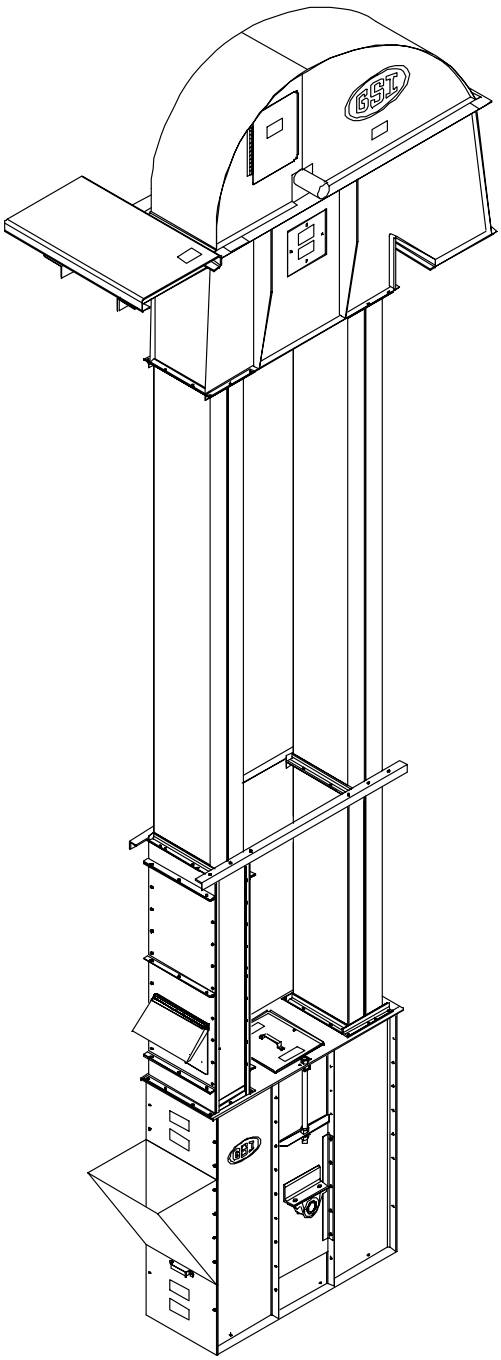
Bucket Elevator



Bucket Elevator

Series 1

GSI

MATERIAL HANDLING

a division of

THE GSI GROUP

Table of Contents

Use of the Equipment Information page will help you identify your equipment in the case that you need to call your dealer or installer. This information should be filled out and kept on record.

Equipment Information

Model Number: _____

Serial Number: _____

RPM : _____

Head Pulley Dia.: _____

Discharge Height: _____

Horsepower: _____

Date Purchased: _____

Dealer Name and Phone Number:

_____

_____

_____

_____

GSI Material Handling Division
1004 East Illinois Street
Assumption, Illinois 62510 USA
Phone 217-226-4421
Fax 888-741-3004

Introduction

Thank you for choosing a GSI product. It is designed to give excellent performance and service for many years.

This manual covers general information on the GSI Bucket Elevator installation. Due to the wide variety of field conditions we cannot cover every aspect of installation. We offer one method for installing bucket elevators but, rely on your qualified contractor's experience and techniques. Some conditions and surroundings do not allow certain practices during the installation of equipment. We can not be responsible for the installation of the bucket elevator. We encourage all personnel operating, installing, or maintaining this equipment to thoroughly read this manual before proceeding.

See Training Sign Off Sheet in the back of this manual.

Safety First

The principal concern of The GSI Group, Inc. (GSI) is your safety and the safety of others associated with grain handling equipment. It is the responsibility of the buyer to make this manual available to the person or persons involved with this equipment. Guards and safety labels have been installed prior to leaving the manufacturing plant. These devices are not to be removed, altered or defaced in any way. Any alterations to the equipment may produce a very dangerous situation and may cause serious injury or death and should be avoided. This manual is written to help you understand safe operating procedures, and some of the problems that may be encountered by the operator or other personnel.

As owner and/or operator, it is your responsibility to know what requirements, hazards and precautions exist, and to inform all personnel associated with the equipment, or who are in the area. Failure to read this manual is a misuse of the equipment.

The GSI Group, Inc. recommends contacting your local power company, and having a representative survey your installation so the wiring is compatible with their system, and adequate power is supplied to your unit. Wiring should be done by a qualified electrician.

Safety decals should be read and understood by all people in the grain handling area. They are affixed to the equipment to warn of danger to persons and of possible equipment damage. These decals must never be removed, tampered with, painted over or obscured in any way. If labels are damaged or become unreadable, replacement labels are available from The GSI Group, Inc.

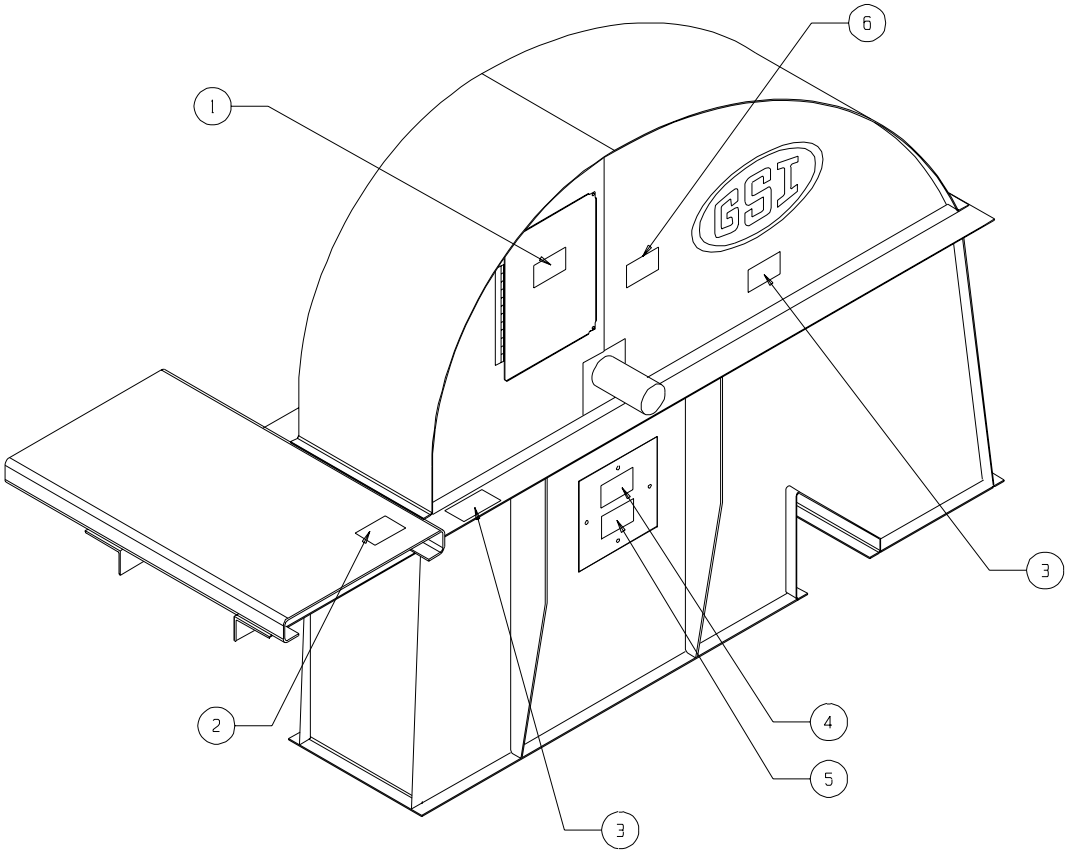
If a decal is damaged or is missing contact:

