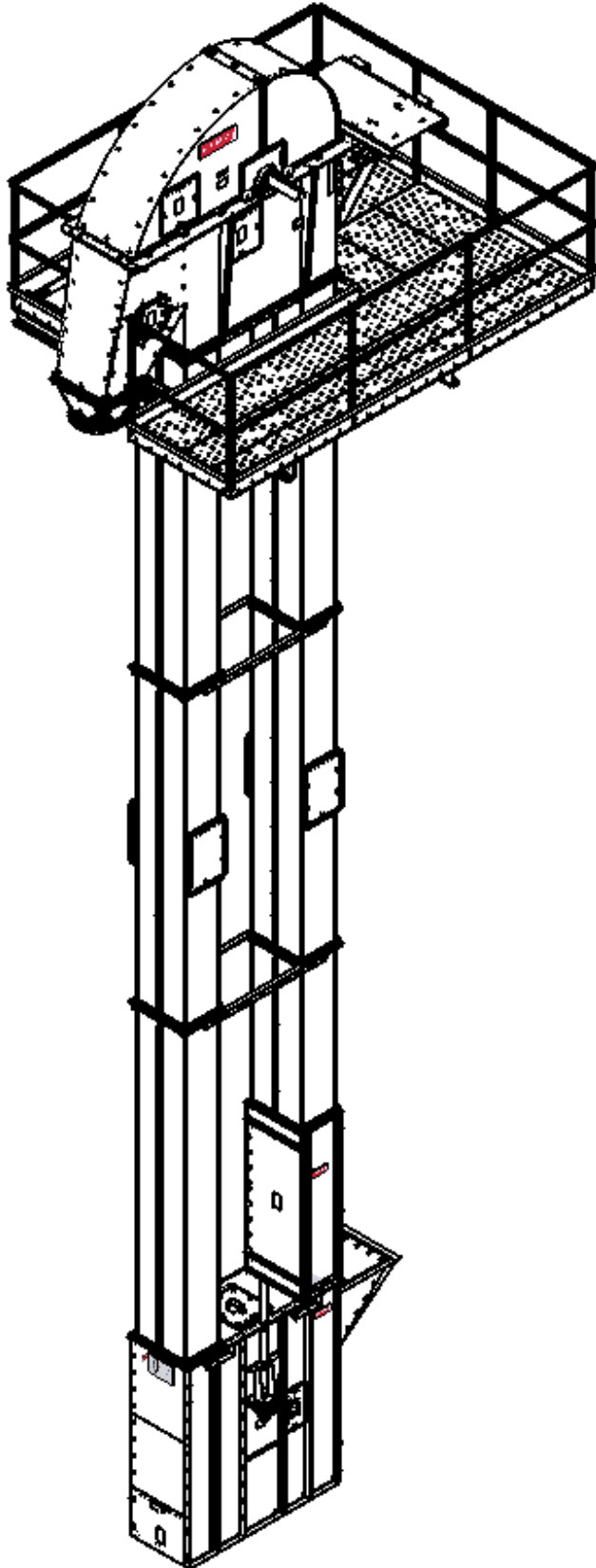


BUCKET ELEVATOR



INSTALLATION AND OPERATION MANUAL

P/N 473793

CHIEF 

Trusted. Tested. True

Chief Industries, Inc. – Agri/Industrial Division

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Manual Revisions

- 08-20-2014
 - Updated warranty information
- 11-01-2014
 - Explosion Venting
 - HD Boot
- 11-02-2015
 - Up and Down Leg Illustration
- 01-01-2016
 - General formatting update
- 10-23-2023
 - General formatting updates.
 - Updated to include new design standards and correct existing information.
 - Removed redundant information on drive assembly.

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For more information about Chief Industries, Inc. and additional products or services please visit our website.

www.agri.Chiefind.com

STANDARD LIMITED WARRANTY

Material Handling Product

1. **Definitions.** The following terms, when they appear in the body of this Standard Limited Warranty for Material Handling Products in initial capital letters shall have the meaning set forth below:
 - A. Accepted Purchase Order shall mean the Purchase Order identified below.
 - B. Chief shall mean Chief Agri/Industrial, a division of Chief Industries, Inc.
 - C. Original Owner shall mean the original owner identified below.
 - D. Product shall mean the Agri/Industrial Equipment as described in the Accepted Purchase Order.
 - E. Reseller shall mean the authorized Chief Agri/Industrial Equipment dealer identified below.

2. **Limited Product Warranty.** Upon and subject to the terms and conditions set forth below, Chief hereby warrants to the Reseller, and, if different, the Original Owner as follows:
 - A. All new Products delivered to the Reseller or the Original Owner by Chief pursuant to the Accepted Purchase Order will, when delivered, conform to the specifications set forth in the Accepted Purchase Order;
 - B. All new Products delivered pursuant to the Accepted Purchase Order will, in normal use and service, be free from defects in materials or workmanship; and
 - C. Upon delivery, Chief will convey good and marketable title to the Products, free and clear of any liens or encumbrances except for, where applicable, a purchase money security interest in favor of Chief.

3. **Duration of Warranty and Notice Requirements.** Subject to the **Exceptions, Exclusions and Limitations** set forth below, the warranties set forth in Section 2 above shall apply to all covered non-conforming conditions that are discovered within the first twenty-four (24) months following delivery of the Product to the carrier designated by the Reseller and/or the Original Owner at Chief's manufacturing facility in Kearney, Nebraska (the "Warranty Period") and are reported to the Chief as provided in Section 4 below within thirty (30) days following discovery (a "Notice Period").

4. **Notice Procedure.** In order to make a valid warranty claim, the Reseller and/or the Original Owner must provide Chief with a written notice of any nonconforming condition discovered during the Warranty Period within the applicable Notice Period specified in Section 3 above. Said notice must be in writing; be addressed to Chief Industries, Inc., Agri/Industrial Division, Customer Service Department, P.O. Box 848, Kearney, NE 68848; and contain the following information: (a) the Customer's name and address; (b) the Reseller's name and address; (c) the make and model of the Product in question; (d) the current location of the Product; (e) a brief description of the problem with respect to which warranty coverage is claimed; and (f) the date on which the Product was purchased.

5. **Exceptions and Exclusions.** Anything herein to the contrary notwithstanding, the warranties set forth in Section 2 above do **not** cover any of the following, each of which are hereby expressly excluded:
 - A. Defects that are not discovered during the applicable Warranty Period;
 - B. Defects that are not reported to the Chief Agri/Industrial Division Customer Service Department in conformity with the notice procedure set forth in Section 4 above within the applicable Notice Period specified in Section 3;
 - C. Any used or pre-owned Products;
 - D. Any Chief manufactured parts that are not furnished as a part of the Accepted Purchase

Order;

- E. Any fixtures, equipment, materials, supplies, accessories, parts or components that have been furnished by Chief but are manufactured by a third party;
- F. Any Products which have been removed from the location at which they were originally installed;
- G. Any defect, loss, damage, cost or expense incurred by the Reseller or the Original Owner to the extent the same arise out of, relate to or result, in whole or in part, from any one or more of the following:
 - (i) Usual and customary deterioration, wear or tear resulting from normal use, service and exposure;
 - (ii) Theft, vandalism, accident, war, insurrection, fire or other casualty;
 - (iii) Any damage, shortages or missing parts which result during shipping or are otherwise caused by the Reseller, the Original Owner and/or any third party;
 - (iv) Exposure to marine environments, including frequent or sustained salt or fresh water spray;
 - (v) Exposure to corrosive, chemical, ash, smoke, fumes, or the like generated or released either within or outside of the structure on which the Product is installed, regardless of whether or not such facilities are owned or operated by the Reseller, the Original Owner or an unrelated third party;
 - (vi) Exposure to or contact with animals, animal waste and/or decomposition;
 - (vii) The effect or influence the Product may have on surrounding structures, including, without limitation, any loss, damage or expense caused by drifting snow;
 - (viii) Any Product or portion thereof that has been altered, modified or repaired by the Reseller, the Original Owner or any third party without Chief's prior written consent;
 - (ix) Any Product or portion thereof that has been attached to any adjacent structure without Chief's prior written approval;
 - (x) Any Product to which any fixtures, equipment, accessories, materials, parts or components which were not provided as a part of the original Accepted Purchase Order have been attached without Chief's prior written approval;
 - (xi) The failure on the part of the Reseller, the Original Owner or its or their third party contractors to satisfy the requirements of all applicable statutes, laws, ordinances rules, regulations and codes, (including zoning laws and/or building codes);
 - (xii) The use of the Product for any purpose other than the purpose for which it was designed; and/or
 - (xiii) The failure of the Reseller, the Original Owner and/or any third party to:
 - (a) properly handle, transport and/or store the Product or any component part thereof;
 - (b) properly select and prepare a site that is adequate for the installation and/or operation of the Product or any component part thereof;
 - (c) properly design and construct a foundation that is adequate for the installation and/or operation of the Product or any component part thereof;
 - (d) properly set up, erect, construct or install the Product and/or any component part thereof; and/or
 - (e) properly operate, use, service and/or maintain the Product and each component part thereof.

6. **Resolution of Warranty Claims.** In the event any nonconforming condition is discovered within the Warranty Period and Chief is notified of a warranty claim as required by Section 4 prior to the end of the applicable Notice Period set forth in Section 3 above, Chief shall, with the full cooperation of the Reseller and the Original Owner, immediately undertake an investigation of such claim. To the extent Chief shall determine, in its reasonable discretion, that the warranty claim is covered by the foregoing Limited Product Warranty, the following shall apply:

- A. Warranty Claims With Respect to Covered Non-Conforming Conditions Discovered Within the First Three Hundred Sixty Five (365) Days and Reported to Chief Within Thirty (30) Days of Discovery. In the case of a warranty claim which relates to a covered non-conforming condition that is discovered during the first three hundred sixty five (365) days of the Warranty Period and is reported to Chief as required by Section 4 within thirty (30) days of discovery as required by Section 3, Chief will, as Chief's sole and exclusive obligation to the Reseller and the Original Owner, and as their sole and exclusive remedy, work in cooperation with the Reseller and the Original Owner to correct such non-conforming condition, and in connection therewith, Chief will ship any required replacement parts to the "ship to address" set forth in the Accepted Purchase Order FOB Chief's facilities in Kearney, Nebraska, and will either provide the labor or reimburse the Reseller or the Original Owner, as may be appropriate in the circumstances, for any out of pocket expense the Original Owner may reasonably and necessarily incur for the labor that is required to correct such non-conforming condition, provided that if work is to be performed by the Reseller or a third party contractor, Chief may require at least two competitive bids to perform the labor required to repair or correct the defect and reserves the right to reject all bids and obtain additional bids. Upon acceptance of a bid by Chief, Chief will authorize the necessary repairs.
 - B. All Other Warranty Claims. Except as is otherwise provided in subsection 6A above, in the case of all other warranty claims which relate to covered non-conforming conditions that are discovered during the Warranty Period and are reported to Chief as required by Section 4 within thirty (30) days following discovery, Chief will, as Chief's sole and exclusive obligation to the Reseller and the Original Owner, and as the Reseller's and the Original Owner's sole and exclusive remedy, ship any required replacement parts to the Original Owner at the "ship to address" specified in the Accepted Purchase Order FOB Chief's facilities in Kearney, Nebraska; and **in such event, Chief shall have no responsibility or liability to either the Reseller or the Original Owner for the cost of any labor required to repair or correct the defect.**
- 7. Warranty Not Transferable. This Warranty applies only to the Reseller and the Original Owner and is **not transferable**. As such, this Warranty does **not** cover any Product that is sold or otherwise transferred to any third party following its delivery to the Original Owner.
 - 8. Limitation on Warranties, Liabilities and Damages. The Reseller and the Original Owner expressly agree that the allocation of the risk, liability, loss, damage, cost and expense arising from any Product that does not conform to the limited warranty given in Section 2 above are fair and reasonable and acknowledge that such allocation was expressly negotiated by the parties and was reflected in the Purchase Price of the Product. Accordingly the Reseller and the Original Owner expressly agree as follows:
 - A. Disclaimer of Implied Warranties. **EXCEPT AS IS OTHERWISE EXPRESSLY SET FORTH HEREIN, CHIEF MAKES NO OTHER REPRESENTATIONS OR WARRANTIES OF ANY KIND WHATSOEVER, WHETHER EXPRESS OR IMPLIED, BY OPERATION OF LAW, COURSE OF DEALING OR OTHERWISE WITH RESPECT TO THE PRODUCT, ANY COMPONENT PART THEREOF OR ANY OTHER GOODS OR SERVICES THAT CHIEF MANUFACTURES, FABRICATES, PRODUCES, SELLS OR PROVIDES TO THE DEALER OR THE ORIGINAL OWNER PURSUANT TO THE TERMS OF ANY ACCEPTED PURCHASE ORDER, INCLUDING WITHOUT LIMITATION ANY REPRESENTATION OR WARRANTY WITH RESPECT TO DESIGN, CONDITION, MERCHANTABILITY OR FITNESS OF THE PRODUCT OR ANY OTHER GOODS OR SERVICES FOR ANY PARTICULAR PURPOSE OR USE.**

- B. **Limitation on Liability.** EXCEPT AS IS OTHERWISE EXPRESSLY SET FORTH IN SECTION 6 ABOVE, CHIEF'S LIABILITY TO THE DEALER AND/OR THE ORIGINAL OWNER WITH RESPECT TO ANY DEFECTS IN ANY PRODUCTS OR FOR ANY OTHER GOODS OR SERVICES WHICH DO NOT CONFORM TO THE WARRANTIES SET FORTH ABOVE SHALL NOT, IN ANY EVENT, EXCEED THE ACTUAL COST OF SUCH NON-CONFORMING PRODUCT, GOODS OR SERVICES AS DETERMINED PURSUANT TO THE ACCEPTED PURCHASE ORDER; AND
- C. **Limitation on the Nature of Damages.** EXCEPT AS EXPRESSLY PROVIDED IN SECTION 6 ABOVE, CHIEF SHALL NOT, UNDER ANY CIRCUMSTANCES, BE LIABLE TO THE DEALER, THE ORIGINAL OWNER OR ANY THIRD PARTY FOR ATTORNEY FEES COURT COSTS OR ANY OTHER SPECIAL, INDIRECT, INCIDENTAL, CONSEQUENTIAL, LIQUIDATED OR PUNITIVE DAMAGES OF ANY NAME, NATURE OR DESCRIPTION AS A RESULT OF THE FAILURE OF ANY PRODUCT OR ANY OTHER GOODS OR SERVICES PURCHASED BY THE DEALER OR THE ORIGINAL OWNER FROM CHIEF PURSUANT TO THE ACCEPTED PURCHASE ORDER TO CONFORM TO THE LIMITED WARRANTIES SET FORTH IN SECTION 2 ABOVE.

8. **Applicable Law.** This Limited Product Warranty has been issued, accepted and entered into by the Reseller, the Original Owner and Chief in the State of Nebraska and shall be governed by, and construed in accordance with, the internal laws of the State of Nebraska. Any legal action or proceeding with respect to any goods or services furnished to the Original Owner by Chief in connection herewith, or any document related hereto shall be brought only in the district courts of Nebraska, or the United States District Court for the District of Nebraska, and, by execution and delivery of this Limited Product Warranty, the undersigned Original Owner hereby accept for themselves and with respect to their property, generally and unconditionally, the jurisdiction of the aforesaid courts. Further, the undersigned Original Owner hereby irrevocably waives any objection, including, without limitation, any forum non conveniens, which it may now or hereafter have to the bringing of such action or proceeding in such respective jurisdictions.

ACKNOWLEDGMENT OF RECEIPT

By its signature hereto, the undersigned Reseller represents and warrants to Chief that the Reseller has provided a true, correct and complete copy of this Standard Limited Warranty to the Original Owner at the time the product was purchased.

Reseller Name and Address: _____

Original Owner Name and Address: _____

Accepted Purchase Order No. _____

Original Jobsite Address: _____

RESELLER:

By: _____
Date

Print name and title

4831-5139-8433, v. 1

Warning

Water Sensitive Materials - Read this notice carefully.

Items must be inspected, and the carrier advised immediately if damage is noted. White rust is a corrosion attack of the zinc coating resulting from the presence of water. Anywhere rust is found will result in a reduction of the life of the galvanized steel.

If water has entered a bundle or if condensation has formed between items, the bundle must be opened, the items separated and all surfaces dried.

If items are to be installed within 10 days:

Store bundled items off the ground high enough to allow air circulation beneath bundle and to prevent water from entering. Store one end at least 8" (20.32cm) higher than the opposite end. Support long bundles in the center. Prevent rain from entering the bundle by covering it with a tarpaulin, making provision for air circulation between the draped edges and the ground.

Do not wrap in plastic.

If items are not to be installed within 10 days:

Provide inside dry storage. Storage beyond 6 months is not recommended. If white rust is apparent upon receipt of shipment, notify Chief immediately. Damage to items resulting from improper storage is the responsibility of the receiver.

Before You Begin



Before starting the installation of the bucket elevator, take time to thoroughly study the construction methods in this manual, this will save you time and money.

Chief makes no warranty concerning components, accessories or equipment not manufactured by Chief.

When using a cutting torch or welding galvanized material, the possibility of developing toxic fumes will exist. Provide adequate ventilation and respiratory protection when using this type of equipment during installation.

Introduction

Thank you for purchasing a Chief bucket elevator. Proper installation and operation will ensure the best overall experience with your equipment.

This proprietary information is loaned with the expressed agreement that the drawings and information herein contained are the property of Chief Industries, Inc. and will not be reproduced, copied, or otherwise disposed of, directly or indirectly, and will not be used in whole or in part to assist in making or to furnish any information for the making of drawings, prints or other reproduction hereof, or for the making of additional products or equipment except upon written permission of Chief Industries, Inc. first obtained and specific as to each case. The acceptance of this material will be construed as an acceptance of the foregoing agreement.

The technical data contained herein is the most recent available at the time of publication and is subject to modification without notice. Chief Industries, Inc. reserves the right to modify the construction and method of operation of their products at any time without any obligation on their part to modify any equipment previously sold and delivered.

Important Note: If you are unable to remedy any service problem after thoroughly studying this manual, contact the dealer from whom you purchased the unit. Your dealer is your first line of service. The following information is required for service:

1. Bucket elevator model and serial number: _____
2. Head pulley diameter: _____
3. Discharge height: _____
4. Motor RPM and HP: _____
5. Type of grain and capacity: _____
6. Dealer purchased from: _____
7. Dealer address and phone number: _____
8. Date purchased: _____
9. Service contractor:
 - a. Name: _____
 - b. Address: _____
 - c. Phone: _____

Elevator Description

The model nomenclature distinguishes the application of the bucket elevator. The information includes a designation of the applicable pulley diameter, discharge height, rated capacity, etc. The definition of the model number nomenclature is as follows:

Example: CBEG36 5000BPH 105'DH LH
 (a) (b) (c) (d) (e)

(a) Elevator Type

CBEG: Chief Bucket Elevator Galvanized

CBESS: Chief Bucket Elevator Stainless Steel

(b) Model Size (Pulley Diameter)

10 = 10" Pulley

16 = 16" Pulley

24W = 24" Pulley – Wide Case

30 = 30" Pulley

36 = 36" Pulley

36W = 36" Pulley – Wide Case

42 = 42" Pulley

42-20 = 42" Pulley – Wide Case

48-30 = 48" Pulley

48-50 = 48" Pulley – Wide Case

(c) Rated Capacity with Units

BPH: Bushels per Hour

MTPH: Metric Tons per Hour

CFH: Cubic Feet per Hour

TPH: Tons per Hour

(d) Discharge Height in Feet

(e) Drive Shaft Projection

-Viewed from Inlet looking toward Discharge

LH: Left-Handed

RH: Right-Handed

Accessory Equipment

All accessory equipment should be installed and maintained in accordance with each individual supplier's installation and operation instructions. However, if any modifications to the Chief standard design are required, contact Chief for special recommendations.

Important Note: Do not modify the bucket elevator design without Chief approval. It is the responsibility of the general contractor to verify that all equipment is properly installed, and that the equipment is compatible with the intended use. A qualified electrician should be contracted to complete all electrical wiring and servicing.

General Contractor Responsibilities

It is the responsibility of the general contractor to verify that the complete system (bucket elevator, and other accessory equipment) is constructed with quality workmanship and that all equipment is installed per the respective manufacturer's instructions.

In addition, the general contractor is responsible for the fitness of use of any system which he constructs. All accessory equipment incorporated into the system should be approved for the intended use by each respective equipment manufacturer.

Field Modifications and Installation Defects

Chief assumes no responsibility for field modifications or installation defects which result in damage or operational problems. If any field modifications are necessary which are not specifically covered by the contents of this installation manual or project specific installation drawings supplied by Chief, contact Chief for approval. Any unauthorized modification or installation defect which affects the structural or operational integrity of the bucket elevator will void the warranty.

Checking Shipment

For your convenience individual items will be labeled with an appropriate part number and packages labeled. Hardware, including bolts, nuts, screws and other small clips or brackets may be divided into smaller packages for ease of use and identification.

Check your shipment at the time of delivery against the packing list provided with the shipment. If any items are missing or any damaged material is evident, note such shortage or damage on the freight bill before you sign the shipment paperwork.

Claims of shortages will not be honored after 30 days from receipt of shipment. Parts that are missing or damaged are the responsibility of the delivering carrier, not the manufacturer or dealer.

It is advisable to reorder damaged or missing parts immediately so that there will be no delay in the installation. After receiving the invoice for the reordered material, file a claim with the delivering carrier immediately.

Suggested Equipment

Chief recommends the following equipment and tools needed for installation. Individual installations may vary.

- Impact wrenches and sockets
- End wrenches
- Crescent wrenches
- Vise grip pliers
- Alignment punches
- Rubber mallets
- Level
- Drill and drill bits
- Screw Guns
- Metal Saw
- Extension cords
- Ladders

Hardware Torque

The following table contains recommended torque values for installation.

When installing hardware, the torque values shown below must be followed. All hardware must seat tight against the corresponding elevator component.

