

Bucket Elevator

Owner's Manual



LAMBTON CONVEYOR LIMITED

102 Arnold Street

Wallaceburg, ON N8A 3P4

Canada



Telephone: (519) 627-8228

Toll free: (888) 239-9713

Fax: (519) 627-0250

www.lambtonconveyor.com

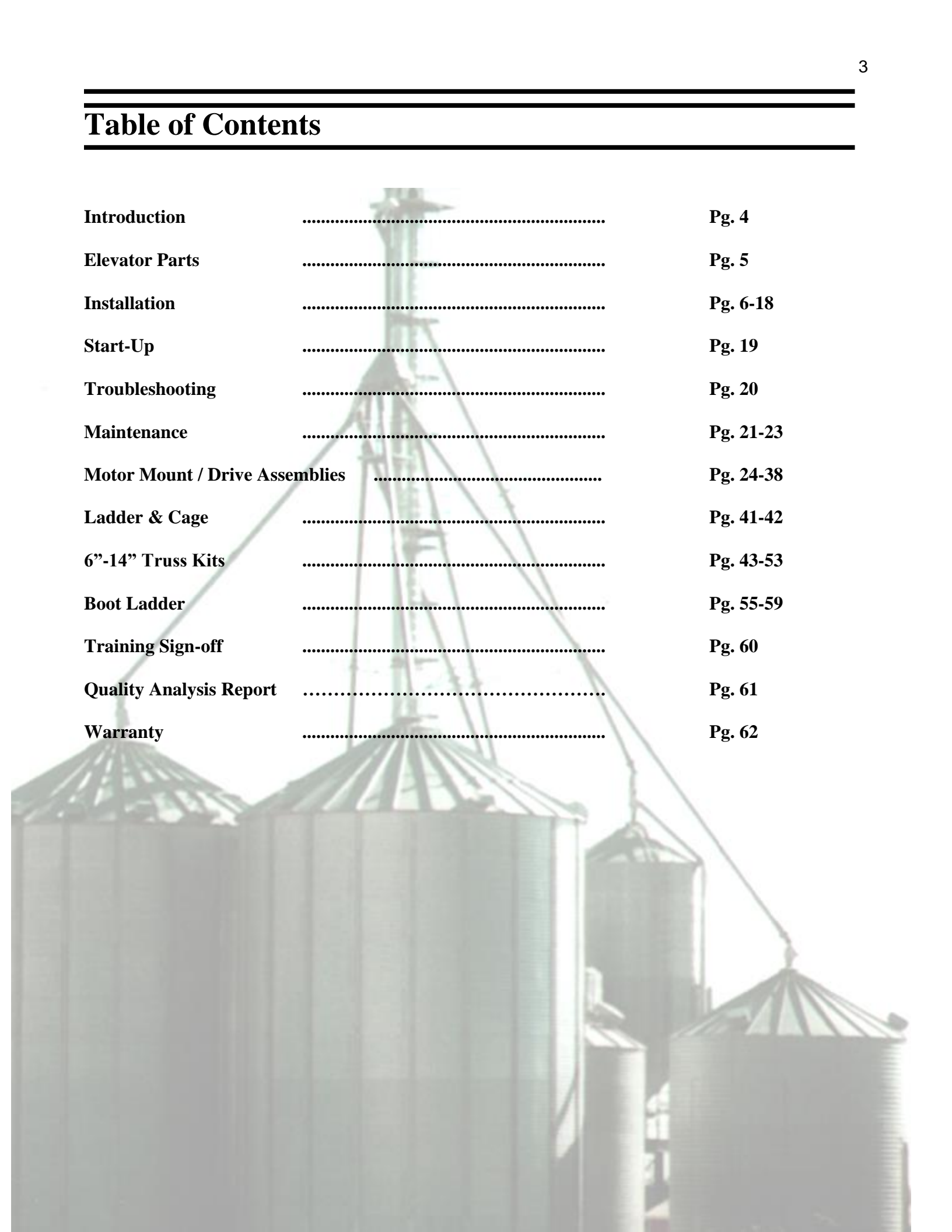
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Safety Guidelines

This manual contains information that is important for the owner/operators to know and understand. The information pertains to safety precautions and preventative maintenance procedures when operating and maintaining this equipment. It is the owner/operators responsibility to ensure that the operators and personnel working close to this equipment are aware of these safety guidelines. Failure to read and understand this manual is a misuse of the equipment and could result in serious injury or death.

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Introduction

This manual covers general information on the installation and maintenance of a Lambton Conveyor grain elevator. It also covers the many safety precautions that should be followed by all operators and personnel working around the equipment.

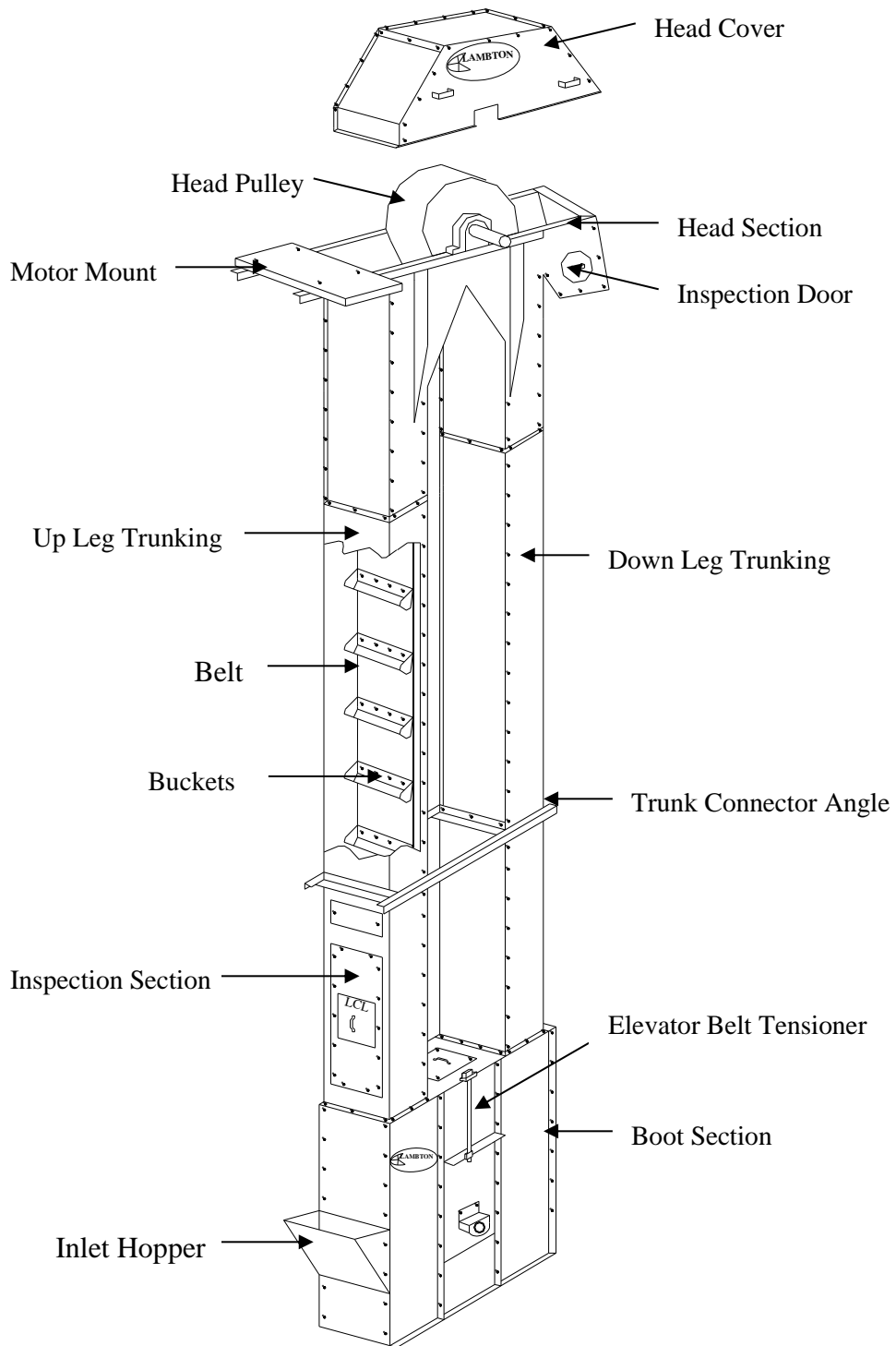
Due to the various situations we cannot cover all aspects of installing the elevator. We have provided a method for installation to be used as a guideline only, qualified contractors should be relied on to construct the elevator. Some conditions and surroundings alter the practices and steps that should be taken during assembly. For these reasons we cannot be responsible for the installation of the elevator. All personnel operating, installing, or maintaining the elevator should thoroughly read and understand this manual before working with the equipment.

It is Lambton Conveyors concern that all personnel associated with our grain handling equipment are kept safe. It is the buyer's responsibility to ensure that this manual is accessible to all personnel working with the bucket elevator. Safety labels have been installed at the manufacturing plant and should never be removed, altered, or covered in any way. Guards have been provided and should be in place at all times unless the elevator has been locked out. Failure to follow these guidelines could produce an extremely dangerous situation and may cause serious injury or death.

The following decal is found on various sections of the elevator, it is located where caution needs to be taken to avoid serious injury or death.



Elevator Parts



Installation

Inspection Upon Delivery

Carefully inspect your shipment as soon as it is received. Verify that the quantity of parts or packages corresponds with the packing slip. Any discrepancies should be taken care of immediately. Report any damages or shortage of parts to the delivering carrier as soon as possible. Lambton Conveyor's responsibility to damaged equipment ends with your acceptance to delivery. Save all paperwork and documentation with any of the elevator components.

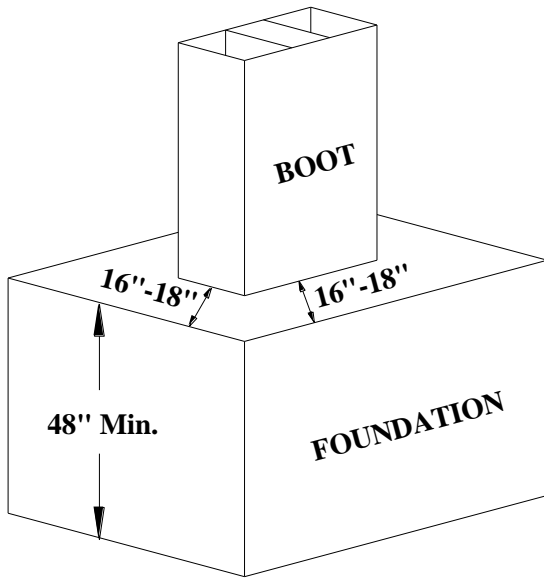
Pre-Installation Preparation

Lambton Conveyors bucket elevators are designed to be vertically self-supporting when erected but are required in all situations to be supported or guyed for additional loads such as wind, distributors, cleaners, spouting, etc. Separate structures or adequate support must be provided for any accessory equipment.

Lambton Conveyor does not assume responsibility for installation by any other vendor other than ours. The installation recommendations within this manual are for consideration only. The owner should consult a qualified civil or structural engineer regarding the design, construction and supervision of the installation, including the foundation and bracing systems. The most important part of the installation is retaining qualified personnel to plan, and erect the elevator as well as its accompanying equipment.

Installation

Consult a qualified engineer or contractor for recommendations on concrete reinforcing for the elevator foundation. The design must take consideration into dead loads, live loads, wind loads, and soil bearing capacity. The boot should be installed on a foundation that provides for adequate drainage to ensure that it stays dry. We have made some suggestions below on boot foundations but due to the various situations these should not be used without further insight to your specific application.



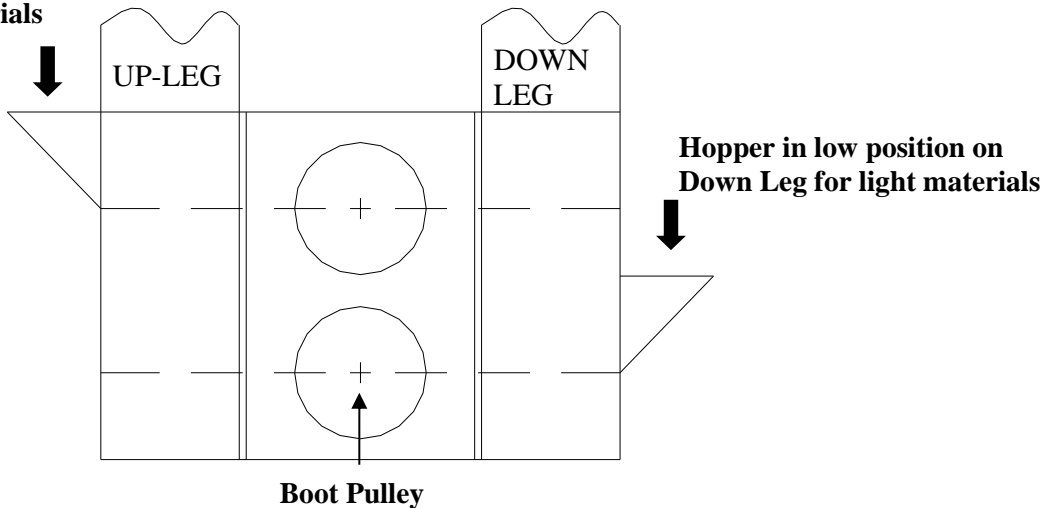
Foundation should be a minimum of 48" in depth. Length and width approximately 16"-18" from base of the boot.

Take time to identify the up and down sides of the boot before installing. After the boot is set into place it needs to be level in all directions prior to anchoring. Remove the boot cover and use a level that will span at least the width of the boot. Metal shims can be used around the perimeter of the boot to achieve a level and plumb position. Once the boot is in a desirable position use anchor bolts to secure the boot to the foundation.

Once the boot is installed the inlet hopper can be installed on either the upside or the downside of the boot, in a high or low position. Most free flowing materials such as grain are best fed into the boot on the up leg side in a high position. Feeds or light materials that tend to dust should be fed on the down leg side in a low position for max filling of the buckets. If mounting hopper on up leg in high position the bottom of the hopper should be no lower than the centre line of the pulley in its highest position. If mounting on the downside low position the hopper inlet should be no higher than the centre line of the pulley in its lowest position. Proper positioning of the inlet hopper is critical to the performance of the bucket elevator. Loss of elevator capacity will occur if buckets are not properly fed with incoming material. Boot hoppers are shipped separately and need to be installed to boot end panels. For more info on boot hopper placement refer to page 8.

Installation

Hopper in low position on
Down Leg for light materials



Do not leave any open space on boot ends above or below the hopper a tight seal needs to be maintained. All setscrews, and hub screws should be checked for proper tightness. The pulley should also be checked and adjusted if necessary.

Caution: End Panels should never be removed from a Boot section, this could cause an elevator to collapse resulting in extensive damage to the elevator and serious injury / death to those working in the area. If end panels are required to be removed a responsible individual should perform the task removing only one never both at a time. Lambton Conveyor takes no responsibility for injury, death, or damage resulting from the removal of the Boot section end panels.

Inspection Section

The inspection section of the bucket elevator has been designed for ease of installation and maintenance. Usually the inspection section is located on the up leg directly above the boot ideally at eye level for optimum service potential and should be specified by the owner upon ordering so we can accommodate to your needs. Depending on your application various lengths of trunking can be supplied to bring the inspection section to a desirable height. The inspection panel permits the installation of the belt and cups, while the inspection door allows you to check the filling of cups, and align the belt as needed. To install the belt and cups remove the front and back panels from the inspection section, these panels will be reinstalled after the belt and cups are in place.

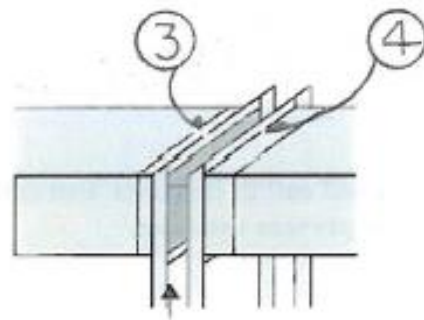
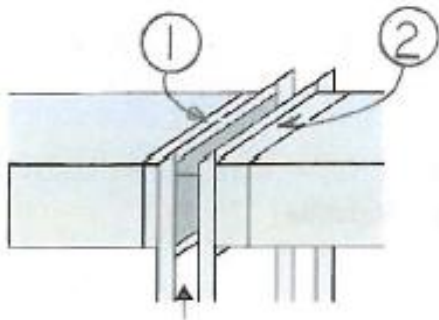
Installation

Trunking

Before the trunking is connected and installed the head, platforms, ladders and safety cages should be installed. Once all accessories are attached to the trunking caulking should be applied to the trunk connecting flanges while the sections are being connected. This will seal out any moisture and prolong the life of your elevator. Due to loading restrictions and safety concerns we recommend lifting 50' sections or less at one time. It is important to maintain plumb and square trunking in all directions. Initially this is done during assembly on the ground. It may be wise to have an electrician wire the elevator for power prior to it being raised and is also a good time to touch up any areas that the galvanized finish has been removed during assembly.

To raise the elevator remove the head cover and wire it to the service platform, now loop the crane cable around the head shaft and secure firmly. An additional line should be fastened to the bottom of the elevator and lifted using a loader or forklift, to prevent the trunk from dragging along the ground. This is for damage protection.

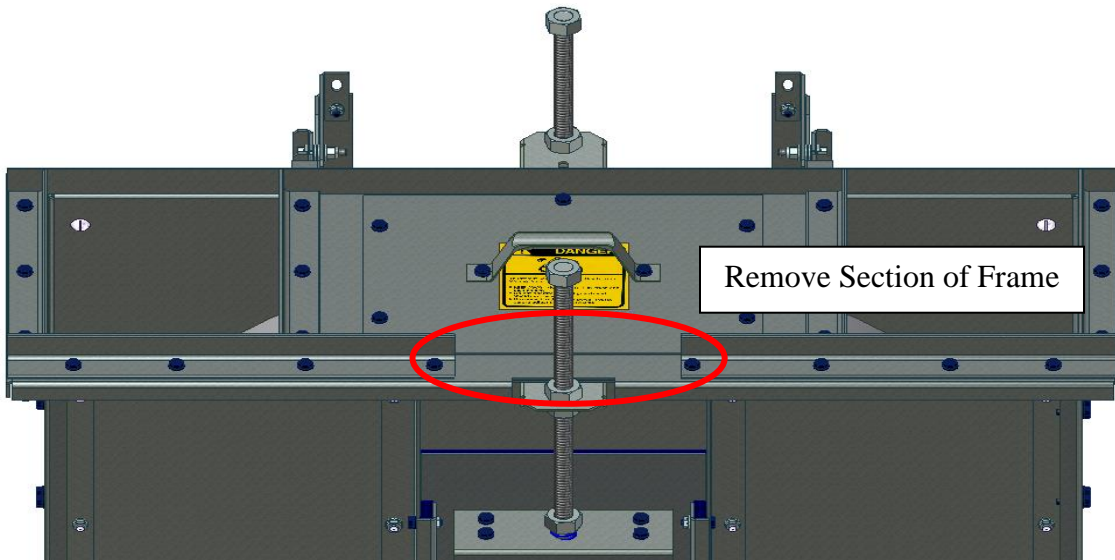
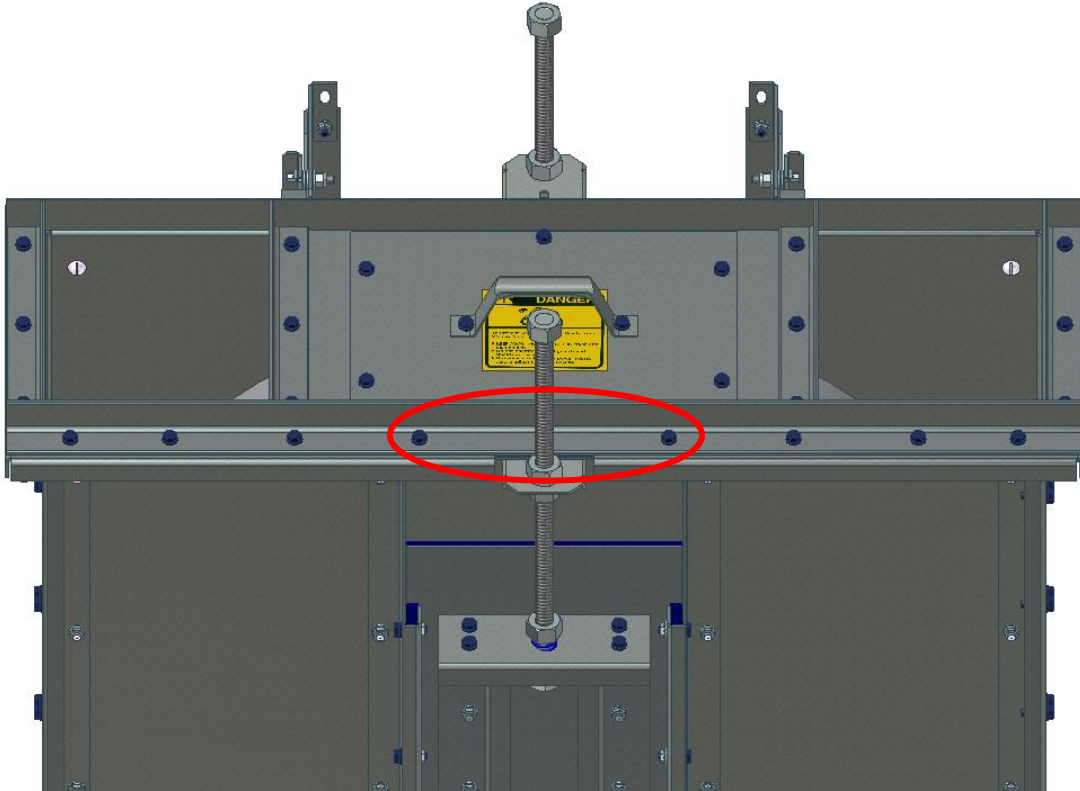
To prevent possible mis-alignment or twisting, assemble the trunk sections together as follows.... All trunk ends are punched with numbers 1,2,3 and 4. Match 3 with 4; and match 1 with 2 (refer to diagrams below).



