



GEA Farm Technologies

Trailer Agi-Pompe® For 20 feet above ground tank PTO pumps

**Instruction Manual / Installation Instructions
(Original instructions)**

**2010-9015-010
05-2012**

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1 Preface

1.1 Information on the Instructions

The manufacturer reserves the right to make changes in the data due to technical developments and to the illustrations provided 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 terminology are explained in detail in Section: Appendix.

This manual is supplied with the product.

- This manual should be kept close at hand and remain with the equipment even when the equipment is sold.
- This manual is not subject to an amendment service. The most recent version can be obtained through the authorized dealer or directly from the manufacturer.

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.



This symbol indicates another document or Section to refer to.

All manuals have a reference number. The 4 middle digits specify the language of the instruction manual:

	Language		Language		Language
-9000-	German	-9013-	Dutch	-9032-	Serbian
-9001-	English (Great Britain)	-9015-	English (America)	-9034-	Slovakian
-9002-	French (France)	-9016-	Polish	-9035-	Chinese
-9003-	Italian	-9018-	Japanese	-9038-	Portuguese (Brazil)
-9004-	Romanian	-9021-	Danish	-9036-	Lithuanian
-9005-	Spanish	-9022-	Hungarian	-9039-	French (Canada)
-9007-	Swedish	-9023-	Czech	-9040-	Latvian
-9008-	Norwegian	-9024-	Finnish	-9041-	Estonian
-9009-	Russian	-9025-	Croatian	-9043-	Spanish (North America)
-9010-	Greek	-9027-	Bulgarian		
-9012-	Turkish	-9029-	Slovene		
Not all of the above languages may be available.					

1.2 Manufacturer's Address

GEA Farm Technologies Canada Inc. / Division GEA Houle Inc.
4591 boul. St-Joseph
Drummondville, Qc, J2A 0C6

 +1 819 477 - 7444

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 geahoule@gea.com

 www.gea-farmtechnologies.com

1.3 Customer service

Authorized Technical Dealer

If necessary, please contact your nearest authorized technical dealer.

There is a comprehensive dealer Internet search function on our website at the following address:

- www.gea-farmtechnologies.com

European Contact Information:

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Siemensstraße 25-27
D-59199 Bönen

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 contact@gea.com

 www.gea-farmtechnologies.com

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GEA Farm Technologies, Inc.
1880 Country Farm Dr.
Naperville, IL 60563

 +1 630 369 - 8100

 +1 630 369 - 9875

 contact_us@gea.com

 www.gea-farmtechnologies.com

1.4 Declaration of conformity

Declaration of conformity in accordance with the machinery directive:
2006/42/EC - Anhang: II A

Manufacturer:	GEA Farm Technologies Canada Inc. / Division GEA Houle Inc. 4591 boul. St-Joseph Drummondville, Qc, J2A 0C6
Product description:	PTO Pumps
Name / Model:	Trailer Agi-Pompe for 20 feet above ground tank
The named product is in conformity with the requirements of the following European directives: 2006/42/EC Machinery Directive	
Conformity with the requirements of these directives is testified by complete adherence to the following standards:	
<ul style="list-style-type: none"> • Harmonized European standards <ul style="list-style-type: none"> EN 349 (2009-01) Minimum distances to prevent pinching parts of the body EN 809 (2009-06) Pumps and pump units for fluids - general safety requirements EN 894 (2010-11) Safety of machinery - Ergonomics requirements for the design of displays and control actuators EN 953 (2009-07) Safety of machinery Guards EN 1037 (2008-11) Safety of machinery Avoidance of unexpected start-up EN 4254-1 (2010-01) Agricultural Machinery - safety General requirements EN 5674 (2006-11) Tractors and machinery for agricultural and forestry - Guards for power take-off (PTO) drive shafts - Wear and strength tests EN 12100-1 (2009-10) Machine safety, basic terms, general design guidelines. Part 1: Basic terminology, methods EN 12100-2 (2009-10) Machine safety, basic terms, general design guidelines. Part 2: Technical guidelines and specifications EN 12162 (2010-05) Liquid pumps - Safety requirements - Procedure for hydrostatic testing EN ISO 13857 (2008-06) Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs EN ISO 14121-1 (2007-12) Safety of machinery - Risk assessment - Part 1: Principles EN ISO 14121-2 (2007-12) Safety of machinery - Risk assessment - Part 2: Practical guidance and examples of methods NF X 08-003-1 (2006-07) Graphic and pictographic symbols - colors and safety signs 	
Person responsible for compiling the relevant technical documents:	Josef Schröer GEA Farm Technologies GmbH Siemensstraße 25-27 D-59199 Bönen ☎ +49 (0) 2383 / 93-70
Drummondville, 01.08.2009	 Yann Desrochers (Head of Research and Development)
The undersigned is acting by virtue of power of attorney from the management of: GEA Farm Technologies Canada Inc. / Division GEA Houle Inc., 4591 boul. St-Joseph, Drummondville, Qc, J2A 0C6	
This declaration certifies compliance with the guidelines indicated, but does not establish any guarantee in the sense of paragraphs 443, 444 of the BGB. This declaration of conformity becomes invalid if design changes are made which affect the technical data given in the instructions and the correct use of the product, thereby significantly altering the machine!	

1.5 GEA Farm Technologies Canada Inc. / Division GEA Houle - General Equipment Warranty



Important notice!

THIS GENERAL WARRANTY APPLIES TO ALL EQUIPMENT SOLD UNDER THE GEA HOULE TRADEMARK.

1.5.1 Limited Warranty

GEA Farm Technologies Canada Inc. / Division GEA Houle (hereinafter referred to as "the Company") warrants to the original buyer and end user (hereinafter referred to as the "Purchaser") that the parts of all equipment sold under the Company trademark are free from defects in material or workmanship for a period of twelve (12) months from the date of delivery of the equipment to the Purchaser. This written warranty takes precedence over any other written warranty included in previous versions of the Company's manuals. Any equipment used for commercial usage, commercial lease on one or more farms is warranted for a reduced period of thirty (30) days only.

Components from third-party manufacturers that are not built by the Company, and which are accessory to the equipment sold under the Company trademark (including, without limitation, the motors and tires), are subject to such third-party manufacturers' specific warranty coverage.

THIS WARRANTY EXTENDS ONLY TO THE PURCHASER AND DOES NOT APPLY IN THE EVENT THAT THE EQUIPMENT IS SOLD OR OTHERWISE TRANSFERRED.

1.5.2 Condition of the Limited Warranty

The Company, through its GEA authorized dealers only (hereinafter referred to as "Authorized Dealer", reserves the right to either repair or replace all parts deemed defective under the following conditions:

1. That the equipment is installed, operated and maintained in accordance with the Company directives;
2. That the Purchaser uses the equipment in accordance with specific instructions, under normal conditions, for the sole purpose for which the equipment was designed;
3. That the Purchaser notifies in writing his Authorized Dealer or the Company (whichever the case may be) of any defect of the equipment. In either case the notification must be made within the twelve (12) months following the date of the delivery to the Purchaser;
4. The Purchaser or the Authorized Dealer must keep the defective parts or equipment for inspection by the Company and return such defective parts or equipment prepaid to the Company, if requested;
5. That the Purchaser does not modify the equipment, nor attempts to repair any equipment or parts without proper authorization from the Company;
6. Depending on the nature of the equipment involved and whether it is fixed or transportable, the Company will repair or replace the defective parts of the equipment free of charge where installed, or at the business place of the Authorized Dealer or the Company, at its sole discretion.

1.5.3 Extent of Limited Warranty

This limited warranty DOES NOT cover:

- Defects caused by negligence of the Purchaser in the maintenance of the equipment, improper use resulting from failure to adhere strictly to the Company's manuals or non-compliance with prescribed maintenance instructions provided by the Company (including, without limitation, lack of lubrication of the equipment), as well as damages arising from non-conforming installation of the equipment, or ambient temperature or conditions of storage of the equipment that do not comply with the Company's recommendations (including, without limitation, any damages resulting from storage or operation of the equipment at a temperature equal or below (5°C/41°F));
- Damages to equipment due to normal wear and tear or to external causes, including issues of power or inadequate electrical conditions (including, without limitation, inadequate tension (neutral/ground), abnormal mechanical or environmental conditions (including, without limitation, damages caused by fire, lightning, flood or other natural disaster), damages caused by the use of sand litter or other abrasive or inadequate material (including, without limitation, damages caused by solids in the manure, such as stone, wood, iron, concrete, and strings), as well as damages caused by ice or frozen manure blocking the evacuation line of the equipment or the introduction of such solids in the equipment;
- Freight and shipping associated with repair or replacement of equipment under this limited warranty, as well as all costs relating to removal or replacement of any equipment that is welded or affixed permanently to the ground or a building (including, without limitation, labour costs, and costs related to concrete or excavation);
- Claims arising from repairs or replacements made by the Purchaser without the prior written consent of the Company. The Purchaser shall not remove or alter any safety device, guard, or warning sign.

If the Purchaser fails to comply with any of its obligations referred to in this paragraph, the Purchaser agrees to save the Company and the Authorized Dealer harmless in respect of any liability or obligation incurred by the Company or the Authorized Dealer resulting from such failure of the Purchaser.

1.5.4 Warranty Limitations and Exclusion

NO WARRANTY, ORAL OR WRITTEN, EXPRESS OR IMPLIED, OTHER THAN THE ABOVE WARRANTY IS PROVIDED IN RESPECT OF THE EQUIPMENT SOLD.

Some states (or jurisdictions) do not allow the exclusion of implied warranties so it is possible that this limitation may not apply.

THE COMPANY DISCLAIMS ALL IMPLIED WARRANTIES, INCLUDING THE WARRANTIES OF MERCHANTABILITY, ADAPTABILITY OR OF PERFORMANCE, PROVIDED THAT SUCH EXCLUSION OF LIABILITY COMPLIES WITH THE LAWS HAVING APPLICABLE REGULATORY JURISDICTION.

THE LIABILITY OF THE COMPANY AND ITS AUTHORIZED DEALERS UNDER THIS WARRANTY IS LIMITED TO REPAIR OR REPLACEMENT OF DEFECTIVE PARTS UP TO THE CONTRACT VALUE FOR THE PURCHASED EQUIPMENT. IN NO EVENT SHALL THE COMPANY BE LIABLE FOR ANY SPECIAL, INDIRECT, CONSEQUENTIAL, INCIDENTAL, PUNITIVE OR EXEMPLARY DAMAGES IN ANY KIND OR CHARACTER, INCLUDING INDIRECT COSTS, LOSS OF PRODUCTION, LOSS OF REVENUES OR PROFITS, AND OTHER DISBURSEMENTS WHICH MAY OCCUR.

Some states (or jurisdictions) do not allow the exclusion or limitation of incidental or consequential damages and so it is possible that these limitations or exclusions may not apply.

1.5.5 General Statements

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS THAT VARY BY JURISDICTION.

THE DEALER IS NOT AUTHORIZED TO MAKE ANY ADDITIONAL REPRESENTATIONS OR PROMISES THAT DIFFER IN ANY WAY FROM THE TERM OF THIS LIMITED WARRANTY, OR MODIFY THE PROVISIONS, DURATION AND CONDITIONS OF THIS LIMITED WARRANTY. NO WAIVER OR MODIFICATION OF THIS LIMITED WARRANTY IS VALID UNLESS AGREED TO IN WRITING AND SIGNED BY THE AUTHORIZED REPRESENTATIVES OF THE COMPANY.

IN THE EVENT OF ANY CONFLICT BETWEEN THE ENGLISH LANGUAGE VERSION AND ANY OTHER TRANSLATED VERSION OF THIS LIMITED WARRANTY (WITH THE EXCEPTION OF THE FRENCH LANGUAGE VERSION) THE ENGLISH VERSION SHALL PREVAIL.

