

BUCKET ELEVATORS



INSTALLATION MANUAL P/N 473793

CHIEF 

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Chief Industries, Inc. – Agri/Industrial Division

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Manual Revisions

- 8-20-2014
 - Updated warranty information
- 11-1-2014
 - Explosion Venting
 - HD Boot
- 11-2-2015
 - Up and Down Leg Illustration
- 1-1-2016
 - General formatting update

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4400 East 39th Street • PO Box 848

Kearney, NE 68847

Phone 800.359.7600

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www.agri.Chiefind.com

STANDARD LIMITED WARRANTY

Material Handling Products

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 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 1 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 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 you the best overall experience with your equipment and guarantee smooth operation.

This proprietary information is loaned with the expressed agreement that the drawings and information therein 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.

Special Service 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: _____

Model Number Description

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

Example: CBEG 36 - 105 - 5000 - 8X10
 (a) (b) - (c) - (d) - (e)

(a) CBEG = Chief bucket elevator galvanized

(b) 36 = Bucket elevator pulley diameter

Where: 36 = 36 inches in diameter

(c) 105 = Bucket elevator discharge height

Where: 105 = 105 feet in height from base of boot to discharge

(d) 5000 = Elevator capacity

Where: 5000 = 5,000 BPH design

(e) 8X10 = Leg section

Where: 8 = 8" width

Where 10 = 10" length

General Design Information

All steel materials are purchased in accordance with the applicable ASTM Standard.

All bolted connections are designed using high strength bolts which meet the specifications of the applicable ASTM or SAE standard.

All galvanized steel conform to ASTM specification A653 with the galvanized coating to ASTM specification A924.

Galvanized coating type G-115 specifies galvanization of 1.15 oz/ft² (Z350; 350 gm/m²) total for both sides in the following materials:

- 22 Gauge thickness & lighter = Commercial Steel Type A, 33ksi min yield (grade 230)
- 18 & 20 Gauge thickness = Structural Steel Grade 40, Class I; 40ksi min yield (grade 275)
- 17 Gauge thickness & heavier = Structural Steel Grade 55, Class I; 55ksi min yield (grade 340)

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, foundation 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 structural damage or storage quality problems. If any field modifications are necessary which are not specifically covered by the contents of the installation manual, contact Chief for approval. Any unauthorized modification or installation defect which affects the structural 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 bin 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 minimum and maximum torque values for installation.

When installing hardware the minimum and maximum torque values shown below must be followed. All hardware must seat tight against the corresponding bin component.

Bolt Diameter	Minimum Torque	Maximum Torque
5/16" (.79cm)	22 ft.-lbs.	28 ft.-lbs.
3/8" (.95cm)	25 ft.-lbs.	44 ft.-lbs.
7/16" (1.11cm)	60 ft.-lbs.	75 ft.-lbs.
1/2" (1.27cm)	50 ft.-lbs.	58 ft.-lbs.

Please note the following wrench / socket size to be used on the corresponding hardware:

Bolt Size	Head Size	Nut Size
5/16"	1/2" wrench	1/2" wrench
3/8"	9/16" wrench	9/16" wrench
7/16"	5/8" wrench	11/16" wrench
1/2"	3/4" wrench	3/4" wrench

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:



Pre-Installation Planning Information

Bucket elevators should be preplanned to meet the project requirements. Engineering drawings will simplify the installation and should include the following:

- Site layout
- Capacities
- Location and orientation of elevator
- Locations of boot foundation
- Location of 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 and withstand winds to 100mph to the height specified. 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 severe structural damage to the structure 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 then adequate clearance must be provided to service the elevator.

Important Note: Adequate clearance must also be provided for removal of the boot pulley and the use of cleanout door. 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 100 mph (160 kph).

		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 (14,651kg)	32,300lbs (14,651kg)	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)	-	-	-	-	-	-	-

Installation

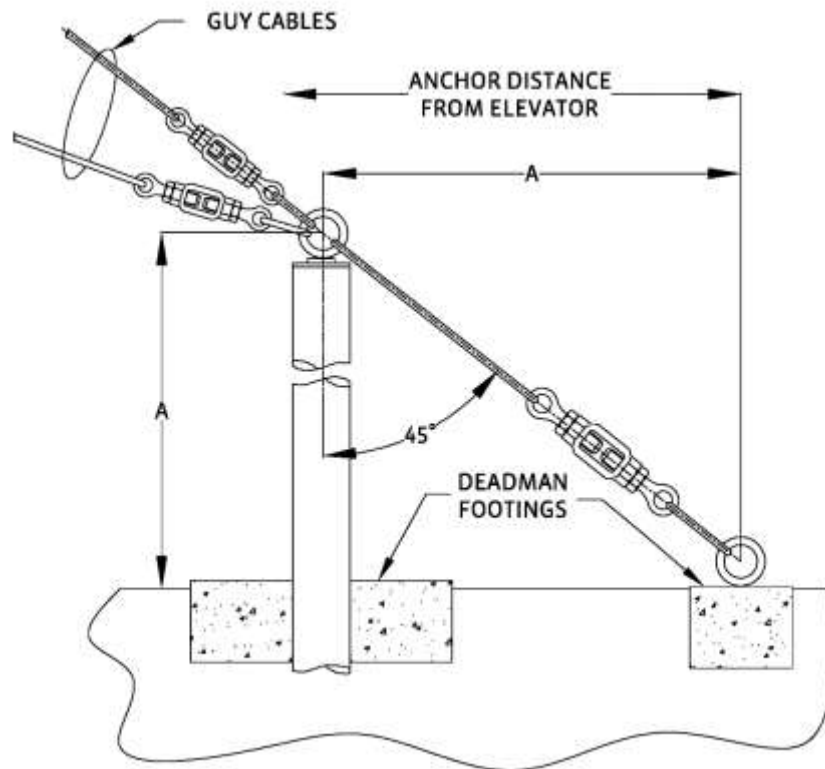
Chief does not assume any responsibility from parts damaged due to faulty or improper installation procedures.

Guy Cables and Anchors

The leg must be braced every 20 ft. between the head section and the top of the boot unit. Guy cables are generally used for bracing above ground level. For legs extending into pits (below ground level) bracing near ground level is recommended, to obtain maximum overhead guy cable clearance.

Important Note: Guy cables should be protected from accidental damage. Trucks or machinery impacting a cable can cause serious damage and result in the collapse of the elevator.

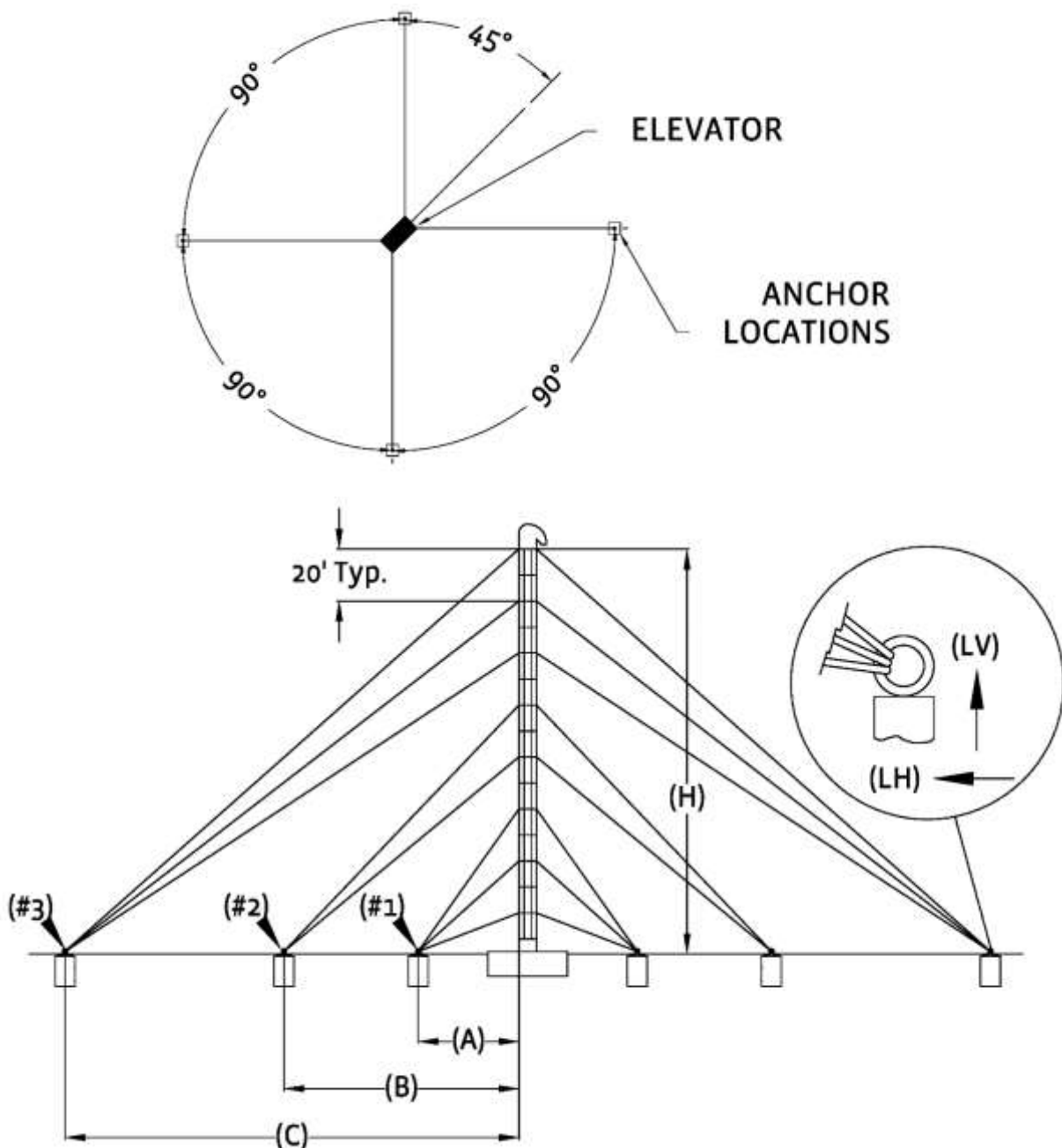
Guy cable protection can be gained by utilizing guard fences and elevated anchors. These will keep equipment a safe distance from the cables and allow vehicles to pass under the cables near the anchor location.



Anchors are to be located 90 degrees apart around the elevator and must be properly designed to withstand the cable loads.

Important Note: All anchors must be designed by a structural engineer to match the soil and ground conditions.

Important Note: All cables or braces attached to buildings or other structures must be approved by the manufacturer of the structure or by a structural engineer.



Anchor locations and loads are shown in the following chart.

Model	Height (FT)	Anchor "A"				Anchor "B"				Anchor "C"			
		Sets	"A"	LH (LBS)	LV (LBS)	Sets	"B"	LH (LBS)	LV (LBS)	Sets	"C"	LH (LBS)	LV (LBS)
CBEG10	40	2	40	3740	3740	-	-	-	-	-	-	-	-
	60	3	60	5780	5780	-	-	-	-	-	-	-	-
	80	2	40	3900	3900	2	80	3840	3260	-	-	-	-
	100	2	40	3960	3960	3	100	5830	4640	-	-	-	-
CBEG16-24W	40	2	40	4910	4910	-	-	-	-	-	-	-	-
	60	3	60	7330	7330	-	-	-	-	-	-	-	-
	80	2	40	5010	5010	2	80	4870	4270	-	-	-	-
	100	2	40	5010	5010	3	100	7400	5910	-	-	-	-
	120	2	40	5010	5010	4	120	10010	7470	-	-	-	-
	140	3	60	7520	7520	4	140	10010	7890	-	-	-	-
	150	3	40	5010	5010	2	90	5040	4410	3	150	10100	6160
CBEG30-36	60	3	60	9370	9370	-	-	-	-	-	-	-	-
	80	2	40	5490	5490	2	80	6660	5470	-	-	-	-
	100	2	40	5490	5490	3	100	9480	7800	-	-	-	-
	120	2	40	5420	5420	4	120	12390	9550	-	-	-	-
	140	3	60	8240	8240	4	140	12390	9950	-	-	-	-
	160	2	40	5490	5490	2	80	5530	4830	4	160	12390	10260
	180	2	40	5450	5450	3	100	8450	6730	4	180	12390	10490
CBEG36W	60	3	60	12940	12940	-	-	-	-	-	-	-	-
	80	2	40	7010	7010	2	80	9480	8520	-	-	-	-
	100	2	40	7010	7010	3	100	13070	10850	-	-	-	-
	120	2	40	6930	6930	4	120	16740	13040	-	-	-	-
	140	3	60	10510	10510	4	140	16740	13570	-	-	-	-
	160	2	40	70200	70200	2	80	7050	6160	2	160	16740	13960
	180	2	40	7000	7000	3	100	10730	8550	3	180	16740	14270

Model	Height (FT)	Anchor "A"				Anchor "B"				Anchor "C"			
		Sets	"A"	HL (LBS)	VL (LBS)	Sets	"B"	HL (LBS)	VL (LBS)	Sets	"C"	HL (LBS)	VL (LBS)
CBEG42	60	3	60	12940	12940	-	-	-	-	-	-	-	-
	80	2	40	7010	7010	2	80	9480	8520	-	-	-	-
	100	2	40	7010	7010	3	100	13070	10850	-	-	-	-
	120	2	40	6930	6930	4	120	16740	13040	-	-	-	-
	140	3	60	10510	10510	4	140	16740	13570	-	-	-	-
	160	2	40	70200	70200	2	80	7050	6160	2	160	16740	13960
	180	2	40	7000	7000	3	100	10730	8550	3	180	16740	14270
CBEG48	60	3	60	12940	12940	-	-	-	-	-	-	-	-
	80	2	40	7010	7010	2	80	9480	8520	-	-	-	-
	100	2	40	7010	7010	3	100	13070	10850	-	-	-	-
	120	2	40	6930	6930	4	120	16740	13040	-	-	-	-
	140	3	60	10510	10510	4	140	16740	13570	-	-	-	-
	160	2	40	70200	70200	2	80	7050	6160	2	160	16740	13960
	180	2	40	7000	7000	3	100	10730	8550	3	180	16740	14270

Guy Cables

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.

Cables can be precut to length according to the following chart. This chart corresponds with [pre-installation information](#). The lengths listed start with the highest elevation cable at each anchor location, starting at the brackets located just below the head section. The lengths continue down the elevator at 20' (6.09m) intervals. All cables are 3/8" diameter except for where an asterisk (*) is shown. The asterisk (*) denotes a 1/2" diameter cable must be used at this location.

Discharge Height (FT)	Guy Cable Length (FT)		
	Anchor "A"	Anchor "B"	Anchor "C"
40	57	-	-
	45	-	-
60	85*	-	-
	73	-	-
	64	-	-
80	57	114*	-
	45	100	-
100	57	142*	-
	45	129	-
	-	117	-
120	57	170*	-
	45	157	-
	-	145	-
	-	135	-
140	85	198*	-
	73	185	-
	64	172	-
	-	162	-
160	57	114	227*
	45	100	213
	-	-	200
	-	-	189
180	57	142	255*
	45	129	241
	-	117	228
	-	-	217

Important Note: Cable lengths shown are straight line lengths. No allowance in the cable length has been made for cable clamping, turn buckles, cable sag or any deviation in bracket or anchor locations. See the chart below for additional cable connection requirements.

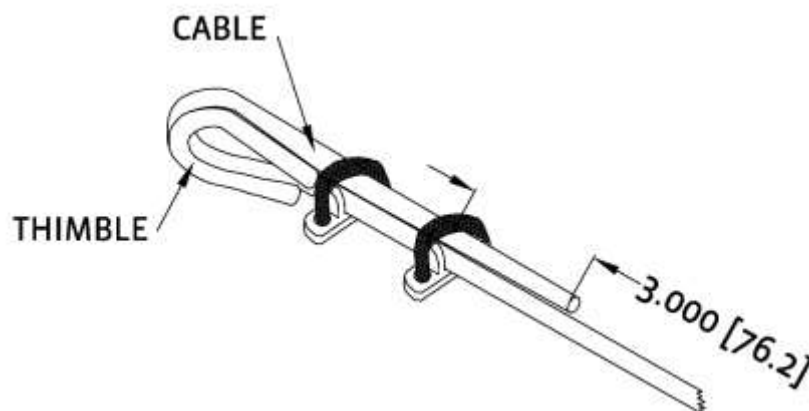
Cable Diameter (in.)	Number of Clamps	Cable Turnback	Nut Torque (ft.-lbs.)
.3750	2	10"	45
.5000	2	12"	65

Important Note: All 3/8" diameter guy cables are to use a 6,950 lb. minimum strength cable (Siemens martin or equivalent). All 1/2" diameter guy cables are to use 12,100 lb. minimum strength cable (Siemens martin or equivalent). Do not mix types of cables even though they meet the minimum strength requirements.

To organize the attachment of cables while the elevator is being installed, pre-mark each guy wire bracket with its future position on the leg (height and direction), then determine the length of the cable for each guy wire bracket being sure to allow for all cable connections. Cut and attach the cables to predetermined guy wire brackets. As the elevator is assembled the guy wire brackets can be installed with the proper cables attached

Connect each guy cable to its anchor, starting with the lowest set of cables and progressing towards the top elevation. Locate a turnbuckle on each cable at a convenient distance from the anchor. Extend the turnbuckles as far as possible to allow for later adjustment.

The recommended method of connecting a cable is to bend the cable around a cable thimble for the specified cable turn back length. Place the first cable clip 3 inches from the dead end. Place the second clip as close to the loop as possible.

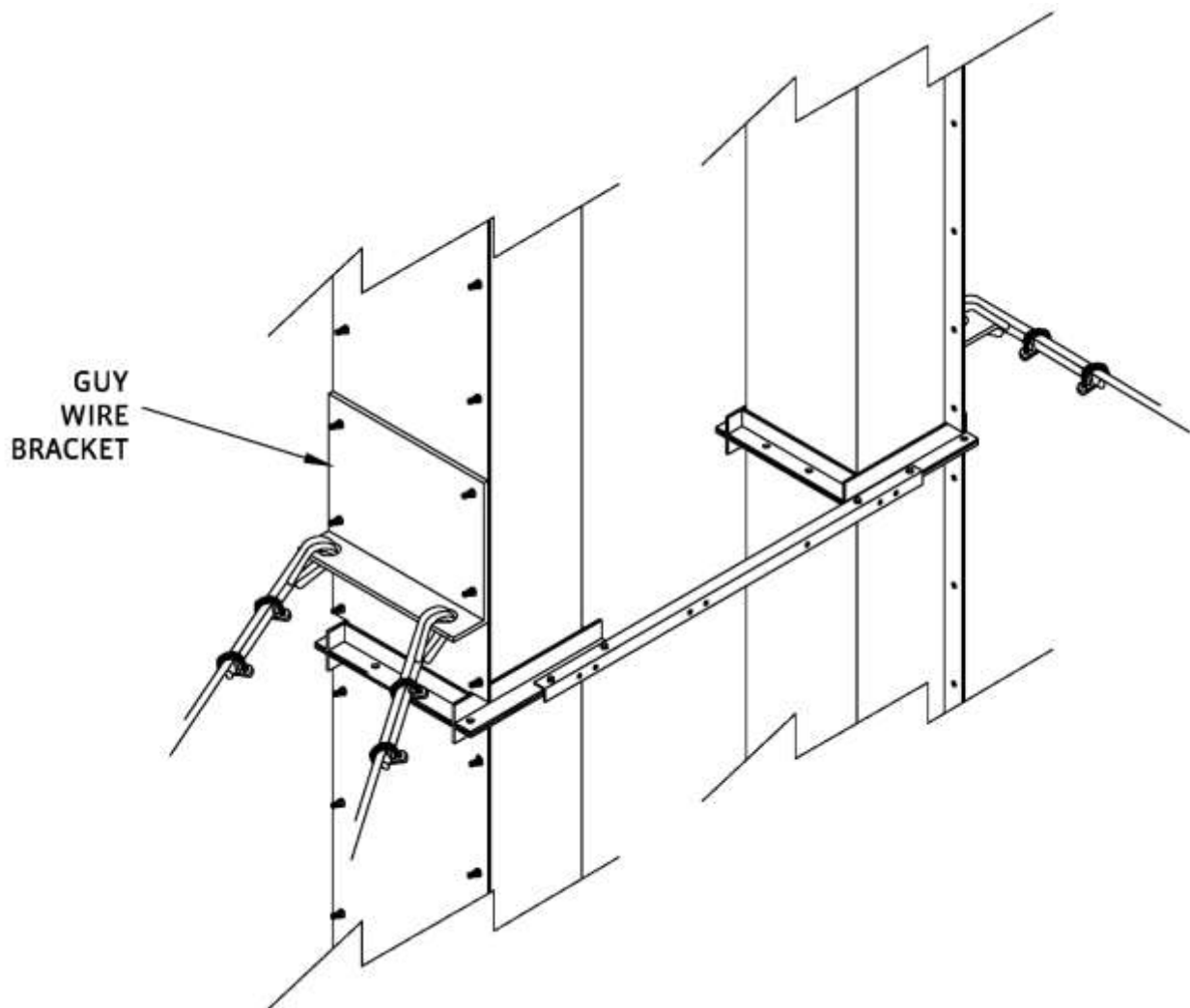


If a work platform is used on the bucket elevator, the top sets of cables are attached to the work platform angle thimble locations.

