STR series

Semi-tanker

Operation Manual / Parts List
(Original operating instructions)

2018-9015-008
01. July 2018

engineering for
a better world

gea.com

Contents

1 General

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

1.1 Information on the document

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

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

This manual is supplied with the product.

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

Layout elements

Pictograms used

Note
The signaling word indicates information that is important for the product and environment.

This pictogram refers to an information source.
(section, manual, Internet, …).

20 . . -**90 . .** -000 All manuals have a reference number. The 4 middle digits specify the language of the instruction manual:

	Language		**Language**		**Language**
-9000-	German	-9013-	Dutch	-9032-	Serbian
-9001-	English (United Kingdom)	-9015-	English (North American)	-9034-	Slovak
-9002-	French (France)	-9016-	Polish	-9035-	Chinese
-9003-	Italian	-9018-	Japanese	-9036-	Lithuanian
-9004-	Romanian	-9021-	Danish	-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	-9050-	Vietnamese
-9012-	Turkish	-9029-	Slovene		
The instruction manuals may not be available in all the listed languages.					

1.2 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.

1.2.1 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.

1.2.2 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.

1.2.3 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.

1.2.4 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.

1.2.5 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.

1.3 SPECIFIC LIMITED WARRANTY APPLICABLE TO SEMI-TANKER (ALL MODELS)

This specific limited warranty benefits to the Purchaser and applies to all semi-tanker models sold by the Company. This limited warranty applies only to following specific parts: reservoir, trailer and its components. 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 1.2). 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.

1.3.1 Extent of specific limited warranty

Reservoir

The warranty period for the reservoir of the semi-tanker 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 semi-tanker is stored inside a building and protected from the weather, in accordance with the recommendations prescribed by the Company.

Stainless steel reservoir

The warranty period for the stainless steel reservoir of the semi-tanker 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.

Trailer and its components: frame, wheels, hubs, axles, suspension system, kingpin, landing gears, braking system, markers and clearance light system

The warranty period of the trailer and its components is subject to such third-party manufacturer's specific warranty coverage from the date of delivery of the equipment to the Purchaser. Third-party components are to be inspected, serviced, repaired and/or replaced at a truck maintenance center upon the manufacturer specific warranty requirements. Date and proof of purchase may be required prior to claim. GEA does not cover third-party warranty and will not be involved in matter regarding inspection, repair, replacement and claiming.

1.4 Manufacturer's address

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

☎ +1 819 477 - 7444
🖷 +1 819 477 - 5565
✉ geahoule@gea.com
@ www.gea.com

1.5 Customer service

Dealer

If necessary, contact your nearest dealer.

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

www.gea.com

US Contact Information:

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

☎ +1 630 369 - 8100
🖷 +1 630 369 - 9875
✉ contact_us@gea.com
@ www.gea.com

1.6 Trailer manufacturer's address

Canadian contact information:

Manac
270, chemin Du Tremblay
Boucherville, Qc, J4B 5X9

☎ 1-800-361-7900
☎ Parts hotline 1-800-545-5086
@ www.manac.ca

US contact information:

Manac
1001, LYN ROAD
SARVER, PA 16055

☎ 1-877-466-2622
☎ Parts hotline 1-800-545-5086
1-724-294-0009
Info@manac.us
@ www.manac.us

2 Safety

2.1 Intended Use

It is exclusively designed to:

- be towed by a semi-truck;
- haul water or liquid manure on the road;
- transfer the liquid into a spreader tank or a reservoir;
- spread the liquid onto a field.

Applications which are not listed here are not part of the intended use and are therefore considered as improper use!

Please note that the following is prohibited:

- processing others substances than liquid manure and water.

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

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

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

2.2 Owner's obligation of care

This product is designed for agricultural purposes only. Make sure to follow the local rules and road regulations in relation with the use of this product.

The product has been designed and constructed taking account of a potential risk analysis and after careful selection of the compliant harmonized standards and other technical specifications. It therefore ensures a maximum level of safety.

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

The owner must ensure that this equipment is safe to operate.

If adding component(s)/equipment not manufactured by GEA 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.

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 the following:

- 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.

2.3 Subsequent modifications

Unauthorized product modifications can have a negative impact on the safety, service life and functionality of the product.

Any modifications not described in the product documentation are deemed to be prohibited.

Changes must be approved by the manufacturer in writing.

Any unauthorized modifications to the product will invalidate the warranty.

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

2.4 Explanation of the safety symbols warnings used

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

The design of the warnings is based on ISO 3864-2 and ANSI535.6.

Safety symbols and key words

Danger!

The signaling word indicates an immediate danger that will lead to loss of life or serious physical injury.

Warning!

The signaling word indicates an immediate danger that could lead to loss of life or serious physical injury.

Caution!

The signaling word indicates hazardous situations that could cause physical injury.

Attention!

The signaling word indicates hazardous situations that could cause damage to property or malfunction.

2.5 General 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.

2.6 Personnel qualifications

Everyone who performs work or activities in connection with the product must carefully read and understand the manual and then act accordingly.

The manufacturer intends to determine the difference between Operator and Qualified personnel.

Operator

The operator is a truck driver having a valid class licence qualifying him to operate a semi-truck on the road.

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.

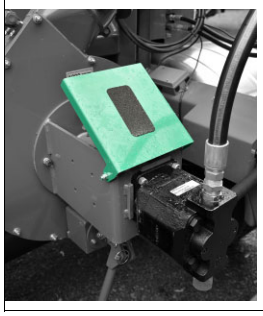
Note
Work that requires special qualifications is described in the relevant chapters!

2.7 Safety guard and devices

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.

	Gear guard on articulated transfer pipe (part no. 2018-7715-910)
	Safety grid on fill opening (part no. 2018-7627-510)
	Bearing housing cover (part no. 2018-1404-230) Anti-slip tape (part no. 2018-3902-540)

2.7.1 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.

2.8 Residual risks

Not all hazards can be eliminated by construction measures.

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

2.9 Dangerous areas

Danger!

Risk of death!
The semi-tanker reservoir contains heavy toxic gases.
► Do not enter the reservoir.

Toxic gases in confined spaces:

Agitated manure produces heavy toxic gases that can cause loss of consciousness, asphyxia or death in few seconds.

Follow the safety procedures for confined spaces before operating or servicing this equipment in such environment.

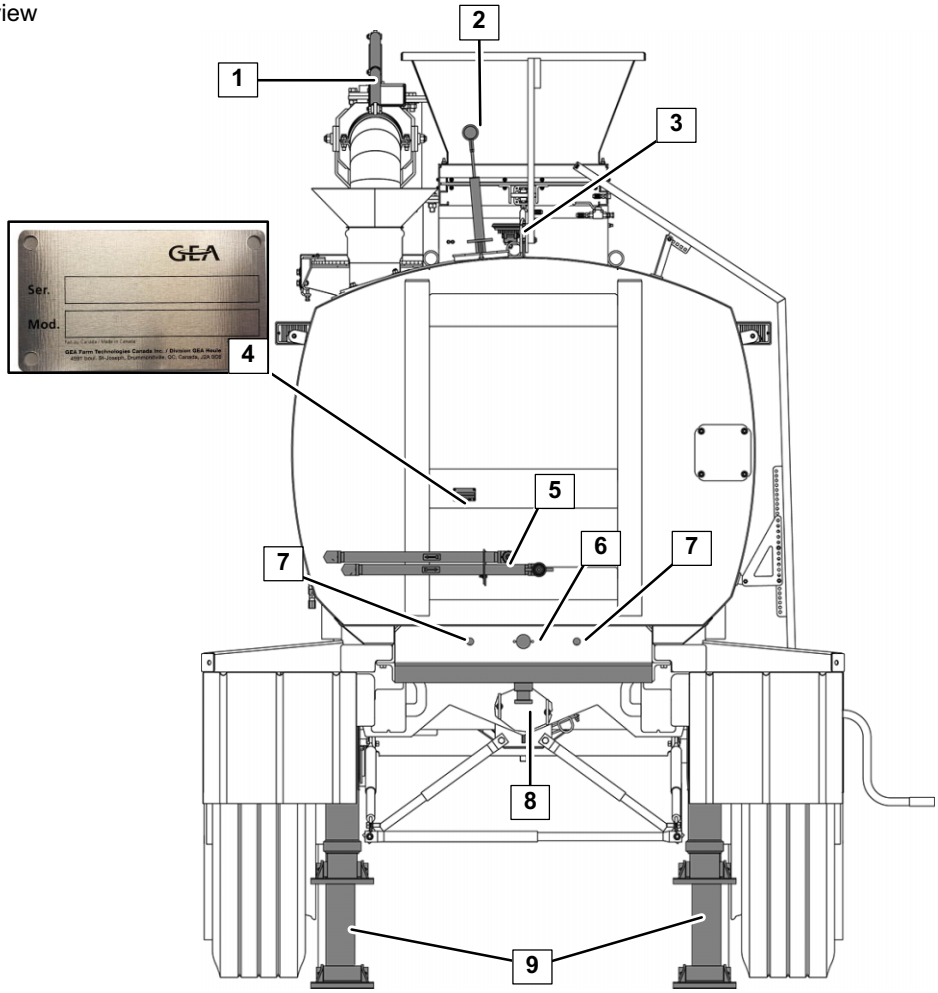
Look at the corresponding Web site below to make sure the local safety procedures for confined spaces are followed.

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

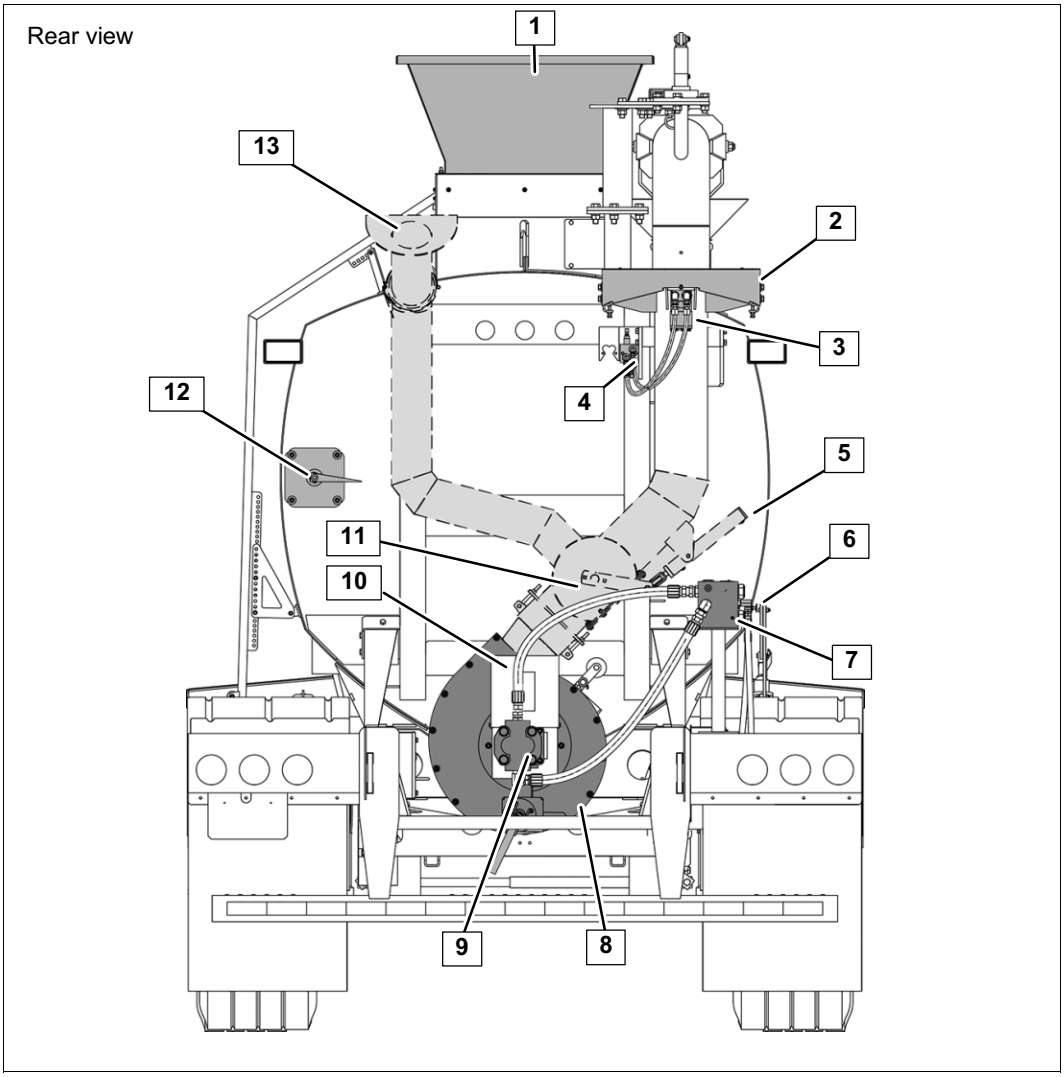
3 Description

3.1 Structural description

Front view

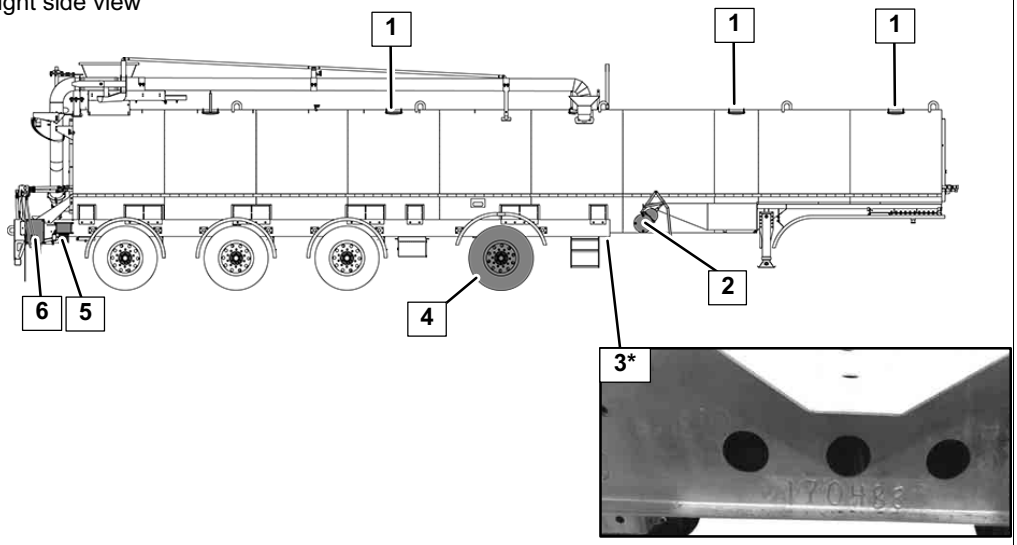


1	Articulated transfer pipe cylinder	6	Electric outlet J560
2	Top fill indicator	7	Pneumatic glad hands
3	Top beam light	8	Kingpin
4	Reservoir serial number and model	9	landing gears
5	Hydraulic hose couplings		



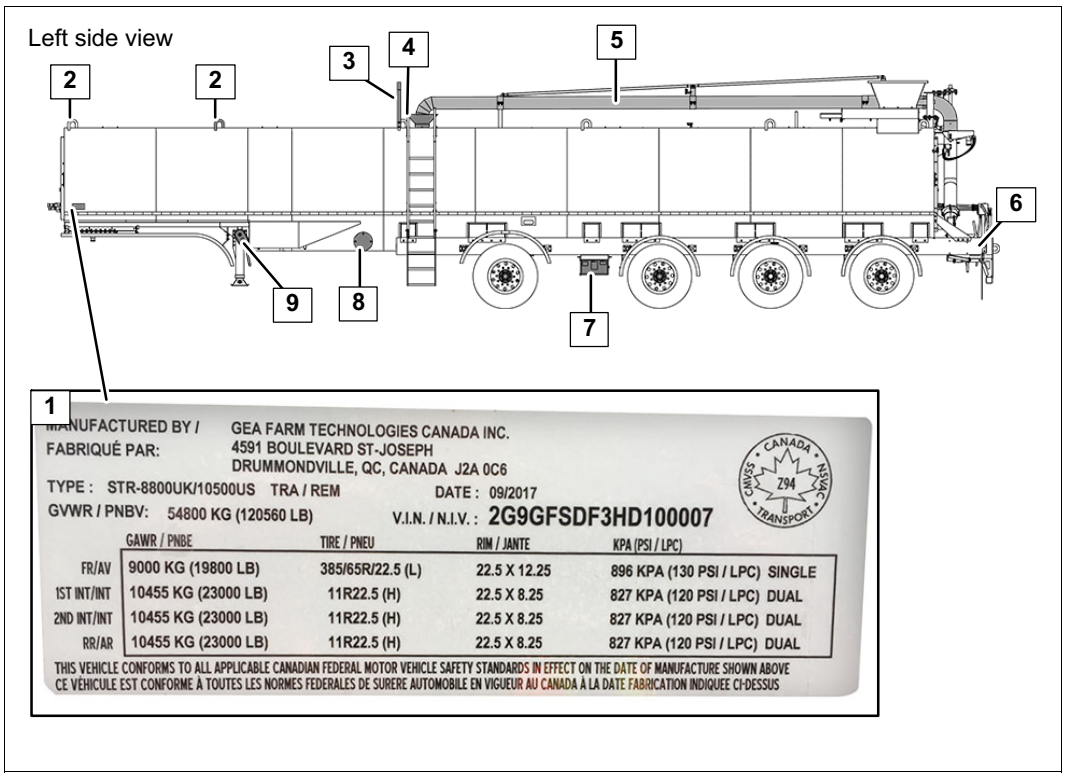
1	Hopper	8	Impeller housing
2	Gear guard on articulated transfer pipe	9	Hydraulic motor of the HE impeller
3	Hydraulic motor of the articulated transfer pipe	10	Bearing housing cover
4	Pressure relief valve	11	Rotative valve
5	Cylinder of the rotative valve	12	Level indicator
6	Manual override valve	13	Spreading nozzle
7	Hi-flow hydraulic block valve		

Right side view



1	Cleaning openings	4	Auto-steer lift axle
2	Side opening with guillotine valve	5	Control box
3*	Undercarriage serial number	6	Hydraulic levers

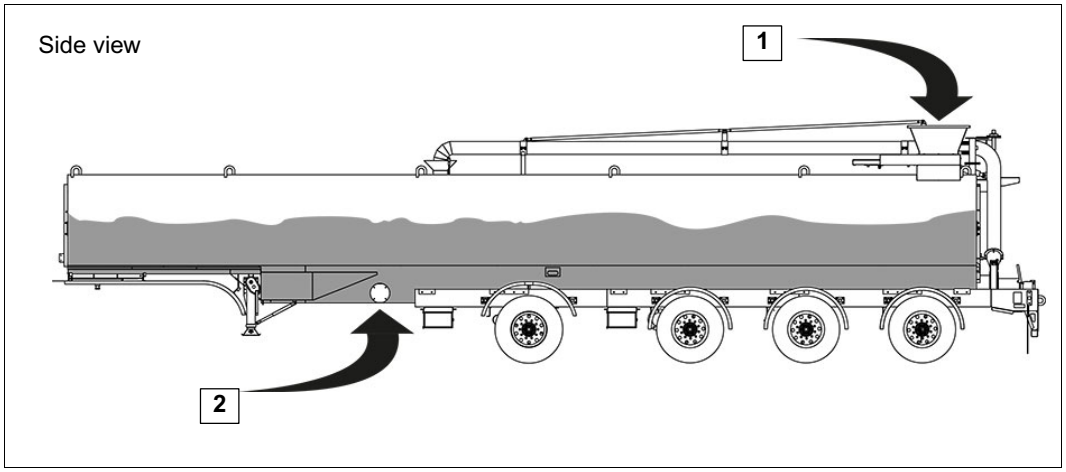
* The undercarriage serial number is normally welded at the front of the undercarriage. The serial number may be located elsewhere on the undercarriage depending on the semi-tanker model.

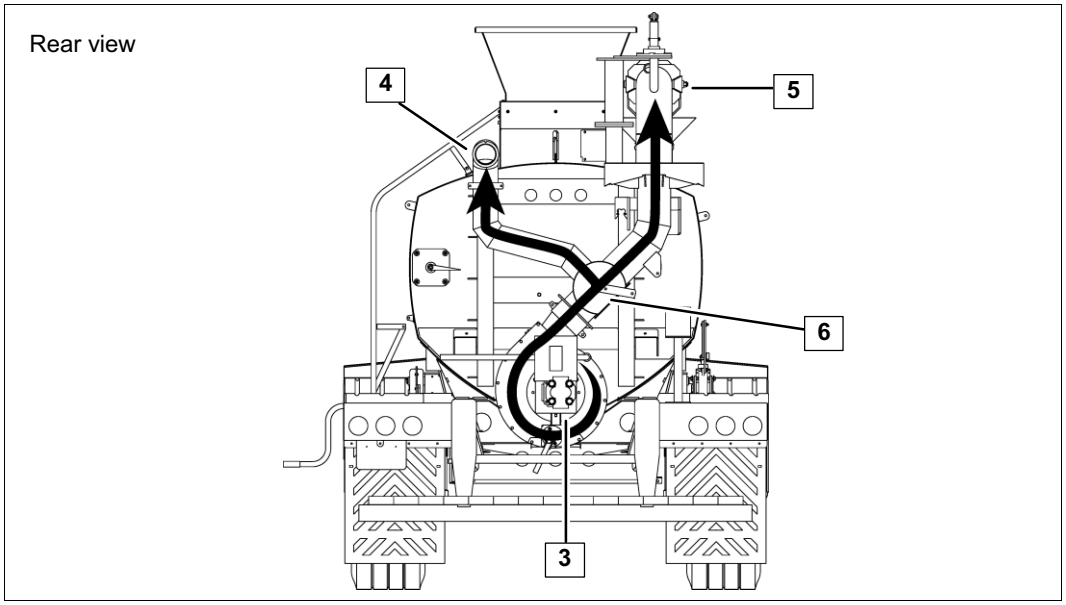


1	Nameplate	6	ABS brake light
2	Lifting rings	7	Pneumatic FRL valve
3	Antenna	8	Side opening
4	Receptacle of the articulated transfer pipe	9	landing gears crank handle
5	Articulated transfer pipe		

3.2 Functional Description

The Semi Tanker is filled with water/liquid manure either through the fill opening (1) or through the side opening (2). Once filled, the impeller (3) pumps the liquid through the rotative valve (6) which directs the liquid to the spreading nozzle (4) or to the articulated transfer pipe (5).





3.3 Technical Data

3.3.1 Semi Tanker

Operating temperature	41°F (5°C) minimum
Operating air pressure	90-130 psi (6.2 bar - 8.9 bar)
Coupling Height	47” (1.19 m)
Maximum speed (STR-240, STR-242, STR-342)	75 mph (120 km/h)
Maximum speed (STR-447)	68 mph (109 km/h)

3.3.2 Wireless remote control

Transmitting frequency	2.4 GHz
Maximum transmitting range*	400 ft (122 m)
Battery type	LiPo
Recharge time (hours)	9.5

* The maximum transmitting range is achievable when the climatic conditions are favorable (Clear sky) and when there are no objects blocking the signal between the transmitter and the receiver.

3.3.3 Hydraulic hoses

O.D.	0.58"	0.86"	1.48"
I.D.	¼"	½"	1"
Quantity of braids	2	2	2
Service pressure	5800 psi (400 bar)	4000 psi (276 bar)	2400 psi (165 bar)

3.3.4 Pneumatic hoses

O.D.	⅜"	½"	⅞"
I.D.	¼"	⅜"	½"
Material	Plastic (green-blue-red)	Plastic (black-red)	Rubber (black)
Service pressure	350 psi (24 bar)	240 psi (16 bar)	225 psi (15 bar)

3.3.5 Pneumatic FRL valve

Maximum operating air pressure	150 psi (10.3 bar)
Filtration	5 micron
Oil reservoir capacity	3.8 oz (112,4 ml)
Minimum operating temperature	39.2ºF (4ºC)
Maximum operating temperature	125.6ºF (52ºC)

3.3.6 Wet kit specifications

Minimum hydraulic transfer rate	40 US GPM (150 LPM)
Maximum hydraulic pressure	3000 psi (206.8 bar)

3.3.7 Hydraulic motor (impeller)

Capacity	40.9 US GPM (155 LPM)
Revolution	900 RPM
Max power	58 HP
Maximum operating pressure	3000 psi (206.8 bar)

3.3.8 Hydraulic HE impeller

Capacity	2500 US GPM (9463 LPM)
Revolution	900 RPM
Power	48 HP
Maximum manure consistency	1 ½" (38mm)

3.3.9 Hydraulic motor (articulated transfer pipe)

Capacity	15 US GPM (57 LPM)
Revolution	932 RPM
Maximum continuous torque	3897 lb in (440 Nm)
Maximum intermittent torque	4783 lb in (540 Nm)
Maximum continuous operating pressure	1800 psid
Maximum intermittent operating pressure	2400 psid

3.3.10 Tires

Note
The following table contains load and inflation information which may not reflect the current load and inflation information from the manufacturer. Always refer to the tire sidewall markings for maximum load and pressure.

Warning!
Never exceed the maximum pressure limitation set by the manufacturer. Applying pressure beyond the limitation may result in tire destruction which can cause, damage, injury and/or death.

Warning!
Risk of suspension malfunction!
When changing the semi-tanker tires, always use the same tire brand and model. Using other brands and/or models may affect suspension performance which can result in damage, injury and/or death.

Steer axle tire

Tire brand		Michelin
Tire model		X Multi T
Load range		L
Size		385/55R22.5
Ply		22
Tire dimensions (inch/mm)	Diameter	39.3” (99.8 cm)
	Width	14.9” (37.8 cm)
Weight (tire without rim)		150 lbs (67 kg)
Approved wheel		11.75 - 12.25
Maximum load and maximum cold pressure		9 920/130 lbs/psi
Maximum speed		68 mph (109 km/h)
Bolt torque		450-500 lb ft (610-677Nm)

Non-steer axle tire

Tire brand		Michelin	Michelin
Tire model		X One XZY 3	XZE-2
Load range		M	H
Size		455/55R22.5	11R22.5
Ply		22	16
Tire dimensions (inch/mm)	Diameter	41.9” (106.4 cm)	41.4” (105.2 cm)
	Width	17.8” (45.2 cm)	11.3” (28.7 cm)
Weight (tire without rim)		203 lb (92 kg)	125.7 lbs (57 kg)
Approved wheel		14.00	8.25 - 7.50
Minimum dual spacing			12.5” (31.75 cm)
Maximum load and maximum cold pressure	Super single	11 700/130 lbs/psi	6610/120 lbs/psi
	Dual		6005/120 lbs/psi
Maximum speed		75 mph (120 km/h)	75 mph (120 km/h)
Bolt torque		450-500 lb ft (610-677Nm)	450-500 lb ft (610-677Nm)

3.3.11 Lubricant specifications

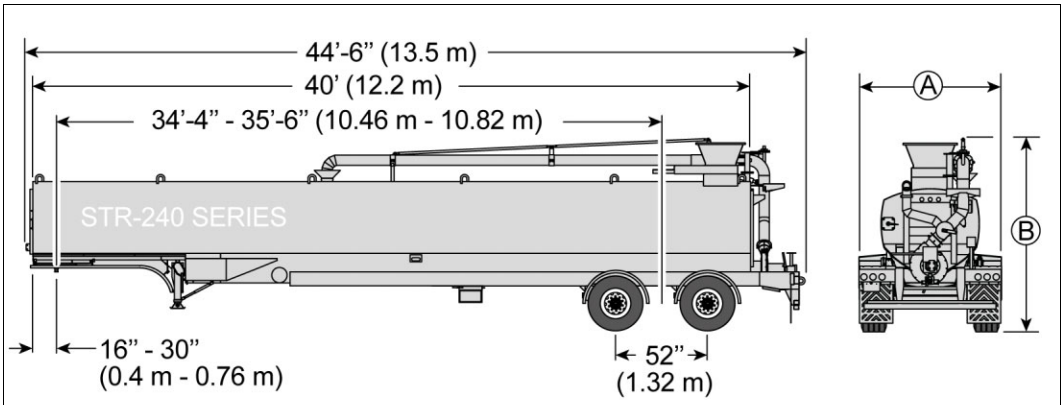
Lubricant type	Product name	Grade	Purpose
Wax	Automotive wax		• To protect the equipment and facilitate cleaning.
Grease	880 Crown and Chassis	2	• To grease wheel hub bearings.
Gearbox oil	TRAXON™	80W-90	• To fill the bearing housing.
Grease	PRECISION™ general purpose EP2	NLGI 2 NLGI 3	• To lubricate the equipment. • Lubricate the slack adjuster.
Hydraulic oil		AW32	• Hydraulic oil for the semi- truck wet kit.
Synthetic air tool oil		ISO 32	• Lubricate the pneumatic cylinder of the top fill opening.
Grease		Lithium or anhydrous calcium extreme pressure grease	• Lubricate the landing gears.

3.4 Geometric data

Note
The GVWR (gross vehicle weight rating) specified on the semi-tanker name plate may not correspond to the maximum load authorized by road regulations.

► Contact local authorities for information about permissible load, special permits and exemptions.

3.4.1 STR-240



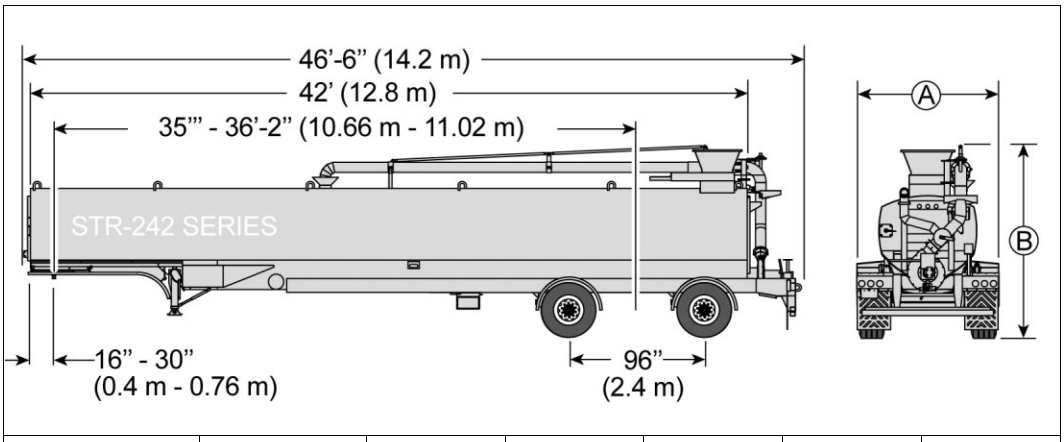
Model	Tire	GAWR**	Unladen weight*	GVWR***	Width **(A)**	Height **(B)**
STR-240 5900 us gal 4900 UK gal 22300 Liters	Super single 455/55R22.5	20020 lbs (9100 kg)	15045 lbs (6824 kg)	72620 lbs (32940 kg)	98" (2.48m)	11'-0" (3.35 m)
	Dual 11R22.5	23000 lbs (10433 kg)	15445 lbs (7005 kg)	82800 lbs (35365 kg)	101¾" (2.58 m)	
STR-240H 7000 us gal 5800 UK gal 26500 Liters	Super single 455/55R22.5	20020 lbs (9100 kg)	15705 lbs (7124 kg)	72620 lbs (32940 kg)	98" (2.48m)	11'-7" (3.5 m)
	Dual 11R22.5	23000 lbs (10433 kg)	16105 lbs (7305 kg)	82800 lbs (35365 kg)	101¾" (2.58 m)	
STR-240HH 8200 us gal 6800 UK gal 31000 Liters	Super single 455/55R22.5	20020 lbs (9100 kg)	16225 lbs (7360 kg)	72620 lbs (32940 kg)	98" (2.48m)	12'-2" (3.7 m)
	Dual 11R22.5	23000 lbs (10433 kg)	16625 lbs (7541 kg)	82800 lbs (35365 kg)	101¾" (2.58 m)	

* Unladen weight is estimated. Weight does not include optional features (up to 1100 lbs (500 kg)).

** GAWR (Gross Axle Weight Rating): allowable load capacity of each axle (determined by the manufacturer).

*** GVWR (Gross Vehicle Weight Rating): maximum allowable weight of our Semi-Tanker with its contents. (determined by the manufacturer). Weight does not include optional features (up to 1100 lbs (500 kg)).

3.4.2 STR-242W



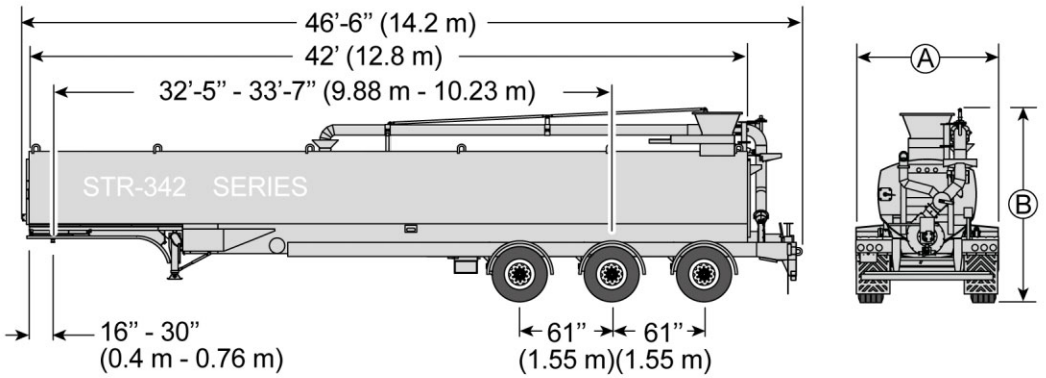
Model	Tire	GAWR**	Unladen weight*	GVWR***	Width **(A)**	Height **(B)**
STR-242W 7100 us gal 5900 UK gal 26850 Liters	Super single 455/55R22.5	20020 lbs (9100 kg)	15995 lbs (7255 kg)	72620 lbs (32940 kg)	98" (2.48m)	11'-5" (3.47 m)
	Dual 11R22.5	23000 lbs (10433 kg)	16395 lbs (7437 kg)	82800 lbs (35365 kg)	101¾" (2.58 m)	
STR-242WH 7400 us gal 6150 UK gal 28000 Liters	Super single 455/55R22.5	20020 lbs (9100 kg)	16120 lbs (7312 kg)	72620 lbs (32940 kg)	98" (2.48m)	11'-7" (3.5 m)
	Dual 11R22.5	23000 lbs (10433 kg)	16720 lbs (7584 kg)	82800 lbs (35365 kg)	101¾" (2.58 m)	

* Unladen weight is estimated. Weight does not include optional features (up to 1100 lbs (500 kg)).

** GAWR (Gross Axle Weight Rating): allowable load capacity of each axle (determined by the manufacturer).

*** GVWR (Gross Vehicle Weight Rating): maximum allowable weight of our Semi-Tanker with its contents. (determined by the manufacturer). Weight does not include optional features (up to 1100 lbs (500 kg)).

