

GRAIN LOOP

Installation and Operation Manual



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Contents

- Warranty 3
- Section 1. Safety Precautions..... 4
- Section 2. Decals..... 8
- Section 3. Product Information..... 9
 - Grain Loop System Features..... 9
 - Grain Loop System Information 10
 - Grain Loop System Specifications..... 11
 - Horsepower Options 11
 - Grain Loop System Typical Layout Designs 12
- Section 4. System Installation..... 13
 - Grain Loop System Support..... 14
 - Sizing the Horsepower of the System..... 15
 - Tube and Component Assembly 16
 - Drive Assembly 17
 - Take Up Corner..... 18
 - Discharge with Gate Assembly..... 18
 - Bin Wells 19
 - Ground Control Kit for Discharge Gates 23
 - Inlet Dump Hopper Assembly 24
 - Final Inspection Check List 24
- Section 5. Operation..... 25
 - Lubrication..... 25
 - Start-Up..... 25
 - Sequence of Operation..... 25
- Section 6. Scheduled Maintenance 27
- Section 7. Troubleshooting 28
 - Troubleshooting Chart 29
- Section 8. Component Dimensions..... 30
 - Drive Corner 30
 - Standard Corner 31
 - Gravity Take-Up Corner..... 32
 - Manual Take-Up Corner 33
 - Loading Hoppers..... 34
 - Hopper Foundation 35
 - Center and Intermediate Hopper 37
 - Intermediate Gate..... 38
- Section 9. Parts List 39
- Section 10. Employer/Employee Training Sign-off 40
- Section 11. Quality Analysis Report..... 41

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Section I. Safety Precautions

This manual contains information that is important for you, the Owner/operator, to know and understand. This information relates to protecting personal safety and preventing equipment problems. It is the responsibility of the owner/operator to inform anyone operating or working in the area of this equipment of these safety guidelines. To help you recognize this information, we use the symbols that are defined below. Please read the manual and pay attention to these sections. Failure to read this manual and its safety instructions is a misuse of the equipment and may lead to serious injury or death.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.



CAUTION used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

NOTE indicates information about the equipment that you should pay special attention.



DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

Safety Instructions

Our foremost concern is your safety and the safety of others associated with this equipment. We want to keep you as a customer. This manual is to help you understand safe operating procedures and some problems which may be encountered by the operator and 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 in the area. Safety precautions may be required from the personnel. Avoid any alterations to the equipment. Such alterations may produce a very dangerous situation where **SERIOUS INJURY** or **DEATH** may occur. This equipment shall be installed in accordance with the current installation codes and applicable regulations which should be carefully followed in all cases. Authorities having jurisdiction should be consulted before installations are made.

Follow Safety Instructions

Carefully read all safety messages in this manual and safety signs on your machine. Keep signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from the manufacturer. Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction. Keep your machinery in proper working condition. Unauthorized modifications to the machine may impair the function and/or safety and affect machine life. If you do not understand any part of this manual or need assistance, contact your dealer.



Read and Understand the Manual

Operate Motor Properly

In an emergency, shut down the power source. Turn OFF and lock out all power sources before performing any maintenance. Do not operate electric motor equipped units until motors are properly grounded. Disconnect power on electrical driven units before resetting motor overloads. Do not repetitively stop and start the drive in order to free a plugged condition. Jogging the drive in this manner can damage the equipment and/or drive components.



Electric Shock Hazard

Stay Clear of Moving Parts

Entanglement in rotating impeller arms will cause serious injury or death.

Keep all shields and covers in place at all times.

Wear close fitting clothing. Stop and lock out power source before making adjustments, cleaning, or maintaining equipment.



Stay Clear

Practice Safe Maintenance

Understand service procedures before doing work. Keep area clean and dry.

Never lubricate, service, or adjust machine while it is in operation.

Keep hands, feet and clothing away from rotating parts.

Keep all parts in good condition and properly installed. Fix damage immediately.

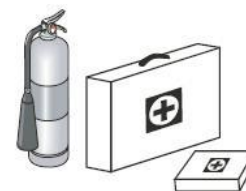
Replace worn or broken parts.

Remove any built up grease oil and debris.



Maintain Equipment and Work Area

Prepare for Emergencies
Be prepared if fire starts.
Keep a first aid kit and fire extinguisher handy.
Keep emergency numbers for doctors, ambulance service, hospital
and fire department near your telephone.



**Keep Emergency Equipment
Quickly Accessible**

Wear Protective Clothing

- Wear close fitting clothing and safety equipment appropriate to the job.
 - Remove all jewelry.
- Long hair should be tied up and back.
- Safety glasses should be worn at all times to protect eyes from debris.
- Wear gloves to protect your hands from sharp edges on plastic or steel parts.
- Wear steel toe boots to help protect your feet from falling debris.
- Tuck in any loose or dangling shoe strings.
 - A respirator may be needed to prevent breathing potentially toxic fumes and dust.
 - Wear hard hat to help protect your head.
 - Wear appropriate fall protection equipment when working at elevations greater than six feet (6').

Eye Protection



Gloves



Steel Toe Boots



Respirator



Hard Hat





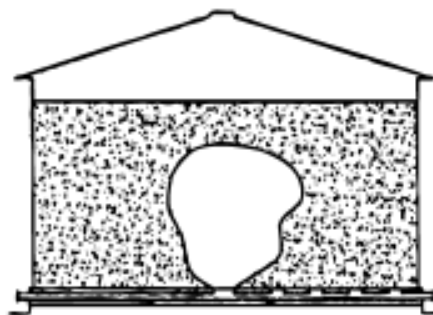
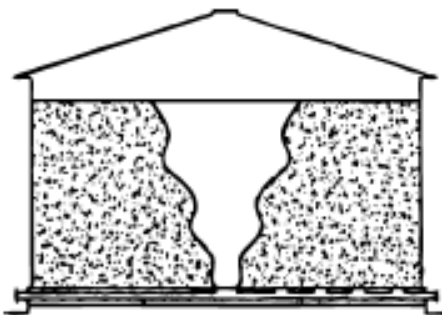
DO NOT ENTER A GRAIN BIN UNLESS POWER IS LOCKED OUT TO ALL BIN EQUIPMENT.



DO NOT ENTER A GRAIN BIN WHILE GRAIN IS BEING REMOVED. FLOWING GRAIN CAN TRAP, BURY AND CAUSE SUFFOCATION.



DO NOT ENTER A GRAIN BIN IF THE GRAIN HAS BRIDGED OR STOPPED FLOWING NORMALLY. THE GRAIN CAN COLLAPSE WITHOUT WARNING AND CAN TRAP, BURY AND CAUSE SUFFOCATION.



Section 2. Decals



Section 3. Product Information

Grain Loop System Features

A Grain Loop is a continuous grain loop conveying system (chain conveyor), that incorporates the functions of many of the traditional grain systems that have been in the market place for a long time. The grain loop can incorporate many storage bin units and provide easy in-load and out-load to trucks or wagons, moving grain vertically and horizontally with ease. The Grain Loop, when joining a line of storage bins, can be designed to provide the following advantages for your farm or commercial storage system:

1. Quick convenient in-load.
2. Quick convenient out-load.
3. Blending of grains.
4. Turning grain within one bin or from one bin to another bin.
5. Easy incorporation of "off-line" functions such as drying, cleaning, rolling, grinding or other processing.
6. Ease of expansion.
7. Ability to incorporate many bins into the system.
8. And, all with push button automation.

The Grain Loop lets you move product with gentle efficiency and at high capacities, requiring less horsepower and causing less damage. The unique U.H.M.W. (Ultra High Molecular Weight) paddle keeps grain flowing gently and evenly from inlet to discharge, taking the place of traditional auger flighting. The closed loop design offers the versatility to create a complete load-in/load-out system with re-circulation capabilities. It can be installed underneath a row of bins or in an existing in-line system.

- An entire family of attachments and options enable the system to accommodate any bin combination.
- Provides expansion capabilities
- Needs less maintenance than traditional conveying systems
- Can reduce drying costs by blending higher moisture grain and dried grain from one bin to another

The simplicity of the design, with four 90° corners completing a rectangular loop and driven by only one or two motors, makes the choice between conventional systems and this one a very easy one. Round Ultra High Molecular Weight (U.H.M.W.) plastic paddles are spaced every 13 inches and are notched to facilitate chain sprockets in each corner.

Owners have found a reduction in damage when compared to traditional conveying systems and the durability of the paddles is unbeatable. The closed-loop design allows you push-button convenience with the effectiveness of a bucket system with savings of up to 40%.

More Key Features

- The high capacity load-in/load-out system also provides re-circulation capabilities.
- One or more bins can be unloaded simultaneously with the loop.
- Reduced drying costs can be achieved by blending higher moisture and dried grain from one bin to another.
- Configuration versatility allows the system to be installed underneath a row of bins in an existing in-line system, or angled to pick-up from conventional unload augers in front of the bins.
- Simple integration facilitating off-line processing such as drying, cleaning or rolling/grinding.
- Ease of manipulating multiple separations.
- Expandable. It can be structured to enable ease of future expansions.

Grain Loop System Information



A Grain Loop System is a chain and paddle conveyor moving through a round housing. A loop system allows you to do total loading and unloading with a single system. Grain Loop Systems will handle a wide range of free flowing materials. They are primarily intended for grain and grain products. They will move material into and out of grain storage structures, vehicles, dryers and other facilities with ease and gentleness. The Grain Loop System is well suited for blending materials while being transferred from one storage unit to another. The height and length of the system is limited by the combined horsepower required to move the grain. The vertical Grain Loop System requires greater horsepower per foot, so the taller units will be more limited in the overall horizontal length. System lengths of several hundred feet are common. However, relatively small systems to accomplish more specific tasks are also available.

Grain Loop System Specifications

Tube size	6" (15.2cm)	8" (20.3cm)	10" (25.4cm)	12" (30.48cm)
Maximum capacity*	1,500 BPH 38 MTPH	4,000 BPH 102 MTPH	6,000 BPH 152 MTPH	10,000 BPH 254 MTPH
Chain travel speed	318 fpm 97 mpm	318 fpm 97 mpm	336 fpm 102 mpm	388 fpm 118 mpm
Head shaft RPM	81	81	81	81
Tube gauge	12 GA 2.6 mm	10 GA 3.43 mm	10 GA 3.43 mm	10 GA 3.43 mm
UHMW paddle thickness	1/2" 12.7 mm	1/2" 12.7 mm	1/2" 12.7 mm	1/2" 12.7 mm
Conveyor chain	81X	81XHH	81XHH	81XHH
Max. HP (kW)	30 (22)	60 (44)	100 (74)	120 (90)
Angle of operation	Horsepower required per foot of conveyor			
	Kilowatt power required per meter of conveyor			
Horizontal	0.042	0.076	0.114	0.178
	0.103	0.186	0.279	0.435
Vertical section length and angle relative to vertical line				
0 deg. (straight vertical)	0.2	0.35	0.5	0.75
	0.489	0.856	1.223	1.835
15 deg.	0.193	0.338	0.482	0.724
	0.472	0.827	1.179	1.771
30 deg.	0.173	0.3	0.433	0.65
	0.423	0.734	1.06	1.59
45 deg.	0.141	0.247	0.353	0.53
	0.345	0.604	0.863	1.296
Empty weight /FT (LBS)	12	19	23	27
Full weight /FT (LBS)**	21	35	48	62
Empty weight /m (KG)	8	13	15	18
Full weight /m (KG)**	14	23	32	42

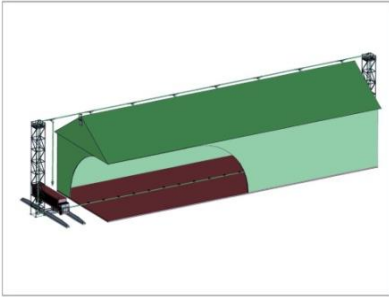
* Note that capacities are estimates only and that increased angle will reduce capacity.
Capacities based on 45 lb/ft³ (721 KG/M³) dry shelled corn.

** Full weight is based on tube full of 45 lb/ft³ (721 KG/M³) material.

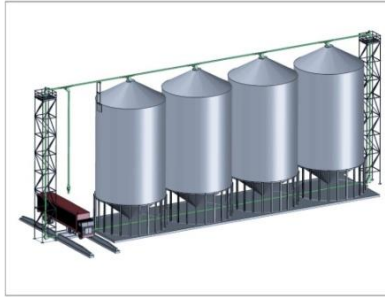
Horsepower Options

Total	6" Model		8" Model		10" Model		12" Model	
HP	1st Drive	2nd Drive	1st Drive	2nd Drive	1st Drive	2nd Drive	1st Drive	2nd Drive
5HP	5HP	Idle						
7.5HP	7.5 HP	Idle						
10HP	10HP	Idle						
15HP	15HP	Idle	15HP	Idle				
20HP	20HP	Idle	20HP	Idle	20HP	Idle		
25HP	25HP	Idle	25HP	Idle	25HP	Idle		
30HP	30HP	Idle	30HP	Idle	30HP	Idle		
30HP*	15HP	15HP	15HP	15HP	40HP	Idle	30HP	Idle
40HP			40HP	Idle	20HP	20HP	40HP	Idle
40HP*			20HP	20HP	50HP	Idle	50HP	Idle
60HP			30HP	30HP	30HP	30HP	60HP	Idle
80HP					40HP	40HP	40HP	40HP
100HP					50HP	50HP	50HP	50HP
120HP							60HP	60HP

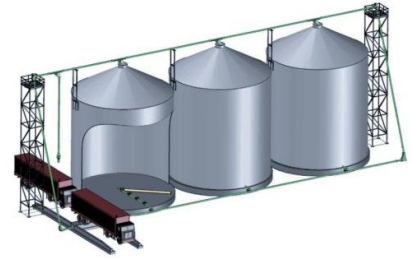
Grain Loop System Typical Layout Designs



Vertical Around Bulk Building
 In situation where bulk storage is used, a grain pump can be constructed to convey crops to and from trucks and rail cars. The use of bin wells and bin sweeps can ensure that all of the crop can be moved turned or blended as required.