1	3	4	2	1	3
2	4	3	1	2	4

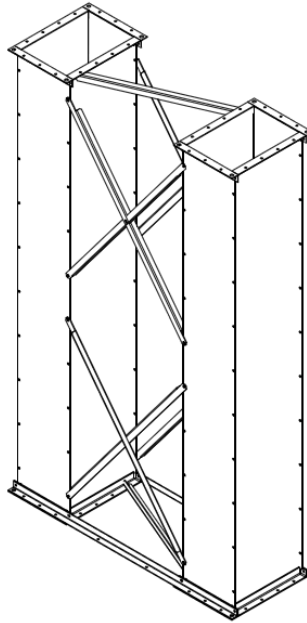
Trunk Frame at Boot

To allow a watershed area on the top of the boot, a small section of trunk frame should be cut out. This will allow water to run off of the boot and not pool near the inspection door. This action is only to be done on the frame that mounts to the boot.

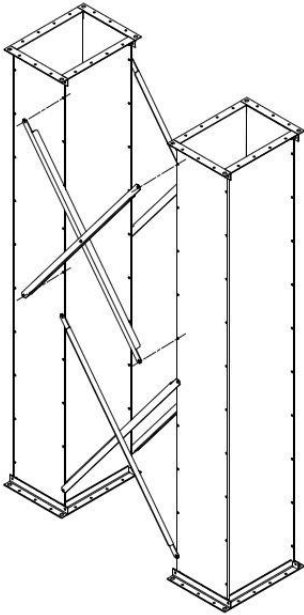


Cross Bracing and Tie Angles

All 42" models include trunk cross bracing (long and short) and tie angles as shown.

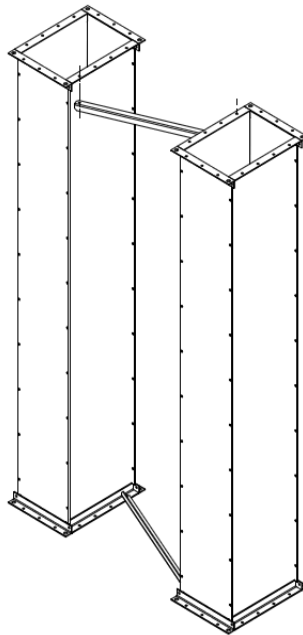


Long Cross Bracing



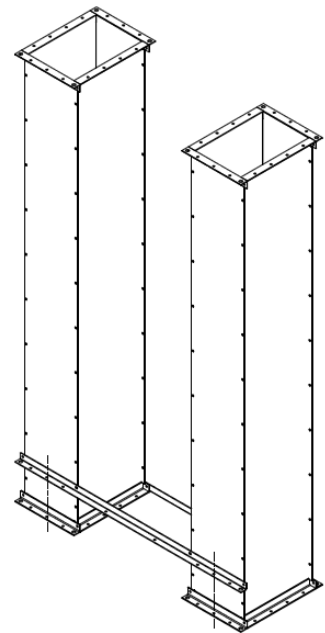
Long cross braces (8) are assembled to both sides of the trunk in sets of 2 using existing hem-lock bolts as shown.

Short Cross Bracing



Short cross braces (2) are mounted to the trunk flanges in opposite directions as shown. The braces should form a cross or "X" when consecutive trunk assemblies are joined together.

Tie Angles



Tie angles (2) are attached to both sides of the trunk on top of the lower flanges only as shown. There should be tie angles at every joint when consecutive trunk assemblies are joined together.

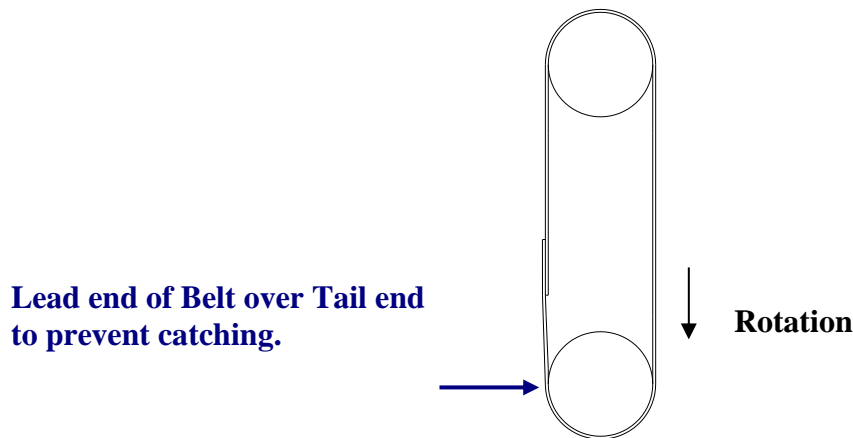
Installation

Belt & Cups

The boot pulley should be adjusted to its highest position initially to allow for belt tensioning after the installation. Installing the belt can be accomplished many different ways; typically a rope is fed from the head section down through the up-leg to the open inspection panel. The belt is then attached and pulled up around the head pulley, fed down the down-leg, around the boot pulley and then spiced to the other end of the belt.

Splicing the belt may require the use of a come-along or similar tool. This is usually accomplished by overlapping the **lead end** of the belt as it comes up from the boot section over the face of the tail end of the belt. It is important that the belt is lapped such that it cannot catch as it travels around each pulley (refer to diagram for clarification). The belt should be lapped at least the length of 4-6 buckets for strength purposes.

Cup bolts are inserted through the punched holes in the belting from the backside. **Note: if one side of the belt appears to be smoother than the other cups should be attached to that side.** The cups are secured using flat washers, lock washers, and nuts on the bucket side. Nuts should be tightened such that bolt heads are set into the back of the belt firmly. Cups should be installed on the belt prior to installation.



Installation

Motor & Drives

Prior to installing the drive assembly the head shaft should be checked for proper alignment and levelness. Shims can be used under the bearings to level the head shaft. A head pulley that is not aligned properly will prevent the belt from tracking properly.

Most drives consist of a motor and a reducer gearbox, or a jackshaft assembly. When using a reducer drive assembly follow the manufacturers instructions carefully to avoid damage. Sheaves should be installed as close to bearings as possible to prevent overhung loads and aligned using a straight edge to avoid excessive belt wear. The belts are then installed and tensioned by either the torque arm assembly or motor mount adjustment depending on the application. More info on the reducer and accessories is located in the manufacturers literature section of this manual. For info on sheave installation and torque specs refer to manufacturers instructions.

Note: Gear drives are shipped without oil do not operate the drive before filling with oil. Use the manufacturers recommended type and quantity found in the Manufacturers literature section of this manual.

All guards should be installed when finished with the drive assembly. The elevator should never be run in any circumstances without the guards in place. Failure to follow these precautions could result in serious injury or death.

Lubrication

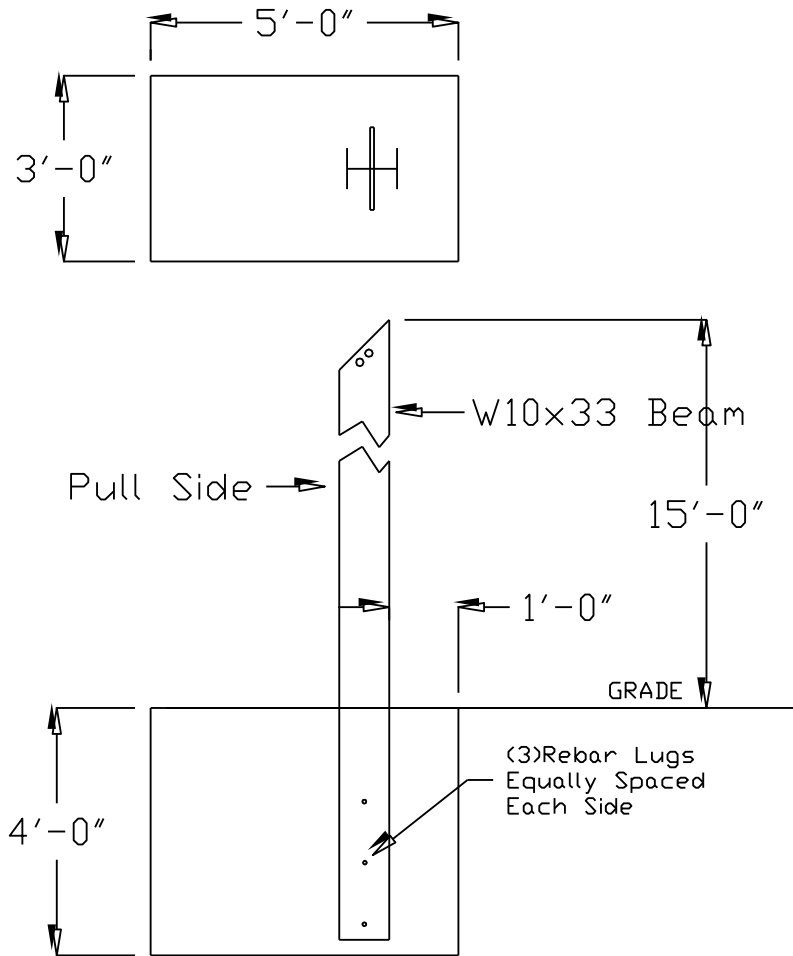
Reducers are shipped without oil; refer to Manufacturers section of this manual for type and quantity for your application. All bearings should be lightly lubricated before initial startup but fully lubricated during. Some bearings are equipped with auto greasers to prevent over lubricating. It has been our experience that most bearings are ruined from over lubricating rather than lack of it. Pressure guns tend to break the seals, in which they are unable to retain lubricant. Ensure that all employees are aware of this fact.

Guy Cables and Anchors

A concrete foundation needs to house a guy post support beam, which will support the cable tension. Guy cables should run from each corner of the elevator at equal angles to the guy posts located on the ground. The guy cables are adjusted to plumb the elevator. Charts are located on pages 11-12 to help you determine the proper setup for your application. Due to the various elevator sizes, geographical locations and conditions in which our elevators are erected we Lambton Conveyor cannot take any liability for results arising from these recommendations. It is the installer's responsibility to ensure proper guying or bracing for their specific application. We recommend a qualified civil or structural engineer be consulted for this part of the installation.

Installation

Guy Post Foundation and Anchoring



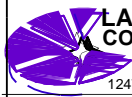
**** NOTE ****

- Foundation site should be well drained and free of vegetation and debris.
- Concrete shall have a min. compressive strength of 20mpa at 28 days.
- All material used for backfill should be a clean, well-graded, crushed stone or sand-gravel mixture.
- Backfill should be placed in 6" lifts and well compacted.

DUE TO VARIATIONS IN ELEVATOR SIZES & HIEGHTS CALL LAMBTON CONVEYOR TO CONFIRM IF THIS TYPE & SIZE OF ANCHOR IS ALLOWABLE

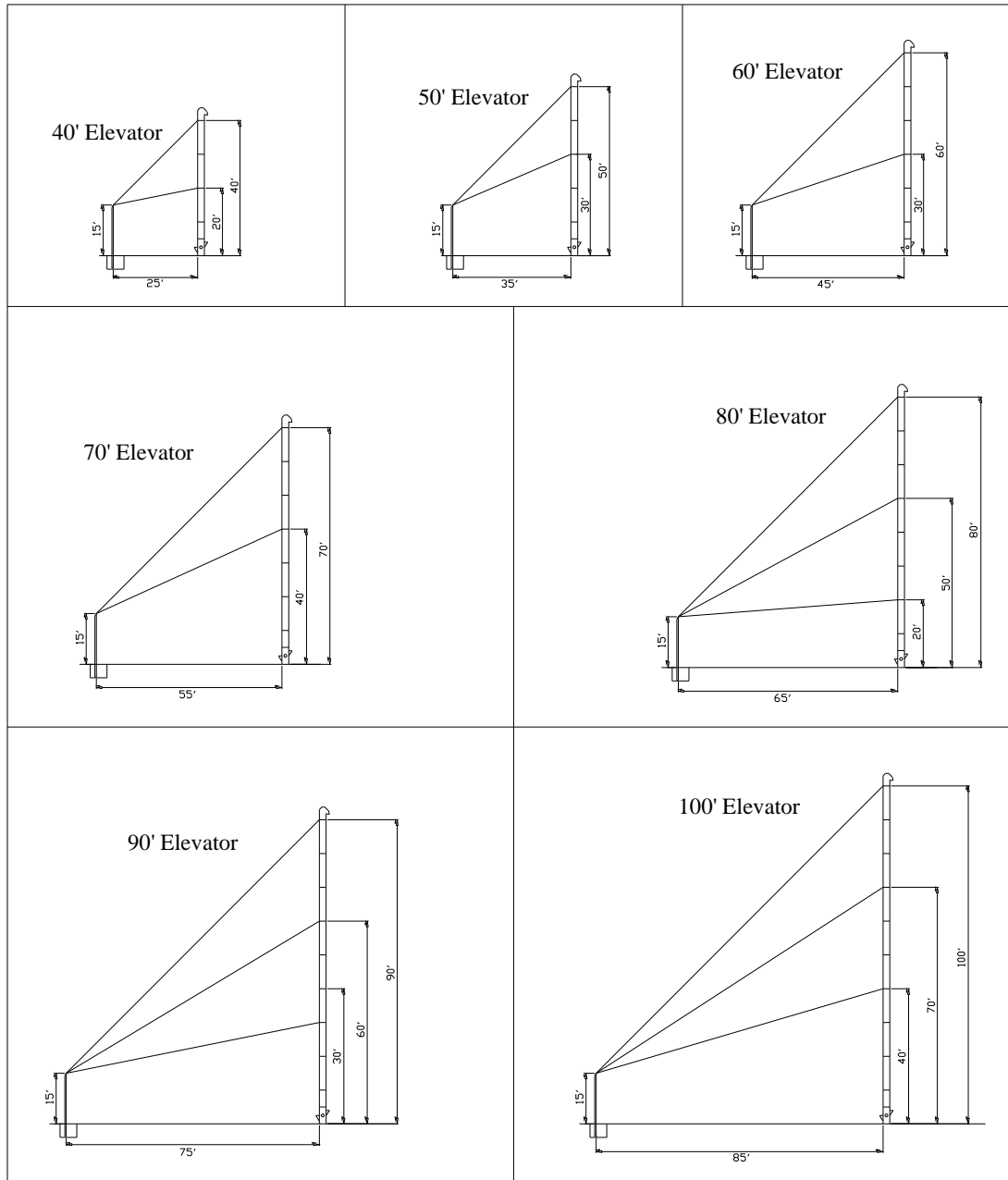
**** NOTE ****

ALL INSTRUCTIONS SHALL BE CONSTRUED AS RECOMMENDATIONS ONLY. DUE TO VARIATIONS IN LOCAL SITE CONDITIONS AND FOUNDATION INSTALLATION, LAMBTON CONVEYOR LTD. ASSUMES NO LIABILITY FOR RESULTS ARISING FROM THE USE OF SUCH RECOMMENDATIONS.