3.4.3 STR-342



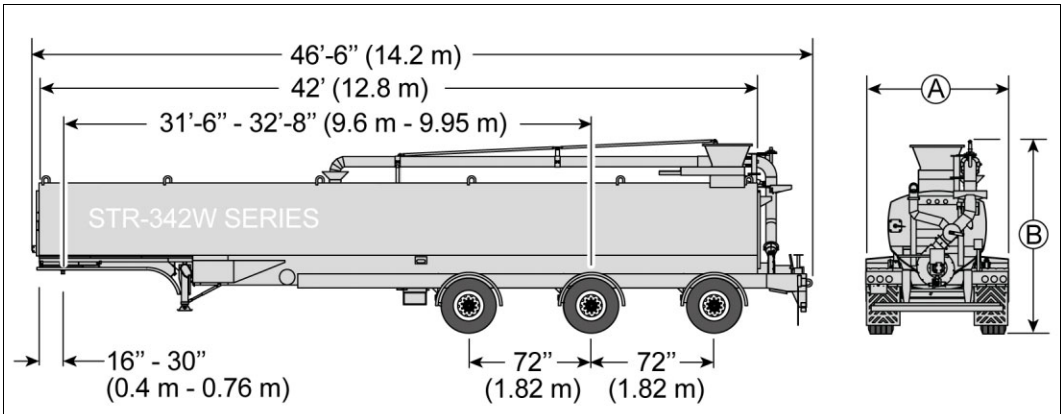
Model	Tire	GAWR**	Unladen weight*	GVWR***	Width **(A)**	Height **(B)**
STR-342 7700 us gal 6400 UK gal 29150 Liters	Super single 455/55R22.5	20020 lbs (9100 kg)	19505 lbs (8847 kg)	97500 lbs (44225 kg)	98" (2.48m)	11'-10" (3.6 m)
	Dual 11R22.5	23000 lbs (10433 kg)	20105 lbs (9119 kg)	109000 lbs (49445 kg)	101¾" (2.58 m)	
STR-342H 8600 us gal 7200 UK gal 32550 Liters	Super single 455/55R22.5	20020 lbs (9100 kg)	20125 lbs (9128 kg)	97500 lbs (44225 kg)	98" (2.48m)	12'-2" (3.7 m)
	Dual 11R22.5	23000 lbs (10433 kg)	20725 lbs (9400 kg)	109000 lbs (49445 kg)	101¾" (2.58 m)	
STR-342HH 7800 us gal 9400 UK gal 35500 Liters	Super single 455/55R22.5	20020 lbs (9100 kg)	20425 lbs (9264 kg)	97500 lbs (44225 kg)	98" (2.48m)	12'-7" (3.8 m)
	Dual 11R22.5	23000 lbs (10433 kg)	21025 lbs (9536 kg)	109000 lbs (49445 kg)	101¾" (2.58 m)	

* Unladen weight is estimated. Weight does not include optional features (up to 1100 lbs (500 kg)).

** GAWR (Gross Axle Weight Rating): allowable load capacity of each axle (determined by the manufacturer).

*** GVWR (Gross Vehicle Weight Rating): maximum allowable weight of our Semi-Tanker with its contents. (determined by the manufacturer).Weight does not include optional features (up to 1100 lbs (500 kg)).

3.4.4 STR-342W



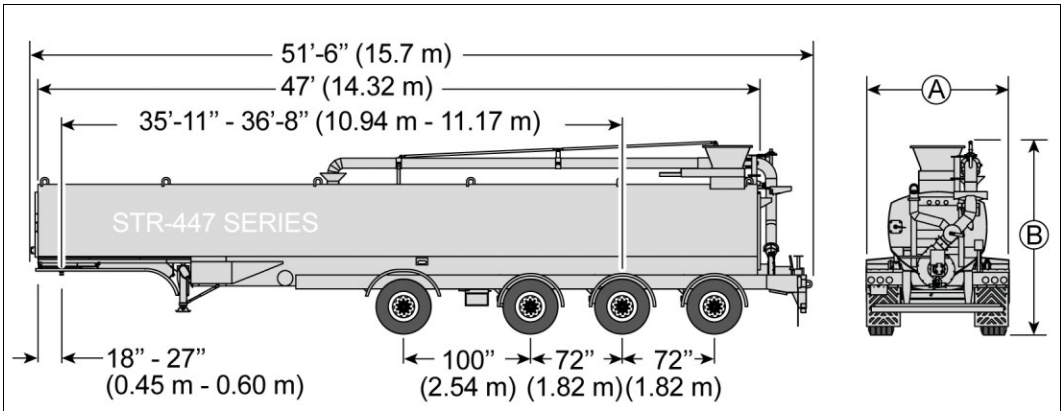
Model	Tire	GAWR**	Unladen weight*	GVWR***	Width **(A)**	Height **(B)**
STR-342W 8600 us gal 7200 UK gal 32550 Liters	Super single 455/55R22.5	20020 lbs (9100 kg)	20800 lbs (9434 kg)	97500 lbs (44225 kg)	98" (2.48m)	12'-2" (3.7 m)
	Dual 11R22.5	23000 lbs (10433 kg)	21400 lbs (9706 kg)	109000 lbs (49445 kg)	101¾" (2.58 m)	
STR-342WH 7800 us gal 9400 UK gal 35500 Liters	Super single 455/55R22.5	20020 lbs (9100 kg)	21590 lbs (9793 kg)	97500 lbs (44225 kg)	98" (2.48m)	12'-7" (3.83 m)
	Dual 11R22.5	23000 lbs (10433 kg)	22190 lbs (10065 kg)	109000 lbs (49445 kg)	101¾" (2.58 m)	

* Unladen weight is estimated. Weight does not include optional features (up to 1100 lbs (500 kg)).

** GAWR (Gross Axle Weight Rating): allowable load capacity of each axle (determined by the manufacturer).

*** GVWR (Gross Vehicle Weight Rating): maximum allowable weight of our Semi-Tanker with its contents. (determined by the manufacturer). Weight does not include optional features (up to 1100 lbs (500 kg)).

3.4.5 STR-447



Model	Tire	GAWR**	Unladen weight*	GVWR***	Width **(A)**	Height **(B)**
STR-447 10500 us gal 8800 UK gal 39800 Liters	Super single 455/55R22.5	20020 lbs (9100 kg)	23800 lbs (10795 kg)	114530 lbs (51950 kg)	98" (2.48m)	12'-7" (3.83 m)
	Dual 11R22.5	23000 lbs (10433 kg)	24405 lbs (11069 kg)	125970 lbs (57140 kg)	101¾" (2.58 m)	

* Unladen weight is estimated. Weight does not include optional features (up to 1100 lbs (500 kg)).

** GAWR (Gross Axle Weight Rating): allowable load capacity of each axle (determined by the manufacturer).

*** GVWR (Gross Vehicle Weight Rating): maximum allowable weight of our Semi-Tanker with its contents. (determined by the manufacturer). Weight does not include optional features (up to 1100 lbs (500 kg)).

4 Handling and assembly

4.1 Special Qualification

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

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

See also the section on ”Personnel qualification”.

4.2 Safety Instructions

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

- Always keep this product on a flat and level surface. An uneven surface could unbalance the product resulting in injuries and/or damages.
- Before installation, look for any damage caused by transport. Do not use damaged components.
- Only use the required tools specified for the installation.
- Read the ”Safety” section as well.

4.3 Preparations before installation

Required tools

	Description/Use
	Overhead crane (minimum lifting capacity 30 000 lbs (15 000 kg)) ● To lift the semi-tanker
	Boom truck (minimum lifting capacity 30 000 lbs (15 000 kg)) ● To lift the semi-tanker
	Safety chains ● To lift accessories
	Eye & eye sling (2x) ● To lift accessories
	Wrench set ● To tighten bolts
	Ratchet set ● To tighten bolts
	Torque wrench ● To tighten bolts at specific torque

To be provided by the customer

- A truck to haul the semi-tanker.
- Wet kit to operate the hydraulic components. Refer to section 3.3.6 Wet kit specifications.

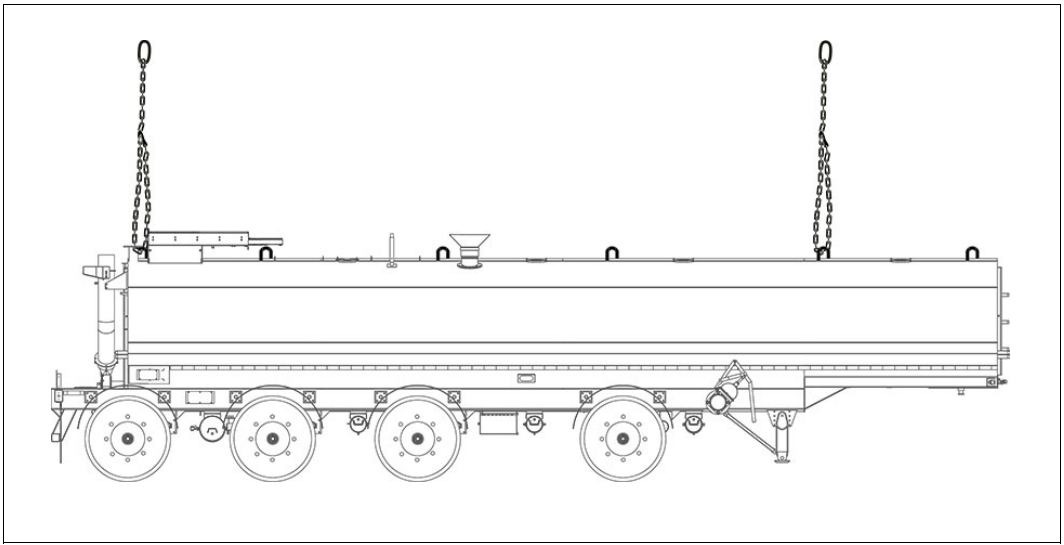
4.4 Product handling

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 30000 lbs (15 000 kg). The lifting capacity only includes the weight of the product.



- Attach chains to the lifting rings as illustrated;
- Remove the chains holding the semi-tanker to the trailer;
- Lift the semi-tanker using an overhead crane;
- Place the semi-tanker on a flat and level surface;
- Chock the wheels. Do not chock the steer-axle.

4.5 Hopper assembly

⚠ Warning!

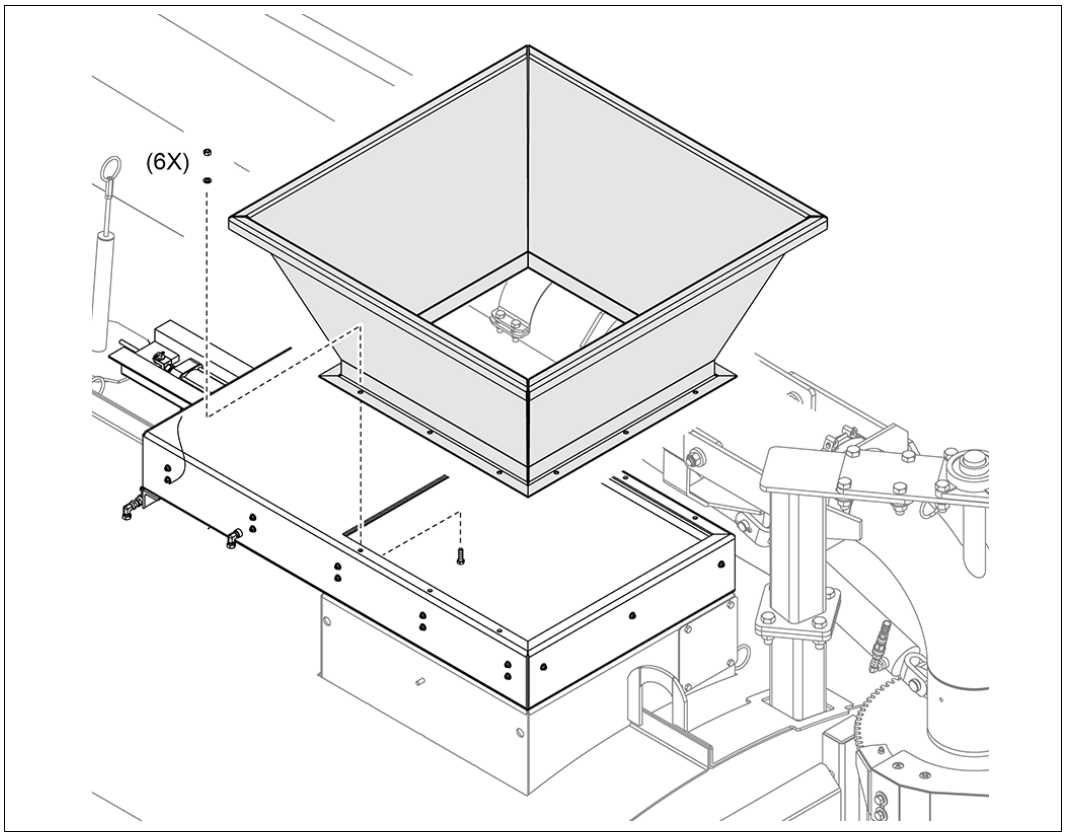
Risk of fall!
The semi-tanker surface can be very slippery.
► Always walk on the nonslip tape installed on the product.

⚠ Caution!

Risk of fall!
The antenna post is not designed to provide a grip to anyone on top of the tank. The post can be damaged by the weight applied.
► Do not grip or apply pressure to the post.

Attention!

To lift the hopper, use a lifting device with a minimum capacity of 125 lbs (50kg).



- Apply marine grade silicone on the hopper base;
- Position the hopper base over the opening;
- Fasten the hopper using 12 bolts and lock nuts. Tighten.

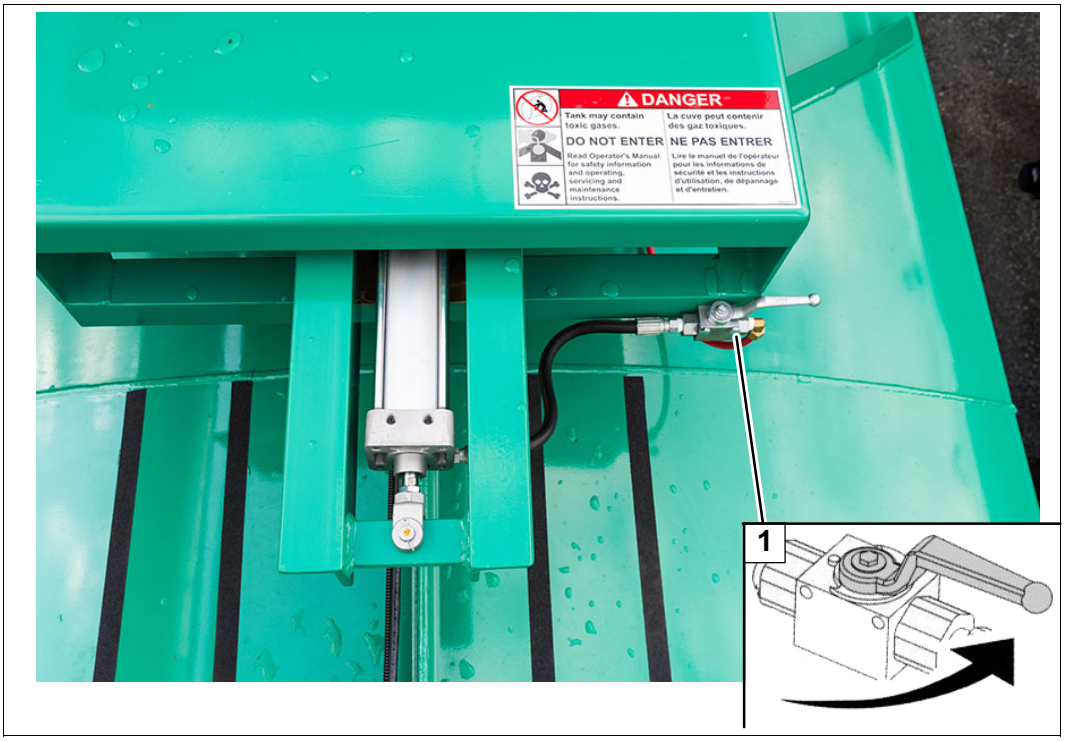
4.6 Top fill opening ball valve

⚠ Warning!

Risk of fall!
The semi-tanker surface can be very slippery.
► Always walk on the nonslip tape installed on the product.

⚠ Caution!

Risk of fall!
The antenna post is not designed to provide a grip to anyone on top of the tank. The post can be damaged by the weight applied.
► Do not grip or apply pressure to the post.



- Open the ball valve (1);

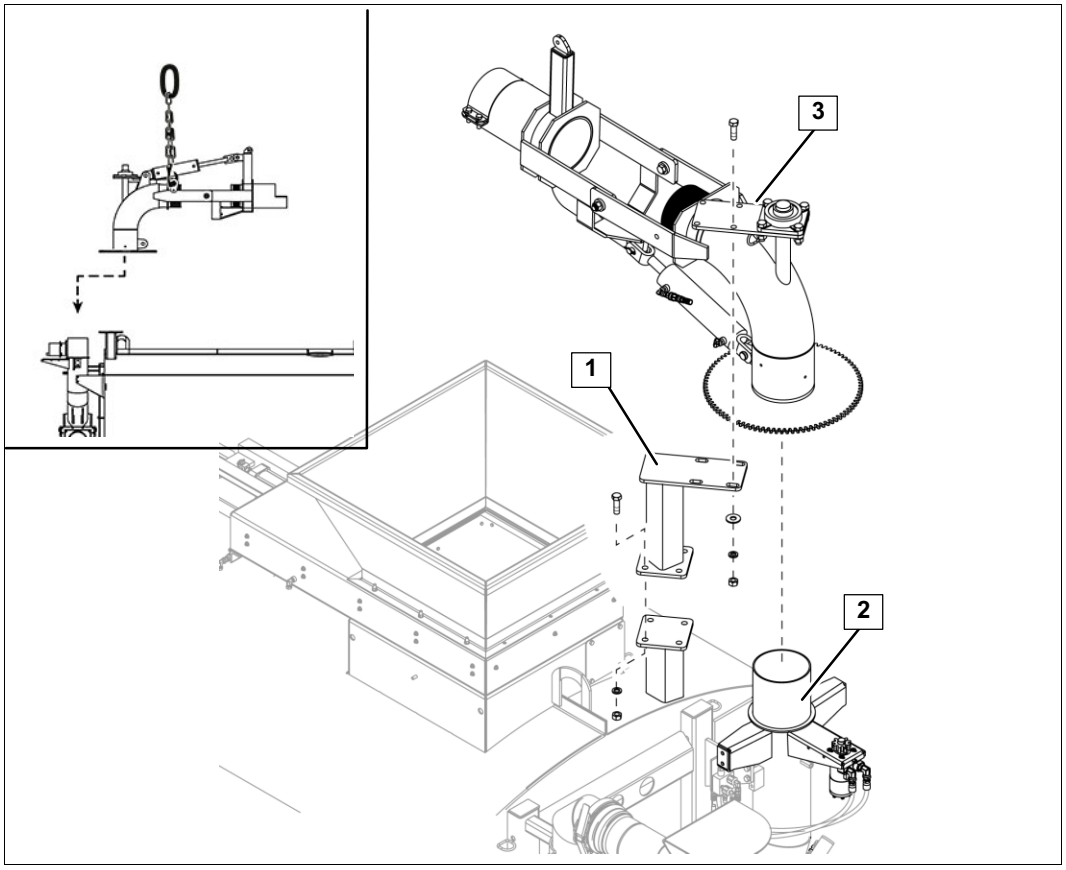
4.7 Articulated transfer pipe assembly

Warning!

Risk of fall!
The semi-tanker surface can be very slippery.
► Always walk on the nonslip tape installed on the product.

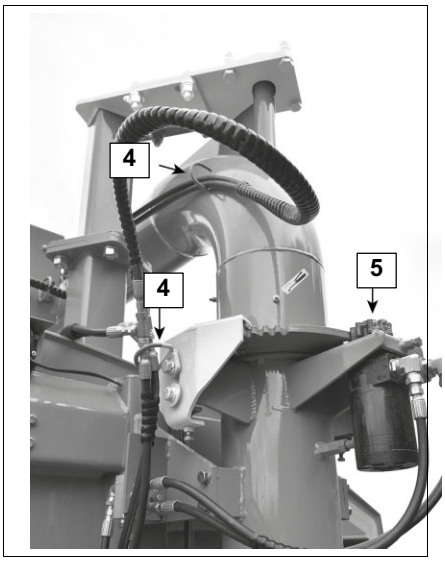
Attention!

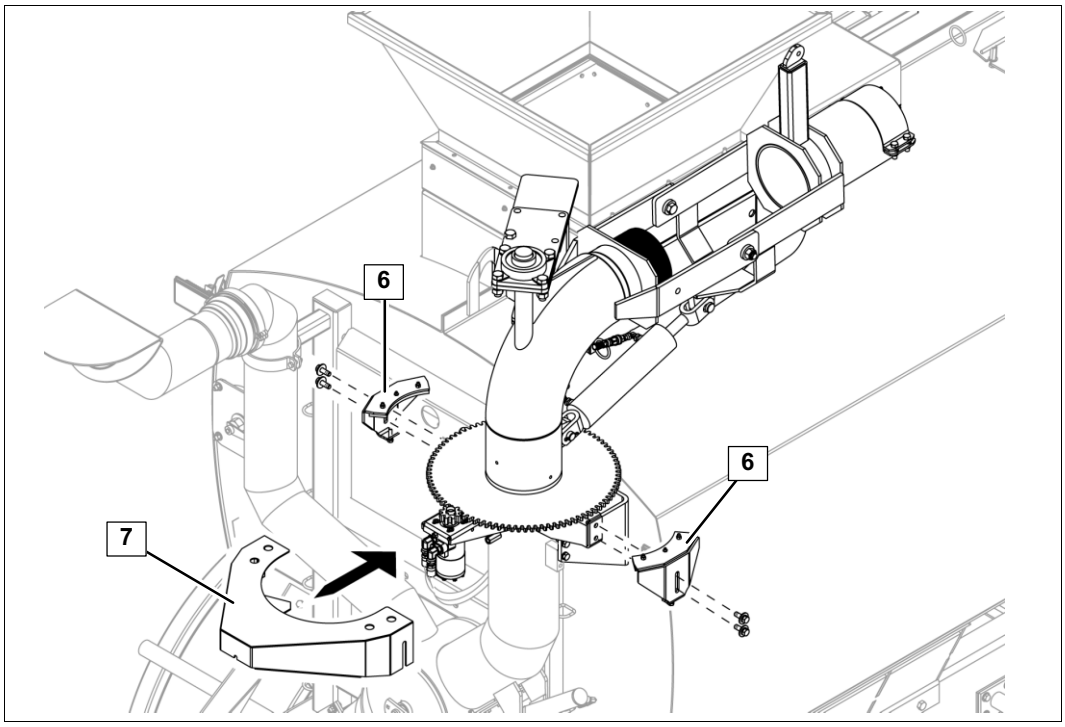
To lift the semi-tanker components, use a lifting device with a minimum capacity of 1000 lbs (500kg).

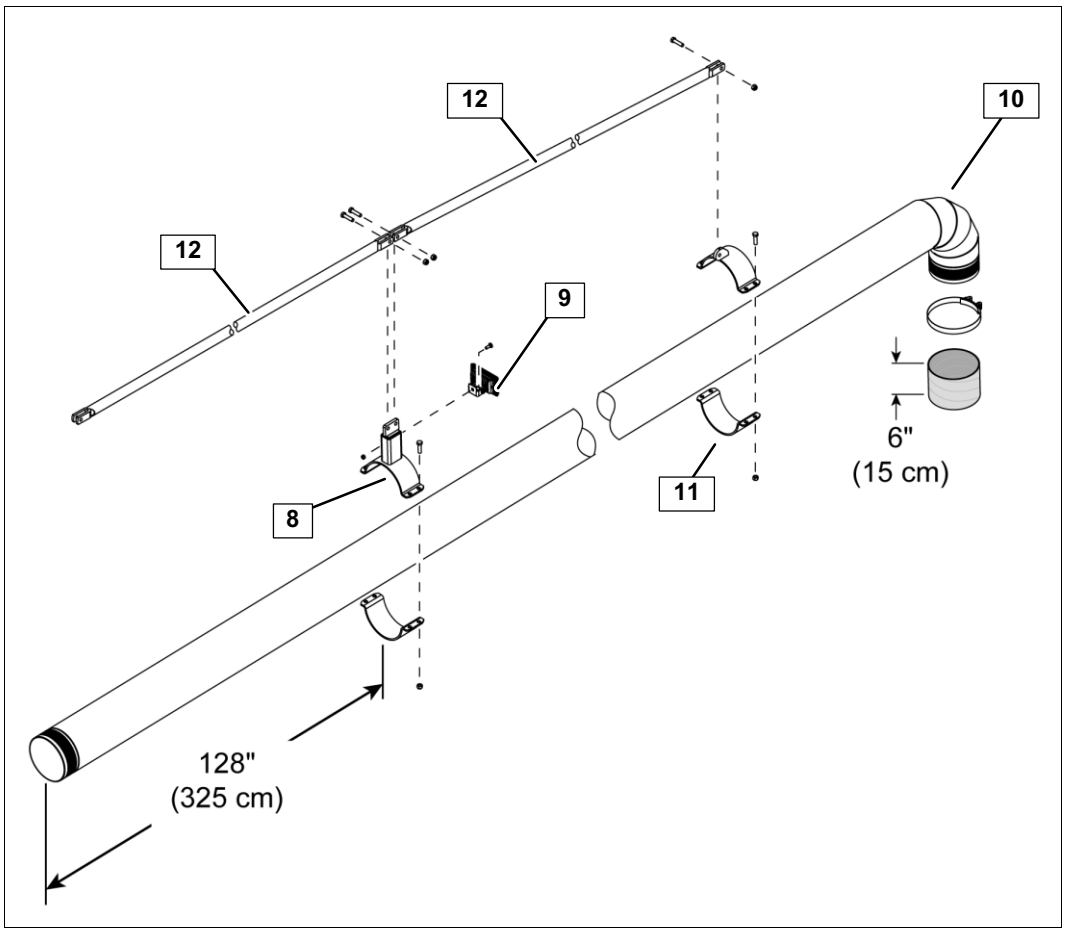


- Assemble the post (1) on the tank using 4 bolts, lock washers and nuts;
- Apply PRECISION™ general purpose EP2 grease on the pipe end (2);
- Lift the elbow by the lifting rings using chains.
- Slowly lower the assembly over the pipe end (2). Make sure the pipe gears gently fit into the motor gears.
- Assemble the top plates (3) using 4 bolts, lock washers and washers;

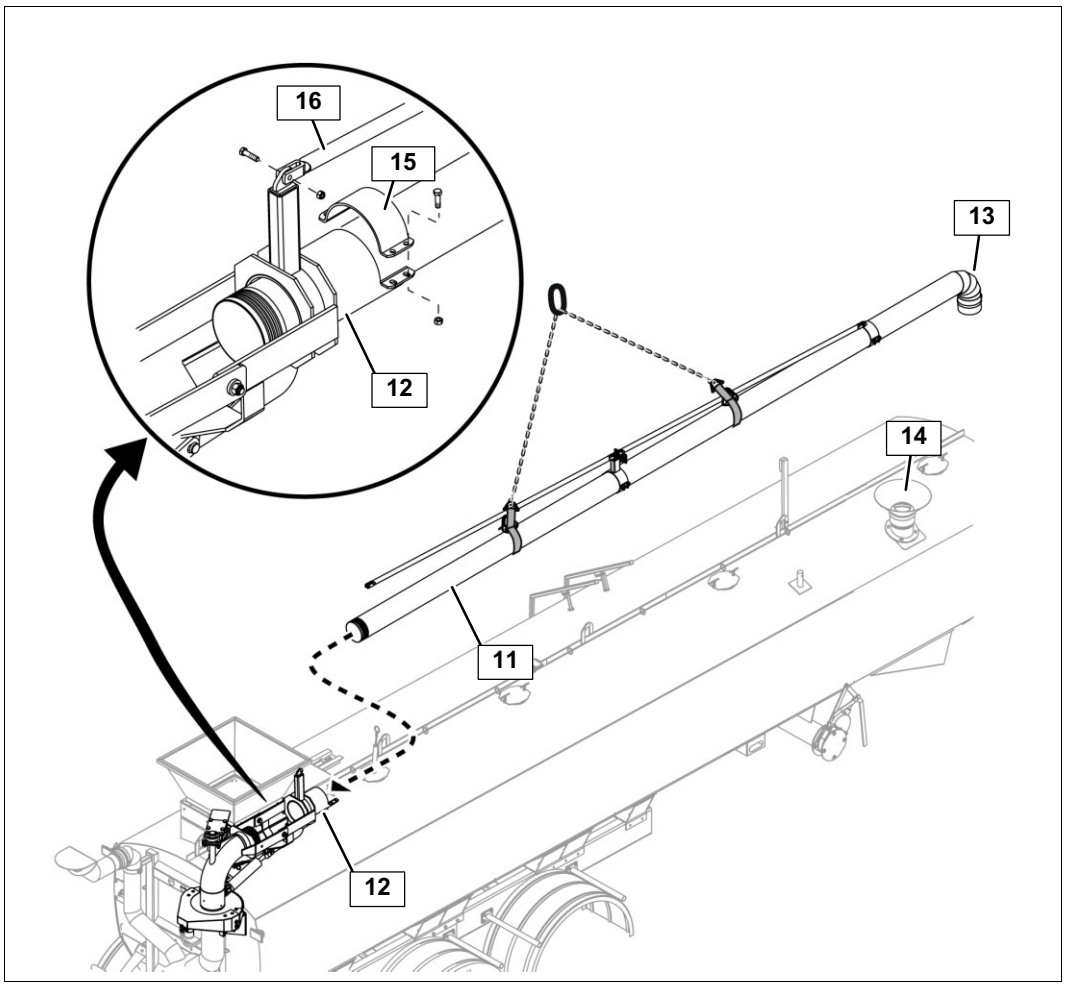
- Insert the hydraulic lines inside the retaining rings (4);
- Connect the hydraulic hoses together. Match the tie wrap colors for proper connection;
- Apply grease over the motor gear (5);
- Assemble the retainers (6) on each side of the articulated transfer pipe using bolts and lock washers.
- Install the gear guard (7) over the retainers.



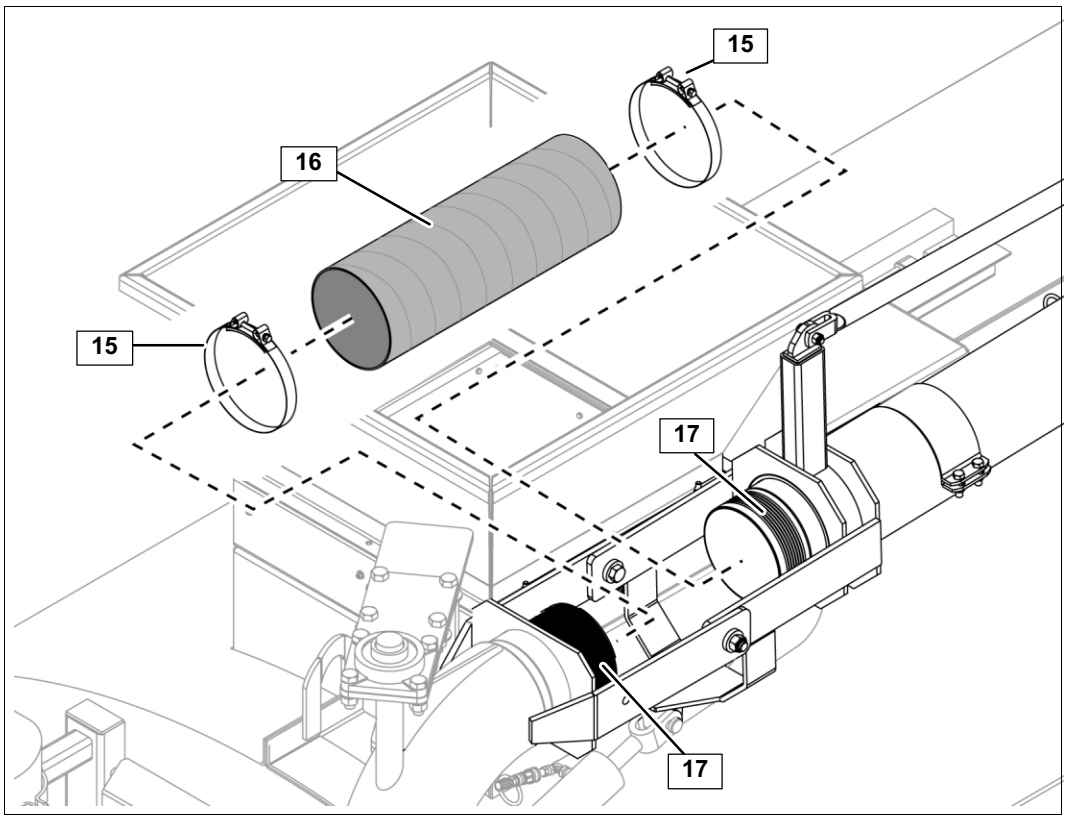




- Assemble the collar (8) and the LED light (9) over the articulated transfer pipe using bolts and nylon lock nuts. The LED light must face the elbow (10) of the pipe;
- Assemble the second collar (11) using bolts and nylon lock nuts. Do not tighten;
- Fasten the tension rods (12) on the collars using bolts and nylon lock nuts;



- Lift the articulated transfer pipe over the semi-tanker using eye&eye slings;
- Slide the articulated transfer pipe (11) inside the articulation (12) while making sure the elbow (13) lays properly in the receptacle (14);
- Secure the articulated transfer pipe using a half collar (15), bolts and nylon lock nuts;
- Fasten the tension rod (14) using a bolt and a nylon lock nut;
- Align the tension rods and collars to the articulated transfer pipe;
- Secure the position by tightening the bolts and nylon lock nuts of the collars and tension rods;
- Run the LED wire on the articulated transfer pipe toward the rear of the semi-tanker.
- Secure the wire on the pipe using stainless steel collars;
- Run the wire next to the hydraulic hoses inside the retaining rings of the elbow;
- Connect the wire;



- Place 2 collars (15) on the 24” (61cm) flexible hose (16) and assemble it over the ribbed ends (17);
- Position the collars in order to secure te hose on the ribbed ends. Tighten.

4.8 Antenna positioning

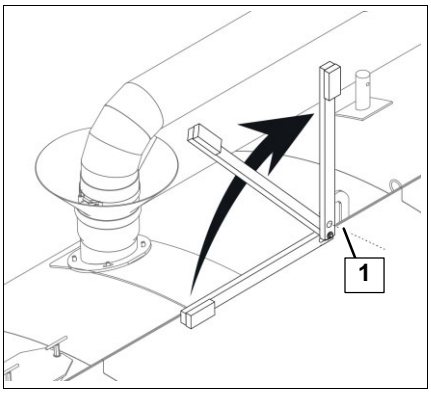
Warning!

Risk of fall!
The semi-tanker surface can be very slippery.
► Always walk on the nonslip tape installed on the product.

Caution!

Risk of fall!
The antenna post is not designed to provide a grip to anyone on top of the tank. The post can be damaged by the weight applied.
► Do not grip or apply pressure to the post.

- Unscrew the hardware (1);
- Place the post in vertical position;
- Install the hardware provided to secure the post. Tighten.

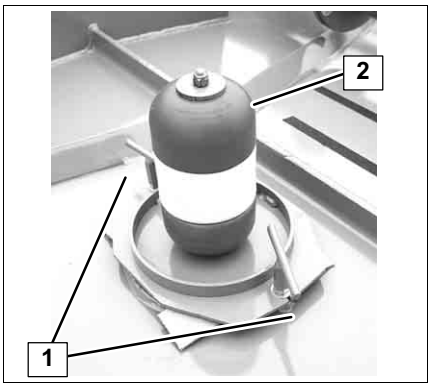


4.9 Top fill indicator assembly

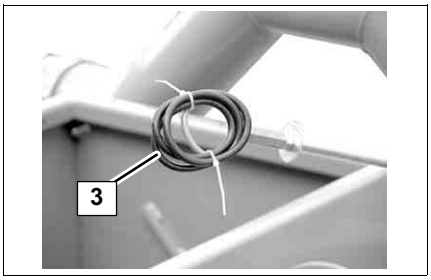
Warning!

Risk of fall!
The semi-tanker surface can be very slippery.
► Always walk on the nonslip tape installed on the product.

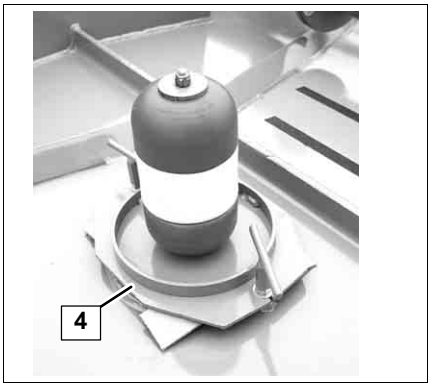
- Unscrew both handles (1);
- Remove the top fill indicator (2) from the opening;



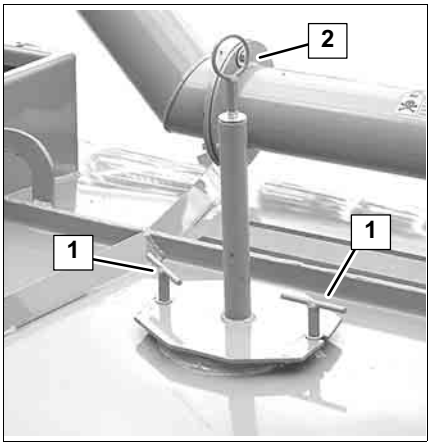
- Remove the O-ring (3) fastened to the top fill indicator;



- 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 semi-tanker;
- Screw both handles (1) to maintain the assembly.