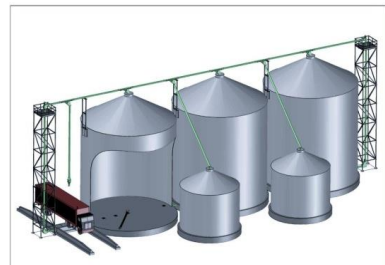
Vertical Around Hoppers
 Hopper bottom bins can also be incorporated into the system. Where the operation deals with a variety of commodities and uses hopper bottom bins extensively, the design can be configured to allow handling multiple crops without fear of contamination.



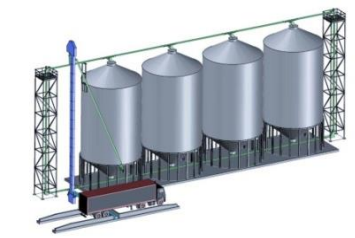
Slanted Pump
 A Slanted pump is most frequently used when an operation is being retrofitted and the storage system is upgraded to take advantage of the grain pumps versatility. Utilizing existing storage structures, instead of building new grain bins, can save expense.



Horizontal Bin Fill
 To fill, 2 rows of bins, a horizontal bin fill formation may suit the farm situation better. The high capacity, low maintenance and ease of operation combine to provide the most efficient top-loading grain handling system in the industry. The same may be said for a horizontal bin unloading system, if the circumstance is right.



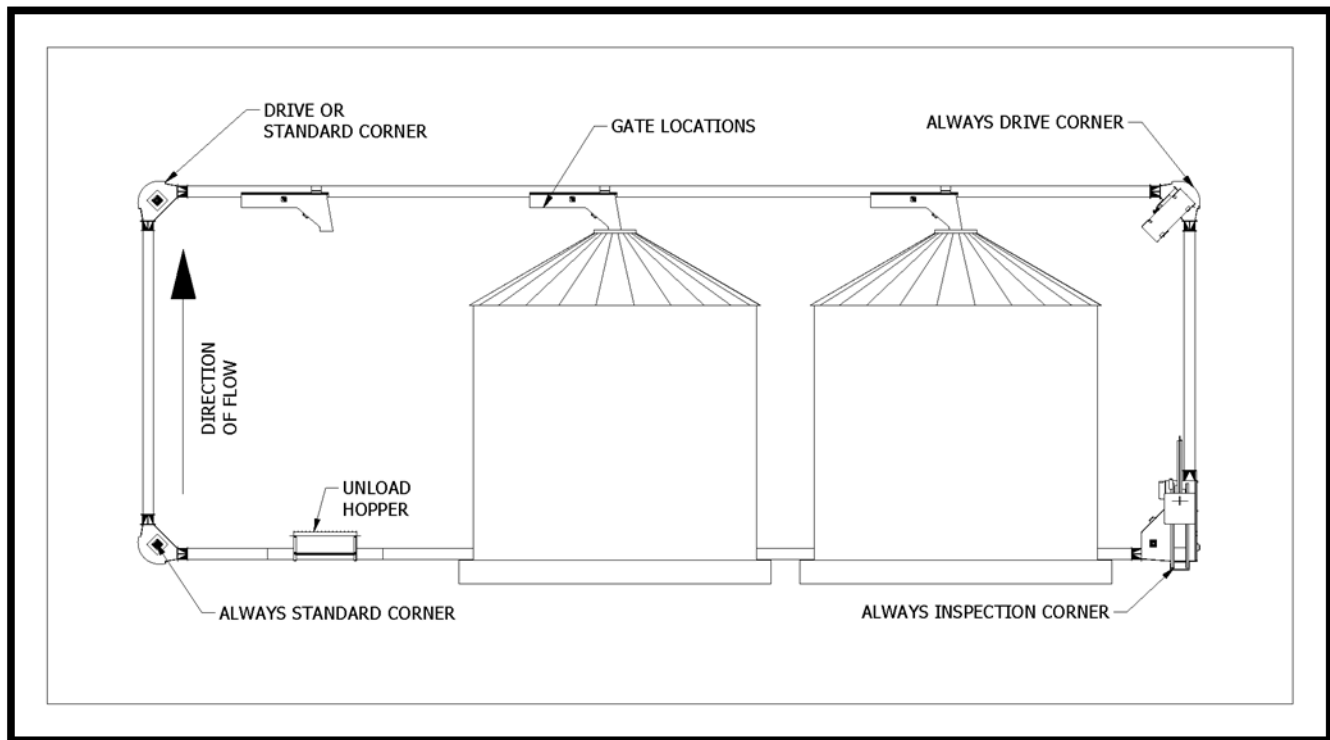
Side Spouts
 Side spout allow the grain loop to incorporate bins that are not in line into the grain system. Other functions such as grain drying, cleaning, rolling and bagging can be incorporated into the system.



A Loop with Bucket Elevator and Hopper Bin Combination
 Where blending feed is a prominent system requirement, a loop with a bucket elevator and hopper bins can be constructed. This allows a number of ingredients to be custom mixed to your specifications and it can all be controlled and monitored electronically.

For other applications, consult Lambton Conveyor Engineering

Section 4. System Installation



A layout should be drawn to show the exact location of grain bins, inlets, outlets, the control box, outlet control kits, the power source and the supporting structure. The layout should consider future expansion, the ability to mix grains from several locations, the grain direction, the operation of slide gates, the use of other conveyors to fill or unload bins and whether the Chain Loop tube is under the center of or besides the grain bins.

Chain Loop Systems are provided with one (1) or two (2) drive corners depending on the power requirements of each system. Drive corners are always located at the upper corners, and the drive corner for single drive systems must be located at the far end of the top chain run. This will allow the drive corner to pull grain up from the loading hopper and across the top to the storage bins. The inspection corner is always located on the ground furthest from the loading hopper. This allows proper chain tensioning throughout the system.

It is important to slide components together tightly and to have the clamping band centered on the joint before tightening the bands. All cuts should be made square and the inside diameter chamfered to ensure that the ends butt together tightly during assembly. Even small gaps left in the tubing system during assembly will gradually close during operation of the Chain Loop causing the chain to require frequent inspection and tightening.

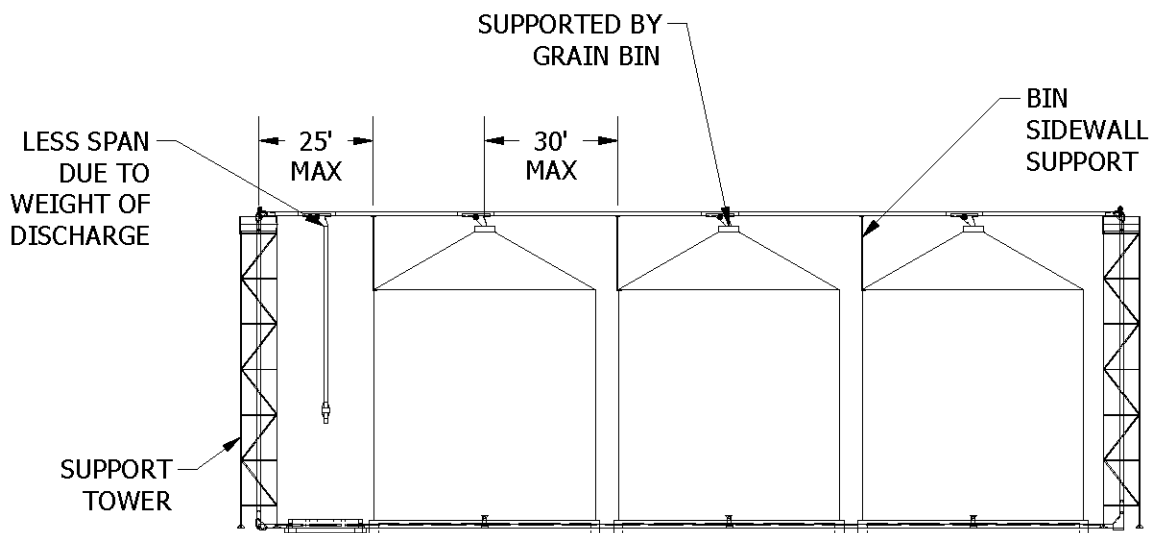
General guidelines to consider are:

1. The Chain Loop will move grain in one direction only; it is not reversible.
2. Provide room for service and maintenance at each of the corners and discharge gates.
3. Avoid having any part of the system under grade to eliminate water accumulation problems.
4. Provide adequate footings for solid supporting structures.
5. Minimize the loaded distance by placing the inlet hopper as close to the vertical tube as possible.
6. There can be no twist in the chain/paddles. The opening should be oriented so that the open side of the paddle will pass across the sprockets.

Grain Loop System Support

Towers or other adequate supports are needed to hold the vertical ends of the Grain Pump System in position. Consider the weight per foot of a fully loaded tubular conveyor. (see System Specifications for pipe weights) The individual corners and other components, particularly the ones with drives weigh considerably more.(see the Component Dimensions section for weights) The horizontal tubular conveyor should be supported at 20 ft. to 30 ft. intervals. This can be done with vertical supports from the ground, from the bin sidewalls, or from the bin roof at the peak.

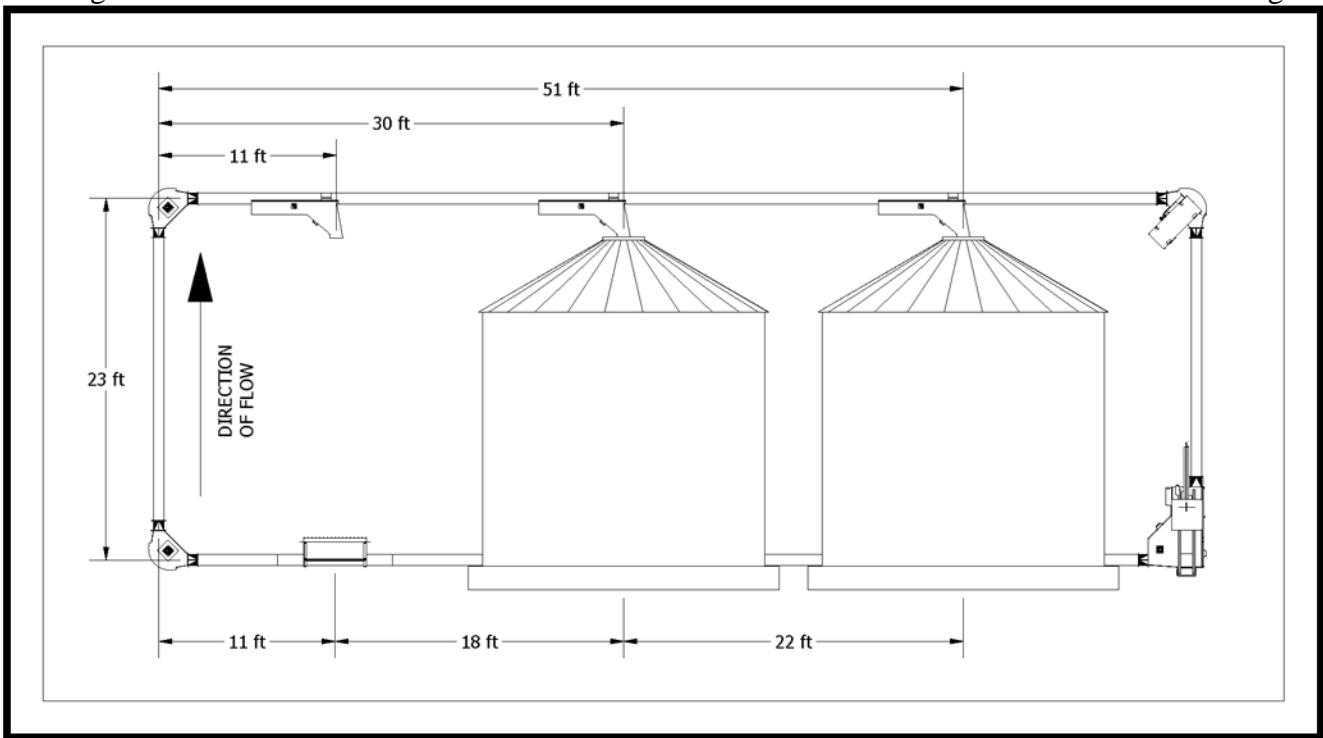
Consult the bin manufacturer concerning their recommendations for loads their bin will support in these areas.



Sizing the Horsepower of the System

System	Size	Vertical	Factor	Horizontal	Factor
6"	To Be Determined				
8"	0.35 HP/loaded foot	(0.86 Kw/M)	0.08	HP/loaded foot	(0.19 Kw/M)
10"	0.50 HP/loaded foot	(1.22 Kw/M)	0.11	HP/loaded foot	(0.27 Kw/M)
12"	0.75 HP/loaded foot	(1.84 Kw/M)	0.18	HP/loaded foot	(0.44 Kw/M)

The system should be designed to minimize the distance grain must be moved. The example shows the dump hopper located next to the vertical tube. If it were located on the other side of the grain bins then the system would have to move grain that much farther before taking it up and over to the discharge gates.