 LAMBTON CONVEYOR Grain Equipment Leaders 1247 Florence Rd, Florence ON, CA NOP 1R0	Phone: (519)695-2316	Fax: (519)695-2529
Guy Post Leg Anchor	JOB NO	
	CHKD BY	
	DRN BY	
	DATE	
	SCALE	3/8" = 1'
	FIG NO	GUYPOST.DWG

Installation

Suggested Elevator Guy Cable Locations

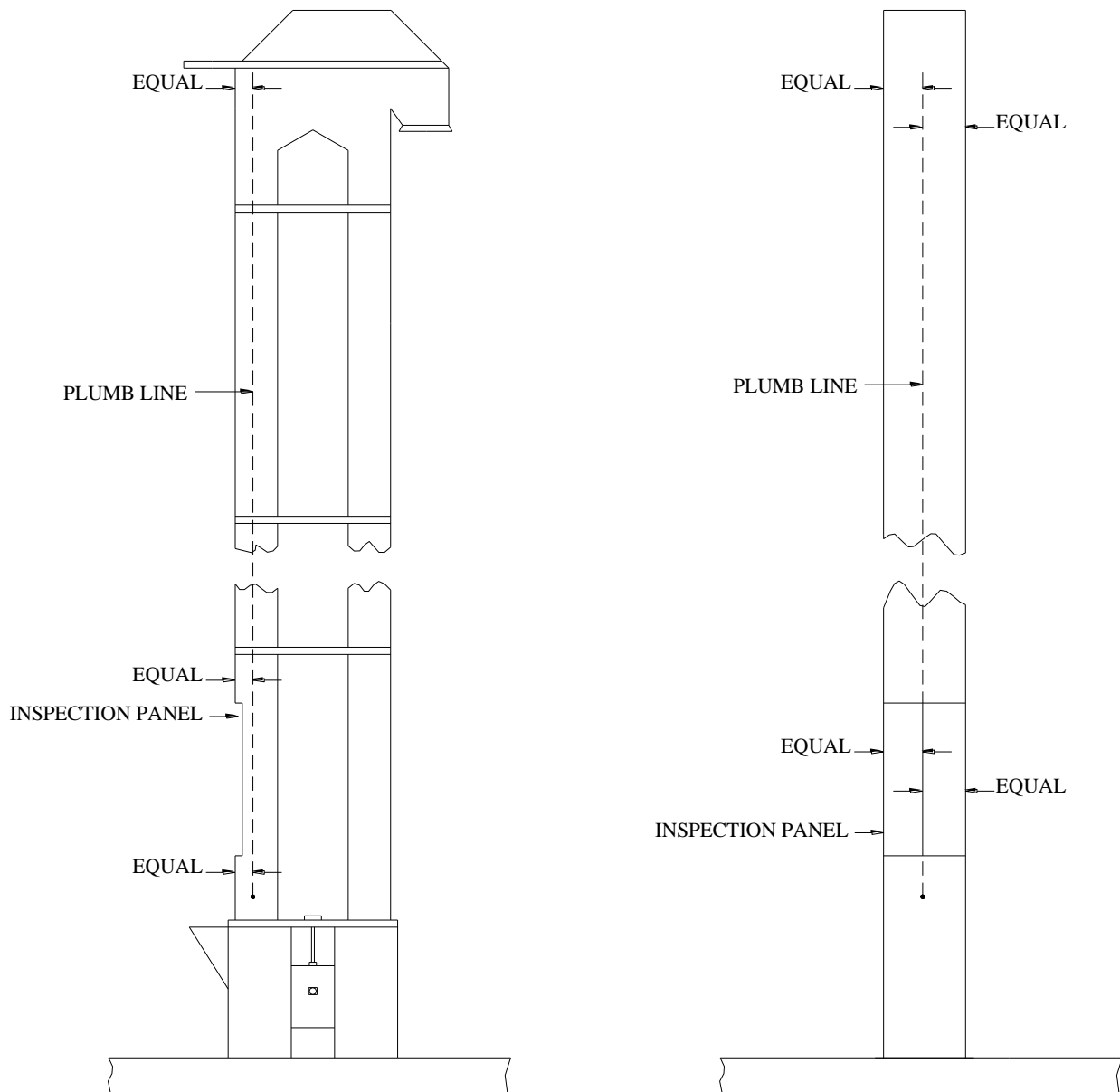


- 1) All cables must be tensioned equally and produce no downward pull on the elevator.
- 2) All heights shown are from grade.
- 3) Guy angles should be no more than 45° to prevent downward pull on the elevator.
- 4) Guys are to be located at all four corners of elevator, running to equally spaced support posts.
- 5) Diagram should be used as a recommendation only

Installation

Plumbing

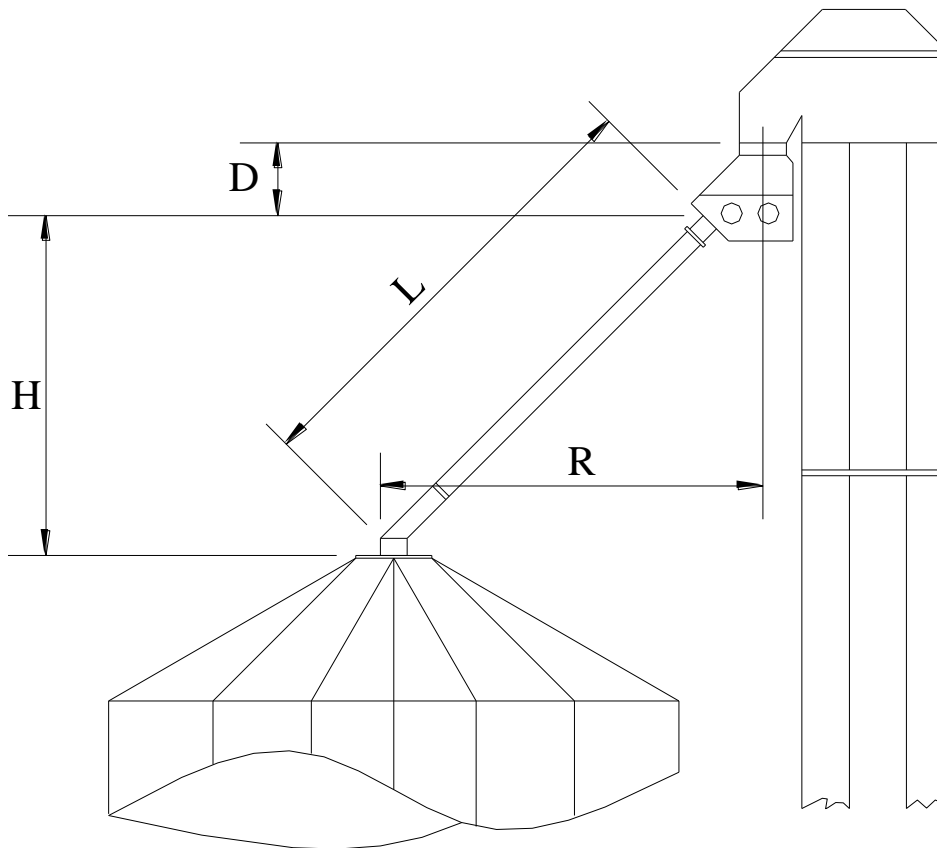
Various methods can be used to plumb the elevator including laser, transit, and plumb bob. Refer to below diagram if using the plumb bob method.



Installation

Spouting

Use the following diagram and chart to determine the lengths of spouting required for your application.



R	Dry Grain 38°		Wet Grain 45°		Feed 60°	
	L	H	L	H	L	H
16	20 ½	12 ½	23	16	32	28
18	23	14	25 ½	18	36	31
20	25	15.5	28 ½	20	40	35
22	29	17	31	22	44	38
24	30	18 ½	34	24	48	42
26	33	20	37	26	52	45
28	35 ½	22	40	28	56	48 ½
30	38	23 ½	42	30	60	52
35	44	27	49 ½	35	70	61
40	50 ½	31	57	40	80	70
45	57	35	64	45	90	78
50	63 ½	39	71	50	100	87

D= Discharge Loss due to distributor or valves

H= Height of spouting

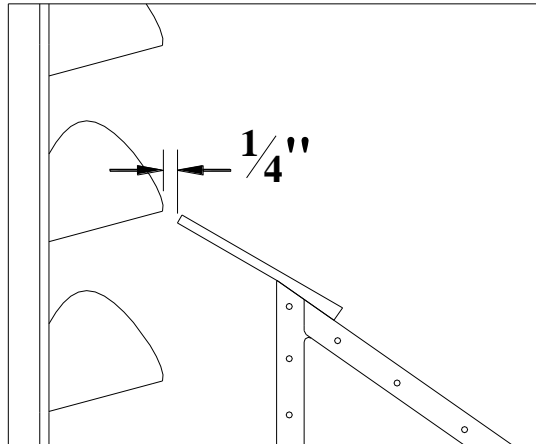
L= Length of spouting

R= Distance to bin

Installation

Final Checks before Start-up

The cup flapper should be adjusted in the head discharge so there is approximately $\frac{1}{4}$ " of clearance between it and the edge of the cups on the lap splice of the belt.



A final check of all parts to ensure that no foreign objects or tools have been left in the elevator is a good idea. All guards, inspections doors, and removable plates should be checked for proper placement. The boot belt tensioners need to be adjusted to tighten the belt on the pulley, adjust each side in small increments until the belt is tight. The drive should be turned by hand to check for proper rotation and clearance. Rotate the belt around a full rotation to check for any obstructions. Make any necessary adjustments. Finally check all setscrews to ensure they are tightened.

Start-Up

Start-Up

After a check of all mentioned components carefully run the elevator without load and check for any problems or necessary adjustments. Make certain that the belt is running in proper alignment, and operating over the centre of each pulley. If adjustments are needed first adjust the boot bearings as needed. If the belt is still not tracking correctly head pulley adjustments may be necessary. Shims can be used underneath the head pulley bearings to correct the belt alignment.

Once all sections of the elevator have been thoroughly checked, all adjustments have been made and proper lubrication is done the elevator can be run **without** load for several hours for an initial break in. Look and listen carefully for any irregularities before running any material through the elevator.

Once you are satisfied with the operation of you elevator it can be put into use. At this point it may be a good idea to check your flow system. Be sure that valves & distributors if equipped are functioning properly.

A chart is located on the following page to assist you in recognizing and repairing any problems you may have with your elevator during start-up or in the future. We at Lambton Conveyor stand ready to assist you with any problems or concerns regarding the operation of our equipment. Feel free to call upon us at any time for information or assistance.

Troubleshooting

Problem	Cause	Solution
Back Legging	Loose Belt	<ul style="list-style-type: none"> • Adjust take-up • Shorten Belt
	Damaged/Missing Buckets	<ul style="list-style-type: none"> • Replace or repair buckets • Find cause
	Obstruction in discharge, distributor, or spouting	<ul style="list-style-type: none"> • Inspect, and remove obstruction • Repair
	Incorrect Spouting Angle	<ul style="list-style-type: none"> • Refer to page 14 for recommended spouting angles
	Overfeeding	<ul style="list-style-type: none"> • Check pit power output • Make adjustment at inlet
	Airlock	<ul style="list-style-type: none"> • Venting may be needed at boot or head
	Cup Flapper out of adjustment	<ul style="list-style-type: none"> • Refer to page 15 for spec
	Loose Buckets	<ul style="list-style-type: none"> • Tighten all bucket bolts firmly
	Overloading	<ul style="list-style-type: none"> • Check overloading capacity
	Wrong Head shaft speed	<ul style="list-style-type: none"> • Check sheave placement (if reversed)
Underfeeding	Buckets not full	<ul style="list-style-type: none"> • Check pit power output
Build-up on Buckets	Material wet or powdery	<ul style="list-style-type: none"> • Dry Material
Noise in Up-Leg	Buckets fully loaded	<ul style="list-style-type: none"> • System working well, full buckets will pump grain up leg for several feet
Belt runs to one side	Out of Plumb Head Bearings uneven Incorrect Belt Tension	<ul style="list-style-type: none"> • Re-check and align • Shim lower side until belt centers • Tension Belt correctly
Missing or Damaged Buckets	Belt Loose Leg not Plumb Obstruction within Leg Build-up on Pulley (ice, etc)	<ul style="list-style-type: none"> • Tighten take-up or shorten belt • Re-plumb • Repair or remove • remove buildup
Build up on Pulleys	Powder or Sticky Material	<ul style="list-style-type: none"> • Winged boot pulley required
Low Capacity	Air Lock	<ul style="list-style-type: none"> • Vent elevator head or boot • Vent bins that are being loaded
	Incorrect spouting size or angle	<ul style="list-style-type: none"> • Check recommendations
	Not feeding enough	<ul style="list-style-type: none"> • Insure required material is being fed at an adequate rate
	Loose Belt	<ul style="list-style-type: none"> • Check for slippage (snug belt) • Check head pulley lagging (replace if necessary)
	Baffle plate in conveyor hopper out of adjustment	<ul style="list-style-type: none"> • Raise baffle plate
	Wrong Head RPM	<ul style="list-style-type: none"> • Check specs. for your elevator
	Buckets Caked or Damaged	<ul style="list-style-type: none"> • Visually inspect, clean, or replace
Excessive Belt Slippage or Burning	Pulley Lagging is worn or loose Ice/moisture on head pulley	<ul style="list-style-type: none"> • Replace with recommended lagging • Run elevator to dry pulley (remove ice if significant)
	Loose Belt	<ul style="list-style-type: none"> • Tighten take-up or shorten belt
Belt Excessively Loose	Stretched Belt	<ul style="list-style-type: none"> • Adjust boot pulley • Re-splice belt if necessary
Overloading of Leg	Pit conveyor running too fast Head Pulley running too slow	<ul style="list-style-type: none"> • Check conveyor speed • Check pulley speed, and reducer for correct gear ratio

Tel #: (519) 627-8228

Toll Free #: 1 (888) 239-9713

Fax #: (519) 627-0250

Maintenance

Routine maintenance checks may include general wear, tightening of nuts and bolts, cleaning of electrical connections and switches, alignment adjustments, guy cable inspection, and lubrication of bearings, gearbox, and other necessary components.

Warning: Elevator needs to be locked out before any maintenance is performed.

Gearbox / Bearings

Check Gearbox oil level every 50 hours.

Change oil in gearbox after the first 24 hours and then every 2,500 hours

Grease all bearings every 800-1000 hours.

To fill the gearbox, remove the plug from the gearbox. See **Figure 132**. On the Bucket Elevator gearbox, fill up to the hole. **Gearboxes are not shipped with oil, so immediate filling is required.** Check these points weekly or every fifty (50) hours of operation.

Grease all bearings every 800 - 1000 hours. See **Figure 131**.



Figure 131
Bearing Grease Zerk



Figure 132
Gearbox Oil Plug

Additional Maintenance Tips

- Check for deterioration or looseness of any bolts or fasteners and continued secure attachment of all ladders and platforms.
- Check the Pulley hub bolts and set screws after the first 8 - 10 hours of operation.
- Check for wear in the spouting.
- Make sure no tools get left in the Bucket Elevator after maintenance.

Fasteners

Check for loose bolts and fasteners after a few days and then every 3 to 4 weeks?

Head and Boot Pulleys

After the first 10 hours of operation, check the pulleys for proper alignment and retighten the taper lock hub bolts and bearing set screws.

Periodically check pulleys for alignment.

On installations that require the Elevator boot to be in direct exposure to extreme weather conditions, it is recommended that the take up bolts be liberally treated with lubricating oil or rust preventative. This will make the take-up operate more easily when necessary.

Leg Belt

Check the belt tension and belt tracking daily.

Check for wear on the sides of the belt. This can indicate misalignment or material build up on the belt or pulleys.

Check for scuffing and wear on back of belt. This usually indicates that the belt is slipping on the head pulley.

A misaligned belt can work over and rub on the side quickly causing damage to the leg.

Belt tensioners should be adjusted in small increments until adequate tension is present

Belt Tension

The belt will stretch after installation and may need further adjustment. Some stretching can be expected during the first few weeks of operation. Belt tension should be maintained by adjusting the belt tensioners located on the boot section when needed. Belt tensioners should be adjusted in small increments until adequate tension is present. Once the belt tensioners have been fully used the belt will need to be re-spliced. Good belt tension is critical for proper traction on the pulleys and optimum performance.

The belt tension needs to be sufficient enough to prevent the belt from slipping at the head pulley. It also needs to be tight enough to prevent discharge of the cups in the up leg. If the belt tracks properly and does not slip when the elevator is operating at maximum capacity, then the belt is sufficiently tensioned. Tension adjustment, however, must wait until the entire installation is complete and material (the product; grain, etc.) can be conveyed to and from the elevator. The belt can be tensioned by comparing the Revolutions Per Minute (RPM) of the boot shaft to that of the head shaft. Check this under load and running empty. Belt slip is most often detected by observing the bearing setscrews on the head and tail shafts while counting the number of revolutions of pulley in the same period of time, typically 30 to 60 seconds.

If the head and boot pulley are the same diameter, then the RPM of the boot shaft will be slightly greater (1-2 RPM) because the lagging on the head increases the diameter of the pulley.

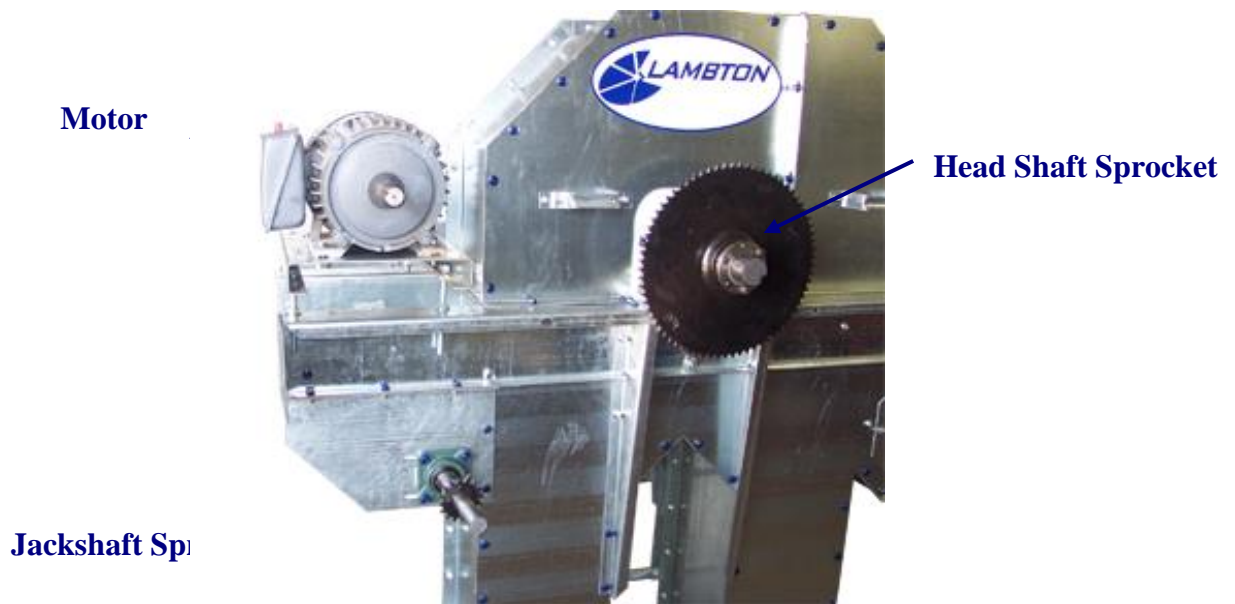
If the boot pulley is smaller in diameter than the head, then the boot shaft RPM will be substantially greater. If the belt is slipping and all other conditions appear to be normal, adjust the takeup. Verify that the belt continues to track the center of the head and boot takeup pulleys. If it does not, check to see if the material being fed into the elevator is entering at an angle and forcing the belt to one side of the pulley. This condition, if it occurs, must be corrected. Continual lateral pressure on the belt can cause the belt edge to rub against the elevator structure causing rapid wear on the belt. More serious than wear, a fire and/or explosion can occur if belt friction generates sufficient heat.

Once the Belt tensioners have been fully extended the belt will need to be shortened and re-spliced. The usual shortening is equivalent to one bucket elevator cup, however if the belt has been allowed to run loose for an extended period of time further shortening may be required.

Jackshaft Drive Assembly

Step #1

Locate the motor and bolt it to the motor mount as shown in the diagram. The Jackshaft and Head shaft sprockets can also be set into position but not tightened at this stage. Applying anti seize compound to the shafts before hand is a useful aid should the sprockets ever need to be removed. Do not apply compound between sheave and sheave bushing or cracking could occur.



Step #2

The chain can now be installed and the sprockets can be adjusted to ensure that the chain will run true. Once this is achieved the sprocket set screws can be tightened, the chain guide block can be installed and the jackshaft can be adjusted to tension the chain then tightened into position.

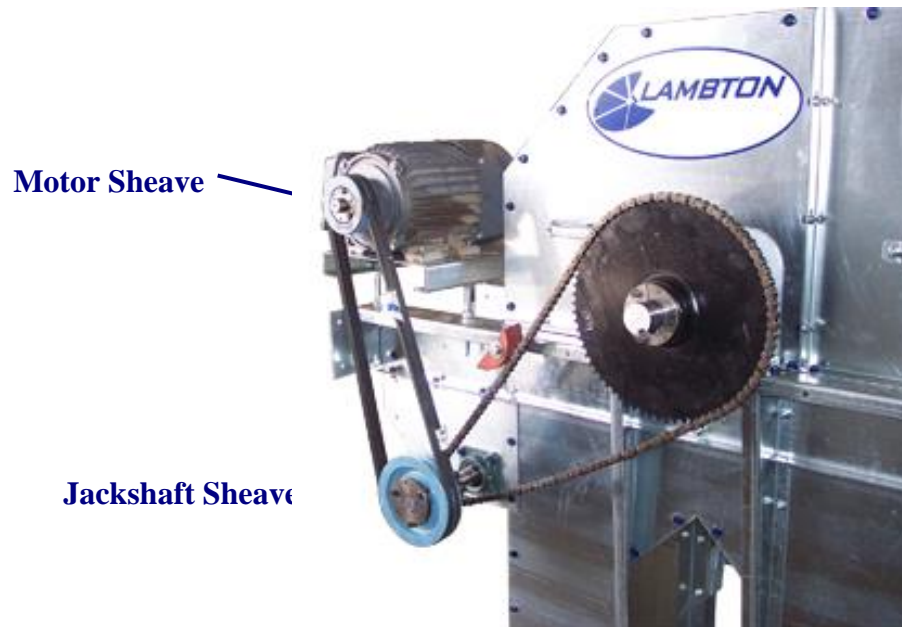


Chain Guide

in

Step #3

The motor and jackshaft sheaves can now be installed and left loose to allow for adjustment. Now install the belts and adjust the sheaves to ensure the belt will run true and tighten into place. Once all components are aligned adjust the motor mount evenly at all four corners to tension the belts. The drive assembly is now finished and should resemble the following.



