

Suspended H-2000 Barn Cleaner Elevator

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

**2002-9015-002
10-2012**

Contents

1	Preface	4
1.1	Information on the instructions	4
1.2	Manufacturer's address	5
1.3	Customer services	5
1.4	Declaration of conformity	6
1.5	GEA Farm Technologies Canada Inc. / Division GEA Houle - General Equipment Warranty	7
1.6	Warranty Applicable to GEA Farm Technologies Canada Inc. / Division GEA Houle's Barn Cleaner Chains, including for 7/8" Chains, Hook & Eye Chains and Pintle Chains	11
2	Safety	15
2.1	Owner's Obligation of Care	15
2.2	Explanation of the Safety Symbols Used	16
2.3	Basic Safety Instructions	17
2.4	Personnel qualification	18
2.5	Safety devices	19
3	Description (Overview)	20
3.1	Product Applications	20
3.2	Modification Made to this Product	21
3.3	Main View	22
4	Technical Data	25
4.1	Geometric Data	25
4.2	Performance Data	27
4.3	Electrical Motor Specifications	28
4.4	Control Panel Specifications	29
4.5	Cable Clamp Assembly	29
4.6	Concrete Anchor Bolts Specifications	30
4.7	Bolt Torque Chart	30
4.8	Lubricant Specifications	31
5	Handling and Installation	32
5.1	Special Personnel Qualifications Required for Handling	32
5.2	Safety Instructions for Handling	32
5.3	Handling the Product and Accessories	33
5.4	Assembly Preparation	34
5.5	Concrete Work Preparation (Typical Overview and Dimensions)	35
5.6	Corner Assembly	42
5.7	H-2000 Assembly	45
5.8	Chain Sections Assembly	62
5.9	H-2000 Suspended Elevator Handling and Installation	67
5.10	Hold Down Shoe Assembly	72
5.11	Packing Material Disposal	74
6	Initial Commissioning	74
6.1	Special Personnel Qualifications Required for Initial Commissioning	74
6.2	Initial Commissioning Check List	75
6.3	H-2000 First Start	77
6.4	Checks After Initial Commissioning	79
6.5	Handing Over to the Owner	79

7	Operating	80
7.1	Safety Instructions for Operating	80
7.2	Checks Before Operating	80
7.3	Operating the H-2000 Suspended Elevator	80
8	Operating Faults	81
8.1	Special Personnel Qualifications Required for Troubleshooting	81
8.2	Safety Instructions for Troubleshooting	81
8.3	Troubleshooting Possible Faults	82
9	Maintenance	83
9.1	Special Personnel Qualifications Required for Maintenance Work	83
9.2	Safety Instructions for Maintenance	83
9.3	Schedule Maintenance Responsibilities	84
9.4	Lubricate the Corner Wheels	85
9.5	Lubricate the Drive Unit	85
9.6	Lubricate the Tensioner	86
9.7	Check the Drive Belts Tension	87
9.8	Check the Barn Chain Tension	88
9.9	Lubricate the Barn Cleaner Chain	89
9.10	Lubricate the Clutch	90
9.11	Clean the Equipment	90
10	Advanced Maintenance	91
10.1	Reversible Clutch Adjustment	91
10.2	Drive Unit Sprocket Adjustment	92
10.3	Paddle Cleaner Adjustment	93
10.4	Corner Adjustment	94
11	Decommissioning	95
11.1	Safety Instructions for Decommissioning	95
11.2	Final Decommissioning/Disposal	95
12	Appendix	96
12.1	Label Position	96
12.2	Abbreviations	97

1 Preface

1.1 Information on the instructions

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, even of extracts, require written authorization from the manufacturer.

The abbreviations, units, technical terms, special names or industry-specific terminology used in this manual are explained in more detail in the "Appendix".

These instructions are part of the supply.

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

Pictograms used



This pictogram indicates information that will help towards better understanding of a procedure or operation.



This pictogram indicates a special tool required for installation.



This pictogram refers to another document or another section of this manual.

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

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

1.2 Manufacturer's address

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

 +1 819 477 - 7444

 +1 819 477 - 5565

 geahoule@gea.com

 www.gea-farmtechnologies.com

1.3 Customer services

Authorized Technical Dealer

If necessary, please contact your nearest authorized technical dealer.

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

www.gea-farmtechnologies.com

European Contact Information:

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

 +49 (0) 2383 / 93-70

 +49 (0) 2383 / 93-80

 contact@gea.com

 www.gea-farmtechnologies.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-farmtechnologies.com

1.4 Declaration of conformity

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

Manufacturer:	GEA Farm Technologies Canada Inc. / Division GEA Houle 4591 boul. St-Joseph Drummondville, Qc, J2A 0C6
Product description:	Barn Cleaner Elevator
Type of product:	Suspended H-2000
The named product is in conformity with the requirements of the following European directives: 2006/42/EC Machinery Directive	
Conformity with the requirements of these directives is testified by complete adherence to the following standards:	
<ul style="list-style-type: none"> • Harmonized European standards EN 953-A1 Safety of machinery (2009-05) Guards EN 1037-A1 Safety of machinery (2008-06) Prevention of unexpected start-up EN 12100-1 Machine safety, basic terms, general design guidelines. (2009-10) Part 1: Basic terminology, methods EN 12100-2 Machine safety, basic terms, general design guidelines. (2009-10) Part 2: Technical guidelines and specifications EN ISO 13857 Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs (2008-06) EN ISO 14121-1 Safety of machinery - Risk assessment - Part 1: Principles (2007-12) EN ISO 14121-2 Safety of machinery - Risk assessment - Part 2: Practical guidance and examples of methods (2007-12) NF X 08-003-1 Graphic and pictographic symbols - colors and safety signs (2006-07) 	
Person responsible for compiling the relevant technical documents:	Josef Schröer GEA Farm Technologies GmbH Siemensstraße 25-27 D-59199 Bönen ✓ +49 (0) 2383 / 93-70
Drummondville, 01.October2012	 Yann Desrochers (Head of Research and Development)
The undersigned is acting by virtue of power of attorney from the management of: GEA Farm Technologies Canada Inc. / Division GEA Houle, 4591 boul. St-Joseph, Drummondville, Qc, J2A 0C6	
This declaration certifies compliance with the guidelines indicated, but does not establish any guarantee in the sense of paragraphs 443, 444 of the BGB. This declaration of conformity becomes invalid if design changes are made which affect the technical data given in the instructions and the correct use of the product, thereby significantly altering the machine!	

1.5 GEA Farm Technologies Canada Inc. / Division GEA Houle - General Equipment Warranty**IMPORTANT NOTICE!**

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

1.5.1 Limited Warranty

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

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

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

1.5.2 Condition of the Limited Warranty

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

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

1.5.3 Extent of Limited Warranty

This limited warranty DOES NOT cover:

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

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

1.5.4 Warranty Limitations and Exclusion

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

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

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

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

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

1.5.5 General Statements

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

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

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

1.6 Warranty Applicable to GEA Farm Technologies Canada Inc. / Division GEA Houle's Barn Cleaner Chains, including for 7/8" Chains, Hook & Eye Chains and Pintle Chains



IMPORTANT NOTICE!

THIS WARRANTY APPLIES TO BARN CLEANERS CHAINS SOLD UNDER THE GEA HOULE TRADEMARK.

1.6.1 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 barn cleaner chain sold under the Company trademark (the "Chain(s)") is free from defects in material or workmanship, for the warranty period stated under the table 1 below. Such warranty period is based upon the Chain type and length. More specifically, this warranty covers the following items:

- welding of the links (7/8" Chain);
- riveting of the links (Pintle Chain);
- welding of the paddles to the Chain;
- normal wear of the Chain joints;
- failure of the links due to poor steel quality.

This warranty does not cover the chains for free stall cleaner systems.

1.6.2 Applicable Warranty Period Depending on Length and Type of Chain

Chain Type	Length of Chains					
	Up to 200' [Up to 61m]	200' to 300' [61m to 91m]	300' to 400' [91m to 122m]	400' to 500' [122m to 152m]	500' to 600' [152m to 183m]	600' to 700' [183m to 213m]
7/8"	10 years	10 years	10 years	9 years	8 years	7 years
Hook & Eye	10 years	9 years	8 years	7 years	6 years	N/A
Pintle	10 years	9 years	8 years	7 years	6 years	N/A

Table 1



Note!

The applicable warranty period as stated above will begin from the date of delivery of the Chain to the Purchaser. To determine the warranty period of the lengthened Chain, the length of the extension must be added to the length of the original Chain. When lengthening the Chain, the warranty period is reduced to take into consideration the total length of the Chain after the extension is added. In addition, the starting date of the warranty period covering the original length of the Chain will prevail over the total length of the Chain after the extension is added.

1.6.3 Reduced Warranty if Use of Sand for Bedding

For all types of Chains, when sand is used for bedding, the warranty will be in effect for a period of twelve (12) months and the coverage will be reduced to defects in workmanship only. More particularly, the premature wear of the Chain that results from the use of sand for bedding will not be covered under this warranty.

1.6.4 Applicable Reimbursement Process for Chain Replacement

In the event that the Chain must be replaced due to defects covered under this warranty, the Company will reimburse the Purchaser an amount equal to ten percent (10 %) of the Chain price list (i.e. price in effect at the time the claim is submitted to the Company), multiplied by the number of full years remaining before the expiry of the warranty period.

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

This written warranty takes precedence over any other written warranty included in previous versions of the Company's manuals.

1.6.5 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 any Chain deemed defective under the following conditions:

1. That the Chain is installed, operated and maintained in accordance with the Company directives, and more specifically:
 - The installation has a maximum of three (3) regular corners, one (1) regular reverse corner and one (1) hold down post with or without pivoting elevator;
 - The Chain of the barn cleaner has completed a maximum of two (2) complete rotations per day;
 - The Chain is lubricated at least once a month or more often if necessary to ensure that the Chain joints are well lubricated at all times;
 - The sprocket, corner wheels and shoes of the hold down post are kept in good condition;
 - For the Pintle Chain, the drop forged links is reversed every fourth year.
2. That the Purchaser uses the Chain in accordance with specific instructions, under normal conditions, for the sole purpose for which the Chain was designed;
3. That the Purchaser notifies in writing his Dealer or the Company (whichever the case may be) of any defect of the Chain. The notification must be made before the expiry of the applicable warranty period;
4. The Purchaser or the Dealer must keep the defective Chain for inspection by the Company and return such defective Chain prepaid to the Company, if requested;
5. That the Purchaser does not modify the Chain, nor attempts to repair the Chain without proper authorization from the Company;
6. The Company will repair or replace the Chain free of charge at the business place of the Dealer or the Company, at its sole discretion.

1.6.6 Extent of Limited Warranty

This limited warranty DOES NOT cover:

- Defects caused by negligence of the Purchaser in the maintenance of the Chain, 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 Chain joints, or Chain paddles hit or deformed by any tool), as well as damages arising from non-conforming installation, or ambient temperature or conditions of storage of the Chain that do not comply with the Company's recommendations (including, without limitation, incorrect Chain tension, use of Chain under temperature conditions equal or below (5°C/41°F), as well as all damages resulting from faulty concrete work, overload of the barn cleaner, or installation where the manure exit hole in the barn wall measures less than 24" high));
- Damages to Chain due to normal wear and tear or to external causes, including abnormal mechanical or environmental conditions (including, without limitation, damages caused to the barn cleaner elevator by strong winds, fire, lightning, flood or other natural disaster), damages attributable to electrical systems (including, without limitation, damages caused by stray voltage), damages caused by the use of sand litter or other abrasive or inadequate material (including, without limitation, damages caused by the presence of solids in the alleys, such as stone, wood, iron, concrete, or strings), as well as damages caused by the blocking of the alleys or the barn cleaner by frozen manure or ice;
- Freight and shipping associated with repair or replacement of the Chain under this limited warranty, as well as all costs related to the removal or replacement of any installation that is welded or affixed permanently to the ground or a building (including, without limitation, labor costs or 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 Dealer harmless in respect of any liability or obligation incurred by the Company or the Dealer resulting from such failure of the Purchaser.

1.6.7 General Statements

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

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

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

2 Safety

2.1 Owner's Obligation of Care

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

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.

In particular, the owner must ensure that:

- everyone working in confined spaces read the SAFETY PROCEDURES IN CONFINED SPACES applicable in the country of operation. Refer to the websites listed in Section: Safety - Basic Safety Instructions;
- everyone working with or performing activities in connection with this product, including himself, read the instructions contained in this instruction manual and follow those instructions;
- everyone is regularly instructed on relevant matters.

The owner must ensure a safe environment by providing:

- this instruction manual with this product;
- a visible sign "DANGER! TOXIC GASES" posted at eye level at the entrance of each toxic gas area;
- adequate ventilation to evacuate toxic gases in each structure surrounding the main storage. Refer to the local rules and regulations on proper ventilation;
- a safety fence surrounding each manure storage, service pit and danger area. Refer to the local requirements;
- a padlock on each electric source feeding this product or its equipment to secure the product when performing maintenance. A caution label is set onto the electric panel "CAUTION! Lock before maintenance or adjustment work". A removable caution sign "Maintenance in progress" must be affixed on the panel when applicable;
- an equipotential bond for electric protection when this product or its equipment is powered by an electric source. All electric conductive parts and the installation's protective earth conductor must be connected to the equipotential bond;
- adequate lighting in all areas where activities in connection with this product are performed. A minimum of 200 lux is required to ensure visibility of the equipment, the controls and the safety labels;
- all required personal safety gear such as hearing, eye, feet protection, etc. in all areas where activities in connection with this product are performed;
- supervision for inexperienced personnel working or performing activities in connection with this product;

- the tools listed in this manual to perform activities in connection with this product;
- an adequate installation of the product in order to use it only for the sole purpose for which it was designed;
- new parts to replace defective, worn and damaged parts on this product;
- appropriate devices such as motor, engine, hydraulic unit, etc. to safely operate this product. To meet the technical requirements, refer to Section: Technical Data.
- a product meeting the local rules and regulations.

2.2 Explanation of the Safety Symbols Used

The safety symbols draw Attention to the importance of the adjacent text. They are based on ISO 3864-2 and ANSI535.6.

Safety symbols and key words



DANGER!

The indication "Danger" signals immediate danger to life or health of personnel.

Death or serious injury will result if the danger is not avoided.



Warning!

The indication "Warning" signals danger to life or health of personnel.

Death or serious injury may result if the danger is not avoided.



Caution!

The indication "Caution" signals dangerous situations.

Death or serious injury may result if the danger is not avoided.



Attention!

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

2.3 Basic Safety Instructions

2.3.1 Safety Procedures in Confined Spaces



DANGER!



Manure produces toxic gases that can lead to death in seconds. When agitated, the manure produces heavy toxic gases such as hydrogen sulphide (H₂S), carbon dioxide (CO₂), methane (CH₄) and ammonia (NH₃). It is **MANDATORY** to follow the Safety Procedures concerning Confined Spaces available in the websites listed below. These safety procedures explain the risks related to manure and how to safely access confined spaces.

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

2.3.2 Safety Instructions

- Read and follow the instructions of this instruction manual before performing activities in connection with this product. Keep the instruction manual with this product allowing anyone to refer to it at any time.
- 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.
- Always wear 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.
- Make sure the environment is safe through all steps listed in this manual. Always be familiar with the environment surrounding the working area. Locate the elements that can be dangerous in order to avoid them. Beware of leaks and spills such as grease, oil, water, etc. which can make a surface slippery causing injuries.
- 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 and for the sole purpose for which it was designed. Do not use damaged, worn or defective parts on this product, replace immediately to avoid serious damages and injuries.
- Use only the tools listed in this manual to perform activities in connection with this product in order to avoid injuries.

- Do not stand underneath suspended loads when handling this product or parts: there is a potential risk of fall, damage and/or loss of stability.
- 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 - Safety Devices. Read and follow the instructions of the safety labels set on this product and make sure the safety labels are legible.
- The devices supplied by the owner to operate this product such as a motor, an engine, a hydraulic unit, etc. must meet the technical requirements indicated in Section: Description - Technical Data.

2.4 Personnel qualification

The manufacturer intends to determine the difference between Trained Personnel and Qualified Personnel.

Trained Personnel

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

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

Qualified Personnel

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

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

An equivalence may be required when operating in other countries.

The special qualifications required in the following activities will be specified in each section when applicable:

- Handling and Installation
- Initial Commissioning
- Operating
- Operating Faults
- Maintenance
- Decommissioning

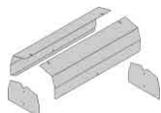
2.5 Safety devices

2.5.1 Protective Safety Parts

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

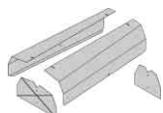
Those parts must be in perfect working condition and remain in place at all times.

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



Safety guard for H-86 drive unit

Hood (part no. 2003-7615-530)
End cover (part no. 2003-1402-480)



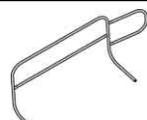
Safety guard for H-95 drive unit

Hood (right side) (part no. 2003-7612-120)
Hood (left side) (part no. 2003-7612-110)
End cover (small) (part no. 2003-1404-430)
End cover (large) (part no. 2003-1404-420)



Safety cable post

Post (part no. 2002-7707-880)



Handrail

Left side (part no. 2002-7724-420)
Right side (part no. 2002-7724-430)

2.5.2 Safety Labels

The labels affixed on this product inform the user on 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 be legible at all times.

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



Refer to Section: Appendix.

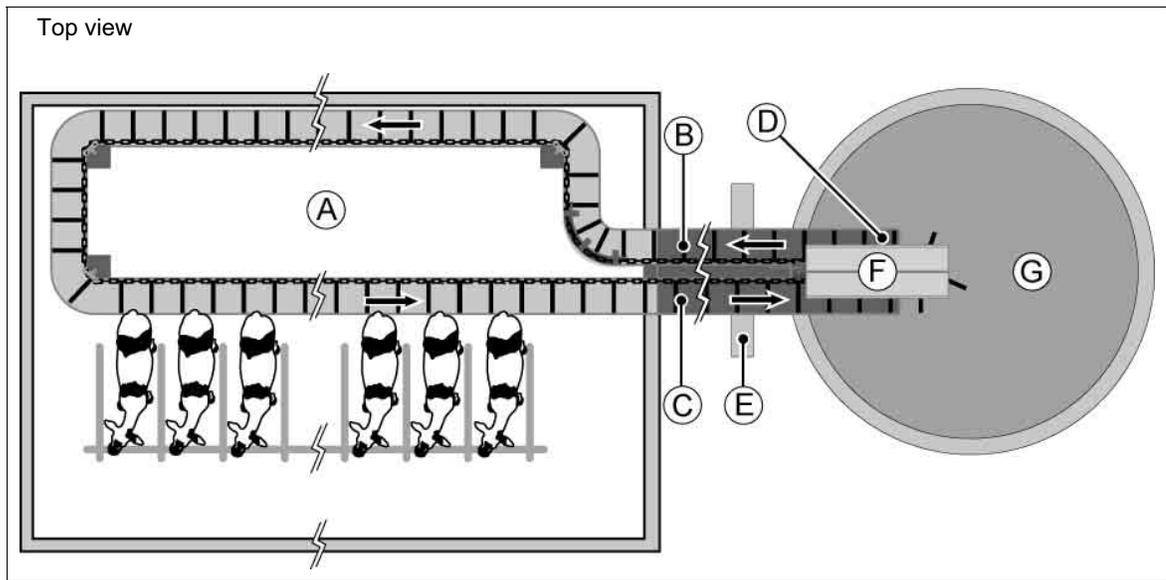
3 Description (Overview)

3.1 Product Applications

Functional Description

Running in a closed circuit, the paddles, driven by a chain, scrape the gutter to convey manure to the outside storage (G).

To do so, a drive unit (F), installed on top of the elevator (D), drives the chain and paddles to collect manure in the loaded gutter (C) to reach the top of elevator (D). Once the top is reached, manure drops in the outside storage (G), then paddles, which are free of manure, run back in the return gutter (B).



A	Barn	B	Return gutter
C	Loaded gutter	D	Barn elevator
E	Elevator concrete base	F	Drive unit
G	Manure storage		

This GEA Houle product and its equipment are designed for agricultural purposes only. Any applications not listed above are considered as improper use and will void the warranty!

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

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

3.2 Modification Made to this Product

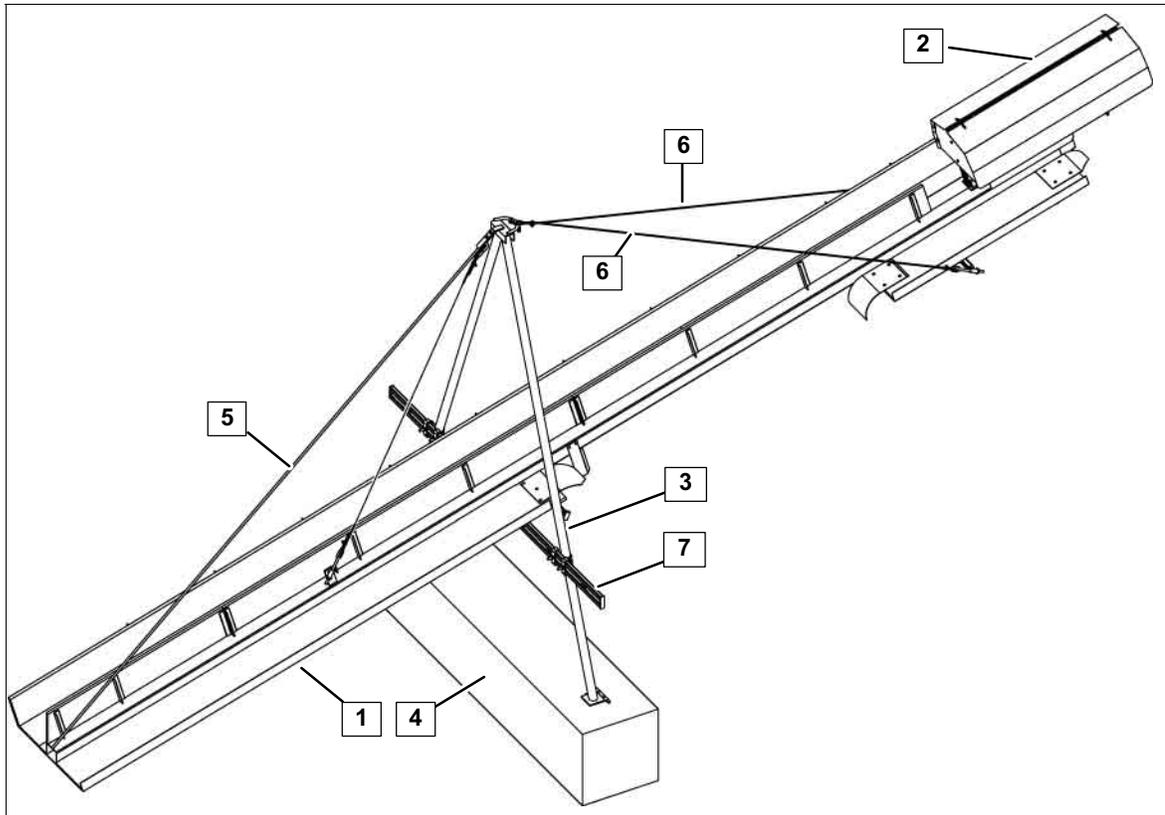
For safety reasons, do not carry out any unauthorized modifications to this product!

Any modification must be approved by the manufacturer in writing prior to the change otherwise the warranty will be voided.

3.3 Main View

3.3.1 H-2000 Suspended Elevator

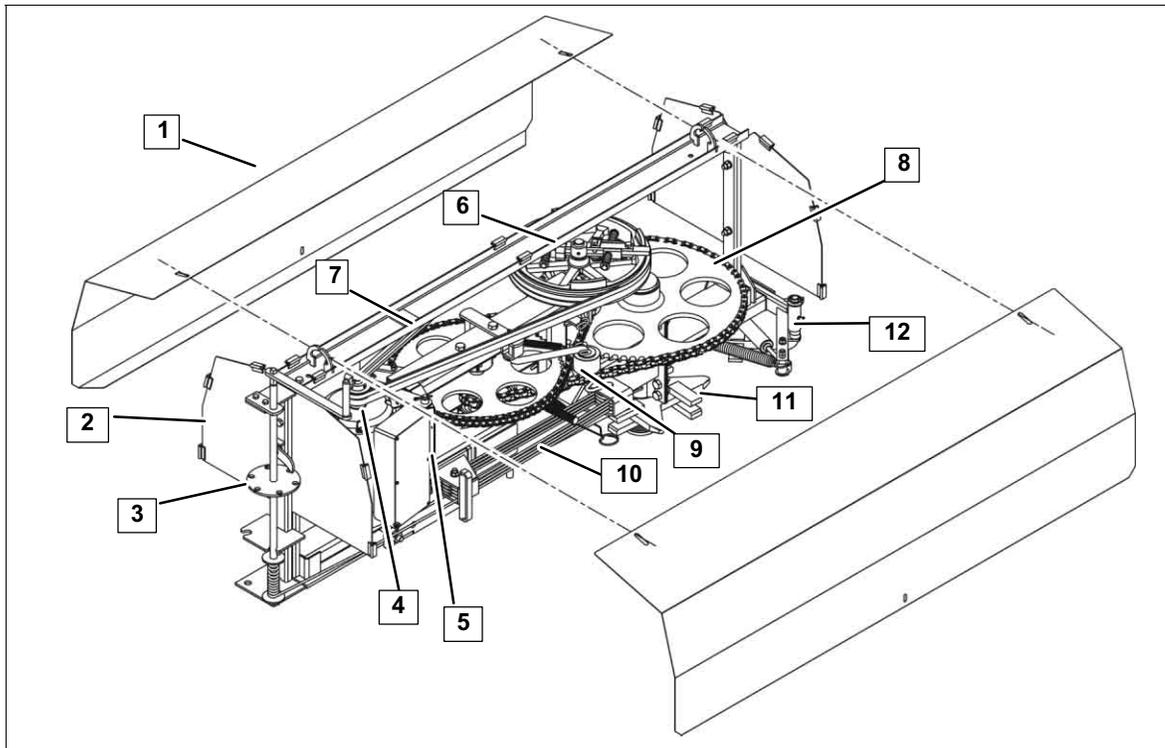
 **Note!**
Available in CW and CCW rotation.



CW rotation shown.

Legend:			
1	Elevator	2	Drive unit
3	"A" support	4	Concrete base
5	Traction rod	6	Steel Cable "A"
7	Cross member	8	Steel Cable "B" (only on 45' and 50' long elevator)

3.3.2 Drive Unit*

**Legend:**

1	Side guard	2	End cover
3	Quick tensioner**	4	Motor
5	Motor support	6	Reversible clutch
7	#60 chain	8	#80 chain
9	Chain tensioners	10	1/4" stainless steel cable
11	Sprocket	12	Paddle cleaner with chock absorber

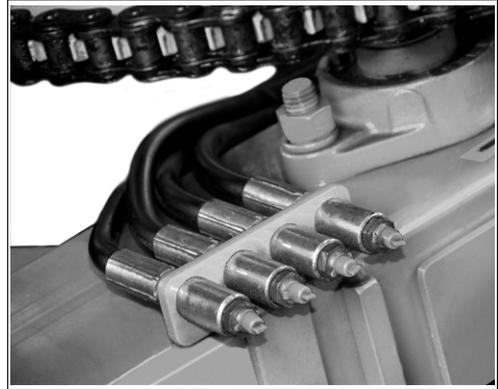
* H86 drive unit shown. H95 drive unit also available.