Bolt Diameter	Torque
5/16" (.79cm)	16 ft.-lbs.
3/8" (.95cm)	29 ft.-lbs.
7/16" (1.11cm)	46 ft.-lbs.
1/2" (1.27cm)	70 ft.-lbs.
5/8" (1.59cm)	140 ft.-lbs.
3/4" (1.91cm)	250 ft.-lbs.
7/8" (2.22cm)	400 ft.-lbs.
1" (2.54cm)	600 ft.-lbs.
1 1/8" (2.86cm)	750 ft.-lbs.
1 1/4" (3.18cm)	1100 ft.-lbs.

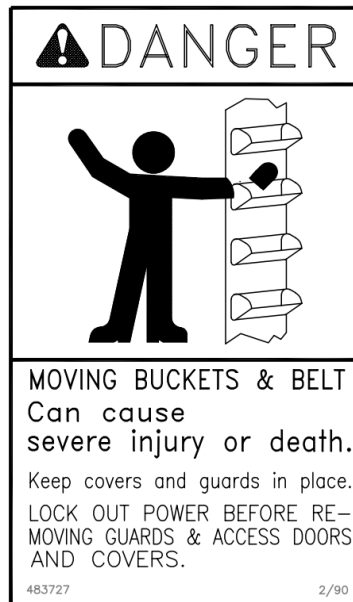
Bucket Elevator Safety

The following decals are installed at appropriate locations. Keep the decals clean at all times. If decals are no longer readable or missing, they must be replaced. Contact Chief Industries for replacement decals.

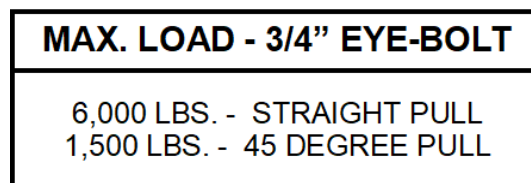
Located on the belt guard cover and back panel:



Located on all head access/inspection doors:



Located on head:



Pre-Installation Planning Information

Bucket elevators should be preplanned to meet the project requirements. Dealer/customer planning drawings will simplify the installation and should include the following:

- Site Layout
- Capacities
- Location and Orientation of Bucket Elevator
- Location of Boot Foundation
- Location Guy Wire Anchors
- Location of Spouting and Accessories

Structural Capacity

Safety is the first consideration in all planning for installation and operation of the elevator. This elevator has been designed to safely support its own weight. It is not designed to support or brace other equipment.

Important Note: All distributors, cleaners and/or spouting must be approved in writing by Chief Agri/Industrial when intending to use the elevator for full or partial support, or bracing, otherwise extra attachments must be independently supported and braced.

Elevator Location

The elevator must be properly located to receive incoming material and discharge it at the desired location. This requires an exact location for the elevator boot unit. Determine whether the boot is to be fed from the down or the up-leg side or both sides of the elevator.

The down leg side is recommended for light materials like ground feed. The up-leg side is recommended for heavier, free flowing materials like whole grains.

On outside installations, check the planned location for the boot, head, spouting, and guy cables for clearance to other structures. Driveways, overhead power lines and building structures can present special hazards and obstructions. On inside installations, check the location for the leg as it passes through each floor. Additional clearance for the ladder must be provided.

Concrete Design and Construction

Foundation designs are based on the allowable soil bearing capacity of the undisturbed soil and should be certified by a licensed engineering firm. Using soil borings to determine the allowable soil bearing capacity, a professional engineer will need to be employed by the contractor to design the foundation and floor slab accordingly. Foundation designs must be approved by a licensed engineer in order to meet local governing building codes and local soil and weather conditions, including seismic and wind loading requirements.

Non-uniform settlement of the foundation can cause damage to the elevator and foundation. An improperly designed or constructed foundation will void all aspects of the warranty. It is the responsibility of the general contractor to verify that an adequate foundation is provided.

Important Note: If the boot is installed in a pit or other permanent structure, adequate clearance must be provided to service the elevator.

Important Note: Adequate clearance must also be provided for the removal of the boot pulley and use of the cleanout doors. On outdoor installations the pit will require a sump pump or drain.

Footing loads are shown in the following chart for wind loading condition of 115 mph.

		Bucket Elevator Model							
		10	16	24W	30	36	36W	42	48
Height (FT)	180	-	-	50,500lbs (22,906kg)	48,100lbs (21,817kg)	48,100lbs (21,817kg)	59,800lbs (27,124kg)	59,800lbs (27,124kg)	59,800lbs (27,124kg)
	160	-	36,500lbs (16,556kg)	45,800lbs (20,774kg)	43,600lbs (19,776kg)	43,600lbs (19,776kg)	53,000lbs (24,040kg)	53,000lbs (24,040kg)	53,000lbs (24,040kg)
	140	-	30,000lbs (13,607kg)	38,450lbs (17,440kg)	36,600lbs (16,601kg)	36,600lbs (16,601kg)	45,800lbs (20,774kg)	45,800lbs (20,774kg)	45,800lbs (20,774kg)
	120	-	26,100lbs (11,838kg)	33,900lbs (15,376kg)	32,300lbs (14651kg)	32,300lbs (14651kg)	40,900lbs (18,551kg)	40,900lbs (18,551kg)	40,900lbs (18,551kg)
	100	17,500lbs (7,937kg)	22,500lbs (10,205kg)	29,800lbs (13,517kg)	28,400lbs (12,882kg)	28,400lbs (12,882kg)	36,300lbs (16,465kg)	36,300lbs (16,465kg)	36,300lbs (16,465kg)
	80	14,300lbs (6,486kg)	18,600lbs (8,436kg)	20,800lbs (9,434kg)	24,100lbs (10,931kg)	24,100lbs (10,931kg)	31,100lbs (14,106kg)	31,100lbs (14,106kg)	31,100lbs (14,106kg)
	60	9,500lbs (4,309kg)	12,500lbs (5,669kg)	18,375lbs (8,334kg)	17,500lbs (7,937kg)	17,500lbs (7,937kg)	23,100lbs (10,477kg)	23,100lbs (10,477kg)	23,100lbs (10,477kg)
	40	7,000lbs (3,175kg)	-	-	-	-	-	-	-

Elevator Installation

Chief does not assume any responsibility from parts damaged due to faulty or improper installation procedures.

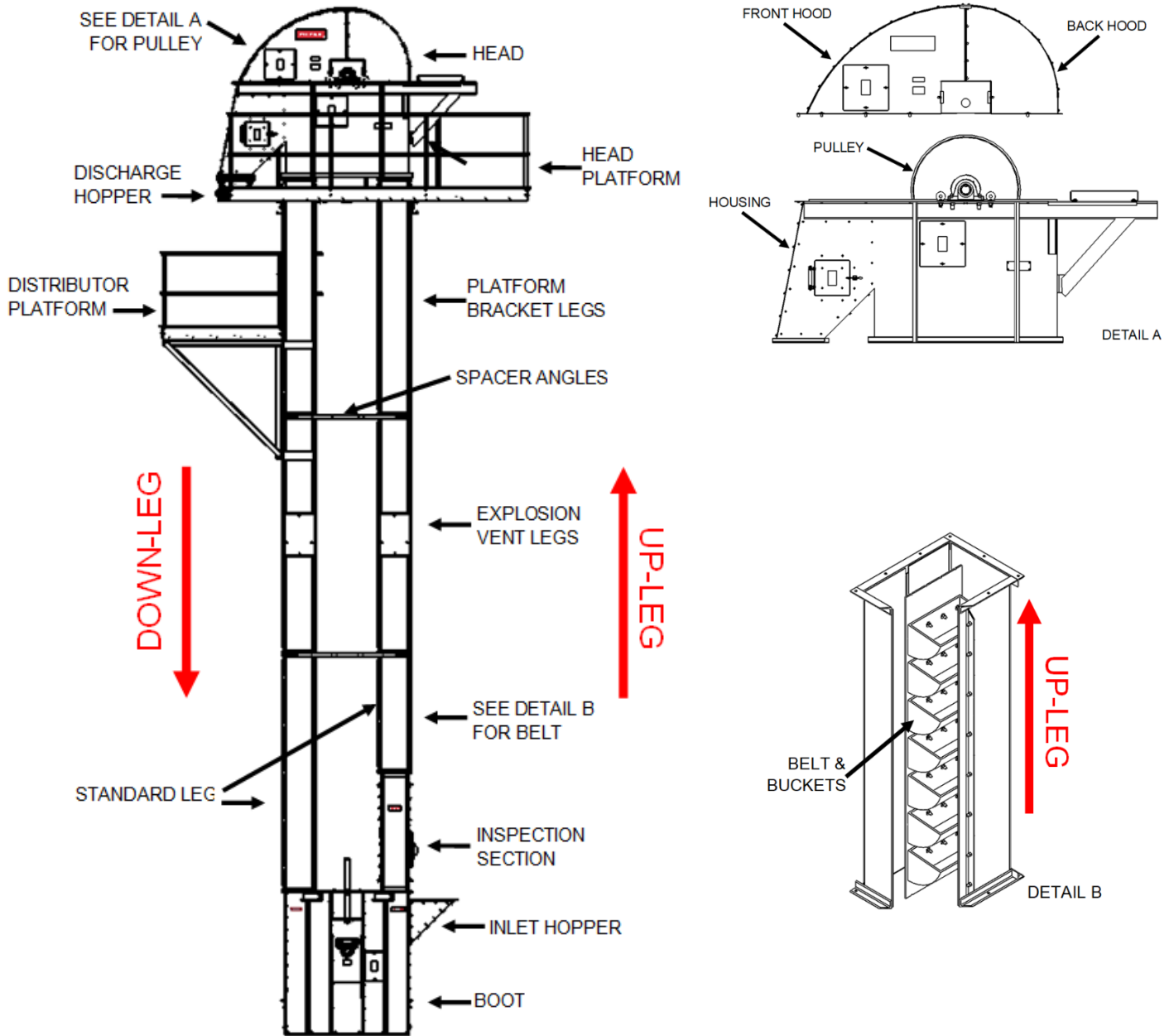
Lateral Support

During installation the bucket elevator must be laterally supported by a guy cable system or another adequate support system.

If guy cables are used the cables must be of sufficient strength, uniform elastic nature, & adequately tensioned to prevent the elevator from bending or whipping under wind loading.

Part Identification

Use the following information to identify parts used during installation.



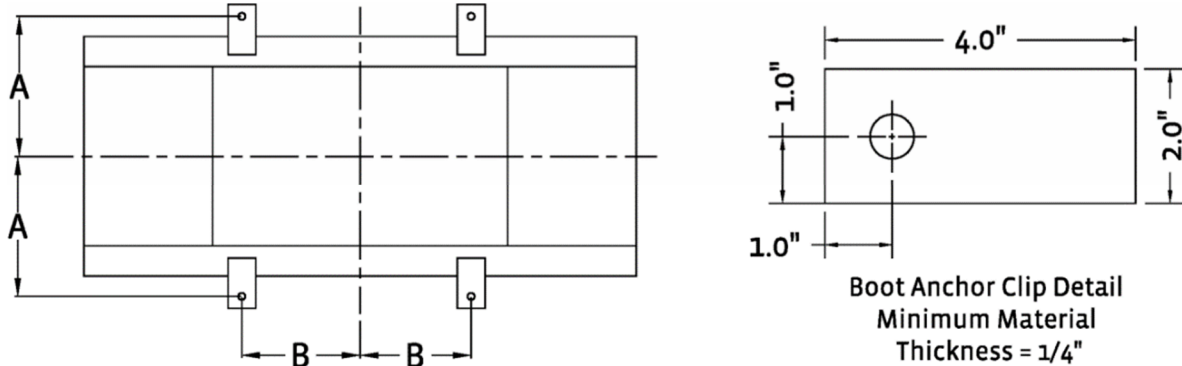
The general installation of the bucket elevator components will be in the following order. The elevator can be completely assembled within about 10' of the ground if this method is used. Crane time can be reduced if 30' sections, including accessories, are attached horizontally on the ground, and then hoisted with the crane. Refer to unit customer drawings for stacking order.