2 Safety

2.1 Owner's obligation of care

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

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

In particular, the owner must ensure that

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



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

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

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

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

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

2.2 Explanation of the safety symbols used

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

Safety symbols and signaling word

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

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

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

 **Attention!**
 The indication "Attention" signals important information on risks for the product or the environment.

2.3 Basic safety instructions

**Note!**

There are warnings about specific residual dangers 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

**Note!**

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

2.5 Protective devices

- Protective devices



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! (American model)
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)



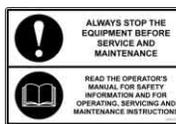
Danger! (European model)
Before removing this cap, stop the pump.
Actuate directional valve cylinder a few times in order to relief pressure from the discharge pipe.
(part no. 2099-4725-070)



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



Warning! (American model)
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! (European model)
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
2010-4703-430

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

1000 rpm
2010-4703-440

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



Grease point
(part no. 2099-4701-240)

3 Description

3.1 Correct applications

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

Trailer Agi-Pompe® for 20 feet above ground tank is exclusively designed for:

- To homogenize and transfer liquid manure containing long bedding and bottom sediments.
 - Maximum consistency for agitation is 1½" [38 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 changes to the product must be approved in writing, by the manufacturer.

Any unauthorized changes to the product will invalidate the warranty.

3.3 Design of the equipment

Design

The Trailer Agi-Pompe® 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.
- hydraulic tilting pivots allowing to pass the vertical pump over an above ground tank wall.
- a propeller which chops fibers in manure.
- an adjustable nozzle 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

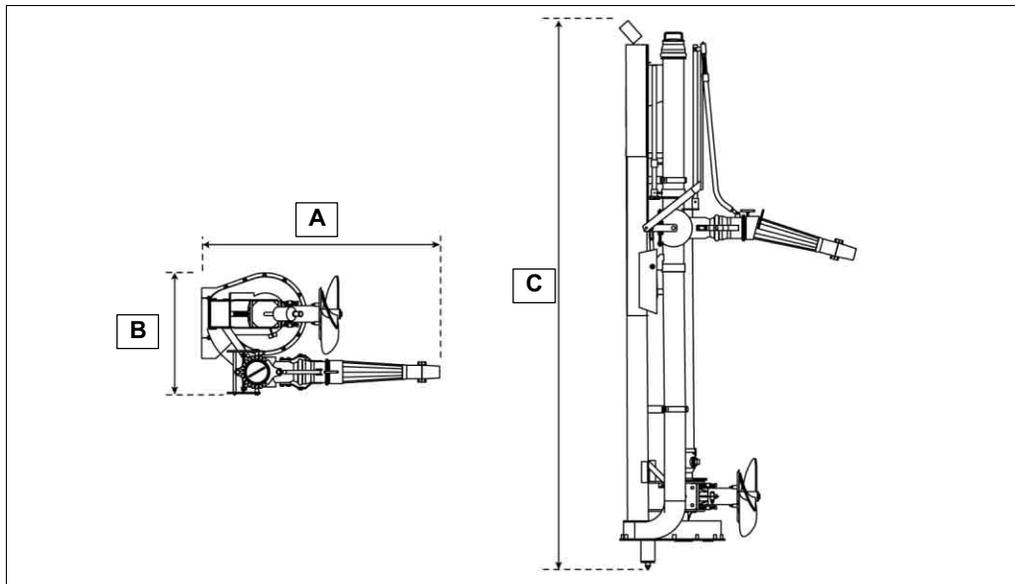
Trailer Agi-Pompe® for 20 feet above ground tank

- 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, chop and transfer manure from an above ground manure tank.
- The pump has a directional propeller which chops fibers in 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

3.5.1 Geometric Data

Pump Dimensions



Legend:		
A	Length	68"
B	Width	35"
C	Height	From 8' to 18'

Trailer Agi-Pompe®	
Impeller Diameter	20" (51 cm)
Weight	7500 lb (3350 kg)
Operating Temperature	5°C (41°F) minimum

3.5.2 Performance Data



Note!

Ratio shown below is for the top gearbox of the pump main frame.
 The ratio of the propeller gearbox is normally -35%.
 The ratio of the 2 gearboxes of the outside member is always 1 to 1.

RPM/ ratio	Horsepower	Nozzle diameter	Nozzle pressure	Shut-off pressure	Maximum head *
540 / 1:1	70	3" [76 mm]	16 psi [1.1 bar]	18 psi [1.2 bar]	29 ft [8.8 m]
540/ +10%	85	3" [76 mm]	20 psi [1.4 bar]	22 psi [1.5 bar]	36 ft [11.0 m]
540/ +26%	105	3" [76 mm]	26 psi [1.8 bar]	28 psi [1.9 bar]	45 ft [13.7 m]
1000/ -35%	125	3" [76 mm]	30 psi [2.1 bar]	33 psi [2.3 bar]	53 ft [16.2 m]
1000/ -26%	140	3" [76 mm]	35 psi [2.4 bar]	38 psi [2.6 bar]	61 ft [18.6 m]

* Maximum pumping head permitted.

3.5.3 Acoustic Emission

Noise Level	80 dBA
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3.5.4 Hydraulic Hoses

I.D.	¼"	½"	¾"
O.D.	0.58"	0.86"	1.10"
Quantity of braids	2	2	2
Service pressure	400 bar (5,800 psi)	276 bar (4,000 psi)	105 bar (3,000 psi)

3.5.5 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

3.5.6 Bolt Torque Chart

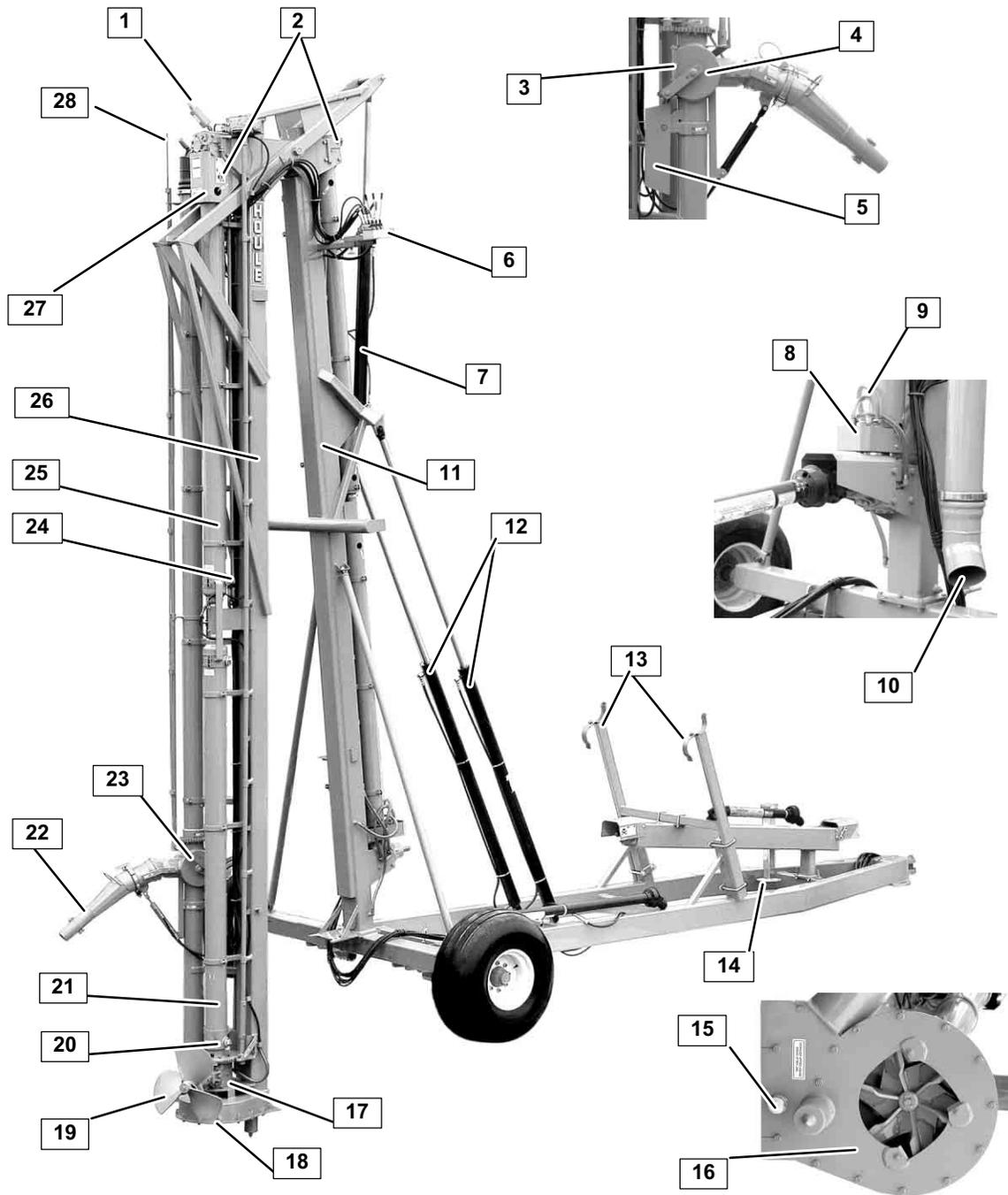


NOTE!

Refer to the bolt torque chart unless otherwise specified in this manual.

Bolt	Mat.	Bolt Diameter									
		1/4"	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"	3/4"	7/8"	1"
SAE 2 	LCS	8Nm (6ft-lb)	16Nm (12ft-lb)	27Nm (20ft-lb)	44Nm (32ft-lb)	64Nm (47ft-lb)	94Nm (69ft-lb)	130Nm (96ft-lb)	210Nm (155ft-lb)	279Nm (206ft-lb)	420Nm (310ft-lb)
SAE 5 	MCS HT	14Nm (10ft-lb)	26Nm (19ft-lb)	45Nm (33ft-lb)	73Nm (54ft-lb)	106Nm (78ft-lb)	155Nm (114ft-lb)	209Nm (154ft-lb)	349Nm (257ft-lb)	518Nm (382ft-lb)	796Nm (587ft-lb)
SAE 8 	MCAS	19Nm (14ft-lb)	39Nm (29ft-lb)	64Nm (47ft-lb)	106Nm (78ft-lb)	161Nm (119ft-lb)	229Nm (169ft-lb)	312Nm (230ft-lb)	515Nm (380ft-lb)	814Nm (600ft-lb)	949Nm (700ft-lb)
Socket Head Cap Screw	AS HT	22Nm (16ft-lb)	45Nm (33ft-lb)	73Nm (54ft-lb)	114Nm (84ft-lb)	170Nm (125ft-lb)	244Nm (180ft-lb)	339Nm (250ft-lb)	542Nm (400ft-lb)	868Nm (640ft-lb)	1315Nm (970ft-lb)

3.6 Main view



Legend:			
1	Oil Tank	2	Top Gearboxes
3	Cover	4	Directional Valve
5	Directional Valve Cylinder (under the guard)	6	Hydraulic Controls of Agitation Nozzle and Propeller
7	Articulation Cylinder	8	Bottom Gearbox on Outside Member
9	Oil Cooler	10	45° Elbow for Transfer Hose
11	Outside Member	12	Lifting Cylinders
13	Support for Traveling	14	Jack Stand
15	Drain	16	Impeller Housing
17	Bottom Gearbox on Main Frame	18	Knife Kit for Bedding (behind propeller)
19	Agitation Propeller	20	Drain
21	Driveline Guard	22	Agitation Nozzle
23	Directional Valve	24	Drain
25	Driveline Guard	26	Main Frame
27	Oil Cooler (under the guard)	28	Agitation / Loading Indicator Rod (Up = loading; Down = agitation)

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.

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.

Loading and unloading

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

	Description	Purpose
	Forklift truck	To lift accessories
	Crane	To lift components
	Safety chains	To lift components



Danger!

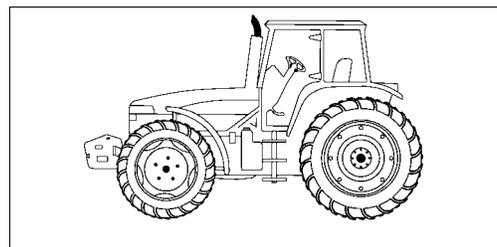
Do not stand underneath suspended loads.