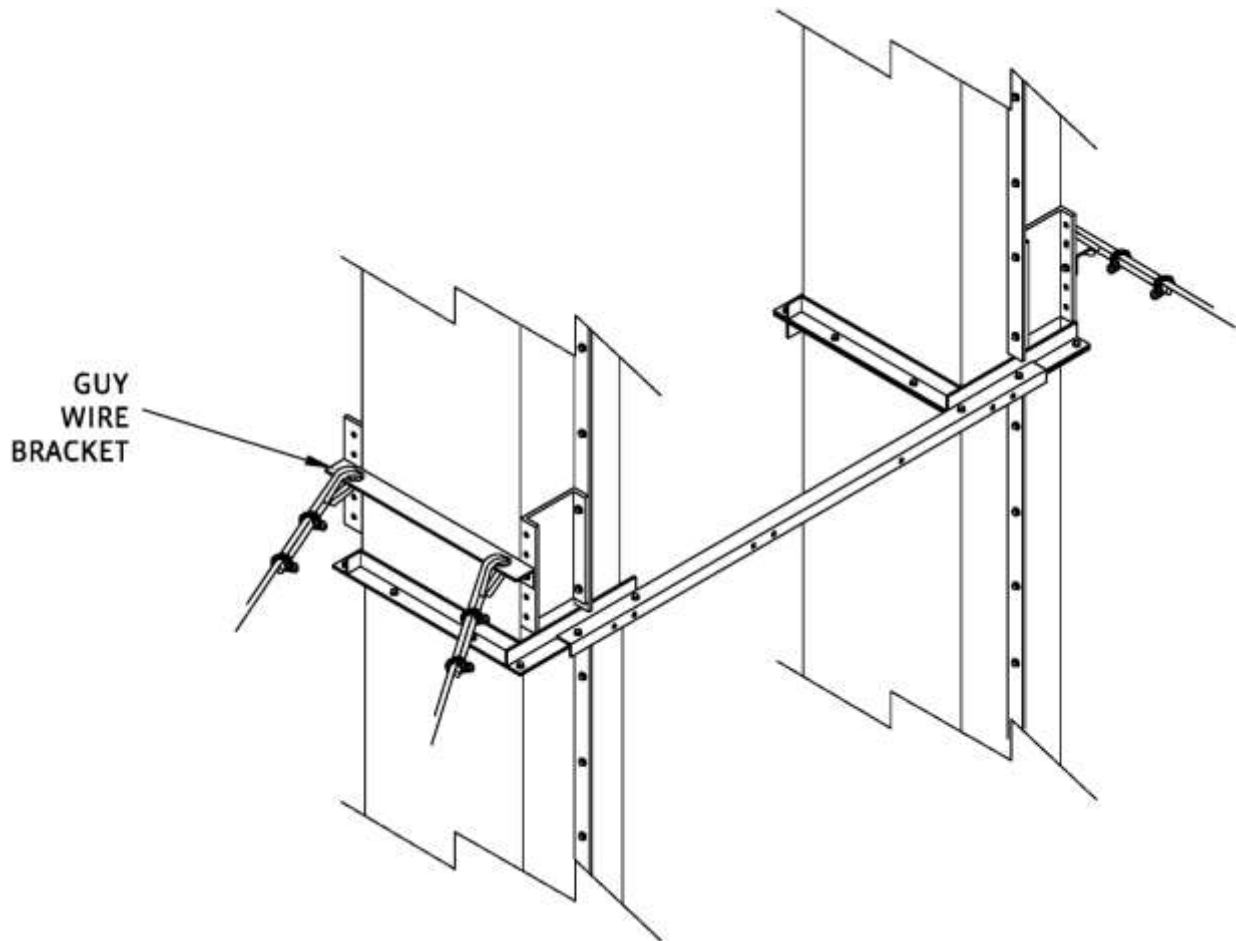
All other cable sets are attached to the bolted leg sections as shown in the following illustrations.

Important Note: Guy Cables must not be attached by other means than those provided. Welding to or cutting into the leg sections is prohibited.

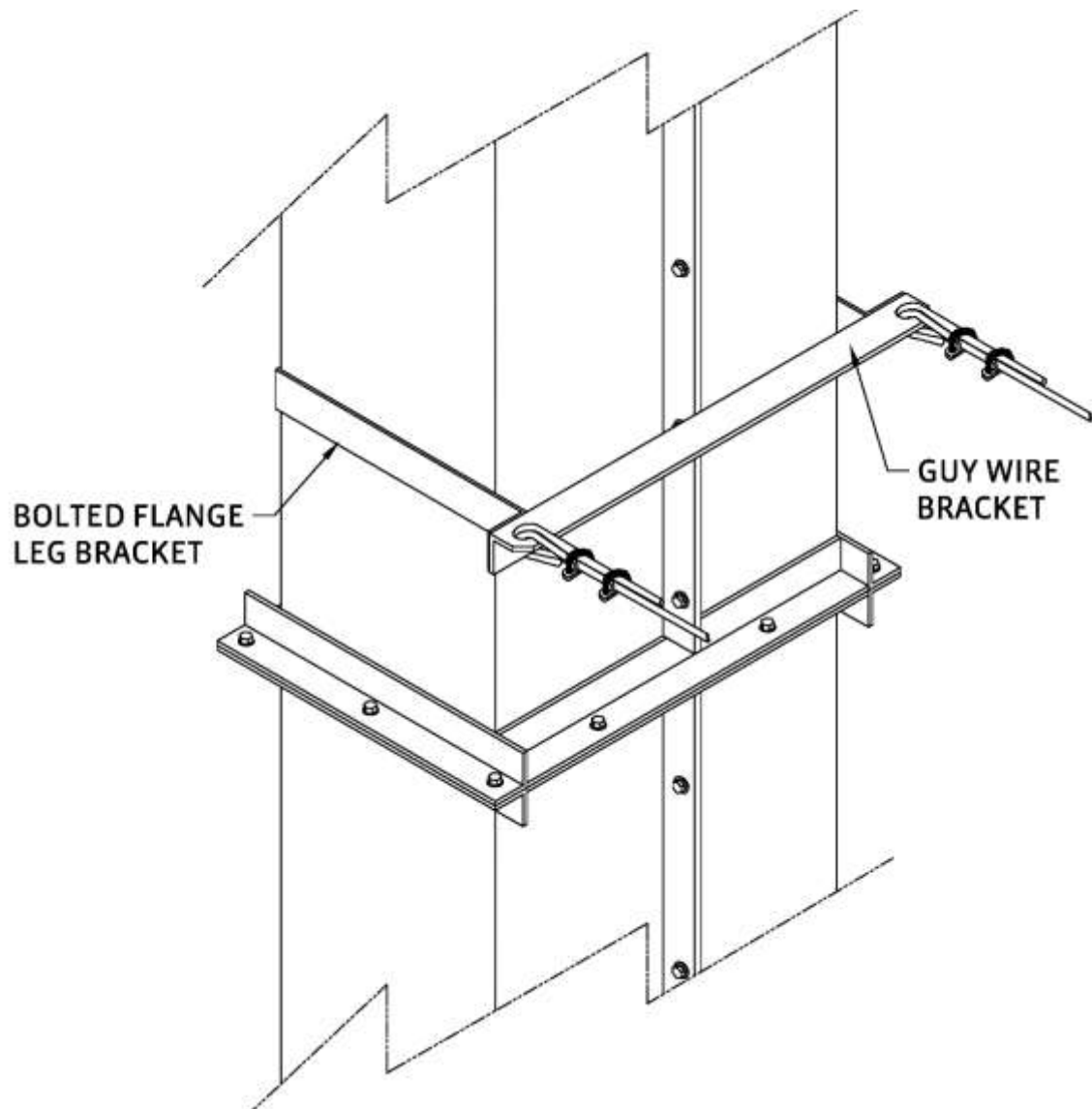
Leg section with body and lid sections



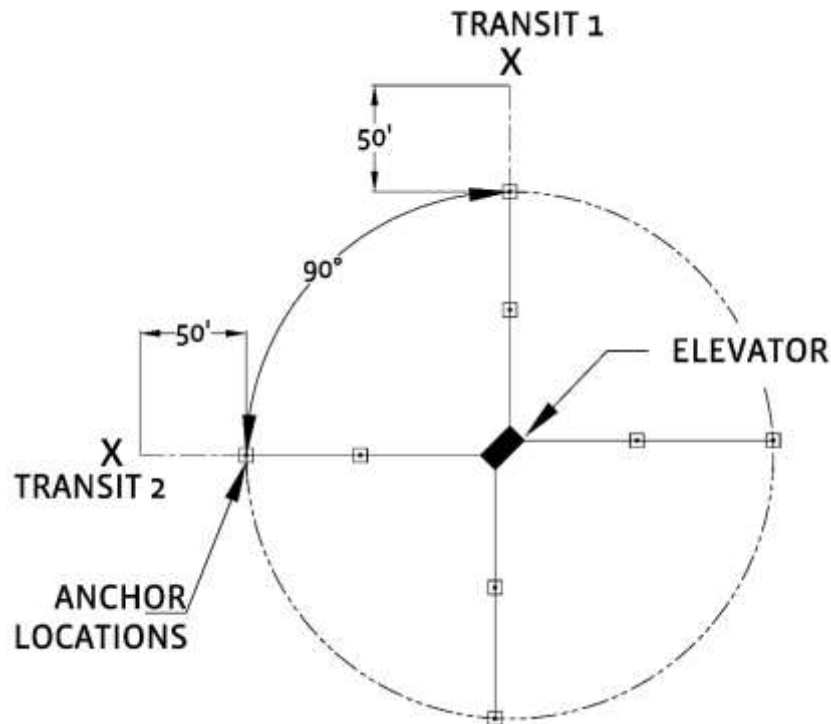
Leg section with 2 body sections



Leg section with 2 body sections



Use two transits to keep the leg straight and plumb while tightening the cables at the turnbuckles. Locate one transit in line with one row of anchors, and 50 feet additional from the farthest anchor. This transit will be used for adjusting cables extending to the right and left of it. Set a second transit 90 degrees from the first transit in line with the row of anchors, to adjust the cables extending in the other two directions.



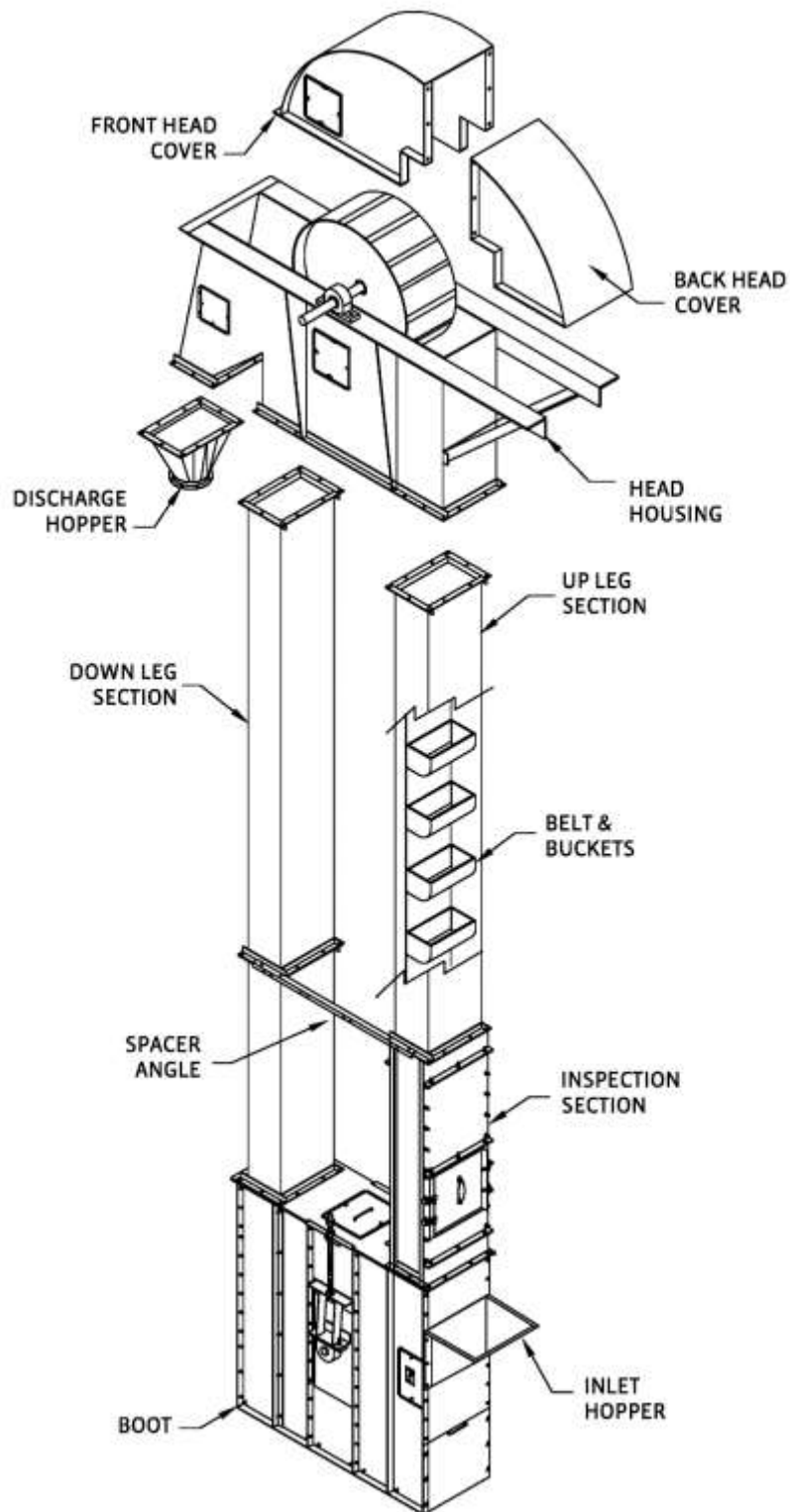
While adjusting all legs to plumb, tension all cables in alternate succession to 600-700 pounds. Starting at the lowest elevation guy wire bracket location, tighten two cables in opposite corners of the elevator. Check leg for plumb, and then tighten the two remaining cables. Repeat this procedure for each successive guy wire bracket.

A final recheck for plumb is made with a plumb bob. If the leg is not perfectly plumb, one can experience difficulty with the belt not running true. Insert a plumb bob into the up leg section from the head section and lower it past the inspection door. Tie the plumb line to a cross board over the top of the head frame. Locate the line so it clears all sides inside the leg. Note the position of the plumb line with respect to the leg casing at the top and bottom ends of the elevator. If it is not the same within 1/2" (1.27cm), readjust the guy cables.

Important Note: After all cables have been tensioned and the leg rechecked for plumb and straightness, permanently secure the turnbuckles from loosening. Either end or the center of a turnbuckle may turn and loosen the cable. One method of securing the cable is to lace a short length of cable through the ends and center of the turnbuckle and secure the cable with cable clamps.

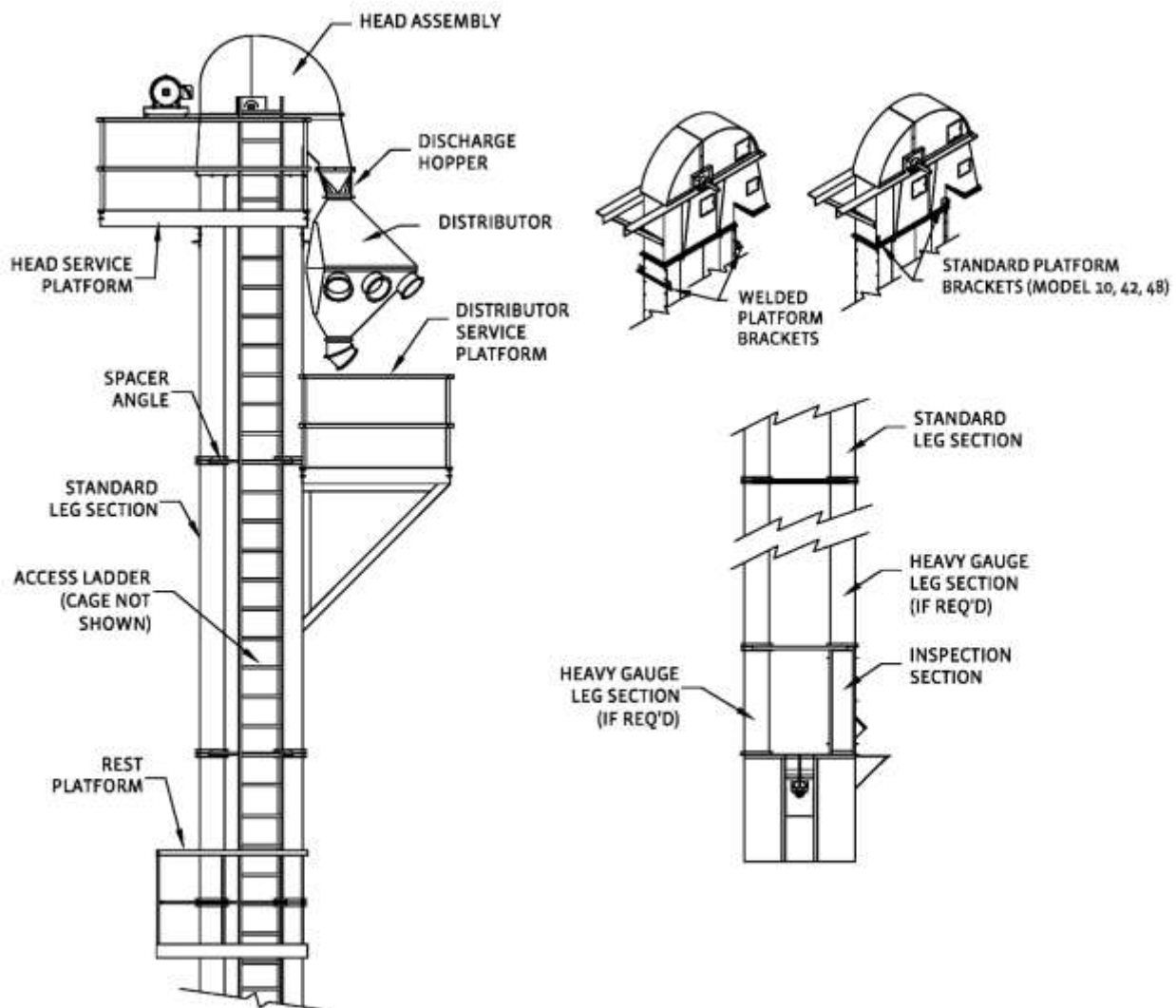
Part Identification

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.

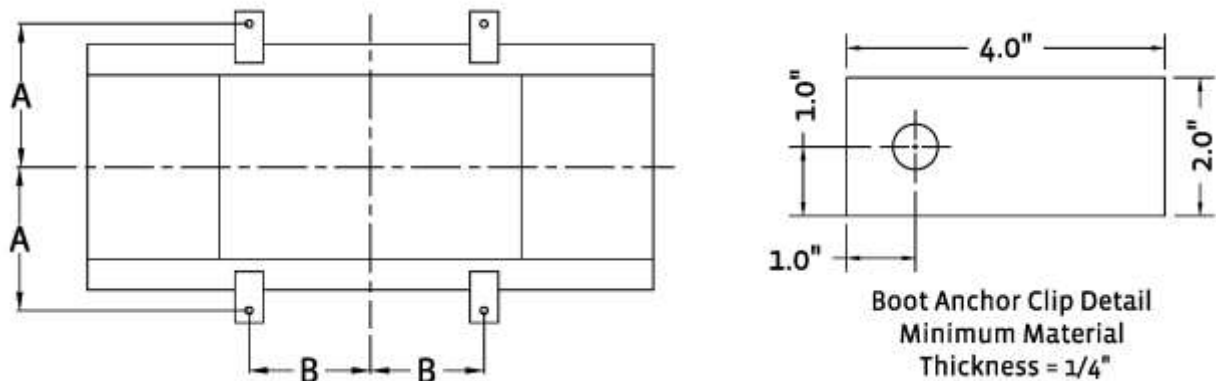
1. Set the boot section on the footing
2. Install leg sections from the top down
3. Install head section



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.

