

GEA Farm Technologies

Free Stall Cleaner with Chain Free Stall Cleaners

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

**2005-9015-002
08-2011**

GEA Farm Technologies - The right choice.

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1 Preface

1.1 Information on the instructions

These instructions are supplied with the product.

- They are designed modular and are only in relation to the mentioned product.
For details of the components which are relevant to the product, please refer to the appropriate manuals.
This applies especially for safety information!
- They should be kept close at hand and remain with the equipment even if the equipment is sold.
- This manual is not subject to an amendment service. The most recent version at any time can be obtained through the technical dealer or directly from the manufacturer.

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.

Abbreviations, units, specialist terms, special names or specialist terminology are explained in more detail in the "Appendix".

Pictograms used



This pictogram indicates information that will help towards a better understanding of the working processes.



This pictogram indicates a special tool required for installation.



A correction bar in the margin indicates changes to the previous edition.




This pictogram refers to another document or chapter.


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

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

1.2 Manufacturer's address

GEA Houle Inc.
4591 boul. St-Joseph
Drummondville, Qc, J2A 0C6

 +1 819 477 - 7444

 +1 819 477 - 5565

 geahoule@geagroup.com

@ www.gea-farmtechnologies.com

1.3 Customer service

Authorised Technical Dealer


If necessary, please contact your nearest authorised 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-farmtechnologies.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-farmtechnologies.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 Houle Inc. 4591 boul. St-Joseph Drummondville, Qc, J2A 0C6	
Product category:	Free Stall Cleaner	
Name / Model:	Free Stall Cleaner with Chain	
The named product is in conformity with the requirements of the following European directives: 2006/42/EC Machinery Directive		
Conformity with the requirements of these directives is testified by complete adherence to the following standards:		
<ul style="list-style-type: none"> Harmonized European standards <ul style="list-style-type: none"> EN 953 (2009-07) Safety of machinery Guards EN 12100-1 (2009-10) Machine safety, basic terms, general design guidelines. Part 1: Basic terminology, methods EN 12100-2 (2009-10) Machine safety, basic terms, general design guidelines. Part 2: Technical guidelines and specifications EN ISO 13857 (2008-06) Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs EN ISO 14121-1 (2007-11) Safety of machinery - Risk assessment - Part 1: Principles EN ISO 14121-2 (2008-02) Safety of machinery - Risk assessment - Part 2: Practical guidance and examples of methods EN 60204-1 (2007-06) Electrical equipment of machines NF X 08-003-1 (2006-07) Graphic and pictographic symbols - colors and safety signs 		
Person responsible for compiling the relevant technical documents:	Josef Schröer GEA Farm Technologies GmbH Siemensstraße 25-27 D-59199 Bönen ☎ +49 (0) 2383 / 93-70	
Bönen, 05.01.2010		Reinhard Frenser (Head of Research and Development)
The undersigned is acting by virtue of power of attorney from the management of: GEA Houle Inc., 4591 boul. St-Joseph, Drummondville, Qc, J2A 0C6		
This declaration certifies compliance with the guidelines indicated, but does not establish any guarantee in the sense of paragraphs 443, 444 BGB. This declaration of conformity becomes invalid if design changes are made which affect the technical data given in the instructions and the correct use of the product, thereby significantly altering the machine!		

1.5 GEA Houle Inc. - General Equipment Warranty



Important notice!

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

1.5.1 Limited warranty

GEA Houle Inc. (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 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 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 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 the freezing point (0°C/32°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 OR REPRESENTATIONS OR PROMISES THAT DIFFER IN ANY WAY FROM THE TERM OF THIS LIMITED WARRANTY, OR MODIFY THE PROVISIONS, DURATION AND CONDITIONS OF THIS LIMITED WARRANTY. NO WAIVER OR MODIFICATION OF THIS LIMITED WARRANTY IS VALID UNLESS AGREED TO IN WRITING AND SIGNED BY THE AUTHORIZED REPRESENTATIVES OF THE COMPANY.

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

1.6 Specific Limited Warranty for Free Stall Cleaner with Chain

This specific limited warranty extends to the Purchaser of all free stall cleaners with chain (individually, the "Cleaner System") sold by the Company. All conditions stated in this specific limited warranty are in addition to the General Equipment Warranty that applies to all equipment sold by the Company (see Section 1.5 above).

1.6.1 SPECIFIC EXCLUSIONS AND RESTRICTIONS (IMPORTANT NOTE)

Losses and damages associated with the injuries or deaths of animals.

The warranty applying to the free stall cleaner specifically excludes all losses and damages associated with injuries or deaths of animals. It is important to note that the free stall cleaner does not detect the contact with animals. As a result, when the cleaner is operating, the animals that are standing or lying in the manure alley may be injured or killed by being thrown under the gates or against the cross gutter level.

Mandatory "4th Reduction" Functionnality. The "4th Reduction" functionnality is mandatory in any one (or a combination of) the following situations where the free stall cleaner is being used:

- the barn is comprised of two (2) alleys that are longer than one hundred fifty feet (150 ft), or four (4) alleys;
- the free stall cleaner is used more than five (5) times a day, or is running more than two (2) hours daily;
- the free stall cleaner is used with more than two (2) scrapers in the same circuit.

If the Purchaser fails to comply with its obligations to purchase the "4th Reduction" functionnality, the Purchaser agrees to save the Company and the Dealer harmless in respect of any liability or obligation resulting from the present warranty.

1.7 Warranty Applicable to GEA Houle Inc.'s Chains for Free Stall Cleaner, including for 7/8" Chains and Pintle Chains**1.7.1 Limited warranty**

GEA Houle Inc. (hereinafter referred to as "the Company") warrants to the original buyer and end user (hereinafter referred to as the "Purchaser") that the free stall cleaner chain sold under the Company trademark (the "Chain(s)") is free from defects in material or workmanship for a period of twelve (12) months from the date of delivery of the Chain to the Purchaser. More specifically, this warranty covers the following items:

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

This warranty does not cover the chains for barn cleaner systems.

1.7.2 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.

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.

1.7.3 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;
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. In either case the notification must be made within twelve (12) months following the date of delivery of the Chain to the Purchaser;
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;

Preface

Warranty Applicable to GEA Houle Inc.'s Chains for Free Stall Cleaner, including for 7/8" Chains and Pintle Chains

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.

1.7.4 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 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 the freezing point (0°C/32°F), as well as all damages resulting from faulty concrete work);
- Damages to Chain due to normal wear and tear or to external causes, including 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 the presence of solids in the alleys, such as stone, wood, iron, concrete, strings, 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.

1.7.5 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 OR 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.

1.7.6 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 ANY DEFECTIVE CHAIN UP TO THE CONTRACT VALUE FOR SUCH PURCHASED CHAIN. 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.

2 Safety

2.1 Owner's obligation of care

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

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

In particular, the owner must ensure that

- Everyone who works with or performs activities in connection with the product carefully reads the instructions (especially the safety instructions and warnings).
- No one must enter into a manure pit at any time, except qualified personnel having knowledge on procedures in confined spaces.
- Safety equipment is available on site (hearing protection, eye protection.). Everyone who works with or performs activities in connection with the product must use safety equipment.
- All local requirements on safety procedures in confined spaces have been followed. Refer to the Basic Safety Instruction section.
- The power source is shut off and locked before lubricating, servicing and adjusting.
- The equipment have been installed in an environment free of explosive gases.
- Safety fences have been installed around the reservoir and/or equipment to protect people and livestock against hazardous fall. Safety fences must meet local requirements regarding workers safety.
- Enough light is provided in each operation and maintenance area to light up equipment, controls and safety stickers. To ensure adequate visibility of safety stickers applied on the equipment, lights must provide 200 lux minimum at these areas.
- The motor installed on the equipment meets local regulations and the technical specifications in this manual.
- The control panel of the equipment meets local regulations and the technical specifications in this manual.
- The safety guards for the corner wheels and for the belts, pulleys and chains of the drive unit are kept in place.
- Never allow bystanders to stay close to the equipment when lifted and / or in operation.
- A full set of legible instructions is always kept by the product so that anyone who has to carry out work on the product can look at the instructions at any time.

- The instructions in the section entitled "Basic safety instructions" are followed.
- The legal requirements are met.
- Operating instructions are produced for the farm. These must be especially adapted to the conditions of the business, once again, expressly taking account of safety aspects.
- The product
 - is only used for its intended purpose.
 - should only be operated if it is in perfect working order.
Particularly check the operation of the safety equipment on a regular basis.
- The work to be carried out is performed by a sufficiently qualified person!



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

- The personnel is regularly instructed in all relevant matters of safety at work and protection of the environment and is familiar with the manual, particularly the safety instructions it contains.
- Operating personnel who requires training only work on the product under the supervision of an experienced person.
- Safety signs, manufacturer's plate and decals, attached to the product, must be replaced immediately if they become illegible or are lost.
- Escape routes are marked by means of signs in accordance with national regulations!
- The personnel protective equipment required for personnel carrying out operation, maintenance and repairs is made available and used.
- Unauthorized persons (e.g. children) are not allowed in hazardous areas.

2.2 Explanation of the safety symbols used

Safety symbols draw attention to the importance of the adjacent text.
The design of the warnings is based on ISO 3864-2 and ANSI535.6.

Safety symbols and signaling word



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.
Injury may result if the danger is not avoided.



Attention!

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

2.3 Basic safety instructions

Safety procedures in confined spaces



Danger!



Manure produces toxic gases that may cause death in a second. When agitated, the manure produces heavy toxic gases such as hydrogen sulfide (H₂S), carbon dioxide (CO₂), methane (CH₄) and ammonia (NH₃). It is **MANDATORY** to follow the Safety Procedures for Confined Spaces before operating or servicing the equipment. These safety procedures clearly explain the risks associated with manure, procedures for a safe access to workspaces and the minimum ventilation requirements to ensure the safety of humans and livestock. Find local safety procedures for confined spaces in Web Sites below.

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



WARNING!

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





Note!

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

- All electrical work must be carried out by a certified electrician.
- Follow the maintenance and safety instructions on the labels affixed to the equipment.
- Do not remove the safety guards for the drive unit and the corner wheels.
- Keep hands, feet and clothing away from all moving parts.
- Never use the equipment if any part of the equipment seems damaged or shows signs of abnormal wear.
- Make sure that no one stands close to moving parts before starting the motor.
- Never allow bystanders to stay close to the equipment when it is lifted and / or in operation.
- Before working on equipment (components, housings, etc.), disconnect it from the electrical power source.
Secure main switches or emergency stop switches with a padlock to ensure they cannot be switched back on again and install a warning sign.
- In particular, make sure that the tightening torques specified are complied with.
- All electrically conductive parts with which the animals might come into contact must be connected to each other and to the installation's protective earth conductor by an additional equipotential bond.
- The operation and maintenance of equipment in livestock farms has inherent risks. Read and follow the instructions carefully (especially the section on "Safety") to ensure your own safety!
- The chapter on "Technical data" gives the permissible working conditions (pressure ranges, temperature ranges, etc.) and these must be followed!
- Do not open or dismantle devices (risk of injury)!
- Do not remove any protective devices (risk of injury)!
- When working with products from other manufacturers always observe the warnings from the safety data sheets and operating instructions from the product manufacturer!
- Follow measures on protection against noise!
- Do not stand underneath suspended loads.
- Always keep the control cabinet, all electricity supply units, and electrical control units closed. Access is only permitted to authorized personnel with a key or special tool.
- Protect live and high-voltage components against moisture. Under no circumstances may water jets or high-pressure cleaners be directed at these!

2.4 Personnel qualification

All personnel who perform work on or with the product must carefully read and understand the instructions and act in accordance with them!

- The operator may only carry out work on the equipment if trained, instructed and authorized to do so by the owner.
- National driver's licence for drive-on machines, stackers and other trucks.
- All equipment handled/moved with lifting devices must be performed by qualified personnel only in accordance with slinging techniques.
- Any work in a reservoir must only be carried out by qualified personnel having knowledge on safety procedure in confined spaces.
- Electrician's licence for any electrical work. The electrician must follow national standards and requirements.
- All welding work must only be performed by trained welders.

In addition, special qualifications are required for the following activities:

- Transport
- Cleaning
- Installation
- Commissioning
- Operation
- Maintenance / servicing
- Troubleshooting
- Repairs
- Shut-down

**Note!**

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

2.5 Protective devices

- Safety guard



Safety guards for drive unit

Upper guard (part no. 2005-7700-970)
Lower guard (part no. 2005-1400-070)
Back end guard (part no. 2005-1400-080)
Front end guard (part no. 2005-1400-090)



Safety guards for corner wheel

7/8" chain model (part no. 2005-7701-090)
pintle chain model (part no. 2005-7700-441)

- Safety symbols, warnings, warning signs and labels



Danger! - High voltage. (American model)

Always turn off and lock main power before service and maintenance.
Read the operator's manual for safety information and for operating, servicing and maintenance instructions.
(part no. 2099-4721-010)



Danger! - High voltage. (European model)
(part no. 2099-4725-240)



Danger! - Finger entanglement hazard.
(part no. 2099-4725-110)



Read the operator's manual for safety information before service and maintenance.
(part no. 2099-4725-130)



Always turn off and lock main power before service and maintenance.
(part no. 2099-4725-150)



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



Refer to the Appendix for labels location

3 Description

3.1 Correct applications

The product described was designed for use in agricultural livestock farm operations.

Type of product / Product name

Free Stall Cleaner / Free Stall Cleaner with Chain

is exclusively designed to:

- clean free stall barns with alleys requiring frequent cleaning.
- clean small to medium size barns to a maximum of 650 ft [198 m] long.
- be operated in an environment free of concrete imperfection and also free of frozen manure. When temperature lowers below freezing point, it is strongly recommended to dismantle the system and to scrape alleys using tractor. If the operator wishes to operate the system under freezing conditions, the interval between each stroke must be short enough to reduce the risk of material freezing in the alleys between strokes.

Any applications that are not listed here are not part of the intended purpose and are therefore considered as improper use!

The following in particular are prohibited:

- processing others substances than manure.
- installing an electrical motor on the equipment which does not match the motor technical specifications provided in this manual. The equipment is not designed to use any other type of motor than those listed. Improper motor performance may result in damage to the equipment and/or motor.

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

Correct use also includes reading the instructions and following the inspection and maintenance instructions.

- Original GEA Houle parts and accessories are specially designed for GEA Houle equipment.
- The manufacturer expressly points out that only original parts and original accessories have been adapted, tested and authorized for use with the product.
- We would specifically like to point out that parts or accessories not supplied by ourselves and setting instructions not provided by GEA Houle are not checked or released by us either.
- The installation or use of products from other manufacturers may affect the specified properties of the original parts and lead to injury to people and animals.
- The manufacturer does not accept any liability for injury to people or animals, or damage to the product, caused by the use of products from other manufacturers.

3.2 Changes to the product

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

Any planned changes must be approved by the manufacturer in writing.

3.3 Design of the equipment

Design

A Free stall cleaner system with chain consists of:

- scrapers running in alleys to bring the manure from one end of the alley to the cross gutter at the opposite end.
- scrapers are pulled by a drive unit using chain and corner wheels installed in a closed loop.
- when a scraper reaches the end of the alley, the drive unit stops and is ready to run on reverse.

Drive

- The free stall cleaner drive unit is driven by an electric motor which is controlled by a programmable control panel.
- The free stall cleaners are pulled in the alleys by a drive unit.
- When the drive unit starts, a sprocket drives the chain pulling the scrapers in the alleys.

3.4 Functional description

Scrapers are positioned in each manure alley.

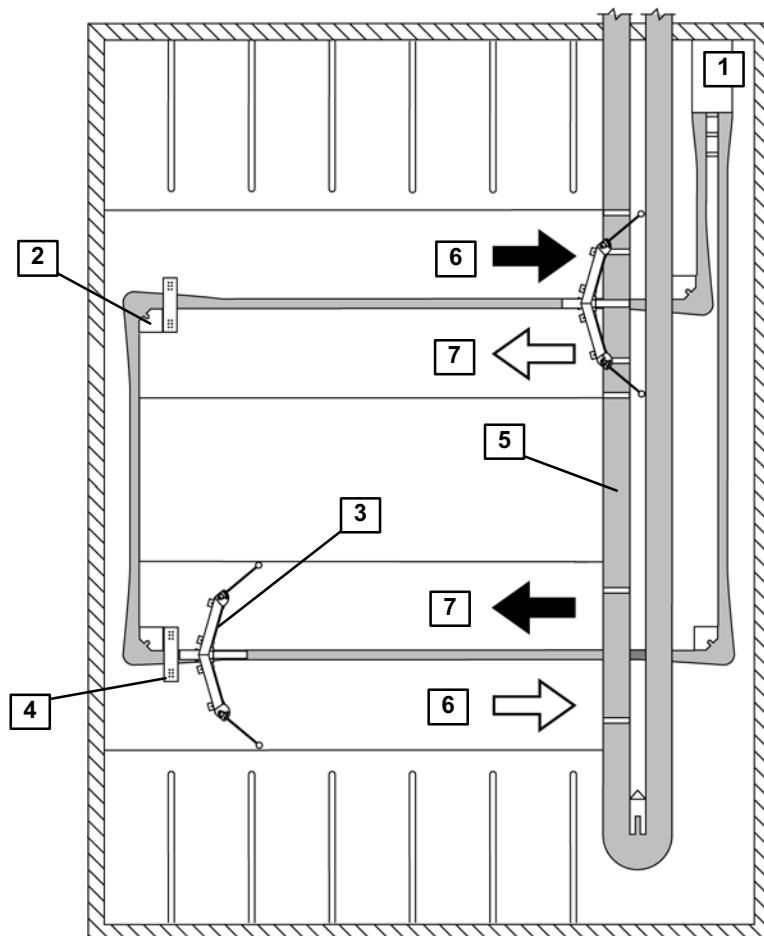
The scrapers are connected to chains which loop around the barn with corner wheels at the end of each alley.

A drive unit positioned at the end of the barn has a sprocket which drives the chain around the barn.

When the scrapers reach the end of the alley the drive unit reverses direction and drives the chain in the opposite direction to move the scrapers to the other end of the alley.

Scrapers in adjacent alleys alternate between cleaning stroke and return stroke.

The scrapers push the manure into a cross gutter located at one end of the barn or in the center of the barn.

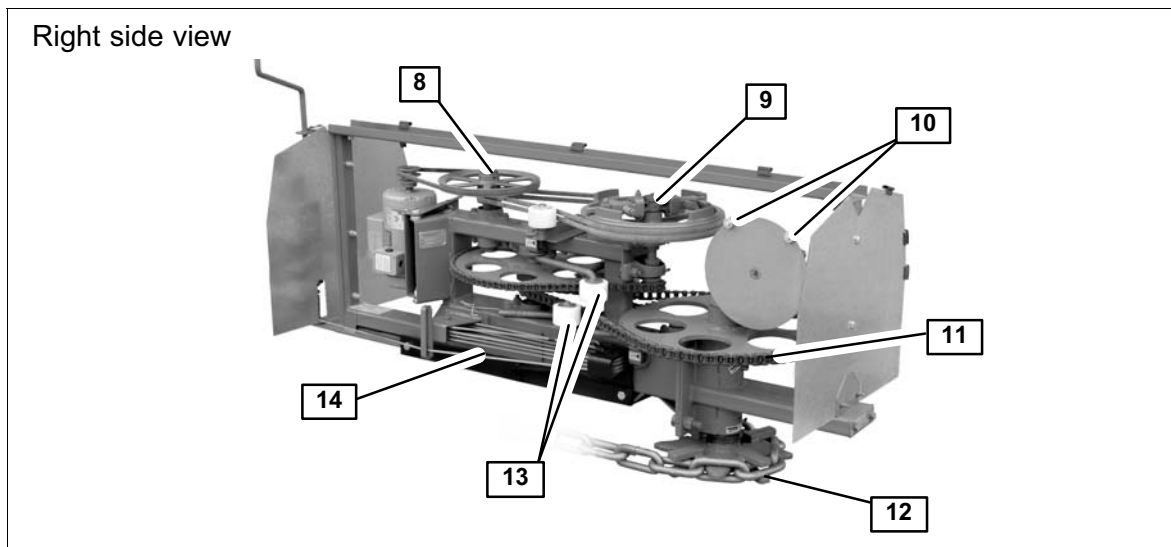
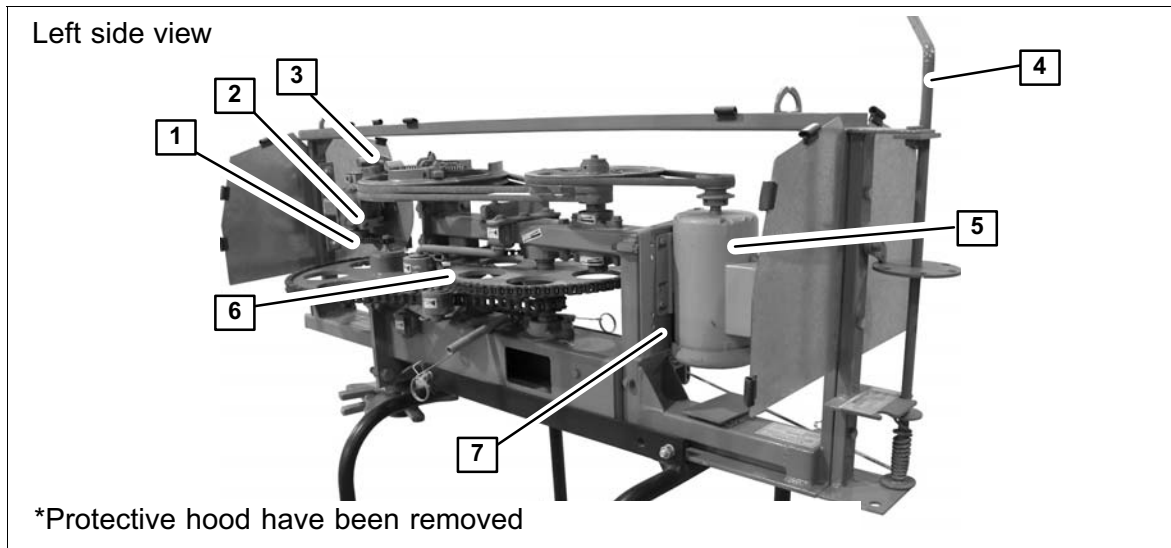


Legend:

1	Drive unit	2	Corner wheel
3	Scraper	4	Stop plate
5	Gutter	6	Clean
7	Return		

3.5 Main View

3.5.1 Drive units

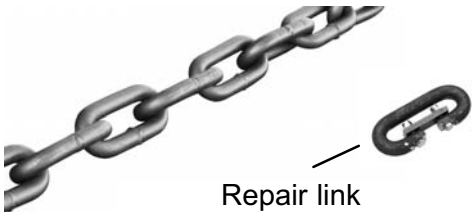
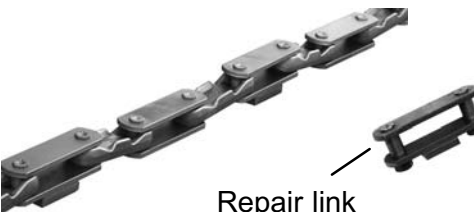


Legend:



1	# 40 chain	2	Speed reducer
3	Stroke limit switch	4	Quick tensioner
5	Motor	6	#60 chain
7	Motor support	8	Fourth reduction
9	Reversible clutch	10	Stroke limiter
11	#80 chain	12	7/8" [22mm] Chain
13	Chain tensioners	14	1/4" stainless steel cable

3.5.2 Chains and components

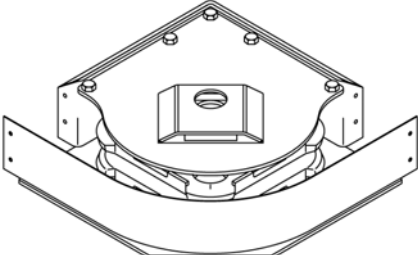
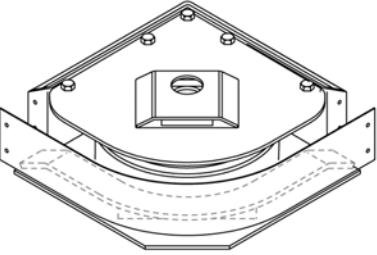
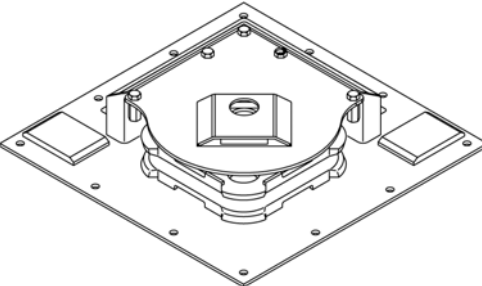
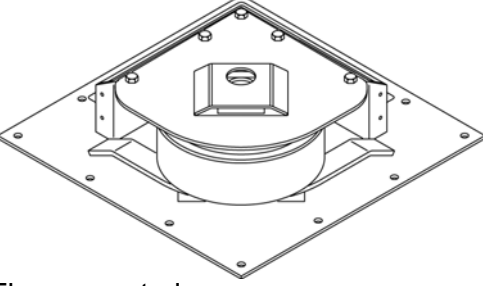
Chains

With 7/8" [22mm] chain	With pintle chain
 <p>Repair link</p>	 <p>Repair link</p>

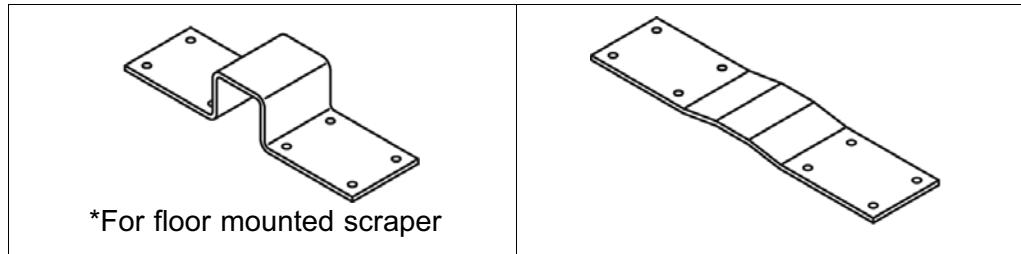
Drive unit sprockets

With 7/8" [22mm] chain	With pintle chain
	

Corner wheels

With 7/8" [22mm] chain	With pintle chain
 <p>Poured in concrete</p>	 <p>Poured in concrete</p>
 <p>Floor mounted</p>	 <p>Floor mounted</p>

Stopper plates



3.5.3 Scrapers

There are 3 basic designs of scrapers with variations available for each type.

Straight scraper

- It is best suited when space is limited at the drop point.
- It can only be groove guided to ensure scraper stability.
- It can clean alley to a minimum width of 73" [1,85m].

16° Tilting scraper

- It cleans alleys effectively by staying in contact with the concrete alley all the time.
- Angled arm design stabilize the scraper while pulling the manure.
- It can be both floor mounted or groove guided.
- It can clean alley to a minimum width of 73" [1,85m].

V-Shape scraper

- It is best suited to clean narrow alleys or when manure becomes very dry in the alleys.
- It can be adapted to clean an alley that varies in width along the path.
- It can be both floor mounted or groove guided.

There are 2 methods to use scrapers.

Floor mounted scraper

- The scraper is guided by the chain only. The length of the draw bar varies in proportion to the width of alley to improve the scraper stability.

Groove guided scraper

- The scraper is guided and maintained centered widthwise by a groove made in the center of the manure alley.
- Draw bar has a guide on the bottom which rides in a groove in the center of the alley to keep the scraper centered in the alley.
- When running in a groove, the scraper always has a short draw bar with male guides.