The GSI Group, Inc.
Material Handling Division
P.O. Box 20
Assumption, IL 62510-0020
phone 217/226-4421
fax 888/741-3004

A free replacement will be sent to you.
(Refer to DC number on the decal.)

Use of the Equipment Information page will help you identify your equipment for maintenance or replacement parts. Fill in this information and keep it on record.

Head Section Decal Locations



1

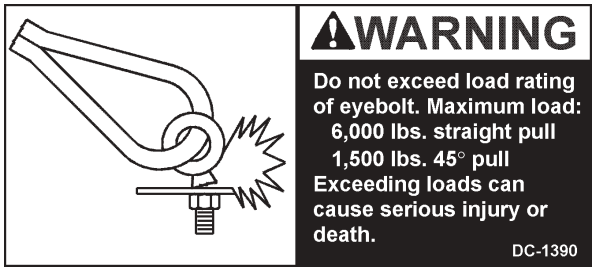
2

3

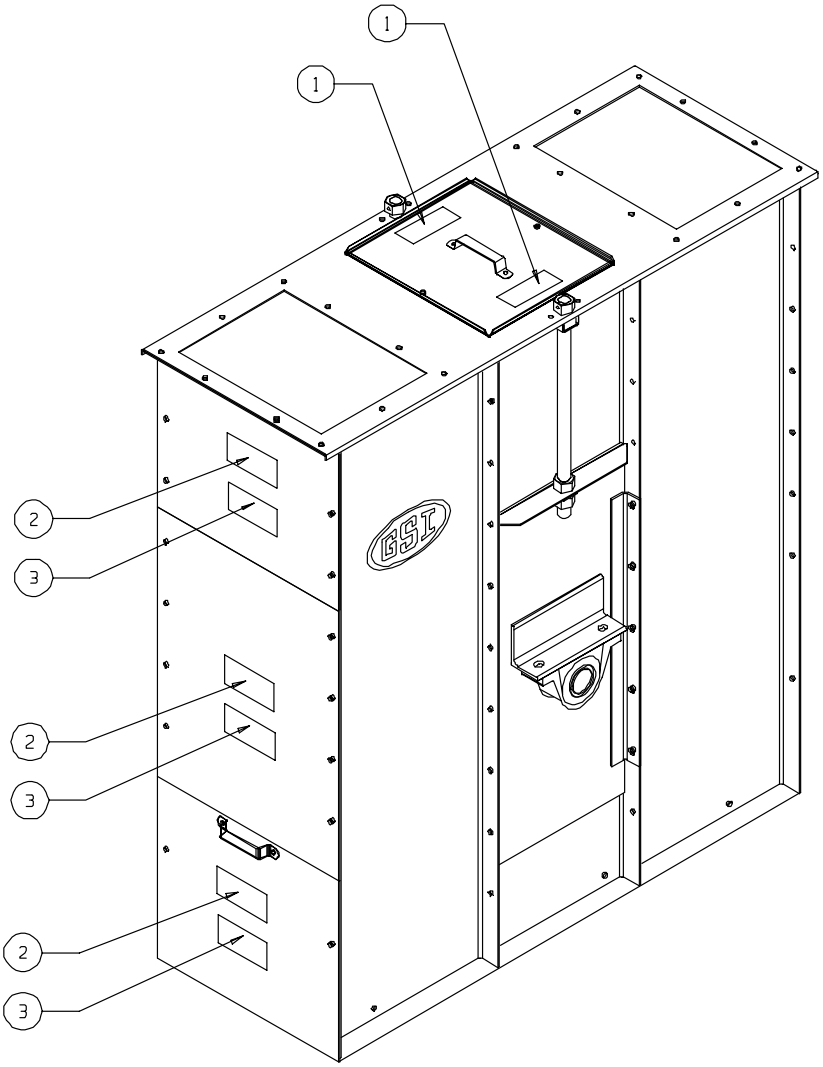
4

5

6



Boot Section Decal Locations

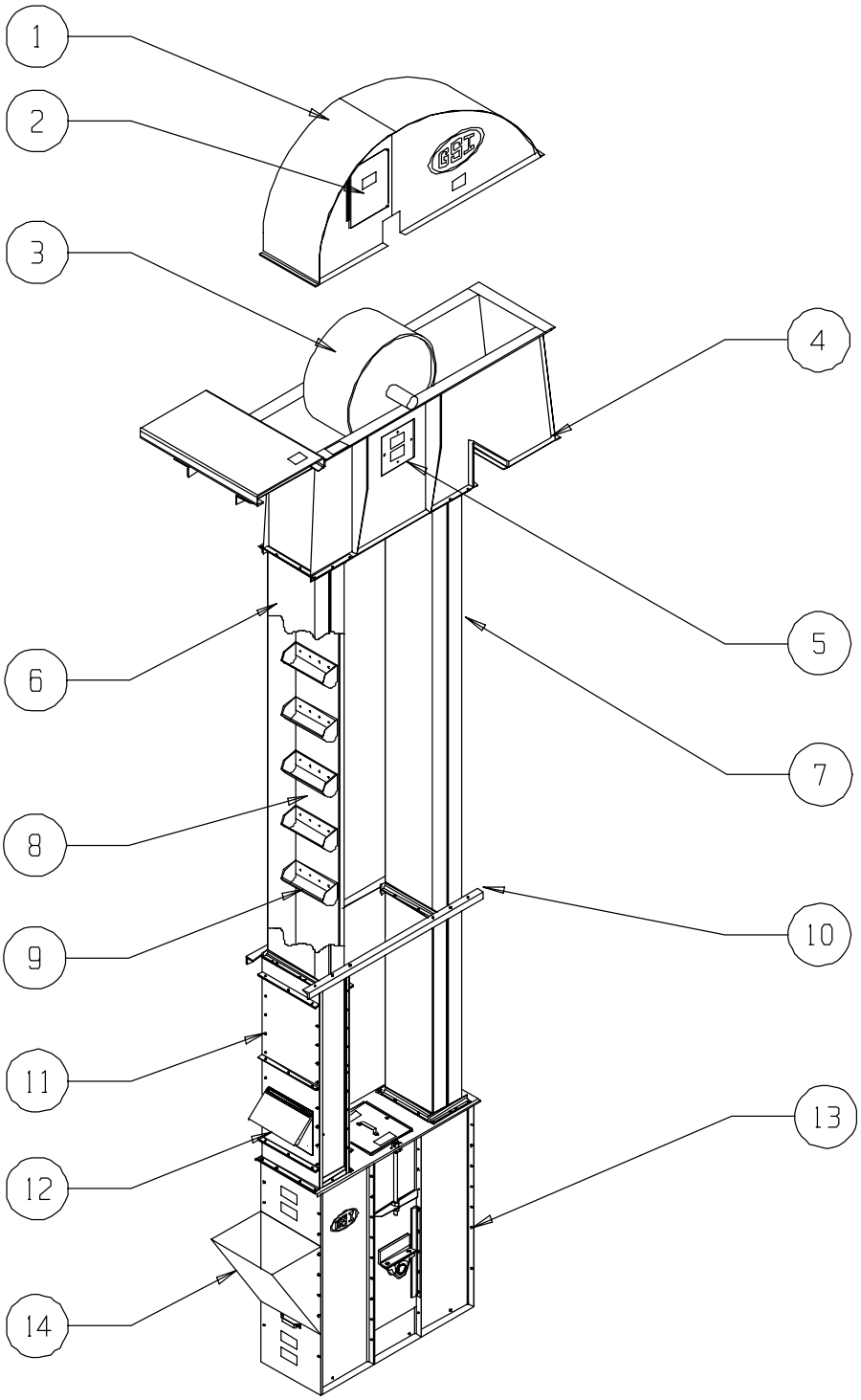


Note: Decals 2 and 3 are typical on both ends.

1

2

3



1. Head Cover
2. Pressure Relief Panel
3. Head Pulley
4. Head Section
5. Inspection Door
6. Up Leg Casing
7. Down Leg Casing
8. Belt
9. Buckets
10. Tie Angle
11. Inspection Section
12. Inspection Pocket
13. Boot Section
14. Inlet Hopper

Receiving Inspection

Carefully inspect the shipment for damage as soon as it is received. Verify that the quantity of parts or packages actually received corresponds to the quantity shown on the packing slip. Any discrepancies should be clarified immediately. One or more cartons containing the fasteners required for assembly are included with the shipment. Report any damage or shortage to the delivering carrier as soon as possible. GSI's responsibility for damage to the equipment ends with acceptance by the delivering carrier. Refer to the bill of lading. Save all paperwork and documentation furnished with any of the elevator components.

Pre-Installation Preparation

GSI's Bucket Elevators are designed to be vertically self-supporting when erected but must be supported or guyed against wind loads. **The elevator has not been designed to support other equipment such as cleaners, distributors or spouting.** Separate structures must be provided for any accessory equipment.

