Liquid manure spreader

EL66

Operation Manual
(Original instructions)

2018-9015-005
09-2016

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a better world

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Contents

1 Preface

This is a GEA product. GEA is the manufacturer of the Houle product line. This product was formerly known under HOULE trademark.

1.1 About the Instructions

The manufacturer reserves the right to make changes due to technical developments in the data and images given in this manual.

This manual is not subject to an amendment service. The most recent version can be obtained through the dealer or directly from the manufacturer.

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

Pictograms used

This pictogram indicates information that will be helpful toward a better understanding of the working processes.

A correction bar in the margin indicates changes to the previous edition. The character string "!!" in the search field of the PDF document locates the correction bar.

This pictogram indicates another document or section to refer to.

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

	language		**language**		**language**
-9000-	German	-9013-	Dutch	-9032-	Serbian
-9001-	English (United Kingdom)	-9015-	English (North American)	-9034-	Slovak
-9002-	French (France)	-9016-	Polish	-9035-	Chinese
-9003-	Italian	-9018-	Japanese	-9036-	Lithuanian
-9004-	Romanian	-9021-	Dänisch	-9038-	Portuguese (Brazil)
-9005-	Spanish (Spain)	-9022-	Hungarian	-9039-	French (Canada)
-9007-	Swedish	-9023-	Czech	-9040-	Latvian
-9008-	Norwegian	-9024-	Finnish	-9041-	Estonian
-9009-	Russian	-9025-	Croatian	-9043-	Spanish (Central America)
-9010-	Greek	-9027-	Bulgarian		
-9012-	Turkish	-9029-	Slovenian		
The instruction manuals may not be available in all the listed languages.					

1.2 Manufacturer's address

GEA Farm Technologies GmbH
Siemensstraße 25-27
D-59199 Bönen

☎ +49 (0) 2383 / 93-70
🖷 +49 (0) 2383 / 93-80
✉ contact@gea.com
@ www.gea.com

1.3 Customer service

Authorized Technical Dealer

If necessary, please contact your nearest dealer.

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

www.gea.com

European contact information:

GEA Farm Technologies GmbH
Siemensstraße 25-27
D-59199 Bönen

☎ +49 (0) 2383 / 93-70
🖷 +49 (0) 2383 / 93-80
✉ contact@gea.com
@ www.gea.com

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

☎ +1 630 369 - 8100
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@ www.gea.com

1.4 Declaration of conformity

Manufacturer:	**GEA Farm Technologies GmbH** **Siemensstraße 25-27** **D-59199 Bönen**
Product category:	**Liquid Manure Spreader**
Type of product:	**EL66**

The product referred to complies with the provisions 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:

- Harmonized European standards

EN 707+A1 (2009-09)	Agricultural machinery - Slurry tankers Safety
EN 953+A1 (2009-05)	Safety of machinery Guards
EN 4254-1 (2013-07)	Agricultural Machinery - safety General requirements
EN 4413 (2011-03)	Hydraulic fluid power General rules relating to systems
EN 12100 (2010-12)	Safety of machinery - General principles for design - Risk assessment and risk reduction
EN ISO 14121-2 (2008-02)	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:

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Drummondville, 01 August 2011

Yann Desrochers
(Head of Research and Development)

The undersigned is acting by virtue of power of attorney from the management of:
GEA Farm Technologies GmbH, Siemensstraße 25-27, D-59199 Bönen

This declaration certifies compliance with the guidelines indicated, but does not establish any guarantee in the sense of paragraphs 443, 444 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 ”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, labor 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.

1.6 SPECIFIC LIMITED WARRANTY APPLICABLE TO LIQUID MANURE SPREADERS (ALL MODELS)

This specific limited warranty benefits to the Purchaser and applies to all models of liquid manure spreaders sold by the Company. This limited warranty applies only to following specific parts: the power take off (”PTO”), axles and wheel hubs, as well as the reservoir. The warranty on these parts is subject to the conditions mentioned below. All conditions stated in this specific limited warranty are in addition to the General equipment warranty that applies to all equipment sold by the Company (see Section 1.5). In the event of any conflict between the conditions stated in this specific limited warranty and those specified in the General equipment warranty, the conditions of this specific limited warranty shall prevail.

1.6.1 Extent of specific limited warranty

This specific limited warranty DOES NOT cover damages caused to the spreader when it is attached behind a tractor excessively powerful or when the power take off is used at excessive revolutions per minute (RPM), or if it is misaligned, defective or modified (including, without limitation, damages resulting from the modification of shear bolts).

Power take off

In the case of a spreader used under normal conditions, the warranty period of the PTO is twelve (12) months from the date of delivery of the equipment to the Purchaser.

In the case of a spreader used for commercial usage, commercial lease on one or more farms, the PTO warranty period is reduced to three (3) months only.

Wheel axles and hubs

In the case of a spreader used under normal conditions, the warranty period of wheel axles and hubs is five (5) years from the date of delivery of the equipment to the Purchaser.

In the case of a spreader used for commercial usage, commercial lease on one or more farms, the warranty period of the wheel axles and hubs is reduced to one (1) year only.

Reservoir

With the exception of the model EL66, the warranty period for the reservoir of the spreader is as set forth below and applies from the date of delivery of the equipment to the Purchaser, against perforation due to corrosion. The extended warranty applies to the reservoir only and does not cover parts, whether removable or attached to the reservoir. This warranty is valid, subject to the following conditions:

1. The reservoir is completely emptied by the Purchaser after each use;
2. The inside of the reservoir is cleaned and sprayed with oil as directed by the Company;
3. The spreader is stored inside a building and protected from the weather, in accordance with the recommendations prescribed by the Company.

¼” thick steel reservoir

The warranty period for the ¼” thick steel reservoir is ten (10) years from the date of delivery of the equipment to the Purchaser. All claims must be submitted before the expiry date of the warranty. In the event of a claim for perforations caused by corrosion, the Company will reimburse the Purchaser the equivalent of ten percent (10%) of the cost of the new reservoir for each full year remaining before the expiry of the extended warranty. The refund will be calculated given the current selling price of the replacement tank at the time of claim by the Purchaser, divided by the number of total years of warranty (ten (10) years), and then multiplied by the number of full years remaining before the expiry of the warranty period.

With respect to the reservoir model EL66, the guarantee mentioned above will apply only in the event that the Purchaser has opted for the extended warranty (”Steel Plus” option – ¼” thick steel reservoir). The ”Stainless Steel” option is also available to the Purchaser of the reservoir model EL66, subject to the additional warranty conditions provided below.

Optional stainless steel reservoir

The warranty period for the stainless steel reservoir of the spreader is fifteen (15) years from the date of delivery of the equipment to the Purchaser. All claims must be submitted before the expiry date of the warranty. In the event of a claim for perforations caused by corrosion, the Company will reimburse the Purchaser the equivalent of six point six percent (6.6%) of the cost of the new reservoir for each full year remaining before the expiry of the extended warranty. The refund will be calculated given the current selling price of the replacement tank at the time of claim by the Purchaser, divided by the number of total years of warranty (fifteen (15) years), and then multiplied by the number of full years remaining before the expiry of the warranty period.

2 Safety

This product is designed for agricultural purposes only. It is not adapted for use on public roads. Make sure to follow the local road regulations in relation with the use of this product.

This product is designed and constructed while taking into account a risk assessment, a selection of harmonized standards and other technical specifications to be complied with in order to guarantee a maximum level of safety.

If component(s)/equipment not manufactured by GEA is/are added to this GEA product, consider that new risk(s) may arise from this addition. Make sure the equipment and the environment surrounding the equipment remain safe.

Since agitated manure produces heavy toxic gases, make sure to follow the safety procedures for confined spaces before operating or servicing this equipment in such environment. Look at the corresponding Web site below to make sure the local safety procedures for confined spaces are followed.

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

Safety is achieved when the safety instructions are followed. It is part of the owner's obligation of care to implement these safety measures and make sure they are carried out at all times.

The owner must ensure a safe environment by providing:

- this instruction manual with this product. Everyone performing activities in connection with this product must read this instruction manual and follow those instructions;
- all required personal safety gear such as hearing, eye, feet protection, etc;
- adequate training for employee(s) working or performing activities in connection with this product;
- the tools listed in this manual to perform activities in connection with this product;
- locally purchased components and/or products that comply with the technical requirements mentioned in section Technical data, if applicable;
- new parts to replace any defective, worn or damaged parts on this product;
- adequate lighting in all areas where activities in connection with this product are performed.

2.1 Explanation of the safety symbols

The safety symbols draw attention to the importance of the adjacent text.

They are based on ISO 3864-2 and ANSI535.6.

Safety symbols and key words

Danger!
The indication ”Danger” signals immediate danger to life or health of personnel.
Death or serious injury will result if the danger is not avoided.

Warning!
The indication ”Warning” signals potential danger to life or health of personnel.
Death or serious injury may result if the danger is not avoided.

Caution!
The indication ”Caution” signals dangerous situations.
Minor or moderate injury may result if the danger is not avoided.

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

2.2 Basic safety instructions

- Only trained personnel can operate this product to ensure safe operating methods. Make sure the personnel performing activities in connection with this product have the skills when special qualifications are required. Read the section Safety - Personnel qualifications.
- Wear appropriate personal safety gear such as hearing, eye, feet protection, etc. when performing activities in connection with this product. Inspect the personal gear and replace if worn and/or defective.
- Familiarize yourself with the environment surrounding the working area. Locate the elements that can be dangerous in order to avoid them.
- No one stands near this product unless they are performing instructions included in this manual. When near this product, keep body parts such as hands, feet, hair as well as clothing away from dangerous parts such as rotating parts, articulated parts, sharp edges, etc.
- Use this product only when in perfect working condition. Do not use damaged, worn or defective parts on this product, replace immediately to avoid serious damages and injuries.
- The use of any tool or lubricant is subject to certain risks. Follow the manufacturer's recommendations and wear appropriate personal safety gear.
- Never remove the safety devices such as guards, covers, chains, labels, etc. from this product to ensure safety unless otherwise indicated in this instruction manual. Refer to section Safety - Protective devices. Read and follow the instructions of the safety labels affixed on this product and make sure the safety labels are legible at all times.

2.3 Personnel qualifications

The manufacturer intends to determine the difference between trained personnel and qualified personnel.

Trained personnel

The operator was trained by the manufacturer or its legal representative to follow all safety rules, cleaning method, general maintenance as well as the operating methods.

It is the operator's responsibility to inform the farm workers of those rules, maintenance and methods.

Qualified personnel

Qualified personnel refers to those having obtained the academic knowledge of a specific field of work.

This personnel has followed a training and subsequently obtained a certification, diploma or any other official document provided by a recognized academic facility in the country of study.

An equivalence may be required when operating in other countries.

The special qualifications required will be specified in each section.

2.4 Protective devices

2.4.1 Safety parts

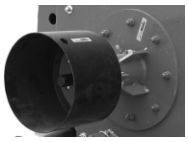
This product is equipped with safety parts protecting the user against dangerous elements.

Those parts must be in perfect working condition and remain in place at all times.

Replace if damaged, worn and/or defective. Refer to the part number.

Safety guard for power take off driveline (American model)

(Part No. 2018-7603-040)



Safety guard for power take off driveline (European model)

(Part No. 2018-7632-470)

Safety grid on fill opening

(Part No. 2018-7627-510) 22" (56 cm)

(Part No. 2018-7627-500) 16" (41 cm) with anti-splash door on fill opening option

2.4.2 Safety labels

The labels affixed on this product inform the user of the potential dangers, the prohibited manoeuvres, the proper procedures and applications when performing activities in connection with this product.

The labels must remain in place and legible at all times.

Replace when damaged. Refer to the part number for the appropriate label.

Refer to section Appendix - Label position.

3 Description (overview)

3.1 Product applications

The EL66 tandem liquid manure spreader is designed to be towed by a tractor to carry and spread water or all types of liquid manure. The EL66 tandem liquid manure spreader must not be towed at a speed exceeding 25 mph (40 km/h).

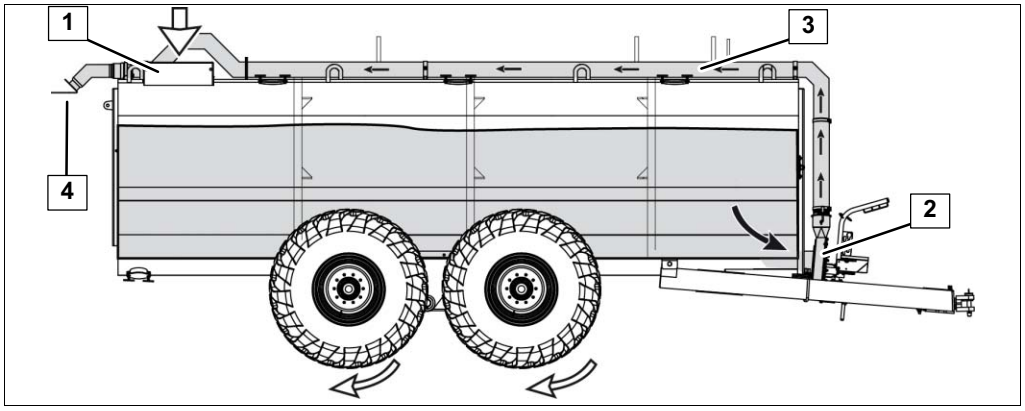
☞ **Note!**
This product and its equipment are designed for agricultural purposes only. Any applications not listed above are considered as improper use.

The manufacturer is not liable for any resulting damages due to improper use of this product. The user carries the risk. Proper use also includes reading and following the instructions of this instruction manual.

- Original GEA parts and accessories are specially designed for GEA products and equipment.
- The manufacturer expressly points out that only original parts and original accessories supplied by GEA are adapted, tested and authorized to be used with this product or equipment. Do not use other suppliers parts or equipment with GEA product unless otherwise approved in writing by GEA.
- The manufacturer does not accept any liability toward injured people or animals or damaged products and equipment caused by the use of other manufacturers products.

3.2 Functional description

The EL66 tandem liquid manure spreader is filled with water or liquid manure through the fill opening (1). The impeller (2) pumps the water/liquid manure in the discharge pipe (3). The water/liquid manure is spreaded through the spreading nozzle (4).



Legend:			
1	Fill opening	3	Discharge pipe
2	Impeller	4	Spreading nozzle

3.3 Modifications to the product

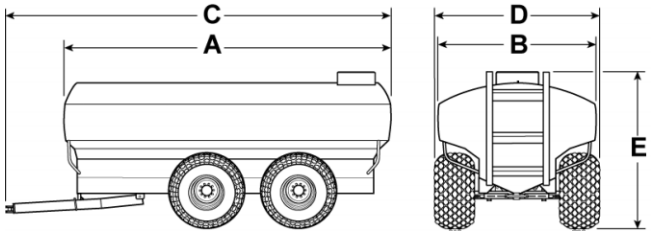
For safety reasons, do not carry out any unauthorized modification to this product!

4 Technical data

4.1 Geometric data (SAE & Imperial)

The following tables contain approximate values. The type of manure and its composition will significantly increase the total weight, particularly when manure contains sand.

EL66



Model Capacity	Tire Size	Overall dimension[1]					Total weight (lbs)[1]		Load (lbs)[1]		
		A	B	C	D	E	Net	Full load[2]	Per axle[2]	Draw bar[2]	
EL66 3000 3000 UK gal 3600 US gal	23.1 X 26	16 ft	75”	22 ft	118”	114”	10276	40196	18153	3890	**Max 7700**

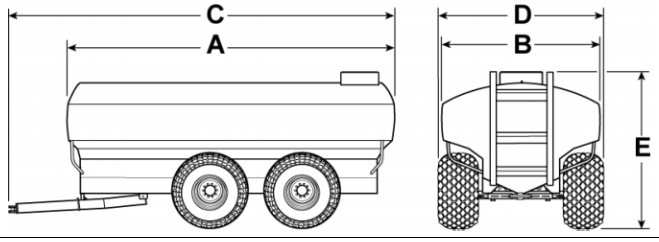
1 Data given for a spreader including wheels, without options nor tool bar.

2 Data given for a spreader filled with water.

4.2 Geometric data (Metric)

The following tables contain approximate values. The type of manure and its composition will significantly increase the total weight, particularly when manure contains sand.

EL66



Model Capacity	Tire Size	Overall dimension[1]					Total weight (kg)[1]		Load (kg)[1]		
		A	B	C	D	E	Net	Full load[2]	Per axle[2]	Draw bar[2]	
EL66 3000 13600 l	23.1 X 26	4.88 m	1.91 m	6.71 m	3 m	2.9 m	4671	18271	8251	1768	**Max 3500**

1 Data given for a spreader including wheels, without options nor tool bar.

2 Data given for a spreader filled with water.

4.3 Tire specifications

Goodyear 23.1 X 26

Ply	Dimensions (inches)		Weight (rim included)	
	Diameter	Width	lbs	kg
12	59	23.5	467	212

Speed (mph)	Pressure (psi)				
	16	18	20	22	24
	Carrying capacity (lbs)				
10	7554	7980	8512	9044	9510
15	6930	7320	7808	8296	8723
20	6305	6660	7104	7548	7937
25	5680	6000	6400	6800	7150
Speed (km/h)	**Pressure (bar)**				
	1.10	1.24	1.38	1.52	1.65
	Carrying capacity (kg)				
10	3427	3620	3861	4102	4313
25	3143	3320	3542	3763	3957
40	2860	3021	3222	3424	3600
50	2567	2722	2903	3084	3243

4.4 Tractor specifications

Spreader model	PTO RPM	Minimum HP		
		When spreading manure at ground level	When injecting or burying manure into soil	When spreading manure on hilly land
3000	540 - 1000	100	120	150

4.5 Performance data

Spreader

Maximum towing speed	25 mph [40 km/h]
Maximum speed using power steering system	8 mph [12 km/h]
Operating temperature	5°C [41°F] minimum

Spreading flow rate

PTO impeller drive		
Maximum manure consistency for spreading (without tool bar)	2 ½" [65 mm]	
Tractor PTO RPM	540 RPM	1000 RPM
Maximum spreading flow rate*	6416 lpm 1695 US gpm 1411 UK gpm	8725 lpm 2305 US gpm 1919 UK gpm

* Transfer rate at the pump output without tool bar. Performance will differ depending on the tool bar model and manure consistency.

Tool bar maximum manure consistency for spreading

• Twin deflector 25 ft tool bar • 3 deflectors 38 ft tool bar	2 ½" [65 mm]
• Deflectors tool bar • Flex drop hoses tool bar • Tool bar with 24" hydraulic disc injectors • Tool bar with 22" concave disc incorporators	½" [13 mm]

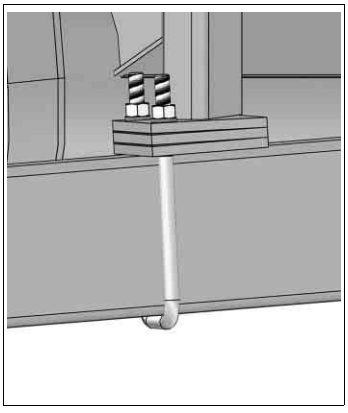
Spreader draw bar inclination

The spreader draw bar is adjusted on the spreader frame according to the tractor draw bar height.

Spacers are placed between the spreader draw bar and the spreader tank to obtain a 3 degree angle towards the front of the tank. It allows a complete drainage of the liquid inside the tank and it ensures that the PTO shaft operates at a proper angle.

By removing or adding spacers, the draw bar can be adapted for another tractor draw bar.

For more information, contact your dealer.



4.6 Hydraulic hose specifications

I.D.	1/4” (6 mm)	1/2” (13 mm)	3/4” (19 mm)
O.D.	0.58” (15 mm)	0.86” (22 mm)	1.10” (28 mm)
Number of braids	2	2	2
Service pressure	5 800 psi [400 bar]	4 000 psi [276 bar]	3 000 psi [207 bar]

4.7 Bolt torque chart

Note!
Refer to the bolt torque chart below 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	6 ft-lb 8NM	12ft-lb 16NM	20ft-lb 27NM	32ft-lb 44NM	47ft-lb 64NM	69ft-lb 94NM	96ft-lb 130NM	155ft-lb 210NM	206ft-lb 279NM	310ft-lb 420NM
SAE 5 	MCS HT	10ft-lb 14NM	19ft-lb 26NM	33ft-lb 45NM	54ft-lb 73NM	78ft-lb 106NM	114ft-lb 155NM	154ft-lb 209NM	257ft-lb 349NM	382ft-lb 518NM	587ft-lb 796NM
SAE 8 	MCAS	14ft-lb 19NM	29ft-lb 39NM	47ft-lb 64NM	78ft-lb 106NM	119ft-lb 161NM	169ft-lb 229NM	230ft-lb 312NM	380ft-lb 515NM	600ft-lb 814NM	700ft-lb 949NM
Socket Head Cap Screw	AS HT	16ft-lb 22NM	33ft-lb 45NM	54ft-lb 73NM	84ft-lb 114NM	125ft-lb 170NM	180ft-lb 244NM	250ft-lb 339NM	400ft-lb 542NM	640ft-lb 868NM	970ft-lb 1315NM

4.8 Lubricant specifications

Lubricant type	Product name	Grade	Purpose
Grease	PRECISION™ XL5 MOLY EP2	2	• To lubricate the equipment.
Gearbox oil	TRAXON™	80W-90	• To fill the bearing housing.
Grease	880 Crown and Chassis	2	• To grease wheel hub bearings.
Brake fluid	DOT3 brake fluid		• To fill the master cylinder.
Biodegradable oil			• To spray over the spreader before storing.

5 Handling and assembly

5.1 Special personnel qualification required for handling

Handling must be performed by a qualified forklift operator and/or qualified overhead crane or hoist operator.

Read the section Safety - Personnel qualifications.

5.2 Safety instructions for handling and assembly

Warning!
Always keep this product on a flat and level surface. An uneven surface could unbalance the product resulting in injuries and/or damages.

Read the section Safety.

5.2.1 Handling tools

	Description	Purpose
	Boom truck	To lift the spreader
	Forklift truck	To lift accessories
	Safety chains	To lift accessories

5.2.2 Assembly tools

	Description	Purpose
	Wrench set	To tighten bolts
	Ratchet tool set	To tighten bolts
	Torque wrench	To tighten bolts
	Air impact	To tighten wheel nuts
	Screw driver set	To install bottom valve
	Cutter	To remove tie wrap

5.2.3 Items provided by the owner:

- A PTO driveline meeting local regulations, if applicable.
- A tractor of appropriate size to match the spreader model. Refer to section Technical data - Tractor specifications.

5.3 Packing material disposal

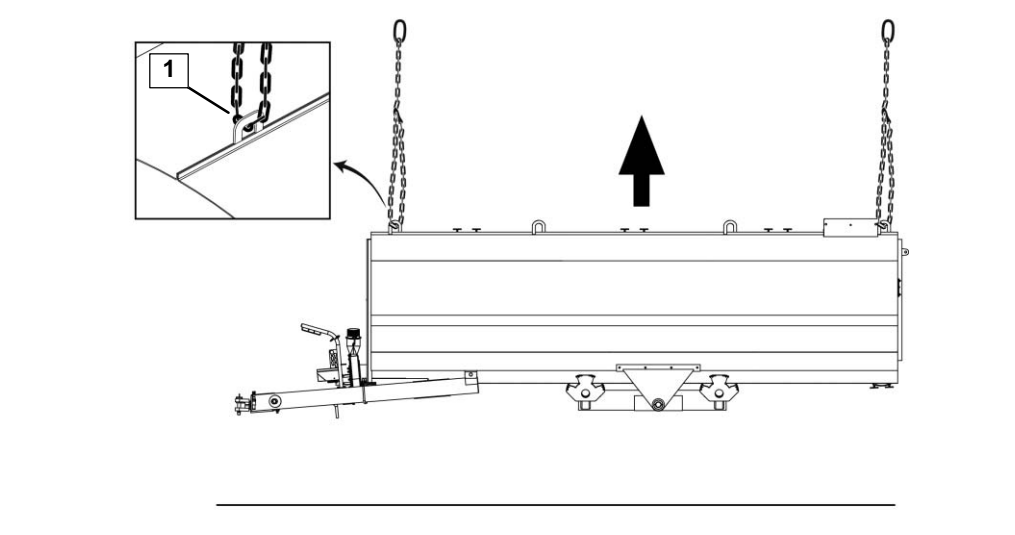
Handle the packing material properly and dispose according to your local rules and regulations on waste disposal. Please refer to your local resources for any questions. Recycle if possible.

5.4 Handling the product

Warning!
Do not stand under suspended loads. Falling loads can cause fatal injuries!

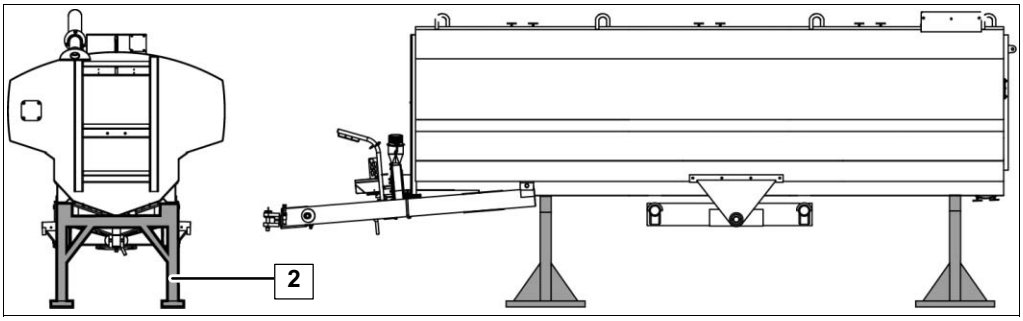
Attention!
To lift this product use a lifting device with a minimum lifting capacity of 10 500 lbs [5 000 kg]. The lifting capacity only includes the weight of the product.

Attention!
Ensure each lifting ring of this product is in reliable condition to avoid an accidental fall causing injuries and/or damages.



- Lift the spreader by the lifting rings (1), located on top of the spreader tank, using a boom truck and safety chains;

Warning!
Always keep the spreader lifted while laying on the support stands (not supplied by GEA) and make sure the support stands can withstand the spreader weight.



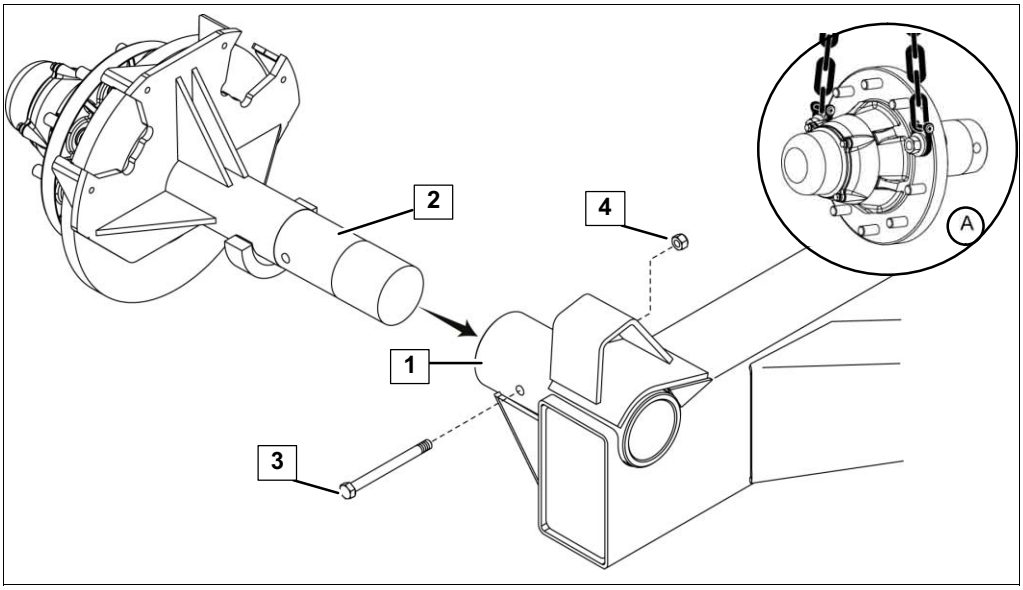
- Position the spreader on support stands (2);
- Remove the transport stands and the wrapping that may cover components fixed to the spreader.

5.5 Hydraulic braking system assembly

5.5.1 Hub assembly

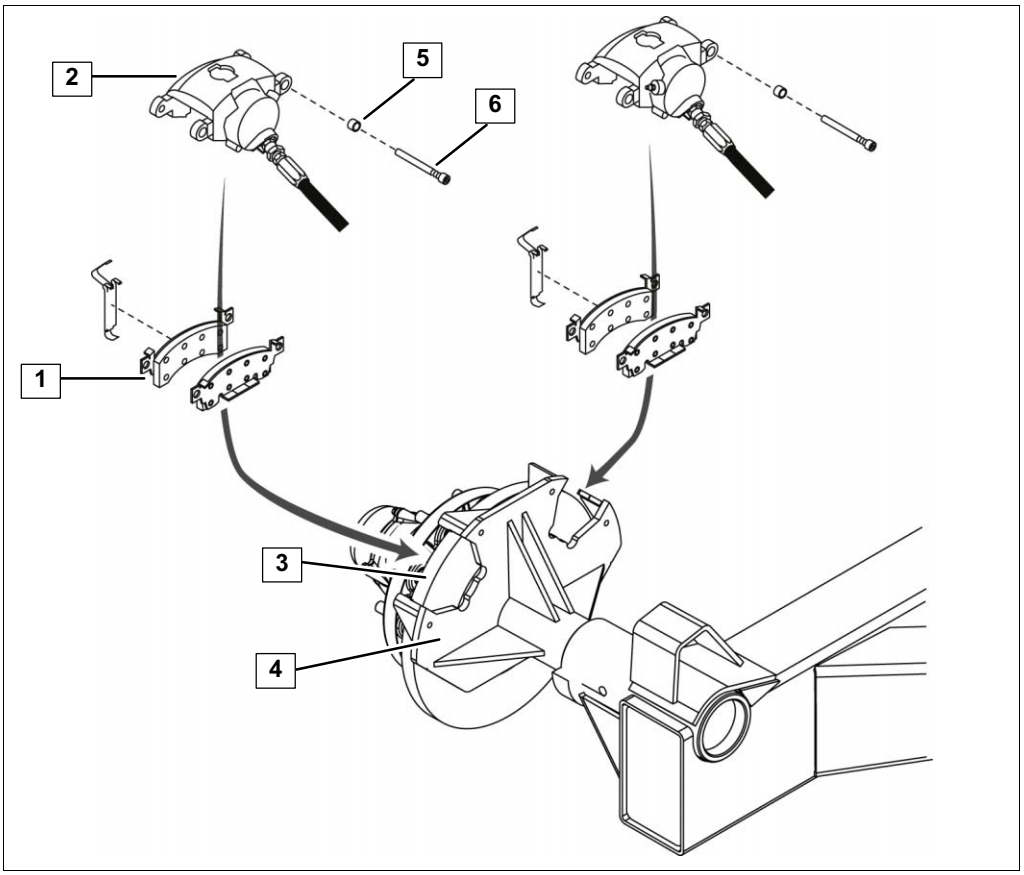
Warning!
Do not stand under suspended loads. Falling loads can cause fatal injuries!

Attention!
To lift wheel hub, use a lifting device with a minimum lifting capacity of 150 lbs [70 kg].



- Apply a thin layer of grade 2 PRECISION^{TM} XL5 MOLY EP2 grease (or equivalent) in the hub receptacle (1);
- Lift the hub. See Detail A;
- Insert the hub shaft (2) in the hub receptacle (1);
- Align the holes of the shaft (2) with the holes of the hub receptacle (1);
- Insert the bolt (3) through the holes. Place the bolt head toward the front of the spreader;
- Secure with a locknut (4). Tighten;
- Repeat these steps for each hub.

5.5.2 Brake parts assembly



- Place the brake pads (1) in the caliper (2) and position the assembly on the brake disk (3);
- Align the holes of the caliper (2) with the holes of the support (4);
- Insert a sleeve (5) in each hole of the caliper (2);
- Insert a bolt (6) in each hole of the caliper (2). Tighten;
- Install two calipers per wheel;
- Repeat these steps for each wheel.