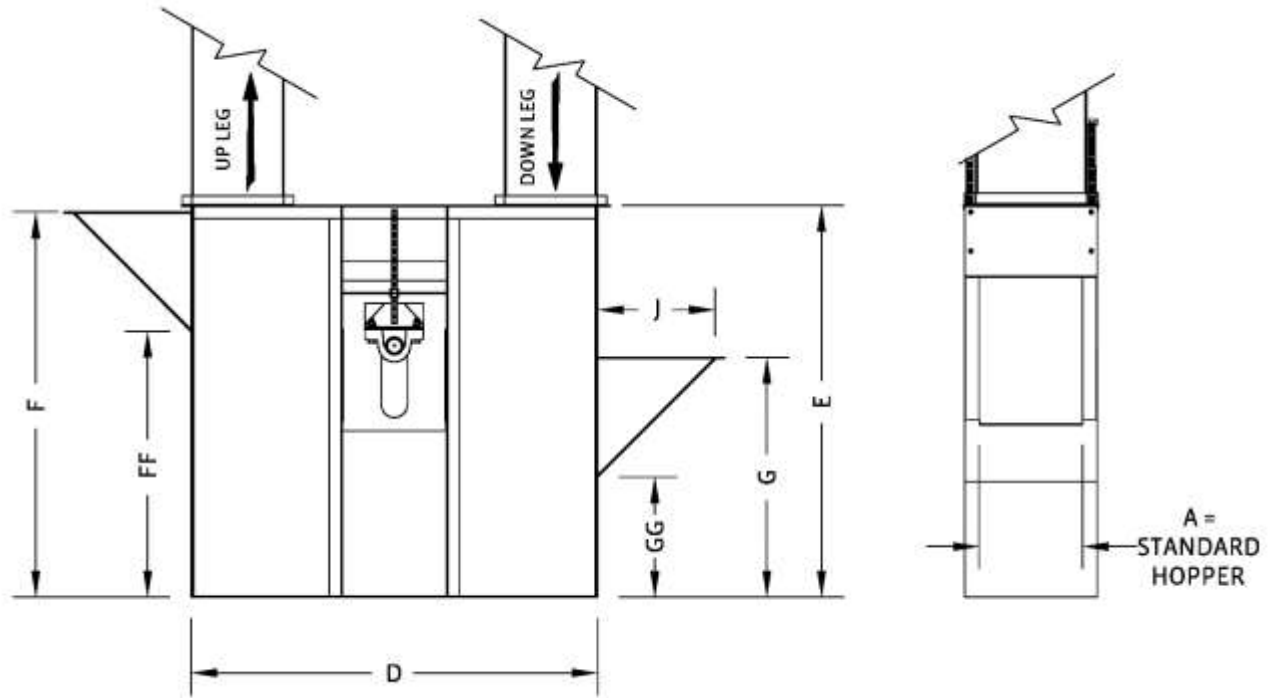
Important Note: Verify the top flanges of the boot where the leg sections will attach are level. Use a grouting cement under the boot base angles as needed to level the boot section. Verify that the grouting cement is used below the complete leveled surface of the boot base angle for proper boot support.



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	13.50"	18.50"
CBEG48-30	22.50"	18.50"
CBEG48-50	36"	18.50"

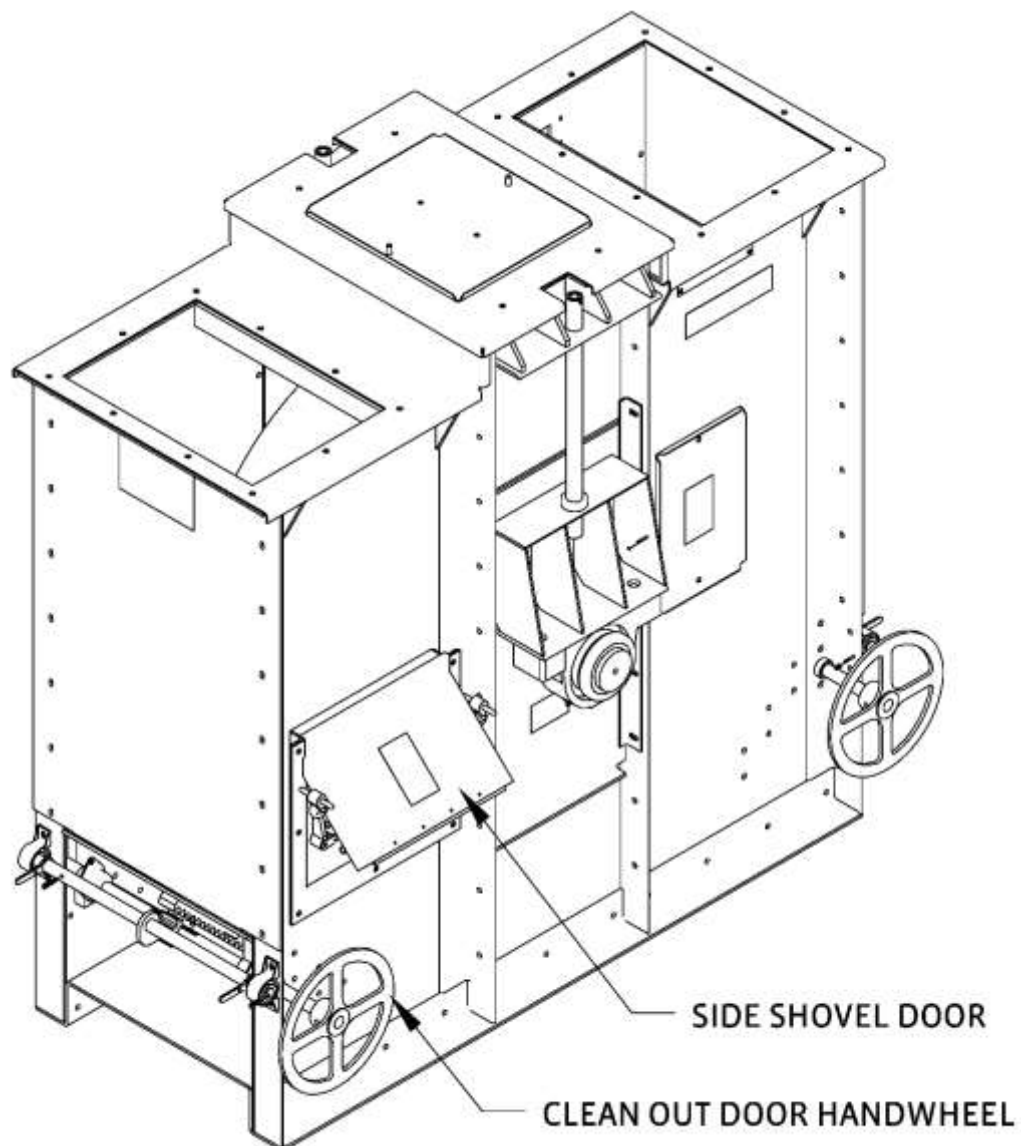
Install the boot inlet hoppers according to the following chart.

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.



Model	"A"	"D"	"E"	"F"	"G"	"J"	"FF"	"GG"
CBEG10	10"	25"	36"	32"	26"	10"	22"	16"
CBEG16	13"	34"	48"	39"	29"	13"	26"	16"
CBEG24W	16"	42"	48"	47"	30"	16"	31"	14"
CBEG30	16"	48"	60"	59"	41"	23"	36"	18"
CBEG36	16"	62"	60"	59"	41"	18"	41"	18"
CBEG36W	20"	62"	60"	59"	41"	18"	41"	18"
CBEG42	20"	68"	72"	71"	50"	27"	44"	23"
CBEG42-20	38"	68"	72"	71"	50"	27"	44"	23"
CBEG48	20"	74"	72"	71"	50"	27"	44"	23"
CBEG48-30	38"	74"	72"	71"	50"	27"	44"	23"
CBEG48-50	65"	74"	84"	82"	50"	42"	40"	23"

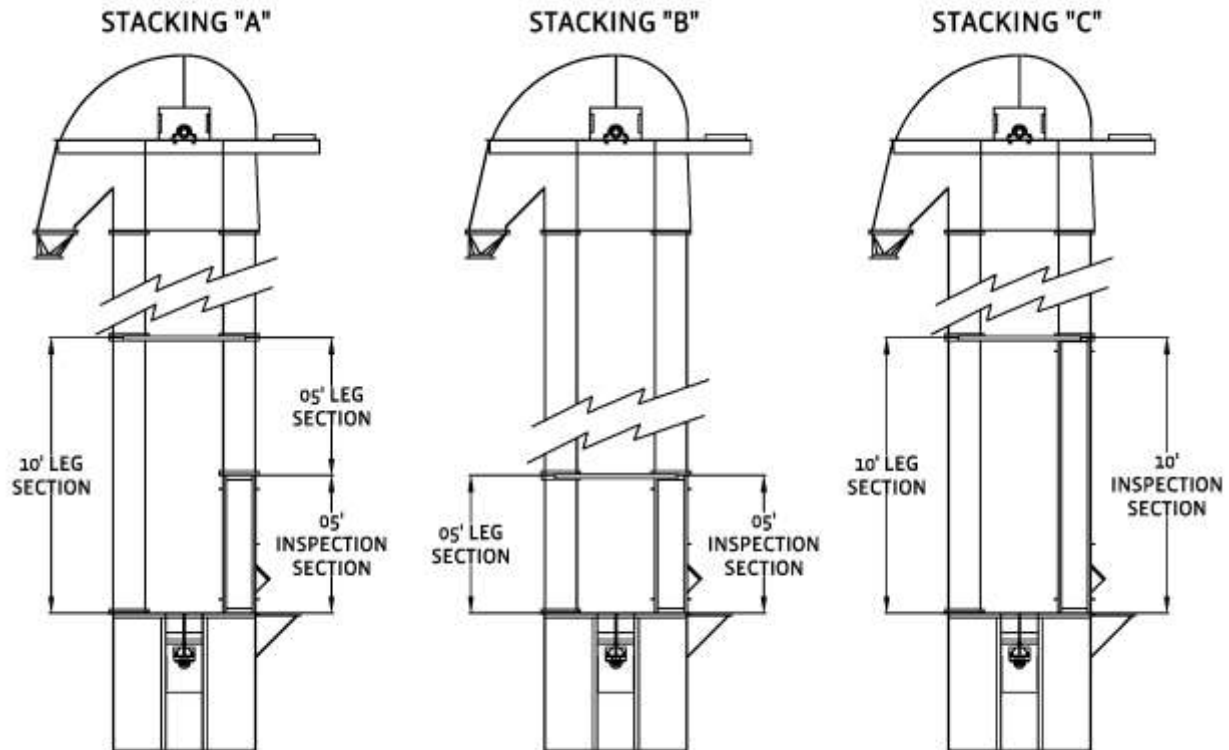
Heavy duty commercial bucket elevator



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

Inspection Section Assembly

Inspection sections can be installed in various configurations as shown below.

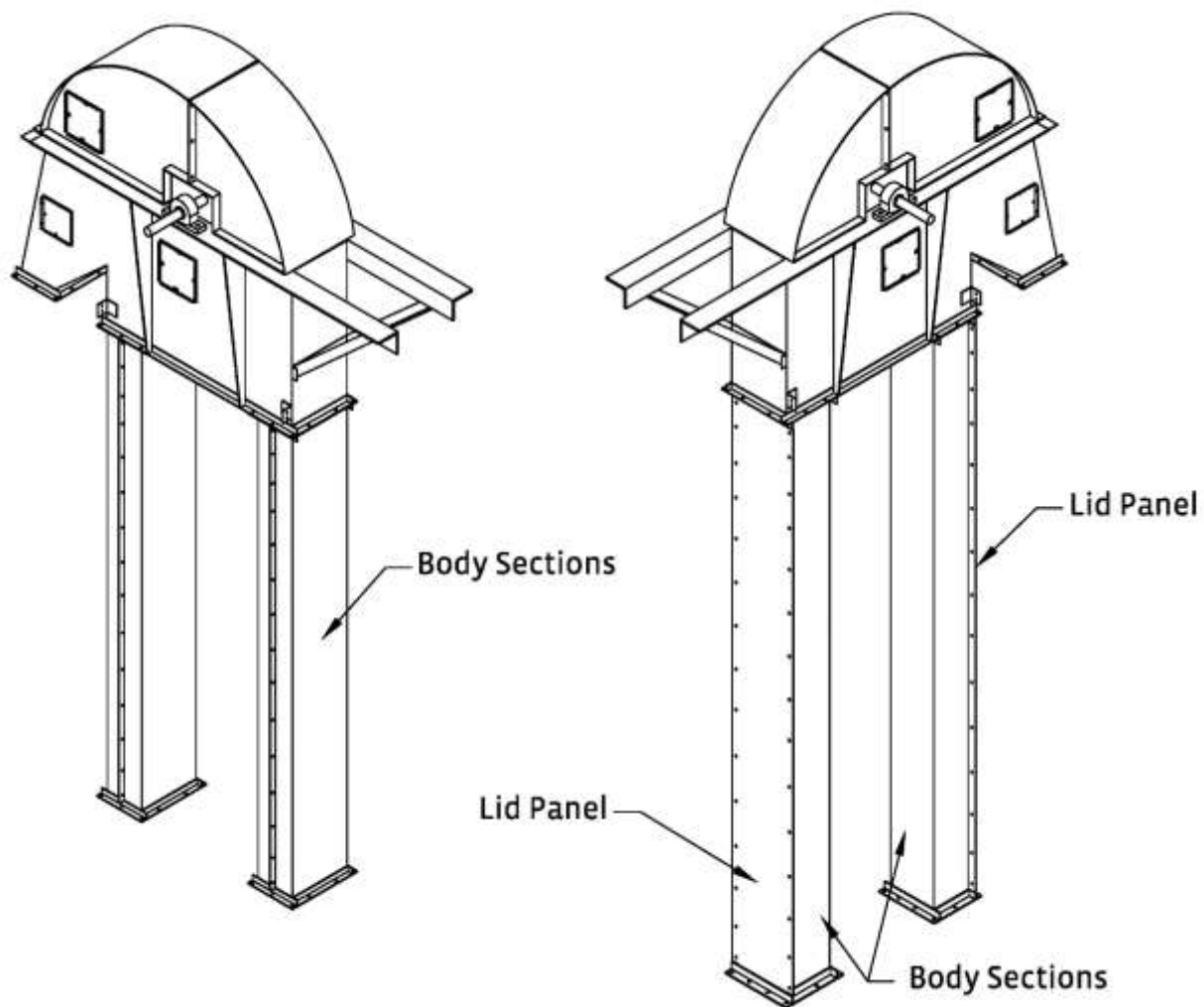


Leg Section Assembly

Install bolted flange leg sections. The elevator height will determine if heavier gauged material leg sections are required at specific locations of your unit. Bolted flange leg sections will be factory stamped, identifying the material gauge. This gauge will determine the placement of the leg section with heavy gauge sections located at the bottom near the boot assembly and lighter gauge sections located at the top near the head section.

Engineering drawings supplied with shipment will provide stacking instructions.

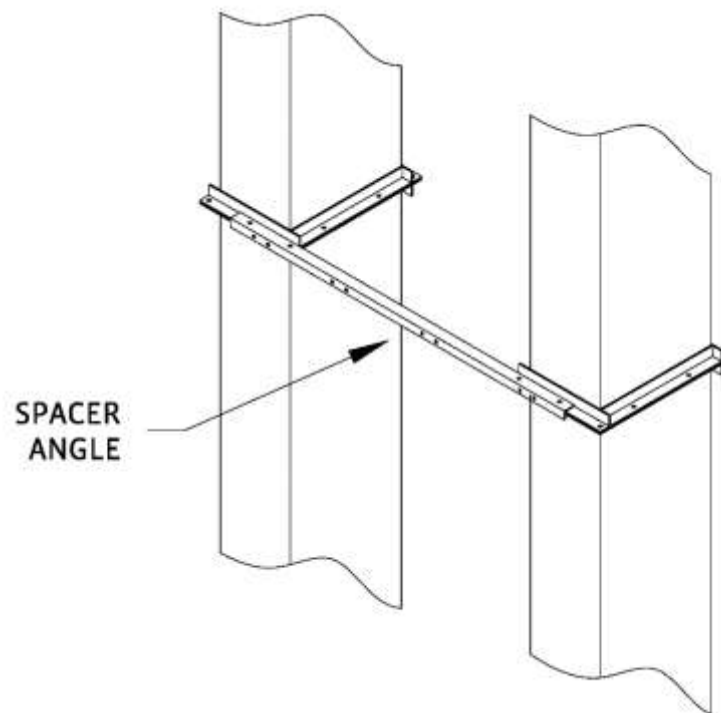
Important Note: Leg section component design will vary depending upon elevator model. Leg sections will consist of two body sections or of a body section and a lid panel.



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.

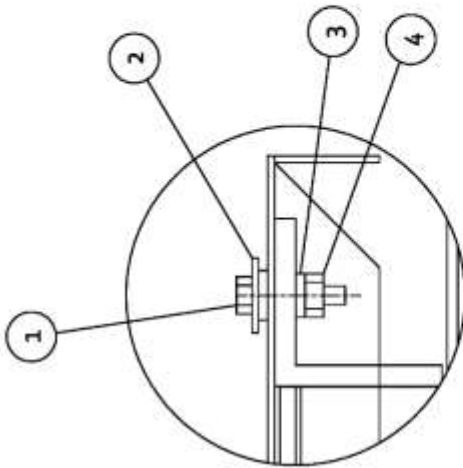
When attaching the body sections and lid panels together, sealant is required on the faces of the leg flanges prior to fastening to seal the joints from dust and weather leaks. Use 3/8"X1.0" (.95cmX2.54cm) bolts to join the body sections and lid panels together.

Accurately 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.



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

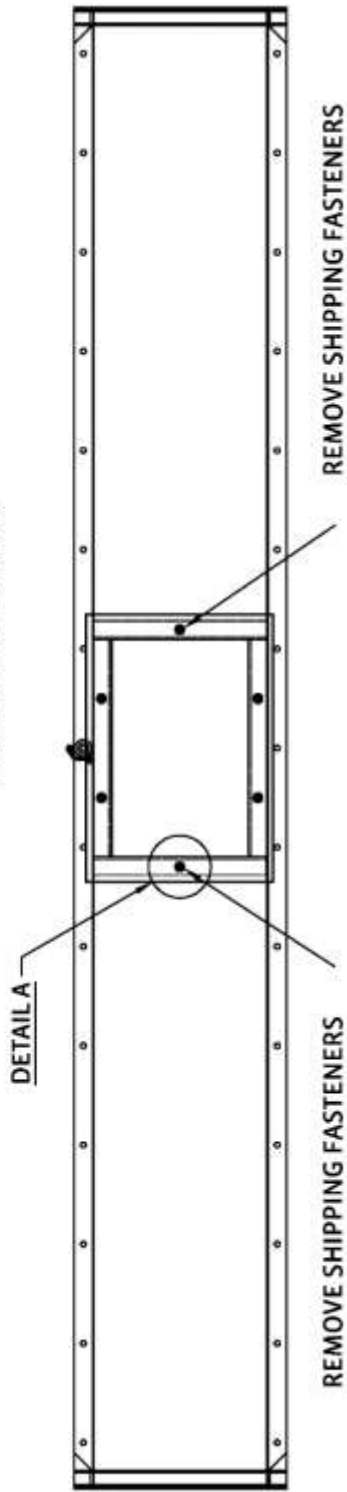
ITEM	QTY	PART NO.	DESCRIPTION
1	6	106360	FASTENER, EXPN-RELIEF, GREEN
2	6	106361	WASHER, 14GA, EXPLN-RELIEF
3	6	106362	GROMMET, EXPLN-RELIEF
4	6	453472	NUT, 1/4-20, HEX, SS



DETAIL A

SCALE: 1/2"=1"

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



Head Section Assembly

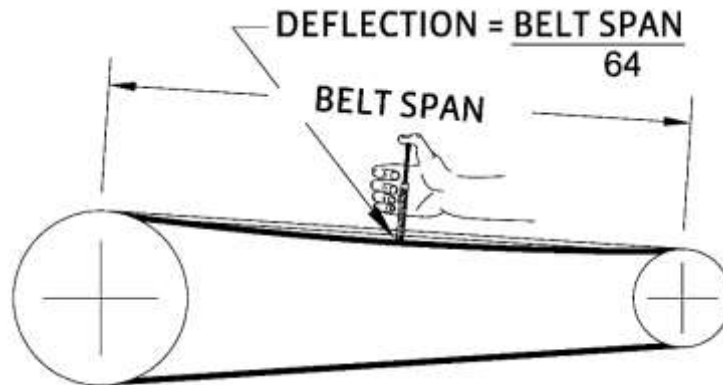
Install the head section of the bucket elevator. Install the reducer drive that is packaged separately, following the manufacturer's complete instructions for installation.

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 on tall and large capacity 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 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 $1/64$ " for each inch of distance between the sheave centers.