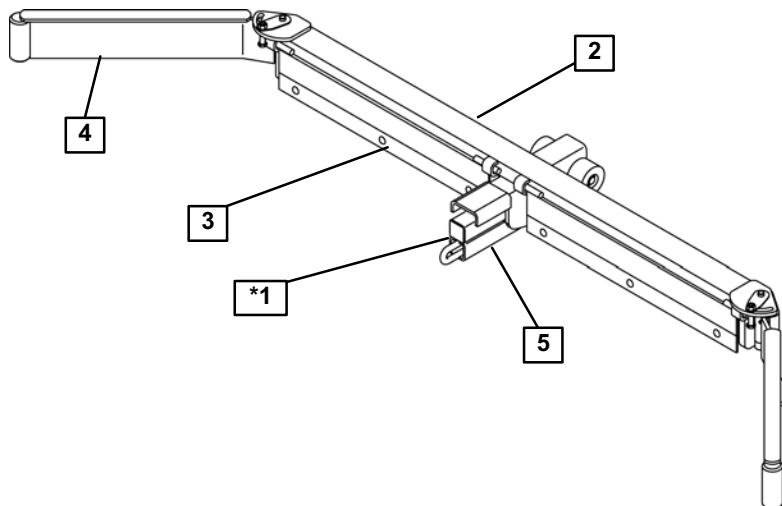
Straight scraper



Note!

The straight scraper are only available with a groove guided draw bar.

Blades can be adjusted to compensate for wear



On concrete floor	
with 7/8" [22mm] chain	with pintle chain
On rubber mats	
with 7/8" [22mm] chain	with pintle chain

Legend:

1	Draw bar	2	Arm
3	Steel blade	4	Folding end
5	Guide	6	Nylon roller

16° Tilting scraper

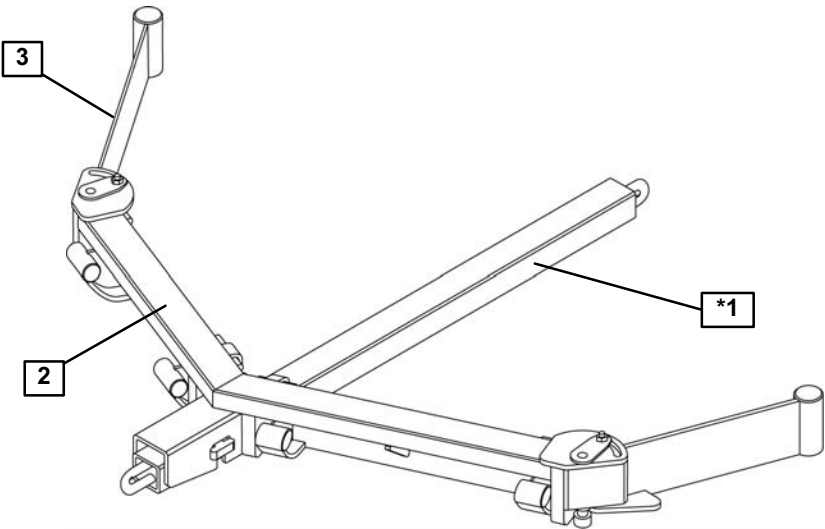


Note!

The 16° scraper are available with both floor mounted or groove guided draw bar.

Blades can be adjusted to compensate for wear

Floor mounted scraper

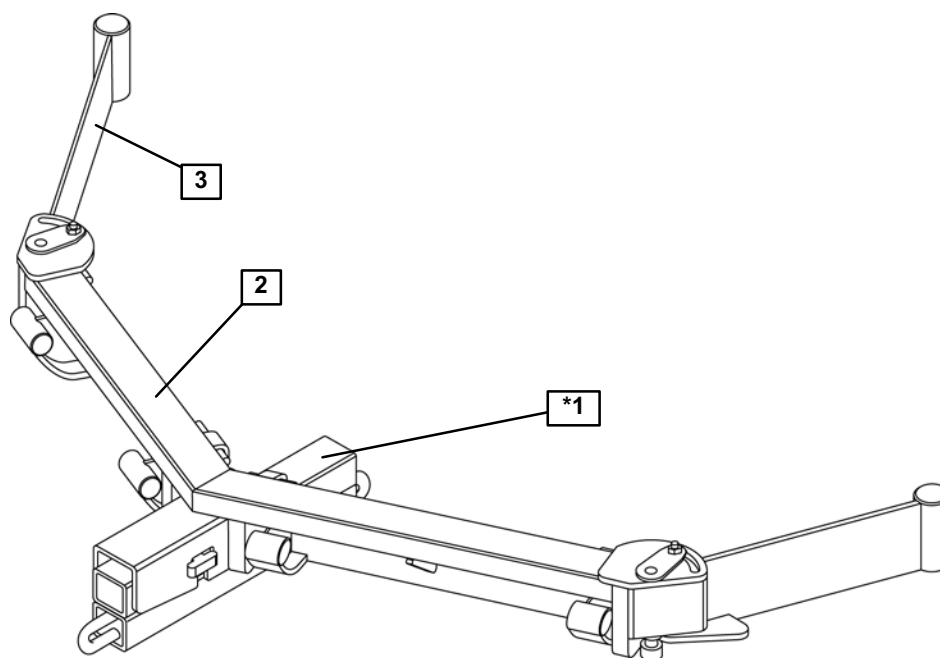


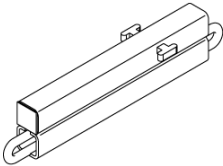
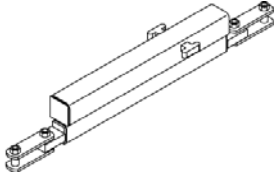
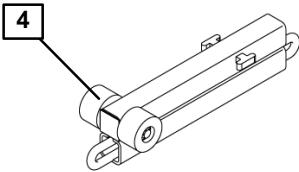
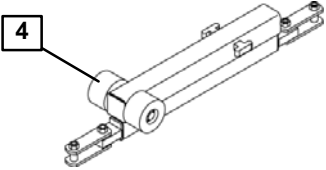
*Floor mounted draw bar	
On concrete floor	
with 7/8" [22mm] chain	with pintle chain
On rubber mats	
with 7/8" [22mm] chain	with pintle chain

Legend:

1	Draw bar	2	Arm
3	Folding end	4	Nylon roller

Groove guided scraper



*Groove guided draw bar			
On concrete floor			
with 7/8" [22mm] chain		with pintle chain	
			
On rubber mats			
with 7/8" [22mm] chain		with pintle chain	
			
Legend:			
1	Draw bar	2	Arm
3	Folding end	4	Nylon roller

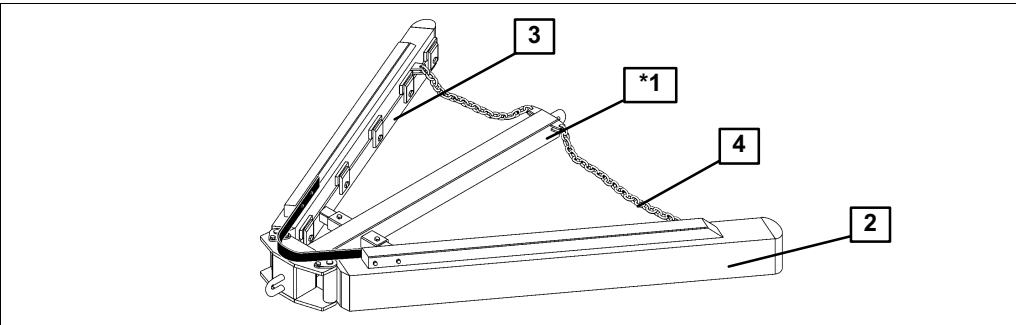
V-Shape scraper



Note!
The V-Shape scraper are available with both floor mounted or groove guided draw bar.

Blades can be adjusted to compensate for wear

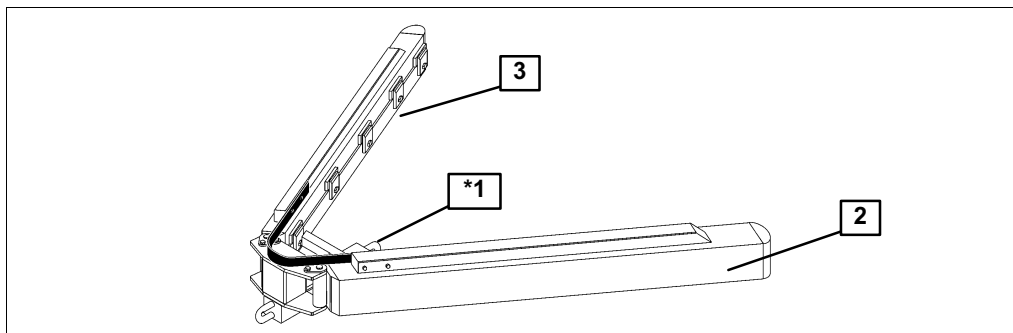
Floor mounted scraper



*Draw bar models	
On concrete floor	
with 7/8" [22mm] chain	with pintle chain
On rubber mats	
with 7/8" [22mm] chain and rollers	with pintle chain and rollers

Legend:			
1	Draw bar	2	Arm
3	Steel blade	4	Chain
5	Nylon roller		

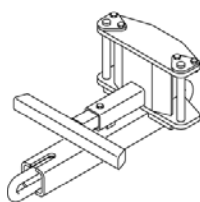
Groove guided scraper



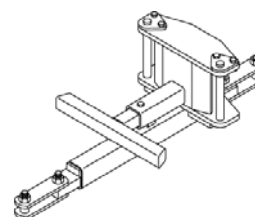
*Draw bar models

On concrete floor

with 7/8" [22mm] chain

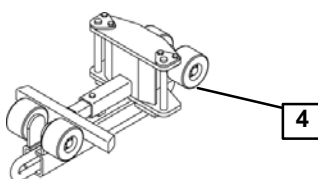


with pintle chain

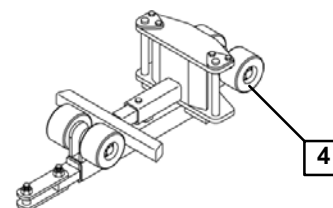


On rubber mats

with 7/8" [22mm] chain and rollers



with pintle chain and rollers



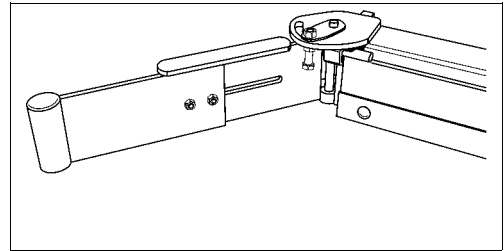
Legend:

1	Draw bar	2	Arm
3	Steel blade	4	Nylon roller

3.5.4 Scraper options

Adjustable folding ends

- Adjustable folding ends maintain the scraper centered in a manure alley that has no guiding groove.
- Requires that the alley width remain constant over the entire length.



Slanted folding end

- Slanted folding end is required when the curbs or the side of the bed are lower than 6" [15cm].



Hinges to fold the scraper arms

- Hinges are useful when a tractor may need to run over the scraper in the alley.



Adjustable flexible blades and low friction nylon rollers

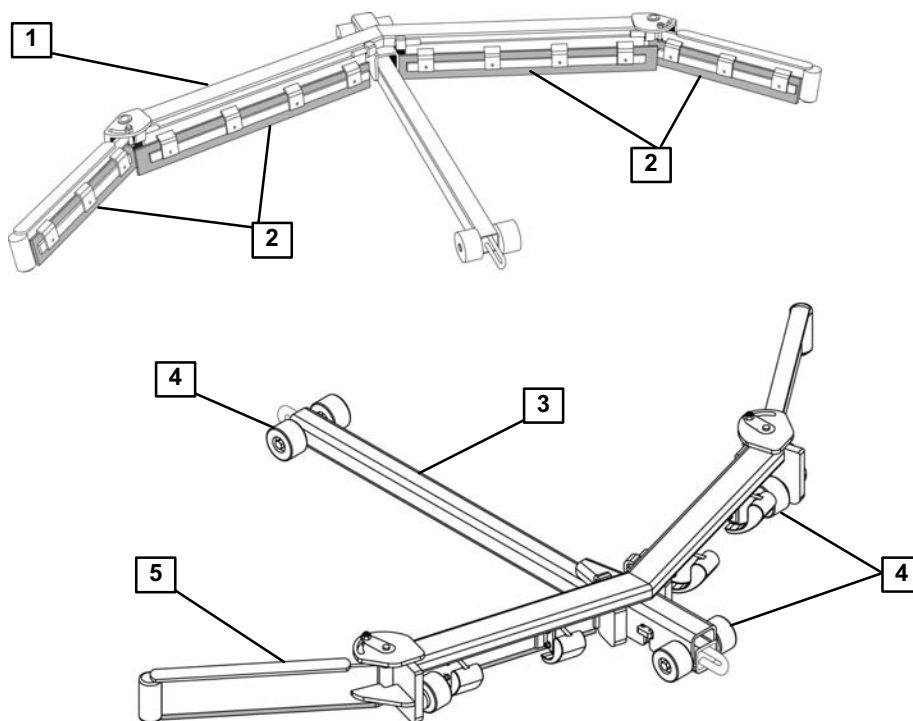
For use on rubber mats



Note!

This option is available for all 16° and straight scrapers, reducing the risk of damaging rubber mat joints.

- The scraper is mounted on nylon wheels in order to prevent the scraper framework from grabbing the rubber mat joints.
- Urethane blades reduce the risk of damaging rubber mat joints. The urethane blades are held in place with steel flat bars, which are fixed with stainless steel set screws.



Legend:

1	Arm	2	Urethane blade
3	Draw bar	4	Nylon roller
5	Folding end		



Attention!

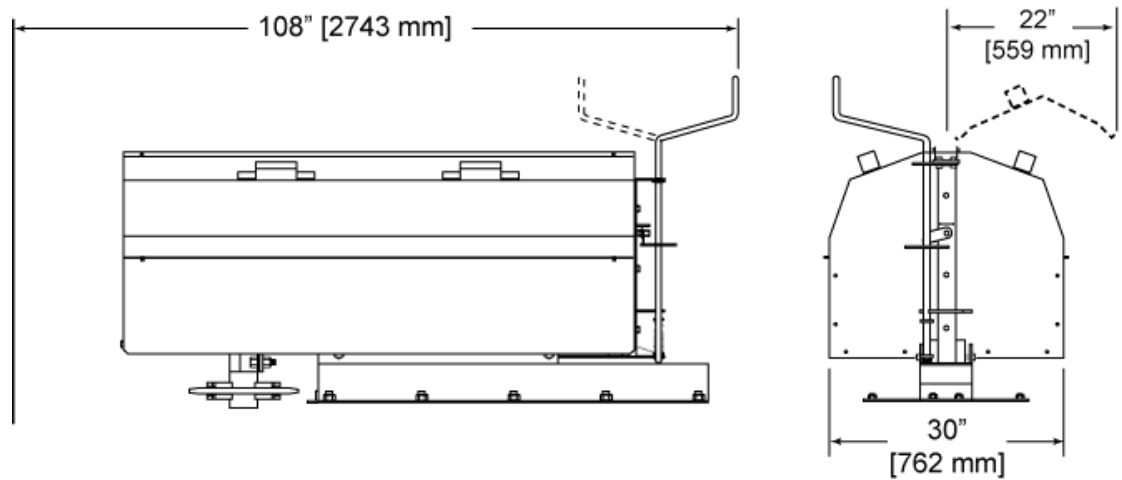
Urethane blades are not suitable for frozen or dry manure.

Options	Straight scraper	16° tilting scraper	V-Shape scraper
Adjustable folding end	Available	Available	Not available
Slanted folding end	Available	Available	Not available
Hinges to fold scraper arms	Available	Available	Not available
Adjustable flexible blade and low friction rollers for rubber mats	Available	Available	Available

3.6 Technical Data

Geometric data

Drive unit dimensions



Drive unit weight

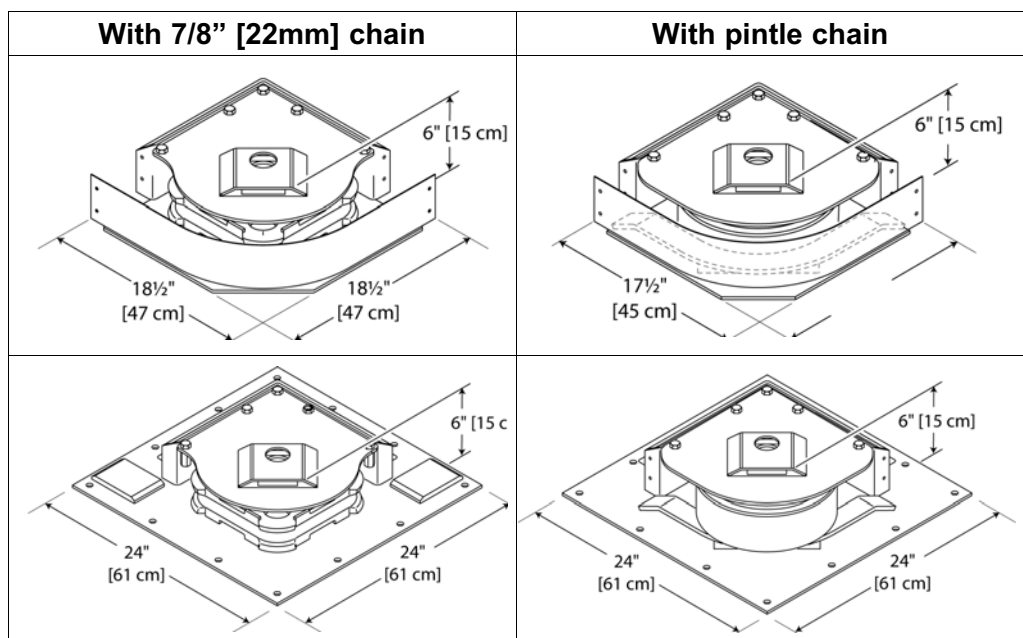
Model	Drive unit less motor	Motor
H-86	573 lbs [260 kg]*	143 lbs [65 kg]*

* Weights listed are the maximum possible with all options.

Maximum length of chain

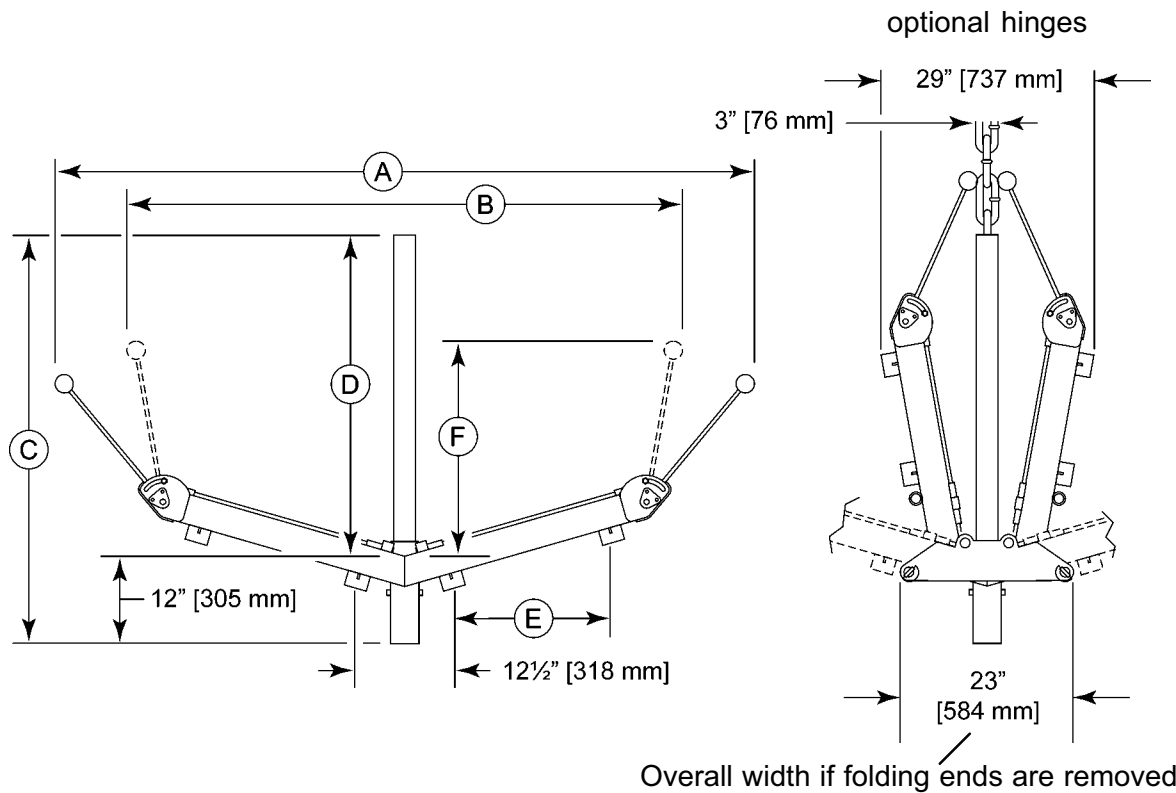
Maximum length of chain	
2 Alleys	750 ft [229 m]
4 Alleys	600 ft [183 m]

Corner wheels



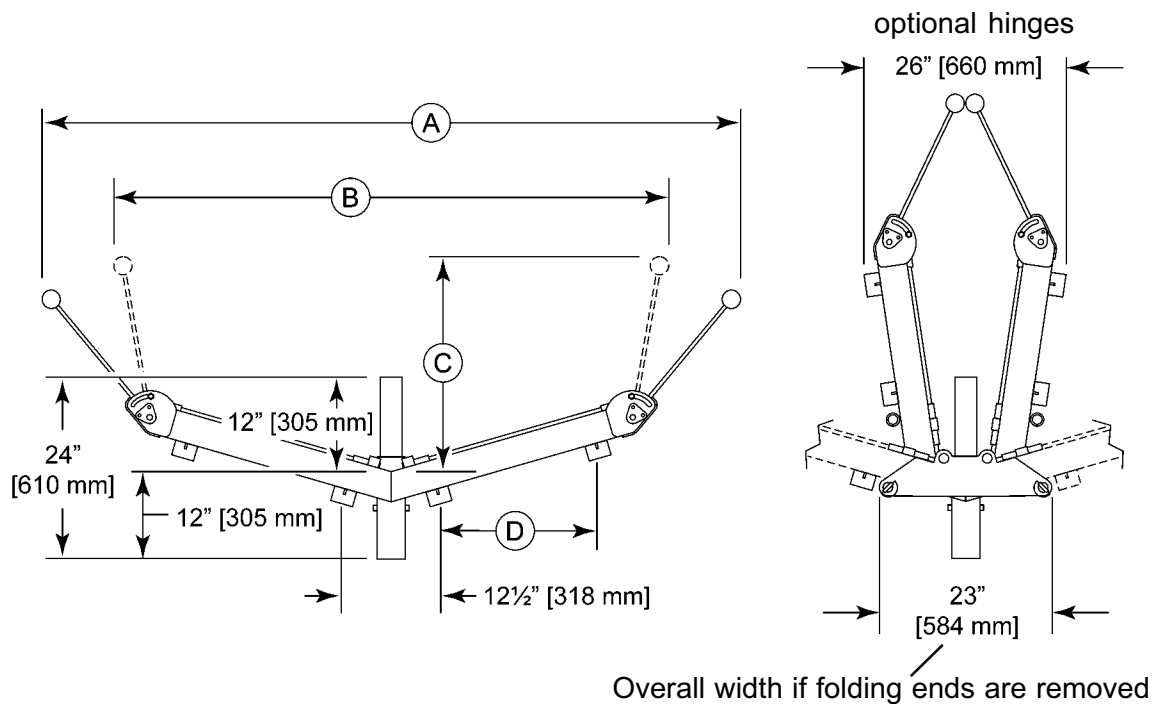
Scrapers

16° Tilted scraper (floor mounted)



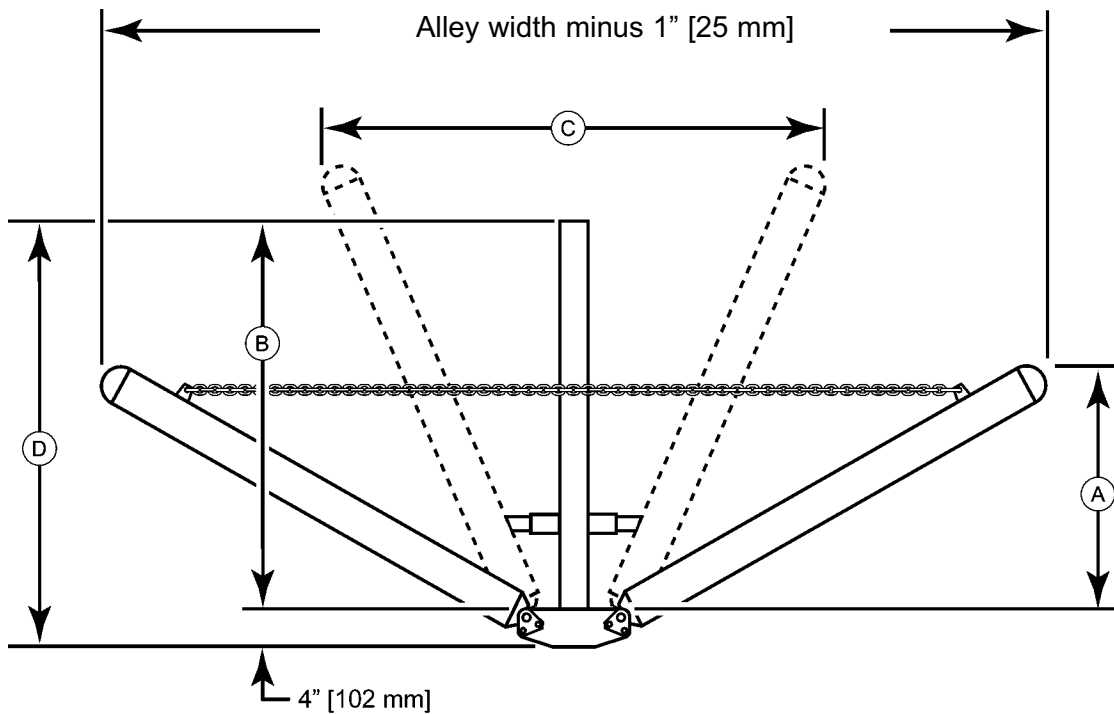
Alley width	A	B	C	D	E	F
6'1"-7' [185 - 213 cm]	86" [2184 mm]	60" [1524 mm]	46" [1168 mm]	34" [864 mm]	13¾" [349 mm]	32" [813 mm]
7'1"-8' [216 x 244 cm]	98" [2489 mm]	72" [1829 mm]	51" [1295 mm]	39" [991 mm]	19¾" [502 mm]	34" [864 mm]
8'1"-9' [246 - 274 cm]	110" [2794 mm]	84" [2134 mm]	56" [1422 mm]	44" [1118 mm]	25¾" [654 mm]	35½" [902 mm]
9'1"-10' [277 - 305 cm]	122" [3099 mm]	96" [2438 mm]	60" [1524 mm]	48" [1219 mm]	31¾" [806 mm]	37" [940 mm]
10'1"-11' [307-335 cm]	134" [3403 mm]	108" [2743 mm]	65" [1651 mm]	53" [1346 mm]	37¾" [959 mm]	39" [991 mm]
11'1"-12' [338-366 cm]	146" [3708 mm]	120" [3048 mm]	70" [1778 mm]	58" [1473 mm]	43¾" [1111 mm]	40½" [1029 mm]
12'1"-13' [368-396 cm]	158" [4013 mm]	132" [3353 mm]	75" [1905 mm]	63" [1600 mm]	49¾" [1264 mm]	42" [1067 mm]
13'1"-14' [399-427 cm]	170" [4318 mm]	144" [3658 mm]	80" [2032 mm]	68" [1727 mm]	55¾" [1416 mm]	44" [1118 mm]

16° Tilted scraper (guided by a groove)