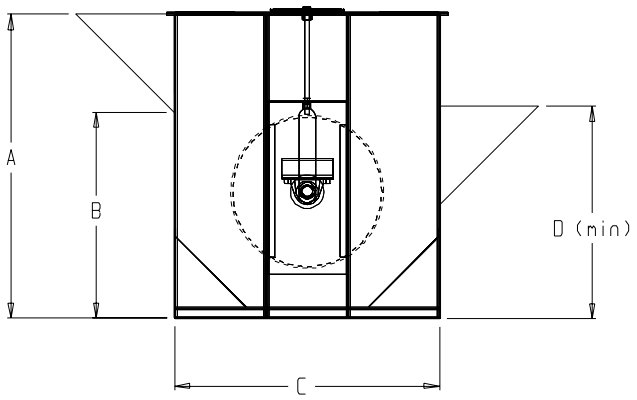
GSI is the vendor of the elevator and certain of its optional accessories only, and does not assume responsibility for the installation. The installation recommendations contained within this manual are for consideration only. The user or installer must consult a civil or structural engineer regarding the design, construction and supervision of the entire installation, including the elevator foundation and the guying cable and/or bracing system. The MOST IMPORTANT preparations are retaining a licensed engineer to plan the installation and a qualified millwright or contractor to erect the elevator and the accompanying equipment and structures.

Elevator Foundation

Consult a qualified engineer or contractor. Additionally, in the process of leveling the boot, GSI recommends that the installer plan on shimming the boot around its perimeter and grouting the base plate after the hold down fasteners are in place and tightened. Hold down fasteners are supplied by the installer.

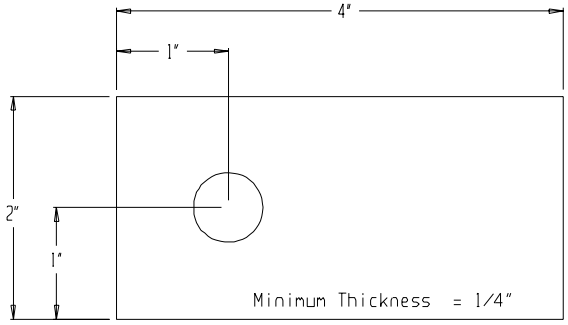
Boot Section

Take time now to identify the up and down side of the boot, as proper positioning is critical. Boot sections are pre-assembled at the factory. Check all the set screws and hub screws for proper tightness, and adjust pulley if necessary. Mark boot casing and sliding plate on both sides for future reference when making adjustments. After boot is set in place, level in all directions prior to anchoring. Use anchor bolts and mounting brackets (not supplied) to secure boot to foundation. Boot foundation must be designed by a local qualified Civil Engineer. Design must take in consideration dead loads, live loads, wind loads and soil bearing loads. We suggest the boot be installed on a foundation that provides adequate drainage away from the boot to ensure the boot stays dry.