Motor Sheave

Jackshaft Sheave

Step #4

Install the guard brackets and guard as shown.

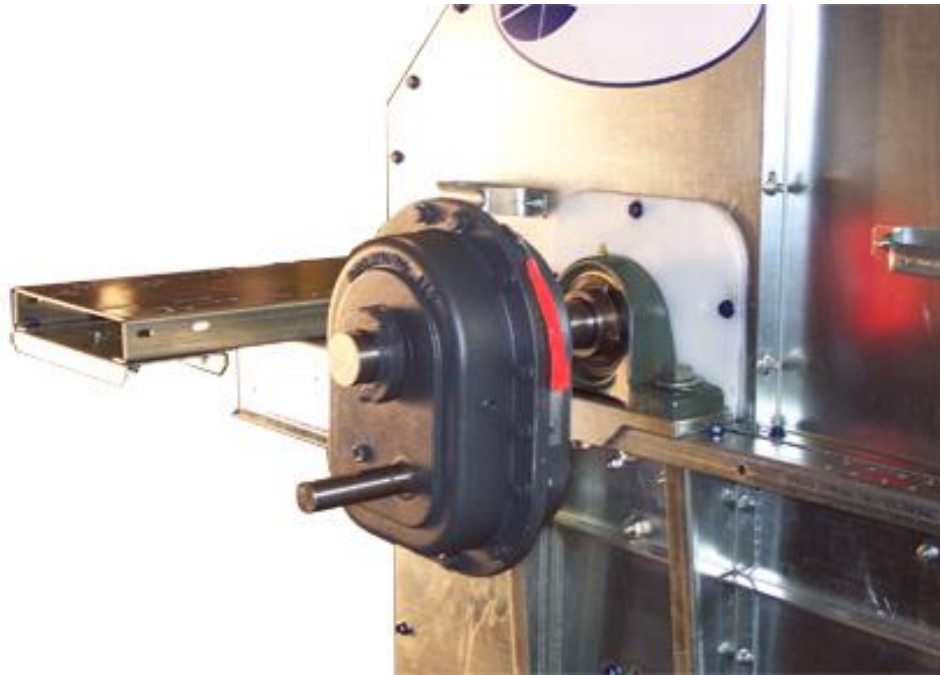


Rear Mounted Single Motor Reducer Drive Assembly

The following assembly outlines the installation of a reducer drive, motor, and guard being installed for a Rear Mounted Single Motor assembly. The gearbox is shipped without oil; refer to installation and maintenance manual for the required type and amount.

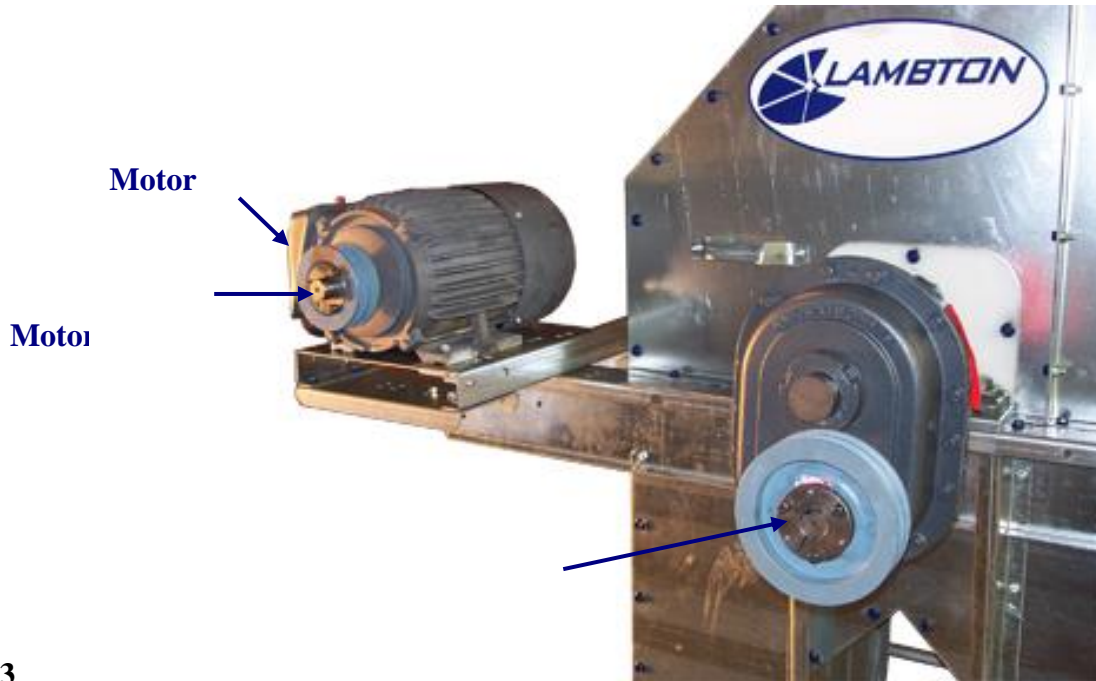
Step #1

Start by installing the Bushing Kit and Gearbox on the head shaft. The torque taper bushing slides on the shaft before the gearbox when using the standard “Browning” gearbox. Applying anti seize compound to the shaft before hand is a useful aid should the gearbox ever need to be removed. The torque taper bushing should be tightened to the gearbox only enough to prevent it from sliding on the shaft. For more info on installing the reducer refer to the “Browning” installation and maintenance manual that comes with the gearbox.



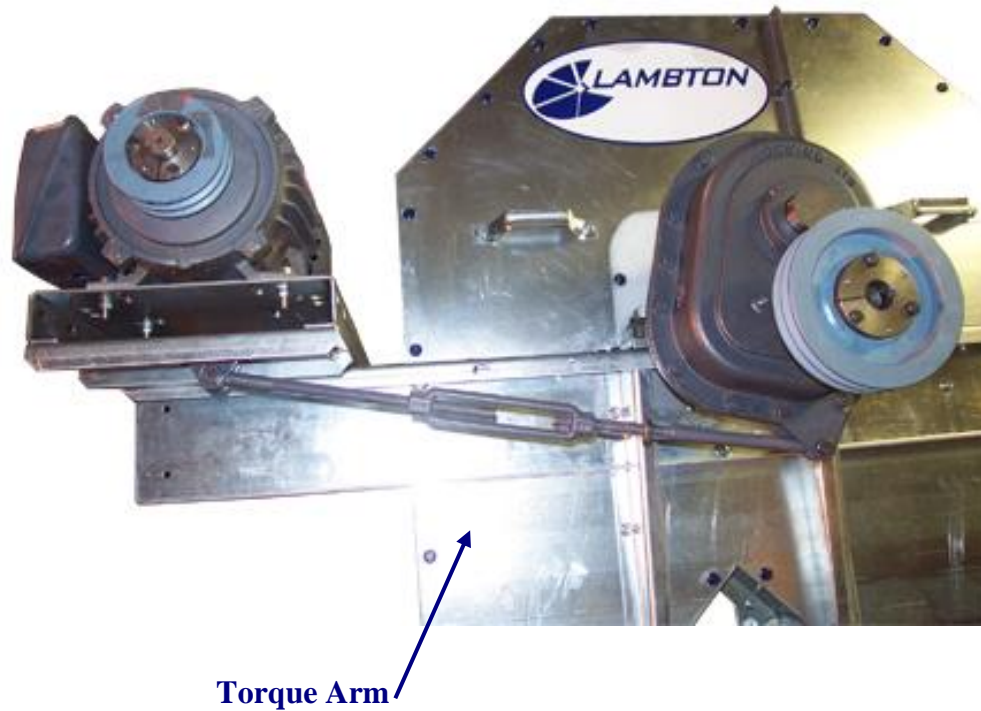
Step #2

Next install the motor as shown and bolt into place. The motor sheave and reducer sheave can also be installed and left un-tightened for the time being to allow for adjustments. If applying anti seize compound to shafts do not apply between sheave and sheave bushing or cracking could occur.



Step #3

The Torque Arm and mounting brackets can now be installed to the motor mount plate and reducer drive as shown in the diagram.



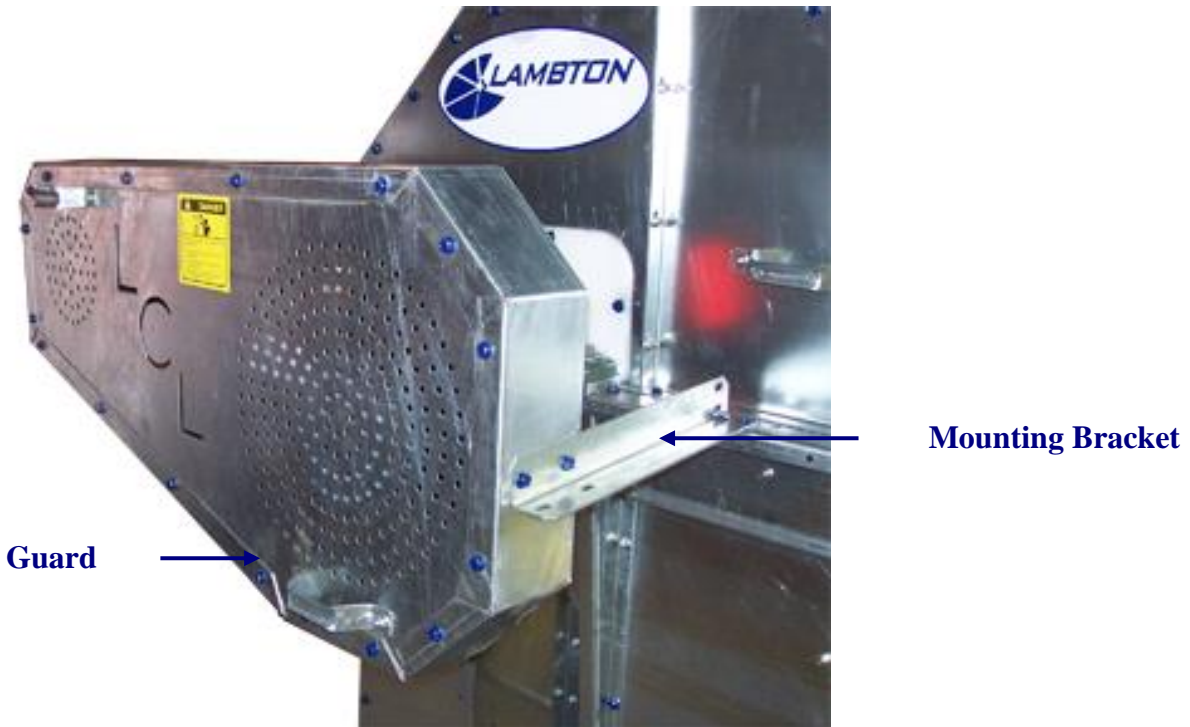
Step #4

Now install the belts and adjust the reducer drive and/or sheaves so the belts will run true. Once the sheaves are aligned tighten all components. The torque arm can now be adjusted to tension the belts.



Step #5

Install the Guard Brackets and Guard to the head assembly.



Rear Mounted Double Motor Reducer Drive Assembly

The following assembly outlines the installation of a reducer drive, motors, and guard being installed for a Rear Mounted Double Motor Assembly. The gearbox is shipped without oil; refer to installation and maintenance manual for the required type and amount.

Step #1

Start by installing the Bushing kit and Gearbox on the head shaft. The torque taper bushing slides on the shaft before the gearbox when using the standard “Browning” gearbox. Applying anti seize compound to the shaft before hand is a useful aid should the gearbox ever need to be removed. The torque taper bushing should be tightened to the gearbox only enough to prevent it from sliding on the shaft. For more info on installing the reducer refer to “Browning” installation and maintenance manual.

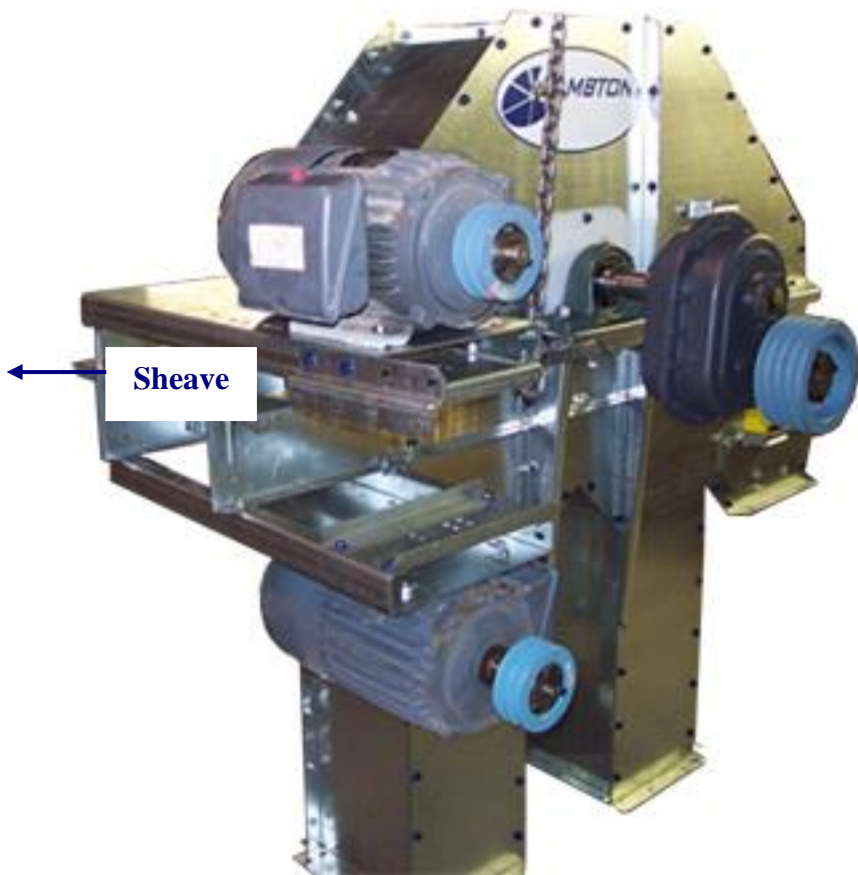


Step #2

Next install the motors as shown and tighten into place. The motor sheaves and reducer sheave can also be installed and left un-tightened for the time being to allow for adjustments. If applying anti-seize compound to shafts do not apply between sheave and sheave bushings or cracking could occur.

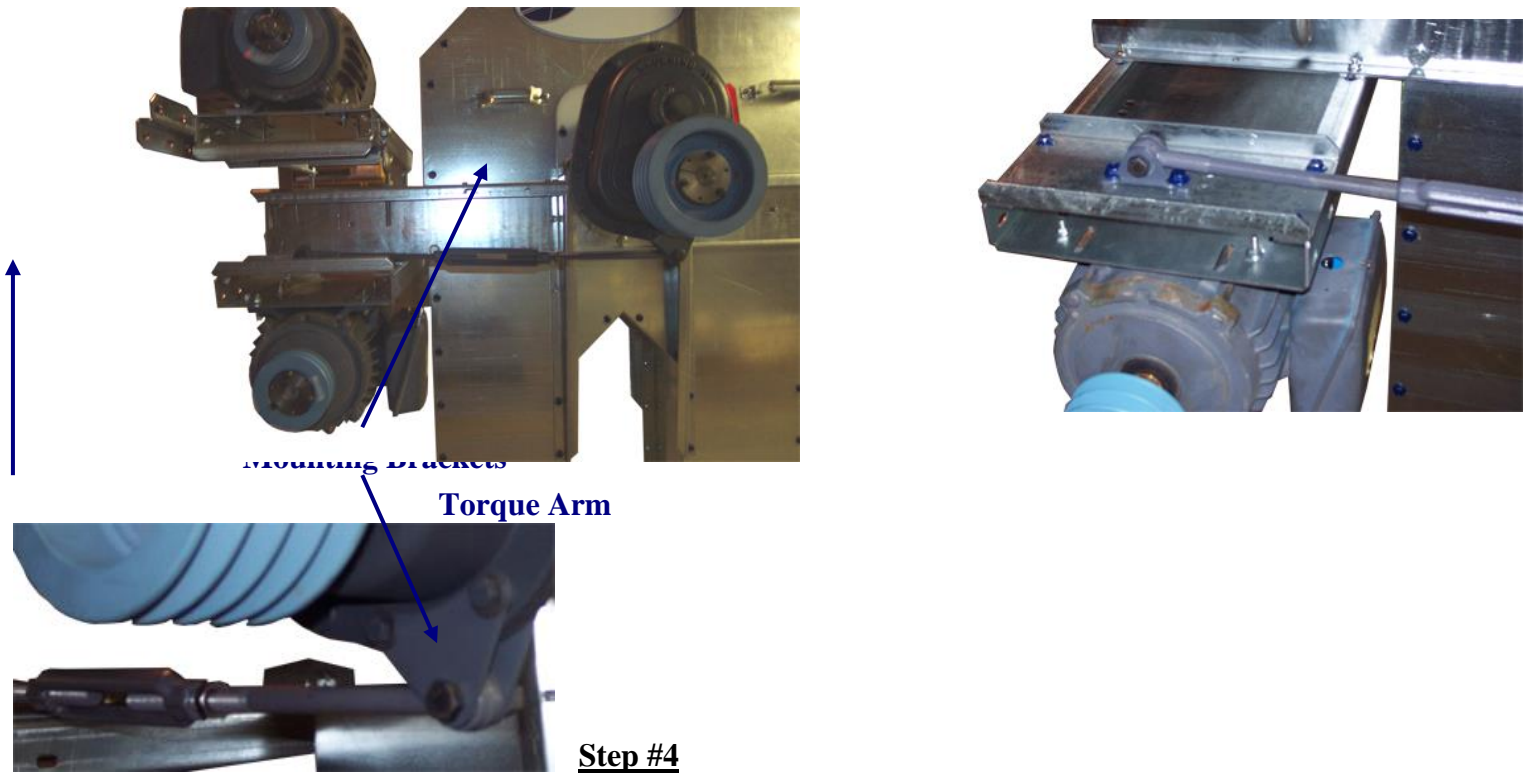


Motor →



Step #3

The Torque Arm and torque arm mounting brackets can now be installed to the motor mount plate and reducer drive as shown in the diagram.



Now install the belts and adjust the reducer drive and/or sheaves so the belts will run true. Once the sheaves are aligned tighten all components. The motor mounts and torque arm can now be adjusted to tension the belts.



Step #5

The mounting brackets and guard can now be bolted into place as shown in the diagram.



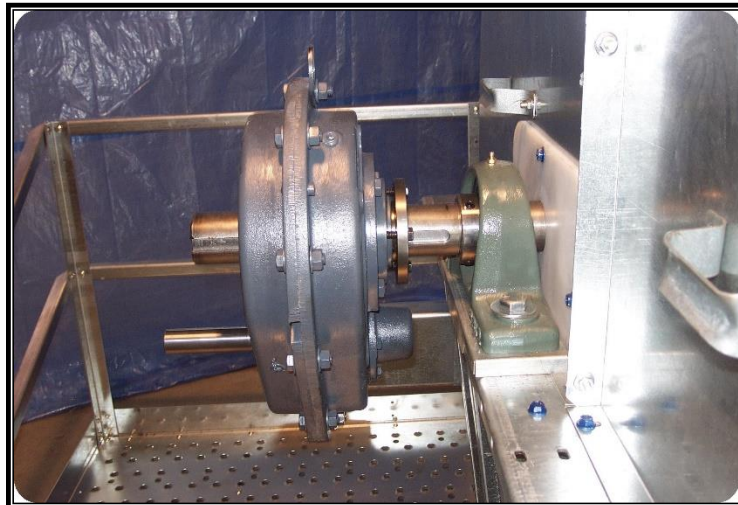
Floor Mounted Motor Reducer Drive Assembly

Note: This manual shows the gearbox, motor(s) and guard being installed with the leg head in an upright position. This is done for illustration purposes only. The motor(s) and guard should be installed after the leg and service platform are assembled and resting horizontally on the “up-side”.

