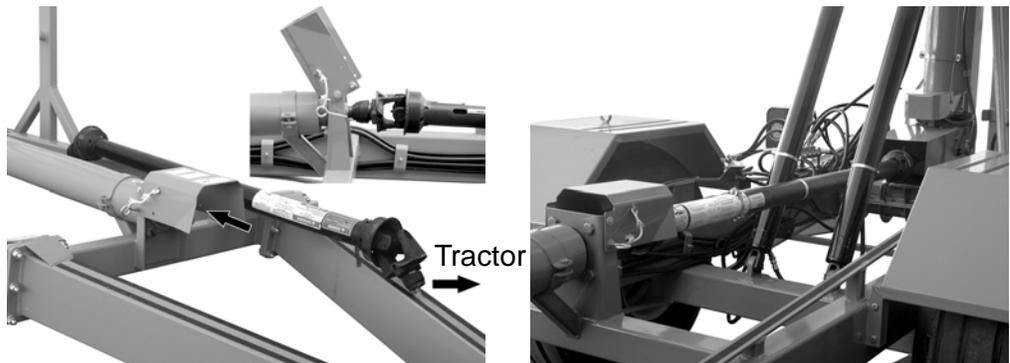
The hydraulic cap on the bottom nozzle may be used to shut off flow to bottom nozzle and therefore increase pressure and flow to the top nozzle.



Attention!

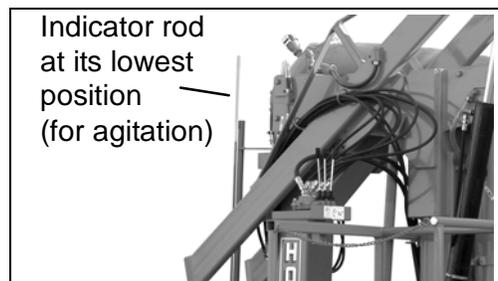
The safety valves of the 3-point hitch cylinder must be shut off when agitating and transferring manure.

- Install the PTO driveline;



- Connect the pump's hydraulic controls to the tractor.

Set the directional valve to the agitation mode at its lowest position on the indicator rod.

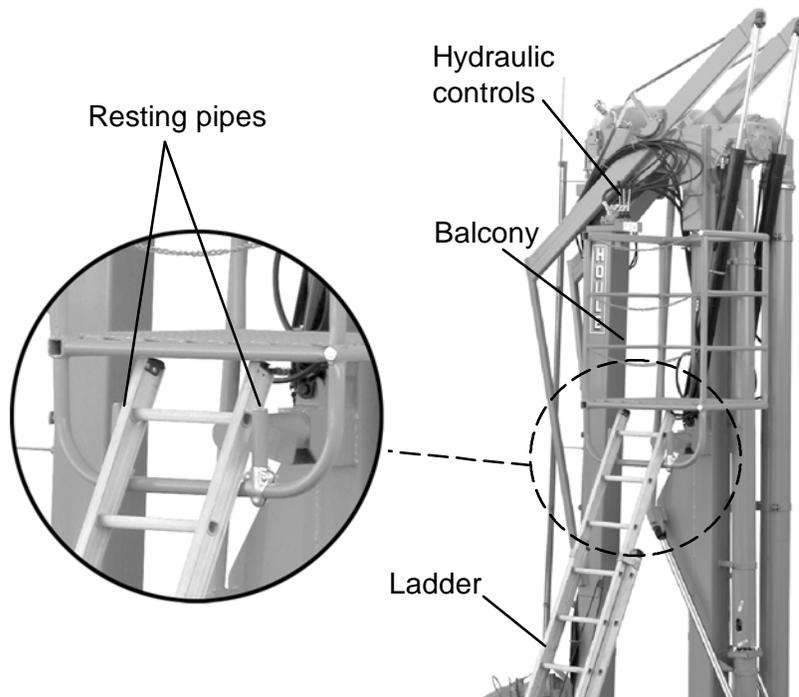


- Engage the PTO at minimum RPM.
- Gradually increase the PTO to 540 or 1000 RPM, depending on the PTO model.
- Install a ladder to reach the balcony;

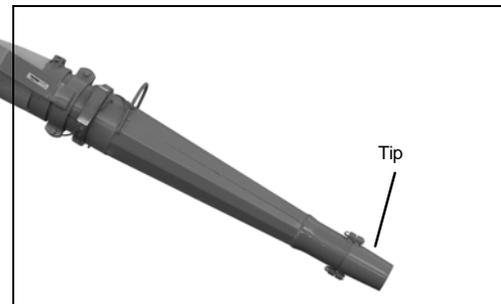


Note!

The two resting pipes can be pivoted to stabilize the ladder.



- Using the nozzle controls (rotation, up/down), 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 cleanup. The tip should be removed once the crust has been broken up or there is a thin crust.



- To speed up agitation, move the agitation nozzle from liquid to solids.
- Turn off the lower nozzle to raise the pressure of the upper nozzle to break down the solid chunks of manure.
- Start the agitation by directing the upper nozzle towards the pump intake.
- When the manure is sufficiently broken down, turn on the lower nozzle and start pivoting progressively the nozzles by moving them away from the pump intake.



Note!

Never allow the propeller and the agitation 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.
- Turn off the pump.

7.5.6 Manure transfer mode



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!

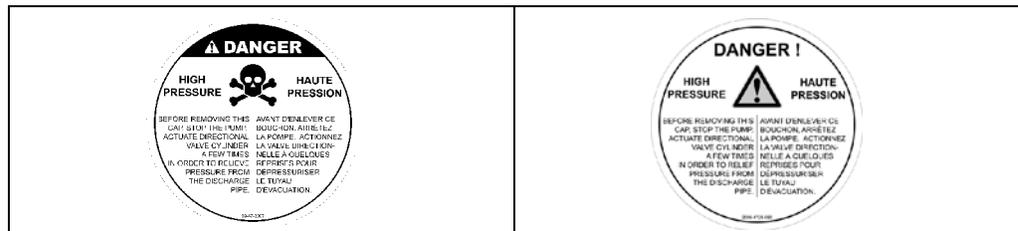
Never unlock a circle lock cap under pressure!

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.



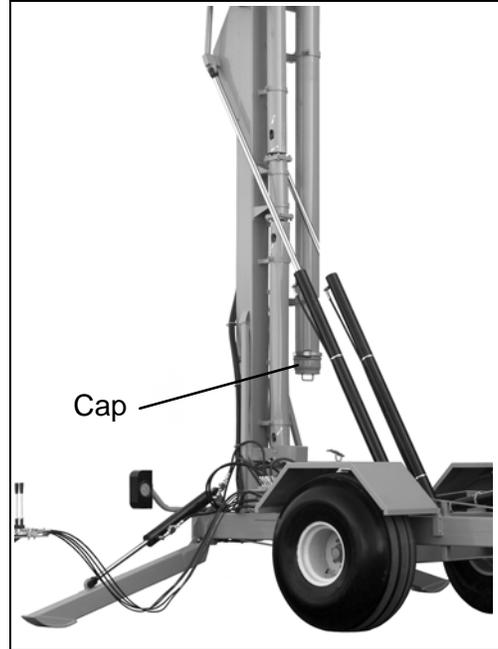
Function of the circle lock cap

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.