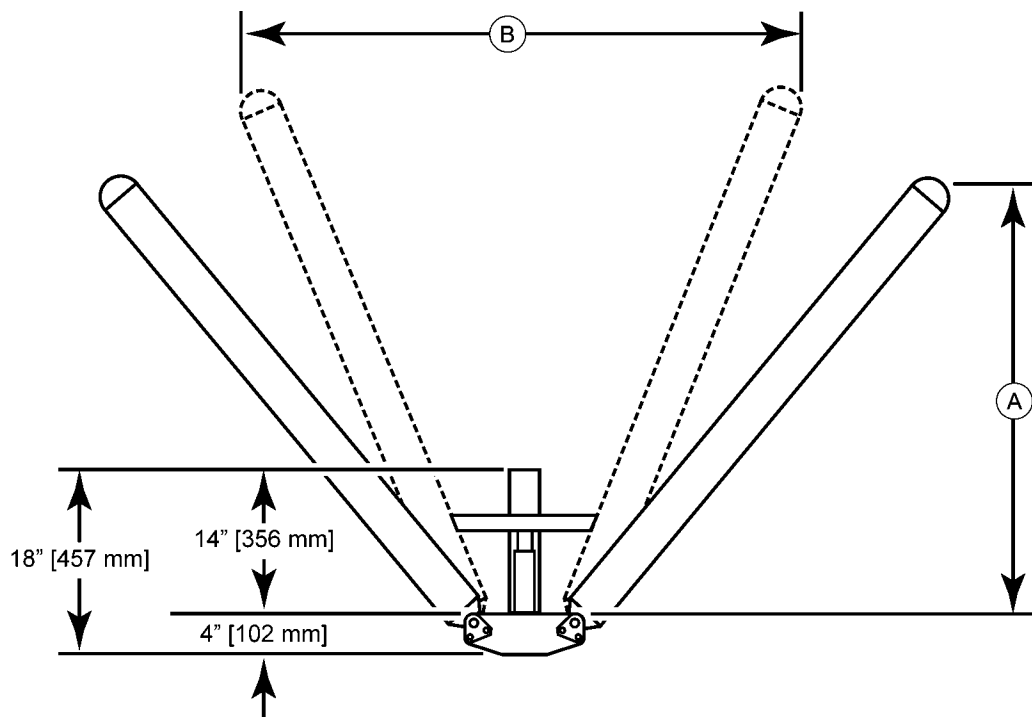
Alley width	A	B	C	D
6'1"-7' [185 - 213 cm]	86" [2184 mm]	60" [1524 mm]	32" [813 mm]	13 ³ / ₄ " [349 mm]
7'1"-8' [216 x 244 cm]	98" [2489 mm]	72" [1829 mm]	34" [864 mm]	19 ³ / ₄ " [502 mm]
8'1"-9' [246 - 274 cm]	110" [2794 mm]	84" [2134 mm]	35 ¹ / ₂ " [902 mm]	25 ³ / ₄ " [654 mm]
9'1"-10' [277 - 305 cm]	122" [3099 mm]	96" [2438 mm]	37" [940 mm]	31 ³ / ₄ " [806 mm]
10'1"-11' [307-335 cm]	134" [3403 mm]	108" [2743 mm]	39" [991 mm]	37 ³ / ₄ " [959 mm]
11'1"-12' [338-366 cm]	146" [3708 mm]	120" [3048 mm]	40 ¹ / ₂ " [1029 mm]	43 ³ / ₄ " [1111 mm]
12'1"-13' [368-396 cm]	158" [4013 mm]	132" [3353 mm]	42" [1067 mm]	49 ³ / ₄ " [1264 mm]
13'1"-14' [399-427 cm]	170" [4318 mm]	144" [3658 mm]	44" [1118 mm]	55 ³ / ₄ " [1416 mm]

V-shape scraper (floor mounted)



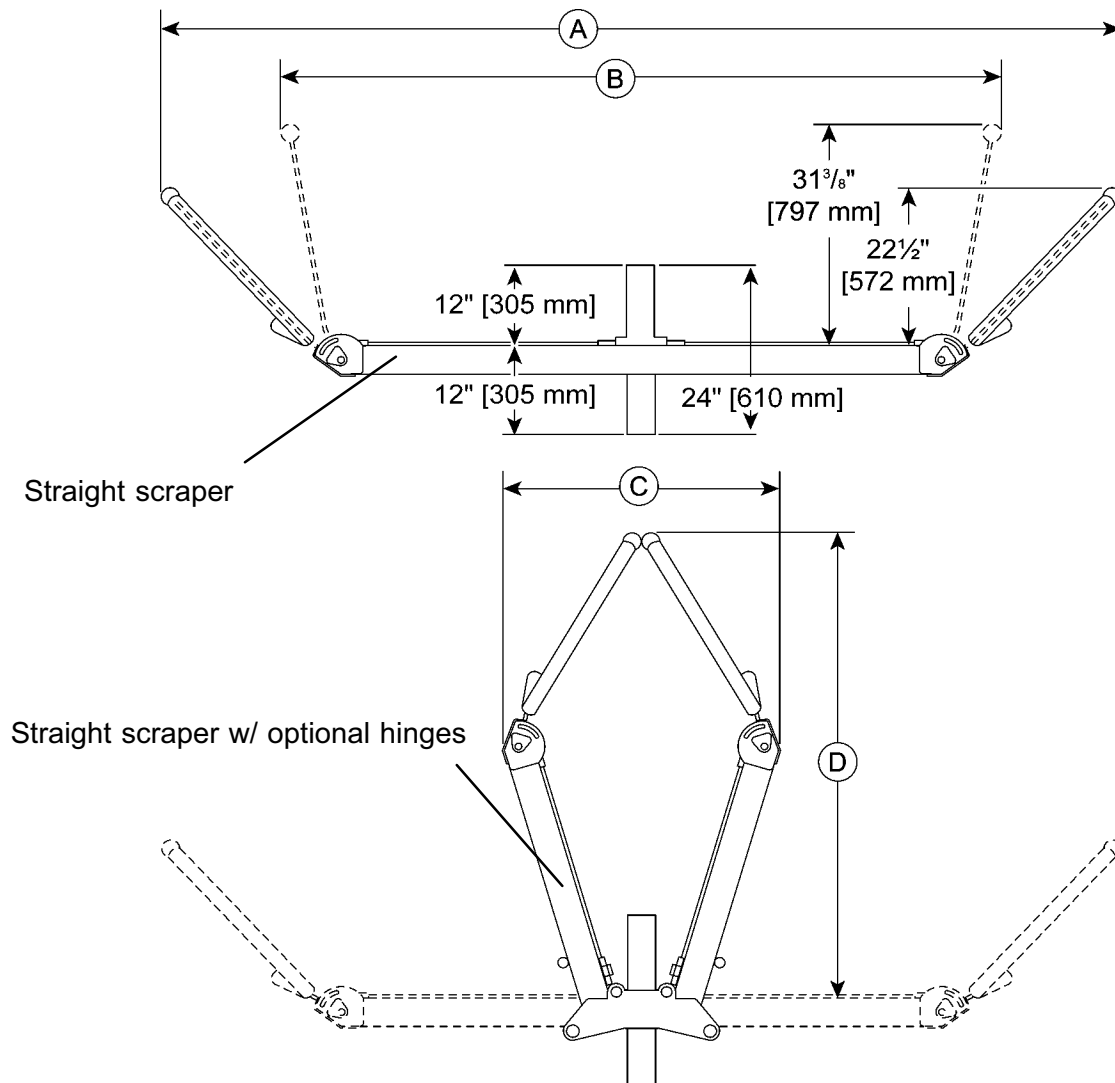
Alley width	A	B	C	D
6'1"-7' [185 - 213 cm]	30" - 23" [762 - 584 mm]	46" [1168 mm]	42" [1067 mm]	50" [1270 mm]
7'1"-8' [216 x 244 cm]	34" - 26½" [864 - 673 mm]	46" [1168 mm]	46½" [1181 mm]	50" [1270 mm]
8'1"-9' [246 - 274 cm]	37" - 30" [940 - 762 mm]	46" [1168 mm]	51½" [1308 mm]	50" [1270 mm]
9'1"-10' [277 - 305 cm]	41" - 33½" [1041 - 851 mm]	48" [1219 mm]	56" [1422 mm]	52" [1321 mm]
10'1"-11' [307-335 cm]	45" - 37" [1143 940 mm]	53" [1346 mm]	61" [1549 mm]	57" [1448 mm]
11'1"-12' [338-366 cm]	48½" - 41" [1232 - 1041 mm]	58" [1473 mm]	65½" [1664 mm]	62" [1575 mm]
12'1"-13' [368-396 cm]	52½" - 44½" [1334 - 1130 mm]	63" [1600 mm]	70½" [1791 mm]	67" [1702 mm]
13'1"-14' [399-427 cm]	56" - 48" [1422 - 1219 mm]	68" [1727 mm]	75" [1905 mm]	72" [1829 mm]

V-shape scraper (guided by a groove)



Alley width	A	B
6'1"-7' [185 - 213 cm]	41½" - 37" [1054 - 940 mm]	52" [1321 mm]
7'1"-8' [216 x 244 cm]	48" - 43" [1219 - 1092 mm]	58" [1473 mm]
8'1"-9' [246 - 274 cm]	54" - 49" [1372 - 1245 mm]	64½" [1638 mm]
9'1"-10' [277 - 305 cm]	60" - 55" [1524 - 1397 mm]	71" [1803 mm]
10'1"-11' [307-335 cm]	66" - 61" [1676 - 1549 mm]	77½" [1969 mm]
11'1"-12' [338-366 cm]	72" - 67" [1829 - 1702 mm]	84" [2134 mm]
12'1"-13' [368-396 cm]	78" - 73" [1981 - 1854 mm]	90" [2268 mm]
13'1"-14' [399-427 cm]	84½" - 79" [2146 - 2007 mm]	96½" [2451 mm]

Straight scraper (guided by a groove)



Alley width	Width		w/ Hinges (optional)	
	forward (A)	reverse (B)	width (C)	length (D)
6'6"-7'5" [198 - 226 cm]	95 1/2" [2426 mm]	62 7/8" [1597 mm]	31 1/4" [794 mm]	49 5/8" [1260 mm]
7'6"-8'5" [229 x 257 cm]	107 1/2" [2731 mm]	74 7/8" [1902 mm]	34" [864 mm]	55 1/8" [1400 mm]
8'6"-9'5" [259 - 287 cm]	119 1/2" [3035 mm]	86 7/8" [2207 mm]	36 1/8" [918 mm]	60 3/4" [1543 mm]
9'6"-10'5" [290 - 318 cm]	131 1/2" [3340 mm]	98 7/8" [2511 mm]	37 7/8" [962 mm]	66 3/8" [1686 mm]
10'6"-11'5" [320-348 cm]	143 1/2" [3645 mm]	110 7/8" [2816 mm]	39 1/4" [997 mm]	72 1/8" [1832 mm]
11'6"-12'5" [351-378 cm]	155 1/2" [3950 mm]	122 7/8" [3121 mm]	40 1/2" [1029 mm]	77 7/8" [1978 mm]
12'6"-13'5" [381-409 cm]	167 1/2" [4254 mm]	134 7/8" [3426 mm]	41 1/2" [1054 mm]	83 3/4" [2127 mm]
13'6"-14'5" [411-439 cm]	179 1/2" [4559 mm]	146 7/8" [3731 mm]	42 3/8" [1076 mm]	89 1/2" [2273 mm]

Electrical motor specifications

Electrical data		
Rated Motor Voltage	As per local requirements	
Frequency	50Hz or 60Hzas per local requirements	
Rated Motor Power	1.5HP to 7.5HP [1KW to 5KW]	
Rated Motor Speed	50Hz@1450rpm 60Hz@1760rpm	
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	
Isulation	155(F) to 130(B)	
Duty type	S1(continuous operation)	
Direction or rotation	Bi-directional	

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

Control panel specifications

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.

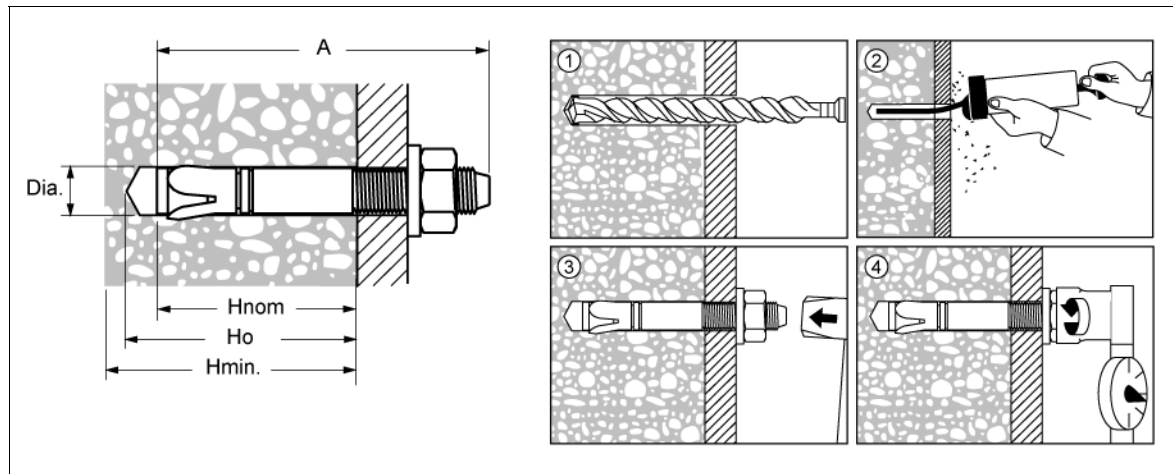
Acoustic emission

Noise level	62 dBA
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Performance data




Operating temperature	5°C [41°F] minimum
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Concrete anchor bolts specifications



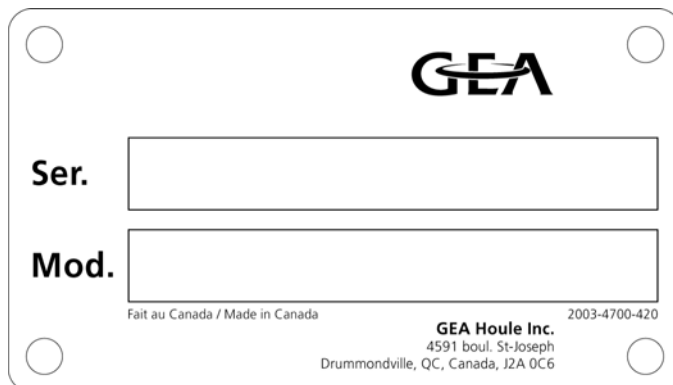
Bolt Diametre	3/8" [10mm]	1/2" [13mm]			3/4" [19mm]
Bolt Length (A)	3" [76mm]	2 3/4" [70mm]	3 3/4" [95mm]	3 3/4" [95mm]	5 1/2" [140mm]
Material	Steel	Steel	Steel	SS 304	Steel
Minimum hole depth (Ho)	Hnom + 1/4" [6mm]	Hnom + 1/4" [6mm]	Hnom + 3/8" [10mm]	Hnom + 1/4" [6mm]	Hnom + 1/4" [6mm]
Hnom	2 3/8" [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 diametre (Dia.)	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)

Bolt torque chart (except when otherwise specified)

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

Manufacturer's plate

The manufacturer's plate is attached to the equipment.



4 Transport

4.1 Special personnel qualification required for transport

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



Also see the section on "Personnel qualification".

4.2 Safety instructions for transport

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

- Only the load suspension and support equipment indicated here should be used, at the specified support points, for transport.



Also read the chapter on "Safety".

Special transport hazards:

- Sharp edges may cause injuries.
- Suspended loads can fall resulting in severe injuries or even death.
- If load suspension devices other than those indicated here are used, this may lead to serious damage to property and/or life-threatening injury to people.
- If lubricants, preservatives, ... are not kept upright during transportation they can leak out and there is a risk of irritation if they come into direct contact with the skin.

4.3 Permissible devices and aids for transportation



Attention!

To lift the equipment, use a lifting device with a minimum capacity of:
3000 lb [1500 kg].

Chain Hoist



Safety Chain



Fork lift truck



4.4 Lifting and moving the drive unit

Using safety chains



Note!

Always remove the safety guard before lifting the drive unit.

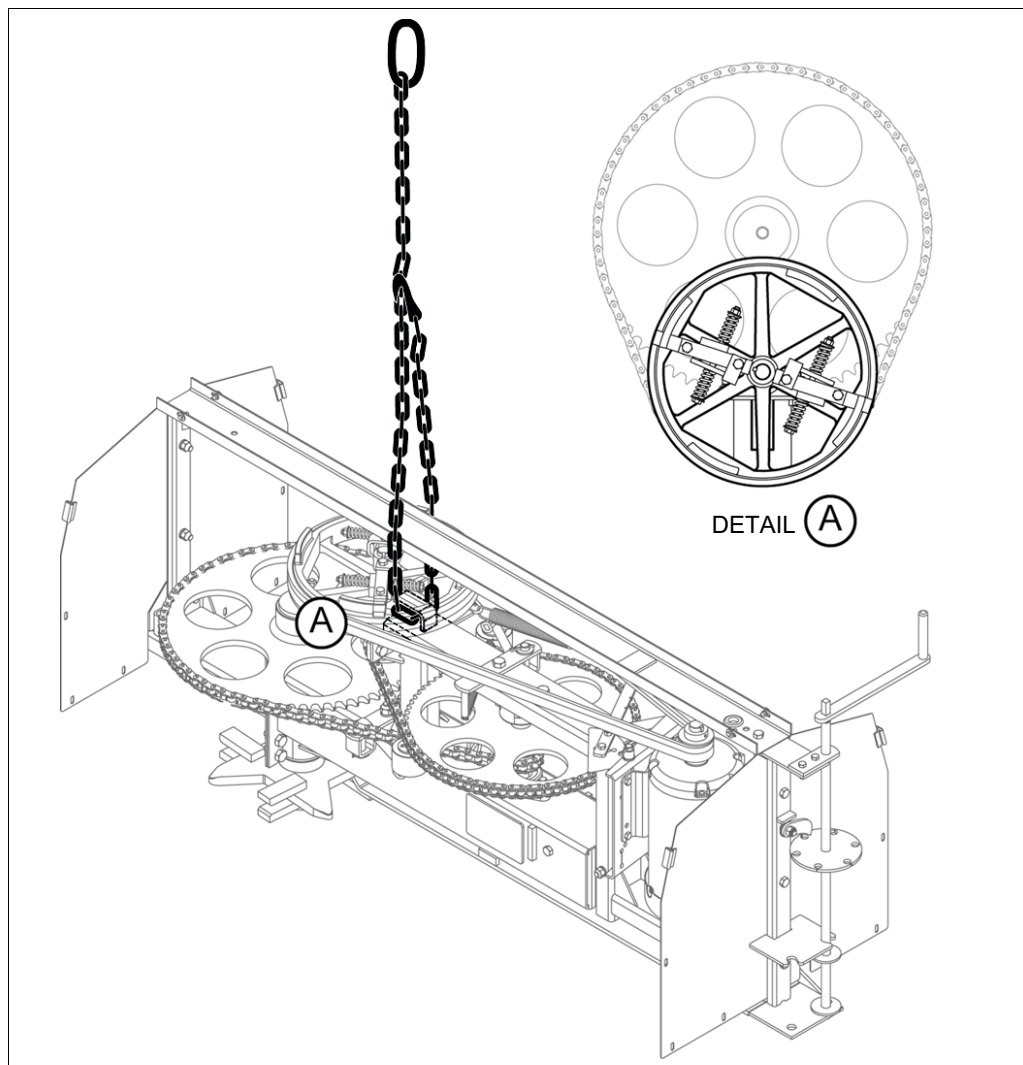


CAUTION!

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



- Turn the pulley to align a pair of wheel branch with the lifting ring. Refer to detail. A
- Attach safety chain to the lifting ring located under wheel. Make sure the chain is installed each side of the wheel branch to avoid damage when lifting the drive unit.
- Lift the drive unit with an appropriate lifting device.



4.5 Storage conditions



Attention!

Risk of corrosion!

When storing the goods supplied, the location must provide protection against:

- Moisture
- Frost
- External damage (jolts, knocks, rodents, insects, . . .)
- Direct sunlight

4.6 Information on disposing of packing material

After unpacking, the packing material is to be handled properly and disposed of carefully in accordance with the valid local regulations on waste disposal and utilization.

5 Installation

5.1 Special personnel qualification required for installation

Installation may only be carried out by specially qualified personnel in accordance with the safety instructions.



Also see the section on "Personnel qualification".

5.2 Safety instructions for installation



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. Control panels must be equipped with an emergency stop button.



Also read the chapter on "Safety".

- Observe any national standards and requirements during installation.
- Before installation, look for any damage caused during transport. Do not use damaged components!
- Use only the special tool indicated for assembly.

Special hazards during installation:







- Injury can be caused by electrical current from live cable ends and components.
- There is a fire hazard associated with welding work.
- Components which have not been removed correctly may fall off or twist.
- Parts loosely placed on top of each other can slip and fall off.
- Components with sharp edges which are still open and accessible represent a source of injury.
- Leaking lubricants, solvents,... could cause injury if they come into direct contact with the skin and could make the floor surface slippery which could result in dangerous fall.
- Serious injury to personnel or damage to property can be caused if the incorrect torque is applied when tightening screws.





5.3 Assembly preparations

Necessary documents

- Foundation plan
- Electrical wiring diagrams

Special tools

	Description	Purpose
	Fork lift truck	To lift the equipment
	Chain hoist	To lift the equipment
	Safety chains	To lift the equipment
	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 Pulleys installation	To tighten set screws on pulleys
	Torque wrench	To tighten bolts and anchor bolts at the specified torque

Local purchased items

Provided by the owner:

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

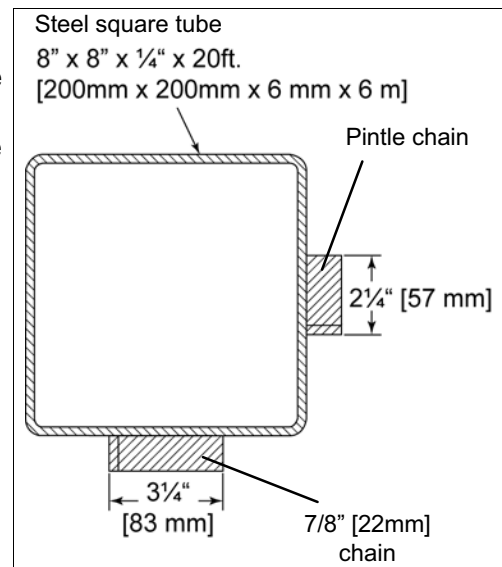
5.4 Environmental prerequisites for setting up

The product must be installed in a well ventilated frost-free environment.

5.5 Preparing steel grooves for 7/8" [22mm] and pintle chains

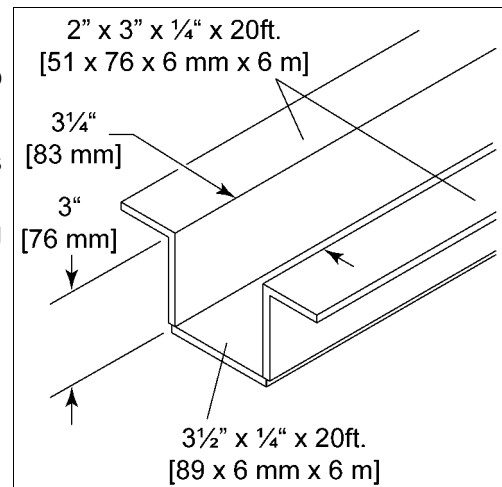
Building a jig

- Here is a typical jig that can easily be made locally to build, at a low cost, the 2 different steel grooves for free stall cleaners with chain.



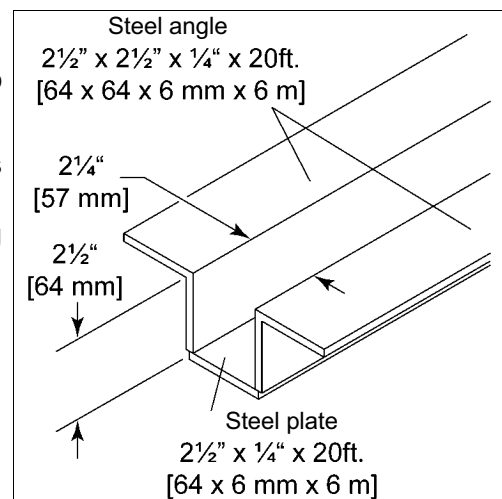
Steel groove for 7/8" [22mm] chain

- Construct the steel groove using two pieces of steel angle and a flat plate.
- Lengths are typical maximums based on the jig dimensions, material availability and handling capabilities.



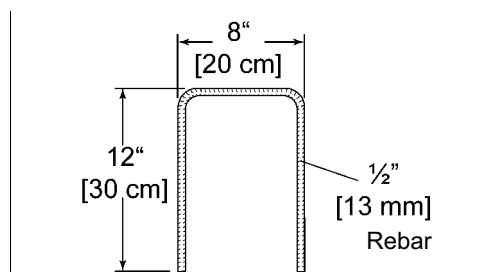
Steel groove for pintle chain

- Construct the steel groove using two pieces of steel angle and a flat plate.
- Lengths are typical maximums based on the jig dimensions, material availability and handling capabilities.

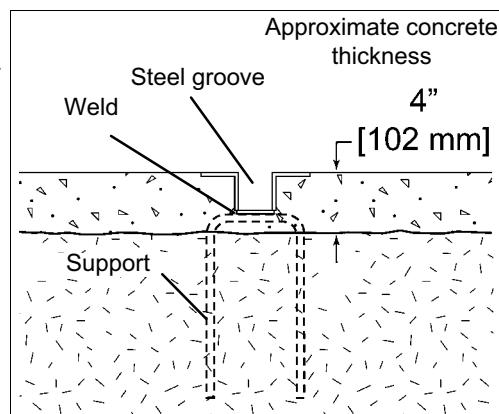


Steel groove supports

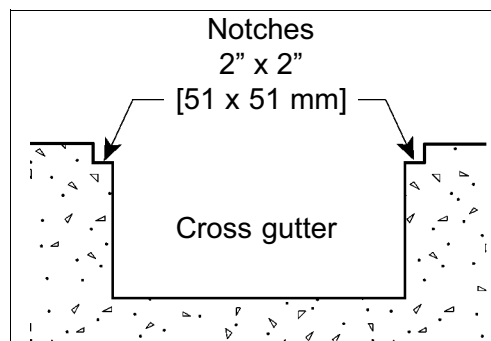
- Make supports for the steel groove from steel rebar. Dimensions are approximate.

**Steel groove installation**

- 3 supports required per 20ft. [6 m] of groove (1 near each end and 1 at the center)
- Weld the supports to the groove on both sides.

**Scraper supports over cross gutter**

- Cross gutter notches
- A notch of must be formed on each side of the cross gutter to install hardwood lumber scraper supports to bridge the gutter.