5.5.3 Hydraulic braking system calibration

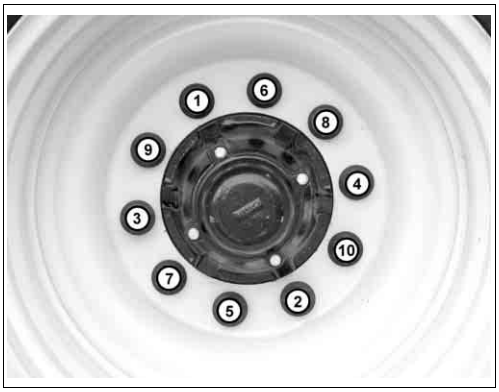
Refer to section Maintenance - Calibrate the hydraulic braking system.

5.6 Wheel assembly

Warning!
Do not stand under suspended loads. Falling loads can cause fatal injuries!

Attention!
To lift the wheels, use a lifting device with a minimum lifting capacity of 1000 lbs [500 kg].

- Check tire air pressure;
- Lift the wheel and position it on the wheel hub;
- Install ten wheel nuts and tighten to 375 ft-lb [508 NM] following the sequence illustrated;
- After tightening all nuts, double check the torque for safety;
- Repeat these steps for each wheel;



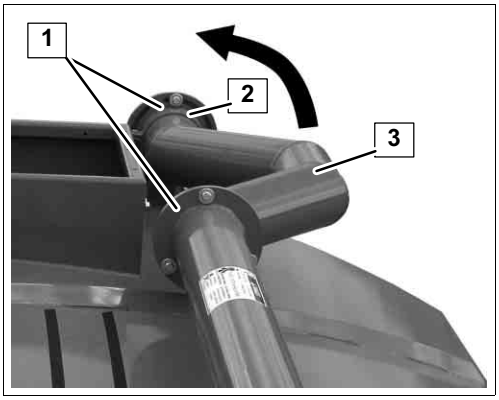
- Lower the spreader on the ground;
- Place wheel chocks on a wheel, one at the front and the other at the back of the wheel, to secure the spreader.

Refer to section Technical data - Tire specifications.

5.7 Anti-siphon assembly

Warning!
Beware of potential falls: always walk on the nonslip band installed on the product.

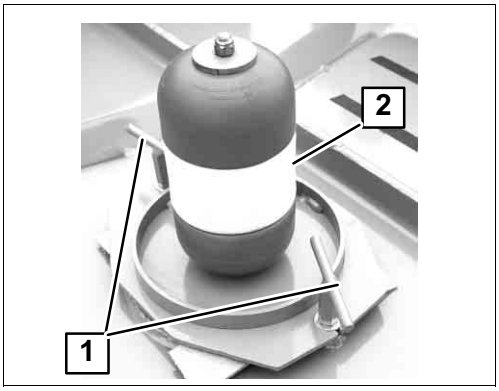
- Loosen the bolts holding the disc flanges (1) and the collar (2);
- Turn the anti-siphon (3) upward;
- Tighten bolts holding the disc flanges (1) and the collar (2).



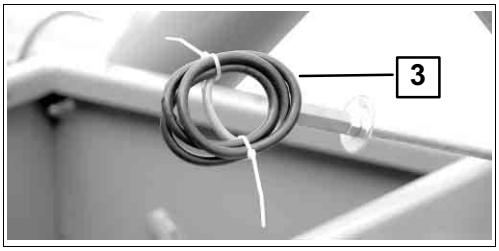
5.8 Top fill indicator assembly

Warning!
Beware of potential falls: always walk on the nonslip band installed on the product.

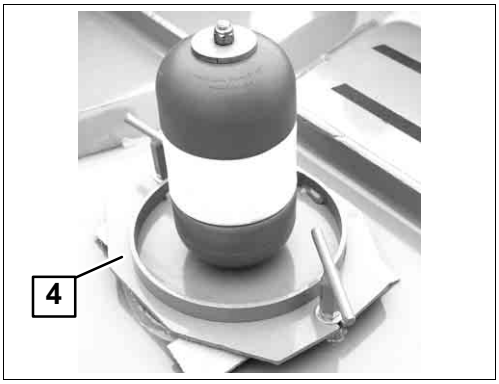
- Unscrew both handles (1);
- Remove the top fill indicator (2) from the opening;



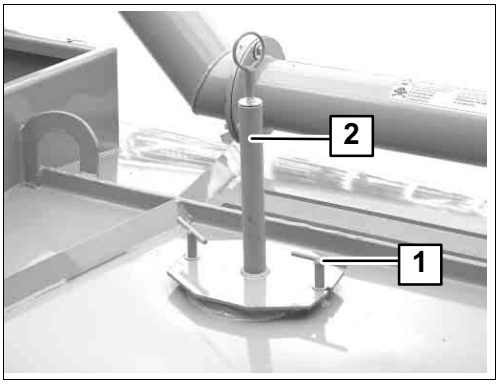
- Remove the O-ring (3) fastened to the top fill indicator;



- Place the O-ring over the lid (4) of the top fill indicator;



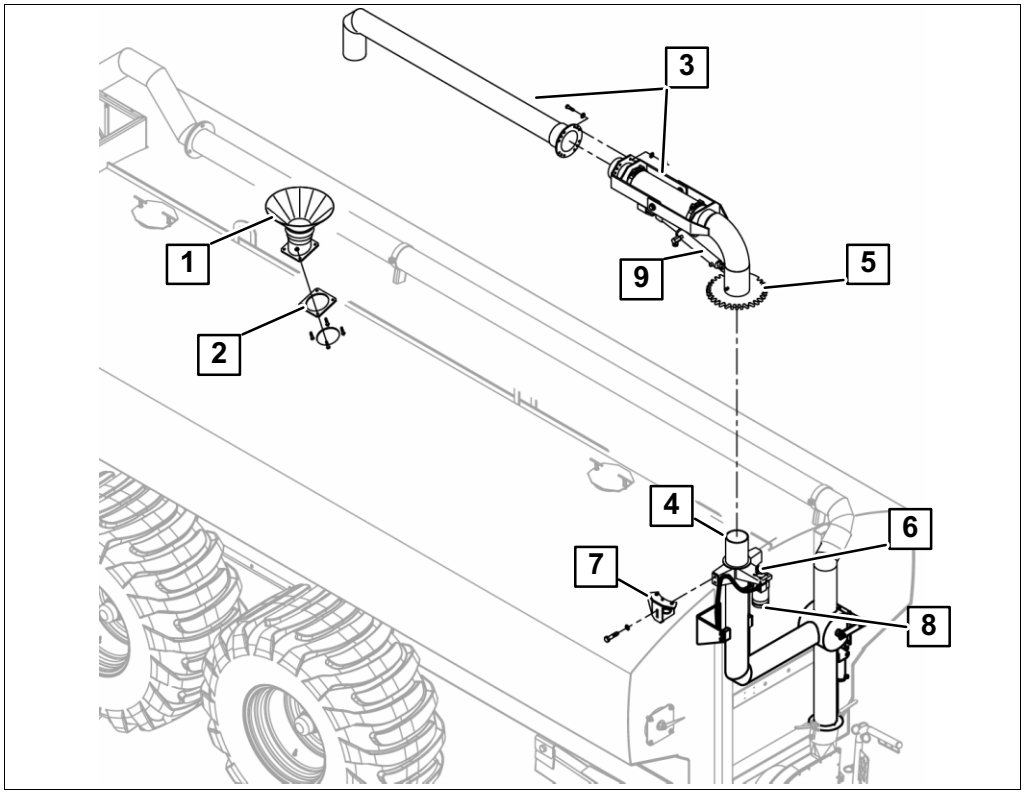
- Turn the top fill indicator (2) upside down and insert it into the spreader tank;
- Screw both handles (1) to maintain the assembly.



5.9 Nursing kit assembly (optional)

Warning!
Beware of potential falls: always walk on the nonslip band installed on the product.

Attention!
To lift the nursing kit assembly, use a lifting device with a minimum lifting capacity of 1450 lbs [650 kg].

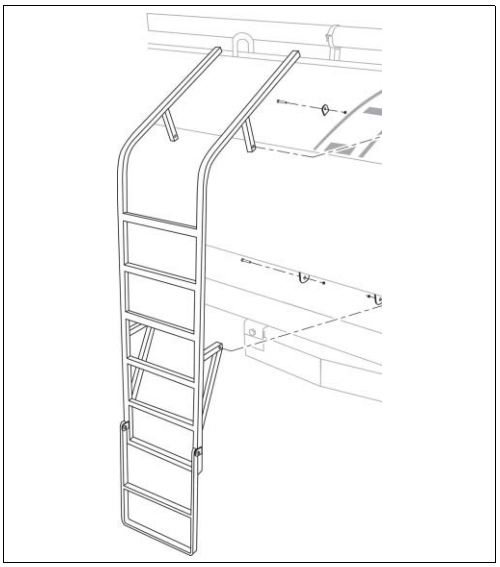


EL54 model shown

- Install the transfer pipe receptacle (1) on top of the spreader using four locknuts, flat washers and a rubber gasket (2);
- Assemble the transfer pipe (3) using bolts, flat washers and locknuts. Tighten all nuts;
- Apply grade 2 PRECISION™ XL5 MOLY EP2 grease (or equivalent) on the pipe end (4) to facilitate the transfer pipe assembly (3);
- Lift the transfer pipe assembly (3) using an appropriate lifting device. Position it over the pipe end (4). Slowly lower the transfer pipe assembly (3) to lean over the pipe end (4) so that the pipe gear (5) fits into the motor gear (6);
- Assemble two retaining brackets (7) on the vertical pipe using bolts and lock washers;
- Connect the hydraulic hoses to the hydraulic motor (8) and to the hydraulic cylinder (9).

5.10 Ladder assembly (optional)

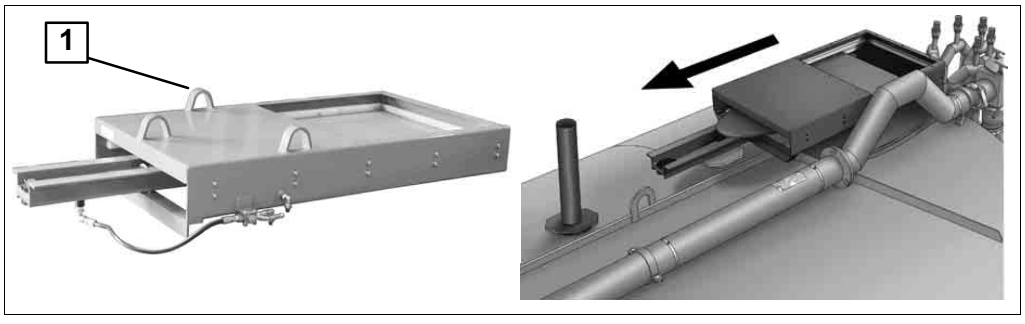
- Install the ladder on the spreader using four bolts and locknuts.



5.11 Hydraulic door on fill opening assembly (optional)

Warning!
Beware of potential falls: always walk on the nonslip band installed on the product.

Attention!
To lift the hydraulic door on fill opening, use a lifting device with a minimum lifting capacity of 375 lbs [165 kg].



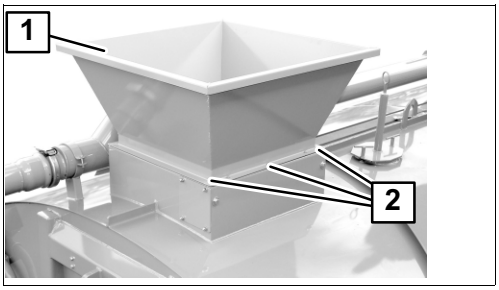
- Lift the hydraulic door by the lifting rings (1) using safety chains. Make sure the door is open before lifting it to ease installation;
- There are two hydraulic hoses installed on top of the tank. Connect one of the hydraulic hoses to the ball valve located on the door frame. Connect the second hose to the cylinder;
- Bolt the door using provided hardware;
- Open the ball valve located on the door frame.

5.12 Hopper assembly (optional)

Warning!
Beware of potential falls: always walk on the nonslip band installed on the product.

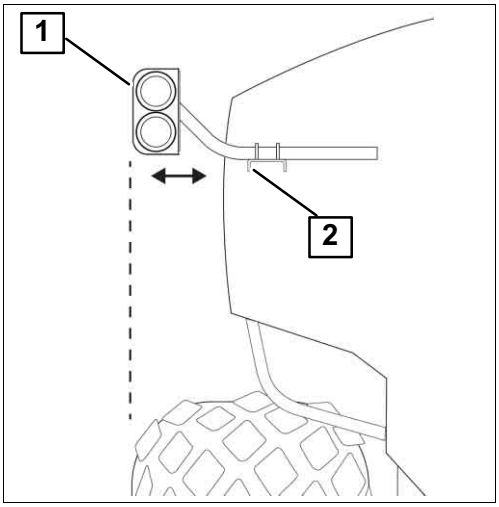
Attention!
To lift the hopper, use a lifting device with a minimum lifting capacity of 125 lbs [50 kg].

- Lift the hopper (1) and position it on the spreader fill opening;
- Install the hopper using 12 bolts (2) and locknuts. Tighten.



5.13 Rear lights assembly (optional)

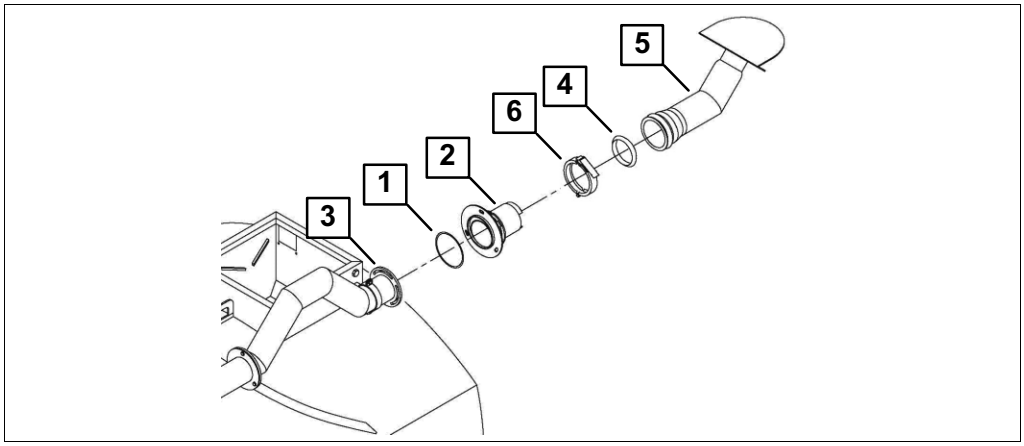
- Install the light support (1) on the fixing plate (2);
- Align the light with the spreader wheel as illustrated hereafter;
- Fix the light support (1) to the fixing plate (2) using "U" bolts.



5.14 Spreading nozzles assembly (optional)

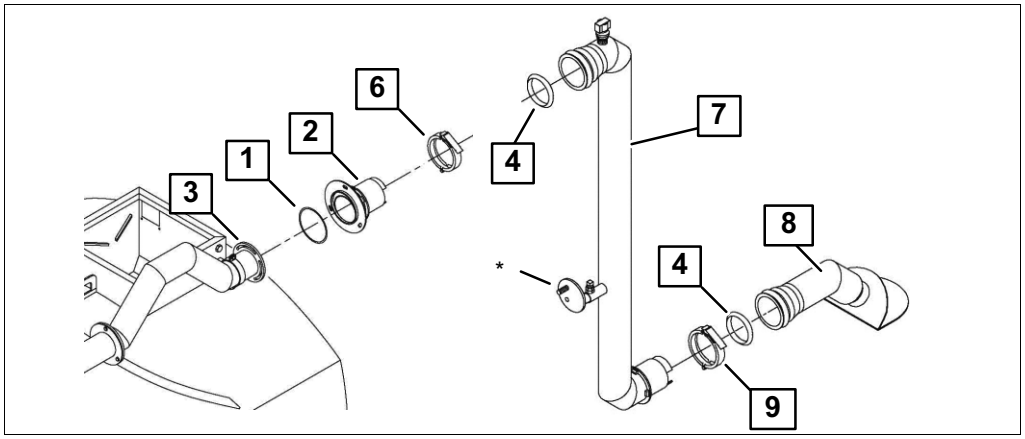
5.14.1 Nozzles without manual directional valve

Top nozzle assembly



- Place the O-ring (1) around the lid of the adapter (2);
- Place the adapter (2) on the anti-siphon end (3). Bolt the assembly using provided hardware;
- Insert the seal (4) inside the spreading nozzle (5);
- Apply grade 2 PRECISION^{TM} XL5 MOLY EP2 grease (or equivalent) on the seal (4);
- Slide the spreading nozzle (5) over the adapter end (2) until it reaches the welded ring on the adapter;
- Install a circle lock clamp (6) over the junction of the spreading nozzle and of the adapter.

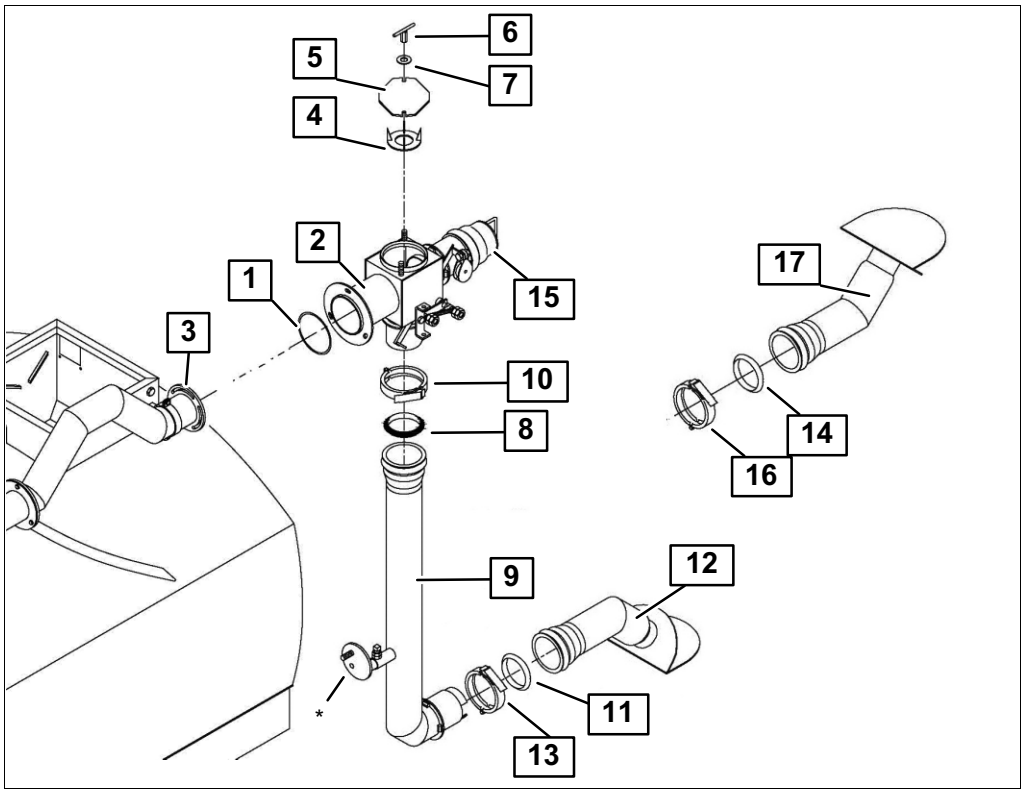
Bottom nozzle assembly



*	Bolted to the spreader

- Place the O-ring (1) around the lid of the adapter (2);
- Place the adapter (2) on the anti-siphon end (3). Bolt the assembly using provided hardware;
- Insert the seal (4) inside the vertical tube (7);
- Apply grade 2 PRECISION^{TM} XL5 MOLY EP2 grease (or equivalent) on the seal (4);
- Slide the vertical tube (7) over the adapter end (2) until it reaches the welded ring on the adapter;
- Install a circle lock clamp (6) over the junction of the vertical tube and of the adapter;
- Insert the seal (4) inside the spreading nozzle (8);
- Apply grade 2 PRECISION^{TM} XL5 MOLY EP2 grease (or equivalent) on the seal (4);
- Slide the spreading nozzle (8) over the vertical tube end (7) until it reaches the welded ring on the vertical tube;
- Install a circle lock clamp (9) over the junction of the vertical tube and of the spreading nozzle.

5.14.2 Nozzles with manual directional valve



*	Bolted to the spreader

Manual directional valve assembly

- Place the O-ring (1) around the lid of the adapter (2);
- Place the adapter (2) on the anti-siphon end (3). Bolt the assembly;
- Place a restrictor (4) inside the top opening of the directional valve;
- Position a cap (5) on the restrictor. Secure it using ”T” handles (6) and flat washers (7).

Bottom nozzle assembly

- Insert the seal (8) inside the vertical tube (9);
- Apply grade 2 PRECISION^{TM} XL5 MOLY EP2 grease (or equivalent) on the seal (8);
- Slide the vertical tube (9) on the bottom adapter (2) until it reaches the adapter welded ring;
- Install a circle lock clamp (10) on the junction of the vertical tube and adapter;
- Insert the seal (11) into the spreading nozzle (12);
- Apply grade 2 PRECISION^{TM} XL5 MOLY EP2 grease (or equivalent) on the seal (11);
- Slide the spreading nozzle (12) over the vertical tube end (9) until it reaches the welded ring on the vertical tube;
- Install a circle lock clamp (13) on the vertical tube and spreading nozzle junction.

Safety cap assembly

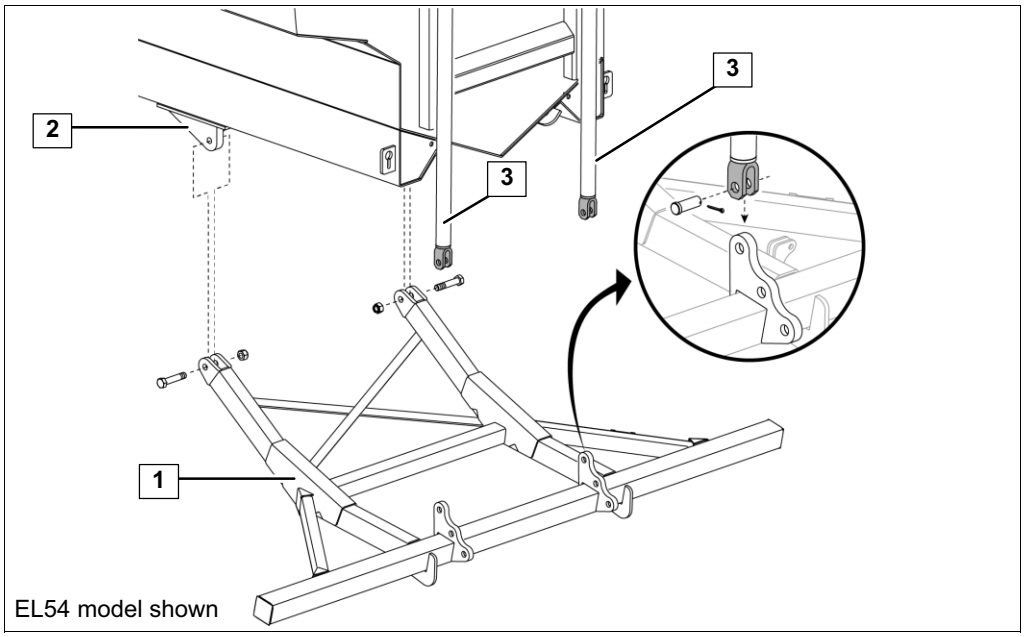
- Insert a seal (14) inside the end cap (15);
- Apply grade 2 PRECISION^{TM} XL5 MOLY EP2 grease (or equivalent) on the seal (14);
- Slide the end cap (15) on adapter (2) until it reaches the adapter welded ring;
- Install a circle lock clamp (16) on the end cap and the adapter junction.

Top nozzle assembly

- Insert a seal (14) inside the spreading nozzle (17);
- Apply grade 2 PRECISION^{TM} XL5 MOLY EP2 grease (or equivalent) on the seal (14);
- Slide the spreading nozzle (17) on the adapter (2) until it reaches the adapter welded ring;
- Install a circle lock clamp (16) over the junction of the spreading nozzle and of the adapter.

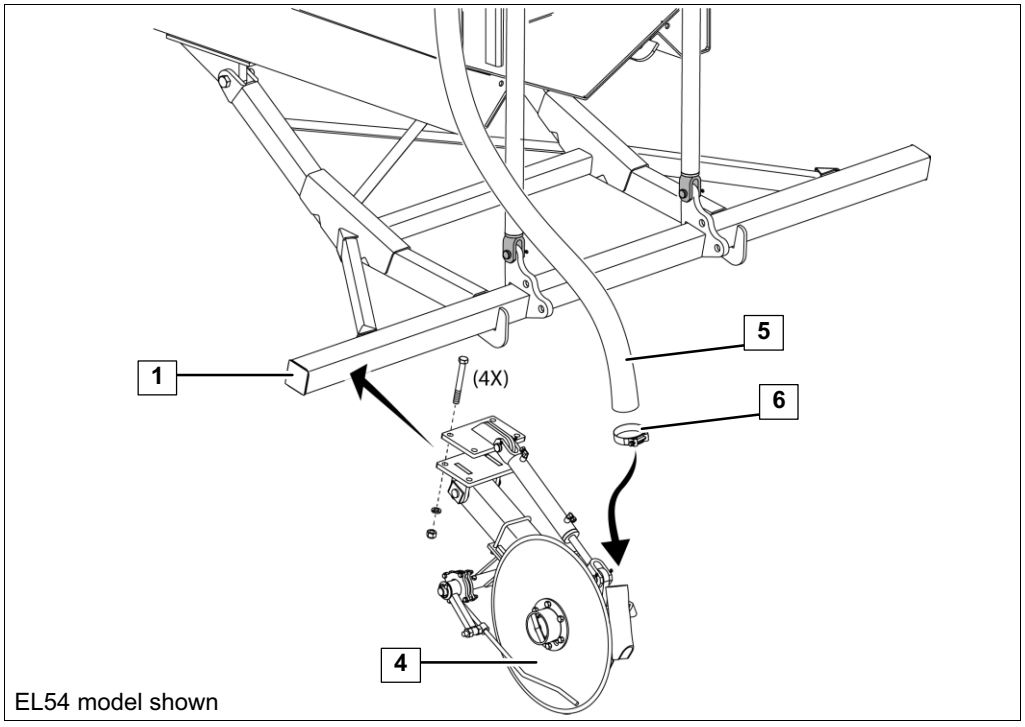
5.15 Tool bar assembly (optional)

5.15.1 Tool bar with 24" hydraulic disc injectors



EL54 model shown

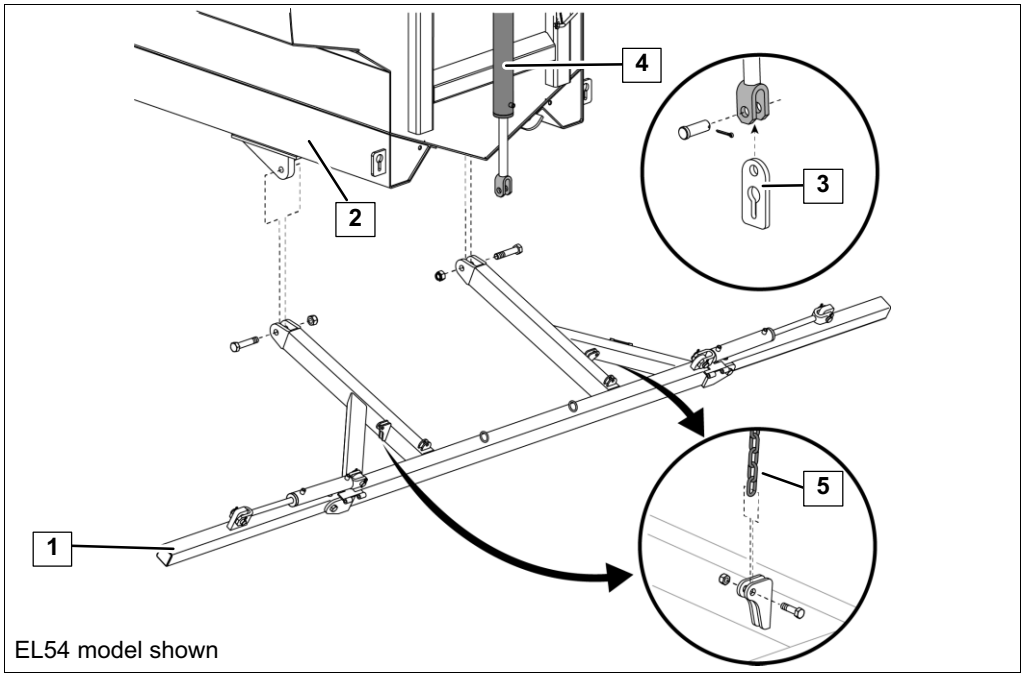
- Bolt the tool bar (1) to the spreader frame (2) using provided hardware;
- Fix the support rods (3) to the tool bar (1);



EL54 model shown

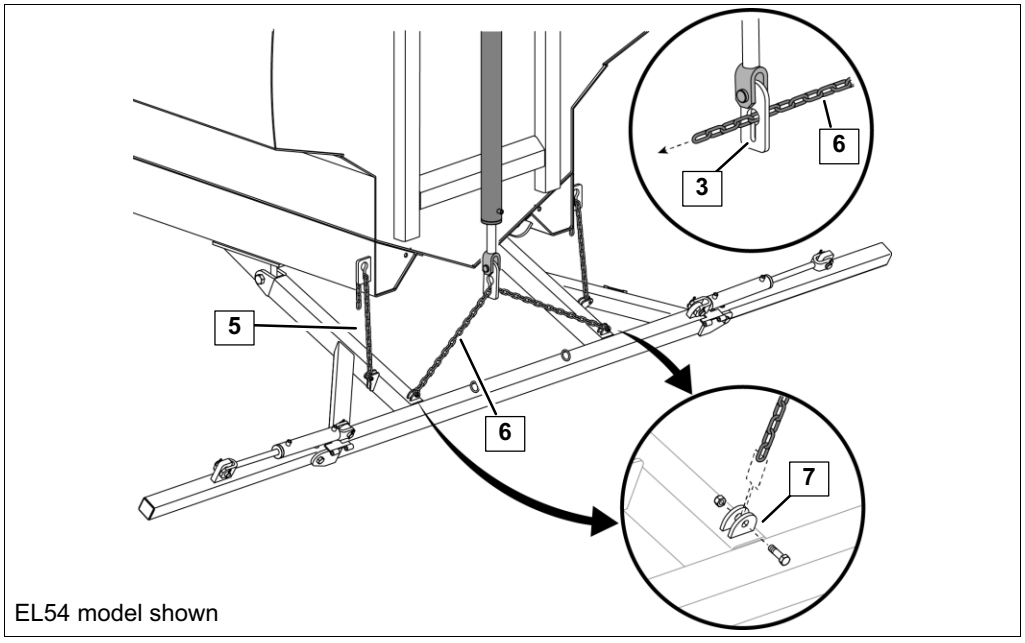
- Install the tools (4) on the tool bar (1);
- Install a hose (5) on each tool using a collar (6);
- Connect hydraulic hoses to the spreader.