Suspended loads may fall, so there is a danger of death!

Travel (short distances)

The pump must be moved with a farm tractor.

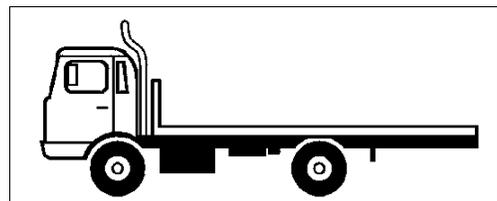
- Minimum towing capacity of;
7,500 lb [3350 kg]
- Maximum speed;
25 mph [40 km/h]



Travel (long distances)

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

- Minimum towing capacity of;
7,500 lb [3350 kg]

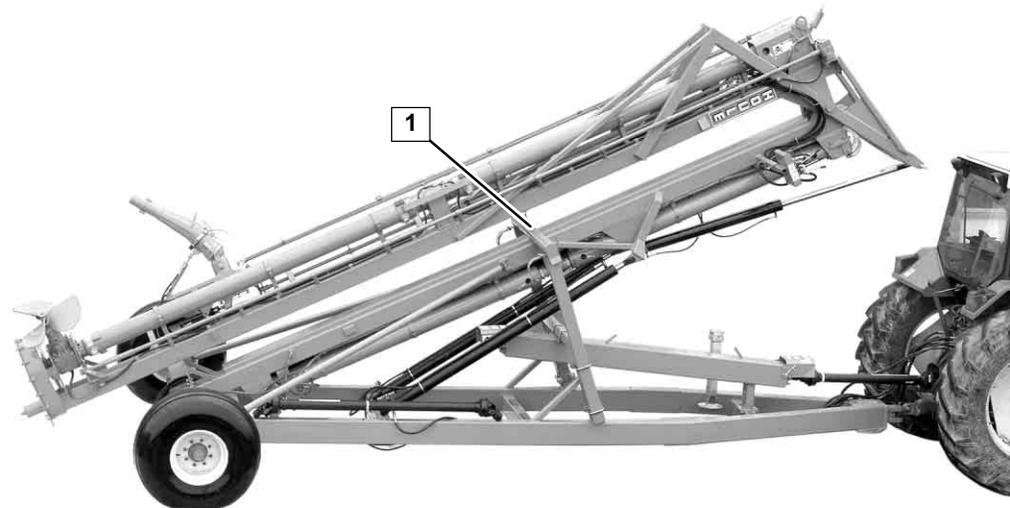


4.4 Transport



Attention! Moving the pump

- Lower the main frame completely and set the outside member (1) on the supports for traveling.



Attention! Moving the pump

- The pump must be moved on a farm tractor with a minimum towing capacity of 7,500 lb [3350 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 or 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.

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;
7,500 lb [3,350 kg].

	Description
	Forklift truck
	Crane
	Safety chains

Local purchased items

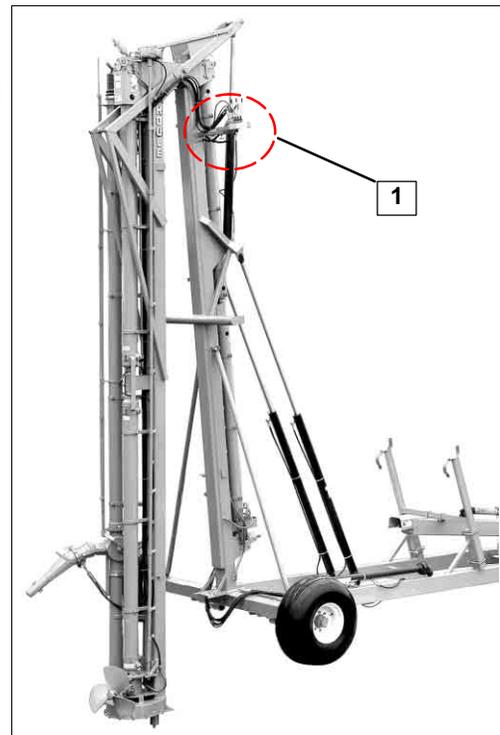
The control levers (1) installed on the upper part of the pump can only be activated when the pump is positioned over the tank wall.

To reach these controls, a balcony (provided by the pit owners) must be fixed on the tank wall.

The balcony must be constructed to meet all local requirements regarding worker safety.

The balcony must be positioned to;

- Enable the operator to safely access the control levers (1) while staying within the confines of the balcony.
- Permit the operator to observe the inside of the tank while staying within the confines of the balcony.



5.4 Environmental prerequisites for setting up



Danger!
Unexpected movement!

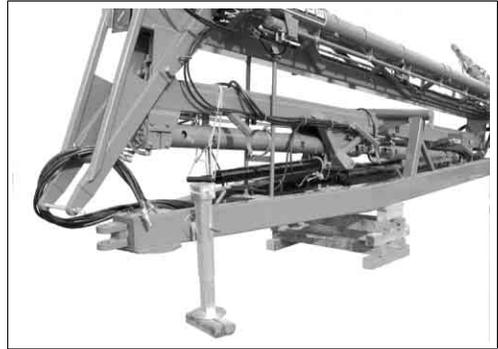
Before assembling the pump, make sure the trailer is on a flat and firm surface and that the rear wheels are blocked.

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.

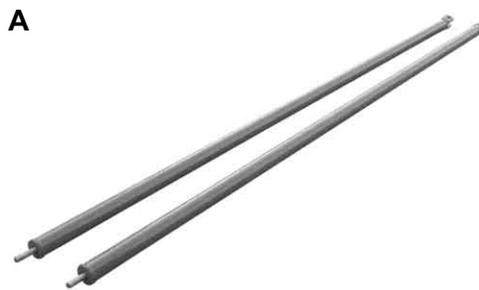
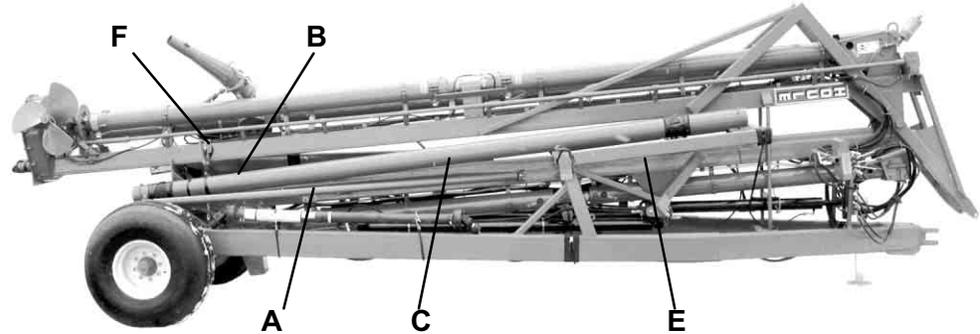
Install wooden blocks underneath to stabilize the front end of the trailer.



5.5 Remove safety devices used during transportation

Shipping position

Remove the parts (A to E) attached to the pump for shipping purposes;
Remove the chain tightener (F) holding the main frame to the trailer;



Lateral reinforcement tubes (2)



8" x 8" [20 cm x 20 cm] tube with drive shaft



6" x 194" [15 cm x 4.93 m] steel discharge pipe



Axle extensions (R and L)



"H" Pump support



Chain tightener

5.6 Pump assembly

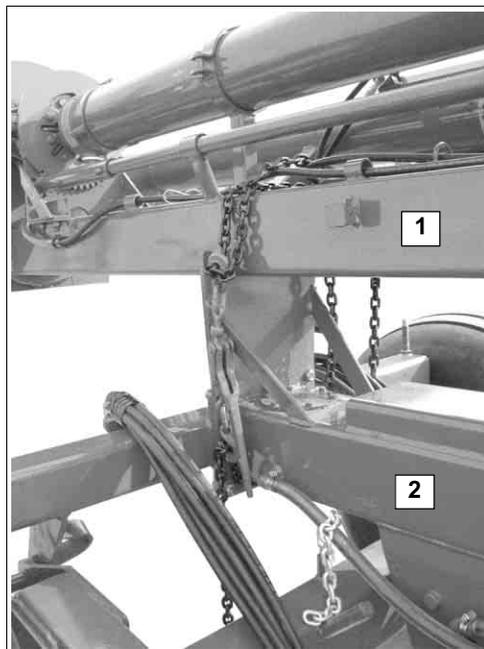
Installation of axle extensions and wheels



Attention!

Make sure to tight wheel nuts to a torque of 122 N/m (90 lbs/foot).

Use a chain to hold together the main frame (1) of the pump and the outside member (2);



Raise the rear end of the trailer high enough so that the tires are off the ground.

Lift with a chain or use a forklift.

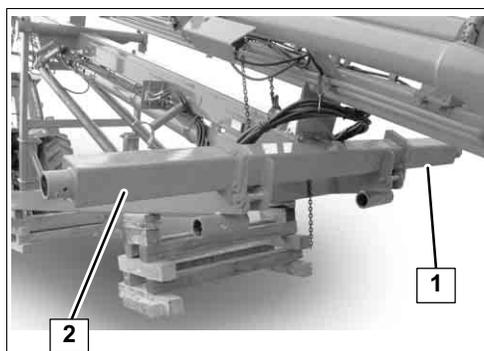


Install wooden blocks under the frame to support and stabilize the rear of the trailer;

Remove wheels from the trailer;

Bolt right (1) and left axle (2) extensions to rear axle;

Install wheels on axle extensions;



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

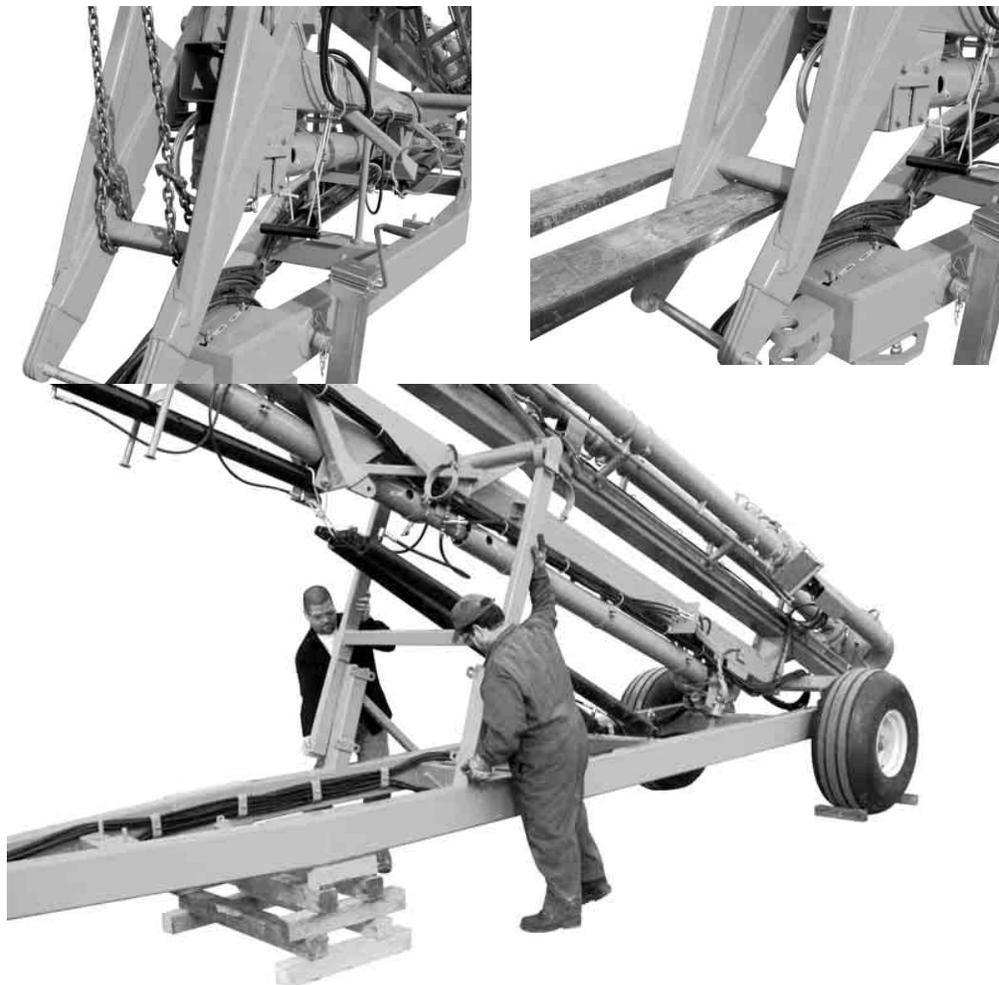
Remove the blocks from underneath the trailer;