4.10 Spreading nozzle assembly (if applicable)

Warning!

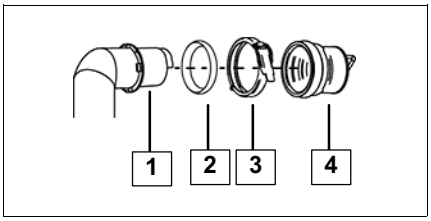
Risk of fall!
The semi-tanker surface can be very slippery.
► Always walk on the nonslip tape installed on the product.

Warning!

Risk of injury!
Never remove/install the spreading nozzle or the end cap from the discharge pipe when the impeller operates.
► Always shut down the impeller and prevent the impeller from operating inadvertently.

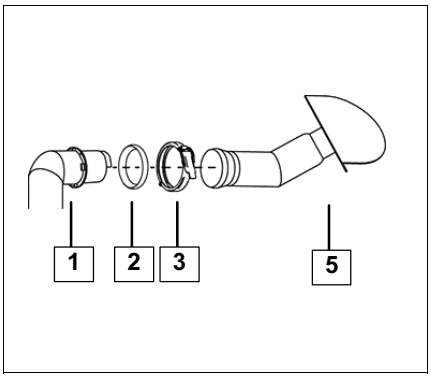
Step 1: Remove the end cap

- Remove the circle lock clamp (3) from the discharge pipe end (1);
- Remove the end cap (4). Make sure the seal (2) remains inside the end cap groove;
- Store the end cap in a dry area.



Step 2: Install the spreading nozzle

- Place the seal (2) inside the spreading nozzle groove (5);
- Apply PRECISION™ general purpose EP2 grease on the seal (2);
- Install the spreading nozzle on the discharge pipe end (1);
- Secure the assembly using a circle lock clamp (3) on the spreading nozzle and the discharge pipe ring.



4.11 Disposal of installation material after installation is completed

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

5 Commissioning

5.1 Special Qualification

Initial commissioning must only be carried out by trained personnel in accordance with the safety instructions.

See also the section on ”Personnel qualification”.

5.2 Safety Instructions

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

- Do not operate this product until the initial commissioning checklist is completed.
- Read the ”Safety” section as well.

5.3 First start

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.

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.

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 guards and safety labels are installed.		
The signal lights, ABS light and beam light are operational.		
The lubrication points are lubricated.		
The oil levels are adequate.		
All bolts are torqued.		
The wheel nuts are tightened at proper torque.		
The owner is instructed on the wheel nut torque verification at initial service period.		
The tires are inflated at proper pressure.		
All drains and openings are closed.		
All electric and pneumatic connections are secured.		
All control boxes are securely closed.		
A visual inspection is performed to ensure there are no leaks, signs of distortion or defective parts.		
The top fill opening ball valve is open.		
The top fill opening opens and closes automatically.		
The air braking system is operational.		
The air suspension system is operational.		
The remote control is operational.		
The hydraulic system is operational.		
The antenna is in upright position.		
The owner is instructed on how to use the side opening.		
The owner is instructed on how to operate the manual override.		
The owner is instructed on how to operate the semi-tanker using the hydraulic levers.		
The owner is instructed on how to operate the semi-tanker using the wireless remote control.		
The discharge functions are operational (impeller, articulated transfer pipe, rotative valve).		

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

Dealer's signature: _____

Owner's signature: _____

Date: _____

5.4 Checks after initial commissioning

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;
- the product works perfectly;
- tires are inflated at proper pressure;
- wheels are torqued.

5.5 Handing over to the owner

Hand over warranty registration form

The warranty registration form must be completed and signed by the customer and the dealer.

6 Operation

6.1 Special Qualification

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

See also the section on ”Personnel qualification”.

6.2 Safety Instructions

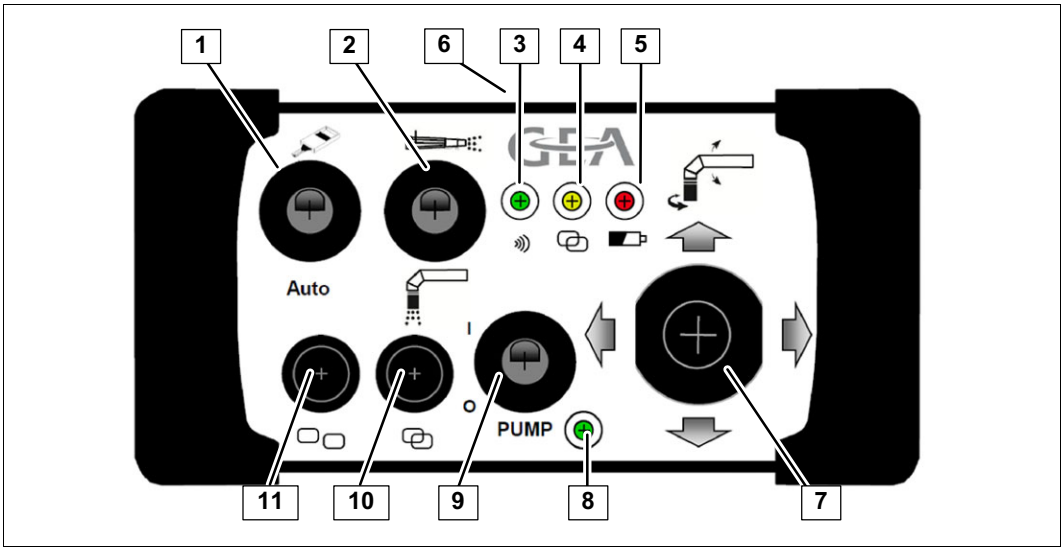
To prevent damage to property and/or life-threatening injury to personnel, always observe the following:

- Do not tow this product at a speed exceeding its maximum speed. Refer to section 3.3.1 Semi tanker.
- Do not use the remote control while driving.
- Do not operate this product if a person is on top.
- Always adapt driving to the road/land conditions. There is a tip over hazard when traveling on a hilly road/land.
- Only use the product for its intended purpose only.
- Make sure the product complies with the road regulations.
- Read the ”Safety” section as well.

Note
The maximum load indicated on the certification/identification plate may or may not be a legal load in the province, state, country of operation.

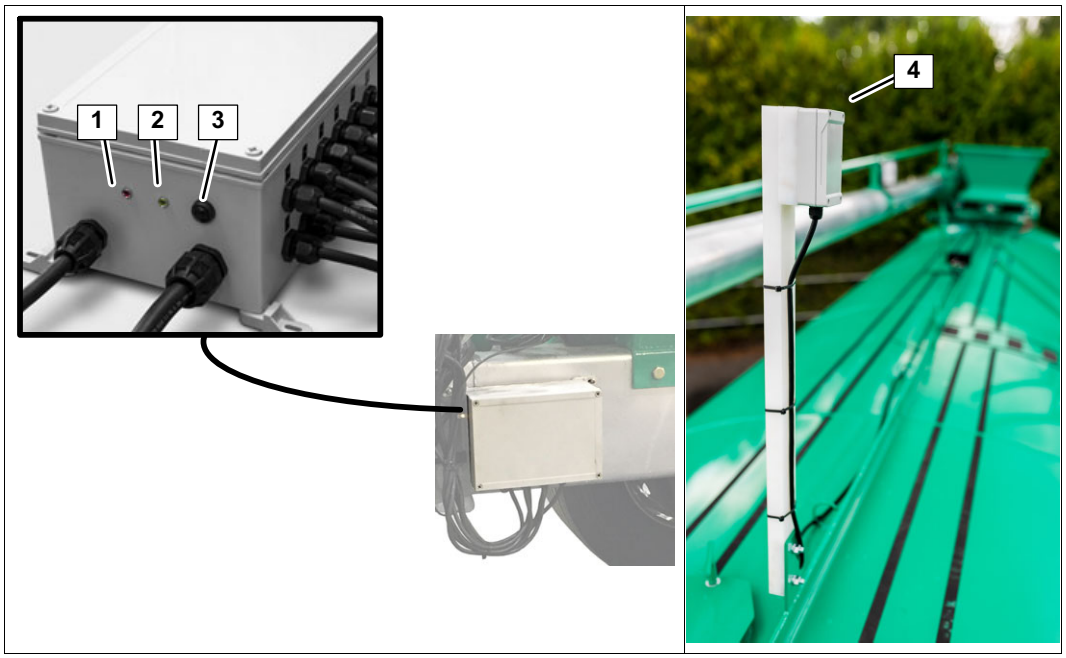
6.3 Description of the operating elements

6.3.1 Remote control (if applicable)



1	Top fill opening toggle switch Auto mode allows auto-operation of the top fill opening. ● The door opens when the semi-tanker parking brakes are applied. ● The door closes when the semi-tanker performs 3 complete wheel turns. Toggle the switch in up position to close the fill opening when the semi-tanker is parked.
2	Rotative valve toggle spring loaded switch - Spread/transfer function Allows to set the rotative valve in spreading or transferring position. Hold the toggle switch for 4 seconds for the rotative valve to completely switch position otherwise the valve could stay in mid-position allowing manure to discharge in both openings.
3	Transmitting indicator light (green) The LED flashes every 5 seconds when the remote communicates with the control box.
4	Connection indicator light (yellow) The LED turns on when the remote is connected to the control box.
5	Low battery indicator light (red) The LED turns on when the battery is low. (less than 20%).
6	Charging indicator light (red) The LED turns on when the remote is being charged.
7	Articulated transfer pipe joystick Allows to position the articulated transfer pipe. The articulated transfer pipe is operational only when the parking brakes are applied and when the impeller is disengaged.
8	Pump indicator light (green) The LED turns on when the impeller is engaged.
9	Pump toggle switch Allows to engage or stop the impeller. The impeller is always disengaged when connecting the remote in order to prevent inadvertent manure discharge.
10	Connection button Allows to connect the remote to the control box.
11	Disconnection button Allows to disconnect the remote from the control box.

6.3.2 Control box (if applicable)



1	Power supply light indicator (red) Blinks every second when the control box is powered. Fast blinking indicates a power supply problem.
2	Transmitting light indicator (green) Blinks every 5 seconds when the remote is connected to the control box. Fast blinking when a function is being performed.
3	Reset button Allows to erase and program a remote control.
4	Antenna

6.3.3 Remote control care

Attention!

Risk of battery damage!

- ► Fully charge the remote battery before storing.
- ► Do not keep the remote exposed to sun rays.
- ► Store in a dry and cool area (5°C-20ºC / 41°F-68°F).

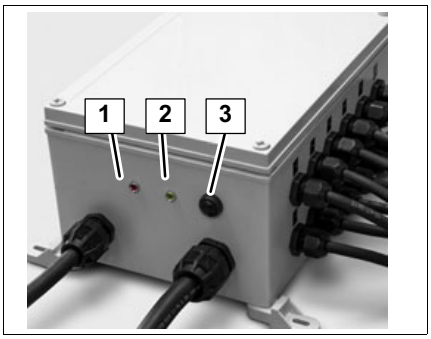
Charging the battery

- Plug the remote in the 12V outlet of the truck. (Charging time: 9.5 hours)

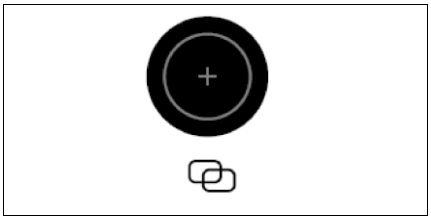
6.3.4 Wireless remote control programming - If required

Note
The remote control is programmed at the factory and ready for use. Perform the following steps only when adding a remote to the system or after a remote control reset.

- Press button (3) on the control box for 3 seconds. The green LED indicator (1) will turn on for 60 seconds indicating that the control box is ready to program the remote control.



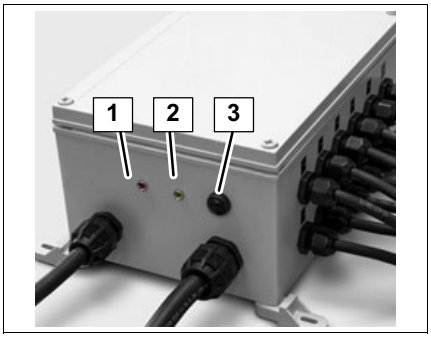
- Press the connection button on the remote control;
  When the green LED indicator (1) turns off, the remote is ready to use.



6.3.5 Wireless remote control reset - if required

Note
The remote control is programmed at the factory and ready for use. Perform the following steps only when facing remote control problems which cannot be solved in the troubleshooting section.

- To reset the remote control, press button (3) on the control box for 12 seconds. The green LED indicator (2) will blink rapidly for about 3 seconds than shut off. All remotes connected to the control box have been reset;
- Before using the remote control perform the remote programming above.



6.4 Coupling the semi-tanker

6.4.1 STEP 1: Fifth wheel inspection and area inspection

⚠ Warning!

Risk of accident!
Non lubricated fifth wheel causes friction between the truck and the semi-tanker kingpin resulting in steering problems.
► Always keep the fifth wheel lubricated.

- Visually inspect the fifth wheel for damaged and/or missing parts;
- Grease the fifth wheel plate;
- Tilt down the fifth wheel toward the rear of the truck;
- Open the fifth wheel jaws;
- Place fifth wheel safety unlocking handle in automatic lock position;
- Lock the sliding fifth wheel (if applicable);
- Visually inspect the semi-tanker kingpin for damages and wear;
- Clear the area around the semi-tanker.

6.4.2 STEP 2: Wheel chock installation

Attention!

Never chock the self-steer axle wheels.

- Make sure the semi-tanker brakes are applied;
- Chock the wheels of the semi-tanker.

6.4.3 STEP 3: Truck positioning

Attention!

Risk of damage!
Improper alignment when coupling can push the semi-tanker sideways resulting in damages to the landing gears.

- Back up the truck directly in front of the semi-tanker;
- Align perfectly the truck to the semi-tanker;
- Back up the truck under the semi-tanker until the fifth wheel touches the semi-tanker without hitting it;
- Apply brakes on the truck;
- Place transmission in neutral.

6.4.4 STEP 4: Semi-tanker coupler height

Caution!

Risk of improper coupling!
If the semi-tanker height is too high when coupling it can prevent the truck and the semi-tanker from coupling correctly.

Caution!

Risk of injury!
Never use the high gear, use the first gear of the landing gears to lift or lower the semi-tanker height to avoid overstraining efforts.

Attention!

Risk of premature wear!
Too high or too low coupling can cause premature wear of the wheels, bearings and brakes.

Attention!

Risk of damage!
If the semi-tanker height is too low when coupling it can cause front damages.

Note
Too high coupling may result in exceeding road regulation on permissible overall height.

- Raise or lower the semi-tanker in order for the semi-tanker to be slightly raised by the truck when coupling;
- Make sure the kingpin and the fifth wheel are perfectly aligned;
- Verify the overall coupling height before coupling. The semi-tanker kingpin height is 47” (1.19m).

6.4.5 STEP 5: Semi-tanker air brake connection

- Inspect the glads and seals of the truck emergency and service air lines;
- Connect the emergency air lines to the semi-tanker;
- Connect the service air lines to the semi-tanker;
- Make sure the air lines are supported to prevent crushing the lines;
- Push the ”air supply” knob located inside the truck cab or place the truck protection control valve from ”emergency” position to ”normal” position to supply air to the semi-tanker;
- Check brake system for crossed air lines:
  - apply and release the brakes; listen for air leaks, for air release and for brake movement.
  - check the air pressure gage for signs of air loss.
- Inspect air lines for damage and wear;
- Verify that air pressure is up to normal;
- Verify that the semi-tanker brakes are working.

6.4.6 STEP 6: Semi-tanker coupling

Attention!

Risk of damage!
Avoid hitting the kingpin too hard.

- Start the truck engine;
- Pull the ”air supply” knob located inside the truck cab or place the protection control valve from ”normal” position to ”emergency”;
- Slowly back up the truck using the lowest gear;
- Stop when the kingpin is locked into the fifth wheel;
- Lightly raise the semi-tanker landing gears off the ground;
- Gently move the truck forward while keeping the semi-tanker brakes applied;
- Place transmission in neutral;
- Apply parking brakes;
- Shut off the engine;
- Remove keys from engine.

6.4.7 STEP 7: Semi-tanker coupling inspection

Warning!

Risk of serious injury!
Do not drive if the coupling is not right.
► Get it fixed.

Caution!

Risk of injury!
Beware of head injuries when inspecting restrained areas.

Attention!

Risk of damage!
Spacing between the fifth wheel and the upper coupler indicates that the kingpin may be on top of the closed fifth wheel jaws which can loosen easily.
► Recouple properly.

- Using a flashlight, check the coupling. Make sure there is no space between the fifth wheel and the upper coupler;
- Verify that the fifth wheel jaws are closed around the shank of the kingpin;
- Check that the locking lever is in ”lock” position;
- Check that the safety catch is in position over the locking lever. On some fifth wheels the catch must be put in place by hand;

6.4.8 STEP 8: Semi-tanker electrical connection

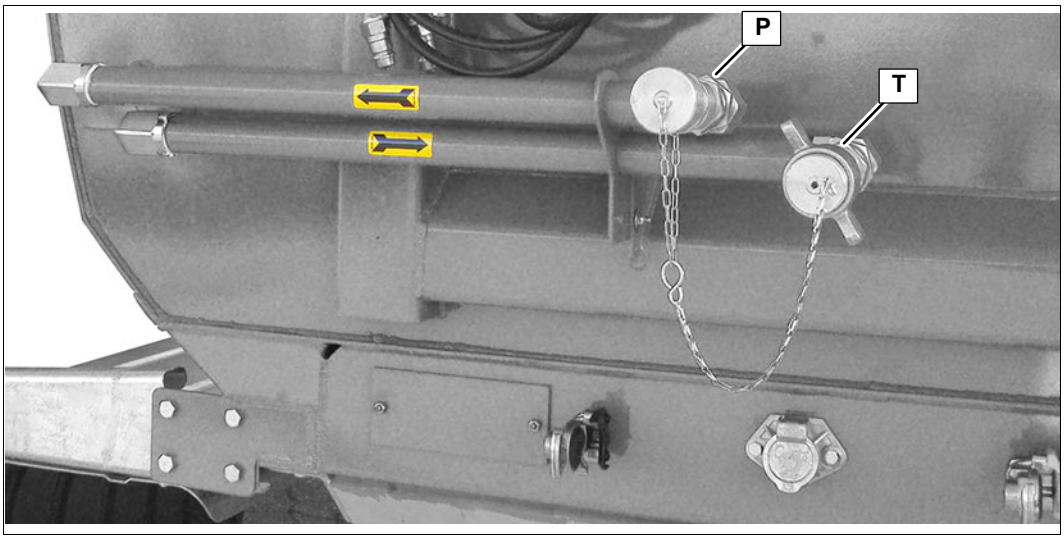
⚠ Warning!

Risk of injury!
Improper connection can cause unexpected or unintended activation of the semi-tanker equipment resulting in hazardous occurrence. The 7-way electrical connector's center pin must be constantly powered for ”ABS” application.

► Contact the truck supplier to make sure the wiring complies with safety standards.

- Plug the truck electrical cord to the semi-tanker;
- Fasten the safety catch of the electrical cord;
- Check the electrical cable for damage and wear;
- Secure the electrical cable to prevent crushing the cable.

6.4.9 STEP 9: Semi-tanker hydraulic connection



- Connect the truck hydraulic outlets to the semi-tanker couplings (P, T). Make sure the couplings are screwed to the indication line;
- Inspect for leaks.

6.4.10 STEP 10: Semi-tanker landing gears lifting

Attention!

Risk of damage!
Never drive the semi-tanker with landing gears part way lifted as they may catch on railroad tracks or other things.

Attention!

Risk of damage!
Make sure the rear of the truck does not contact the landing gears and/or bracing when turning sharply.

- Raise the landing gears using the low gear range and switch to high gear range once free of weight;
- Lift the landing gears completely;
- Secure the crank handle;
- Check for clearance between the rear of the truck and the landing gear. Make sure there is enough clearance between the truck tires and the underside of the semi-tanker.

6.5 Pre-trip checklist

Warning!

Risk of accident!
Never travel/operate the truck and semi-tanker if any defect is detected while performing the pre-trip checklist.

► Always repair and reinspect the truck and semi-tanker before traveling/operation.

Truck verifications

The following verifications should be performed on the truck and semi-tanker while taking into account the procedures instructed by the country/province/state of operation. If the country/province/state requires additional pre-trip verifications, follow them.

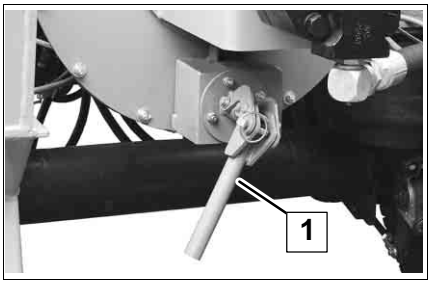
- Test the service brakes;
- Test the parking brake;
- Check the steering mechanism;
- Test the horn;
- Verify windshield washer level;
- Test the wipers;
- Verify the mirrors;
- Verify the emergency equipment;
- Verify the lighting devices, reflector and signal devices;
- Inspect the wheels, rims and tires;
- Verify the suspension;
- Inspect the frame;
- Inspect the coupling devices.

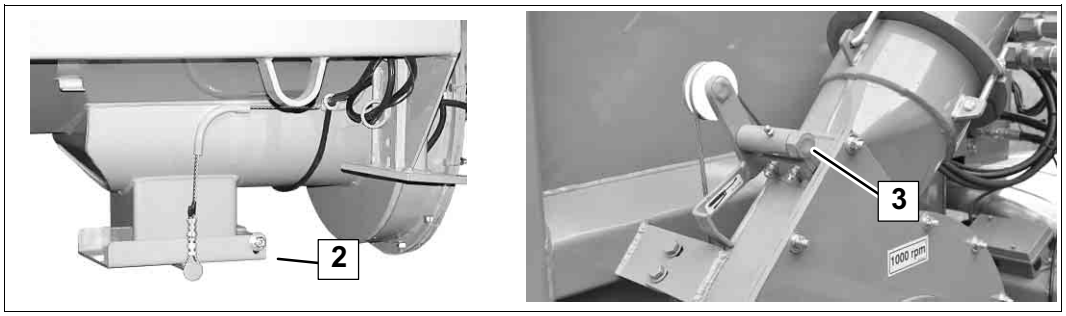
Semi-tanker verifications

The following verifications are additional pre-trip verifications required to ensure that the semi-tanker is safe to travel on roads.

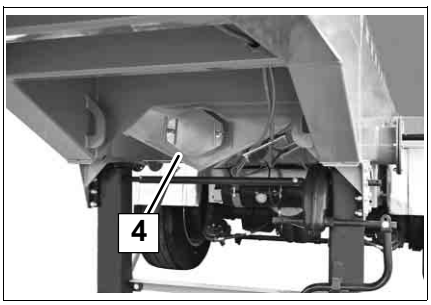
- Check that articulated transfer pipe is placed in the receptacle;
- Check that the door panel of the pneumatic system control box is closed and locked;
- Check that the door panel of the electric system is closed and locked;
- Check that the crank handle of the landing gears is lock in place;
- Check that the pneumatic door of the fill opening is closed;
- Check that the remote control is stored;
- Check that the bearing housing guard is in place;
- Ensure that the overall inspection is performed;
- Check that each wheel-end is lubricated;
- Check that the air tanks have been purged completely;
- Check that there are no air leaks.

- Close the impeller housing drain, push the cap over the opening and lock the toggle clamp (1).
- Close the stone collector drain (2) by turning the pivot bolt (3) using the wheel nut wrench;





- Close the front cleaning opening (4) by screwing both handles;



6.6 While traveling verifications

6.6.1 Air brake system verifications

Warning!

Risk of severe and/or fatal injury!
Never undertake the road if any defect is identified while performing the following verifications.
► Always proceed with the corrective actions prior to undertake the road again.

Warning!

Risk of severe and/or fatal injury!
Stop immediately if any improper adjustment or brake malfunction should arise while traveling.
► Reinspect and verify the braking system prior to undertake the road again.

Attention!

Never exceed the semi-tanker maximum speed regardless of the speed limits and/or the outstanding handling of the tires.
► Refer to section 3.3.1 Semi tanker.

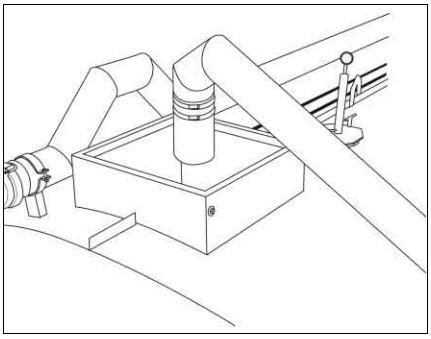
The following verifications should be performed on the truck and semi-tanker while taking into account the procedures instructed by the country/province/state of operation. If the country/province/state requires additional verifications, follow them.

- Measure the stroke of the brake rod. Make sure the length corresponds to the manufacturer's specifications;
- Verify that the brake rod and the slack adjuster form a 90º angle when the brakes are applied;
- Verify that the compressor maintains maximum pressure in all reservoirs;
- Inspect for leaks;
- Verify that the glad hands are secured;
- Verify that all hoses are secured;
- Inspect the drum, tires and bearings for overheating;
- Inspect and test the truck emergency braking system;
- Verify that the truck service valve works perfectly.

6.7 Loading the semi-tanker through the top fill opening

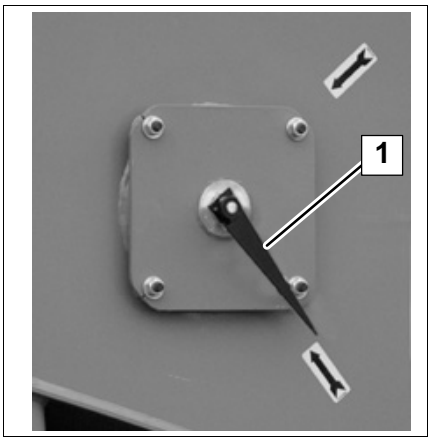
Note
Manure consistency must be less than 1 ½" (38mm).
To perform a consistency test, refer to section 11.7.

- Verify that all drains and openings are closed;
- Position the semi-tanker under the loading pipe;
- Apply the parking brakes: The top fill opening will open automatically. If the top fill opening does not open, refer to section 7.6 Manual opening of the top fill opening.

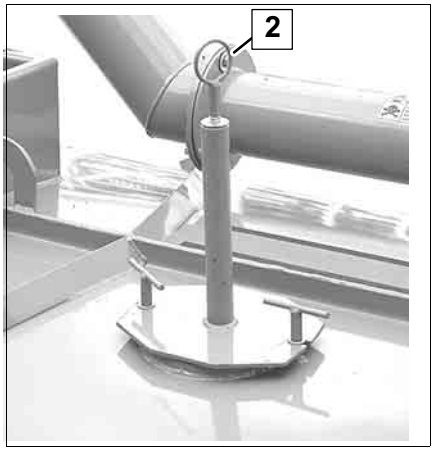


Attention!
Risk of spillage!
Make sure the top fill opening is open before loading manure.

- Engage the pump to start filling;
- Watch the level indicator (1) at the rear of the semi-tanker;
- Reduce filling rate when the semi-tanker is 75% full;



- Stop filling when the top level rod indicator (2) starts to rise.
- Release the parking brakes. The top fill opening should close automatically once the semi-tanker has performed 3 complete wheel turns.
- Perform the axle load verification step. Refer to section 6.9.



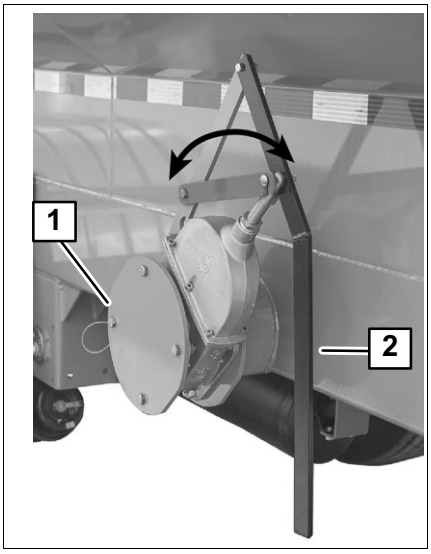
6.8 Loading the semi-tanker through the side opening

Note
Manure consistency must be less than 1 ½" (38mm).
To perform a consistency test, refer to section 11.7.

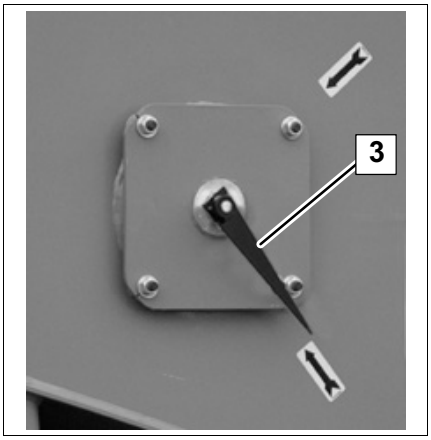
Attention!

Risk of damage!
If the top fill opening remains closed pressure can build inside causing reservoir deformation.
► Make sure the top fill opening is open before loading manure.

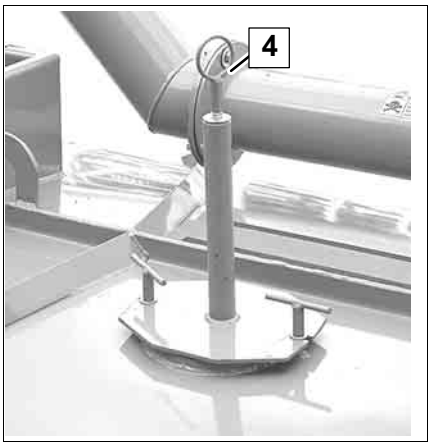
- Place the semi-tanker on a flat and level surface. It will allow the semi-tanker to be filled completely. A light slope may considerably reduce the filling capacity.
- Apply the parking brakes;
- Verify that the drains and openings are closed;
- Remove the gate valve cap (1) and store in a clean and dry area;
- Install the quick connect adaptor of your choice;
- Verify that the adaptor is securely installed;



- Unlock the lever (2) by pivoting the lock bar;
- Open the gate valve by pulling the lever (1);
- Engage the transfer pump and start filling the semi-tanker;
- Monitor the level indicator (3) at the rear of the semi-tanker;
- Reduce filling rate when the semi-tanker is ¾ full;



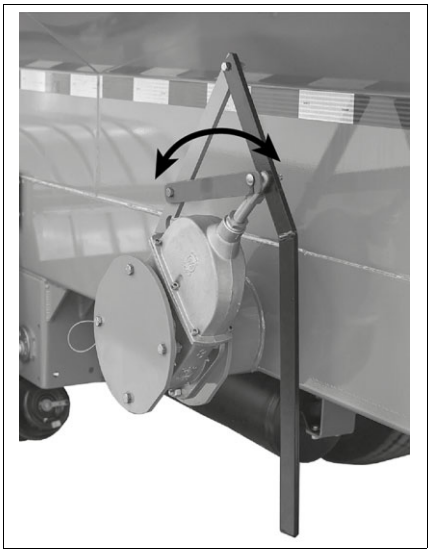
- Stop filling when the top level rod indicator (4) starts to rise.



⚠ Caution!

Risk of projection!
Before removing the hose from the side opening stop the pump and wait a few seconds to release the pressure inside the hose.

- Close the gate valve;
- Lock the gate valve by pivoting the lock bar;
- Wait a few minutes for the hose to drain;
- Disconnect the hose;
- Release the parking brakes. The top fill opening should close automatically once the semi-tanker has performed 3 complete wheel turns.
- Perform the axle load verification step in section 6.9.

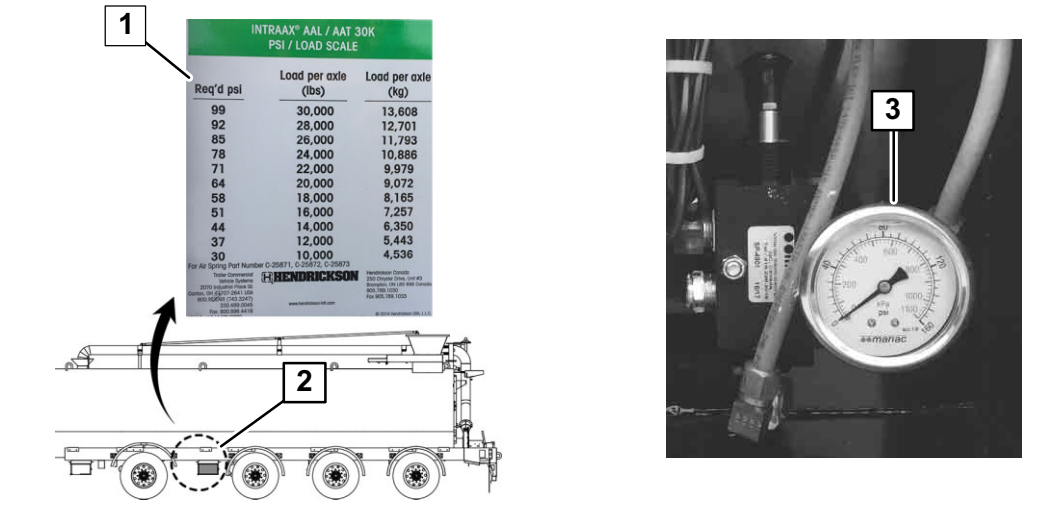


6.9 Axle load verification

After loading the semi-tanker, weigh the semi-tanker to verify that the load per axle does not exceed the recommendations of the manufacturer of the suspension while also following the road regulations implemented by the country, state, province where the semi-tanker operates.

⚠ Caution!

Risk of rupture!
Never exceed the maximum load per tire.
► Refer to the load rating indicated on the tire sidewall.



- Find the axle rating sticker (1) affixed inside the black box (2) located on the side of the semi-tanker;
- Check pressure gage (3) located inside the black box. The suspension must be fully pressurized;
- Compare pressure reading and actual load to the values indicated on the manufacturer's axle rating sticker (1);
- Adjust load, if required;
- Perform the following kingpin adjustment step, if required.

6.9.1 Kingpin adjustment

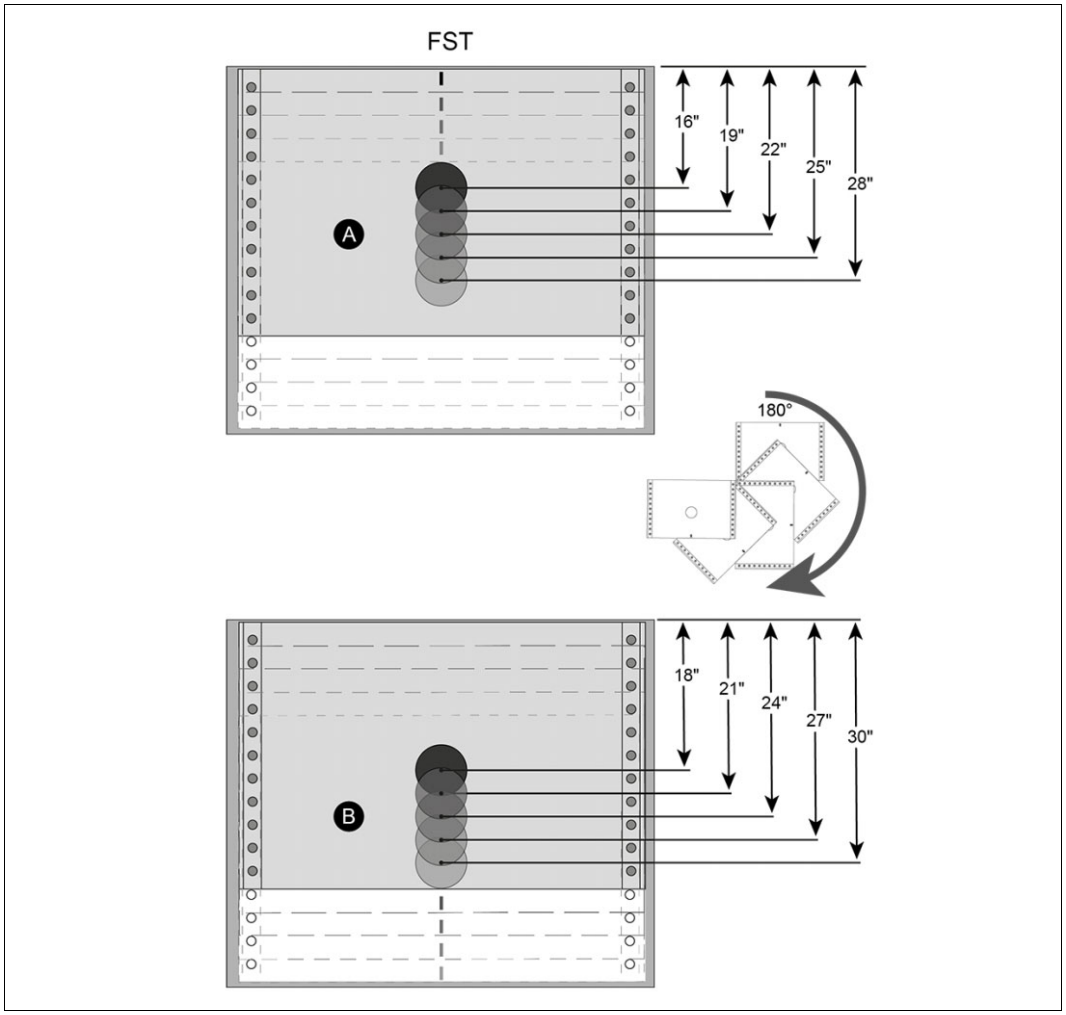
While traveling, the semi-tanker handling may indicate that front to rear weight distribution requires adjustment. Refer to the following illustration to learn about the kingpin adjustment options.