This example illustrates a system and the power requirements for different functions of a Chain Loop System. If the main requirement is maximum filling rate, then the motor size for this 8" system would be:

$$0.35 \text{ HP/ft} \times 23 \text{ vertical ft.} = 8.05 \text{ HP plus}$$

$$0.08 \text{ HP/ft} \times (11 + 51 \text{ horizontal ft.}) = 4.96 \text{ HP}$$

$$= 13.01 \text{ (Use a 15 HP motor)}$$

If the requirement is maximum flow rate while moving grain from bin to bin as well as a maximum filling rate, then the motor size would be:

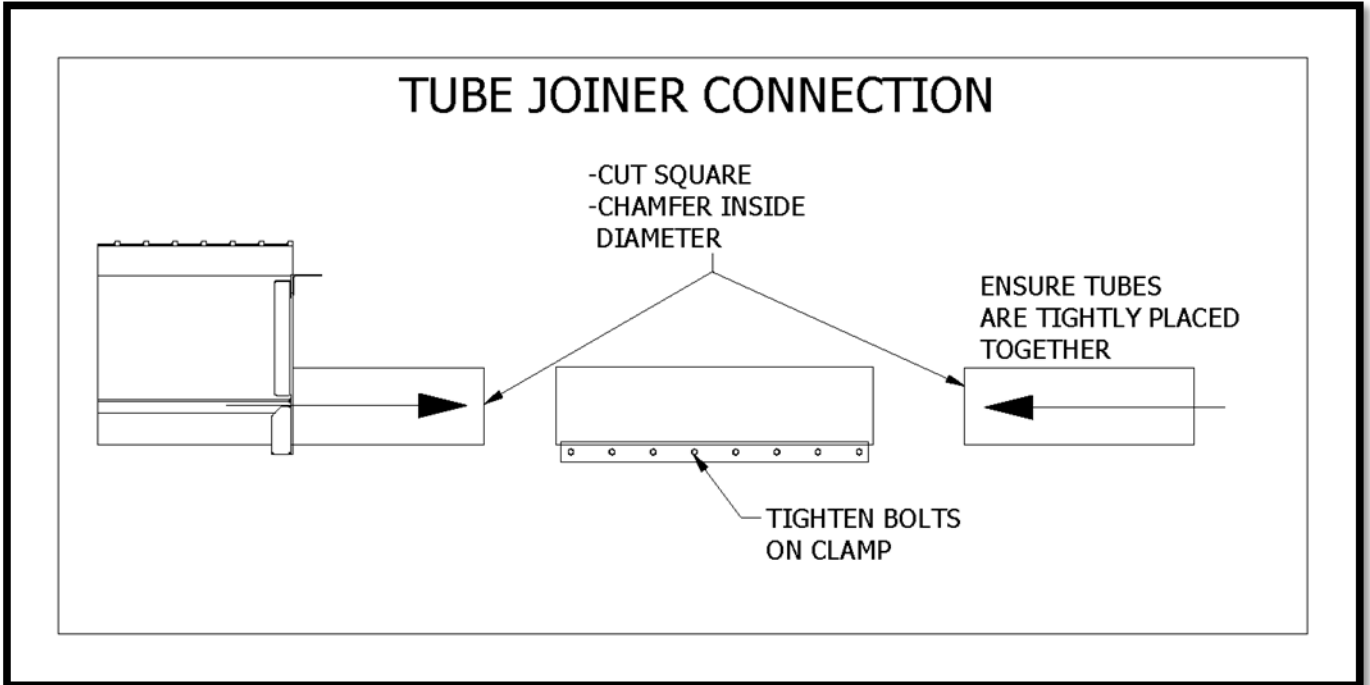
$$0.35 \text{ HP/ft} \times 23 \text{ vertical ft.} = 8.05 \text{ HP plus}$$

$$0.08 \text{ HP/ft} \times (22 + 18 + 11 + 51 \text{ horizontal ft.}) = 8.16 \text{ HP}$$

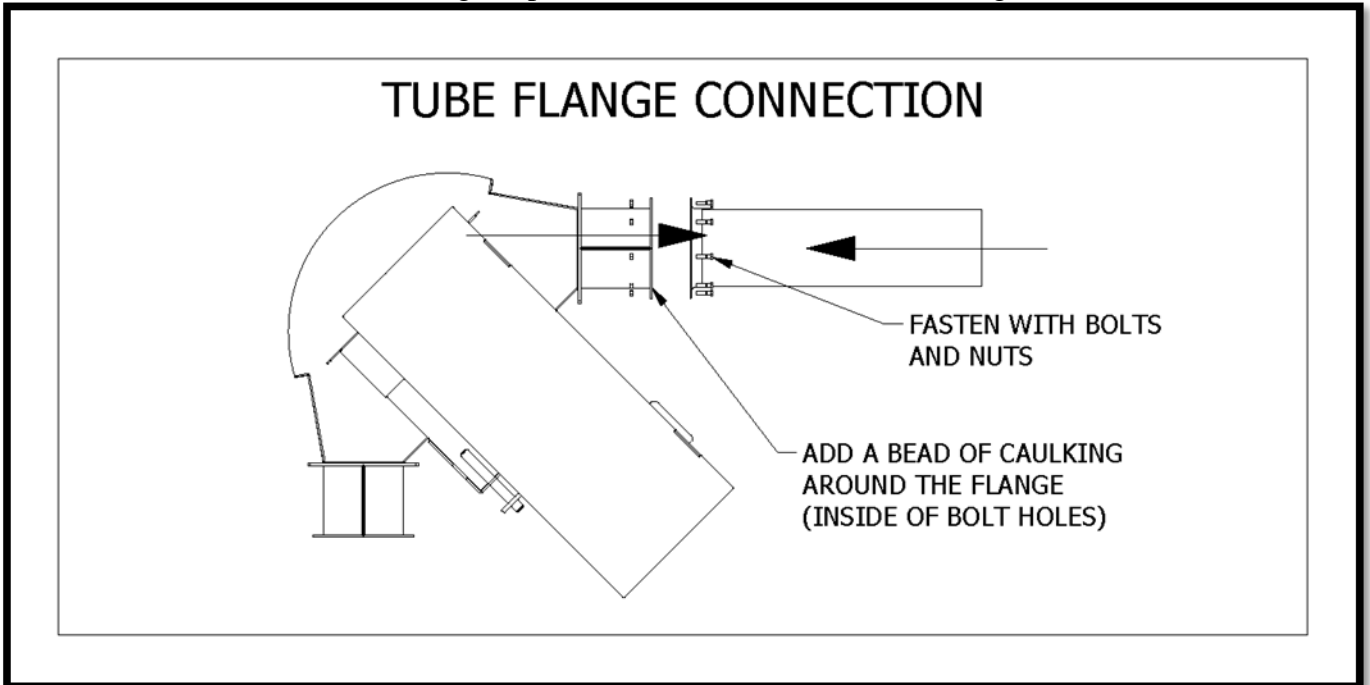
$$= 16.21 \text{ (Use a 20 HP motor)}$$

Tube and Component Assembly

Lay the sections out in order so as to determine what portions to assemble prior to actual placement in the system. When cutting tubes to exact length, the ends must be cut square and any burrs on the ends must be removed by chamfering the inside diameter. There are two methods of connecting the tubes to the components and to other tubes:



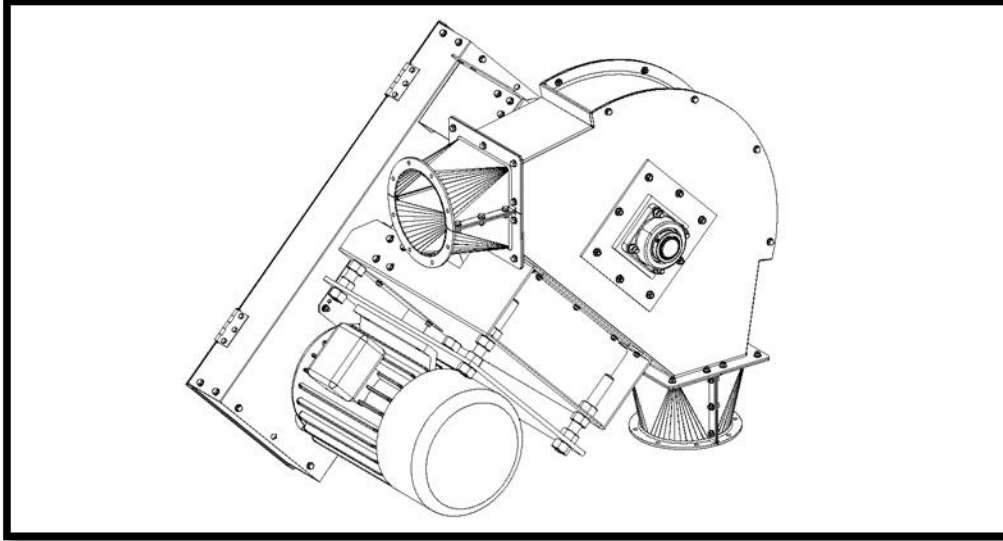
1. Join tube and corner components together with connecting bands. Slide the tube sections tight together and space the connecting band in equal amounts on both parts of the connection. Tighten the bolts in the band. Fasten the discharge in place within the tube with connecting bands.



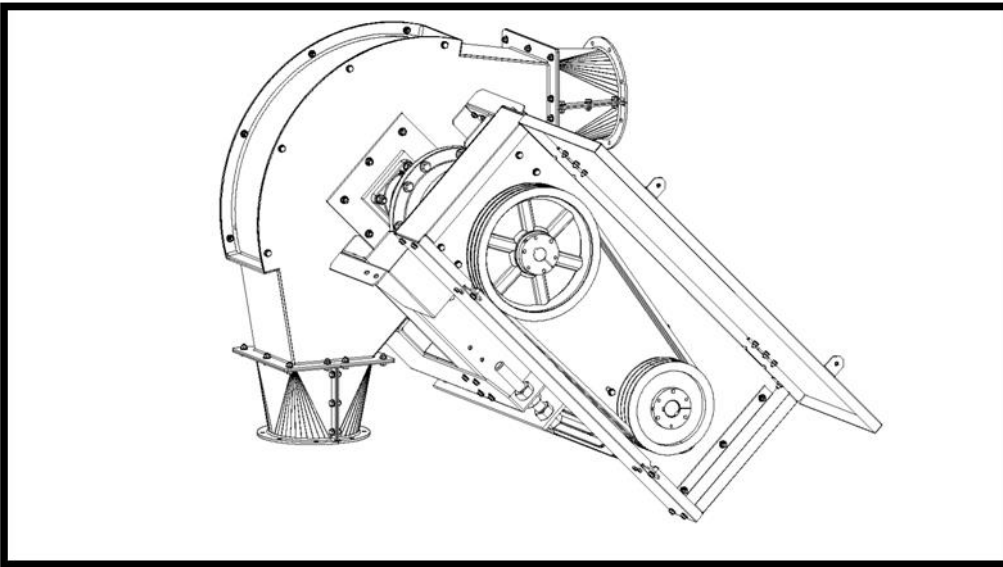
2. If the connection uses supplied flanges then place a bead of caulking around the flange on the inside of the bolt holes to seal for weather. Fasten with provided bolts and nuts. This connection is provided for ease of assembly and disassembly.

Drive Assembly

The Chain Loop System is powered by an electric 1750 RPM motor.



IMPORTANT: Use the proper size motor to ensure satisfactory operation. Too small of a motor will not supply the horsepower required to achieve capacity and damage to the motor may occur. Too large of a motor may cause high stress on components resulting in shorter life. See Page 11 for motor size specifications.

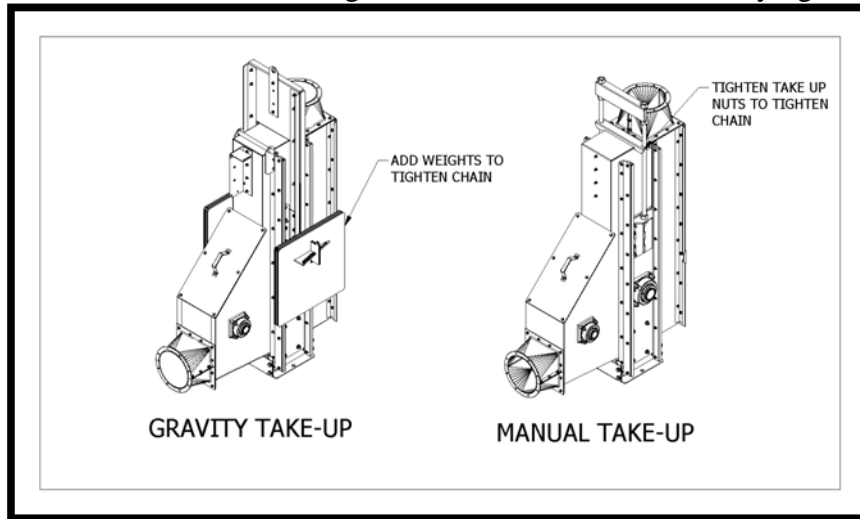


IMPORTANT: Use the motor sheave furnished. If other size sheaves are used or substituted, improper chain speed and unsatisfactory operation will result. Mount the sheaves as close to the belt guard back as possible. Align sheaves by using a straight edge, placed across the outer faces of both sheaves. Secure in place using taper lock bushing. Be sure drive keys are properly installed. Check sheave alignment again after sheaves are secured to shafts. Install the belts onto the sheaves and set belt tension. To tighten belts, turn the 3/4" nuts on the motor mount rods to raise the motor mount assembly. Raise all the rods the same distance so the motor mount assembly is parallel with the top. Check that all fasteners are tightly secured. Close and fasten belt guard. The gear reducer is shipped without oil. It is necessary to

add the proper amount of oil before running. Use a high grade petroleum base, rust and oxidation inhibited R and O gear oil. Follow the instructions on the reducer name plate, warning tags and in the installation manual attached to the reducer.