5.15.2 Deflectors tool bar



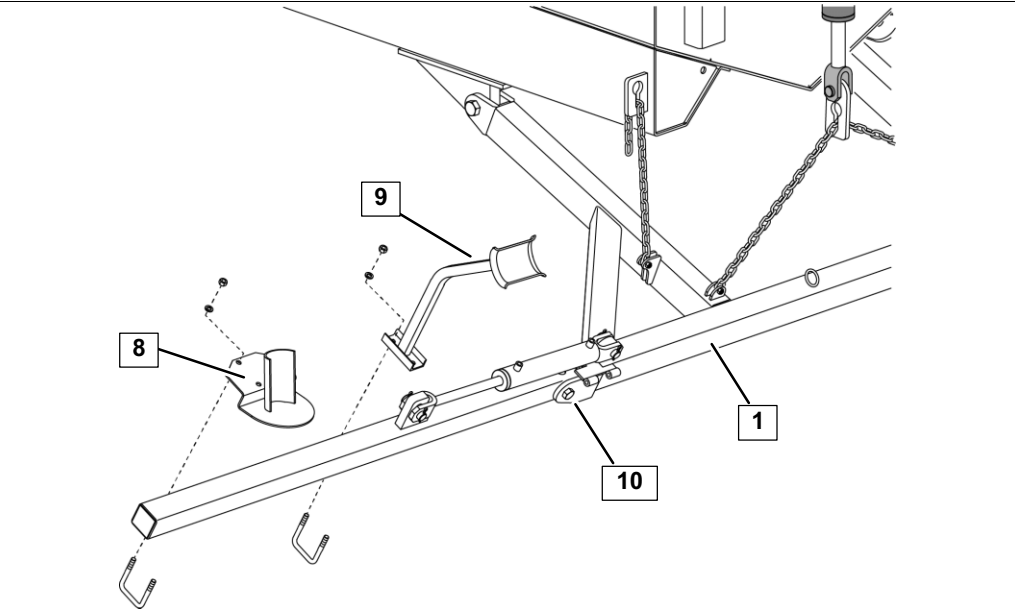
EL54 model shown

- Bolt the tool bar (1) to the spreader frame (2) using provided hardware;
- Fix the plate (3) to the hydraulic cylinder (4);
- Install safety chains (5);



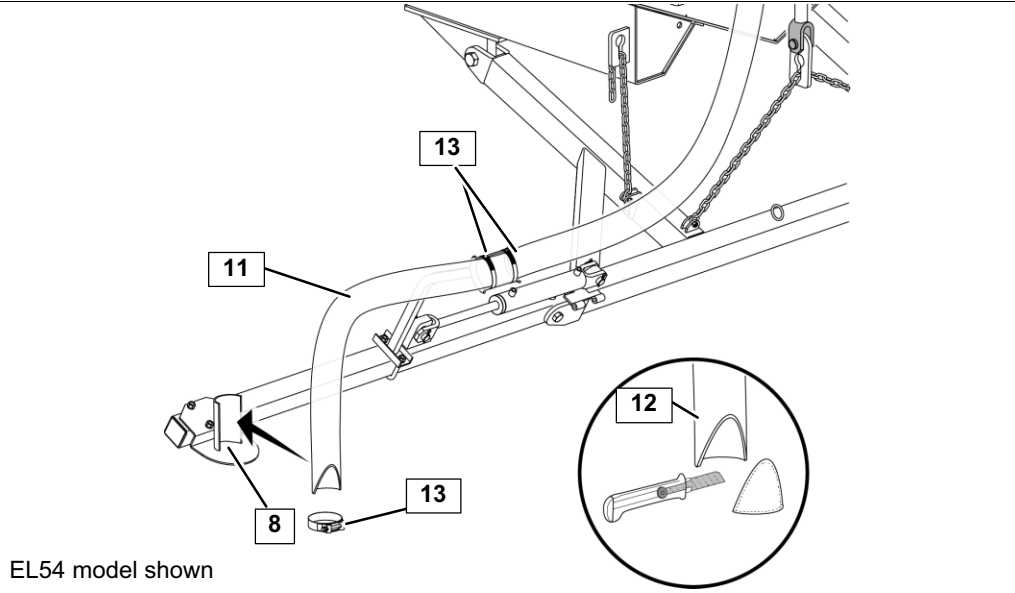
EL54 model shown

- Insert the lifting chains (6) through the plate (3);
- Fix both ends of the lifting chain (6) to the tool bar brackets (7);



EL54 model shown

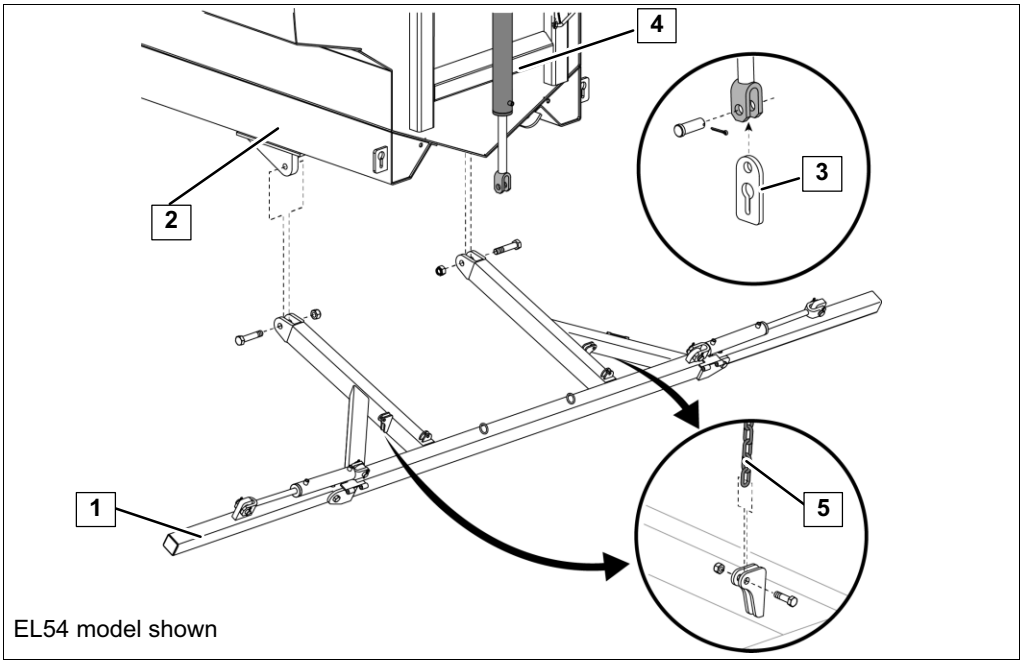
- Install the deflectors (8) on the tool bar (1) using provided hardware;
- Position the hose support (9) halfway between the tool bar end and the hinge (10) on both sides;
- Fix the hose support (9) on the tool bar using provided hardware;



EL54 model shown

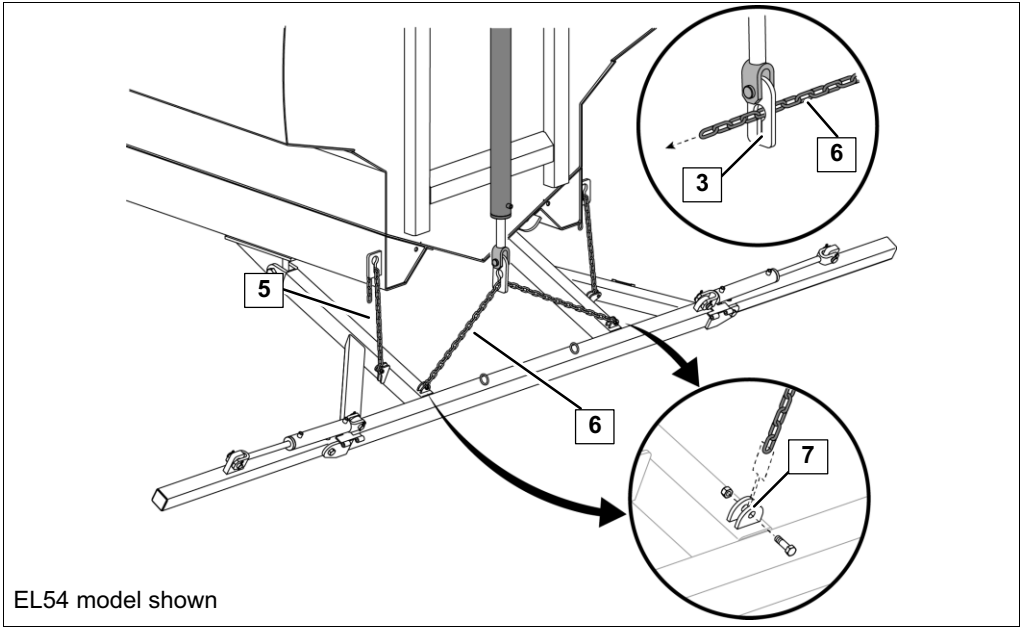
- Install a hose (11) from the spreader distributor to the deflector (8);
- Cut the hose (11) at proper length. The hose (11) should not be tight, keep a loose;
- Cut the hose end as illustrated (12);
- Install the hose end in the deflector (8) and fix it using collars (13);
- Repeat these steps for each deflector;
- Connect hydraulic hoses to the spreader.

5.15.3 Flex drop hoses tool bar



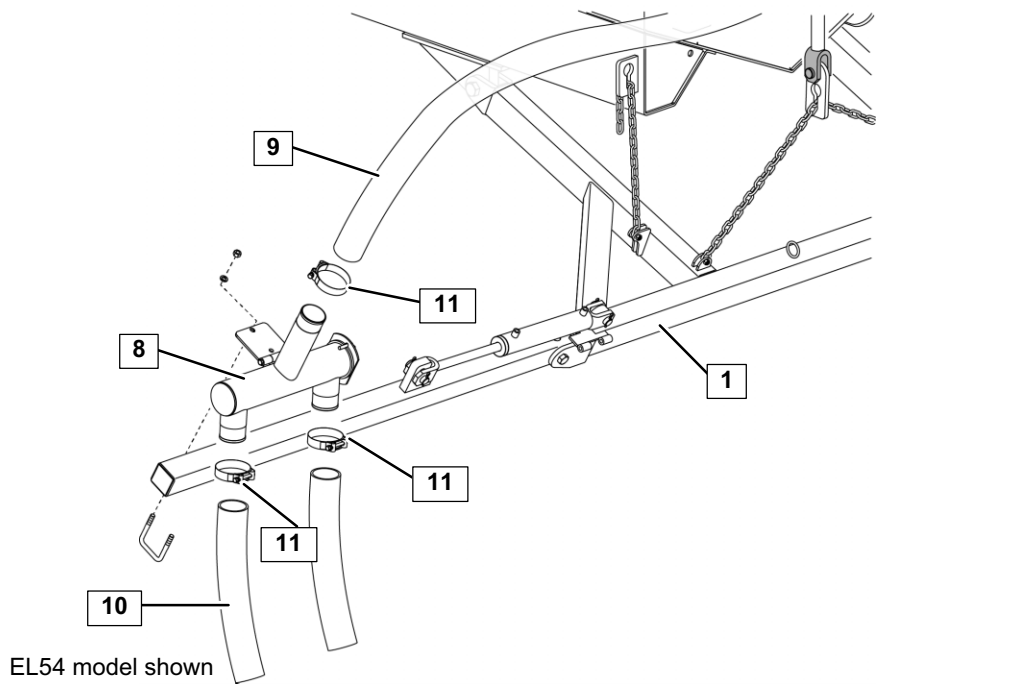
EL54 model shown

- Bolt the tool bar (1) to the spreader frame (2) using provided hardware;
- Fix the plate (3) to the hydraulic cylinder (4);
- Install safety chains (5);



EL54 model shown

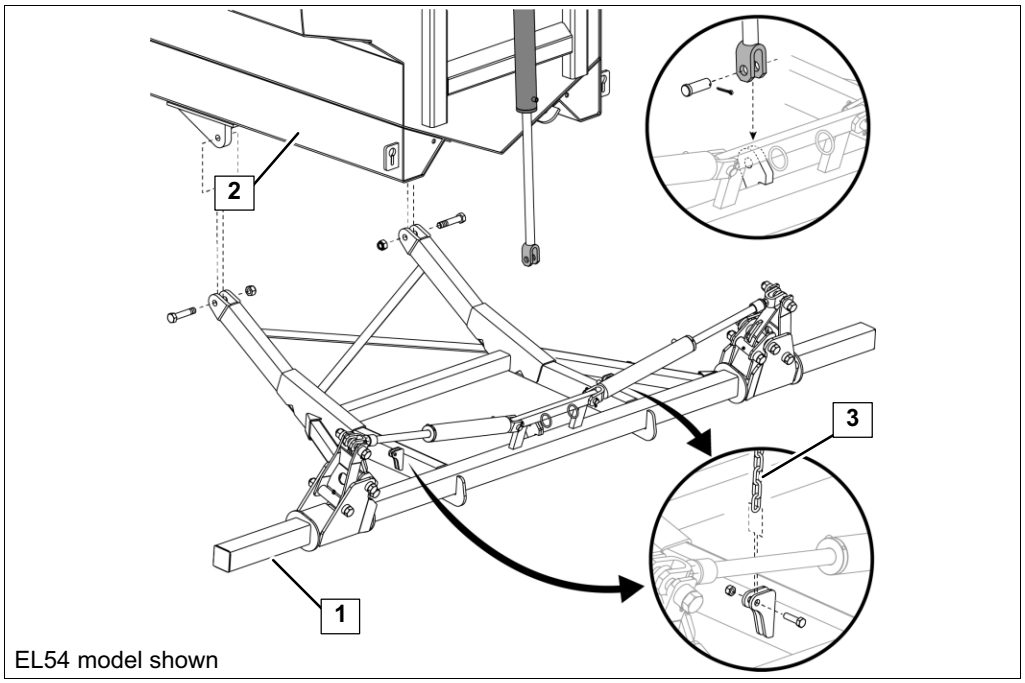
- Insert the lifting chains (6) through the plate (3);
- Fix both ends of the lifting chain (6) to the tool bar brackets (7);



EL54 model shown

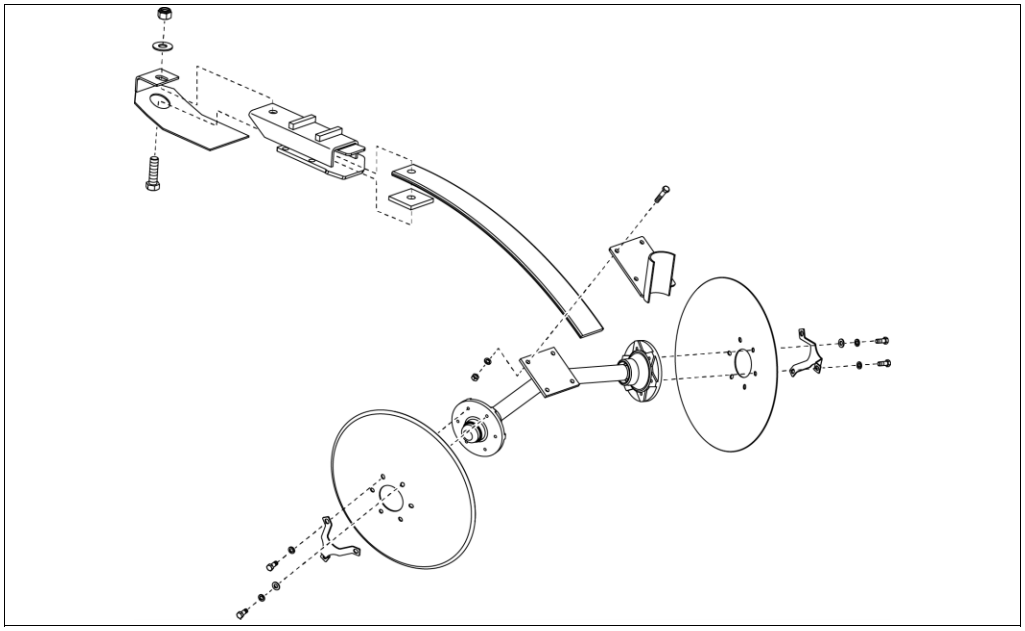
- Install the tools (8) on the tool bar (1) using provided hardware;
- Install a hose (9) from the spreader distributor to the tool (8);
- Cut the hose (9) at proper length. The hose (9) should not be tight, keep a loose;
- Fix the hose (9) to the tool (8) using a collar (11);
- Cut hose ends (10) at desired length for each tool (8);
- Fix the hose ends (10) to the tool (8) using collars (11);
- Repeat these steps for each tool (8);
- Connect hydraulic hoses to the spreader.

5.15.4 Tool bar with 22" concave disc incorporators

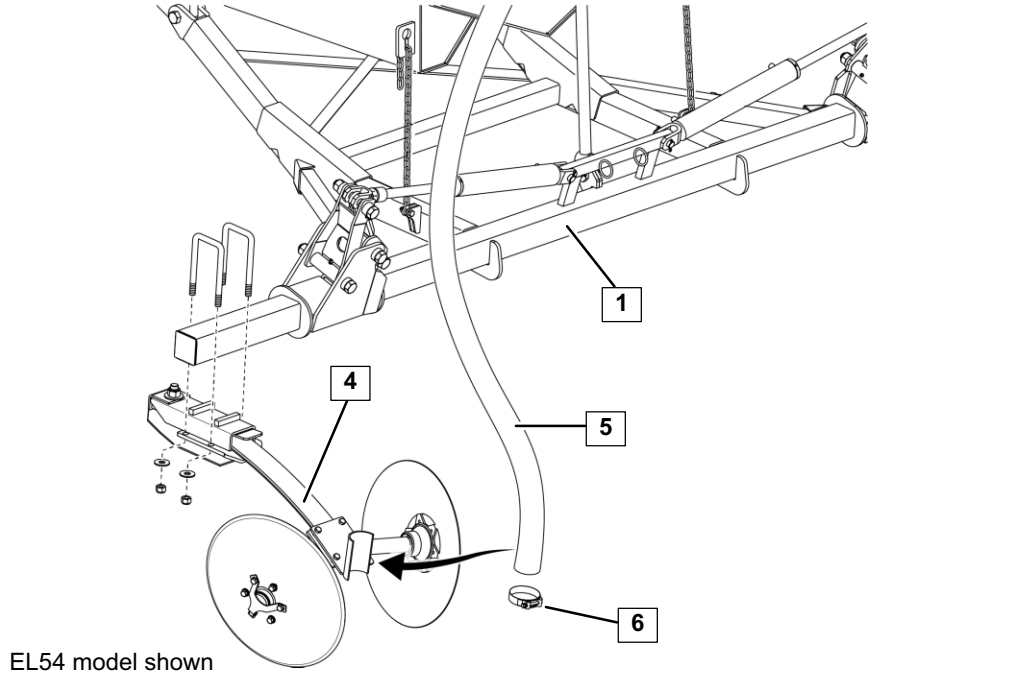


EL54 model shown

- Bolt the tool bar (1) to the spreader frame (2) using provided hardware;
- Connect the hydraulic cylinder to the tool bar (1);
- Install safety chains (3);



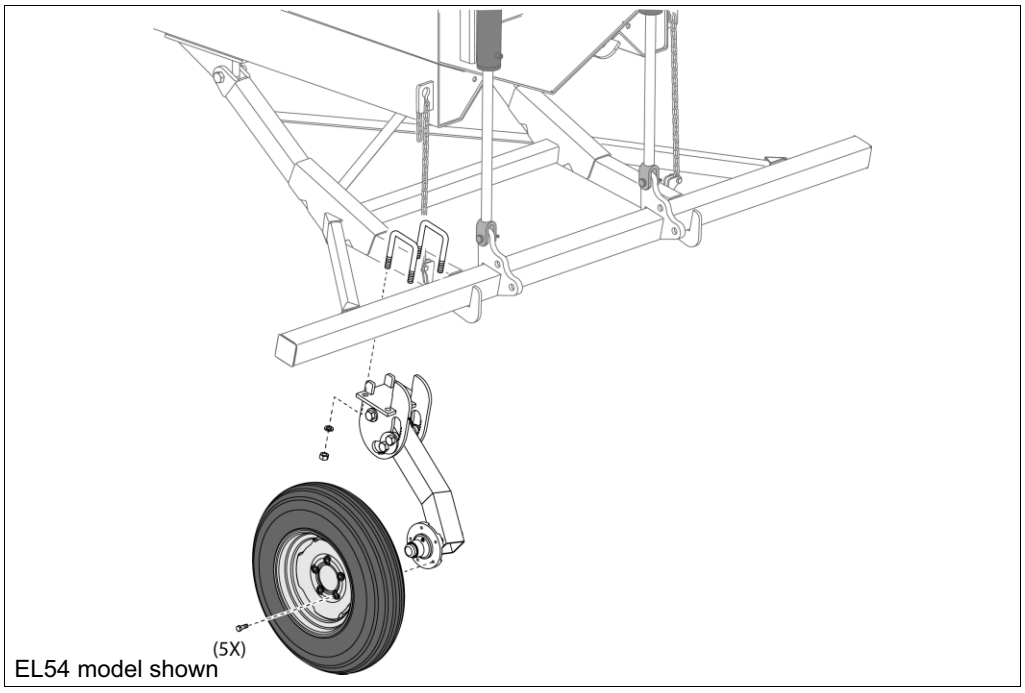
- Assemble the tool as illustrated above;



EL54 model shown

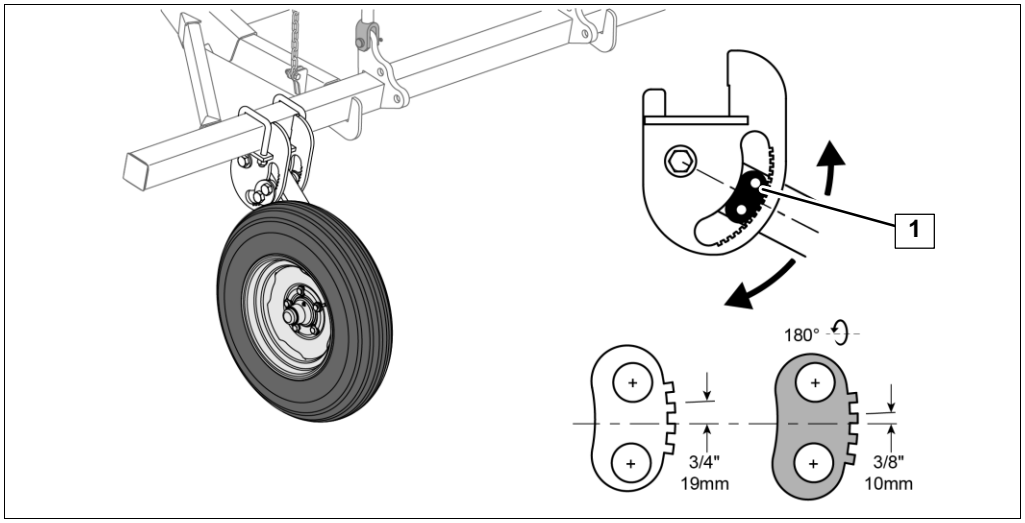
- Install the tools (4) on the tool bar (1);
- Install a hose (5) from the spreader distributor to the tool (4);
- Cut the hose (5) at proper length. The hose (5) should not be tight, keep a loose;
- Fix the hose (5) to the tool (4) using a collar (6);
- Repeat these steps for each tool (4);
- Connect hydraulic hoses to the spreader.

5.15.5 Gauge wheel (if applicable)



EL54 model shown

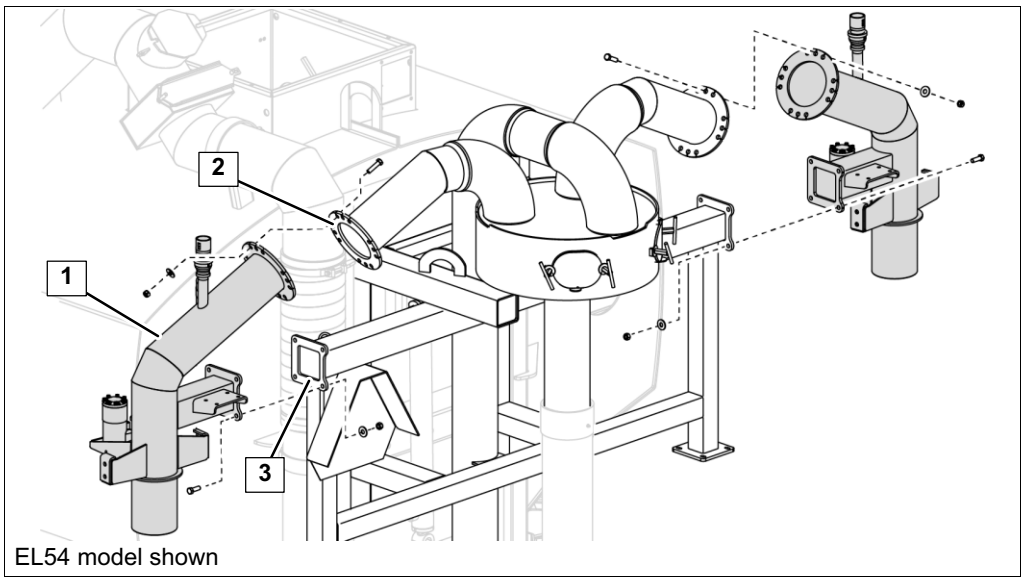
- Fix the gauge wheel on the tool bar as illustrated above using provided hardware;



- To adjust the gauge wheel height, remove the locking plate (1) to unlock the wheel. Lower the tool bar to the desired height. Put the locking plate back in place to lock the wheel.

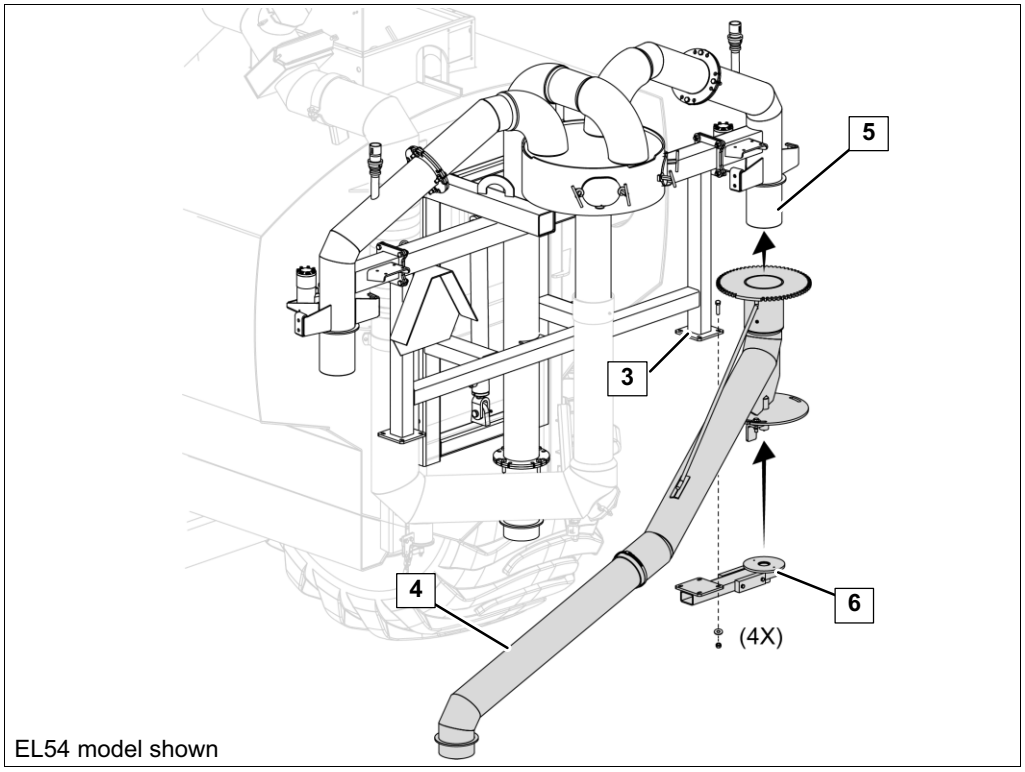
Note!
Depending on the locking plate installation side, the adjustment can be of ¾" or ⅜" between each tooth.

5.15.6 3 deflectors 38 ft tool bar



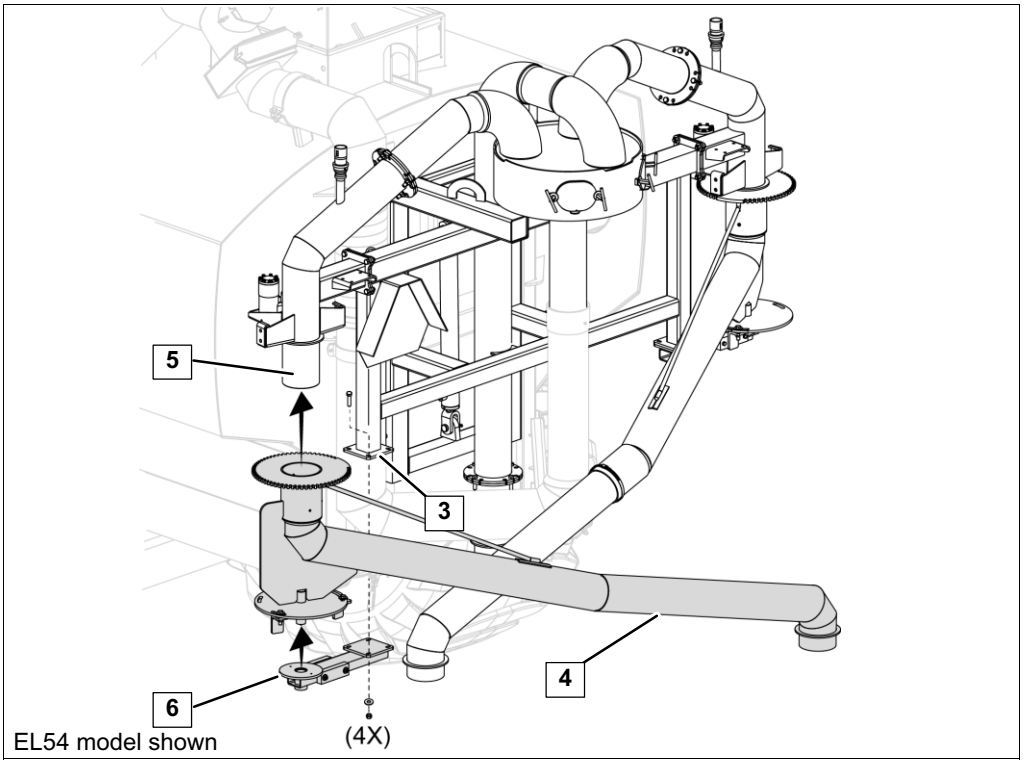
EL54 model shown

- Apply silicone on flange (2);
- Fix the part (1) to the flange (2) and to the tool bar frame (3), on both sides, using provided hardware;



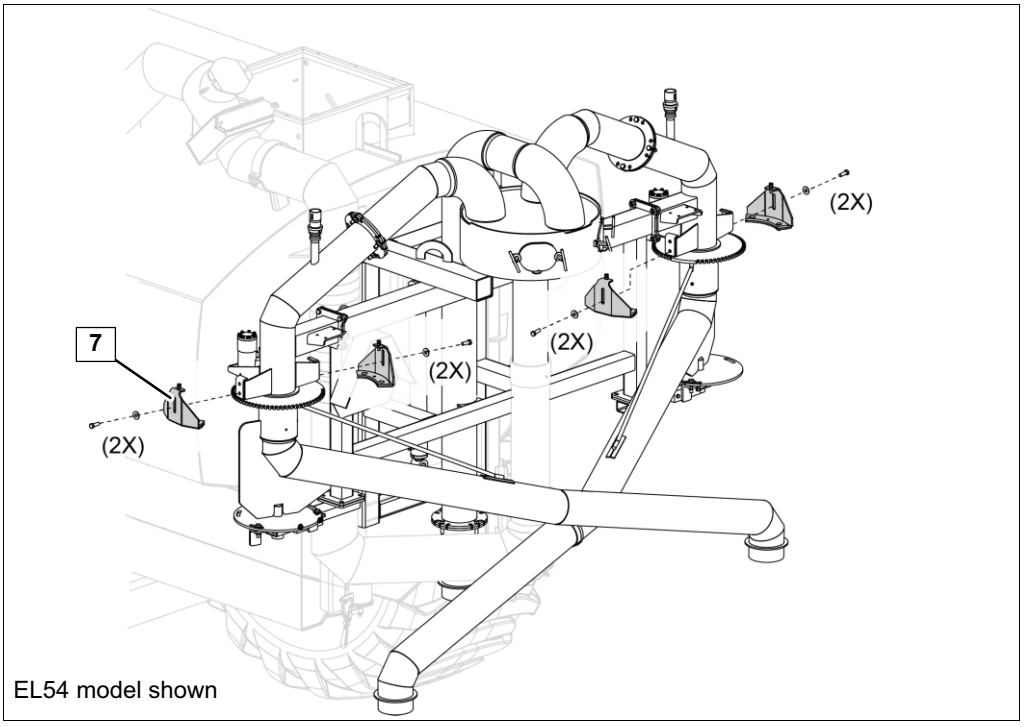
EL54 model shown

- Apply grade 2 PRECISION™ XL5 MOLY EP2 grease (or equivalent) on the part (5);
- Insert the arm (4) over the part (5);
- Install the pivot support (6) on the arm (4) then fix the pivot support (6) to the tool bar frame (3);



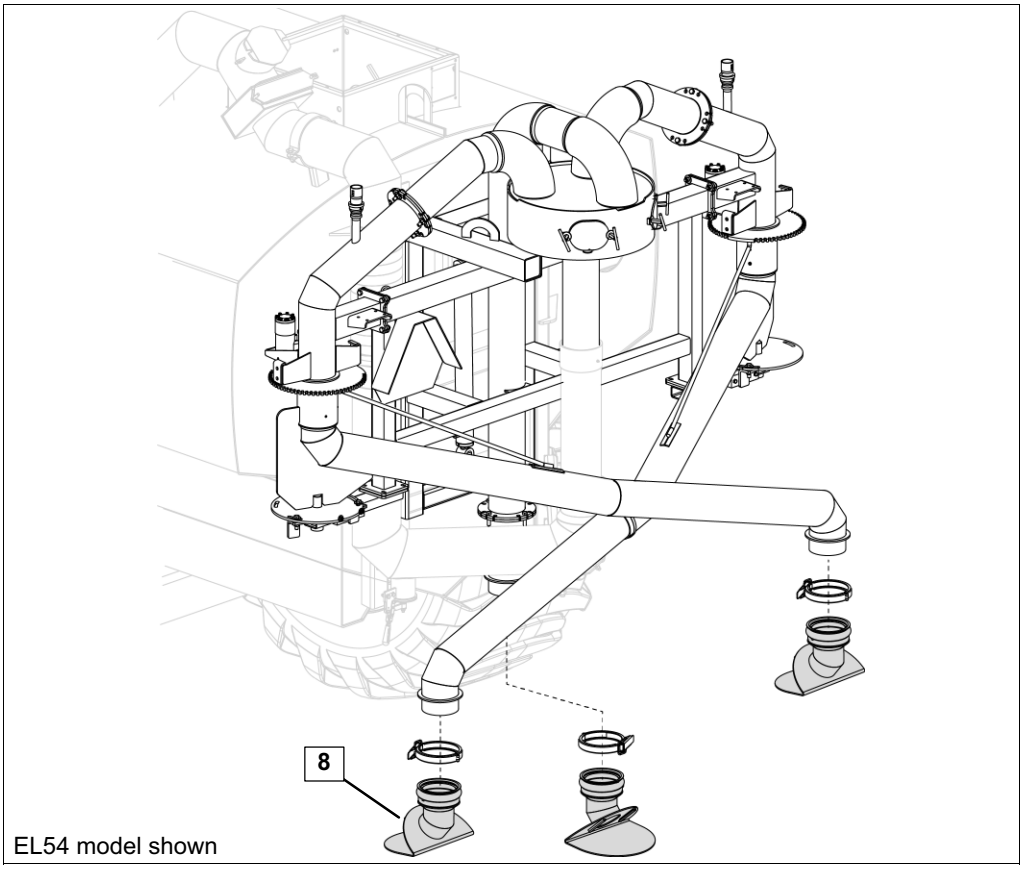
EL54 model shown

- Apply grade 2 PRECISION™ XL5 MOLY EP2 grease (or equivalent) on the part (5);
- Insert the arm (4) over the part (5);
- Install the pivot support (6) on the arm (4) then fix the pivot support (6) to the tool bar frame (3);



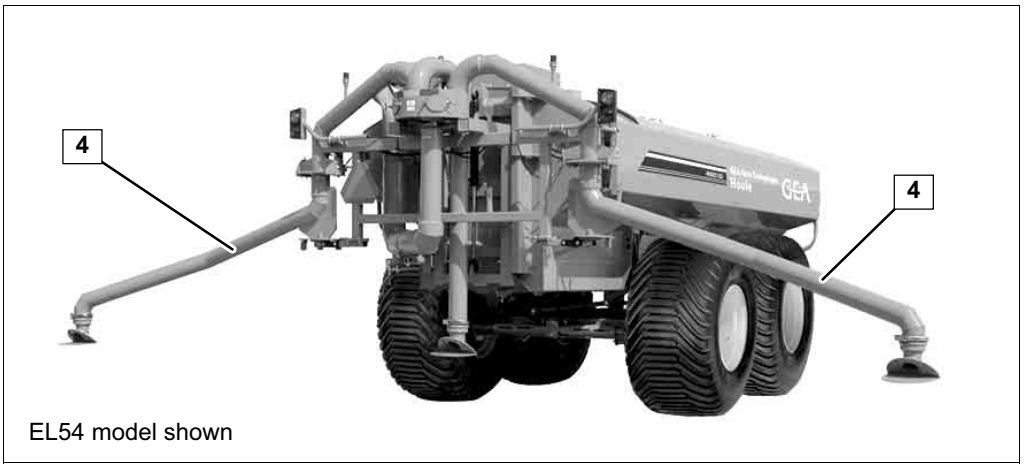
EL54 model shown

- Install the retaining fixtures (7), on both sides, using provided hardware;



EL54 model shown

- Install the deflectors (8) as illustrated above using provided hardware;
- Lubricate all greasing points on the tool bar using grade 2 PRECISION^{TM} XL5 MOLY EP2 grease (or equivalent);



EL54 model shown

- Open each arm (4) manually until the stopper is reached;
- Start hydraulic motors to close the arms (4).