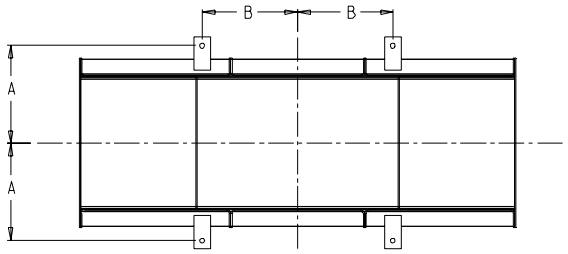


	Diameter of Boot Pulley				
	10"	16"	24"	30"	36"
A	36"	48"	48"	60"	60"
B	24"	32"	32"	44"	44"
C	25"	37"	42"	55"	65"
D	26"	29"	35"	37"	41"

Typical anchor clip



Suggested method of anchoring boot

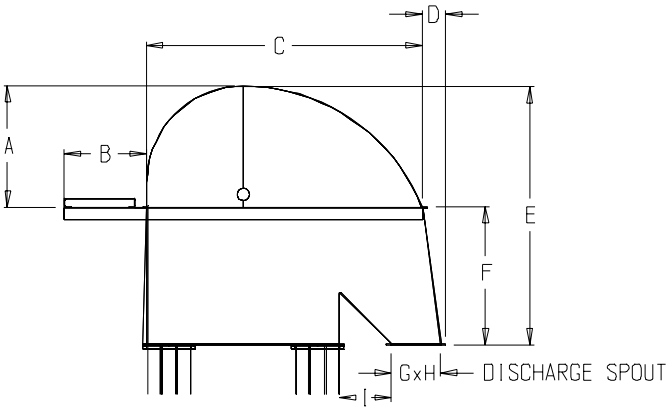


Trunking

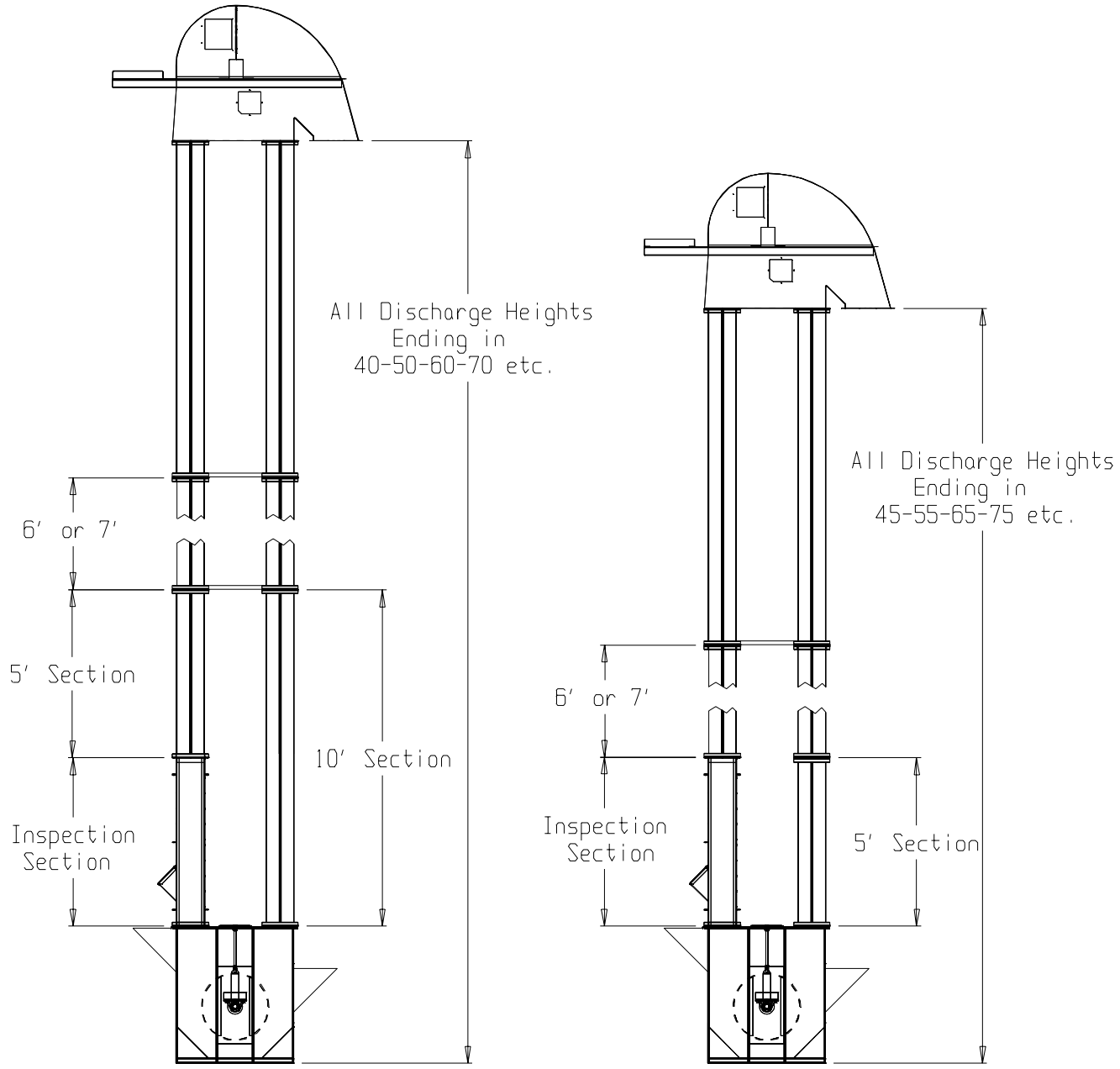
Trunking is manufactured in our jigging system, so any sequence can be used for erection. Check each section for damage before assembly. DO NOT install damaged sections. Repair or replace them prior to installation. Typically, the inspection section should be at eye level for optimum service potential. Caulk around the connecting flanges of each section during assembly to seal the unit from dust and weather. Install the first section on top of the boot, square and plumb trunk section. Do not tighten bolts. Install next trunking section and tie angles, bolt in place. Now go back and tighten bolts on first joint. Continue this process until all sections have been installed. Be sure to straighten the trunking in all directions as you assemble. Check all sections after final section is in place. You may assemble three sections on the ground before lifting into place. Do not assemble and lift more than three, 10' sections at a time. Remember to consider the excess weight of the head, platforms, ladders and other accessories when lifting into place.