** Three types of tensioner are available: tensioner installed on drive unit (as illustrated), tensioner installed at the bottom of elevator and manual tensioner.

3.3.3 Options

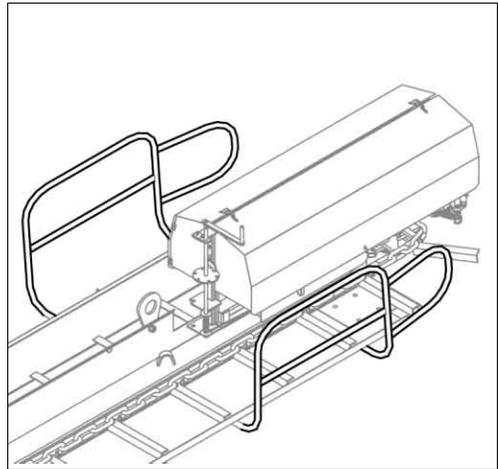
Remote Grease Line Kit

The remote grease line kit is used to ease lubrication of drive end parts.



Handrail

One or two handrails can be added.



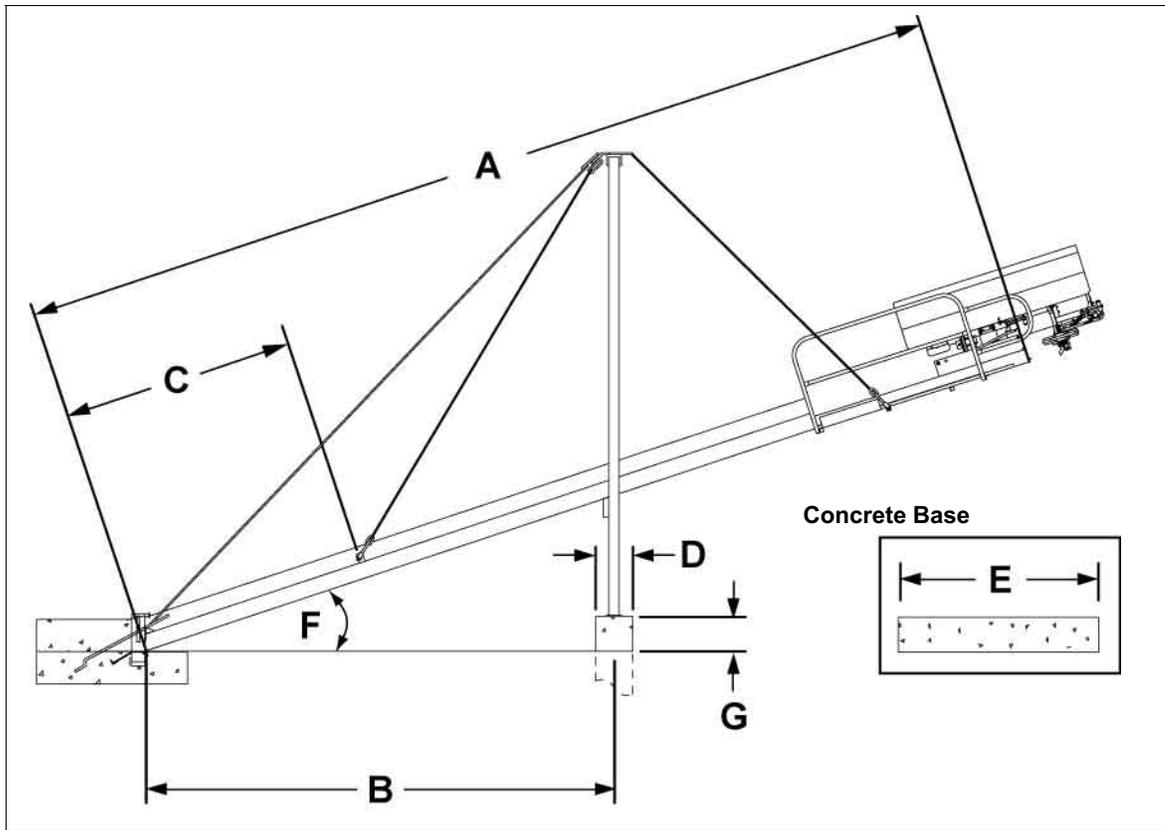
3.3.4 Models of chain with paddles

7/8" Chain	Pintle Chain	Hook & Eye Chain
		

4 Technical Data

4.1 Geometric Data

4.1.1 Elevator Dimensions



Elevator Dimensions (without Drive Unit)

Length (A)	Base Location (B) ¹	Turnbuckle Location (C)	Base Thickness (D) ²	Base Width (E) ²	Elevator Slope (F) ³	Base Height (G) ²	Weight
35' [10.67 m]	15' [4.57 m]	-----	30" [762 mm]	13' [3.96 m]	16°	30" [762 mm]	2130 lb [966 kg]
40' [12.19 m]	20' [6.10 m]	-----	30" [762 mm]	13' [3.96 m]	16°	30" [762 mm]	2434 lb [1104 kg]
45' [13.72 m]	22' [6.71 m]	12' [3.66 m]	30" [762 mm]	13' [3.96 m]	16°	30" [762 mm]	2738 lb [1242 kg]
50' [15.24 m]	25' [7.62 m]	12' [3.66 m]	30" [762 mm]	13' [3.96 m]	16°	30" [762 mm]	3042 lb [1380 kg]

1. Measurement from the front of the hold down post to the center of the concrete base.
2. Provide a footing according to the land topography while respecting referenced measurement from the bottom of gutter.

Consider the measurement given to install the elevator at the appropriate slope. Note that this measurement does not include footing under the concrete base.

Consider the topography in order to design a footing under the concrete base.

3. 16° slope = 1:3.4 ratio = 3.5 pitch.

4.1.2 Drive Unit Dimensions



Dimensions	Drive Unit Model	
	H-86	H-95
Length	79" (2 m)	79" (2 m)
Width	26.5" (67.3cm)	35" (89 cm)
Height	38" (96.5 cm)	38" (96,5 cm)
Weight	573 lbs [260 kg]	606 lbs [275 kg]

4.2 Performance Data

4.2.1 H-86 Drive Unit Model

Motor*	Pulley Diameter (motor side)	Chain Type	Barn chain maximum length	Speed
50 Hz 1450 RPM	3,8" [97 mm]	7/8" Chain	500 ft (152m)	20,34 ft/min [6,2 m/min]
		Pintle Chain		19,2 ft/min [5,85 m/min]
		Hook & Eye Chain Sprocket 4 teeth		16,78 ft/min [5,12 m/min]
		Hook & Eye Chain Sprocket 5 teeth		15,38 ft/min [4,69 m/min]
60 Hz 1760 RPM	3" [76 mm]	7/8" Chain		18,79 ft/min [5,73 m/min]
		Pintle Chain		17,73 ft/min [5,41 m/min]
		Hook & Eye Chain Sprocket 4 teeth		15,5 ft/min [4,73 m/min]
		Hook & Eye Chain Sprocket 5 teeth		14,21 ft/min [4,33 m/min]

4.2.2 H-95 Drive Unit Model

Motor*	Pulley Diameter (motor side)	Chain Type	Barn chain maximum length	Speed
50 Hz 1450 RPM	4,5" [114 mm]	7/8" Chain	700 ft (213m)	20,92 ft/min [6,38 m/min]
		Pintle Chain		19,75 ft/min [6,02 m/min]
		Hook & Eye Chain Sprocket 4 teeth		17,26 ft/min [5,26 m/min]
		Hook & Eye Chain Sprocket 5 teeth		15,82 ft/min [4,82 m/min]
60 Hz 1760 RPM	3,8" [97 mm]	7/8" Chain		19,48 ft/min [5,94 m/min]
		Pintle Chain		18,39 ft/min [5,61 m/min]
		Hook & Eye Chain Sprocket 4 teeth		16,08 ft/min [4,9 m/min]
		Hook & Eye Chain Sprocket 5 teeth		14,74 ft/min [4,49 m/min]

* The motor size is determined by the total length of barn cleaner chain required.
Refer to table below:

Motor	Barn Cleaner Chain Length				
	0 - 200 ft	201 - 275 ft	276 - 375 ft	376 - 600 ft	601 - 700 ft
60 Hz	1.5 HP	2 HP	3 HP	5 HP	7.5 HP
50 Hz	1.1 kW	1.5 kW	2.2 kW	4 kW	5.5 kW

Operating Temperature	41°F [5°C] minimum
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4.2.3 Acoustic Emission

Noise Level	62 dBA
-------------	--------

4.3 Electrical Motor Specifications

Electrical Data	
Rated Motor Voltage	As per local requirements
Frequency	50 Hz or 60 Hz as per local requirements
Rated Motor Power	1.5 HP to 7.5 HP [1.1 KW to 5.5 KW]
Rated Motor Speed	50 Hz @ 1450 rpm 60 Hz @ 1760 rpm
Rated Motor Torque	No special requirements
Rated Motor Current	No special requirements
Efficiency	Min. 80%
Power Factor	No special requirements

General Data		
Standard Specifications	NEMA	IEC
Frame Sizes Required*	145T, 182T, 184T, 213T	90, 100, 112, 132
Type of Construction	B3	
Weight	No special requirements	
Frame Material	No special requirements	
Degree of Protection	IP 55	
Method of Cooling	TEFC, IC 411 (Totally Enclosed, Fan Cooled)	
Vibration Class	No special requirements	
Insulation	155(F) to 130(B)	
Duty Type	S1(continuous operation)	
Direction or Rotation	Depending on elevator installation	

* Motor frame sizes allowed to be fit on the motor support.

4.4 Control Panel Specifications



Refer to the instruction manual provided with the control panel for further information.

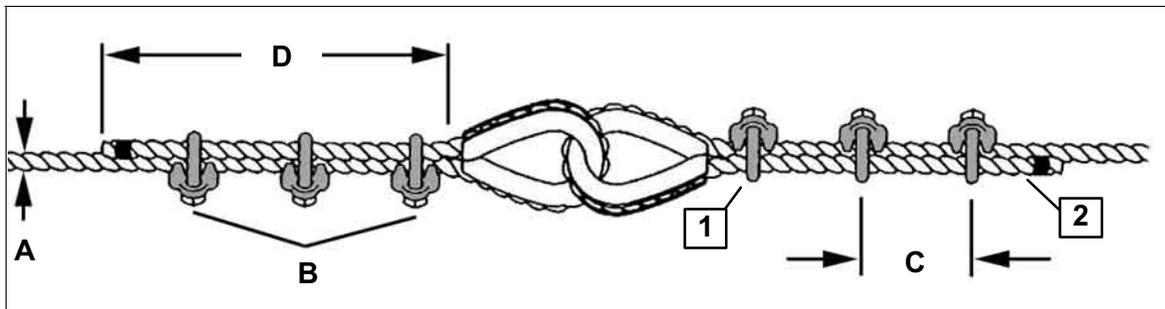
The control panel must:

- comply with the following requirements:
2006/95/CE directives (Electrical equipment designed for use within certain voltage limits)
92/31/CEE directives (Electromagnetic compatibility);
- comply with the following harmonized standards:
EN 60204-1 (Safety of machinery - Electrical equipment of machines);
EN 61082-1 (Documents used in electrotechnology);
EN 60617 (Graphical symbols);
- be equipped with an emergency stop;
- be protected by a lockable disconnect switch (cut-off switch);
- meet all motor specifications provided in this manual;
- meet local electrical requirements;

Special specifications:

- The control panel protection devices must be designed to avoid any unexpected start.

4.5 Cable Clamp Assembly



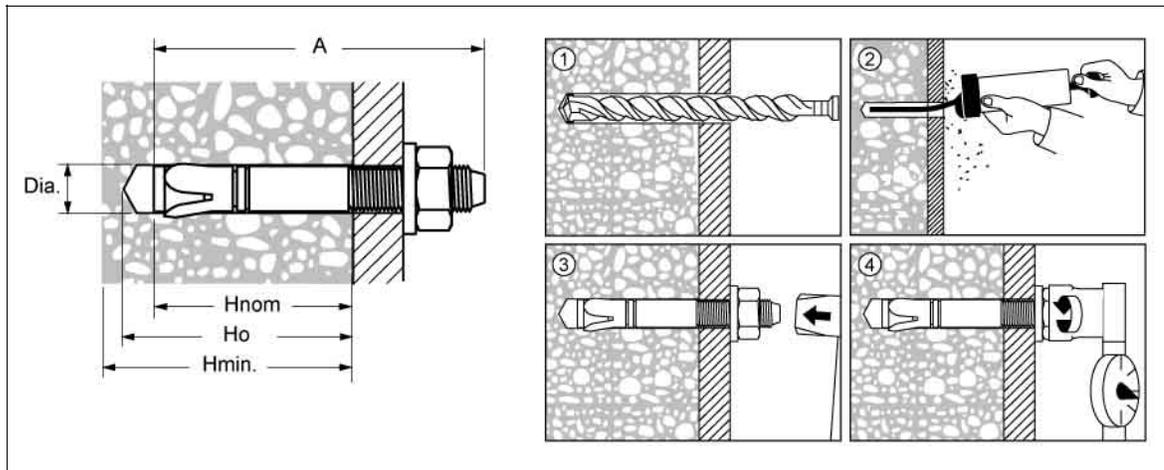
Cable Diameter (A)	Clamp size	Quantity of clamp required (B)	Spacing Between Clamps (C)	Dead End Length (D)	Torque
3/16"	3/16"	2	1.125" [29mm]	3.75" [95mm]	7.5 ft-lb [10Nm]
1/4"	1/4"	2	1.5" [38mm]	4.75" [121mm]	15 ft-lb [20.3Nm]
3/8"	3/8"	2	2.25" [57mm]	6.5" [165mm]	45 ft-lb [61Nm]
1/2"	1/2"	3	3" [76mm]	11.5" [292mm]	65 ft-lb [88Nm]



Note!

U-bolt (1) of clamps must always be positioned over the dead end segment (2).

4.6 Concrete Anchor Bolts Specifications



Bolt Diameter	3/8" [10mm]	1/2" [13mm]			3/4" [19mm]
Bolt Length (A)	3" [76mm]	2 3/4" [70mm]	3 3/4" [95mm]	3 3/4" [95mm]	5 1/2" [140mm]
Material	Steel	Steel	Steel	SS 304	Steel
Minimum Hole Depth (Ho)	Hnom + 1/4" [6mm]	Hnom + 1/4" [6mm]	Hnom + 3/8" [10mm]	Hnom + 1/4" [6mm]	Hnom + 1/4" [6mm]
Hnom	2 3/8" [60mm]	1 3/4" [45mm]	2 1/4" [57mm]	2 1/4" [57mm]	4 1/4" [108mm]
Hmin	4" [101mm]	4" [101mm]	4" [101mm]	4" [101mm]	6" [152mm]
Concrete Drill Bit Diameter	3/8" [10mm]	1/2" [13mm]	1/2" [13mm]	1/2" [13mm]	3/4" [19mm]
Torque	25Nm (20ft-lb)	54Nm (40ft-lb)	54Nm (40ft-lb)	54Nm (40ft-lb)	150Nm (110ft-lb)

4.7 Bolt Torque Chart



Note!

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

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

4.8 Lubricant Specifications

Lubricant Type	Brands / Specifications	Purpose
Biodegradable Oil	Use this brand (or equivalent): <ul style="list-style-type: none">• PPG Chemfil Chemlube Agri-eco 1000	<ul style="list-style-type: none">• Lubricate barn cleaner chain.
All-Purpose Grease	Use this brand (or equivalent): <ul style="list-style-type: none">• EP2 mineral grease	<ul style="list-style-type: none">• Lubricate the equipment.

5 Handling and Installation

5.1 Special Personnel Qualifications Required for Handling

Handling must be performed by a qualified forklift operator.

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

Electric work and electric maintenance must be performed by a qualified electrician.

Welding work must be performed by a qualified welder.



Read the Section: Safety - Personnel qualification.

5.2 Safety Instructions for Handling



Warning!

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



CAUTION!

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



Attention!

Beware when lifting this product. The product will be unbalanced.



Attention!

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



Attention!

Beware of potential fire hazards such as those caused by welding, cutting, grinding, etc.



Attention!

Do not install damaged and/or defective parts.



Also read the Section: Safety.

5.3 Handling the Product and Accessories

5.3.1 Special Tools

	Description	Purpose
	Boom truck	To move the elevator. To lift the drive unit.
	Chain	To lift the drive unit.
	Forklift truck	To lift and move accessories.
	Hammer drill	To make holes in the concrete floor.
	Concrete drill bit	To make holes in the concrete floor.
	Hammer	To insert anchor bolts.
	Wrench set	To tighten bolts and anchor bolts.
	Ratchet tool set	To tighten bolts and anchor bolts.

	Allen wrenches	To tighten set screws on pulleys.
	Torque wrench	To tighten bolts and anchor bolts at the specified torque.

5.4 Assembly Preparation

5.4.1 Necessary Documents

- Foundation plan
- Electrical wiring diagrams

5.4.2 Items Provided by the Owner

- An electric motor meeting technical specifications as provided in this manual.
Refer to the Section: Technical Data - Electrical Motor Specifications.
- A control panel meeting local regulations and motor specifications.
Refer to the Section: Technical Data - Control Panel Specifications.
This apply only when this item is not supplied by the manufacturer.

5.5 Concrete Work Preparation (Typical Overview and Dimensions)

The concrete work must be performed by qualified personnel. All concrete forms must be prepared to fit the elevator components.



Attention!

To ease installation and ensure system functionality, all parts poured into concrete must be levelled perfectly.



Note!

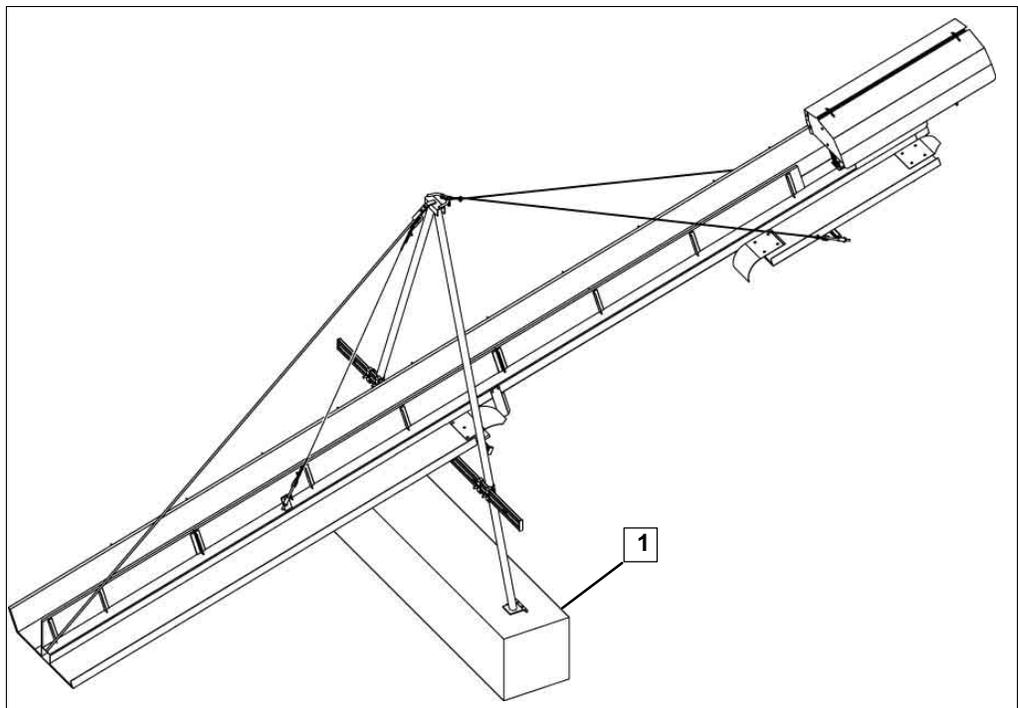
Make sure the bottom of the gutter is levelled to ensure that the paddles move freely.



Note!

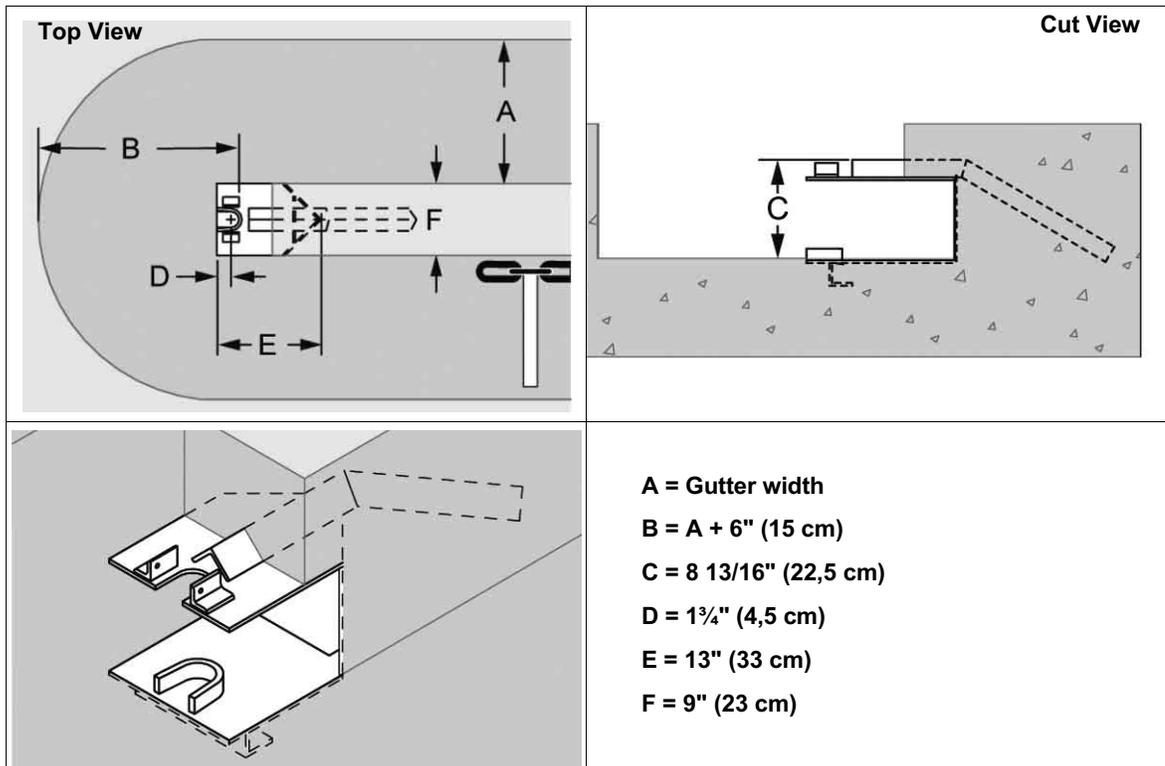
Refer to the following illustrations prior to install the corners into the gutter. When installing the concrete forms, position and level the bottom of each corner box to the bottom of the gutter. Also align the sides of each corner to the sides of the gutter.

5.5.1 Concrete base (under elevator support)

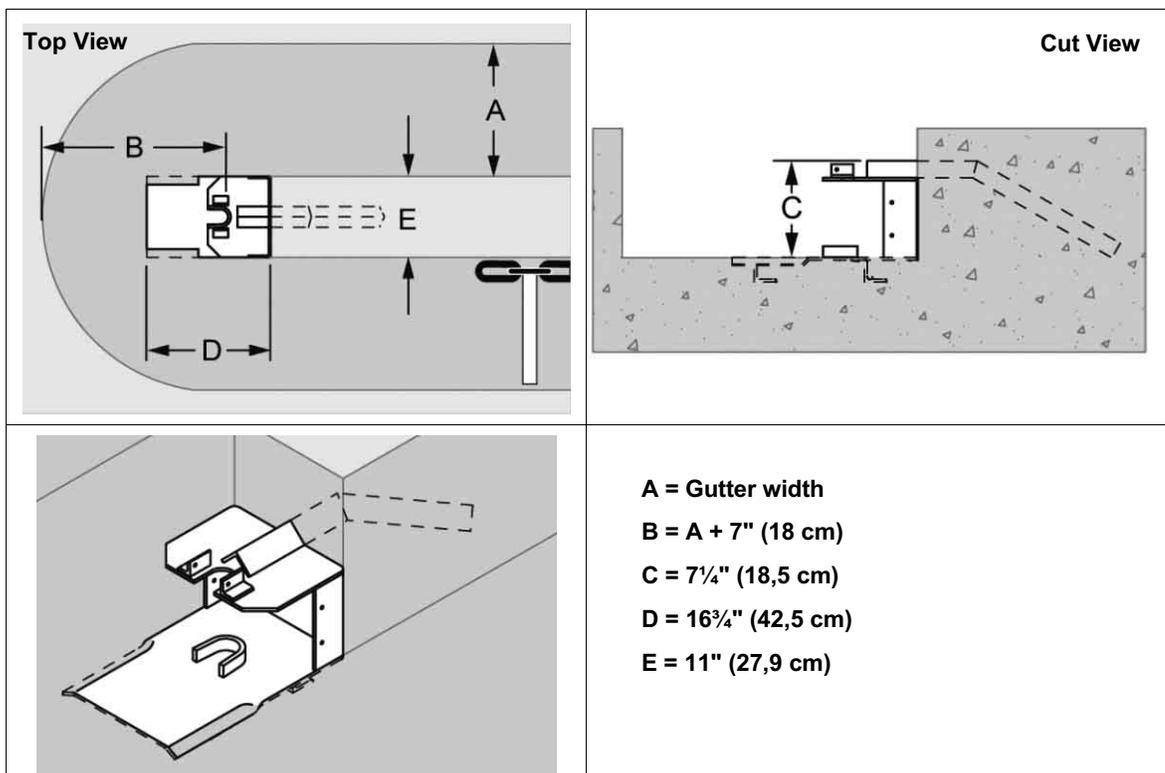


In order to build the concrete base (1) adequately, refer to section: Technical Data - Geometric Data.