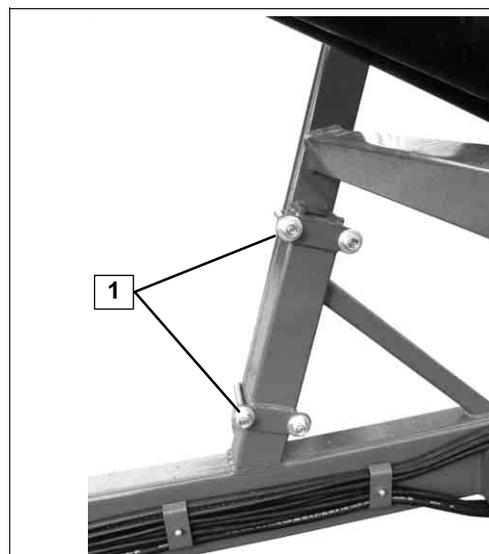
Remove the chain holding together the main frame of the pump and the outside member;

Installation of the "H" support

Raise the front of the outside member and the two lifting cylinders high enough to install the "H" support;
Lift with a chain or use a forklift.

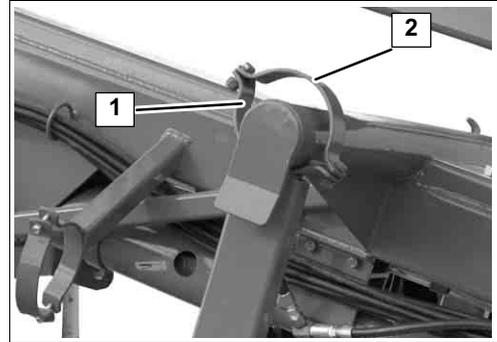


Attach the "H" support to the frame using the 4 U-bolts (1);



Note:

The half-collar brackets (1) must be oriented towards the rear of the trailer;
Lower the outside member on the "H" support and install the safety collars (2);



Installation of lifting cylinders



Attention!

Do not attempt to raise the outside member of the pump by activating the lifting cylinders until the whole pump assembly procedure is completed.



Attention!

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



Attention!

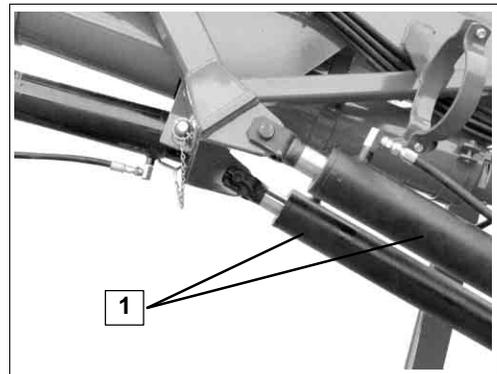
Before installing the lifting cylinders, support the cylinder rods and operate the cylinders a few times (a complete stroke in and out), to purge the air out;



Attention!

Activate the cylinders using the hydraulic controls of the tractor.
Refer to section Operation - Description of the operating elements for easy hydraulic connections.

Attach the two lifting cylinder (1) rods to the outside member of the pump;



Installation of lateral reinforcement tubes

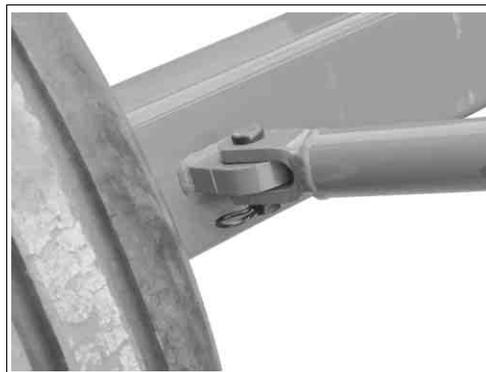
First, install the threaded ends of the tubes to the brackets welded on the outside member;



Then attach the yoke end of the tubes to the rear axle with the pins.

Secure with cotter pins;

To center the pump on the "H" support of the trailer, adjust the nuts of the threaded ends of the tubes;



Installation of articulation cylinder



Attention!

Do not attempt to raise the main frame of the pump by activating the articulation cylinder until the whole pump assembly procedure is completed.

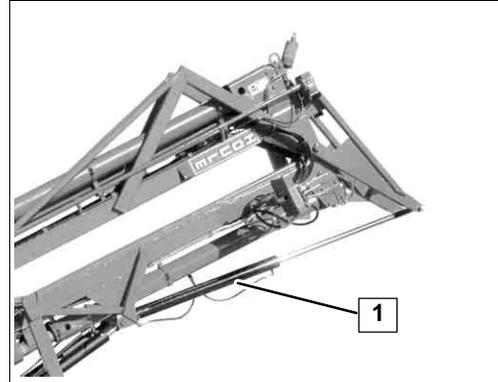
Remove the rope retaining the articulation cylinder (1) and remove the small "H" support used for shipping;

Before installing the articulation cylinder (1), support the cylinder rod and operate the cylinder a few times (a complete stroke in and out), to purge the air out;



Activate the articulation cylinder using the hydraulic controls of the tractor. Refer to Section Operation - Description of the operating elements for easy hydraulic connections.

Attach the end of the cylinder rod to the main frame of the pump;

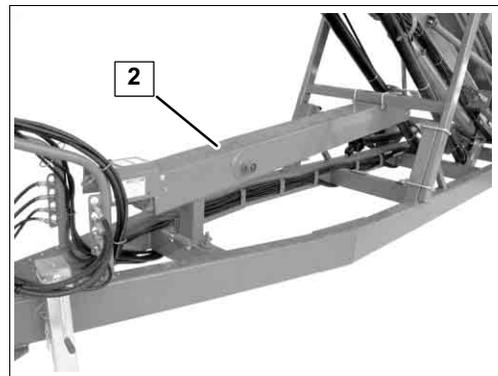


Installation of 8" x 8" [20 cm x 20 cm] tube with drive shaft

Fix the flanged leg of the 8" x 8" [20 cm x 20 cm] tube (2) on the trailer without tightening the bolts;

Attach the tube to the "H" support using the U-bolts;

Center the tube and tighten all bolts;

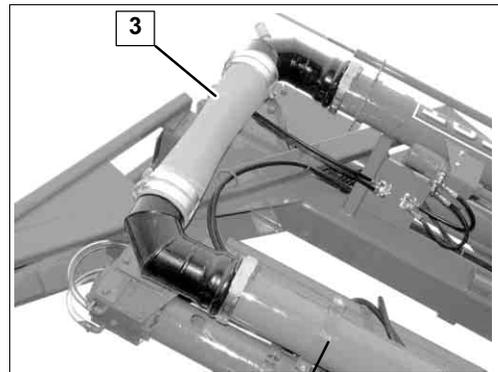


Installation of 6" [15 cm] steel discharge pipe

Attach the 6" x 194" [15 cm x 4.93 m] steel discharge pipe to the outside member of the pump;

Align the end of the discharge pipe with the end of the pipe already attached to the main frame of the pump;

Connect the 180° flexible elbow (3) to the discharge pipe and tighten the 6" [15 cm] circle lock clamp.



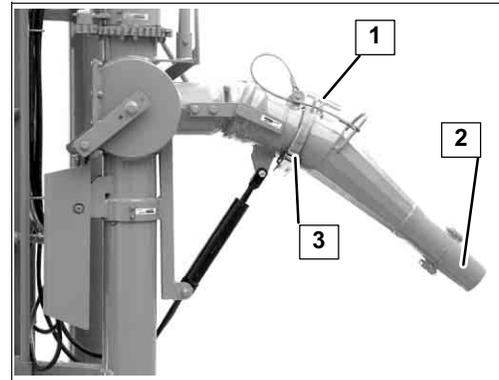
Agitation nozzle

Install the nozzle on the directional valve.

Point the nozzle towards the ground.

Install the circle lock (3) and tighten the safety bolt (1) to secure the nozzle;

If required, install the reducer (2) 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.

5.7 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 must be performed by trained personnel in accordance with the safety instructions.

6.2 Checks before initial commissioning

The dealer must make sure that:

- this product is in perfect working condition and used for the sole purpose for which it was designed. There are no damaged, worn or defective parts. The assembly of the product was completed by following the instructions in the Section: Installation;
- only authorized personnel are permitted in the initial commissioning area;
- unnecessary object or equipment are removed from the initial commissioning area;
- the safety devices such as guards, covers, chains, labels, etc. remain in place to ensure safety;
- lubricants such as grease, oil, etc. are at an appropriate level. To locate the grease points, refer to Section Appendix: Label Position;
- all parts to be connected such as the draw bar, the PTO, the hydraulic and air connector, etc. are secured;
- all bolts are tight. Refer to: Description -Technical Data -Bolt Torque Chart.
- Once the tractor is in place, at the good distance from the pump to respect the extension range of the PTO, apply safety brakes and install wheel chocks to prevent tractor displacement and PTO separation.

6.3 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 propeller 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 propeller out of manure for more than one minute may result in damage.



Refer to the Operation section for proper procedures.

6.4 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.

6.5 Handing over to the owner

Declaration of conformity and CE mark

(only necessary for European Union member states)

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

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

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

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

7 Operation

7.1 Special personnel qualification required for operation

Operation must be performed by trained personnel in accordance with the safety instructions.

7.2 Safety instructions for operation



WARNING!

Keep the safety devices in place.



CAUTION!

No one stands near this product unless they are performing instructions included in this Section.



CAUTION!

Keep body parts and clothing away from moving parts.



CAUTION!

Wear protective boots, eye gear and gloves for all steps included in this Section.



Read the Section: Safety

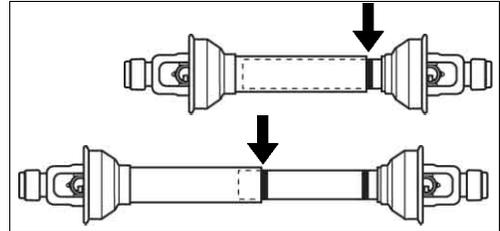
7.3 Checks Before Operation

- Lubricants such as grease, oil, etc. are at an appropriate level. To find the grease points, refer to Section Appendix: Label Position;
- All parts to be connected such as draw bar, PTO, hydraulic and air connectors, etc. are secured;
- All bolts are tight. Refer to Section: Description -Technical Data - Bolt Torque Chart.

PTO driveline

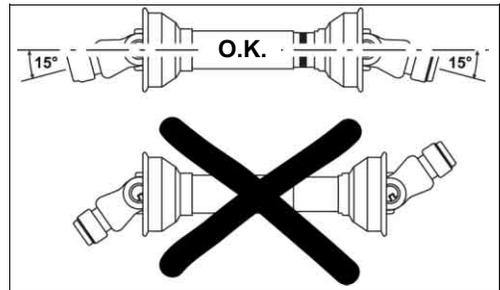
Maximum Extension and Retraction

- 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.