Head section

Head sections are pre-assembled at the factory. Check all hardware for proper tightness. Head cap is designed to allow front half to slide forward and be clamped to hold in place during installation of belt or servicing. Explosion vent door should not be altered in any way. Motor mount and torque arm will need to be adjusted to fit your drive package.



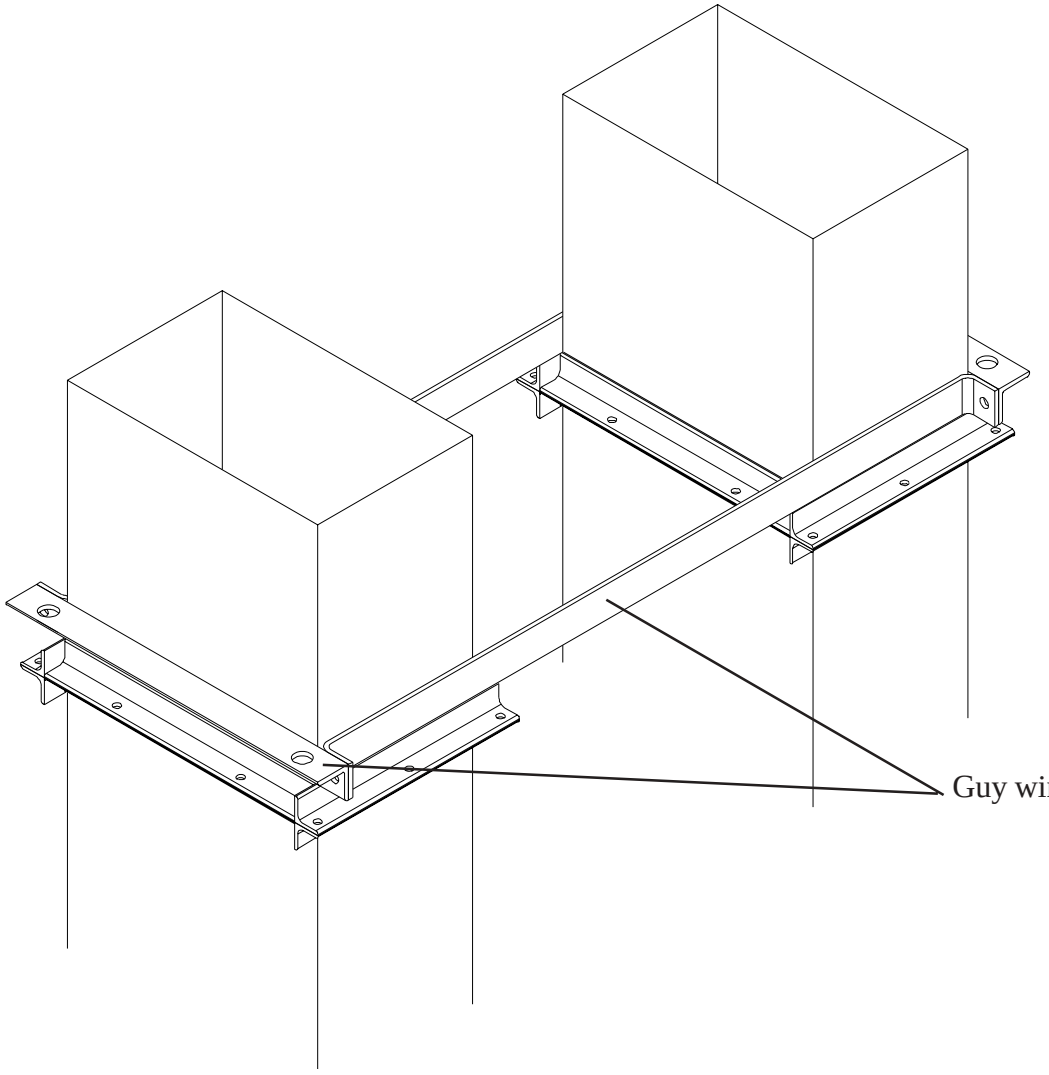
Typical Trunk Stacking Setups



Guy Cables and Anchors

The elevator leg is designed to be self supportive, but needs to be guyed or supported otherwise laterally every 20 feet against wind loads. At each 20 foot level , four cables must be attached in equal directions. Guy cables (not supplied) are to be of **sufficient strength, of uniform elastic nature and adequate tension** applied to prevent the elevator from whipping in wind storms.

⚠ Guy cables should not be attached by any other means than those provided. Welding to or cutting into the leg sections is prohibited unless approved by GSI manufacturing in writing.