If your Elevator has not been ordered with a Service Platform, refer to the “Motor Mount Assembly” section of this manual for installation of the motor mount.

The gearbox can be mounted before if you so choose. The gearbox is shipped without oil. Be sure to refer to the gearbox manual for required oil type and quantity.

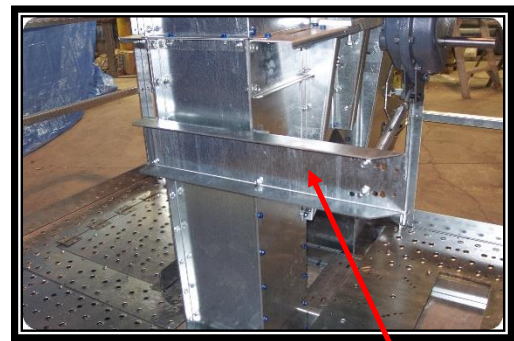
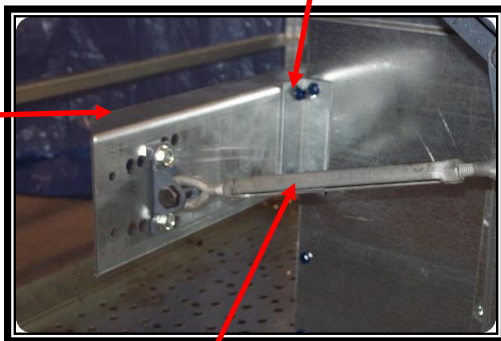
Start by installing the gearbox and torque taper bushing on the head shaft. The torque taper bushing goes on the shaft before the gearbox if using our standard “Browning” gearbox. Applying anti seize compound to the shaft and bushing is a helpful aid should the gearbox ever need to be removed. Tighten the torque taper bushing only enough so the gearbox will not slide on the shaft. It will need to be positioned later to align the belts.



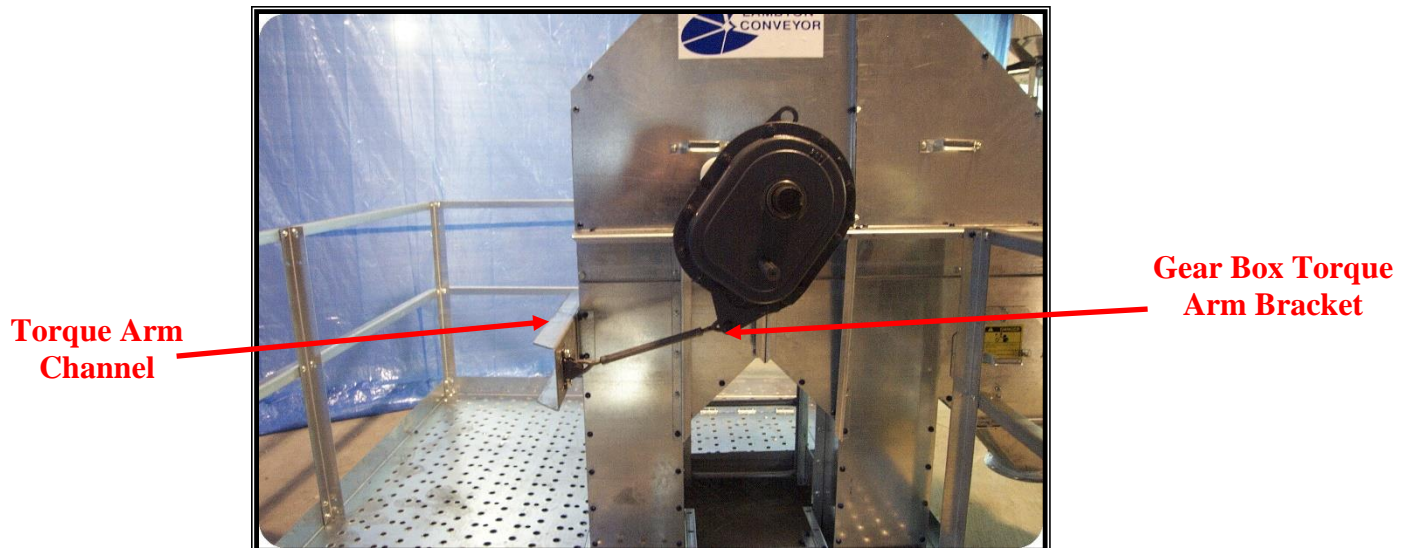
Now install the torque arm brackets to the head and the gearbox as well as the threaded torque arm. The torque arm bracket on the head consists of (1) C – channel and (2) angle brackets. The (2) angle brackets bolt on each side of the head to the existing $5/16 \times 3/4$ bolts below the main bearing channels. Then bolt the channel to the angle brackets so it extends out to the gearbox side of the head.

Angle Bracket

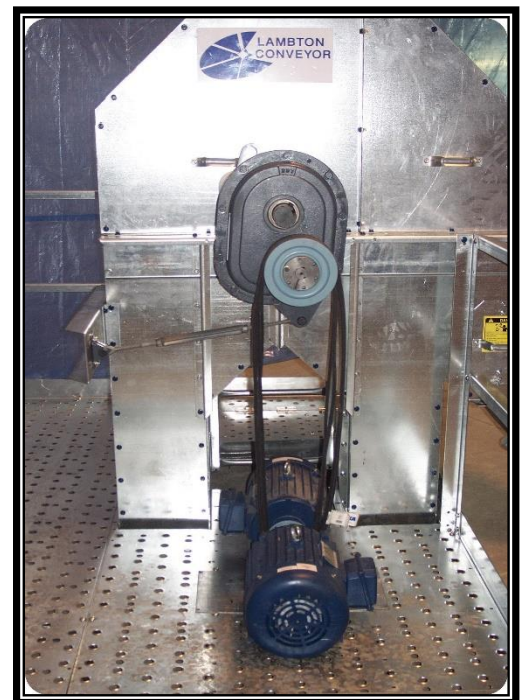
**Torque Arm Bracket
C – channel**



Attach the (2) torque arm brackets to the existing bolts in the gearbox. Then bolt the threaded torque arm to the gearbox and to the torque arm channel. The torque arm channel has a series of holes in it to adapt to the different sizes of torque arms used.



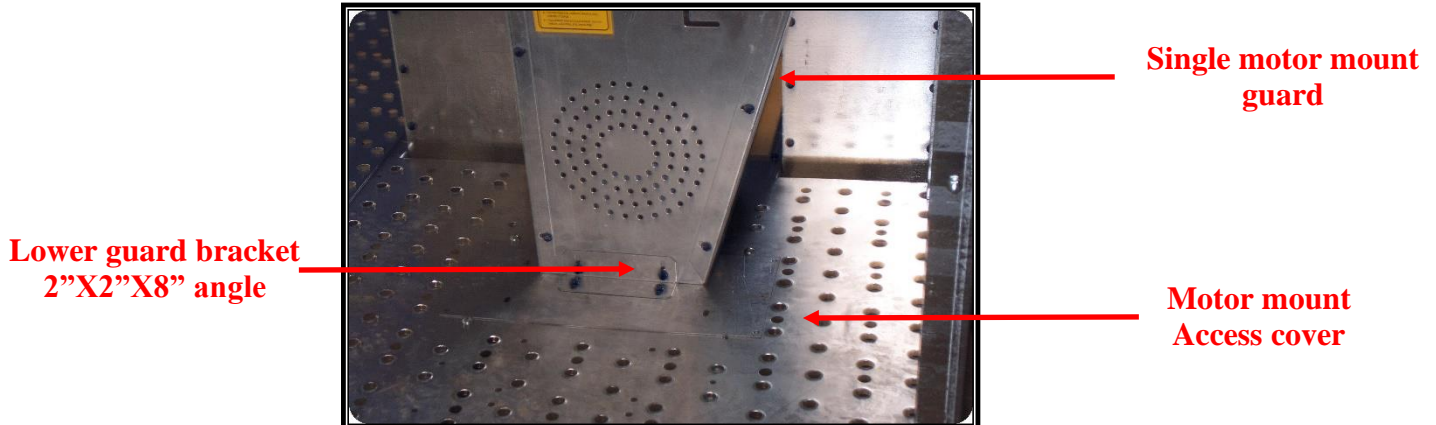
Install the motor(s), sheaves and belts. The smaller sheaves go on the motor(s). Anti-seize compound may be used between the sheave bushing and the shaft it is on, but do not use it between the sheave and sheave bushing as it can cause the sheave to crack. With the motor(s), sheaves, belts, and gearbox installed align the gearbox and (or) sheaves so the belts are running true. Now tighten all components. The threaded torque arm may also now be turned outward to tension the belts.



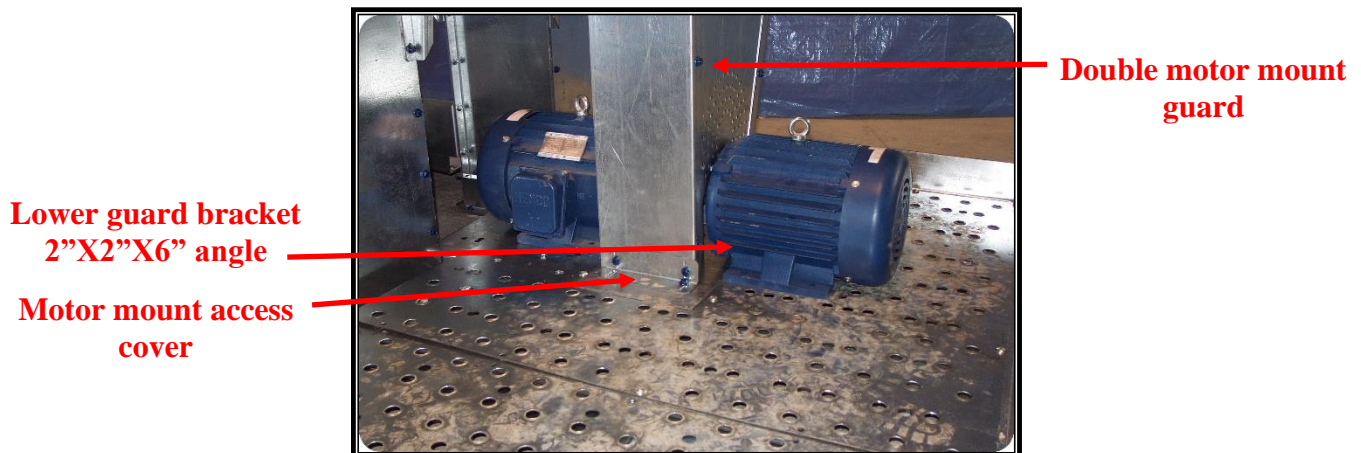
NOTE: Pictures show a double motor combination. For elevators with single motors the outer motor will be absent

Lastly install the guard. Start by bolting the lower guard bracket to the motor mount access cover, then using self tapping screws, install the motor mount access cover. For single motor guards the lower guard bracket is a 2"X2"X8" angle which bolts to the middle holes of the motor mount access cover, using

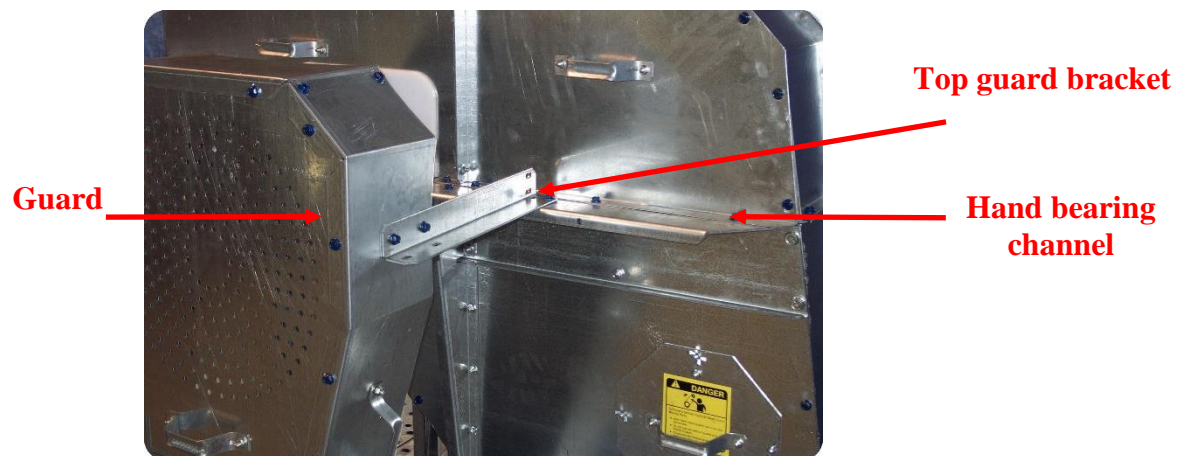
$\frac{5}{16}$ " X $\frac{3}{4}$ " flange head bolts. The guard can now be bolted to the bracket also using $\frac{5}{16}$ " X $\frac{3}{4}$ " flange head bolts.



For double motor mount guards the lower guard bracket is a 2"X2"X6" angle which bolts to the end holes on the rear side of the motor mount access plate using $\frac{5}{16}$ " X $\frac{3}{4}$ " flange head bolts. The guard can also be bolted to the bracket using $\frac{5}{16}$ " X $\frac{3}{4}$ " flange head bolts.



Now bolt the top guard bracket to the guard then to the main bearing channels near the front of the head using $\frac{5}{16}$ " X $\frac{3}{4}$ " flange head bolts.



With all components tightened your assembly should look as shown.



SINGLE



DOUBLE

Floor Mounted Motor Reducer Drive Assembly
FOR ELEVATORS ORDERED WITHOUT A SERVICE PLATFORM

11x7-24 Motor Mount Assembly

The following assembly outlines the build-up of an 11x7-24 single motor mount setup. Refer to the parts list to assist you in identifying the various parts.

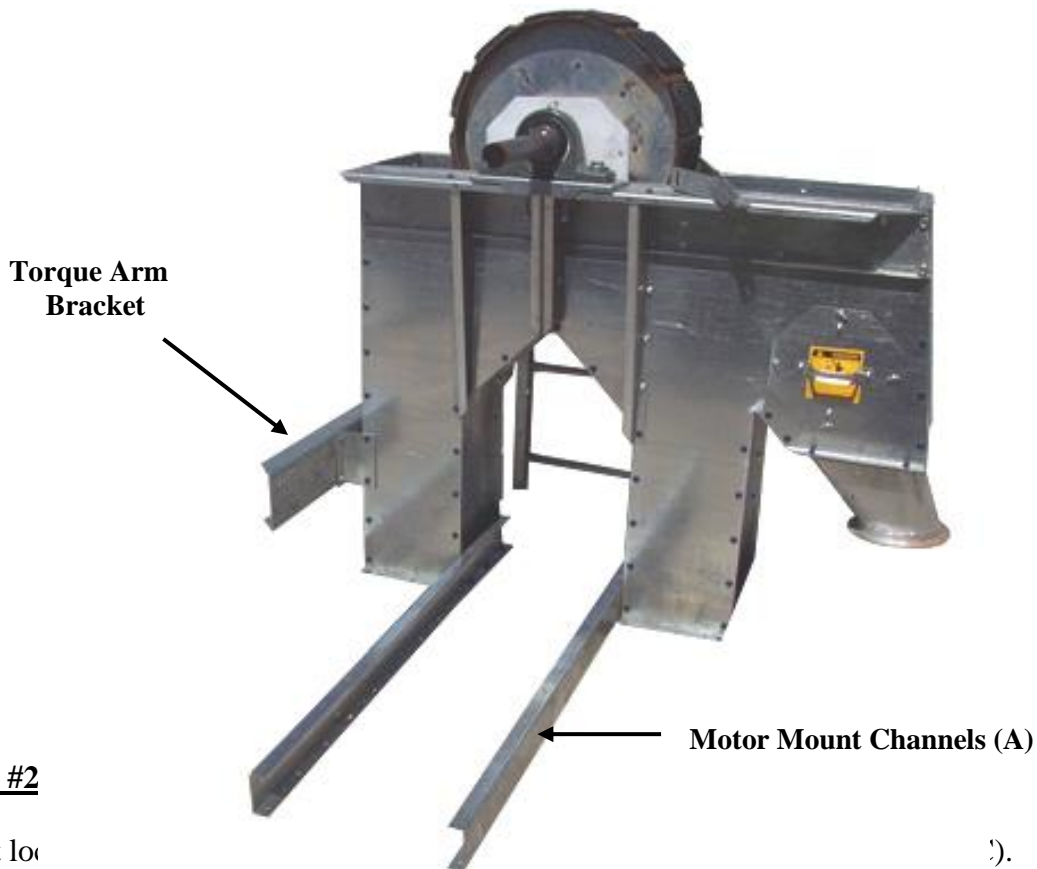
Parts List

Part	Letter	Part #	Description	Length	Quantity
Motor Mount Channels	A	userv117.023	C-Channel	42"	2
Top Motor Mount Plate	B	userv117.009	Plate/Channel	20 1/8" x 16 1/8"	1
Bottom Motor Mount Plate	C	userv117.010	Plate/Channel	19 5/16" x 16 1/8"	1
Kick Braces	D	userv117.013	Angle	26 1/2"	2

Note: use 5/16" x 3/4" hex head bolts, and nuts unless otherwise stated.

Step #1

Start by locating the two Motor Mount Channels (A) and bolt into place as shown.



Step #2

Next locate the top plate and slide it into place. The bottom plate is then bolted in place as shown and

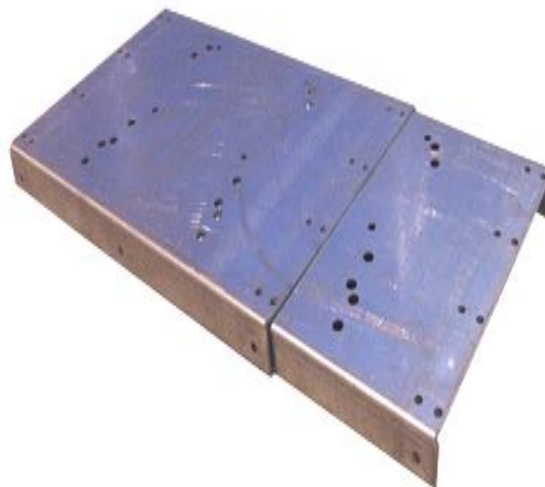
Next locate the top plate and slide it into place. The bottom plate is then bolted in place as shown and



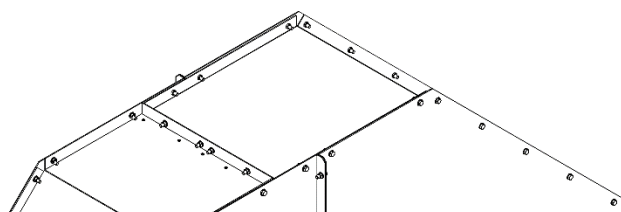
Step #3

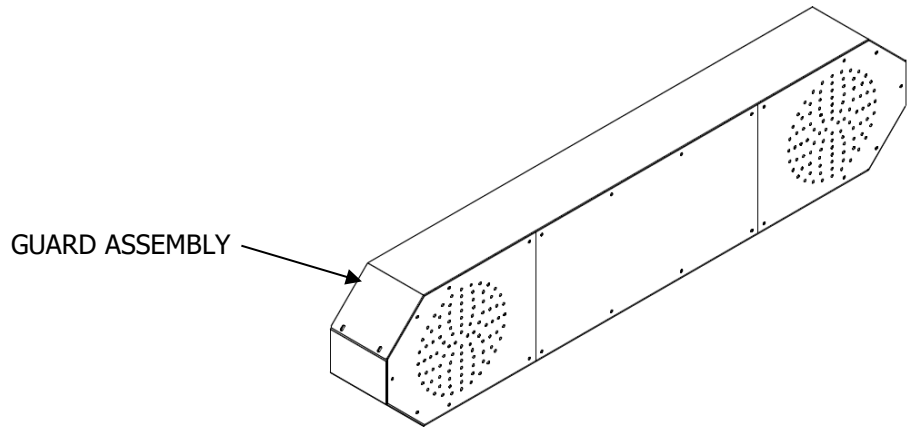
The final step of the assembly is to fasten the two Kick (D) from the bottom of the motor mount channels to the trunking as shown.