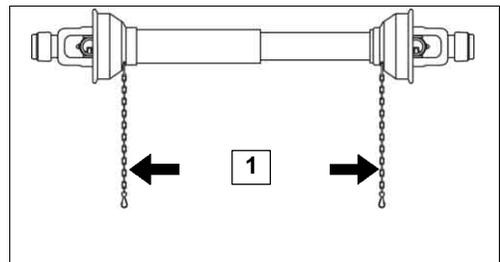


Lubrication

- On universal joints, use a high quality grease formulated specifically for intensive use.

Safety Chains (on European model only)

- Safety chains (1) must be in place at all times to prevent the driveline guards from rotating.
- Make sure that the safety chains (1) do not restrict the movement of the driveline when operating or transporting the equipment.

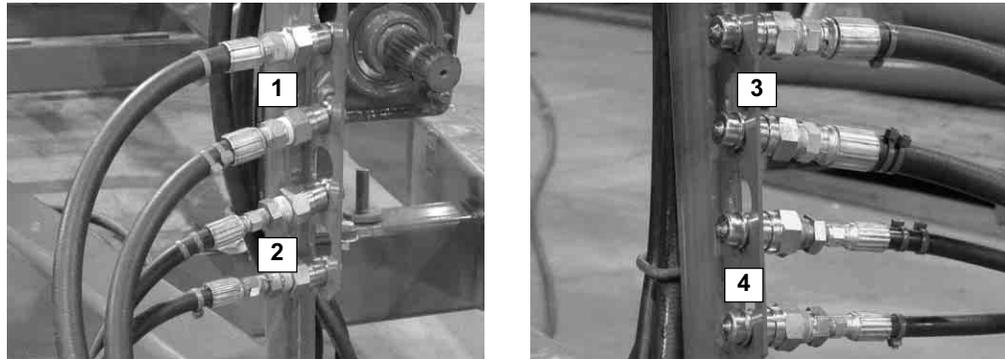


- Never use the safety chains (1) to secure the PTO when disconnected from the tractor.
- Replace any damaged chain.

7.4 Description of the operating elements

7.4.1 Hydraulic connections

The hydraulic hoses that connect to the tractor are color coded for ease of connection.



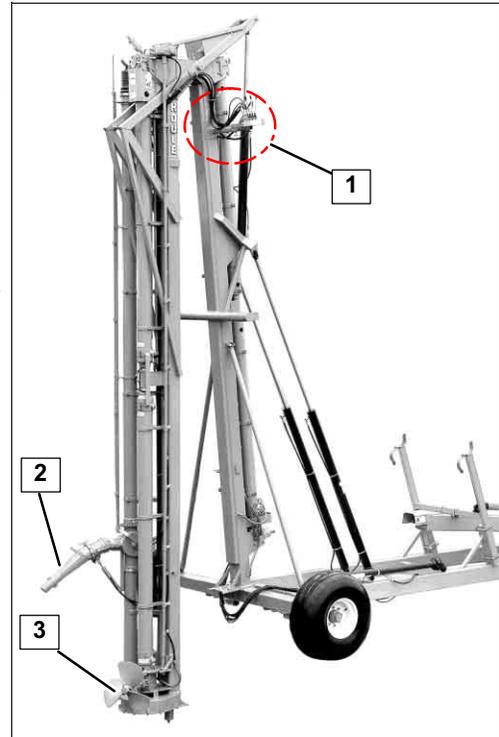
Color code	Application	Pressure line	Cylinder action
Red (4)	Directional Valve	one stripe: loading two stripes: agitation	OUT IN
Green (3)	Hydraulic Controls	one stripe: return line two stripes: pressure	n.a. n.a.
Blue (2)	Articulation Cylinder (main frame of the pump)	one stripe: to lower two stripes: to raise	OUT IN
Orange (1)	Lifting Cylinders (2) (outside member)	one stripe: to lower two stripes: to raise	IN OUT

7.4.2 Hydraulic controls

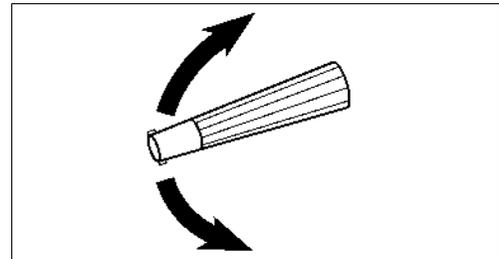
The control levers (1) installed on the upper part of the pump can only be activated when the pump is positioned over the tank wall.

To reach these controls, a balcony (provided by the pit owners) must be fixed on the tank wall.

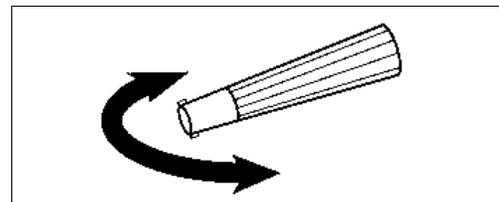
The operator must stand on the balcony in order to safely operate the control levers (1) and observe the inside of the tank.



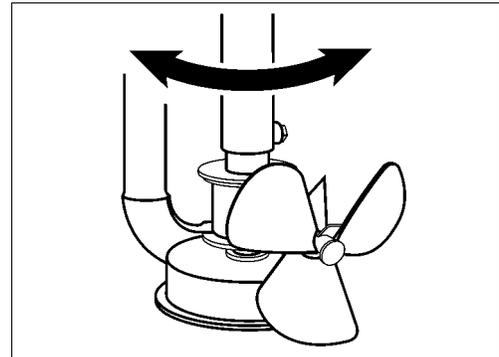
Agitation nozzle up / down (2)



Agitation nozzle rotation (2)



Agitation propeller rotation (3)



7.4.3 Circle lock cap on discharge pipe

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



Danger!

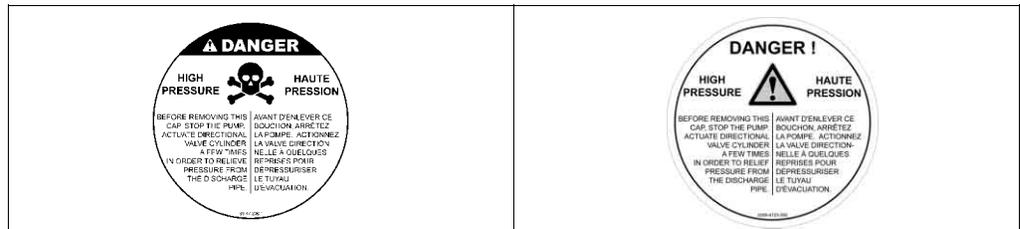
Never unlock a circle lock cap under pressure!

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

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

Carefully read the instructions on the circle lock cap

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



Function of the circle lock cap

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

Compressed air under the circle lock cap

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

7.5 Operating



Danger!

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.

Lock the pump on supports using half collars and bolts.

Outside member lowered and locked on supports for traveling



Attention! **Moving the pump**

- The pump must be moved on a farm tractor with a minimum towing capacity of;
7,500 lb [3350 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 or 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.

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.

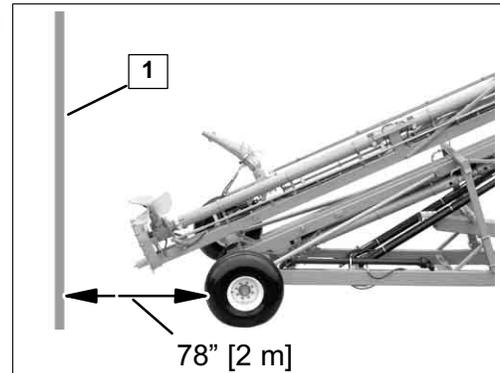
Follow the instructions in the maintenance section.



Note!

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

Back up the trailer wheels 78" [2 m] away from the wall of the tank (1);



Connect the hydraulic hoses of the pump to the tractor.



Refer to section Operation - Description of the operating elements

Description of the operating elements

Hydraulic connections

7.5.3 Raising the pump



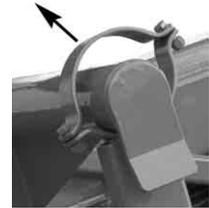
Danger!

Keep all articulated components away from electric power lines.

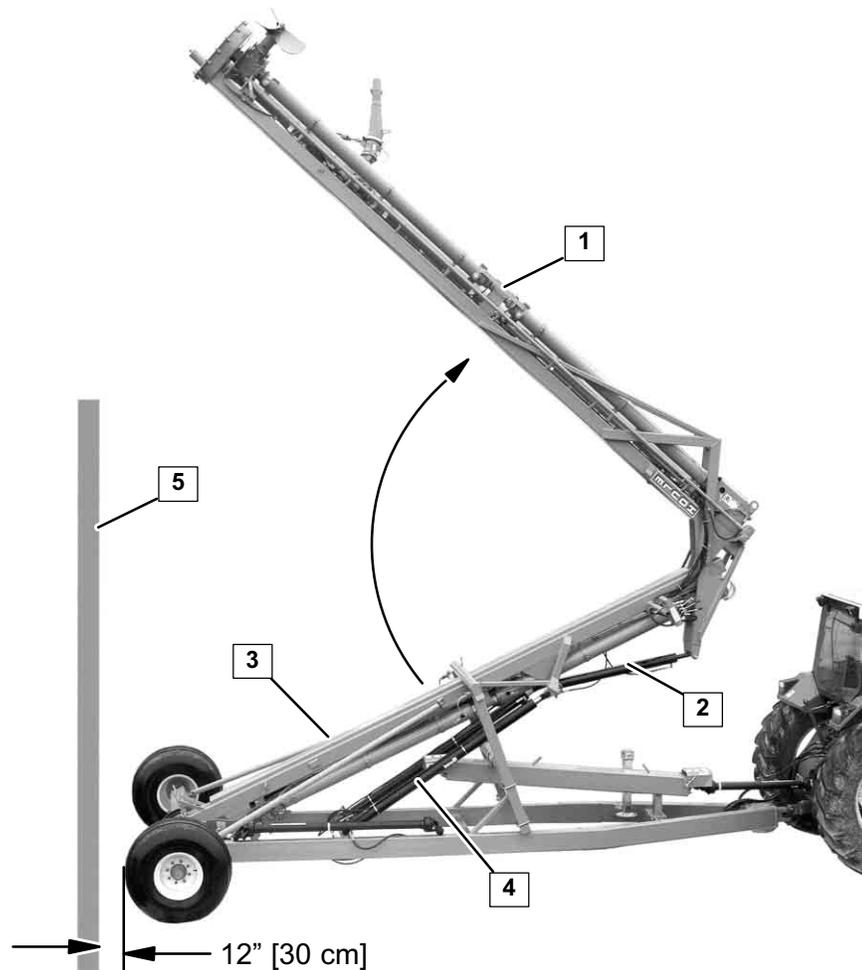


Attention!

Before raising the pump, remove half collars from the pump support to unlock the pump.



Operate the articulation cylinder to lift the main frame to the maximum;
Slowly back up the pump until the trailer wheels are 12" [30 cm]) away from the wall of the tank;



Legend:			
1	Main Frame	2	Articulation Cylinder
3	Outside Member	4	Lifting Cylinder
5	Tank Wall		

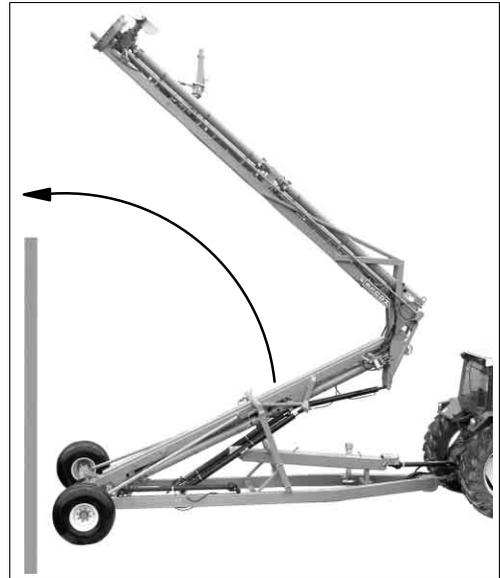
7.5.4 Lowering the pump



Danger!