1. Set the Boot Section on the Footing
2. Install Leg Sections
3. Install Head Section
4. Install Accessories

Boot Section Assembly

Locate the boot on its foundation according to the pre-planned requirements. The boot must be bolted into position prior to installation of the elevator to avoid accidental movement. Use lag bolts for anchor clip attachment for standard duty and heavy-duty commercial boots. Use lag bolts through base plate holes on self-cleaning boots.

Important Note: Verify the top flanges of the boot where the leg sections will attach are level. Use grouting cement under the boot base as needed to level the boot section. Verify that the grouting cement is used below the complete leveled surface of the boot base angle or foot for proper boot support.



Model	A	B
CBEG10	8.50"	6.25"
CBEG16	10.00"	6.50"
CBEG24W	11.50"	10.50"
CBEG30	11.50"	12.00"
CBEG36	11.50"	15.50"
CBEG36W	13.50"	15.50"
CBEG42	13.50"	18.50"
CBEG42-20	22.50"	18.50"
CBEG48-30	22.50"	18.50"
CBEG48-50	36.00"	18.50"

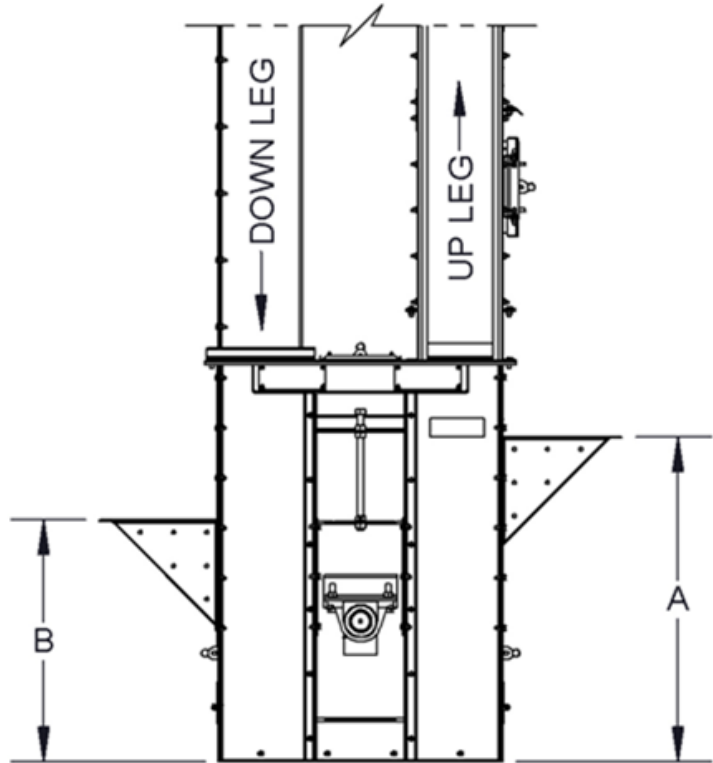
Install the boot inlet hoppers according to the following chart.

Important Note: Never locate the inlet hoppers lower than these dimensions or the elevator capacity will be affected. For special loading conditions consult Chief for inlet position.

Boot Model	Trunking Size	Inlet Mounting Position	
		A	B
10	10X8.5	32"	24"
16	13X10	39"	29"
24W	16X10	54"	34"
30	16X10	59"	36"
36	16X14	66"	38"
36W	20X14	68"	43"
42	20X14	76"	47"
42-20	38X14	76"	47"
48-30	38X14	79"	47"
48-50	65X14	106"	62"

FOR PROPER BUCKET FILL
DO NOT
 LOCATE THE INLET BELOW THE GIVEN
 DIMENSION FOR YOUR UNIT.

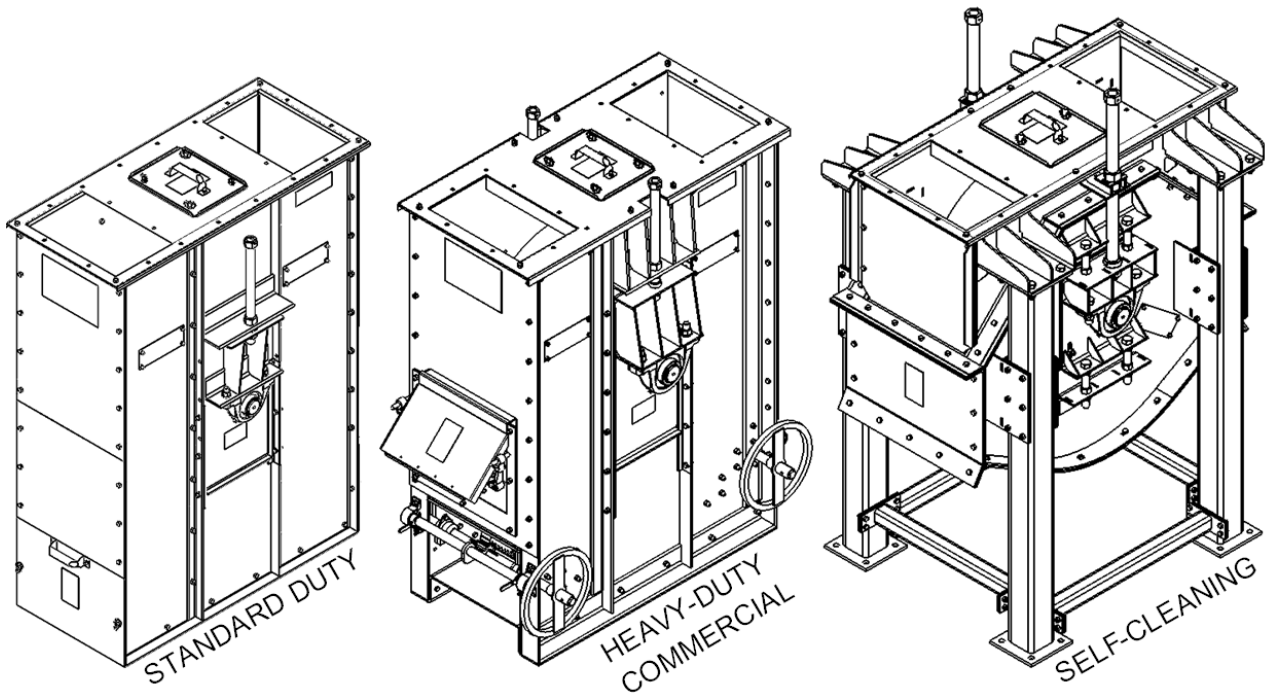
CONSULT THE FACTORY FOR
 OTHER LOADING CONDITIONS



Boot Types

Model	Boot Type		
	Standard Duty	Heavy-Duty Commercial	Self-Cleaning
10	X	-	Y
16	X	-	Y
24W	X	Y	Y
30	X	Y	Y
36	Y	X	-
36W	Y	X	-
42	-	X	-
42-20	-	X	-
48-30	-	X	-
48-50	-	X	-

X = Default Y = Available/Optional - = Not Available/Optional



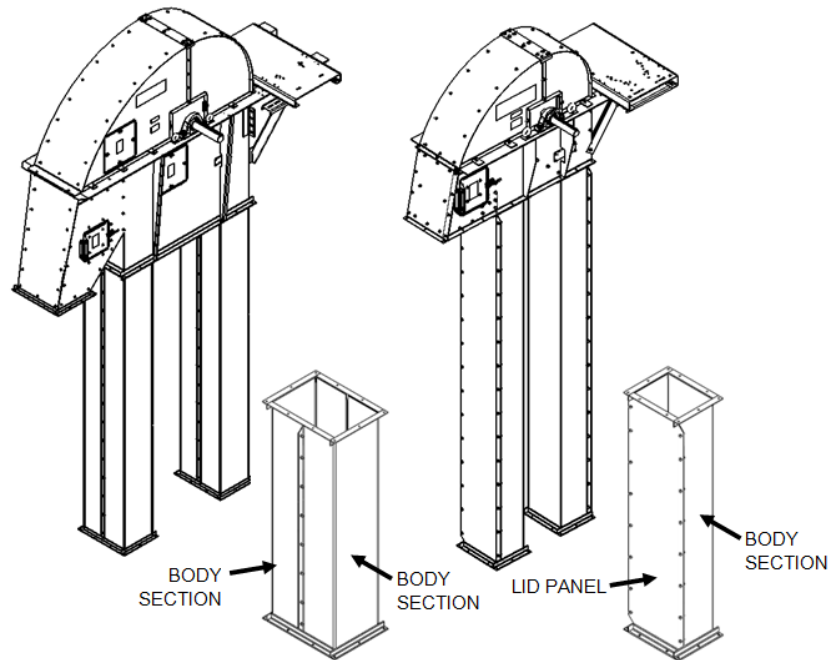
Important Note: Do not operate the elevator with cleanout doors open. Verify that the side shovel door and all rubber latches are secured during normal operation.

Leg Section Assembly

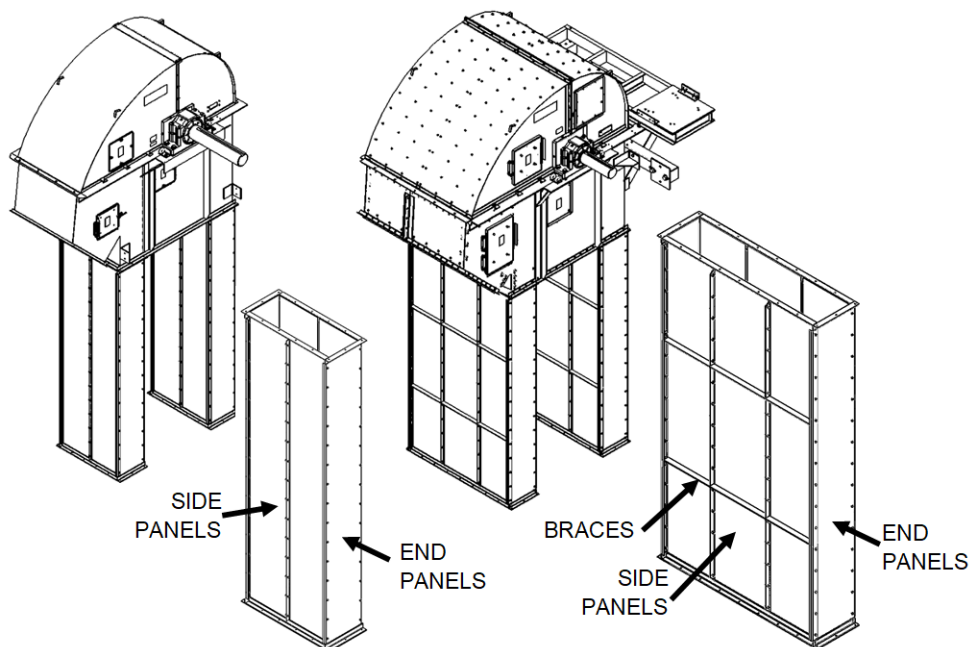
Install bolted flange leg sections. The elevator height will determine if heavier gauged material leg sections are required at specific locations of your unit.