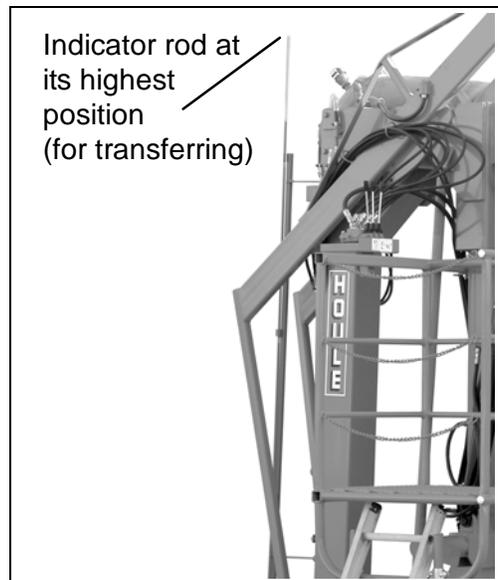
Compressed air under the circle lock cap

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.



- Using the lever inside the cabin of the tractor, set the directional valve to the transfer mode at its highest position on the indicator rod.



- Engage the PTO at minimum RPM;
- Gradually increase the PTO RPM until the desired transfer capacity is reached.

 **Note!**

The lower nozzle can remain turned on during the manure transfer.

- Before loading is completed;
- Gradually decrease the PTO RPM to minimum.
- Stop the PTO.
- Set the directional valve to the agitation mode.
- Once finished, remove the loading pipe from the auxiliary pipe.

-
- Position back the circle lock cap on the auxiliary pipe using the circle lock.



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.

Repositioning for transportation

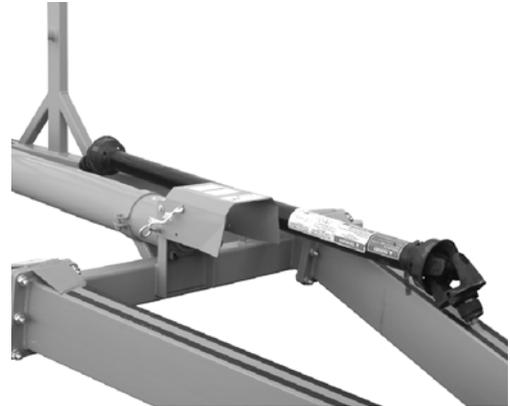
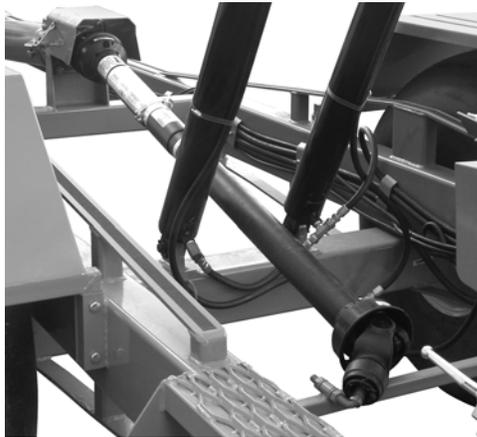


Danger!

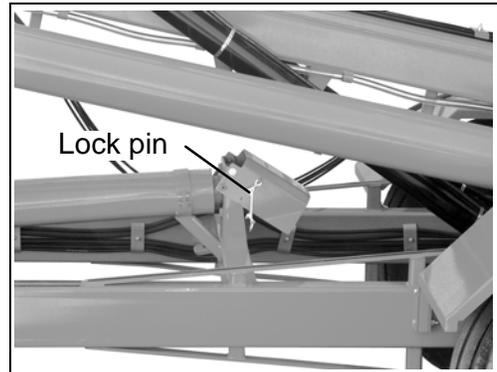
Rotating driveline keep away!

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

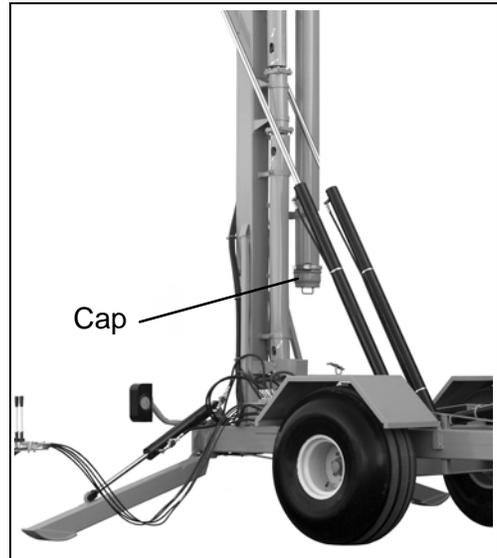
Remove the PTO drivelines from the pump and install them on their supports.



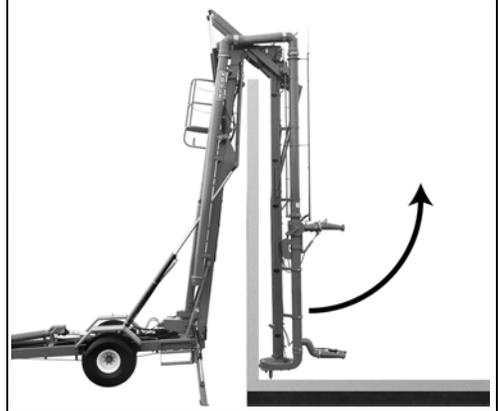
Lower the jack shaft guard by removing the lock pin.



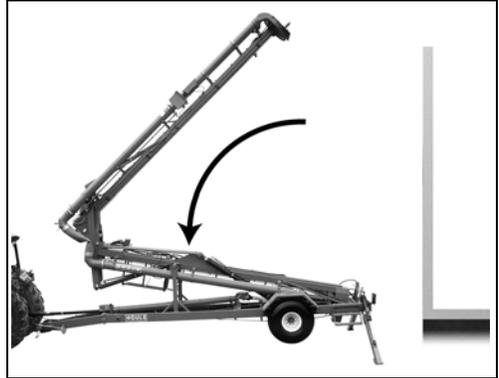
Disconnect the loading pipe and reinstall the cap using the circle lock.