Caution!

Property damage, personal injury and/or death can occur!
Improper kingpin adjustment can cause improper weight distribution resulting in poor handling of the semi-tanker.

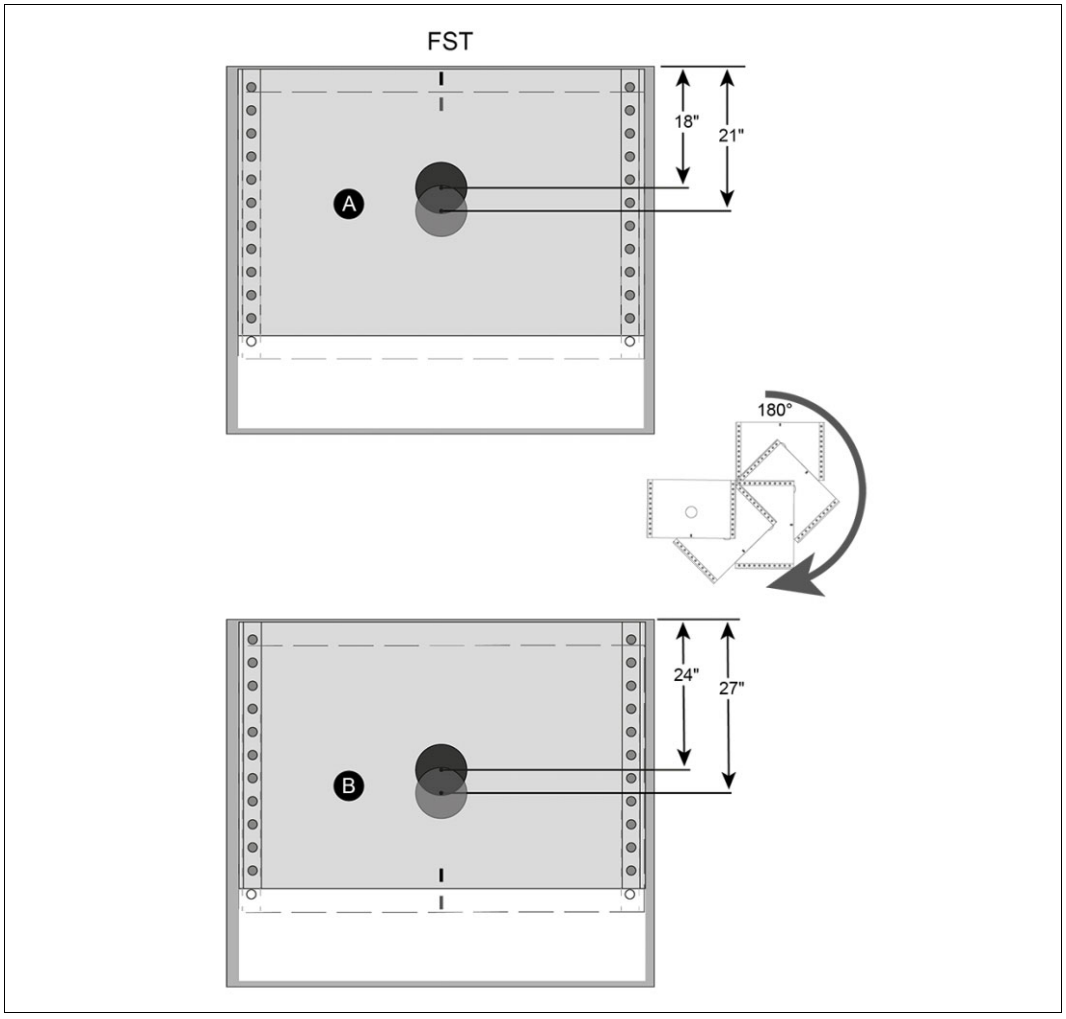
Note
Kingpin adjustment must be performed by a certified truck maintenance center.

Tandem and triple axle semi-tanker



FST	Front of the semi-tanker
A	Original kingpin setting from the factory - adjustable position
B	Kingpin when rotating 180° - adjustable position

Triple axe with auto-steer axle semi-tanker



FST	Front of the semi-tanker
A	Original kingpin setting from the factory - adjustable position
B	Kingpin when rotating 180° - adjustable position

6.10 Discharging manure using the remote control

Warning!

Risk of injuries or death!
It is strictly prohibited to use the remote control while driving on public roads.

Note
The remote control is programmed at the factory and is ready for use.

6.10.1 Discharging through the articulated transfer pipe

Danger!

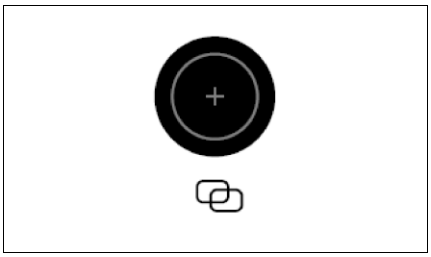
Beware of electrical power lines!
Operating this product near electrical power lines can result in fatal injuries.
► Make sure this product is operated in a secure environment.

Danger!

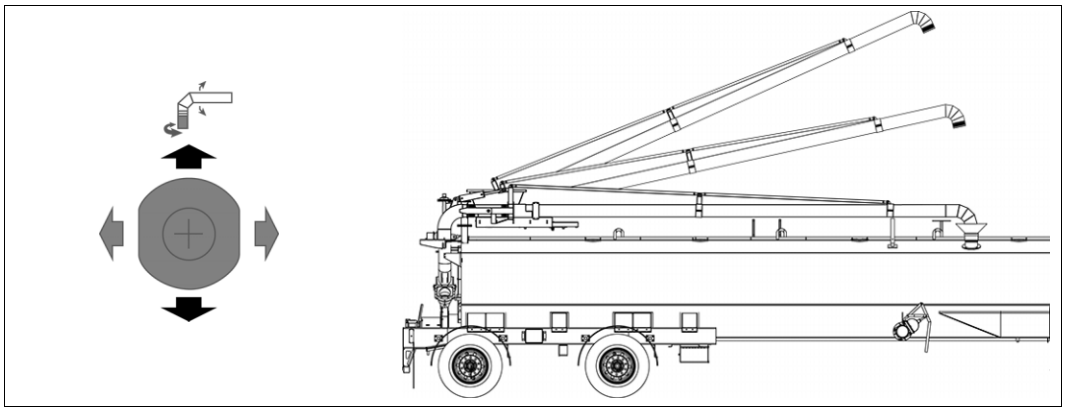
Risk of fatal injury!
A vehicle could collide with the articulated transfer pipe.
► Never position the semi-tanker articulated transfer pipe across a road or path where vehicles travel.

Note
The parking brakes must be applied for the articulated transfer pipe to be operational.

- Place the semi-tanker on a flat and level surface;
- Apply the parking brakes;
- Press this button to connect the remote control to the control box.
  - If the remote does not connect, verify that the impeller is disengaged.
  - The yellow indicator light turns on when the remote is connected;

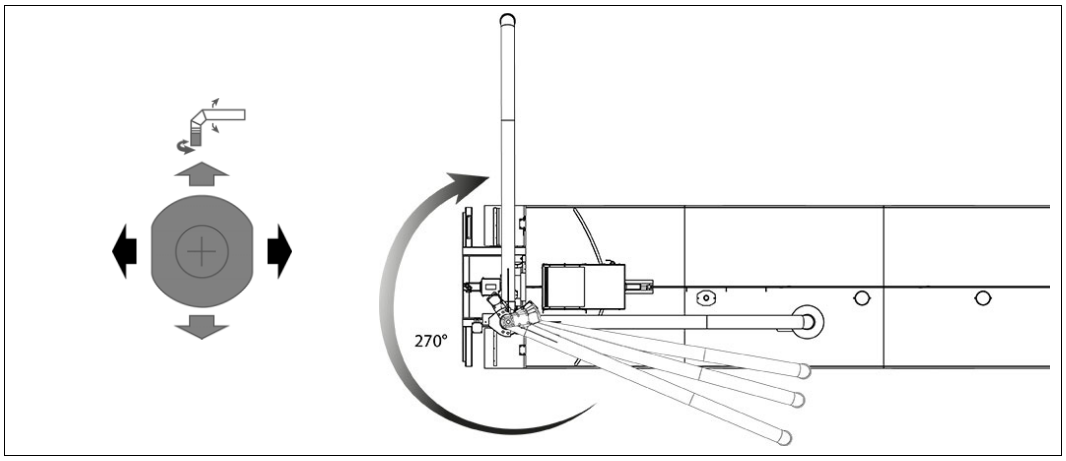


- Engage the hydraulic system of the truck;
- Raise the articulated transfer pipe using the joystick;



- Rotate the articulated transfer pipe and position the pipe end over the discharge point using the joystick;

Note
The articulated transfer pipe rotation range is limited to 270°.



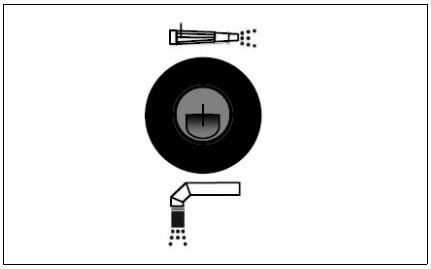
Attention!

Risk of spillage!

Liquid manure can be discharged by both articulated transfer pipe and spreading nozzle if the rotative valve is not correctly positioned.

► Always hold the toggle switch at least 3 seconds to position the rotative valve in the desired mode.

- Toggle down this switch for at least 3 seconds to place the rotative valve in transferring position;



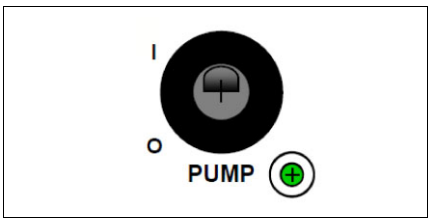
Attention!

Risk of spillage!

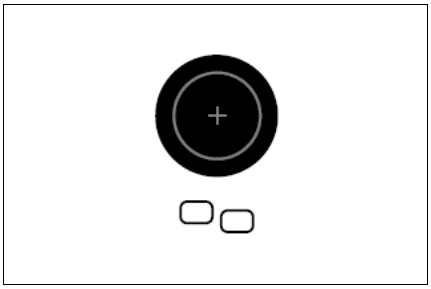
The articulated transfer pipe cannot be operated when the impeller is engaged.

► Always ensure that the articulated transfer pipe is in position before engaging the impeller.

- Toggle up this switch to engage the pump;
- Monitor the manure level inside the spreader or reservoir while transferring;
- Toggle down this switch to disengage the pump;

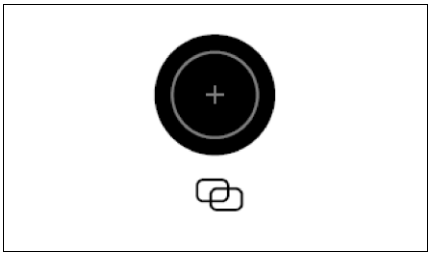


- Place the articulated transfer pipe in his receptacle by using the joystick once the semi-tanker is empty;
- Disengage the hydraulic system of the truck.
- Press this button to disconnect the remote from the control box.



6.10.2 Discharging manure through the spreading nozzle

- Stop the semi-tanker at the spreading site;
- Apply the parking brakes;
- Press this button to connect the remote control to the control box.
  - If the remote does not connect, verify that the impeller is disengaged.
  - The yellow indicator light turns on when the remote is connected.



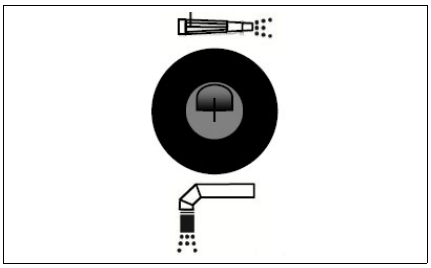
- Engage the hydraulic system of the truck;

Attention!

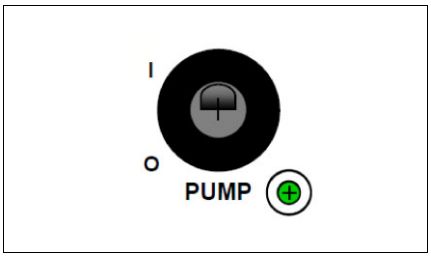
Risk of spillage!
Liquid manure can be discharged by both articulated transfer pipe and spreading nozzle if the rotative valve is not correctly positioned.

► Always hold the toggle switch at least 3 seconds to position the rotative valve in the desired mode.

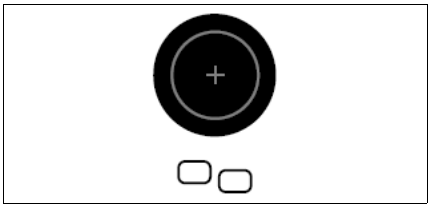
- Toggle up this switch at least 3 seconds to place the rotative valve in spreading position;
- Release the parking brakes;
- Drive to the spreading area;



- Toggle up this switch to engage the pump when ready to spread;
- Toggle down this switch to disengage the pump;
- Disengage the hydraulic system of the truck;



- Press this button to disconnect the remote from the control box.



6.11 Discharging manure using the hydraulic levers

6.11.1 Discharging through the articulated transfer pipe

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.

Danger!

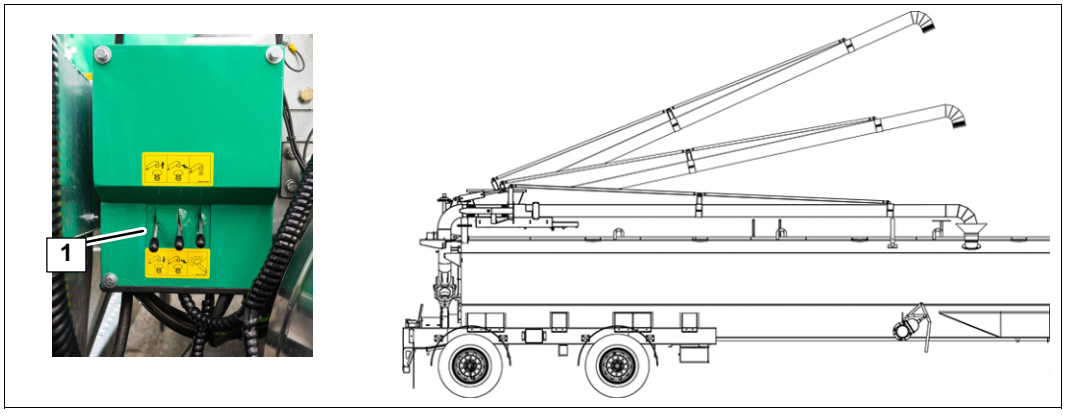
Risk of fatal injury!
A vehicle could collide with the articulated transfer pipe.
► Never position the semi-tanker articulated transfer pipe across a road or path where vehicles travel.

- Place the semi-tanker on a flat and level surface;
- Apply the parking brakes;
- Engage the hydraulic system of the truck;

Attention!

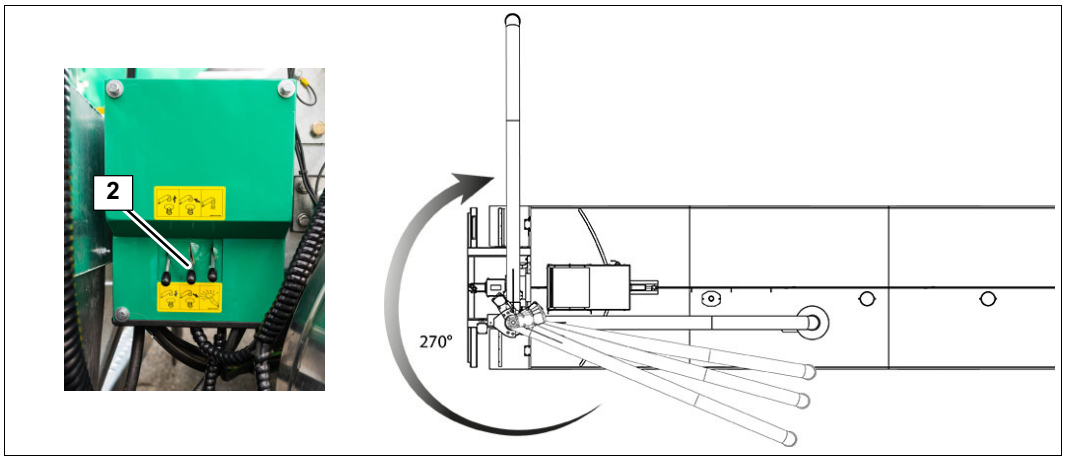
Risk of spillage!
Liquid manure can be discharged by both articulated transfer pipe and spreading nozzle if the rotative valve is not correctly positioned.
► Always hold the lever at least 3 seconds to position the rotative valve in the desired mode.

- Raise the articulated transfer pipe using the lever (1);



- Rotate the articulated transfer pipe and position the pipe end over the discharge point using the lever (2);

Note
The articulated transfer pipe rotation range is limited to 270°.



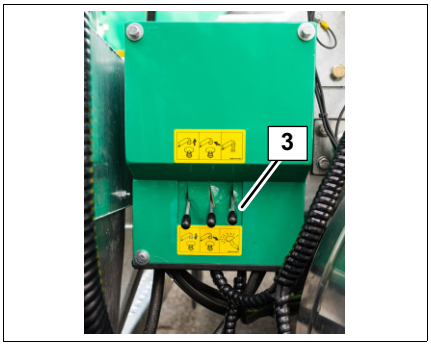
Attention!

Risk of spillage!

Liquid manure can be discharged by both articulated transfer pipe and spreading nozzle if the rotative valve is not correctly positioned.

► Always hold the lever at least 3 seconds to position the rotative valve in the desired mode.

- Pull up the lever (3) for at least 3 seconds to place the rotative valve in transferring position;



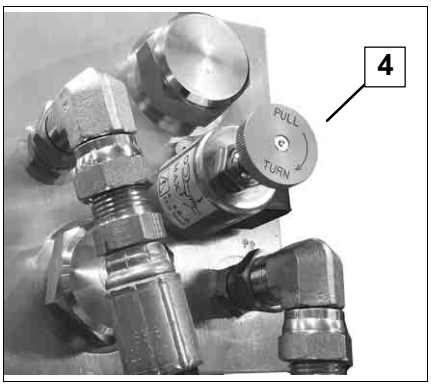
Attention!

Risk of spillage!

The articulated transfer pipe cannot be operated when the impeller is engaged.

► Always ensure that the articulated transfer pipe is in position before engaging the impeller.

- Pull and turn clockwise the knob (4) to engage the pump. Turn the knob until the override tooth is completely out of the detent base;
- Monitor the manure level inside the spreader or reservoir while transferring;



- Turn clockwise the knob (4) to disengage the pump. Turn the knob until the override tooth is securely engaged in the slot of the detent base.
- Place the articulated transfer pipe in his receptacle by using the levers once the semi-tanker is empty;
- Disengage the hydraulic system of the truck.

6.11.2 Discharging through the spreading nozzle

Attention!

Risk of spillage!

Liquid manure can be discharged by both articulated transfer pipe and spreading nozzle if the rotative valve is not correctly positioned.

► Always hold the lever at least 3 seconds to position the rotative valve in the desired mode.

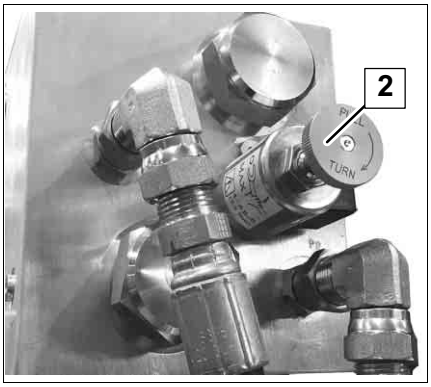
- Place the semi-tanker on a flat and level surface;
- Apply the parking brakes;
- Engage the hydraulic system of the truck;
- Push down the lever (1) for at least 3 seconds to place the rotative valve in spreading position;

Attention!

Risk of spillage!

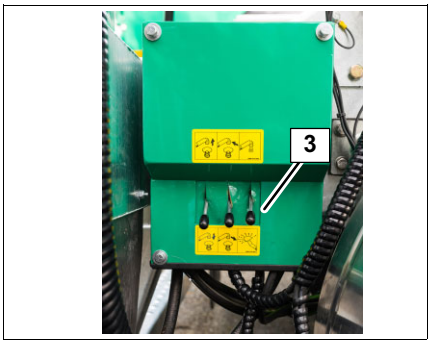
Disengage the hydraulic system of the truck before performing the next step otherwise manure will discharge immediately.

- Pull and turn clockwise the knob (2) to engage the pump. Turn the knob until the override tooth is completely out of the detent base;
- Move the semi-tanker to the spreading area;



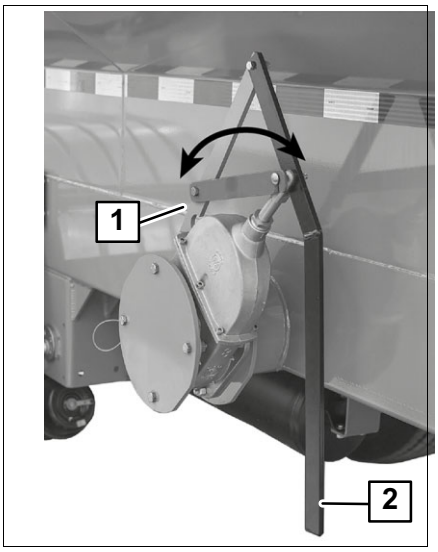
- Engage the hydraulic system of the truck to start spreading;
- Disengage the hydraulic system of the truck to stop spreading;
- Place the semi-tanker on a flat and level surface;
- Apply the parking brakes;
- Turn clockwise the knob (4) to disengage the pump. Turn the knob until the override tooth is securely engaged in the slot of the detent base.
- Engage the hydraulic system of the truck;

- Push up lever (3) for at least 3 seconds to place the rotative valve in transferring position to prevent inadvertent manure discharge.



6.12 Discharging manure through the side opening

- Place the semi-tanker on a flat and level surface;
- Apply the parking brakes;
- Connect the discharge hose to the quick connect adaptor previously installed over the gate valve;
- Place the discharge hose into the reservoir;
- Unlock the lever (1) by pivoting the lock bar;
- Slowly open the gate valve by pulling the lever (2) to discharge the content of the semi-tanker;
- Close and lock the gate valve;
- Disconnect the discharge hose.



6.13 Uncoupling the Semi-tanker

6.13.1 STEP 1: Area inspection

Attention!

Risk of damage!
Improper alignment between the truck and the semi-tanker can cause damages to the supports legs when pulling out at an angle.

- Place the semi-tanker on a flat and level surface which can support the semi-tanker weight;
- Verify that the uncoupling area is level and debris-free;
- Ensure that the truck is perfectly aligned to the semi-tanker.

6.13.2 STEP 2: Air pressure release

Note
Applying the truck brakes while pushing against the semi-tanker kingpin allows holding the rig with pressure off the locking jaws.

Note
When lowering the landing gears of the semi-tanker, do not lift the semi-tanker in order to make easier the fifth wheel unlatching and make easier the next coupling.

- Shut off the semi-tanker air supply to lock the braking system;
- Release pressure on the fifth wheel jaws by gently moving the truck backward;
- Apply the truck parking brakes while pushing against the semi-tanker kingpin;
- Lower the semi-tanker landing gears until they firmly contact the ground;
- Turn the crank a few turns to remove weight from the truck but do not lift the semi-tanker yet.

6.13.3 STEP 3: Air lines disconnection

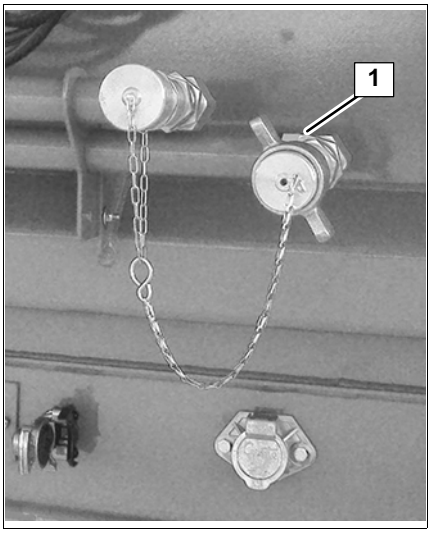
- Disconnect the air lines from the semi-tanker;
- Connect the air lines to the dummy connectors at the rear of the truck cab;
- Support air lines to prevent damage and wear.

6.13.4 STEP 4: Electrical cable disconnection

- Disconnect the electrical cable from the semi-tanker;
- Hang the electrical cable on the support with plug downward to prevent moisture from entering the plug;
- Support the cable to prevent damage and wear;
- Install the outlet protectors.

6.13.5 STEP 5: Hydraulic disconnection

- Disconnect the hydraulic hoses and protect with covers (1);
- Hang the hoses on the truck support;
- Clean and install the covers over the semi-tanker hydraulic outlets;
- Wipe off oil leaks and dispose properly.



6.13.6 STEP 6: Fifth wheel unlocking

⚠ Warning!

Risk of crushing!
Always keep legs and feet away from the rear truck wheels to prevent injuries in case the vehicle moves when unlocking the fifth wheel.

- Raise the release handle lock of the fifth wheel;
- Pull the release handle to ”open” position;
- Move the truck forward until the fifth wheel pulls out from under the semi-tanker;
- Stop the truck while making sure the frame is kept under the semi-tanker;
- Apply parking brakes;
- Place the transmission in neutral.

6.13.7 STEP 7: Semi-tanker inspection

- Inspect the ground to make sure it can support the weight of the semi-tanker;
- Inspect the landing gears for damage and wear;
- Release the truck parking brakes;
- Ensure the area is clear;
- Slowly move the truck from under the semi-tanker.

7 Maintenance

If necessary, contact your nearest authorized technical dealer.

7.1 Special Qualification

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

See also the section on ”Personnel qualification”.

7.2 Safety Instructions

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

- Do not stand underneath the semi-tanker if coupled to the truck while the engine is running.
- Immediately replace any components that are not in perfect condition.
- Read the ”Safety” section as well.

Before carrying out any maintenance work, ensure the following:

- Always secure the semi-tanker by installing wheel chocks.
- The area for the maintenance work and access to the working area should be secured over a wide area and there should not be any unauthorized persons in the working area.
- Suitable lifting gear and load suspension equipment must be available when replacing larger components.
- Suitable collection vessels are available for all substances that might be harmful to ground water (oils, coolants, cleaning and disinfecting agents, etc.)

After completing the maintenance work, check the following:

- All protective devices, covers, panels, strainers, filters, etc. that were removed previously must be reinstalled correctly.

7.3 Inspections and preventive maintenance

Note
When operating this GEA Houle product using other manufacturer's components and/or products such as a PTO, a truck, a motor, a pump, etc., ALWAYS perform maintenance of the component and/or product as recommended by its manufacturer.

Note
To comply with the specific warranty coverage of third-party equipment, always replace defective/spare parts with OEM components unless otherwise authorized by the manufacturer.

Scheduled maintenance responsibilities

Note
This section includes minimal inspection and lubrication requirements for normal on-highway applications. A semi-tanker subjected to off-road, abnormal, extreme and rough conditions should be inspected and lubricated more often to ensure product integrity.

FREQUENCY / TASK	Daily	Weekly	Monthly	Every 6 months	Every 6 years	First 80 km to 160 km (50 miles to 100 miles)	Every 3200 km (2000 miles)	Every 6400 km (4000 miles)	Every 9650 km (6000 miles)	Every 16 000 km (10 000 miles)
Wheel nut torque verification						O	O			O
Tire inspection	O									
Rim inspection	O									
Wheel-end oil level verification	O									
Air tank purge and inspection	O									
Glad hands inspection	O									
General inspection	O									
General lubrication	O									
Bearing housing lubrication	O									
Chain coupling lubrication	O									
Bearing housing oil level verification		O								
Semi-tanker cleaning			O							
Bearing housing oil change			O							
Air springs inspection			O							
FRL valve purge and maintenance			O							
Top fill opening pneumatic valve maintenance			O							
Articulated transfer pipe lubrication			O							
Gate valve lubrication			O							

O: Task to be performed by the Operator personnel.
Maintenance steps are detailed in the following sections.

M: Task to be performed by a qualified mechanic at a certified truck maintenance center.
Contact a certified truck center for maintenance.

TASK \ FREQUENCY	Daily	Weekly	Monthly	Every 6 months	Every 6 years	First 80 km to 160 km (50 miles to 100 miles)	Every 3200 km (2000 miles)	Every 6400 km (4000 miles)	Every 9650 km (6000 miles)	Every 16 000 km (10 000 miles)
Brake chamber and push rod inspection			O							
Cam tube lubrication			O							
Pivot connection inspection			O							
Hubcap and hub inspection			O							
Slack adjuster inspection and lubrication			O							
Brake s-cam and cam tube inspection			M							
Self-steer tie rod end inspection and lubrication			M							
Bolt torque verification			M							
Tri-functional bushing and component inspection								M	M	
Ride height measurement and adjustment								O	O	
Shock components inspection								O	O	
Self-steer axle kingpin bushing and lock straight pivot arms lubrication								O	O	
Self-steer axle lock straight air spring and lock straight chamber inspection								O	O	
Wheel monitor RM-70								O	O	
Welds inspection								O	O	
Kingpin and bolt inspection								O	O	
Landing gears lubrication				O						
Hydraulic hose change					M					

O: Task to be performed by the Operator personnel.
Maintenance steps are detailed in the following sections.

M: Task to be performed by a qualified mechanic at a certified truck maintenance center.
Contact a certified truck center for maintenance.

7.4 Maintenance to be performed by the operator

Note
The operator is a truck driver having a valid class licence qualifying him to operate a semi-tanker on the road.

7.4.1 Wheel nut torque verification

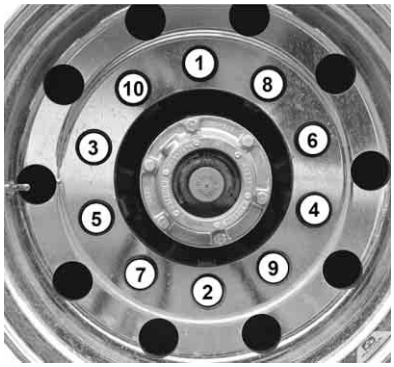
- First 80 km to 160 km (50 miles to 100 miles)
- Every 3200 km (2000 miles)
- Every 16000 km (10 000 miles)

Note
Re-torque all wheel nuts after the initial ”in-service” and following any installation of wheels to hub assembly.

Caution!

Risk of injury!
Insufficient mounting torque can cause wheel shimmy, cause damage to parts and extreme tire tread wear which can result in serious injury and/or death.

- Park the semi-tanker on a flat and level surface;
- Chock the wheels of the semi-tanker;
- Check proper inflation of each tire and spare using an accurate gage. Make sure the tires are ”COLD” when checking the inflation.
- Check that all nuts are torque to 475±25 ft. lbs (680±30 Nm) by following the sequence illustrated;
- Check the seating of wheel and brake drum at the pilot bosses;



Note
If any defect is found, immediately contact a truck maintenance center for repair.

7.4.2 Tire inspection

Daily

Warning!

Possible injury!
Tire and wheel servicing must be done only by qualified personnel using proper tools and procedures. Failure to comply with proper procedures may result in serious injury or death.

Warning!

Possible injury!
Improper inflation can result in improper vehicle handling, rapid and irregular tire wear, sudden tire destruction and loss of vehicle control which can cause serious damages, injuries and/or death.
► Do overinflate or underinflate tires.

If any tire is suspected of having run flat at very low pressure (less 80% of normal pressure) or run at a higher pressure, NEVER attempt to inflate or deflate the tire, visit a truck tire retailer at once to perform a complete tire inspection.

Warning!

Possible injury!
Any inflated tire mounted on a wheel contains explosive energy. The use of damaged, mismatched or improperly assembled tire and wheel parts can cause the assembly to burst apart with explosive force that can lead to serious injuries and/or death.

Warning!

Possible injury!
If a tire has lost four pounds of pressure or more, look for signs of penetration, valve leakage or wheel damage. Visit a truck tire retailer for repair.
► Do not inflate the tire, the inner structure could be damaged.

Caution!

Exceeding the maximum load per tire will build excessive heat that may result in tire destruction, property damage and injuries. Refer to the specifications indicated on the tire sidewall.
► Do not exceed the total load per tire.

Caution!

Damaged tires can cause rapid pressure loss, sudden tire destruction, failure to control the vehicle which can cause serious damages, injuries and/or death.
► Never use damaged tires.

Caution!

A ”HOT” tire builds up pressure which fools the pressure obtained on the pressure gage.

► Never check pressure, inflate or deflate air from a ”HOT” tire. Always check pressure, inflate or deflate air from a ”COLD” tire.

Attention!

Avoid driving over potholes, curbs, metal, rocks, wood debris. Unavoidable contact with such hazards requires careful tire inspection.

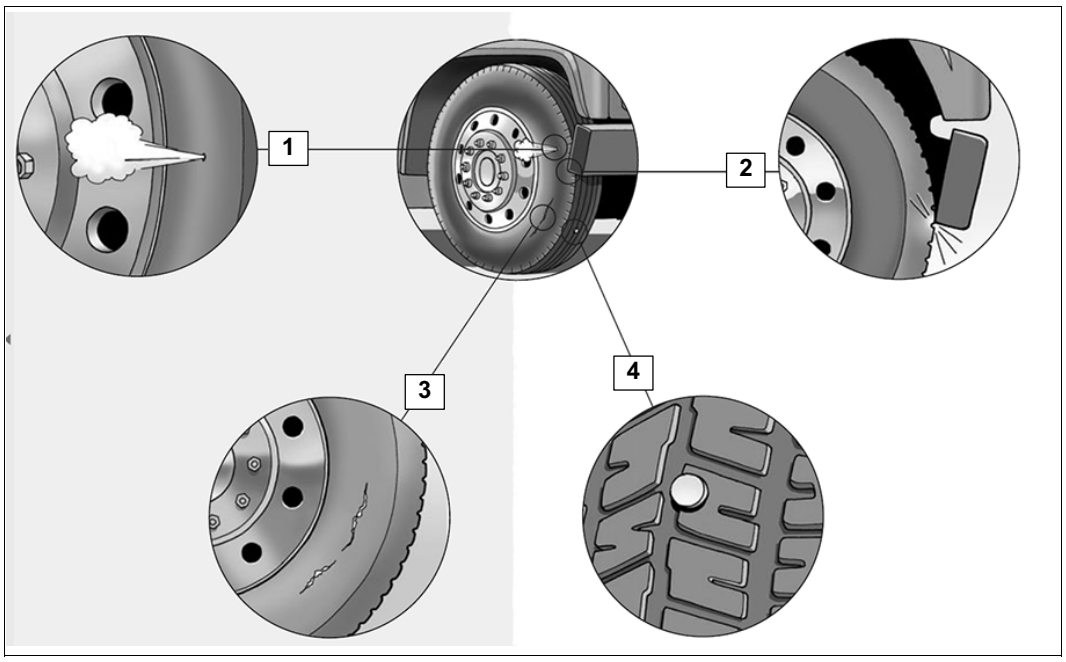
► If any damage is found, visit a truck tire retailer for inspection/repair.