Braces

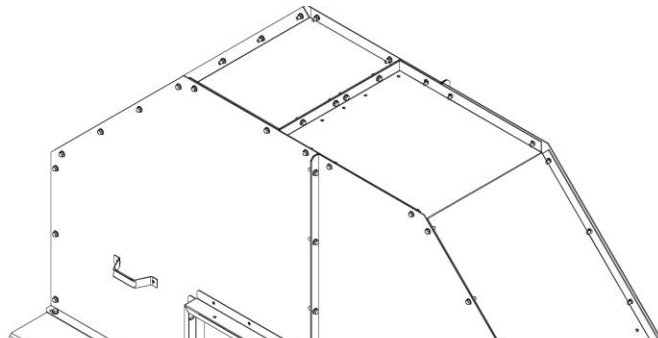


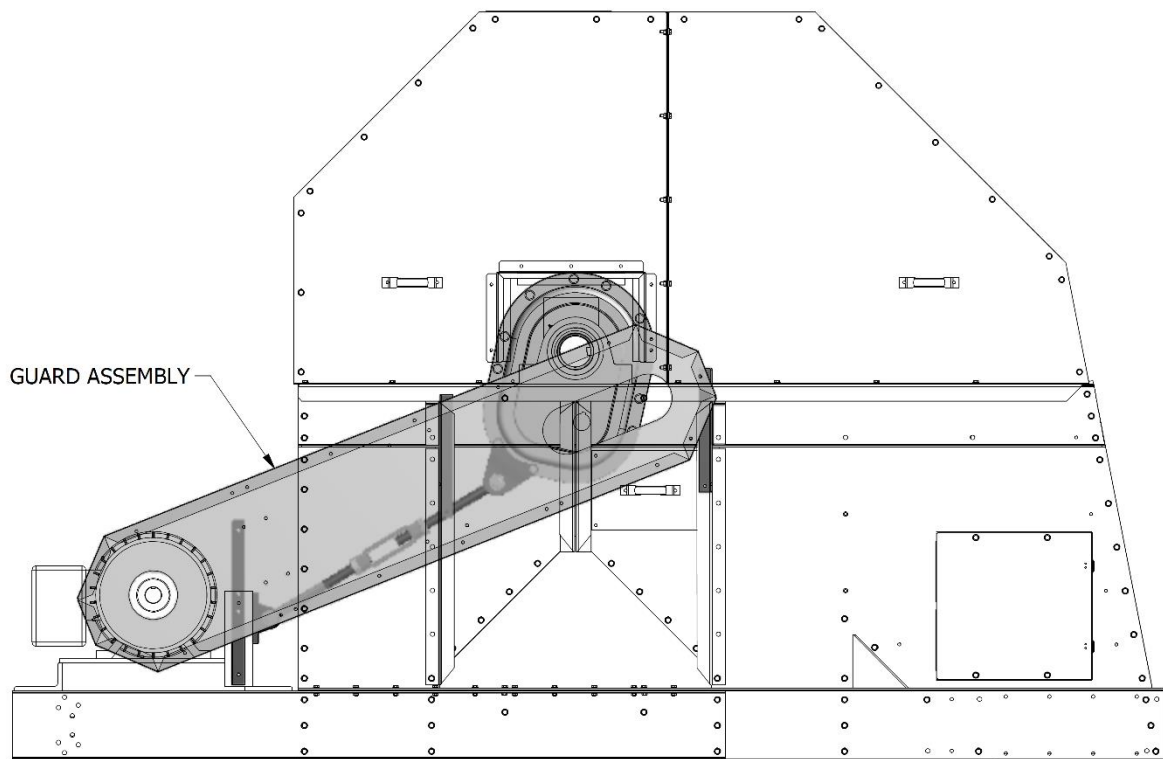
Motor mount assembly for 42" models





Motor mount assembly for 42" models



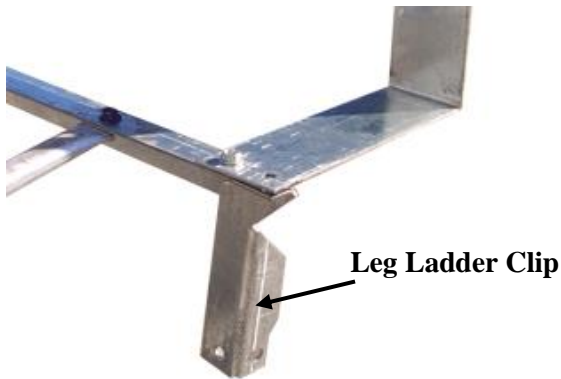


Ladder and Safety Cage Assembly

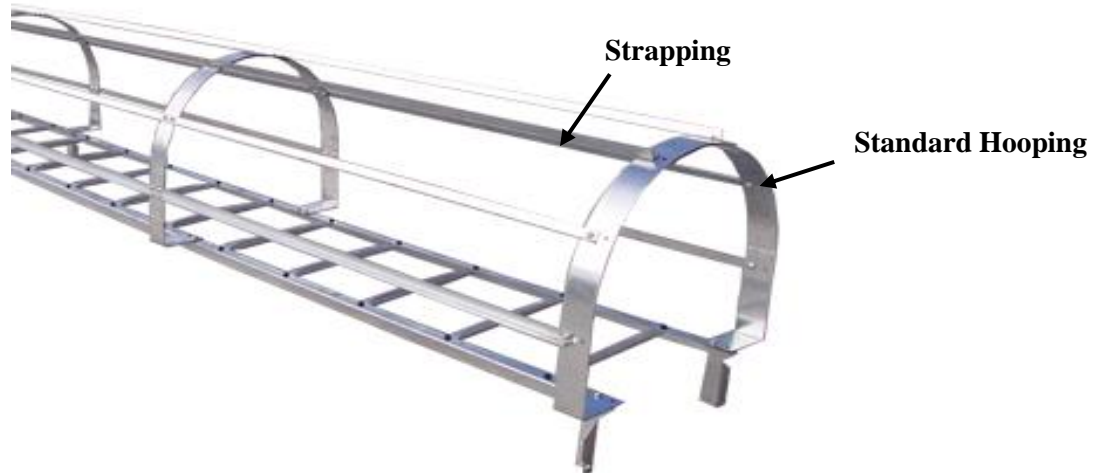
The Lambton Conveyor Ladder Safety cage is designed to help prevent serious injury or death. At no time should the ladder be accessible without the safety cage in place. It is the owner's responsibility to ensure that unauthorized personnel are kept clear of these assemblies.

Step #1

To assemble your ladder safety cage start by bolting the Leg Ladder Clips every 10' in conjunction with the safety cage hoops every 5'. Note that leg ladder clips are left and right application; make sure you have them mounted correctly. The starter section of hooping is larger than the standard hooping and should be mounted at the bottom of the first section of ladder. Use 5/16" x 3/4" hex head bolts, torque to 17 ft. lbs minimum.

**Leg Ladder Clip****Hooping-Starter Section****Step #2**

The safety cage Strapping is bolted to the outside of the hooping using 5/16" x 3/4" button head bolts. The button head of the bolt should be facing the inside of the cage and torque to 17 ft. lbs minimum. Note: strapping will need to be slightly bent to bolt to starter hooping.

**Strapping****Standard Hooping**

The ladder can be fastened to each section of trunking as the elevator is being erected. The ladder clips will bolt through the top and bottom of each trunk using 5/16" x 1" bolts, torque to 17 ft. lbs minimum. Although ladders are assembled at the factory all bolts should be checked for proper tightness.

Ladder Attachment Kit (OPTIONAL)

Each kit includes:

2x Angles

2x Right hand ladder clip
 2x Left hand ladder clip
 Additional hardware

For shipping:

This does not come bundled as a kit. The angles will be bundled together and tagged. The ladder clips will be added to the other ladder clips for the order. The same goes for the hardware.

Installation:

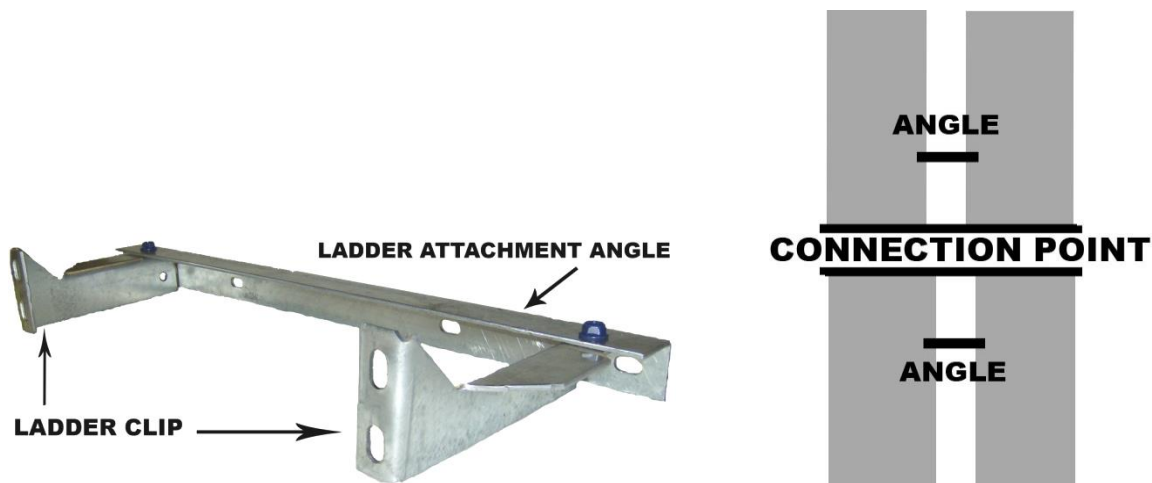
The ladder attachment angles will be installed at the top of the lower section of trunk and the bottom of the upper section of trunk that are to be stacked using the crane.

Step #1: Attach the angle to the side of the trunking using the existing bolts (second bolt down/up the trunk) at the trunk attachment point. Which holes you use depend on the type of leg you have. Simply match up the slotted holes with the two holes in the trunk.

Step #2: After you have the angle attached you can add the two ladder clips to this angle.

Step #3: Now you can attach the ladder to the two ladder clips. To do this you will need to use the bolts from the second ladder rung and attach the clips to the back of the ladder. This means the ladder rung being between the ladder and the ladder clip (make sure to use the correct slot in the ladder clip and double check that the ladder is in the correct position).

With this done the completed sections of trunk are now ready to lift and the ladder will be secure.



6,8,10" TRUSS KIT PARTS LISTS

6,8,10" SINGLE TRUSS PARTS LIST

PART NO.	DESCRIPTION	LENGTH	QTY
FSA-TRUS-XX-RE	RABBIT EARED TUBE CLAMPS 1/2'S		4
FSA-TRUS-XX-SCT	SPIDER LEG TUBE CLAMPS 1/2'S		2
DIS-0738	MAIN ANGLE FOR SHORT SPIDER	40"	4
TRUSS.02S	STAR ANGLE FOR SHORT SPIDER	50"	4
DIS-0862	WELD ON SUPPORT FOR SHORT SPIDER	30"	8
HDBY008900ZC	1/2" X 9" EYE BOLT		4
HDNFS008JCD	1/2" SERRATED FLANGE NUT		8
EGM-CLMP-006	3/8" CABLE CLAMP		16
EGM-WRTHIM-006	3/8" WIRE ROPE THIMBLE		12
HDBF005100JCB	5/16" X 1" FLANGE HEX BOLT		34
HDNFS005JCD	5/16" SERRATED FLANGE NUT		34

6,8,10" TRIPLE TRUSS PARTS LIST

PART NO.	DESCRIPTION	LENGTH	QTY
FSA-TRUS-XX-RE	RABBIT EARED TUBE CLAMPS 1/2'S		4
FSA-TRUS-XX-SCT	SPIDER LEG TUBE CLAMPS 1/2'S		6
DIS-0738	MAIN ANGLE FOR SHORT SPIDER	40"	8
TRUSS.02S	STAR ANGLE FOR SHORT SPIDER	50"	8
DIS-0862	WELD ON SUPPORT FOR SHORT SPIDER	30"	8
DIS-0735	MAIN ANGLE FOR EXTENDED SPIDER	62-1/2"	4
TRUSSN.01	OUTER STAR ANGLE FOR EXTENDED SPIDER	82"	4
TRUSS.02N	INNER STAR ANGLE FOR EXTENDED SPIDER	48-1/2"	4
DIS-0857	WELD ON SUPPORT FOR EXTENDED SPIDER	62"	8
HDBY008900ZC	1/2" X 9" EYE BOLT		4
HDNFS008JCD	1/2" SERRATED FLANGE NUT		8
EGM-CLMP-006	3/8" CABLE CLAMP		16
EGM-WRTHIM-006	3/8" WIRE ROPE THIMBLE		20
HDBF005100JCB	5/16" X 1" FLANGE HEX BOLT		82
HDNFS005JCD	5/16" SERRATED FLANGE NUT		82

6,8,10" 5-WAY TRUSS PARTS LIST

PART NO.	DESCRIPTION	LENGTH	QTY
FSA-TRUS-XX-RE	RABBIT EARED TUBE CLAMPS 1/2'S		4
FSA-TRUS-XX-SCT	SPIDER LEG TUBE CLAMPS 1/2'S		10
DIS-0738	MAIN ANGLE FOR SHORT SPIDER	40"	8
TRUSS.02S	STAR ANGLE FOR SHORT SPIDER	50"	8
DIS-0862	WELD ON SUPPORT FOR SHORT SPIDER	30"	8
DIS-0735	MAIN ANGLE FOR EXTENDED SPIDER	62-1/2"	8
TRUSSN.01	OUTER STAR ANGLE FOR EXTENDED SPIDER	82"	8
TRUSS.02N	INNER STAR ANGLE FOR EXTENDED SPIDER	48-1/2"	8
DIS-0857	WELD ON SUPPORT FOR EXTENDED SPIDER	62"	8
DIS-0739	MAIN ANGLE FOR SUPER EXTENDED SPIDER	75"	4
DIS-0742	OUTER STAR ANGLE FOR SUPER EXTENDED SPIDER	99-1/2"	4
TRUSS.02	INNER STAR ANGLE FOR SUPER EXTENDED SPIDER	65-1/2"	4
TRUSSN.07	WELD ON SUPPORT FOR SUPER EXTENDED SPIDER	75"	8
HDBY008900ZC	1/2" X 9" EYE BOLT		4
HDNFS008JCD	1/2" SERRATED FLANGE NUT		8
EGM-CLMP-006	3/8" CABLE CLAMP		16
EGM-WRTHIM-006	3/8" WIRE ROPE THIMBLE		28
HDBF005100JCB	5/16" X 1" FLANGE HEX BOLT		134
HDNFS005JCD	5/16" SERRATED FLANGE NUT		134

12,14" TRUSS KIT PARTS LISTS

12,14" SINGLE TRUSS

PART NO.	DESCRIPTION	LENGTH	QTY
FSA-TRUS-XX-RE	RABBIT EARED TUBE CLAMPS 1/2'S		4
FSA-TRUS-XX-SCT	SPIDER LEG TUBE CLAMPS 1/2'S		2
DIS-0713	MAIN CHANNEL FOR SHORT SPIDER	36"	4
TRUSS12.009	STAR ANGLE FOR SHORT SPIDER	51"	4
DIS-0854	WELD ON SUPPORT FOR SHORT SPIDER	30"	8
HDBY008900ZC	1/2" X 9" EYE BOLT		4
HDNFS008JCD	1/2" SERRATED FLANGE NUT		8
EGM-CLMP-006	3/8" CABLE CLAMP		16
EGM-WRTHIM-006	3/8" WIRE ROPE THIMBLE		12
HDBF005100JCB	5/16" X 1" FLANGE HEX BOLT		46
HDNFS005JCD	5/16" SERRATED FLANGE NUT		46

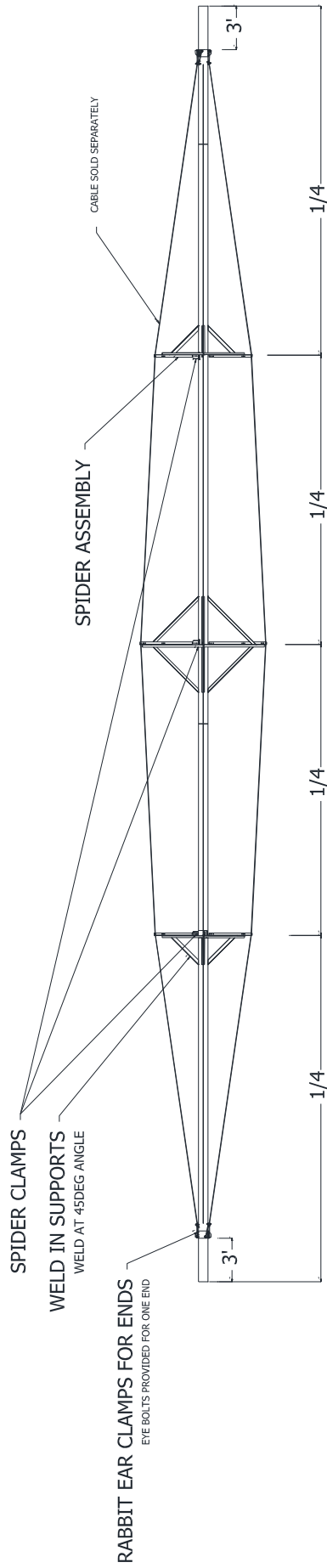
12,14" TRIPLE TRUSS

PART NO.	DESCRIPTION	LENGTH	QTY
FSA-TRUS-XX-RE	RABBIT EARED TUBE CLAMPS 1/2'S		4
FSA-TRUS-XX-SCT	SPIDER LEG TUBE CLAMPS 1/2'S		6
DIS-0713	MAIN CHANNEL FOR SHORT SPIDER	36"	8
TRUSS12.009	STAR ANGLE FOR SHORT SPIDER	51"	8
DIS-0854	WELD ON SUPPORT FOR SHORT SPIDER	30"	8
DIS-0714	MAIN CHANNEL FOR EXTENDED SPIDER	60"	4
TRUSS12.007	OUTER STAR ANGLE FOR EXTENDED SPIDER	82-1/2"	4
TRUSS.02N	INNER STAR ANGLE FOR EXTENDED SPIDER	48-1/2"	4
DIS-0859	WELD ON SUPPORT FOR EXTENDED SPIDER	56"	8
HDBY008900ZC	1/2" X 9" EYE BOLT		4
HDNFS008JCD	1/2" SERRATED FLANGE NUT		8
EGM-CLMP-006	3/8" CABLE CLAMP		16
EGM-WRTHIM-006	3/8" WIRE ROPE THIMBLE		20
HDBF005100JCB	5/16" X 1" FLANGE HEX BOLT		120
HDNFS005JCD	5/16" SERRATED FLANGE NUT		120

12,14" 5-WAY TRUSS

PART NO.	DESCRIPTION	LENGTH	QTY
FSA-TRUS-XX-RE	RABBIT EARED TUBE CLAMPS 1/2'S		4
FSA-TRUS-XX-SCT	SPIDER LEG TUBE CLAMPS 1/2'S		10
DIS-0713	MAIN CHANNEL FOR SHORT SPIDER	36"	8
TRUSS12.009	STAR ANGLE FOR SHORT SPIDER AND INNER STAR ANGLE FOR SUPER EXTENDED SPIDER	51"	12
DIS-0854	WELD ON SUPPORT FOR SHORT SPIDER	30"	8
DIS-0714	MAIN CHANNEL FOR EXTENDED SPIDER	60"	8
TRUSS12.007	OUTER STAR ANGLE FOR EXTENDED SPIDER	82-1/2"	8
TRUSS.02N	INNER STAR ANGLE FOR EXTENDED SPIDER	48-1/2"	8
DIS-0859	WELD ON SUPPORT FOR EXTENDED SPIDER	56"	8
DIS-0716	MAIN CHANNEL FOR SUPER EXTENDED SPIDER	72"	4
TRUSS12.012	OUTER STAR ANGLE FOR SUPER EXTENDED SPIDER	103"	4
DIS-0853	WELD ON SUPPORT FOR SUPER EXTENDED SPIDER	72"	8
HDBY008900ZC	1/2" X 9" EYE BOLT		4
HDNFS008JCD	1/2" SERRATED FLANGE NUT		8
EGM-CLMP-006	3/8" CABLE CLAMP		16
EGM-WRTHIM-006	3/8" WIRE ROPE THIMBLE		28
HDBF005100JCB	5/16" X 1" FLANGE HEX BOLT		194
HDNFS005JCD	5/16" SERRATED FLANGE NUT		194

TRUSS KIT GENERAL ARRANGEMENT

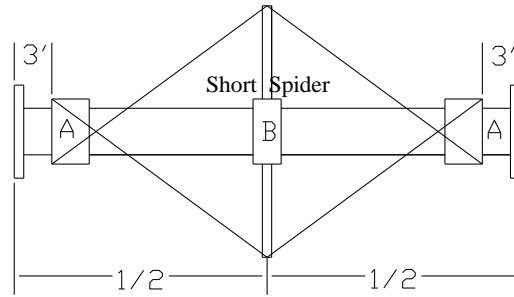


USE EQUIDISTANT SPACING FOR ALL KITS
AS SHOWN HERE IN EXAMPLE OF TRIPLE TRUSS.