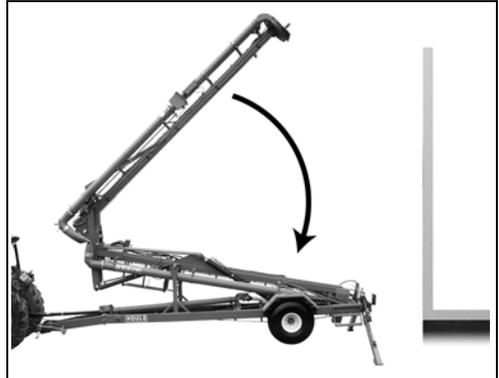
Operate the articulation cylinders to raise the pump over the wall of the tank;



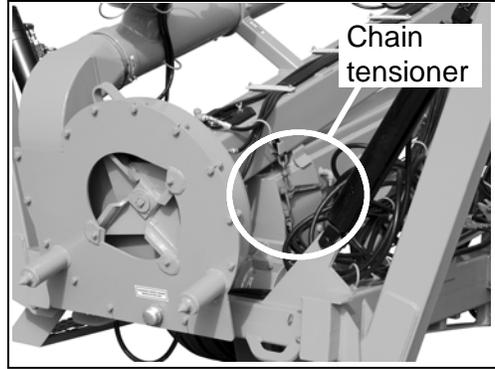
Operate the lifting cylinders to lower the outside member until it reaches the support;



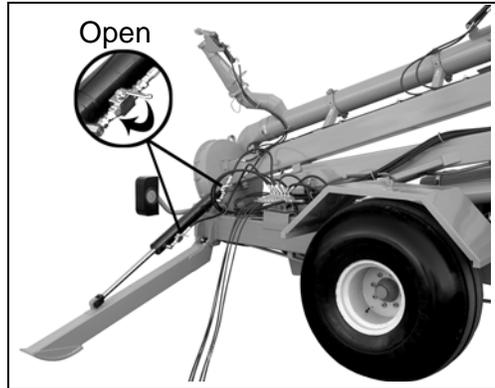
Operate the articulation cylinders to lower the main frame. The main frame must lean on the outside member.



Lock the pump using the chain or cable tensioner;

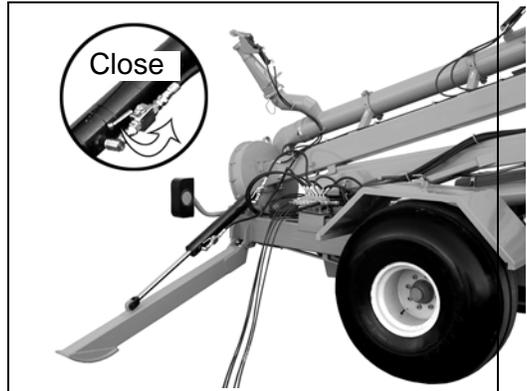


Open the stabilizing legs cylinder ball valves.



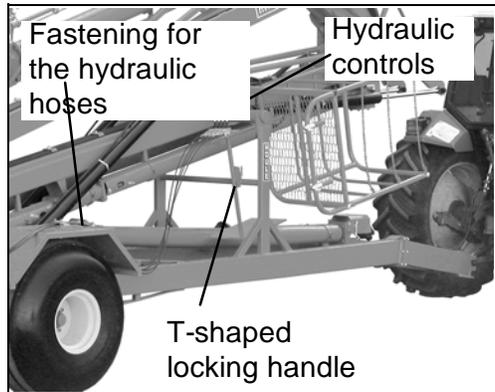
Activate the stabilizing legs cylinders to lift them up.

Once accomplished, close the ball valves.



Secure the hydraulic system controls on the pump using the T-shape locking handle.

Run the hydraulic hoses along the trailer fender.



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; 11.4
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.
The Internal member or external member will not move properly.	The chain or cable tensioner are holding the members in the traveling position.	Remove the chain or cable tensioner.
	Safety valve is closed.	Open valve.
	Lack of lubrication	Refer to section; 9.3
	The hydraulic hoses are not connected properly.	Refer to section; 7.4
	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.
	Hydraulic control valve is defective.	Replace defective part.
	The trailer is positioned too close to the tank.	Refer to section; 7.5

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 Inspections 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.



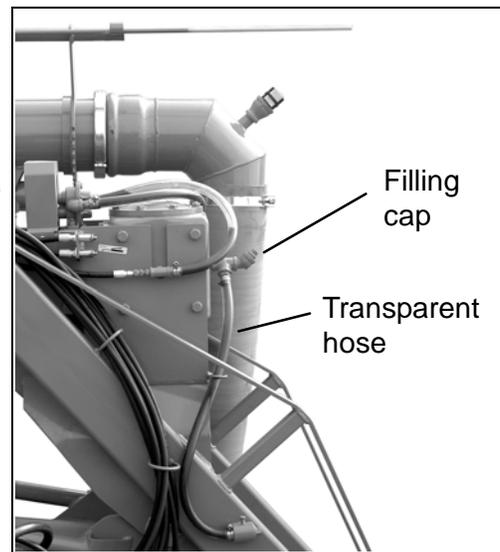
Danger!

Rotating driveline keep away!

Turn off the tractor before lubricating or cleaning the pump.

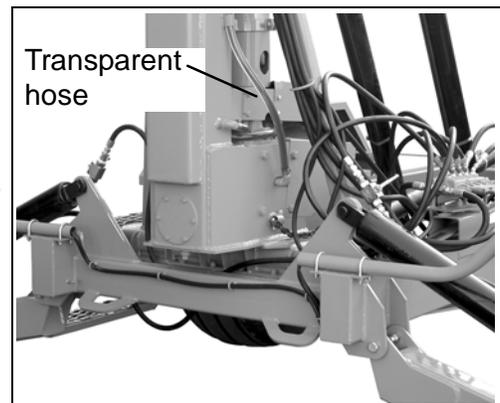
Oil level of the main frame

- The transparent hose on the pump must always be filled with oil when the pump is operating.
- Add SAE 80W90 gear oil if necessary.



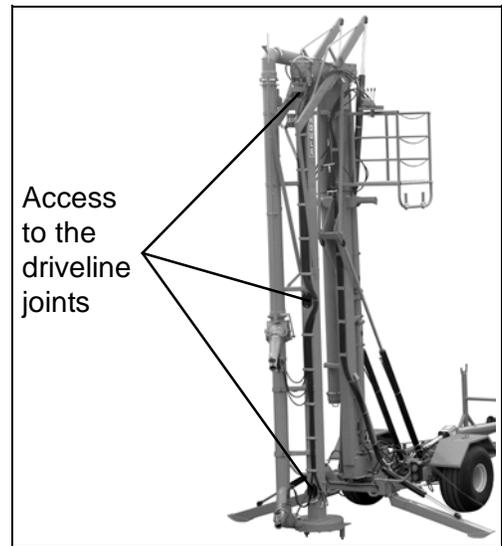
Oil level of the outside member

- The transparent hose on the pump must always be filled with oil when the pump is operating.
- Add SAE 80W90 gear oil if necessary.