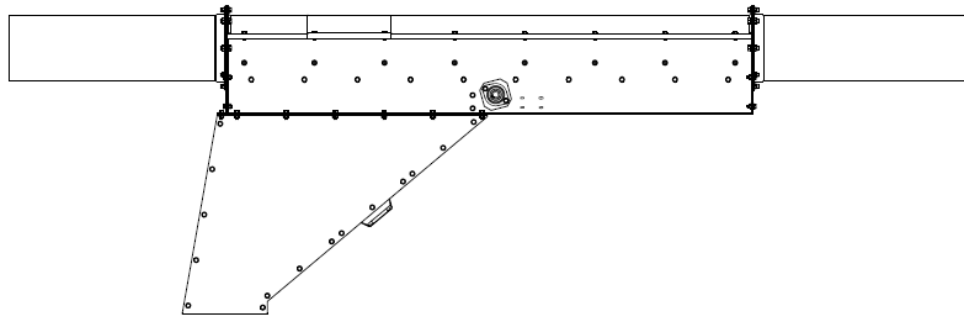
Take Up Corner

There are two types of take up corners available for a loop system, a gravity take up and a manual take up. While both of these options perform the same function, the gravity option requires much less maintenance than the manual option. The manual take must be manually tightened regularly to ensure chain tightness, but it can be used in a completely horizontal position. The Gravity Take-Up uses weights to keep the chain tensioned, add weights until the chain is sufficiently tightened.



	For Loop Systems over 45 degrees from vertical use the Manual Take-Up only. The Gravity Take-Up will not function properly.
--	---

Discharge with Gate Assembly



Assemble the intermediate discharge gate to the tube sections using tube joiners as outlined above. It may be necessary to cut exact lengths of tube conveyor sections to locate the discharge unit in the desired location. Relocating tube saddle brackets may also be required. The intermediate discharge gate is designed for chain travel in one direction only. Make sure it is oriented properly as shown above, or referring to the decal on the discharge unit. Operation in the wrong direction can cause paddle damage. The discharge transition and drive option can also be installed at this time.

	The sliding section of the discharge assembly needs to be adjusted after installation. Ensure the gate open and closes smoothly before operating the system.
--	--

Bin Wells

Bin well installation for Chain Loop Systems installed under a row of grain bins. Position the center bin well so that the bin sweep pivot is at the center of the bin and on top of the Chain Loop tube. Intermediate wells may be placed on the tube between the center and bin wall if desired.

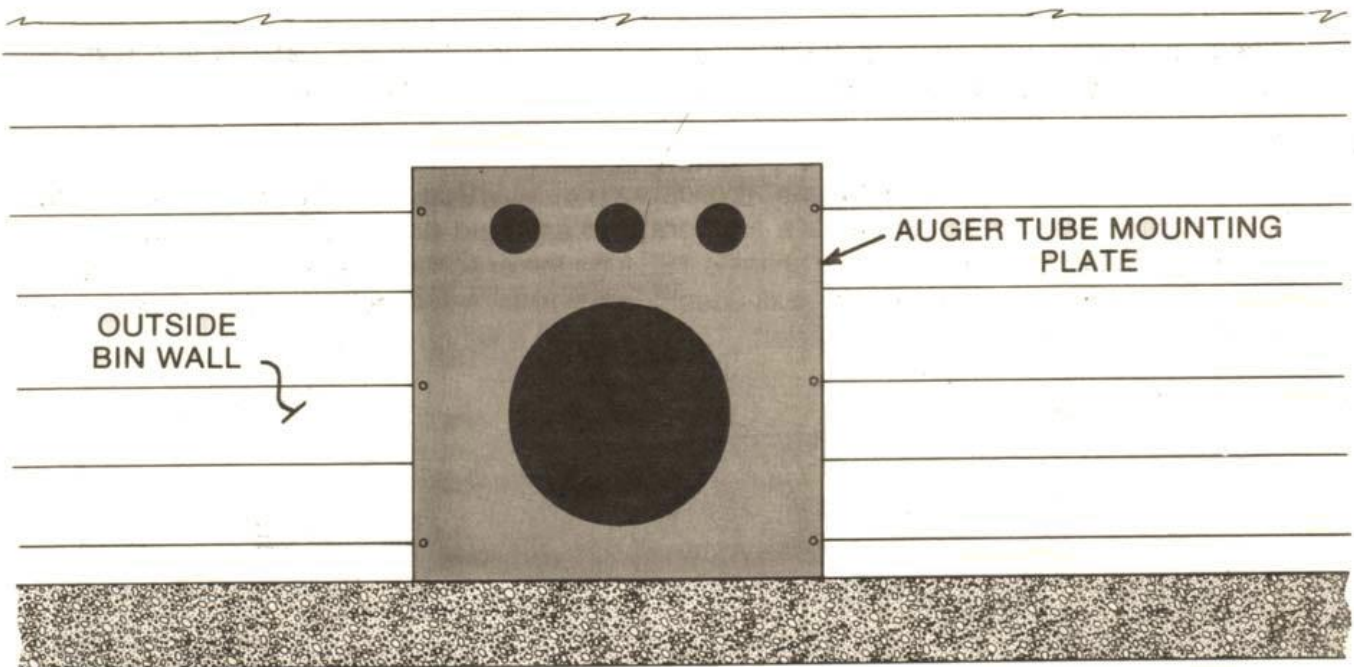


The Intermediate well(s) should not be opened until the center well has completely unloaded.

NOTE: Do not cut the opening with the chain and paddles inside the tube or they may be damaged. The control pipe for the center well (1/2" pipe) should fit inside the pipe used for the intermediate wells (1" pipe).

Before installing the drying floor described in the following sub -sections, the under floor auger tube and well should be installed. As part of your erection planning, the location where the auger tube will enter the bin should have been determined. The best position for the auger entry is the exact opposite side of the bin where the fan entrance transition is made. This helps prevent air flow obstruction by the auger the tube and hot or cold spots that could result.

1. Place the auger tube mounting plate on the bin at the position where the tube will enter and mark on the bin where the holes are to be cut for the auger tube and control rod. If an intermediate well is to be used, an additional hole for that control rod will be required.

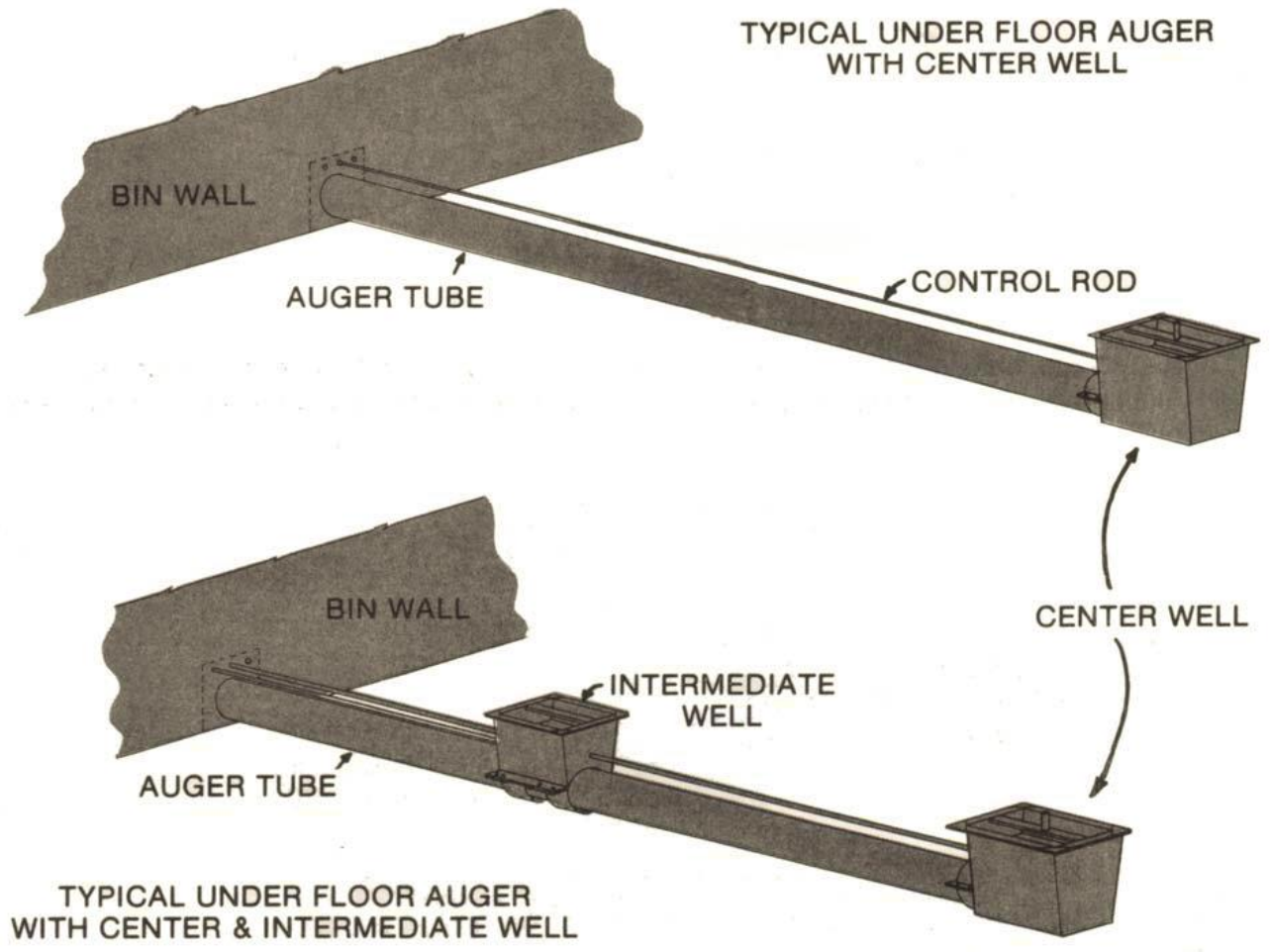


2. With the hole cut in the sidewall, attach the plate to the outside of the bin using self-drill screws. Slide the tube through the plate and bin wall. Tar around the tube mounting plate to prevent air leakage.

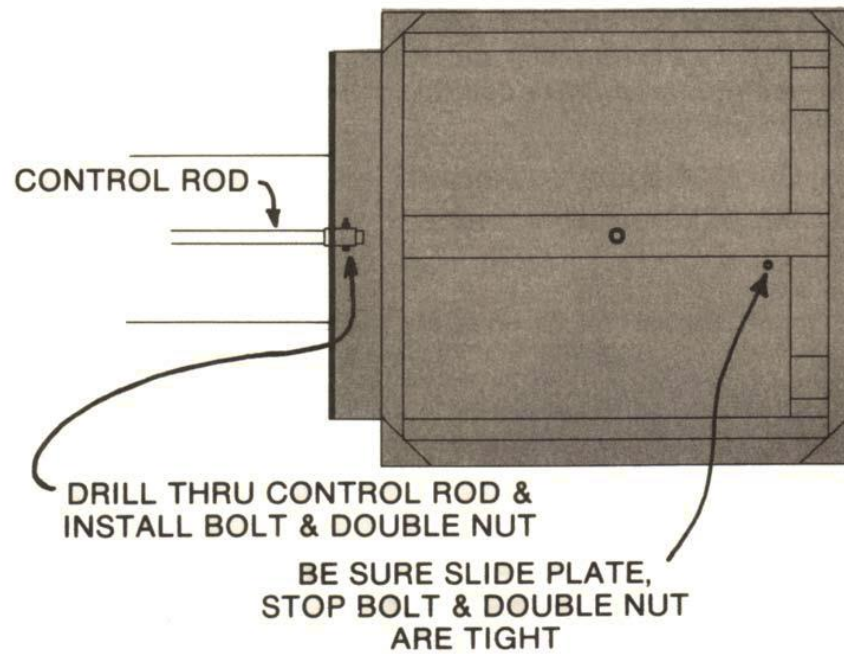
3. Mark the exact centre of the bin on the concrete floor and position the centre well over this mark.

4. Connect the auger tube to the centre well.

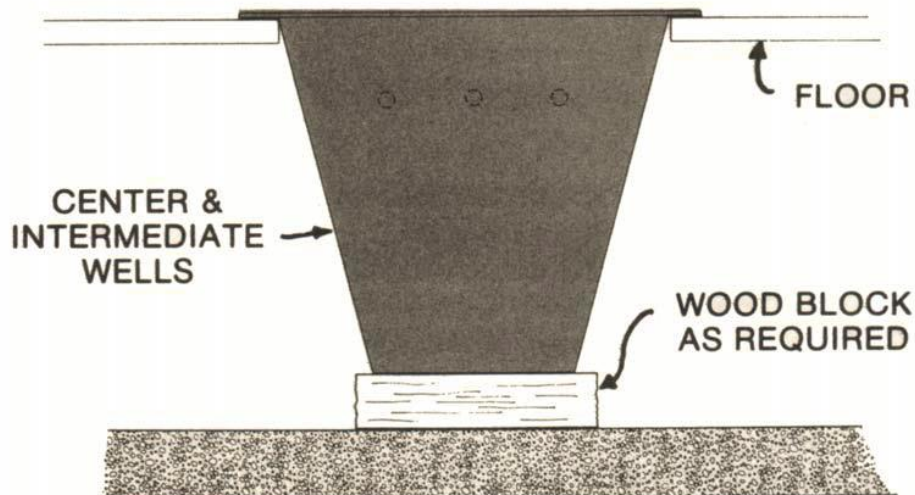
5. If an intermediate well is to be used, place the well over the tube and mark the area to be cut out of the tube. This is normally about 1 inch smaller than the exposed tube are looking in the well from the top. After cutting out this area the intermediate well can be bolted in position on the auger tube.