Note
Never mix different types of tires, use only the tires specified in section 3.3.10 - Tires.

Note
Do not rely on the aspect of a Michelin X One tire to determine proper inflation. Use a properly calibrated gage to verify the pressure.

Note
For new and retread tires, check for signs of failure during the break period.

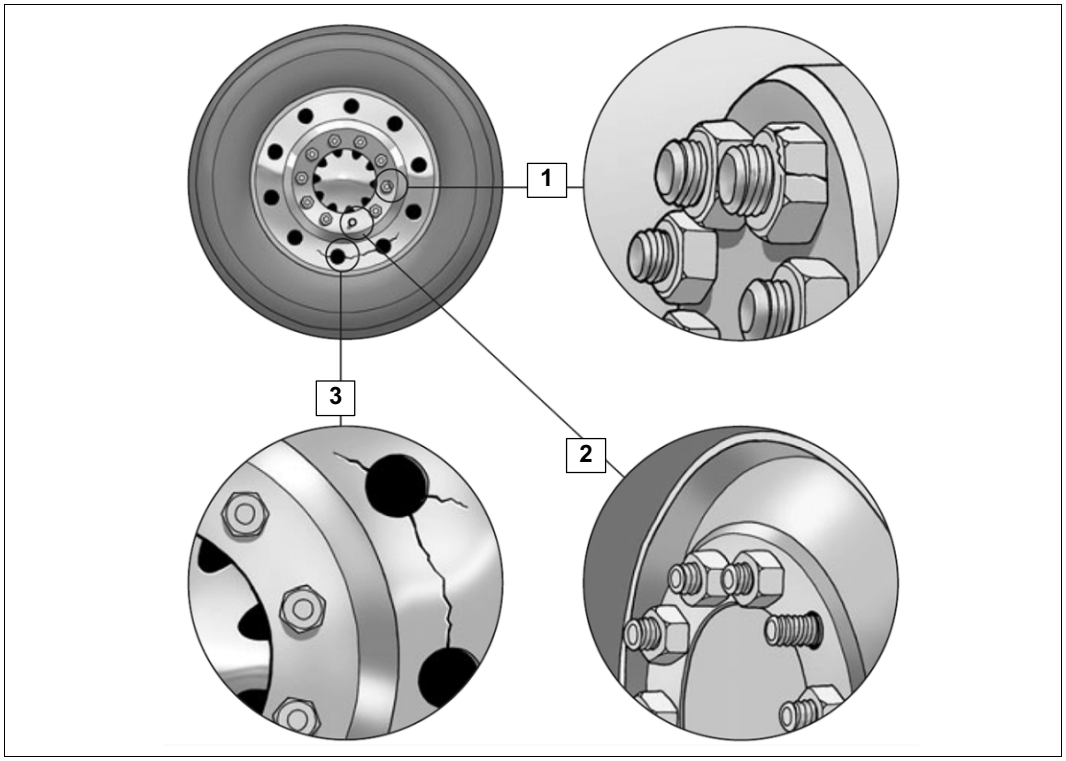
- Place the semi-tanker on a flat and level surface;
- Apply the parking brakes;
- Chock the wheels of the semi-tanker;
- Check proper inflation of each tire and spare using an accurate gage. Refer to the manufacturer pressure requirements indicated on the tire sidewall. Make sure the tires are ”COLD”;
- Inspect tires sidewalls and the inner liner for creases, wrinkling, discoloration, or insufficient treads, and examine the exterior for signs of bumps or undulations as well as broken cords;



- Look for punctures, audible air leaks (1);
- Make sure no fixed part of the vehicle touches the wheel assembly (2);
- Look for bulges, cracks, cuts, penetrations and abnormal tire wear, particularly on the edges of the tire tread (3);
- Inspect tires for nails and other objects (metal, glass, wood, etc) embedded in the rubber, and for stones and other objects lodged between duals, any breaks or other defects (4);
- Check tires for uneven wear:
  - If the inside shoulder wears faster than the rest of the tread, the vehicle may be out of alignment. Have the alignment of the wheels and parallelism of the axles checked by a truck maintenance center;
  - If the tire shows more wear on the shoulders than in the center of the tread, the tire may have run underinflated. Visit a tire retailer for complete tire inspection;
  - If the tire shows wear in the center of the tread rather than on the shoulders, the tire may have run overinflated. Visit a tire retailer for complete tire inspection.

7.4.3 Rim inspection

Daily



- Place the semi-tanker on a flat and level surface;
- Apply the parking brakes;
- Chock the wheels of the semi-tanker;
- Check damaged lugs (1);
- Check for missing lugs (2);
- Check for damaged rim (3);

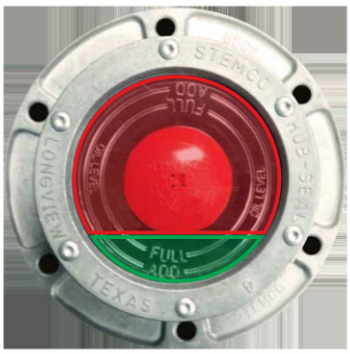
Note
If any defect is found, immediately contact a truck maintenance center for repair.

7.4.4 Wheel-end oil level verification

Daily

Note
Allow sufficient time for oil to set prior to check the level.

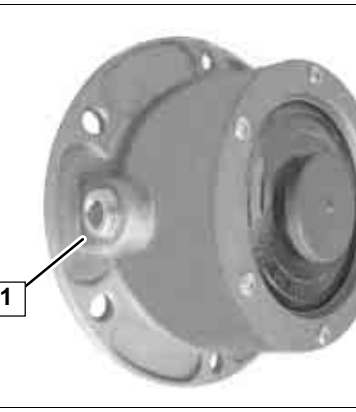
- Place the semi-tanker on a flat and level surface;
- Apply the parking brakes;
- Chock the wheels of the semi-tanker;
- Check oil level at hubcap window;
- Add oil if required. Follow steps below.



Oil refill steps

Attention!
Follow the TMC RP #631 practice for wheel-end lubrication.
► Do not over fill.

- Wipe clean the set screw fill plug (1) to prevent contaminating the oil;
- Remove plug;
- Fill the wheel end with oil at room temperature 60°F (16ºC);
- Let the oil set;
- Install the set screw fill plug (1) and tighten to 7±2 ft. lbs (10±2 Nm) torque.



Note
If any defect is found, immediately contact a truck maintenance center for repair.

7.4.5 Air tank purge and inspection

Daily

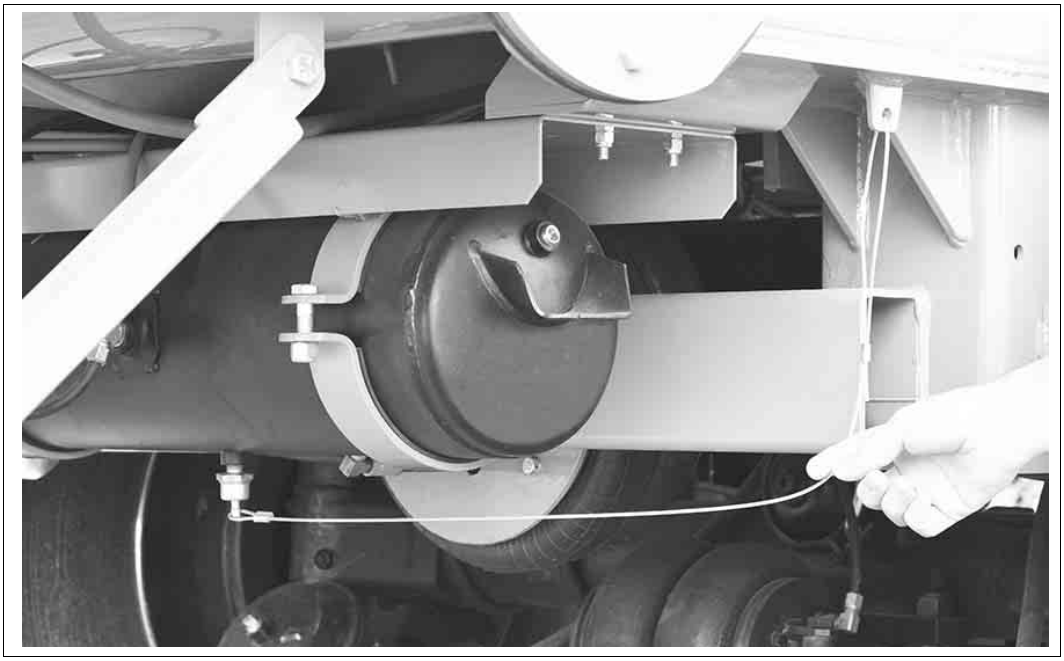
Caution!

Risk of injury!
Additives can deteriorate the valve seals resulting in improper braking efficiency that can lead to damages, injuries and/or death.
► Never use additives such as antifreeze in the air brake system.

Caution!

Risk of injury!
Improper servicing of the braking system air filter can contaminate the wet tank and air tanks which can result in improper braking efficiency causing damages, injuries and/or death.

Note
Cold weather conditions, high humidity conditions and rain season can cause condensation. In such conditions, purge the air tanks several times per day.



- Place the semi-tanker on a flat and level surface;
- Apply the parking brakes;
- Chock the wheels of the semi-tanker;
- Clean the air filter of the braking system. Follow the maintenance instructions of the truck manufacturer;
- Purge the truck wet tank and air tanks has instructed by the manufacturer;
- Purge the semi-tanker air tanks by pulling the wire on each air tank until the tanks are completely empty.

Caution!

Risk of injury!
Serious damages, injuries and/or death can occur.
► Never operate a vehicle with brake defects and/or improper brake adjustment.

Caution!

Risk of injury!
Brake system air losses are extremely hazardous conditions that can cause accidents or breakdowns.
► Immediately repairs any air leak.

Note
If a leak is found and/or waste comes out of an air tank when purging, immediately contact a truck maintenance center for inspection/repair.

- Run the truck engine until the air brake system pressure gage shows at least 105 psi (725 kPa);
- Let the air tanks fill;
- Turn off the engine;
- Listen to air leaks;
- Read the gage inside the truck without applying the brakes to check if pressure is maintained;
- Visually inspect the air tanks for cracks, corrosion, damage, etc.

7.4.6 Glad hands inspection

Daily

- Inspect the glad hands for wear, corrosion, damage, leaks, etc.

Note
If any defect is found, immediately contact a truck maintenance center for repair.

7.4.7 Air hose inspection

Daily

- Place the semi-tanker on a flat and level surface;
- Apply the parking brakes;
- Chock the wheels of the semi-tanker;
- Inspect the air lines to find any signs of bumps, flatness, cracks;
- Inspect the air lines for leaks;
- Inspect the air lines for loose connections.

Note
If any defect is found, immediately contact a truck maintenance center for repair.

7.4.8 General inspection

Daily

Note
In addition to standard inspections below, also perform daily vehicle inspections as regulated by the country, state and/or province in which the truck operates.

- Place the semi-tanker on a flat and level surface;
- Apply the parking brakes;
- Chock the wheels of the semi-tanker;
- Walk around the semi-tanker and look for signs of obvious wear, leaks, damages, abnormalities:
- Wipe off any leak and grease excess to monitor abnormal leaks on the next inspection.

Note
If any defect is found, immediately contact a truck maintenance center for repair.

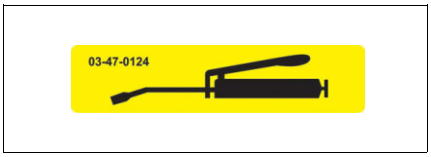
7.4.9 General lubrication

Daily

Note
Grease must contain mineral oil and lithium thickener having a NLGI rating of 2 or 3 (without MOLY).

Note
Ensure lubricant is fresh and moisture free.

- Place the semi-tanker on a flat and level surface;
- Apply the parking brakes;
- Chock the wheels of the semi-tanker;
- Lubricate all grease point labelled using PRECISION™ general purpose EP2 grease or equivalent. (yellow/black grease gun label only)



7.4.10 Bearing housing lubrication

Daily

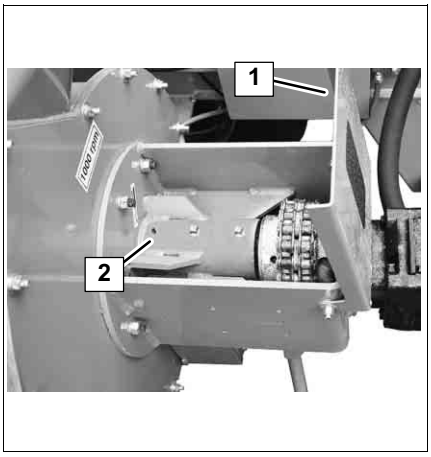
Warning!

Risk of injury!
Make sure the impeller cannot start inadvertently.
► Turn off the hydraulics of the truck before lubricating the bearing housing.

Note
Grease must contain mineral oil and lithium thickener having a NLGI rating of 2 or 3 (without MOLY).

Note
Ensure lubricant is fresh and moisture free.

- Place the semi-tanker on a flat and level surface;
- Apply the parking brakes;
- Chock the wheels of the semi-tanker;
- Open the chain coupling cover (1);
- Wipe clean the grease fitting (2);
- Fill the bearing housing through the fitting (2) with 3 grams of PRECISION™ general purpose EP2 grease or equivalent;
- Clean grease spills.



Note
Dispose lubricant according to local rules and regulations;

7.4.11 Chain coupling lubrication

Daily

Warning!

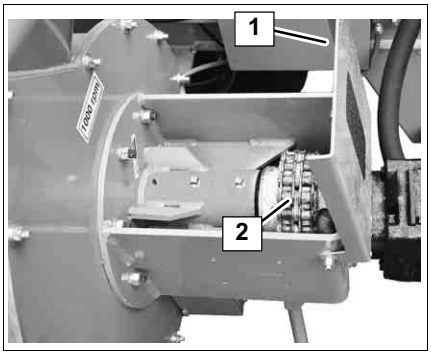
Risk of injury!
Make sure the impeller cannot start inadvertently.
► Turn off the hydraulics of the truck before lubricating the bearing housing.

Note
Grease must contain mineral oil and lithium thickener having a NLGI rating of 2 or 3 (without MOLY).

Note
Ensure lubricant is fresh and moisture free.

- Place the semi-tanker on a flat and level surface;
- Apply the parking brakes;
- Chock the wheels of the semi-tanker;

- Open the chain coupling cover (1);
- Wipe clean the entire chain coupling (2) using a clean rag;
- Apply PRECISION™ general purpose EP2 grease or equivalent over the entire chain coupling (2) using a brush;
- Close the chain coupling cover (1);
- Clean grease spills.



Note
Dispose lubricant according to local rules and regulations;

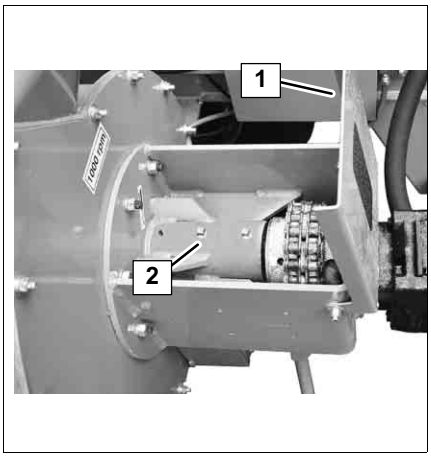
7.4.12 Bearing housing oil level verification

Weekly

Warning!

Risk of injury!
Make sure the impeller cannot start inadvertently.
► Turn off the hydraulics of the truck before lubricating the bearing housing.

- Place the semi-tanker on a flat and level surface;
- Apply the parking brakes;
- Chock the wheels of the semi-tanker;
- Open the chain coupling cover (1);
- Wipe clean the fill plug (2);
- Remove fill plug (2);
- Check the oil level inside the housing and make sure level reaches the top of the shaft. Add 80W90 TRAXON™ gearbox oil, if necessary.
- Apply TEFLON tape to the fill plug (2);
- Install the fill plug (2);
- Clean oil spills.



Note
Dispose lubricant according to local rules and regulations;

7.4.13 Semi-tanker cleaning

Monthly

STEP 1: Reservoir cleaning

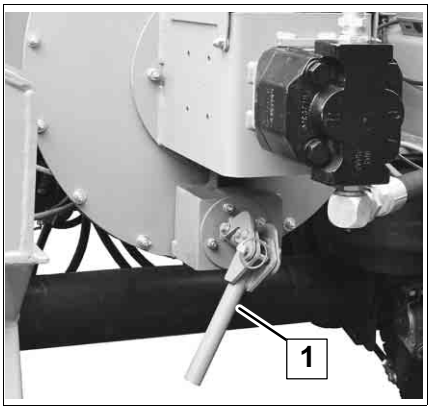
- Place the semi-tanker on a flat and level surface;
- Apply the parking brakes. The top fill opening will open automatically. If the top fill opening does not open refer to section 7.6 Manual opening of the top fill opening;
- Chock the wheels of the semi-tanker;
- Close all drains;
- Fill the semi-tanker to ⅓ with water;
- Remove wheel chocks;
- Release parking brakes;
- Move the semi-tanker back and forth a few times to stir the water inside;
- Move to an area to dispose of the liquid. Follow local rules and regulation on waste water disposal.
- Empty the semi-tanker by:
  - Spreading;
  - Transferring using the articulated transfer pipe;
  - Unloading through the side opening;

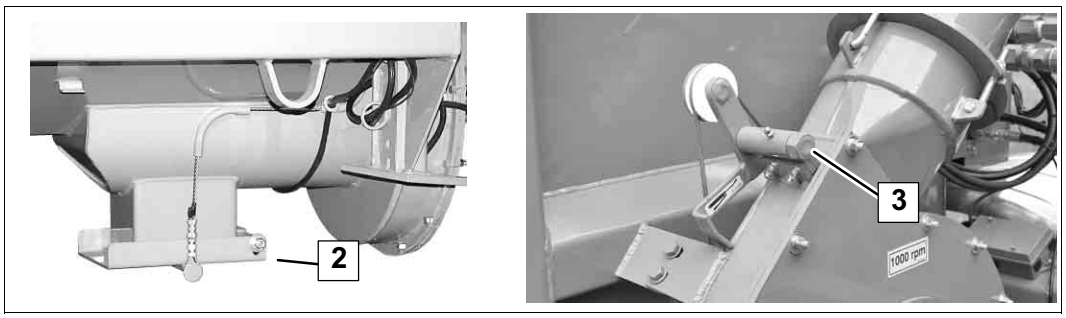
Refer to section 6.10 to 6.12 on discharging the semi-tanker.

Attention!

Risk of spillage!
There can be significant amount of waste water in the impeller drain housing.

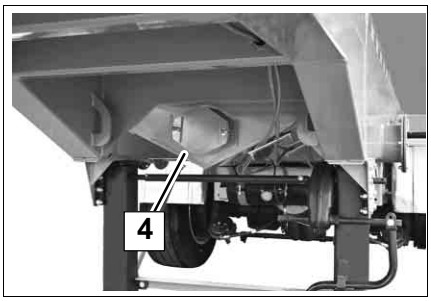
- Place the semi-tanker on a flat and level surface;
- Apply the parking brakes;
- Chock the wheels of the semi-tanker;
- Open the impeller housing drain by unlocking the toggle clamp (1);





- Open the stone collector drain (2) by turning the pivot bolt (3) using the wheel nut wrench;

- Open the front cleaning opening (4) by unscrewing both handles;



Note
When storing the product, always keep drains opened to allow venting of the reservoir.

⚠ Warning!

Risk of fall!
The semi-tanker surface can be very slippery.
► Always walk on the nonslip tape installed on the product.

⚠ Caution!

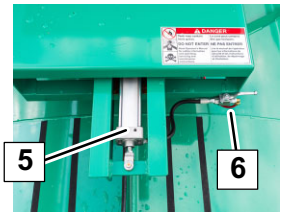
Risk of fall!
The antenna post is not designed to provide a grip to anyone on top of the tank. The post can be damaged by the weight applied.
► Do not grip or apply pressure to the post.

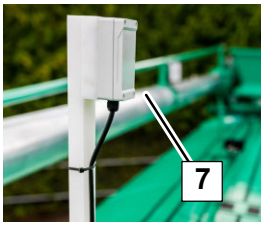
Attention!

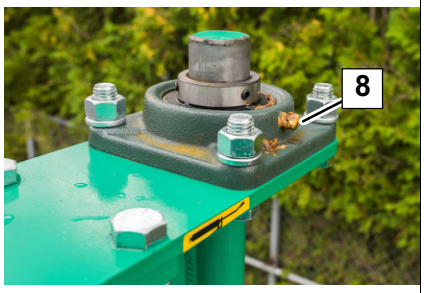
Risk of paint damage!
Use cold water to clean this product. Do not exceed 2000 psi (105 bar) when using a pressure washer and keep the nozzle at a distance of 1ft (30 cm) from the surface to prevent damaging the paint.

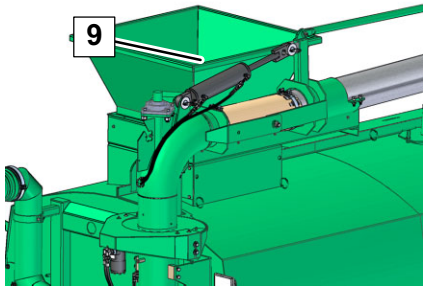
Attention!

Risk of damage!
Do not pressure wash the following components.
► Only use tap water.









5	Pneumatic cylinder of the fill opening
6	Ball valve and hoses of the fill opening
7	Antenna
8	Bearing of the articulated transfer pipe
9	Hydraulic cylinder and hoses of articulated transfer pipe
10	Beam light and wires

- Climb on top of the reservoir using the ladder.
- Pressure wash the top of the reservoir excepting the components listed above.
- Climb down the reservoir;

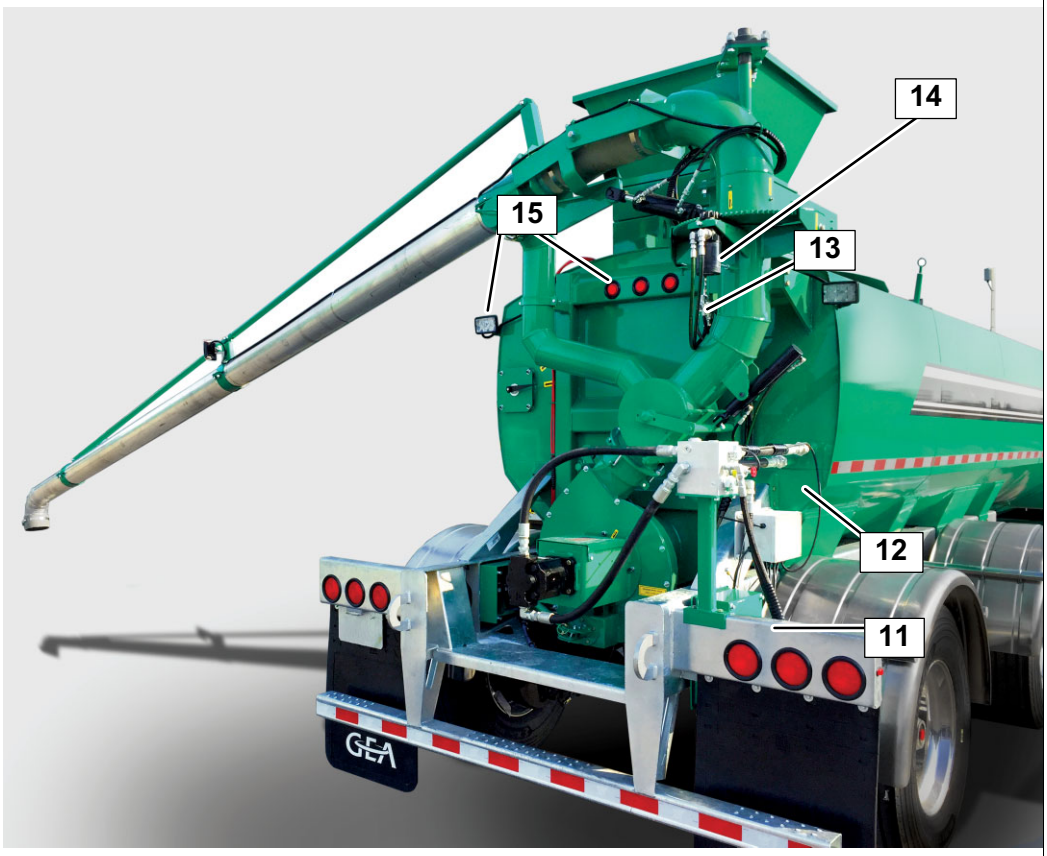
- Pressure wash the sides of the reservoir. Do not wash the undercarriage yet.
- Pressure wash the front of the reservoir except for the components listed below.

→ Do not pressure wash,only use rag.

- electric connectors;
- pneumatic connectors;
- hydraulic connectors.

Attention!

Risk of damage!
Do not pressure wash the following components.
► Only use tap water.



11	Hi-flow hydraulic block valve and hoses
12	Rotative valve cylinder and hoses
13	Pressure relief valve and hoses
14	Articulated transfer pipe motor and hoses
15	Signal lights

- Pressure wash the rear of the semi-tanker excepting the components listed above.
- Wax regularly the semi-tanker reservoir with an automotive wax. It will prevent manure from adhering to the reservoir.
- Perform the reservoir lubrication. Refer to section 7.3 Inspections and preventive maintenance.

STEP 2: Undercarriage cleaning

Attention!

Risk of paint damage!
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 prevent damaging the paint.

Attention!

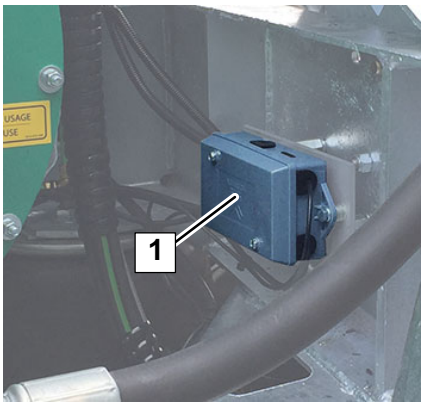
Risk of paint damage!
Never use aggressive cleaners and/or solvents to clean the undercarriage.

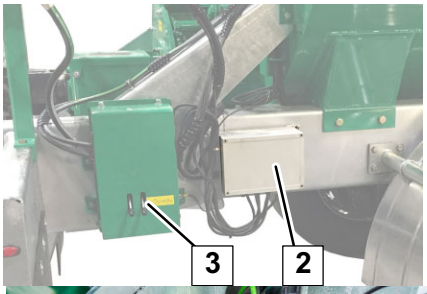
Attention!

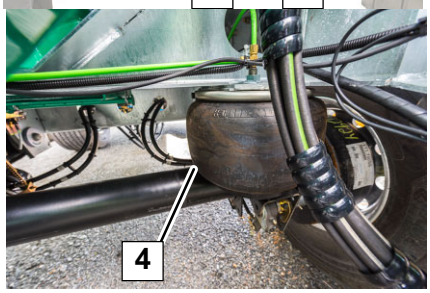
Risk of damage!
Do not use solvents, abrasives products nor steam cleaning methods for cleaning the air springs.

Attention!

Risk of damage!
Do not pressure wash the following components.
► Only use tap water.







1	Junction box
2	Control box
3	Hydraulic levers and hose
4	Air springs
	Black pneumatic box
	Brake boosters
	RM-70 box
	Wheel sensors
	Lubrication points

- Pressure wash the undercarriage excepting the components listed above.
- Perform the undercarriage lubrication. Refer to section 7.3 Inspections and preventive maintenance.

Note
To apply a corrosion preventative coating, contact a truck maintenance center. The manufacturer of the undercarriage recommends using a soft coat SG-500 from Scharpf Group or a hot wax 1210HP product from Daubert Chemical company.

7.4.14 Bearing housing oil change

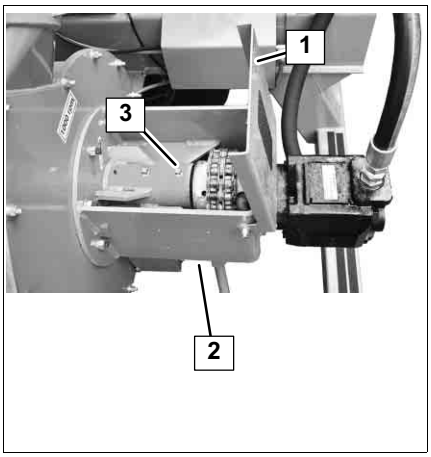
Monthly

Warning!

Risk of injury!
Make sure the impeller cannot start inadvertently.
► Turn off the hydraulics of the truck before lubricating the bearing housing.

- Place the semi-tanker on a flat and level surface;
- Apply the parking brakes;
- Chock the wheels of the semi-tanker;

- Open the chain coupling cover (1);
- Place a container under the bearing housing drain plug (2);
- Remove the drain plug (2);
- Remove the fill plug (3) to drain the housing;
- Once the housing is completely drained, wipe clean and add TEFLON tape to the drain plug (2);
- Install drain plug;
- Wipe clean the fill area;



- Add 6.75 oz (200 ml) of 80W-90 TRAXON™ gearbox oil (or equivalent). The oil level must reach the top of the shaft;
- Wipe clean the fill plug (3);
- Install TEFLON tape to the threads;
- Install fill plug;
- Clean oil spills;

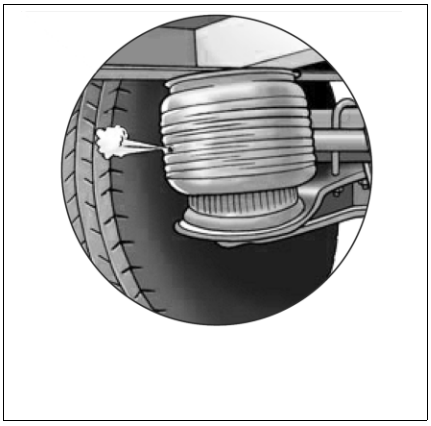
Note
Dispose lubricant according to local rules and regulations;

7.4.15 Air spring inspection

Monthly

Attention!

Risk of damage!
Do not use solvents, abrasives products nor steam cleaning methods for cleaning the air springs.



- Place the semi-tanker on a flat and level surface;
- Keep truck at idle to keep air pressure in the suspension system;
- Chock the wheels of the semi-tanker;
- Inspect the outside diameter of the air spring for signs of irregular wear, heat cracking, age cracking, punctures, chafing or horizontal splits;
- Check for air leaks;
- Make sure there is sufficient clearance around the complete circumference of the air spring while at its maximum diameter;
- Make sure the air lines do not contact the air springs;
- Inspect for buildup of foreign materials;
- Clean the air springs using water;
- Check hardware tightness;

Note
If any defect is found, immediately contact a truck maintenance center for inspection and repair.

7.4.16 FRL valve purge and maintenance

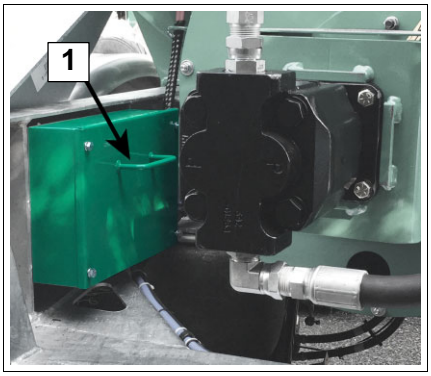
Monthly

Caution!

Risk of injury!
Pneumatic components can cause personal injury and/or property damage when improperly handled, defective or, improperly adjusted!
► Always wear personal safety gear.

STEP 1: Purge

- Place the semi-tanker on a flat and level surface;
- Apply the parking brakes;
- Chock the wheels of the semi-tanker;
- Locate the FRL valve at the rear of the semi-tanker;
- Remove the FRL valve cover (1);



- Screw the knob (2) to purge the valve until the reservoir is empty;
- Unscrew the knob tightly;
- Reinstall the FRL valve cover (1).

Note
Air supply must be moisture free if ambient temperature is below freezing.

STEP 2: General inspection

- Inspect FRL valve to find any signs of:
  - Air leaks;
  - Pressure drop;
  - Corrosion;
  - Damages to the bowls;
  - Sludge build up in bowls;
  - Damages to the component and gage.

Note
If any defect is found, repair immediately.

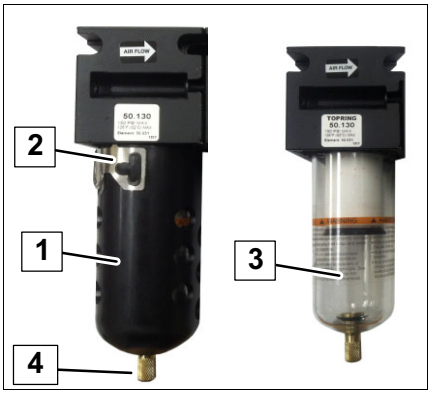
STEP 3: Filter cleaning

Note
A visible coating of dirt or condensation on the filter or an excessive pressure drop indicates that cleaning is necessary.

Caution!

Risk of injury!
Tighten the bowl properly before applying air pressure in the line.

- Disconnect electrical supply;
- Shut off air supply and screw the knob to open the valve (4) and depressurize air lines;
- Remove plastic cover (1) from the bowl by pressing the metal tab (2) and turning counterclockwise;
- Remove the bowl (3) by turning counterclockwise;
- Wash bowl using household soap and water;
- Dry out bowl;



- Clean filtering elements using alcohol;
- Blow out from the inside using low compressed air;
- Reassemble.

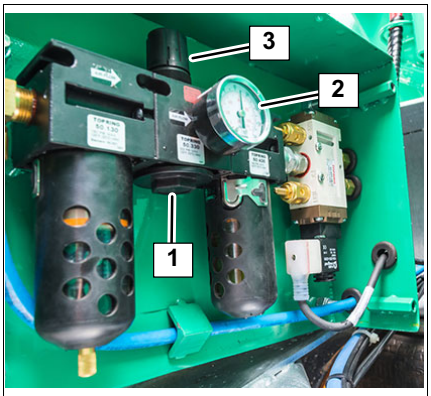
STEP 4: Regulator cleaning

Note
Erratic regulator operation or loss of regulation is mostly due to dirt in the disc area of the regulator.

Caution!

Risk of projection!
When disassembling the regulator, beware of the loaded spring located under the plastic hexagonal bolt (1).

- Keep the air system depressurized before performing the following steps;
- Disassemble the regulator but do not remove regulator from the assembly;
- Clean parts using household soap and water;
- Dry out component using low compressed air;
- Reassemble;
- When reassembling, make sure the seat is firmly in place and that the stem fits into the center hole of the diaphragm assembly;



- Tighten cage slightly at approximately 50 in/lb (5 Nm) torque. A little bit more than hand tight.
- Connect electrical supply;
- Turn on the air supply;
- Once the tractor air pressure gage reaches its maximum, check the pressure gage (2) and make sure it matches the tractor gage reading.
- If the pressure gages does not match, check the pressure valve adjustment as follows:
  - Pull knob (3) on the regulator;
  - Turn the knob (3) clockwise until it cannot turn. The regulator must be completely opened to allow full air pressure;
  - Press knob to set the adjustment.

STEP 5: Lubricator cleaning

Caution!

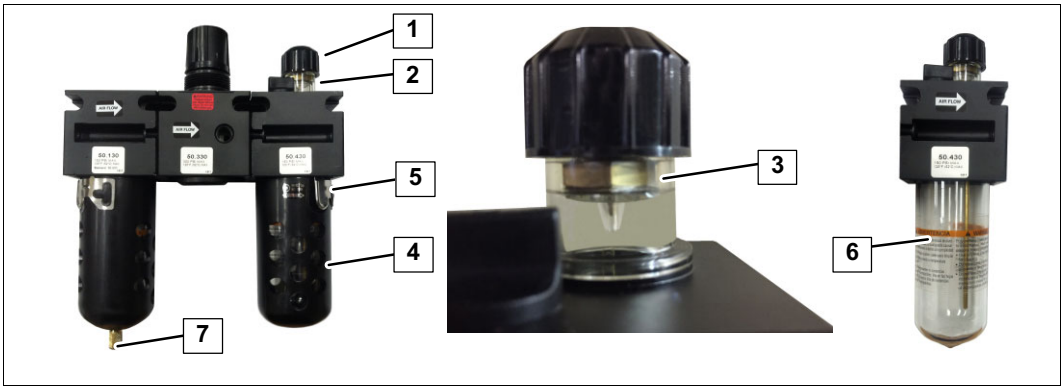
Risk of projection!
Tighten the bowl properly before applying air pressure in the line.