9.3.1 After emptying each pit

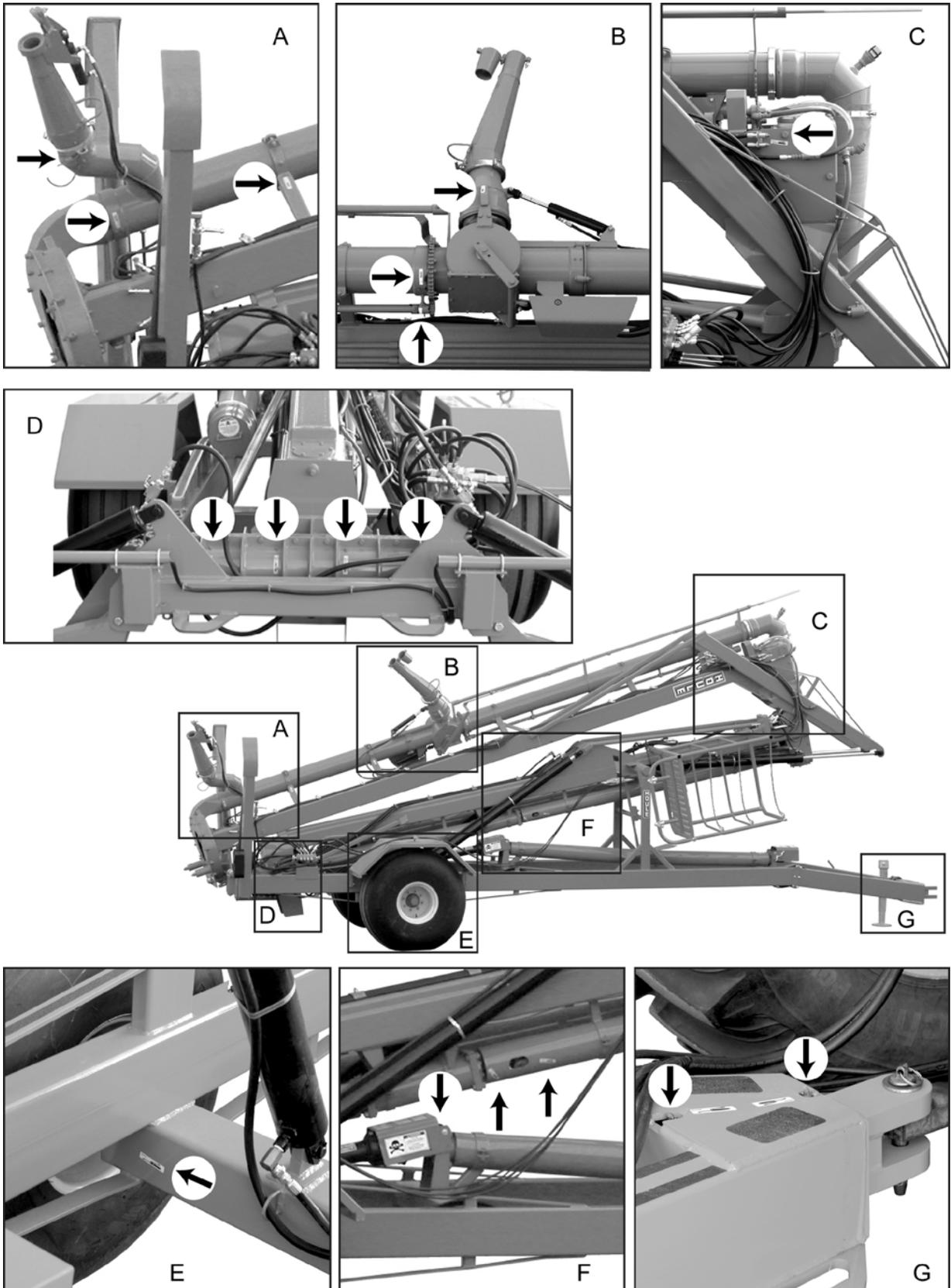
- Grease joints of the driveline;



- Grease all parts labeled with.



Grease points



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 articulation and 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

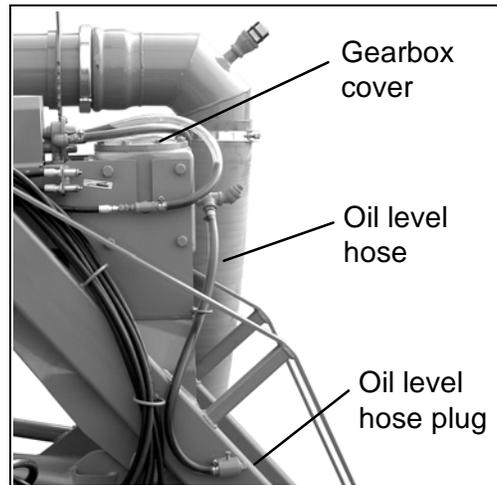
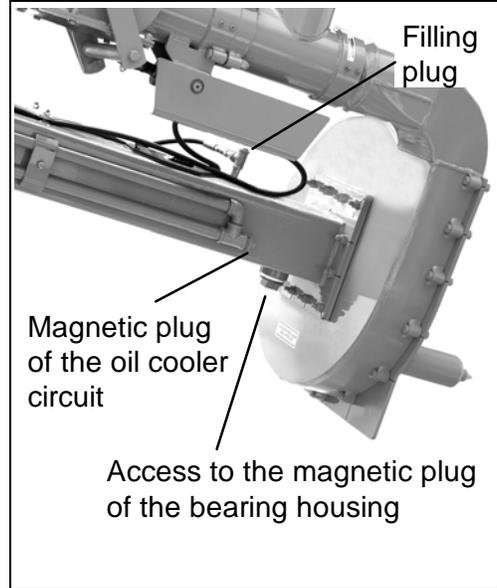
- Grease the rotation pivots of the agitation nozzle;
- Grease the directional valve.
- Change the oil of in both internal and external members.

**Note!**

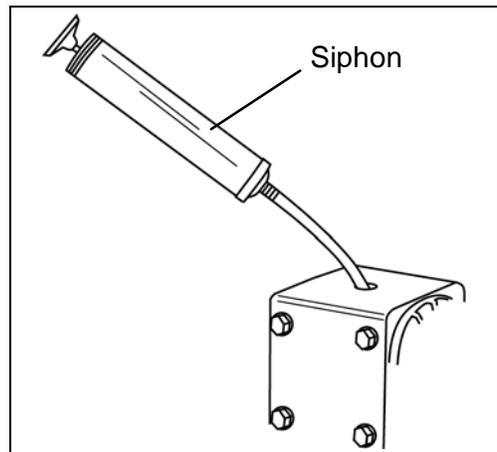
Use gearbox oil SAE 80W90.

To change the oil of the internal member:

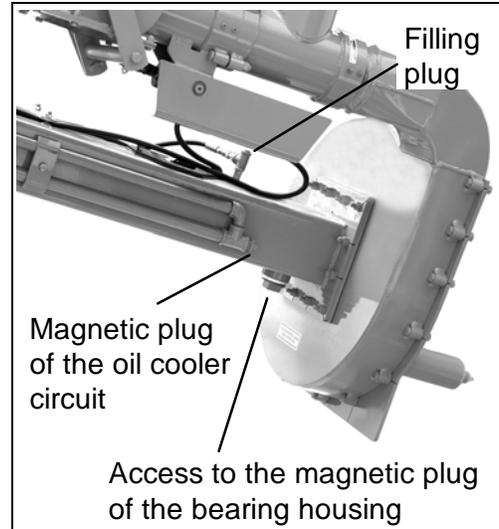
- Remove the magnetic plug located at the bottom of the oil cooler pipes.
- Collect the used oil in an appropriate container with a minimum capacity of **8 gal. [30 liters]**
- Unscrew the access cap to the bearing housing located underneath the pump.
- Unscrew the bearing housing magnetic cap
- Remove 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 top gearbox cover and remove the hose plug to drain the oil.