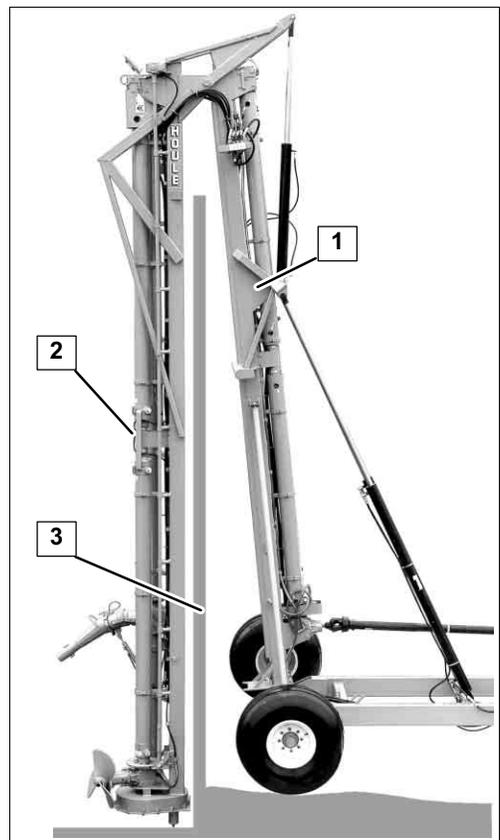
Keep all articulated components away from electric power lines

Operate the lifting cylinders to lift the outside member (1).



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

Set the main frame (2) parallel to the wall of the tank (3);



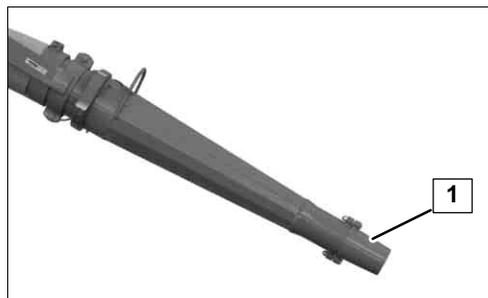
7.5.5 Agitation mode



Danger!

Rotating driveline keep away!
Turn off the tractor before working on the equipment.

- Install the PTO drivelines.
- 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.
- Using the nozzle controls (rotation, up/down) and the direction control of the propeller, agitate the content of the pit;
- Operate the agitation nozzle to break chunks and direct them towards the pump intake.
- A boltable tip (1) may be installed on the nozzle to improve thick crust cutting. The tip (1) should be removed when crust has been broken up or when there is a thin crust.



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



Note!

Never allow the 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.



Danger!

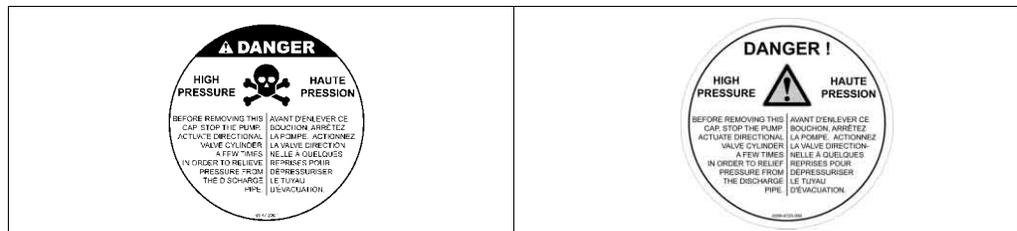
Never unlock a circle lock cap under pressure!

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

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

Carefully read the instructions on the circle lock cap

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



Function of the circle lock cap

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

Compressed air under the circle lock cap

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

- Remove the cap of the discharge pipe;
- Install the loading pipe using the circle lock.
- Stabilize the loading pipe according to the instructions supplied with the loading pipe.
- Set the directional valve to the transfer mode 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.
- 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.

7.5.7 Repositioning for transportation



Danger!

Rotating driveline keep away!

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

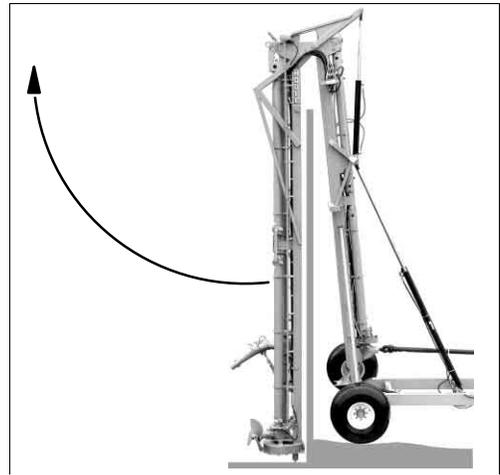


Danger!

Keep all articulated components away from electric power lines

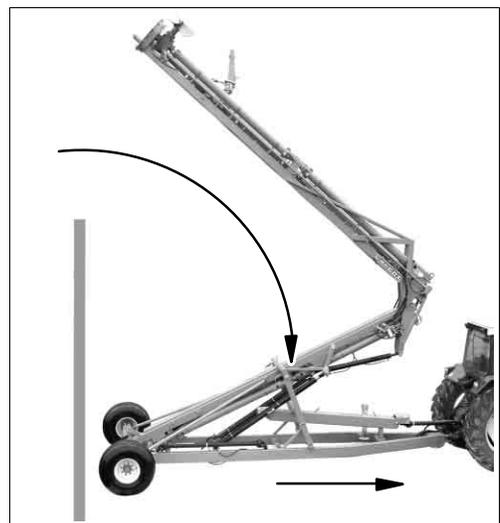
Remove the PTO drivelines from the pump;

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



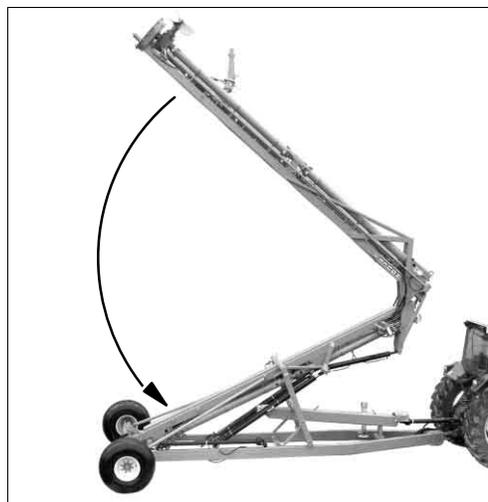
Operate the lifting cylinders to lower the outside member until it reaches the support;

Slowly move the pump away from the wall of the tank;



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

Lock the pump on supports using half collars and bolts.



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.

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.	Broken PTO shear bolts.	Replace PTO shear bolts.
	PTO driveline has a defective joint or is disconnected.	Inspect the drive line.
	Broken shaft in drive line.	Replace.
	Manure too thick	Refer to section Appendix - Consistency test
	Foreign material in the directional valve.	Remove cover and clean out.
	Obstruction in the impeller intake.	Lift the pump and clear the obstruction.
	Worn out impeller/housing	Replace part.
	Lack of lubrication	Refer to section Maintenance - Inspections and preventive maintenance
Vibration in the driveline.	The PTO joints are out of alignment.	Refer to section Operation - Checks Before Operation
	Foreign material wrapped on propeller	Remove foreign material; Adjust knife kit; Refer to section Maintenance - Repairs
The main frame or outside member will not move properly.	The safety collars are holding the outside member in the traveling supports.	Remove the safety collars.
	Safety valve is closed.	Open valve.
	Lack of lubrication	Refer to section Maintenance - Inspections and preventive maintenance
	The hydraulic hoses are not connected properly.	Refer to section Operation - Description of the operating elements
The main frame or outside member will not move properly.	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.
	The trailer is positioned too close to the tank.	Refer to section Operation - Operating
Not chopping long material	Knife kit worn or out of adjustment.	Replace or adjust knife kit; Refer to section Maintenance - Repairs

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.

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 Safety - Protective devices

- 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!

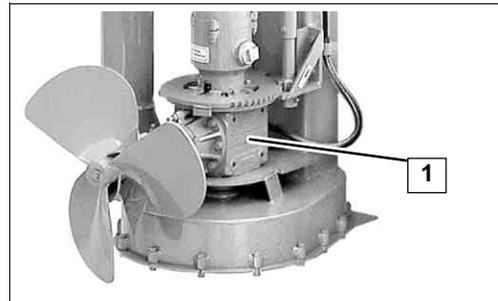
Turn off the tractor before lubricating or cleaning the pump.

Oil level

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

9.3.1 After emptying each pit

- Grease the upper and lower joints of the pump driveline;
- Grease the 3 shafts of the bottom gearbox (1).



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. There are 5 grease points on each joint. On universal joints, use a high quality grease formulated specifically for intensive use.
- Follow the manufacturer's specifications.



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

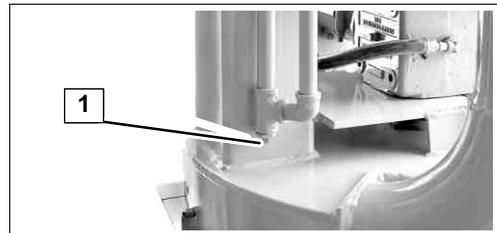


Note!

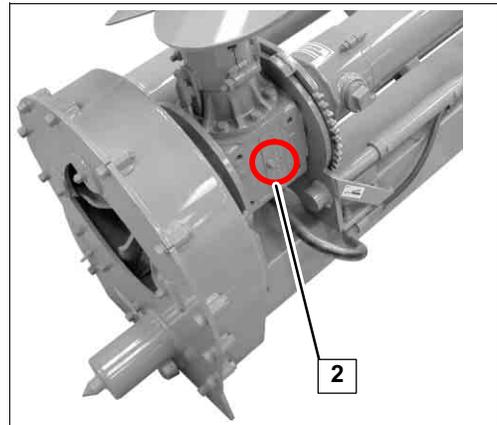
Use gearbox oil SAE 80W90.

To change the oil of the pump main frame:

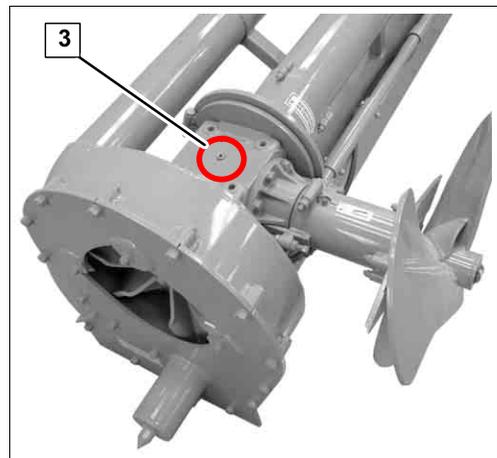
- Remove the magnetic plug (1) located at the bottom of the oil cooler pipes.



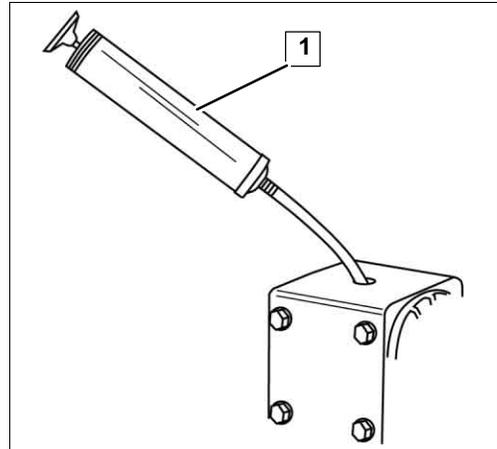
- Remove the magnetic plug (2) located on the side of the bottom gearbox.



- Rotate the gearbox so that the hole of the magnetic plug faces downwards and remove the filling plug (3) located on the other side of the gearbox. This allows air to enter at the top of the gearbox and the oil to drain from the bottom.



- Remove the oil tank located on the top gearbox;
- Use a siphon (1) to complete the drainage of both gearboxes;



- Clean and reinstall both magnetic plugs;
- Fill the bottom gearbox with oil and reinstall the filling plug;
- Fill the top gearbox with oil and reinstall the oil tank;
- Fill up the oil tank to the indicated level.