Customer drawings supplied with shipment will provide stacking instructions.

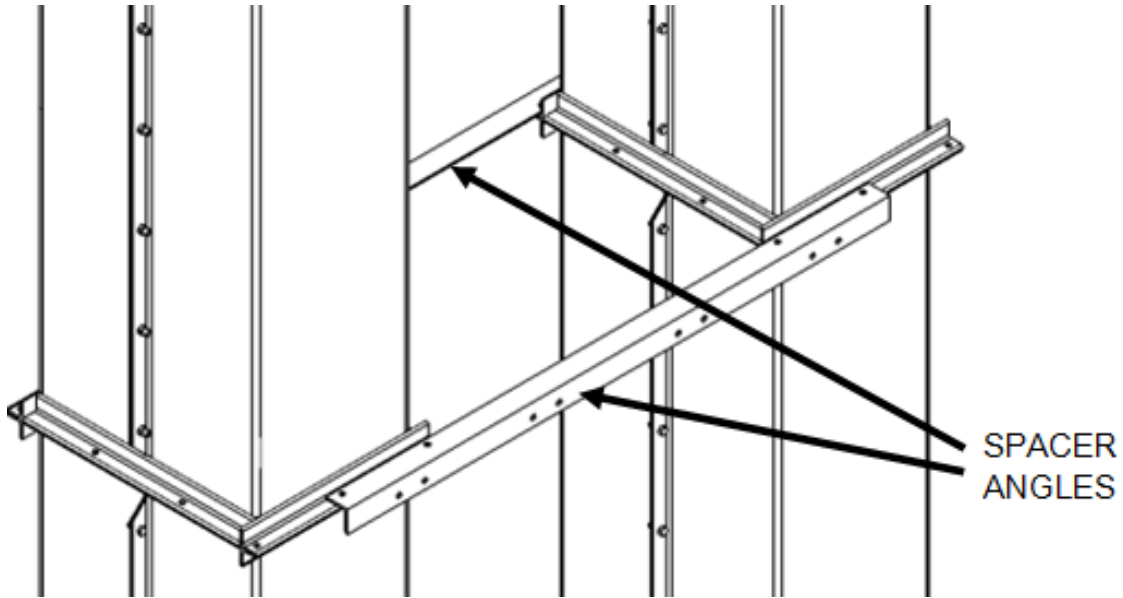
Important Note: Leg section component design will vary depending upon elevator model. Leg sections will consist of two body sections, a body section and a lid panel, two end panels and four side panels, or two end panels and six side panels supported by four braces.



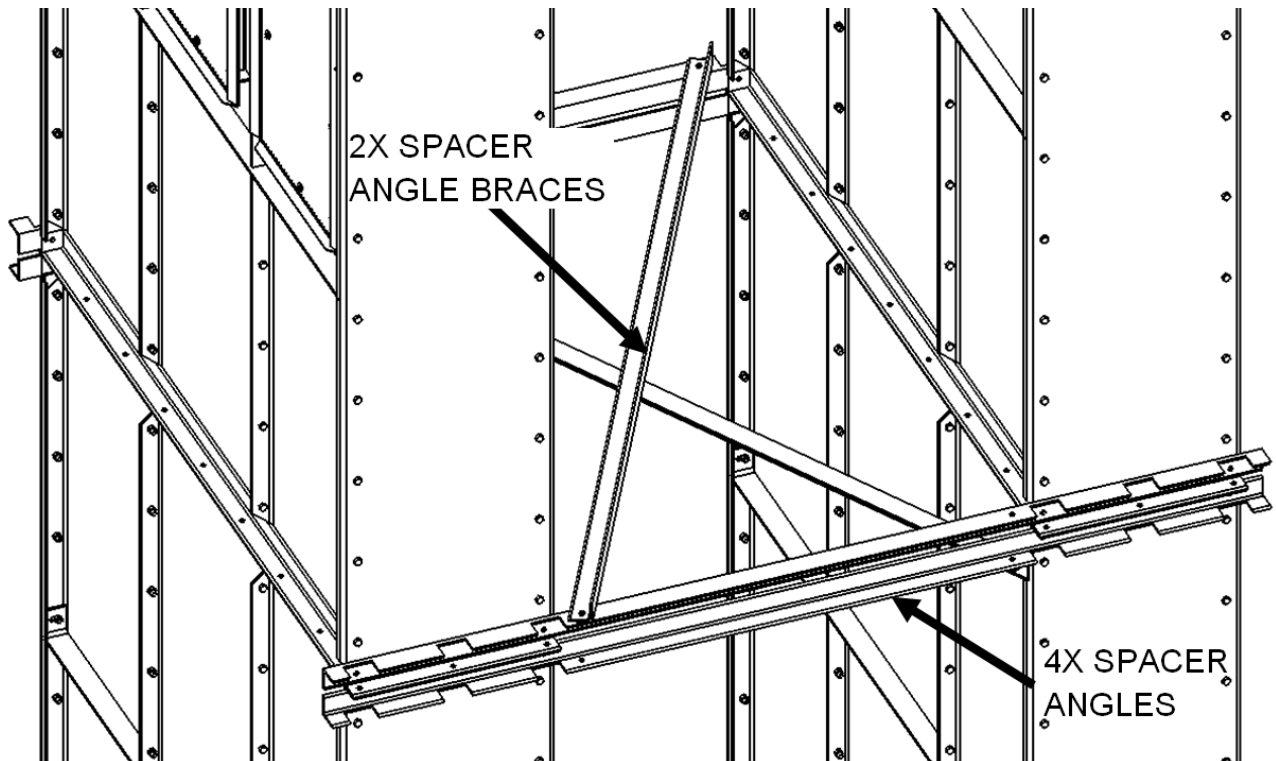
Important Note: When attaching leg sections that consist of a body section and lid panel, verify that the lid panel is located away from the center of the elevator.



Align the flanges on the leg sections and place spacer angles between the lower ends of each pair of leg sections to hold the sections parallel and help reduce flange stress while making the horizontal assembly.



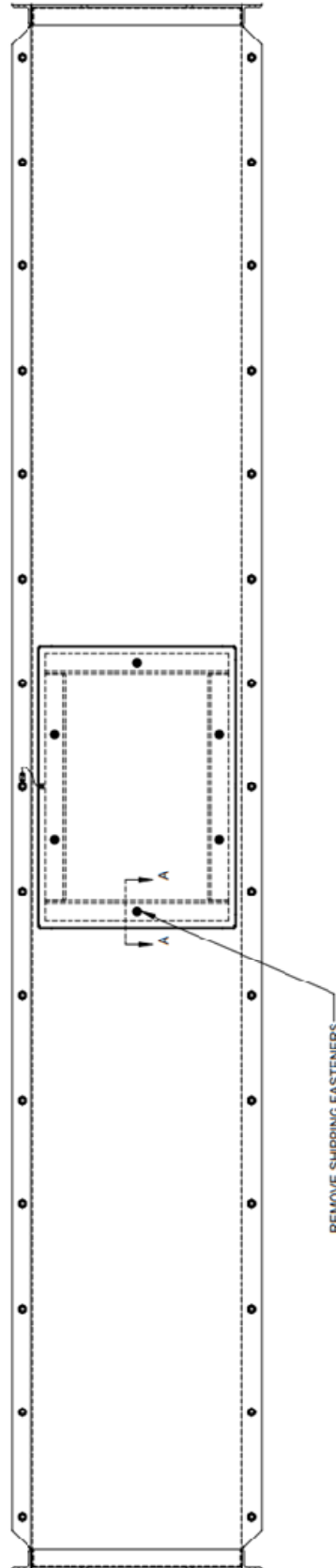
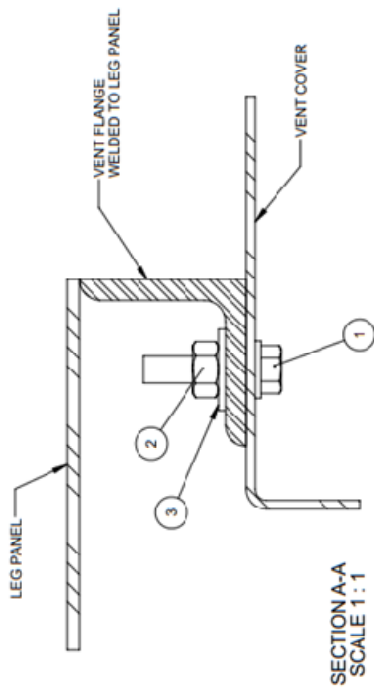
For CBEG48-50, spacers are placed between the lower and upper ends of each pair of legs to hold the sections parallel and a brace set diagonally on each spacer set for support.



When installing explosion vented leg sections, shipping fasteners must be removed and explosion relief fasteners installed as shown in the following illustration.

ITEM	QTY	PART NO.	DESCRIPTION
1	6	106300	FASTENER, 1/4-20x1"SS GCREW W/DKA74 GREEN EXP WASH IER
2	6	453472	NUT, HEX, 1/4-20, SS
3	6	453480	WASHER, FLAT, 1/4X.7540X.0650, SS

- NOTE:**
1. REMOVE THE SHIPPING FASTENERS.
 2. ATTACH DOOR IN 6 LOCATIONS USING FASTENERS PROVIDED IN HARDWARE PACKAGE 9121365, 9149275, OR 9149692, AS SHOWN IN SECTION A. HAND TIGHTEN ONLY! DO NOT USE WRENCHES!
 3. REPEAT PROCEDURE FOR ALL EXPLOSION VENTED LEG SECTIONS.



Head Section Assembly

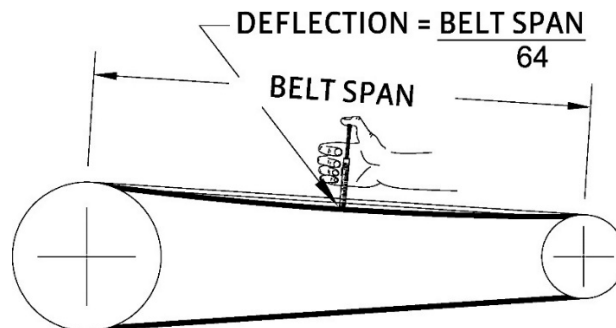
Install the head section of the bucket elevator. Install the reducer drive that is packaged separately, following the manufacturer's complete instructions for installation.

Important Note: Reducer drives are shipped without lubricant. Do not operate the elevator until the reducer drive has been filled with an approved lubricant as noted in the manufacturer's instructions.

A reducer backstop is recommended for all elevators. This backstop prevents a loaded elevator from reversing direction when power is lost to the head pulley. If the reducer drive has been equipped with a backstop, verify the correct direction of rotation. To verify the direction of rotation, rotate the top of the head pulley towards the discharge side of the head. The pulley should rotate freely in this direction but not in the opposite direction. If the backstop is reversed, refer to the reducer manufacturer's instructions.

Position the motor on the head assembly motor mount and attach it with the bolt package provided. Adjustment to the motor mount may be required so that the end of the motor shaft is in line with the end of the reducer input shaft.