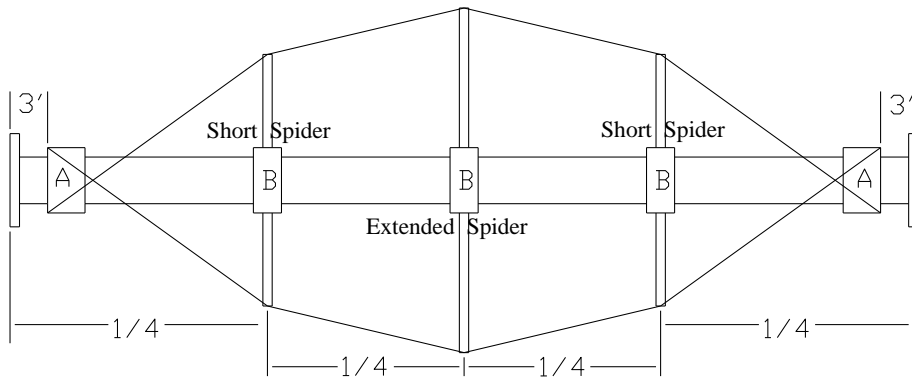
USE WIRE ROPE THIMBLES WHERE CABLE PASSES
THROUGH STAR ANGLES AND ON ENDS.

TRUSS KIT ILLUSTRATION SHOWING SPACING AND CABLE CROSSOVER

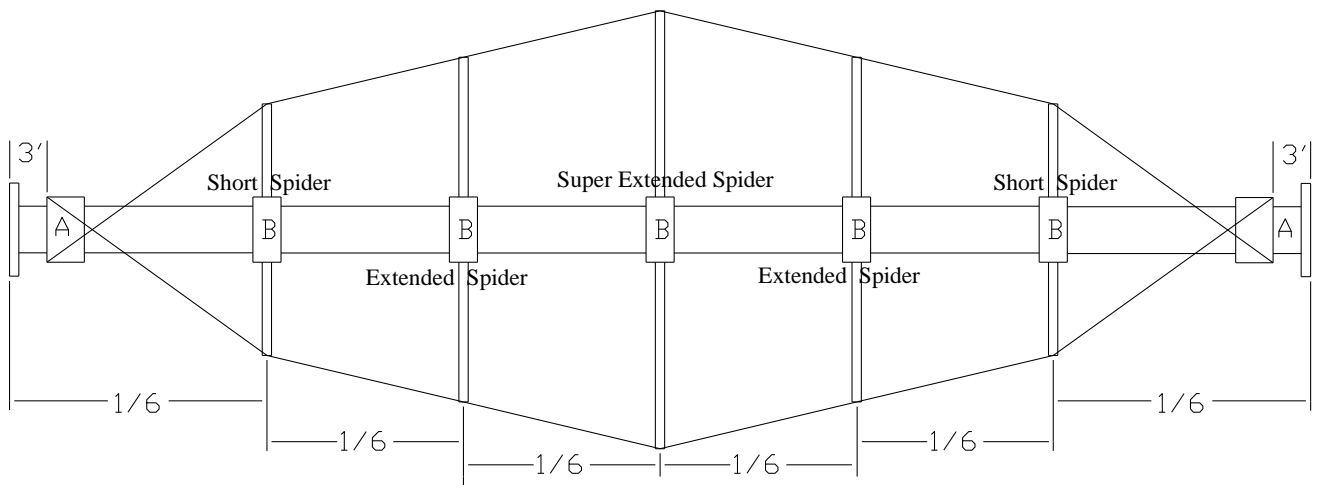
Single Truss



Triple Truss

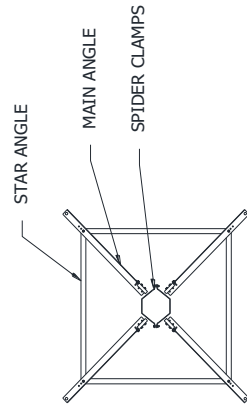


Five Truss

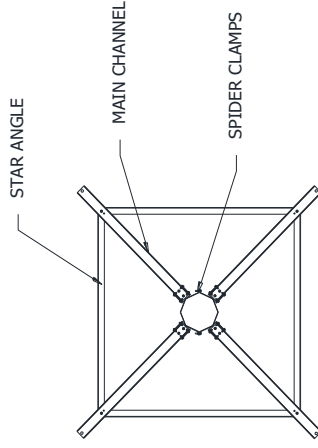


SPIDER ASSEMBLY

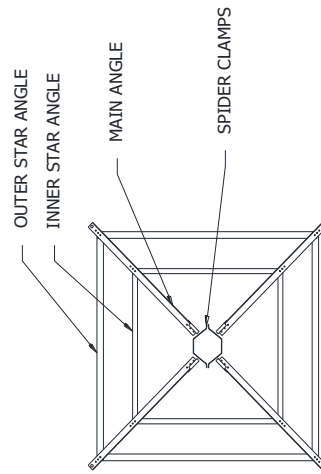
6,8,10" SHORT SPIDER ASSEMBLY



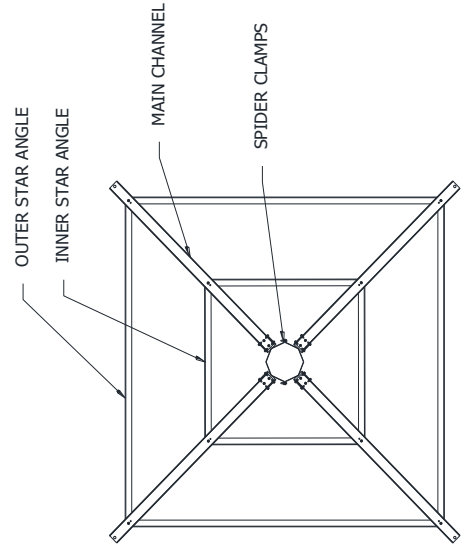
12,14" SHORT SPIDER ASSEMBLY



6,8,10" EXTENDED/SUPER EXTENDED SPIDER ASSEMBLY

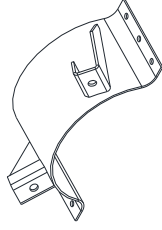


12,14" EXTENDED/SUPER EXTENDED SPIDER ASSEMBLY

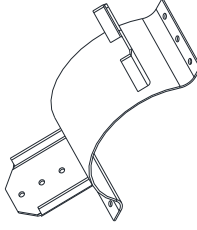


CLAMPS

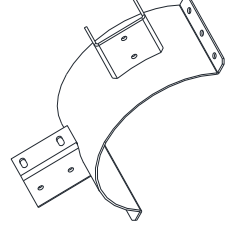
RABBIT EAR CLAMP HALF



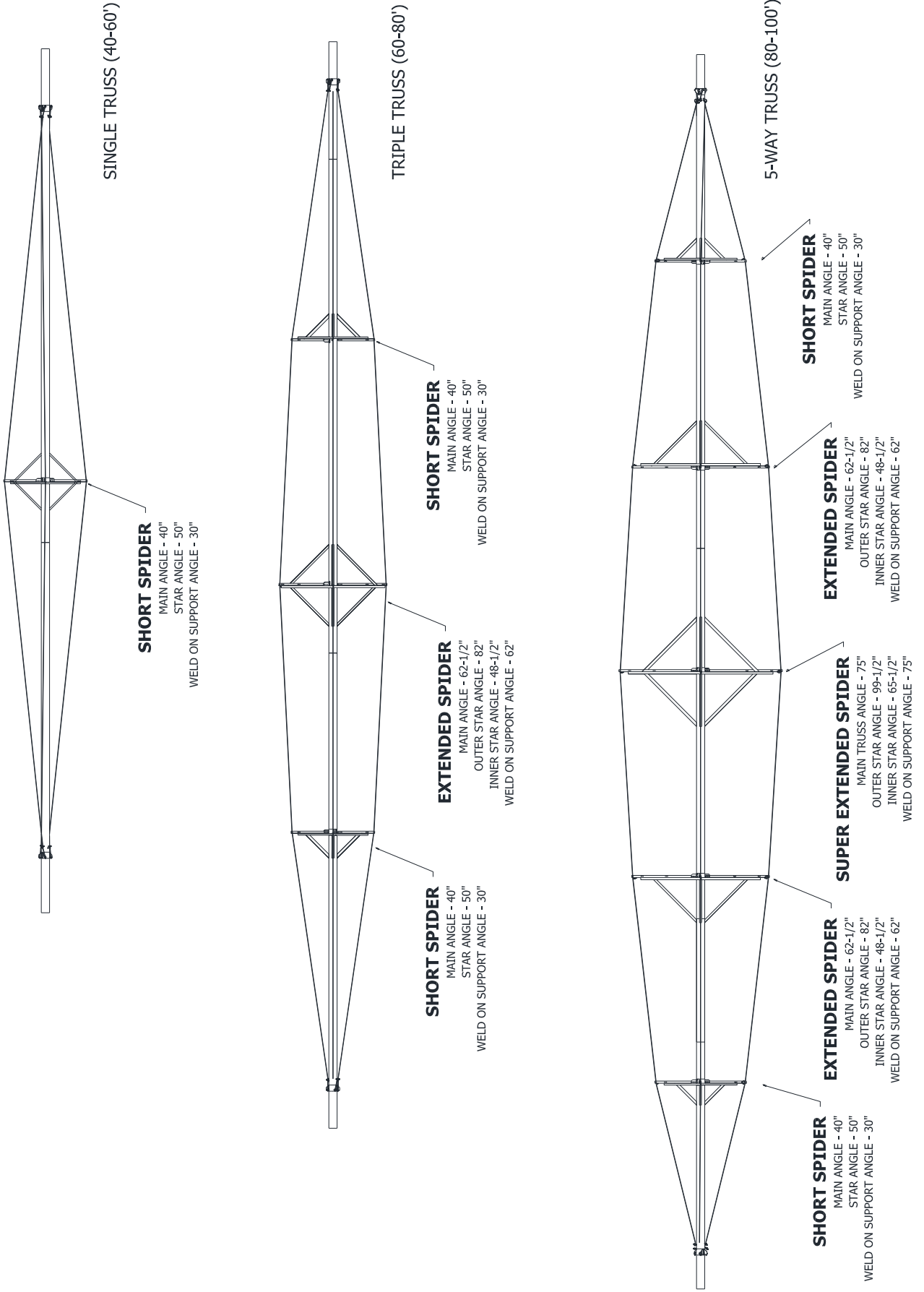
6,8,10" SPIDER CLAMP HALF



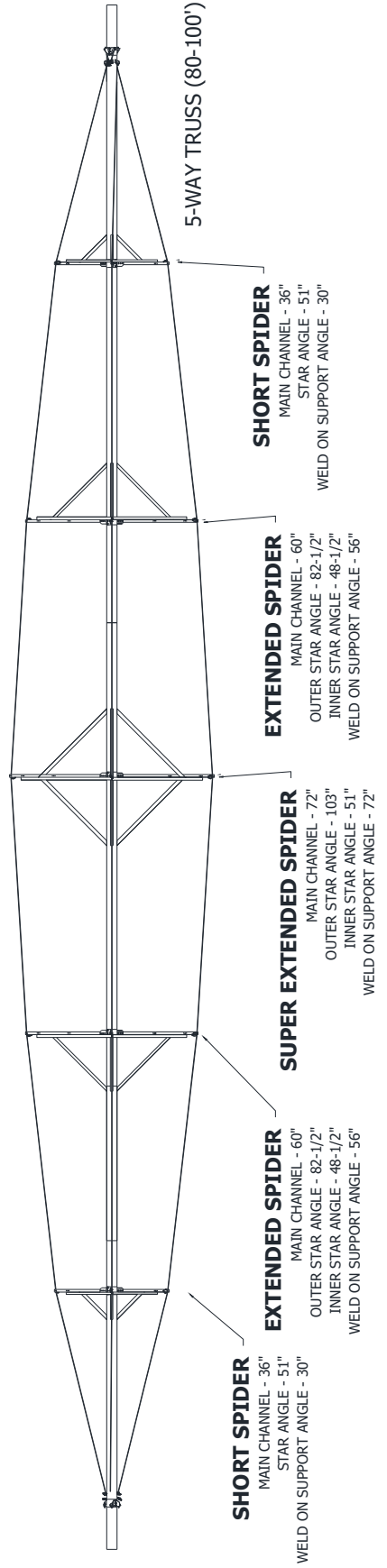
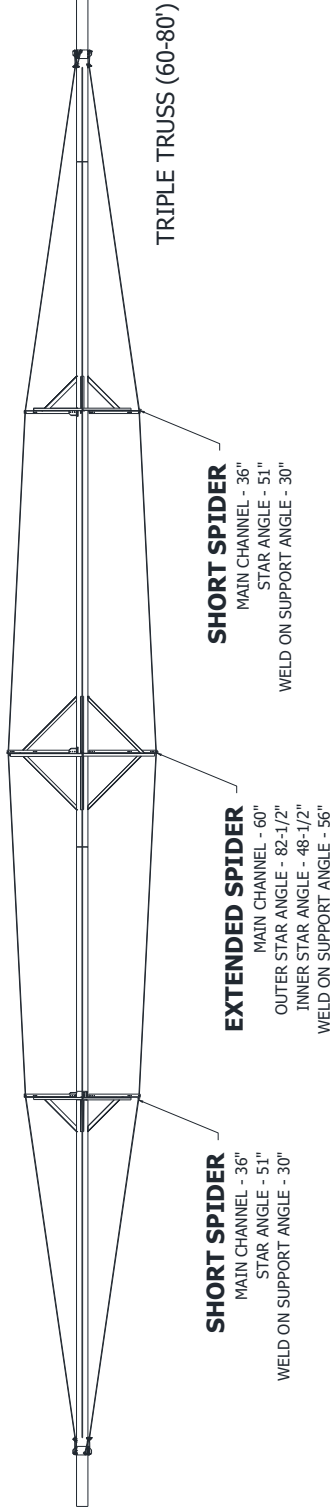
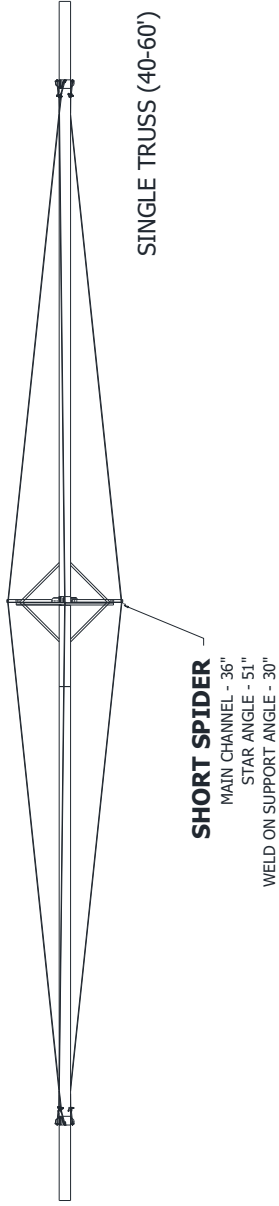
12,14" SPIDER CLAMP HALF



6", 8", 10" TRUSS ARRANGEMENT



12,14" TRUSS ARRANGEMENT



Assembly Instructions

The following outlines the assembly of a 6", 8", or 10" truss kit using, Single, Triple, and Five Truss setups. Refer to the previous pages for parts list and arrangement drawings. The most important factor when erecting a truss kit is cable tension at all points. In order to function properly the cable must be exerting a force on all spider arms.

Step #1

Start by attaching (2) Rabbit Eared Tube Clamps to the ends of the spouting. Tighten bolts firmly, and tack weld to prevent slipping. Note: clamp is shown with eyebolts and cables installed, ignore this for now.



Tack Weld

Rabbit Ear Tube Clamp

Step #2a

Locate Spider Tube Clamps and bolt tightly to the spout. Space the Spider Clamps according to the spacing mentioned in the general arrangement drawing. Fasten the Main Angle/Channels to the spider clamps so that each is evenly spaced apart on the clamp. Attach the Star Angles to the Main Angle/Channels using the inner holes for 10", middle for 8", and outer for 6" spouting. **Note:** unevenly spaced spider legs will prevent the hookup of the support angles.

Refer to drawings on previous pages for parts list and arrangement.



Step #2b

For Extended and Super Extended spider (used on triple and 5-way truss kits) follow instructions in Step #2a. The Extended and Super Extended spider assemblies have an Inner and Outer Star Angle.



Step #3

Attach the eyebolts to the rabbit ears at one end of the spouting only. At the opposite end of the spouting loop a cable through a rabbit ear as shown below on the left. Cross the cable over to the opposite side of the spout and loop it through the top hole on the spider arm as shown on bottom right. To finish, switch sides again and loop the cable through the eyebolt at the other end of spouting.

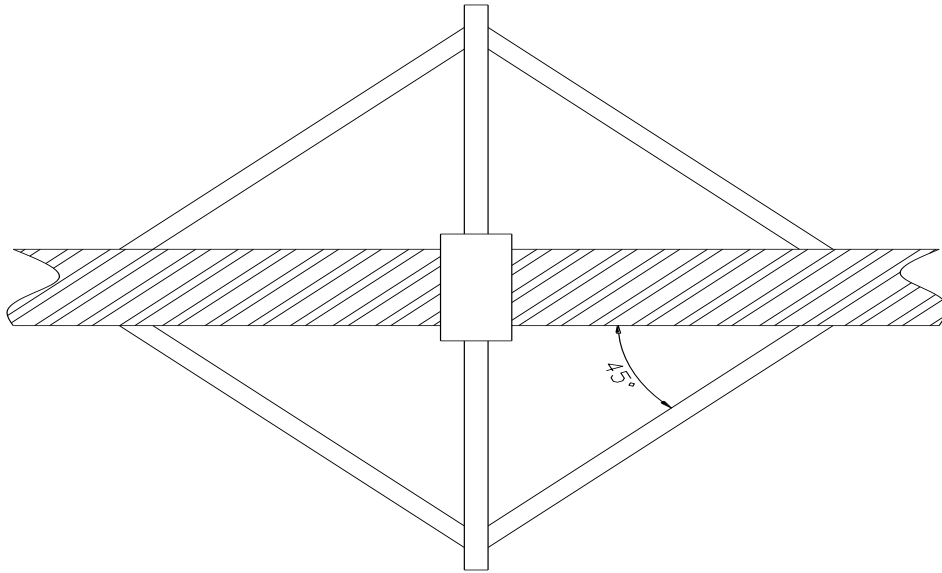
Clamps must be used on all cable ends and where cable



Cable clamp must be fastened with looped end over free end of cable otherwise slipping will occur.