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.

Read the section Safety - Personnel qualifications.

6.2 Safety instructions for initial commissioning

Warning!
Do not start this product until the initial commissioning checklist is completed.

The first start steps intend to test the product in order to validate its functionality and efficiency before handing it over to the customer. Therefore, the dealer along with the customer must operate the product as well as the operating elements.

6.3 Initial commissioning checklist

This checklist must be completed by the dealer and the customer to validate that the product is assembled and/or installed according to the manufacturer's instructions and that it is safe for use.

> ☞ **Note!**
> Additional information necessary to complete the checklist can be found in this instruction manual.

General	**DONE**	**N/A**
The owner received the instruction manual from the dealer and commits to read it.		
The owner is instructed by the dealer on how to operate and maintain the product.		
The safety guard/grid and safety labels are installed.		
The signal lights are operational.		
The lubrication points are lubricated.		
The oil levels are adequate.		
All bolts are torqued.		
All drains are closed.		
All connections are secured.		
A visual inspection is performed to ensure there are no leaks, signs of distortion or defective parts.		
The wheel nuts are tightened at correct torque.		
The tires are inflated at appropriate pressure.		
The tractor draw bar is adjusted to minimum length while respecting the PTO limitations.		
The spreader impeller matches the tractor RPM.		
The owner is instructed on the PTO driveline instructions.		
The spare safety shear bolts are removed from the PTO guards.		
The anti-siphon is in the upright position.		
The owner is instructed on how to adjust the spreading flow rate using the PTO, the flow regulator, the restriction plate, the directional valve and understands how to use the spreading chart.		
The black film behind the spreader is removed.		

Hydraulic brakes	DONE	N/A
The hydraulic brakes are operational.		
The owner is instructed on how to verify and adjust the master cylinder.		
The owner is instructed on how to operate the hydraulic braking system.		

Options	DONE	N/A
The owner is instructed on how to operate the nursing kit.		
The owner is instructed on how to operate the in-tank recirculation kit.		
The owner is instructed on how to operate the hydraulic door on fill opening.		
The owner is instructed on how to operate the tool bar.		
The rear lights electrical connectors are connected to the tractor.		
The solenoid valve selector switch is connected to the tractor 12 VDC outlet. Hose connection is done.		

☞ **Note!**
The dealer and the owner must fill the warranty registration form when the checklist is completed.

Dealer's signature: _____

Owner's signature: _____

Date: _____

6.4 Checks after initial commissioning

Note!
The initial commissioning of this product can reduce the tractor hydraulic oil level. Follow the recommendations of the tractor manufacturer to ensure proper hydraulic oil level.

The owner must make sure that:

- there are no damaged, worn, defective parts or signs of distortion;
- the safety devices such as guards, grids, covers, chains, etc. are in perfect working condition and remain in place to ensure safety;
- the lubricants such as grease, oil, etc. are at an appropriate level;
- there are no leaks;
- all bolts are tight. Refer to section Technical data - Bolt torque chart;
- the product works perfectly;
- tires are inflated at appropriate pressure.

6.5 Handing over to the customer

Hand over warranty registration form

The warranty registration form must be completed and signed by the customer and the dealer. The warranty registration form must be returned to GEA Farm Technologies Canada Inc. to validate the warranty.

7 Operating

7.1 Special personnel qualification required for operation

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

Read the section Safety - Personnel qualifications.

7.2 Safety instructions for operation

Warning!
Tip over hazard when traveling on a hilly land. Adapt the tractor driving to the land conditions.

Warning!
Do not tow this product at a speed exceeding 25 mph [40 km/h].

Warning!
Do not operate this product if a person is on top.

Read the section Safety.

7.3 Checks before operation

- The safety devices such as guards, grids, covers, chains, labels, etc. remain in place to ensure safety;
- Lubricants such as grease, oil, etc. are at appropriate level. To locate the grease points, refer to section Appendix - Label position;
- The wheel nuts are tightened at correct torque;
- Tires are inflated at appropriate pressure;
- The signal lights are functional;
- The product is in perfect condition. There is no visible damage;
- Only authorized personnel are in the working area of the equipment;
- No unnecessary object or material is located in the working area of the equipment;
- The PTO driveline meets local requirements.

7.4 Connecting the spreader

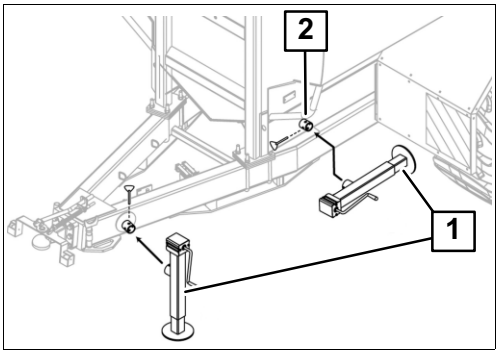
7.4.1 Hitching the spreader

Attention!
Connect the hydraulic hoses properly to ensure safe operation. Refer to section Appendix - Hydraulic diagram.

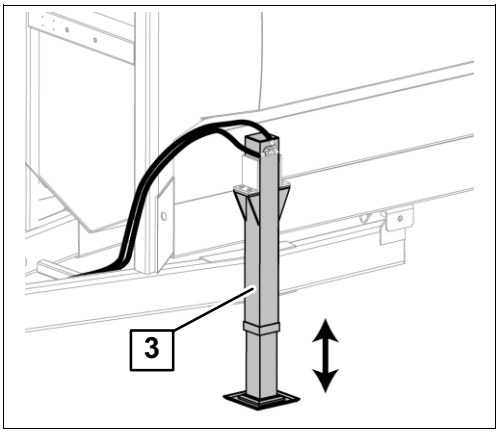
Note!
The tractor draw bar must be adjusted to minimum length.

Note!
The spreader must be towed by the tractor for which it was designed. If changing tractor, refer to Technical data - Performance data - Spreader draw bar inclination section.

- Using the jack (1), position the spreader draw bar to connect the tractor;
- When the spreader is connected, the jack must be placed on the transport support (2);

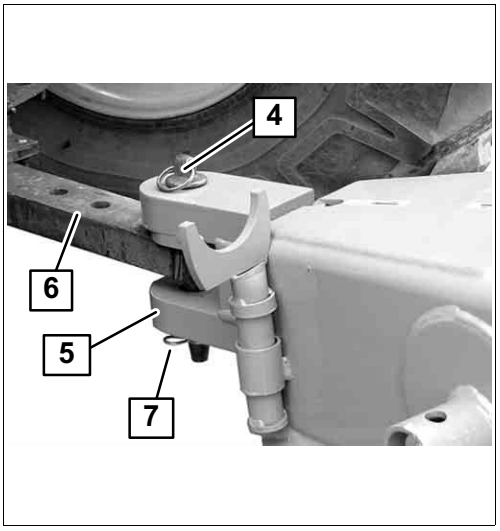


- If a hydraulic jack (3) is used, connect the hydraulic hoses to the tractor and adjust the spreader draw bar height.

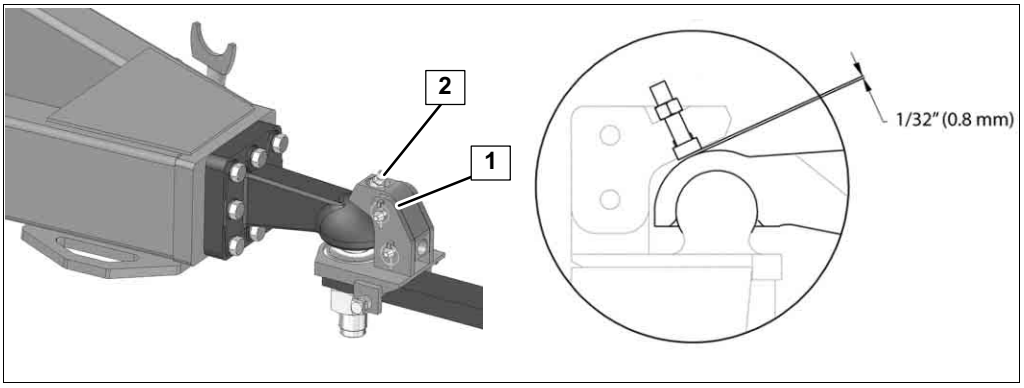


Single / double hitch connection

- Position the tractor to connect its draw bar to the spreader hitch. Double hitch model shown;
- Grease the pin (4) using grade 2 PRECISION™ XL5 MOLY EP2 grease (or equivalent);
- Insert the pin (4) through the spreader hitch (5) and the tractor draw bar (6);
- Secure the assembly with a safety cotter pin (7);
- Turn off the tractor and apply the hand brake.



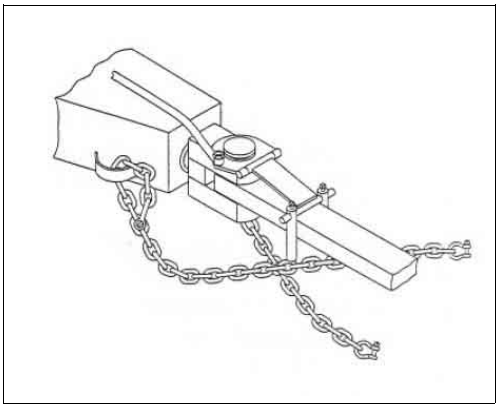
Ball hitch connection



- Lubricate all greasing points using grade 2 PRECISION™ XL5 MOLY EP2 grease (or equivalent);
- Remove the pin (1);
- Position the tractor to connect its draw bar to the spreader hitch;
- Install the pin (1) back in position;
- Perform the adjustment using the bolt and nut (2).

Safety chains connection

- Attach safety chains between the tractor and the spreader draw bar. Follow local regulations;
- Remove the manual jack or retract the hydraulic jack;
- Remove the wheel chocks.



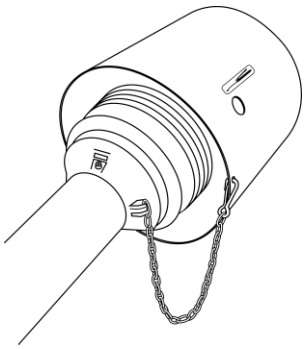
7.4.2 Connecting the PTO driveline

Warning!
Turn off the tractor and apply the hand brake before connecting or disconnecting the PTO driveline.

Refer to the following instructions when the PTO driveline is supplied by GEA otherwise follow the manufacturer's recommendations.

Safety chains (European model only)

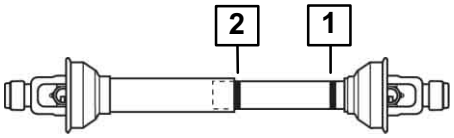
- Safety chains must be in place at all times to prevent the driveline guards from rotating. Replace if damaged;
- Make sure the safety chains do not restrict the driveline movement when operating or transporting the spreader;

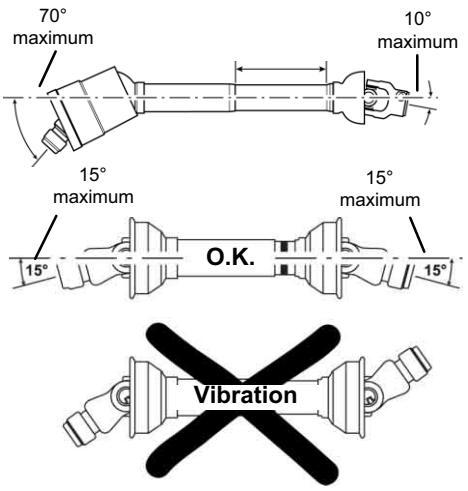


- Never use the safety chains to secure the PTO when disconnected from the tractor.

Maximum extension and retraction

- Always keep the edge of the female guard between the indicators while operating;
- The minimum retraction indicator (1) must never disappear underneath the female guard;
- The maximum extension indicator (2) must never be completely visible.



Maximum angle of PTO joints	
Constant velocity PTO driveline ● One PTO joint must be set at a maximum of 70° angle. The other PTO joint must be set at a maximum of 10° angle. **Standard PTO driveline** ● Both PTO joints must be set at the same angle (maximum 15° angle);	
● Joints must always be directed toward the same side of the driveline.	
Lubrication	
● For universal joints, use a high quality grease formulated for intensive use. Follow the instructions of the PTO manufacturer for proper lubrication.	

7.4.3 Connecting the components

Attention!
Connect the hydraulic and pneumatic hoses properly to ensure safe operation. Refer to section Appendix.

- Connect the spreader hydraulic hoses and/or pneumatic hoses to the tractor. Double check all connections for safety purpose;
- Connect the electrical outlet of the spreader to the tractor.

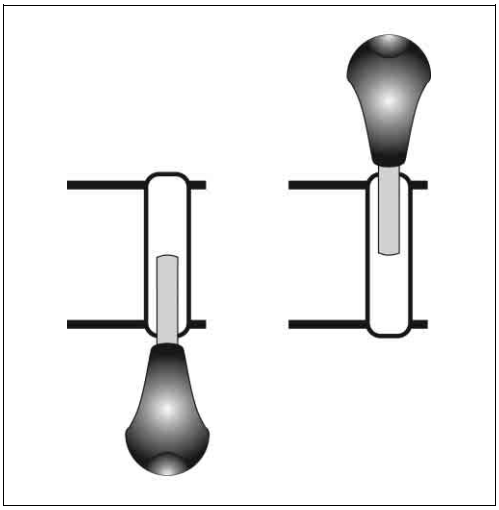
7.5 Testing safety components

Lights

- Check the left and right signal lights and visually confirm their functionality at the rear of the spreader;
- Apply the brake and visually confirm that the brake indicators work properly.

Hydraulic braking system

- Apply and release the spreader brakes a few times before moving the spreader. Depending on the type of hydraulic master cylinder installed, brakes can be activated by a control lever or by a brake pedal located inside the tractor;
- Move the spreader to a wide and safe area. Apply the service brakes a few times to ensure that the brakes can stop the spreader properly.



7.6 Moving the spreader

Danger!
Before moving the spreader on public roads, make sure the tool bar is correctly positioned for safe transportation (set to the smallest position in width, completely raised and locked with safety chains), if applicable.

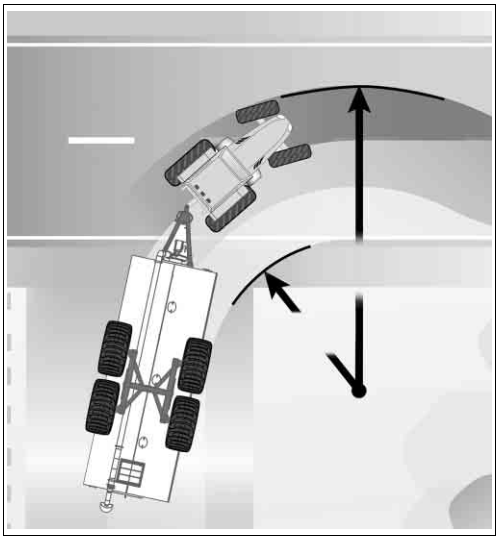
Note!
Make sure all local rules and regulations are followed.

Attention!
Disengage the PTO before turning.

Attention!
Shift the tractor to a lower gear when traveling down a hilly land.

- Before moving the spreader, make sure all connections are secured. Refer to section Operating - Connecting the spreader;
- Release the brakes and move the spreader;
- To keep manure homogenized during transport, make sure the directional valve is set in recirculation mode and activate the impeller drive;

When turning with the spreader, make sure the turning radius is not too tight. Tight turns will cause premature wear of the tires and could damage wheel components.



7.7 Loading the spreader

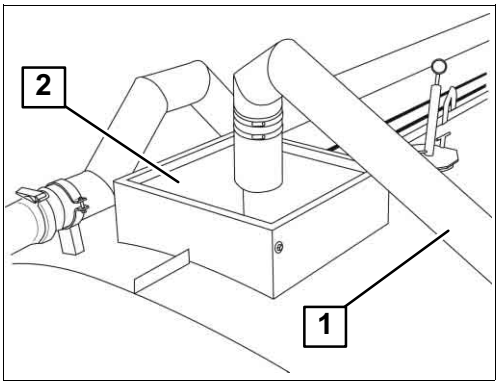
Attention!
Make sure all drains and cleaning openings are closed before loading.

Attention!
Always keep this product on a flat and level surface.

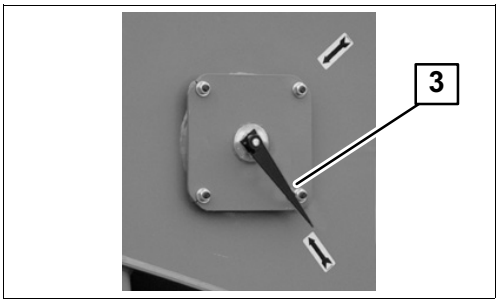
Attention!
Do not use the jack when the spreader tank contains liquid.

Note!
Before loading the spreader, make sure that manure is homogenized and that the consistency matches the tool bar capacity. Refer to section Technical data - Performance data.

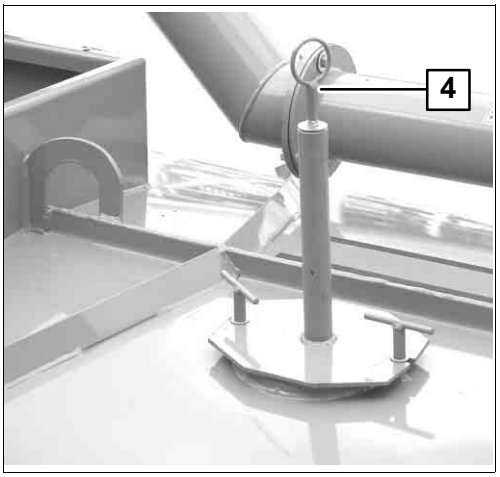
- Position the spreader to center the loading pipe (1) in the fill opening (2);
- Open the hydraulic door on fill opening, if applicable;
- Start filling the spreader with liquid manure;



- Watch the level indicator (3) at the front or at the rear (optional) of the spreader while loading;



- Reduce filling rate when the spreader tank is ¾ full;
- Stop filling when the top level rod indicator (4) starts to raise.



7.8 Spreading

Attention!
Never open cleaning openings and drains when the spreader tank contains liquid.

Attention!
If using a PTO, disengage the PTO before turning.

Note!
Familiarize yourself with the hydraulic functions and spreading tools before spreading.

7.8.1 Spreading with a nozzle

- Adjust the tractor speed according to the desired spreading rate. Refer to section Appendix - Spreading rate calculation;
- Engage the impeller to start spreading;
- Disengage the impeller when the spreader is empty;

7.8.2 Spreading with twin deflector 25FT tool bar

Note!
The spreading pattern can be adjusted by changing the deflector restriction plates and/or by changing the tool bar restriction plate.

- Engage the impeller to start spreading;
- Adjust the tractor speed according to the desired spreading rate. Refer to section Appendix - Spreading rate calculation;
- Disengage the impeller when the spreader is empty;

7.8.3 Spreading with three deflector 38 FT tool bar

Danger!
Before moving the spreader on public roads, make sure the tool bar is correctly positioned for safe transportation (set to the smallest position in width, completely raised and locked with safety chains), if applicable.

Note!
Make sure all local rules and regulations are followed.

Note!
The spreading pattern can be adjusted by changing the deflector restriction plates and/or by changing the tool bar restriction plate.

- Once on the field, unfold the tool bar arms using the tractor hydraulic control. Make sure it is placed in spreading position;
- Engage the impeller to start spreading;
- Adjust the tractor speed according to the desired spreading rate. Refer to section Appendix - Spreading rate calculation;
- Disengage the impeller when the spreader is empty;
- Fold the tool bar arms using the tractor hydraulic control. Make sure it is completely folded before moving out of the field.

7.8.4 Spreading with low spreading tool bar

Danger!
Before moving the spreader on public roads, make sure the tool bar is correctly positioned for safe transportation (set to the smallest position in width, completely raised and locked with safety chains), if applicable.

Note!
Make sure all local rules and regulations are followed.

- Raise the tool bar using the tractor hydraulic control;
- Adjust the tool bar safety chains to set the proper spreading position. The spreading pattern of each tool should not overlap on the ground when spreading.
- Lower and unfold the tool bar to the spreading position:
  - If the spreader is not equipped with a shredder kit, disengage the tractor hydraulic control lever once the tool bar is positioned.
  - If the spreader is equipped with the shredder kit, the tractor hydraulic control lever must be kept engaged while spreading;
- Engage the impeller to start spreading;
- Adjust the tractor speed according to the desired spreading rate. Refer to section Appendix - Spreading rate calculation;
- Disengage the impeller when the spreader is empty;
- Raise the tool bar using the tractor hydraulic control lever;
- Fold the tool bar arms using the tractor hydraulic control. Make sure it is completely folded before moving out of the field.
- Adjust the safety chains to its shortest length;
- Set the tractor hydraulic lever on float position.

7.8.5 Spreading with 22” concave disc incorporators

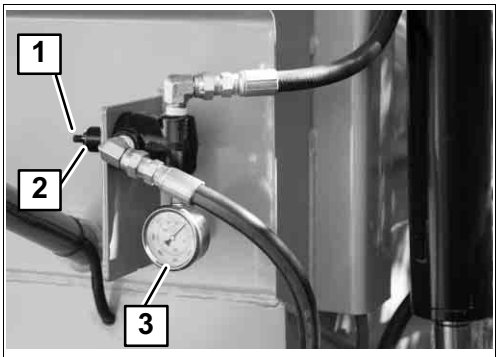
Danger!
Before moving the spreader on public roads, make sure the tool bar is correctly positioned for safe transportation (set to the smallest position in width, completely raised and locked with safety chains), if applicable.

Note!
Make sure all local rules and regulations are followed.

- Raise the tool bar using the tractor hydraulic control;
- Adjust the tool bar safety chains to its maximum length;
- Lower and unfold the tool bar to the spreading position. Keep the tractor hydraulic control lever engaged while spreading;
- For better results, adjust the tool bar pressure valve adjustment below.
- Engage the impeller to start spreading;
- Adjust the tractor speed according to the desired spreading rate. Refer to section Appendix - Spreading rate calculation;
- Disengage the impeller when the spreader is empty;
- Raise the tool bar using the tractor hydraulic control lever;
- Fold the tool bar arms using the tractor hydraulic control. Make sure it is completely folded before moving out of the field;
- Adjust the safety chains to its shortest length;
- Set the tractor hydraulic lever on float position.

Tool bar pressure valve adjustment (if applicable)

- Unlock the nut (1);
- Apply hydraulic pressure to the tool bar;
- Move the spreader few feet to verify the concave discs penetration. The discs should penetrate 4” to 5” in the soil while moving;
- Adjust the pressure by using the screw (2). The indicator (3) must not exceed 500 psi;
- Repeat until the proper adjustment.
- Lock the nut (1) when adjusted.



7.8.6 Spreading with 24" hydraulic disc injectors

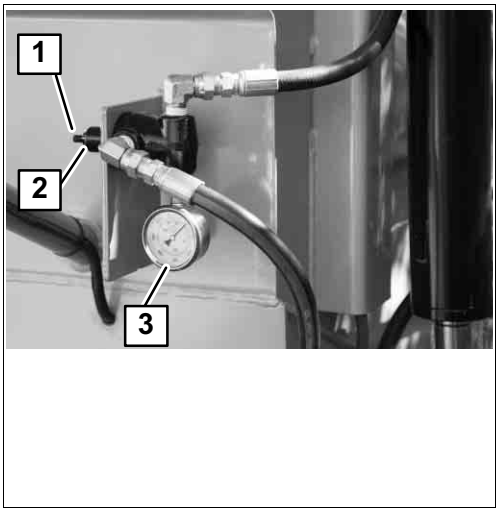
Danger!
Before moving the spreader on public roads, make sure the tool bar is correctly positioned for safe transportation (set to the smallest position in width, completely raised and locked with safety chains), if applicable.

Note!
Make sure all local rules and regulations are followed.

- Raise the tool bar using the tractor hydraulic control;
- Adjust the tool bar safety chains to its maximum length.
- Lower and unfold the tool bar to the spreading position. Keep the tractor hydraulic control lever engaged while spreading;
- Adjust the gauge wheels to maintain the hydraulic discs at desired depth in the soil.
- For better results, adjust the tool bar pressure valve adjustment below.
- Engage the impeller to start spreading;
- Adjust the tractor speed according to the desired spreading rate. Refer to section Appendix - Spreading rate calculation;
- Disengage the impeller when the spreader is empty;
- Raise the tool bar using the tractor hydraulic control lever;
- Fold the tool bar arms using the tractor hydraulic control. Make sure it is completely folded before moving out of the field.
- Adjust the safety chains to its shortest length;
- Set the tractor hydraulic lever on float position.

Tool bar pressure valve adjustment (if applicable)

- Unlock the nut (1);
- Apply hydraulic pressure to the tool bar;
- Move the spreader few feet to verify the concave discs penetration. The discs should penetrate 4” to 5” in the soil while moving;
- Adjust the pressure by using the screw (2). The indicator (3) must not exceed 500 psi;
- Repeat until the proper adjustment.
- Lock the nut (1) when adjusted.

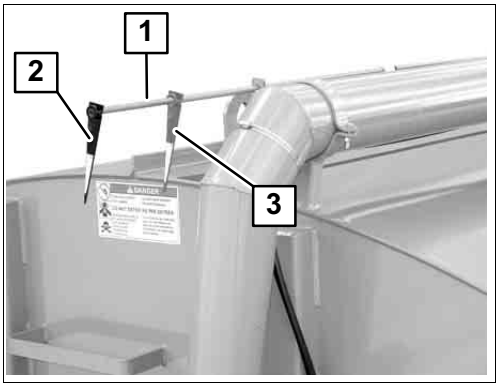


7.9 Operating spreader options

7.9.1 In-tank recirculation kit

Attention!
Disengage the PTO when turning.

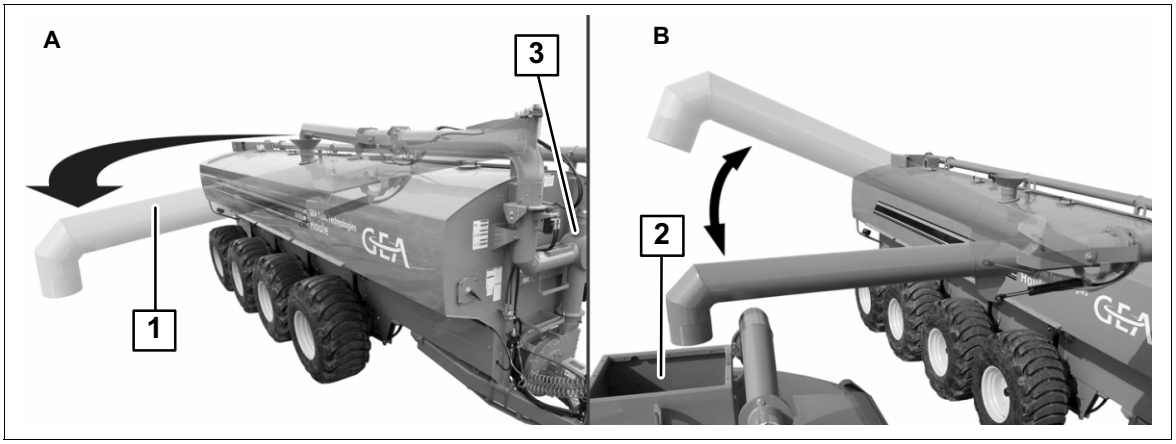
- Position the directional valve indicator (1) in recirculating mode (2);
- Engage the PTO in low revolution;
- Disengage the PTO to interrupt recirculating mode (example: before turning);
- Position the directional valve in spreading mode (3).



7.9.2 Nursing kit

Danger!
BEWARE OF ELECTRICAL POWER LINES!
Operating this product near electrical power lines can result in fatal injuries. Make sure this product is operated in a secure environment. Consult your local electrical supplier regarding electrical safety.

Attention!
Always keep this product on a flat and level surface.