5.5.2 180° Corner Wheel Box (7/8" Chain)

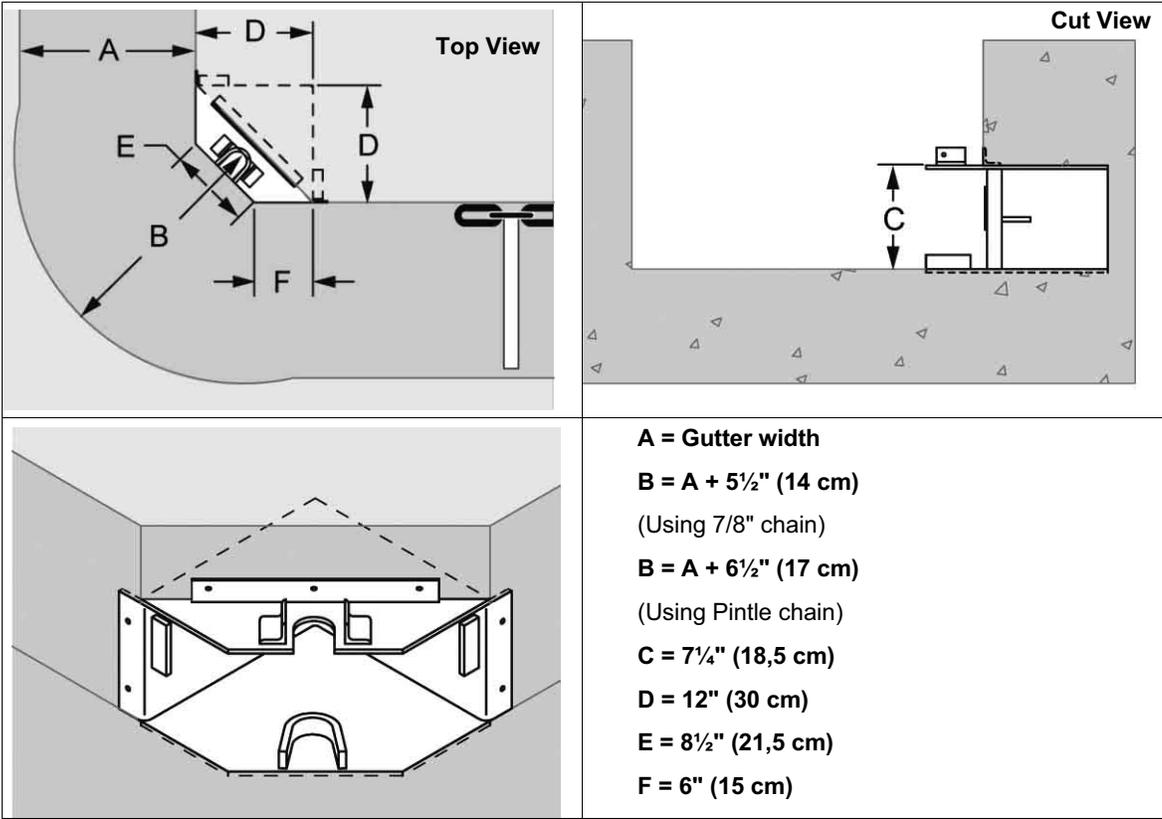


5.5.3 180° Corner Wheel Box (Pintle Chain, Hook and Eye Chain)

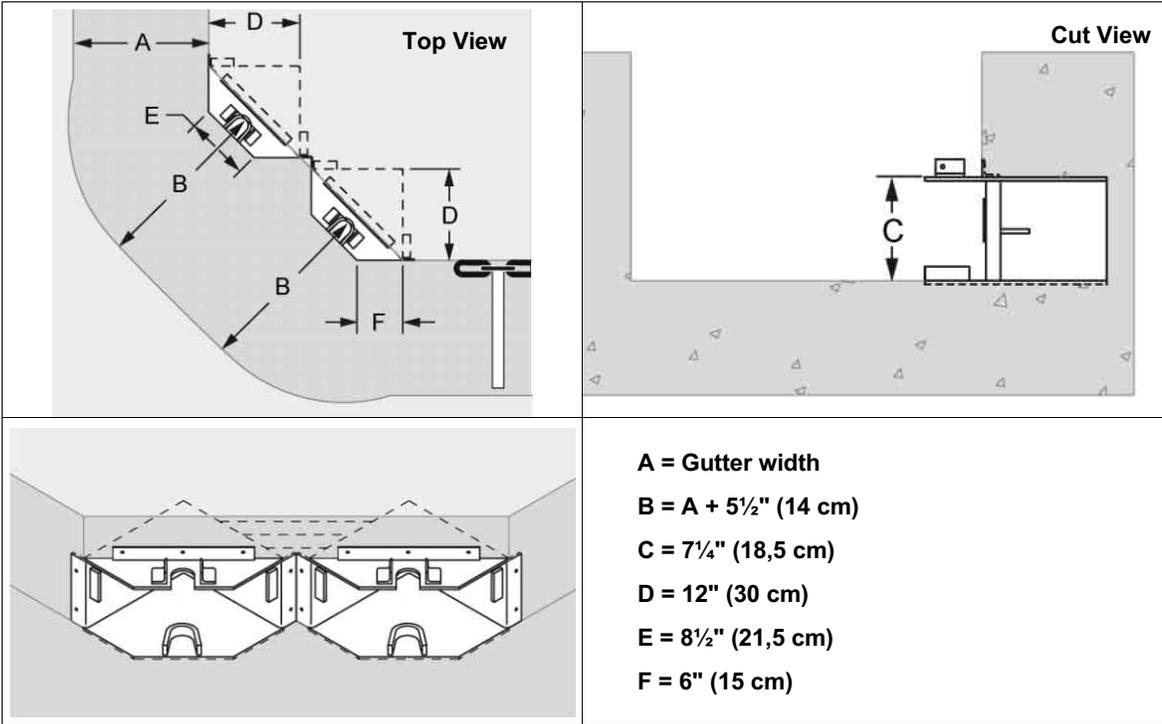


* Dashed line shows hidden parts poured in concrete.

5.5.4 90° Regular Corner Wheel Box (7/8" Chain or Pintle Chain)

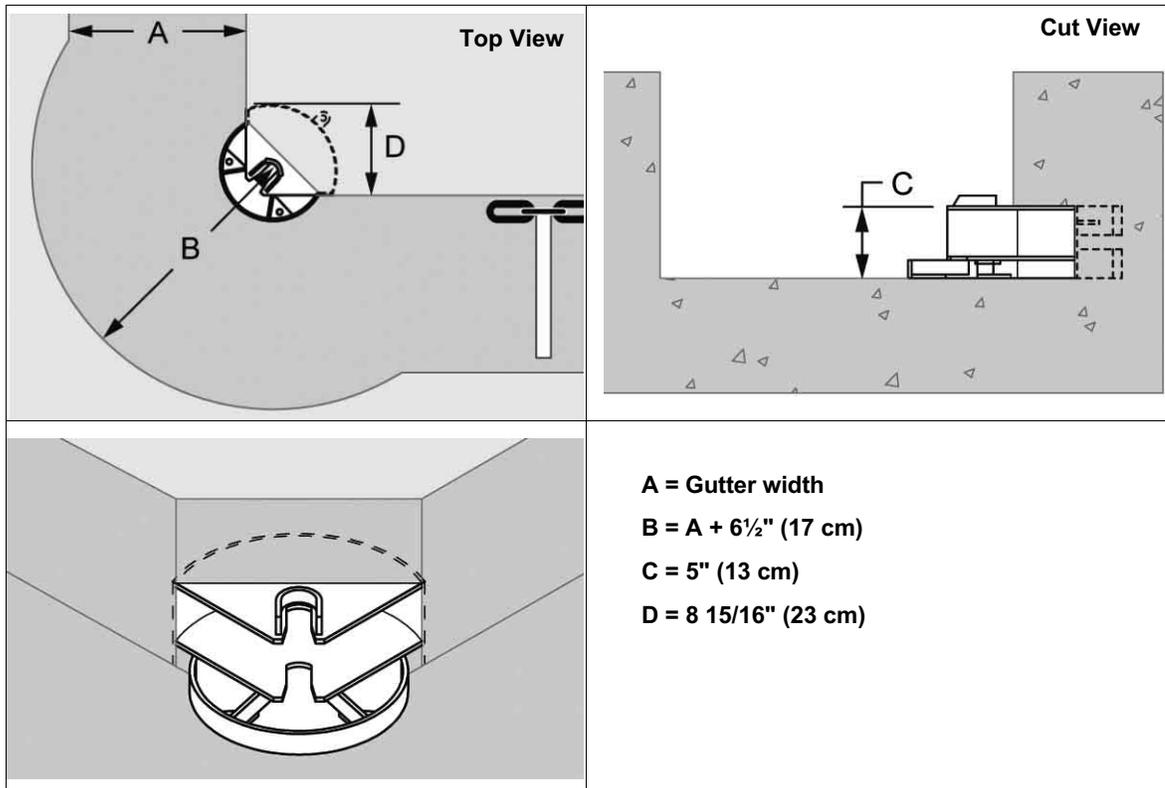


5.5.5 90° Corner with Double Wheel (7/8" Chain)



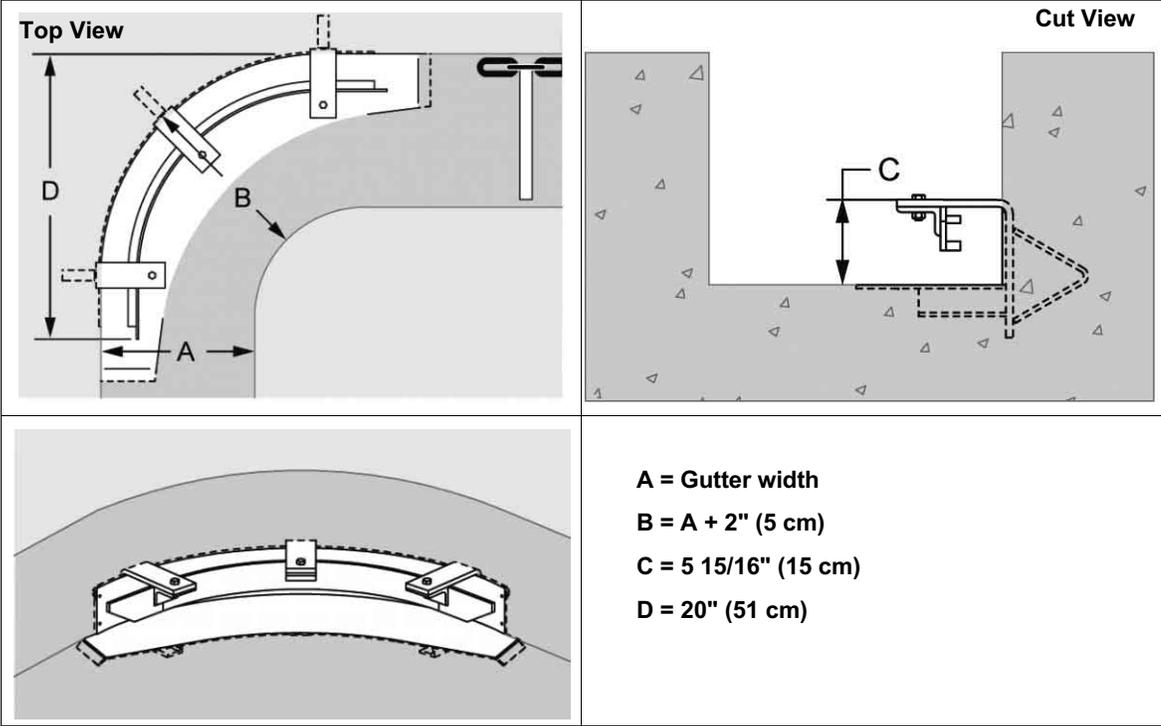
* Dashed line shows hidden parts poured in concrete.

5.5.6 90° Corner Wheel Box (Hook and Eye Chain)

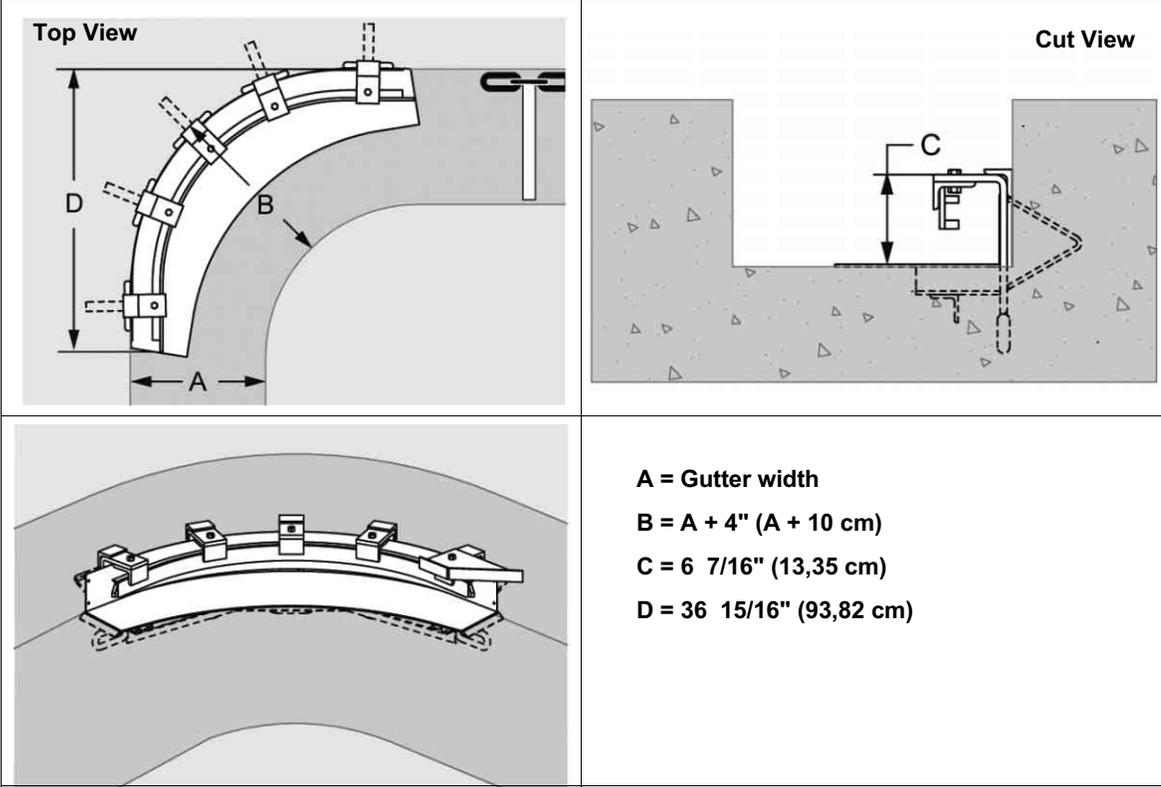


* Dashed line shows hidden parts poured in concrete.

5.5.7 90° Reverse Corner (7/8" Chain, Pintle Chain, Hook and Eye Chain)

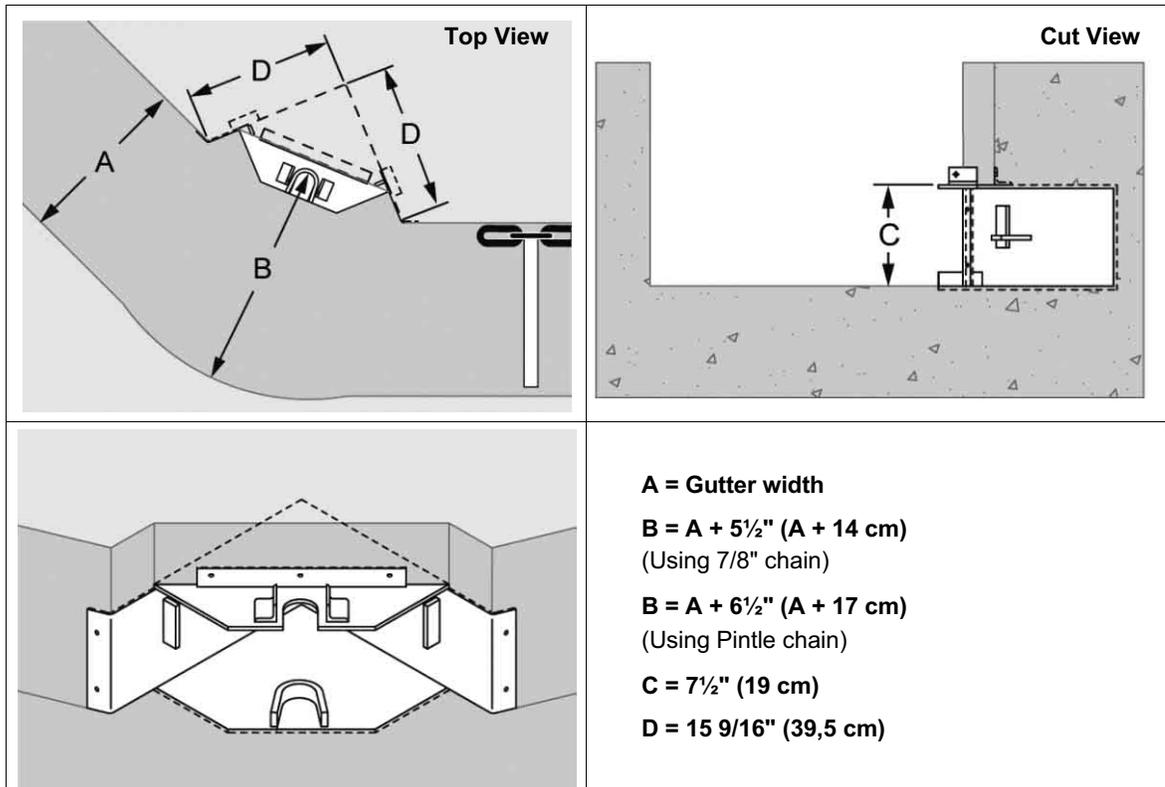


5.5.8 90° Loaded Reverse Corner (7/8", Pintle, Hook and Eye Chain)

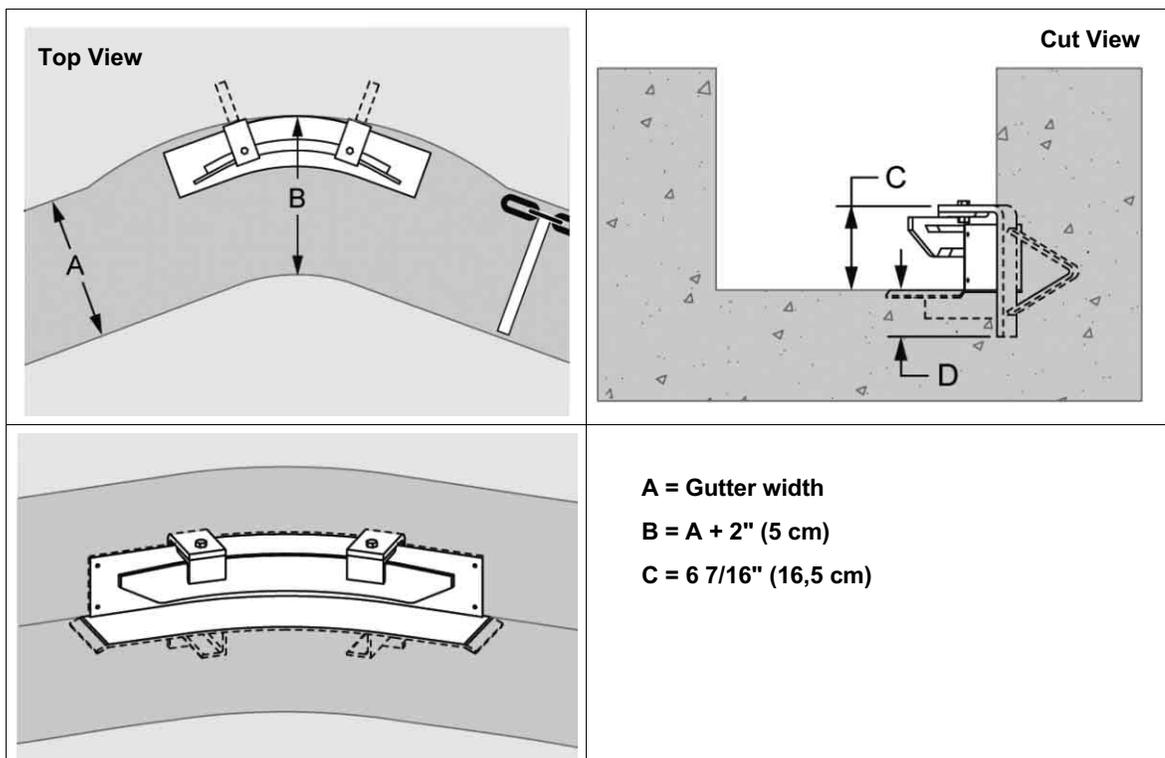


* Dashed line shows hidden parts poured in concrete.

5.5.9 45° Regular Corner Box (7/8" Chain, Pintle Chain)

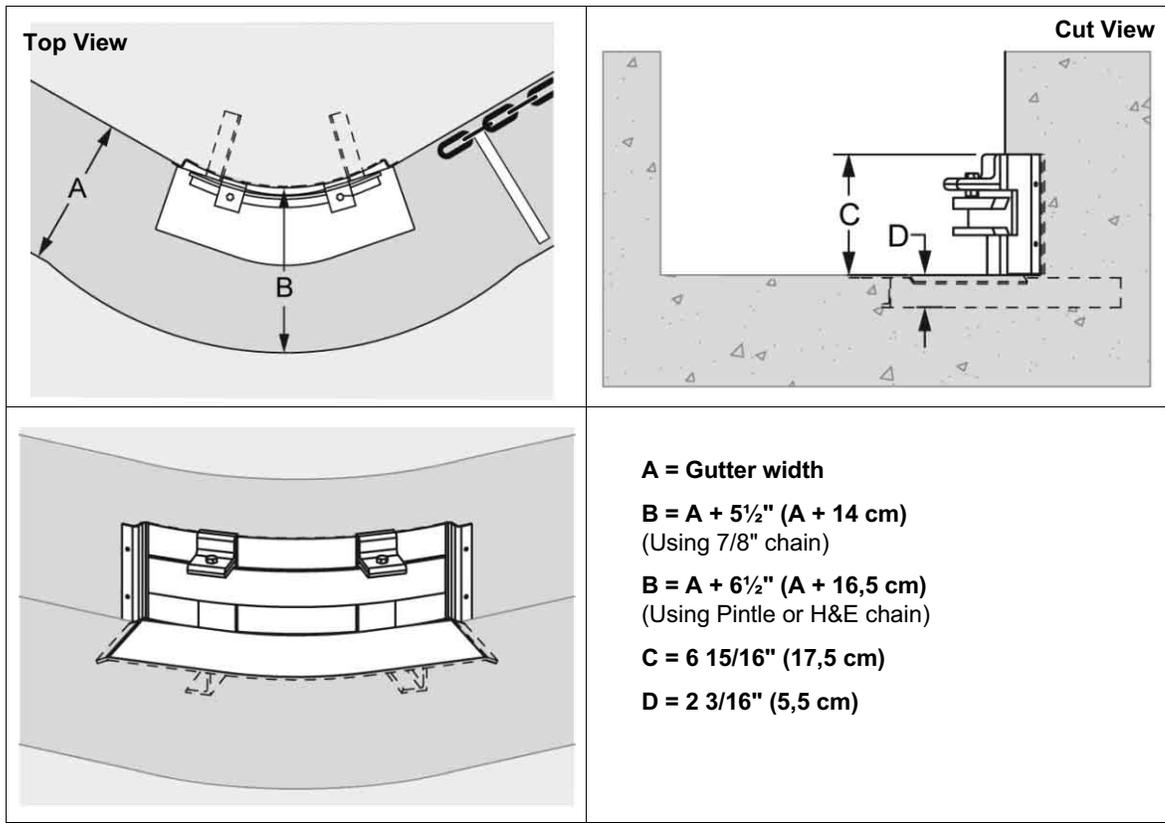


5.5.10 45° Short Reversed Corner Box (7/8" Chain, Pintle Chain, Hook and Eye Chain)



* Dashed line shows hidden parts poured in concrete.

5.5.11 45° Corner with Shoe (7/8" Chain, Pintle Chain, Hook and Eye Chain)



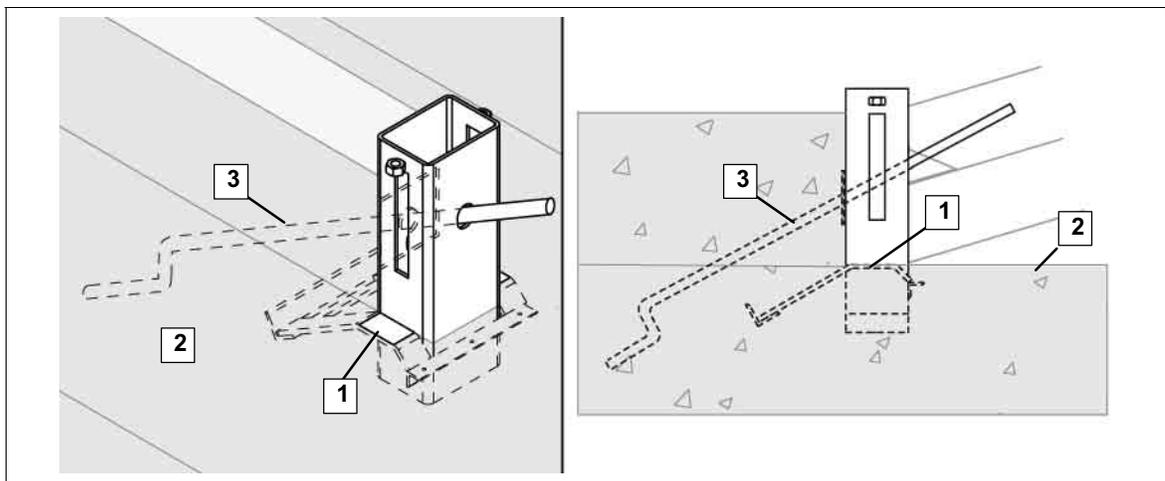
5.5.12 Hold Down Post

The function of the hold down post is to maintain the bottom of the elevator.



Note!

Refer to the following illustrations prior to install the hold down post at the end of gutter. When installing the concrete forms, position and level the hold down post as illustrated. Place the top of flat bar (1) even with the bottom of the gutter (2). Make sure the anchor rod is inserted through the post (3).



* Dashed line shows hidden parts poured in concrete.

5.6 Corner Assembly

5.6.1 7/8" [22mm] Chain Corner Wheel Assembly (45°, 90°, 180°)



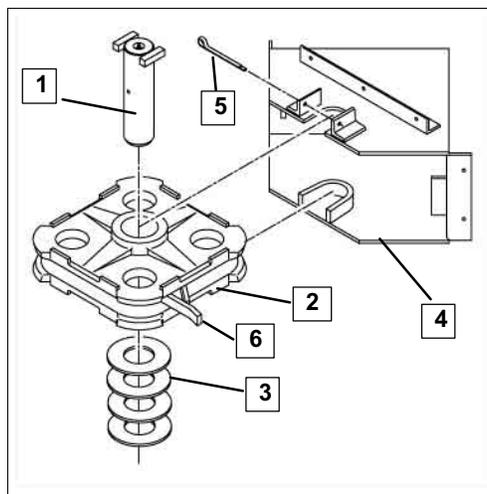
Note!

The wheel shaft (1) must be set in a vertical position when seated into the wheel box (4).

Before wheel assembly, check if the shaft is perfectly levelled when positioned.

If not, use a piece of flatbar to correct the shaft and weld it in place once the shaft is levelled.

- Grease the shaft (1) generously and insert it into wheel (2).
- Install four washers (3) under wheel (2) to adjust wheel height. In case of a wheel set too high, the paddles will not clean the gutter. A washer can be removed to lower the wheel. In case of a wheel set too low, the paddles will force down against the gutter damaging mechanical parts. A washer can be added to raise the wheel.



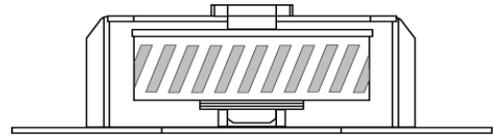
- Position wheel assembly into corner box (4) and ensure that corner wheel cleaner (6) is pointing towards direction of chain rotation.
- Install a cotter pin (5) to maintain the shaft (1).

5.6.2 Pintle Chain Corner Wheel Assembly

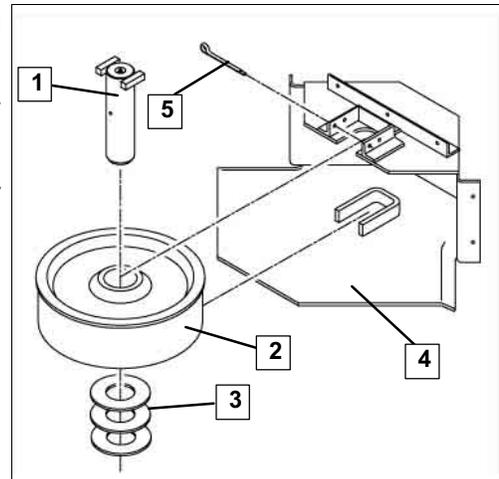


Note!