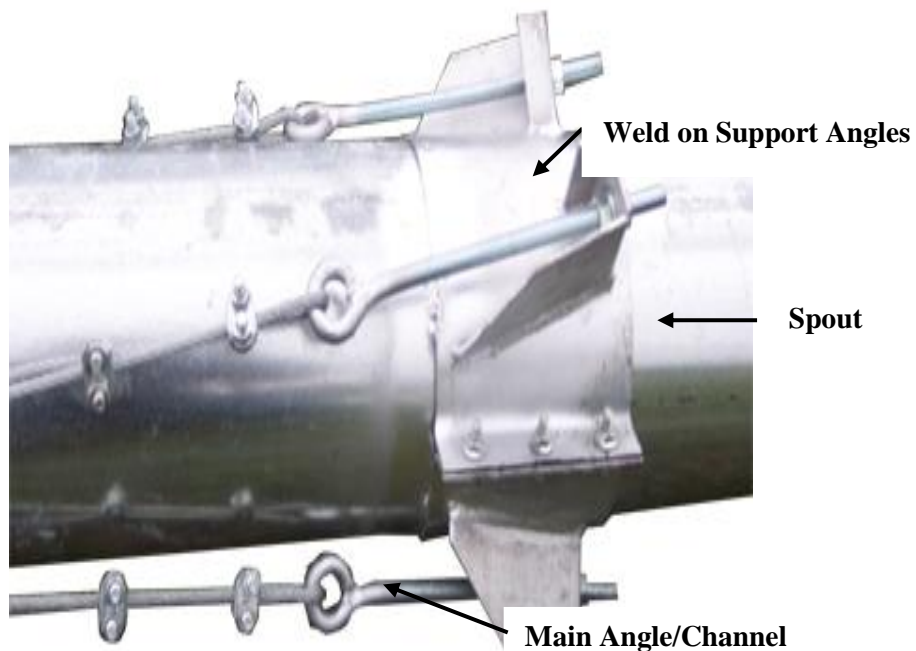
Step #4

To tighten the eyebolts first loosen the front nut then tighten the back nut until cable is tight. When cable tension is adequate the front nut can be tightened again to lock the eyebolt in place. If tension is not distributed evenly over the spider assemblies the eye bolts should be adjusted as required.

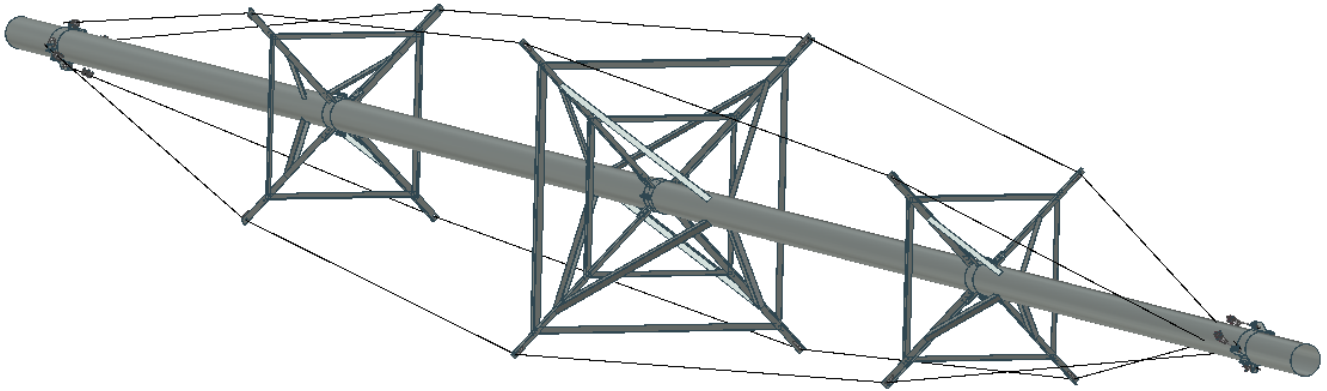


Step #5

Weld on Supports are located according to arrangement drawings and welded at approximately a 45-degree angle for maximum strength. These should be installed only after you are satisfied with the setup of the truss kit.



Assembly is complete and the spout can be lifted into position.



Boot Ladder

Parts List (9x5, 9x6, 11x7, 12x7 Elevators)

Part Name	Letter	Part #	Length	Quantity
Ladder Channels	A	uboot16.017	42 ¾"	2
Ladder Rungs	B	gla-ladrung	18 ½"	4
Bottom Kickers	C	uboot16.019	NA	2
Ladder Clips	D	uboot16.018	NA	2
Swing arm Channels	E	uboot16.020	21 7/8"	2
Ladder Latch	F	uboot16.021	18 ½"	1
5/16" x ¾" bolts	Used Grade 8 Strength Bolts ONLY			18
5/16" x 1" bolts				4
5/16" nuts				26

Parts List 16x8 Elevator Only

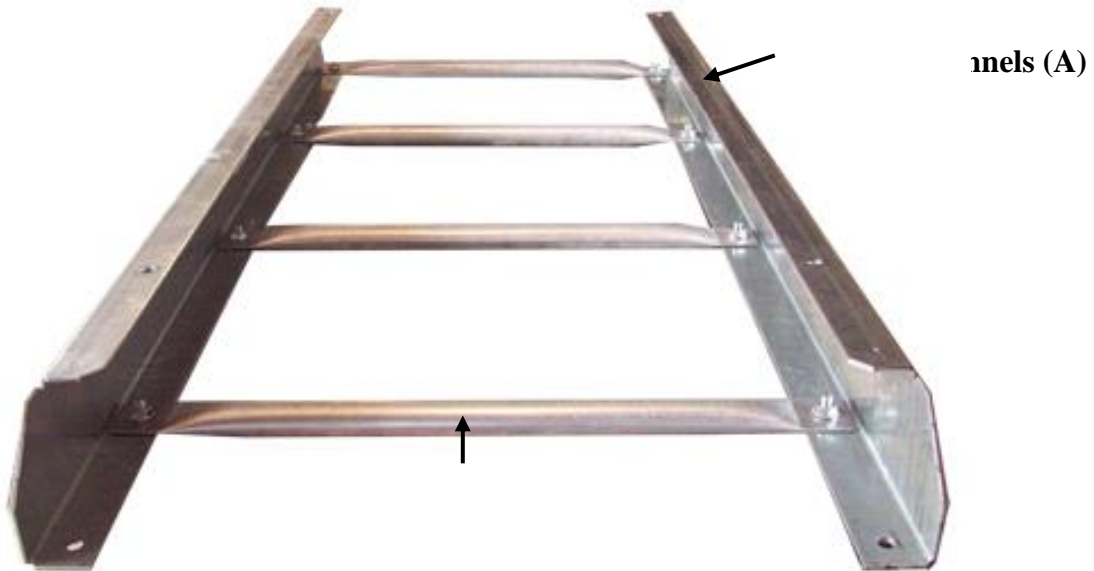
Part Name	Letter	Part #	Length	Quantity
Ladder Channels	A	uboot42.035	66 ¾"	2
Ladder Rungs	B	gla-ladrung	18 ½"	4
Bottom Kickers	C	uboot42.034	NA	2
Ladder Clips	D	uboot42.036	NA	2
Swing arm Channels	E	uboot42.033	21 7/8"	2
Ladder Latch	F	uboot42.032	21 ½"	1
5/16" x ¾" bolts	Use Grade 8 Strength bolts ONLY			22
5/16" x 1" bolts				4
5/16" nuts				30



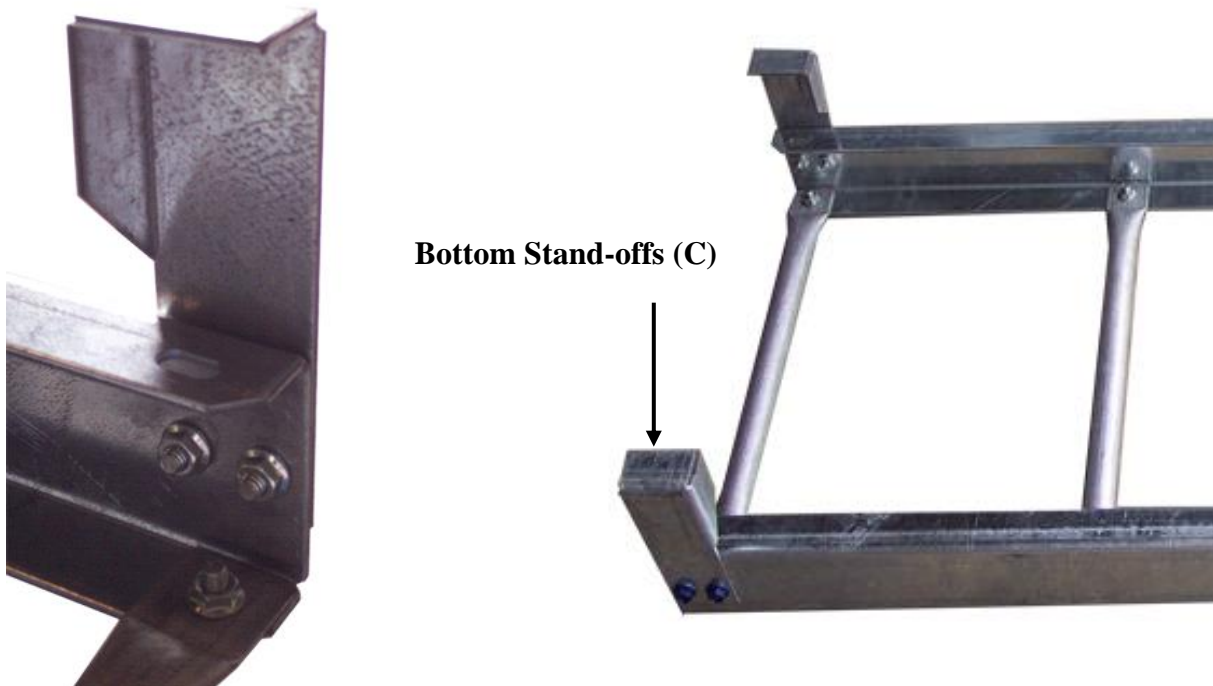
s (B)

Step #1

Locate the two Ladder Channels (A) and fasten four Ladder Rungs (B) using (8) 5/16" x 3/4" bolts as shown.

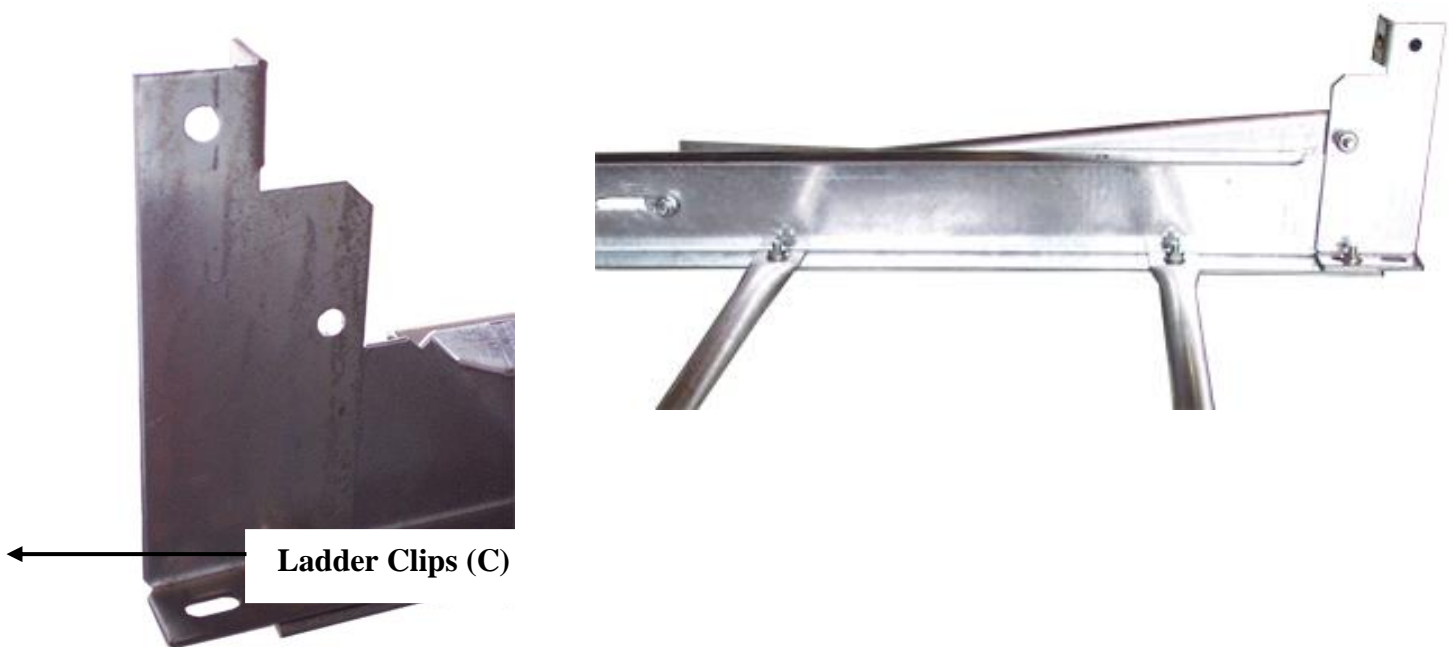
**Step #2**

Locate the two Bottom Stand-offs (C) and mount them on the bottom of the ladder channels using (4) 5/16" x 3/4" bolts.

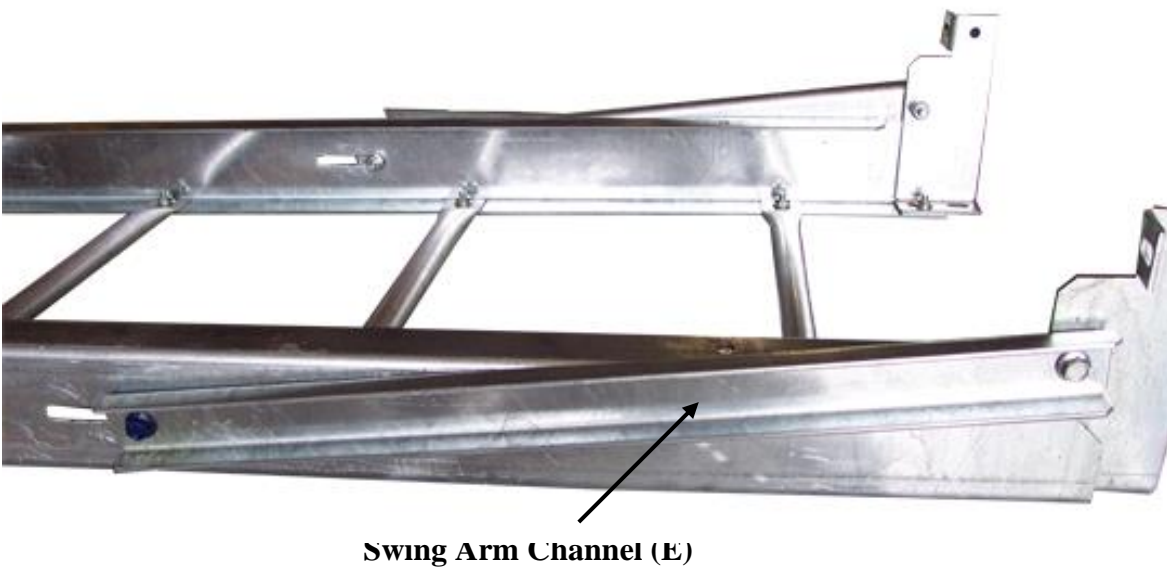


Step #3

Now attach the two Ladder Clips (C) at the top of the ladder channels as shown in the diagram, using (2) 5/16" x 3/4" bolts.

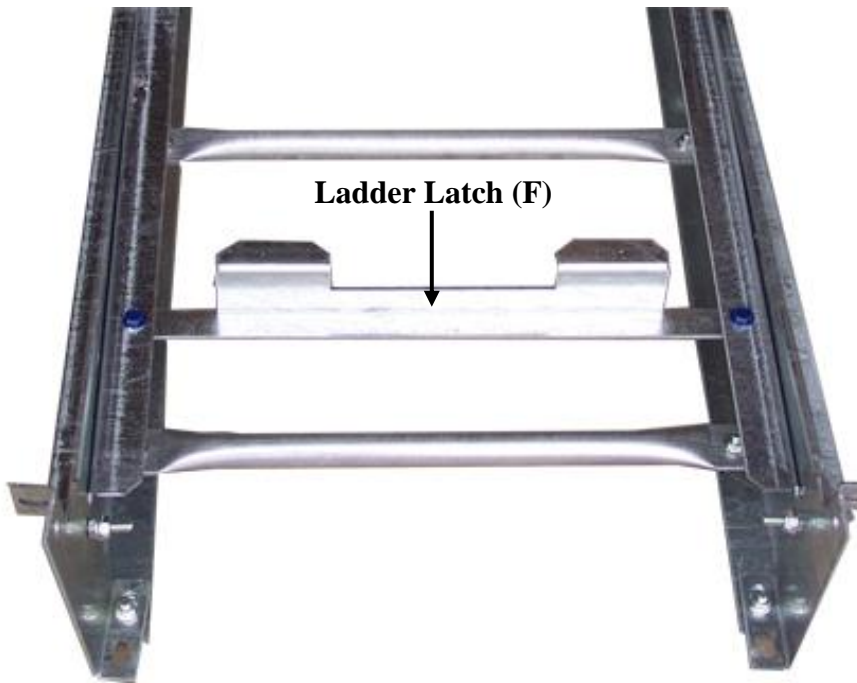
**Step #4**

Locate the 2 Swing Arm Channels (E) and fasten with (4) 5/16" x 1" bolts. Leave bolts loose enough so swing arms pivot freely and double nut bolts so they don't loosen.



Step #5

Now mount the Ladder Latch (F) using (2) 5/16" x 3/4" bolts to the inside of the ladder main channels on the same side as the ladder rungs.



Your ladder is now fully assembled and should resemble the picture below.



Step #6

The ladder is now assembled and can be mounted to the boot using (2) 5/16" x 3/4" bolts. Simply hook the ladder clips over the edge of the boot as shown in the diagram, and bolt into place. The first section of trunk must be installed before the ladder is mounted to avoid interference with the ladder clips.



Note: to lift the ladder the two top bolts on the ladder main channels are to be removed, then lift the ladder and latch it on a ladder rung further up. For your own safety when the ladder is in the down position be sure to replace the bolts on the ladder main channels, and when not in use place ladder in the upright position. It is the owner's responsibility to ensure unauthorized personnel are unable to access these assemblies.

Quality Analysis Report

RA#: _____ Date: _____ Originator: _____

Distributor: Lambton Conveyor Phone #: 519-627-8228 Fax #: 519-627-0250

Account #: _____ Contact: _____ Salesperson: _____

Sales Order #: _____ Invoice #: _____ Purchase Order #: _____

Qty.	Part #	Reason for Return

FOR WARRANTY EVALUATION, THE FOLLOWING APPLICATION INFORMATION MUST BE COMPLETED

Application Information:

Type of Application: _____ Input RPM: _____ Output RPM: _____

HP: _____ Ratio: _____ Environment (wet, dusty, etc.): _____

Lubrication Type: _____ Type of Loading (shock, constant, etc.): _____

Type of Drive: _____ Operating Temperature: _____ Length of Service: _____

Probable Cause or Comments: _____



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