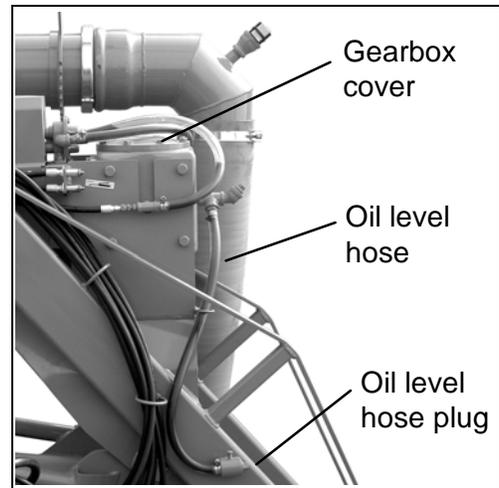
- Use a siphon to complete the drainage of the gearbox;



- Clean and reinstall the magnetic plug and the bearing housing access plug.
- Through the plug hole, pour the oil in the bearing housing and fill.
- Replace the filling plug.



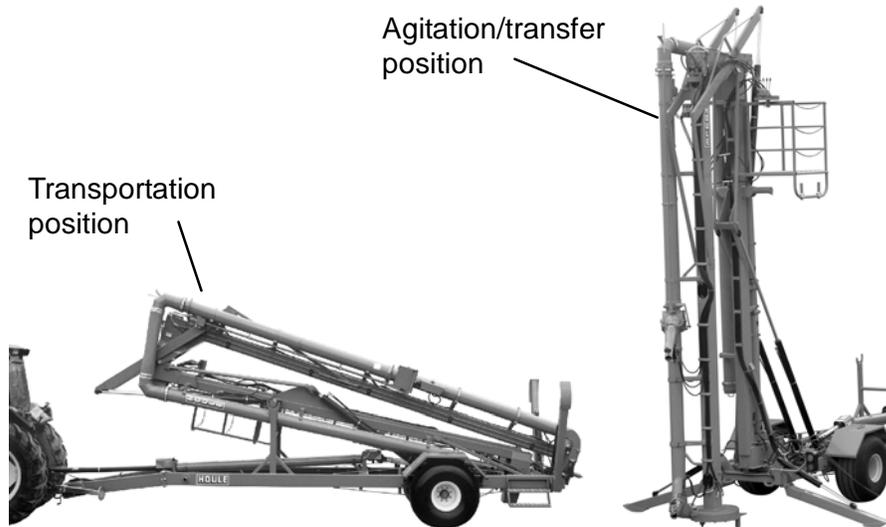
- Reinstall the hose plug of the transparent oil gauge hose.
- Fill the upper gearbox with oil through the opening and reinstall the gearbox cover tightening the bolts alternately to;
55 in-lbs [6.2 Nm]





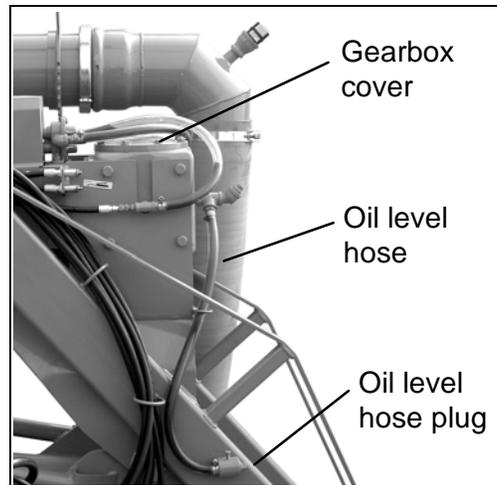
Attention!

After an oil change, articulate the pump in the agitation/transfer position to install the PTO drivelines. Run the pump for 1 minute only, then turn off the pump. Remove the PTO drivelines and articulate the pump in the transportation position.



Refer to the Operation section for instructions on how to articulate the pump.

- Make sure the transparent hose showing the oil level is full.
- Add oil if necessary.

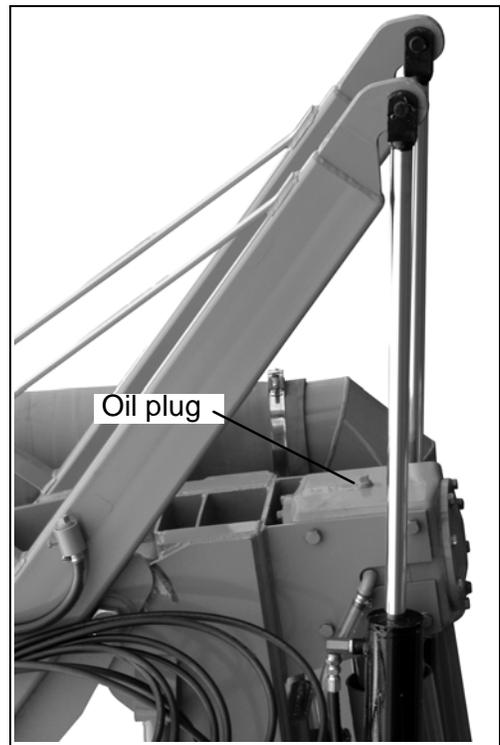
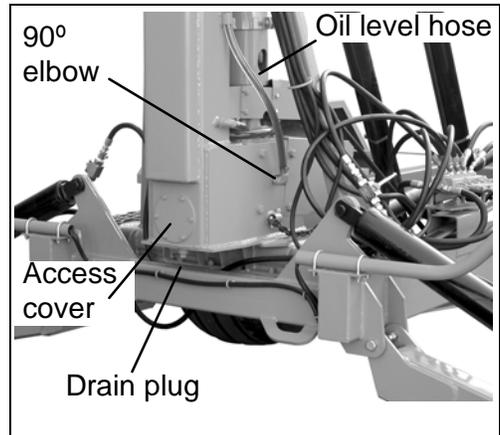


Attention!

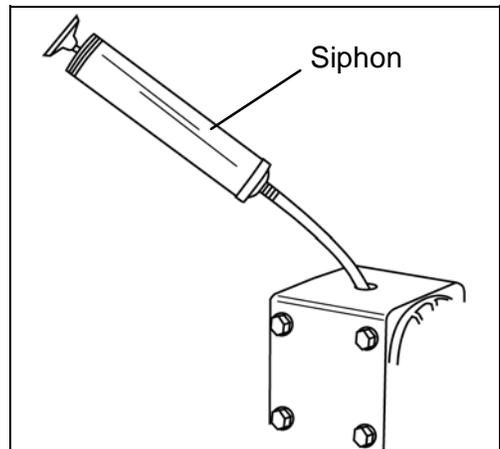
Wipe out any oil spill. Safely dispose of used oil by following local and/or state regulations concerning the proper handling of dangerous goods.