Attention!

Risk of damage!
Solvents such as carbon tetrachloride, trichlorethylene, acetone, paint thinner can damage the bowl, the sight dome and the sight glass.
► Only use soft soap and water to clean these parts.

Attention!

The bowl is made of polyurethane resin which is compatible with most hydrocarbon based synthetic lubricants.
► Always check compatibility and never mix lubricant types.



- Keep the air system depressurized before performing the following steps;
- Pull the adjusting knob (1);
- Unscrew the sight dome assembly (2);
- Remove inner drip spool (3);
- Clean using household soap and water;
- Dry out components using compressed air;
- Reassemble;
- Remove plastic cover (4) by pressing the metal tab (5) and turning counterclockwise;
- Remove the bowl (6) by turning counterclockwise;
- Wash bowl using household soap and water;
- Dry out bowl;
- Unscrew the knob (7) to close the drain.

Note
Dispose lubricant according to local rules and regulations;

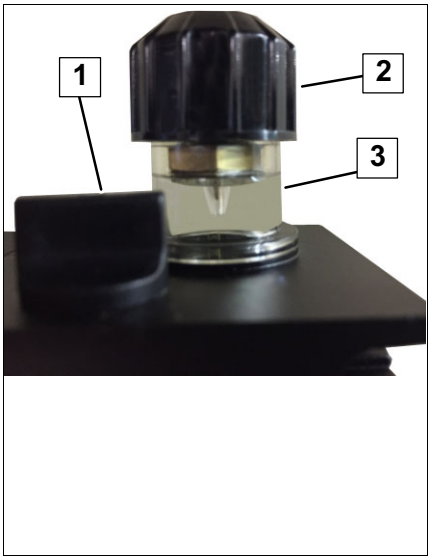
Attention!

Risk of damage!

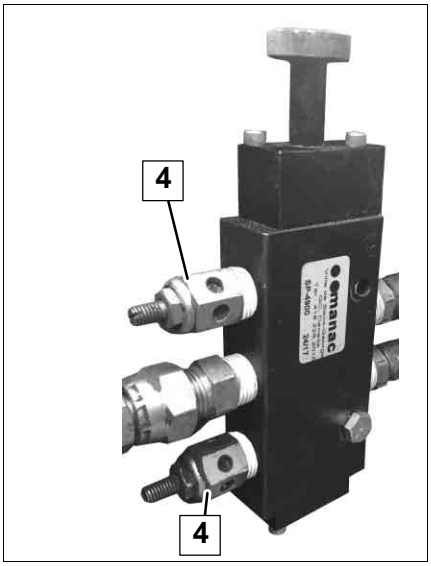
The air system requires constant lubrication while operating.

► Always keep the oil level over the tube inside the bowl to ensure proper lubrication.

- Fill bowl to ¼" (6 mm) from the top of the bowl with approximately 3.4 oz (100 ml) of synthetic air tool ISO 32 oil. Filling can also be done by removing the filling plug (1);
- Install and hand tighten the bowl properly;
- Reinstall the plastic cover.
- Turn on air supply;
- Screw in knob (2) completely (clockwise);
- Unscrew the knob by 2 turns (counter clockwise);
- Check oil supply through the oil sight dome (3). One to two drops of oil per minute is suggested.



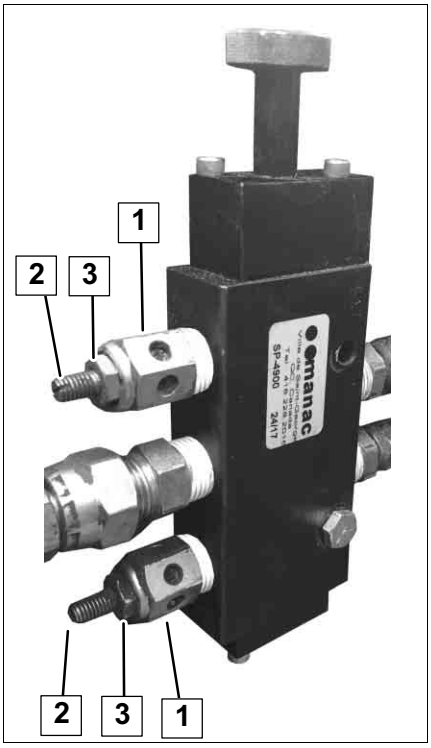
- Check lubrication flow by placing a piece of paper near the exhaust (4).
  - A heavy film indicates over-lubrication. Reduce drip rate by turning knob (2) clockwise.



7.4.17 Top fill opening pneumatic valve maintenance

Monthly

- Disconnect electrical supply;
- Shut off air supply and depressurize all air lines connected to the valve;
- Unscrew the exhausts (1) from the valve;
- Remove all thread sealant tape;
- Clean the exhaust by applying pressurized air into the exhausts;
- Wipe clean the ports of the valve;
- Add thread sealant tape to the exhausts;
- Install the exhausts;
- Snug fit;
- Make sure each adjustment screw (2) is completely unscrewed and secured in place with the nut (3). Readjust if required.

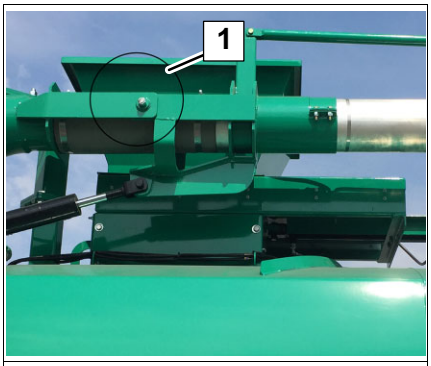


7.4.18 Articulated transfer pipe lubrication

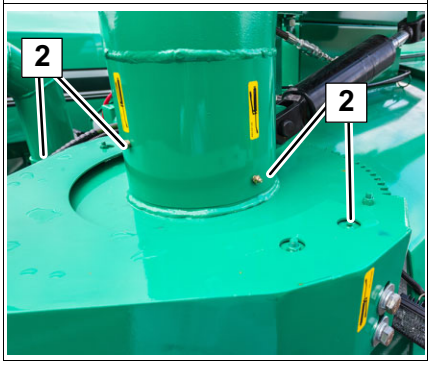
Monthly

Note
Grease must contain mineral oil and lithium thickener having a NLGI rating of 2 or 3 (without MOLY).

- Apply PRECISION™ general purpose EP2 grease or equivalent to:
  - the pivot points (1).



  - the grease fittings (2).



7.4.19 Gate valve lubrication

Monthly

Note
Grease must contain mineral oil and lithium thickener having a NLGI rating of 2 or 3 (without MOLY).

- Apply PRECISION™ general purpose EP2 grease or equivalent to the pivot points of the gate valve.

7.4.20 Brake chamber and push rod inspection

Monthly

Note
If any defect is found, immediately contact a truck maintenance center for repair.

- Place the semi-tanker on a flat and level surface;
- Apply the parking brakes;
- Chock the wheels of the semi-tanker;
- Make sure the brake chamber hoses and fittings are not leaking or damaged;
- Inspect the push rod linkages for damages or bent;
- Make sure all parts are secured.

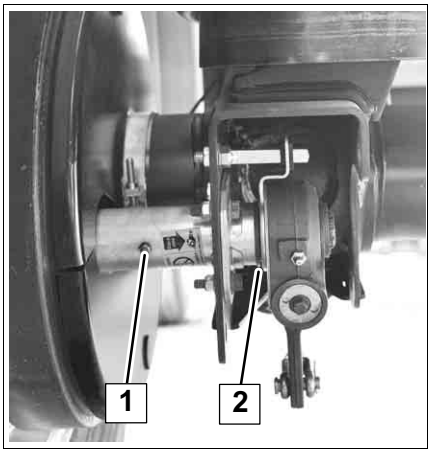
7.4.21 Cam tube lubrication

Monthly

Note
If any defect is found, immediately contact a truck maintenance center for repair.

Note
Ensure lubricant is fresh and moisture free.

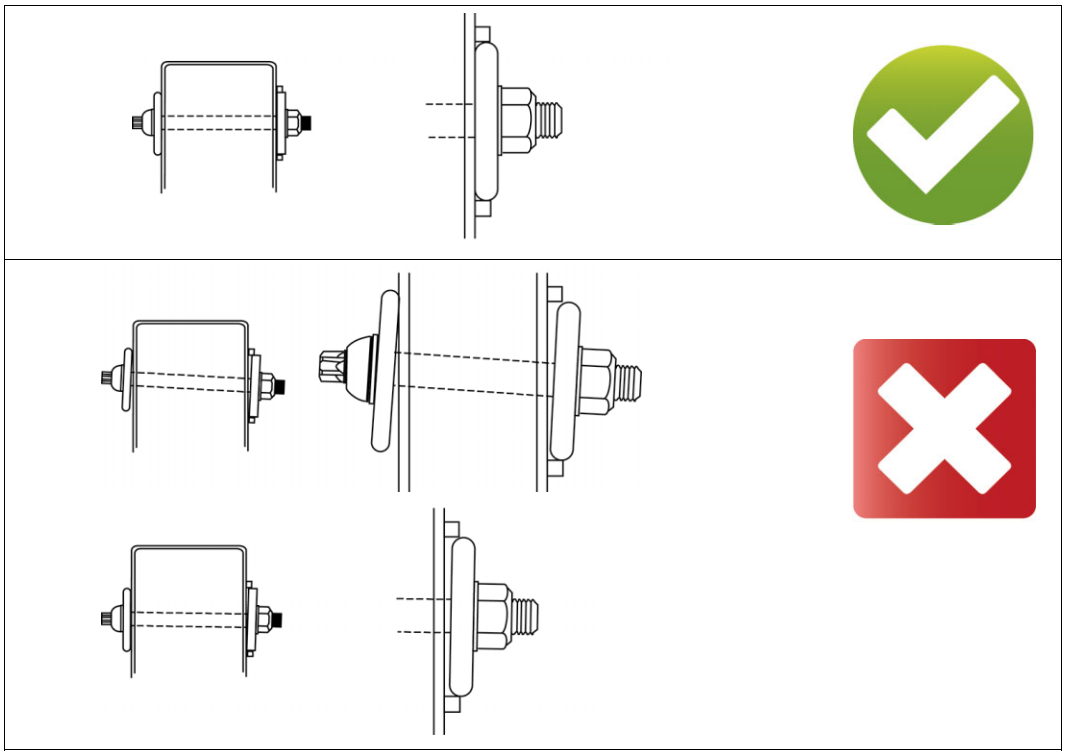
- Place the semi-tanker on a flat and level surface;
- Apply the parking brake;
- Chock the wheels of the semi-tanker;
- Wipe clean the cam tube grease fitting (1);
- Apply 4 oz (113 g) of #2 EP NLGI chassis and lubricate until grease purges out of the seal (2);
- Wipe off grease;
- Repeat steps for each cam tube.



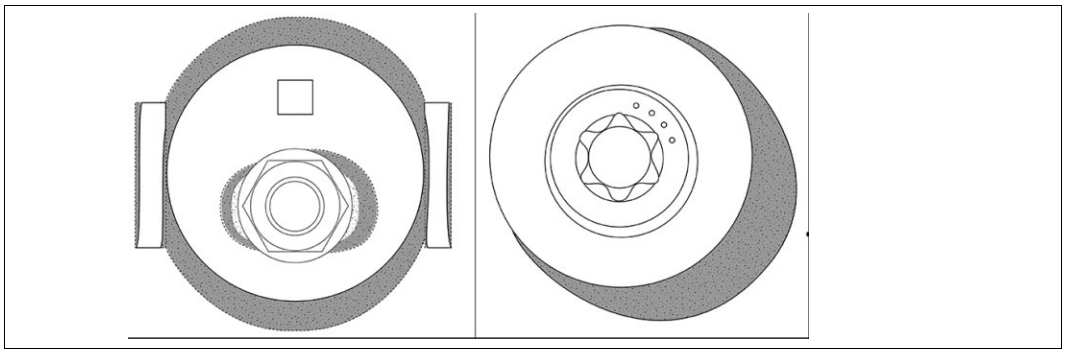
7.4.22 Pivot connection inspection

Monthly

Note
If any defect is found, immediately contact a truck maintenance center for repair.



- Place the semi-tanker on a flat and level surface;
- Apply the parking brakes;
- Chock the wheels of the semi-tanker;
- Exhaust air from the semi-tanker suspension;
- Inspect the pivot connection;



- Inspect the pivot bolt for wear signs of polished side material, smudged surface coating and/or distorted slot, as represented in grey.

7.4.23 Hubcap and hub inspection

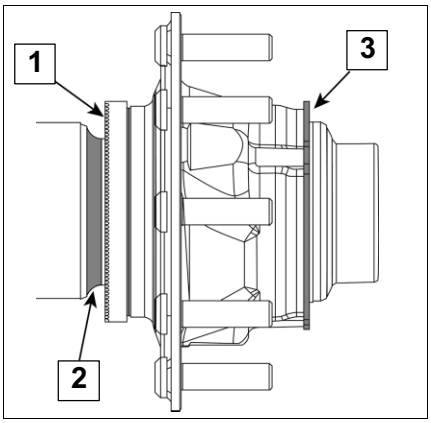
Monthly

Note
If any defect is found, immediately contact a truck maintenance center for repair.

Attention!

Risk of damage!
Forcing water past the seal will degrade the lubricant's performance and corrode the bearings.
► Do not pressure wash or steam clean the hub assembly.

- Place the semi-tanker on a flat and level surface;
- Apply the parking brakes;
- Chock the wheels of the semi-tanker;
- Inspect the back of the hub seal (1). If there is significant oil spatters on the rim and tire, the hub seal probably leaks;
- Inspect the spindle bearing shoulder (2) and the hubcap seal (3). Small amount of grease can be visible. However if a large amount of grease is visible, the hub is leaking and should be replaced;
- Wipe off lubricant to monitor closely any leak.



7.4.24 Slack adjuster inspection and lubrication

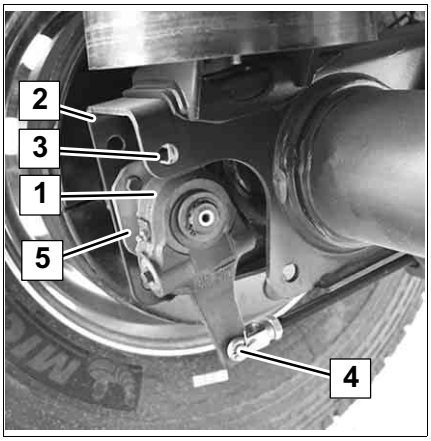
Monthly

Note
If any defect is found, immediately contact a truck maintenance center for repair.

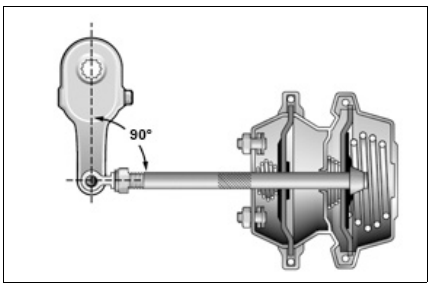
Note
Ensure lubricant is fresh and moisture free.

Attention!
Risk of damage!
Using moly-disulfide grease may affect the internal friction clutches and reduce the automatic adjustment reliability.
► Do not use Moly-disulfide grease, use standard chassis grease.

- Place the semi-tanker on a flat and level surface;
- Apply the parking brakes;
- Chock the wheels of the semi-tanker;
- Exhaust air from the semi-tanker suspension;
- Visually inspect the slack adjuster integrity (1), the bracket (2) and control arm (3). Never operate the product if damaged, repair;
- Inspect the connection of the control arm (3) to the bracket (2);
- Make sure the cutter pin (4) is properly installed and undamaged;
- Wipe clean the slack adjuster grease fitting (5);



- Grease the slack adjuster until new grease purges out from around the inboard camshaft splines and from the pawl assembly;
- Visually inspect the slack adjuster and push rod angle as instructed by the manufacturer of the component.



Note
For further inspection information, follow the guidelines of the North American commercial vehicle safety alliance CVSA uniform vehicle inspection criteria;

7.4.25 Ride height measurement and adjustment

- Every 6400 km (4000 miles)
- Every 9650 km (6000 miles)

Note
If any defect is found, immediately contact a truck maintenance center for repair.

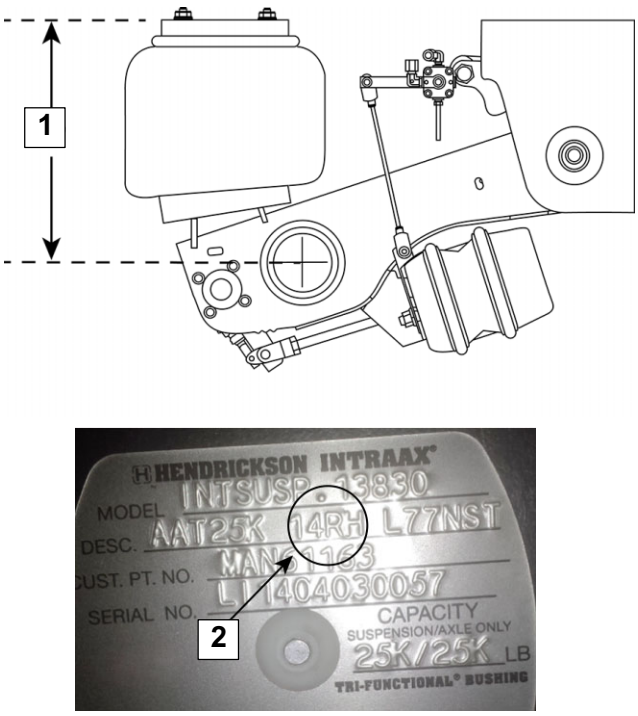
Attention!

Risk of damage!
Operating the air suspension outside its specified ride height range can reduce ride quality, damage cargo and increase suspension wear

STEP 1: Measure the ride height

Note
To measure the ride height properly, the truck fifth wheel height must be at the same designed kingpin height 48” (1.22m) as the semi-tanker. If not, uncouple the semi-tanker to measure the ride height.

- Place the semi-tanker on a flat and level surface;
- Chock the wheels of the semi-tanker;
- Release the semi-tanker parking brakes. If the semi-tanker is uncoupled, maintain pressure in the semi-tanker air-ride suspension system by applying shop air to the semi-tanker emergency glad hand to ensure that the parking brakes remain released;
- Check and adjust air pressure in the tires. The tires must be at the manufacturer's recommended pressure before measuring the ride height. Refer to the recommendations indicated on the tire sidewall;
- Maintain air pressure in the semi-tanker air-ride suspension system;



- Measure the distance (1) from the center of the axle to the mounting surface of the suspension;
- Compare the measure to the values in the following table;

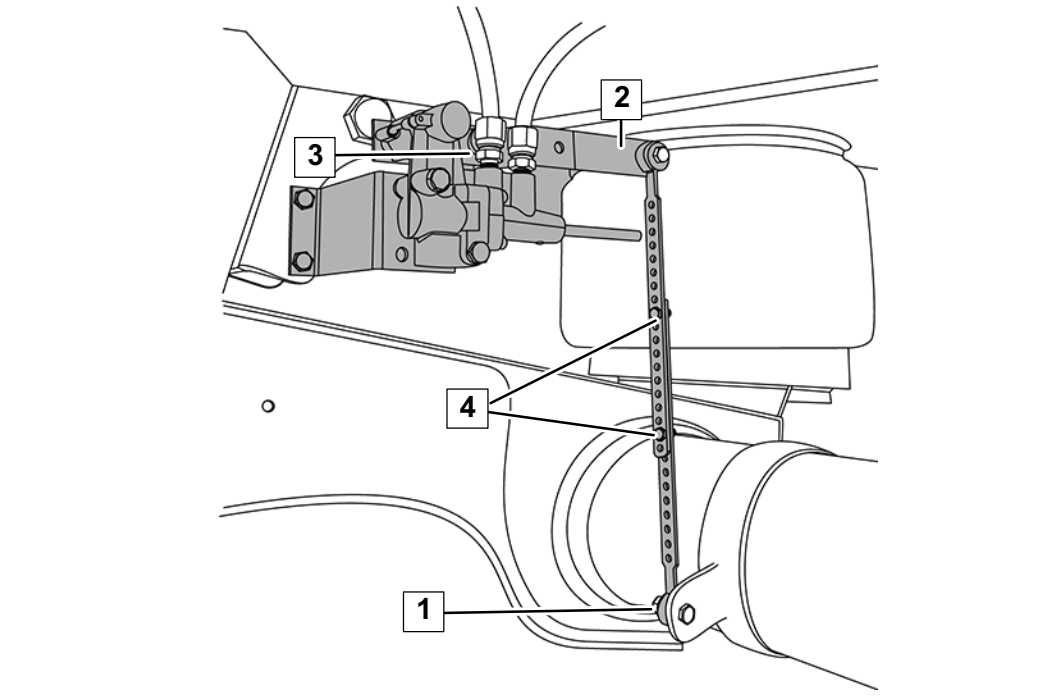
(2) Designed ride height	Minimum ride height	Maximum ride height
14” (35.5 cm)	13 ¼” (33.6 cm)	15 ¾” (40cm)

- If the ride height does not range within the values in the table, adjust the suspension height by following the next step.

STEP 2: Adjust the ride height

Note
Make sure the reservoir pressure is at 90 psi (620 kPa) minimum to ensure adequate pressure to open the pressure protection valve.

Note
It may take 5 to 10 seconds before the height control valve allows air flow.



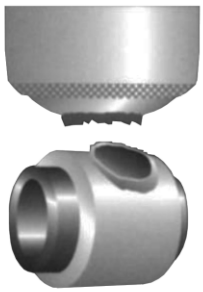
- Disconnect the height control valve linkage at the lower bracket (1);
- Push up the height control valve arm (2) to raise (add air) the ride height or push down to lower (remove air) the ride height until the distance between the suspension mounting surface and the center of the axle equals the designed ride height;
- Measure the ride height, as instructed in step 1;
- With the suspension at proper ride height, lock the height control arm (2) in the neutral position by inserting the wooden centering pin (3) through the control arm and into the hole in the valve body;
- Disconnect the linkages (4) and reconnect the height control valve linkage at the lower bracket (1);
- Reconnect the linkages (4) while making sure the control arm (2) remains in neutral position;
- Remove the wooden centering pin (3).

7.4.26 Shock component inspection

Every 6400 km (4000 miles)

Every 9650 km (6000 miles)

Note
If any defect is found, immediately contact a truck maintenance center for repair. If there is misting on the shock but no signs of leaks, the shock absorber is not defective.

Broken mount	Broken bushing	Broken dust tube
		
Bent or dent	**Leak**	**Improper installation**
		

- Pull the semi-tanker at moderate speeds for at least 15 minutes;
- Park the semi-tanker on a flat and level surface;
- Chock the wheels of the semi-tanker;
- Touch each shock absorber carefully on its body below the dust cover or tube, after first touching a nearby part of the frame to establish a reference ambient temperature of the metal. All shocks should be warmer than the frame;
- Compare the warmth of the shocks. Suspect failure in any shock absorber that is noticeably cooler;
- Perform the following inspection to determine if shocks should be replaced:
  - Uneven tire wear (make sure the ride is properly balanced);
  - Ride deterioration;
  - Broken or torn air spring (shocks will affect air springs only if they are broken or missing).

7.4.27 Self-steer axle kingpin bushing and lock straight pivot arms lubrication

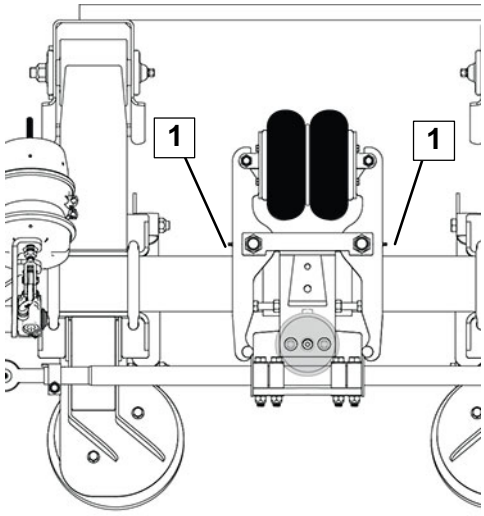
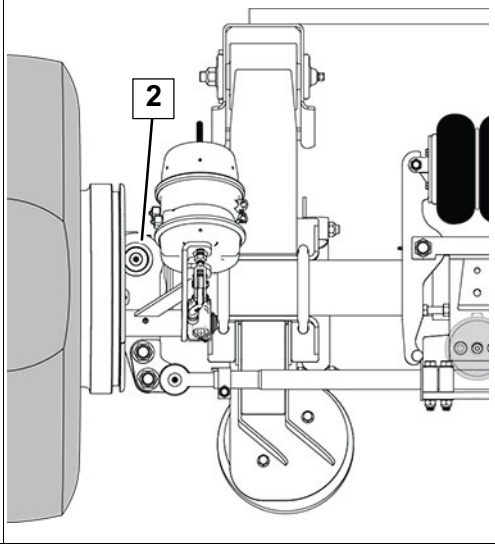
Every 6400 km (4000 miles)

Every 9650 km (6000 miles)

Note
If any defect is found, immediately contact a truck maintenance center for repair.

Attention!
Do not apply anti-seize compound or additional lubricant to pivot connection hardware. This can lead to overtightened fasteners, unpredictable connection clamp loads and unreliable axle alignments.

Note
Grease must contain mineral oil and lithium thickener having a NLGI rating of 2 or 3 (without MOLY).

Lock straight pivot arms	Kingpin bushing
	

- Place the semi-tanker on a flat and level surface;
- Apply the parking brakes;
- Chock the wheels of the semi-tanker;
- Wipe clean the grease fittings of the lock straight pivot arms (1);
- Apply PRECISION™ general purpose EP2 grease or equivalent;
- Wipe clean the grease fittings of the kingpin bushing (2);
- Apply PRECISION™ general purpose EP2 grease or equivalent through the top and bottom grease fitting on each side of the self-steer axle.

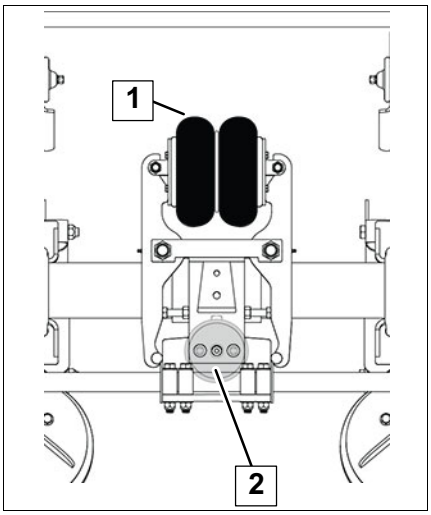
7.4.28 Self-steer axle lock straight air spring and lock straight chamber inspection

Every 6400 km (4000 miles)

Every 9650 km (6000 miles)

Note
If any defect is found, immediately contact a truck maintenance center for repair.

- Place the semi-tanker on a flat and level surface;
- Apply the parking brakes;
- Chock the wheels of the semi-tanker;
- Inspect the lock straight air spring (1) and the lock straight chamber (2) for signs of rubbing, chafing, leaks or damages;
- Make sure the air spring pressure is regulated to 25 psi (172 kPa).



7.4.29 Wheel-monitor RM-70 inspection

Every 6400 km (4000 miles)

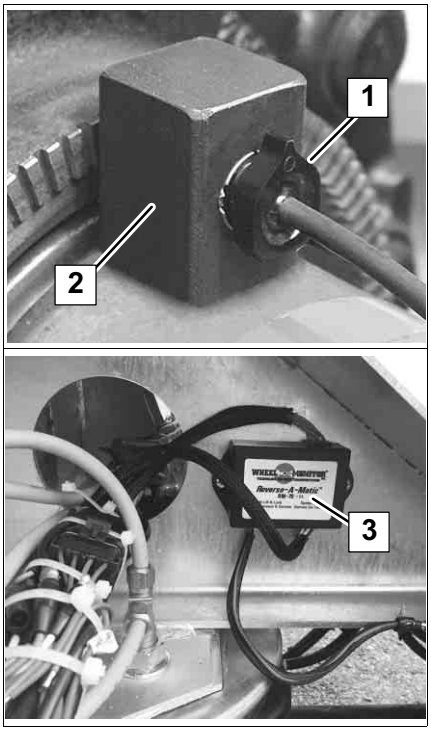
Every 9650 km (6000 miles)

Note
If any defect is found, immediately contact a truck maintenance center for repair.

Note
The RM-70 counts each wheel revolution.

Note
After releasing the semi-tanker parking brakes the RM-70 waits for the vehicle to move. When the semi-tanker completes 3 wheel revolutions, the RM-70 sends the signal for closing the fill opening. If the semi-tanker stops more than 1.5 seconds between wheel revolution the RM-70 restarts the count and the fill opening remains open.

- Place the semi-tanker on a flat and level surface;
- Apply the parking brakes;
- Chock the wheels of the semi-tanker;
- Inspect the sensor (1);
- Inspect the sensor block (2);
- Inspect the electric connections;
- Inspect the Reverse-A-Matic module (3) located inside the undercarriage frame;
- Perform the wheel direction functionality test.



7.4.30 Welds inspection

Every 6400 km (4000 miles)

Every 9650 km (6000 miles)

Note
If any defect is found, immediately contact a truck maintenance center for repair.

- Place the semi-tanker on a flat and level surface;
- Apply the parking brakes;
- Chock the wheels of the semi-tanker;
- Visually inspect all welds to find any cracks, holes, rust.

7.4.31 Welds inspection

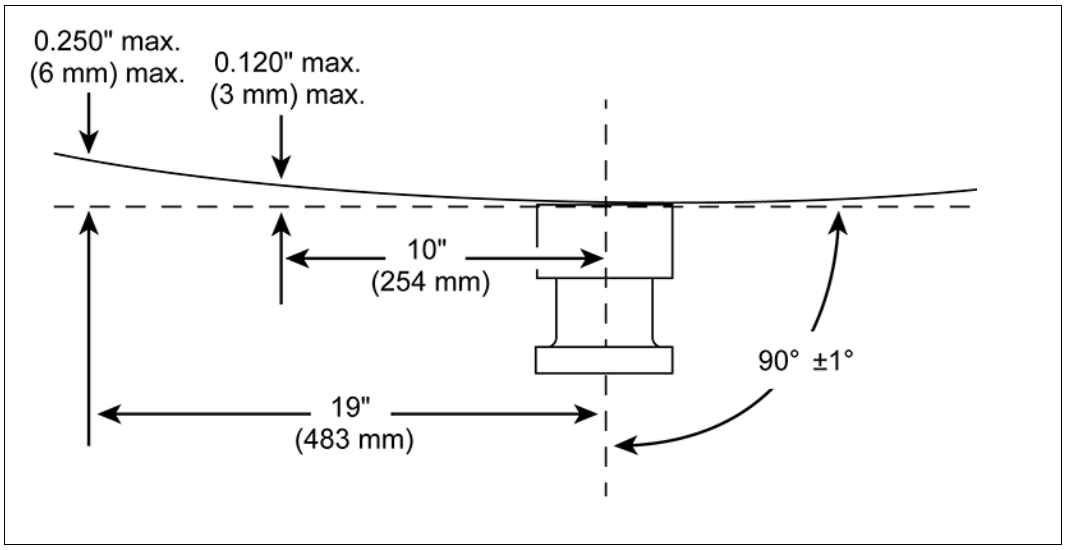
- Every 6400 km (4000 miles)
- Every 9650 km (6000 miles)

Note
If any defect is found, immediately contact a truck maintenance center for repair.

Note
The semi-tanker is equipped with a mushroom 2” SAE kingpin.

STEP 1: Upper coupler plate flatness

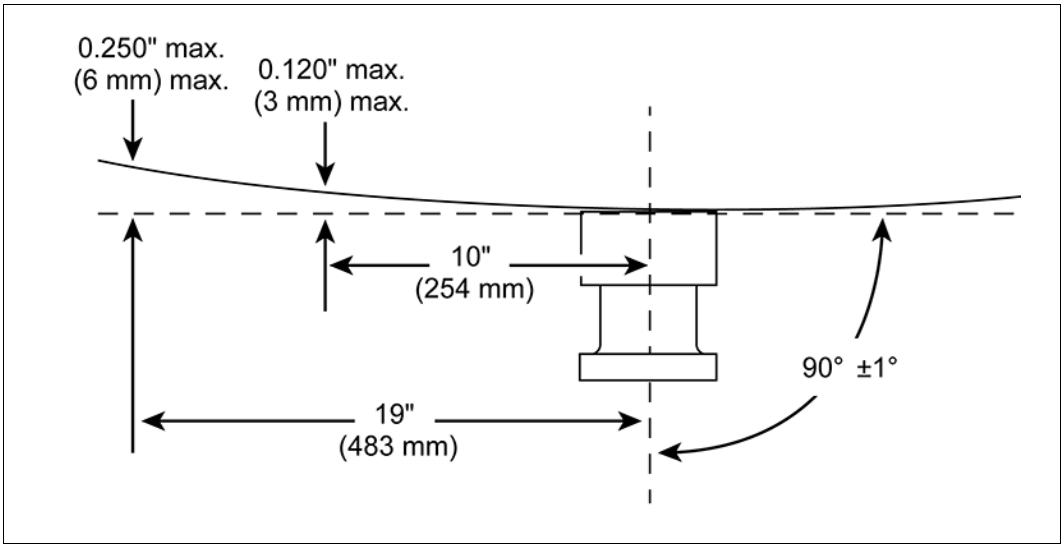
Attention!
Any bump, valley or warping in the coupler plate will cause uneven loading of the fifth wheel which can result in damages to the top plate and poor lock life.



- Place the semi-tanker on a flat and level surface;
- Apply the parking brake;
- Chock the wheels of the semi-tanker;
- Uncouple the truck from the semi-tanker;
- Check the flatness of the upper coupler plate in all direction using a 48” (122 cm) straight edge. Refer to the following illustration for tolerances;
- Replace the trailer upper coupler plate if the flatness exceeds the tolerance indicated.

STEP 2: Inspect the kingpin for straightness

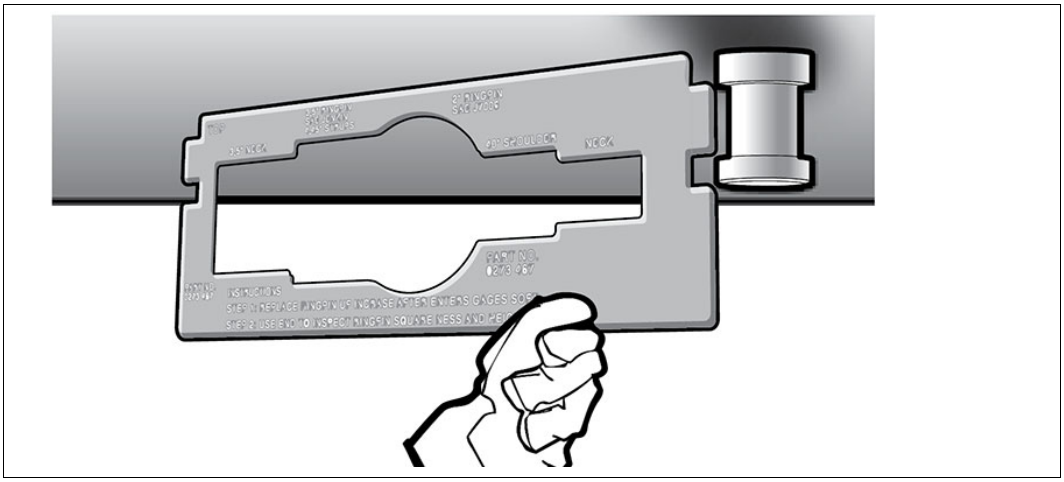
Note
A bent kingpin accelerates lock wear and can interfere with proper fifth wheel locking.



- Using a square or kingpin gage, check to see if the kingpin is bent;
- Replace the kingpin if the bent exceeds 1° from square in any direction.