Washers (3) are used to adjust corner wheel height. Add or remove washers to adjust the wheel height making sure the pintle chain rolls on the center zone of each wheel.

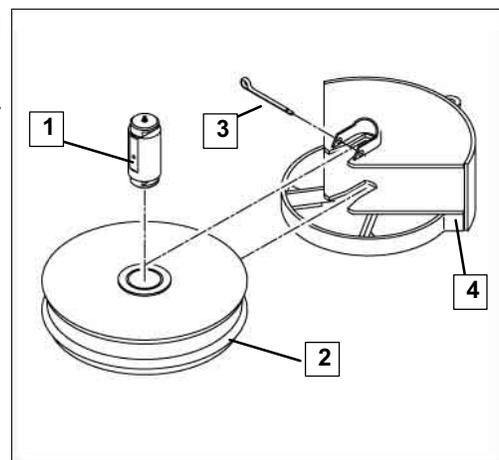


- Grease the shaft (1) generously and insert into wheel (2).
- Install three washers (3) under wheel (2) to adjust wheel height.
- Position wheel assembly into corner box (4).
- Install a cotter pin (5) to maintain the shaft (1).



5.6.3 Hook and Eye Corner Wheel Assembly

- Grease the shaft (1) generously and insert it into wheel (2).
- Position wheel assembly into corner box (4).
- Install a cotter pin (3) to maintain the shaft (1).



5.6.4 90° and 45° Corner with Shoe Assembly

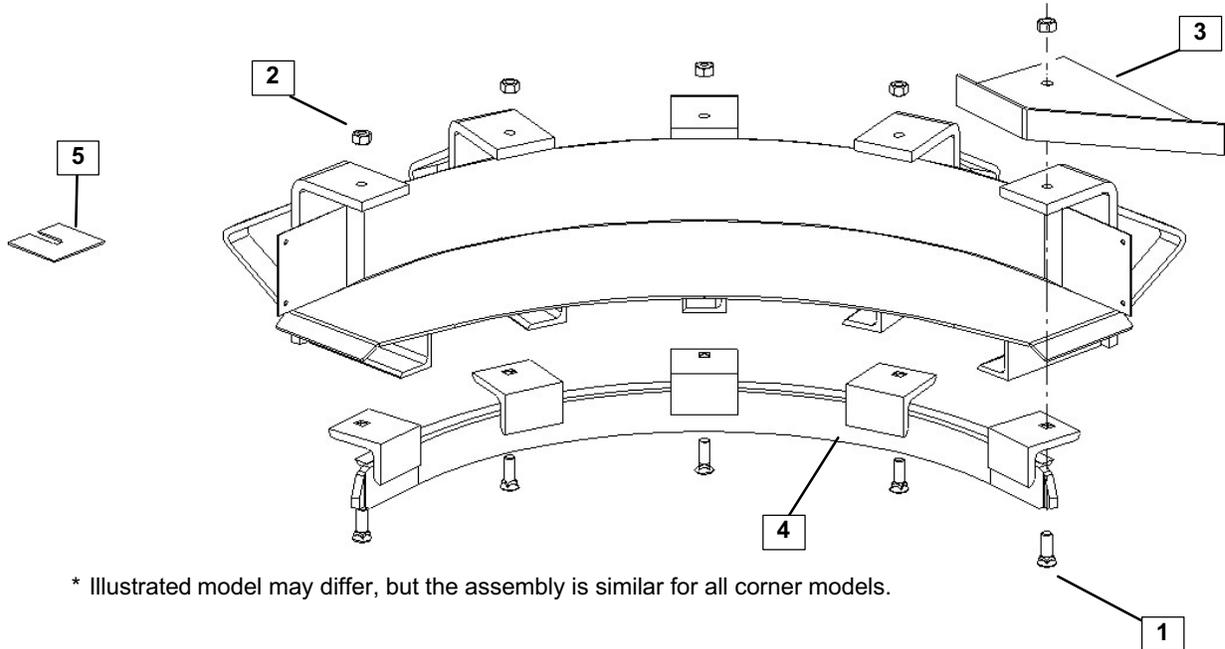


Note!

Shims (3) are used to adjust shoe height. In case of a shoe set too high, the paddles will not clean the gutter.

A shim can be added to lower the shoe. In case of a shoe set too low, the paddles will force down against the gutter damaging mechanical parts.

A shim must be removed to raise the shoe.



* Illustrated model may differ, but the assembly is similar for all corner models.

- Using carriage bolts (1) and nuts (2), install the shoe (4) to the corner. For hook and eye corner model only, install the corner guard (3) to the corner frame as per the chain direction. Install the guard on the side where the chain enters the corner.
- If needed, insert shims (5) between fixing brackets to adjust the height of the shoe (4).

5.7 H-2000 Assembly

5.7.1 Handling and Installation

Step 1: Assembly Preparation



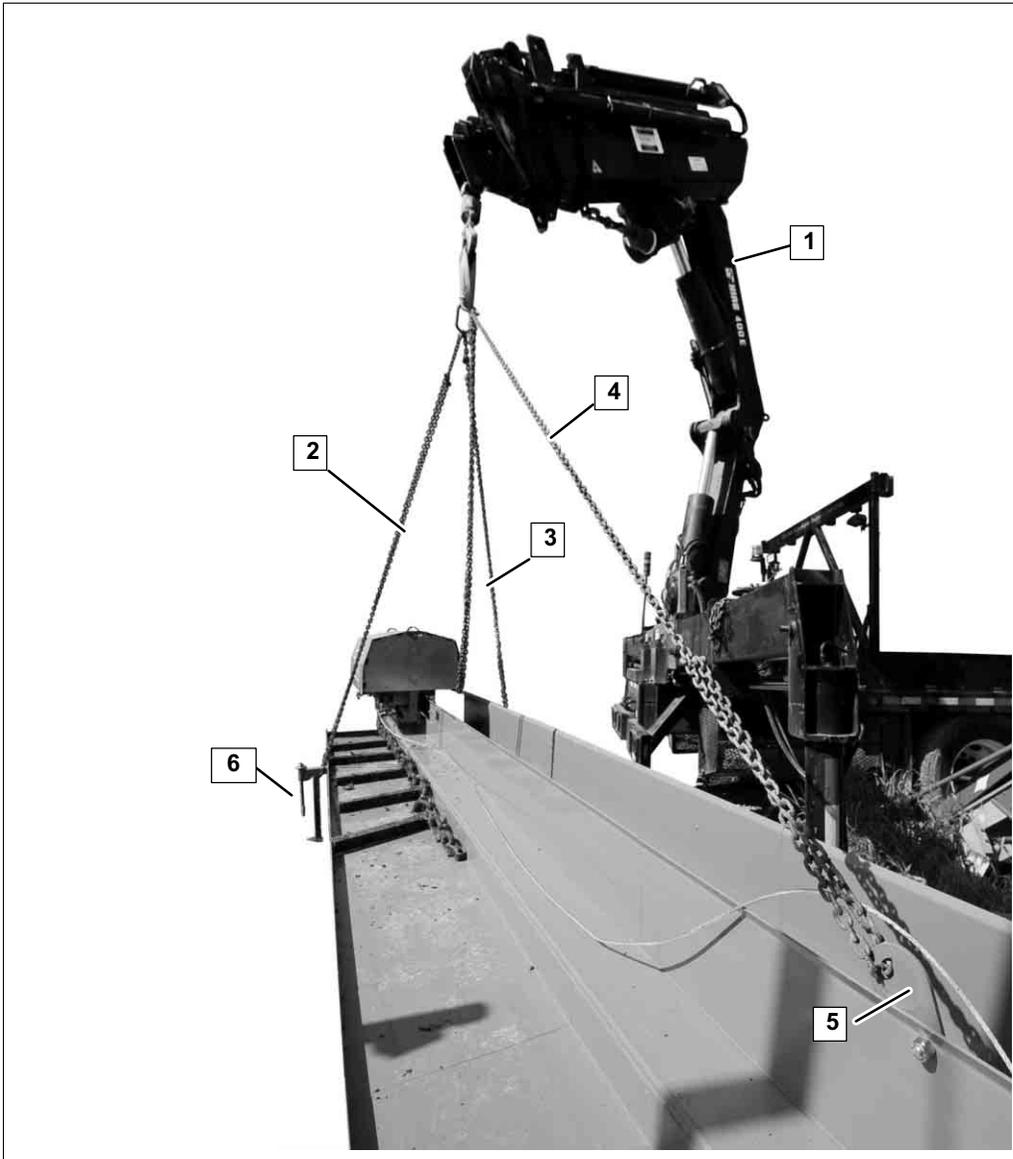
Attention!

To lift this product, use a lifting device with a minimum lifting capacity of 3750 lb [1750 kg].



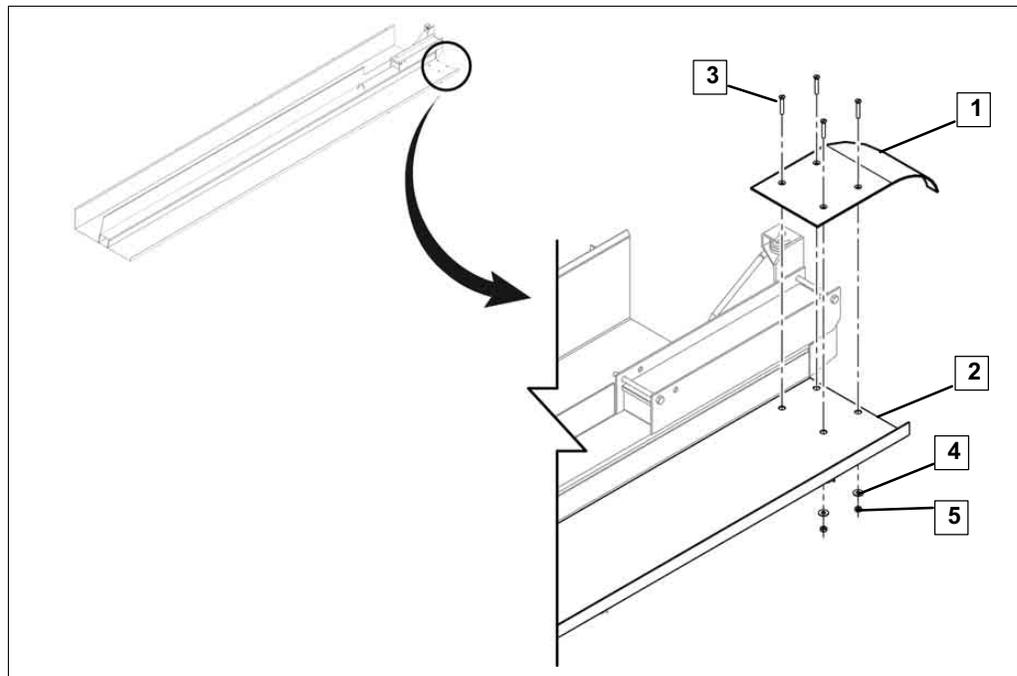
Note!

Make sure the lifting ring bolt is tightened before lifting the elevator.



- Hook three safety chains (2,3,4) between the boom truck (1) and the elevator lifting ring (5) and turnbuckles (6).
- Lift the elevator with the boom truck.
- Place the elevator on pieces of wood in front of the barn gutter.

Step 2: Return Plate Assembly



- Position the return plate (1) on the elevator frame (2) and install it using four flat slotted screws (3), washers (4) and nuts (5). Torque all screws.

Step 3: Drive Unit Assembly



CAUTION!

Beware of the drive belts and pulleys, which can cause fingers entanglement.



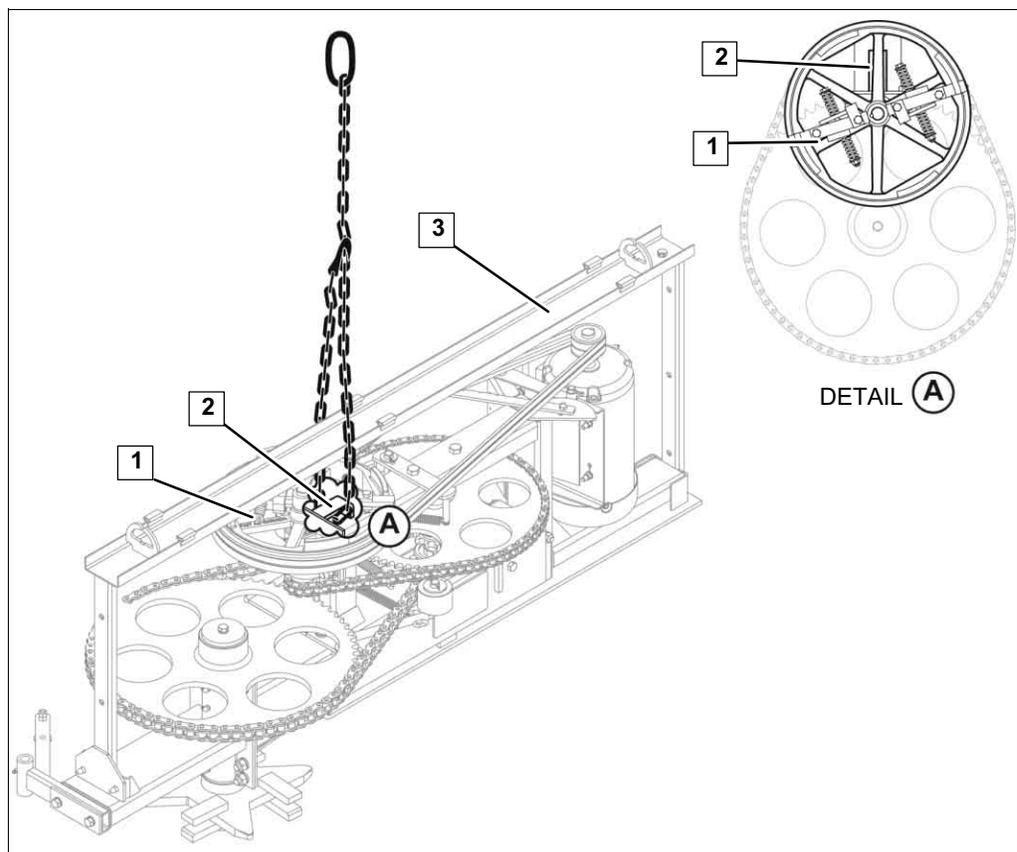
Attention!

To lift this product, use a lifting device with a minimum lifting capacity of 3750 lb [1750 kg].

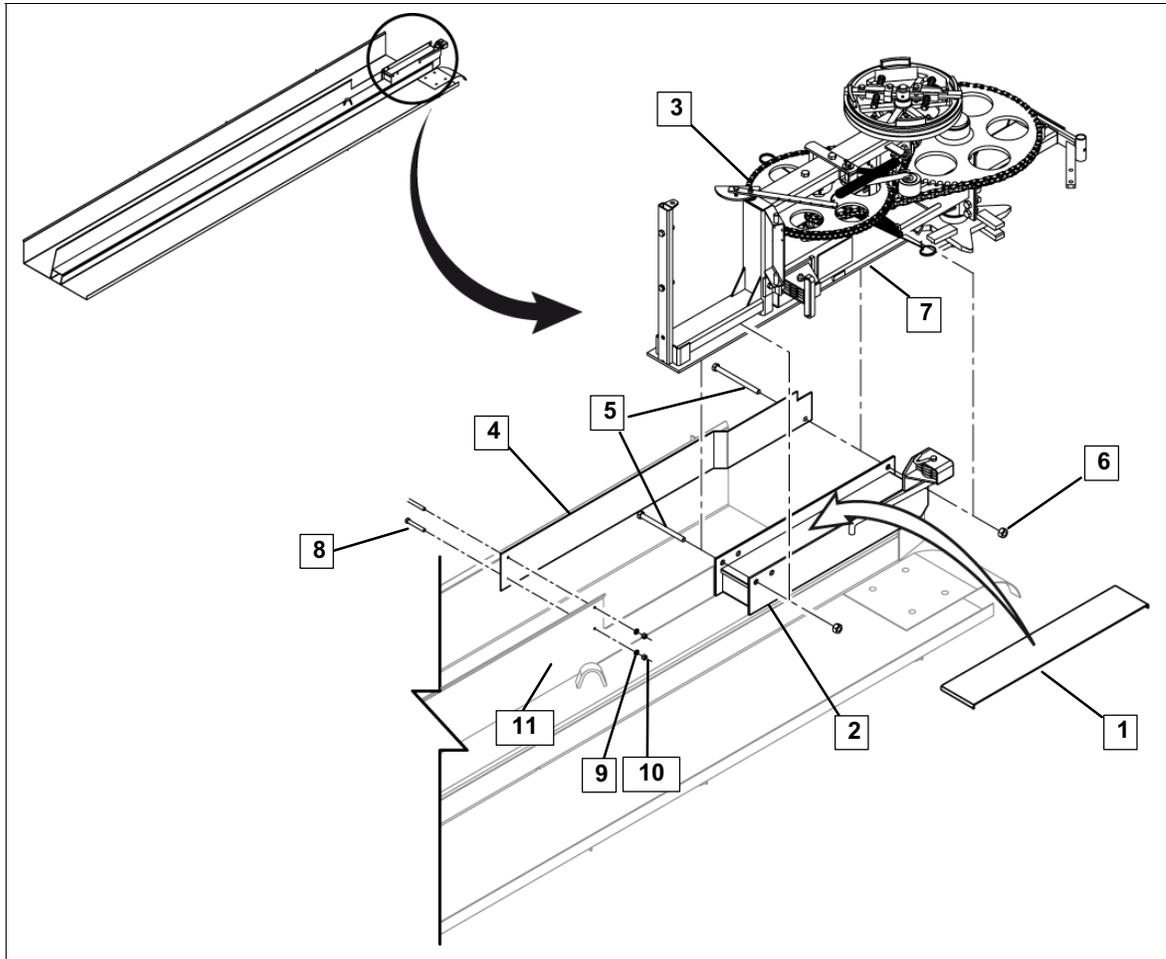


Note!

Always remove the safety cover before lifting the drive unit.



- Turn the pulley (1) to align a wheel branch with the lifting ring (2) located under the wheel. See detail A.
- Attach the safety chain to the lifting ring (2) as illustrated.
- Lift drive unit (3) with the lifting device.



Note!

Use EP2 mineral grease.

- Install the sliding plate (1) over the drive unit support (2) and apply grease all over the sliding plate (1).
- Position the drive unit (3) and the litter deviator (4) on the support (2) and fix with two bolts (5) and nuts (6). Make sure the bolts (5) are properly installed through the drive unit base (7). Tighten bolts but do not overtight.
- Install two screws (8), lock washers (9) and nuts (10) to fix the litter deviator (4) on the elevator frame (11).

Step 4: Motor Installation



Warning!



Always shut off and lock the power supply before installing the equipment.



CAUTION!

When electrical motors and/or control panels come from a supplier other than the manufacturer, it is mandatory to verify components compatibility.

Make sure motors and/or control panels match the equipment specifications.

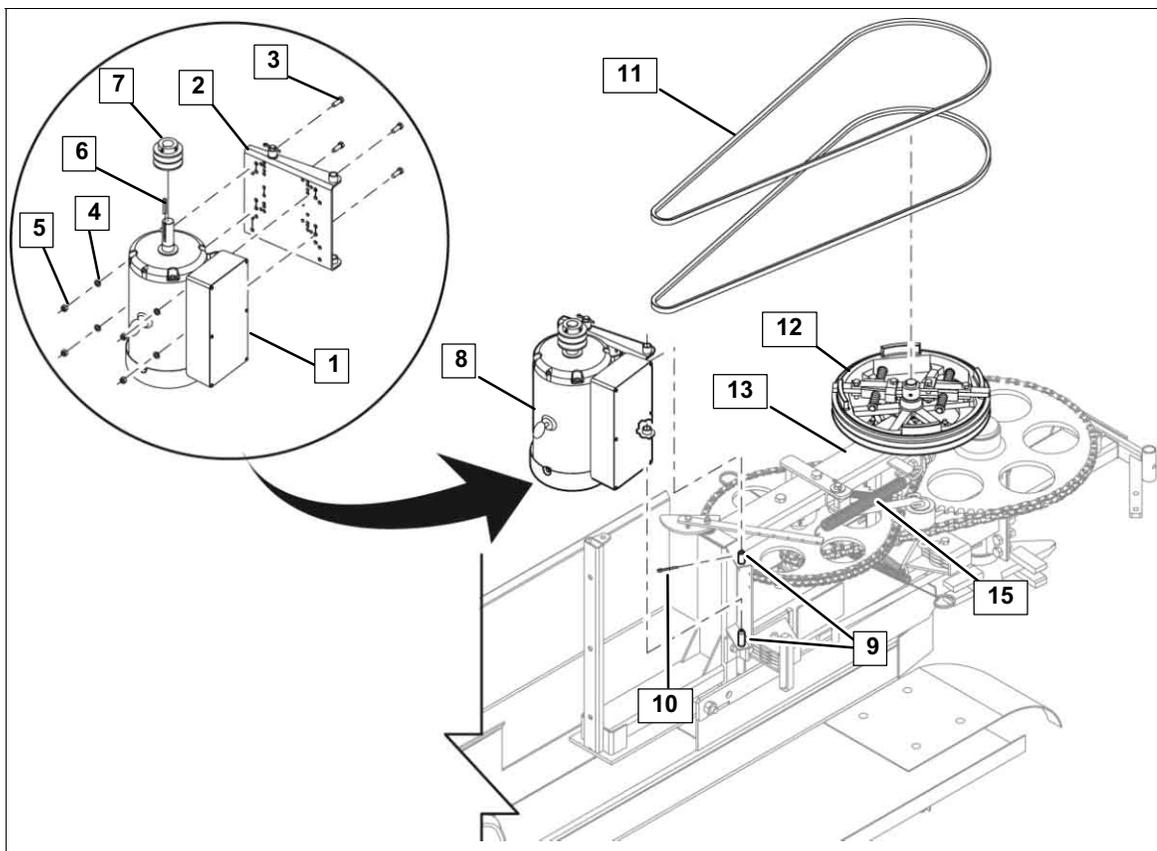
Refer to the Section: Technical Data - Electrical Motor Specifications / Control Panel Specifications.



To tighten bolts adequately, refer to the Section: Technical Data - Bolt Torque Chart.

- Refer to pictures below to find the motor bolt pattern on the appropriate motor support.

	Motor				Drive Unit Motor Support
	Power		Type		Bolt Pattern Location
	HP	KW	NEMA	IEC	
A	-	-	-	-	
B	-	-	-	-	
C	-	-	-	-	
D	1.5	1.1	145T	90	
E	2	1.5	145T	90	
F	3	2.2	182T	100	
G	3	2.2	182T	112	
H	3 - 5	2.2 - 3.7	184T	112	
I	7.5	5.5	213T	132	
J	-	-	-	-	



CAUTION!

Beware of the drive belts and pulleys, which can cause fingers entanglement.

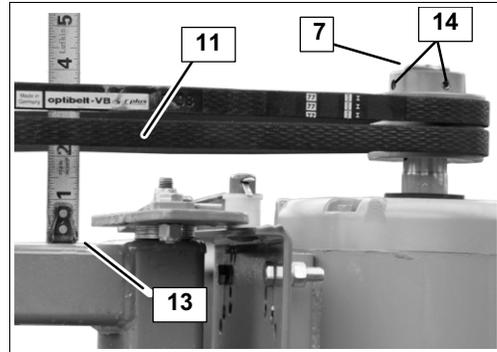


Attention!

Make sure the tension spring (15) has been removed before installing the motor.

- Bolt the motor (1) on the motor support (2) with four bolts (3), lock washers (4) and nuts (5).
- Apply a thin layer of grease on motor shaft and install the key (6) and the pulley (7).
- Install the motor assembly (8) on pivot pins (9) and lock it with a cotter pin (10).
- Install two belts (11) between pulleys (7,12).

- Adjust the distance between the lower belt (11) and the top of the drive unit frame (13) in order to get 2 1/8" [54mm]. Torque the set screws (14) to lock the pulley (7) in place. Check if the pulleys are perfectly aligned. If required, adjust the motor pulley.



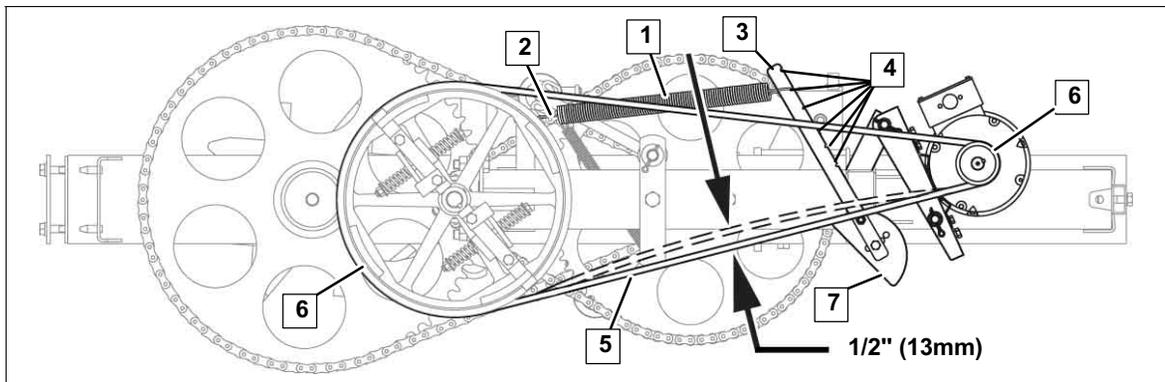
- Have electrical motor wired to the control panel by a certified electrician.

Step 5: Belt Tension Adjustment



CAUTION!

Spring is under tension. Always wear eye protection and handle the spring with care.



- Install the spring (1) between the anchor (2) and the belt tension arm (3). Make sure the spring hook is correctly seated into the arm notch (4).
- There are six notches (4) on tension arm (3) designed to adjust the belt tension. Position spring hook on appropriate notch in order to adjust tension at the appropriate deflection. Make sure spring hook is well inserted on a notch.
- Adjust the lever (7), if necessary, using adjustment holes to increase or to decrease pressure on the motor.