Attention!

After an oil change of the 2 gearboxes of the pump main frame, run the pump for 1 minute only. Stop the pump and check the oil level. Add oil if necessary.

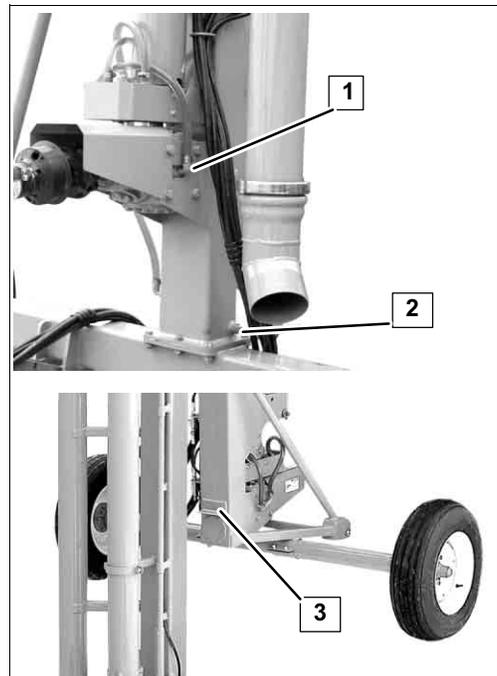
To change the oil of the outside member:



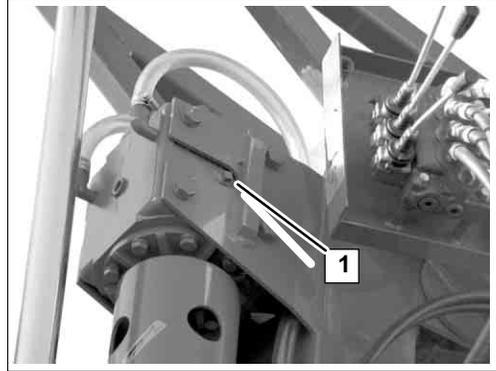
Note!

Use a container with a minimum capacity of 8 gal. [30 L].

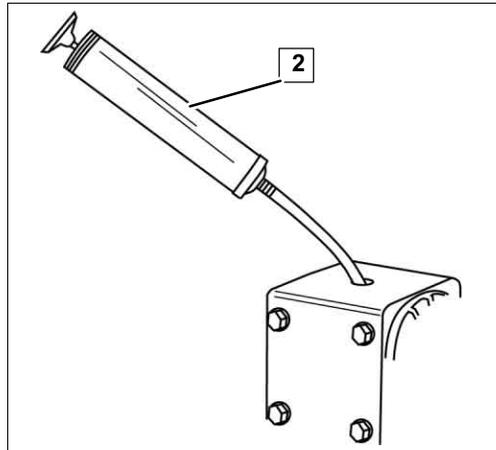
- Remove the drain plug (2) located under the outside member and collect the oil in a proper container;
- Remove the access cover (3) bolted at the bottom of the outside member and clean out the reservoir of any accumulation of deposits;
- Disconnect the hose and unscrew the 90° elbow (1) on the side of the lower gearbox;



- Remove the oil plug (1) on the side of the upper gearbox;



- Use a siphon (2) to complete the drainage of both gearboxes;



- Reinstall the oil plug on the upper gearbox;
- Reinstall the 90° elbow on the lower gearbox and reconnect the hose;
- Remove the dip stick located on the side of the pump outside member, and fill with approximately 8 gal. [30 L] of SAE 80W90 gear oil.



Attention!

After an oil change of the gearboxes of the pump outside member, run the pump until the oil cooler pump has filled the upper gearbox of the outside member of the pump.

Stop the pump and check the oil level.

Add oil if necessary.

Checking the oil level in the outside member:

- To verify the oil level inside the outside member, remove the dip stick located on the side of the pump outside member, and check the oil level.
- Add oil if necessary.



Attention!

Wipe out any oil spill.

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

Cleaning the pump



Attention!

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

- Pressure wash the entire pump.



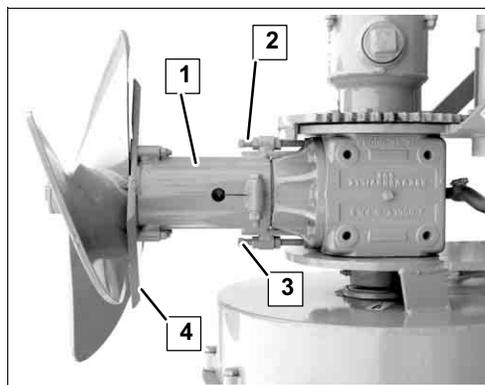
9.4 Repairs

PTO driveline shear bolts

Tractor PTO	Part No.	Dimensions	Grade	Quantity
1-3/8" - 6 splines	2010-2404-670	3/8"-16NC x 1	8	2
1-3/8" - 21 splines	2010-2404-010	3/8"-16NC x 1	2	2
1 3/4" - 20 splines	2010-2404-670	3/8"-16NC x 1	8	2

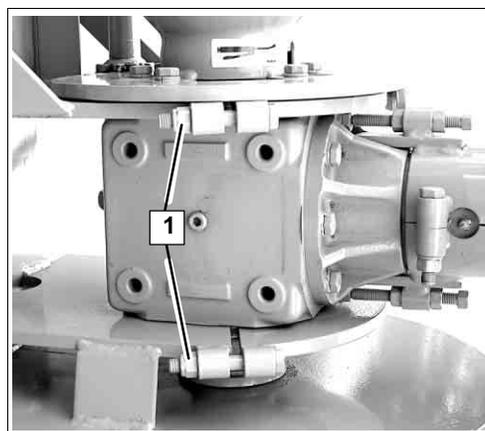
Knife Kit Adjustment

- Loosen up the holding bolts (3);
- Using the adjustment bolts (2), slide the tube (1) so that the knife (4) ends up being right next to the propeller;
- Tighten up the holding bolts (3).



Adjustment of the bottom gearbox pivot on the main frame (when required)

- To reduce vibrations, tighten up the adjustment bolts (1) of the bottom gearbox pivot. Allow just enough play so that the gearbox turns freely.



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.

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;



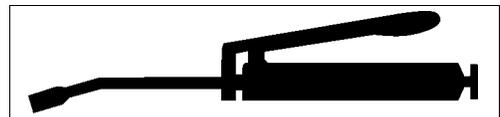
Attention!

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 Appendix - 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

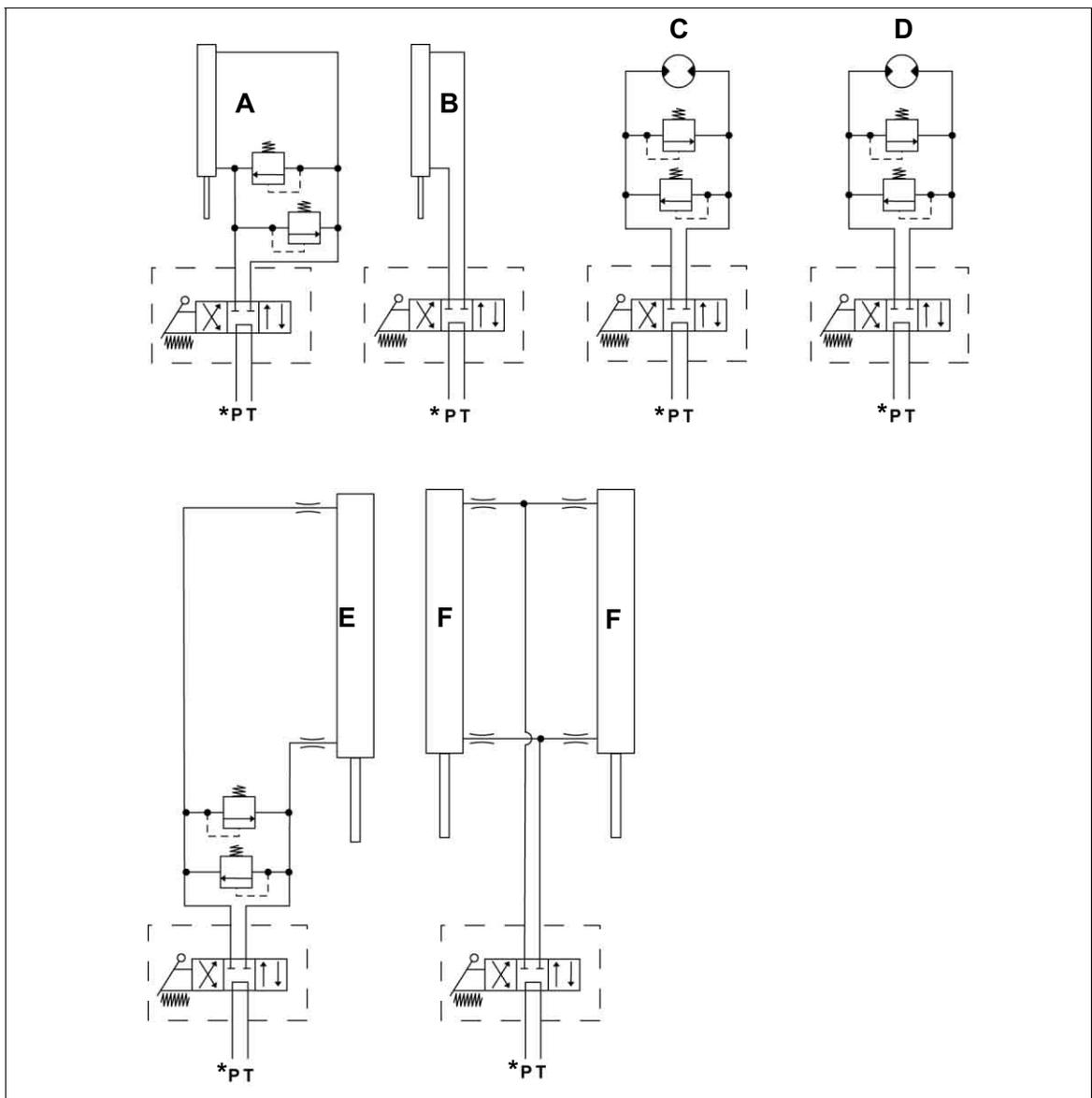
11.1 Hydraulic schematic

Hydraulic controls



Note!