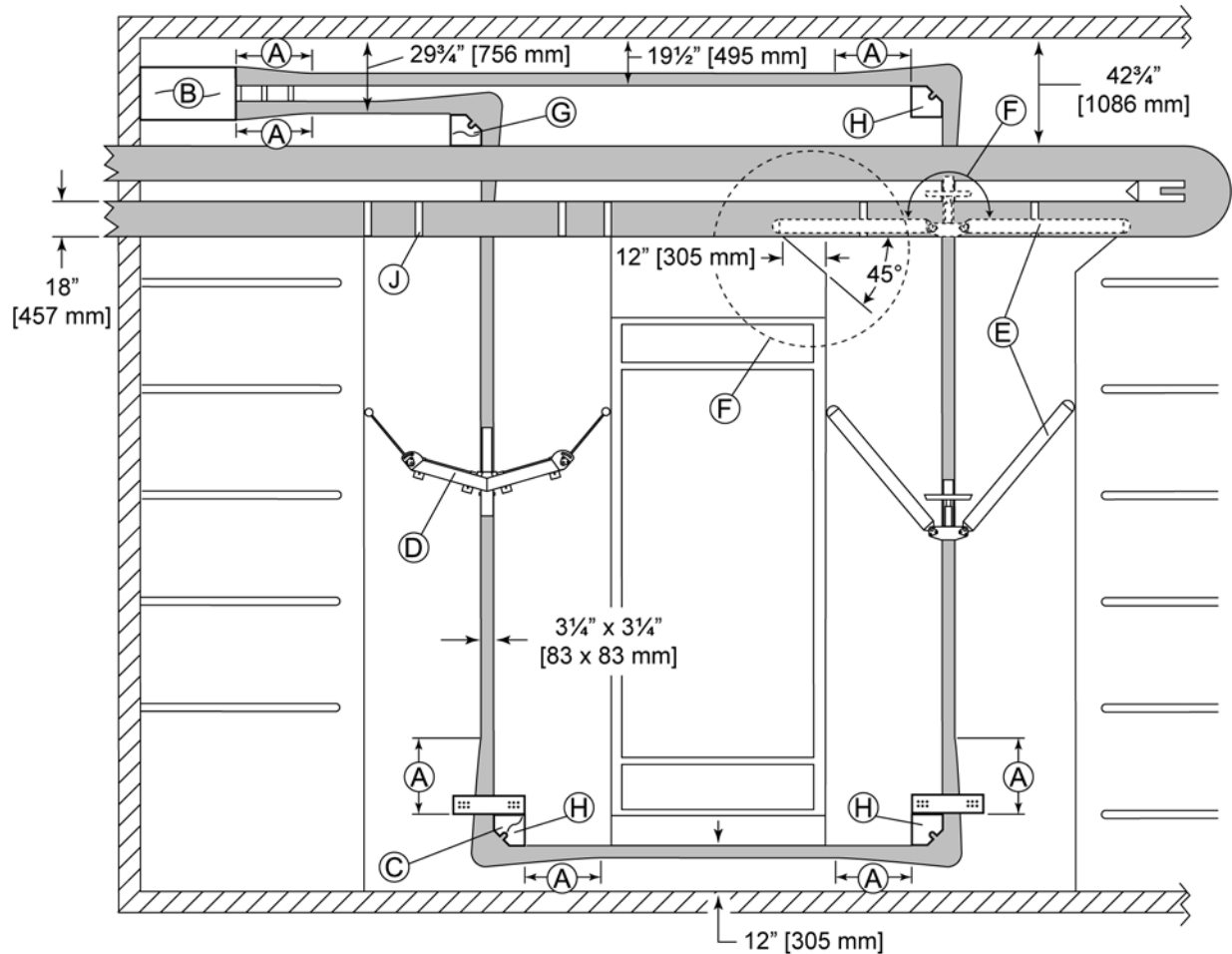


Installation

Installation of a free stall cleaner with 7/8" [22mm] chain in a groove

5.6 Installation of a free stall cleaner with 7/8" [22mm] chain in a groove

Overview of installation



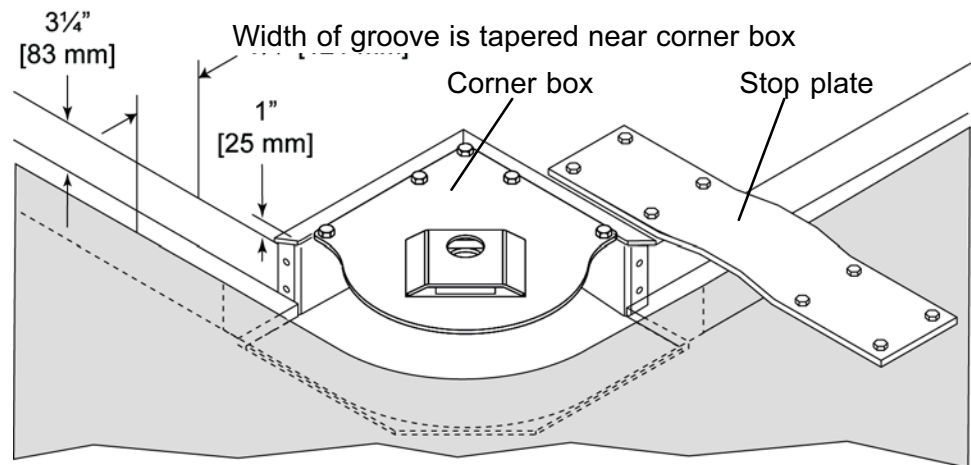
Legend:

A	Tapered groove. For details refer to section; Installation of 7/8" [22mm] chain corner boxes Installation of drive unit with 7/8" [22mm] chain in a groove
B	Recessed section in front of drive unit must be 4" [102 mm] lower than bottom of the chain groove.
C	Top of corner box must be 1" [25 mm] higher than the walking area.
D	16° alley scraper in a groove
E	V-shape scraper in a groove
F	If the V-shape scraper must fully open above the loaded gutter without reaching the curb between both gutters, the corners at the end of the alley must be angled.
G	Special corner box
H	Corner box
J	Scraper supports



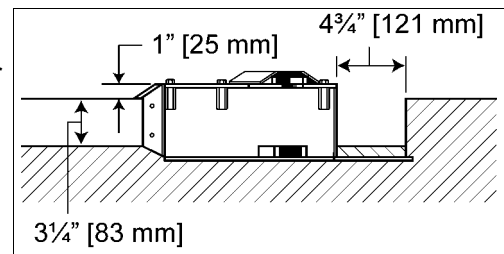
For instructions on making a steel groove refer to section;
Preparing steel grooves for 7/8" [22mm] and pintle chains

5.6.1 Installation of 7/8" [22mm] chain corner boxes



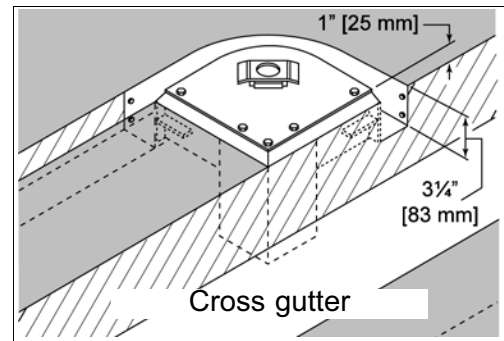
Side view

Top of the corner box must be higher than the walking area 1" [25 mm].



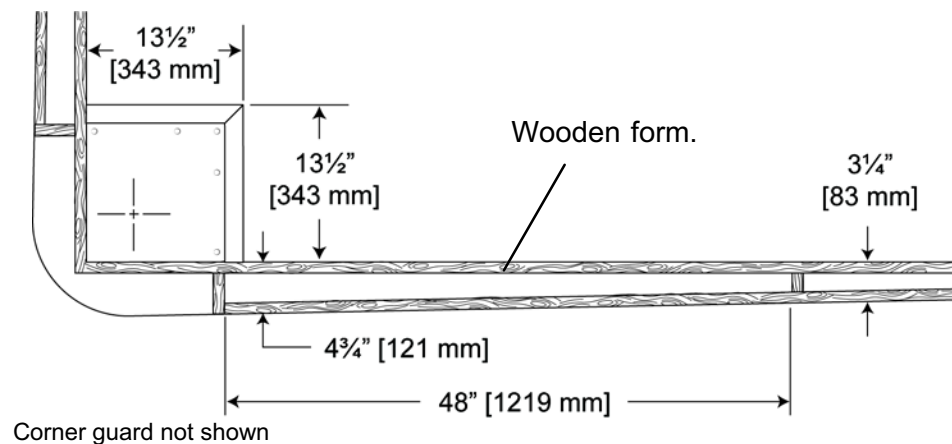
Special corner box

This special corner box can be installed flush with the side of the cross gutter.



Tapered groove

To allow for side fluctuation as the chain rotates around the corner wheel, the chain groove must have a long gradual taper (widthwise) at each corner box.

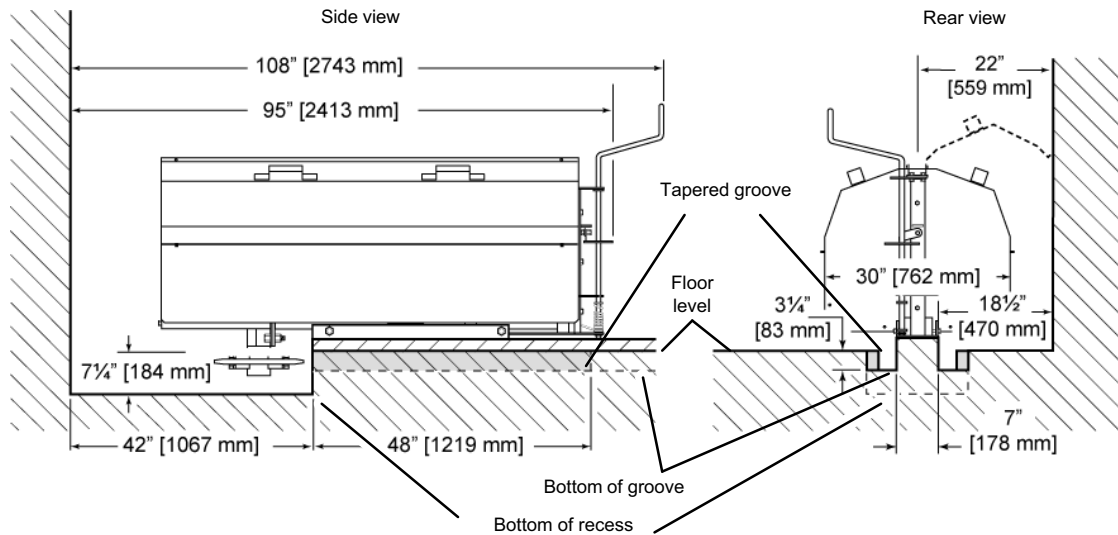


5.6.2 Installation of drive unit support using 7/8" [22mm] chain in a groove

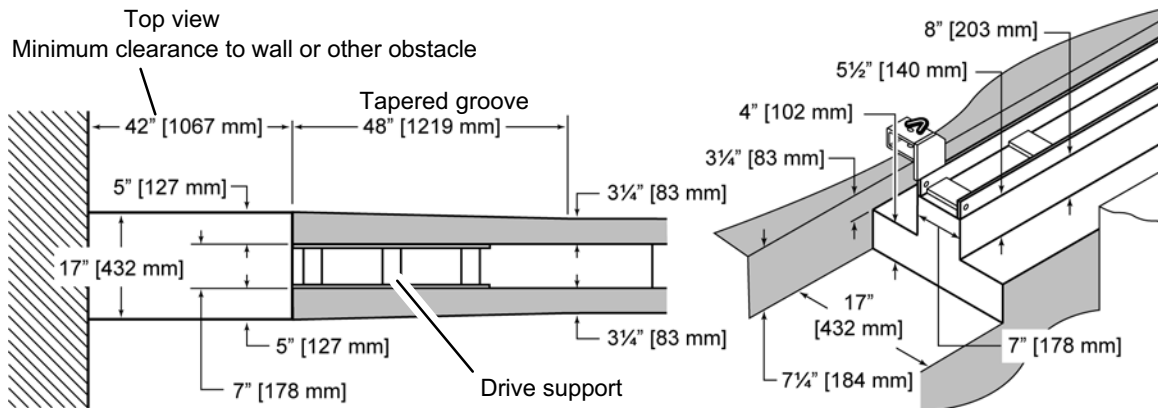


Note!

Dimensions from drive unit to walls are the minimum requirements.

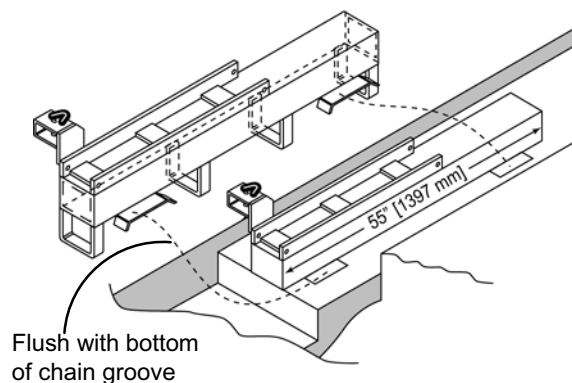


Concrete details for tapered groove and drive recess

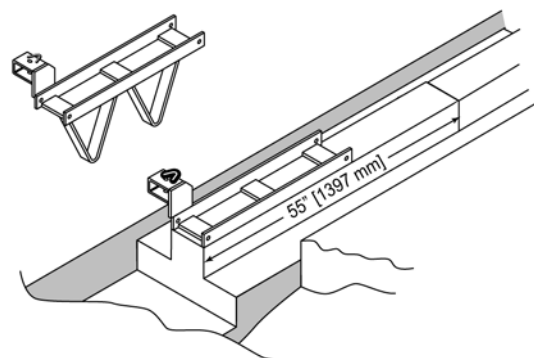


Installation of the drive support frame

Drive unit support welded on 55" long steel base

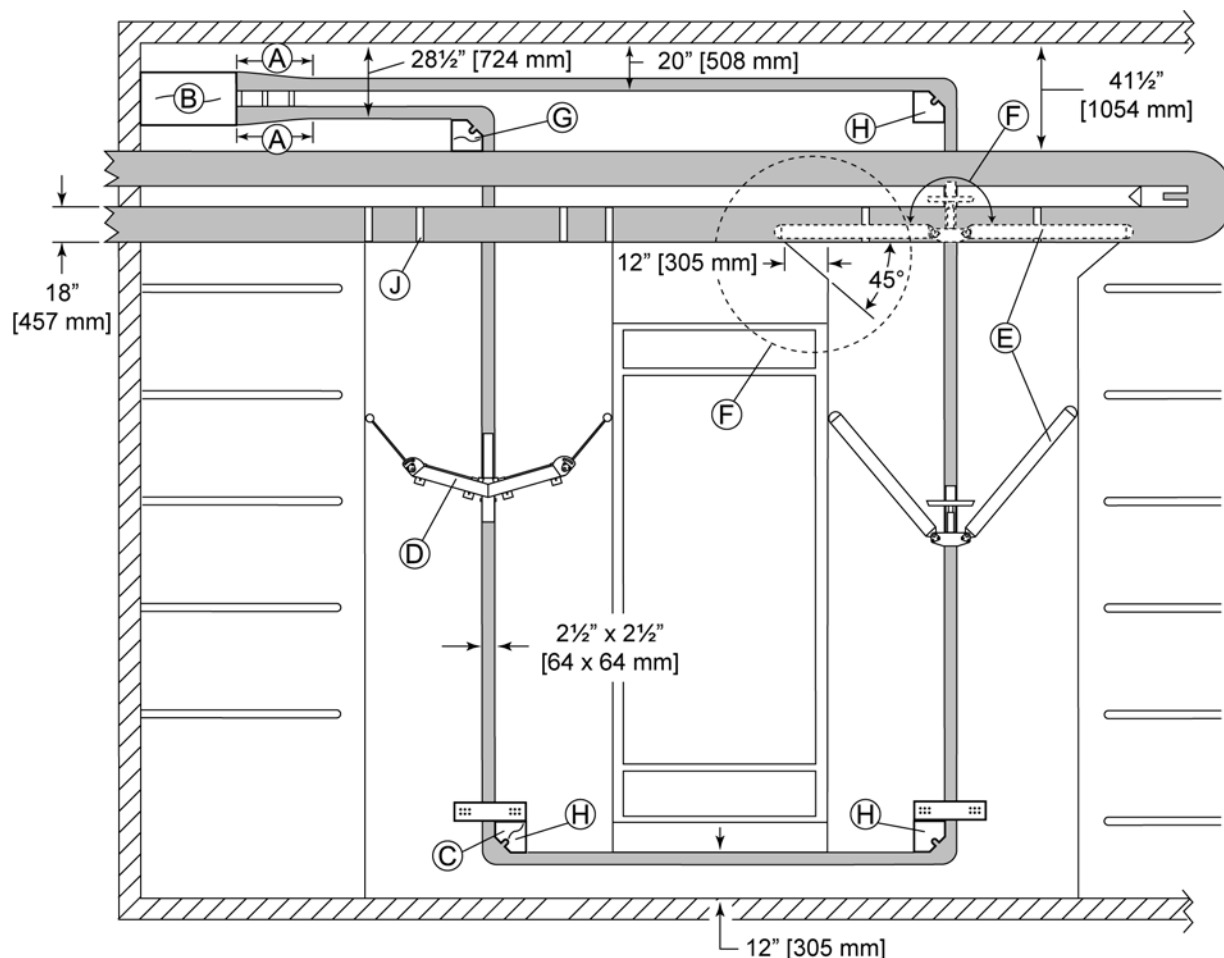


Drive unit support on poured concrete curb



5.7 Installation of a free stall cleaner with pintle chain in a groove

Overview of installation



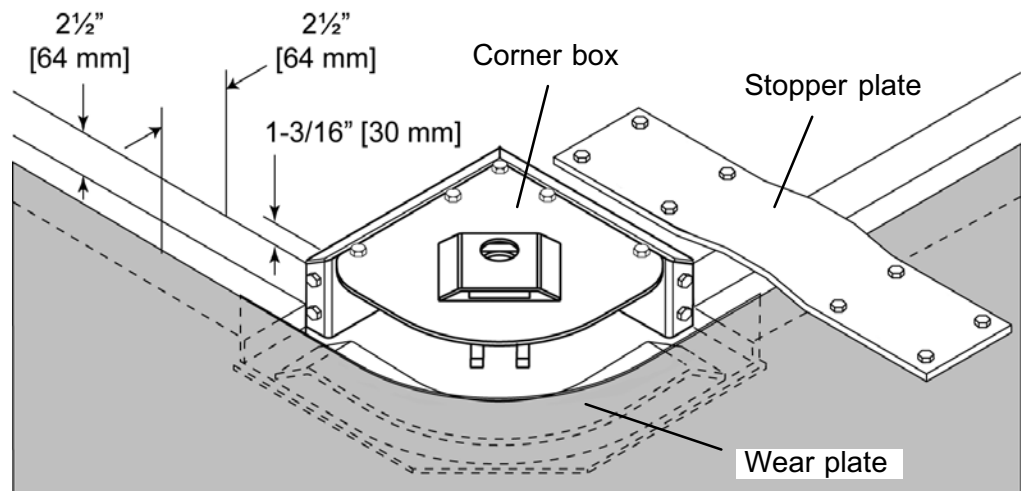
Legend:

A	Tapered groove. For details refer to section; Installation of drive unit with pintle chain in a groove
B	Recessed section in front of drive unit must be 4" [102 mm] lower than bottom of the chain groove.
C	Top of corner box must be 1" [25 mm] higher than the walking area.
D	16° alley scraper in a groove
E	V-shape scraper in a groove
F	If the V-shape scraper must fully open above the loaded gutter without reaching the curb between both gutters, the corners at the end of the alley must be angled.
G	Special corner box
H	Corner box
J	Scraper supports



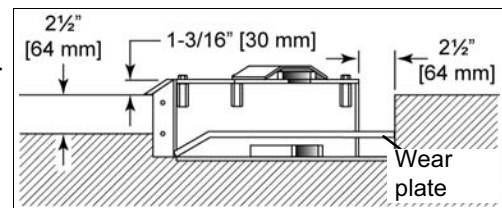
For instructions on making a steel groove refer to section;
Preparing steel grooves for 7/8" [22mm] and pintle chains

5.7.1 Installation of pintle chain corner boxes



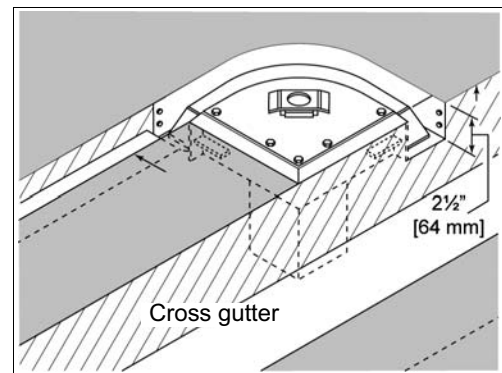
Side view

Top of the corner box must be higher than the walking area 1-3/16" [30 mm].

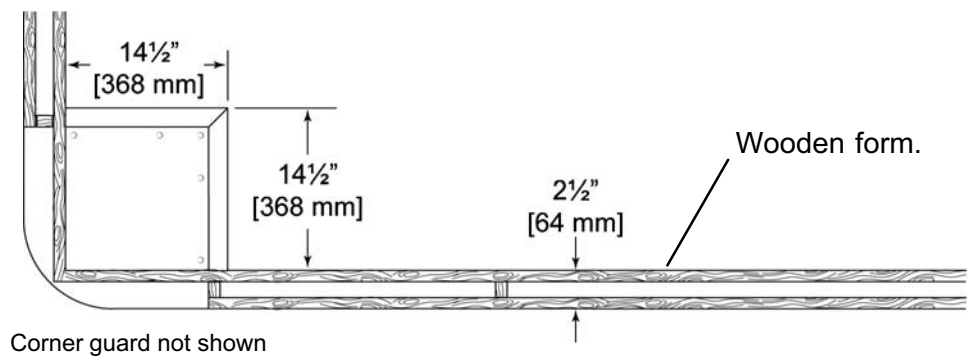


Special corner box

This special corner box can be installed flush with the side of the cross gutter.



Chain groove

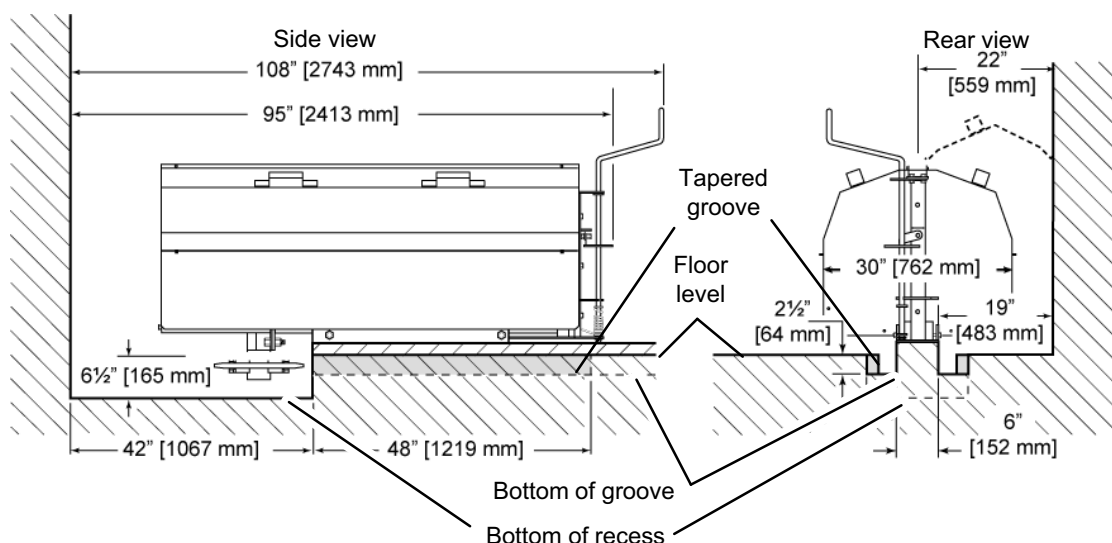


5.7.2 Installation of drive unit support using pintle chain in a groove

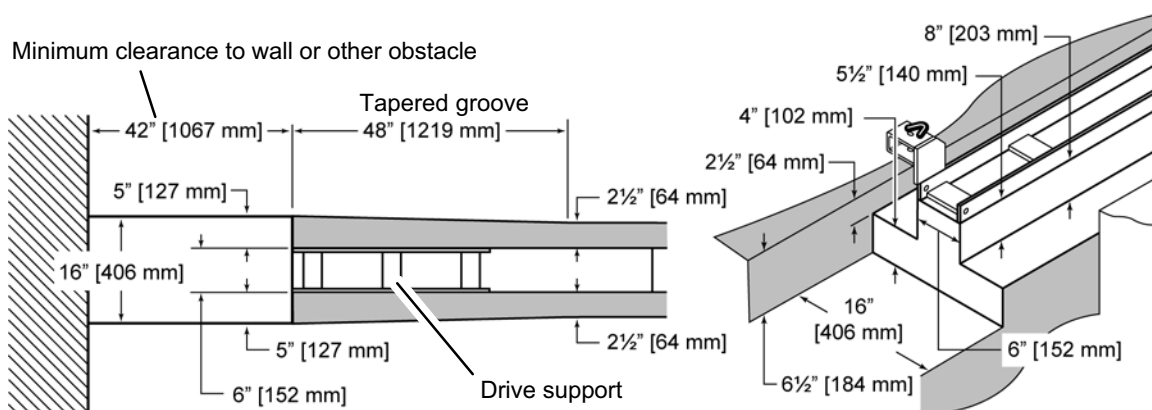


Note!

Dimensions from drive unit to walls are the minimum requirements.

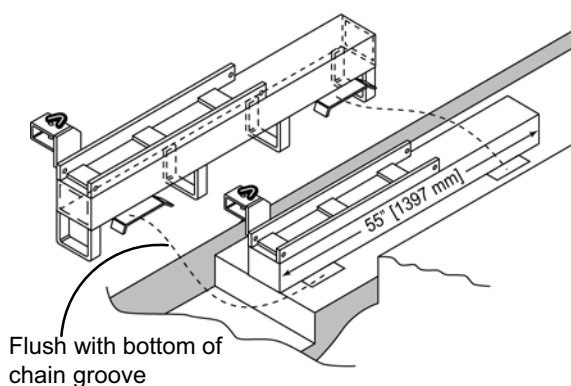


Concrete details for tapered groove and drive recess

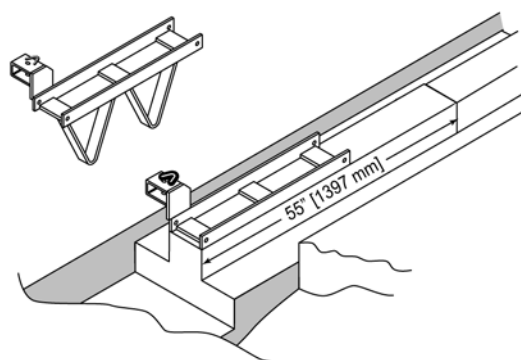


Installation of the drive support frame

Drive unit support welded on 55" long steel base



Drive unit support on poured concrete curb



5.8 Installation of a free stall cleaner floor mounted

When installing a floor mount system into an existing barn, the location of the corner boxes and the drive unit is dictated by the center of the manure alley.

The chain of the system must always be centered in the manure alley.

If there are cow stalls on only one side of the alley, it is possible to offset the cleaner chain by a maximum of 6" [152 mm] towards the stalls.

You must decide this before ordering the scrapers so they will be made accordingly.

Drive unit position



Note!

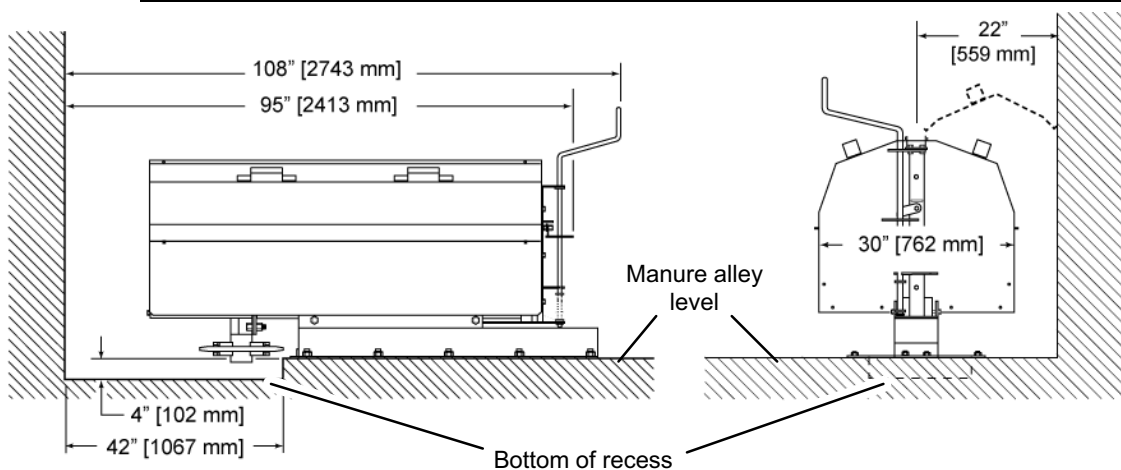
Dimensions from drive unit to walls are the minimum requirements.