To change the oil of the external member:

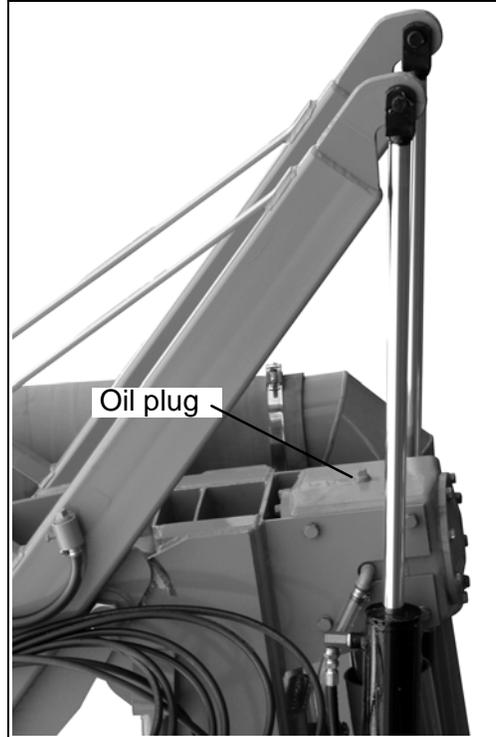
- Remove the drain plug located at the base of the external member.
- Collect the used oil in an appropriate container with a minimum capacity of **8 gal. [30 liters]**
- Remove the access cover to the rear of the external member and clean the inside of the tube.
- Disconnect the oil hose and unscrew the 90° elbow on the side of the lower gearbox.
- Unscrew the plug located on the top of the upper gearbox.



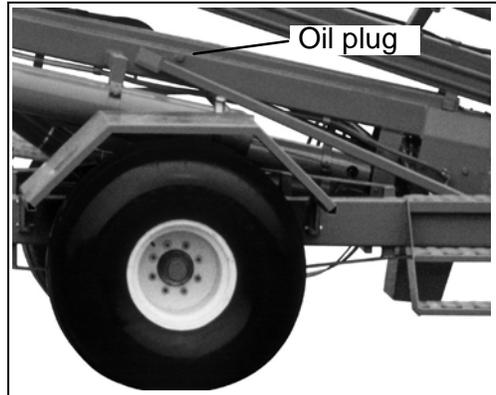
- Use a siphon to completely drain both gearboxes.



-
- Reinstall the 90° elbow on the lower gearbox and reconnect the hose;
 - Pour gearbox oil through the hole located on the upper gearbox. Approximately;
2 gal. [8 liters] SAE 80W90



- Remove the oil plug located at the the bottom of the external member.
- Pour gearbox oil through the hole.
6 gal. [24 liters] SAE 80W90
- Reinstall the plug.



- Reinstall the upper gearbox oil plug.



Attention!

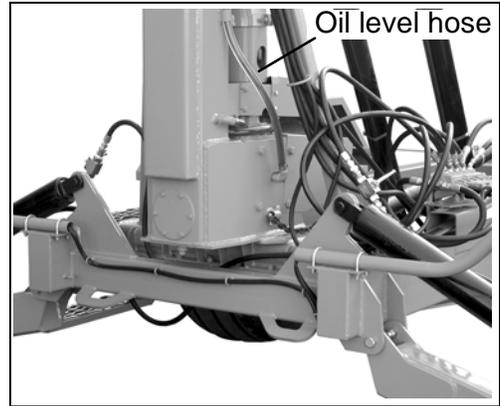
After an oil change, run the pump until the oil of the pump fills the upper gearbox.

Turn off the pump and verify the oil level inside the external member. Refill when needed.

Checking the oil level of the external member:

Make sure the transparent hose showing the oil level is full.

Add oil if necessary (SAE 80W90 gear oil).



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

- 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;



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



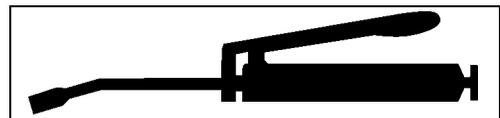
Attention!

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 11.2 Label position

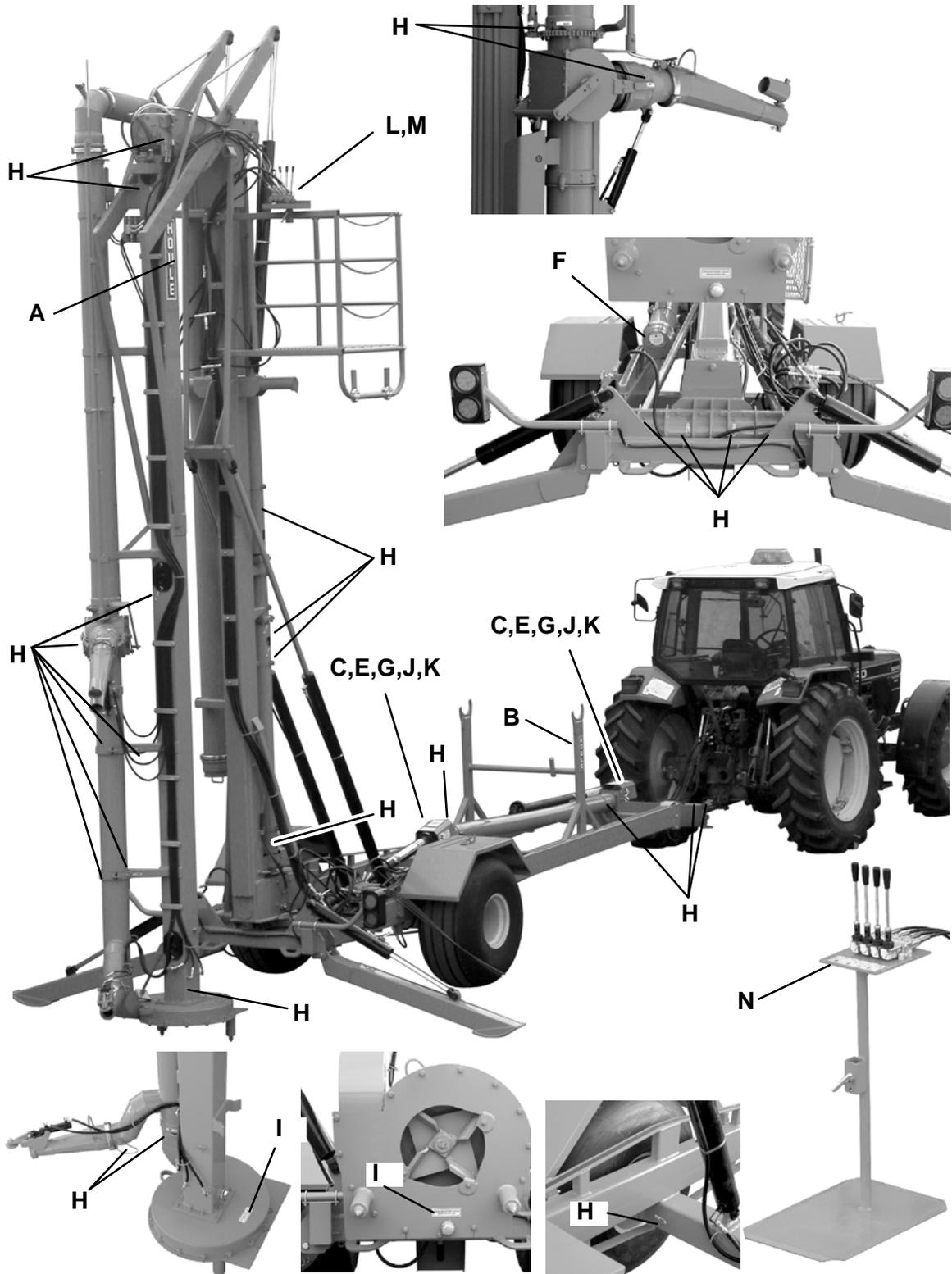
-
- To prevent corrosion, spread a film of oil on all moving parts.