6. Install control rod from outside bin wall to centre well slide plate. If an intermediate well is used this rod will pass through the knockouts provided in the intermediate well housing. Install control rod guides, as required, depending on bin diameter. Connect control rod as shown at centre and intermediate wells.



7. The final installation of the well can be completed when the floor has been laid up to the well. The floor will require some field cutting to permit the installation of the wells.



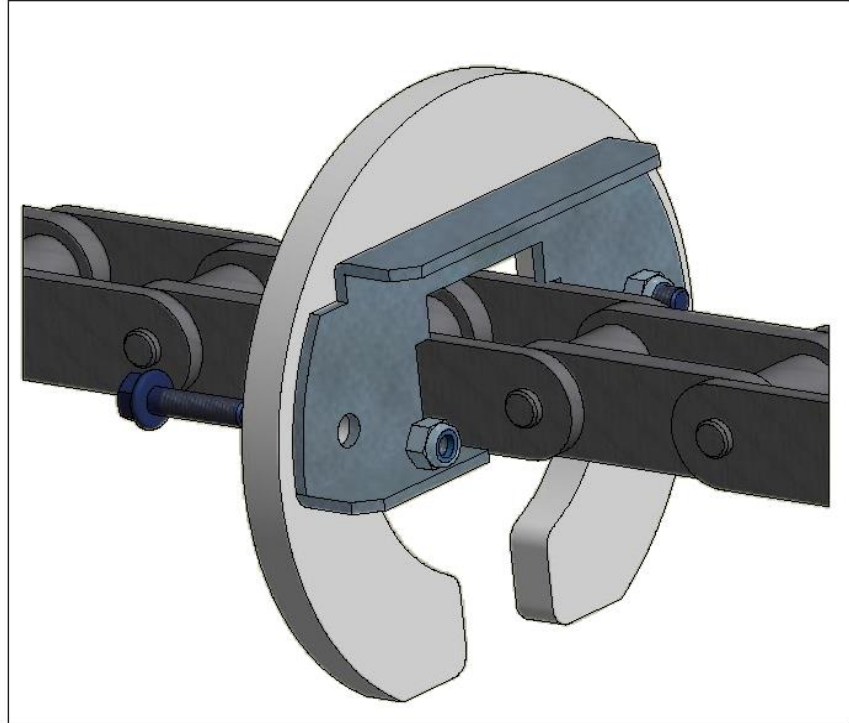
8. Use self-drill screws at 4" max. spacing around well to fasten it to the floor.

9. Install a block under the well to assure that pressure exerted by grain on the well will be absorbed by the block and not transferred to the raised floor.

10. Be sure that control rods and slides operate properly before completing the installation of the floor.

Chain and Paddles

The paddles are attached to the chain with 5/16" x 1 1/4" flange bolts and nylock nuts. Make sure that the chain paddle brackets are oriented as shown on the right. The nylock nut should be inside the "V" shaped chain paddle bracket and the flange bolt against the face of the plastic paddle. Make sure all hardware is tightened properly to a torque of 20 ft. lbs.



The chain is shipped in 10' lengths and needs to be spliced. Make sure to bend the ends of the cotter pins to prevent them from working loose and causing the chain to break.

Use an electrical fish tape or wire to pull the chain through the tube assembly. It is possible for the chain to twist a full 360° during this process. Visually check the chain through open inspection covers at the discharge gates and openings for wells to make sure that this has not happened. Adjust the tightening screws in the inspection corner all the way up and connect the final chain link through the access door in the inspection corner after removing as much chain slack as possible. Tighten the chain by turning the adjusting screws clockwise; adjust each side equally to keep the sprocket shaft square with the housing. Remove chain links if there is not enough travel in the adjusting screw to tighten the chain. Make sure that the sprocket shaft is square to the housing by measuring the shaft position on both sides of the housing. The chain should be tightened until the paddles are nearly rigid on the chain. The tips of the paddles should only move 3/4" when grabbed and pulled by hand. Check and re-tension the chain after the system has been trial run while empty.

Figure 6M



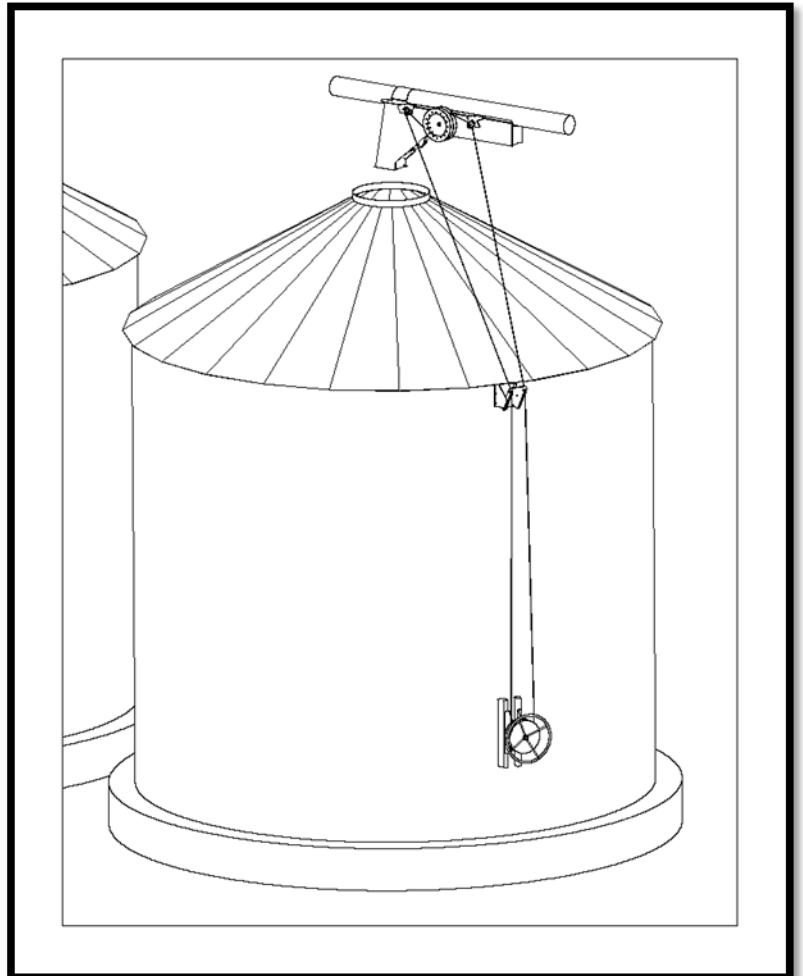
Make sure all shields and safety guards are in place before restoring power.



Turn OFF and lock out the main power source BEFORE removing any inspection covers or shields.

Ground Control Kit for Discharge Gates

Determine the best location for each ground control kit. The cable idler pulley bracket is usually mounted at the top of the bin wall, just under the roof eave, in line with the control wheel on the discharge gate. The ground control wheel-mounting bracket should be mounted to the bin wall directly under the idler pulley bracket at a convenient operating height. It is important to keep the cable in line with the control wheels on both the discharge gate and at the ground to avoid having the cable “walk off” either wheel. The ground control wheel can be mounted to the same bin as the discharge gate, or to an adjacent bin. Each control system should be marked to identify which discharge gate is being controlled. Each control system should be marked after installation to clearly identify whether the discharge gate is open or closed. Set screws in the ground control wheel can be used to lock the wheel in position to prevent accidental opening or closing of the discharge gate. Assemble the idler pulleys to the mounting bracket on the inside surface if the cable is going to a discharge gate on the same bin. Assemble them on the outside if the cable is going to an adjacent bin. Attach the idler pulley bracket to the bin wall just under the eave to ensure that the cable will clear the bin roof. Attach the ground control wheel bracket to the bin wall directly below the idler bracket. Assemble the wheel-mounting bracket loosely to the wall bracket and slide it up as far as possible. Assemble the control wheel to the shaft and secure with cotter pins. Make sure that the discharge gate is half open and wrap the cable 5 times around the discharge gate control wheel. Note that turning the wheel clockwise will close the gate. Secure the cable to the wheel with the cable clamp by attaching it to the approximate middle of the 5 wraps of cable. This will ensure that the gate will fully open and close without restriction from the cable clamped to the wheel. Make sure that the discharge gate is still half open. Route the cable back through the right idler pulley and down to the ground control wheel. At the ground control wheel, turn the wheel until the cable clamp is up and wrap the cable 5 times around it. Secure the cable clamp to the middle wrap. Splice the ends of the cable with a cable clamp. With the discharge gate half open, the splice should be at least 5' away from the pulleys and control wheels. Slide the ground wheel bracket down to take up any slack in the cable and tighten in place. Check the installation by turning the ground wheel clockwise to fully close the discharge gate and counterclockwise to fully open the gate without any restrictions from the cable splice or the clamps on the control wheels. If the rotation is wrong, then reverse the direction of the 5 wraps on the ground control wheel.



Inlet Dump Hopper Assembly

The dump hopper will include a length of tubular conveyor from 6' to 11' depending on the length of dump hopper selected. It will also include a top safety screen or drive over grating. There is a grain flow control inside the hopper that is adjustable using the jack screws located under the grating. Start with the flow control closed and slowly open it, letting more grain in until the desired flow and motor amperage is reached.

CAUTION

Overloading the Loop Hopper can cause the system to plug which could damage the system and adjacent structures.

A dump hopper is to receive grain into the Chain Loop System and should be located at a point along the bottom conveyor portion. Usually dump hoppers are located near the standard corner where the chain and paddles turn to carry grain up. For drive over systems, the grate must be supported by a concrete structure. (See Drawing Section)

NOTE: When the system is not in use, it is a good practice to cover the hopper with a rubber mat to help keep water, animals and debris out.

Final Inspection Check List

The Grain Loop System requires an inspection before start-up after the assembly is complete and before each use. The following are critical areas to be inspected.

1. Make sure that the main power isolator is locked in the “OFF” position and that the only key is in the possession before removing any shields and inspection covers.
2. Check all safety decals and replace any that are worn, missing or illegible. See Page 22 for decal part numbers and location.
3. Check for proper chain tension and adjust if necessary. See Page ?? for full instructions.
4. Check that the discharge gates open and close completely. Remove the inspection cover from the top of the discharge gate and make sure that the gate is clean inside.
5. Check the lubricant level in the gear reducer at the drive corner.
NOTE: The gear reducer is shipped dry and needs to be filled to the proper level before use.
6. Check the condition of the drive belts and make sure that they are aligned and tensioned properly.
7. Check that the corner sprockets are centered in the housings. Realign the sprockets and tighten the set screws if necessary.
8. Check overall structural integrity of the Grain Loop System and make sure that all supports and components are secure.
9. Check to make sure that the chain moves freely (this is particularly important if the temperature is below freezing). Use a pipe wrench on the end of each of the corner shafts to manually move the chain.
10. Make sure all shields and safety guards are in place before restoring power.

Section 5. Operation

Lubrication

Reducers are shipped without oil; refer to the Manufacturers manual to determine the proper type and quantity for your application. All bearings should be lightly lubricated before initial start-up but fully lubricated during. Some bearings are equipped with auto greasers (optional) 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.

Start-Up

A final check of all parts to ensure that no foreign objects or tools have been left in the drag is a good idea. All guards, inspection panels, and removable sections should be checked for proper placement. The chain tensioners need to be adjusted to tighten the chain on the sprockets, refer to chain section for more info. The drive should once again be turned by hand to check for proper tracking, and to ensure there are no obstructions. Finally check all setscrews to ensure they are tightened.

After a check of all mentioned components carefully run the loop **without** load and check for any problems or necessary adjustments. Make certain that the chain is running in proper alignment throughout the loop. If adjustments are required refer to the troubleshooting section of this manual.

Once all sections of the conveyor have been thoroughly checked, all adjustments have been made and proper lubrication is done the loop 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 loop.

Once you are satisfied with the operation of your loop it can be put into use. At this point it may be a good idea to check the rest of your flow system. Be sure any outlets, inlets, etc are functioning properly.

A chart is located in the Troubleshooting section to assist you in recognizing and repairing any problems you may have with your loop 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.

Sequence of Operation

The Grain Loop is generally used to transfer grain to or from storage bins. Grain can be fed into the system through an inlet dump hopper or through center or intermediate grain wells in the storage bins. Wells from more than one bin can be opened at the same time to blend the contents of different bins. The system is usually oriented vertically (with the tube running under the storage bins), or at an angle with the bottom tube running along the sides and the top tube running over the fill holes of the storage bins. Horizontal installations are also possible - check with your dealer for special gear reducer lubrication requirements for horizontal installations. The Grain Loop System should always be run under partial load for a period of time to polish the tube walls before attempting to run at full load. This is especially true when breaking in a new system but equally important after being idle for a length of

time. Observe the amp meter on the drive motor while running with a partial load until the amperage starts to decline. This is an indication that the tube walls have been polished enough to handle a larger load. It is very important to avoid stopping the chain under a loaded condition. Never attempt to restart until the Loop System has been emptied of as much grain as possible. Observe the following basic sequence for using the Grain Loop System to fill storage bins.

1. Open the discharge gate above the destination bin.
2. If available, open the discharge gate above a bin downstream from the destination bin to be used as an overflow.
3. Start the Grain Loop drive motor. Station an individual at the control box to observe the amp gauge of the drive motor.
4. Let grain flow into the inlet dump hopper. Open the flow control by adjusting the chains on the hopper a small amount at a time to make sure that the amperage does not exceed the capability of
5. The drive motor.
NOTE: Some materials and grains such as soybeans flow very easily, so it is important to make sure that the center shield in the inlet hopper is adjusted low enough to prevent overloading the system.
6. Let the Grain Loop run until the system is empty.
7. Close the discharge gates and the dump hopper flow control when through filling.
8. Shut down the drive motor.
9. Make sure to lock out the power source before leaving the work area.