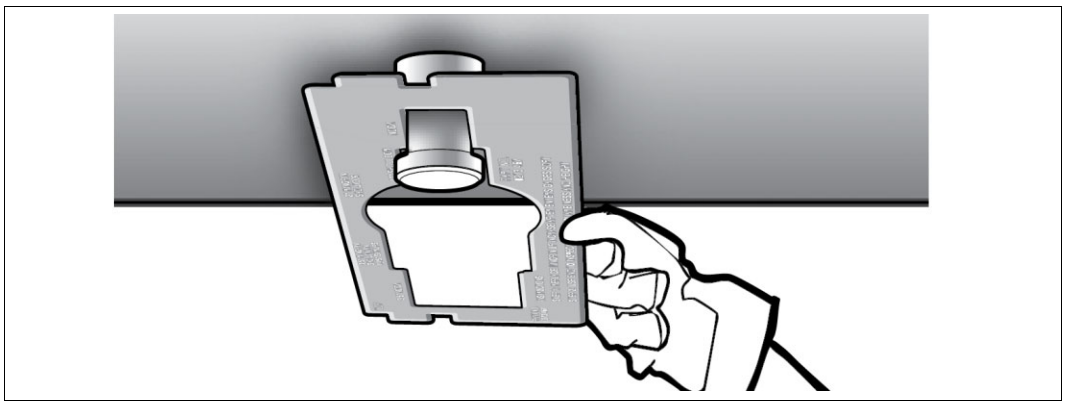
STEP 3: Inspect the kingpin for proper length

Note
If a lube plate is used, check the kingpin length. The kingpin must be sized to compensate for the thickness of the lube plate otherwise the kingpin will be too short.



- Using the manufacturer kingpin gage, check length, as illustrated.

STEP 4: Inspect the kingpin wear



- Check wear on kingpin using the manufacturer kingpin gage;
- Attempt to slide the kingpin inside the appropriate gage slot diameter. If the kingpin slides into the gage slot, this indicates a ⅛" wear. Replace the kingpin.

STEP 5: Check the kingpin mounting

⚠ Caution!

Safety hazard!
A loose mounting will cause excessive chucking and rapid lock wear.

- Make sure the kingpin is securely mounted. If the kingpin is not securely mounted repair, reinstall or replace the kingpin.

STEP 6: Check the kingpin for damage

⚠ Caution!

Safety hazard!
Do not use the semi-tanker if the kingpin is damaged. Any damage can interfere or affect the safe use of the semi-tanker.

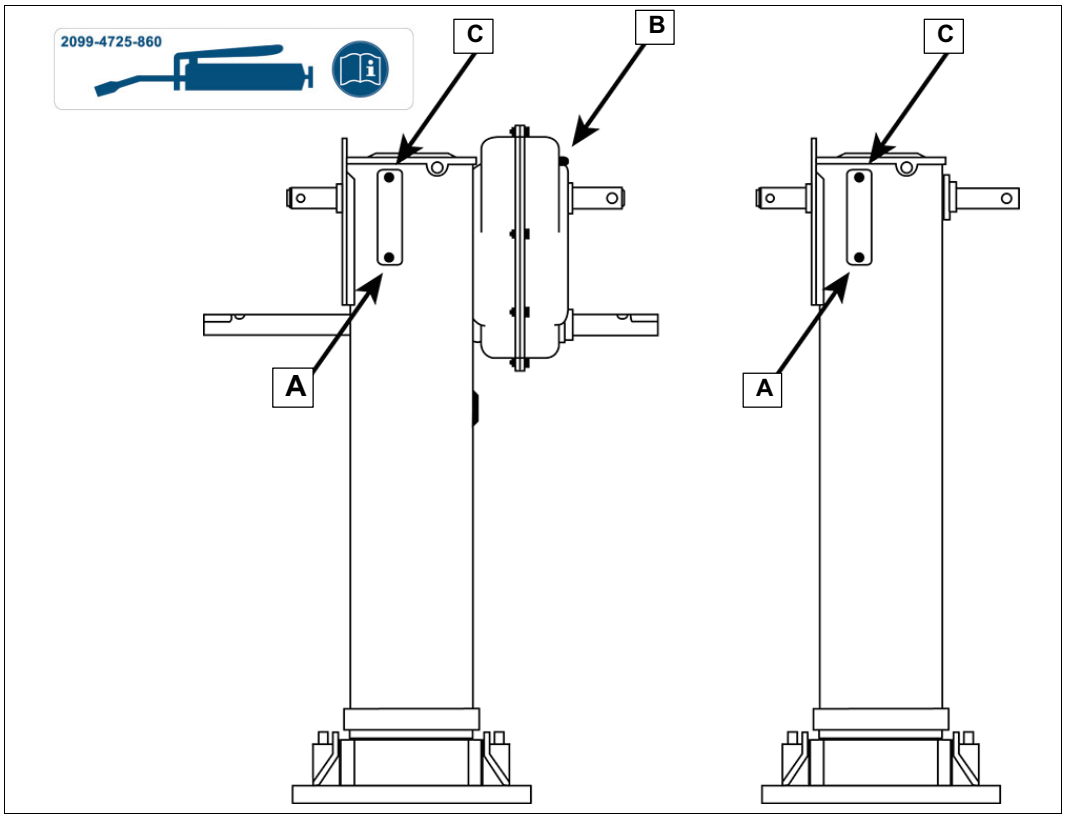
- Inspect the kingpin for any nicks, gouges, deformation or cracks;

7.4.32 landing gears lubrication

Every 6 months

Note
If any defect is found, immediately contact a truck maintenance center for repair.

Note
Use a lithium or anhydrous calcium extreme pressure grease that operates down to -54°C (-65ºF).



- Fully retract the landing gear, then using high gear, lower the leg 2-3 turns.
- Lubricate the following grease points labelled using specified grease. (white/blue grease gun label only)
- Lubricate the lift-screw assembly through grease fittings A. Apply ½ lb (228 g). of grease;
- Lubricate the gearbox using grease fitting B. Apply ¼ lb (114 g). of grease;
- Lubricate the bevel gear using grease fittings C. Apply ¼ lb (114 g). of grease;
- Distribute the lubrication by fully extending and retracting the legs several times.

7.5 Control box fuse replacement

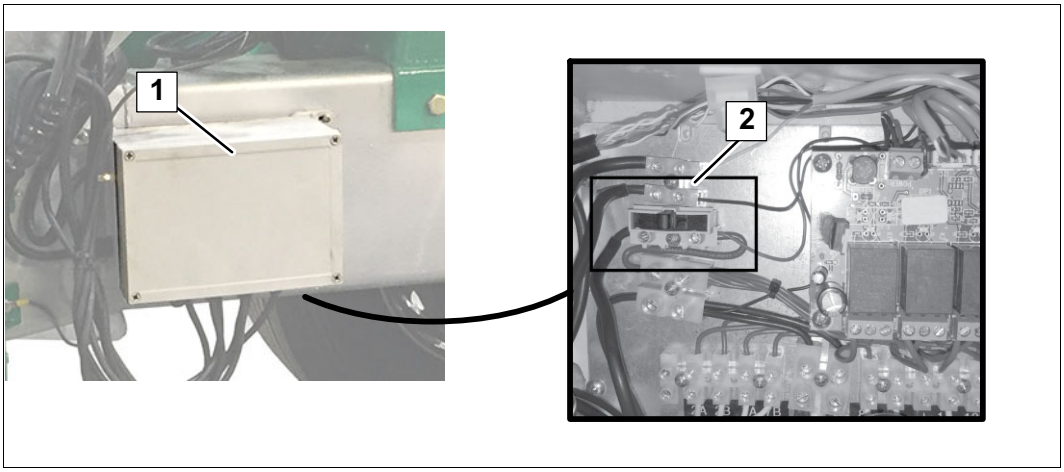
Caution!

Risk of electric shock!
Always shut down the power of the the control box by disconnecting the semi-tanker electric connector from the truck power outlet.

Attention!

Risk of damage!
Do not use metal tools and/or objects to remove the fuse inside the control box, use fingers.

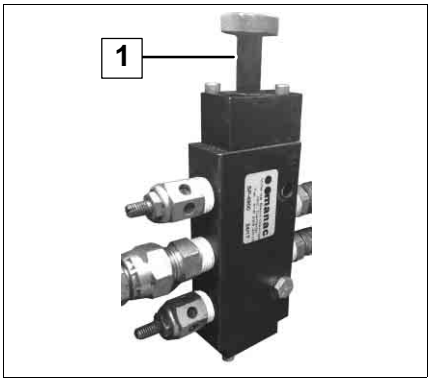
Note
Do not perform work inside the control box other than replacing the fuse.



- Remove control box cover (1) using a screwdriver;
- Locate the fuse socket (2);
- Flip tab using fingers;
- Remove and inspect the fuse;
- Replace the fuse with a 10A - 250VAC ceramic fuse #BK/MDA-10-R;
- Reinstall cover.

7.6 Manual opening of the top fill opening

- Push the detent (1) and slightly turn clockwise or counterclockwise to open the fill opening. The detent must remain pressed down for air to bypass inside;
- Turn clockwise or counterclockwise to release the detent in order to close the fill opening.



8 Troubleshooting

If necessary, contact your nearest authorized technical dealer.

8.1 Special Qualification

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

See also the section on ”Personnel qualification”.

8.2 Safety Instructions

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

- Read the ”Safety” section as well.

8.3 Troubleshooting possible faults

Symptom	Possible cause	Solution
The ABS brake light indicator on the semi-tanker does not turn on within 3 seconds of ignition.	The truck power outlet is not connected to the semi-tanker.	Connect the power outlet of the truck to the semi-tanker. Refer to section 6.4.8 STEP 8: Semi-tanker electrical connection.
	There is a fault in the braking system.	Contact a truck maintenance center for inspection/repair.
	Burned light.	Replace with a certified light.
The ABS brake light indicator of the semi-tanker stays on after ignition.	A fault occurred during operation and still exists.	Contact a truck maintenance center for inspection/repair.
The ABS brake light indicator blinks after ignition.	The ”ignition power activation” mode is activated.	Remove key from the ignition. Wait a few minutes before ignition.

Symptom	Possible cause	Solution
The semi-tanker partially brakes or does not brake at all.	The semi-tanker air hoses are not connected to the truck.	Connect the pneumatic hoses. Refer to section: 6.4.5 STEP 5: Semi-tanker air brake connection.
	Insufficient air in the air braking system.	Inspect the air braking system to find any damage. Refer to section 6.4 Coupling the semi-tanker.
	The brake pads are worn.	Contact a truck maintenance center for inspection/repair.
	Water in the air braking system.	Purge the air reservoirs. Refer to section 7.4.5 Air tank purge and inspection.
The semi-tanker does not brake evenly.	A worn out brake pad.	Contact a truck maintenance center for inspection/repair.
	A faulty caliper.	
	A distorted brake disc.	
The brake lights and/or signal lights do not operate.	The truck power outlet is not connected to the semi-tanker.	Connect the power outlet. Refer to section 6.4.8 STEP 8: Semi-tanker electrical connection.
	Damaged lighting component	
	Burned light	Replace with a certified light.

Symptom	Possible cause	Solution
The semi-tanker does not transfer or spread manure.	The liquid manure consistency is too thick.	Perform a manure consistency test. Refer to section 11.7 Consistency test. Hydraulic HE impeller requires a maximum consistency of 1½" (38 mm).
	The rotative valve is not in proper position.	Set the rotative valve in proper position. Hold the switch for at least 3 seconds to position valve.
	The rotative valve is obstructed.	Contact your dealer.
	The articulated transfer pipe is obstructed.	Contact your dealer.
	The impeller is obstructed.	Contact your dealer.
	The impeller or the housing is worn out.	Contact your dealer.
Manure keeps discharging from the spreading nozzle.	The rotative valve is in spreading position.	Press and hold the rotative valve button to rotate in the transferring position, if applicable.
	The rotative valve leaks.	Contact your dealer.
The remote does not turn on when pressing the connection button or does not operate any function.	The remote is not connected to the control box because there is currently another remote connected to the control box. The remote beeps twice.	Wait until the other remote disconnects from the control box.
	The remote is out of range. The indicator light does not appear on the remote.	Engage the remote only within the transmitting range of the control box. Refer to section 3.3.2 Wireless remote control.

Symptom	Possible cause	Solution
The remote does not turn on when pressing the connection button or does not operate any function.	There is an obstacle preventing the remote from connecting to the control box. The indicator light does not appear on the remote.	Clear obstacle and reconnect the remote to the control box.
	The impeller is turned on. The remote impeller green indicator light flashes three times and the remote beeps three times.	Turn off the impeller by placing the switch to ”O” position. Reconnect the remote to the control box.
	The remote control is not programmed.	Program the remote control. Refer to section 6.3.4 Wireless remote control programming.
	The remote battery is completely discharged.	Recharge the remote battery. To operate the semi-tanker without using the remote control, refer to section 6.11 Discharging manure using the hydraulic levers.
	The truck power is disengaged	Make sure the truck electric supply is properly connect to the semi-tanker. If applicable, flip the switch inside the truck which supplies power to the semi-tanker.
	The control box fuse is triggered.	Open the control box to find out if the fuse is triggered. Change fuse if required. Refer to section 7.5 Control box fuse change.

Symptom	Possible cause	Solution
The remote control turns off by itself while using it.	Remote is out of range.	Reduce distance between the remote and the control box.
	There is an obstacle between the remote and the control box	Remove the obstacle.
The remote does not turn off when pressing the disconnection button.	The remote is out of range.	The remote will automatically disconnect from the control box after a few minutes.
	The impeller is turned on. The remote disconnection indicator light flashes.	Turn off the impeller by placing the switch to ”O” position. and disconnect the remote from the control box.
The top fill opening does not open and/or close.	The air flow does not reach the pneumatic cylinder.	Make sure the FRL valve regulator is completely open. Refer to section 7.4.16 FRL valve purge and maintenance.
		Close tightly the filter purge of the FRL valve. Refer to section 7.4.16 FRL valve purge and maintenance.
		Clean the air filter of the FRL valve. Refer to section 7.4.16 FRL valve purge and maintenance.

Symptom	Possible cause	Solution
The top fill opening does not open and/or close. Note: Refer to section 7.6 to manually open the top fill opening.	The cylinder is not properly lubricated.	Check the lubricator oil level of the FRL valve. Refer to section 11.4.16 FRL valve purge and maintenance - lubricator cleaning.
	The exhaust ports on the cylinder pneumatic valve are clogged or not properly adjusted.	Perform steps in section 7.4.17 Top fill opening pneumatic valve maintenance.
	The electric supply does not reach the top fill opening pneumatic valve.	Make sure the truck electric supply is properly connect to the semi-tanker. Refer to section 11.4 Electric wiring diagram.
	The wheel sensor of the top fill opening is defective.	Contact your dealer.

9 Decommissioning

9.1 Special Qualification

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

See also the section on ”Personnel qualification”.

9.2 Safety Instructions

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

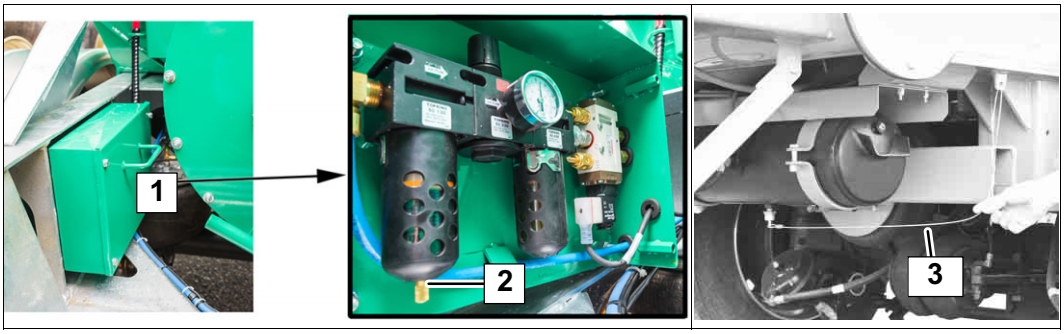
- Read the ”Safety” section as well.

9.3 Temporary decommissioning

Attention!

Risk of damage!
Keep all hose couplings clear of dirt and sand when disconnected from the truck.
► Always hook them on their supports.

STEP 1: Purge the air system



- Remove the guard of the FRL valve located at the rear (1) of the semi-tanker;
- Screw the knob (2) to purge completely;
- Unscrew the knob to close;
- Reinstall the guard.
- Clean the air filter of the braking system. Follow the maintenance instructions of the truck manufacturer;
- Purge the truck wet tank and air tanks has instructed by the manufacturer;
- Purge the semi-tanker air tanks by pulling the wire (3) on each air tank until the tanks are completely empty.

Note
If dirt comes out of an air tank when purging, contact a truck maintenance center for inspection/repair.

STEP 2: Clean

- Perform cleaning. Refer to section 7 Maintenance.

STEP 3: Lubricate the equipment

- Perform complete lubrication. Refer to section 7 Maintenance.

9.4 Disposal

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

10 Undercarriage spare parts

Note
The following spare parts can only be ordered at a certified truck maintenance center.

Rim

2335909	Wheel guard, plastic, accur, 10st, hub-piloted
2336571	Wheel nut, 2 pieces

Tire

240010	Tire assembly conti, HTR2, L/20-Alcoa ”LVL one”
240389	Tire assembly Michelin Multi Energy T,L/20-ALCOA, Ultraone
2403891	Tire assembly Michelin Multi Energy T,L/20-ALCOA, Ultraone

Hub and drum

2117904	Stl H&D, short, 10st, alu whl, hm518445, castdrum, mtb
2117905	Stl H&D, long, 10st, alu whl, hm518445, castdrum, mtb
21179055	Stl H&D, long, 10st, alu whl, hm518445, castdrum, mtb, w/ABS

Landing gear

273503	Landing gear brace gear
273511	Landing gear cross shaft, black armor
273546	Landing gear crank, mark-v, vertical fold
273730	Landing gear component kit (2” bolt)
986170488-01	Landing gear set, h.d, out/mt, h.d ax, large ft (12X17)

Coupling

281403	King pin SAE T-809 serie

Suspension

72028	Lift center wheel, 38.00 c/c
721922	AAT partbox 30K, LDA
72207	AAT hanger D-21905 (8.0”) without wing, without paint
722142	AAT axle 30K-hp, 28spl, h23hxs lining
76007	Suspension air ride, HT250TB14, 5rd, Q/A, brass and hardware
76507	Support kit/plates, HT250TB

Axle

2013103	Auto steer axle 700912-09628N, F24, xl
202224	Hub seal set, stemco, guardian-hp, trl axle
2030626	Bearing cone, lml, hm518445
203484	Hub cap, 6 blt, stemco, L/gasket, for oil, w/pipe plug
203485	Hub cap gasket, 6 blt cap no.343-4195
203873105	Slack adjuster auto. Haldex, str arm, with bolt kit
203878105	Slack adjuster auto. Gunite, straight + nut, clevis
2039082	Dust shield, stl, sgl pce, clamp-on kit with collar
203931	Spindle nut, tp axilok, (ax-12-3480)
2220342	Spring brake, tse, type-3030tl, L/clevis, caged
2230281	Yoke assembly, w/stl clevis pin-cotter pin, forged
2630601	Cap screw, hex hd, stl, zinc plated
263606	Spring lock washer, stl, zinc plated, regular
371001	Oil, gearlube, SAE 80W90
371080	Compound, lubricating, lok-cease brush top

Electrical

2280062	Lift system module RM-70-H
2280064	Cable wheel sensor brake drum RM-70
2280065	Adapter 4-way leads - autodeploy system
22801516	ABS Wabco cable supply, 4-con, harness con. std
22801517	ABS Wabco power cable 4 cond, with plug - std conn.
22803000	ABS Wabco s-plus sensor assembly, 90D
22803500	ABS Wabco sensor spring clip
22804001	ABS Wabco sensor extension with plug
252072	Harness 3-way, sm/slf-slf-slf, dbl jacket
2521007	2 wire cable jumper, 2slm/2slf
2521176	Main harness 7 cond. Extension, ABS drop
2521185	Main harness 7 cond. Extension, drop
251510	Harness rear sill, 7 cond. Male oin, 2 conn. ABS (4 light)
2521758	Relay, single, male thin/female thin (slm/slf)
2521812	Y-adaptor female for male pin lamp
2521819	2 wire cable jumper, 2slm/2slf, black
2521838	Relay, single male thin/double female thin (slm/dslf)
2521860	UBS dummy plug
2521870	Single contact pigtail, dbl-seal type, slm/slm
2521883	Relay, single, slm/slf

2521918	Single contact pigtail for 46742 lamp, slm/slm
2521935	Relay, single, male thin / without terminal. (slm/cut)
25292720	Lamp grommet, oval, close back
253016	Lamp marker, led, red, micronova, snap-in grommet, pigtail
253020	Lamp marker led, amber, micronova, type snap-in
2532895	Tie nylon white, H.D (175lbs cap)
2534039	License lamp sealed unit, led clear
2534549	Marker lamp base, dbl bulb sealed, grey
253469	Unit marker led, red, female pin, supernova
2534735	Lamp signal led, red, male pin, grommet /mt, next gen.
2535688	Side flasher lp unit, led, amber, oval, grommet/mt
2537011	Lamp grommet, flushmount
253712	Lamp grommet, flushmount
253904	Tie, nylon, white
253805	Rubber liner, threaded, lever switch
2538113	Lever switch, 2-position open/closed, molded wire
253864	Terminal, loop, not isolated
253900	Tie, nylon white, (50 lbs cap)
253904	Tie nylon white
9822003	Main harness
9822009	Mid turn curb side, male pin
9822010	Mid tirn road side, male pin
9832254	7-cond, main harness 23 feet
987172210-03	Cable extension 4-wire
E0002800	Electronic control (RM-50&60)

Miscellaneous fasteners

2630312	Cap screw, hex hd, stl, zinc plated
2630325	Cap screw, hex hd, stainless steel
263051	Cap screw, hex hd, stl, zinc plated
2630658	Cap screw, hex hd, stl, zinc plated yellow
263067	Cap screw, hex hd, stl, zinc plated
263069	Cap screw, hex hd, stl, zinc plated
263070	Cap screw, hex hd, stl, zinc plated
2630721	Cap screw, hex hd, stl, zinc plated
263075	Cap screw, hex hd, stl, zinc plated
2630741	Cap screw, hex hd, stl, zinc plated
263216	Washer flat, stl, stainless steel, std-style, serie-818
263225	Washer flat, stl, stainless steel, std-style
263311	Nut hex, stl, zinc plated
2634021	Nylon stop nut, hex, stl, zinc plated
263403	Nylon stop nut, hex, stl, zinc plated
263405	Nylon stop nut, hex, stl, zinc plated
263407	Nylon stop nut, hex, stl, zinc plated
263506	Washer, flat, stl, zinc plated, uss-style
263509	Washer, flat, stl, zinc plated, uss-style
263760	Tap screw, thd cut, pan hd, phil drv #2, stl, zinc plated

Door

502930	Bumper tube ”safety grip” roll formed, unpainted

Accessories

3030110	Fender kit (2), half-cercle, aluminum
3030117	Fender mounting kit, zinc plated
3030118	Fender kit (2), half-tandem, aluminum, 3-grooves
3031000	Tape adhesive, anti-skid, black
987172210-01	Fender kit (2), half-tandem, aluminum, 3-grooves
986170488-02*	Fender kit (2), half-tandem, aluminum, 4-ribs
986170488-03*	Fender kit (2), single axle, s.s.3-ribs

* Only applicable to tandem semi-tanker model

Sticker

3038034	Sticker notice!!, If the ABS indicator lamp.
3038052	Sticker rear guard caution
3038078	Sticker maintenance torque/inspection, Intraax
3038161	Sticker weight conversion table
3038330	Sticker notice!! Ride height (H)
3038587	Sticker When the parking brakes...
3038596	Sticker suspension load/psi, Intraax-AAL/AAT 30K
3038597*	Sticker suspension load/psi scale. Reyco 25 Aruu-6.5
3038625	Sticker Attention! This semi-tanker should not...
3038247	Sticker ABS logo, round
3038480	Sticker 90 psi

* Only applicable to tandem semi-tanker model

Pneumatic

233025	Gauge air pressure. Ctr/mt,s.s, lquid fill w/logo
73007	Valve leveling w/mt kit
73060	Linkage kit, adjustable, flat type, multi-hole
734912	Hcv mounting kit
2221042	Hose air brake, rigid, swivel D.O.T.
2221061	Hose air brake, rigid, swivel D.O.T.
2221072	Hose air brake, rigid, swivel D.O.T.
2221084	Hose air brake, rigid, swivel D.O.T.
2221096	Hose air brake, rigid, swivel D.O.T.
223050	Air tank 1425 in/cu, 1-hole, ¾ npt
223052	Air tank 1425 in/cu, 1-hole, ¾ npt
22307215	Air tank 3100 in/cu, 1-hole, ¾ npt, oppos.
2230726	Air tank 3100 in/cu, 3-hole, ¾ npt, oppos.
2231073	Gladhand service blue with filter
2231084	Gladhand emergency red with filter
223113	Fitting brass, sleeve, hex
2231143	Fitting brass, street tee, extruded
2231210	Hose separator, style-1, plastic, blk, dog bone
2231211	Hose separator, style-1, plastic blk
2231212	Hose separator, style-2, plastic, black loop
223126	Hose clip, hose/ABS line sensor, plastic, blk

Pneumatic

223216	Clamp tube rigid, open type, sgl hole, stl, zinc plated
223238	Grommet rubber black
223242	Grommet rubber black
223249	Hole plug plastic (pe), snap-in type-1, black
2232500	Snap bushing nylon black, universal diameter
223269	Air tank cushion solid neoprene, 2 hole black
223350	Control box. Stl, black hinge/L.H, 8-holes with bracket
223354	Control box, steel, black, hinge/L.H, 12 holes with bracket
223404	Fitting brass, insert sleeve
223452	Fitting brass nipple close
2234572	Fitting brass nipple close
2234595	Fitting steel nipple hexagonal, plated
2234645	Fitting steel nipple hexagonal, plated
223465	Fitting brass nipple long
223502	Fitting brass bushing
2235021	Fitting brass bushing
223504	Fitting brass bushing
223505	Fitting brass bushing
223552	Plastic tubing air brake, flexible black
2235528	Plastic tubing air brake, flexible blue
223553	Plastic tubing air brake, flexible black
2235535	Plastic tubing air brake, flexible red
223555	Plastic tubing air brake, flexible green
223560	Plastic tubing air brake, flexible red
223610	Valve drain, brass, back seating type
2236203	Valve pneumatic pilot 3-port/2 pos. return spring
2236204	Valve Alkon, push/pull knob detent, air piloted
2236205	Valve Alkon, solenoide, elect/manual. spring
2236228	Valve relay, service Sealco
2236230	Valve relay, service Sealco + support
223644	Valve press protection, on80/off70psi
223681	Valve quick purge
223688	Valve relay ratio N-V adjustable
2236991**	Valve control, brake cylinder
2236993*	Valve spring brake control

Pneumatic

223703	Fitting steel terminal, bolt, cd plated
223715	Fitting brass, street tee, extruded
223727	Fitting brass, 90 elbow, extruded
2237273	Fitting brass, 90d street elbow, extruded
2237404	Fitting brass, 90d elbow, extruded, c/w insert D.O.T.
2237412	Fitting brass, connector SAE J844d nylon tub
2237413	Fitting brass, connector SAE J844d nylon tub
2237414	Fitting brass, connector SAE J844d nylon tub
2237419	Fitting brass, street tee, extruded
2237545	Fitting brass, 90 elbow, extruded, c/w insert D.O.T.
223760	Fitting brass, plug, hex socket hd
2237624	Fitting brass, plug, hex head, cored
2237625	Fitting brass, plug, hex head, cored
223777	Fitting brass, connector, SAE-J844D nylon tub
2237773	Fitting brass, 90d elbow, extruded, c/w insert D.O.T.
2237821	Fitting steel, terminal bolt, cd plated
223785	Fitting brass, tee, extruded
223910	Fitting steel, muffler, zinc plated
2239419	Fitting brass, connector SAE J844d nylon tub
228005	Power cord for Reverse-a-matic
22801004	ABS wabco, ecu/valve/2s/1m standard
233011	Pressure regulator, in/out
233012	Mounting kit, support, regulator + nut std
23327	Switch pneumatic Tramec, accessories/ABS

* Only applicable to tandem semi-tanker model

** Not applicable to tandem semi-tanker model

11 Appendix

11.1 Bolt torque charts

11.1.1 Trailer suspension bolt torque

Note
The following bolt torque table are torque values for fasteners of Hendrickson trailer commercial vehicle systems. For other manufacturer components, contact the manufacturer for more specifications

Caution!

Do not apply anti-seize compound or additional lubricant to pivot connection hardware. This can lead to overtightened fasteners, unpredictable connection clamp loads and unreliable axle alignments.

Suspension component description	ft-lbs	Nm
ADB bolt-on dust shield hardware (for mounting to torque plate)	15±3	21±3
Air spring nut, lower	58±2	79±2
Air spring nut, upper ¾”	90±10	125±10
Air spring nut, upper ½”	45±5	61±6
Body rail clip bolt	100±10	135±12
Brake chamber mounting nut*	138±7*	187±9*
Hubcap mounting bolts	15±3	21±3
Lift mechanism air spring, actuator ¾”	50±5	70±4
Lift mechanism air spring, actuator 3/8”	18±2	25±2
Quick-align pivot connection	550±45	750±50
S-cam support bearing mounting nut	40±5	55±6
Shock bolts	225±10	300±10
Welded pivot connection 1 ⅛”	800±25	1085±30
Disc brake dust shield clamp ½” wide band	60±10	7±1
Disc brake dust shield clamp ⅝” wide band	90±10	10±1
Drum brake dust shield clamp	110±15	13±1
Height control valve mounting	70±10	8±1

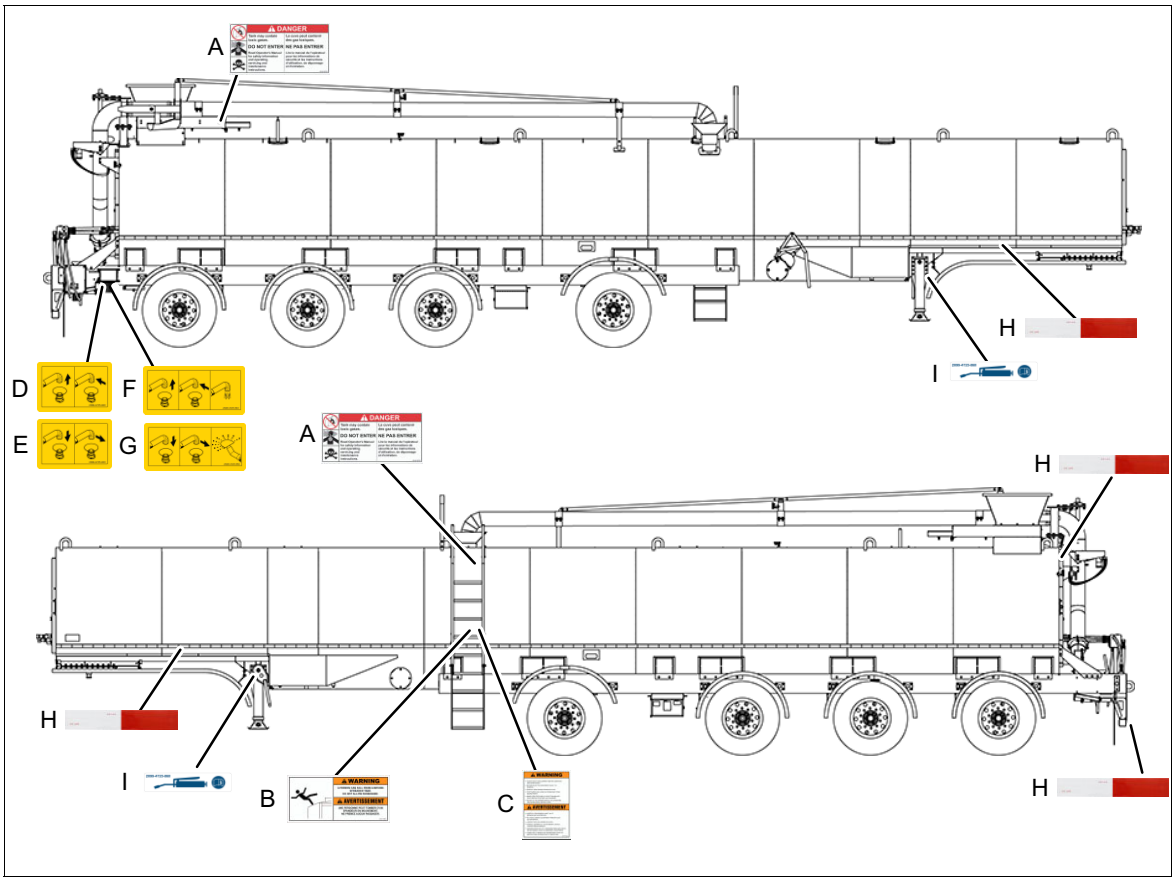
* Hendrickson recommended torque value. Contact component manufacturer for more specifications.

11.1.2 Bolt torque chart

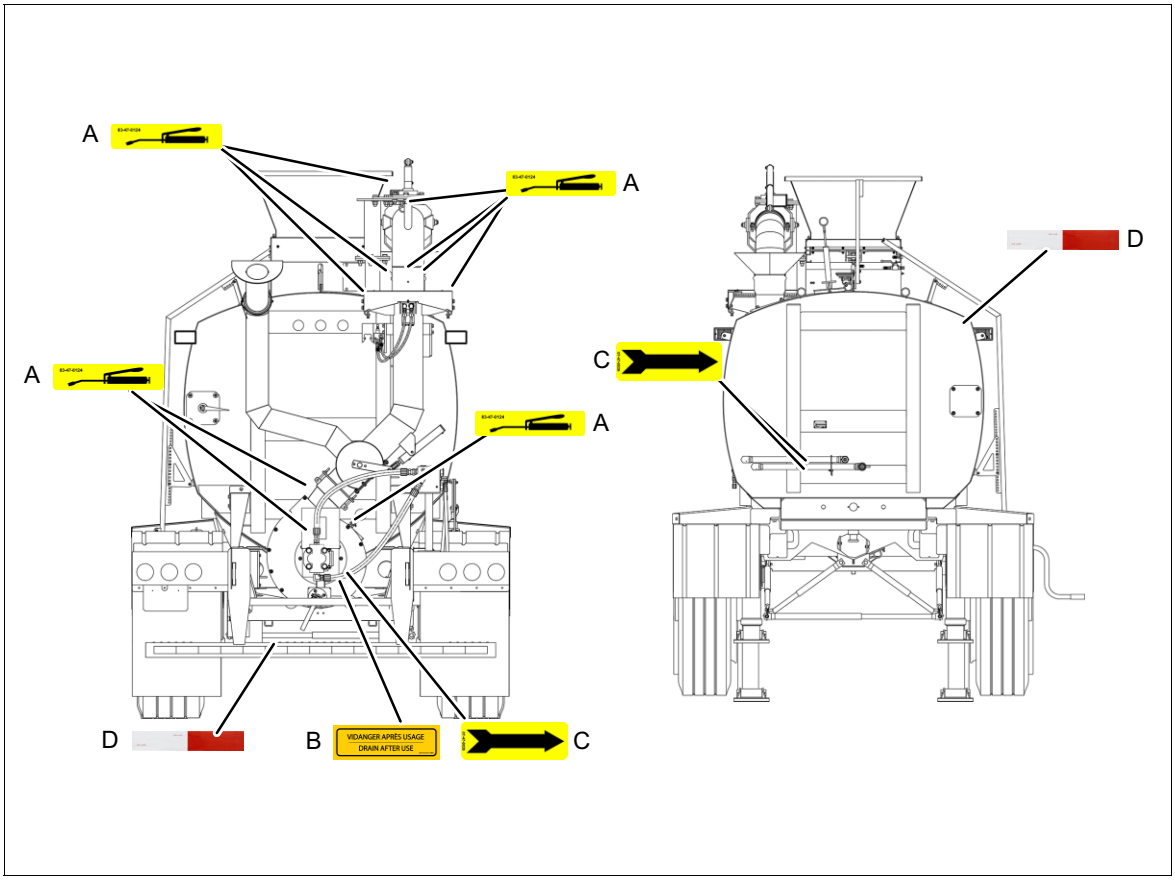
Note
Unless otherwise specified in this manual, follow the torque requirements in this table.