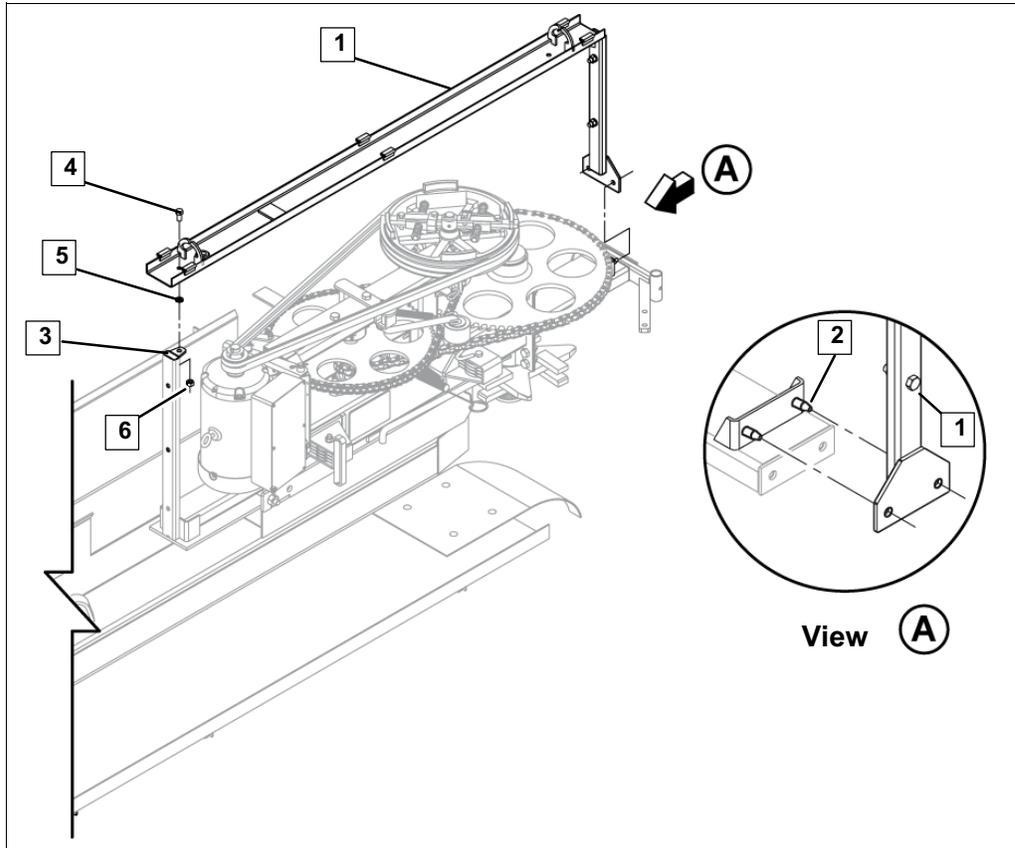
Note!

Belt (5) must deflect roughly 1/2" (13mm) when applying pressure of 12 lb (5kg) midway between pulleys (6).

Step 6: Guard Support Frame Assembly



To tighten bolts adequately, refer to the Section: Technical Data - Bolt Torque Chart.



- Slide the hood frame (1) on pins located on the front of drive unit (2). (see view A)
- Bolt the support frame (1) to the vertical post (3) with a 1/2" x 1" [13 x 25mm] bolt (4), lock washer (5) and nut (6).

Step 7: Chain Tensioner Assembly (Available with Hook & Eye Chain)



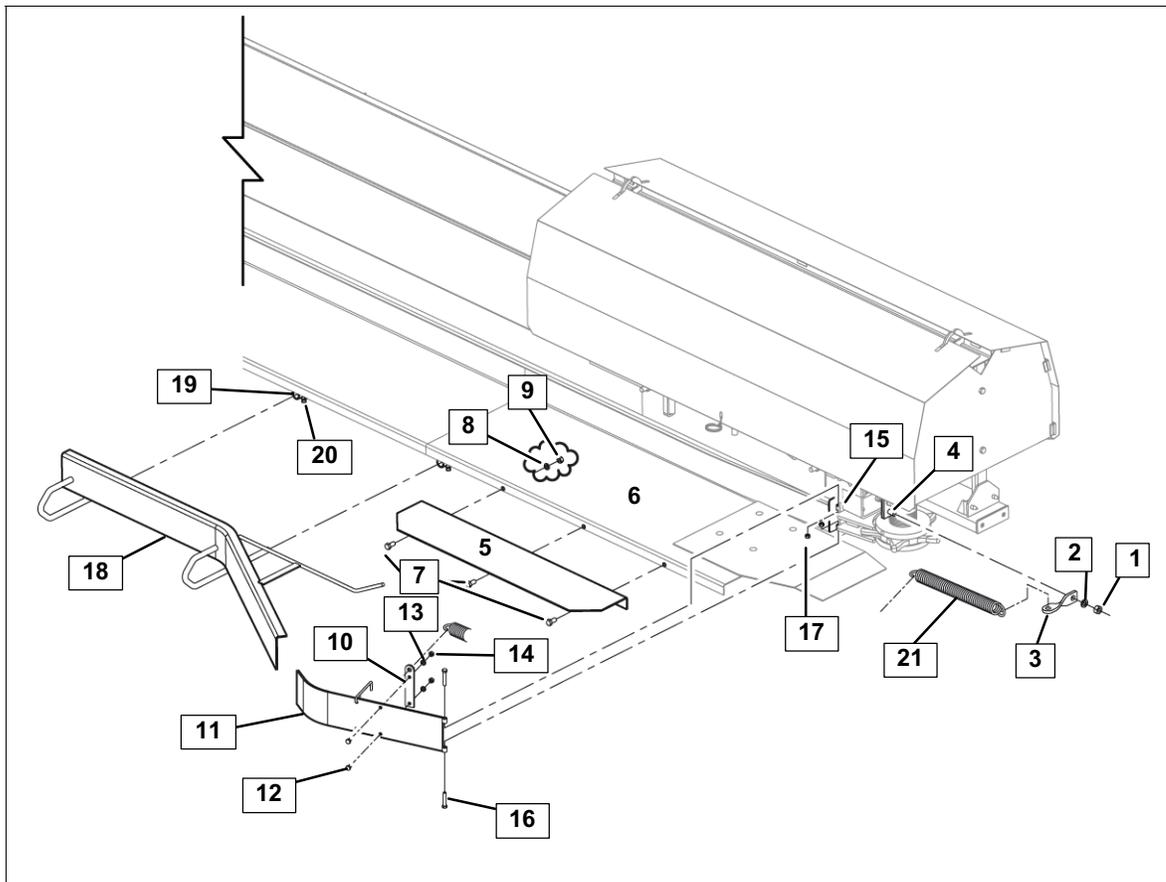
CAUTION!

Spring is under tension. Always wear eye protection and handle the spring with care.



Note!

Chain tensioner must always be installed on the return gutter side. Never install it on the loaded side. Depending on the sense of rotation, components will be adapted to fit with return gutter that can either be on the left or on the right side. Illustration below shows an installation using a clockwise rotation.

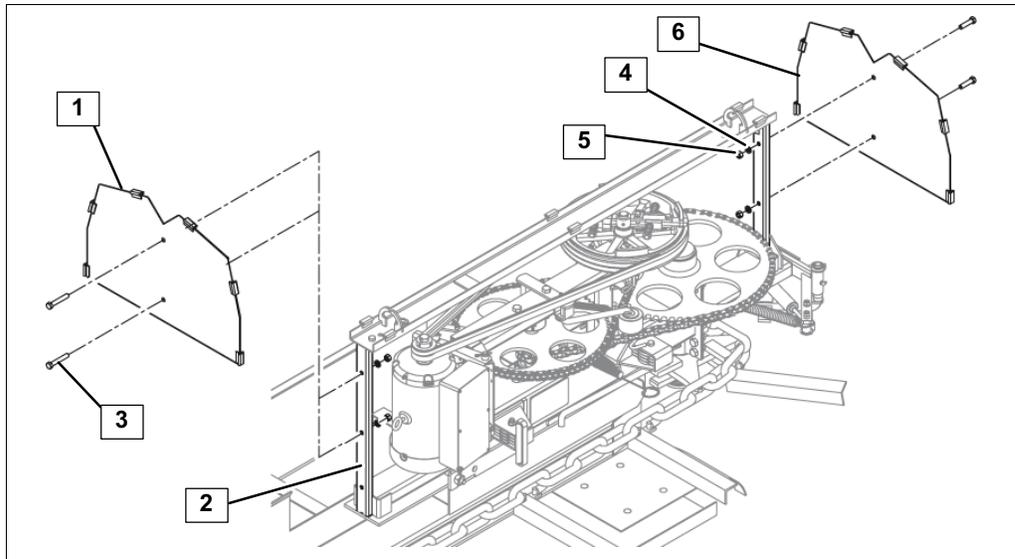


- Remove the nut (1) and the lock washer (2) from drive unit and install twisted bracket (3) on the bolt (4). Fix with lock washer (2) and nut (1).
- Assemble the extension plate (5) on the return gutter side of the elevator (6). Fix with three bolts (7), lock washers (8) and nuts (9).
- Assemble the spring attachment (10) on the tension plate (11). Fix with two bolts (12), lock washers (13) and nuts (14).
- Assemble the tension plate (11) assembly on the drive unit hinge (15). Fix with two bolts (16) and nuts (17).
- Hook the springs (21) between the twisted bracket (3) and the spring attachment (10).
- Install the side retaining plate (18) by inserting the rods into the elevator pipes (19). Torque screws (20).

Step 8: Drive Unit Hood Caps Assembly

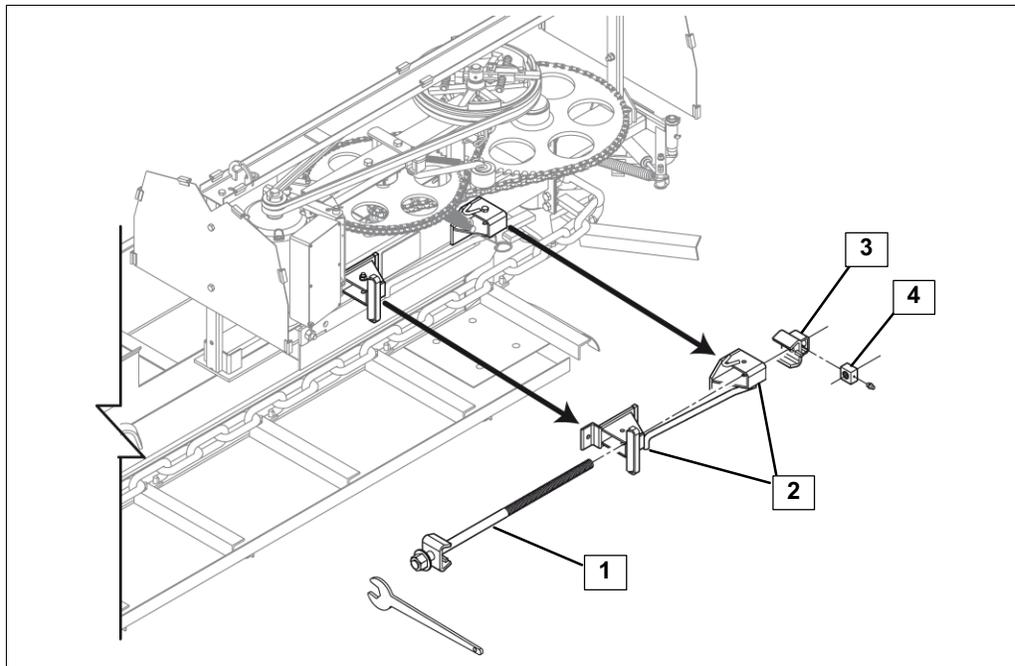


To tighten bolts adequately, refer to the Section: Technical Data - Bolt Torque Chart.



- Position both end cover (1, 6) on the hood frame (2) and fix with two 1/2" x 2" [13 x 51mm] bolts (3), lock washers (4) and nuts (5).

Step 9: Manual Tensioner Assembly



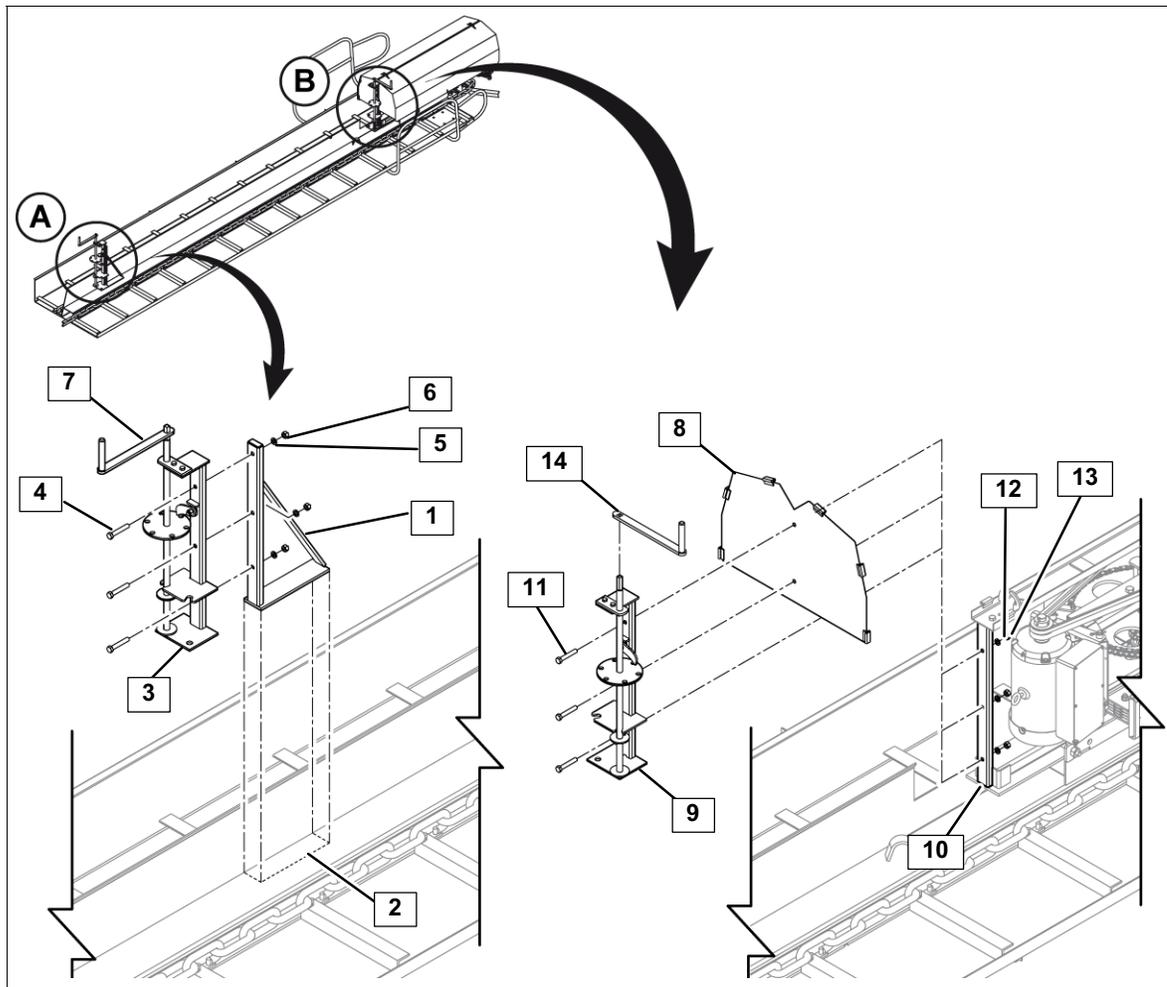
- Position the nut (4) inside nut casing (3).
- Slide the adjustment screw (1) inside the supports (2) and screw the nut assembly (3, 4). The supports (2) are exploded to ease comprehension, they are already installed on the equipment.

Step 10: Quick Tensioner Winch Assembly



Note!

There are two ways to install quick tensioner winch:
(A) at the bottom of the elevator;
(B) on the drive unit frame.



A) At the Bottom of the Elevator

- Position the winch support (1) on the elevator tube frame (2) and weld it in place.
- Install the quick tensioner winch (3) on the winch support (1) and fix with three bolts (4), lock washers (5) and nuts (6).
- Install the winch lever (7).

B) On the Drive Unit Frame

- Position the end cover (8) and the quick tensioner winch (9) on drive unit support (10). Fix with three bolts (11), lock washers (12) and nuts (13).
- Install the winch lever (14).

Step 11: Quick Tensioner Cable installation



CAUTION!

Always wear protecting gloves when handling/installing the cable.



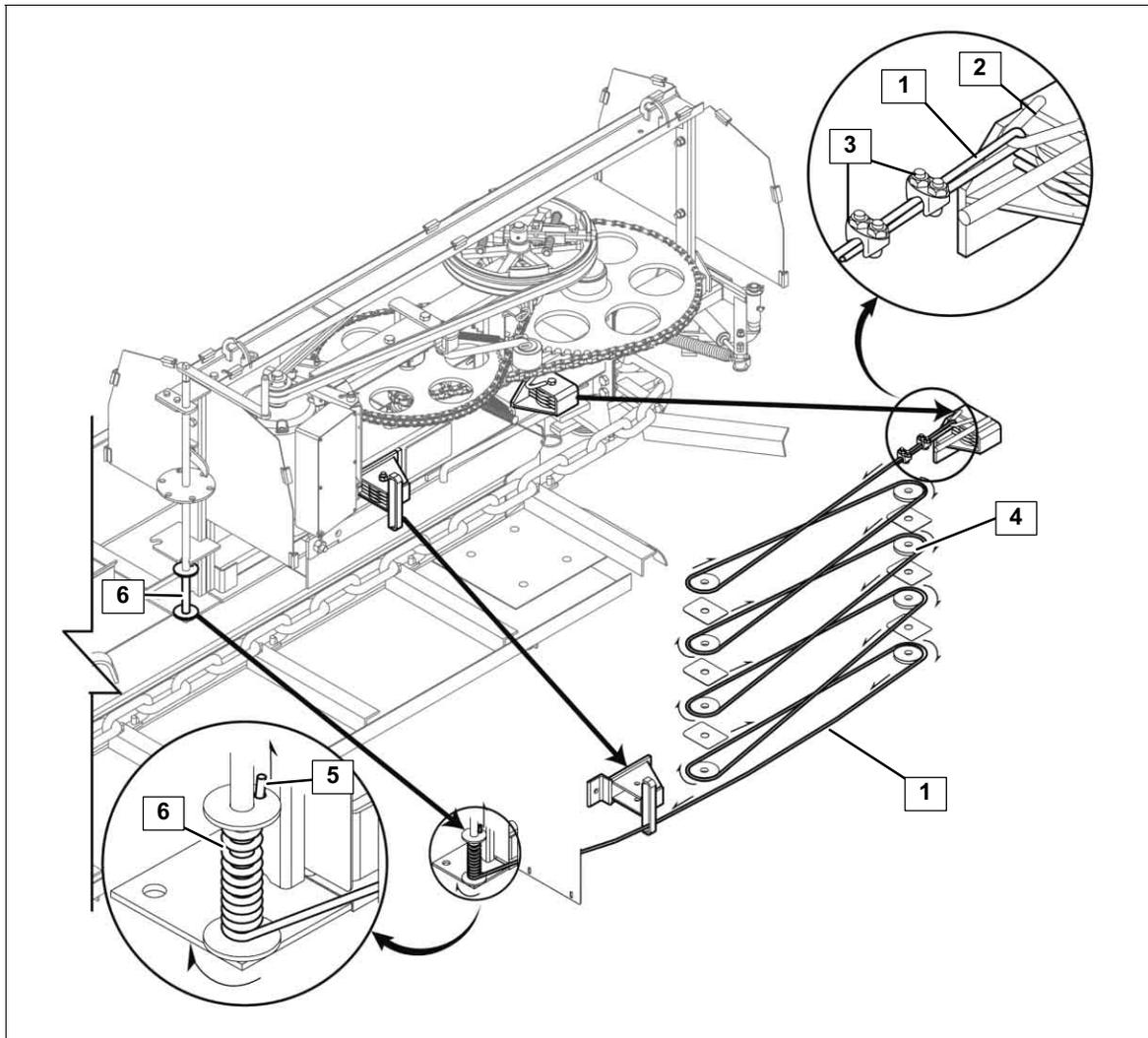
Note!

To ease cable installation and prevent cable splitting, apply electrical tape on each cable end.



Note!

The exploded view of the pulleys is shown for clarity purpose only.



- Install the cable (1) through the eyelet (2) and attach it with two cable clamps (3).



Refer to the Section: Technical Data - Cable Clamp Assembly.

- Place the cable (1) around pulleys (4) by following the path illustrated.
- Insert the cable end (5) into the tensioner winch (6). Make sure the cable is correctly wind up on the winch, as shown.

Step 12: Paddle Cleaner Assembly



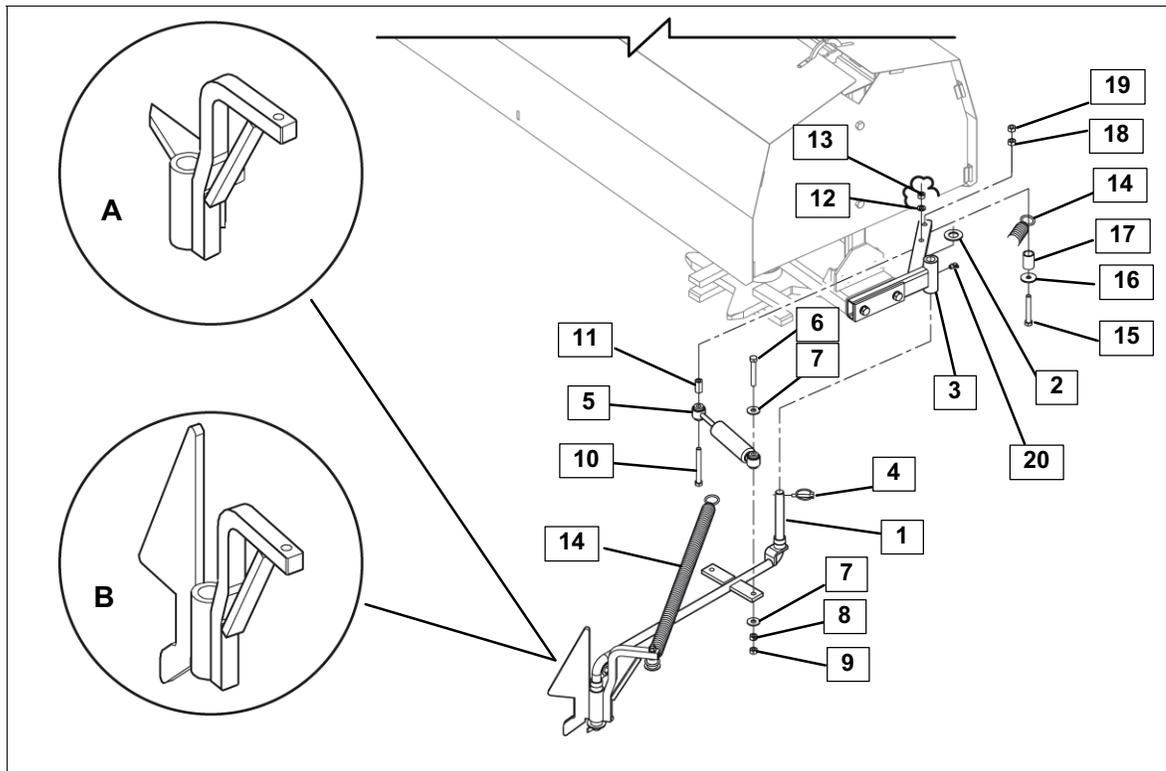
CAUTION!

Spring is under tension. Always wear eye protection and handle the spring with care.



Note!

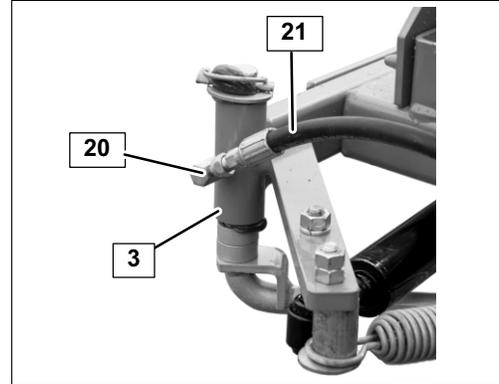
Paddle cleaner must always be installed to clean paddle coming out of the loaded gutter side. Depending on rotation direction, components will be adapted to fit with loaded gutter that can either be on left or right side. Illustration below shows installation using counterclockwise rotation.



A	Hook and eye chain paddle cleaner model
B	7/8" chain and pintle chain paddle cleaner model

- Insert the paddle cleaner shaft (1) into the pivot support (3). Place the washer (2) on top and lock it with lock pin (4).
- Install the shock absorber (5) on the paddle cleaner assembly and fix with bolt (6), two washers (7), nut (8), and locknut (9). Make sure shock absorber pivots freely.
- Install the shock absorber (5) on the pivot support (3) and fix with bolt (10), coupling nut (11), lock washer (12), and nut (13).
- Install the spring (14) on the pivot support (3) and fix with bolt (15), washer (16), bushing (17), nut (18), and locknut (19).
- Install the grease line fitting (20) on the pivot support (3). Hand-tight only. Make sure the adaptor opening points upward to clear the stroke of the paddle cleaner.

- Connect the grease hose (21) to the grease line fitting (20).
- Fill the grease line (21) until grease jut out from the pivot support (3).
- Check if the paddle cleaner works properly.

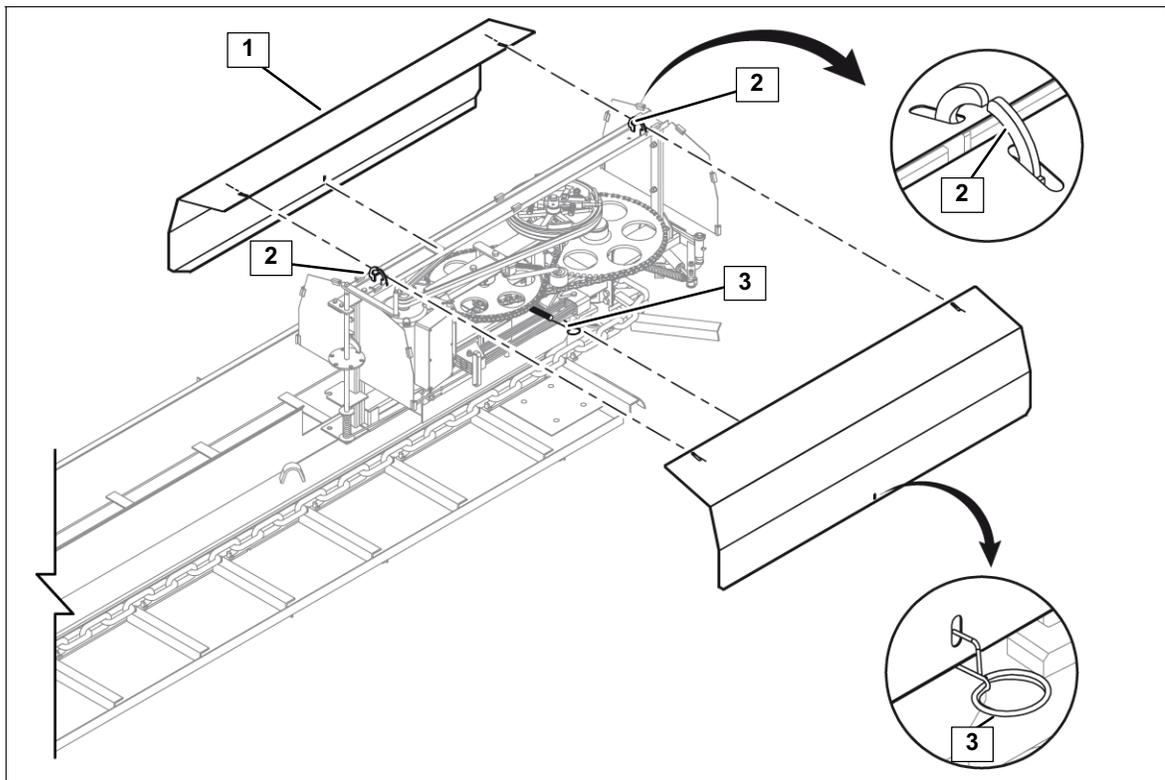


Step 13: Safety Cover Assembly



Note!

Make sure no objects or tools remain inside the drive unit before installing safety covers.