Observe the following basic sequence for using the Grain Loop System to transfer grain from storage bins.

1. Open the discharge gate above the withdrawal bin.
2. Open the discharge gate above the destination bin or truck-loading spout.
3. Start the Grain Loop drive motor. Station an individual at the control box to observe the amp gauge of the drive motor.
4. Open the slide gate under the withdrawal bin a little at a time to make sure that the amperage does not exceed the capability of the drive motor.
5. Close the discharge gate above the destination bin or truck when full.
DO NOT SHUT DOWN THE GRAIN LOOP DRIVE MOTOR AT THIS TIME.
6. Close the slide gate under the withdrawal bin.
7. Run the Loop System until all remaining grain in the tube has been returned to the withdrawal bin.
8. Shut down the drive motor.
9. Make sure to lock out the power source before leaving the work area.

A sweep auger may be placed in the bin after all the grain has been removed that will gravity-flow through the center well. Shut down and lock out all power to the Grain Loop System before installing the sweep auger. If intermediate bin wells are being used, they should be opened after grain has stopped flowing into the center well and before the sweep auger is placed in the bin. Shut down and lock out the Grain Loop System before installing the sweep auger.

Section 6. Scheduled Maintenance



Power must be locked out prior to any maintenance or repairs being performed on the equipment to prevent accidental start-up. Failure to follow this precaution may result in serious injury or death.

To extend the life of your drag conveyor perform the tasks listed frequently. Like all equipment the overall life of your drag conveyor can be greatly reduced if it is abused and poorly maintained.

- Check all bearings and moving parts daily during operation for any problems
- Lubricate all bearings, and drive components as needed according to the manufacturers recommendations.
- Inspect the v-belts frequently for proper tension and wear. Replace when necessary.
- Check drag chain, and sprockets periodically for wear, damage and proper adjustment. Any worn or broken paddles should be replaced or straightened.
- Tightening of bolts, electrical connections, and switches

Routine maintenance may include but is not limited to the above.

Section 7. Troubleshooting

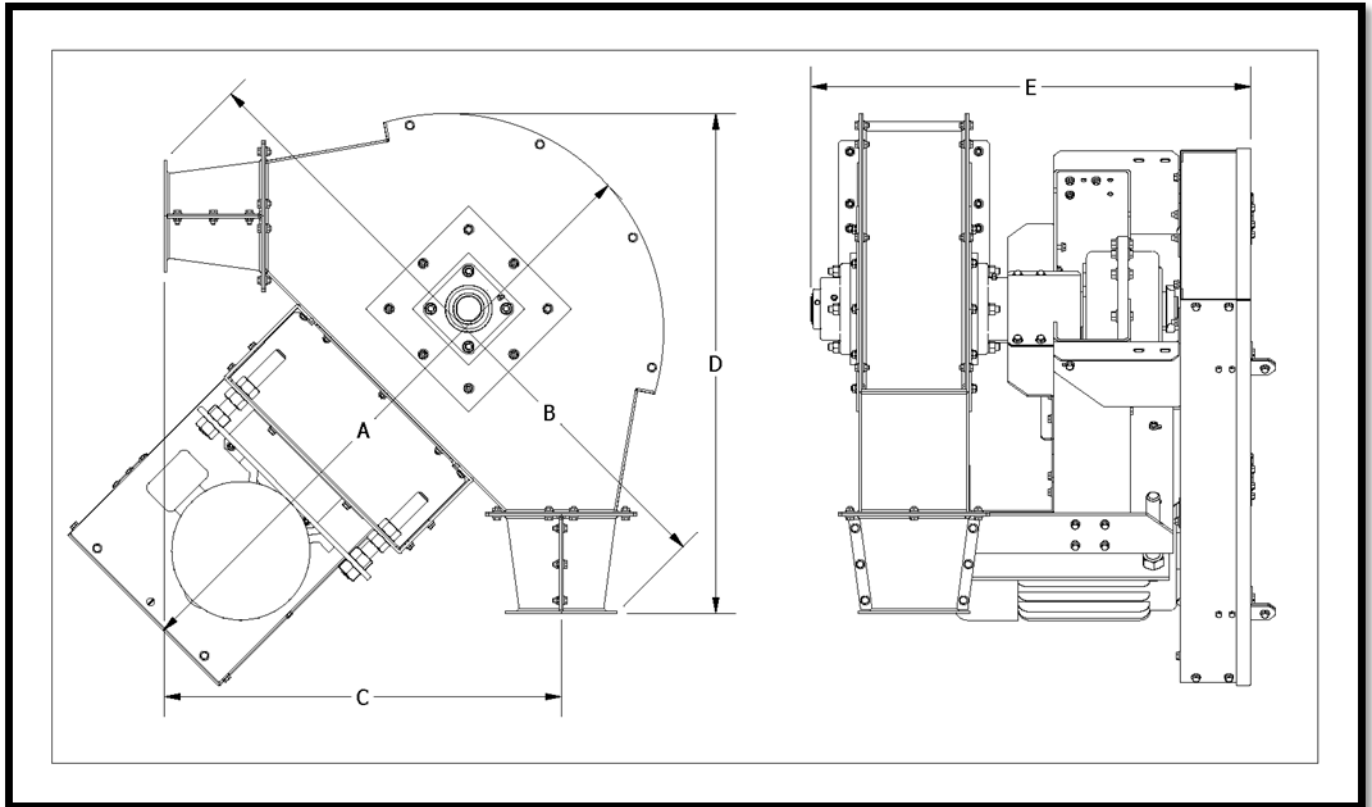
1. Chain is slipping on the drive sprocket
 - a. Check the chain tension and tighten at the inspection corner if necessary.
 - b. Check for obstructions in the system. The paddles may be catching at joints in the tubing.
 - c. Check to make sure that the sprockets are centered in the corner housings.
 - d. Avoid starting the system under load. Let the system run until empty before shutting down. If shut down does occur while the system is loaded, remove as much grain as possible and turn the corner sprockets by hand with a pipe wrench to loosen the chain before turning the power back ON.
2. Grain recycling back to the fill point
 - a. Check to make sure that the discharge gate is open.
 - b. Check and clean out the slide gate in the discharge gate.
 - c. Chain speed may be too fast. The drive corner shaft speed should be 94 RPM.
3. Drive belts are slipping
 - a. Check the drive motor amperage and make sure that the motor is not overloaded.
 - b. Tighten belts if slippage occurs when the drive motor is not fully loaded.
4. System is not delivering full capacity
 - a. Make sure that grain is not over running the discharge gate and returning to the fill-point.
 - b. Chain speed may be too slow. See System Specs for corner RPM data.
 - c. High moisture grain will move at a lower capacity than dry grain.
 - d. Check for obstructions in the inlet hopper.
 - e. Check to make sure that the chain has not been installed with a twist.
5. Paddles breaking
 - a. Check to make sure that the sprockets are centered in the corner housings.
 - b. Avoid starting the system under load. Let the system run until empty before shutting down. If shut down does occur while the system is loaded, remove as much grain as possible and turn the corner sprockets by hand with a pipe wrench to loosen the chain before turning the power back ON.
 - c. Check to make sure that the paddles are fastened securely to the chain brackets.
 - d. Let the system “break-in” and the tubing become polished before loading to full capacity.
 - e. If you hear paddles “clicking” at a joint, check for gaps in the tubing. This will require loosening the bolts in the connecting band to be able to see the tube joint.
6. Chain failure
 - a. Check to make sure that the master connecting links have been installed correctly.
 - b. Check for obstructions in the system.
 - c. Avoid starting the system under load. Let the system run until empty before shutting down.

Troubleshooting Chart

Problem	Cause	Solution
Low Capacity	Improper Chain Speed Loose Chain Improper Feeding Plugged	<ul style="list-style-type: none"> • Check for proper shaft RPM • Check chain tension • Check inlet grain level • Check discharges
Noisy Operation	Loose UHMW Paddles Bottom not Aligned Worn Drive Components Worn Sprocket	<ul style="list-style-type: none"> • Check all bolts and chains • Check tube joints for alignment • Check oil levels and shaft seals • V-belt alignment, and tension • Replace
Uneven UHMW (paddle wear)	Conveyor Misalignment Sprocket Slipped on shaft	<ul style="list-style-type: none"> • Check conveyor alignment • Check sprocket set screws
Excessive carry-over	Discharge Gates not fully open	<ul style="list-style-type: none"> • Check gate operation
Uneven Sprocket Wear	Worn Chain Improper Alignment Carry-over into discharge	<ul style="list-style-type: none"> • Replace Chain • Check Sprocket alignment • Check inlet location

Section 8. Component Dimensions

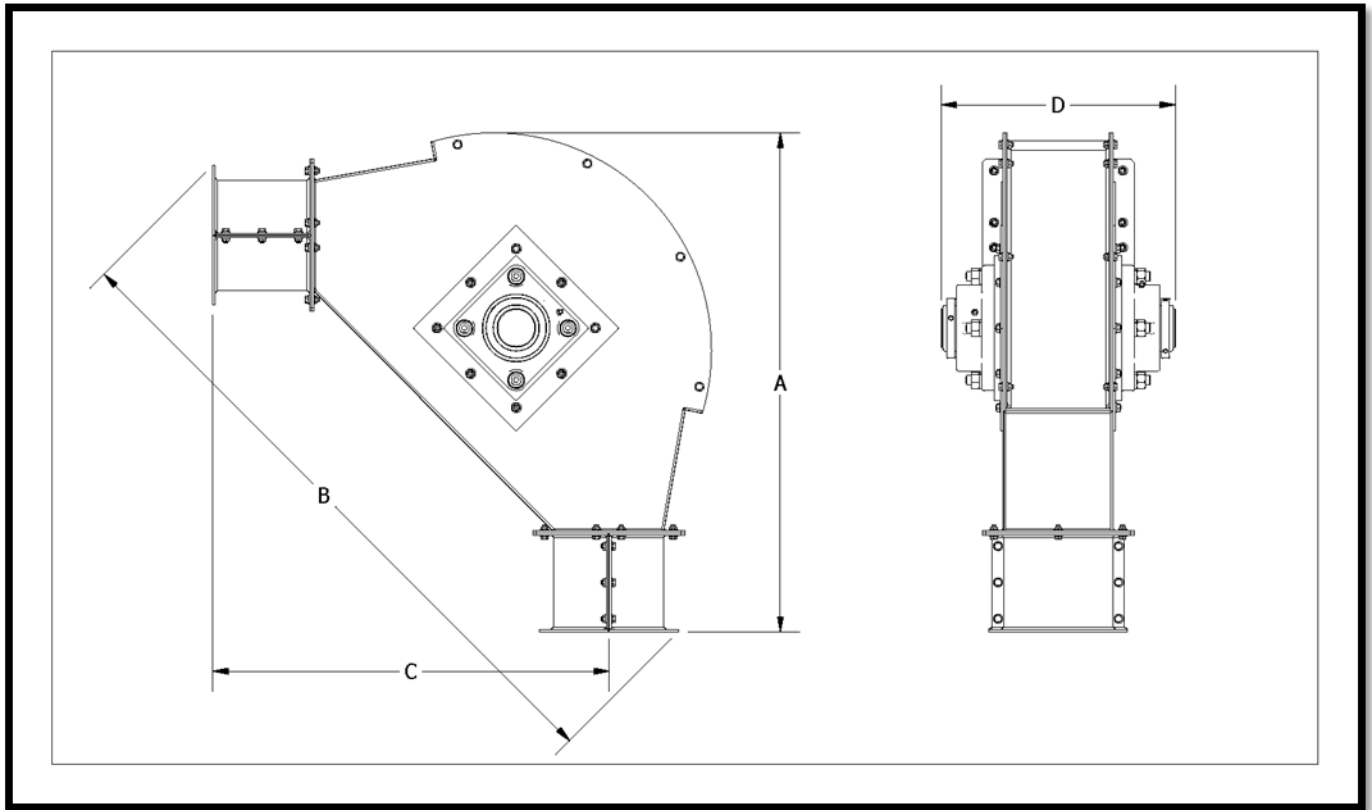
Drive Corner



Dimensions (in Inches)					
Model	A (Max.)	B	C	D	E (Max.)
6" System	47 3/4	48 5/8	30 1/8	37 7/8	33 3/8
8" System	50 3/8	49 7/8	30	37 7/8	35 3/4
10" System	51 1/2	59 1/4	35 5/8	43 3/8	40 3/8
12" System	57	69 5/8	38 7/8	47 7/8	42 1/2

Part Numbers				
Horse Power	6" System	8" System	10" System	12" System
10	GRPU06-02-10			
15		GRPU08-02-15		
20		GRPU08-02-20		
25		GRPU08-02-25	GRPU10-02-25	
30		GRPU08-02-30	GRPU10-02-30	GRPU12-02-30
40		GRPU08-02-40	GRPU10-02-40	GRPU12-02-40
50			GRPU10-02-50	GRPU12-02-50
60				GRPU12-02-60