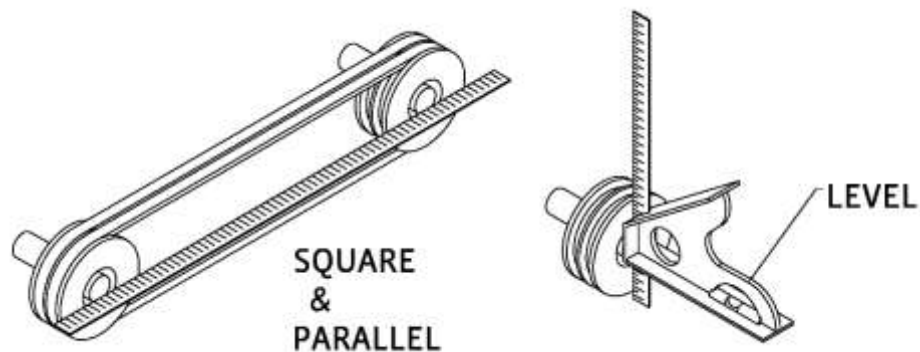


Important Note: Compare the force you have applied with the values in the following chart. The force should be between the minimum and maximum shown. The maximum value shown is for a “New Belt”, and new belts should be tensioned at this value to allow for expected tension loss. Used belts should be maintained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

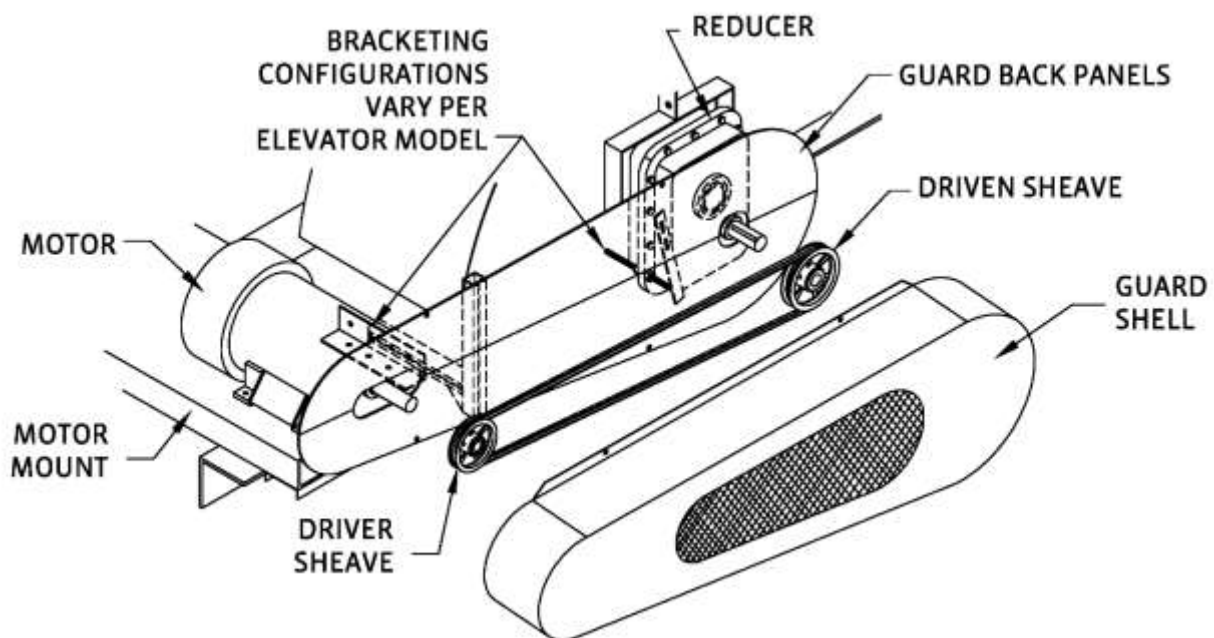
Cross Section	Smallest Sheave Diameter Range (in)	RPM Range	Belt Deflection Force (lbs)			
			Super Gripbelt		Gripnotch Belt	
			Min	Max	Min	Max
3V	2.2-2.4	1000-2500	-	-	3.3	4.9
		2501-4000	-	-	2.9	4.3
	2.65-3.65	1000-2500	3.6	5.1	4.2	6.2
		2501-4000	3.0	4.4	3.8	5.6
	4.12-6.90	1000-2500	4.9	7.3	5.3	7.9
		2501-4000	4.4	6.6	4.9	7.3
5V	4.4-6.7	500-1749	-	-	10.2	15.2
		1750-3000	-	-	8.8	13.2
		3001-4000	-	-	5.6	8.5
	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, sprockets, and drive components assembled at the manufacturer (including the bucket elevator pulley) 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 drive package 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 belt guard shell over the sheaves and belts and then attaching the shell to the back panels



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

Important Note: Explosion proof electrical equipment must be used whenever an elevator is located in an explosive environment. A safety switch should be installed on the head section 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 of the components as shown in the following chart.

Model	Head / Drive / Motor (lbs)	Head Platform (lbs)	Distributor Platform (lbs)	10ft Leg Section (lbs)	10ft Ladder / Cage (lbs)	Rest Platform (lbs)	10 ft Guy Cable (lbs)	Misc (lbs)
CBEG10	453	710	460	170	100	200	70	100
CBEG16	1135	670	470	215	100	300	70	300
CBEG24W	1517	710	500	215	100	300	70	300
CBEG30	3160	770	480	230	100	160	110	386
CBEG36	4142	840	480	275	100	160	110	386
CBEG36W	4252	900	490	300	100	160	110	386
CBEG42	6145	980	490	375	100	160	110	386
CBEG48	6224	980	490	500	100	160	110	400

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 clean out 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 forces 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 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.

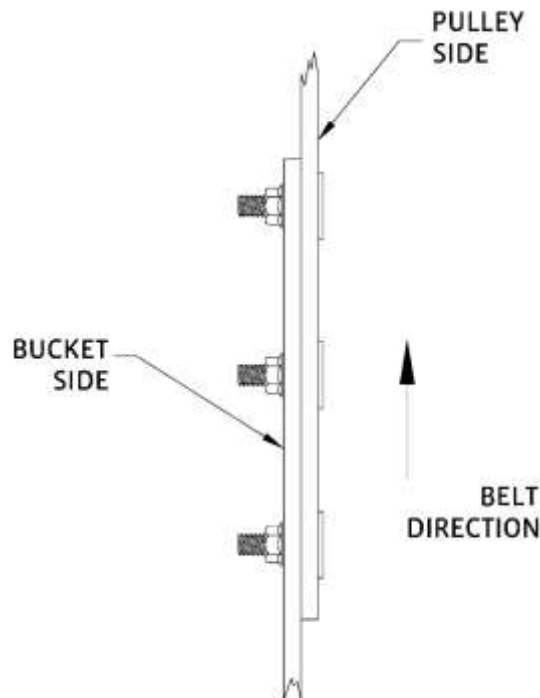
With the head hood removed, drop one end of the rope down the up leg and out the inspection opening. Drop the other end of the rope down the down leg, around the boot pulley and back up to the inspection opening. Removal of the cleanout doors will aid in feeding the rope around the boot pulley.

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.

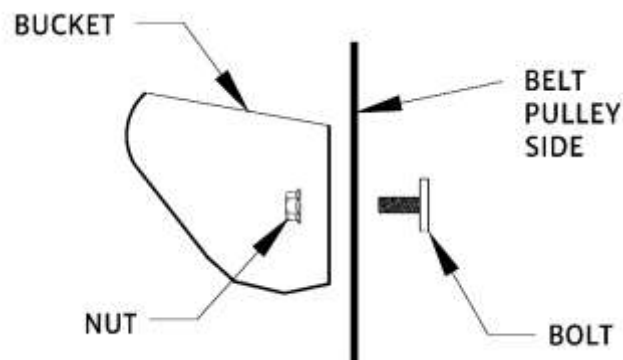
Temporary Belt Splice

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

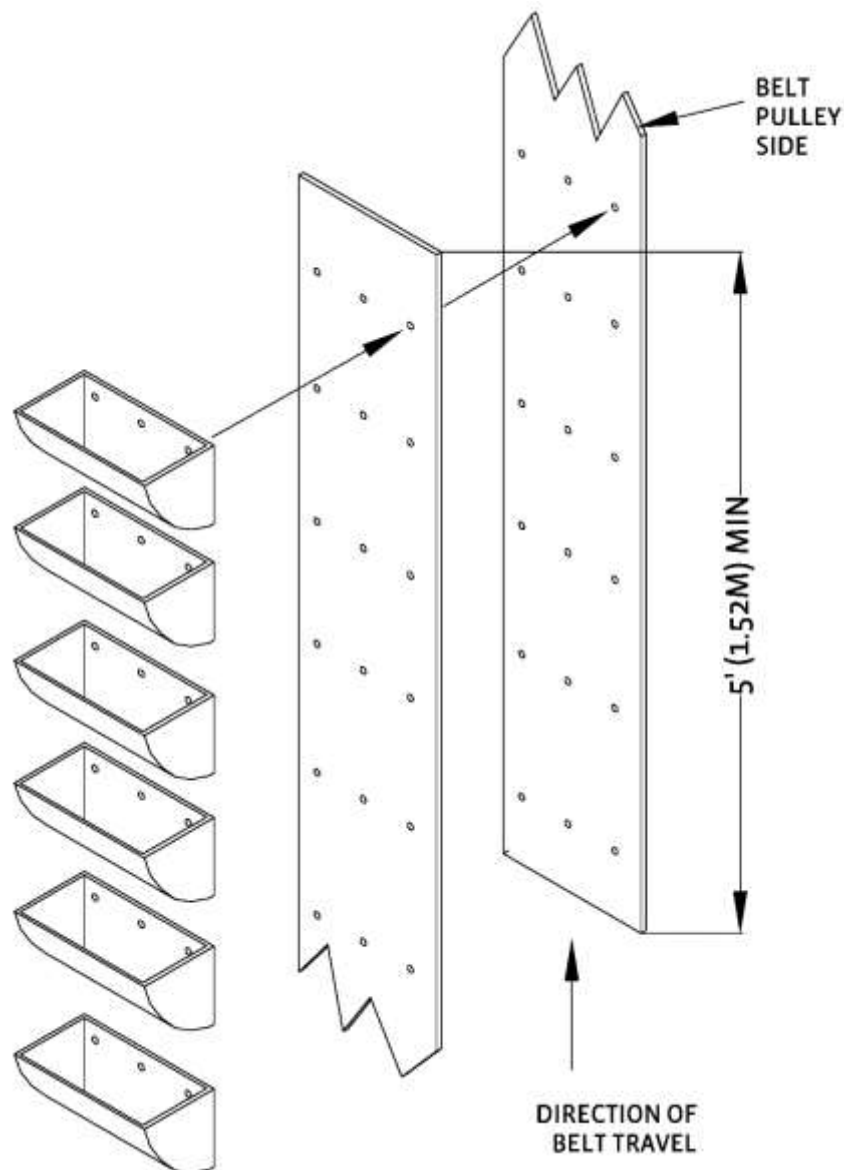
Install the buckets by bolting them to the pre-punched holes in the belt. Insert bolts from pulley side of belt and tighten nuts until bolt head is flush with belt. Tighten bolts to 10 ft-lbs of torque. Install buckets at intervals of 15 or more holes (bucket spacing) on the belt to help reduce an unbalanced 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 clean out doors, inspection section back panel, screen door front panel, & head hoods.

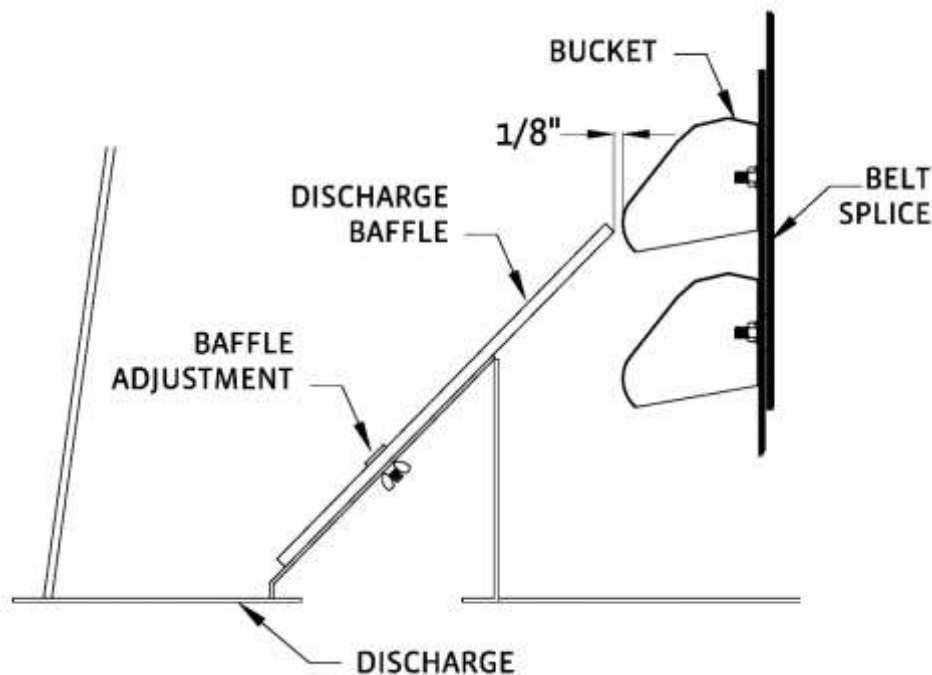
Belt Tension Adjustment

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 belt still slips, adjust the boot pulley down one more inch.

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 and boot pulley keys 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 boot. 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:

- Back Legging (grain being returned inside the down leg)
- Slippage of the head pulley
- Correct filling of the buckets
- Electrical current draw on the motor (amperage)

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 for correct tight fit (drive, pulleys, sprockets, belts, chains, 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

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 conveyor, find the source of the noise, then lock out power to conveyor 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 plumb, resulting in the belt not running on center and/or damage to the leg. **Important Note:** Never remove or loosen 1 or more cables without providing another form of support for the elevator.

Troubleshooting

Items shown below are an aide 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 75% 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 size of opening
 2. Hopper installed incorrectly
 3. Buckets or cups running above 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. Incorrect bucket or cup design
 5. Overfilling of buckets or cups
 - c. Possible cause: Incorrect belt speed
 - i. Possible reason or solution
 1. Incorrect drive sheaves
 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 is exceeding capacity of the bucket elevator
 2. Belt speed is too slow
 3. Belt slipping on the head pulley
 4. 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 of heater
4. Problem: Motor cannot start belt
 - a. Possible cause: Back stop is reversed
 - i. Possible reason or solution
 1. Backstop should be installed correctly
 - b. Possible cause: Motor rotation reversed
 - i. Possible reason or solution
 1. Motor wiring incorrect
 - c. Possible cause: Boot is filled with material
 - i. Possible reason or solution
 1. Material not shut off prior to bucket elevator being emptied/ shut off
 - d. Possible cause: Damaged reducer
 - i. Possible reason or solution
 1. Damaged gears or bearings
 - e. Possible cause: Bucket or cup caught in leg
 - i. Possible reason or solution
 1. 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
 - 1. Refer to manufacturers specifications
 - b. Possible cause: Incorrect grade or weight of lubricant
 - i. Possible reason or solution
 - 1. Refer to manufacturers specifications
 - c. Possible cause: Reducer overloaded
 - i. Possible reason or solution
 - 1. Incorrect size of reducer
 - d. Possible cause: Reducer failing
 - i. Possible reason or solution
 - 1. 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 loose
 - 2. Worn lagging on head pulley

Manufacturer Data / Recommendations

The following pages have been provided to assist our customer during maintenance of components that have been factory installed on your Chief Elevator.

Dodge S-2000 Spherical Roller Bearings

INSTRUCTION MANUAL FOR DODGE®S-2000 SPHERICAL ROLLER BEARINGS

These instructions must be read thoroughly before installing or operating this product.

WARNING: To ensure that drive is not unexpectedly started, turn off and lock out or tag power source before proceeding. Failure to observe these precautions may result in bodily injury.

INSTALLATION

GENERAL INFORMATION

DODGE S-2000 Spherical Roller Bearing mounted units incorporate a unique way of sealing the internal components of the bearing while still allowing a full + or - 1 degree of misalignment. The patented sealing system (Pat. #5,908,249) has proven effective, due to its constant contact pressure, in protecting the internal bearing components under maximum allowable misaligned conditions.

NON-EXPANSION BEARING

1. Clean shaft and bore of bearing. The shaft should be straight, free of burrs and nicks, and correct size (see shaft tolerance table). If used shafting is utilized, then the bearing should be mounted on unworn section of shafting.
2. Lubricate shaft and bearing bore with grease or oil to facilitate assembly. Slip bearing into position. When light press fit is required, press against the end of the inner ring of bearing. Do not strike or exert pressure on the housing or seals.
3. Bolt bearing to support, using shims where necessary to align bearing so inner ring does not rub on seal carrier. Use full shims which extend across the entire housing base.
4. Determine final shaft position and tighten setscrews in the locking collar(s) of non-expansion bearing to recommended torque while the other bearings remain free. Rotate the shaft slowly under load, if possible, to properly center the rolling elements with respect to the raceways. Then tighten setscrews into the locking collar of the remaining bearings to the recommended torque.

WARNING: Because of the possible danger to persons(s) or property from accidents which may result from the improper use of products, it is important that correct procedures be followed: Products must be used in accordance with the engineering information specified in the catalog. Proper installation, maintenance and operation procedures must be observed. The instructions in the instruction manuals must be followed. Inspections should be made as necessary to assure safe operation under prevailing conditions. Proper guards and other suitable safety devices or procedures as may be desirable or as may be specified in safety codes should be provided, and are neither provided by Baldor Electric Company nor are the responsibility of Baldor Electric Company. This unit and its associated equipment must be installed, adjusted and maintained by qualified personnel who are familiar with the construction and operation of all equipment in the system and the potential hazards involved. When risk to persons or property may be involved, a holding device must be an integral part of the driven equipment beyond the speed reducer output shaft.

5. Check rotation. If there is any strain, irregular rotational torque or vibration, it could be due to incorrect alignment, bent shaft or bent supports. Installation should be rechecked and correction made where necessary.

EXPANSION BEARING

1. Clean shaft and bore of bearing. The shaft should be straight, free of burrs and nicks, and correct size (see shaft tolerance table). If used shafting is utilized, then the bearing should be mounted on unworn section of shafting.
2. Lubricate shaft and bearing bore with grease or oil to facilitate assembly. Slip bearing into position. When light press fit is required, press against the end of the inner ring of bearing. Do not strike or exert pressure on the housing or seals.
3. Bolt bearing to support, using shims where necessary to align bearing so inner ring does not rub on seal carrier. Use full shims which extend across the entire housing base.
4. Position expansion bearing in the housing. For normal expansion conditions, the bearing insert should be positioned in the center of the housing. To center bearing insert in housing, move bearing insert to extreme position and mark shaft. Then using bearing maximum total expansion table, move bearing insert in opposite direction one-half the total expansion to center bearing in the housing. If maximum expansion is required, move bearing insert to the extreme position in the housing to permit full movement in direction of expansion. After expansion bearing has been positioned in the housing, tighten the setscrews in the locking collar to the recommended torque.
5. Check rotation. If there is any strain, irregular rotational torque or vibration, it could be due to incorrect alignment, bent shaft or bent supports. Installation should be rechecked and correction made where necessary.

FIELD CONVERSION (RE-OP) OF A NON-EXPANSION BEARING INTO AN EXPANSION BEARING

All non-expansion bearing sizes can be re-oped to become expansion bearings. To re-op a non-expansion to an expansion bearing follow these steps:

1. Move the snap ring, opposite from the collar side of bearing, to the outermost snap ring groove.
2. Install bearing per Expansion Bearing instructions listed above.

NOTE: Bearing nameplate has a non-expansion Part Number. When bearing is re-oped the bearing should be marked as expansion for future reference.

Table 1 - BEARING MAXIMUM TOTAL EXPANSION	
Shaft Size (in.)	Total Expansion (in.)
1-3/8 - 1 1/2	3/16
1-11/16 - 3 7/16	1/4
3-15/16	5/16
4-7/16 - 4 15/16	3/8

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LUBRICATION INSTRUCTIONS

OPERATION IN PRESENCE OF DUST, WATER OR CORROSION VAPORS

This bearing is factory lubricated with No. 2 consistency lithium complex base grease which is suitable for most applications. However, extra protection is necessary if bearing is subjected to excessive moisture, dust, or corrosive vapor. In these cases, bearing should contain as much grease as speed will permit (a full bearing with consequent slight leakage through the seal is the best protection against contaminant entry).

In extremely dirty environments, the bearing should be purged daily to flush out contaminants. For added protection, it is advisable to shroud the bearing from falling material.

HIGH SPEED OPERATION

At higher operation speeds, too much grease may cause overheating. In these cases, the amount of lubrication can only be determined by experience. If excess grease causes overheating, remove grease fittings and run for ten minutes. This will allow excess grease to escape. Then wipe off excess grease and replace grease fittings.

In higher speed applications, a small amount of grease at frequent intervals is preferable to a large amount at infrequent intervals. However, the proper volume and interval of lubrication can best be determined by experience.

AVERAGE OPERATIONS

The following table is a general guide for normal operating conditions. However, some situations may require a change in lubricating periods as dictated by experience. If the bearing is exposed to unusual operating conditions, consult a reputable grease manufacturer.

Lubrication Guide

Read Preceding Paragraphs Before Establishing Lubrication Schedule

Table 2 - Suggested Lubrication Period in Weeks								
Hours run per day	1 to 250 rpm	251 to 500 rpm	501 to 750 rpm	751 to 1500 rpm	1501 to 2000 rpm	2001 to 2500 rpm	2501 to 3000 rpm	
8	12	12	10	7	5	4	3	2
16	12	7	5	4	2	2	2	1
24	10	5	3	2	1	1	1	1

OPERATING TEMPERATURE

Abnormal bearing temperatures may indicate insufficient lubrication. If the housing is too hot to touch for more than a few seconds, check the temperature by applying a thermometer at the top of the pillow block with the thermometer tip surrounded by putty.