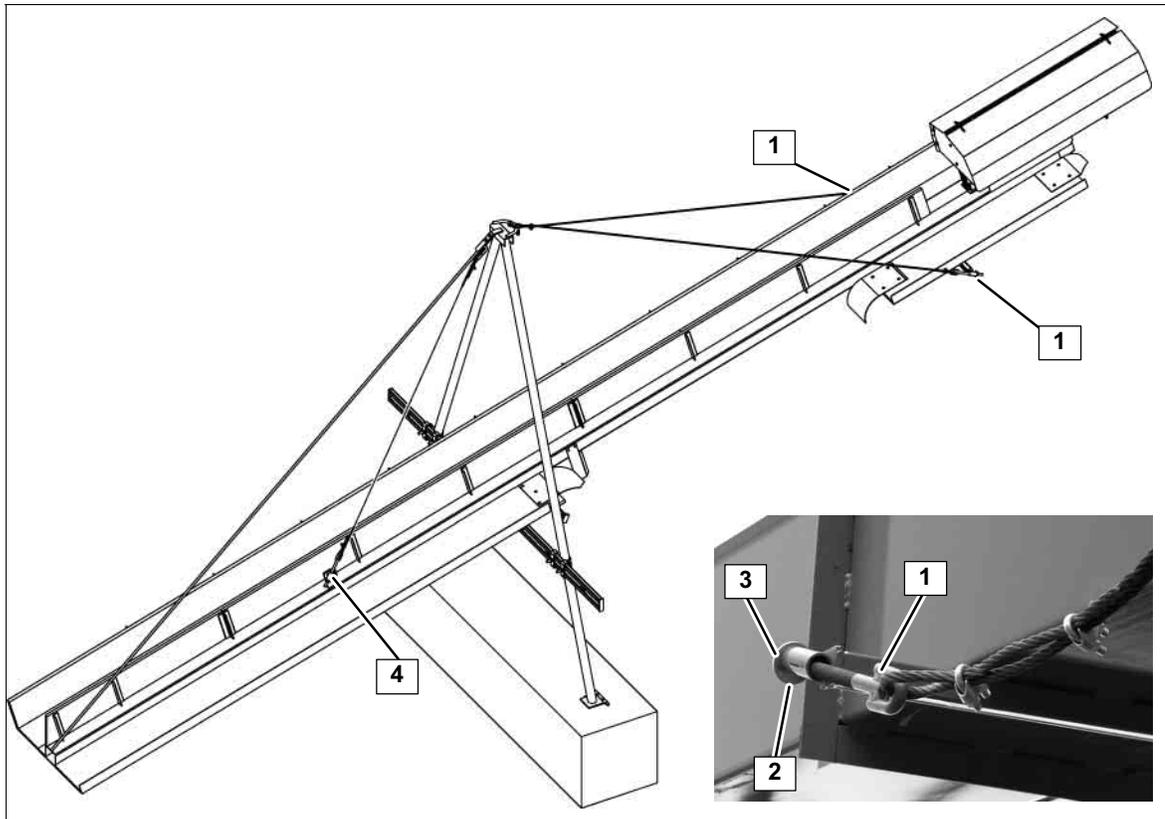


- Install both safety covers (1) into the hooks (2).
- Lock the safety covers (1) in place with the spring hooks (3) located under the drive unit gears.

Step 14: Turnbuckles Assembly



To tighten bolts adequately, refer to the Section: Technical Data - Bolt Torque Chart.



- Install a turnbuckle (1) on each side of the elevator using the washer (2) and locknut (3) provided.
- Only on 45 and 50 feet elevator, install another turnbuckle (4) at the bottom of the elevator for cable "B" installation.



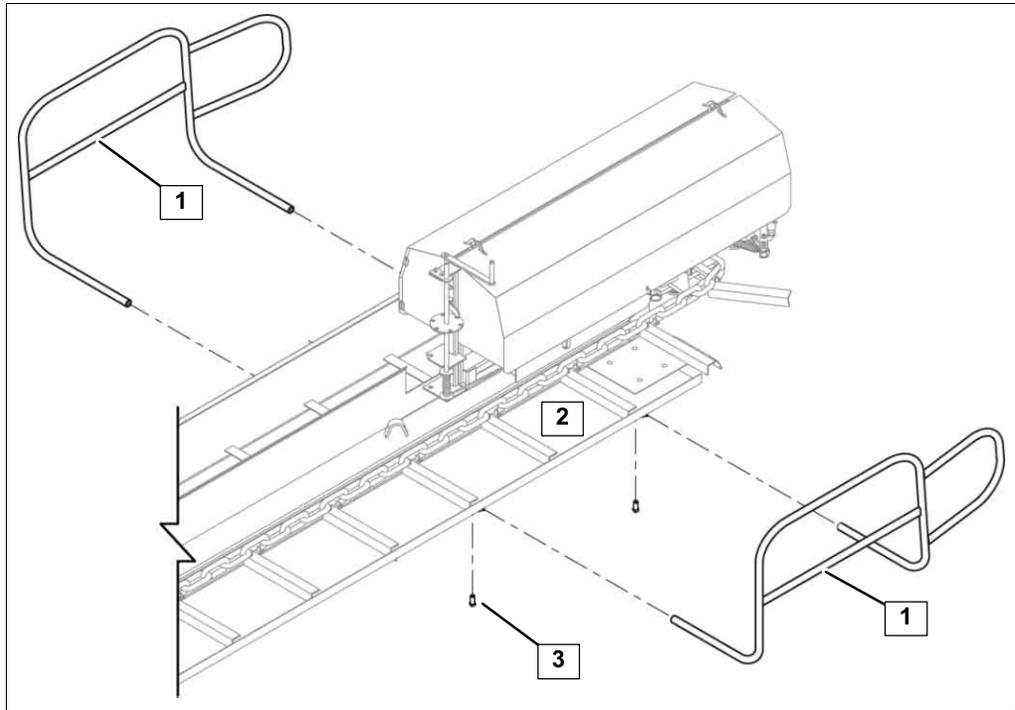
Note!

Do not screw turnbuckle locknuts completely to allow tension adjustment of steel cable. Cables will be installed later.

Step 15: Handrails Assembly (Option)

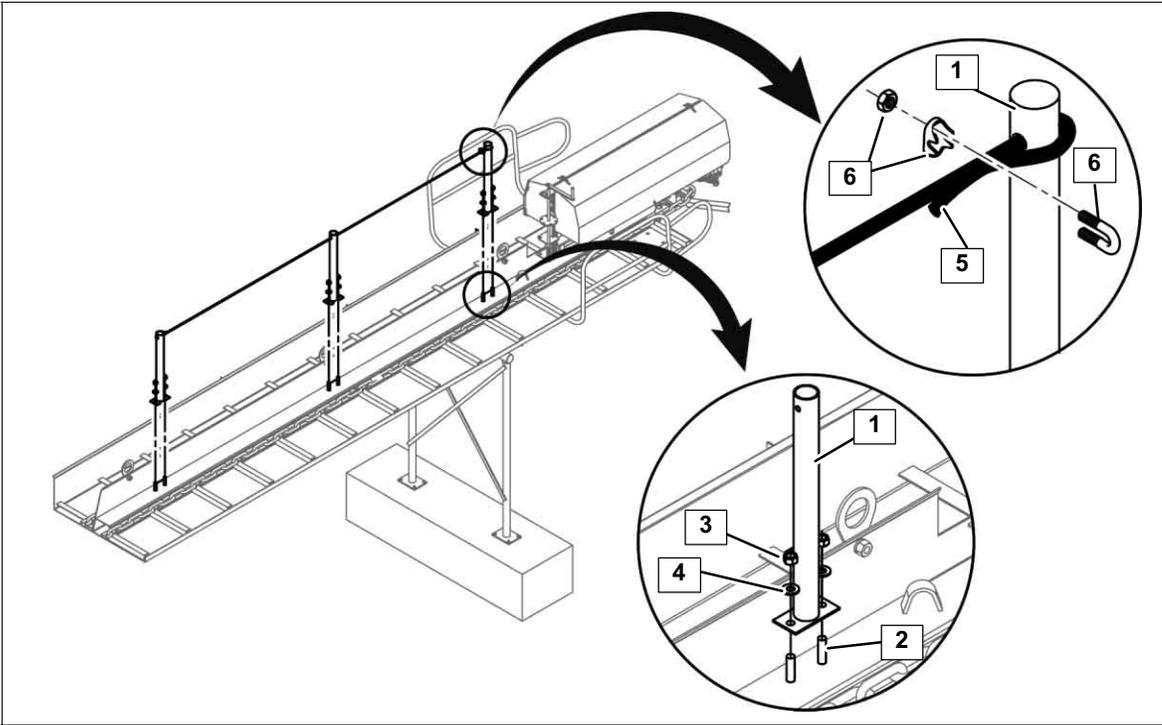


To tighten bolts adequately, refer to the Section: Technical Data - Bolt Torque Chart.



- Install one or two handrails (1) on the elevator (2) and fix it with two bolts (3).

Step 16: Safety Cable Assembly



- Install posts (1) on the elevator studs (2) and fix with washers (3) and nuts (4). Depending on the elevator length, additional posts may be required.
- Insert the stainless steel cable (5) through the posts (1) and fix both ends with cable clamps (6). Make sure cable is tighten between posts.

Tape both end of cable with electrical tape.



Refer to the Section: Technical Data - Cable Clamp Assembly.

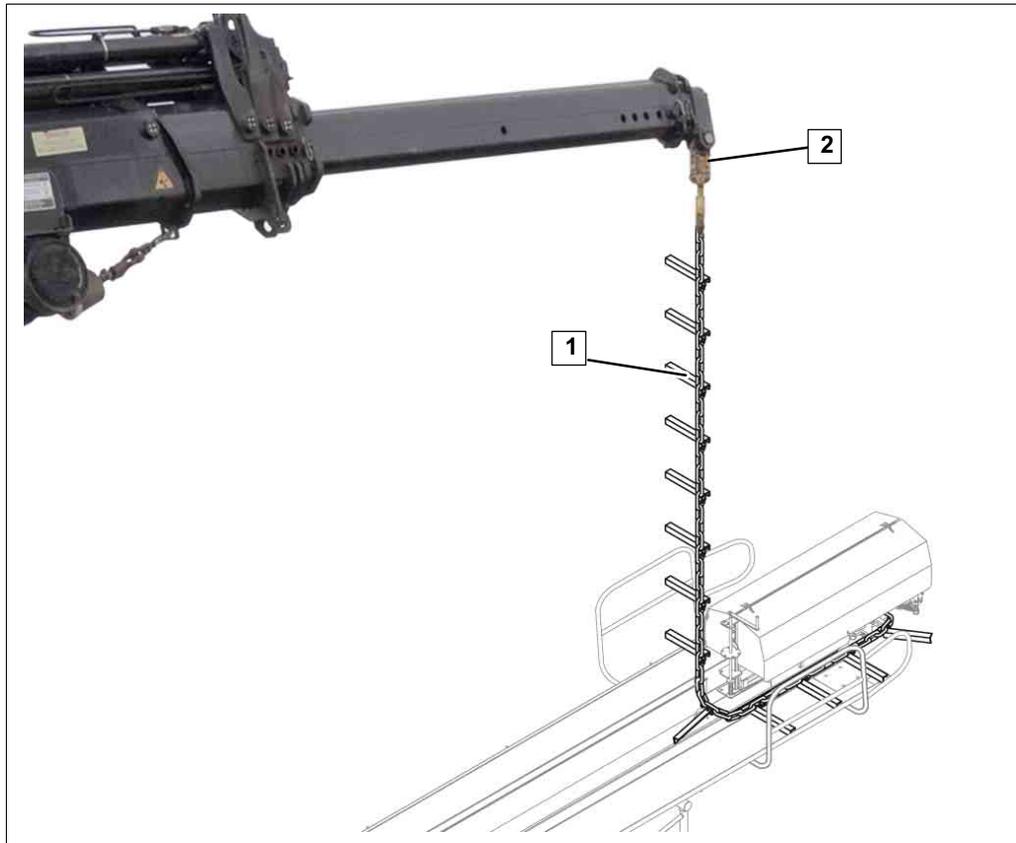
5.8 Chain Sections Assembly

Step 1: Placing Chain Section inside the Gutter



Warning!

Handle barn cleaner chains with care.
Chain links can create pinching points that can cause injuries.



- Attach the barn cleaner chain section (1) to the boom truck hook (2).
- Lift the barn cleaner chain.



Note!

Once the drive unit is assembled on the elevator, place barn chain sections in the elevator and assemble it as explained below.

The following steps explain how to assemble $\frac{7}{8}$ " chain sections inside the elevator.

To assemble another chain model, refer to Step 2 in this section.

- Install barn cleaner chain section (A) in the elevator gutter (B).

Depending on the drive unit rotation, place chain in order to match elevator rotation. Illustration shows counterclockwise rotation.

- Install chain sections in the barn gutter in order to go all over the gutter path.

Check the drive unit rotation in order to install the chain sections in the appropriate direction.

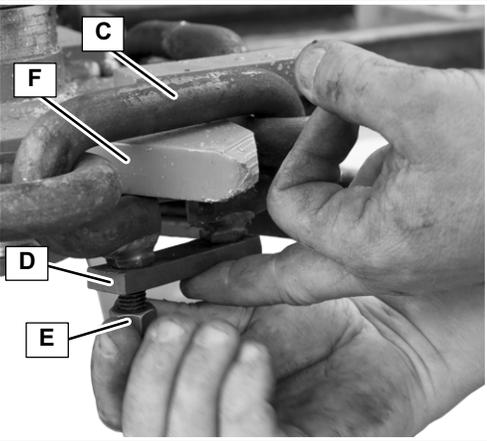
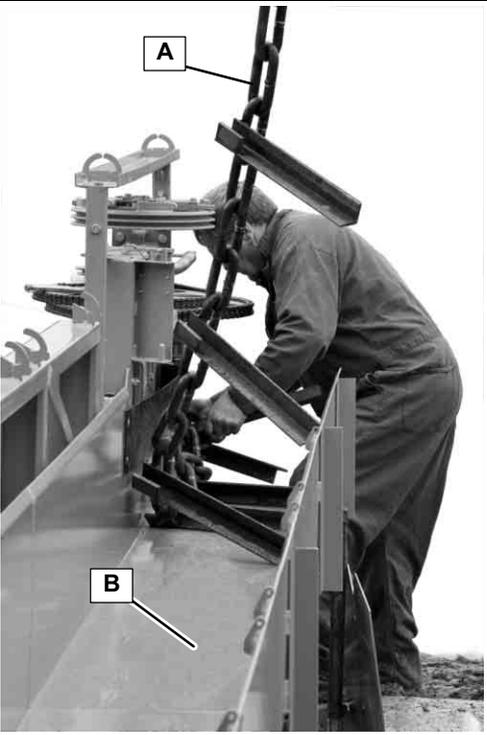
Use repair links (C) to joint chain sections (A).

- Chain sections between the elevator and the barn gutter will be jointed last.

- Assemble the chain sections with repair links (C), flat bar (D) and nuts (E).

Place the repair links in the drive unit sprocket (F).

When using Pintle chain or Hook and Eye Chain, Refer to Step 2 below.



Step 2 : Chain Link Assembly



Refer to the appropriate chain model listed below.

7/8" [22mm] Chain Assembly



Note!

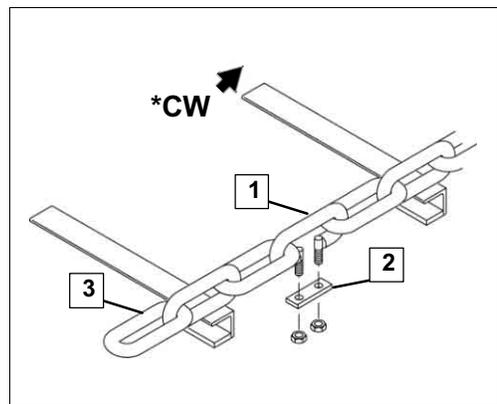
While assembling the chain sections together, make sure the chain is not twisted and the welded joints (3) of links never run inside drive unit sprocket.



To tighten bolts adequately, refer to the Section: Technical Data - Bolt Torque Chart.

- Install a repair link (1) to joint two chain sections.
Position threaded rod downward.
- Bolt the plate (2) under the repair link (1). Torque nuts.
- Repeat these steps to assemble the complete chain.

Follow the pattern: one chain section (3), one repair link (1), one chain section (3), one repair link (1)...



* Illustration shows paddle assembly using clockwise rotation.

Pintle Chain Assembly



Attention!

Make sure to tight link nuts to a torque of 122 N/m (90 ft/lb).

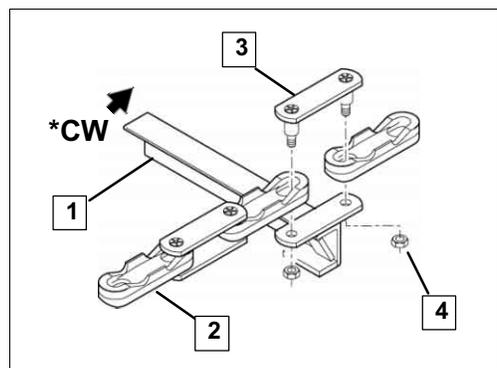


Note!

Flat surface of forged links must always face downward as illustrated.

- Install a paddle (1) to joint two chain sections (2).
- Bolt the paddle (1) with link plate (3) and nuts (4). Torque nuts.
- Repeat these steps to assemble the complete chain.

Follow the pattern: one paddle (1), one chain section (2), one paddle (1), one chain section (2)...



* Illustration shows paddle assembly using clockwise rotation.

Hook and Eye Chain Assembly

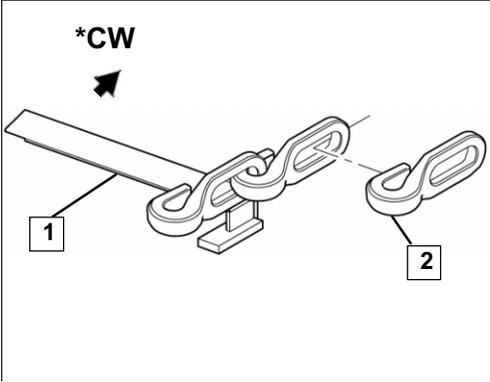


Note!

Chain links must be hooked one after the other. To assemble them correctly, always follow the position of link welded on the paddle. Hook each link on the same direction making sure the hook openings of chain links never face the drive unit sprocket.

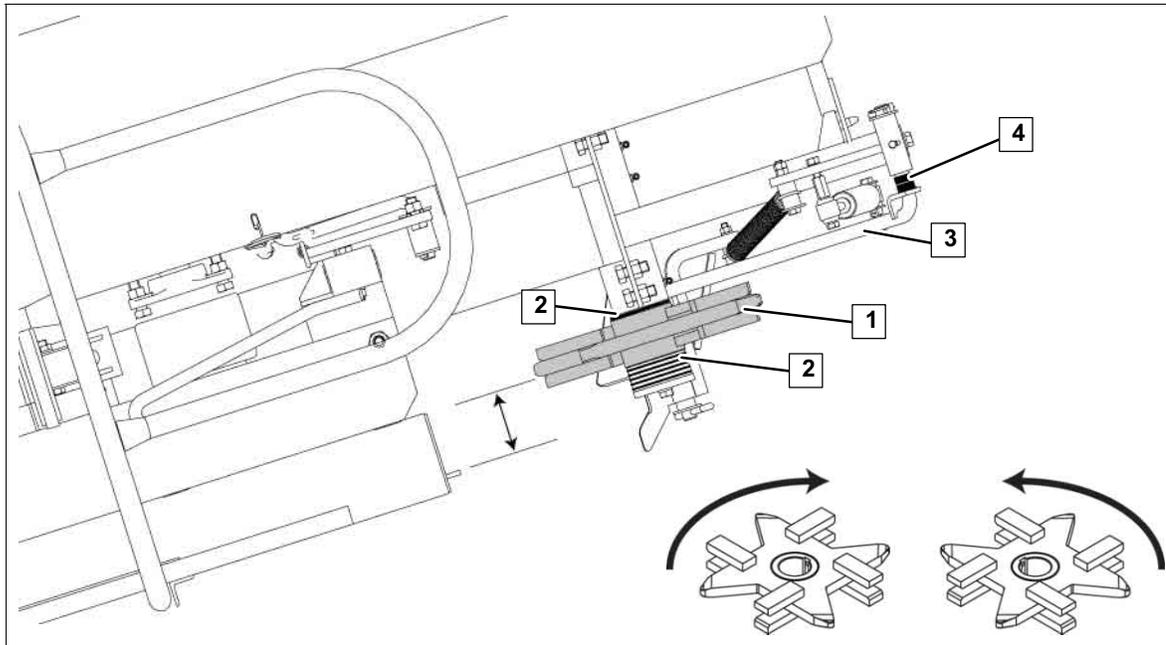
- Assemble one paddle (1) with three chain links (2).
- Repeat this step to assemble the complete chain.

Follow the pattern: one paddle (1), three links (2), one paddle (1), three links (2)...



* Illustration shows paddle assembly using clockwise rotation.

Step 3: Check Sprocket and Paddle Cleaner Adjustment



Check if the sprocket is properly adjusted to the type of paddle and chain. Make sure the sprocket (1) is correctly adjusted to pull the paddles by following the loaded gutter path.

- If the paddles force against the gutter, the sprocket is set too low. Remove one shim (2) from the top of sprocket and place it under the sprocket.
- If the paddles do not touch the gutter, the sprocket is set too high. Remove one shim (2) under the sprocket and place it over the sprocket.

Check if the paddle cleaner (3) is properly adjusted to the type of paddle and chain. Make sure the cleaner is correctly adjusted to clean the paddles.

- If the cleaner is set too low. Remove one spacer (4) from the bottom and place the spacer (4) on top of the shaft.
- If the cleaner is set too high. Remove one spacer (4) from the top and place the spacer (4) at the bottom.

5.9 H-2000 Suspended Elevator Handling and Installation

Step 1: Elevator Installation



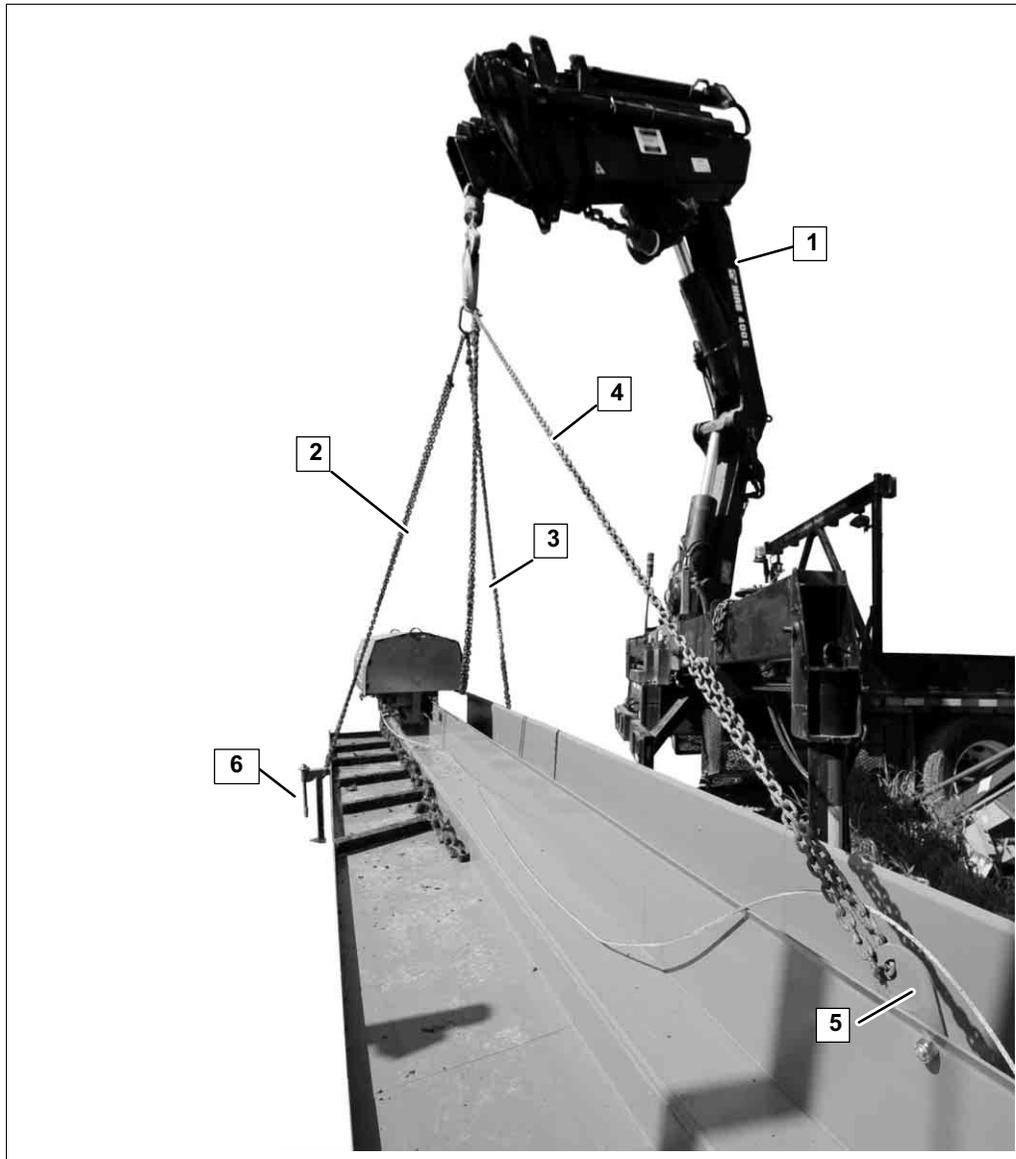
Attention!

To lift this product, use a lifting device with a minimum lifting capacity of 3750 lb [1750 kg].



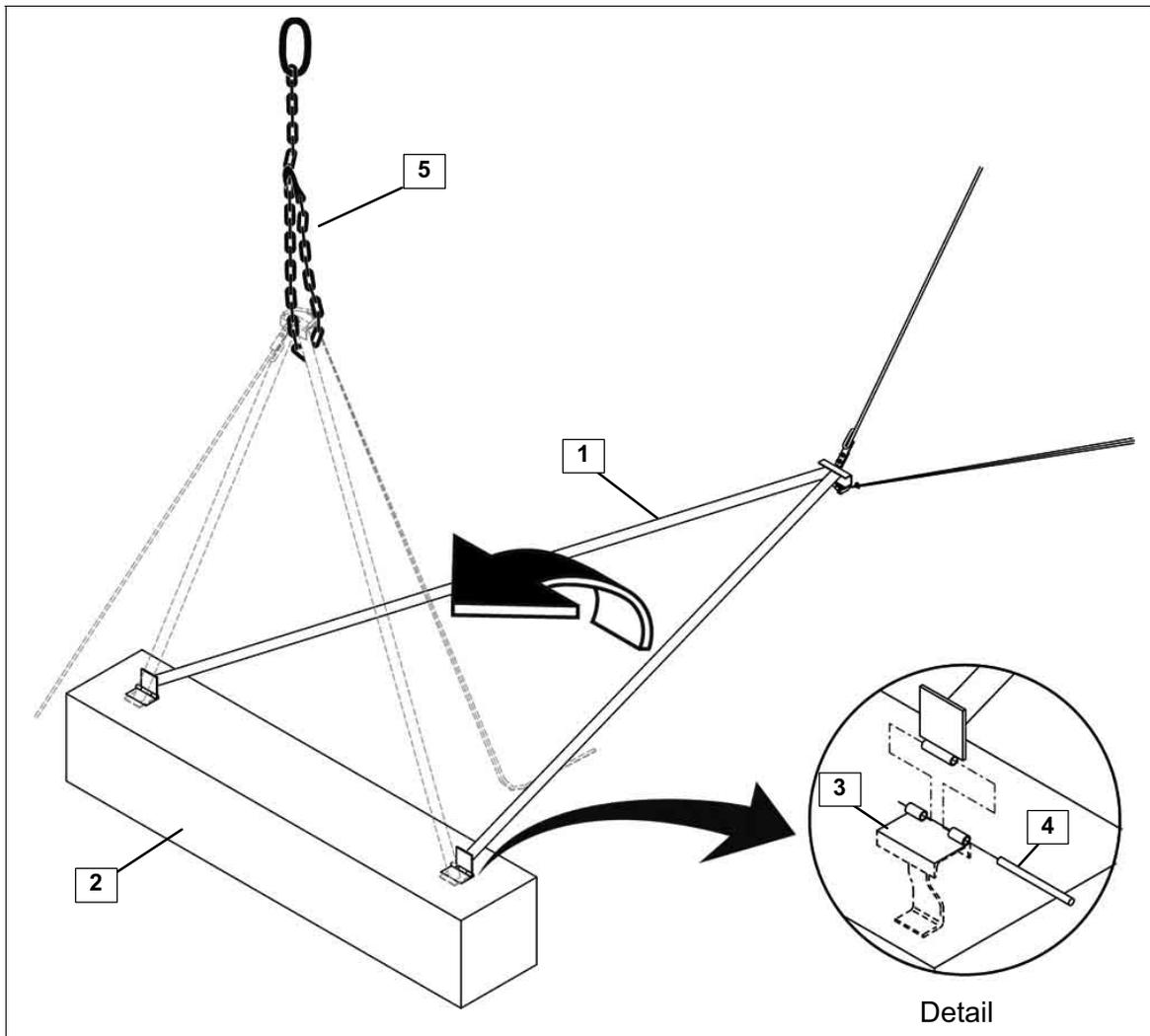
Note!