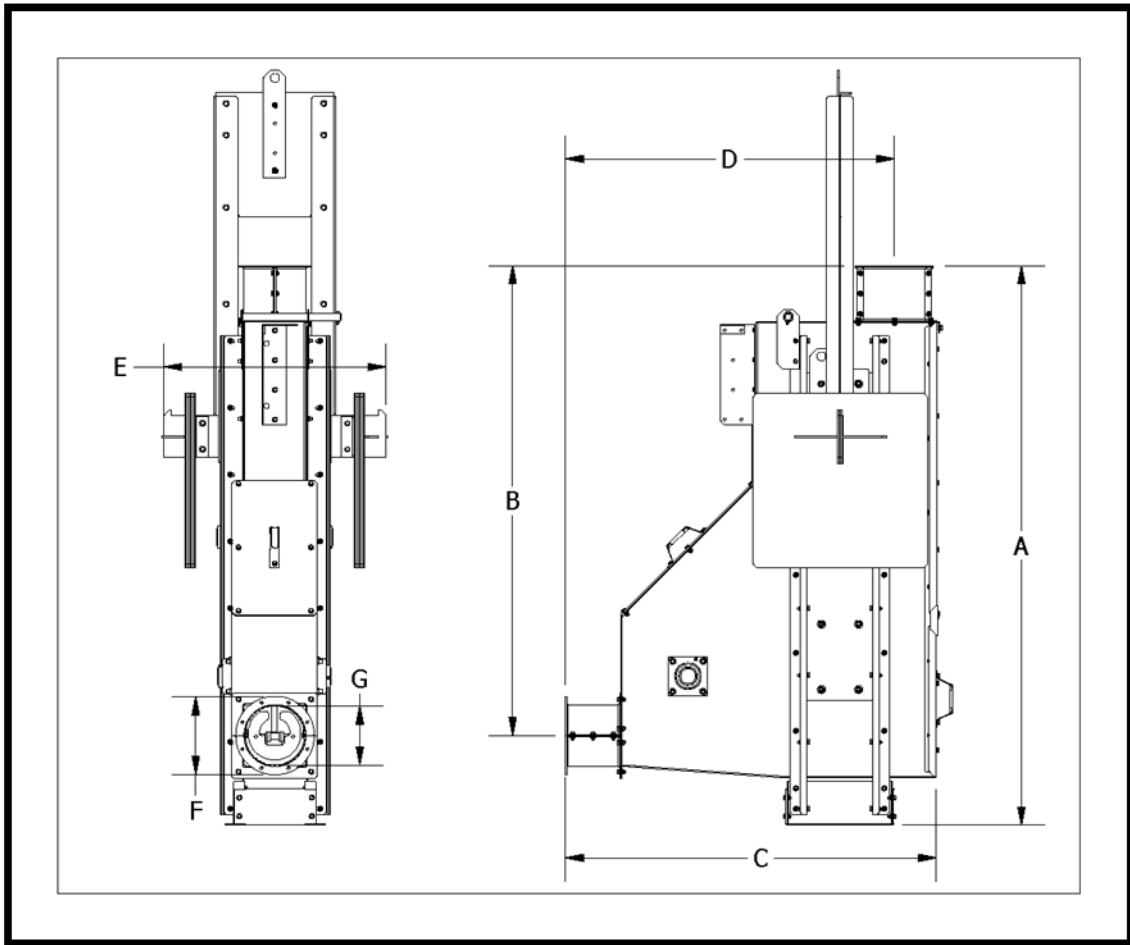
Standard Corner



Dimensions (in Inches)				
Model	A	B	C	D
6" System	37 7/8	48 5/8	30	17 3/4
8" System	37 7/8	49 7/8	30	17 3/4
10" System	43 3/8	59 1/4	35 5/8	19 7/8
12" System	47 7/8	69 5/8	38 7/8	21 7/8

Part Numbers				
Horse Power	6" System	8" System	10" System	12" System
10	GRPU06-03-10			
15		GRPU08-03-15		
20		GRPU08-03-20		
25		GRPU08-03-25	GRPU10-03-25	
30		GRPU08-03-30	GRPU10-03-30	GRPU12-03-30
40		GRPU08-03-40	GRPU10-03-40	GRPU12-03-40
50			GRPU10-03-50	GRPU12-03-50
60				GRPU12-03-60

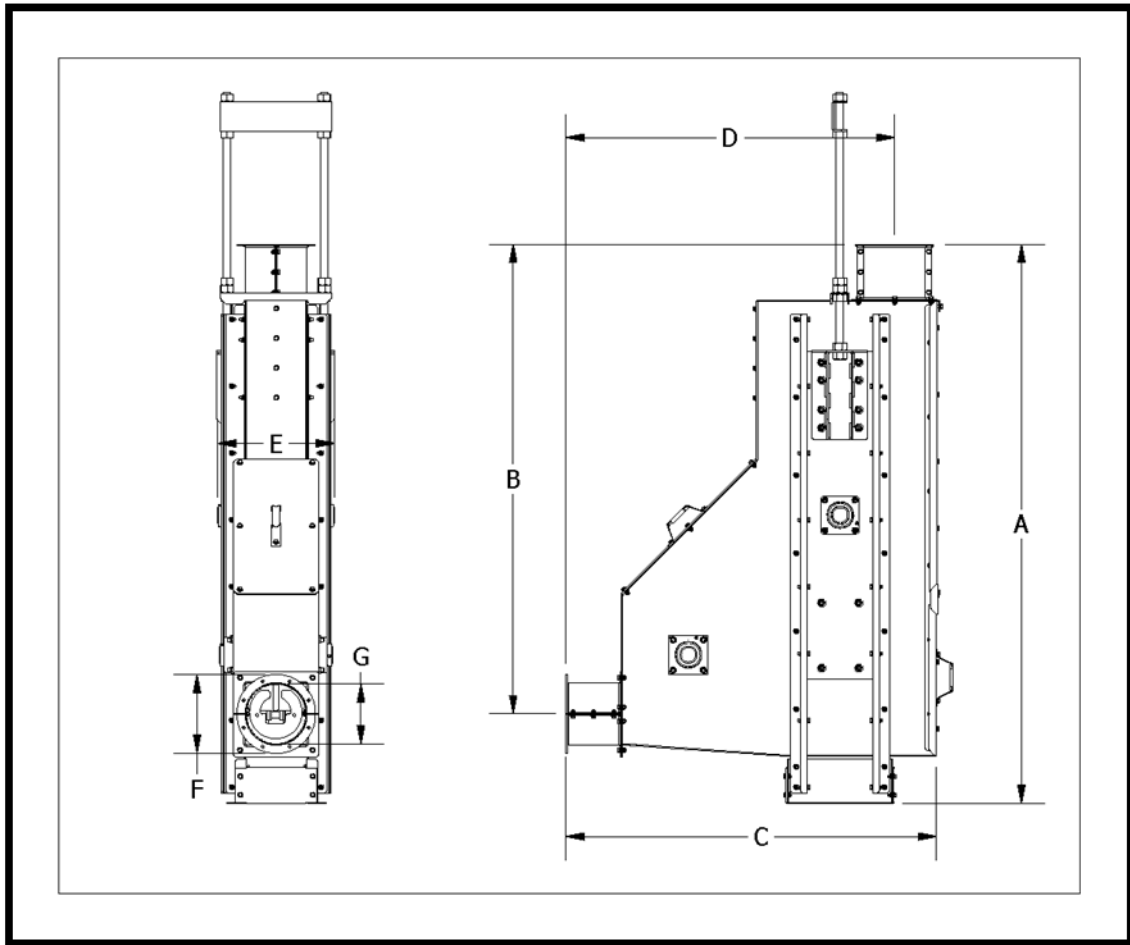
Gravity Take-Up Corner



Dimensions (in Inches)							
Model	A	B	C	D	E	F	G
6" System	75 1/4	63 1/4	50	44 1/4	30	8 1/2	6
8" System	75 1/4	63 1/4	50	44 1/4	30	10 1/2	8
10" System	75 3/4	62 1/2	50 1/2	43 1/2	32	12 1/2	10
12" System	77 3/4	63 3/4	56 1/2	48	34	14 1/2	12

Part Numbers				
Horse Power	6" System	8" System	10" System	12" System
10	GRPU06-01-10			
15		GRPU08-01-15		
20		GRPU08-01-20		
25		GRPU08-01-25	GRPU10-01-25	
30		GRPU08-01-30	GRPU10-01-30	GRPU12-01-30
40		GRPU08-01-40	GRPU10-01-40	GRPU12-01-40
50			GRPU10-01-50	GRPU12-01-50
60				GRPU12-01-60

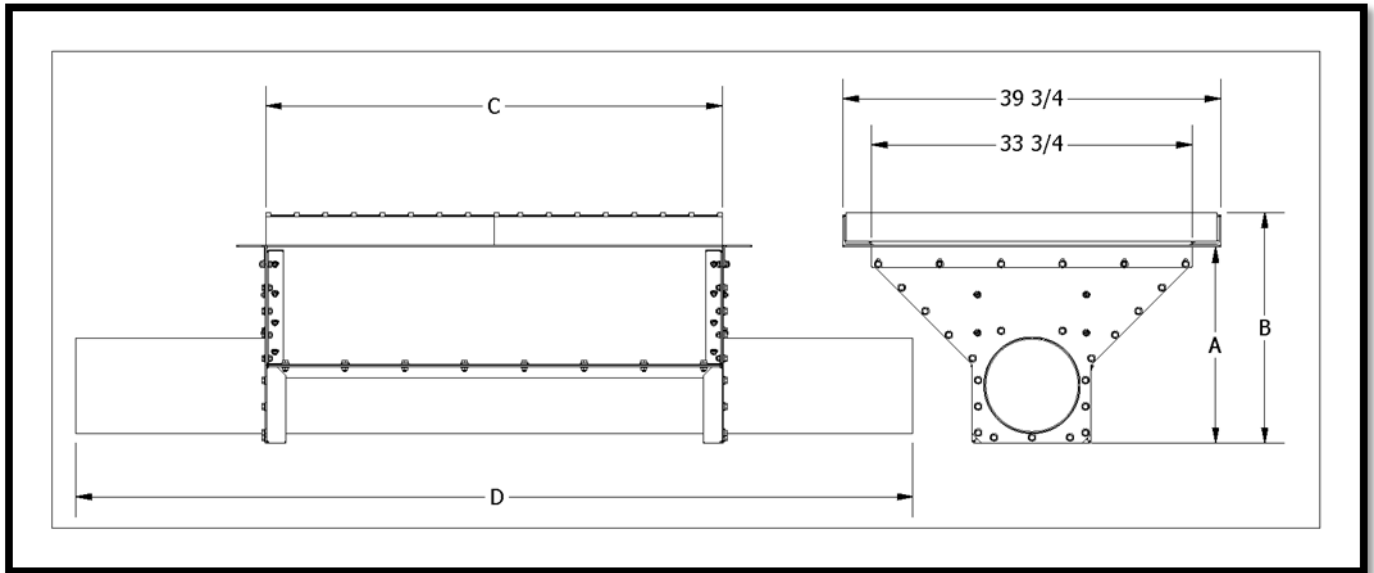
Manual Take-Up Corner



Model	A	B	C	D	E	F	G
6" System	75 1/4	63 1/4	50	44 1/4	17 3/4	8 1/2	6
8" System	75 1/4	63 1/4	50	44 1/4	17 3/4	10 1/2	8
10" System	75 3/4	62 1/2	50 2/4	43 1/2	19 3/4	12 1/2	10
12" System	77 3/4	63 3/4	56 1/2	48	21 3/4	14 1/2	12

Part Numbers				
Horse Power	6" System	8" System	10" System	12" System
10	GRPU06-04-10			
15		GRPU08-04-15		
20		GRPU08-04-20		
25		GRPU08-04-25	GRPU10-04-25	
30		GRPU08-04-30	GRPU10-04-30	GRPU12-04-30
40		GRPU08-04-40	GRPU10-04-40	GRPU12-04-40
50			GRPU10-04-50	GRPU12-04-50
60				GRPU12-04-60

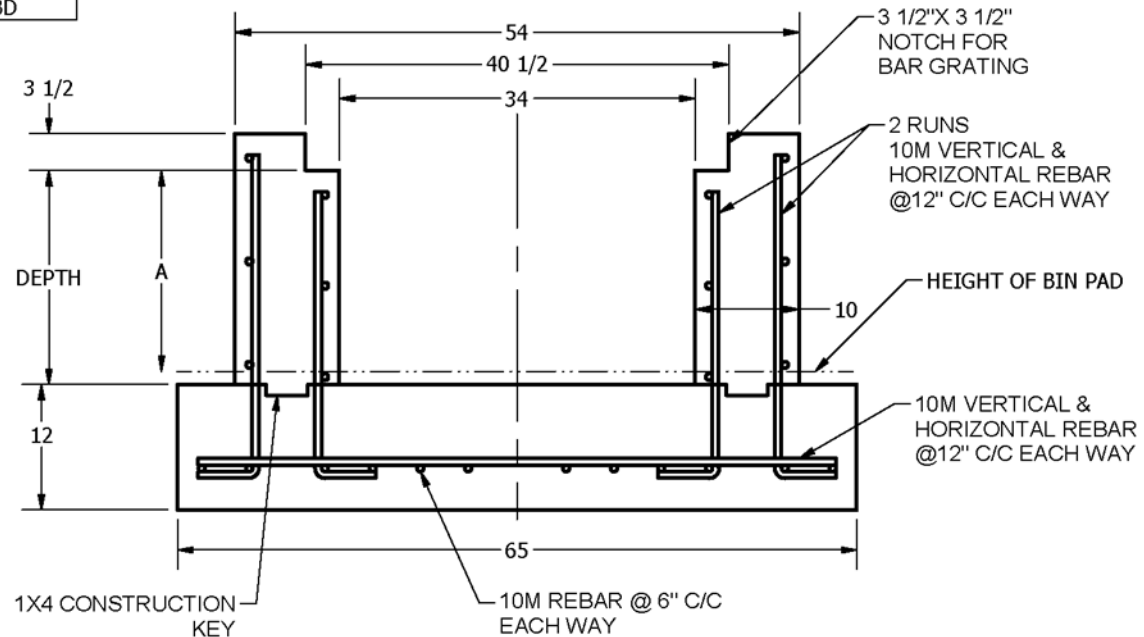
Loading Hoppers



Hopper Length	6" System	8" System	10" System	12" System	Dim (C)	Dim (D)
Dim (A)	TBD	TBD	20 5/8	TBD		
Dim (B)	TBD	TBD	24 1/4	TBD		
4' Hopper	GRPU06-05-04	GRPU08-05-04	GRPU10-05-04	GRPU12-05-04	48	88
4' Hopper w/DOG	GRPU06-05-04G	GRPU08-05-04G	GRPU10-05-04G	GRPU12-05-04G	48	88
8' Hopper	GRPU06-05-08	GRPU08-05-08	GRPU10-05-08	GRPU12-05-08	96	136
8' Hopper w/DOG	GRPU06-05-08G	GRPU08-05-08G	GRPU10-05-08G	GRPU12-05-08G	96	136
12' Hopper	GRPU06-05-12	GRPU08-05-12	GRPU10-05-12	GRPU12-05-12	144	184
12' Hopper w/DOG	GRPU06-05-12G	GRPU08-05-12G	GRPU10-05-12G	GRPU12-05-12G	144	184
"DOG" = Drive-over Grate			All dimensions in inches unless otherwise noted			