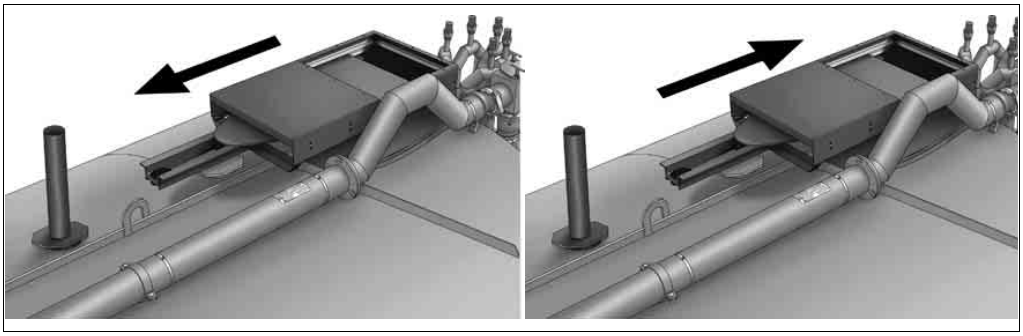
- Use the hydraulics to lift and rotate the articulated transfer pipe (1) over the fill opening (2) of the other spreader;
- Set the directional valve (3) in transfer mode;
- Engage the PTO to start transfer;
- Monitor the level indicator of the spreader being filled;
- Reduce the PTO revolution when the spreader tank is ¾ full;
- Disengage the PTO when the spreader is full;
- Use the hydraulics to position the transfer pipe in transport position.

7.9.3 Hydraulic door on fill opening

Warning!
Do not operate the hydraulic door while a person stands on the spreader.

Attention!
Make sure the opening is not obstructed.

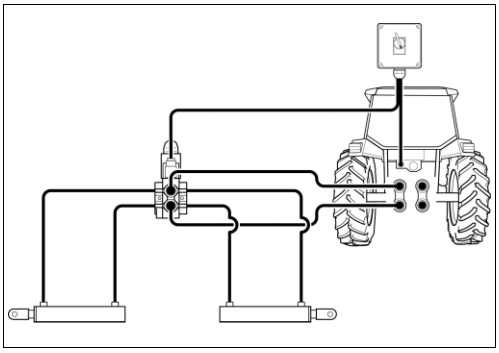
Note!
Make sure the ball valve is opened before operating the hydraulic door. The ball valve is located on the door frame.



- Open or close the hydraulic door using the hydraulic control.

7.9.4 Solenoid valve

- Connect the solenoid valve kit to the tractor 12 VDC electrical output;
- Connect hydraulic hoses to the tractor;
- Turn the selector switch to proper position to control a specific option;
- Activate the lever to control the hydraulic option.



Refer to section Appendix - Hydraulic diagrams.

7.10 Disconnecting

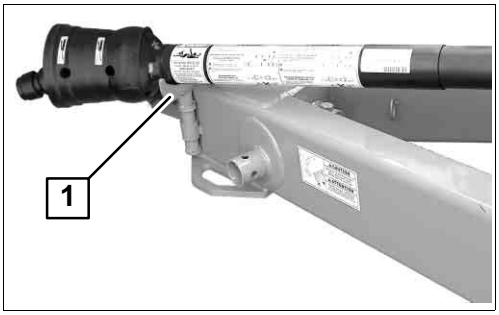
PTO driveline disconnection

Warning!
Turn off the tractor and apply the hand brake before connecting or disconnecting the PTO driveline.

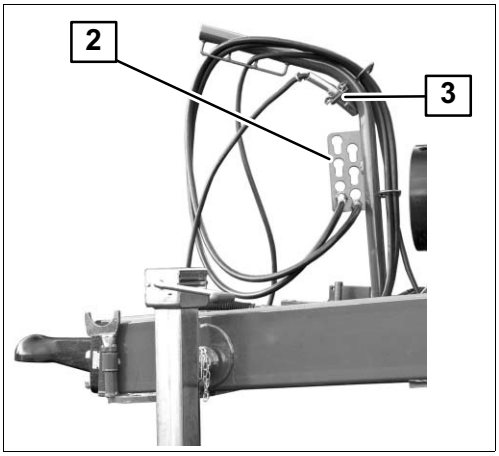
Attention!
Keep all hose couplings clear of dirt and sand when disconnected. Always hook them on their supports.

Note!
Refer to the PTO driveline instruction manual and follow the manufacturer's recommendations.

- Remove the safety chain, if applicable. (European model not illustrated);
- Disconnect the PTO from the tractor;
- Place the PTO driveline end on the draw bar support (1);

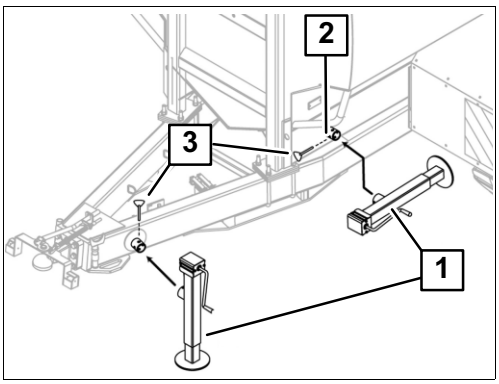


- Disconnect the spreader hydraulic hoses and pneumatic hoses from the tractor, if applicable. Place the connectors in the corresponding support (2);
- Disconnect the electrical outlet and place it in the corresponding support (3);

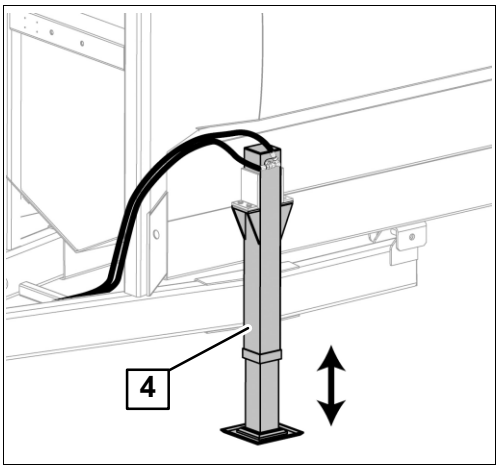


Unhitching the spreader

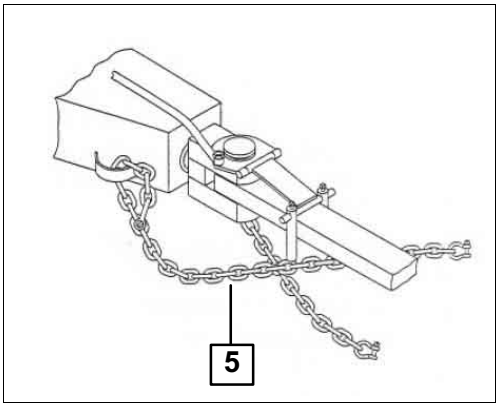
- Keep the spreader on a flat and level surface;
- Place wheel chocks;
- Remove the manual jack (1) from the transportation support (2);
- Place the jack on the draw bar, secure with a safety pin (3);
- Adjust the spreader height;



- If using a hydraulic jack (4), connect the hydraulic hoses to the tractor to extend the jack;

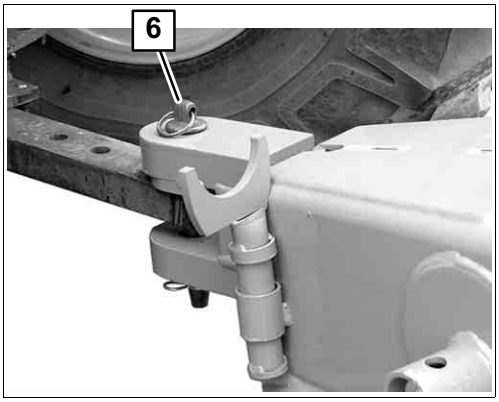


- Remove the safety chains (5) from the tractor;



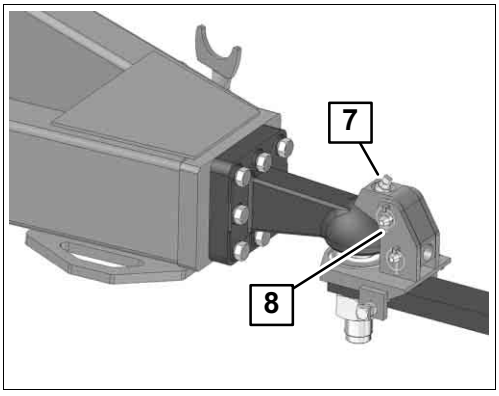
Single / double hitch

- Remove the pin (6);
- Using the jack, lift the spreader draw bar.



Ball hitch

- Loosen the nut (7);
- Remove the pin (8);
- Using the jack, lift the spreader draw bar.



8 Troubleshooting

8.1 Special personnel qualification required for troubleshooting

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

Read the section Safety - Personnel qualifications.

8.2 Safety instructions for troubleshooting

Read the section Safety.

8.3 Troubleshooting possible faults

Spreading		
Symptom	**Possible cause**	**Solution**
The spreader does not spread properly or not at all.	The liquid manure is too thick.	Check consistency. Refer to section Appendix - Consistency test.
	The directional valve is not in the proper position.	Set the directional valve in spreading position.
	Foreign material in the directional valve.	Contact your dealer.
	Obstruction in the discharge pipe.	Contact your dealer.
	Obstruction in the impeller output.	Contact your dealer.
	The PTO is defective.	Refer to the manufacturer's recommendations.
	Worn out impeller or housing.	Contact your dealer.
Liquid manure keeps discharging from the tool bar while the PTO is stopped.	Anti-siphon is not positioned properly.	The anti-siphon must be positioned upward, adjust if necessary. Refer to section Handling and assembly - Anti-siphon assembly.

Hydraulic braking system		
Symptom	**Possible cause**	**Solution**
The spreader partially brakes or does not brake at all.	The hydraulic hoses of the tractor are not connected to the hydraulic braking system.	Connect hydraulic hoses properly. Refer to section Appendix - Hydraulic diagrams. Check tractor hydraulic oil level. Find leak and repair. Add hydraulic oil.
	The brake pads are worn out.	Refer to section Maintenance - Hydraulic braking system.
	Insufficient oil quantity in the master cylinder.	Find leak and repair. Refer to section Maintenance - Hydraulic braking system.
	Air or water inside the hydraulic brake lines.	Find infiltration and repair. Refer to section Maintenance - Hydraulic braking system.
	Defective hose connector (occurs only with manually activated brake system).	Clean restrictor of the hydraulic hose connector.
The spreader does not brake evenly.	A worn out brake pad.	Refer to section Maintenance - Hydraulic braking system.
	A faulty caliper.	Contact your dealer.
	A distorted brake disk.	

Electrical		
Symptom	**Possible cause**	**Solution**
Signal lights / Halogen lights do not turn on.	Electrical plug is not connected to the tractor.	Connect electrical plug to the tractor.
	Light bulb burned out.	Replace light bulb.
	Electrical wires cut.	Repair the electrical problem.
	Short circuit.	

Options		
Symptom	**Possible cause**	**Solution**
Recirculation system does not recirculate.	Fibrous material can be stuck in the recirculating pipe.	Contact your dealer.
Anti-splash flapper door stays open.	Dried manure located on the door flap and/or on the sides of the opening.	Clean door and/or sides with water.
The solenoid valve does not work.	Electric wires are defective or not connected.	Contact your dealer.

☞ **Note!**
For any other faults, contact your dealer.

9 Maintenance

9.1 Special personnel qualification required for maintenance work

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

Read the section Safety - Personnel qualifications.

9.2 Safety instructions for maintenance

Attention!
Tractor PTO or hydraulic components must be disconnected unless otherwise specified in the maintenance instructions.

Note!
Have within reach containers to collect all substances potentially harmful such as oils, coolants, cleaning and disinfecting agents, etc.

Read the section Safety.

9.3 Schedule maintenance responsibilities

9.3.1 GEA Farm Technologies Canada Inc. maintenance schedule

Task	Before each use or every 10 hours	After each use	Every 200 hours of use	Once a year	If necessary	Action by
Visual inspection	X					Trained personnel
Lubricate hitch	X					
Lubricate the equipment	X					
Check oil level of bearing housing	X					
Fill the grease chamber of the bearing housing	X					
Torque wheel nuts	X					
Grease wheel hub bearings			X			
Torque bolts			X			
Change the oil of bearing housing			X			
Lubricate the tool bar (option)		X				
Open drains		X				
Open cleaning openings		X				
Clean the product		X		X		
Change hydraulic brake parts					X	
Calibrate the hydraulic braking system					X	

Attention!
When operating this GEA product using other manufacturers components and/or products such as a PTO, a tractor, a motor, a pump, etc., ALWAYS perform maintenance of the component and/or product as recommended by its manufacturer.

9.4 Visual inspection

Before each use

Inspect the spreader to find any defective parts or signs of abnormal wear.

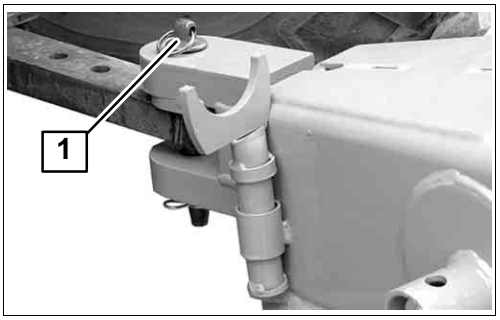
9.5 Lubricate hitch

Before each use or every 10 hours

Note!
Use grade 2 PRECISION™ XL5 MOLY EP2 grease (or equivalent).

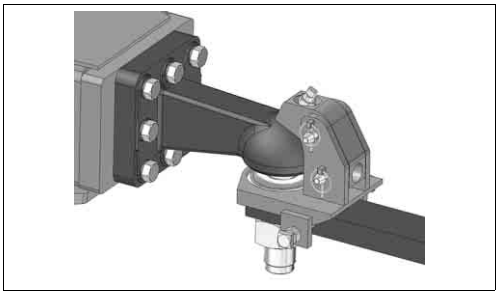
Single / double hitch

- Lubricate all lubrication points;
- Remove the cotter pin and the pin from the hitch. Add grease inside the swivel point (1).



Ball hitch

- Lubricate all lubrication points.

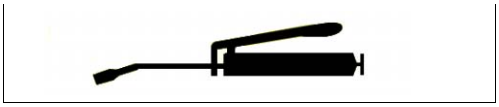


9.6 Lubricate the equipment

Before each use or every 10 hours

Note!
Use grade 2 PRECISION™ XL5 MOLY EP2 grease (or equivalent).

- Lubricate all parts labelled with:



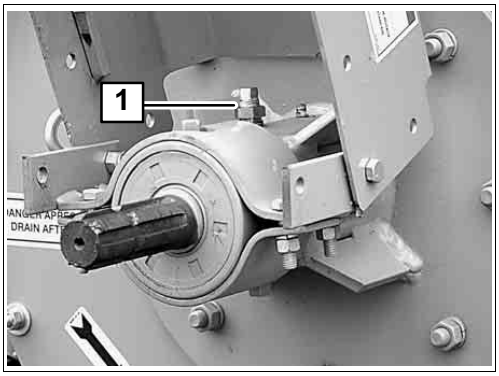
Refer to section Appendix - Label position.

9.7 Check oil level of bearing housing

Before each use or every 10 hours

Note!
Use 80W-90 TRAXON™ gearbox oil (or equivalent).

- Unscrew the filling plug (1);
- Fill with oil until the level reaches the top of the shaft;
- Clean and reinstall the filling plug (1).

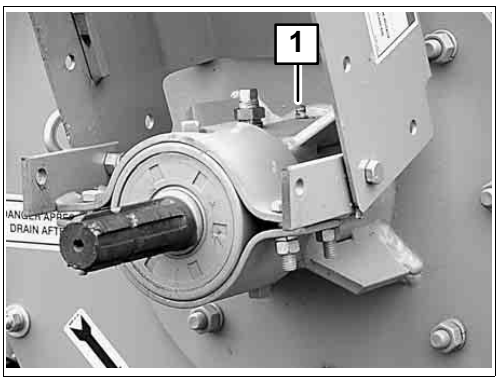


9.8 Fill the grease chamber of the bearing housing

Before each use or every 10 hours

Note!
Use grade 2 PRECISION™ XL5 MOLY EP2 grease (or equivalent).

- Add grease in the grease chamber of the bearing housing through the fitting (1).

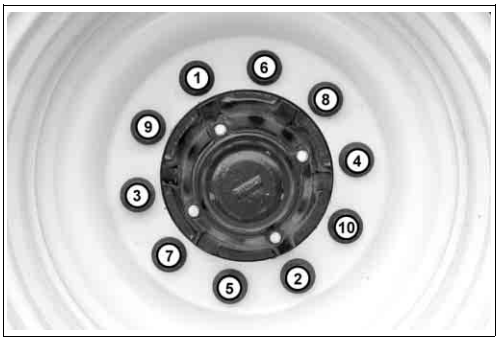


9.9 Torque wheel nuts

Before each use or every 10 hours

Note!
It is of prime importance to check the torque of the nuts after the 3 to 5 first trips.

- Ensure wheel nuts are torqued to 375 ft-lb [508 NM];
- To torque wheel nuts, follow the sequence illustrated.

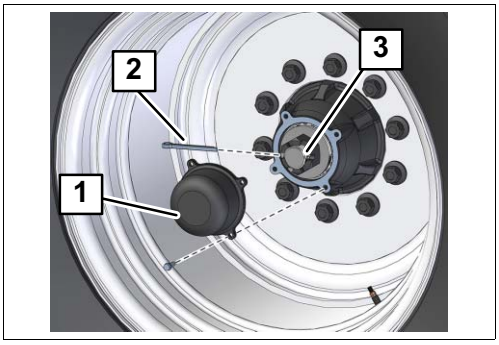


9.10 Grease wheel hub bearings

Every 200 hours of use

Note!
Use grade 2 - 880 Crown and Chassis grease (or equivalent).

- Using a jack, lift the axle until the tire no longer touches the ground;
- Unscrew the hub dust cap (1);
- Remove the grease by cleaning the cap and the bearing;
- Remove the cotter pin (2);



- Check the torque of the wheel hub assembly as follows:
  - Torque the castle nut (3) to 190 ft-lb [258 NM] to ensure seating of the bearing assembly;
  - Unscrew the castle nut to the next slot to allow the cotter pin installation. This step releases pressure on bearings in order to prevent overheating;
  - Check the assembly. Make sure there is no gap in the bearing assembly by moving the tire. Make sure the wheel can be easily rotated by hand. If checks fail, redo the steps;
- Reinstall the cotter pin (2);
- Cover the bearing with grease. Completely fill the gap with grease between the bearing and the hub;
- Fill the cap with grease and reinstall it.

9.11 Torque bolts

Every 200 hours of use

Check torque of:

- transportation support bolts;
- components fastened on the spreader.

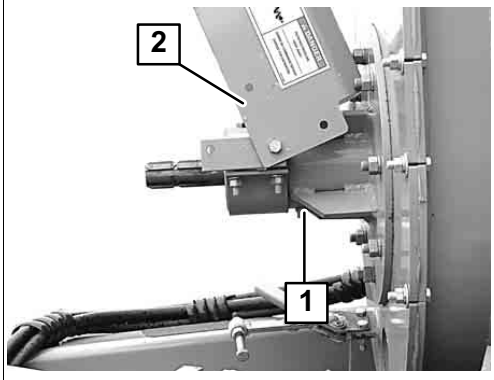
Refer to section Technical data - Bolt torque chart.

9.12 Change the oil of bearing housing

Every 200 hours of use

Note!
Use 80W-90 TRAXON^{TM} gearbox oil (or equivalent).

- Place a container under the drain plug (1) to collect oil;
- Remove the filling plug (2) located between the grease fitting and the air vent;
- Unbolt the drain plug (1);
- Reinstall the drain plug (1) once the housing is drained;
- Fill with oil until the level reaches the top of the shaft;
- Clean and reinstall the filling plug (2).

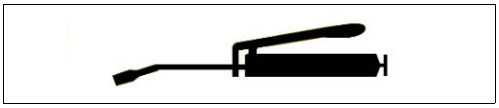


9.13 Lubricate the tool bar (option)

After each use

Note!
Use grade 2 PRECISION^{TM} XL5 MOLY EP2 grease (or equivalent).

- Grease all parts labelled with:

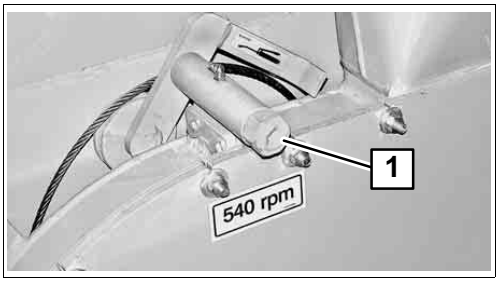


9.14 Open drains

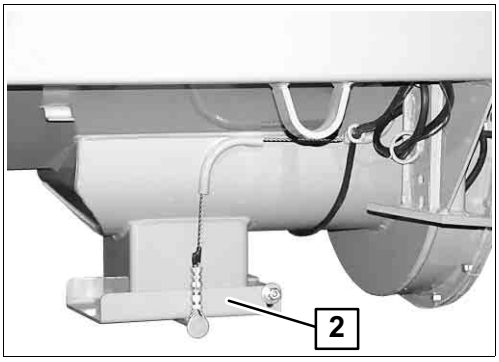
After each use

Attention!
Make sure the spreader is empty before opening the drains.

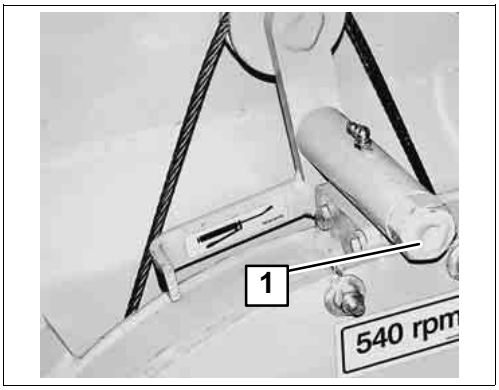
- Use the wheel nut wrench to turn the pivot bolt (1) to open the drain (2);



- Clean the drain (2);

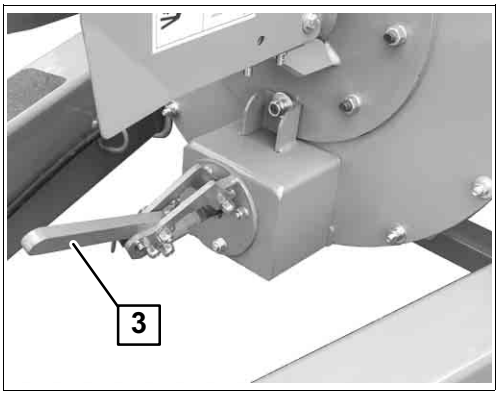


- Use the wheel nut wrench to turn the pivot bolt (1) to close the drain (2).



Impeller housing drain

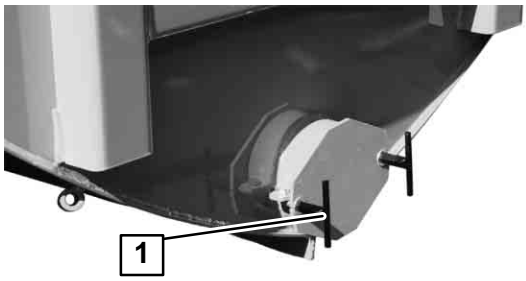
- To open the drain, unlock the toggle clamp (3). The cap will open to drain the impeller housing;
- To close the drain, place the cap over the impeller housing opening and lock the toggle clamp (3).

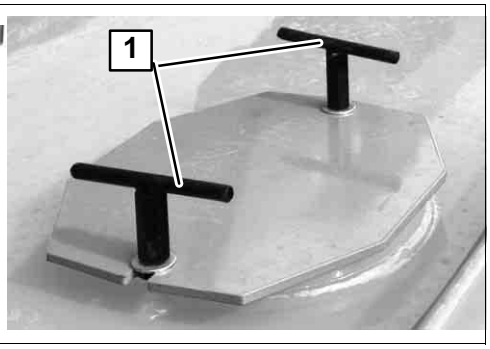


9.15 Open cleaning openings

After each use

Attention!
Make sure the spreader is empty before opening cleaning openings.





- Unscrew the handles (1);
- Remove the cover.

9.16 Clean the product

After each use and once a year

Warning!
Beware of potential falls: always walk on the nonslip band installed on the product.

Attention!
Use cold water to clean this product. Do not exceed 2000 psi [105 bar] when using a pressure washer and keep the nozzle at a distance of 1ft [30 cm] from the surface to clean.

- Make sure all drains and cleaning openings are closed;
- Fill 1/3 of the spreader tank with water;
- Move the tractor back and forth to stir the water inside the tank;
- Move it to a spreading area and spread the wasted water to clean the discharge pipe and hoses;
- When empty, open the drains and cleaning openings. Keep them open to allow ventilation;
- Pressure wash the entire product and equipment;

- Wax the spreader before each spreading season to prevent manure from adhering to the surface.

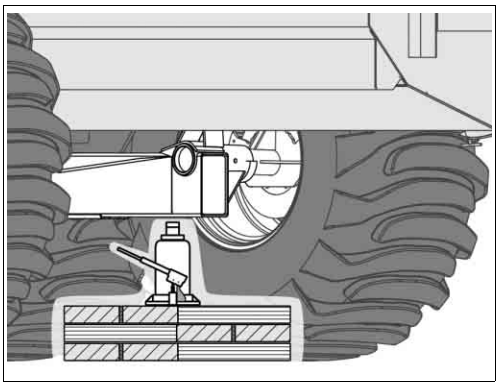
9.17 Change hydraulic brake parts

If necessary

Remove the wheel

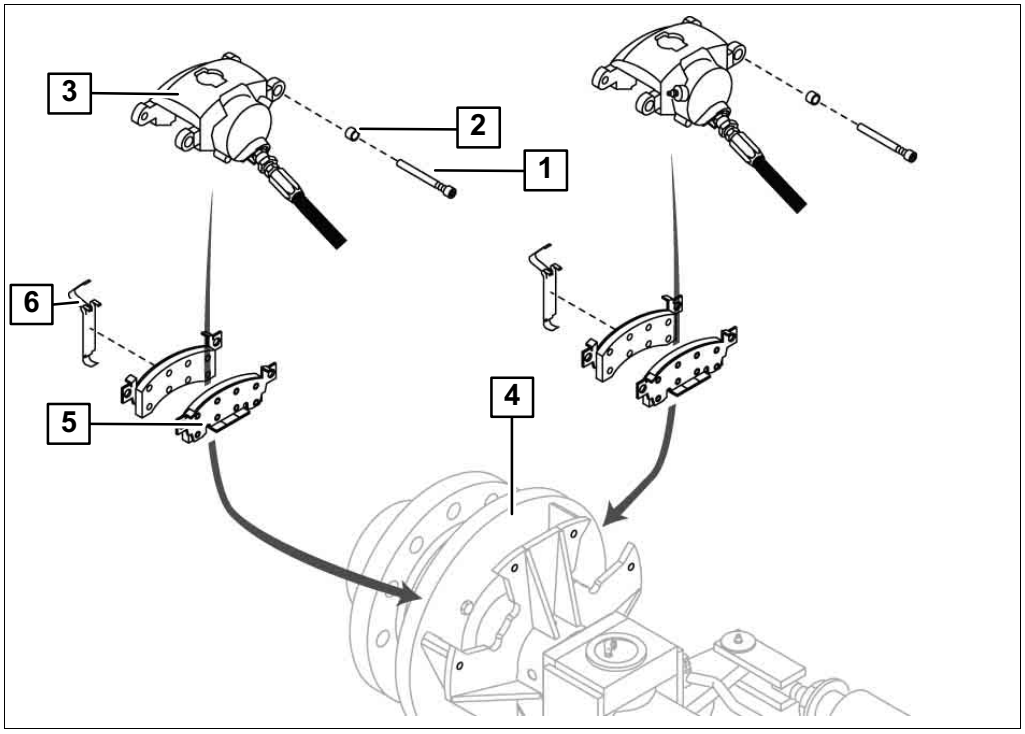
Attention!
Make sure the spreader is empty.

- Using a jack with a minimum lifting capacity of 4000 lbs (2000 kg), lift the spreader wheel;
- Remove the wheel nuts with an air impact gun;
- Remove the wheel and store it in a safe area using a forklift truck.



Refer to section Handling and assembly - Wheel assembly.

Remove calipers



- Remove bolts (1) and sleeves (2) from the calipers (3);
- Remove the calipers (3) from the brake disk (4);
- Remove the brake pads (5) from the calipers (3);
- Replace the brake pads (5);
- Reinstall the components;
- Calibrate the brake system.

Part No	Description
2018-4700-170	Kit of four brake pads (5)
2018-4700-180	Kit of six brake pads (5)
2018-4710-200	Brake pad clips (6)

Refer to section Maintenance - Calibrate the hydraulic braking system.

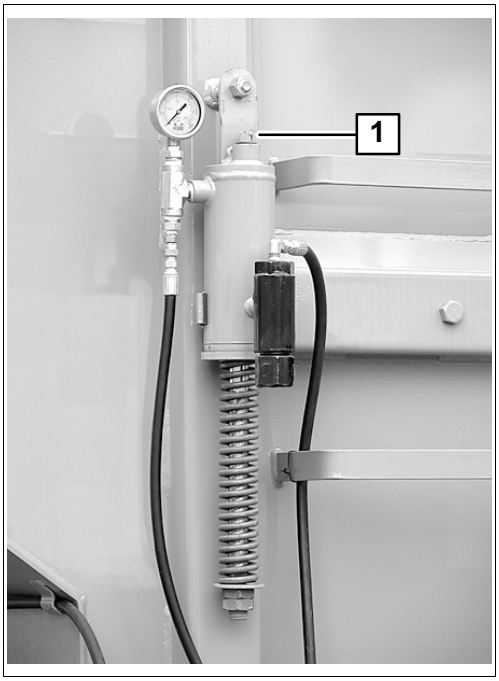
9.18 Calibrate the hydraulic braking system

If necessary

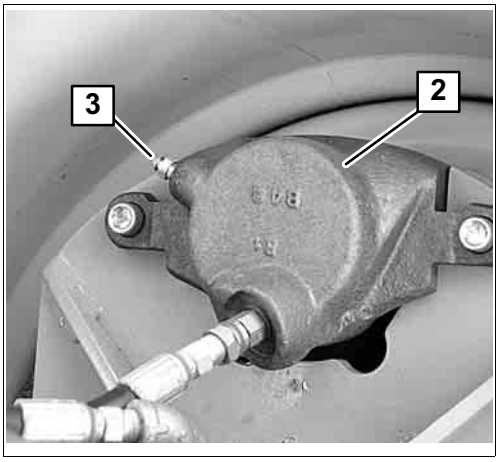
Bleed brake system

Note!
Use DOT 3 brake fluid.

- Connect the hydraulic hoses of the spreader braking system to the tractor;
- Start the engine of the tractor;
- Remove the filling plug (1) located on top of the master cylinder;
- Fill the master cylinder with oil;
- Screw the filling plug (1) on the master cylinder;
- Locate the calipers (2) of the first axle;
- Unscrew plug (3) from the calipers to release air;
- Apply the brake pedal or hand brake slowly until oil comes out of the caliper;



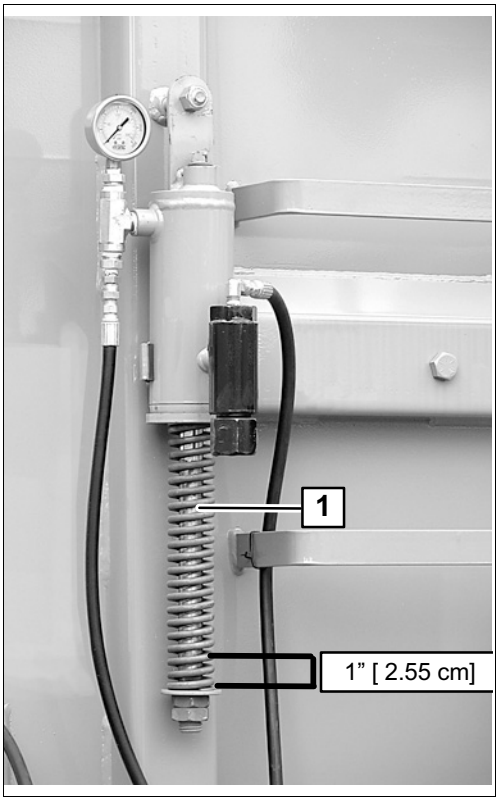
- Maintain the brake pedal or hand brake in position;
- Screw the plug (3) on the calipers;
- Release the brakes;
- Repeat these steps until all calipers are purged. Always purge the calipers starting from the first axle to the last;
- Make sure the oil level of the master cylinder is full before and after bleeding the braking system.