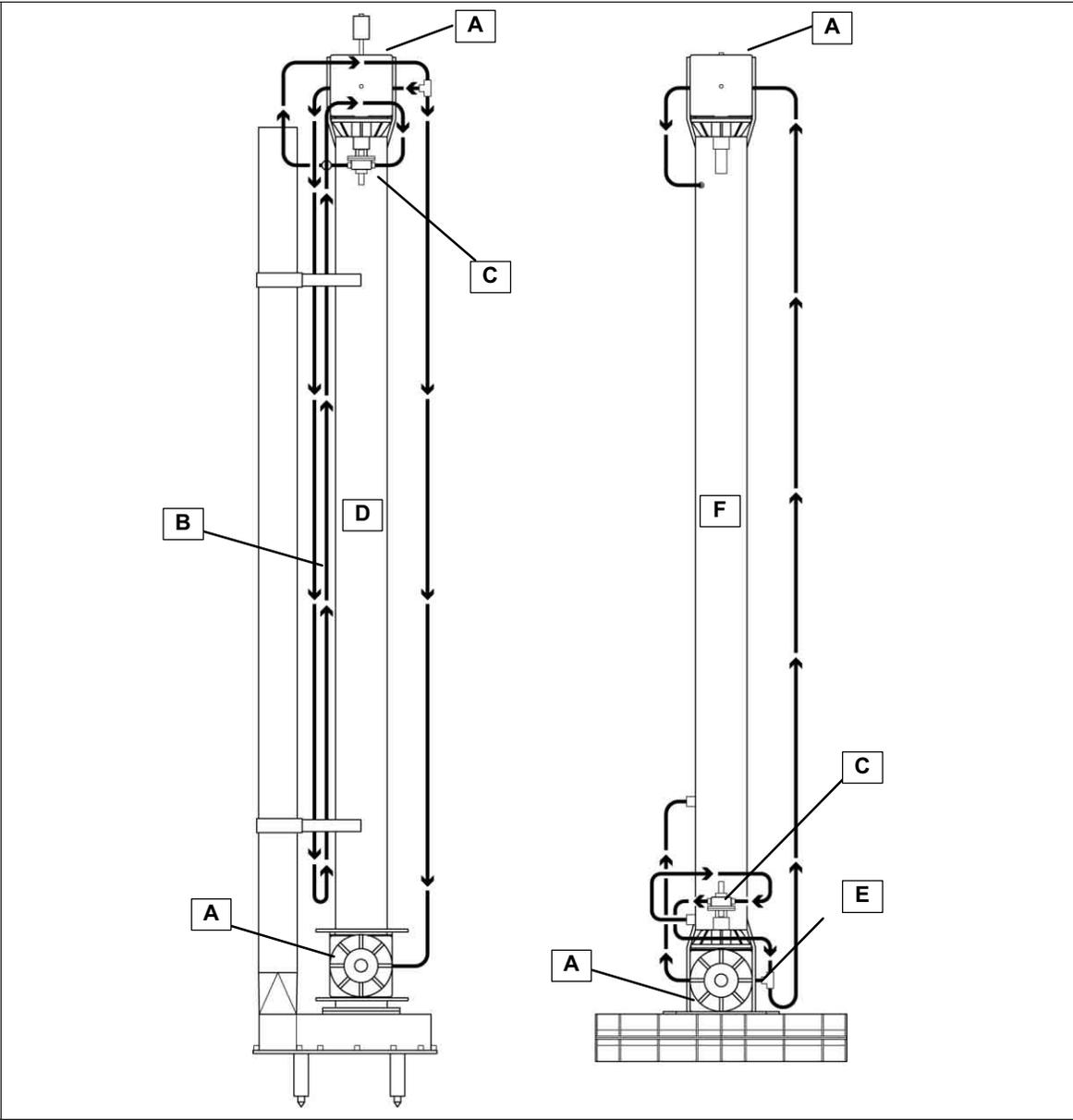
The diagram illustrates all hydraulic controls available on the pump. The dashed frame shows a component equipped with a control lever.



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

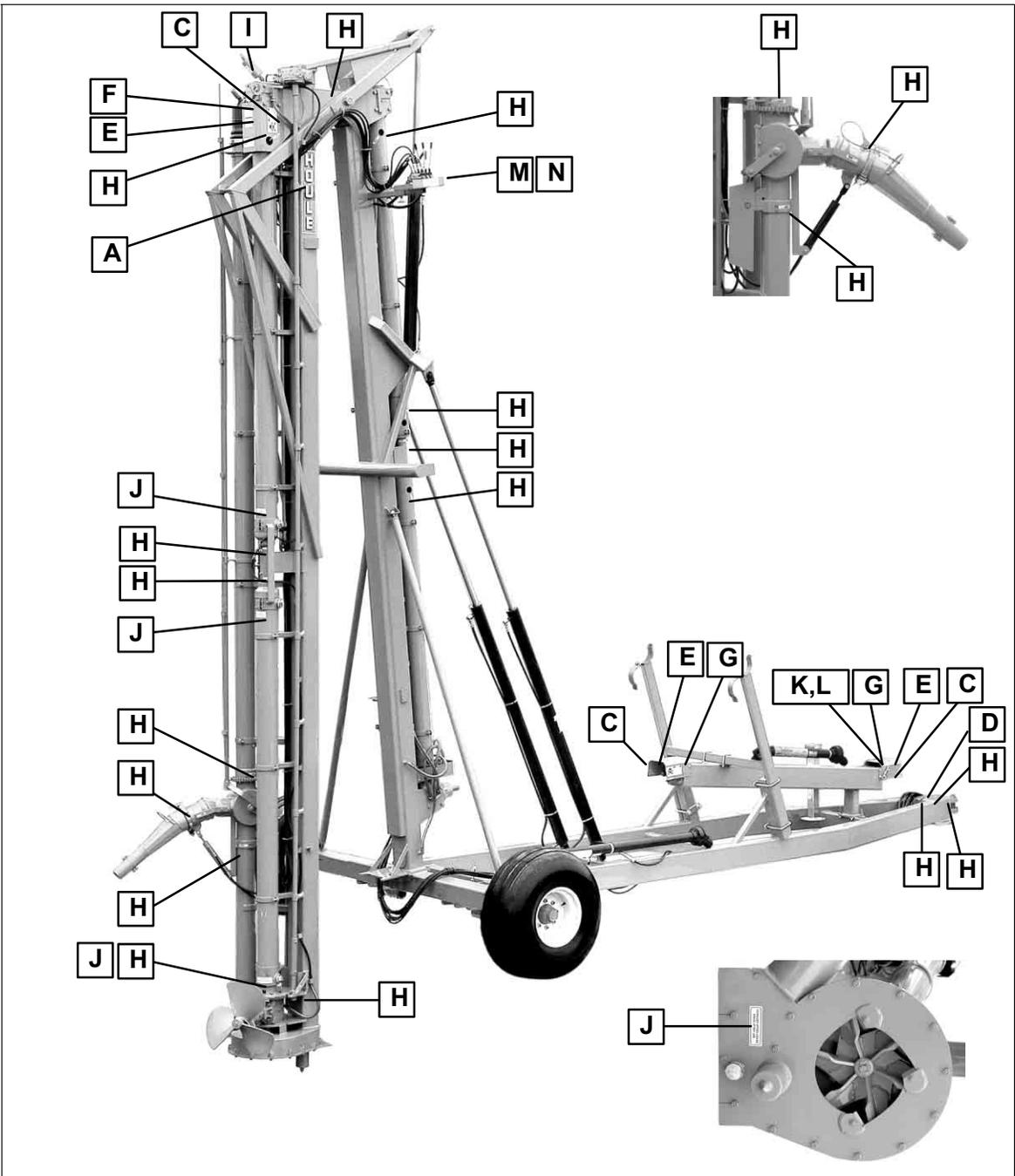
A	Directional valve cylinder	B	Nozzle height cylinder
B	Nozzle rotation motor	D	Propeller rotation motor
C	Articulation cylinder	F	Tilting cylinder

Cooling system

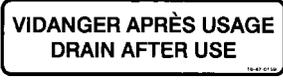
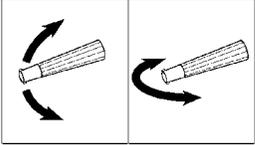
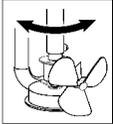


A	Gear Box
B	Cooling Pipes 3/4" (19mm)
C	Oil Pump
D	Pump Main Frame
E	Restrictor 3/16" (5mm)
F	Outside Member

11.2 Label position



	American	European
A	 <p>2010-4700-400</p>	
B	 <p>2019-4703-660</p>	
C	 <p>▲ DANGER TOXIC GASES MANIPULER PRODUITS TOXICOLOGIQUES HAUTEMENT VOLATILS EN TOUTES CIRCONSTANCES</p> <p>GAS TOXICOS ES MANIPULAR PRODUCTOS QUÍMICOS VOLATILES EN TODAS LAS SITUACIONES CON ESPECIAL PRECAUCIÓN</p> <p>2099-4720-010</p>	
D		 <p>DANGER ! KEEP ALL ARTICULATED COMPONENTS AWAY FROM ELECTRIC POWER LINES</p> <p>2099-4725-070</p>
E	 <p>▲ DANGER ROTATING DRIVELINE, KEEP AWAY!</p> <p>ARRETE DE COMMANDE ROTATIF GARDEZ VOS DISTANCES!</p> <p>2099-4720-020</p>	
F	 <p>▲ DANGER HIGH PRESSURE HAUTE PRESSION</p> <p>BEFORE REMOVING THIS CAP STOP THE PUMP ACTIVER LA POMPES VALVE DIRECTIONAL VALVE CYCLING A FEW TIMES IN ORDER TO RELIEVE PRESSURE FROM THE DISCHARGE PIPE D'EVACUATION</p> <p>2099-4720-070</p>	 <p>DANGER ! HIGH PRESSURE HAUTE PRESSION</p> <p>BEFORE REMOVING THIS CAP STOP THE PUMP ACTIVER LA POMPES VALVE DIRECTIONAL VALVE CYCLING A FEW TIMES IN ORDER TO RELIEVE PRESSURE FROM THE DISCHARGE PIPE D'EVACUATION</p> <p>2099-4725-090</p>
G	<p>▲ WARNING</p> <ul style="list-style-type: none"> • ALWAYS STOP THE EQUIPMENT BEFORE SERVICING AND MAINTENANCE • NEVER ADJUST THE PUMP PRESSURE WHILE IT IS RUNNING • STOP ALL FLOW BEFORE SERVICING • ALWAYS WEAR PROTECTIVE GEAR WHEN SERVICING • WHEN SERVICING IS CLEAR FROM WORKING AREA • REFER TO THE OWNER'S MANUAL FOR SERVICING AND MAINTENANCE INSTRUCTIONS <p>▲ AVERTISSEMENT</p> <ul style="list-style-type: none"> • ARRÊTEZ TOUJOURS L'ÉQUIPEMENT AVANT TOUT TRAVAIL D'ENTRETIEN • NE JAMAIS RÉGLER LA PRESSION DE LA POMPES EN COURS DE FONCTIONNEMENT • ARRÊTEZ TOUJOURS LE DÉBIT AVANT TOUT TRAVAIL D'ENTRETIEN • PORTER TOUJOURS DES ÉQUIPEMENTS DE PROTECTION PERSONNELLE • SE RÉFÉRER À LA NOTICE DE L'ÉQUIPEMENT POUR LES PROCÉDURES D'ENTRETIEN ET D'ÉVALUATION <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>03-47-0124</p> <p>2003-4701-240</p>	

	American	European
I	 <p>2099-4724-090</p>	
J	 <p>2010-4701-590</p>	
K	 <p>2010-4703-430</p>	
L	 <p>2010-4703-440</p>	
M	 <p>2010-4703-790</p>	
N	 <p>2010-4703-380</p>	

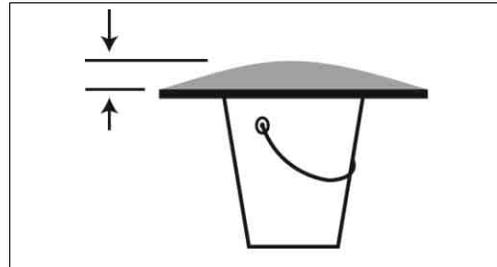
11.3 Abbreviations

Units	Explanation	Units	Explanation
A	Amperage (electric current)	kW	kilowatt
@	at	km/h	kilometres per hour
CE / EC	European Union	LPM	litres per minute
cm	centimetres	lb	pounds
°	degree angle	m	metre
°C	degree centigrade/ Celsius (temperature)	min	minute
CW	clockwise	mph	miles per hour
CCW	counterclockwise	mm	millimetres
°F	degree Fahrenheit (temperature)	N/m	Newton metre
fax	facsimile	NC	national coarse thread
' / ft	Feet (= 305 mm)	O.D.	outside diameter
ft-lb	foot-pound	PTO	power take-off
gal.	gallon	PVC	polyvinyl chloride
GPM	gallons per minute	psi	pounds per square inch (pressure)
Hp	horsepower	QC	Quebec (Qc)
hrs	hours	RPM	revolutions per minute
Hz	Hertz	SAE	Society of Automotive Engineers
I.D.	inside diameter	us/ USA	United States of America
Inc.	Incorporated	V	volt (voltage)
" / in	inch (= 25.4 mm)	VDC	volts of direct current
kg	kilograms	VAC	volts of alternative current
kPa	kilo Pascal	www	world wide web

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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