Because the thermometer reading will be approximately 10°F lower than the actual bearing temperature, add ten degrees to the reading and compare to the temperature rating of your grease. If the bearing temperature reading is consistent and operating within the recommended limits of your grease, the bearing is operating satisfactorily. The recommended maximum operating temperature for S-2000 Spherical Roller Bearings is 200 °F.

STORAGE OR SPECIAL SHUT DOWN

If equipment will be idle for some time, before shutting down, add grease to the bearing until grease purges from the seals. This will ensure protection of the bearing, particularly when exposed to severe environmental conditions. After storage or idle period, add fresh grease to the bearing before starting.

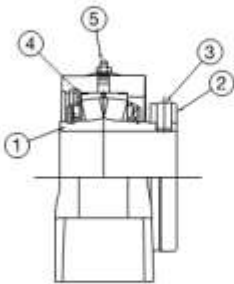
Table 3 - Set Screw Torque Table		
Shaft Size	Socket Set Screw Size	Tightening Torque
1-3/8 - 1-3/4 in.	5/16 in.	165 Inch Pounds
1-15/16 - 2-7/16 in.	3/8 in.	290 Inch Pounds
2-11/16 - 3-7/16 in.	1/2 in.	620 Inch Pounds
3-15/16 - 4-15/16 in.	5/8 in.	1325 Inch Pounds

Table 4 - Recommended Shaft Tolerance Table		
Normal Shaft Size	Low to Normal Equivalent Load and Catalog Speed*	
Up to 1-1/2 in.	+ .000 in.	- .0005 in.
Over 1-1/2 to 2-1/2 in.	+ .000 in.	- .001 in.
Over 2-1/2 to 4 in.	+ .000 in.	- .001 in.
Over 4 to 5 in.	+ .000 in.	- .0015 in.

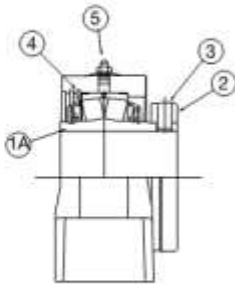
*Normal equivalent load .08C to .18C.

On severe applications and where dynamic balance and minimum runout are important, a snug to light press fit may be required to obtain optimum bearing performance. Consult Dodge Product Support.

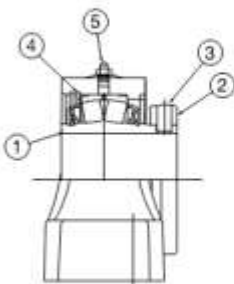
S-2000 Parts Components



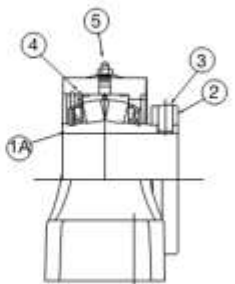
2 BOLT PILLOW
BLOCK S2000-R



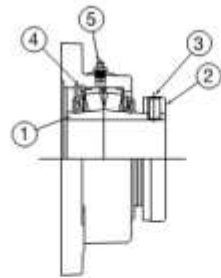
2 BOLT PILLOW
BLOCK S2000-L



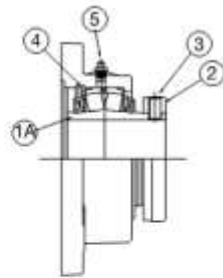
4 BOLT PILLOW
BLOCK S2000-R



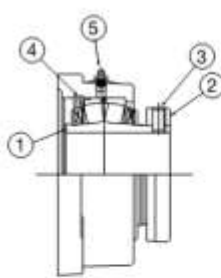
4 BOLT PILLOW
BLOCK S2000-L



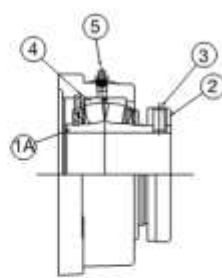
3 & 4 BOLT ROUND
FLANGE S2000-R



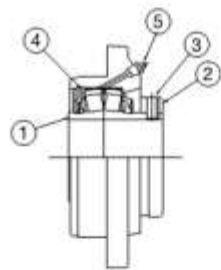
3 & 4 BOLT ROUND
FLANGE S2000-L



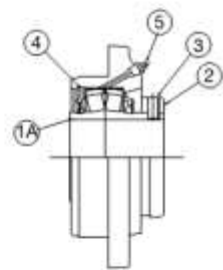
4 BOLT SQUARE
FLANGE S2000-R



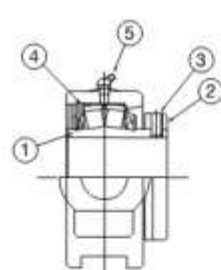
4 BOLT SQUARE
FLANGE S2000-L



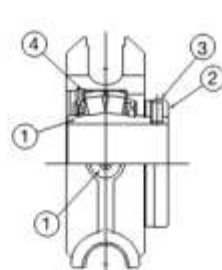
PILOTED FLANGE
S2000-R



PILOTED FLANGE
S2000-L



WIDE SLOT TAKE-
UP S2000-R



TPHU TAKE-UP
S2000-R

COMPONENT PART NUMBERS (1 3/8" - 4 15/16")						
ITEM	1	1A	2	3	4	5
Shaft Size	Bearing Inert Assembly (R) Seal	Bearing Inert Assembly (L) Seal	*Collar	*Set Screw	Snap Ring	**Grease Fitting
1 3/8	070000	070016	040050	400058	069276	405015
1 7/16	070001	070017	040050	400058	069276	405015
1 1/2	070002	070018	040050	400058	069276	405015
1 11/16	070003	070019	040051	400058	069277	405015
1 3/4	070004	070020	040051	400058	069277	405015
1 15/16	070005	070021	070587	400094	069278	405015
2	070006	070022	070587	400094	069278	405015
2 3/16	070007	070023	070588	400094	069279	405015
2 7/16	070008	070024	040054	400094	069280	405015
2 11/16	070009	070025	070589	400150	069281	405015
2 15/16	070010	070026	070589	400150	069281	405015
3	070011	070027	070589	400150	069281	405015
3 7/16	070012	070028	040056	400154	069282	405015
3 15/16	070013	070029	060946	400186	069283	405015
4 7/16	070014	070030	* 060947	* 400186	069284	405015
4 15/16	070015	070031	* 040059	* 400190	069285	405015
QTY/PER	1	1	1	2	1	1
*Shaft sizes 4 7/16" - 4 15/16" have two collars a.						
** WSTU and TPHU TU take a 405016 grease fitting.						

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A MEMBER OF THE ABB GROUP

P.O. Box 2400, Fort Smith, AR 72902-2400 U.S.A., Ph: (1) 479.646.4711, Fax (1) 479.648.5792, International Fax (1) 479.648.5895

Dodge Product Support

6040 Ponders Court, Greenville, SC 29615-4617 U.S.A., Ph: (1) 864.297.4800, Fax: (1) 864.261.2433

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3/12 Printshop 200

Dodge Imperial and ISAF Bearings

Instruction Manual for Dodge Imperial & ISAF Bearing

These instructions must be read thoroughly before installation or operation.

WARNING: To ensure the drive is not unexpectedly started, turn off and lock-out or tag power source before proceeding. Failure to observe these precautions could result in bodily injury.

Inspection

Inspect shaft to ensure it is smooth, straight, clean, and within commercial tolerances.

Mounting

Install the Non-Expansion unit first.

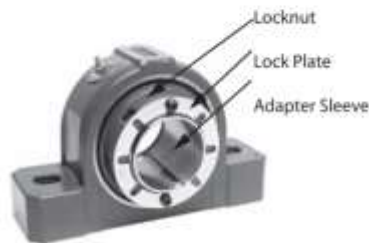


Figure 1

1. Remove lock plate located on the face of the locknut.
2. Turn locknut counter clockwise until bearing will freely slide onto the shaft.
3. Slide bearing to the desired position on the shaft.

NOTE: All Weight Must Be Removed from the Bearing When Obtaining The ZERO Reference Point".

4. The "ZERO Reference Point" is defined as the point when the clearance between the adapter sleeve, shaft and bearing bore has been removed.

To reach the "ZERO Reference Point" rotate locknut clockwise, using both hands, as tight as possible. When

WARNING: Because of the possible danger to persons(s) or property from accidents which may result from the improper use of products, it is important that correct procedures be followed. Products must be used in accordance with the engineering information specified in the catalog. Proper installation, maintenance and operation procedures must be observed. The instructions in the instruction manuals must be followed. Inspections should be made as necessary to assure safe operation under prevailing conditions. Proper guards and other suitable safety devices or procedures as may be desirable or as may be specified in safety codes should be provided, and are neither provided by Baldor Electric Company nor are the responsibility of Baldor Electric Company. This unit and its associated equipment must be installed, adjusted and maintained by qualified personnel who are familiar with the construction and operation of all equipment in the system and the potential hazards involved. When risk to persons or property may be involved, a holding device must be an integral part of the driven equipment beyond the speed reducer output shaft.

mounting bearing with shaft sizes 3-15/16" and larger, the following TEST must be performed. As a test to insure you have reached the "ZERO Reference Point" tap on the O. D. of the nut with a hammer and attempt to rotate the nut using both hands. If the nut will not rotate then you have reached the "ZERO Reference Point" and you should proceed to step 5. If you can rotate the nut, using both hands, then you have not reached the true "ZERO Reference Point", and should repeat step 4A until "ZERO Reference Point" is obtained. When the "ZERO Reference Point" is reached, the bearing will not be able to move by hand axially on the shaft.

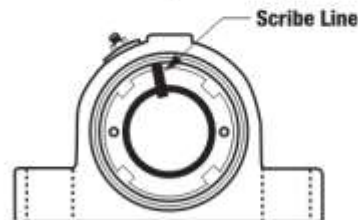


Figure 2

5. Scribe a line through the locknut face and adapter race.
6. Using a Spanner or Drift & Hammer, rotate locknut clockwise by the number of turns shown in Table 1.

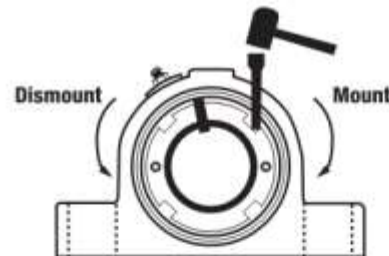


Figure 3

Table 1 - Locknut Rotation from "Zero Reference Point"

Shaft Size (inches)	Locknut Rotation
1-1/8 - 1 7/16	3/4 to 7/8 turn
* 1-1/2	3/4 to 7/8 turn
** 1-1/2	7/8 to 1 turn
1-5/8 - 2	7/8 to 1 turn
2-3/16 - 3	1 to 1-1/4 turns
3-3/16 - 4	1-1/4 to 1-1/2 turns
4-7/16 - 4 1/2	1-1/8 to 1-3/8 turns
4-15/16 - 5 1/2	1-3/8 to 1-5/8 turns
5-15/16 - 6	1 to 1-1/4 turns
6-7/16 - 7	1-1/8 to 1-3/8 turns

* IMPERIAL IP & ISAF

** IMPERIAL IP With Type E Dimensioned Housing

BALDOR • DODGE

7. Slide lock plate over shaft and align tang of lock plate with slot in adapter sleeve.
8. **TIGHTEN NOT LOOSEN** locknut until lock plate slots overlap the two threaded holes on the locknut face.
9. Insert and tighten button head screws to locknut face.
10. Bolt down pillow block or flange unit to the structure.

Install the Expansion Unit

1. Remove lock plate located on the face of the locknut.
2. Turn locknut counter clockwise until bearing will freely slide onto the shaft.
 - a. If Locknut Facing Outboard: Align housing mounting holes with substructure mounting holes and snug bolts. Push insert as far as possible in the direction of the fixed bearing.
 - b. If Locknut Facing Non-Expansion Bearing: Align housing mounting holes with substructure mounting holes and snug bolts. Position Expansion bearing insert in center of housing (NOTE: This is necessary because in the process of mounting, the bearing is being drawn toward the locknut.)

Note: All Weight Must be Removed from the Bearing when Obtaining the "ZERO Reference Point".

3. Follow steps 4 through 10 found under mounting of the Non-Expansion bearing.

Dismounting

1. Remove weight off bearing via slings or jacks.
2. Remove mounting bolts from bearing.
3. Remove button head screws and lock plate from locknut.
4. (Figure 3) Rotate locknut counter clockwise until bearing freely slides from the shaft.

Field Conversion of a Non-Expansion Bearing into an Expansion Bearing

Imperial IP

1. Move snap ring opposite collar side, to the outmost snap ring groove.
2. Remove Non-Expansion nameplate and re-label as an Expansion bearing.

ISAF

1. Remove bearing cap.
2. Remove stabilizing ring.
3. Reassemble cap on base and torque cap bolts to values in Table 2.

Table 2 - Cap Bolt Torque for ISAF Grade 5 Bolts

ISAF Shaft Size (inches)	2 Bolt Base		4 Bolt Base	
	Bolt Size	Torque Ft-Lbs.	Bolt Size	Torque Ft-Lbs.
1-7/16 - 1-11/16	3/8 - 16	24 - 30		
1-15/16 - 2-3/16	7/16 - 14	40 - 50		
2-7/16 - 2-1/2	1/2 - 13	60 - 75	1/2 - 13	60 - 75
2-11/16 - 3	5/8 - 11	120 - 150	5/8 - 11	120 - 150
3-3/16 - 3-1/2	3/4 - 10	208 - 260	3/4 - 10	208 - 260
3-11/16 - 4			3/4 - 10	208 - 260
4-7/16 - 4-1/2			7/8 - 9	344 - 430
4-15/16 - 7			1 - 8	512 - 640

Grease Lubrication

DODGE IP and ISAF bearings are pre-packed with NLGI #2 Lithium Complex grease. For re-lubrication select a grease that is compatible with a #2 Lithium Complex grease. Re-lubricate in accordance with Table 3.

Storage or Special Shutdown

If exposed to wet or dusty conditions or to corrosive vapors, extra protection is necessary. Add grease until it shows at the seals; rotate the bearing to distribute grease; cover the bearing. After storage or idle period, add a little fresh grease before running.

Table 3 - Re-Lubrication Intervals (Months) Based on 12 hours per day, 150° F M

Shaft Size (inches)	RPM								
	250	500	750	1000	1250	1500	2000	2500	>3000
1-1/8 to 2	4	3	2	2	1	0.5	0.25	0.25	0.25
2-3/16 to 2-1/4	3.5	2.5	1.5	1	0.5	0.5	0.25	0.25	0.25
2-3/8 to 3	3	2	1.5	1	0.5	0.25	0.25	0.25	0.25
3-3/16 to 3-1/2	2.5	1.5	1	0.5	0.25	0.25	0.25	0.25	-
3-11/16 to 4-1/2	2	1.5	1	0.5	0.25	0.25	0.25	-	-
4-15/16 to 5-1/2	1.5	1	0.5	0.25	0.25	0.25	-	-	-
5-15/16 to 6	1	0.5	0.5	0.25	0.25	0.25	-	-	-
6-7/16 to 7	1	0.5	0.25	0.25	0.25	-	-	-	-

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Dodge Product Support

6040 Ponders Court, Greenville, SC 29615-4617 U.S.A., Ph: (1) 864.297.4800, Fax: (1) 864.261.2433

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06/14 Litho 25,000

Dodge QD Bushings

QD* Bushings

These instructions must be read thoroughly before installation or operation.

WARNING: To ensure that drive is not unexpectedly started, turn off and lock out or tag power source before proceeding. Failure to observe these precautions could result in bodily injury.

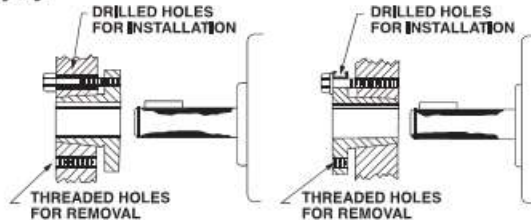


Figure 1 - Conventional Mounting

Figure 2 - Reverse Mounting

INSTALLATION:

1. Clean shaft, product bore, bushing, tapered surface and bushing bore of oil, paint dirt, etc.

CAUTION: DO NOT USE LUBRICANTS. The use of lubricants can cause product breakage during installation.

2. QD bushing sizes JA thru W (see table on page 2) may be assembled in either conventional or reverse mounting. Size H must be assembled in conventional mounting position only.

CAUTION: When mounting a product on size M thru S bushings, the hub jack holes should be positioned away from the bushing saw slot to reduce the possibility of bushing breakage and insert cap screws through drilled holes in hub.

Conventional Mounting (Fig. 1): Place bushing in hub. Tighten cap screws finger tight into threaded holes in bushing flange.

Reverse Mounting (Fig. 2): Place bushing in hub and insert cap screws thru drilled holes in bushing flange. Tighten cap screws finger tight into threaded holes in hub.

3. With key on shaft, slide loosely assembled unit onto shaft so that cap screw heads are on the outside. Locate unit in desired position on shaft. When using conventional mounting for large or heavy parts, it may be easier to mount the key and bushing on the shaft first, then place the product on the bushing aligning the holes and installing the cap screws.

WARNING: When mounting on a vertical shaft, insure that the products and/or bushing do not drop during installation.

4. Tighten cap screws alternately and evenly to the wrench torque specified in table below.

Note: When tightened there will be a 1/8" to 1/4" gap between bushing flange and hub. Should this gap close, then either undersize shafting or wrong bushing shaft size is indicated.

CAUTION: Excessive screw torque may cause damage to either bushing and/or product.

5. Tighten setscrew over key to torque value listed below.

Warning: Because of the possible danger to person(s) or property from accidents, which may result from the improper use of products. It is important that correct procedures be followed. Products must be used in accordance with the engineering information specified in the catalog. Proper installation, maintenance and operation procedures must be observed. The instructions in the instruction manual must be followed. Inspections should be made as necessary to assure safe operation under prevailing conditions. Proper guard and other suitable safety devices or procedures as may be desirable or as may be specified in safety codes should be provided and are neither provided by Baldor Electric Company nor are the responsibility of Baldor Electric Company or the manufacturer of this component. This unit and its associated equipment must be installed, adjusted and maintained by qualified personnel who are familiar with the construction and operation of all equipment in the system and the potential hazards involved. When risk to persons or property may be involved, a holding device must be an integral part of the driven equipment beyond the speed reducer output shaft.



REMOVAL

1. Remove all cap screws.
2. Install cap screws into threaded jack holes.
3. Tighten all jackscrews alternately and evenly, beginning with screw farthest from bushing saw slot, until bushing grip is released. Slide unit off shaft.

CAUTION: Excessive screw torque may cause damage to either bushing and/or product. Uneven pressure on jackscrews may also damage the bushing flange making removal difficult without damage to the product.

Recommended Torque - English					Recommended Torque - Metric				
Cap Screws			Key Seat Set Screws		Cap Screws			Key Seat Set Screws	
Bushing	Size	lb-in	Size	lb-in	Bushing	Size	N-m	Size	N-m
QT	1/4-20 x 7/8	90	#10-24	36	QT	M6 x 1 x 25	5.6	—	—
JA	#10-24 x 1	60	#10-24	36	JA	M5 x 0.8 x 22	9.6	—	—
SH	1/4-20 x 1-3/8	108	1/4-20	87	SH	M6 x 1 x 35	11.5	M6 x 1	7.7
SDS	1/4-20 x 1-3/8	108	1/4-20	87	SDS	M6 x 1 x 35	11.5	M6 x 1	7.7
SD	1/4-20 x 1-7/8	108	1/4-20	87	SD	M6 x 1 x 50	11.5	M6 x 1	7.7
SK	5/16-18 x 2	180	1/4-20	87	SK	M8 x 1.25 x 50	20.5	M6 x 1	7.7
SF	3/8-16 x 2	360	5/16-18	165	SF	M10 x 1.5 x 50	34	M10 x 1.5	35
E	1/2-13 x 2-3/4	720	3/8-16	290	E	M12 x 1.75 x 70	77	M10 x 1.5	35
F	9/16-12 x 3-5/8	900	3/8-16	290	F	M14 x 2 x 100	100	M10 x 1.5	35
J	5/8-11 x 4-1/2	1620	3/8-16	290	J	M16 x 2 x 120	194.5	M12 x 1.75	55
M	3/4-10 x 7	2700	3/8-16	290	M	M20 x 2.5 x 180	256	M12 x 1.75	55
N	7/8-9 x 8	3600	1/2-13	620	N	—	—	—	—
P	1-8 x 9-1/2	5400	5/8-11	1325	P	—	—	—	—
W	1-1/8-7 x 11-1/2	7200	1-8	5000	W	—	—	—	—
S	1-1/4-7 x 15-1/2	9000	1-1/4-7	7600	S	—	—	—	—

Bag of Hardware (Includes 3 cap screws and 3 washers)			
Bushing	Part Numbers - English	Bushing	Part Numbers - Metric
QT	411682	QT	411801
JA	411683	JA	411802
SH	411684	SH	411803
SDS	411684	SDS	411803
SD	411685	SD	411805
SK	411686	SK	411806
SF	411687	SF	411807
E	411688	E	411808
F	411689	F	411809
J	411690	J	411810
M	411691	M	411811
N	411692	N	411812
P	411693	P	411813

*QD is a registered trademark of EMERSON



BALDOR

World Headquarters

P.O. Box 2400, Fort Smith, AR 72902-2400 U.S.A., Ph: (1) 479.646.4711, Fax (1) 479.648.5792, International Fax (1) 479.648.5895

Dodge Product Support

6040 Ponders Court, Greenville, SC 29615-4617 U.S.A., Ph: (1) 864.297.4800, Fax: (1) 864.281.2433

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3/10 TCP 30,000

Dodge XT Pulley Bushing

Conveyor Pulley Bushing Instruction Manual

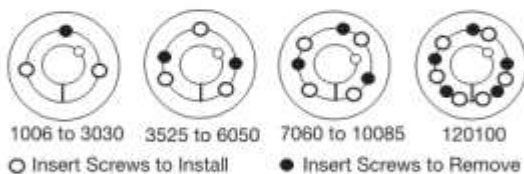
These instructions must be read thoroughly before installing or operating this product. This instruction manual was accurate at the time of printing. Please see www.dodge-pt.com for updated instruction manuals.