Adjust master cylinder

Note!
Use DOT 3 brake fluid.

- Connect the hydraulic hoses of the tractor to the spreader braking system;
- Start the engine of the tractor;
- Do not apply the brakes. Measure the length of the master cylinder rod (1);
- Remove the filling plug located on top of the cylinder;
- Partially apply the brake pedal or hand brake until the master cylinder rod retracts of 1” [2.55 cm];
- Maintain the brake in position;
- Fill the master cylinder with oil. Make sure the cylinder is completely filled to prevent air infiltration;
- Install and tighten the filling plug;
- Release the brake pedal or hand brake.



9.19 Shear bolts replacement kit

Tractor PTO	Part No.	Dimensions	SAE Steel Grade	Quantity
1⅜"-6 splines	2010-7505-710	⅜"-16NC x 1	8	2
1⅜"-21 splines	2010-7505-720	⅜"-16NC x 1	2	2
1¾" - 20 splines	2010-7505-710	⅜"-16NC x 1	8	2

10 Decommissioning

10.1 Special personnel qualification required for decommissioning

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

Read the section Safety - Personnel qualifications.

10.2 Safety instructions for decommissioning

Attention!
Keep all hose couplings clear of dirt and sand when disconnected from the tractor. Always hook them on their supports.

Read the section Safety.

10.3 Temporary decommissioning

Cleaning

Warning!
Beware of potential falls: always walk on the nonslip band installed on the product.

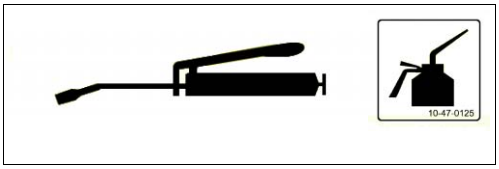
Attention!
Use cold water to clean this product. Do not exceed 2000 psi [105 bar] when using a pressure washer and keep the nozzle at a distance of 1 ft [30 cm] from the surface to clean.

- Make sure the spreader is empty;
- Make sure all drains and cleaning openings are closed;
- Fill 1/3 of the spreader tank with water;
- Move the tractor back and forth to stir the water inside the tank;
- Move it to a spreading area and spread the wasted water to clean the discharge pipe and hoses;
- Pressure wash the entire product and equipment;

- Move to a storage area;
- Open the drains and cleaning openings. Keep them open to allow ventilation.

Lubricate

- Grease parts labelled with:
- Spray the entire product with a thin layer of biodegradable oil to protect from corrosion.



Refer to section Appendix - Label position.

Store

Note!
Refer to the PTO driveline instruction manual and follow the manufacturer's recommendations.

- Place the product in a storehouse after cleaning to protect it against the elements and prevent premature corrosion;
- Turn off the tractor engine;
- Place wheel chocks, one at the front and one behind a wheel of the spreader;
- Raise the spreader draw bar using a jack;
- Disconnect the PTO driveline;
- Disconnect all hydraulic and pneumatic hoses and hook them on the support;
- Disconnect the spreader from the tractor draw bar.

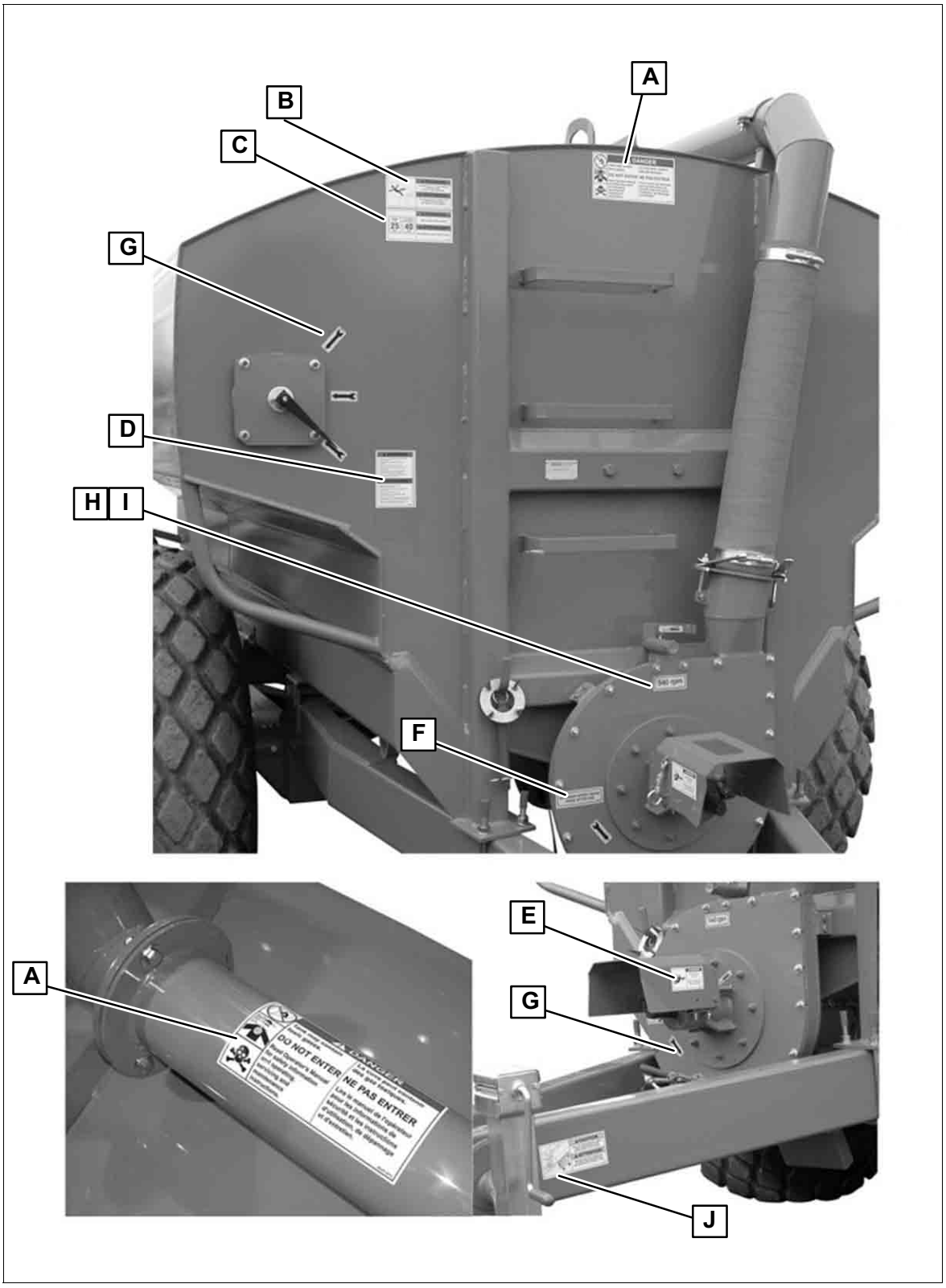
10.4 Final decommissioning/disposal

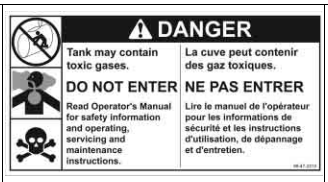
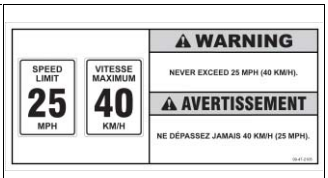
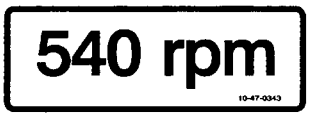
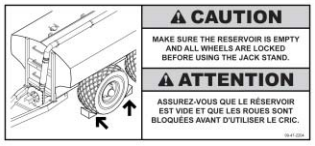
After final decommissioning, handle all components properly and dispose of them in accordance with your valid local rules and regulations on waste disposal. Recycle if possible.

11 Appendix

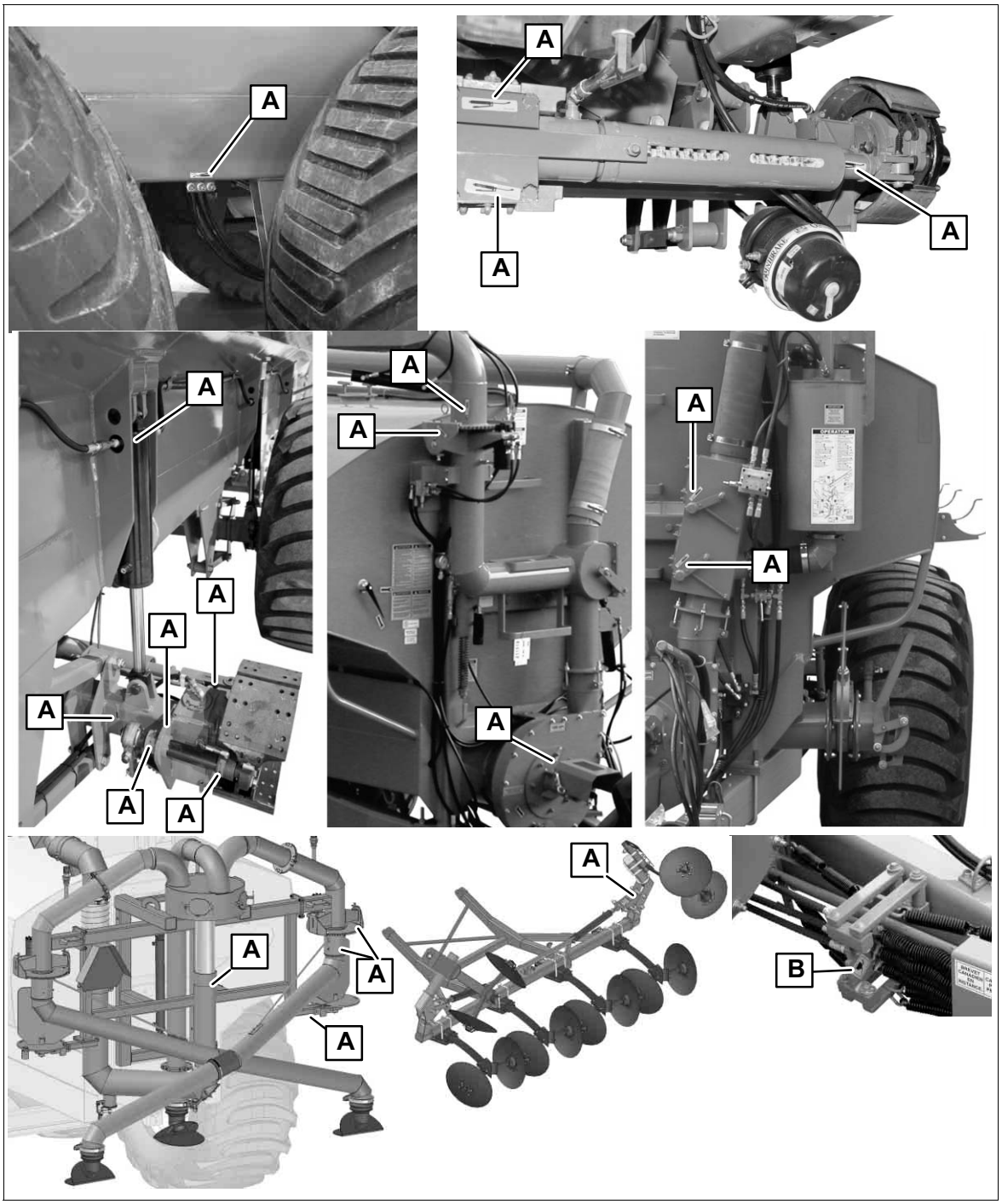
11.1 Label position

11.1.1 Safety labels



A	 2099-4720-100	**B**	 2099-4721-080	**C**	 2099-4721-050
D	 2099-4721-020	**E**	 2099-4720-020	**F**	 2010-4701-590
G	 2007-4700-390	**H**	 2010-4703-430	**I**	 2010-4703-440
J	 2099-4722-040	**K**	 2018-4701-840		

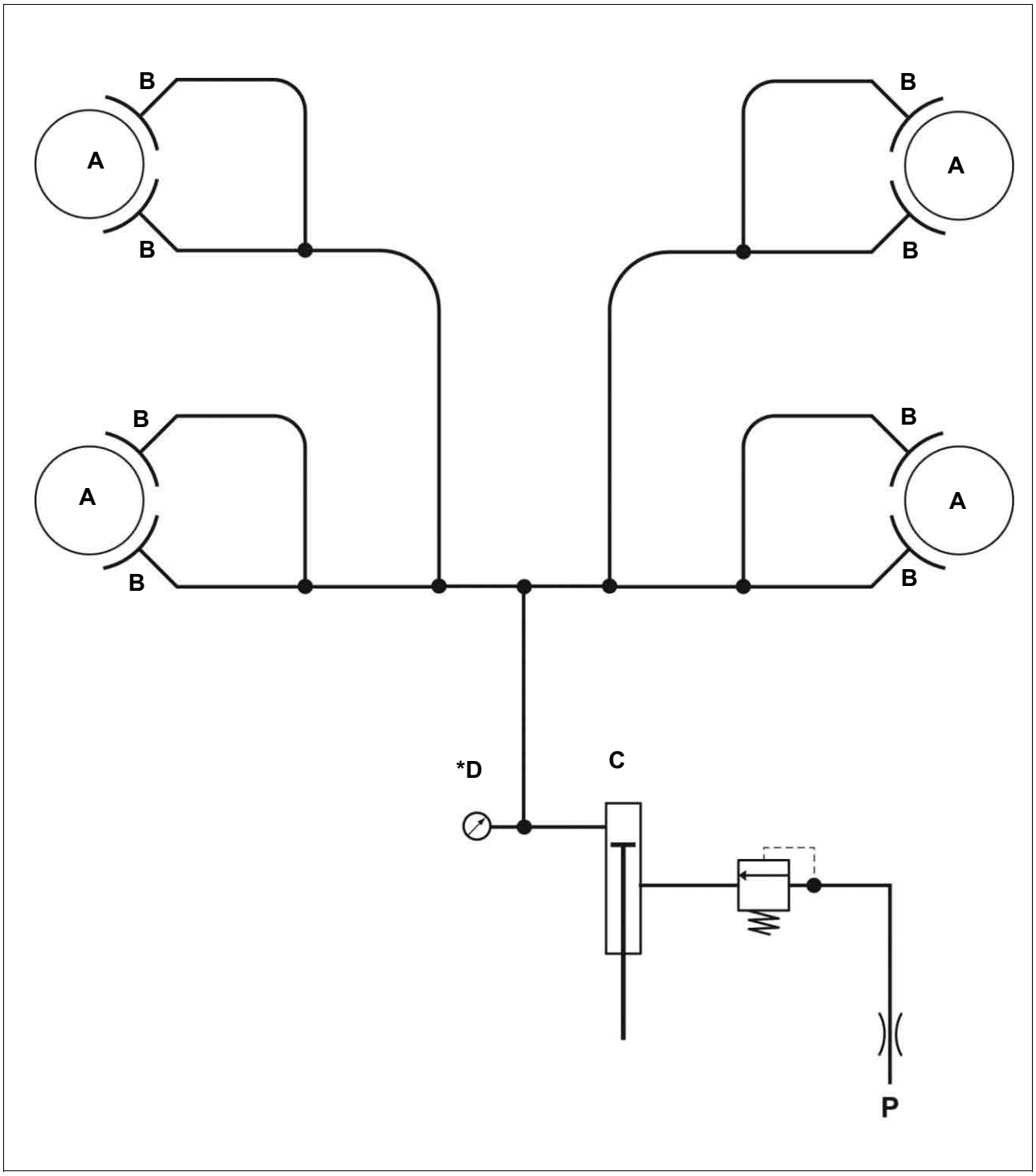
11.1.2 Lubrication labels



A	 2099-4701-240	B	 2099-4701-250

11.2 Hydraulic diagrams

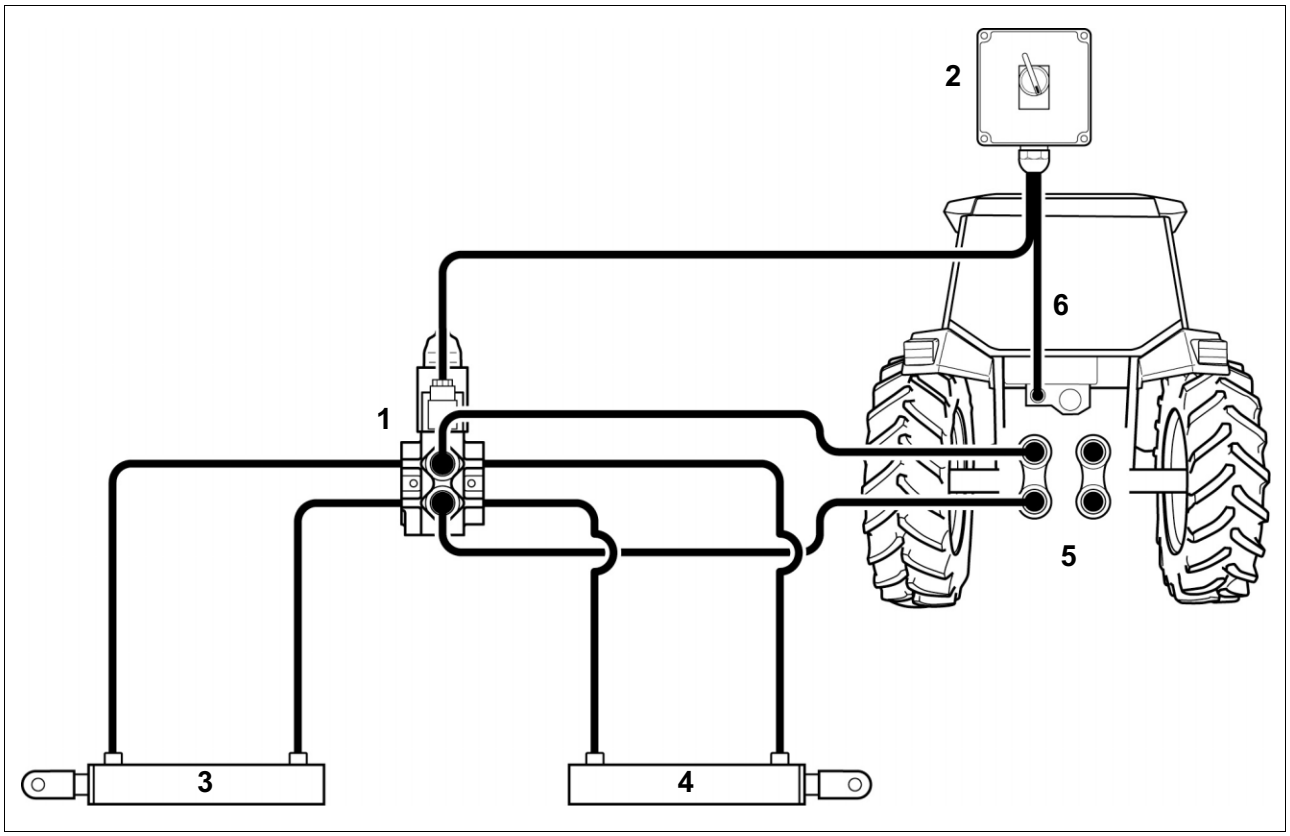
11.2.1 EL66 hydraulic brake



* supplied only for manually activated brakes

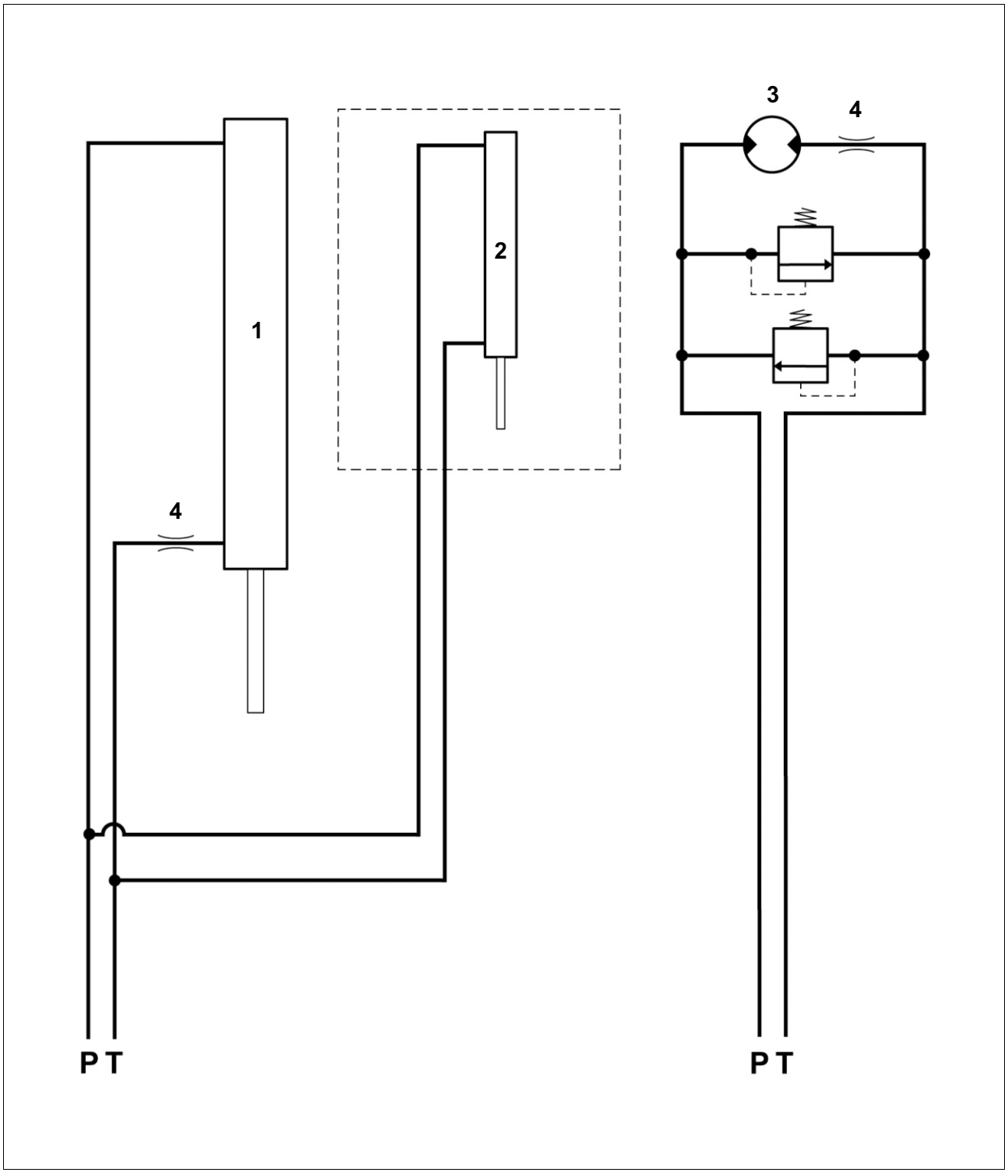
Legend:			
A	Disk brakes	C	Master cylinder
B	Calipers	D	Pressure gauge

11.2.2 Solenoid valves control option



Legend:			
1	Solenoid valve	4	Hydraulic component #2
2	Selector switch	5	Tractor hydraulic outlets
3	Hydraulic component #1	6	Tractor electric connection (12VDC)

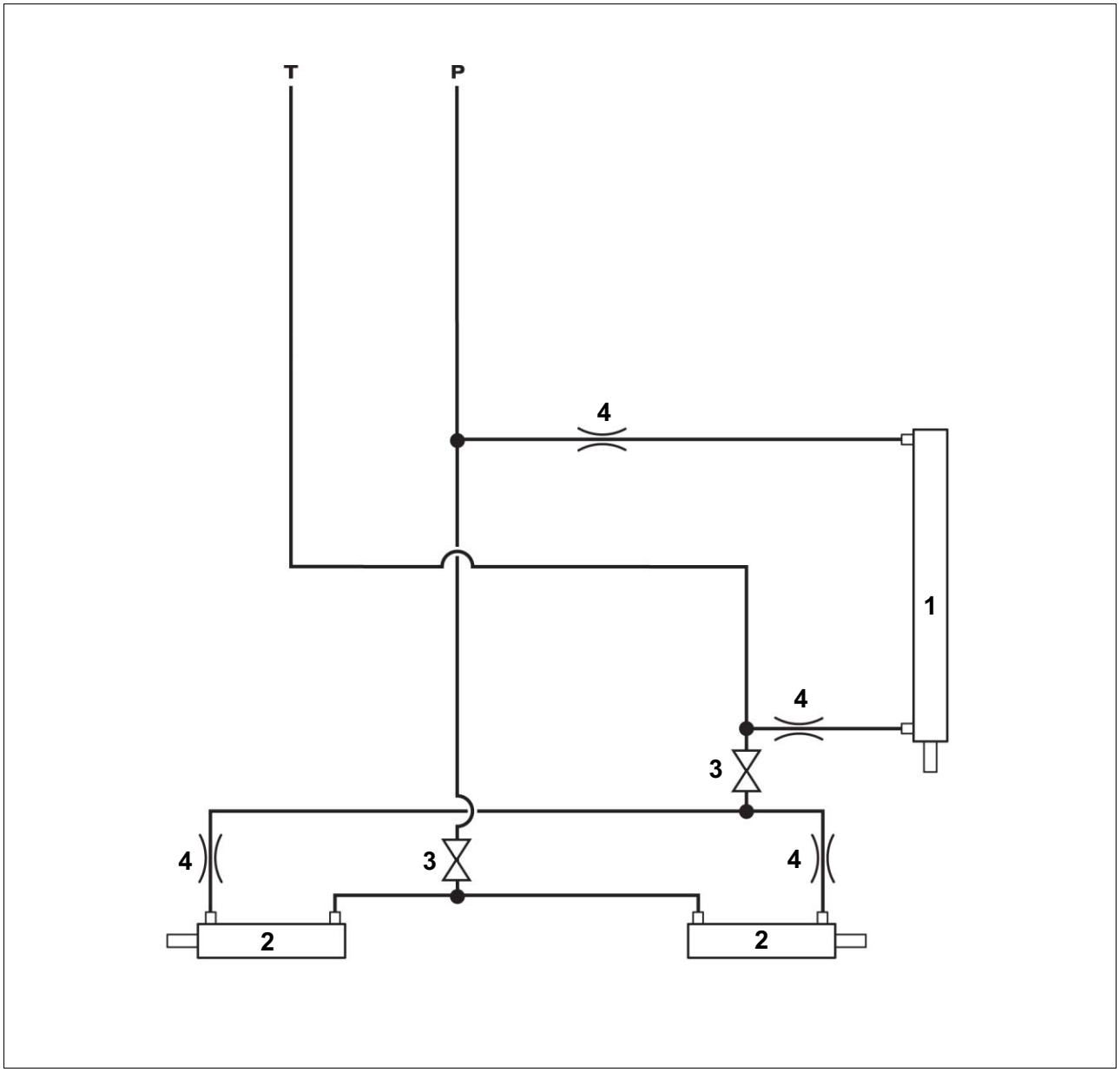
11.2.3 Nursing kit option



Legend:			
1	Hydraulic cylinder	3	Hydraulic motor
2	Optional hydraulic cylinder	4	Restrictor

11.3 Hydraulic Diagrams - Flex drop hoses or Low pressure deflectors

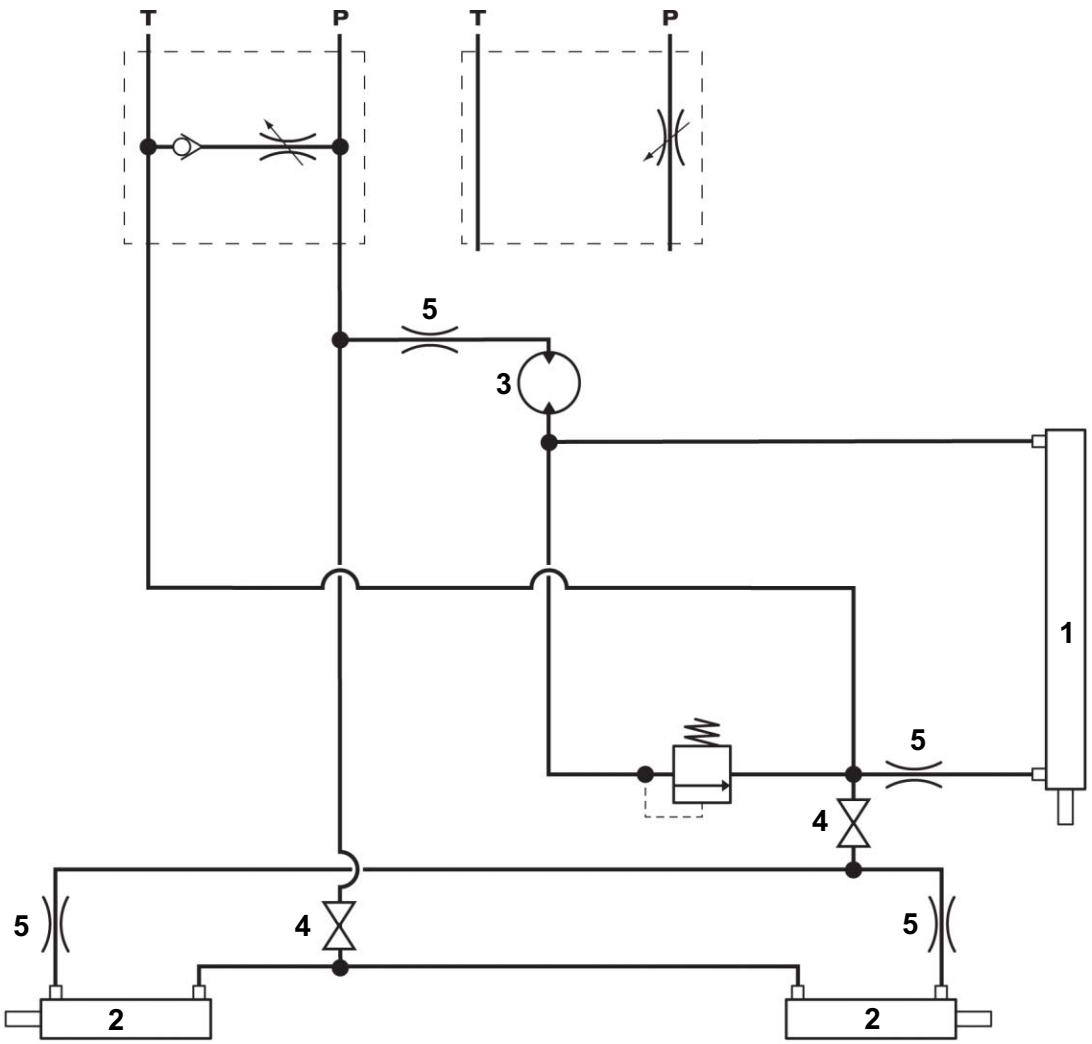
11.3.1 Flex Drop Hoses or Low Pressure Deflectors (with Folding Ends)



Legend:			
1	Tool bar hydraulic cylinder	3	Ball valve
2	Folding end hydraulic cylinder	4	Restrictor