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

11.2 Safety labels and lubrication labels position on the reservoir



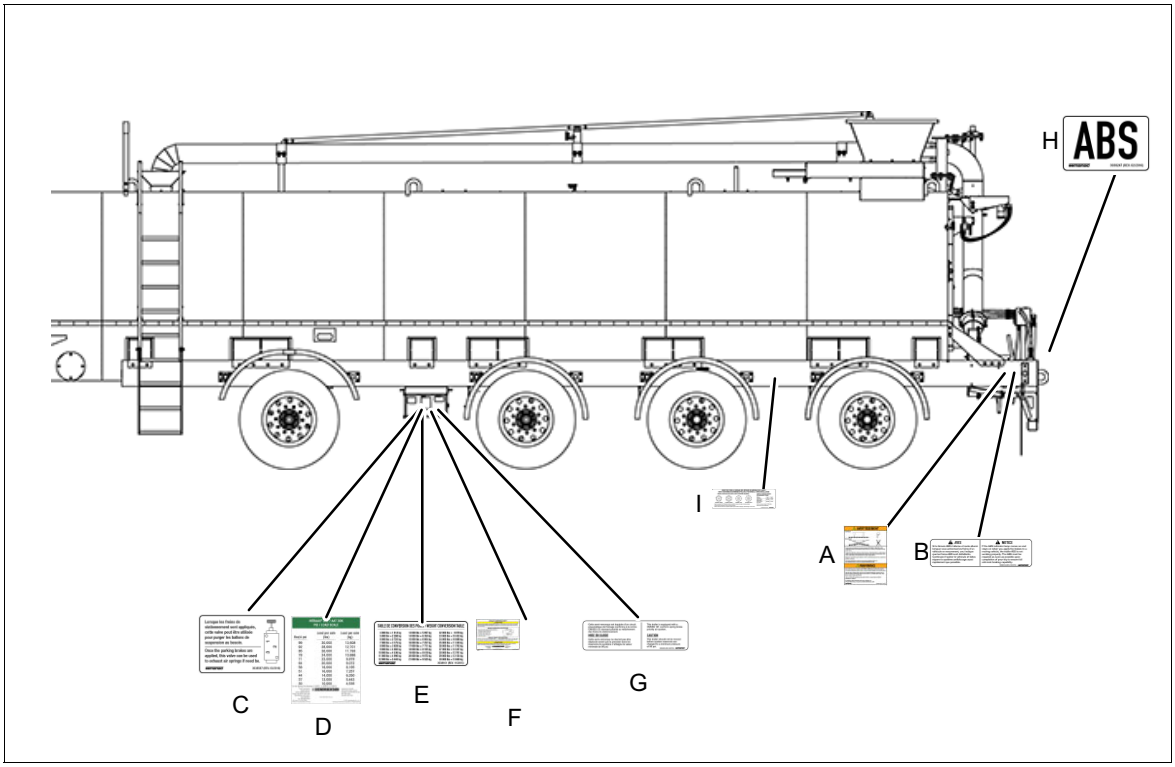
Item	Part-No.		Description	
A	2099-4720-100		Danger sign	Do not enter! Tank may contain toxic gases.
B	2099-4721-080		Warning sign	Do not allow passenger!
C	2099-4721-020		Warning sign	Always stop the equipment before servicing and maintenance.
D	2099-4725-820		Control sign	Articulated transfer pipe (up, left)
E	2099-4725-830		Control sign	Articulated transfer pipe (down, right)
F	2099-4725-840		Control sign	Articulated transfer pipe (up, left) Rotative valve (transfer mode)
G	2099-4725-850		Control sign	Articulated transfer pipe (down, right) Rotative valve (spreading mode)
H	2018-4703-840			Safety reflective tape (red/white)
I	2099-4725-860		Lubrication	Lubrication point (use specific lubricant mentioned in the manual)

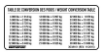


Item	Part-No.		Description	
A	2003-4701-240		Lubrication	Lubrication point
B	2010-4701-590	VIDANGER APRÈS USAGE DRAIN AFTER USE	Instruction	Drain after use
C	2007-4700-390			Flow direction
D	2018-4703-840			Safety reflective tape (red/white)

11.3 Safety labels and labels position on the undercarriage

Note
Contact a truck maintenance center to replace safety labels.



Item	Part-No.		Description	
A	3038052		Warning sign	Underride guard inspection *(Manac)*
B	3038034		Notice	Information about ABS indicator lamp *(Manac)*
C	3038587		Instruction	How to exhaust suspension air springs *(Manac)*
D	3038596			psi / load scale table *(Hendrickson)*
E	3038161			Weight conversion table *(Manac)*
F	3038078		Caution sign	Intraax suspension safety *(Hendrickson)*
G	3038625		Caution sign	This trailer should not be moved before system reservoirs are charged to a minimum pressure of 90 psi. *(Manac)*
H	3038247			Anti-lock Braking System *(Manac)*
I	3038480		Instruction	Nuts tightening recommended practice for wheels / rims installation *(Manac)*

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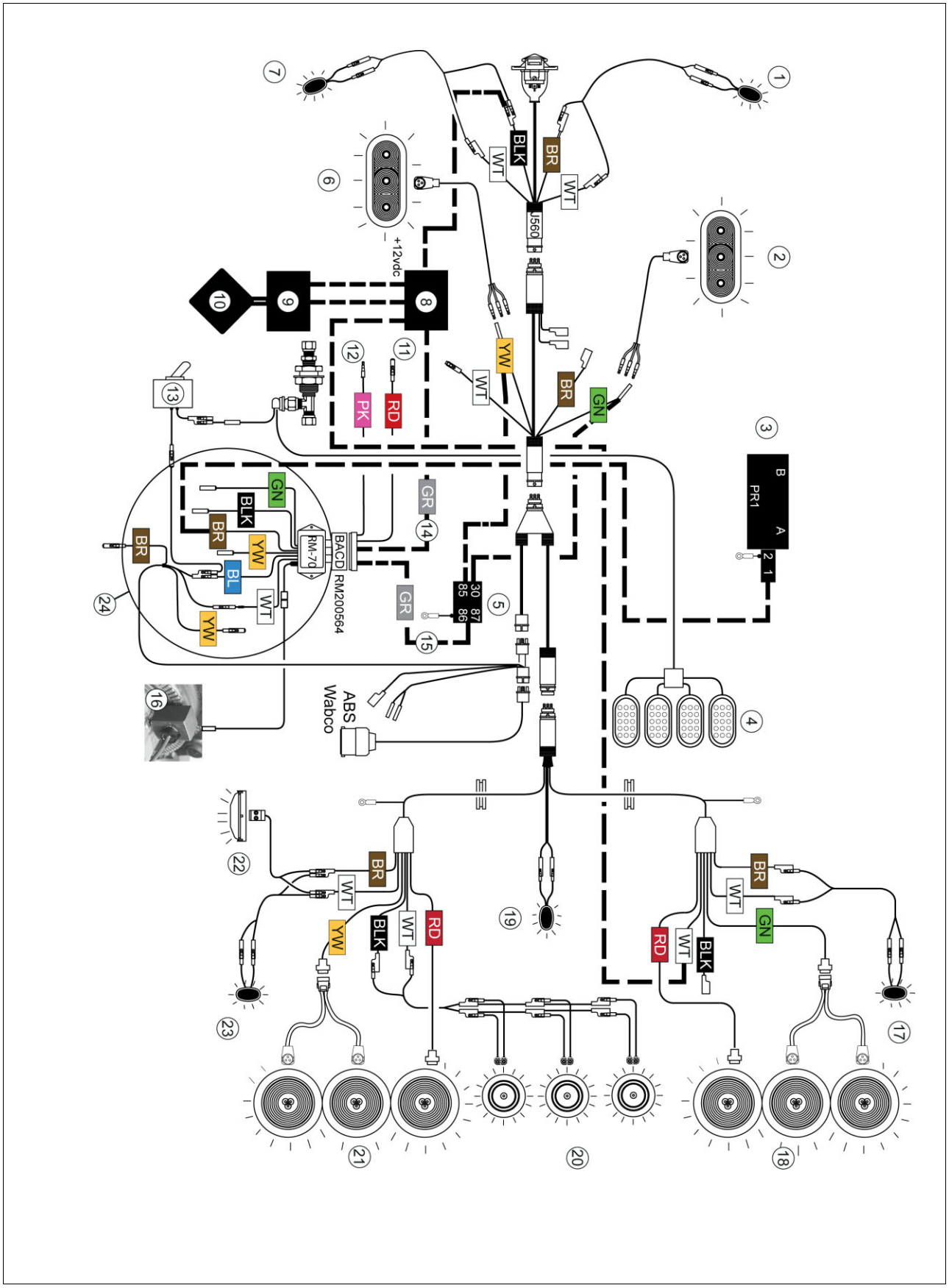
11.4 Electric wiring diagram



Components legend:					
1	Right front orange parking light	9	Pressure switch*	17	Right parking light
2	Right front orange indicator & hazard light	10	Parking brake*	18	Right parking & turn signal lights
3	Fill opening pneumatic valve*	11	Bulb check (Not connected)	19	ABS indicator light
4	Beam lights	12	Lift axle control	20	Identification lights
5	Relay*	13	Switch	21	Left parking & turn signal lights
6	Left front orange indicator & hazard light	14	Pressure switch input	22	LED licence plate light
7	Left front orange parking light	15	4-way flasher input	23	Left parking light
8	Control box*	16	Wheel sensor	24	RM-70

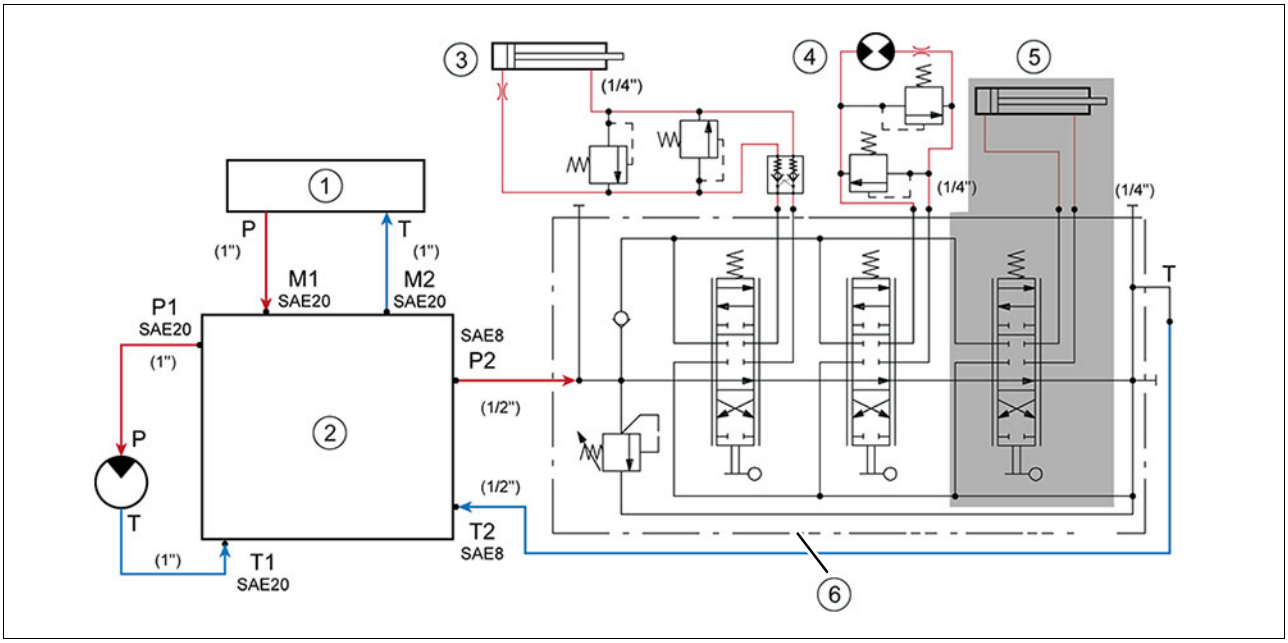
* For a tandem semi-tanker, part #5 is removed from the wiring diagram as well as the wiring (dotted line) connected to the part.

* For all semi-tanker models operating without a wireless remote control, parts #3-5-8-9-10 are removed from the wiring diagram as well as the wiring (dotted line) connected to each part.

RM-70 legend:			
BLK	Black - To free the steer-lock (auto-steer axle)	GN	Green - To lock the steer lock (auto-steer axle)
BL	Blue - Keyed power + 12V	YW	Yellow - Backup alarm
BR	Brown - Cylinder control	WT	White - Ground

Wiring legend:			
BLK	Black wire	YW	Yellow wire
BL	Blue wire	WT	White wire
BR	Brown wire	PK	Pink wire
GN	Green wire	RD	Red wire
GR	Grey wire		Dotted line

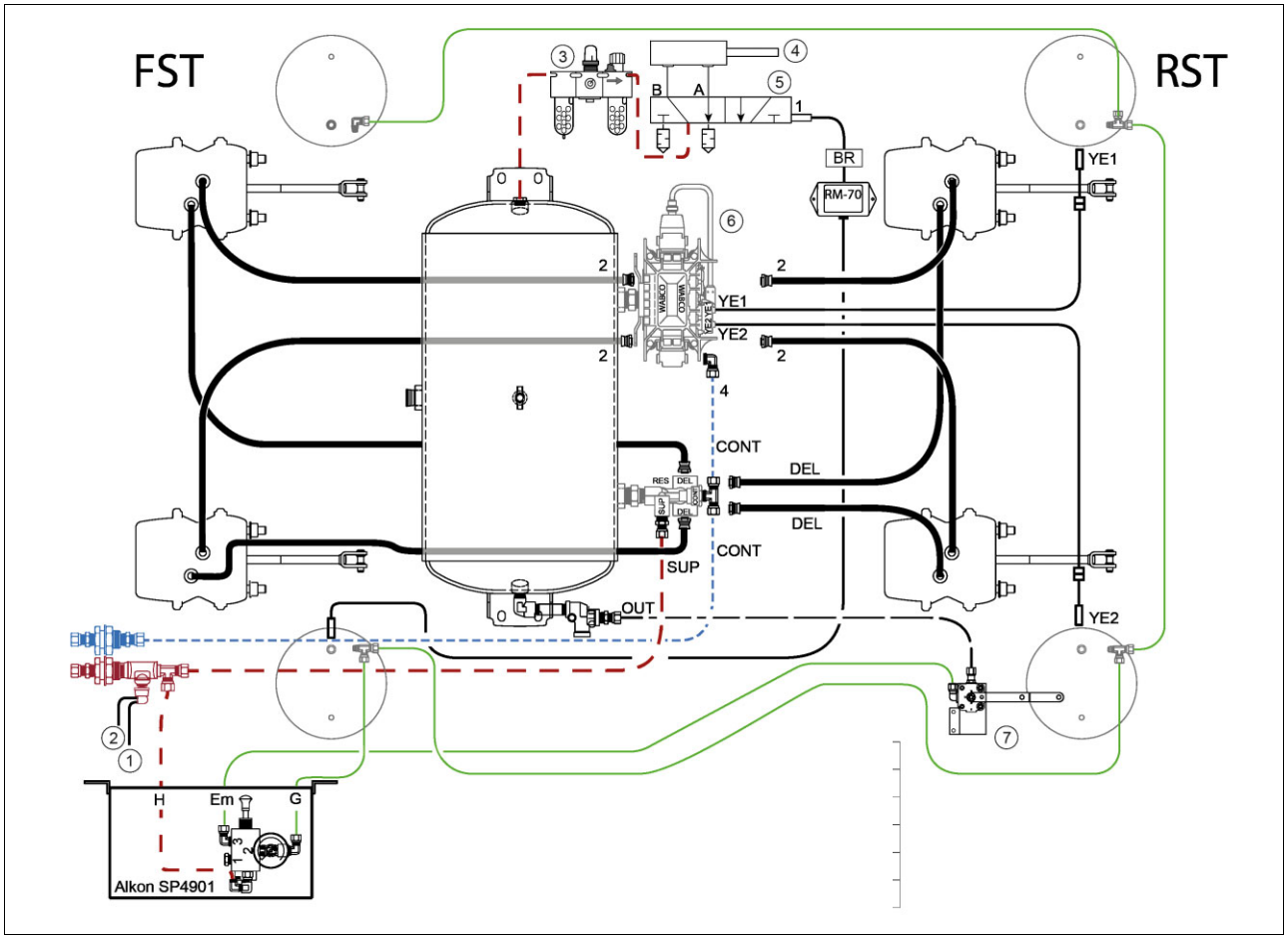
11.5 Hydraulic diagram



Legend:			
1	Truck wet kit (40 US GPM @ 3000psi)	4	Articulated transfer pipe hydraulic motor (Left and right rotation)
2	Hi-flow hydraulic block valve	5	Rotative valve cylinder (transfer or spread)
3	Articulated transfer pipe cylinder (up and down motion)	6	Hydraulic control valve SD5
	Hydraulic components in shaded area are added for semi-tanker equipped with a rotative valve.		

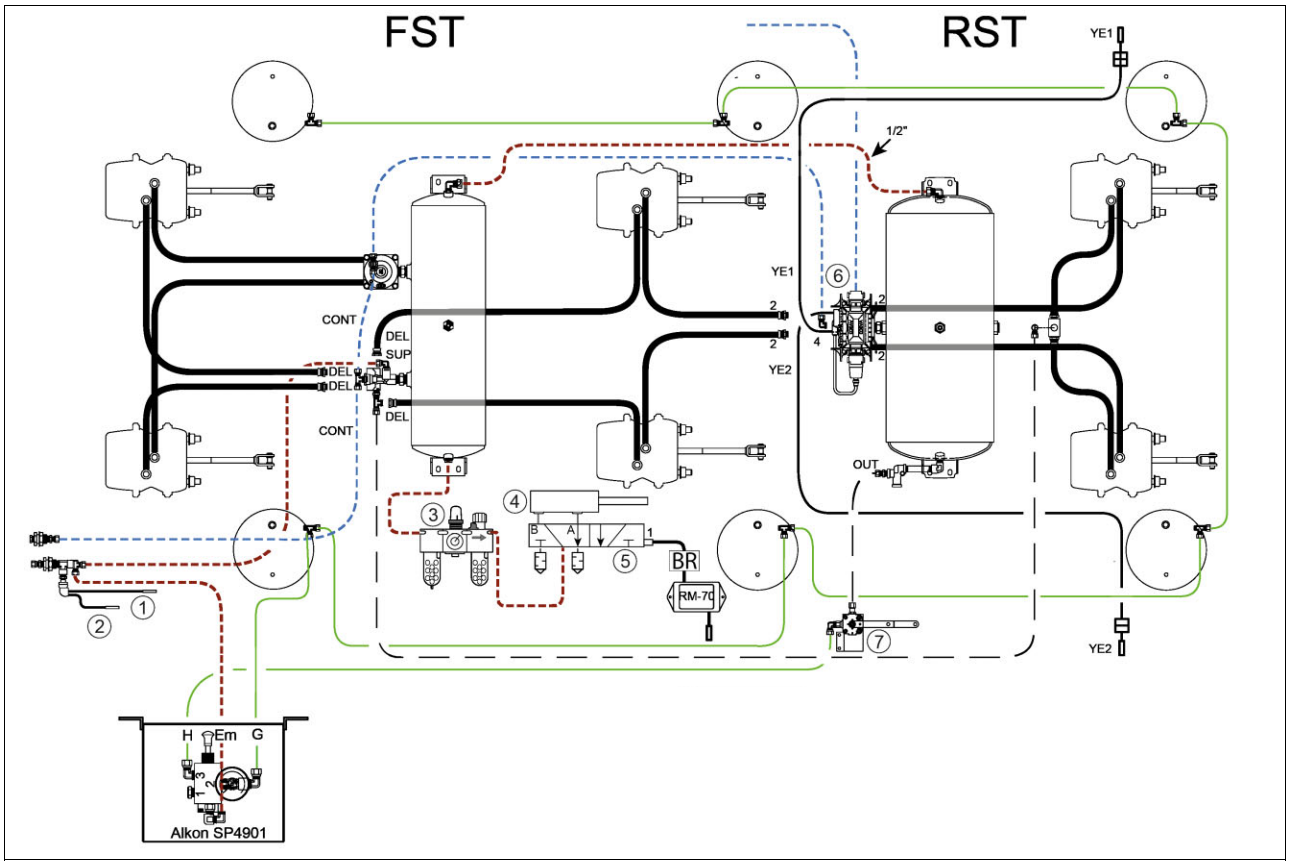
11.6 Pneumatic diagram

11.6.1 Tandem semi-tanker pneumatic diagram



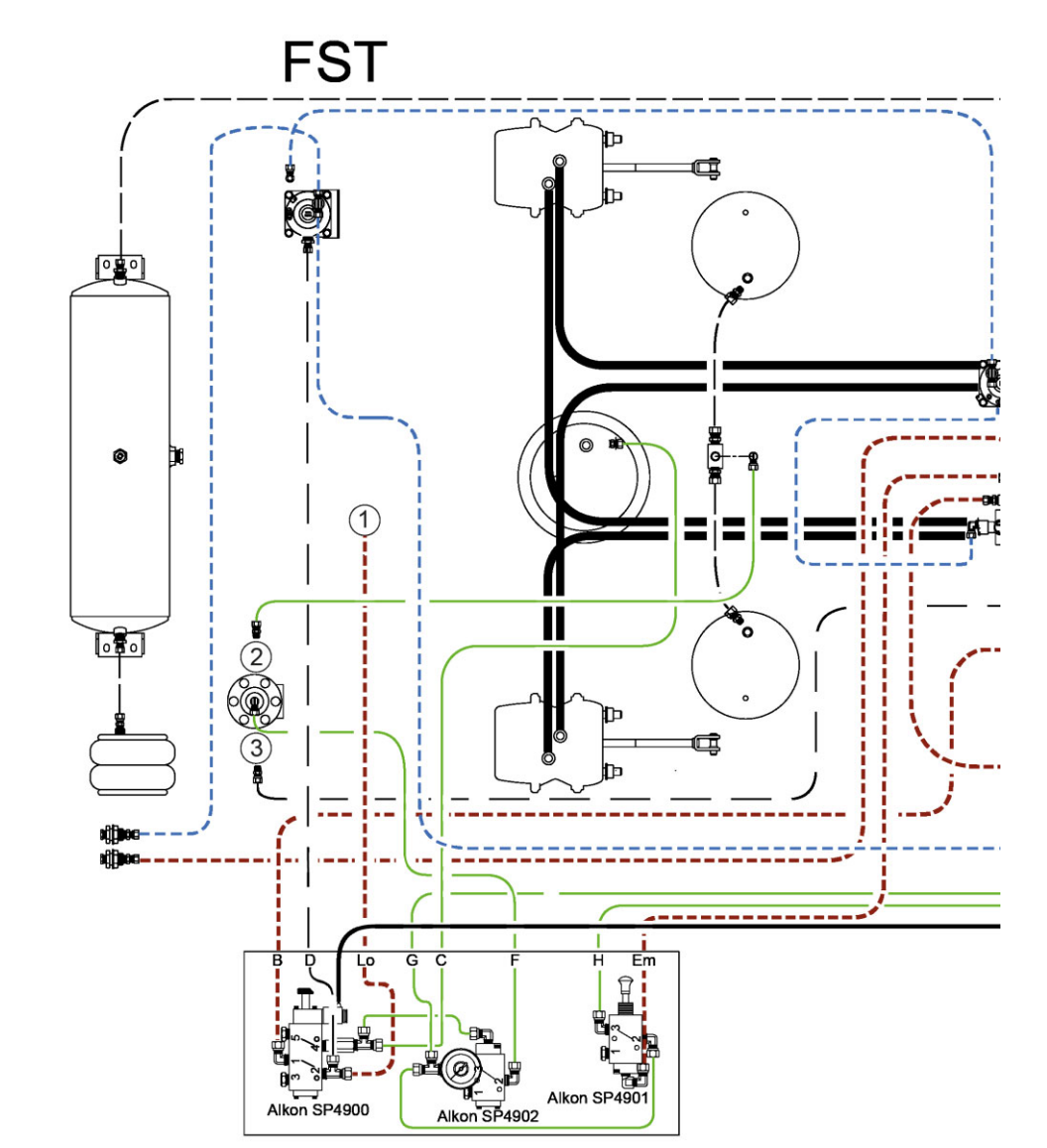
FST	Front semi-tanker		Service line
RST	Rear semi-tanker		Emergency line
1	Toggle switch		Suspension line
2	Beam lights		Brake line
3	FRL valve		Electric wire
4	Fill opening pneumatic cylinder		Other
5	Pneumatic valve	BR	Brown wire
6	Wabco valve		
7	Ride height valve		

11.6.2 Triple axle semi-tanker pneumatic diagram

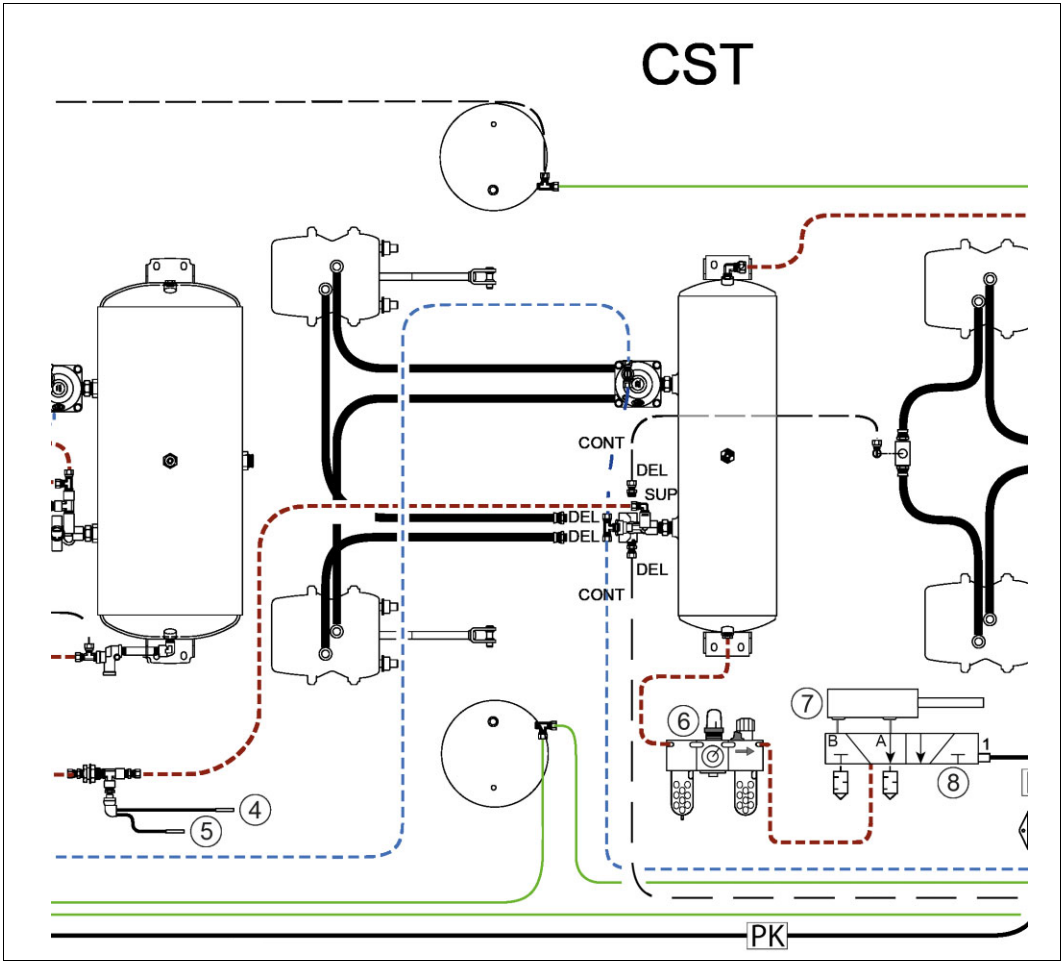


FST	Front semi-tanker	- - -	Service line
RST	Center semi-tanker	- - -	Emergency line
1	Beam lights	———	Suspension line
2	Toggle switch	▬▬	Brake line
3	FRL valve	▬▬	Electric wire
4	Fill opening pneumatic cylinder	———	Other
5	Pneumatic valve	BR	Brown wire
6	Wabco valve		
7	Ride height valve		

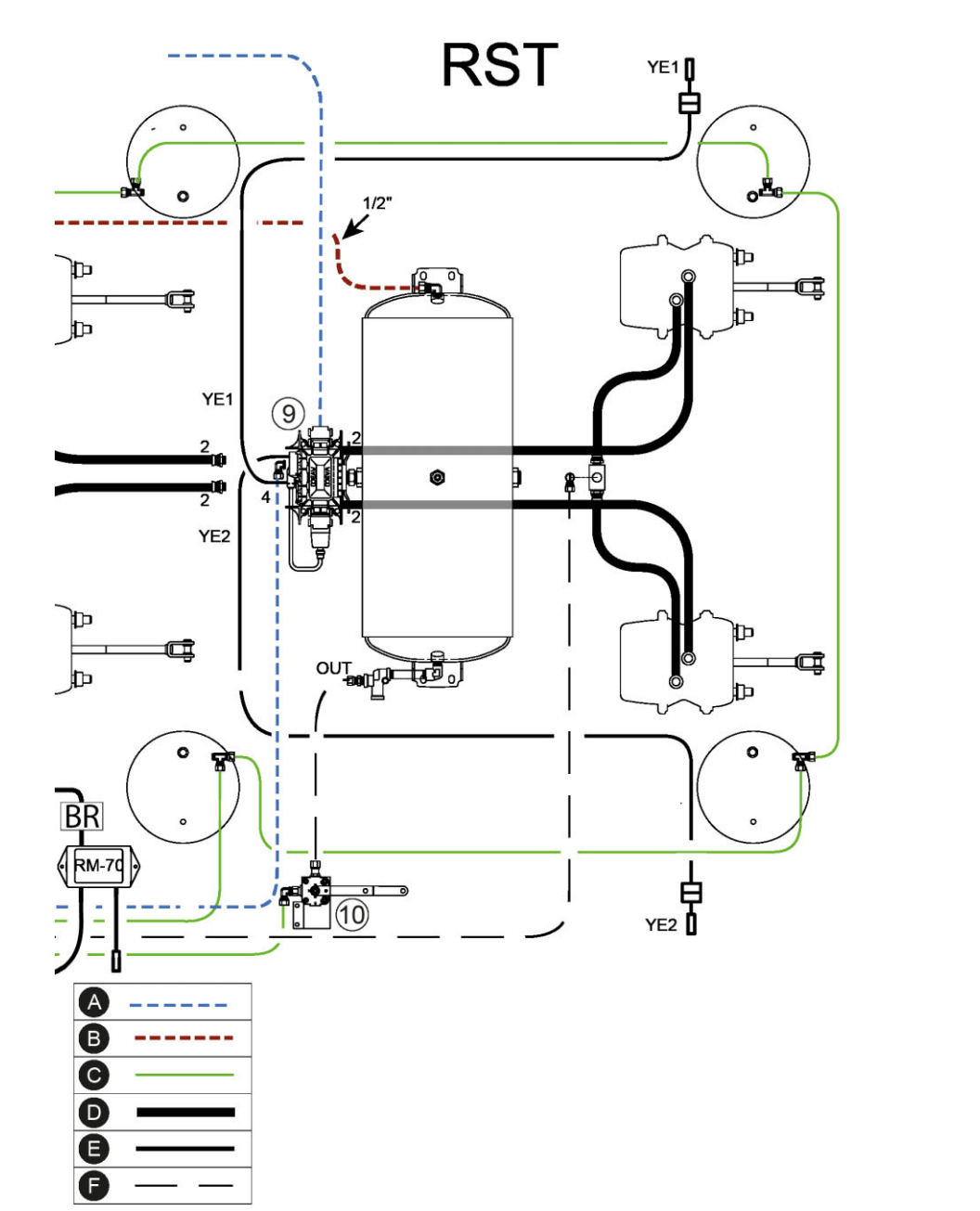
11.6.3 Triple axle with auto-steer axle semi-tanker pneumatic diagram



FST	Front semi-tanker		Service line
1	Locking cylinder		Emergency line
2	Service		Suspension line
3	Emergency		Brake line
			Electric wire
			Other



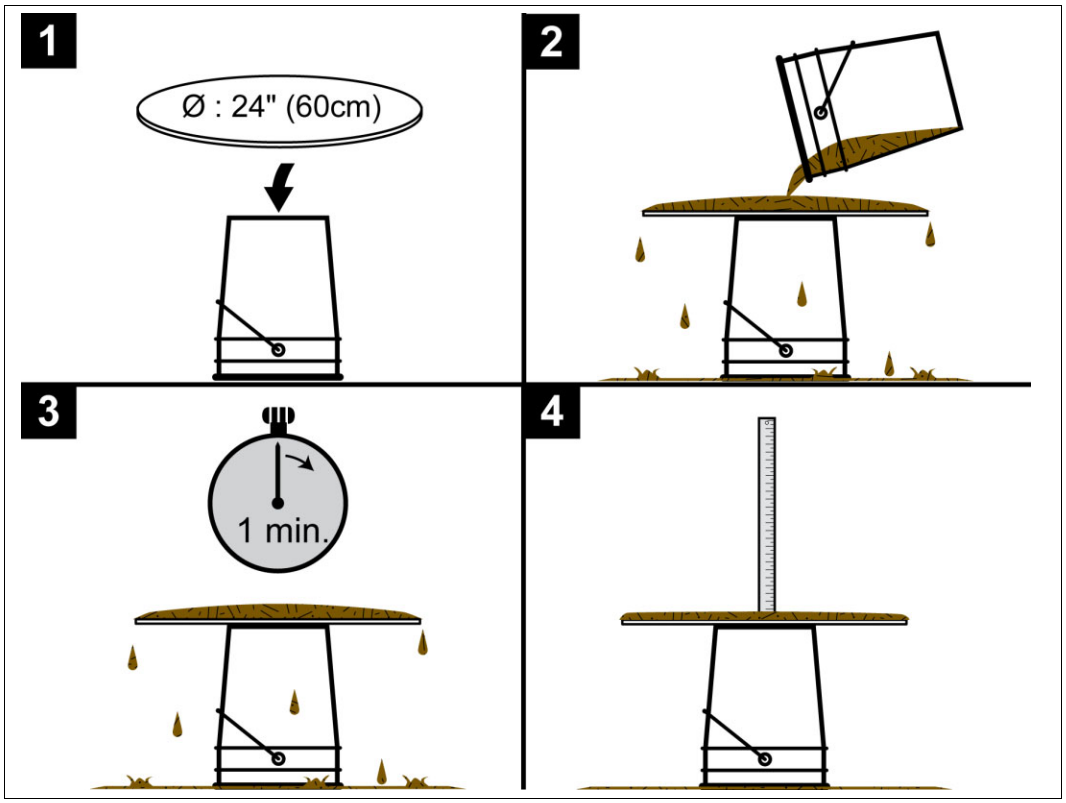
CST	Center semi-tanker		Service line
4	Beam lights		Emergency line
5	Toggle switch		Suspension line
6	FRL valve		Brake line
7	Fill opening pneumatic cylinder		Electric wire
8	Pneumatic valve		Other
PK	Pink wire		



RST	Rear semi-tanker		Service line
9	Wabco valve		Emergency line
10	Ride height valve		Suspension line
BR	Brown wire		Brake line
			Electric wire
			Other

11.7 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.

11.8 Directories

Abbreviations

Term	Explanation
@	at
Ø	Diameter
CW	clockwise
CCW	counterclockwise
fax	facsimile
I.D.	inside diameter
Inc.	Incorporated
O.D.	outside diameter
QC	Quebec
SAE	Society of Automotive Engineers
USA	United States of America
WWW	World Wide Web

Units

Unit	Explanation
°C	Degree Celsius/ Centigrade
°F	Degree Fahrenheit
s	Second
min	Minute
” (in)	Inch (= 25.4 mm)
mm	Millimeters
cm	Centimeters
m	Meters
g	Gram
kg	Kilogram
kPa	Kilo-pascal
ft	Foot
ft-lb	Foot-pound
NM	Newton meter
gal	Gallon
gpm	Gallons per minute
km/h	Kilometers per hour
mph	Miles per hour
HP	Horsepower
lb	Pound
Hz	Hertz
psi	Pounds per square inch
RPM	Revolutions per minute
kW	Kilowatts
A	Amp (current)
V	Volt (voltage)

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