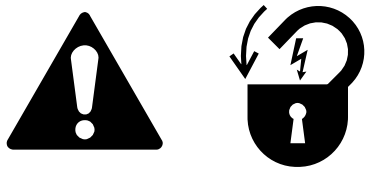


Gear Reducer

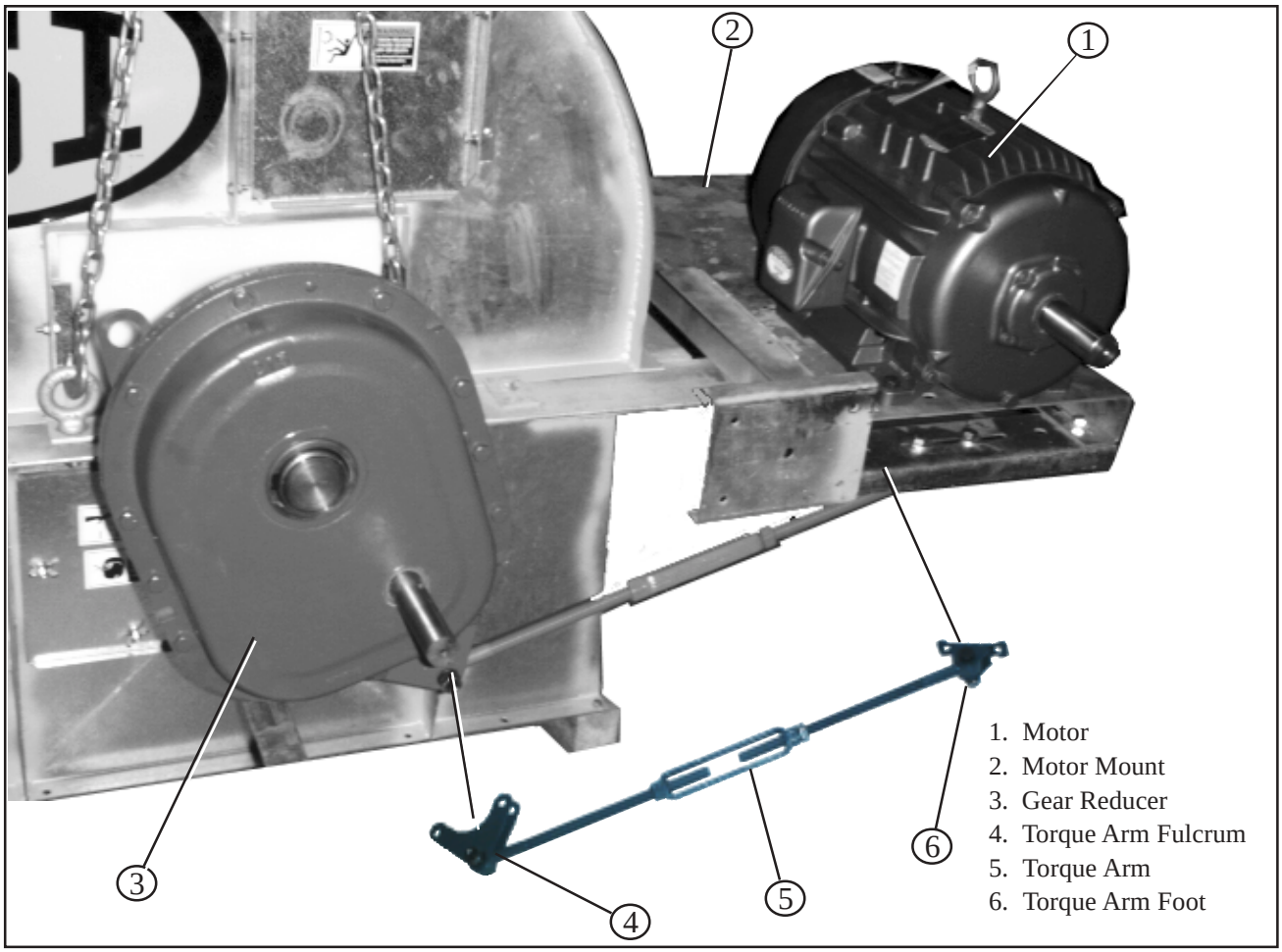
The gear reducer is packaged separately and includes manufacturer's complete instructions for installation. Follow these instructions. The reducer torque arm connects to the torque arm bracket, and is included with the motor mount. (See below). The gear reducer should be in the position shown. Adjust either the torque arm or where the foot is bolted to the torque arm to achieve these results. Tighten all bolts and setscrews. Check the gear reducer instructions for lubricant type and vent plug location.

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

A reducer backstop is standard on all series one bucket elevators. The reducer is equipped with a backstop, check for a correct direction of rotation by rotating the top of the head pulley toward 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 gear reducer instructions.



Explosion proof electrical equipment must be used whenever an elevator is located in an explosive atmosphere. A safety switch should be installed on the head to prevent accidental motor operation when servicing the head. Always practice proper lock out and tag out procedures when servicing equipment.



1. Motor
2. Motor Mount
3. Gear Reducer
4. Torque Arm Fulcrum
5. Torque Arm
6. Torque Arm Foot

1) Install shaft mount reducer on elevator according to the instructions provided by reducer manufacturer.

2) If not already mounted, mount belt guard bracket to motor mount using the bolts supplied. Do not tighten hardware.

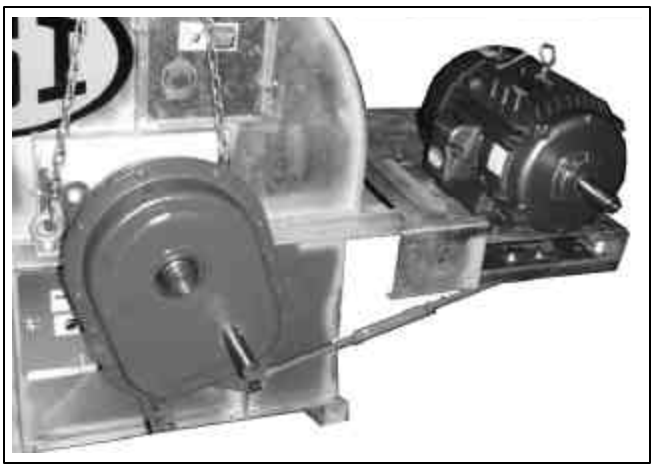
3) Mount motor onto elevator motor mount. Use bolts and lock washers provided in drive package. Motor mount may need to be adjusted, for proper alignment.

4) Hang belt guard back panel on motor and reducer shafts with the curved slot on reducer end and the round hole over the motor shaft. The warning decal should be upright and visible. Secure the back panel to belt guard bracket using plate, washer and 1/2" bolt provided. Adjust mounting bracket to give proper clearance between belt guard and panel and sheaves.

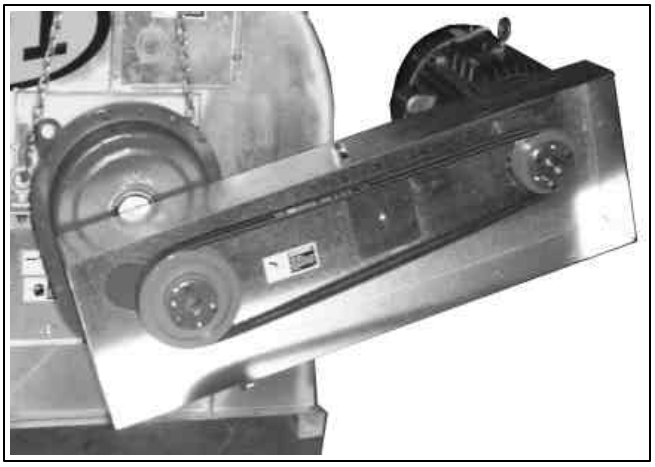
5) Drill a 7/16" hole in one of open holes of guard bracket through belt guard back panel. Secure together with 3/8" bolt through drilled hole. This insures drive guard will not move due to drive vibration.

6) Install adjustable "U" brace towards lower end of the belt guard back panel, positioning brace so that it does not interfere with belts or torque arm. Field drill a 7/16" hole in elevator housing and guard back panel to secure brace. Insert 3/8" bolts from inside of elevator to insure clearance between bolts and buckets.