P	Pressure	**T**	Tank

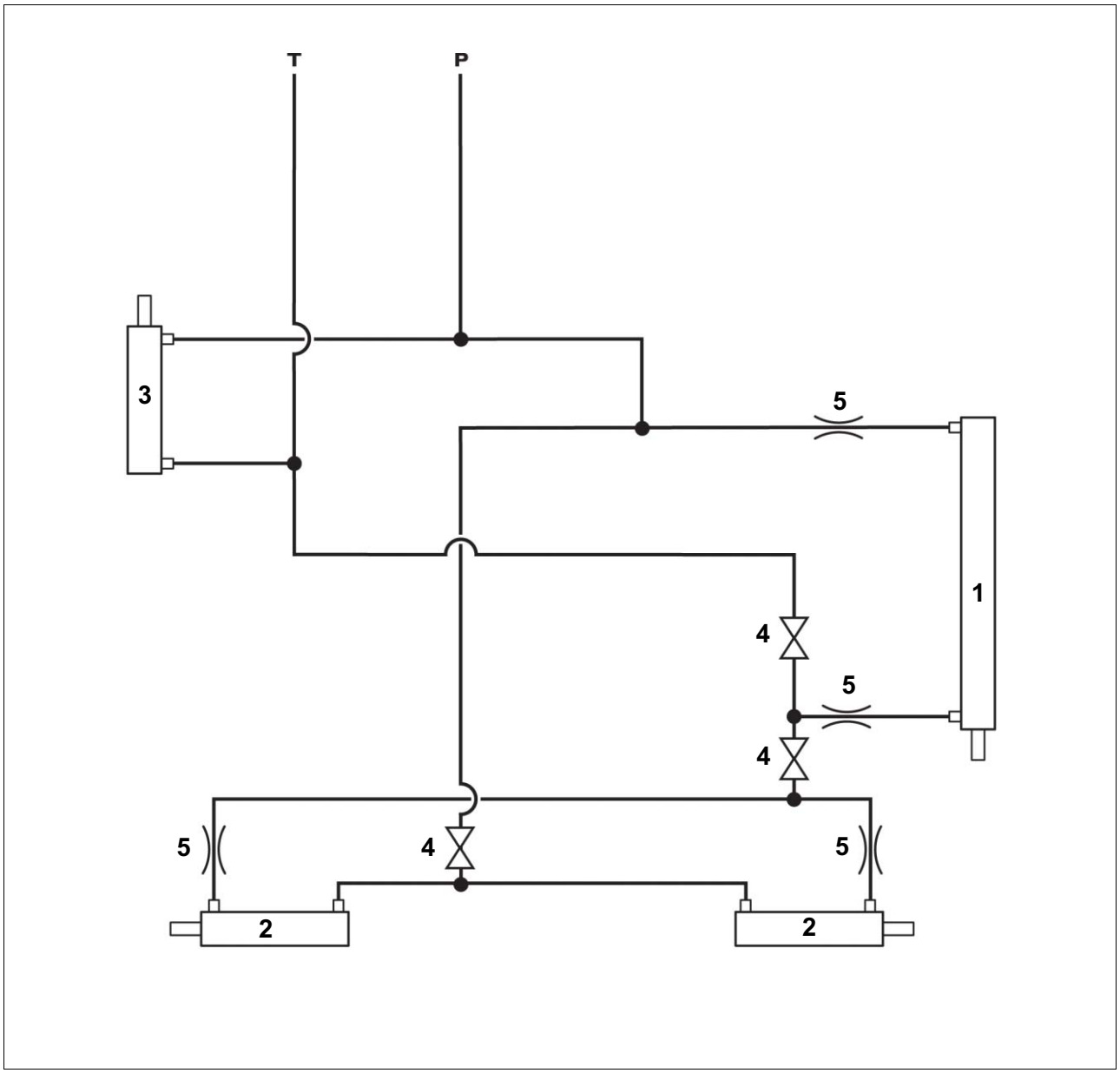
11.3.2 Flex Drop Hoses or Low Pressure Deflectors (with Folding Ends and Hydraulic Shredder)



Legend:			
1	Tool bar hydraulic cylinder	4	Ball valve
2	Folding end hydraulic cylinder	5	Restrictor
3	Shredder hydraulic motor	6	Pressure relief valve

P	Pressure	**T**	Tank

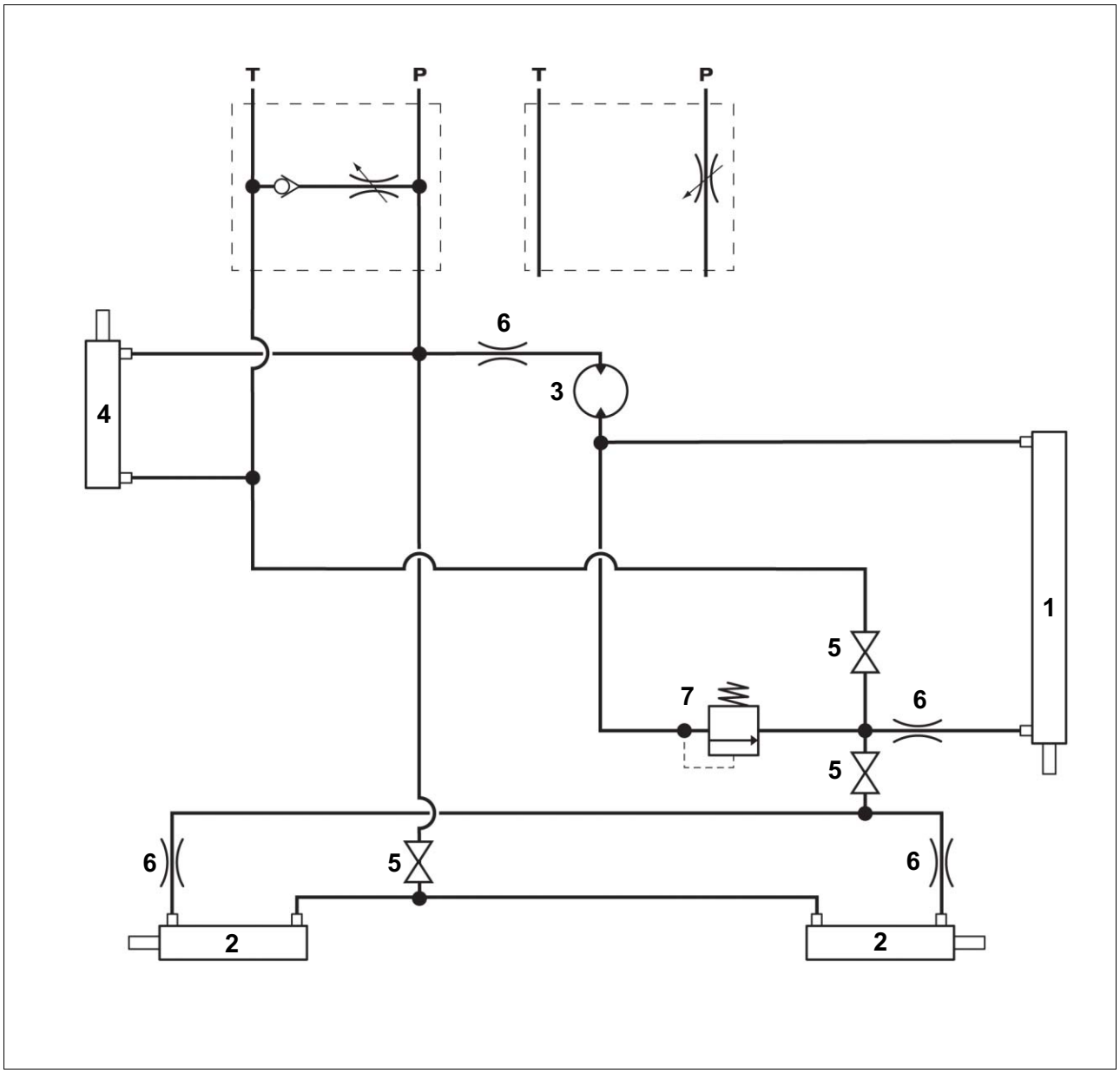
11.3.3 Flex Drop Hoses or Low Pressure Deflectors (with Folding Ends and Recirculation Kit)



Legend:			
1	Tool bar hydraulic cylinder	4	Ball valve
2	Folding end hydraulic cylinder	5	Restrictor
3	Recirculation valve hydraulic cylinder		

P	Pressure	**T**	Tank

11.3.4 Flex Drop Hoses or Low Pressure Deflectors (with Folding Ends, Recirculation Kit and Hydraulic Shredder)

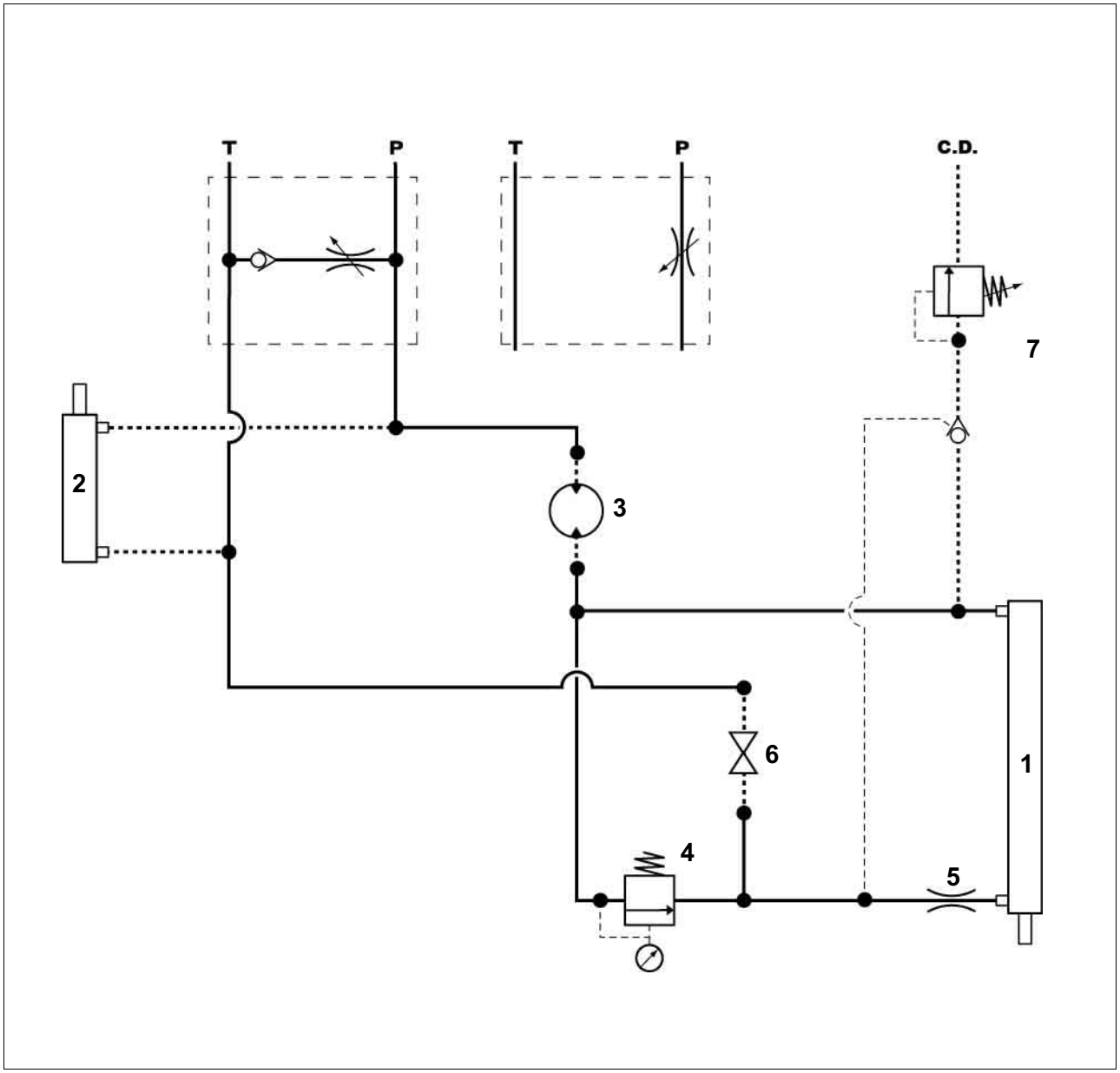


Legend:			
1	Tool bar hydraulic cylinder	5	Ball valve
2	Folding end hydraulic cylinder	6	Restrictor
3	Shredder hydraulic motor	7	Pressure relief valve
4	Recirculation valve hydraulic cylinder		

P	Pressure	**T**	Tank

11.4 Hydraulic Diagrams - 22” Concave disc incorporators

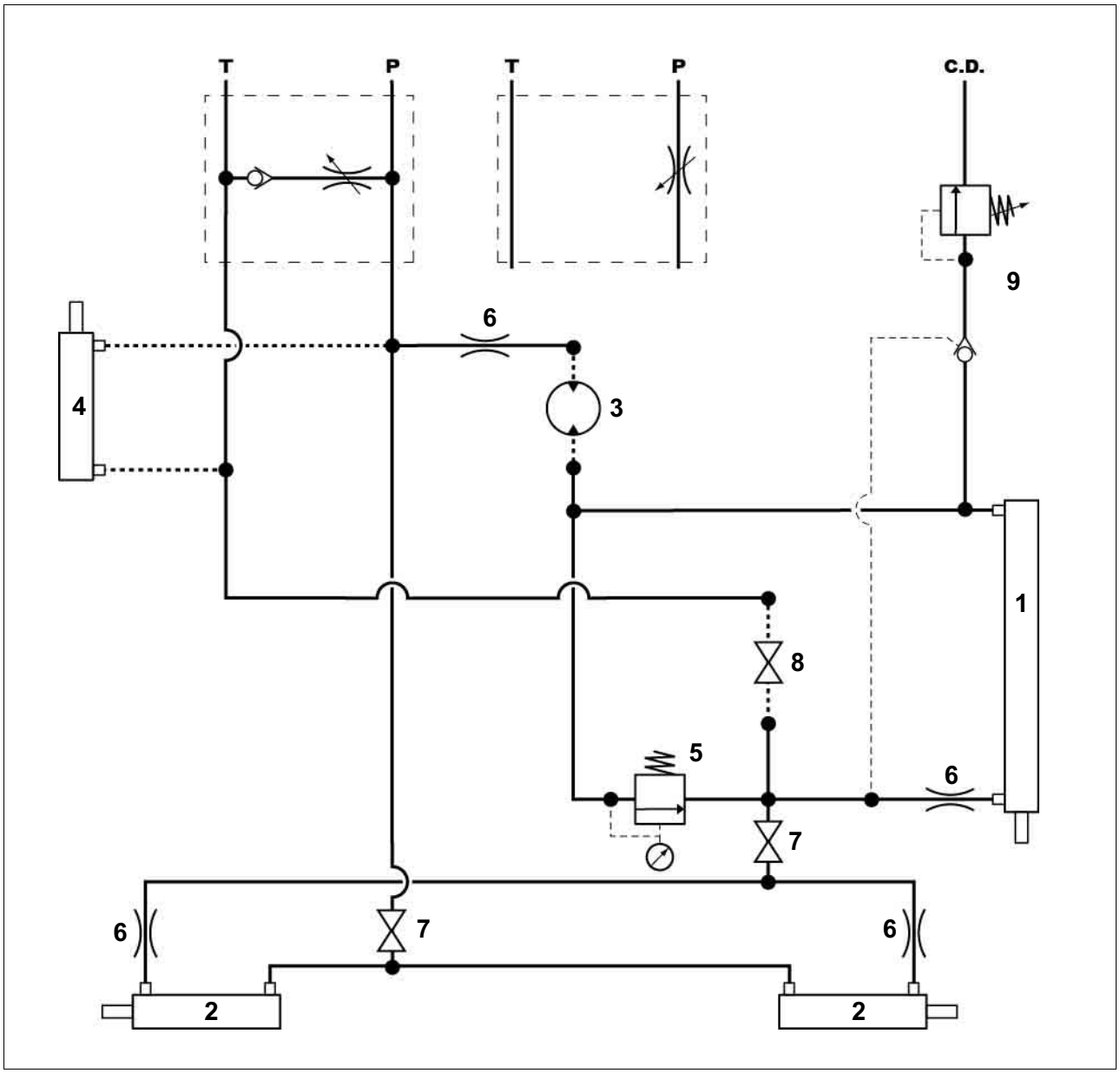
11.4.1 22” Concave disc incorporators without folding ends



Legend:			
1	Tool bar hydraulic cylinder	5	Restrictor
2	Recirculation valve hydraulic cylinder	6	Ball valve (included with recirculation kit)
3	Shredder hydraulic motor	7	Relief valve kit for pressurized tool bar (optional)
4	Pressure relief valve		

P	Pressure	**T**	Tank
C.D.	Case Drain		

11.4.2 22” Concave disc incorporators with folding ends

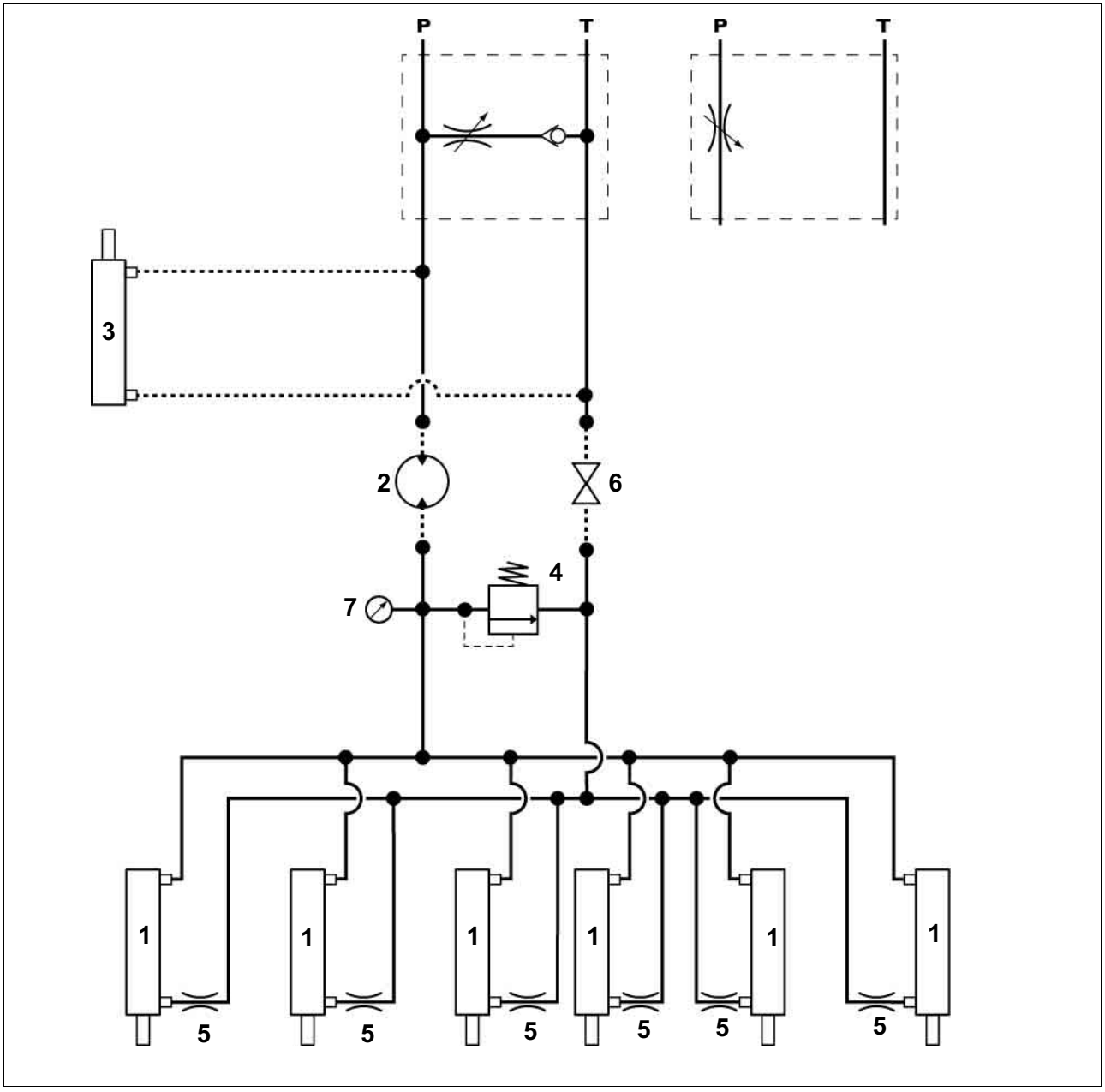


Legend:			
1	Tool bar hydraulic cylinder	6	Restrictor
2	Folding end hydraulic cylinder	7	Ball valve
3	Shredder hydraulic motor	8	Ball valve (included with recirculation kit)
4	Recirculation valve hydraulic cylinder	9	Relief valve kit for pressurized tool bar (optional)
5	Pressure relief valve		

P	Pressure	**T**	Tank
C.D.	Case Drain		

11.5 Hydraulic Diagrams - 24” Hydraulic Disc Injectors

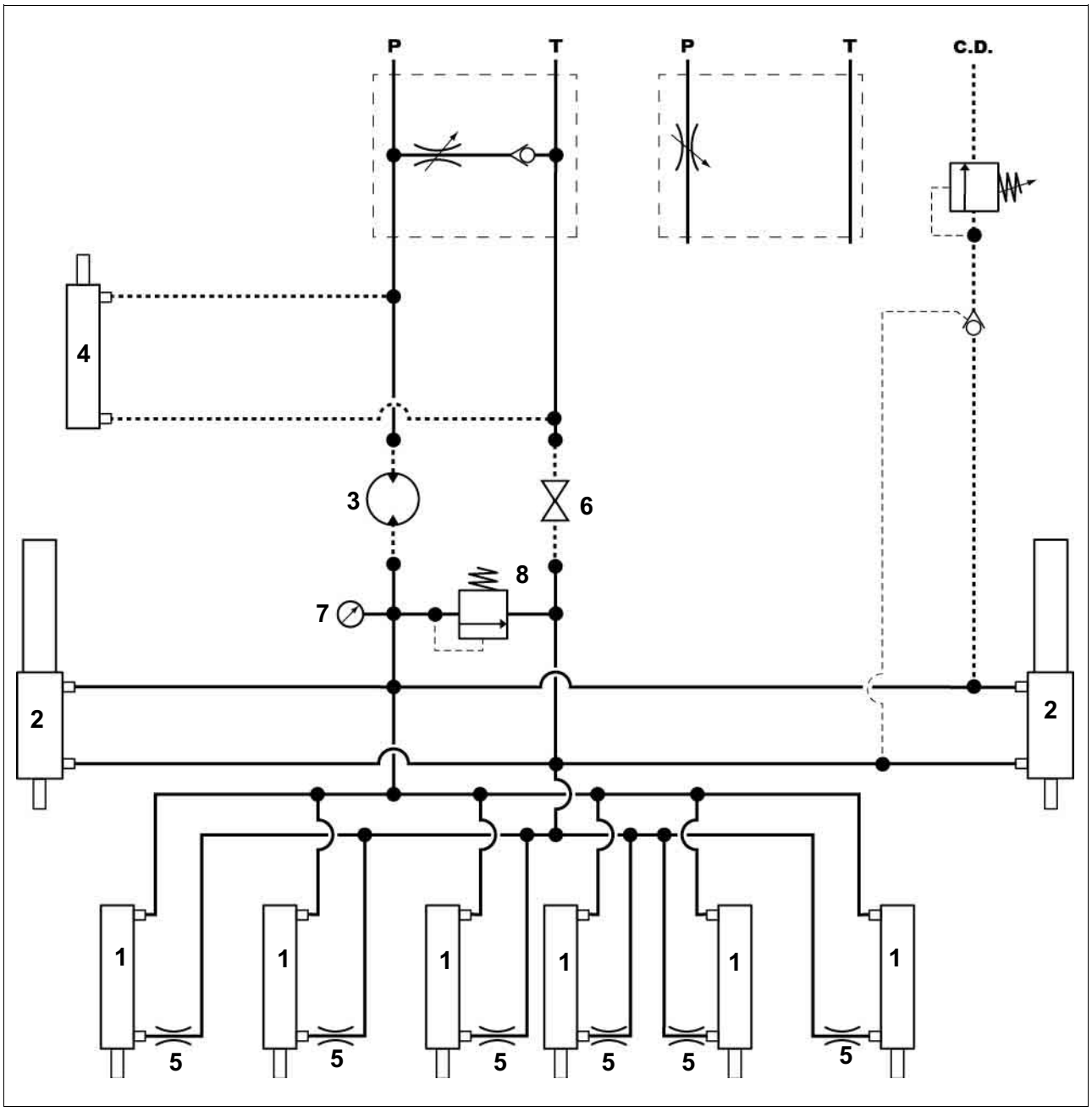
11.5.1 24” Hydraulic Disc Injectors (6 Injectors without tool bar cylinders)



Legend:			
1	Disc hydraulic cylinder	5	Restrictor
2	Shredder hydraulic motor (optional)	6	Ball valve (included with recirculation kit)
3	Recirculation valve hydraulic cylinder (optional)	7	Pressure gauge
4	Pressure relief valve		

P	Pressure	**T**	Tank

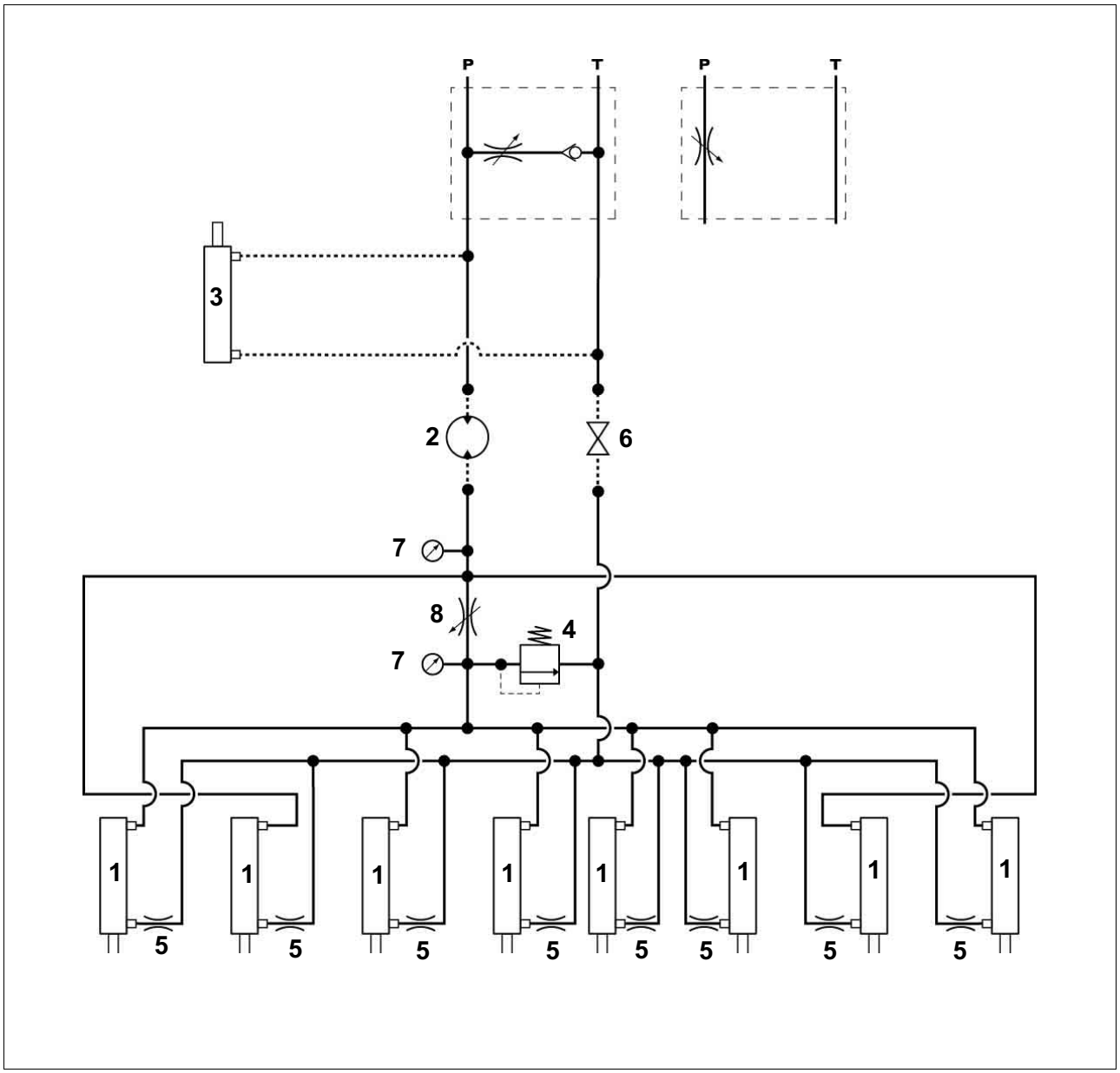
11.5.2 24” Hydraulic Disc Injectors (6 Injectors with tool bar cylinders)



Legend:			
1	Disc hydraulic cylinder	6	Ball valve (included with recirculation kit)
2	Tool bar hydraulic cylinder	7	Pressure gauge
3	Shredder hydraulic motor (optional)	8	Pressure relief valve
4	Recirculation valve hydraulic cylinder (optional)	9	Relief valve kit for pressurized tool bar (optional)
5	Restrictor		

P	Pressure	**T**	Tank
C.D.	Case Drain		

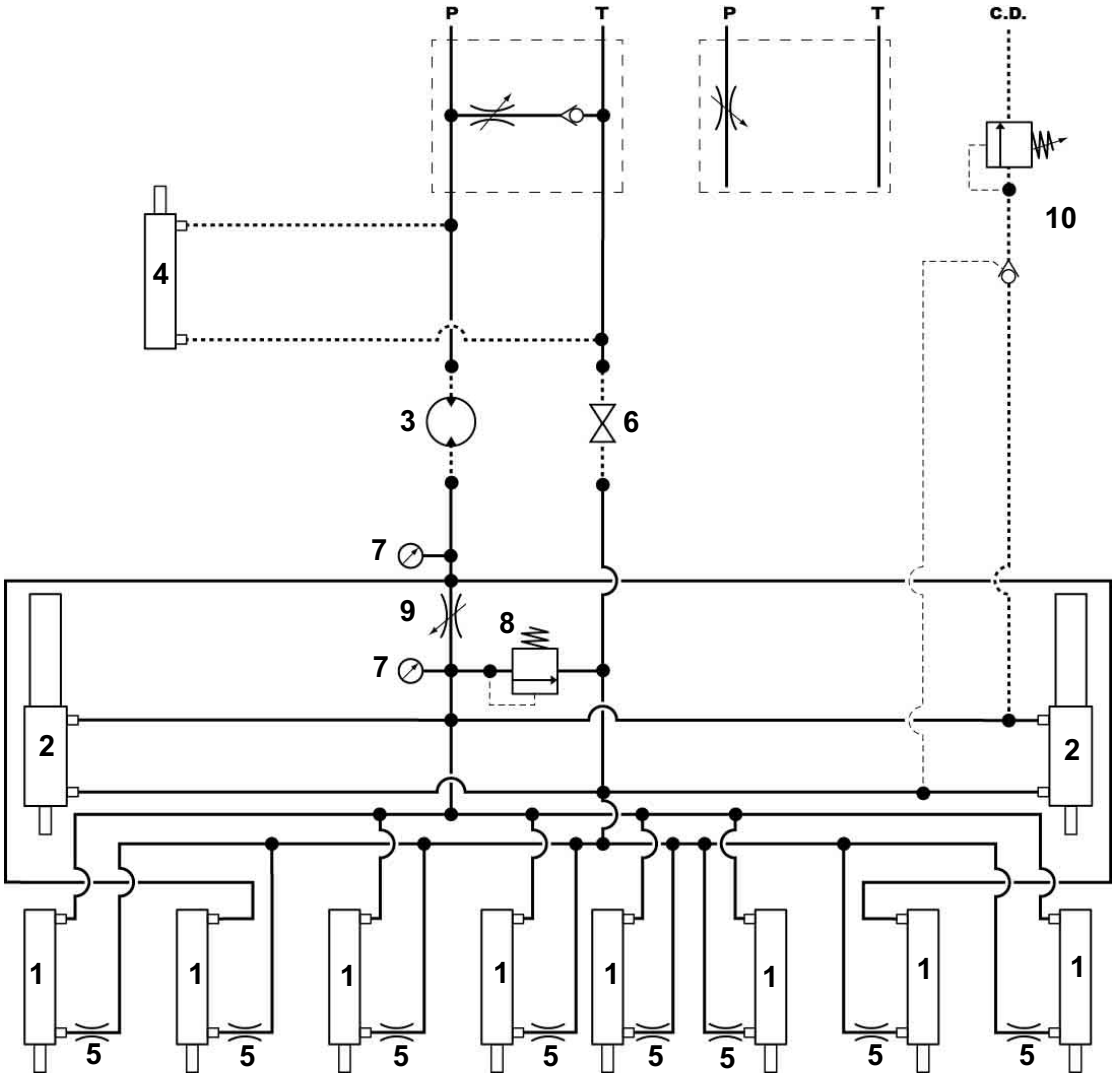
11.5.3 24” Hydraulic Disc Injectors (8 Injectors without tool bar cylinders)