Install the drive belts and adjust belt tension. Using a belt tension checker adjust the belts so that a force in the middle of each belt will deflect the belt $\frac{1}{64}$ " for each inch of distance between the sheave centers.

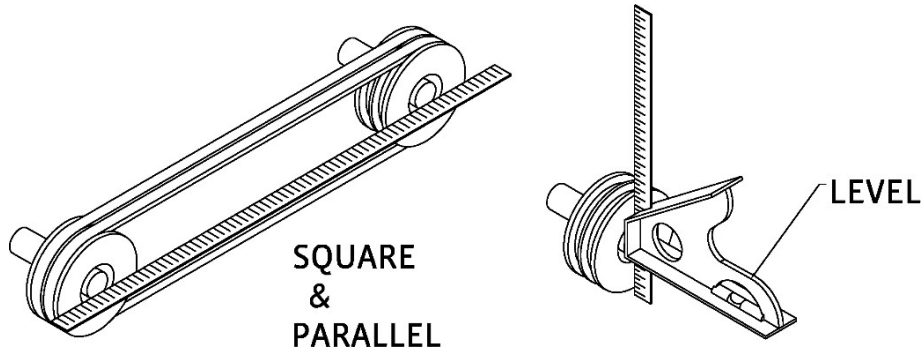


Important Note: Compare the force you have applied with the values in the following chart. The force should be between the minimum and maximum shown. The maximum value shown is for a “New Belt”, and new belts should be tensioned at this value to allow for expected tension loss. Used belts should be maintained at the minimum value.

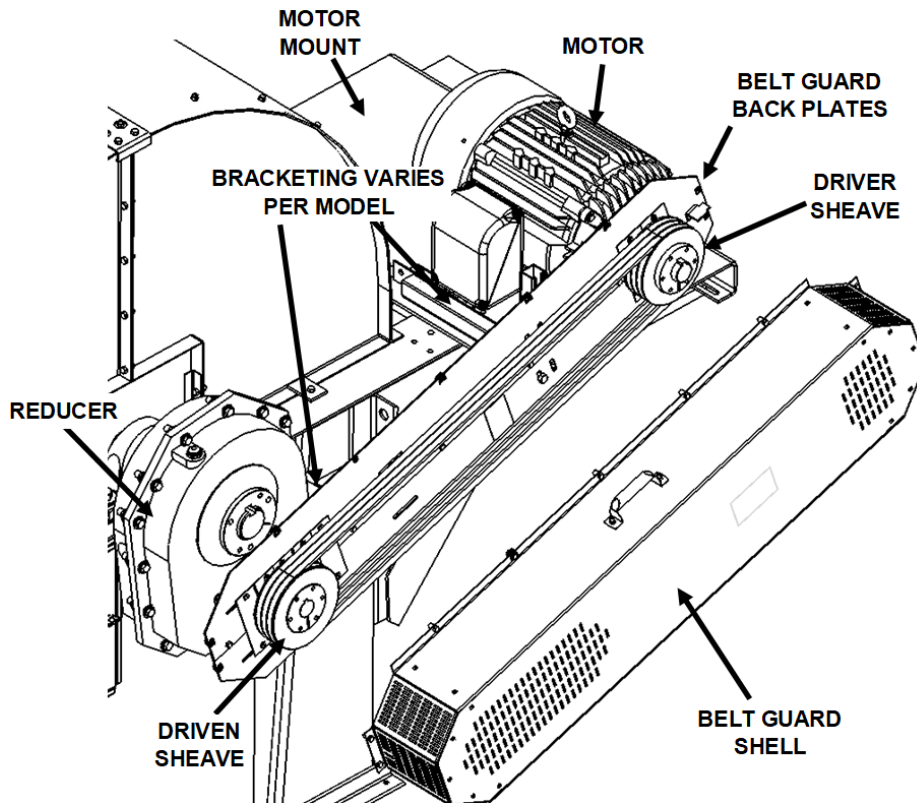
Cross Section	Smallest Sheave Diameter Range (in)	RPM Range	Belt Deflection Force (lbs)			
			Super Gripbelt		Gripnotch Belt	
			Min	Max	Min	Max
3V	2.2-2.4	1000-2500	-	-	3.3	4.9
	2.65-3.65	1000-2500	3.6	5.1	4.2	6.2
	4.12-6.90	1000-2500	4.9	7.3	5.3	7.9
5V	4.4-6.7	500-1749	-	-	10.2	15.2
		1750-3000	-	-	8.8	13.2
	7.1-10.9	500-1740	12.7	18.9	14.8	22.1
		1741-3000	11.2	16.7	13.7	20.1
	11.8-16.0	500-1740	15.5	23.4	17.1	25.5
		1741-3000	14.6	21.8	16.8	25.0

The ideal tension is the lowest tension at which the belt will not slip under peak load conditions (over tensioning shortens belt and bearing life). Check tension frequently during the first 24 hours to 48 hours of operation.

Important Note: All sheaves and drive components should be checked for alignment, centered, and tightened prior to operation and at regular operating intervals.



Install the belt guard and drive components. Since configurations and bracketing of belt guards differ per model of elevator and reducer drive, refer to the supplemental drawings shipped with the elevator for installation instructions on your specific model. Install the belt guard back panels and bracketing. Adjust the belt guard bracketing to allow for back panel clearance away from motor & reducer. Install sheaves and belts allowing for clearance away from back panels. Complete the installation by placing the belt guard shell over the sheaves and belts and then attaching the shell to the back panels.



Important Note: Do not operate the bucket elevator without a correctly installed belt guard assembly.

Important Note: Explosion proof electrical equipment must be used whenever a bucket elevator is located in an explosive environment. A safety disconnect switch should be installed to prevent accidental motor operation when servicing any components.

Assembled Sections Installation

Follow all engineering drawings supplied with shipment for stacking instructions. Prior to hoisting the assembled sections verify the following:

- Verify no parts have been damaged.
- Verify all joints are correctly aligned and sealant applied to all flanges.
- Verify all hardware is correctly installed and torqued to specifications.

Crane Hoisting

Prior to hoisting assembled components verify the following:

- Weather conditions are favorable for installation.
- Foundation is fully cured.
- Boot upper flange is leveled.
- There is adequate clearance to attach all guy cables and that the guy anchors are installed correctly.
- Crane is positioned on firm ground.
- Verify the lifting capacity of the crane with the weight estimates of the components as shown in the following chart. (The chart is a general estimate for planning. Review shipment details for final weights prior to lifting.)

Model	Estimated Weights in Pounds (lbs)							
	Head/ Drive/ Motor	Head Platform	Distributor Platform	10' Leg Section	10' Ladder/ Cage	Rest Platform	10' Guy Cable	Misc
10	700	995	710	110	100	200	70	100
16	1225	930	710	160	100	300	70	300
24W	1850	1040	725	175	100	300	70	300
30	2450	1100	725	175	100	160	110	400
36	3850	1250	740	260	100	160	110	400
36W	4350	1250	750	300	100	160	110	400
42	5800	1360	750	365	100	160	110	400
42-20	7550	1500	840	630	100	160	150	500
48-30	11725	1800	840	630	100	160	150	500
48-50	17450	3280	1000	1000	100	160	150	750

Attach hoisting slings to all eye bolts provided on the head section and verify that the load is distributed evenly.

Important Note: When hoisting, do not allow any portion of the assembled components to drag on the ground. Take precautions to avoid damage during the installation process.

Important Note: Keep all components intact during assembly. Any removal of component parts during installation weakens the structural strength of the entire elevator. Do not under any circumstances cut or weld the leg sections or the inspection section of the elevator as this will cause structural damage. Use only approved leg sections and leg brackets.

Prior to setting the leg and inspection sections on the boot section, ensure plumb between all sections between the head and boot sections. Use one or more transits to check the position. Caulk the flanges and set the assemblies into position. Torque all bolts correctly as described previously.

Belt and Bucket Installation

The belt and buckets are installed after the elevator is installed, guyed, and plumbed. The general procedure is to install the belt, make a temporary belt splice, install the buckets, and then make the final splice.

Belt Installation

Adjust the boot pulley into its highest position to allow maximum belt adjustment. Remove the cleanout doors at the bottom of the boot. Remove the hoods on the head to expose the head pulley. Open the inspection section by removing the front door, screen, and back cover.

Important Note: Care should be taken in removing inspection section parts. Pressure and force from an improperly plumbed elevator can cause the leg sections to collapse when inspection panels are removed.

Loosen all bolts first to see if the covers are free of side loading on the bolts. If they are not free, do not remove the bolts until the problem is corrected.

Important Note: The screen and cover should never be removed during winds in excess of 20 MPH.

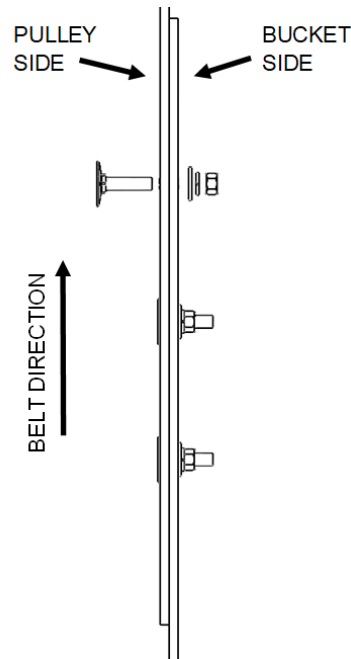
Several methods may be used to place the belt inside the elevator legs. Generally, the belt is pulled with a rope or cable in through the inspection section opening, up and over the head pulley, down and around the boot pulley and back up to the inspection opening for splicing. Verify that the rope or cable used for this purpose has sufficient strength to lift the belt to the head pulley.

With the head hood removed, drop one end of the rope down the up leg and out the inspection opening. Drop the other end of the rope down the down leg, around the boot pulley and back up to the inspection opening. Removal of the cleanout doors will aid in feeding the rope around the boot pulley.

Attach the belt to the end of the rope coming down the up leg. Use a piece of angle to attach the rope to the belt. The angle should be the same width as the belt width with holes along one side to match the bucket holes and an eye bolt in the center of the other side for connecting the rope. Bolt the angle to the belt using the flat headed bolts provided for the buckets. It will be necessary to remove the motor drive belt to allow the upper head pulley to turn freely. Be careful that the belt does not run away when the belt in the down leg becomes longer than the belt in the up leg.

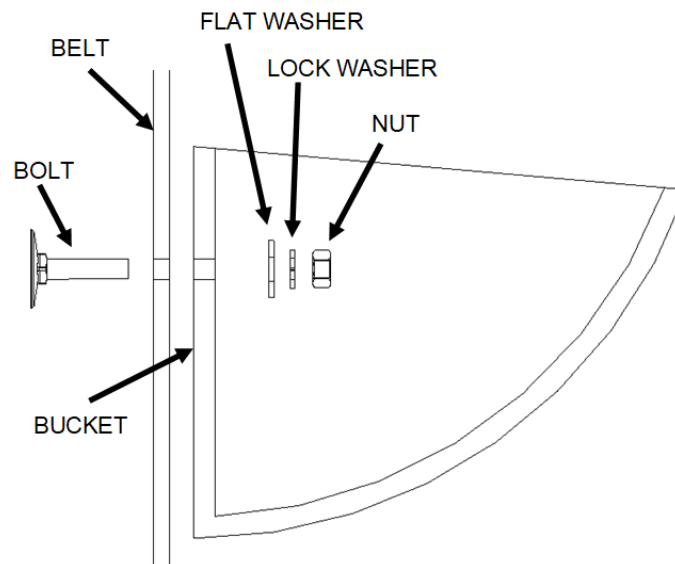
Temporary Belt Splice

Make a temporary lap splice by overlapping the belt ends and inserting flat head bucket bolts through 3 or more sets of pre-punched bucket holes. The lap is made so that the trailing end of the belt is in contact with the pulleys and not the leading end. Lift the lower end of the belt to remove the excess slack from the belt. The flat head of the bolt is to run on the pulley side of the belt. Use flat washers under the nuts at this time.