WARNING: To ensure the drive is not unexpectedly started, turn off and lock-out or tag power source before proceeding. Failure to observe these precautions could result in bodily injury.

PURPOSE

This procedure provides general direction and guidelines for the installation, operation, and storage of conveyor pulley bushings.

TAPER-LOCK



INSTALLATION

1. Determine bushing size from identification on face of bushing.
2. Clean shaft, bore and outside of bushings, and bore of hubs (taking bushings from hubs if already assembled). Remove any oil, grease and dirt.
3. Slip shaft into pulley hubs and slip bushings onto shaft and into hubs. Place screws loosely in holes that are threaded on hub side (shown as ○ on diagram above).
4. Locate shaft in desired position and tighten screws in each bushing slightly to seat bushings in hubs.
5. Tighten screws alternately and evenly in one bushing only until all screws are pulled up to the proper wrench torque listed in Table 1. Do NOT over torque. Hammer against large end of bushing. Hammer first beside the screw farthest from the bushing split and then hammer on the bushing on the opposite side of the screw. Avoid hammering close to the O.D. of the bushing to prevent damage. Working toward the split, hammer on the bushing on each side of each screw. Then hammer on each side of the bushing split. Make sure that the surfaces on both sides of the split are even. Screws can now be tightened a little more using the specified torque. Repeat this alternating hammering and retightening until the specified wrench torque no longer turns the screws after hammering. Check to make

WARNING: Because of the possible danger to person(s) or property from accidents which may result from the improper use of products, it is important that correct procedures be followed. Products must be used in accordance with the engineering information specified in the catalog. Proper installation, maintenance and operation procedures must be followed. The instructions in the instruction manuals must be observed. Inspections should be made as necessary to assure safe operation under prevailing conditions. Proper guards and other suitable safety devices or procedures as may be desirable or as may be specified in safety codes should be provided, and are neither provided by Baldor Electric Company nor are the responsibility of Baldor Electric Company. This unit and its associated equipment must be installed, adjusted and maintained by qualified personnel who are familiar with the construction and operation of all equipment in the system and the potential hazards involved. When risk to persons or property may be involved, a holding device must be an integral part of the driven equipment beyond the speed reducer output shaft.

sure the surfaces on both sides of the split are even. Fill all other holes with grease to exclude dirt. If a key seated bushing is used without a key, a fluid resistant material to prevent moisture can be filled in the key seat.

6. Tighten the second bushing per step 5.

REMOVAL

1. Remove all screws.
2. Insert screws into holes that are threaded on the bushing side (shown as ● on diagram). In sizes where washers are found under the screw heads, be sure to use the washers.

NOTE: One screw in each hub is left over and is not used in the removal process.

3. Tighten screws alternately until bushings are loosened in hubs. If bushing does not loosen, tap on face of hub.

HE, QD®, AND XT®

INSTALLATION

1. Determine bushing size from identification on face of bushing.
2. Clean shaft, bore and outside of bearings, and bore of hubs (taking bushings from hubs if already assembled). Remove any oil, grease and dirt.
3. Slip shaft into pulley and slip bushings onto shaft and into hubs. If required, carefully insert a wedge into bushing split and tap lightly to allow bushing to slide on shaft. Align unthreaded holes in bushing with threaded holes in hub. Place bolts loosely in holes that are not threaded.
4. Locate shaft in desired position, remove wedges if used and tighten bolts in each bushing slightly to seat bushings in hubs.
5. Tighten bolts in a star pattern alternately and evenly as illustrated in Figures 1 - 6 in one bushing only until all bolts are pulled up to the proper wrench torque listed in Table 1. Do NOT over torque. If a key seated bushing is used without a key, a fluid resistant material to prevent moisture can be filled in the key seat.
6. Check to ensure the bushing flange does not contact the hub.
7. Tighten the second bushing per step 5.

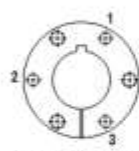


Figure 1: QD-SF thru J

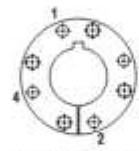


Figure 2: QD-M thru W



Figure 3: QD-S thru Z

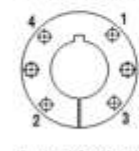


Figure 4: HE-25 thru 40, XT-15 through 30

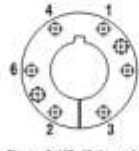


Figure 5: HE-45 through 100, XT-100

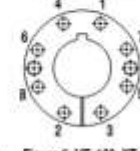


Figure 6: HE-120, XT-120

BALDOR • DODGE

REMOVAL

1. Remove all bolts.
2. Insert bolts into threaded holes on bushing flange.
3. Tighten bolts alternately until bushings are loosened in hubs. If bushing does not loosen, carefully insert a wedge into bushing split and tap lightly to allow bushing to slide on shaft.

*QD is a registered trademark of Emerson Electric Co.

*XT is a registered trademark of Van Gorp Corporation

LONG-TERM PULLEY STORAGE INSTRUCTIONS

1. Block the pulley to keep the face from touching the ground.
2. Inside storage is recommended. If stored outside, protect the pulley from harsh elements.
3. Clean the assembly before installation.

SHAFTING

1. A protective coating has been applied at the factory to all exposed surfaces. For long term storage, additional coatings of rust preventative are recommended.
2. Remove protective coatings before assembly of bearings or other components.

LAGGED PULLEYS

1. Inside storage is recommended. Store in a cool, dark area where the pulley will not be exposed to direct sunlight or extreme temperature or humidity variations. Areas of high ozone concentration, such as areas with electric motors or other electrical arc producing machinery, should not be used for storage.
2. Do NOT allow oil, grease, kerosene, solvents, or other chemicals to contact the lagging.
3. After long-term storage, some oxidation may occur on lagging surface. Reduce lagging thickness by 1/32" by grinding to remove the oxidation.

PILLOW BLOCKS

1. Refer to manufacturer's recommendations.

GENERAL OPERATION INSTRUCTIONS

1. For best practice, bushing bolts should be re-torqued weekly for the first month of operation.
2. No modifications, repair, or other work should be performed on the conveyor pulley assembly without prior written consent of Baldor Electric Company.
3. Do NOT allow material to be trapped between the belt and pulley face.
4. Do NOT allow material to build up on the pulley face.
5. Do NOT allow the edge of the conveyor belt to wander past the edge of the rim.
6. Do NOT skew the pulley in an attempt to track the conveyor belt.

Table 1 - Recommended Tightening Torque

Bushings Type	Qty	Screws		Torque lb-ft	Hammer Size (TL Only)
		Size			
TL	1210, 1215, 1310, 1610 & 1615	2	3/8-16 NC	15	6 LB.
	2012	2	7/16-14 NC	23	6 LB.
	2517 & 2525	2	1/2-13 NC	36	6 LB.
	3020 & 3030	2	5/8-11 NC	67	6 LB.
	3535	3	1/2-13 NC	83	12 LB.
	4040	3	5/8-11 NC	142	12 LB.
	4545	3	3/4-10 NC	204	12 LB.
	5050	3	7/8-9 NC	258	12 LB.
	6060	3	1-1/4-7 NC	650	20 LB.
	7060 & 8065	4	1-1/4-7 NC	650	20 LB.
HE	10085	4	1-1/2-6 NC	1140	20 LB.
	120100	6	1-1/2-6 NC	1140	20 LB.
	HE25	4	3/8-16 NC	30	N/A
	HE30	4	1/2-13 NC	60	
	HE35	4	9/16-12 NC	90	
	HE40	4	5/8-11 NC	140	
	HE45	6	5/8-11 NC	140	
	HE50	6	3/4-10 NC	200	
	HE60	6	7/8-9 NC	350	
	HE70	6	1-8 NC	500	
	HE80	6	1-1/8-7 NC	500	
	HE100	6	1-1/4-7 NC	600	
QD	HE120	8	1-1/4-7 NC	600	
	SF	3	3/8-16 NC	30	N/A
	E	3	1/2-13 NC	60	
	F	3	9/16-12 NC	75	
	JS or J	3	5/8-11 NC	135	
	MS or M	4	3/4-10 NC	225	
	NS or N	4	7/8-9 NC	300	
	PS or P	4	1-8 NC	450	
	WS or W	4	1-1/8-7 NC	600	
	SS or S	5	1-1/4-7 NC	750	
XT	ZS or Z	5	1-1/8-7 NC	600	
	XTB15	4	1/4-20 NC	7.9	N/A
	XTB20	4	5/16-18 NC	16.7	
	XTB25	4	3/8-16 NC	29.2	
	XTB30	4	7/16-14 NC	45.8	
	XTB35	4	1/2-13 NC	70	
	XTB40	4	9/16-12 NC	100	
	XTB45	4	5/8-11 NC	140	
	XTB50	4	3/4-10 NC	250	
	XTB60	4	7/8-9 NC	400	
	XTB70	4	1-8 NC	600	
	XTB80	4	1-1/8-7 NC	750	
	XTB100	6	1-1/8-7 NC	750	
	XTB120	8	1-1/8-7 NC	750	

* Torque values listed are based on dry torque.

Dodge product installation manuals

These can be found on the Dodge website using the following address: http://www.baldor.com/support/product_manuals.asp



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Dodge Torque Arm II Reducers

Instruction Manual
DODGE® TORQUE-ARM™ II Speed Reducers
Ratios 5, 9, 15, 25, and 40:1

- TA0107L

TA1107H

TA2115H

TA3203H

TA4207H

TA5215H
- TA6307H

TA7315H

TA8407H

TA9415H

TA10507H

TA12608H

These instructions must be read thoroughly before installation or operation.

WARNING: To ensure that drive is not unexpectedly started, turn off and lock out or tag power source before proceeding. Remove all external loads from drive before removing or servicing drive or accessories. Failure to observe these precautions could result in bodily injury.

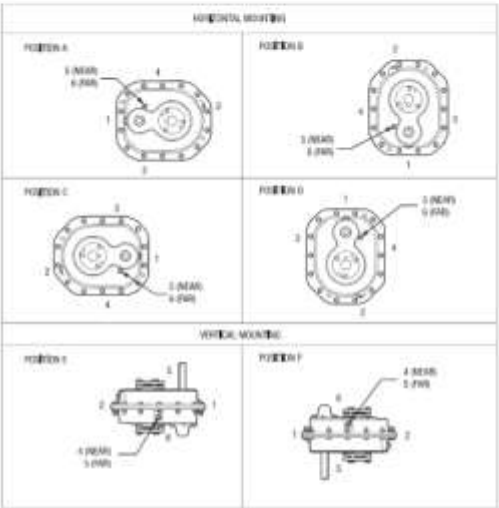
INSTALLATION

1. Use lifting bracket to lift reducer.
2. Determine the running positions of the reducer (Figure 1). Note that the reducer is supplied with 6 plugs; 4 around the sides for horizontal installations and 1 on each face for vertical installations. These plugs must be arranged relative to the running positions as follows:

Horizontal Installations -Install the magnetic drain plug in the hole closest to the bottom of the reducer. Throw away the tape that covers the filter/ventilation plug in shipment and install plug in topmost hole. Of the 2 remaining plugs on the sides of the reducer, the lowest one is the minimum oil level plug.

Vertical Installations -Install the filter/ventilation plug in the hole provided in the upper face of the reducer housing as installed. If space is restricted on the upper face, install the vent in the highest hole on the side of the reducer per Figure 1. Install a plug in the hole in the bottom face of the reducer. Do not use this hole for the magnetic drain plug. Of the remaining holes on the sides of the reducer, use the plug in the upper housing half for the minimum oil level plug.

WARNING: Because of the possible danger to person(s) or property from accidents which may result from the improper use of products, it is important that correct procedures be followed. Products must be used in accordance with the engineering information specified in the catalog. Proper installation, maintenance and operation procedures must be observed. The instructions in the instruction manuals must be followed. Inspections should be made as necessary to assure safe operation under prevailing conditions. Proper guards and other suitable safety devices or procedures, as may be desirable, or as may be specified in safety codes should be provided, and are neither provided by Baldor Electric Company, nor are the responsibility of Baldor Electric Company. This unit and its associated equipment must be installed, adjusted and maintained by qualified personnel who are familiar with the construction and operation of all equipment in the system and the potential hazards involved. When risks to persons or property may be involved, a holding device must be an integral part of the driven equipment beyond the speed reducer output shaft.



Output Speeds Above 15 RPM						
Mounting Position	Vent and Plug Locations					
	1	2	3	4	5	6
Position A	Level	Plug	Drain	Vent	Plug	Plug
Position B	Drain	Vent	Level	Plug	Plug	Plug
Position C	Plug	Level	Vent	Drain	Plug	Plug
Position D	Vent	Drain	Level	Plug	Plug	Plug
Position E	Level	Plug	Plug	Drain	Vent	Plug
Position F	Plug	Drain	Level	Plug	Plug	Vent

Output Speeds Above 15 RPM and Below *						
Mounting Position	Vent and Plug Locations					
	1	2	3	4	5	6
Position A	Plug	Level	Drain	Vent	Plug	Plug
Position B	Drain	Vent	Plug	Level	Plug	Plug
Position C	Level	Plug	Vent	Drain	Plug	Plug
Position D	Vent	Drain	Level	Plug	Plug	Plug
Position E	Level	Plug	Plug	Drain	Vent	Plug
Position F	Plug	Drain	Level	Plug	Plug	Vent

* Below 15 RPM output speed, oil level must be adjusted to reach the highest oil level plug. If reducer position is to vary from those shown in Figure 1, either more or less oil may be required. Consult Baldor Electric Company Dodge Engineering in Greenville, SC.

Figure 1 - Mounting Positions



The running position of the reducer in a horizontal application is not limited to the four positions shown in Fig. 1. However, if running position is over 20° in position "B" & "D" or 5° in position "A" & "C", either way from sketches, the oil level plug cannot be used safely to check the oil level, unless during the checking, the torque arm is disconnected and the reducer is swung to within 5° for position "A" & "C" or 20° for position "B" & "D" of the positions shown in Figure 1. Because of the many possible positions of the reducer, it may be necessary or desirable to make special adaptations using the lubrication filling holes furnished along with other standard pipe fittings, stand pipes and oil level gauges as required.

If mounting the Torque-Arm II reducer on an inclined angle, consult Dodge for proper oil level.

3. Mount reducer on driven shaft as follows:

For Taper Bushed Reducer: Mount reducer on driven shaft per instruction in Torque-Arm II Bushing Installation section of this manual.

4. Install sheave on input shaft as close to reducer as practical (Figure 2).

5. If not using a Dodge Torque-Arm II motor mount, install motor and V-belt drive so belt will approximately be at right angles to the centerline between driven and input shaft (Figure 3). This will permit tightening the V-belt with the torque arm.

6. Install torque arm and adapter plates reusing the reducer bolts. The adapter plates will fit in any position around the input end reducer.

7. Install torque arm fulcrum on a flat and rigid support so that the torque arm will be approximately at right angles to the centerline through the driven shaft and the torque arm anchor screw (Figure 4). Make sure that there is sufficient take-up in the turnbuckle for belt tension adjustment when using V-belt drive.

CAUTION: Unit is shipped without oil. Add proper amount of recommended lubricant before operating. Failure to observe this precaution could result in damage to or destruction of the equipment.

8. Fill gear reducer with recommended lubricant (Table 2).

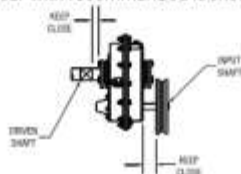


Figure 2 - Reducer and Sheave Installation

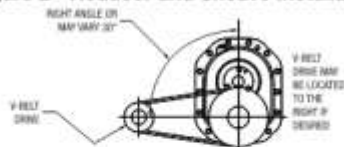


Figure 3 - Angle of V-Drive

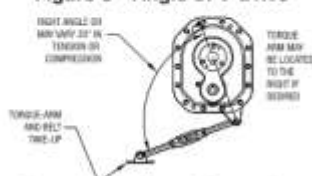


Figure 4 - Angle of Torque-Arm

TORQUE-ARM II BUSHING INSTALLATION

WARNING: To ensure that drive is not unexpectedly started, turn off and lock out or tag power source before proceeding. Remove all external loads from drive before removing or servicing drive or accessories. Failure to observe these precautions could result in bodily injury.

The Dodge Torque-Arm II reducer is designed to fit both standard and short length driven shafts. The Standard Taper Bushings series is designed where shaft length is not a concern. The Short Shaft Bushing series is to be used where the driven shaft does not extend through the reducer.

Standard Taper Bushings:

1. One bushing assembly is required to mount the reducer on the driven shaft. An assembly consists of two tapered bushings, bushing screws and washers, two bushing backup plates and retaining rings, and necessary shaft key or keys. The driven shaft must extend through the full length of the reducer. If the driven shaft does not extend through the reducer do not use the standard tapered bushings; instead use the short shaft bushings as described in the Short Shaft Bushings section that follows. The minimum shaft length, as measured from the end of the shaft to the outer edge of the bushing flange (Figure 5), is given in Table 1.

2. Install one bushing backup plate on the end of the hub and secure with the supplied retaining ring. Repeat procedure for other side.

3. Place one bushing, flange end first, onto the driven shaft and position per dimension "A", as shown in Table 1. This will allow the bolts to be threaded into the bushing for future bushing and reducer removal.

4. Insert the output key in the shaft and bushing. For easy of installation, rotate the driven shaft so that the shaft keyseat is at the top position.

5. Mount the reducer on the driven shaft and align the shaft key with the reducer hub keyway. Maintain the recommended minimum distance "A" from the shaft bearing.

6. Insert the screws, with washers installed, in the unthreaded holes in the bushing flange and align with the threaded holes in the bushing backup plate. If necessary, rotate the bushing backup plate to align with the bushing screws. Tighten the screws lightly. If the reducer must be positioned closer than dimension "A", place the screws with washers installed, in the unthreaded holes in the bushing before positioning reducer making sure to maintain at least 1/8" between the screw heads and the bearing.

7. Place the second tapered bushing in position on the shaft and align the bushing keyway with the shaft key. Align the unthreaded holes in the bushing with the threaded holes in the bushing backup plate. If necessary, rotate the bushing backup plate to align with the bushing holes. Insert bushing screws, with washers installed in the unthreaded holes in the bushing. Tighten screws lightly.

8. Alternately and evenly tighten the screws in the bushing nearest the equipment to the recommended torque given in Table 1. Repeat procedure on outer bushing.

Short Shaft Bushings:

1. One bushing assembly is required to mount the reducer on the driven shaft. An assembly consists of one long tapered bushing, one short tapered bushing, one tapered bushing wedge, bushing screws and washers, two bushing backup plates and retaining rings, and necessary shaft key or keys. The driven shaft does not need to extend through the reducer for the short shaft bushing to operate properly. The minimum shaft length, as measured from the end of the shaft to the outer edge of the bushing flange (Figure 5), is given in Table 1.

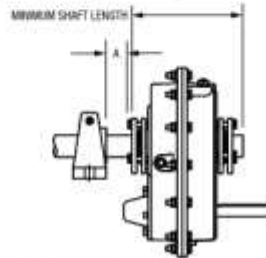


Figure 5 – Minimum Recommended Dimensions

Table 1 – Minimum Mounting Dimensions and Bolt Torques

Minimum Required Shaft Length			
Reducer Size	Standard Taper Bushing	Short Shaft Bushing	
TA0107L	6.83	4.32	
TA0107L	6.83	4.32	
TA1107H	6.95	4.43	
TA2115H	7.80	4.80	
TA3203H	8.55	5.46	
TA4207H	8.94	5.66	
TA5215H	10.33	6.35	
TA6307H	10.82	6.72	
TA7315H	11.87	7.62	
TA8407H	12.82	8.10	
TA9415H	13.74	8.56	
TA10507H	15.46	9.67	
TA12608H	18.32	11.60	

Bushing Screw Information and Minimum Clearance for Removal			
Reducer Size	Fastener Size	Torque in lb-ft	A
TA0107L	5/16-18	20-17	1.08
TA1107H	5/16-18	20-17	1.20
TA2115H	3/8-16	20-17	1.20
TA3203H	3/8-16	20-17	1.20
TA4207H	3/8-16	26-23	1.48
TA5215H	1/2-13	77-67	1.81
TA6307H	1/2-13	77-67	1.81
TA7315H	1/2-13	77-67	2.06
TA8407H	1/2-13	77-67	2.06
TA9415H	5/8-11	86-75	2.39
TA10507H	5/8-11	86-75	2.39
TA12608H	5/8-11	86-75	2.39

2. The long bushing is designed to be installed from the side of the reducer opposite the driven equipment as shown in Figure 6. The long bushing when properly installed is designed to capture the end of the customer shaft that does not extend through the reducer. Normally the reducer would be mounted such that the input shaft extends from the side of the reducer opposite the driven equipment however the reducer design allows installation of the reducer to be mounted in the opposite direction.
3. Install the tapered bushing wedge into the hollow bore of the reducer from the same side as the long bushing will be installed. When installing the tapered bushing wedge into the reducer hub, install the flange end first so that the thin taper is pointing outwards towards the long bushing as shown in Figure 6. The wedge is properly installed when it snaps into place in the reducer hub.