10.4 Final decommissioning/disposal

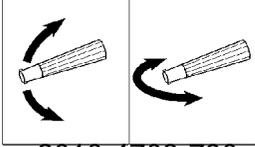
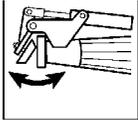
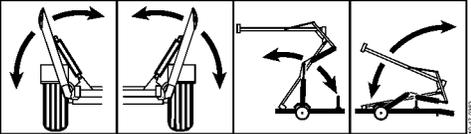
After final decommissioning, handle all components properly and dispose of them in accordance with valid local regulations on waste disposal and utilization.

11 Appendix

11.1 Label position



	American	European
A	 <p>2010-4700-400</p>	
B	 <p>2019-4703-660</p>	
C	 <div data-bbox="711 575 857 693"> <p>⚠ DANGER</p> <p>TOXIC GASES</p> <p>WAHURE PRODUSES TOXIC GASES THAT MAY CAUSE LOSS OF CONSCIOUSNESS, ASPHYXIA OR DEATH IN FEW SECONDS.</p> <p>GAZ TOXIQUES</p> <p>IL Y A UN RISK D'INHALATION DE GAZ TOXIQUES QUI PEUT PROVOQUER LA PERTE DE CONSCIENCE, L'ASPHYXIE, L'AVORTIF ET LA MORT EN QUELQUES SECONDES.</p> </div> <p>2099-4720-010</p>	
D		 <p>DANGER ! KEEP ALL ARTICULATED COMPONENTS AWAY FROM ELECTRIC POWER LINES</p> <p>2099-4725-070</p>
E	 <div data-bbox="711 911 857 1024"> <p>⚠ DANGER</p> <p>ROTATING DRIVELINE. KEEP AWAY!</p> <p>ARBRE DE COMMANDE ROTATIF. GARDEZ VOS DISTANCES!</p> </div> <p>2099-4720-020</p>	
F	 <p>⚠ DANGER</p> <p>HIGH PRESSURE  HAUTE PRESSION</p> <p>BEFORE REMOVING THIS CAP, STOP THE PUMP, ACTIVATE DIRECTIONAL VALVE CYLINDER A FEW TIMES IN ORDER TO RELIEVE PRESSURE FROM THE DISCHARGE PIPE.</p> <p>AVANT D'ENLEVER CE Bouchon, ARRETEZ LA POMPE, ACTIONNEZ LA VALVE DIRECTIONNELLE A QUELQUES REPRESSES POUR PRESSURISER LE TUYAU D'EVACUATION.</p> <p>2099-4720-070</p>	 <p>DANGER !</p> <p>HIGH PRESSURE  HAUTE PRESSION</p> <p>BEFORE REMOVING THIS CAP, STOP THE PUMP, ACTIVATE DIRECTIONAL VALVE CYLINDER A FEW TIMES IN ORDER TO RELIEVE PRESSURE FROM THE DISCHARGE PIPE.</p> <p>AVANT D'ENLEVER CE Bouchon, ARRETEZ LA POMPE, ACTIONNEZ LA VALVE DIRECTIONNELLE A QUELQUES REPRESSES POUR PRESSURISER LE TUYAU D'EVACUATION.</p> <p>2099-4725-090</p>
G	<div data-bbox="639 1352 802 1583"> <p>⚠ WARNING</p> <ul style="list-style-type: none"> ALWAYS STOP THE EQUIPMENT BEFORE SERVICING ANY PARTS. ALWAYS WEAR PROTECTIVE EQUIPMENT. KEEP OFF THE MACHINE WHEN THE PUMP IS RUNNING. KEEP YOUR FEET AND TOES AWAY FROM THE PUMP. WANT TO BE EXPOSED TO CLEANING FLUIDS INTO YOUR EYES, STOP THE EQUIPMENT. KEEP OFF THE MACHINE WHEN THE PUMP IS RUNNING. <p>⚠ AVERTISSEMENT</p> <ul style="list-style-type: none"> ARRÊTEZ TOUJOURS L'ÉQUIPEMENT AVANT DE RÉPARER N'IMPORTE QUEL COMPOSANT. PORTER TOUJOURS UN ÉQUIPEMENT DE PROTECTION PERSONNELLE. ÉLOIGNER LES PIEDS ET LES TOES DE LA POMPE QUAND ELLE FONCTIONNE. NE PAS SE TENIR SUR LA MACHINE QUAND LA POMPE EST EN MARCHÉ. ÉLOIGNER LES PIEDS ET LES TOES DE LA POMPE QUAND ELLE FONCTIONNE. ÉLOIGNER LES PIEDS ET LES TOES DE LA POMPE QUAND ELLE FONCTIONNE. </div> <p>2099-4721-020</p>	 <p>ALWAYS STOP THE EQUIPMENT BEFORE SERVICE AND MAINTENANCE</p>  <p>READ THE OPERATOR'S MANUAL FOR SAFETY INFORMATION AND FOR OPERATING, SERVICING AND MAINTENANCE INSTRUCTIONS</p> <p>2099-4725-110</p>
H	 <p>2003-4701-240</p>	

	American	European
I	<div style="border: 1px solid black; padding: 5px; text-align: center;"> VIDANGER APRÈS USAGE DRAIN AFTER USE </div> <p style="text-align: center;">2010-4701-590</p>	
J	<div style="border: 1px solid black; padding: 5px; text-align: center;"> 540 rpm </div> <p style="text-align: center;">2010-4703-430</p>	
K	<div style="border: 1px solid black; padding: 5px; text-align: center;"> 1000 rpm </div> <p style="text-align: center;">2010-4703-440</p>	
L	 <p style="text-align: center;">2010-4703-790</p>	
M	 <p style="text-align: center;">2010-4703-381</p>	
N	 <p style="text-align: center;">2010-4703-380</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