Refer to the general view drawings to know where to locate the drive unit and recess in relation to the center of the manure alley.

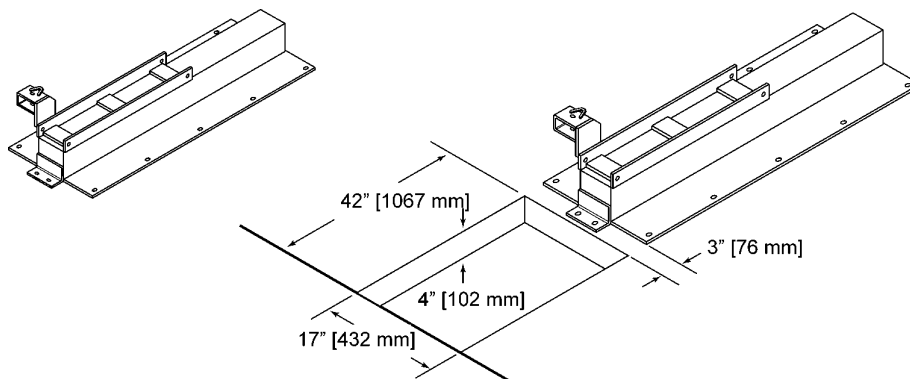
Overview of system with 7/8" [22mm] chain

Overview of system with pintle chain



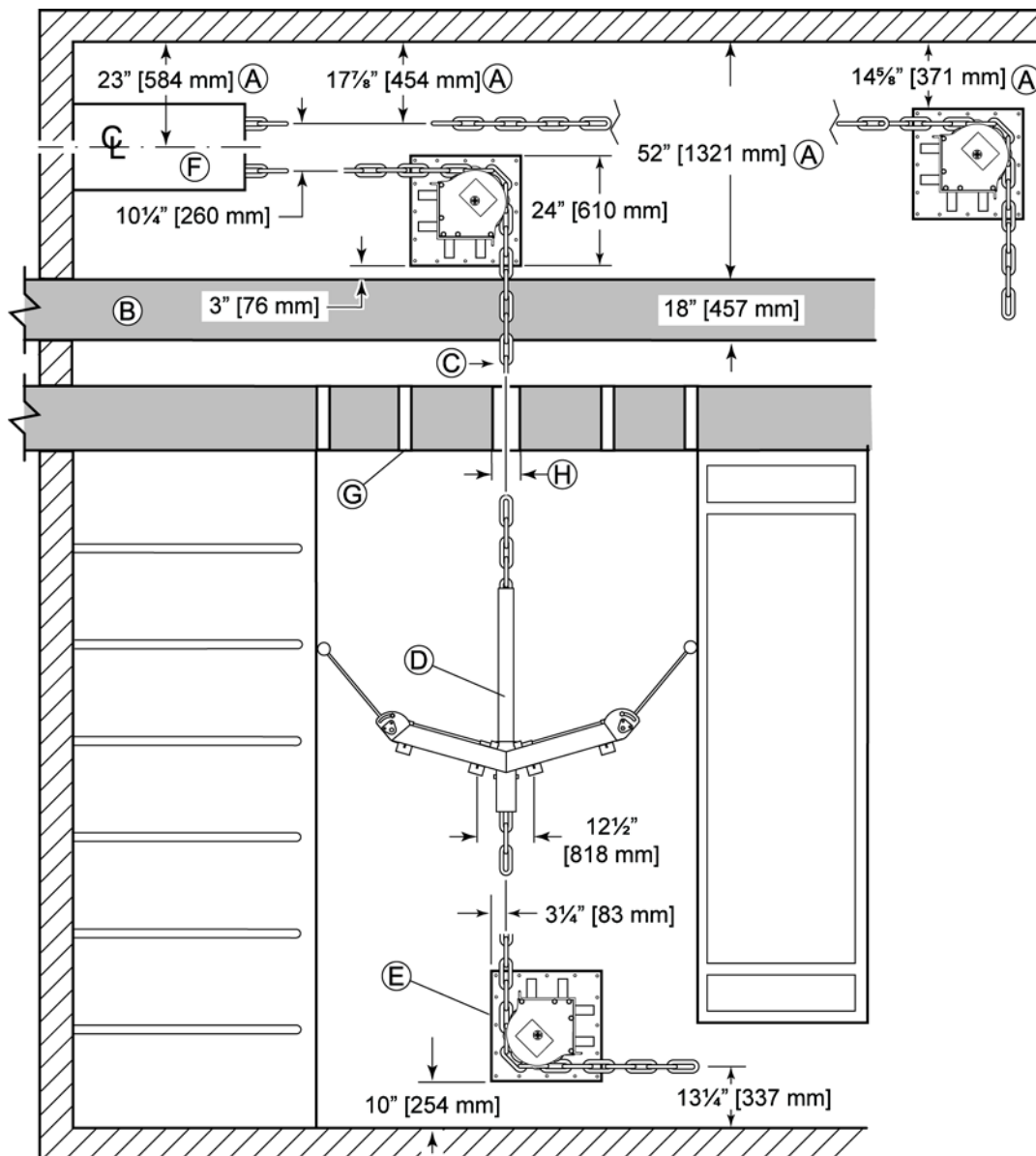
A recess below the manure alley level is required in front of the drive unit to provide clearance for the drive sprocket.

Installation of the drive support frame



- Install the drive unit on the concrete floor using 10 anchor bolts (1/2" x 3 3/4" [13 x 95 mm] stainless steel bolts). Refer to the Technical Data Section on Concrete Anchor Bolt.

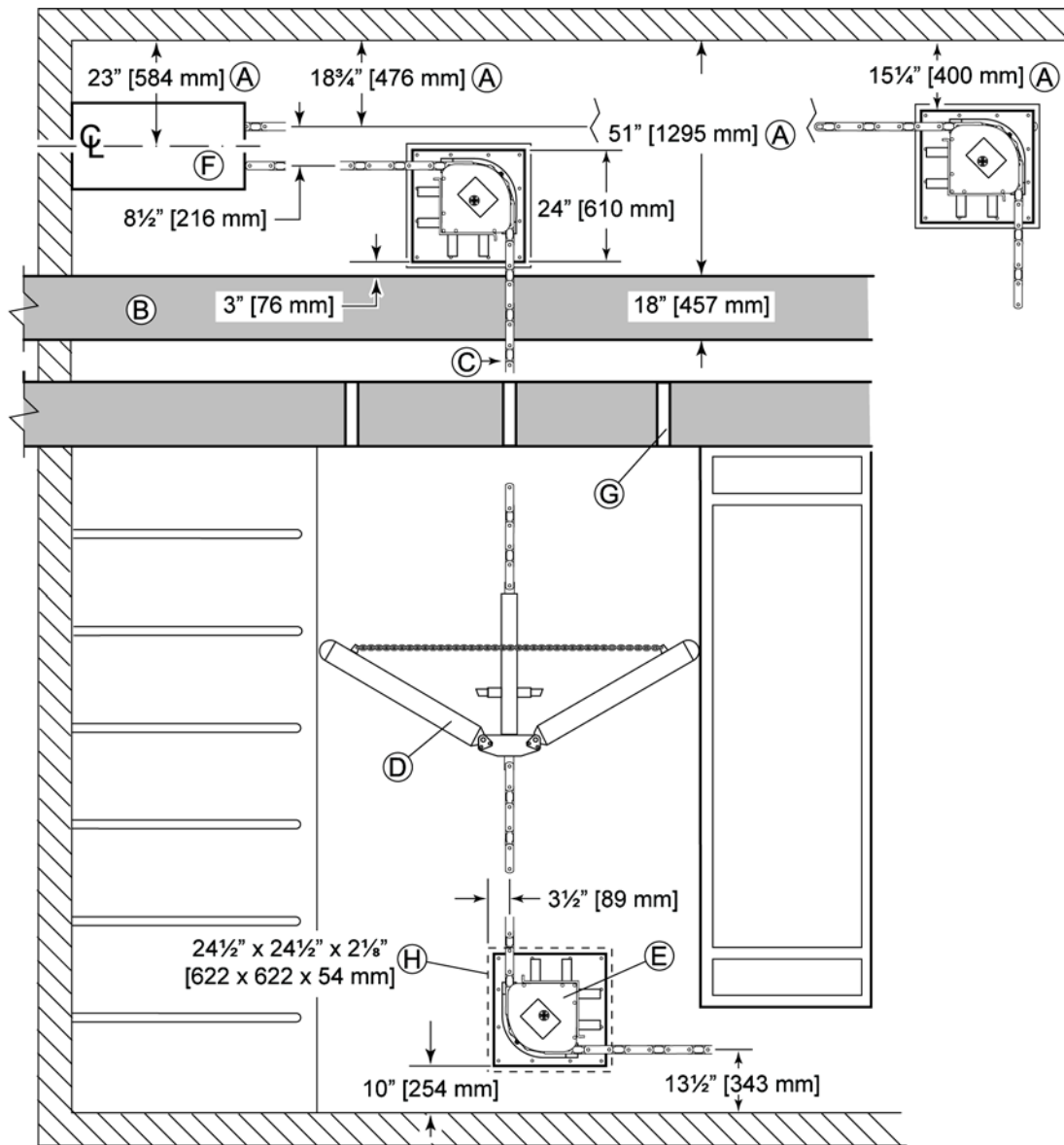
5.8.1 Overview of system with 7/8" [22mm] chain



Legend:

A	These dimensions are relative to each other. Increase them all equally.
B	Cross gutter
C	7/8" [22mm] chain
D	16° alley scraper
E	Corner box
F	Recessed section in front of drive unit for drive sprocket clearance.
G	Scraper supports (Refer to section Functional description for positions)
H	Width of center support; <ul style="list-style-type: none"> • 4" [102 mm] if only the scraper draw bar crosses the gutter. • 14" [356 mm] if the center section of the scraper must also cross the gutter.

5.8.2 Overview of system with pintle chain



Legend:

A	These minimum dimensions are relative to each other. Increase them all equally.
B	Cross gutter
C	Pintle chain
D	V-shape scraper
E	Corner box
F	Recessed section in front of drive unit for drive sprocket clearance.
G	Scraper supports (Refer to section Functional description for positions)
H	Corner box recess

5.8.3 Installation of corner boxes floor mounted for 7/8" [22mm] chain

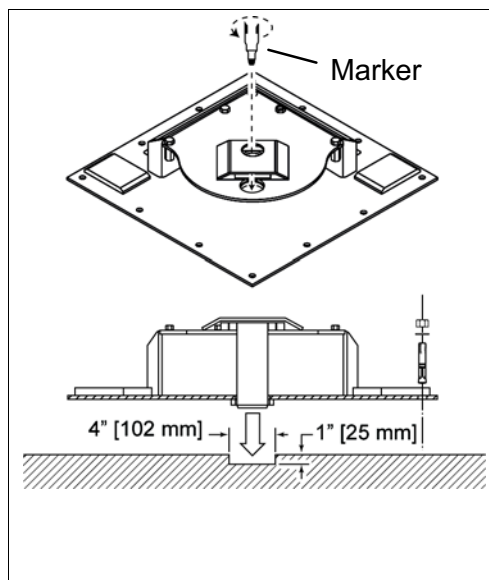


Refer to the general view drawing to know where to locate the corner boxes in relation to the center of the manure alley.

Overview of system with 7/8" [22mm] chain

A hole must be drilled under the corner box for clearance of the shaft of the corner wheel.

- Use the corner box as a template to mark the hole location.
- Remove the corner box and drill the hole.
 - 4" [102 mm] diameter
 - 1" [25 mm] deep minimum
- Install the corner box on the concrete floor using 12 anchor bolts (1/2" x 3 3/4" [13 x 95 mm] stainless steel bolts). Refer to the Technical Data Section on Concrete Anchor Bolt.



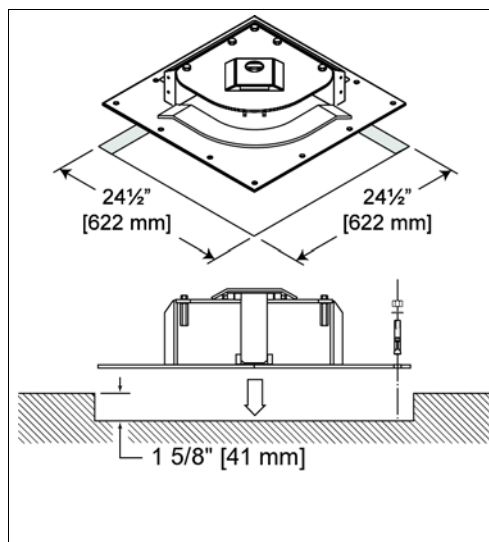
5.8.4 Installation of corner boxes floor mounted for pintle chain



Refer to the general view drawing to know where to locate the corner boxes in relation to the center of the manure alley.

Overview of system with pintle chain

- The corner box must be recessed below the floor level.
- This recessed section must be a minimum 24 1/2" [622 mm] square to fit the corner box properly.
- Use the corner box as a template to mark the location of the recess on the concrete floor.
- Install the corner box on the concrete floor using 12 anchor bolts (1/2" x 3 3/4" [13 x 95 mm] stainless steel bolts). Refer to the Technical Data Section on Concrete Anchor Bolt.



5.9 Installing the drive unit



WARNING!

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



CAUTION!

Never allow bystanders to stay close to the equipment when it is lifted.



CAUTION!

Sharp edges may cause cuts.



Attention!

All screws and nuts made of stainless steel are to be greased thoroughly to prevent them from seizing during tightening!



To install concrete anchor bolts properly, refer to the Technical Data Section on Concrete Anchor Bolt.



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

5.9.1 Installation of drive unit on the support

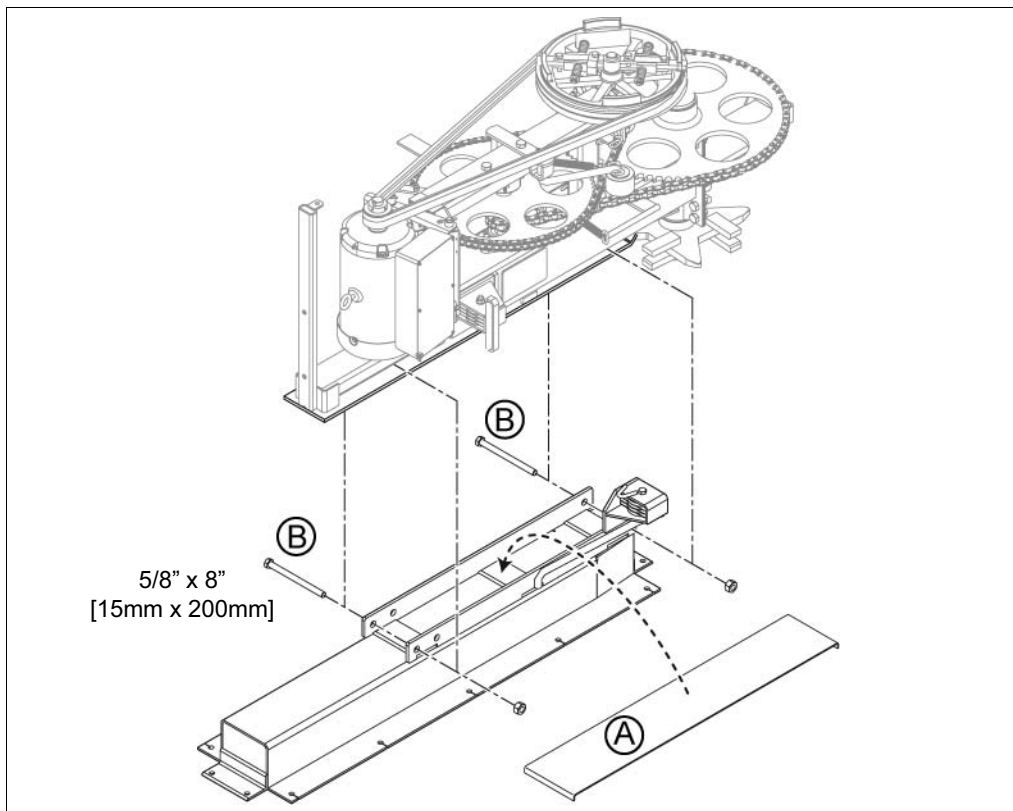
- Install the sliding plate over the drive unit support. (A)



Note!

Use EP2 mineral grease

- Apply grease all over the sliding plate.
- Install the drive unit on its support.
- Install 2 bolts on the support to limit the sliding adjustment of drive unit. Make sure the bolts are properly installed through the drive unit base. (B)



5.10 Installation of the drive system



WARNING!



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



WARNING!

Always put back in place the safety guard before starting the equipment.



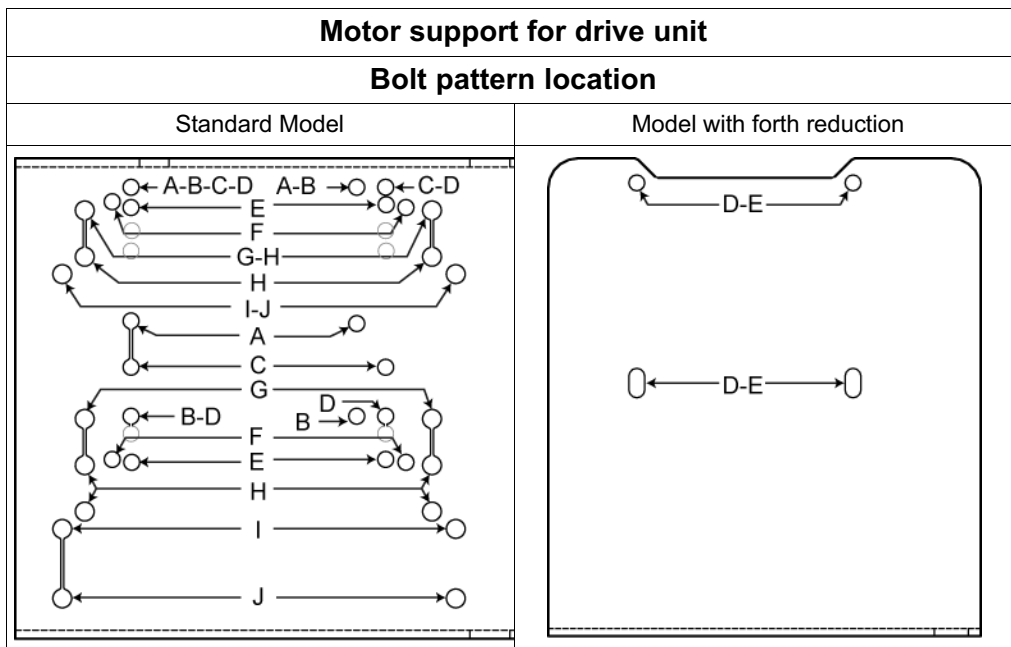
CAUTION!

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 Technical Data section on Motor specifications and on Control panel specifications.



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

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



	Motor			
	Power		Type	
	HP	KW	NEMA	IEC
A	-	-	-	-
B	-	-	-	-
C	-	-	-	-
D	1.5 - 2	1 - 1.5	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	213T	132
J	-	-	-	-

5.10.1 Installing the motor

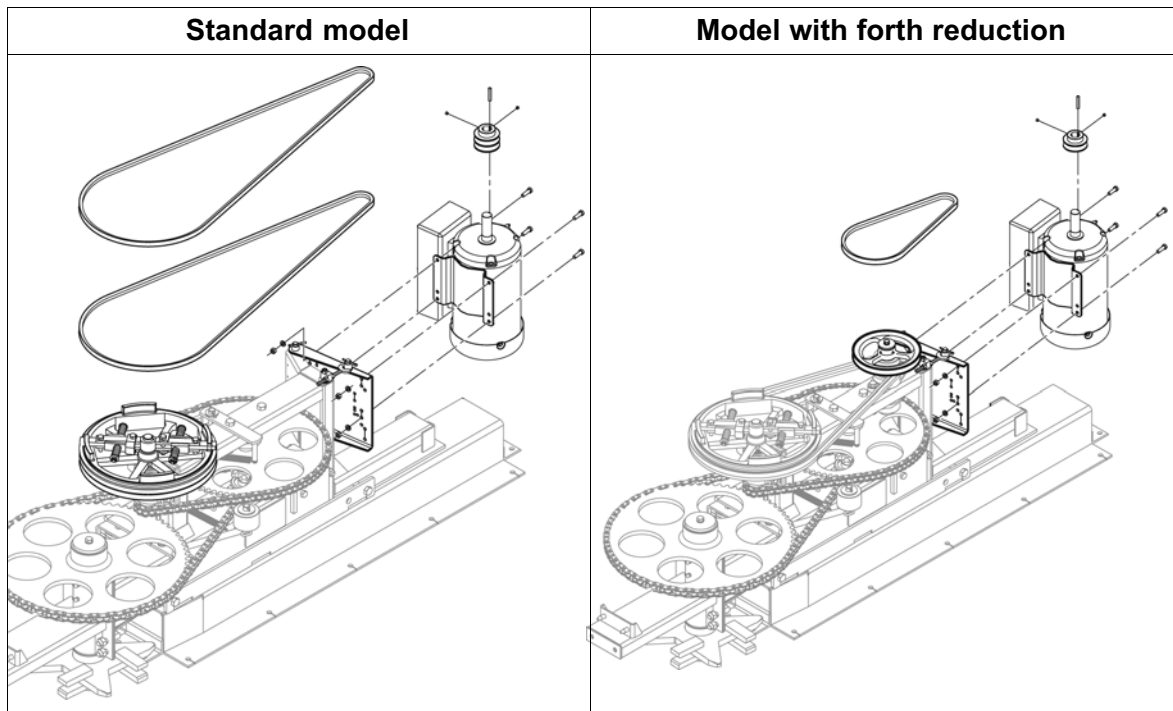


CAUTION!

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



- Using the appropriate bolt pattern, bolt the motor on the support.
- Assemble the key and the pulley on the motor shaft.
- Using a straight edge, align pulleys.
- Tighten cap screw once pulley is located properly.



- Wire the electrical motor to the control panel.

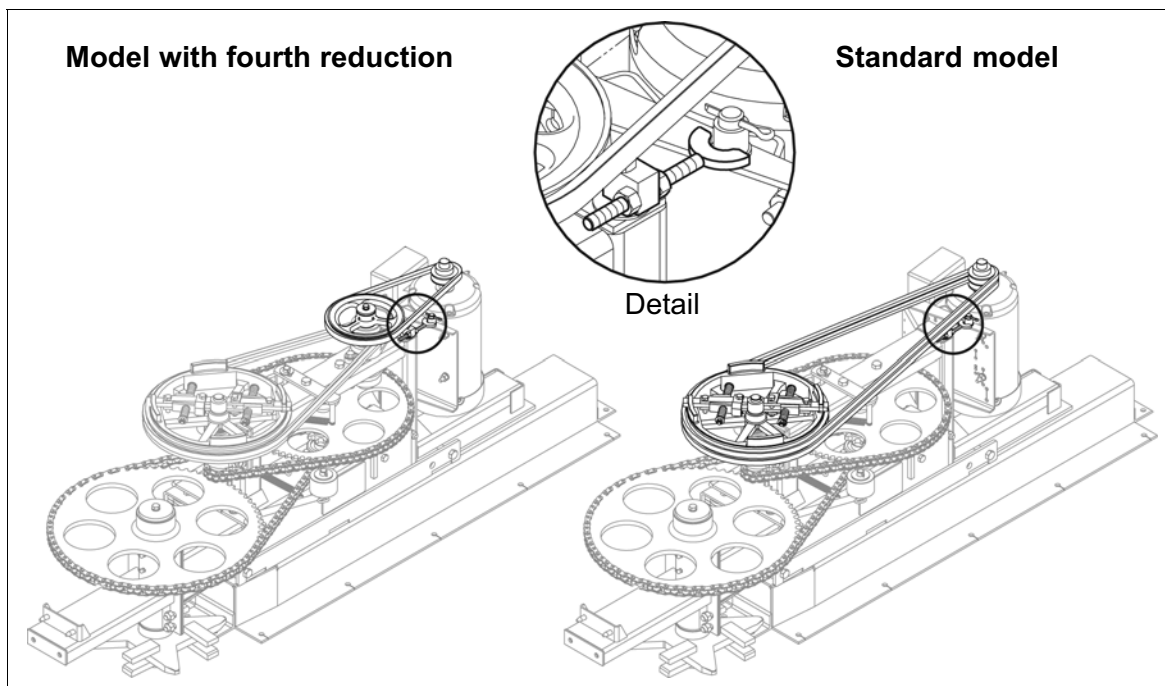
5.10.2 Adjusting belt tension



Note!

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

- Screw in the adjustment bolt to tighten the belt;
- Lock the adjustment bolt by tightening the lock nuts. Refer to detail below.

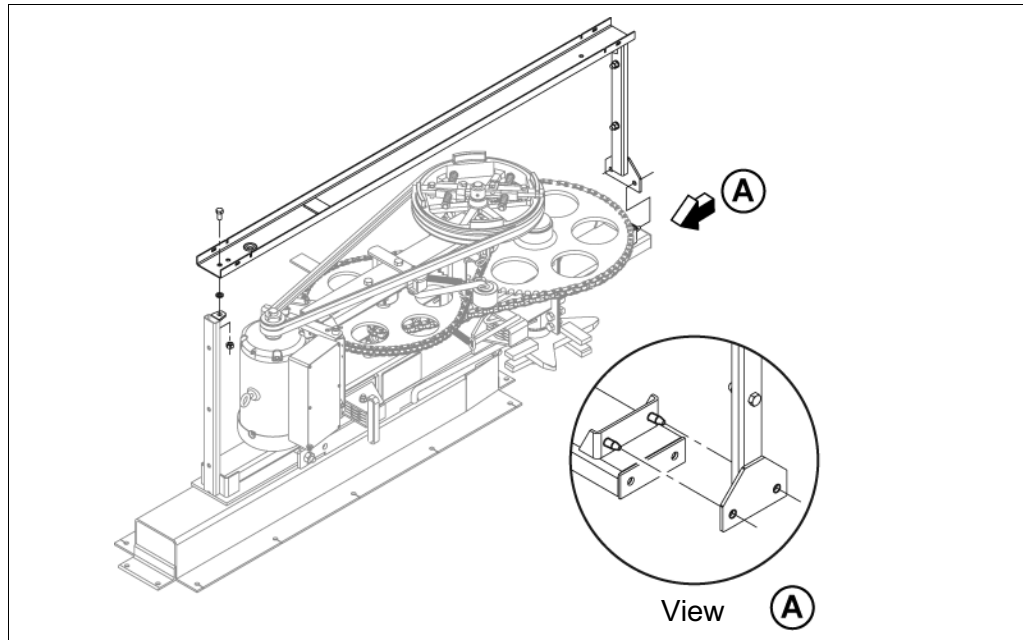


5.10.3 Installation of guard support frame



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

- Slide the support on the bracket located on the drive unit end. see view A;
- Bolt the support on the drive unit vertical beam using a bolt ($1/2" \times 1"$ [13 x 25mm]).