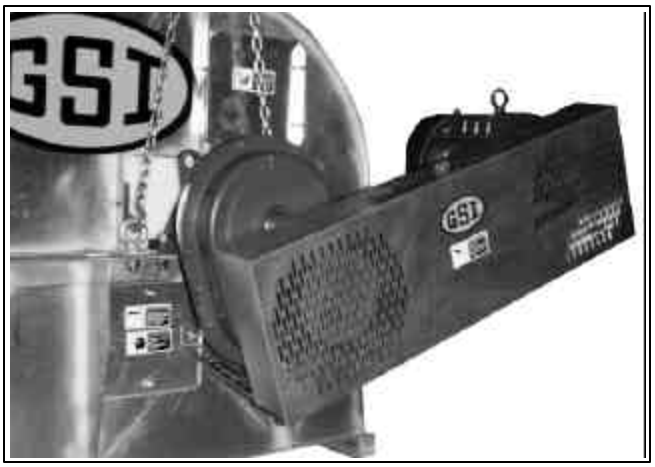
7) To finish belt guard installation place belt guard cover to back panel. Insert tabs in slots and hang in top holes first, then let cover close completely and secure with latches. Insert a cotter pin to insure the latch stays tight.



Drive Assembly.



Belt guard back panel.



Belt guard complete.

Belting, Buckets, and Splicing

Installing the belt can be accomplished several different ways. Typically, the belt is fed through the inspection door, up around the head pulley and back again by affixing a rope or cable.

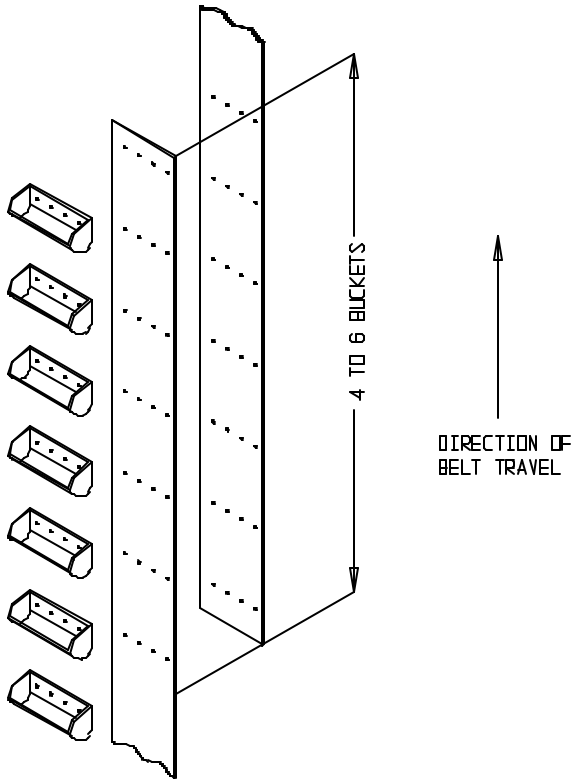
IMPORTANT! To prevent the belt from rolling over the top, anchor end securely.

When connecting the sections together use caution due to the weight of the belt countering your effects. A winching device may be required for best results. Prior to installing the belt, the bottom boot bearing slides should be adjusted to the upper most point to allow tightening for proper belt tension. On shorter installations, assembling the buckets to the belt first may be less time consuming. However, the additional weight of the buckets and connecting hardware make the belt more difficult to handle.

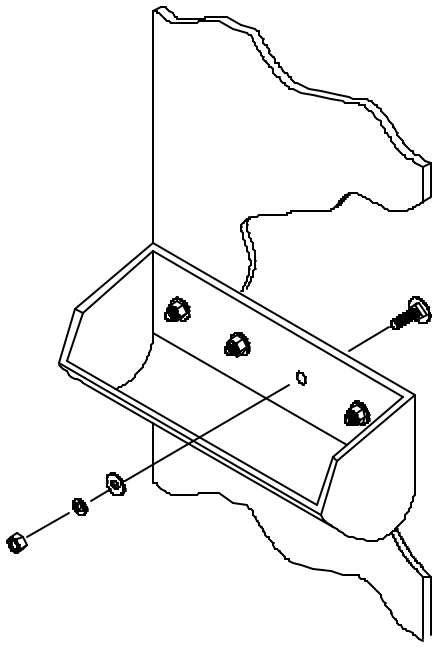
Belt splicing is usually accomplished by either an overlap splice or a bar splice. Again, before attempting to splice the belt, check the boot take up slides for positioning in the highest position. The overlap splice is usually accomplished by drawing one end of the belt over the other "overlapping" 4 to 6 buckets. Overlap the bottom belt on the cup side. (Refer to drawing).

An alternative method, the bar splice (not included) is usually accomplished by turning the ends of the belt out and affixing the manufactured bar splice components per the manufacturer's recommendations. Lacing and other specific types of belt splicing are not recommended. Please consult the factory or your contractor if in question.

Buckets are attached with the hardware provided. Insert bolts through back side of belt and bucket, secure with flat washer, lock washer and nut on bucket side. Tighten nut adequately to ensure the bolt head is slightly dimpled into belt. **Caution: Do not over tighten and break bolts.** Torque requirement for 1/4" fasteners is 50 inch pounds and for 3/8" fasteners is 96 inch pounds.



Overlap Joint



Typical attachment of buckets to belt.

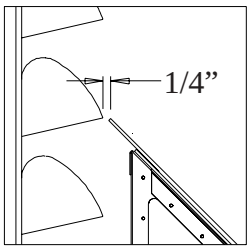
Drives and Lubrication

IMPORTANT! Reducers are shipped without oil. Check all drive components for proper lubrication. Refer to the instructions included with the drive unit for proper oil requirements. Install the vent plug per reducer manufacturer's recommendations.

Bearings are lubricated at the factory and do not require grease until after initial running of elevator. Bearings should be lubricated on a regular schedule and are best lubricated while rotating, until a thin film of grease appears at the seal. Contact the factory if you have questions on proper greasing.

Final Checks and Start-up

Adjust the throat plate in the head discharge so there is about 1/4" clearance between it and edge of the buckets on the lap splice



Do a final check of all parts to be sure all hardware is tight and no foreign objects or tools are left inside elevator. Check all guards, inspection doors, and removable plates to be sure they are in place and secure. Tighten the take-up screws on the boot evenly to tighten the belt on the pulley, keeping bottom pulley level, and work from side to side in small amounts until belt is tight.