Make sure the lifting ring bolt is tightened before lifting the elevator.



- Hook three safety chains (2,3,4) between the boom truck (1), the elevator lifting ring (5) and the turnbuckles (6).
- Lift the elevator and put it on the support concrete base. Make sure the bottom of the elevator is even with barn gutter.

Step 2:"A" Support Installation



- Lay "A" support (1) on the concrete base, over the elevator previously placed on.
- Assemble "A" support to anchor (3) using the hinge pin (4) (see Detail).
- Cut cable "A" and cable "B" following the information contained in the table below. Cable "B" is only required for 45' and 50' long elevator.

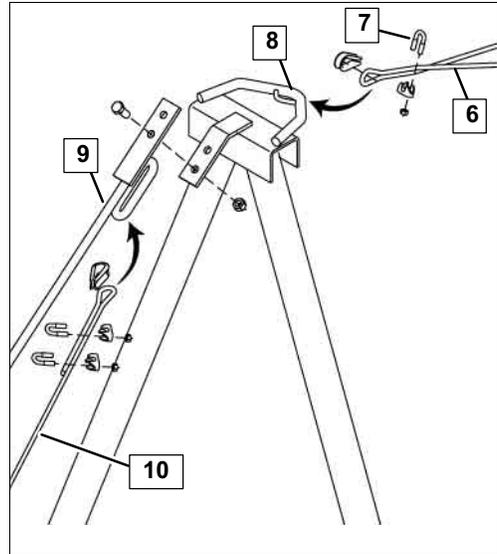
H-2000	Cable A	Cable B
35'	40' (double folded)	-
40'	50' (double folded)	-
45'	50' (double folded)	25'
50'	52' (double folded)	26'

- Install the steel cable "A" (6) and the steel cable clamp (7) at the top of "A" support.

Make sure both ends of the cable are at equal distance before installing the cable clamp (7).

The clamp must be installed at about 8" (20cm) from the ring (8).

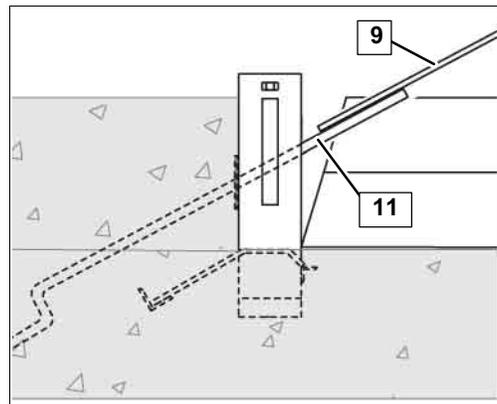
- Install the traction rod (9) to "A" support with the ring facing downward.
- If required, install the steel cable "B" (10) to traction rod (9) ring using two steel cable clamps.



- Using a chain (5), lift the "A" support in upright position.

Once vertical, weld the traction rod (9) to the hold down post anchor rod (11).

- Weld "A" support legs to concrete anchors (4). (See previous page).



Note!

For suspended elevators 45' long or more, 2 traction rods are supplied (one with a ring and a plain one). The plain one must be welded at the end of the other rod.



Refer to the Section: Technical Data - Cable Clamp Assembly.

Step 3: Elevator slope adjustment



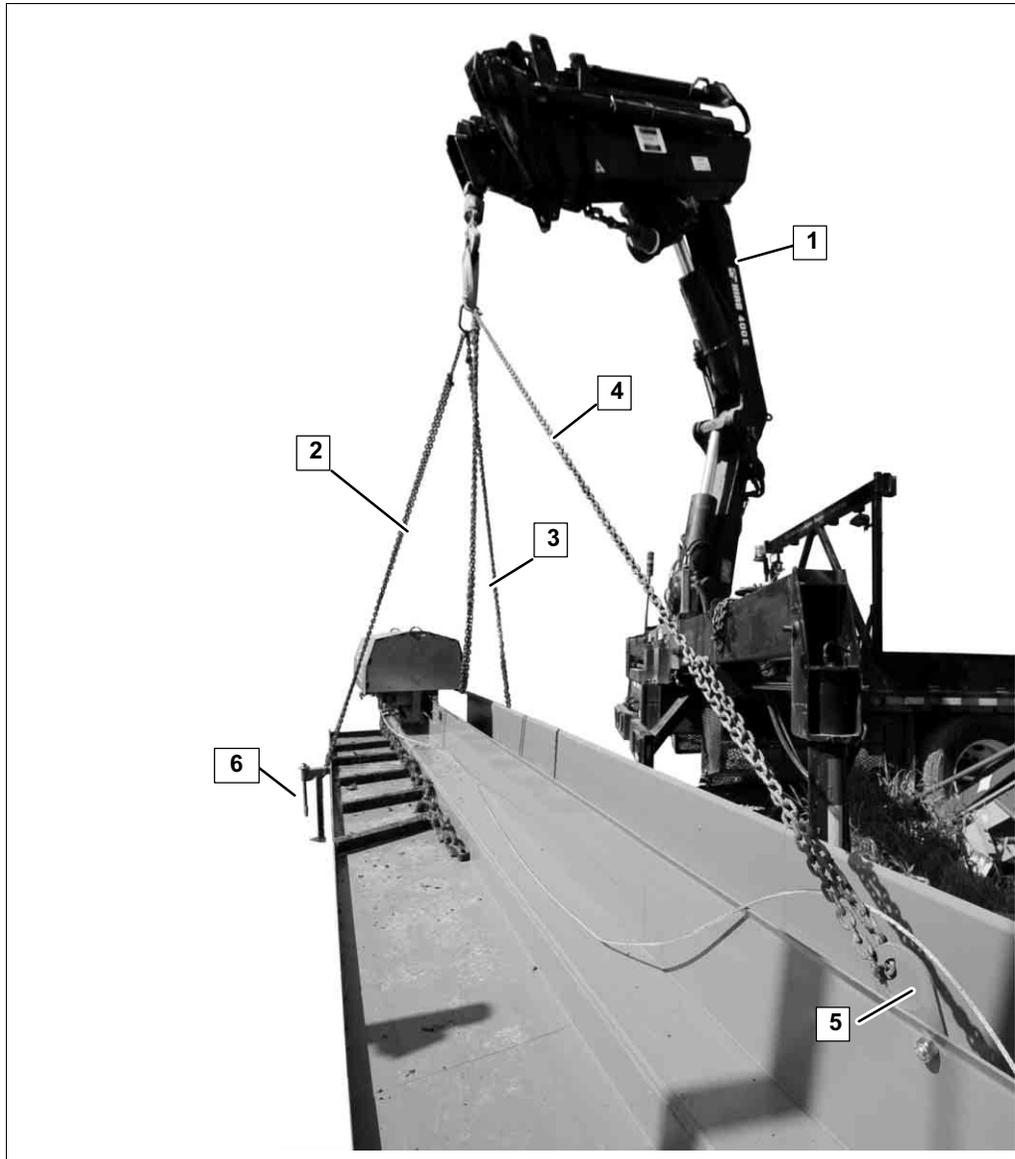
Attention!

To lift this product, use a lifting device with a minimum lifting capacity of 3750 lb [1750 kg].



Note!

Make sure the lifting ring bolt is tightened before lifting the elevator.



- Lift the elevator (drive unit side) to set the slope. Make sure the bottom of elevator is kept even with the barn gutter.



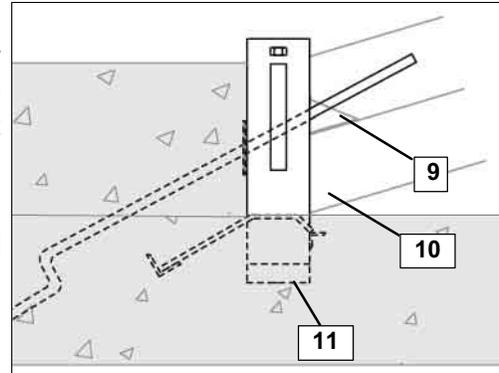
Note!

Elevator standard slope is:

- 3,5 : 12 (S.A.E. ratio)
- 1 : 3,5 (metric ratio)

- Using steel triangles (9) as reinforcement plate, weld them over the junction of the elevator main frame (10) and the hold down post (11).

Before welding, make sure the elevator base is perfectly aligned and levelled with barn gutter.

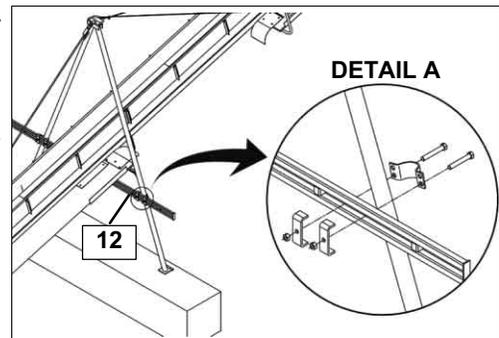


- Install the "A" support cross member (12) under the elevator using provided hardware (see Detail A).

Make sure the support is completely in contact with the elevator.

Torque bolts.

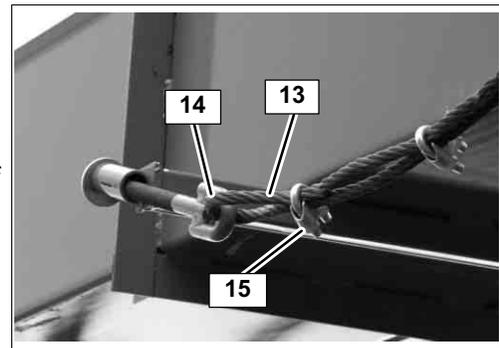
- Weld the cross member (12) to "A" support. Maintain the elevator lifted.



- Insert steel cable "A" (13) into the turnbuckles (14).

One end of steel cable in turnbuckle on left side, other end of steel cable in the turnbuckle on right side of elevator.

- For 45' and 50' elevator, insert cable "B" into the turnbuckle at the bottom of the elevator. (not illustrated)



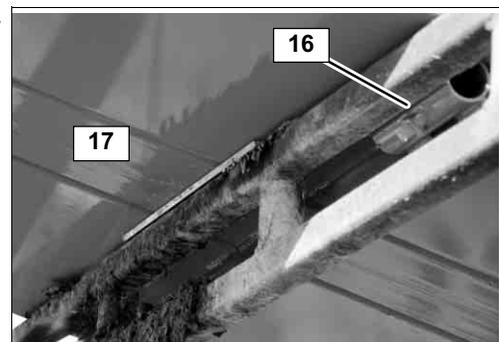
- Tighten each steel cable and install the cable clamps (15) to hold in place.

For an easy adjustment of cable, lift the elevator 5" (152cm) higher than should be.

When releasing, the steel cable will stretch some.

- Install elevator on cross member (16) and weld elevator main frame (17) to cross member (16).

- If required, adjust tension of steel cables using tension if needed.



5.10 Hold Down Shoe Assembly

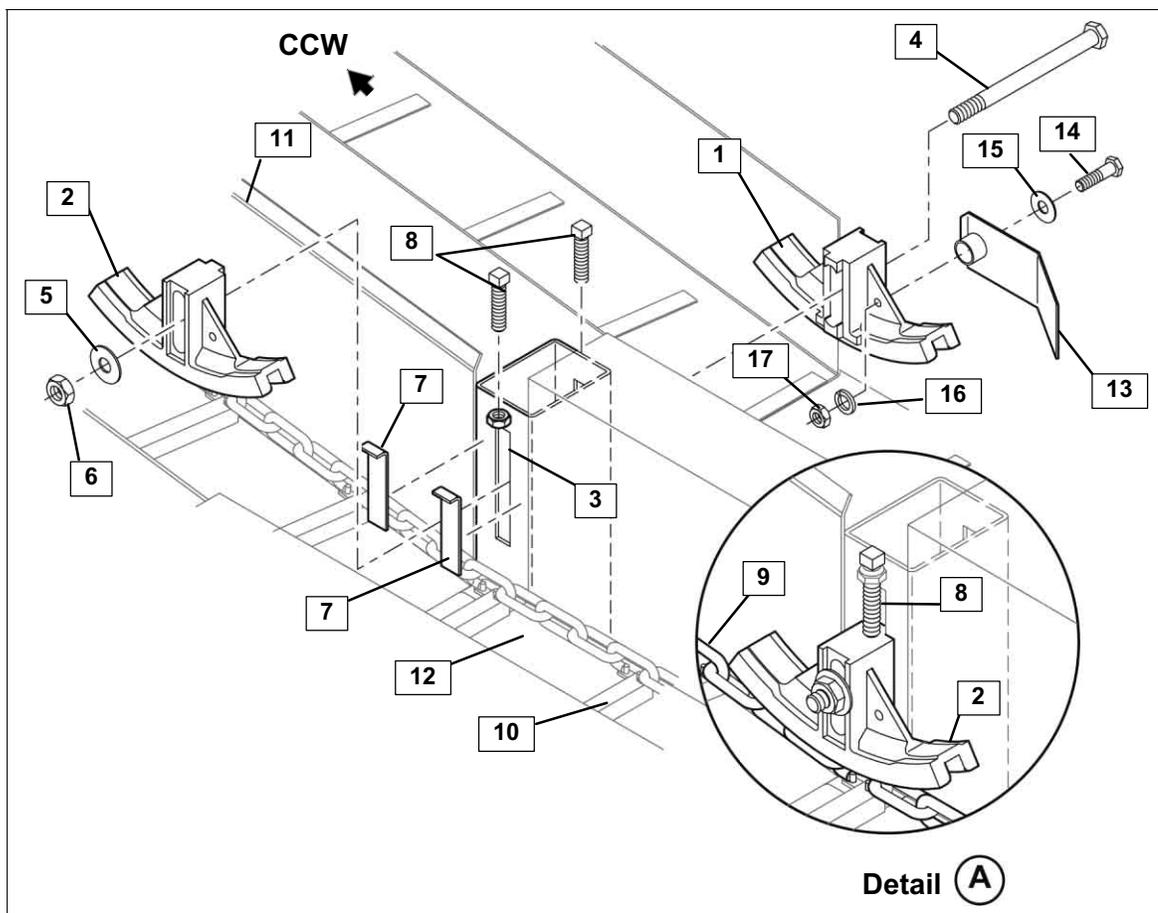


Note!

The following instruction shows an elevator running in counterclockwise rotation.

If the installation runs on clockwise rotation, components have to be flip from one side to the other.

5.10.1 7/8 Chain and Hook and Eye Chain Shoes



- Position both hold down shoes (1,2) on the hold down post slots (3). Fix with bolt (4) washer (5) and nut (6).

Do not tighten.

If needed, add shims (7) on the return gutter shoe (2).

- Install the height adjustment bolts (8) above the hold down shoes (1,2).
- Apply a pressure on the hold down shoes to hold the paddles (10) against gutter floor. See Detail A.
- Screw adjustment bolts (8) to adjust the height of the loaded shoe (1).

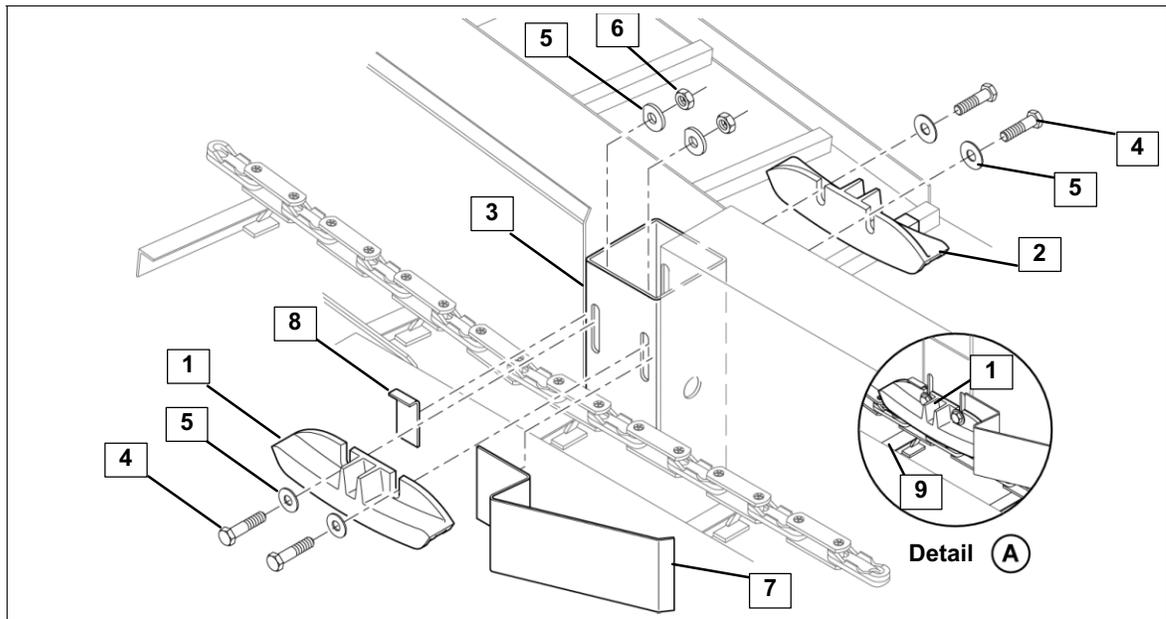
Adjust the gap between the chain paddle (10) and the gutter to 1/4" [6mm].

A gap smaller than 1/4" [6 mm] will force paddles against the gutter and may result in damage.

A gap greater than 1/4" will reduce the efficiency of the system.

- Screw the adjustment bolts (8) to adjust the height of the return shoe (2).
Adjust to get a little tension on the chain (9).
Make sure the paddles run freely under the shoe.
- Tighten the bolt (4) to lock the hold down shoes (1, 2).
- Install the litter deviator (13) on the loaded shoe (1) and position it even with chain.
Fix with bolt (14), washer (15), lock washer (16) and nut (17).

5.10.2 Pintle Chain Shoes



- Assemble both hold down shoes (1,2) on hold down post (3) and fix with four bolts (4), eight washers (5) and four nuts (6).
Do not tighten yet.
- Install the litter deviator (7) with the shim (8) between shoe and hold down post.
Position the deviator on the loaded gutter side, even with the chain.
- Apply pressure on the hold down shoe (loaded side (1)) until there is a gap of $\frac{1}{4}$ " (6 mm) between the paddle and the bottom of the gutter.
Lock the hold down shoe with hardware (4,5,6). Do not set a gap smaller than $\frac{1}{4}$ " (6 mm), otherwise the paddles will be forced against the gutter and it may result in premature wear.
Do not set a gap greater than $\frac{1}{4}$ " (6 mm) otherwise the system efficiency will be reduced.
- Apply a little pressure on the hold down shoe (return side (2)).
Lock the hold down shoe with hardware (4,5,6). Make sure the paddles run freely under the shoe.

5.11 Packing Material Disposal

Handle the packing material properly and dispose according to your local rules and regulations on waste disposal.

Please refer to your local resources for any question. Recycle if possible.

6 Initial Commissioning

6.1 Special Personnel Qualifications Required for Initial Commissioning

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



Read the Section: Safety - Personnel Qualifications.

6.2 Initial Commissioning Check List

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 is safe for use.



Note!

Additional information necessary to complete the checklist can be found in this instruction manual specially in the Maintenance section.

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 lubrication points are lubricated.		
All bolts are torqued.		
All connections are secured.		
A visual inspection is performed to ensure there are no leaks, signs of distortion or defect parts.		
The concrete of the gutter is flat and smooth. (no imperfections)		
Drive Unit	DONE	N/A
The drive unit motor, pulleys and belts are properly assembled and tensioned.		
The drive unit sprocket is correctly adjusted to pull paddles even with the gutter.		
The clutch is adjusted to protect the equipment.		
Elevator	DONE	N/A
The elevator is assembled to get a 16° slope = 1:3.4 ratio = 3.5 pitch.		
The elevator is properly welded to the hold down post.		
The elevator support is adequately assembled.		
The chain tensioner is assembled. (Quick tensioner or manual tensioner)		
The safety cable is installed on the elevator central frame.		
The handrails are installed on top of the elevator. (optional)		
The paddle cleaner is installed and correctly adjusted to clean paddles.		
The hold down shoe is correctly installed.		
Chain and Corners	DONE	N/A
The barn chain sections are assembled adequately and fully lubricated.		
All corners are correctly assembled and adjusted to pull paddles even with the gutter.		



Note!

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

Dealer's signature: _____

Owner's signature: _____

Date: _____

6.3 H-2000 First Start



CAUTION!

Do not start this product until all initial commissioning checks are completed.
Refer to Section: Initial Commissioning Checklist.

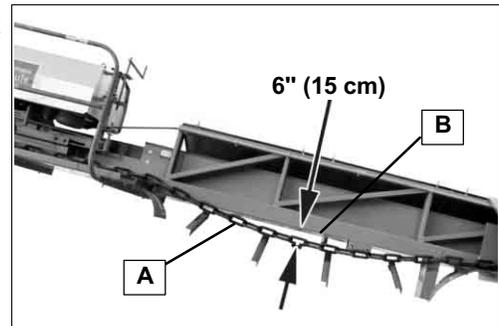
The first start steps intend to test the product in order to validate its functionality and efficiency before handing it over to the customer.

Therefore, the authorized dealer along with the customer must operate the product as well as the operating elements.

To operate adequately, refer to Section: Operation.

Check the Chain Tension

- Ensure that chain (A) is not suspended longer than 6" (15 cm) from elevator edge (B).



- Engage the drive unit to check if the chain is adjusted properly while running. Refer to the picture below for correct chain adjustment.

	Chain too loose or not lubricated
	Chain too tight
	Correct adjustment



If an adjustment has to be done, refer to section Maintenance - Check the Barn Chain Tension.

Reversible Clutch Adjustment



CAUTION!

Do not adjust the clutch when the drive unit is supplied. Perform the adjustment step by step (turn off and lock the power supply, adjust the clutch, then turn the power supply on to test the adjustment).



Attention!

The reversible clutch must be adjusted to release instantly when barn chain is blocked.

It protects the product against damage only. It is not designed to protect livestock.



Note!

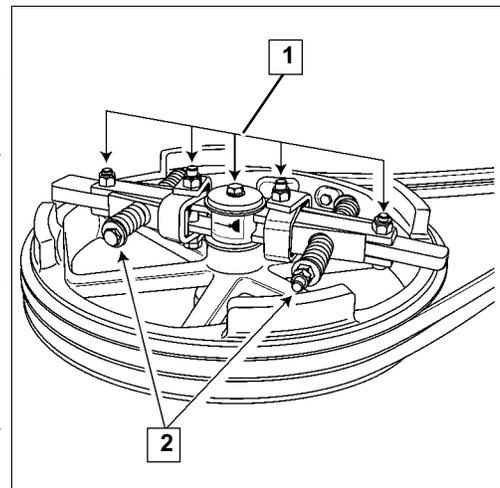
The clutch is designed to release in one direction only.

As the drive unit can either be used for a CW or a CCW rotation, it is very important to install the clutch to release in the appropriate direction.

If necessary, remove the bolt of the center pivot and turn the assembly upside down.

To adjust the clutch:

- Make sure all pivoting parts (1) run freely.
- Make sure the paddles in the gutter carry a full load of manure.
- Loosen the adjustment nuts (2) until the clutch releases when the barn cleaner is engaged.
- Gradually tighten up the nuts until the clutch can stay engaged to evacuate manure from the gutter when it is full.



6.4 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, covers, chains, etc. are in perfect working condition and remain in place to ensure safety;
- the lubricants such as grease, oil, etc. are at an appropriate level;
- there are no leaks;
- all bolts are tight. Refer to Section: Technical Data - Bolt Torque Chart;
- the product works perfectly.
- the barn chain is correctly tensioned.
- the drive unit chain is tensioned correctly.
- the drive unit belts are correctly tensioned.
- the paddle cleaner is adjusted.

6.5 Handing Over to the Owner

Hand-Over Warranty Registration Form

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

7 Operating

7.1 Safety Instructions for Operating



Warning!

Keep the safety devices in place.



Warning!

Do not climb the elevator or stand in the gutter when the drive unit is supplied. The drive unit could start anytime.



CAUTION!

Keep body parts and clothing away from moving parts.



Read the Section: Safety.

7.2 Checks Before Operating

- Lubricants such as grease, oil, etc. are at an appropriate level.
To find the grease points, refer to Section: Appendix - Label Position;
- All bolts are tight. Refer to Section: Technical Data - Bolt Torque Chart;
- Lubricate the full length of the chain using vegetable oil or equivalent.
Refer to the local environmental regulations.

7.3 Operating the H-2000 Suspended Elevator



Note!

The primary operating element for a barn cleaner elevator is the control. (see Control Panel Operator's Manual for details).



Note!

The cleaning parameters for an elevator are set with the control or started manually. (see Control Panel Operator's Manual for details).

8 Operating Faults

8.1 Special Personnel Qualifications Required for Troubleshooting

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



Read the Section: Safety - Personnel Qualifications.

8.2 Safety Instructions for Troubleshooting



Warning!

Do not climb the elevator or stand in the gutter when the drive unit is supplied. The drive unit could start anytime.



Warning!

Always shut off and lock the power supply before working on the equipment.



Warning!

Keep the safety devices in place.



CAUTION!

Keep body parts and clothing away from moving parts.



CAUTION!

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



Read the Section: Safety.