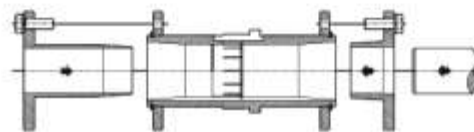


Figure 6 – Short Shaft Bushing and Output Hub Assembly

4. Align the tapered bushing wedge keyway with the reducer hub keyway. The keyway in the wedge is slightly wider than the keyway in the reducer hub allowing for easier installation.
5. Install one bushing backup plate on the end of the hub and secure with the supplied retaining ring. Repeat procedure for other side.
6. Install the short bushing; flange first, on the driven shaft and position per dimension "A", as shown in Table 1. This will allow the bolts to be threaded into the bushing for future bushing and reducer removal.
7. Insert the output key in the shaft and bushing. For easy of installation, rotate the driven shaft so that the shaft keyseat is at the top position.
8. Mount the reducer on the driven shaft and align the shaft key with the reducer hub keyway. Maintain the recommended minimum distance "A" from the shaft bearing.
9. Insert the screws, with washers installed, in the unthreaded holes in the bushing flange and align with the threaded holes in the bushing backup plate. If necessary, rotate the bushing backup plate to align with the bushing screws. Tighten the screws lightly. If the reducer must be positioned closer than dimension "A", place the screws with washers installed, in the unthreaded holes in the bushing before positioning reducer making sure to maintain at least 1/8" between the screw heads and the bearing.
10. Place the long bushing in position on the shaft and align the bushing keyway with the shaft key. Use care to locate the long bushing with the tapered bushing wedge installed earlier. Align the unthreaded holes in the bushing with the threaded holes in the bushing backup plate. If necessary, rotate the bushing backup plate to align with the bushing holes. Insert bushing screws, with washers installed in the unthreaded holes in the bushing. Tighten screws lightly.
11. Alternately and evenly tighten the screws in the bushing nearest the equipment to the recommended torque given in Table 1. Repeat procedure on outer bushing.

Bushing Removal for Standard Taper or Short Shaft Bushings:

1. Remove bushing screws.
2. Place the screws in the threaded holes provided in the bushing flanges. Tighten the screws alternately and evenly until the bushings are free on the shaft. For ease of tightening screws make sure screw threads and threaded holes in the bushing flanges are clean. If the reducer was positioned closer than the recommended minimum distance "A" as shown in Table 1, loosen the inboard bushing screws until they are clear of the bushing flange by 1/8". Locate two (2) wedges at 180 degrees between the bushing flange and the bushing backup plate. Drive the wedges alternately and evenly until the bushing is free on the shaft.
3. Remove the outside bushing, the reducer, and then the inboard bushing.

LUBRICATION

IMPORTANT: Because reducer is shipped without oil, it is necessary to add the proper amount of oil before operating reducer. Use a high-grade petroleum base rust and oxidation inhibited (R&O) gear oil (Tables 2 and 3). Follow instructions on reducer warning tags, and in the installation manual.

For average industrial operating conditions, the lubricant should be changed every 2500 hours of operation or every 6 months, whichever occurs first. Drain reducer and flush with kerosene, clean magnetic drain plug and refill to proper level with new lubricant.

CAUTION: Too much oil will cause overheating and too little will result in gear failure. Check oil level regularly. Failure to observe this precaution could result in bodily injury.

Under extreme operating conditions, such as rapid rise and fall of temperature, dust, dirt, chemical particles, chemical fumes, or oil sump temperatures above 200°F, the oil should be changed every 1 to 3 months, depending on severity of conditions.

Table 2—Oil Volumes

Approximate Reducer Size		Volume of Oil to Fill Reducer to Oil Level Plug ①②											
		③Position A		③Position B		③Position C		③Position D		③Position E		③Position F	
		④Qt	L	④Qt	L	④Qt	L	④Qt	L	④Qt	L	④Qt	L
TA0107L	Single	0.7	0.6	0.5	0.5	0.7	0.6	1.4	1.3	1.3	1.2	1.5	1.4
	Double	0.7	0.6	0.5	0.5	0.6	0.6	1.3	1.3	1.2	1.2	1.4	1.3
TA1107H	Single	1.3	1.3	0.7	0.7	0.7	0.6	1.7	1.6	1.5	1.4	1.9	1.8
	Double	1.3	1.3	0.7	0.7	0.6	0.6	1.7	1.6	1.5	1.4	1.9	1.8
TA2115H	Single	2.1	2.0	1.2	1.2	1.1	1.0	2.7	2.5	2.3	2.2	3.1	2.8
	Double	2.1	2.0	1.1	1.1	1.0	1.0	2.6	2.5	2.4	2.3	3.0	2.9
TA3203H	Single	2.8	2.7	1.6	1.6	1.8	1.7	4.1	3.9	3.3	3.1	4.4	4.2
	Double	2.8	2.7	1.5	1.4	1.7	1.6	4.0	3.8	3.4	3.3	4.2	4.0
TA4207H	Single	4.4	4.2	2.6	2.5	2.9	2.8	7.4	7.0	6.3	6.0	7.8	7.3
	Double	4.4	4.2	2.5	2.4	2.8	2.6	7.3	6.9	6.4	6.0	7.5	7.1
TA5215H	Single	7.4	7.0	4.9	4.7	5.8	5.5	13.2	12.5	11.6	11.0	13.1	12.4
	Double	7.4	7.0	4.7	4.4	5.5	5.2	12.9	12.2	11.4	10.8	12.6	11.9
TA6307H	Single	8.8	8.4	5.8	5.5	6.6	6.2	16.1	15.3	13.2	12.5	16.1	15.3
	Double	8.8	8.4	5.5	5.2	6.2	5.9	15.8	15.0	13.9	13.1	15.3	14.5
TA7315H	Single	8.4	8.0	11.8	11.1	13.9	13.2	22.5	21.3	22.1	20.9	25.1	23.7
	Double	8.4	8.0	10.8	10.3	13.2	12.5	22.0	20.9	22.4	21.2	23.1	21.8
TA8407H	Single	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Double	7.7	7.3	11.7	11.1	13.7	12.9	25.1	23.8	24.0	22.7	25.8	24.4
TA9415H	Single	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Double	17.0	16.1	16.8	15.9	18.1	17.1	33.2	31.4	33.2	31.4	38.6	36.5
TA10507H	Single	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Double	38.0	36.0	27.6	26.1	25.8	24.4	53.5	50.6	53.8	50.9	56.1	53.0
TA12608H	Single	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Double	53.0	50.2	41.5	39.3	37.1	35.1	70.7	66.9	72.2	68.3	80.4	76.1

① Oil quantity is approximate. Service with lubricant until oil runs out of oil level hole.

② Refer to Figure 1 for mounting positions.

③ US measure: 1 quart = 32 fluid ounces = .94646 liters.

④ Below 15 RPM output speed, oil level must be adjusted to reach the highest oil level plug. If reducer position is to vary from those shown in Figure 1, either more or less oil may be required. Consult Baldor Electric Company, Dodge Engineering, Greenville, SC.

Table 3 – Oil Recommendations

Output RPM	ISO Grades For Ambient Temperatures of 50° F to 125° F *											
	Torque-Arm II Reducer Size											
	TA0107L	TA1107H	TA2115H	TA3203H	TA4207H	TA5215H	TA6307H	TA7315H	TA8407H	TA9415H	TA10507H	TA12608H
301 – 400	320	320	320	220	220	220	220	220	220	220	220	220
201 – 300	320	320	320	220	220	220	220	220	220	220	220	220
151 – 200	320	320	320	220	220	220	220	220	220	220	220	220
126 – 150	320	320	320	220	220	220	220	220	220	220	220	220
101 – 125	320	320	320	320	220	220	220	220	220	220	220	220
81 – 100	320	320	320	320	320	220	220	220	220	220	220	220
41 – 80	320	320	320	320	320	220	220	220	220	220	220	220
11 – 40	320	320	320	320	320	320	320	320	320	320	220	220
1 – 10	320	320	320	320	320	320	320	320	320	320	320	320

Output RPM	ISO Grades For Ambient Temperatures of 15° F to 60° F *											
	Torque-Arm II Reducer Size											
	TA0107L	TA1107H	TA2115H	TA3203H	TA4207H	TA5215H	TA6307H	TA7315H	TA8407H	TA9415H	TA10507H	TA12608H
301 – 400	220	220	220	150	150	150	150	150	150	150	150	150
201 – 300	220	220	220	150	150	150	150	150	150	150	150	150
151 – 200	220	220	220	150	150	150	150	150	150	150	150	150
126 – 150	220	220	220	150	150	150	150	150	150	150	150	150
101 – 125	220	220	220	220	150	150	150	150	150	150	150	150
81 – 100	220	220	220	220	220	150	150	150	150	150	150	150
41 – 80	220	220	220	220	220	150	150	150	150	150	150	150
11 – 40	220	220	220	220	220	220	220	220	220	220	150	150
1 – 10	220	220	220	220	220	220	220	220	220	220	220	220

NOTES:

1. Assumes auxiliary cooling where recommended in the catalog.
2. Pour point of lubricant selected should be at least 10°F lower than expected minimum ambient starting temperature.
3. Extreme pressure (EP) lubricants are not necessary for average operating conditions. When properly selected for specific applications, TORQUE-ARM II backstops are suitable for use with EP lubricants.
4. Special lubricants may be required for food and drug industry applications where contact with the product being manufactured may occur. Consult a lubrication manufacturer's representative for his recommendations.
5. For reducers operating in ambient temperatures between -22°F (-30°C) and 20°F (-6.6°C) use a synthetic hydrocarbon lubricant, 100 ISO grade or AGMA 3 grade (for example, Mobil SHC627). Above 125°F (51°C), consult Baldor Electric Company, Dodge Gear Application Engineering, Greenville, SC for lubrication recommendation.
6. Mobil SHC630 Series oil is recommended for high ambient temperatures.

GUIDELINES FOR TORQUE-ARM II REDUCER LONG-TERM STORAGE

During periods of long storage, or when waiting for delivery or installation of other equipment, special care should be taken to protect a gear reducer to have it ready to be in the best condition when placed into service.

By taking special precautions, problems such as seal leakage and reducer failure due to lack of lubrication, improper lubrication quantity, or contamination can be avoided. The following precautions will protect gear reducers during periods of extended storage:

Preparation:

1. Drain oil from the unit. Add a vapor phase corrosion inhibiting oil (VCI-105 oil by Daubert Chemical Co.) in accordance with Table 4.
2. Seal the unit airtight. Replace the vent plug with a standard pipe plug and wire the vent to the unit.
3. Cover all unpainted exterior parts with a waxy rust preventative compound that will keep oxygen away from the bare metal. (Non-Rust X-110 by Daubert Chemical Co. or equivalent).
4. The instruction manuals and lubrication tags are paper and must be kept dry. Either remove these documents and store them inside, or cover the unit with a durable waterproof cover which can keep moisture away.
5. Protect reducer from dust, moisture, and other contaminants by storing the unit in a dry area.

6. In damp environments, the reducer should be packed inside a moisture-proof container or an envelope of polyethylene containing a desiccant material. If the reducer is to be stored outdoors, cover the entire exterior with a rust preventative.

When placing the reducer into service:

1. Fill the unit to the proper oil level using a recommended lubricant. The VCI oil will not affect the new lubricant.
2. Clean the shaft extensions with petroleum solvents.
3. Assemble the vent plug into the proper hole.

Follow the installation instructions provided in this manual.

Table 4 – Quantities of VCI #105 Oil

Reducer Size	Quantity (Ounces / Milliliter)
TA0107L	1 / 30
TA1107H	1 / 30
TA2115H	1 / 30
TA3203H	1 / 30
TA4207H	1 / 30
TA5215H	2 / 59
TA6307H	2 / 59
TA7315H	3 / 89
TA8407H	3 / 89
TA9415H	4 / 118
TA10507H	6 / 177
TA12608H	8 / 237

VCI #105 and #10 are interchangeable.
VCI #105 is more readily available.

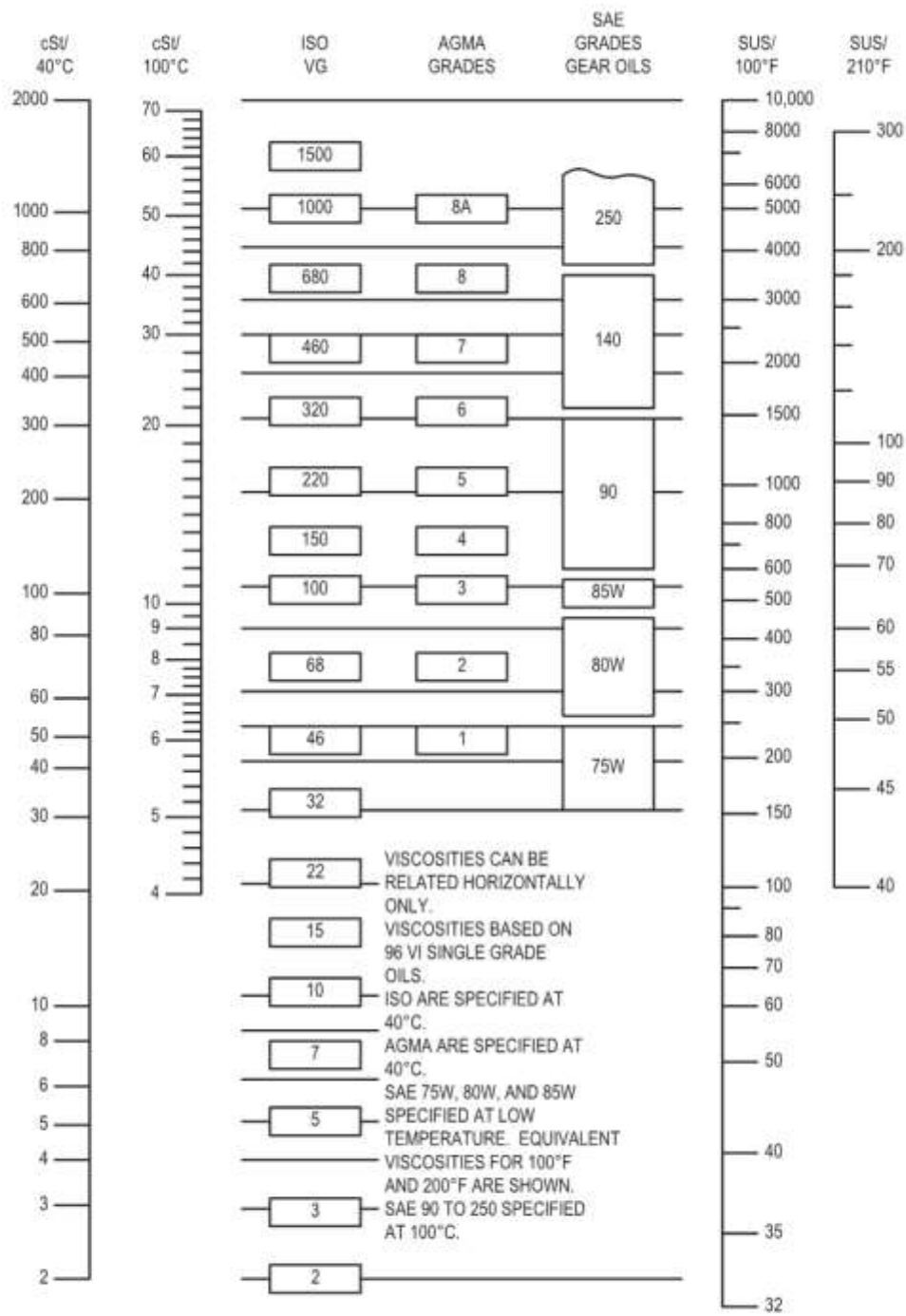


Figure 7 - OIL VISCOSITY EQUIVALENCY CHART

4B Level Indicator



Product Datasheet

Binswitch

BETTER BY DESIGN

Binswitch

Programmable Capacitance Point Level Indicator

APPLICATION

Detects level or plug situations in bulk granular solids or liquids.

METHOD OF OPERATION

The Binswitch Sensor detects level or plug situations for bulk granular solids or liquids in tanks, bins, or silos and can be used as a plug or choke detector in chutes, conveyors and elevator legs. A two color LED shows material present or absent.

The programmable Binswitch includes a time delay on material arriving or leaving, and fail-safe relay settings for high and low levels.

The Binswitch has a polycarbonate housing that is corrosion and abrasion resistant, dust-tight, and waterproof.

FEATURES

- ▶ Totally Sealed Construction (Submersible)
- ▶ Applications for Level or Plug Sensing
- ▶ Adjustable Sensitivity
- ▶ CSA Class II Div 1 Groups E, F & G Approved
- ▶ IP67 Protection

PART NUMBERS/ACCESSORIES

- ▶ BS1V3FC Replaced by Multi-Voltage Binswitch Elite
- ▶ BS1V4FC Replaced by Multi-Voltage Binswitch Elite
- ▶ BS1V6FC Replaced by Multi-Voltage Binswitch Elite
- ▶ BS1V10FC Replaced by Multi-Voltage Binswitch Elite
- ▶ BS2V10FC Replaced by Multi-Voltage Binswitch Elite
- ▶ BP1V10FC Programmable Binswitch (5 Wire)
- ▶ SMP Mounting Plate
- ▶ SMPS Mounting Plate (Stainless Steel)
- ▶ A34NPT 3/4 in. NPT Conduit Adapter
- ▶ BMA 1-1/4 in. NPT Mount
- ▶ BAS Abrasion Shield (1-1/4 in. NPT Mount)
- ▶ BMPG36 Gland Mount
- ▶ BSM3 3 in. Clamp Mount



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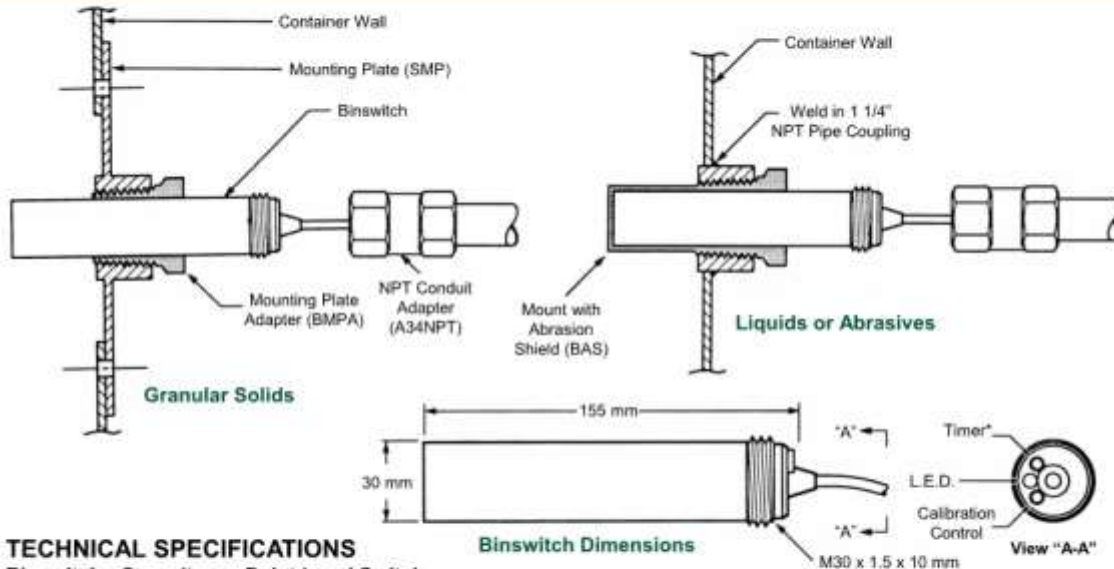
625 Erie Avenue, Morton, IL 61550 USA Tel: 309-698-5611 Fax: 309-698-5615

www.go4b.com/usa



Binswitch

BETTER BY DESIGN



TECHNICAL SPECIFICATIONS

Binswitch - Capacitance Point Level Switch

	BP1V10FC
Power Supply:	12-240 VDC/24-240 VAC
Supply Tolerance:	N/A
Power Consumption:	50 mA
Fuse:	5 amp maximum
Operating Temp:	-22° F to +158° F
Sensing Range:	1" (25mm) typical
Output:	Programmable voltage free relay 1 pole normally open 1 pole normally closed
Contact Rating:	3 amp, 240 VAC, non-inductive
Fail-to-Safe:	High or low level fail-safe, relay de-energized material present/power failure
Calibration:	Screw potentiometer
Timer:	Programmable for "make", "break" (0-1 or 0-5 minutes)
LED Display:	Red: material present Green: material absent Red Flashing: timing material arriving Green Flashing: timing material leaving
Cable Enclosure:	6' (2m) 5 conductor cable Polycarbonate, threaded one end 30mm x 1.5mm
Protection:	IP67 - NEMA 6 and 6P Dust tight and water resistant
Approvals:	CSA Approved for Class 2 Div. 1 Groups E, F, & G (US and Canada) GOST-R (Russia)
Weight:	10.5 ounces



Binswitch Installed on Bucket Elevator Spouting
(With SMP, BAS & A34NPT)

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4B Slip Indicator



Product Datasheet

M300 Slipswitch

BETTER BY DESIGN

M300 Slipswitch

Monitors Rotating Machinery for Dangerous Underspeed Conditions

APPLICATION

The M300 Slipswitch is a simple inductive shaft speed monitoring device. The self-contained unit has a single set point, which signals when the shaft speed has dropped by 20% of normal running speed. It is used for detecting dangerous slow down and underspeed conditions on conveyors, bucket elevators, airlocks, mixers, fans, grinders and many other machines.