Rotate by hand or carefully jog drive to check for proper rotation, clearance and operation of entire unit. Make any adjustments necessary. Jog minimum of one complete revolution of belt. If no problems exist, carefully run elevator while checking all aspects of operation of the unit.

Tracking of the belt is very important for optimum results. To correct any tracking problems first adjust the boot bearings. Adjust the take up screws downward on the side that the belt is tracking toward. If this does not correct the problem or if the belt is tracking properly on the boot pulley but not the head pulley, further adjustments to the head pulley may be required.

The bearing side that the belt is tracking toward may need to be shimmed to compensate. After loosening the head bearing bolts, use the jacking screws to raise the bearing. A full shim is placed under the bearing base, jack screws are backed off and the bearing mounting bolts are retightened. Use thin shims to make small adjustments until the belt tracks properly.

Once you are sure everything is complete and all adjustments are made and proper lubrication is done, run the elevator for an initial break-in WITHOUT load for several hours. Look and listen for any irregularities before running any material through the unit. Recheck all moving parts and adjust as needed. The final tension of the belt is done under load.

Maintenance

The belt will stretch after installation and may need further adjustment. Expect some stretching during the first few weeks of operation. Belt tension should be maintained by turning the boot take up screws slowly and evenly to maintain proper tracking. When the screw adjustment is completely used, the belt will have to be re-spliced. Good belt tension is critical for proper traction on the pulley and optimum performance.

Regularly scheduled maintenance will ensure long life and safe operation of the unit.

Routine maintenance checks may include general wear, loose nuts and bolts, electrical wiring, contacts, switches, misalignment, guy wire inspection, bearing seals and lubrication and oil content for gearbox .

WARRANTY

THE GSI GROUP, INC. ("GSI") WARRANTS ALL PRODUCTS MANUFACTURED BY GSI TO BE FREE OF DEFECTS IN MATERIAL AND WORKMANSHIP UNDER NORMAL USAGE AND CONDITIONS FOR A PERIOD OF TWENTY-FOUR MONTHS AFTER RETAIL SALE TO THE ORIGINAL END USER OF SUCH PRODUCTS. GSI'S ONLY OBLIGATION IS, AND PURCHASER'S SOLE REMEDY SHALL BE FOR GSI, TO REPAIR OR REPLACE, AT GSI'S OPTION AND EXPENSE, PRODUCTS THAT, IN GSI'S SOLE JUDGMENT, CONTAIN A MATERIAL DEFECT DUE TO MATERIALS OR WORKMANSHIP. ALL DELIVERY AND SHIPMENT CHARGES TO AND FROM GSI'S FACTORY WILL BE PURCHASER'S RESPONSIBILITY. EXPENSES INCURRED BY OR ON BEHALF OF THE PURCHASER WITHOUT PRIOR WRITTEN AUTHORIZATION FROM AN AUTHORIZED EMPLOYEE OF GSI SHALL BE THE SOLE RESPONSIBILITY OF THE PURCHASER.

EXCEPT FOR THE ABOVE STATED EXPRESS LIMITED WARRANTIES, GSI MAKES NO WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE IN CONNECTION WITH (i) PRODUCT MANUFACTURED OR SOLD BY GSI OR (ii) ANY ADVICE, INSTRUCTION, RECOMMENDATION OR SUGGESTION PROVIDED BY AN AGENT, REPRESENTATIVE OR EMPLOYEE OF GSI REGARDING OR RELATED TO THE CONFIGURATION, INSTALLATION, LAYOUT, SUITABILITY FOR A PARTICULAR PURPOSE, OR DESIGN OF SUCH PRODUCT OR PRODUCTS.

IN NO EVENT SHALL GSI BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING, WITHOUT LIMITATION, LOSS OF ANTICIPATED PROFITS OR BENEFITS. PURCHASER'S SOLE AND EXCLUSIVE REMEDY SHALL BE LIMITED TO THAT STATED ABOVE, WHICH SHALL NOT EXCEED THE AMOUNT PAID FOR THE PRODUCT PURCHASED. THIS WARRANTY IS NOT TRANSFERABLE AND APPLIES ONLY TO THE ORIGINAL PURCHASER. GSI SHALL HAVE NO OBLIGATION OR RESPONSIBILITY FOR ANY REPRESENTATIVE OR WARRANTIES MADE BY OR ON BEHALF OF ANY DEALER, AGENT OR DISTRIBUTOR OF GSI.

GSI ASSUMES NO RESPONSIBILITY FOR FIELD MODIFICATIONS OR ERECTION DEFECTS WHICH CREATE STRUCTURAL OR STORAGE QUALITY PROBLEMS. MODIFICATIONS TO THE PRODUCT NOT SPECIFICALLY COVERED BY THE CONTENTS OF THIS MANUAL WILL NULLIFY ANY PRODUCT WARRANTY THAT MIGHT HAVE BEEN OTHERWISE AVAILABLE.

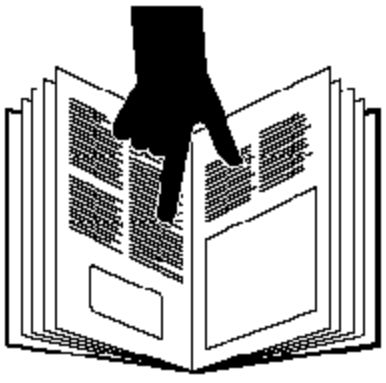
THE FOREGOING WARRANTY SHALL NOT COVER PRODUCTS OR PARTS WHICH HAVE BEEN DAMAGED BY NEGLIGENT USE, MISUSE, ALTERATION OR ACCIDENT. THIS WARRANTY COVERS ONLY PRODUCTS MANUFACTURED BY GSI. THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED. GSI RESERVES THE RIGHT TO MAKE DESIGN OR SPECIFICATION CHANGES AT ANY TIME.

PRIOR TO INSTALLATION, PURCHASER HAS THE RESPONSIBILITY TO RESEARCH AND COMPLY WITH ALL FEDERAL, STATE AND LOCAL CODES WHICH MAY APPLY TO THE LOCATION AND INSTALLATION.

Employer/Employee Training Sign Off Sheet

GSI is making every effort to warn, guard, and educate the consumer when using the various kinds of equipment that we manufacture. GSI has included this sign off sheet for you and your staff to use in the training process on installation and operation of the equipment described in this manual. Read the entire manual, sign off, and date on chart below.

DATE	EMPLOYEE SIGNATURE	EMPLOYER SIGNATURE



MATERIAL HANDLING

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October 1998