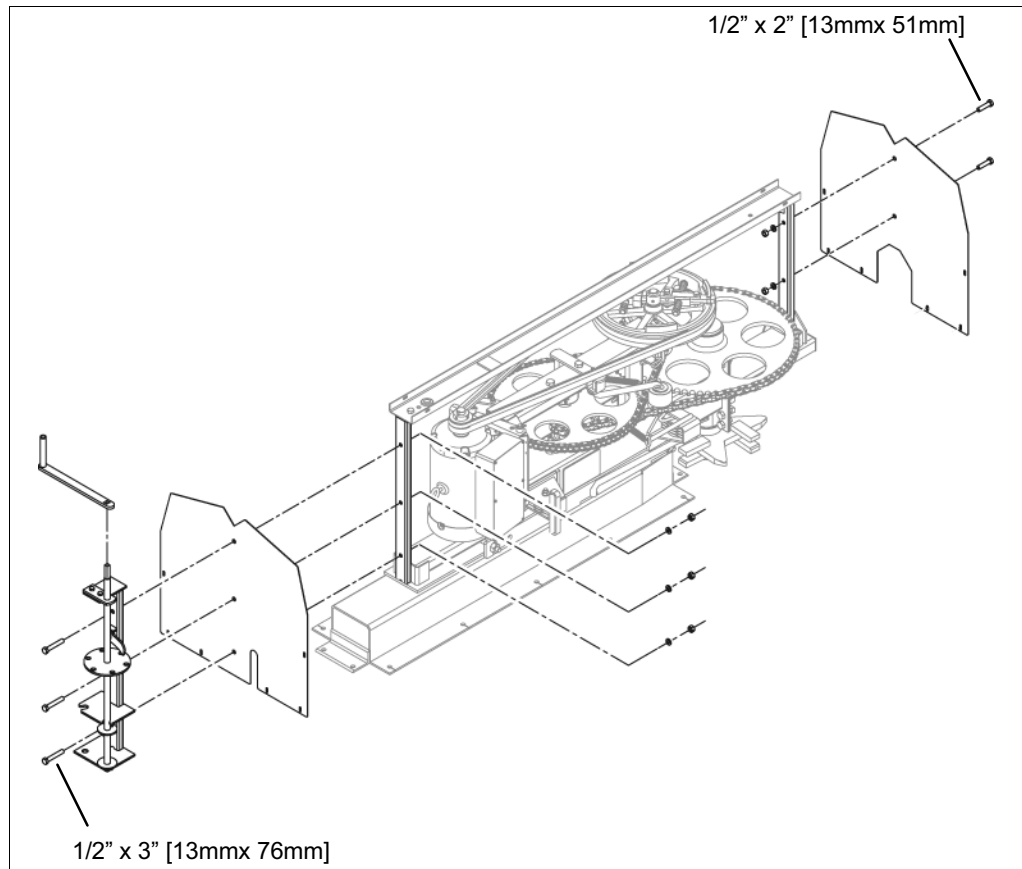


5.10.4 Installation of quick tensioner



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

- Install the quick tensioner and the back end cover on the drive unit frame using 3 bolts.
- Install the front end cover on the drive unit frame using 2 bolts.



5.10.5 Installation of quick tensioner cable



CAUTION!

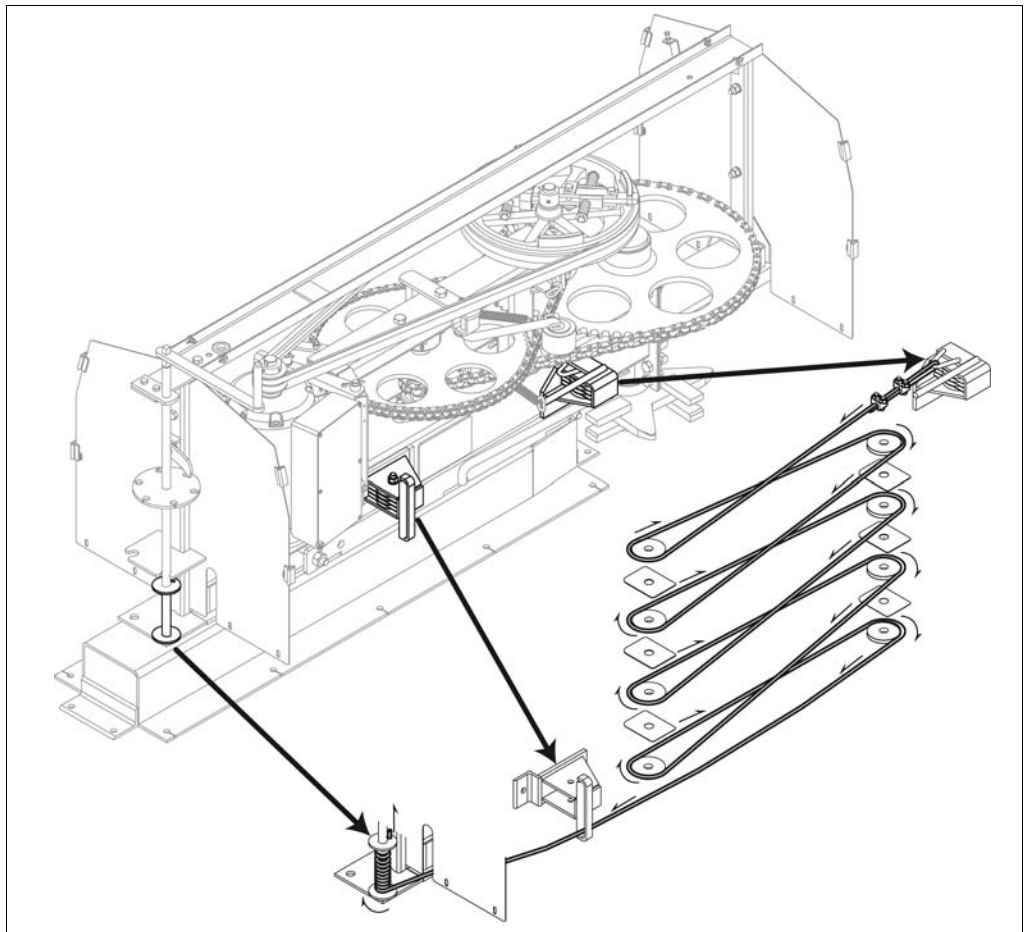
Always wear protecting gloves when handling/installing the cable.



Note!

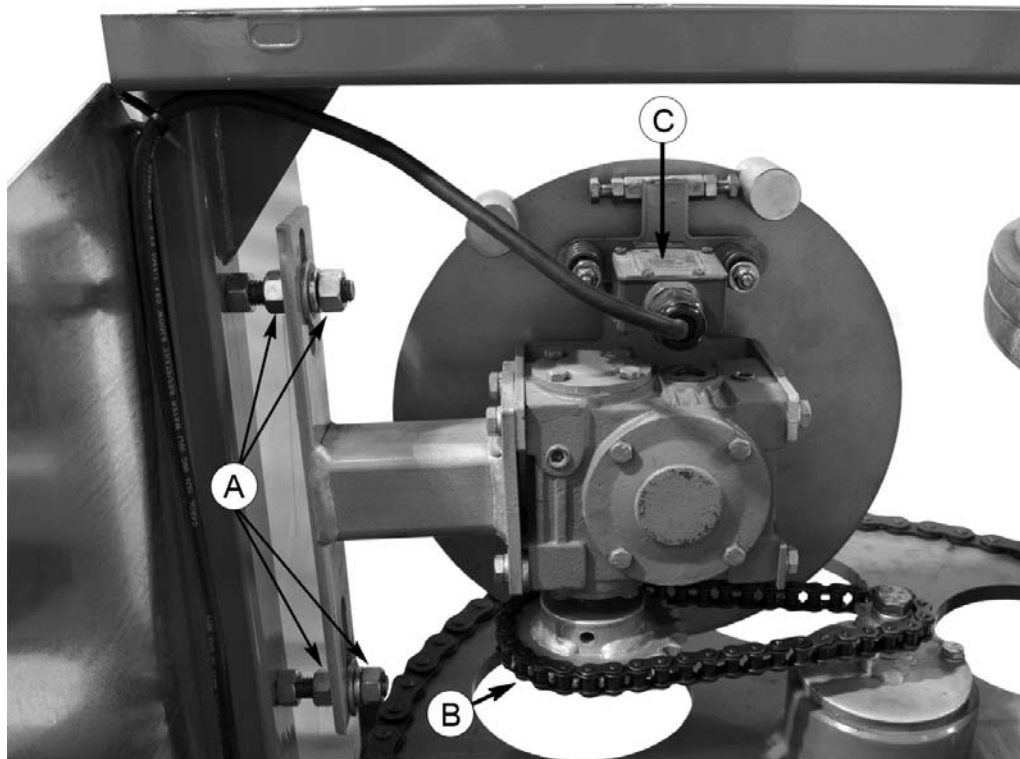
To facilitate cable installation and prevent cable splitting, apply electrical tape on each cable end.

- Install the cable between the quick tensioner winch and the drive unit support frame.
- Using 2 cable clamps, attach the cable to the drive unit support.
- Place the cable around the pulleys following the path illustrated below.
- Insert the end of cable into the tensioner. Make sure the cable is not too long but long enough to fully slide the drive unit.

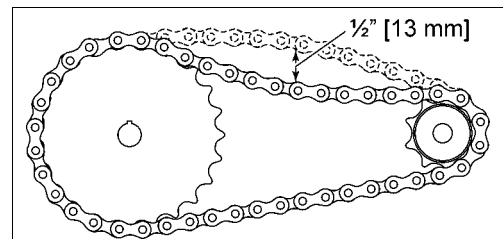


5.10.6 Installation of the stroke limit switch

- Install the stroke limit switch assembly to the frame of the drive unit using existing bolts and nuts (A).
Bolts are installed on both side of assembly to allow chain tension adjustment.
- Install the gears and the driving chain. (B)
- Install the stroke limit switch on the support. (C)



- To tighten or loosen up the chain, adjust the nuts located on each side of the support. (A)
- You must leave about 1/2" [13 mm] of play in chain as shown.



- Connect the wires of the stroke limit switch to the automatic control panel.



See instructions for further information on the subject "Owner's Manual of the Control Panel".

5.11 Safety guards



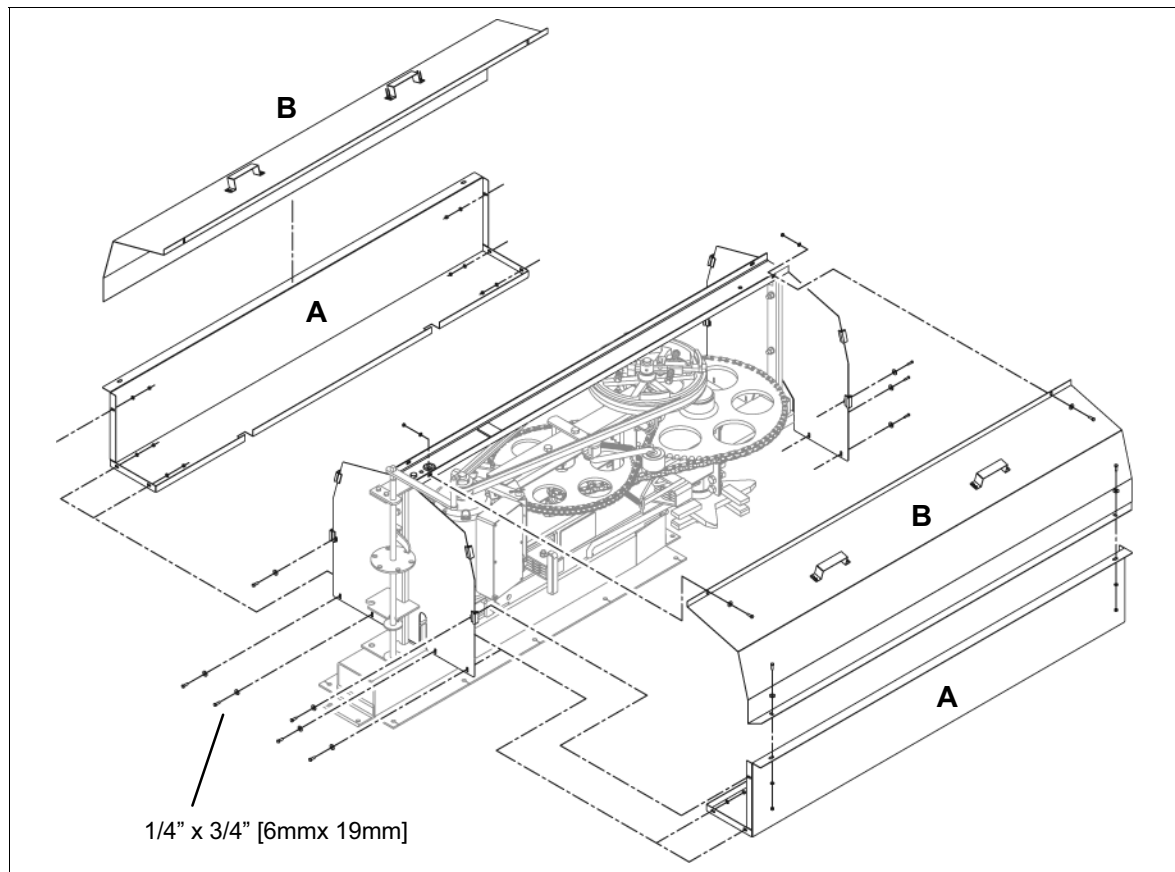
Note!

Check and make sure that there are no objects or tools remains inside the drive unit before installing the upper guards.



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

- Using 6 bolts per panel, install the lower safety guards between both back end and front end guard. (A)
- Using 4 bolts per panel, install the upper safety guards over the lower guards. (B)



5.12 Assemble the scrapers



WARNING!

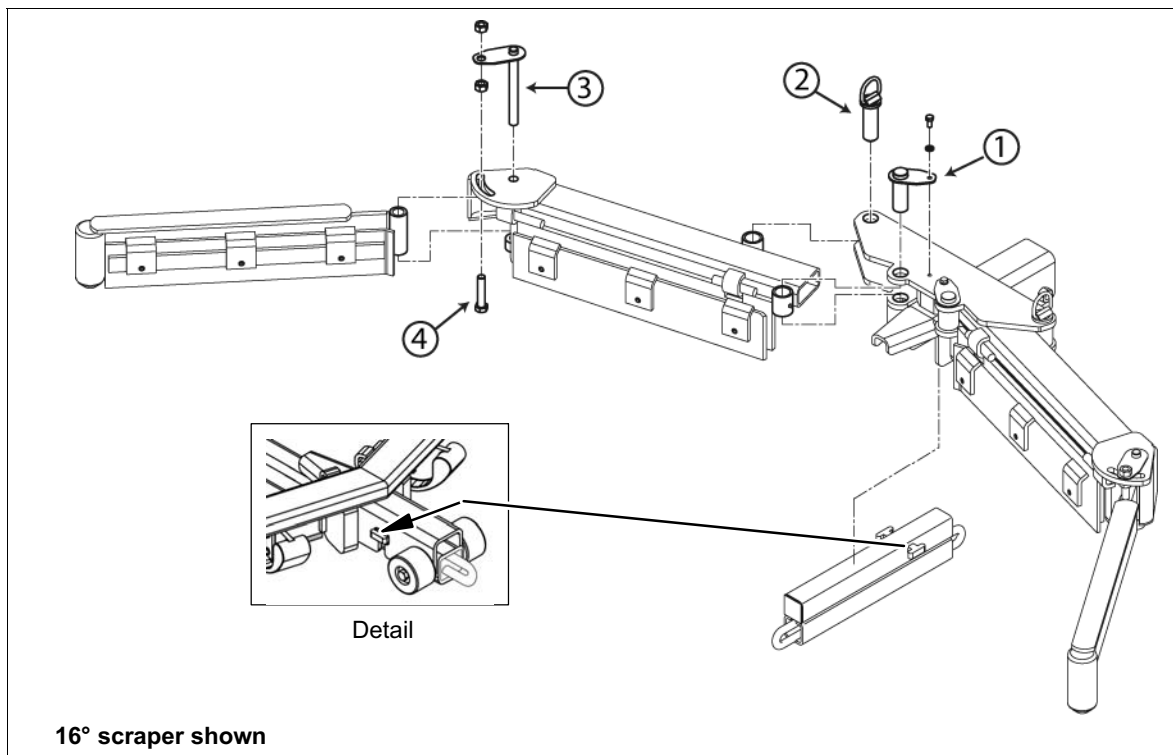
Beware of all mobile parts when handling and assembling the scrapers. Handling scraper parts may result in pinching or injury.

5.12.1 16° scraper or straight scraper

- Install the draw bar under the scraper. Refer to detail below.

5.12.2 16° scraper or straight scraper with optional hinges

- Install the draw bar under the arm support. Refer to detail below.
- Position the scraper arm making sure the holes are fit aligned with arm support;
- Install hinge through the hole and bolt it on top of the arm support (1).
- Install the arm retaining pin through the arm support (2).
- Position the folding ends making sure the hole is fit aligned with the scraper arm.
- Install the hinge through the hole (3).
- Install the stopper bolt making sure to lock hinge in place (4).
- Repeat steps to assemble the arm on the other side.

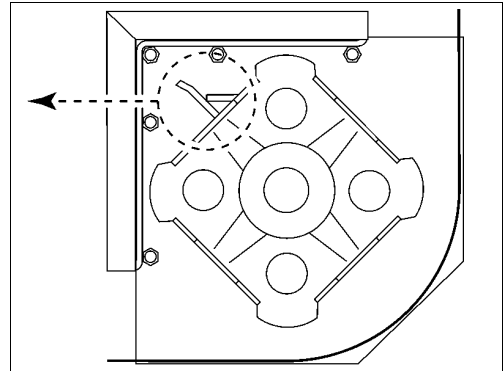


5.13 Installing corner wheels for in a groove and floor mounted systems

5.13.1 Installation of corner wheels and 7/8" [22mm] chain

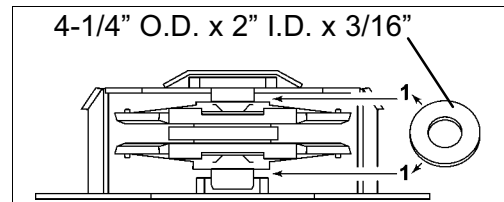
7/8" [22mm] corner wheels

- The corner wheel cleaner must always point towards the inside corner of the box.



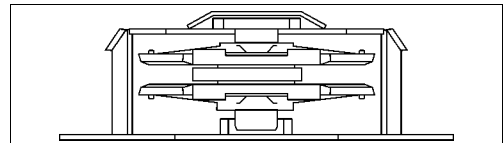
7/8" [22mm] corner wheel with standard shaft

- A washer must be set on each side of the wheel.



7/8" [22mm] corner wheel with bearing and seals

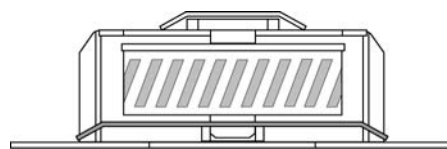
- No washers are needed, the shaft supports the wheel at proper height.



5.13.2 Installation of corner wheels for pintle chain

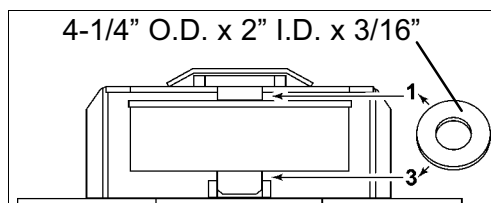
**Note!**

Make sure the pintle chain roll on the center zone of each wheel.



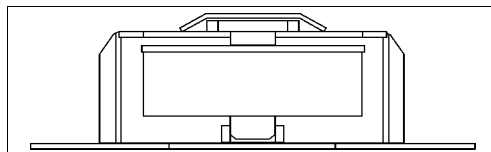
Pintle corner wheel with standard shaft

- You must set 3 washers underneath and 1 washer above the wheel.



Pintle corner wheel with bearing and seals

- No washers are needed, the shaft supports the wheel at proper height.



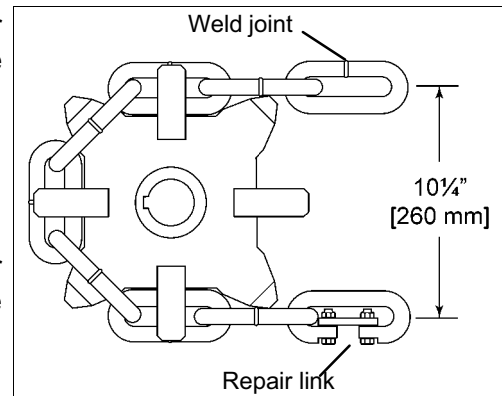
5.14 Installing chains for in a groove and floor mounted systems

5.14.1 Installation of 7/8" [22mm] chain



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

- Welded joints of links must never touch the concrete floor nor the drive unit sprocket.
- Ensure the chain is not twisted anywhere around the full circuit.
- The repair link must be installed horizontally with the nuts inward for proper alignment around the sprocket and the corner wheel.



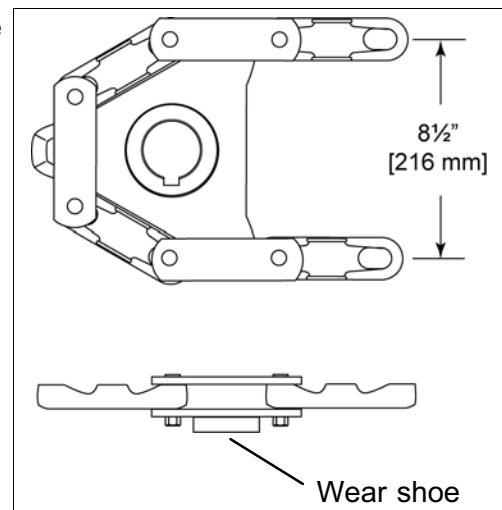
5.14.2 Installation of pintle chain



Attention!

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

- Ensure wear shoe is facing concrete floor.
- Ensure nuts are tightened.

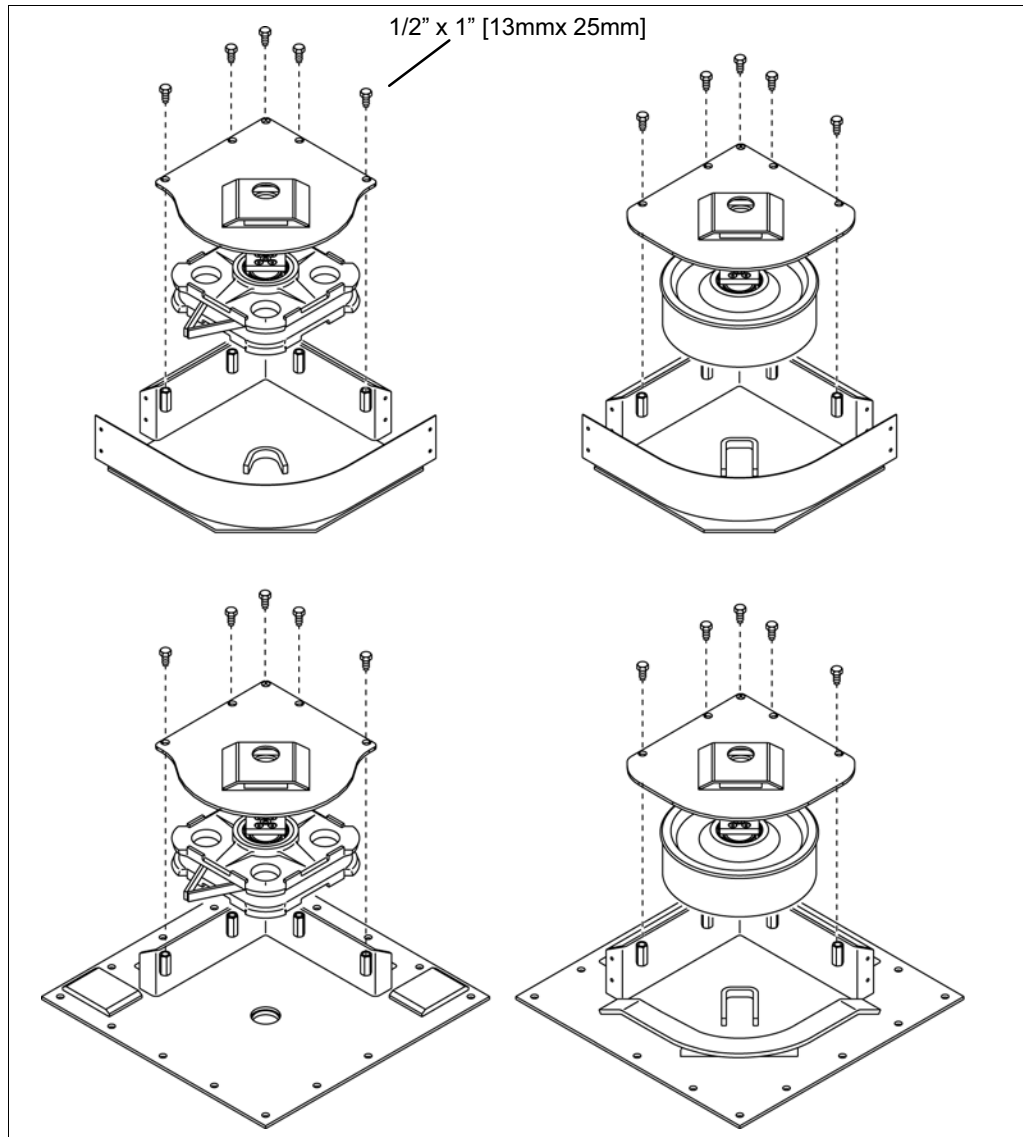


5.15 Installation of corner boxes covers



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

- Install corner box cover using 5 bolts.



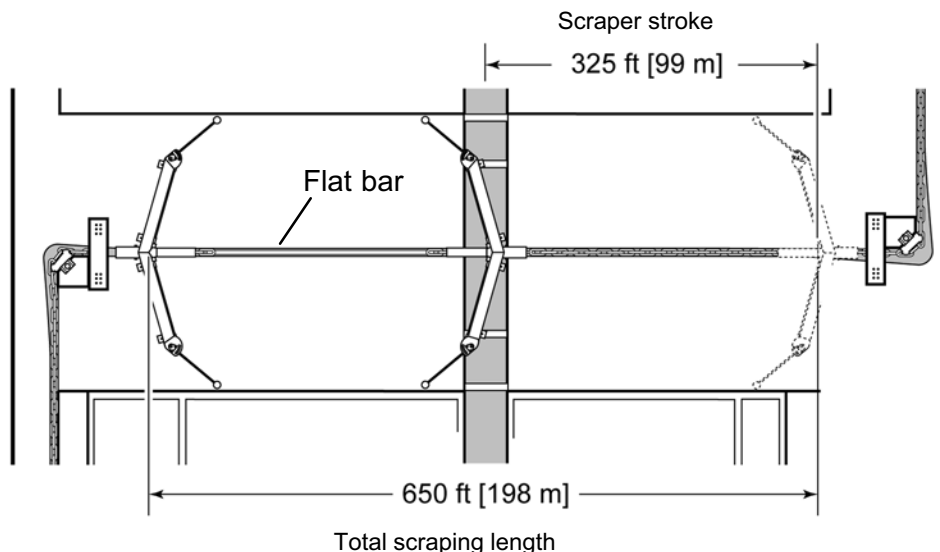
5.16 Optional equipment

System using two scrapers per manure alley

Barn with the cross gutter at center (maximum barn length 650 ft. [198 m])

2 scrapers can be linked together face to face, using flat bar, to bring the manure to a cross gutter at the center of the barn.

The distance between the scrapers must be the half of the total scraping length.