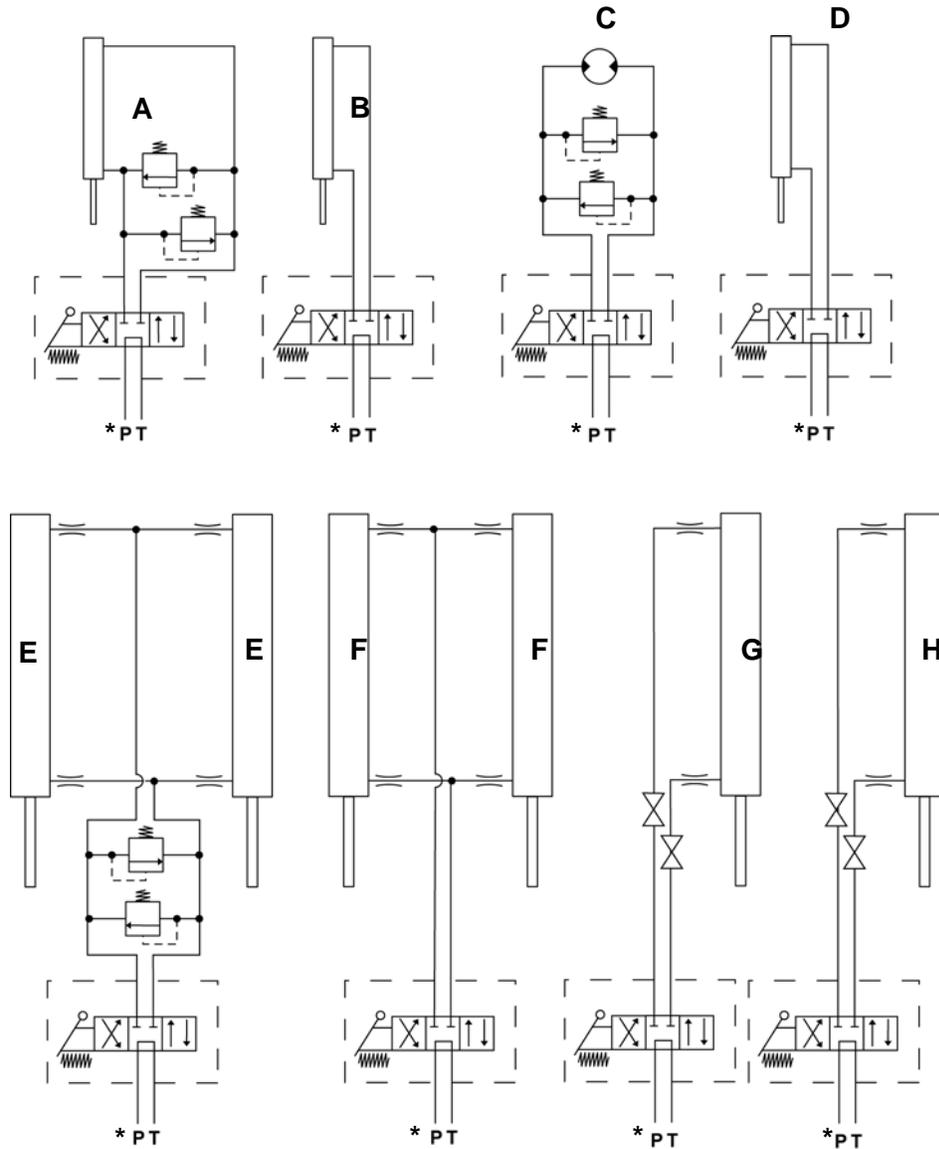
11.3 Hydraulic diagrams

Hydraulic control



Note!

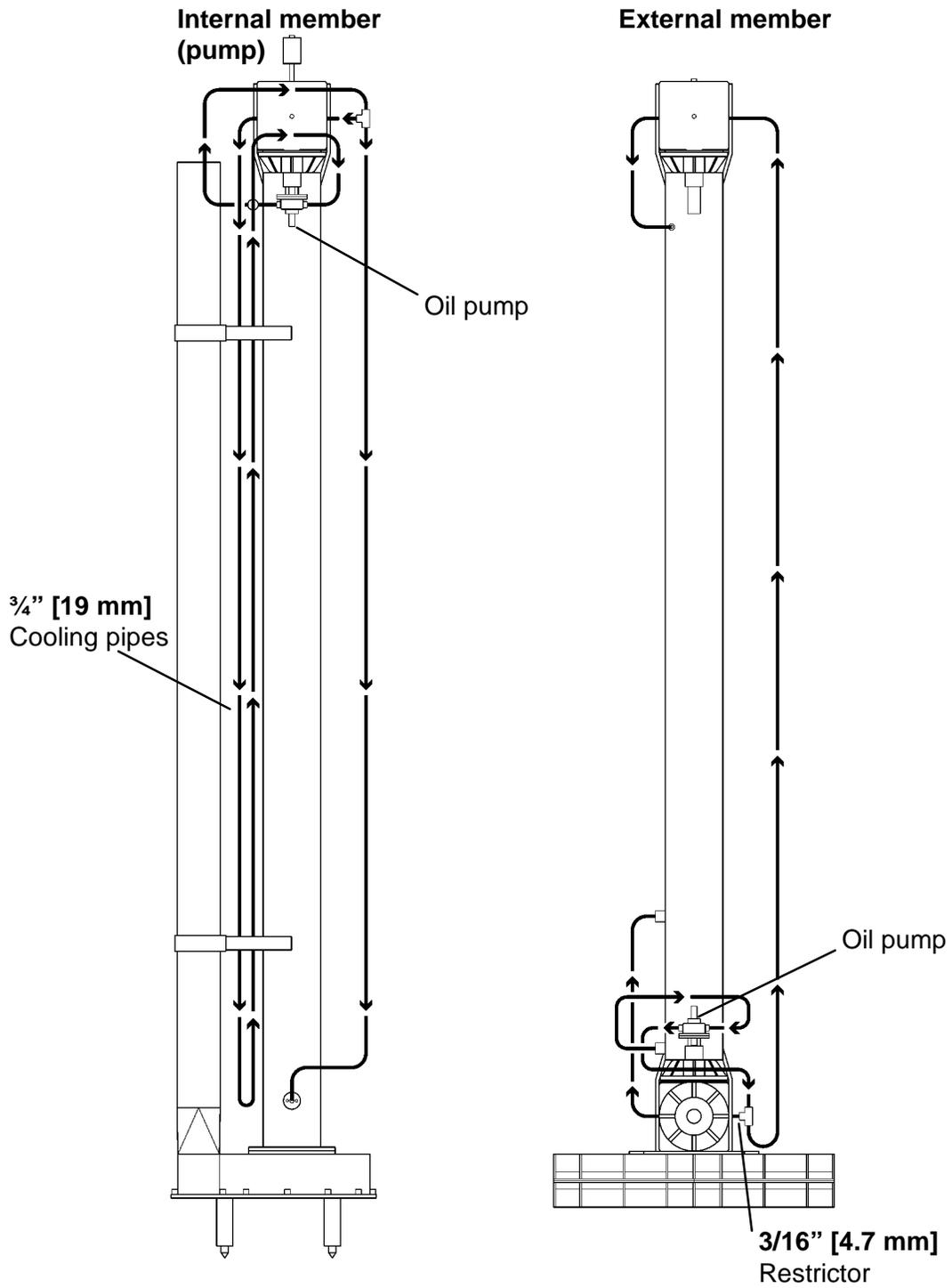
The diagram illustrates all hydraulic controls available on the pump. The dashed frame shows a component equipped with a control lever.



* 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	Articulation cylinder	F	Tilting cylinder
G	Left stabilizing leg cylinder	H	Right stabilizing leg cylinder

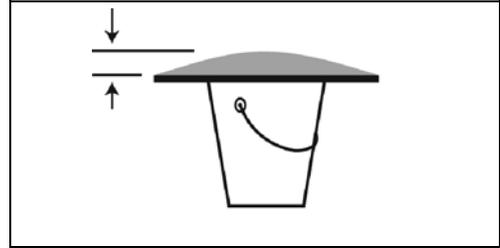
Cooling system



11.4 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)

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