8.3 Troubleshooting Possible Faults

Fault	Possible Cause	Solution
Drive unit is not running.	Control panel is turned off.	Turn the control panel on.
	Emergency stop switch has been pressed.	Check the protection stop switch and activate if necessary.
	Power supply has been disconnected.	Check all connections and wires.
	Cleaning interval is set too long.	See Control Panel Operator's Manual for details.
Drive unit motor is running but the chain is not moving.	Clutch setting is too light.	Readjust clutch.
	The chain is broken or disconnected.	Replace or reconnect the chain.
	The drive belt is slipping, broken or off the pulley.	Adjust or repair the belt.
	A roller chain is broken or off the gear.	Repair the chain.
Drive unit motor is tripping the circuit breaker or overloads.	Manure is frozen in the gutter.	Turn off the drive unit until the gutter thaws. Confirm that the barn ventilation system, side curtains, etc. are set properly for the ambient conditions.
	Corner wheels not lubricated.	Lubricate corner wheels.
	Manure load exceeding the cleaning capacity.	Reduce cleaning intervals.
	Barn chain not lubricated.	Lubricate chain.
	Obstacles impeding the paddles.	Clear the obstruction.
	Defective circuit protection.	Replace defective part.
	Loose or corroded electrical connections.	Check electrical connections.



Note!

For any other faults than those listed above, please contact your authorized dealer.

9 Maintenance

9.1 Special Personnel Qualifications Required for Maintenance Work

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

Electric work and electric maintenance must be performed by a qualified electrician.

Welding work must be performed by a qualified welder.



Read the Section: Safety - Personnel Qualifications.

9.2 Safety Instructions for Maintenance



Warning!



Always shut off and lock the power supply before working on the equipment.



Warning!

Always wear a safety harness before climbing the elevator for maintenance. Always keep the harness attached to the elevator to prevent dangerous fall.



CAUTION!

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



Note!

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



Read the Section: Safety.

9.3 Schedule Maintenance Responsibilities

Task	First 50 hours of operation	Every 25 hours of operation	Every 50 hours of operation / Every week	Every 100 hours of operation / Every month	Every 500 hours of operation / Every 6 months	Every year	Action by
Check the torque of bolts and anchor bolts. Tighten if necessary.	X					X	Trained personnel
Lubricate the corner wheels.		X					
Lubricate the drive unit.		X					
Lubricate the tensioner.		X					
Check the drive belt tension.	X						
Check the chain tension.				X			
Lubricate the barn cleaner chain.			X				
Lubricate the drive unit clutch.				X			
Check wear of components.					X		
Clean the equipment.						X	



Attention!

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

9.4 Lubricate the Corner Wheels

Every 25 hours of operation



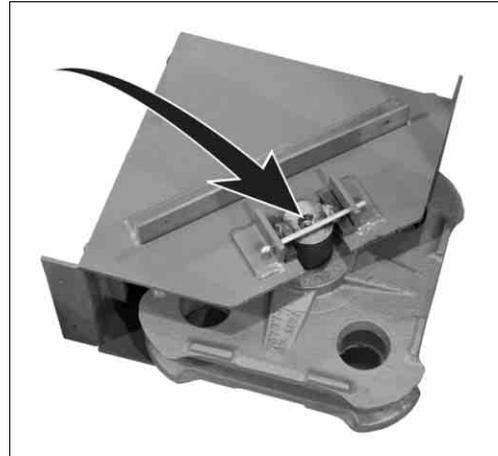
Note!

Use general purpose grease.



Refer to Section: Technical Data - Lubricant Specifications.

- Use a grease gun to lubricate corner wheels.



9.5 Lubricate the Drive Unit

Every 25 hours of operation



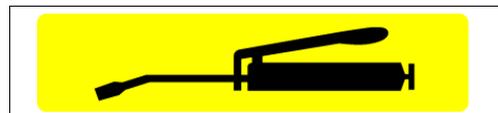
Note!

Use general purpose grease.



Refer to Section: Technical Data - Lubricant Specifications.

- Grease all parts labelled with:



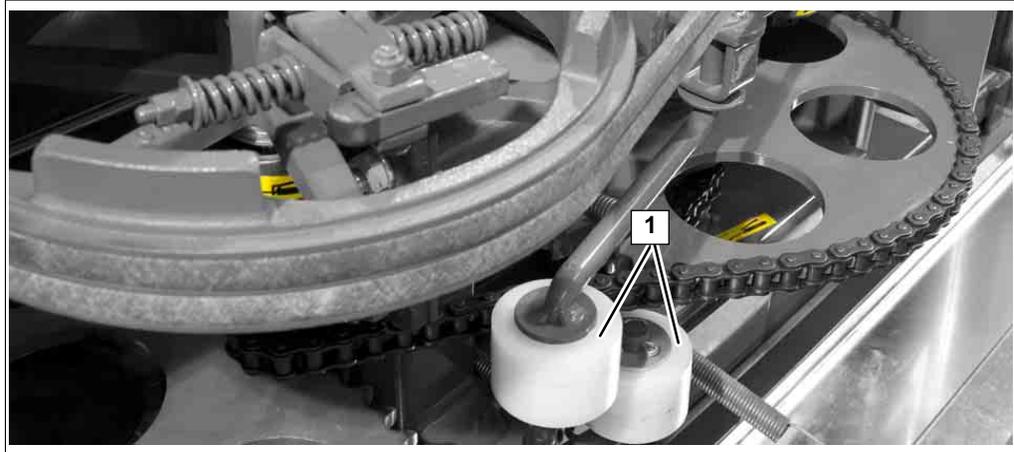
Refer to Section: Appendix - Label Position.

9.6 Lubricate the Tensioner

Every 25 hours of operation

 **Note!**
Use fine oil.

- Lubricate the rollers (1) of the chain tensioner.

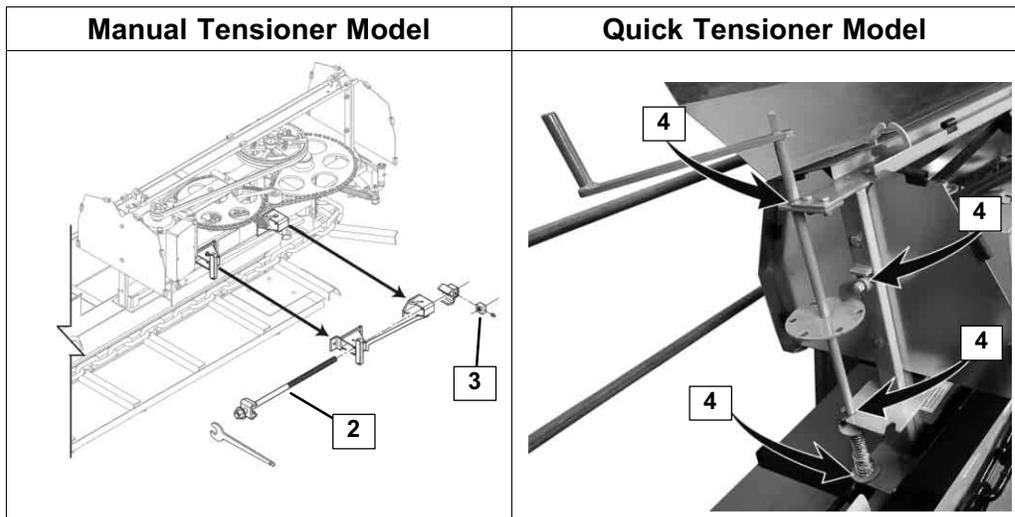


Manual Tensioner Model

- Lubricate the screw (2) and the nut (3) of the manual tensioner.

Quick Tensioner Model

- Lubricate all the pivot points (4) of the quick tensioner.



9.7 Check the Drive Belts Tension

First 50 hours of operation



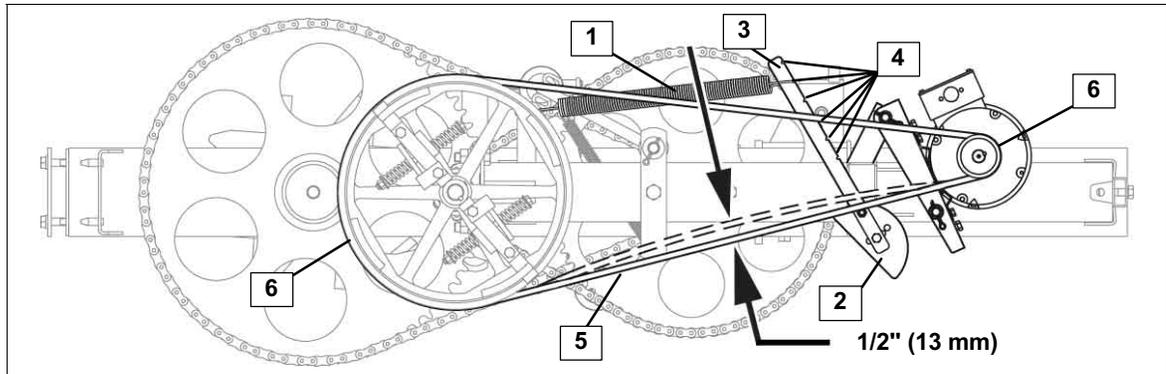
CAUTION!

Spring is under tension. Always wear eye protection and handle the spring with care.



Note!

Belt (5) must deflect roughly 1/2" (13 mm) when applying pressure of 12 lbs (5 kg) midway between pulleys (6).



Check the belt tension making sure it deflects adequately. If required, adjust the tension as follows:

- There are six notches (4) on the tension arm (3) that allow belt tension adjustment.
- Position spring (1) hook on appropriate notch (4) in order to adjust tension. Make sure spring hook is well seated into a notch (4).
- Adjust the lever (2), if necessary, using adjustment holes to increase or to decrease pressure on the motor.

9.8 Check the Barn Chain Tension

Every 100 hours of operation

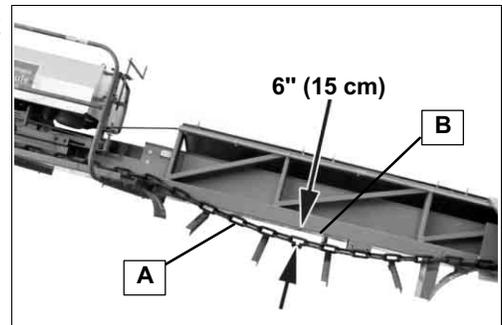
 **Warning!** Always shut off and lock the power supply before adjusting chain tension.

 Unexpected start-up can result in severe injuries caused by the handle.
If drive unit starts when handle lock mechanism is not engaged, the handle will start to rotate in reverse and can severely hit the operator.

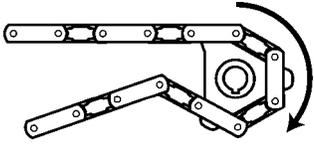
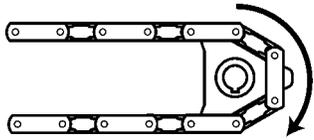
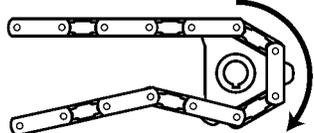
 **Warning!** Be careful when tensioning the chain, handle is under tension. Before releasing the handle, make sure the tensioner lock is engaged into the disc hole.

 **Attention!** Do not adjust the barn chain too loose or too tight. It will result in premature wear of the whole system.

- Ensure that chain (A) is not suspended longer than 6" (15 cm) from elevator edge (B).

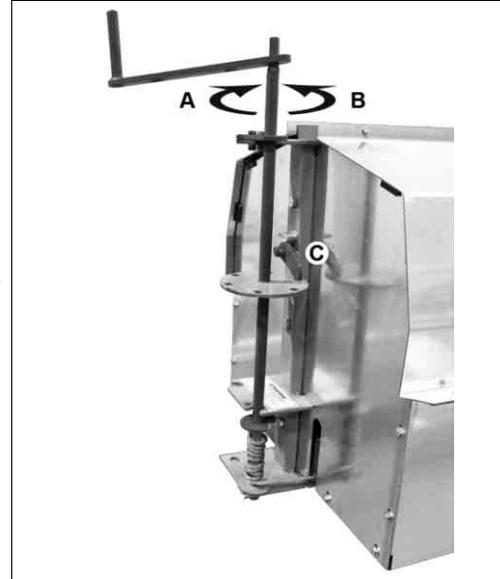


- Engage the drive unit to check if the chain is adjusted properly while running.
- Adjust the chain tension with the chain tensioner (quick or manual) until the correct adjustment is reached.

	Chain too loose or not lubricated
	Chain too tight
	Correct adjustment

Adjust the chain tension as needed to obtain the correct adjustment.

- Turn the handle clockwise to increase tension (A).
- Turn the handle counterclockwise to decrease tension (B).
- Lock the handle by inserting the lock (C) into a hole.



9.9 Lubricate the Barn Cleaner Chain

Every 50 hours of operation or Every week



Attention!

For barns using sand bedding, increase the lubrication frequency to twice a week.



Attention!

Failure to lubricate chain or running chain dry without manure/water will result in extreme wear on chain links reducing chain life dramatically. Make sure the chain is always kept lubricated.



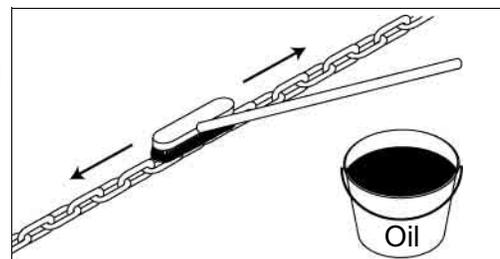
Note!

Use biodegradable oil.



Refer to Section: Technical Data - Lubricant Specifications.

- Lubricate the full length of the chain.
- Dip the brush in the oil bucket and spread the oil all over the chain.

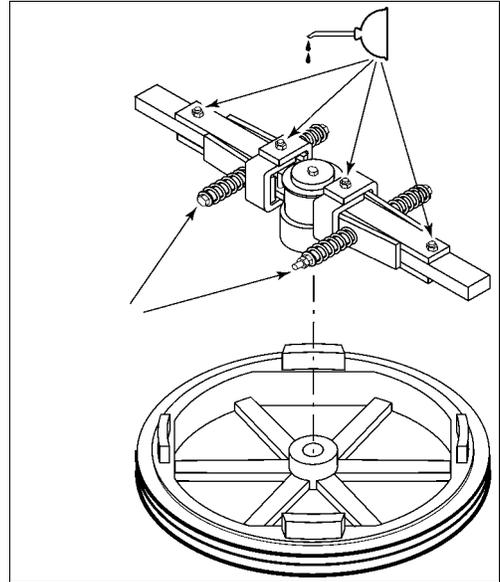


9.10 Lubricate the Clutch

Every 100 hours of operation or Every month

 **Note!**
Use fine oil

- Lubricate all moving parts of the clutch.



9.11 Clean the Equipment

Every year

 **CAUTION!**
Always wear eye protection when cleaning the equipment.

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

- Pressure wash the entire equipment.
- Clean manure buildup from scrapers and corner wheels.



10 Advanced Maintenance

10.1 Reversible Clutch Adjustment



CAUTION!

Do not adjust the clutch when the drive unit is supplied. Perform the adjustment step by step (turn off and lock the power supply, adjust the clutch, then turn the power supply on to test the adjustment).



Attention!

The reversible clutch must be adjusted to release instantly when barn chain is blocked. It protects the product against damage only. It is not designed to protect livestock.

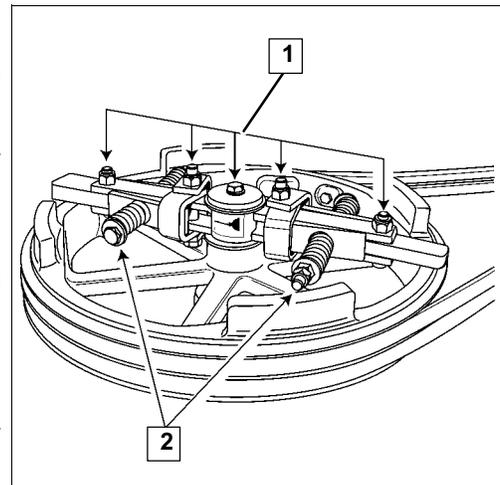


Note!

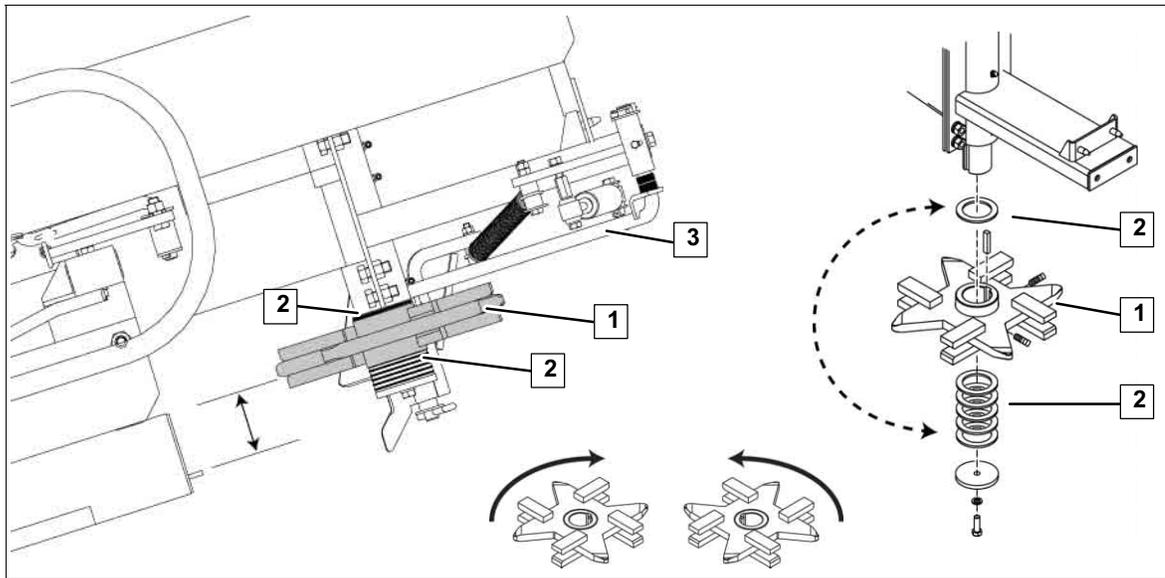
The clutch is designed to release in one direction only. As the drive unit can either be used for a CW or a CCW rotation, it is very important to install the clutch to release in the appropriate direction. If necessary, remove the bolt of the center pivot and turn the assembly upside down.

To adjust the clutch:

- Make sure all pivoting parts (1) run freely.
- Make sure the paddles in the gutter carry a full load of manure.
- Loosen the adjustment nuts (2) until the clutch releases when the barn cleaner is engaged.
- Gradually tighten up the nuts until the clutch can stay engaged to evacuate manure from the gutter when it is full.



10.2 Drive Unit Sprocket Adjustment



The sprocket must be adjusted to pull the paddle in a straight line keeping the paddles slightly in contact with the bottom of the gutter.

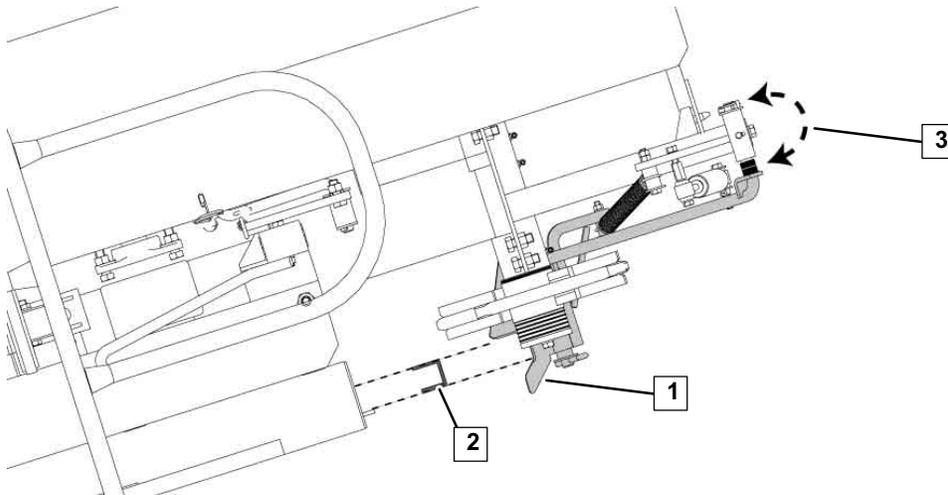
- If the paddles force against the gutter while running, the sprocket is set too low.

Remove one shim (2) from the top of sprocket and place it under the sprocket.

- If the paddles do not touch the gutter while running, the sprocket is set too high.

Remove one shim (2) under the sprocket and place it over the sprocket.

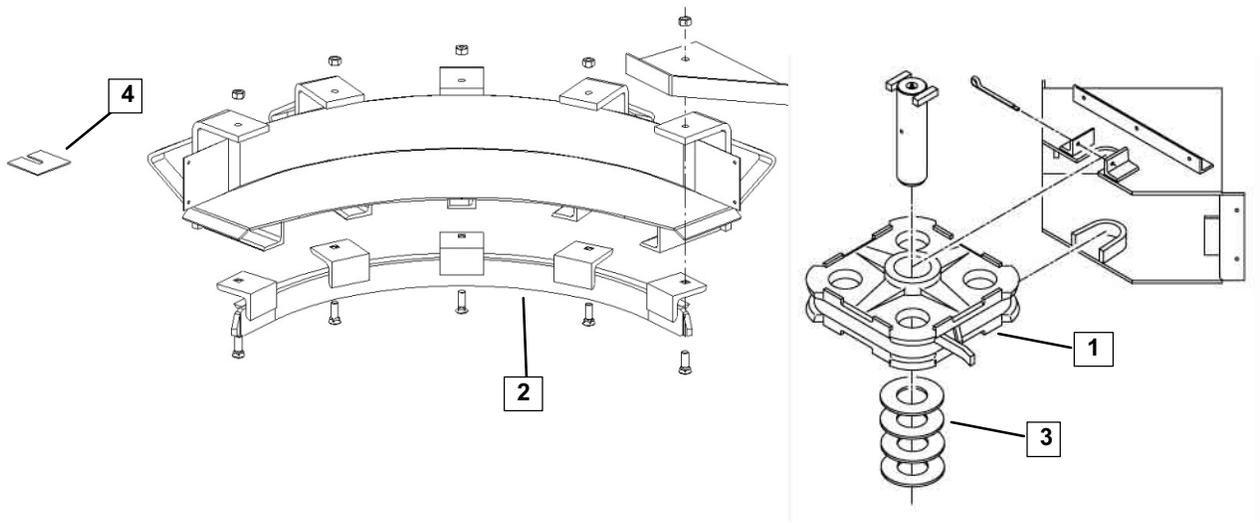
10.3 Paddle Cleaner Adjustment



The paddle cleaner (1) must be adjusted at the proper height to follow paddles path (2) and ensure cleaning.

- If the cleaner is set too low. Remove one spacer (3) from the bottom and place the spacer (3) on top of the shaft.
- If the cleaner is set too high. Remove one spacer (3) from the top and place the spacer (3) at the bottom.

10.4 Corner Adjustment



* Illustrated model may differ, but the assembly is similar for all corner models.

The corner must be adjusted to pull the paddle keeping them slightly in contact with the bottom of the gutter.

- If the paddles force against the gutter while running, the corner is set too low.
- If the paddles do not touch the gutter while running, the corner is set too high.
- Adjust the wheel (1) or shoe (2) by adding or removing washers (3)/shims (4).

11 Decommissioning

11.1 Safety Instructions for Decommissioning



Warning!



Always shut off and lock the power supply before working on the equipment.



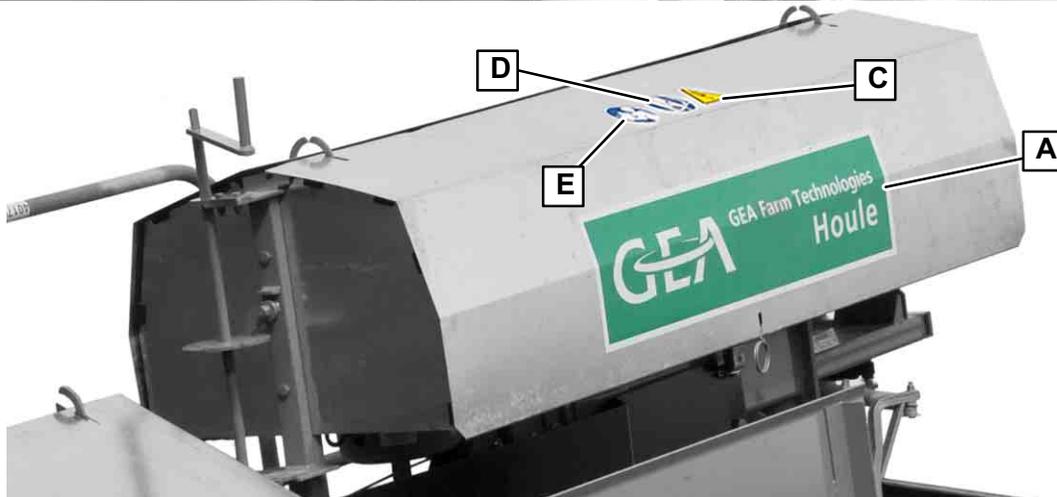
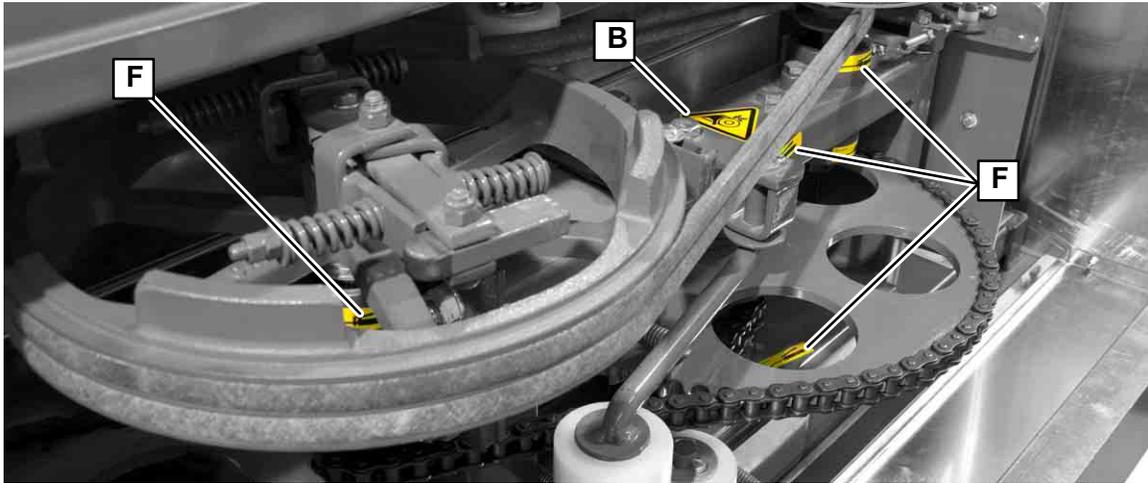
Read the Section: Safety.

11.2 Final Decommissioning/Disposal

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

12 Appendix

12.1 Label Position



<p>A</p>	<p style="text-align: right;">US + EU</p>  <p>2005-4703-560</p>	<p>B</p>  <p style="text-align: right;">US + EU</p> <p>2099-4725-110</p>	<p>C</p>  <p style="text-align: right;">EU</p> <p>2099-4725-240</p>
<p>D</p>	 <p style="text-align: right;">EU</p> <p>2099-4725-150</p>	<p>E</p>  <p style="text-align: right;">EU</p> <p>2099-4725-130</p>	<p>F</p>  <p style="text-align: right;">US + EU</p> <p>2099-4701-240</p>
<p>G</p>	 <p style="text-align: right;">US + EU</p> <p>2099-4725-270</p>		

US = American label / EU = European label

12.2 Abbreviations

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



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