METHOD OF OPERATION

An inductive sensing device located in the nose of the M300 enclosure will detect a metal target. This target can be an existing bolt head or device attached to a shaft. During installation the M300 is set to the normal machine shaft RPM by calibrating with the magnet provided. The internal microprocessor sets the underspeed output to operate at exactly 20% below normal machine shaft RPM. This allows the M300 output to be used for automatic shutdown of machinery during dangerous underspeed or belt slip conditions.

FEATURES

- ▶ Underspeed Detection at 20%
- ▶ Totally Sealed Construction (Submersible)
- ▶ Microprocessor Accuracy
- ▶ LED Indication
- ▶ CSA / NRTL Class II Div 1 Groups E, F & G Approved
- ▶ IP67 Protection

PART NUMBERS/ACCESSORIES

- | | |
|--------------|---------------------------------------|
| ▶ M3001V10F | M300 Slipswitch (2 Wire) |
| ▶ M3005V10CA | M300 Slipswitch (5 Wire) |
| ▶ A34NPT | 3/4" NPT Conduit Adapter |
| ▶ WG1-4B-4 | Whirligig® Shaft Sensor Mount |
| ▶ MAG2000 | Mag-Con™ Whirligig Magnetic Connector |
| ▶ SM2 | SpeedMaster™ Sensor Testing Device |
| ▶ CDL1 | 2 Wire Load Device (110 VAC) |
| ▶ CDL4 | 2 Wire Load Device (24 VDC) |



The SpeedMaster™ is the only device that accurately tests the calibration of a speed switch, and allows testing of the alarm and shutdown features of the sensor while installed on the machine shaft.

To see it in action, visit:
www.go4b.com/speedmaster



ATEX and IECEx Versions Available



Please refer to instruction manual for correct installation.
Information subject to change or correction. Nov 2010

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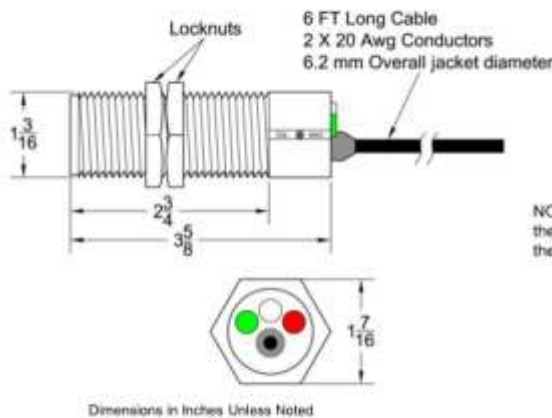


Product Datasheet

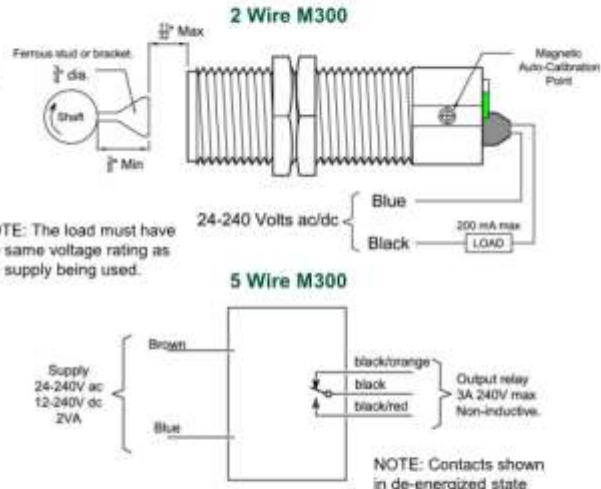
M300 Slipswitch

BETTER BY DESIGN

DIMENSIONS



CONNECTIONS



TECHNICAL SPECIFICATIONS

M300 Slipswitch - Monitors Rotating Machinery for Dangerous Underspeed Conditions

	M3001V10F (2 Wire)	M3005V10CA (5 Wire)
Power Supply:	24-240 VAC/VDC	12-240 VDC / 24-240 VAC
Power Consumption:	Load dependent (200 mA maximum)	30 mA
Fuse:	5 amp maximum	5 amp maximum
Output:	Triac, normally closed above set speed, normally open at 20% below set speed	Relay, normally energized, closed contact above set speed. Normally de-energized, open contact at 20% below set speed
Relative Humidity:	90% RH	90% RH
Switching Capacity:	200 mA maximum	N/A
Contact Rating:	NA	3 A - 240 VAC (non-inductive)
Saturation Voltage:	8 Volts maximum (output on)	N/A
Leakage Current:	1.6 mA maximum (output off)	N/A
Operating Temperature:	-13°F (-25°C) to +158°F (70°C)	5°F (-15°C) to +122°F (50°C)
Start Up Delay:	0 - 30 seconds (programmable)	0 - 30 seconds (programmable)
Sensing Range:	11/32" (9mm) maximum on ferrous metal	11/32" (9mm) maximum on ferrous metal
Input Pulse Range:	10 - 3,600 ppm	10 - 3,600 ppm
Trip Point:	20% below set speed	20% below set speed
LED Indicator:	Red LED indicates input pulses. Green LED shows output at nominal speed and acts as a calibration aid.	
Calibration:	Magnetic	Magnetic
Cable:	6' (2m) 2 conductor	6' (2m) 5 conductor
Approval:	CSA / NRTL Class II Div 1 Groups E, F, & G (US and Canada)	CSA / NRTL Class II Div 1 Groups E, F, & G (US and Canada)
Protection:	IP67	IP67

Please refer to instruction manual for correct installation. Information subject to change or correction. Nov 2010

4B COMPONENTS LIMITED •

625 Erie Avenue, Morton, IL 61550 USA Tel: 309-698-5611 Fax: 309-698-5615

www.go4b.com/usa

Rolfes Belt Alignment Indicator

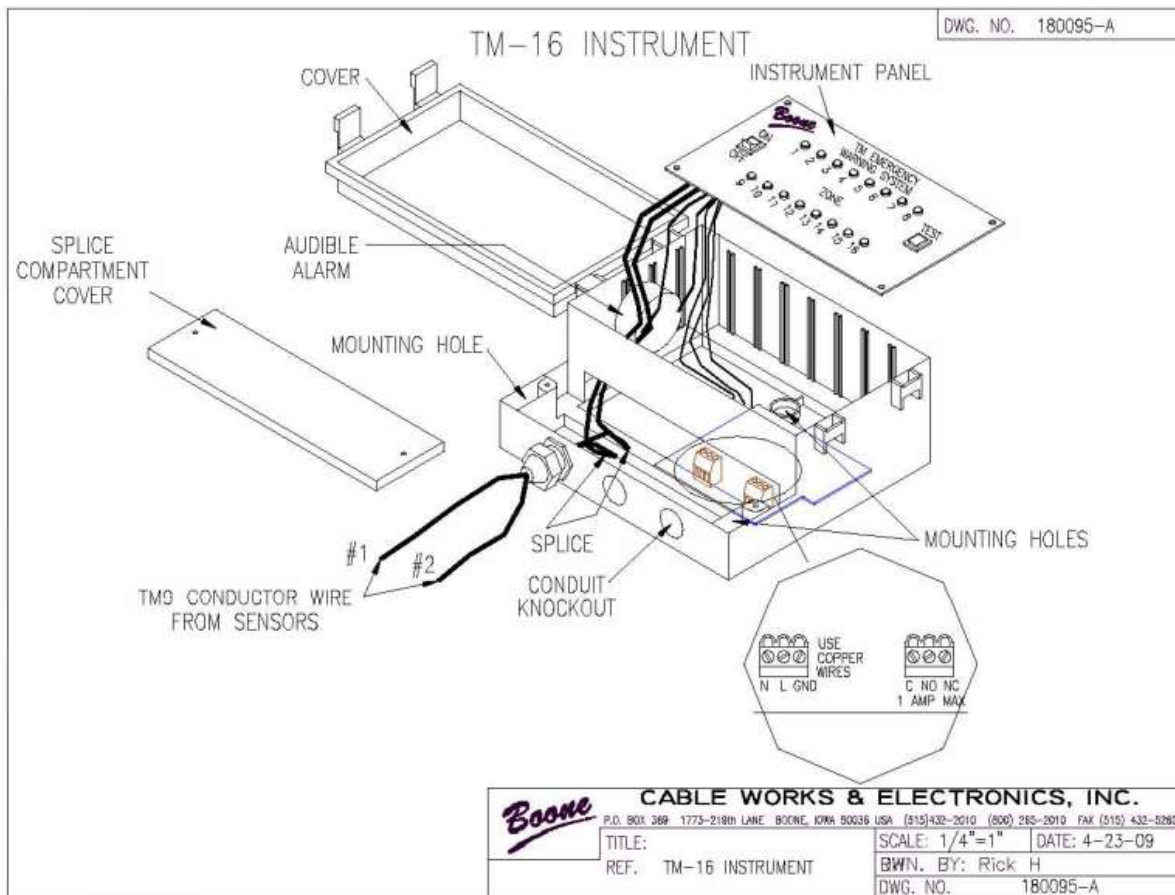
**INSTALLATION
AND
INSTRUCTION MANUAL

FOR**



**TM-16 EMERGENCY
WARNING
SYSTEM**

SPECIAL NOTE BOONE CABLE WORKS & ELECTRONICS, INC.
1773-219TH LANE – P.O. BOX 429
READ THIS ENTIRE BOOKLET BOONE, IOWA 50036 USA
BEFORE PROCEEDING WITH PHONE (515) 432-2010 FAX (515) 432-5262
THE INSTALLATION TOLL FREE NUMBER – 1-800-265-2010
Web Address: (rolfesatboone.com)

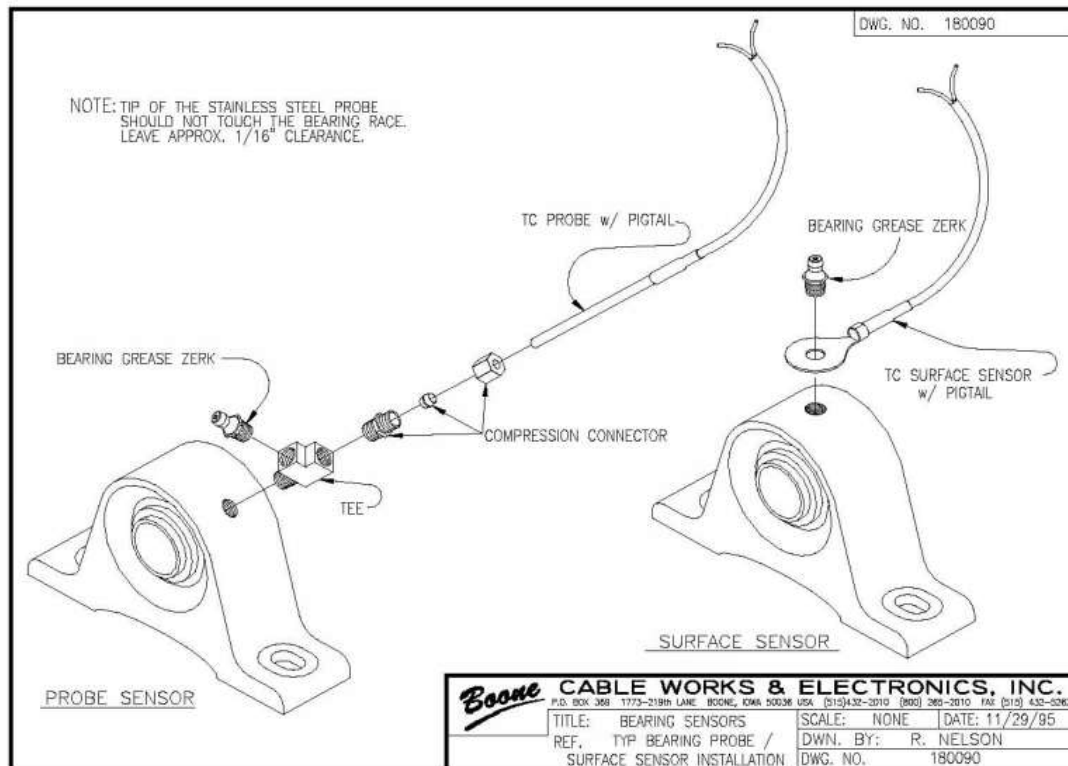


1. Wiring Runs, Color Coded and Splices

The Instrument, which can monitor 16 sensors, has two TM wires in its splice compartment. The wire marked #1 is for zones 1 through 8. The wire marked #2 is for zones 9 through 16.

The wire is run from the instrument to within 5 feet of each sensor. Strap and mount the wire so that it is exposed to the least amount of physical and environmental stress. The most desirable method is to enclose all wires in a dedicated conduit to provide mechanical protection.

“WARNING – IF THE SENSOR IS NOT ATTACHED PROPERLY AND SECURELY TO THE MONITORED PIECE OF EQUIPMENT, HEAT MAY FAIL TO TRANSFER TO THE SENSOR CAUSING IT TO NOT OPERATE PROPERLY. CHECK THE SENSORS REGULARLY TO SEE IF THEY ARE ATTACHED SECURELY.”

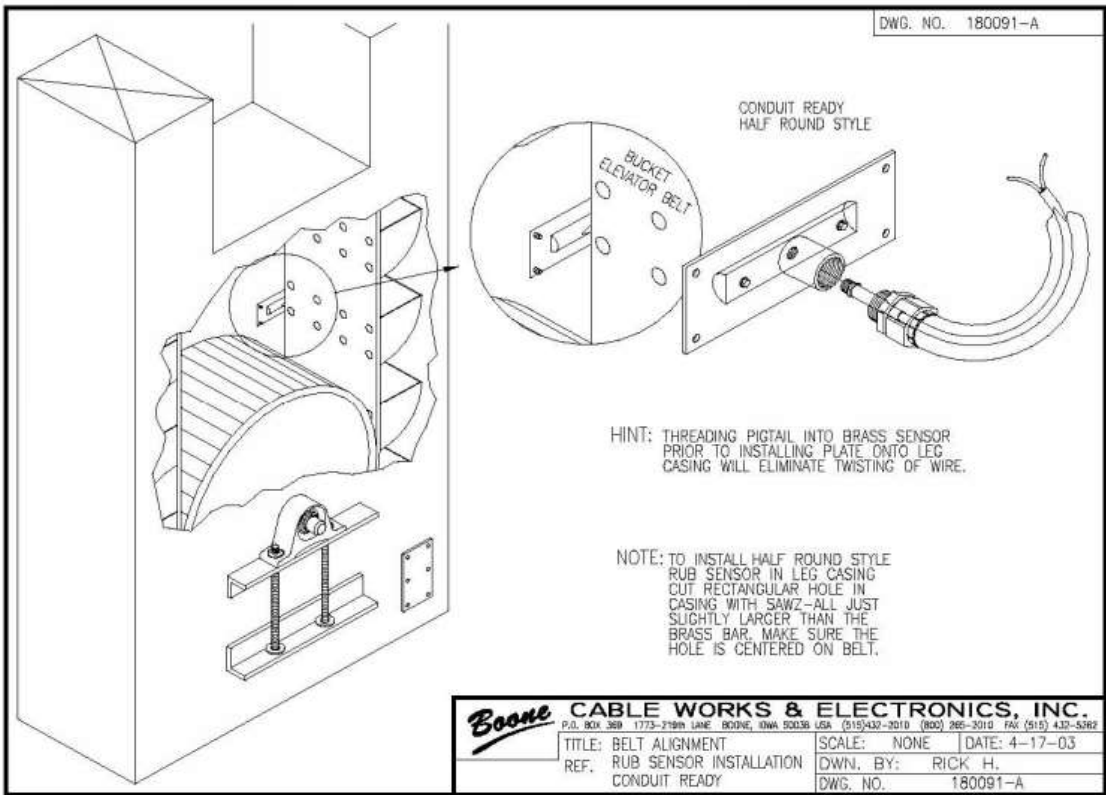
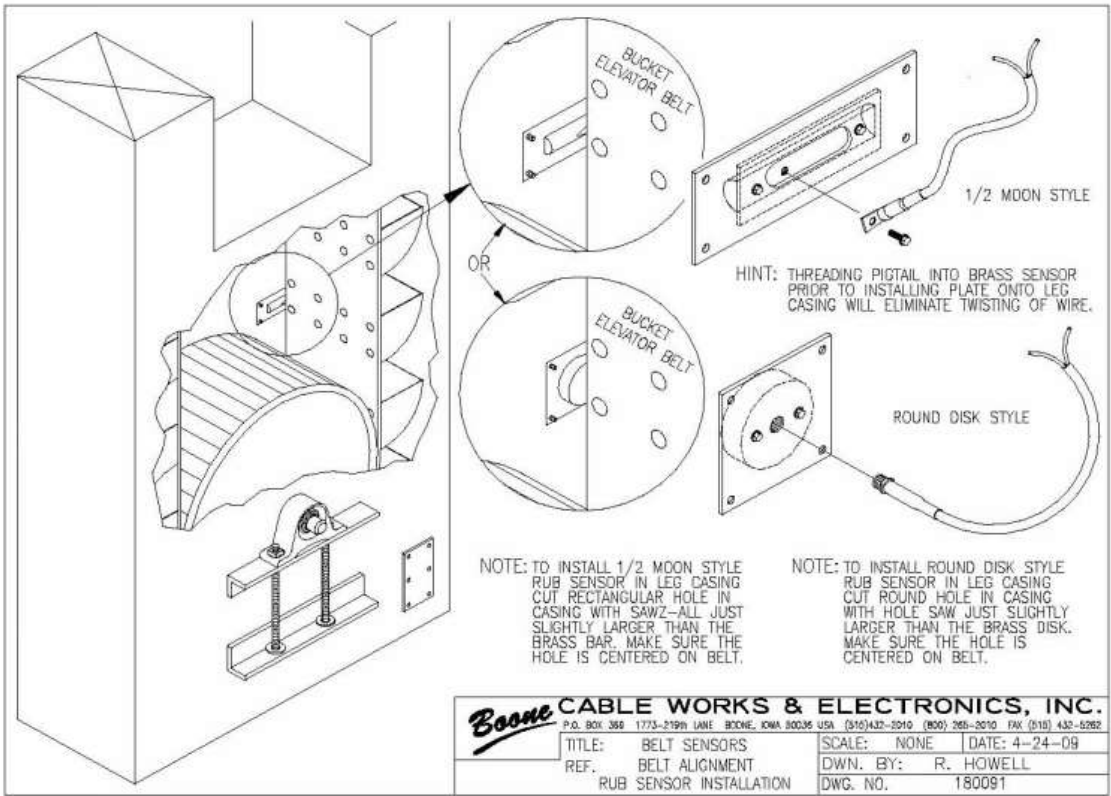


□. Belt Alignment

Belt alignment is accomplished by attaching the sensor to a brass heat transfer plate (See Drawing #180091 and 180091-A for conduit ready installations). The brass pad transfers the heat of the belt rubbing against it and activates the sensor. Two style of brass plates are available, as ½ moon and an optional round disk style. The ½ moon offers a greater range of motion on the belt, while the round disk is easier to install. It is important to tighten the sensor securely for a good thermal bond.

The sensor has a thermostat attached to the housing with approximately 10 feet of wire. See Drawing #180096-A when wiring the probe into the system.

“WARNING – IF THE SENSOR IS NOT ATTACHED SECURELY TO THE MONITORED PIECE OF EQUIPMENT, HEAT MAY FAIL TO TRANSFER TO THE SENSOR CAUSING IT TO NOT OPERATE PROPERLY. CHECK THE SENOSRS REGULARLY TO SEE IF THEY ARE ATTACHED SECURELY.”





Should you have any questions concerning assembly instructions, parts or drawings, please feel free to contact us at any of the following.

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4400 East 39th Street • PO Box 848
Kearney, NE 68847
Phone 800.359.7600

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