Hopper Foundation

PIT DEPTH		
LOOP DIAMETER	DEPTH	"A"
6"	TBD	TBD
8"	19 3/4"	19 1/4"
10"	20 3/4"	TBD
12"	TBD	TBD



NOTES:

- Foundation design is based on a min. allowable soil bearing capacity of 3000 psf.
- Concrete shall have a min. compressive strength of 20mpa at 28 days.
- Foundation site should be free of vegetation & debris & well drained.
- Lap all lateral bars by 35 bar diameters, and stagger all laps by 3'-0".
- All mat'l 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.
- Rebar in footing should have min. 3" concrete cover.
- Rebar in wall should have min. 2" concrete cover.
- 10M Rebar equivalent - #3 rebar or $\phi.375"$

PIT LENGTH	
HOPPER LENGTH	CONCRETE PIT LENGTH (MIN)
4'	54"
8'	102"
12'	150"

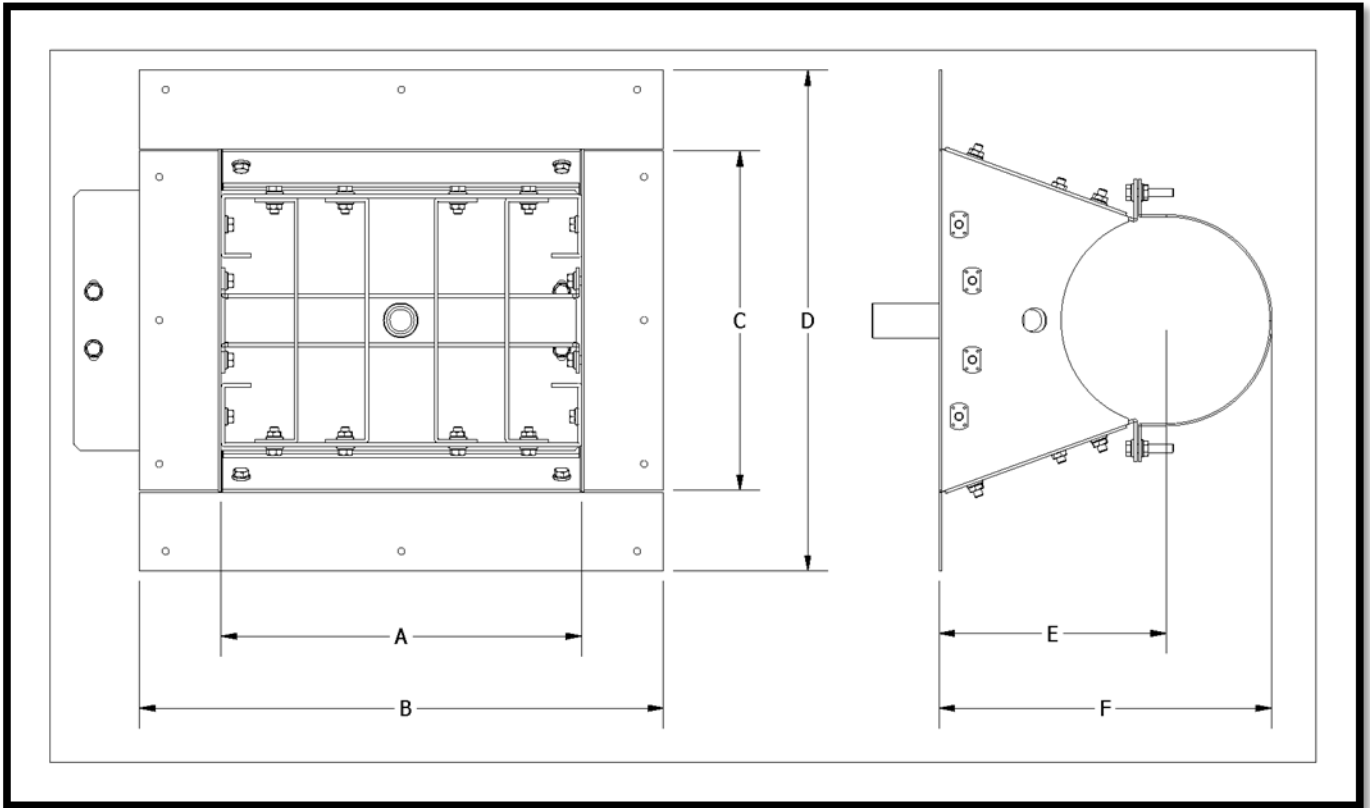
DRAWN BY: rdeline	DATE: 7/13/10
CHECKED BY:	DATE:
SIGNATURE:	
SIZE: A	MATERIAL
MASS: N/A	



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 www.lambtonconveyor.com
 1-888-239-9713

TITLE: CONCRETE FOUNDATION FOR GRAIN LOOP	
DWG #: GRPU-FOUND	TYPE: ASSM
QUOTE-PRJ: GRAIN LOOP	SHEET 1 / 1

Center and Intermediate Hopper

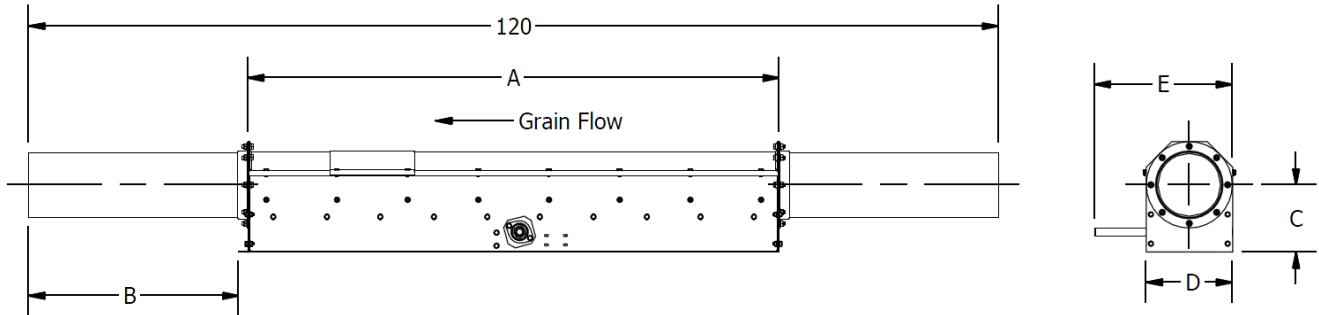


Center Hopper Dimensions (in Inches)							
Model	A	B	C	D	E	F	Part #
6" System	13 3/4	19 7/8	12	18	7 3/4	10 5/8	06-CEN-BSKT
8" System	13 3/4	19 7/8	12 7/8	19	8 3/4	12 5/8	08-CEN-BSKT
10" System	13 3/4	19 7/8	12 7/8	19	7 3/4	12 3/4	10-CEN-BSKT
12" System	13 3/4	19 7/8	14 1/4	20 1/4	11 1/2	17 5/8	12-CEN-BSKT

Intermediate Hopper Dimensions (in Inches)							
Model	A	B	C	D	E	F	Part #
6" System	13 3/4	19 7/8	12	18	7 3/4	10 5/8	06-INT-BSKT
8" System	13 3/4	19 7/8	12 7/8	19	8 3/4	12 5/8	08-INT-BSKT
10" System	13 3/4	19 7/8	12 7/8	19	7 3/4	12 3/4	10-INT-BSKT
12" System	13 3/4	19 7/8	14 1/4	20 1/4	11 1/2	17 5/8	12-INT-BSKT

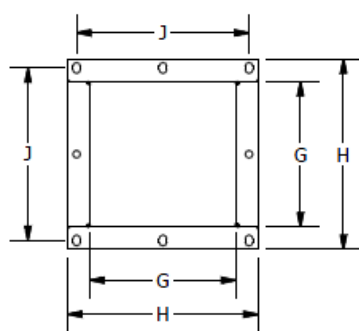
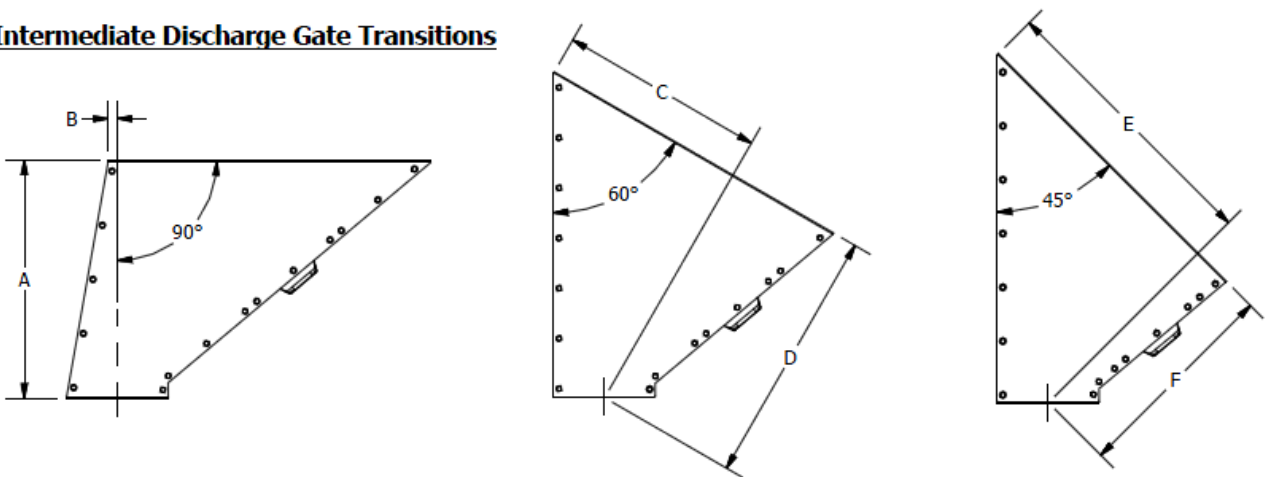
Intermediate Gate

Intermediate Discharge Gate

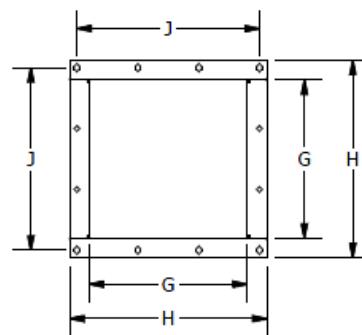


Intermediate Discharge Gate Dimensions - Inch (cm)					
Size	A	B	C	D	E
6	61 3/4 (156.8)	28 (71.1)	7 1/4 (18.4)	8 5/8 (21.9)	15 1/8 (38.4)
8	65 3/4 (167)	26 (66)	8 1/4 (21)	10 5/8 (27)	17 1/8 (43.5)
10	85 3/4 (217.8)	16 (40.6)	9 1/4 (23.5)	12 5/8 (32.1)	19 (48.3)
12	91 3/4 (233)	12 3/4 (32.4)	10 1/4 (26)	15 1/8 (38.4)	21 1/4 (54)

Intermediate Discharge Gate Transitions



6", 8" & 10" OUTLETS



12" OUTLET

Intermediate Discharge Gate Transition Dimensions - Inch (cm)									
Size	A	B	C	D	E	F	G	H	J
6	25 1/4 (64.1)	0 (0)	20 3/8 (51.8)	26 3/4 (67.9)	28 1/8 (71.4)	22 1/4 (56.5)	6 1/8 (15.6)	8 5/8 (21.9)	7 5/8 (19.4)
8	25 (63.5)	1 (2.5)	21 5/8 (54.9)	26 7/8 (68.3)	29 1/2 (74.9)	22 1/8 (56.2)	8 1/8 (20.6)	10 5/8 (27)	9 5/8 (24.4)
10	33 1/8 (84.1)	1/2 (1.3)	27 3/4 (70.5)	35 1/2 (90.2)	38 1/4 (97.2)	29 1/2 (74.9)	10 1/8 (25.7)	12 5/8 (32.1)	11 5/8 (29.5)
12	34 1/8 (86.7)	1 5/8 (4.1)	29 3/4 (75.6)	36 5/8 (93)	40 5/8 (103.2)	30 1/8 (76.5)	12 1/8 (30.8)	15 1/8 (38.4)	14 (35.6)

Section 9. Parts List

Coming Soon

Section 10. Employer/Employee Training Sign-off

Lambton Conveyor has included this training sign-off sheet for the owner/operator to make use of in the training, installation, and operation processes of the equipment described in this manual. Read the entire manual, sign-off and date the chart below.

Date	Employee Signature	Employee Name Printed

Section I I. Quality Analysis Report

RA#: _____ Date: _____ Originator: _____

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

Account #: _____ Contact: _____ Salesman: _____

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: _____