Bucket Installation

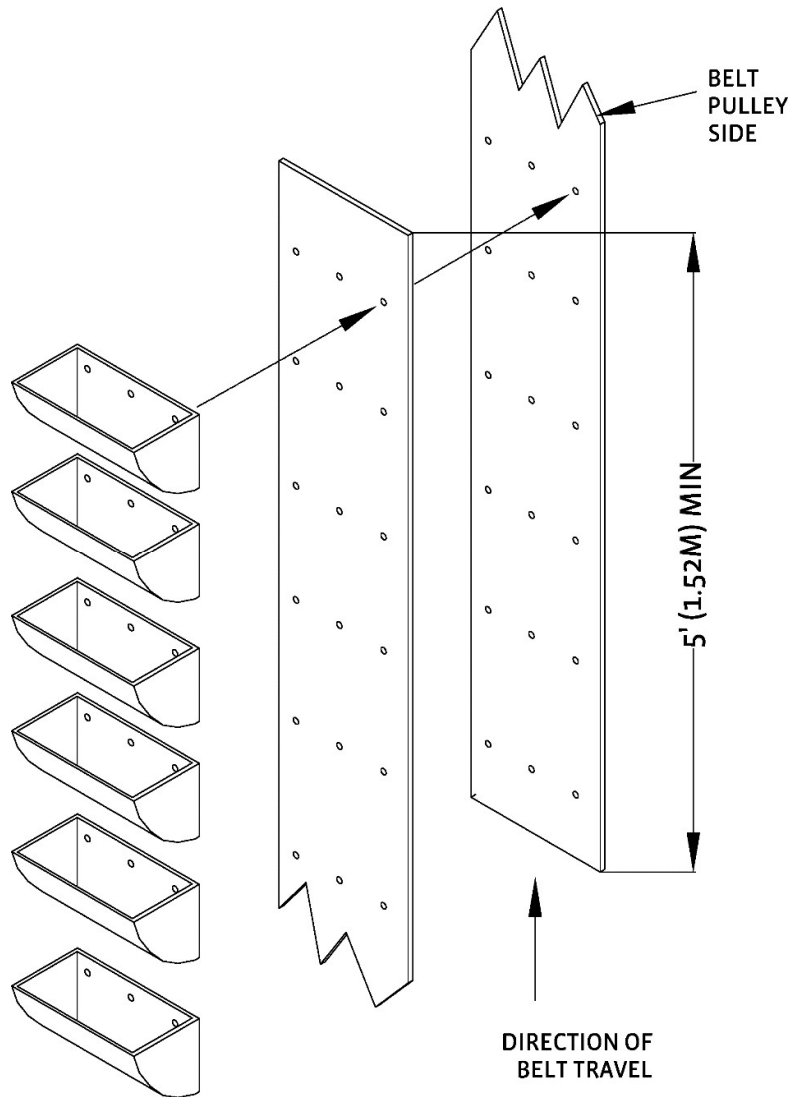
Install the buckets by bolting them to the pre-punched holes in the belt. Insert bolts from pulley side of belt and tighten nuts until bolt head is flush with belt. Tighten bolts to 10 ft-lbs of torque. Install buckets at intervals of 15 or more holes (bucket spacing) on the belt to help reduce an unbalanced condition on the belt. Continue adding another bucket to each spacing interval until all buckets are installed.



Final Belt Splice

Allow the belt and buckets to hang for 24 hours or more to remove much of the initial belt stretch. The belt can then be re-spliced, tightened, adjusted and squared. With the boot pulley in its highest position, disconnect the temporary lap splice at the inspection door.

Remove the excess slack from the belt and re-splice the belt. A five foot overlap is recommended on the lap splice. Using the bolts located in the buckets, match the overlapping pre-punched holes then bolt the belts together using these bucket hole locations. On pre-punched belts with holes spaced over 12 inches apart the splice must span and include 4 sets of bolt holes. Field drill extra sets of holes if required.



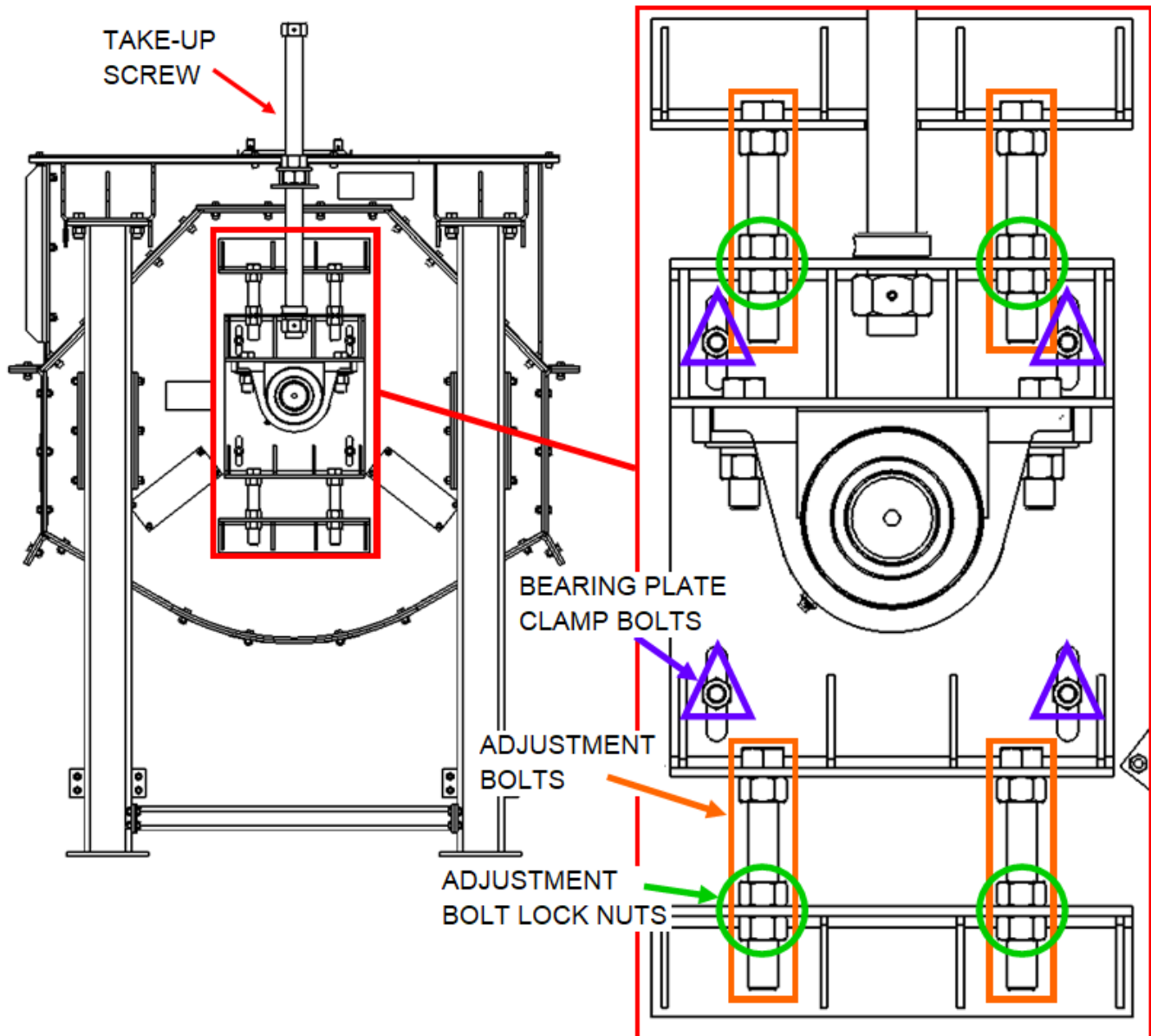
Important Note: Recheck all bolts in the belt and buckets for proper tension. All bolt heads are to be flush with the belt surface. Replace cleanout doors, inspection section back panel, screen door front panel, & head hoods.

Belt Tension Adjustment

Belt tension at the boot pulley must be maintained to eliminate belt slippage at the head pulley. Adjust boot pulley until slack is taken out of the belt. Then adjust the boot pulley down 1" (2.54cm). Steering (belt centering) is accomplished by adjusting one side of the pulley down an additional increment of length compared to the opposite side. The belt will then move to the slack side. If the belt still slips, adjust the boot pulley down one more inch.

Self-Cleaning Boot Adjustment

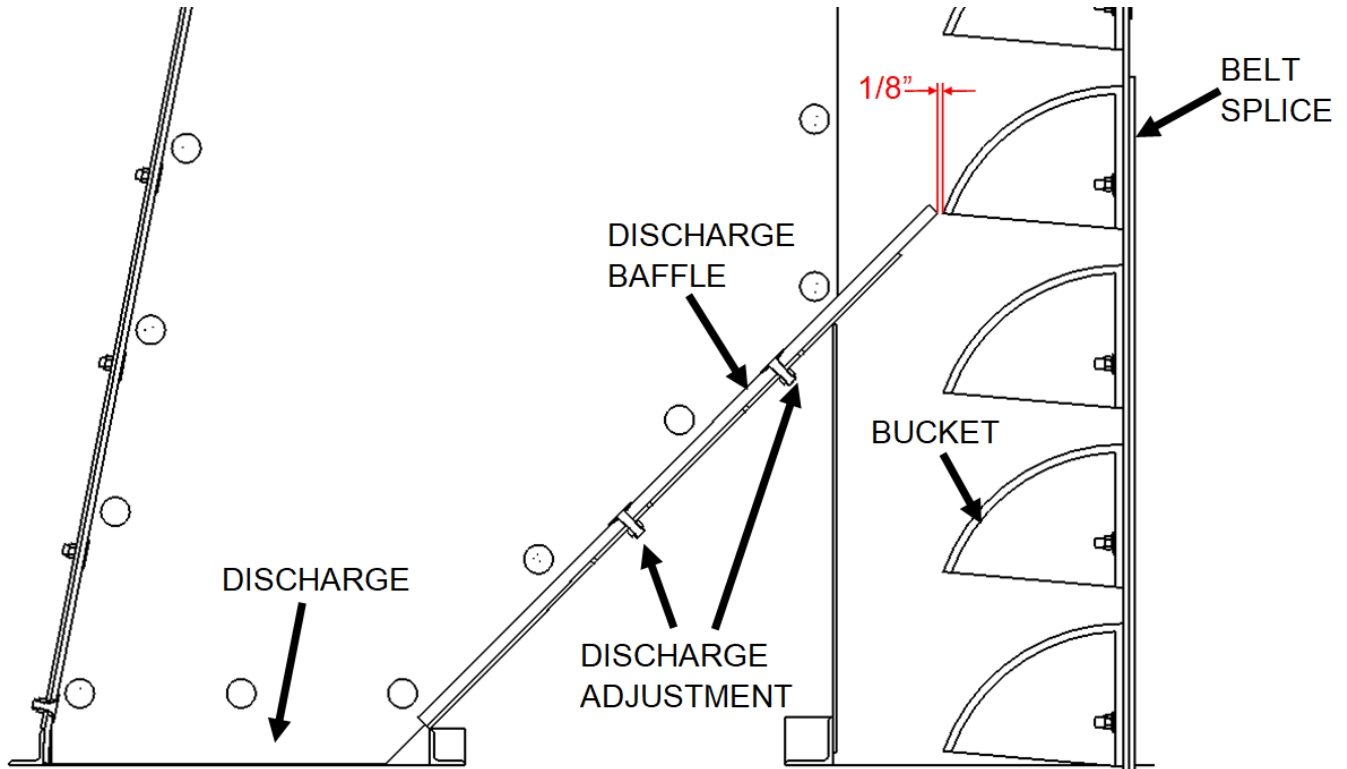
- Loosen Bearing Plate Clamp Bolts.
- Locate the spliced area of the belt to the bottom of the boot.
- Move Adjustment Bolts to have roughly .125" clearance from bucket to boot bottom panel. It will be necessary to move the take-up screw while setting bucket clearance.
- Tighten Adjustment Bolt Lock Nuts.
- Adjust belt tension as previously outlined.