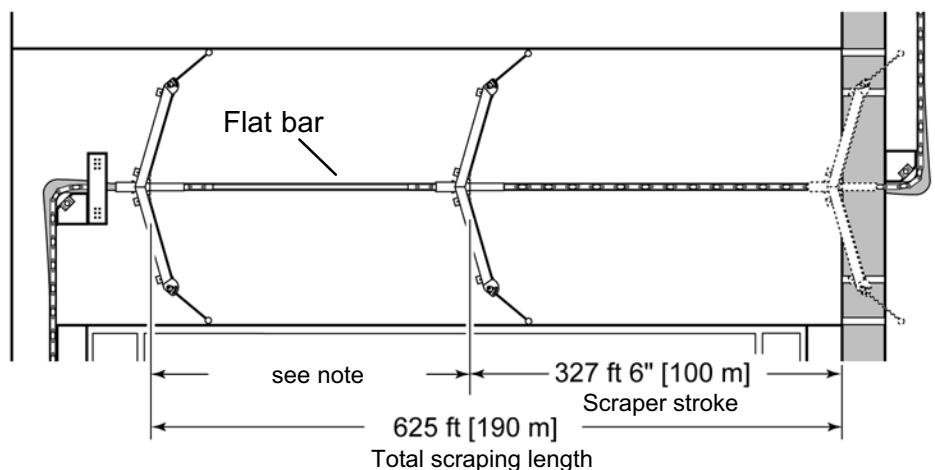


Barn with the cross gutter at one end (maximum barn length 625 ft [190 m])

2 scrapers can be linked together, using flat bar, to shuttle stroke the manure to a cross gutter at one end of the barn.

With this configuration, the scraper closest to the cross gutter recuperates the manure left in the alley by the furthest back scraper.

The distance between the scrapers must be set as shown below.



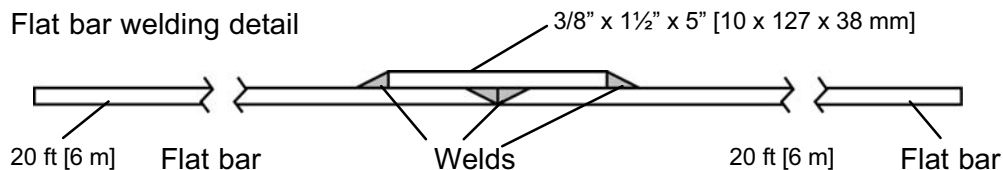
Note!

Distance between scrapers =

$\text{Total scraping length} \div 2 - (15 \text{ ft } [4.6 \text{ m}]) = 297 \text{ ft } 6" [91 \text{ m}]$

Flat bar junction welding detail

Normally, scrapers in the same alley are linked with flat bars, which are welded together using a short flat bar section overlapping the joint.



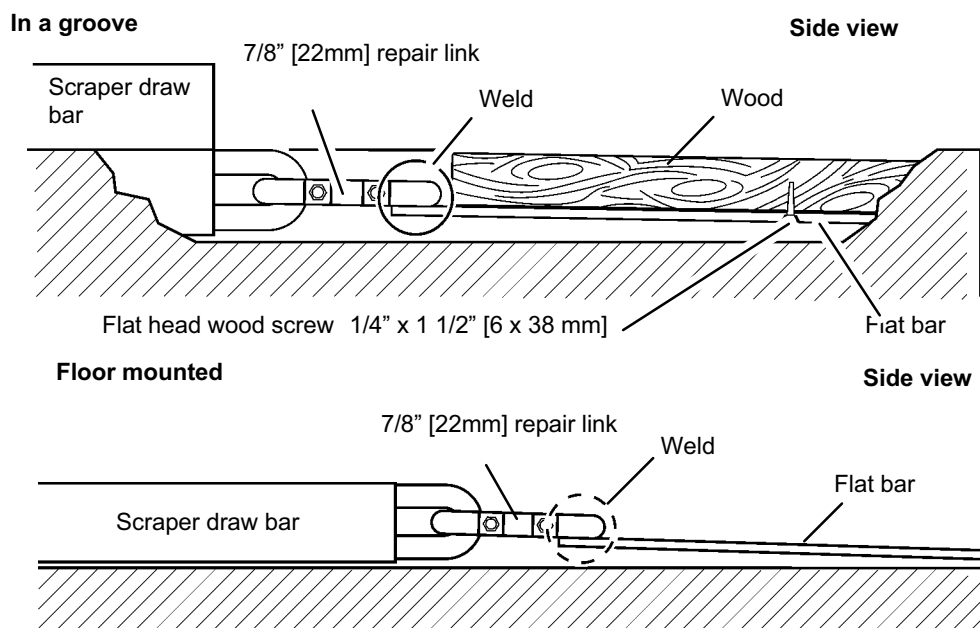
Attaching a flat bar to a 7/8" [22mm] chain system

Pre-drilled flat bar allowing a wooden spacer to be attached to the top of it with wood screws.

The wood is to fill the groove reducing the risk of hurting a cow's hoof.

Wooden spacer and flat head wood screws must be supplied locally.

Space screws every 2 ft [60 cm].



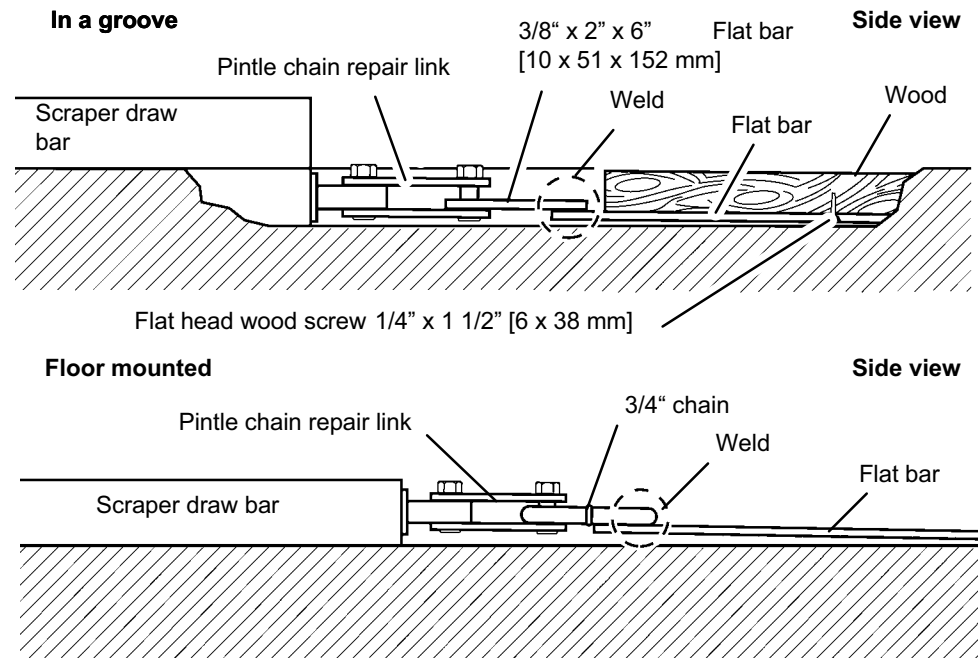
Attaching a flat bar to a pintle chain system

Pre-drilled flat bar allowing a wooden spacer to be attached to the top of it with wood screws.

The wood is to fill the groove reducing the risk of hurting a cow's hoof.

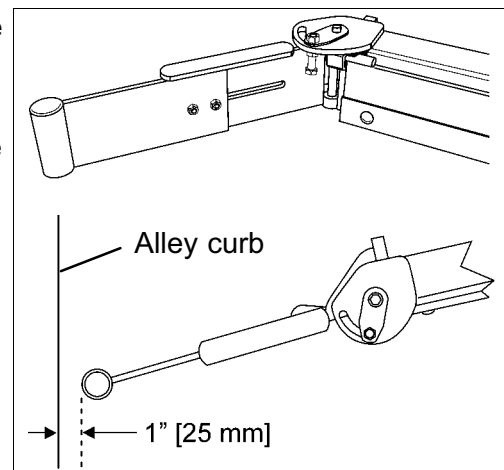
Wooden spacer and flat head wood screws must be supplied locally.

Space screws every 2 ft [60 cm].



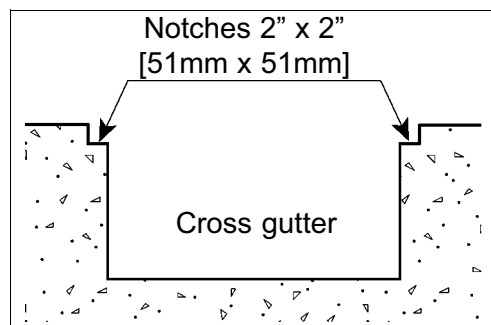
Adjustable folding ends

- Be sure the scraper draw bar is in the center of the alley.
- Adjust the ends to the dimension shown at the narrowest part of the alleyway.

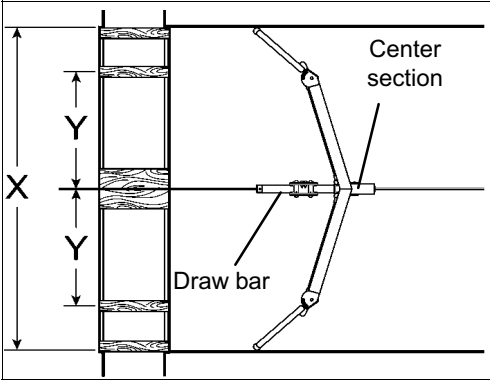
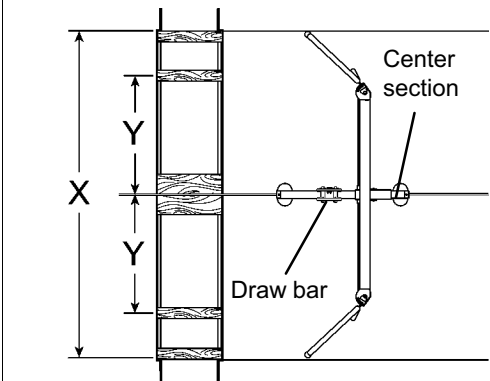


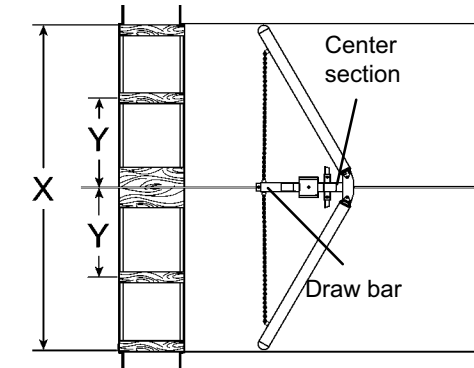
Scraper supports over cross gutter

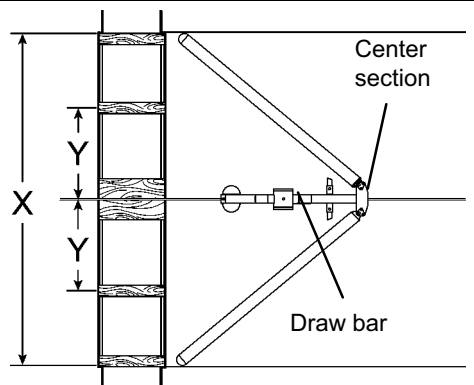
- Cross gutter notches
- A notch must be formed on each side of the cross gutter to install hardwood lumber scraper supports to bridge the gutter.



- Width of the center support;
 - 4" [10cm] if only the draw bar crosses the gutter
 - 8" [20cm] if the scraper center section must cross the gutter.

16° Tapered scraper		Alley width X	Intermediate Y
		6'1"-7' [185 - 213 cm]	23" [584 mm]
		7'1"-8' [216 x 244 cm]	29" [737 mm]
		8'1"-9' [246 - 274 cm]	35" [889 mm]
		9'1"-10' [277 - 305 cm]	41" [1041 mm]
		10'1"-11' [307-335 cm]	47" [1194 mm]
		11'1"-12' [338-366 cm]	53" [1346 mm]
		12'1"-13' [368-396 cm]	59" [1499 mm]
		13'1"-14' [399-427 cm]	65" [1651 mm]
Straight scraper		Alley width X	Intermediate Y
		6'6"-7'5" [198 - 226 cm]	22" [556 mm]
		7'6"-8'5" [229 - 257 cm]	28" [708 mm]
		8'6"-9'5" [259 - 287 cm]	34" [860 mm]
		9'6"-10'5" [290 - 318 cm]	40" [1013 mm]
		10'6"-11'5" [320 - 348 cm]	46" [1165 mm]
		11'6"-12'5" [351 - 378 cm]	52" [1318 mm]
		12'6"-13'5" [381 - 409 cm]	58" [1470 mm]
		13'6"-14'5" [411 - 439 cm]	64" [1622 mm]

V-shape scraper floor mounted	Alley width X	Intermediate Y
 <p>The diagram shows a side view of a V-shaped scraper assembly. A vertical dimension line on the left is labeled 'X' and spans the height of the V-shape. Two horizontal dimension lines within the V-shape are labeled 'Y'. To the right, a perspective view shows the 'Center section' and a 'Draw bar' connecting it to the main structure.</p>	6'1"-7' [185 - 213 cm]	11" [279 mm]
	7'1"-8' [216 x 244 cm]	13" [330 mm]
	8'1"-9' [246 - 274 cm]	15" [381 mm]
	9'1"-10' [277 - 305 cm]	18" [457 mm]
	10'1"-11' [307-335 cm]	21" [533 mm]
	11'1"-12' [338-366 cm]	23" [584 mm]
	12'1"-13' [368-396 cm]	25" [635 mm]
	13'1"-14' [399-427 cm]	28" [711 mm]

V-shape scraper w/ guide groove	Alley width X	Intermediate Y
 <p>The diagram shows a side view of a V-shaped scraper assembly with a guide groove. A vertical dimension line on the left is labeled 'X' and spans the height of the V-shape. Two horizontal dimension lines within the V-shape are labeled 'Y'. To the right, a perspective view shows the 'Center section' and a 'Draw bar' connecting it to the main structure.</p>	6'1"-7' [185 - 213 cm]	16" [406 mm]
	7'1"-8' [216 x 244 cm]	19" [483 mm]
	8'1"-9' [246 - 274 cm]	22" [559 mm]
	9'1"-10' [277 - 305 cm]	25" [635 mm]
	10'1"-11' [307-335 cm]	28" [711 mm]
	11'1"-12' [338-366 cm]	32" [813 mm]
	12'1"-13' [368-396 cm]	35" [889 mm]
	13'1"-14' [399-427 cm]	38" [965 mm]

5.17 Information on disposing of material after installation is finished

Handle unused installation material properly and dispose in accordance with current valid local regulations on waste disposal and utilization.

6 Initial Commissioning

6.1 Special personnel qualification required for initial commissioning

Initial commissioning may only be performed by specially qualified personnel in accordance with the safety instructions.



Also see the section on "Personnel qualification".

6.2 Safety instructions for initial commissioning

To prevent damage to property and/or life-threatening injury to personnel always follow these instructions:

- Before starting for the first time, check that all tools and other parts have been removed from the danger area.
- Make sure all electrical connections and safety devices are properly installed to meet local and national regulations.



Also read the chapter on "Safety".

Special risks involved in initial commissioning:

- Incorrectly wired connections may destroy electrical/electronic components.
- Defective connections can cause the product to start up unexpectedly or make uncontrolled movements.

6.3 Checks before initial commissioning

The owner should ensure that:

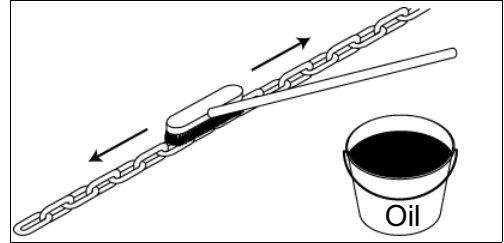
- Each point of the warranty registration form have been met.
- All stationary components are securely anchored to the floor.
- The drive unit is greased properly.
- The drive unit chains are properly tensioned.
- The drive belt is tensioned properly.
- All guards and covers are in place.
- All corner wheels are greased properly.
- All scrapers are centered in the alleys.
- All installation materials and debris are cleaned up and removed from the alleys.
- The bottom and the sides of the manure alleys are free of cement imperfections.
- The full length of the chain is lubricated.



Note!

Use vegetable oil or equivalent. Refer to the local environmental regulations.

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



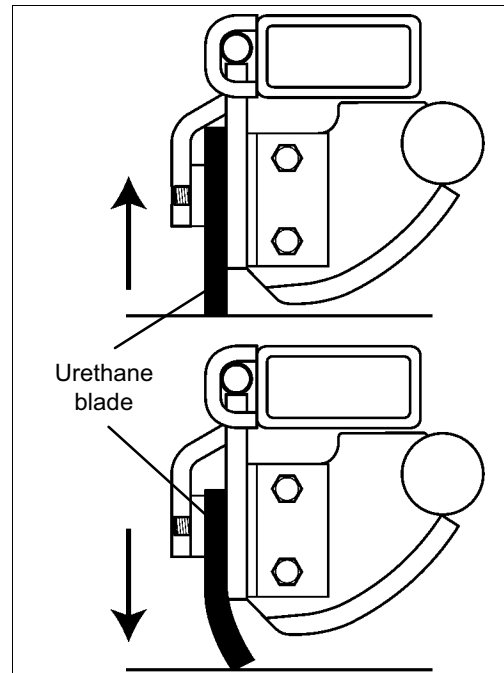
- The urethane blade have been properly adjusted.

Adjusted fully up:

- The stiffness of the urethane blade is at maximum so it cleans the manure alley similarly to a steel blade.

Adjusted lower:

- The urethane blade cleans the manure alley more gently, like a squeegee would.



6.4 First start

Once the equipment is fully assembled in accordance with instructions and the operating and safety instructions are read carefully, the equipment can be put into operation.

Activate the equipment and check the functions.



Attention!

It might be necessary to operate the system with the safety guards temporarily removed. Beware of all the moving parts and reinstall the safety guards as soon as the work is completed.



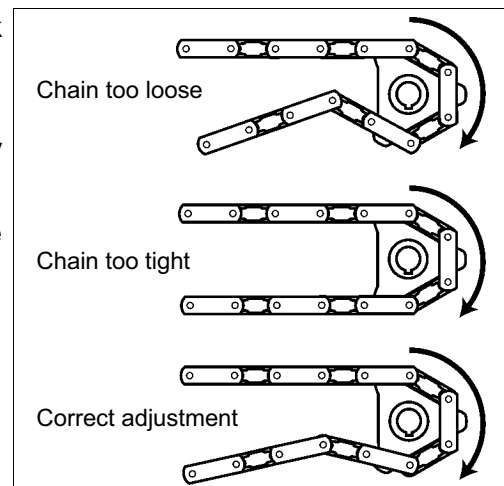
Attention!

Keep one person stationed at the control during all of the tests in this section. Be prepared to press the emergency stop button in order to prevent injury to personnel or damage to equipment. Also keep one person stationed in each alley to monitor the operation of the scrapers. If the person stationed at the control is unable to observe and clearly hear all persons in all alleys, position someone to relay information.

Check chain tension

Manually engage a short stroke to check if the chain is adjusted properly;

- The chain must be tightened enough to leave the drive unit sprocket freely on its return side when in use.
- A chain too tight will bring premature wear to the whole system.



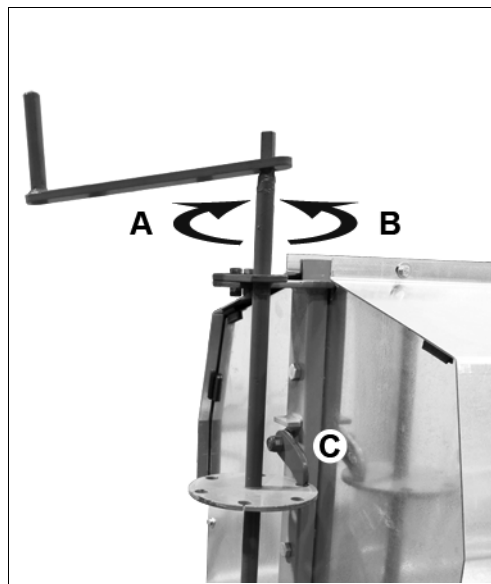
WARNING!

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



- Adjust the chain tension as needed to achieve the correct adjustment.

- A) Increase tension
- B) Decrease tension
- C) Tensioner lock

**Attention!**

A chain too tight will bring premature wear to the whole system.

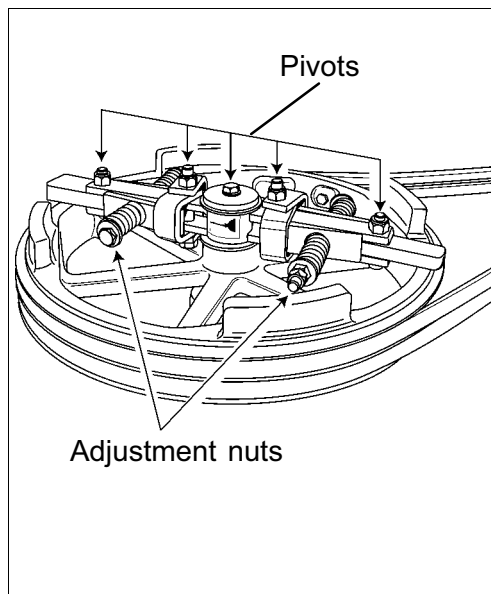
Adjustment of the reversible clutch

**Attention!**

The reversible clutch must be adjusted to release instantly in case a scraper touches the stop plate. The clutch cannot prevent cow injuries.

The clutch adjustment must be done when scrapers carry a full load of manure.

- Make sure that all pivots rotate freely. Loosen the adjustment nuts fully;
- Using the manual mode of the control panel, engage the drive unit to either Forward mode or Reverse mode and stop it when the clutch releases;
- Tighten each adjustment nut one turn.
- Repeat instruction until the clutch remains engaged.

**Attention!**

A cow laying in the manure alley is a small obstacle for the system. It is **NOT** possible to adjust the clutch so it releases itself on contact with a cow laying in the alley.

Stroke Limit Switch Adjustment



Attention!

Beware of all moving parts when adjusting the stroke limit switch.

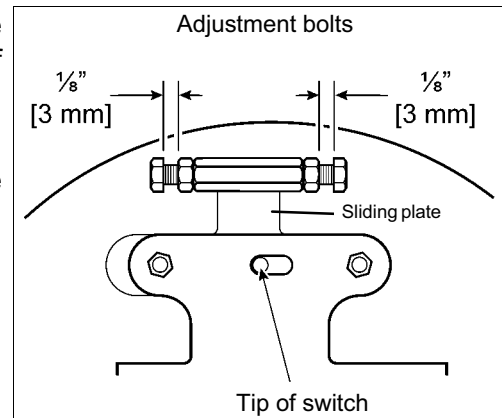


Note!

If the control panel is on automatic mode, the motor waits 10 seconds before starting in opposite direction.

Initial set up of the left and right adjustment bolts

- Set the adjustment bolts of the sliding plate to get 1/8" [3mm] of thread between the bolt head and lock nut.
- Set the sliding plate so the tip of the switch is centered;



Position the scrapers at the stop point for CW rotation

- Using the manual mode of the control panel, engage the drive unit to either Forward mode or Reverse mode so the disc rotates clockwise. (Front view, switch behind disc).
- Stop the drive unit when scrapers have reached their stop point (6" [152 mm] from the stop plates);



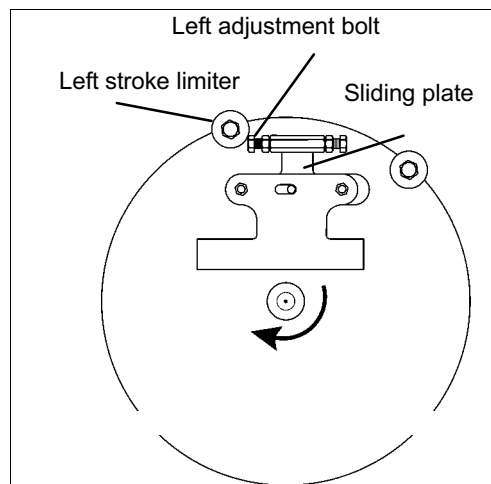
Left stroke limiter setting



Note!

When disc rotates clockwise, the left stroke limiter pushes the tip of the switch rightward.

- Slowly push the sliding plate to the right until the switch is activated (you will hear the click of the switch).
- Set the left stroke limiter against the left adjustment bolt.
- Lock the stroke limiter on the disc using the hexagonal bolt;



Test the setting

- Using the manual mode of the control panel, engage the drive unit to start the drive unit in opposite direction;
- When the scrapers have backed up approximately 20 ft [6 m] from their stop point, stop the drive unit;
- Push on the sliding plate to activate the stroke limit switch in the opposite direction (listen for the click of the switch again);



Attention!

Be careful! From this point, the stroke limit switch may not stop and reverse the drive unit automatically. Be ready to manually stop the drive unit when scrapers are 6" [152 mm] away from the stop plates.

- Using the manual mode of the control panel, engage the drive unit;
- After the scrapers have been stopped by the stroke limit switch, you can fine-tune the switch with the adjustment bolt as needed.



Attention!

Be cautious! One single turn of the bolt represents up to 20" [51 cm] of stroke for the scrapers.

- Repeat the **Test the setting** procedures to verify all adjustments until the stroke limit switch is adjusted properly.

Position the scrapers at the stop point for CCW rotation

- Using the manual mode of the control panel, engage the drive unit to either Forward mode or Reverse mode so the disc rotates counterclockwise.
(Front view, switch behind disc).
- Stop the drive unit when the scrapers reach their stop point, at the opposite end of manure alleys (6" [152 mm] from the stop plates).



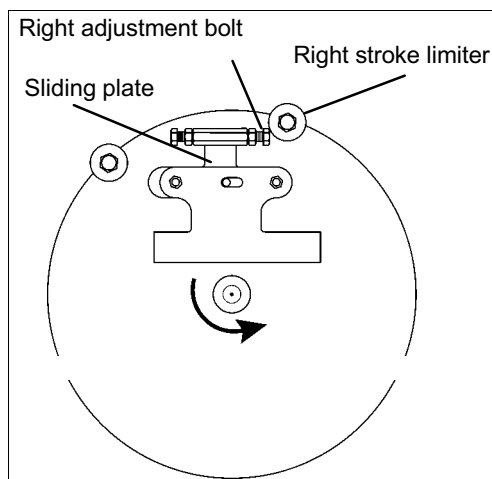
Right stroke limiter setting



Note!

When disc rotates counterclockwise, the right stroke limiter pushes the tip of the switch leftward.

- Slowly push the sliding plate to the left until the switch is activated (you will hear the click of the switch).
- Set the right stroke limiter against the right adjustment bolt.
- Lock the stroke limiter on the disc using the hexagonal bolt.
- Repeat the Test the setting procedures for the right stroke limit switch is adjusted properly.



6.5 Checks after initial commissioning

- Confirm that all scrapers in all alleys are at there respective stopping points.
- Check the chain tension.
- Check the chain tension on the drive unit.
- Check the belt tension on the drive unit.
- Manually operate the system for its first complete cleaning cycle to make sure the system is in order.

6.6 Handing over to the owner

Hand-over warranty registration form

The warranty registration form must be completed and signed by the customer and the dealer. The warranty registration form must be returned back to GEA Houle Inc. to validate the warranty.

7 Operation

7.1 Special personnel qualification required for operation

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

The operator may only carry out work on the equipment if trained, instructed and authorized to do so by the owner.



Also see the section on "Personnel qualification".

7.2 Safety instructions for operation

To prevent damage to property and/or life-threatening injury to personnel always follow these instructions:

- Only fit or use the product for its intended purpose.



Also read the chapter on "Safety".

Special dangers involved in operation:

- Incorrect use may lead to serious damage to property and/or life-threatening injury to people.
- The careless use of personal protection equipment could result in serious physical injury.
- Scrapers running at a low speed in the alley could crush people or livestock against obstacles.

Before operating, make sure you are familiar with the following:

- the operating and control elements
- the equipment
- the method of operation
- the immediate environment
- the safety devices

Carry out the following checks before every start:

- Check and make sure that all of the safety devices (safety guard, emergency-off switches, etc.) are present and working.
- Check the product for visible damage; immediately repair without any delay damage found (note: personnel qualification required) or send to the specialist dealer - the product may only be used if in perfect condition.
- Check and make sure that only authorized personnel are in the work area of the machine and no one will be endangered by the machine starting.
- Check and make sure that there are no unnecessary object or material is located in the working area.
- Check and make sure that the working area has been cleaned from oil, grease, parts...