Legend:			
1	Disc hydraulic cylinder	5	Restrictor
2	Shredder hydraulic motor (optional)	6	Ball valve (included with recirculation kit)
3	Recirculation valve hydraulic cylinder (optional)	7	Pressure gauge
4	Pressure relief valve	8	Needle valve

P	Pressure	**T**	Tank

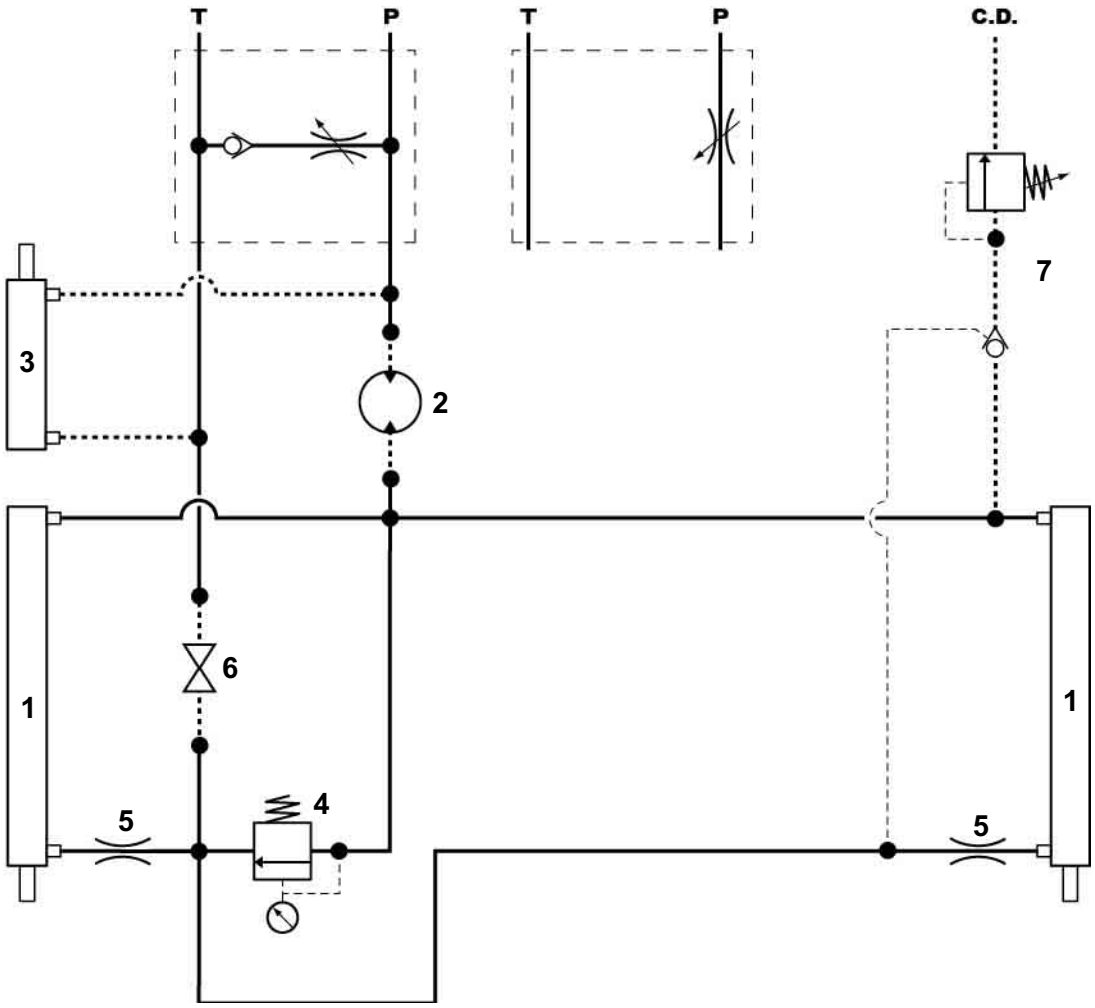
11.5.4 24” Hydraulic Disc Injectors (8 Injectors with tool bar cylinders)



Legend:			
1	Disc hydraulic cylinder	6	Ball valve (included with recirculation kit)
2	Tool bar hydraulic cylinder	7	Pressure gauge
3	Shredder hydraulic motor (optional)	8	Pressure relief valve
4	Recirculation valve hydraulic cylinder (optional)	9	Needle valve
5	Restrictor	10	Relief valve kit for pressurized tool bar (optional)

P	Pressure	**T**	Tank
C.D.	Case Drain		

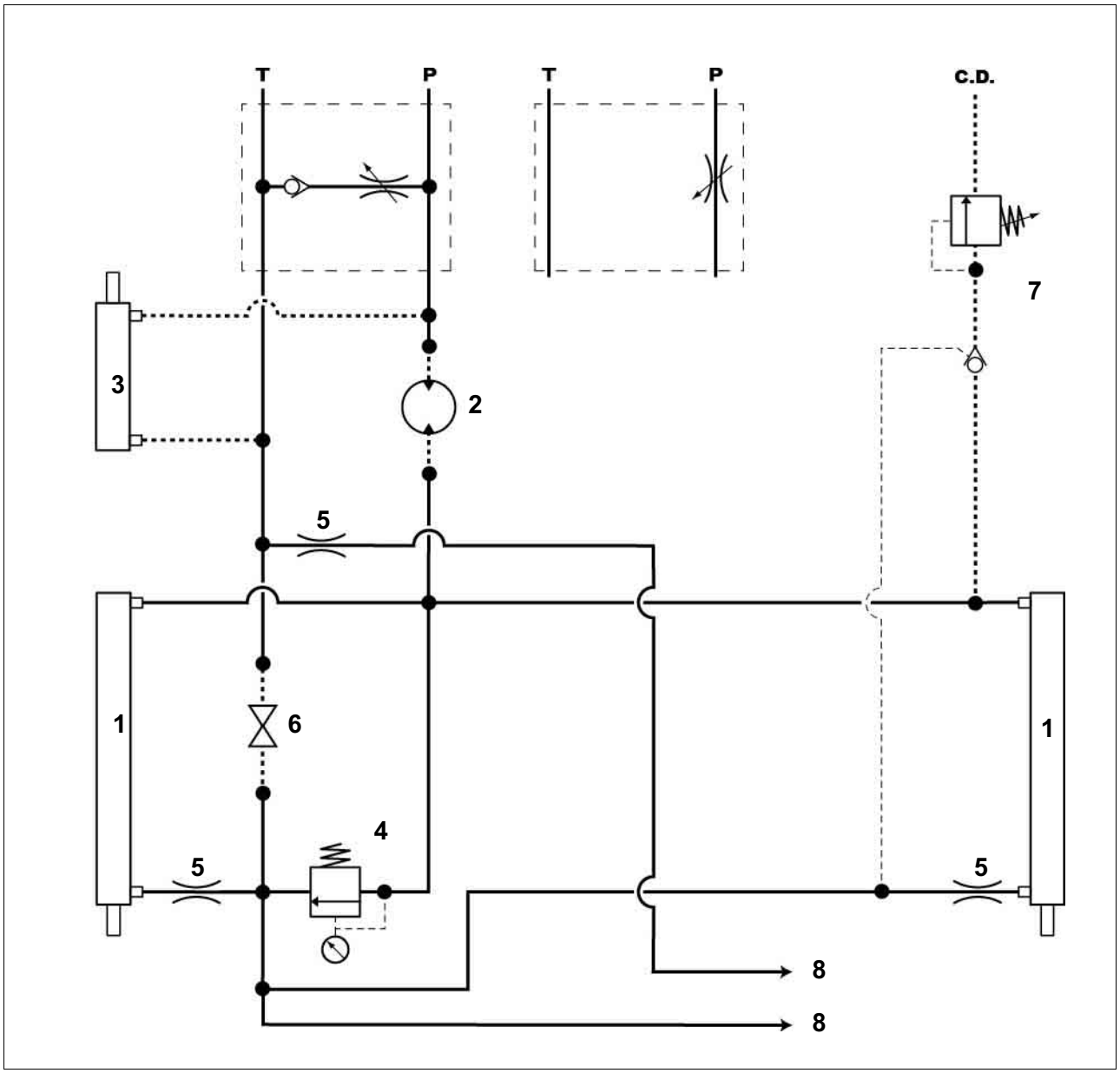
11.6 Hydraulic Diagram - DMI or Yetter Injectors



Legend:			
1	Tool bar hydraulic cylinder	5	Restrictor
2	Shredder hydraulic motor (optional)	6	Ball valve (included with recirculation kit)
3	Recirculation valve hydraulic cylinder (optional)	7	Relief valve kit for pressurized tool bar (optional)
4	Pressure relief valve		

P	Pressure	**T**	Tank
C.D.	Case Drain		

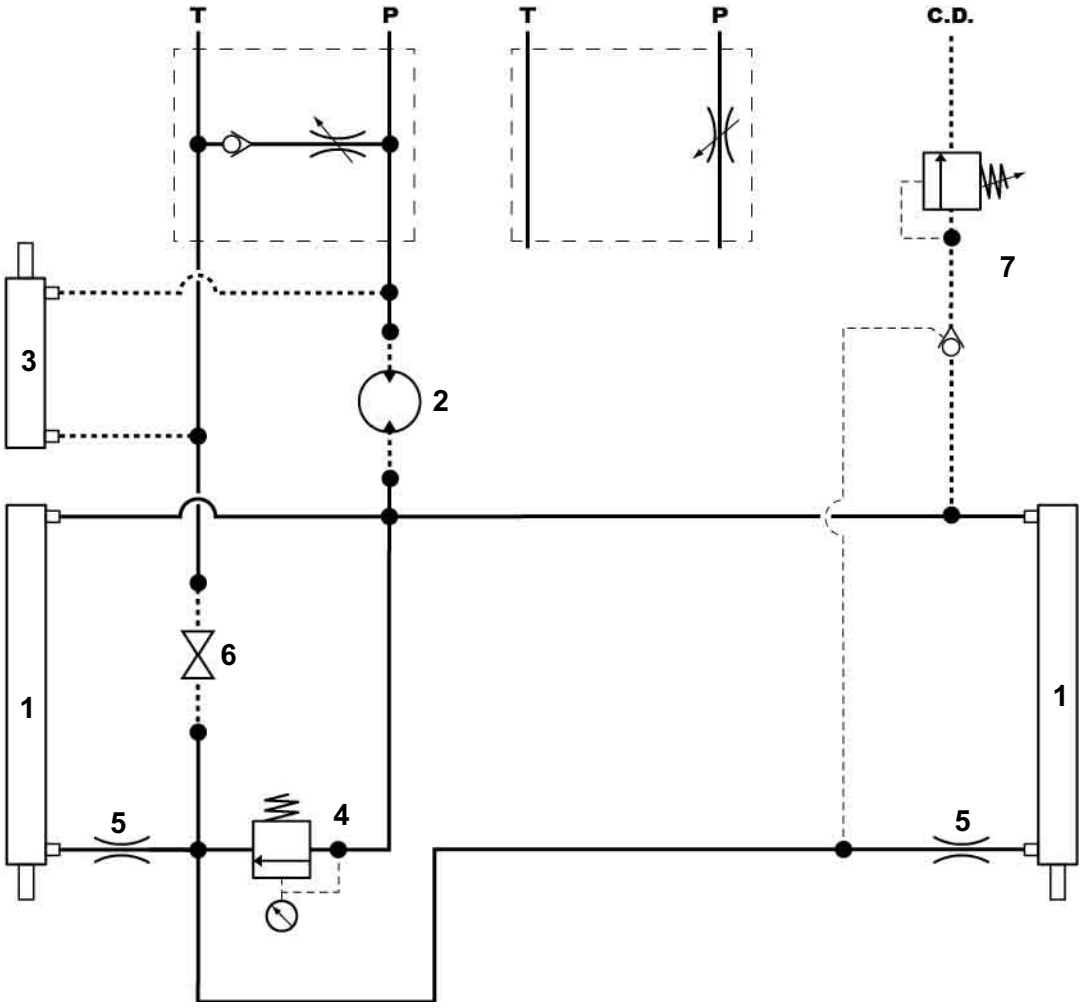
11.7 Hydraulic diagram - 7 DMI Injectors



Legend:			
1	Tool bar hydraulic cylinder	5	Restrictor
2	Shredder hydraulic motor (optional)	6	Ball valve (included with recirculation kit)
3	Recirculation valve hydraulic cylinder (optional)	7	Relief valve kit for pressurized tool bar (optional)
4	Pressure relief valve	8	To the folding end cylinder

P	Pressure	**T**	Tank
C.D.	Case Drain		

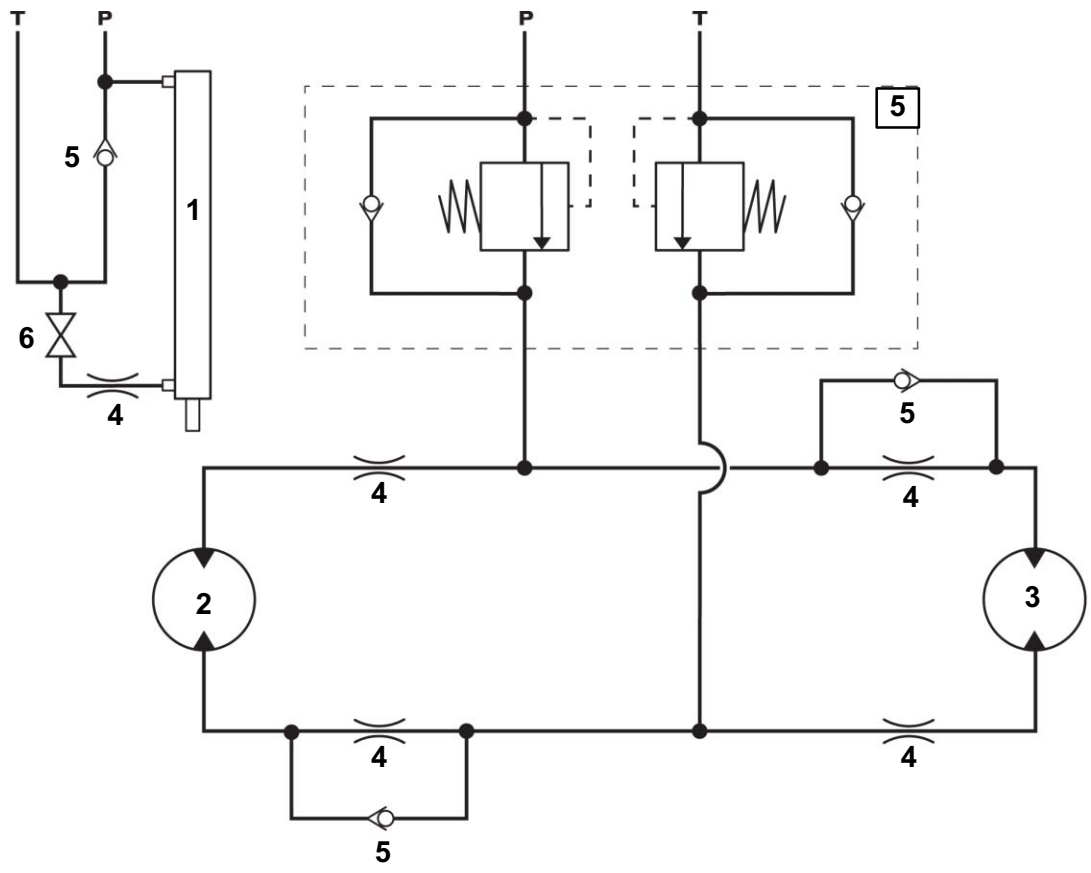
11.8 Hydraulic Diagram - Bourgeault Disc Injectors



Legend:			
1	Tool bar hydraulic cylinder	5	Restrictor
2	Shredder hydraulic motor (optional)	6	Ball valve (included with recirculation kit)
3	Recirculation valve hydraulic cylinder (optional)	7	Relief valve kit for pressurized tool bar (optional)
4	Pressure relief valve		

P	Pressure	**T**	Tank
C.D.	Case Drain		

11.9 Hydraulic diagram - 38 FT Wide Tool Bar with 3 Deflectors

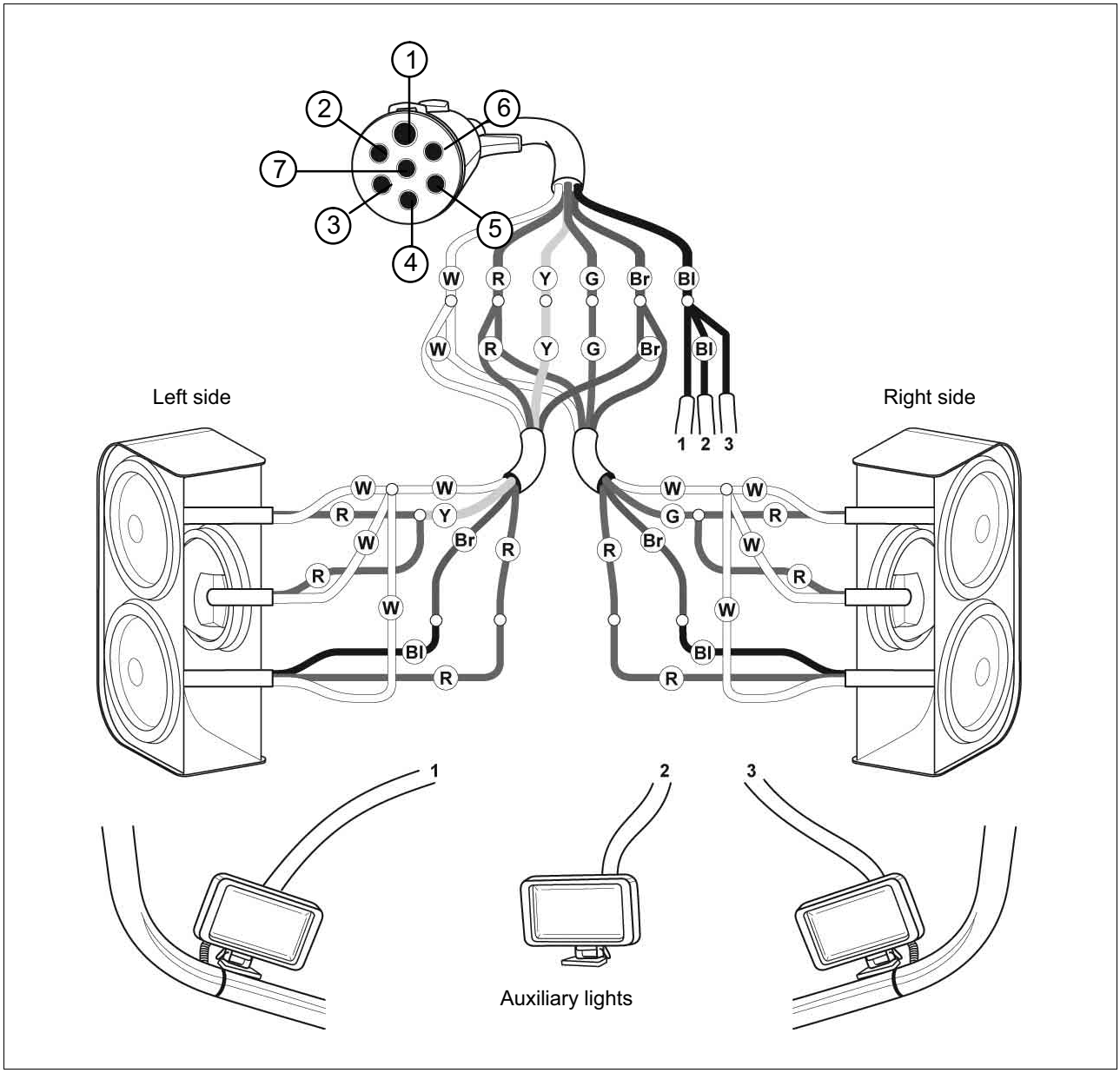


Legend:			
1	Tool bar hydraulic cylinder	4	Pressure relief valve
2	Folding arm hydraulic motor (left side)	5	Restrictor
3	Folding arm hydraulic motor (right side)	6	Ball valve

P	Pressure	**T**	Tank

11.10 Electric diagram

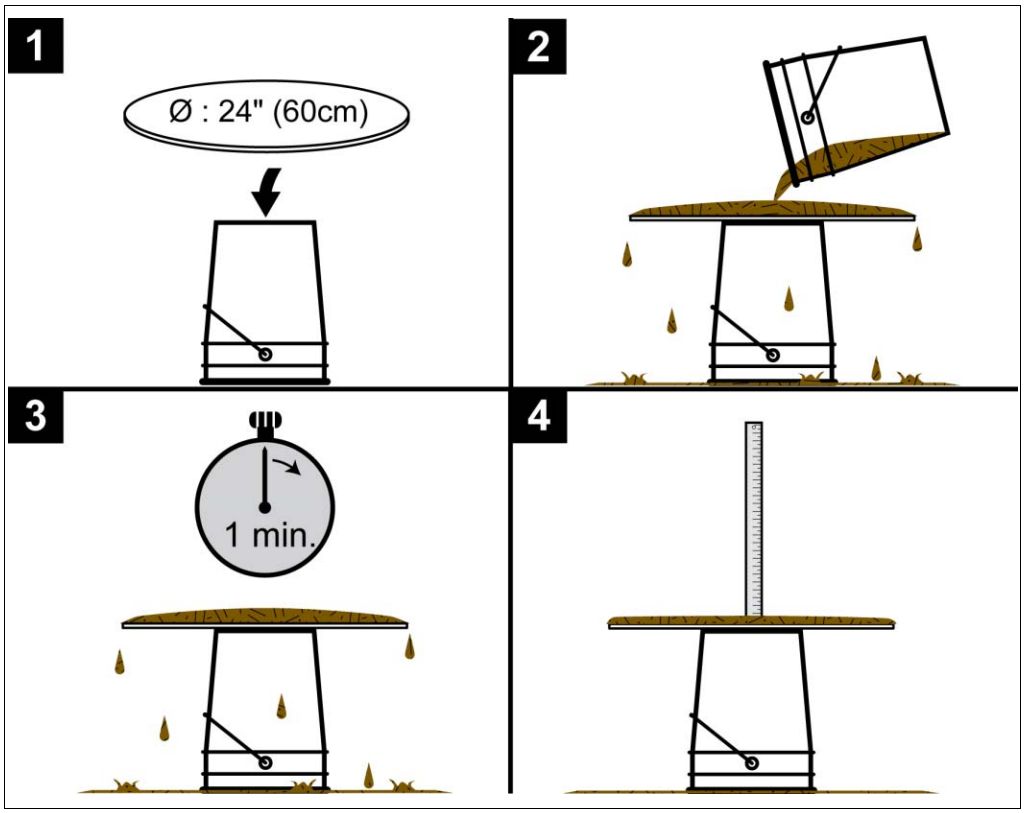
11.10.1 Signal lights



Legend:		
1	White (W)	Ground
2	Black (Bl)	Auxiliary lights
3	Yellow (Y)	Left flasher
4	Red (R)	Brakes
5	Green (G)	Right flasher
6	Brown (Br)	Parking light
7	Not used	

11.11 Consistency test

GEA Houle determined the following method to verify if the viscosity of the liquid manure is suitable for this product.



1. Set a pail on a level surface and install a 24” [60cm] round plate at the center of the pail.
2. Fill a second pail with homogenized liquid manure and slowly pour it in the center of the plate until it overflows all around the plate. Remain close to the plate when pouring the liquid manure.
3. Wait for one minute.
4. Measure the thickness of the liquid manure at the center of the plate.

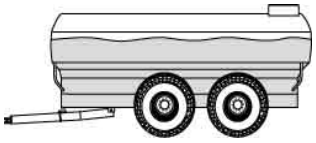
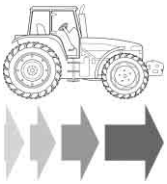
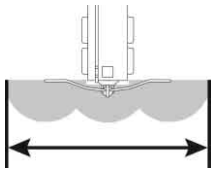
11.12 Spreading rate calculation

Four parameters are needed to determine a spreading rate: the volume of manure, the time needed to spread the manure, the tractor speed and the spreading width.

Determine which type of measurement unit (imperial or metric) and follow the instructions.

Before calculating the spreading rate, test the product and note the parameters described below:

- Fill the spreader tank with liquid manure;
- Note the volume of manure inside the spreader tank;
- Move to a spreading area;
- Position the tool bar to spread;
- Move the spreader at a constant speed;
- Spread the manure and monitor the time it takes for the spreader to be empty;
- Note time and speed;
- Measure and note the width of the spreading pattern.

	**Spreader volume**	Result: _____ litres or gal (UK)
	**Spreading time**	Result: _____ minutes
	**Tractor speed**	Result: _____ km/h or mph
	**Spreading width**	Result: _____ meters or feet

Apply results previously obtained to the following formulas. Calculate the flow rate then the spreading rate.

Flow rate formula:

Metric unit

Spreader volume ÷ spreading time = litres/minute
Example: 14550 litres ÷ 3 minutes = 4850 litres/minute

Imperial unit

Spreader volume ÷ spreading time = gal (UK)/minute
Example: 3200 gal (UK) ÷ 3 minutes = 1067 gal (UK)/min

Spreading rate formula:

Metric unit

Flow rate x 600 ÷ spreading width ÷ tractor speed = litres/hectare
Example: 4850 litres/minute x 600 ÷ 11.5 meters ÷ 9.6 km/h = 26359 litres/hectare

Imperial unit

Flow rate x 495 ÷ spreading width ÷ tractor speed = gal (UK)/acre
Example: 1067 gal (UK)/minute x 495 ÷ 38 feet ÷ 6 mph = 2316 gal (UK)/acre

Spreading rate versus spreading speed:

- Determine the proper spreading rate according to your application in order to define the tractor speed;
- Apply the rule of three as follows;

Tractor speed x required spreading rate ÷ monitored spreading rate = new speed
Example: 9.6 km/h x 20000 litres/hectare ÷ 26359 litres/hectare = 7.28 km/h

To spread 20 000 litres/hectare of manure, the driver must maintain the tractor speed to 7.28 km/h.

Note!
Also read section Flow rate adjustment.

11.13 Flow rate adjustment

The spreading rate takes the flow rate into account;

If the flow rate is reduced, the spreading rate is proportionally reduced;

When the maximum spreading speed is reached and the spreading rate is too high for the needs and as per the local regulations, flow rate must be reduced;

To adjust the flow rate, proceed with the steps below. If the first adjustment step is insufficient to obtain the desired spreading rate, proceed with the second adjustment step and so on.

1. reduce the speed of the PTO;
2. adjust the flow regulator;
3. add a restriction plate in the housing;
4. add a restrictor in the directional valve;
5. finally, insert restrictors in the deflectors.

Step 1: PTO

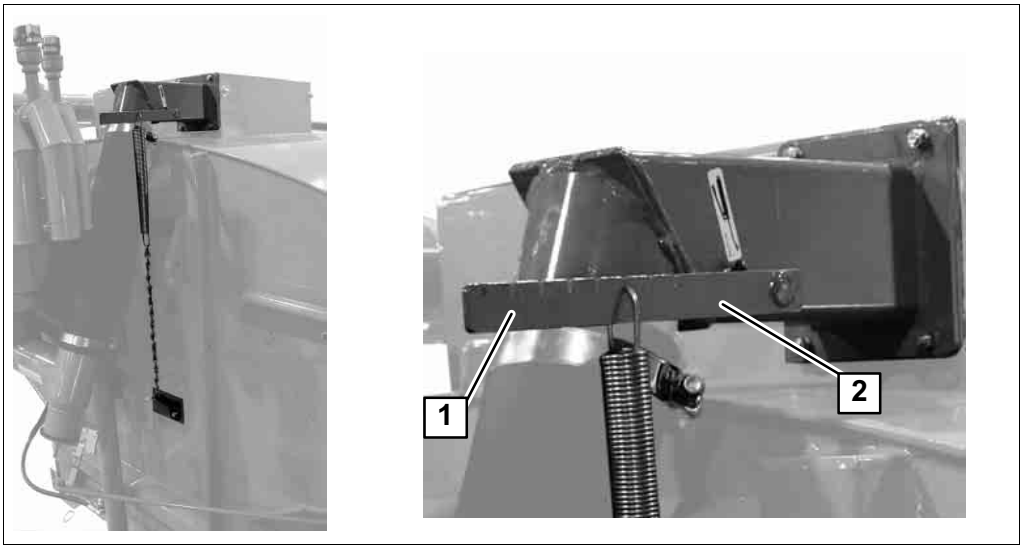
Start by reducing the PTO speed to decrease the impeller revolution therefore limiting the amount of manure inside the spreading pipe.

Step 2: Flow regulator (if applicable)

A spreader can be equipped with a spreading tool bar using a distributor to provide an equal amount of manure to each spreading nozzle.

The flow regulator connected to the distributor is used to direct liquid manure inside the spreader tank therefore limiting the amount of manure inside the distributor.

Note!
Always restrain flow rate using the flow regulator before adding a restrictor inside the manual directional valve.

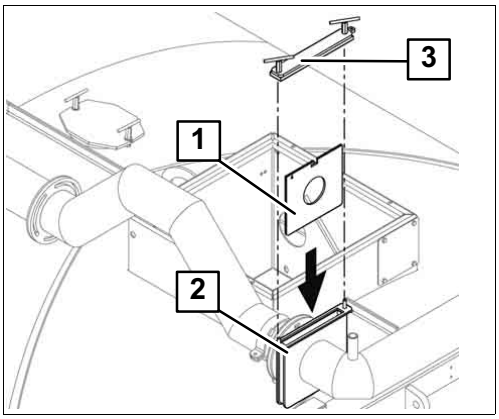


- To maximize manure flow inside the distributor, position the tension spring near the edge of the lever (1). The tension on the spring will increase and close the flapper inside the return pipe;
- To limit manure flow to the distributor, position the tension spring on the opposite end (2). The tension on the spring will decrease and open the flapper inside the return pipe.

Step 3: Restriction plate (if applicable)

A spreader discharge pipe can be equipped with a housing designed to insert a restriction plate to limit flow rate.

- Slide a restriction plate (1) in the housing (2);
- Close the opening with the cover (3).



Step 4: Directional valve restrictor (if applicable)

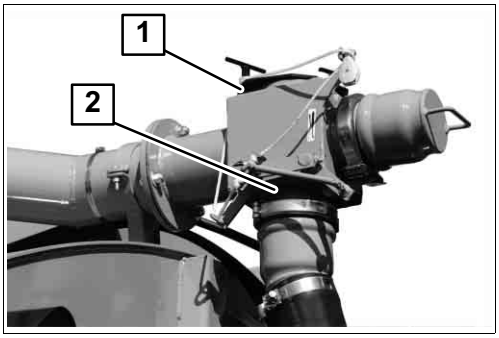
A spreader can be equipped with more than one spreading tool at a time.

A directional valve is installed on the discharge pipe allowing the user to select a spreading tool.

Flow rate can be reduced only inside the lower spreading tool by placing a restrictor in the lower opening of the directional valve.

☞ **Note!**
Always restrain flow rate using the flow regulator before adding a restrictor inside the manual directional valve.

- Remove the cleaning opening (1);
- Place a restrictor in the lower opening (2) of the directional valve to reduce the flow rate of the tool connected.



Step 5: Deflector restrictor (if applicable)

When using a tool bar to spread manure, a restrictor is inserted in each deflector to limit the opening and to reduce the flow rate.

Pressure is increased to allow larger spreading width.

- Insert a restrictor (1) in each tool bar deflector (2).

11.14 Abbreviations

Terms	Explanation	Terms	Explanation
@	at	Ø	diameter
EC	European Community	CW	clockwise
CCW	counterclockwise	fax	facsimile
I.D.	inside diameter	Inc.	Incorporated
NC	national coarse	O.D.	outside diameter
PTO	power take off	PVC	polyvinyl chloride
QC	Quebec	SAE	Society of Automotive Engineers
USA	United States of America	WWW	World Wide Web

Units	Explanation	Units	Explanation
A	ampere	kg	kilogram
AC	alternative current	kPa	kilopascal
cm	centimeter	kW	kilowatt
°	degree	km/h	kilometres per hour
°C	degree Celsius	lpm	liter per minute
°F	degree Fahrenheit	lb	pound
DC	direct current	m	meter
ft	foot	min	minute
ft-lb	foot-pound	mph	miles per hour
gal	gallon	mm	millimeter
gpm	gallons per minute	NM	newton meter
HP	horsepower	psi	pounds per square inch
hr	hour	RPM	revolutions per minute
Hz	hertz	s	second
in.	inch	v	volt

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