Discharge Baffle Adjustment

A discharge baffle is located in the head discharge section to deflect material from the buckets, so a minimum amount of material returns down the leg (back legging). Adjust the baffle so it will clear the buckets by 1/8" (.31cm).

Important Note: Since buckets mounted on lapped belt splices will run closer to the baffle, final adjustments need to be made at this spliced location to provide adequate clearance.



Start up and Operation

Prior to operating the elevator, check all areas for safety issues and machine damage which could occur during operation. Follow all manufacturers' pre-start up instructions for each individual component provided with your elevator. In addition, verify the following:

- Leg properly plumbed.
- Guy cables tensioned and secured.
- Head pulley key(s) are in place.
- Secure set screws in drive sheaves, head and boot shafts, pulleys, shaft bearings, and gear reducers.
- Head pulley is level, centered, and squared in housing.
- Discharge baffle properly positioned and discharge clear of obstructions.
- All hardware is in place with correct torque.
- Elevator belt splice is square and belt properly tensioned.
- Sheaves properly aligned and V-belts properly tensioned.
- Bushing bolts in sheaves and reducer are torqued to manufacturer specifications.
- Drive guard and other safety devices installed.
- All debris is removed from the elevator. Frequently recheck the boot for debris during the first few days of operation. During construction debris can be left in other areas that feed to the bucket elevator, such as dump pits, bin unload conveyors or grain bins.
- Head hood, boot cleanouts, and inspection section panels in place and properly secured.
- Reducer installed to manufacturer specifications.
- Reducer has lubricant and is filled to proper level.
- Correct vehicle clearance to elevator or guy cables.
- Safety restrictions on electric controls and climbing ladders.
- Safety restrictions on pits.
- Electrical equipment is installed to meet national electric code and/ or local safety codes, including explosion proof equipment where required.

After an initial pre-start inspection, operate the bucket elevator empty under power for a period of time to verify the belt is tracking on the center of the head and boot pulleys and that all buckets are traveling in the correct direction.

To complete an elevator system, material feed and discharge connections must be made to the bucket elevator. Complete these connections prior to placing the bucket elevator into service.

Since the elevator has been previously operated without material, it may now be tested under load. It is suggested that the flow systems be verified next. Allow only a small amount of material to enter the elevator while it is running. Verify that the material can flow through the system connections, valves, distributors, etc. for proper operation. Once all flow paths have been verified, the elevator may be loaded to capacity.

When the elevator is operating at full capacity verify the following:

- There is no back legging (grain being returned inside the down leg).
- There is no slippage of the head pulley.
- Buckets are filling correctly.

After the first 8-10 hours of operation inspect the following:

- Verify all bolts attached to the buckets are tight and flush to the belt.
- Verify that the tracking of the belt is correctly centered in the leg inspection section.
- Check the drive components (drive, pulleys, belts, torque arm).
- Check gear reducer for overheating or oil leakage.
- Check head pulley hub bolts and set screws for correct torque.

Set Screw Diameter	Socket Size	Ball Bearing Torque		Roller Bearing Torque	
		In.-lb.	Kg.-M.	In.-lb.	Kg.-M.
#10	3/32"	30	.3	-	-
1/4"	1/8"	70	.8	-	-
5/16"	5/32"	140	1.6	125	1.4
3/8"	3/16"	220	2.5	225	2.6
7/16"	7/32"	350	4.0	325	3.7
1/2"	1/4"	-	-	475	5.5
5/8"	5/16"	-	-	1150	13.2
3/4"	3/8"	-	-	1600	18.4

Periodic Maintenance

The following are guidelines for maintaining the elevator. Operators will have to determine what inspection and service intervals are necessary for their application. Factors to consider are the frequency of operation and the operating environment of the equipment.

1. Daily
 - a. Always be aware of the normal operating sounds. If any abnormal sounds occur, stop the elevator, find the source of the noise, then lock out power to elevator and repair the problem.
2. Weekly
 - a. Lubricate bearings according to manufacturer specifications.
3. Monthly
 - a. Check V-belt tension and overall condition. Replace if worn, frayed, or cracked.
 - b. Check that set screws in pulleys and bearings are tight. If necessary, tighten to manufacturers' specifications.
 - c. Check for missing or damaged buckets. Replace if necessary. Check bucket bolts for tightness.
 - d. Check that the elevator belt is properly tensioned and is running in the center of the leg.
 - e. Check oil level in gearbox and inspect seals for signs of leakage. Follow manufacturer's specifications for oil level and oil change periods.
 - f. Check that the motor is clean and properly ventilated.
 - g. Lubricate motor according to manufacturer's specifications and intervals.
4. Quarterly
 - a. Check guy cables, turnbuckles and cable clamps for damage or loosening. Any change in cable tension may cause the leg to go out of the plumb, resulting in the belt not running on center and/or damage to the leg. **Important Note:** Never remove or loosen any cables without providing another form of support for the elevator.

Troubleshooting

The items shown below are an aid to troubleshooting when a problem is encountered. Some causes can be corrected by reviewing certain areas of the assembly instructions. When checking elevator capacities, note that rated capacities are calculated using water level cup fill.

1. **Problem:** Measured Capacity is Reduced from the Rated Capacity
 - a. **Possible cause:** Buckets or Cups not Filling Correctly
 - i. *Possible reason or solution:*
 1. Inlet opening too small. Increase the size of the opening.
 2. Hopper is installed incorrectly/low.
 3. Buckets or cups running above the inlet.
 4. Material not feeding into hopper.
 - b. **Possible cause:** Material is Back Legging
 - i. *Possible reason or solution:*
 1. Discharge spouting and/or distributor is inadequate or obstructed.
 2. Incorrect belt speed.
 3. Incorrect adjustment of baffle.
 4. Overfilling of buckets or cups.
 - c. **Possible cause:** Incorrect Belt Speed
 - i. *Possible reason or solution:*
 1. Incorrect drive sheave assembly.
 2. Incorrect motor speed.
 3. Incorrect reducer ratio.
 4. Head pulley slipping.
 5. Drive belt slipping.
 - d. **Possible cause:** Inadequate Bucket or Cup Volume
 - i. *Possible reason or solution:*
 1. Residual material inside buckets or cups.
 2. Incorrect bucket or cup size for specific material.
2. **Problem:** Elevator is Being Overloaded
 - a. **Possible cause:** Buckets or Cups Overfilling
 - i. *Possible reason or solution:*
 1. Inlet feed exceeds the capacity of the bucket elevator.
 2. Belt slipping on the head pulley.
 3. Incorrect bucket or cup size for specific material.
3. **Problem:** Motor Starter Shutting Off
 - a. **Possible cause:** Motor is Overloaded
 - i. *Possible reason or solution:*
 1. Leg is being overloaded.
 2. Line voltage is low.
 3. Incorrect drive sheaves.

- b. Possible cause: Incorrect Equipment (too small of motor, starter incorrectly sized, or motor and/or starter is defective)
 - i. *Possible reason or solution:*
 1. Excessive current draw.
 2. Incorrect size.
- 4. **Problem:** Motor Cannot Start Belt
 - a. Possible cause: Back Stop is Reversed
 - i. *Possible reason or solution:* Backstop should be installed correctly.
 - b. Possible cause: Motor Rotation Reversed
 - i. *Possible reason or solution:* Motor wiring incorrect.
 - c. Possible cause: Boot is Filled with Material
 - i. *Possible reason or solution:* Material not shut off prior to bucket elevator being emptied/ shut off.
 - d. Possible cause: Damaged reducer
 - i. *Possible reason or solution:* Damaged gears or bearings.
 - e. Possible cause: Bucket or cup caught in leg.
 - i. *Possible reason or solution:* Loose buckets or cups.
- 5. **Problem:** Belt Will Not Track Correctly (rubbing on sides of the leg sections)
 - a. Possible cause: Belt Not Centered on Boot Pulley
 - i. *Possible reason or solution:*
 1. Belt too loose.
 2. Boot pulley not level.
 3. Material build up on boot pulley.
 - b. Possible cause: Belt Not Centered on Head Pulley
 - i. *Possible reason or solution:*
 1. Elevator is out of plumb.
 2. Head pulley not level.
 3. Belt loose or slipping.
 4. Bucket or cups not filling evenly.
 5. Belt splice is crooked or slipped.
- 6. **Problem:** Excessive Noise or Vibration
 - a. Possible cause: Buckets or Cups Hitting Elevator
 - i. *Possible reason or solution:*
 1. Obstruction in the leg sections.
 2. Bent or damaged buckets or cups.
 3. Belt loose.
 4. Cups hitting the bottom of the boot section.
 5. Excessive belt speed.
 - b. Possible cause: Motor or Drive Noise
 - i. *Possible reason or solution:*
 1. Failed bearings in motor, head shaft or boot shaft.
 2. Failed bearings or gears in reducer.
 3. Loose motor mount, torque arm or reducer.
 4. Insufficient oil in reducer.

7. **Problem:** Reducer Overheating
 - a. Possible cause: Low or Overfilled Gear Lubricant
 - i. *Possible reason or solution:* Refer to manufacturers specifications.
 - b. Possible cause: Incorrect Grade or Weight of Lubricant
 - i. *Possible reason or solution:* Refer to manufacturers specifications.
 - c. Possible cause: Reducer Overloaded
 - i. *Possible reason or solution:* Incorrect size of reducer.
 - d. Possible cause: Reducer Failing
 - i. *Possible reason or solution:* Worn gears or failed bearings.
8. **Problem:** Excessive Belt Slippage or Belt Melting
 - a. Possible cause: Belt Slipping on Head Pulley
 - i. *Possible reason or solution:*
 1. Belt is loose.
 2. Worn lagging on head pulley.