In normal operation:

- Do not remove or deactivate safety devices during operation.
- During operation, it is strictly forbidden to remain within the hazard area!
- Operating personnel must make sure that no unauthorized personnel are in the working area.
- The following checks should be performed at least once a day:
 - Visually check for any damage.
 - Check that all safety devices are working.

7.3 Description of the operating elements



Note!

The primary operating element for a scraper system is the control. (see Control Panel Operator's Manual for details);

Quick tensioner

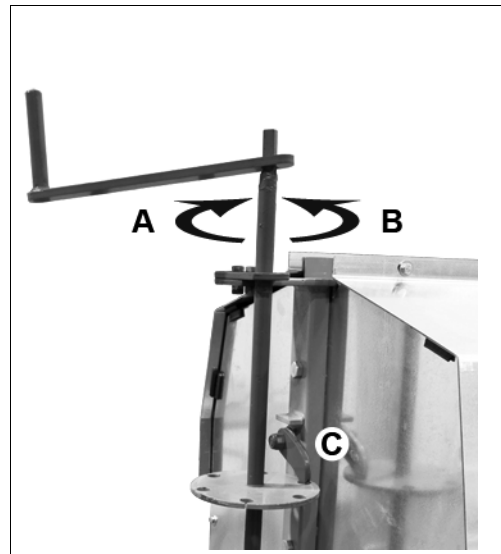


WARNING!

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



- Adjust the chain tension as needed to achieve the correct adjustment.
 - A) Increase tension
 - B) Decrease tension
 - C) Tensioner lock



7.4 Operating

The maximum load, for 1 scraper, is equivalent to the manure produced by 12 cows in a 24-hour period.

For example, a manure alley containing 72 stalls must be cleaned at least 6 times per day, with even intervals between each cleaning.

Cleanings per day	Cleaning interval hrs.	Max stalls / scraper
1	24	12
2	12	24
3	8	36
4	6	48
6	4	72
8	3	96



Note!

The cleaning parameters for a scraper system are set with the control.
(see Control Panel Operator's Manual for details);

8 Operating faults

If necessary, please contact your nearest authorized technical dealer.

8.1 Special personnel qualification required for troubleshooting

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



Also see the section on "Personnel qualification".

8.2 Safety instructions for troubleshooting

To prevent damage to property and/or life-threatening injury to personnel always follow these instructions:

- First of all, prevent the product from being restarted accidentally.
- Secure the range of action of all moving parts.



Also read the chapter on "Safety".

Special dangers involved in troubleshooting:

- Energy sources switched on unintentionally may lead to serious damage to property and/or life-threatening injuries to people and animals.
- The careless use of personal protection equipment could result in serious physical injury.
- Leaking lubricants, solvents,... could cause injury if they come into direct contact with the skin and could make the floor surface slippery which could result in dangerous fall.
- Unsecured manual operation could result in a higher risk of injury caused by crushing/shearing/being pulled in/...

8.3 Troubleshooting possible faults

Symptom	Possible cause	Remedy
Drive unit is not running.	Power supply has been disconnected.	Check all connections and wires.
	Emergency stop switch has been pressed.	Check the protection stop switch and activate if necessary.
	Control panel is turned off.	Turn on the control panel.
	Cleaning interval is set to long.	See Control Panel Operator's Manual for details.
	Stroke limit switch is not adjusted properly.	Adjust stroke limit switch.
	Stroke limit switch is defective (shorted).	Replace defective part.
Drive unit motor is running but the scrapers aren't moving.	The chain is broken or disconnected.	Replace or reconnect the chain.
	The drive belt is slipping, broken or off the pulley.	Tension the belt.
	The drive chain is broken or off the gear.	Repair the chain.
	Clutch setting is too light.	Readjust clutch.
Drive unit motor is tripping the circuit breaker or overload.	Loose or corroded electrical connections.	Check electrical connections.
	Defective circuit protection.	Replace defective part.
	Obstacles impeding the scrapers.	Clear the obstruction.
	Chain not lubricated.	Lubricate chain.
	Manure load exceeding the scrapers capacity.	Reduce cleaning intervals.
	Corner wheels not lubricated.	Lubricate corner wheels.
	Manure is frozen in the alleys	Turn off the scraper until the alleys thaw. Confirm that the barn ventilation system, side curtains, etc are set properly for the ambient conditions.
Scrapers not cleaning alleys sufficiently.	Scraper blades are worn or out of adjustment.	Adjust or replace scraper blades.

Symptom	Possible cause	Remedy
Scrapers stop before reaching the stop point at the end of the alley.	Obstacles impeding the scrapers and the clutch setting is too high.	Clear the obstruction. Readjust clutch.
	The stroke limit switch is not set properly.	Confirm that the jam nut was tight.
		Reset the stroke limit switch.
	Drive unit motor is tripping the circuit breaker or overload.	See Symptom; Drive unit motor is tripping the circuit breaker or overload.

9 Maintenance

If necessary, please contact your nearest authorized technical dealer.

9.1 Special personnel qualification required for maintenance work

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



Also see the section on "Personnel qualification".

9.2 Safety instructions for maintenance



WARNING!



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

To prevent damage to property and/or life-threatening injury to personnel always follow these instructions:

- Only use original spare parts / original wearing parts / original accessories. In the case of products by other manufacturers it cannot be ensured that they have been designed and produced from the point of view of loads and safety.
- All steps involved in the maintenance work must be done in the order specified.
- The maintenance work specified in the instructions (adjustment, cleaning, lubrication, inspection, etc.) must be performed at the specified frequency.
- Maintenance work should be performed only with the tools designed for this purpose.
- Note the special information in this manual for the individual components.
- All warnings and warning signs must be present and legible.
- Immediately replace components that are not in perfect condition.



Also read the chapter on "Safety".

Before carrying out any maintenance work, make sure of the following:

- The area for the maintenance work and access to the working area should be secured over a wide area and there should not be any unauthorized people in the working area.
- There are suitable hoists and load suspension devices available for changing larger parts.
- That suitable collection vessels are available for all substances that might be harmful to the ground water (oils, coolants, cleaning and disinfecting agents, etc.)

Special risks involved in maintenance work:

- Serious damage to property might occur if wrong replacement or wearing parts are installed.
- If energy sources are switched on unintentionally, this may lead to serious bodily injury or damage to property.
- There is a risk of injury from components/tools... with accessible sharp edges.
- There is a fire hazard associated with welding, cutting and grinding work.
- The careless use of personal protection equipment can result in serious physical injury.
- Leaking lubricants, solvents,... could cause injury if they come into direct contact with the skin and could make the floor surface slippery which could result in dangerous fall.
- Serious injury to personnel or damage to property can be caused if the incorrect torque is applied when tightening screws.
- Unsecured manual operation means a higher risk of injury due to crushing/shearing/being pulled in/...

After completing the maintenance work, check the following:

- Replace all guards, cover,... removed for maintenance.
- That all safety devices are in good working condition.
- Remove from the working area all the tools, materials and other equipment.
- Remove and clean oil, grease, parts from the working area.
- The operation making sure all is working properly.

9.3 Scheduled maintenance responsibilities

Interval	Description	Action (by)
First 50 hours of operation	Check torque of bolts and anchor bolts	Check/tighten (Operator)
Every 100 hours of operation	Lubricate the equipment	Check / fill (Operator)
	Check the speed reducer	Check / fill (Operator)
Every 250 hours of operation	Lubricate the barn cleaner chain	Check / fill (Operator)
Every 500 hours of operation	Check the tension of stroke limit switch chain	Check/tighten (maintenance technician)
	Lubricate the clutch	Check/tighten (maintenance technician)
	Check tension of drive belts	Check/tighten (maintenance technician)
	Check the chain tension	Check/tighten (maintenance technician)
	Inspect scraper blades	Check / adjust / replace (Operator)
	Clean the control and the switches	Clean (maintenance technician)
Every year	Clean the equipment	Clean (Operator)
	Check torque of bolts and anchor bolts	Check/tighten (Operator)

Regular checks on electrical equipment must be carried out by qualified personnel:

- Grease electrical motor bearings as per the recommendations of motor's manufacturer.
- Tighten any loose connections.
- Replace damaged lines or cables immediately.
- Close-off any cable openings that are not used.
- Check all fastening screws after 50 hours of operation to ensure they are securely seated!

Keep records of checks in a safe place so that they can be inspected at any time.

9.3.1 First 50 hours

Bolts and anchor bolts

- Check all bolts and anchor bolts making sure they are securely tightened.

9.3.2 Every 100 hours

Lubricate the equipment

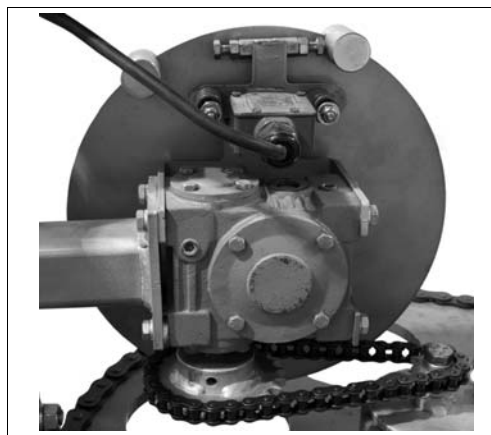
**Note!**

Use EP2 mineral grease

- Lubricate the corner wheels;
- Lubricate the drive unit;

Check the speed reducer:

- Check the speed reducer integrity.



9.3.3 Every 250 hours

Lubricate barn cleaner chain

**Attention!**

For barns using sand for bedding increase the lubrication interval to twice a week.

**Attention!**

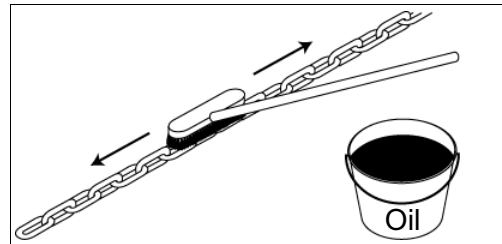
Failure to lubricate chain or running chain dry without manure/water will result in extreme wear on chain links reducing chain life dramatically.

The chain joints are being greased by the surrounding slurry manure. If certain portions of the chain become dry because of lack of slurry manure, lubricate this portion of the chain periodically to keep it greasy and avoid premature wear.

**Note!**

Use vegetable oil or equivalent. Refer to the local environmental regulations.

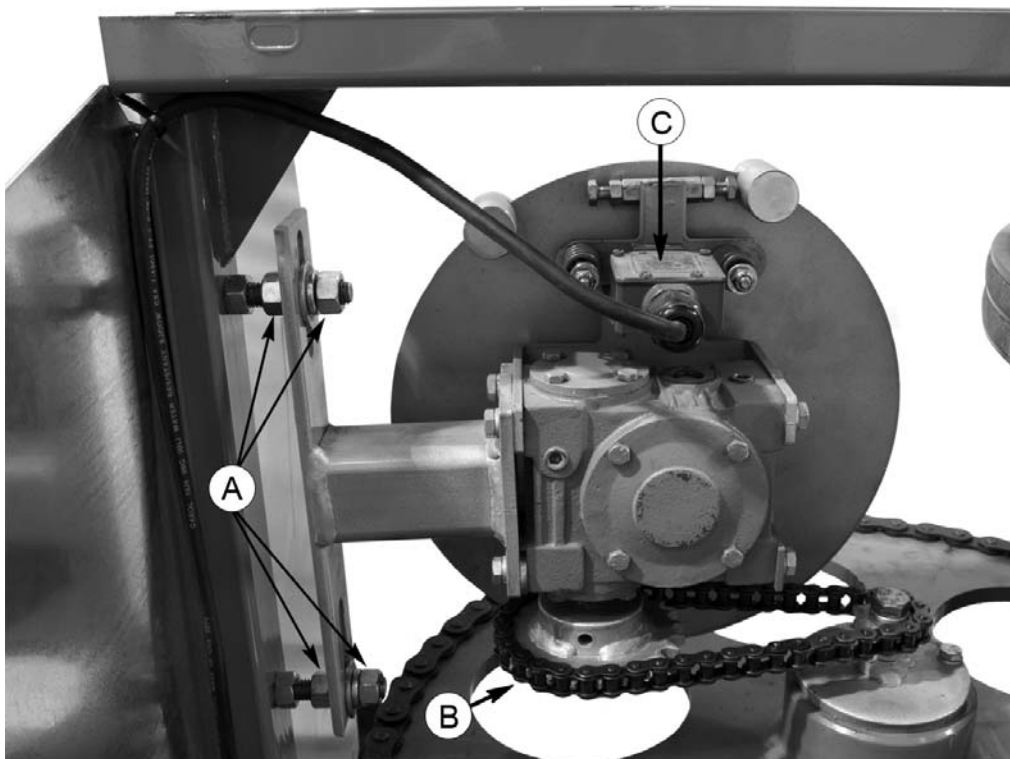
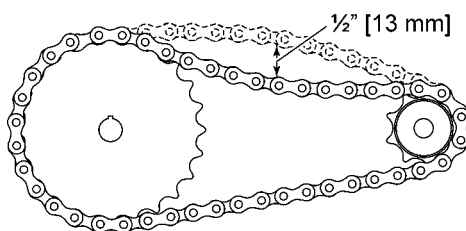
- Lubricate the full length of the chain.
- Dip the brush in the oil bucket and spread the oil all over the chain.



9.3.4 Every 500 hours

Check the tension of stroke limit switch chain:

Correct adjustment

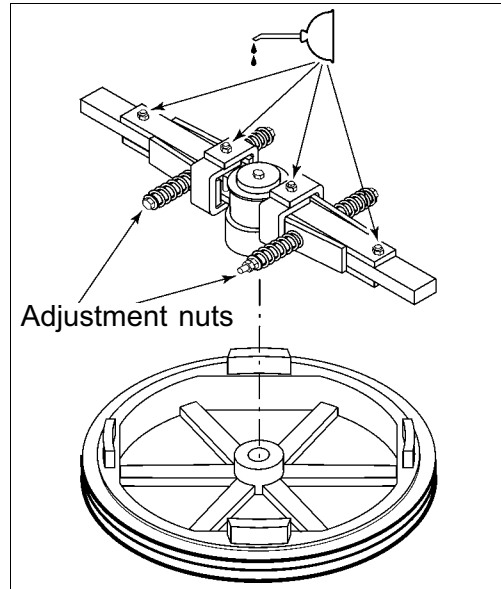


Adjustment:

- To tighten or loosen up the chain, adjust the nuts located on each side of the support. (A)
- Slide the speed reducer support evenly to obtain a $\frac{1}{2}" [13\text{mm}]$ sag in the chain;
- Tighten the bolts of the speed reducer support.

Lubricate the clutch

- Lubricate moving parts of the clutch.



Check the drive belt tension



CAUTION!

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



Note!

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

- If the tension is out of adjustment, follow the instructions below according to the drive unit model;

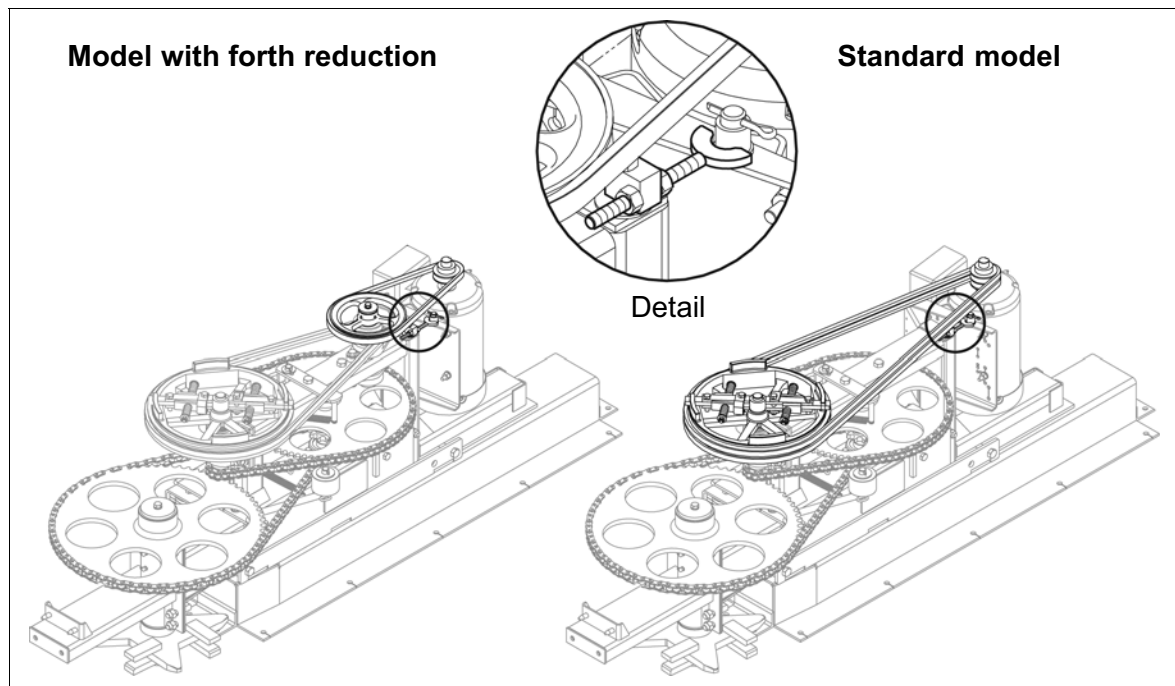
Adjustment:



Note!

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

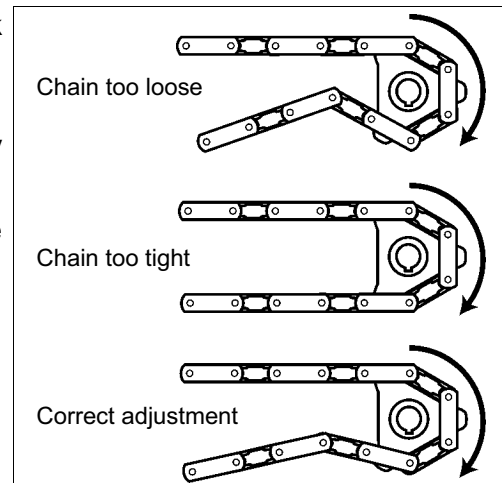
- Screw in the adjustment bolt to tighten the belt;
- Lock in the adjusting bolt by tightening the lock nuts. Refer to detail below.



Check chain tension

Manually engage a short stroke to check if the chain is adjusted properly;

- The chain must be tightened enough to leave the drive unit sprocket freely on its return side when in use.
- A chain too tight will bring premature wear to the whole system.

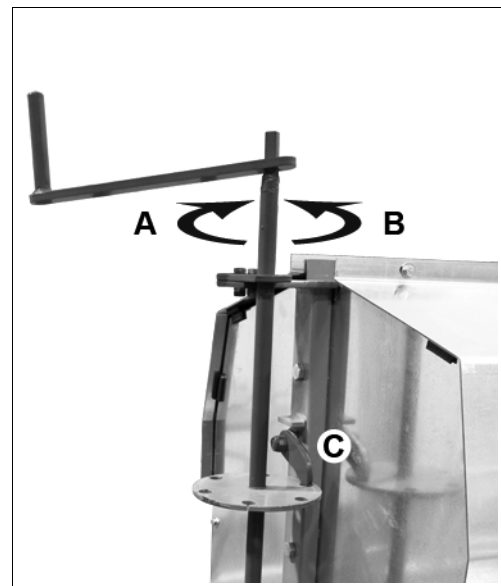


WARNING!



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

-
- Adjust the chain tension as needed to achieve the correct adjustment.
- A) Increase tension
B) Decrease tension
C) Tensioner lock



Attention!

A chain too tight will bring premature wear to the whole system.

Inspect scraper blades

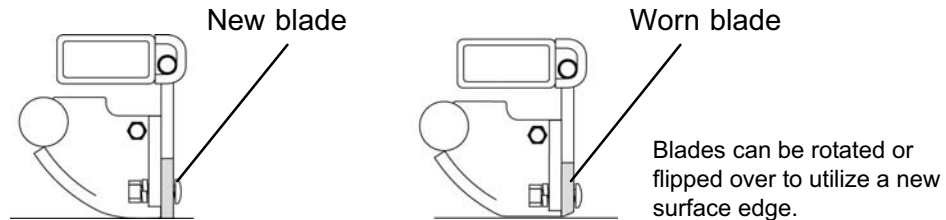
- Check the scraper blades for wear on the scraping edge.



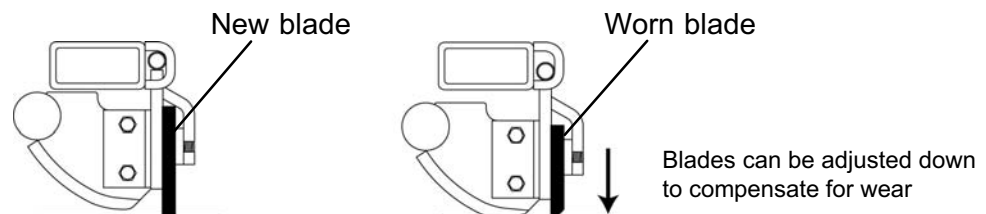
Note!

Blades can be rotated or flipped over to utilize a new surface edge. Blades should be replaced once they can no longer be adjusted effectively.

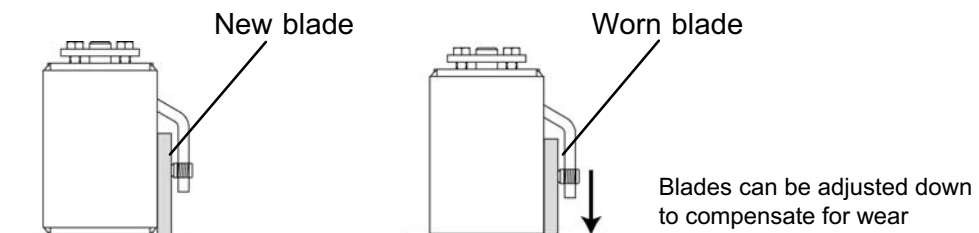
Steel blades on 16° or straight scrapers



Urethane blades on 16° or straight scrapers



Steel blades on V-shape scrapers



Clean the control and the switches

- Turn off the power and lock the main switch.
- Using dry compressed air, clean the automatic control panel, the stroke limit switch.
- Unlock the main switch and turn the power back on.
- Check all the functions.

9.3.5 Every year

Bolts and anchor bolts

- Check all bolts and anchor bolts making sure they are securely tightened.

Clean the equipment

**CAUTION!**

Always wear eyes protection when cleaning the equipment.

**Attention!**

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

- Clean manure buildup from scrapers and corner wheels.



10 Decommissioning

10.1 Special personnel qualification required for decommissioning

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



Also see the section on "Personnel qualification".

10.2 Safety instructions for decommissioning

To prevent damage to property and/or life-threatening injury to personnel always follow these instructions:

- The steps involved in the decommissioning work must be done in the order specified.
- The operating area for decommissioning must be safe.



Also read the chapter on "Safety".

Special dangers involved in decommissioning:

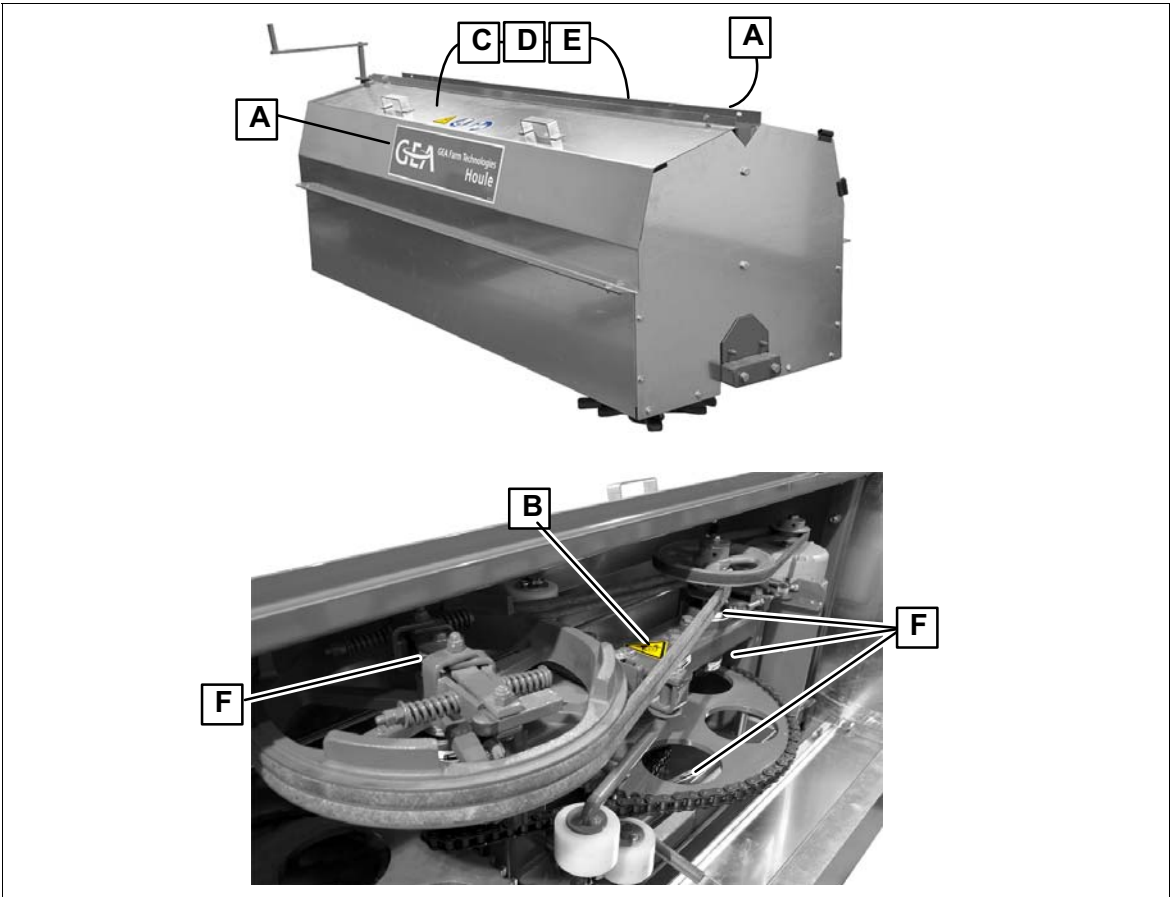
- Leaking lubricants, solvents,... could cause injury if they come into direct contact with the skin and could make the floor surface slippery which could result in dangerous fall.
- Components which have not been removed correctly may fall off or twist.
- There is a risk of injury from open components / tools /.... with sharp edges.
- Suspended loads can fall and then there will be a risk of death - do not stand underneath suspended loads!








10.3 Final decommissioning/disposal

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

11 Appendix

11.1 Label position



A	<div>US + EU</div>  <div>2005-4703-560</div>	B	<div>US + EU</div>  <div>2099-4725-110</div>	C	<div>US</div>  <div>2099-4721-010</div>
					<div>EU</div>  <div>2099-4725-240</div>
D	<div>EU</div>  <div>2099-4725-150</div>	E	<div>EU</div>  <div>2099-4725-130</div>	F	<div>US + EU</div>  <div>2099-4701-240</div>

US = American label / EU = European label

11.2 Abbreviations

Units	
°	Degrees (angles)
°C	Degrees Celsius/ Centigrade
s	Second
min	Minute
' (ft)	Foot (= 30.5 cm)
" (in)	Inch (= 25.4 mm)
mm	Millimetre
cm	Centimetre
m	Metre
AS	Alloy Steel
HT	Heat Treated
LCS	Low Carbon Steel
MCS	Medium Carbon Steel
MCAS	Medium Carbon Alloy Steel
mm ²	Square millimetre
mm ³	Cubic millimetre
g	Gram
kg	Kilograms
kPa	Kilopascal
kW	Kilowatt
A	Amp (current)
V	Volt (voltage)
Ω	Ohm (resistance)

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