

# 12" GRAIN PUMP® LOOP CONVEYING SYSTEM

## OWNER'S & OPERATOR'S MANUAL

Effective February 18, 2011

Publication No. 1032646

**IMPORTANT!** The gearbox is shipped **Without Oil**.  
***Oil must be added before operation.***  
Refer to the Lubrication Section in this manual.



***Hutchinson/Mayrath***

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## **Hutchinson/Mayrath**

A Division of **GLOBAL** Industries, Inc.

### **POLICIES AND PROCEDURES**

- Prices:** Prices in effect at time of shipment will apply. Prices are subject to change without notice. All prices are F.O.B. Clay Center, Kansas. Orders shipped from locations other than Clay Center, Kansas will be subject to additional charges, such as back freight and/or additional freight.
- Service Charge:** A service charge will be assessed for all past due balances as permitted by state law not to exceed 1-1/2% per month.
- Minimum Order:** Processing and handling costs necessitate a minimum charge of \$15.00 net on all orders.
- Back Orders:** Back orders will be shipped as they become available. Contact Hutchinson/Mayrath Customer Service for alternative shipping options or if cancellation is desired.
- Damaged Goods:** It is the consignee's responsibility to check all shipments thoroughly upon receipt of goods. If any damage is discovered, it must be noted on the freight bill of lading before signing. The consignee must make necessary claims against the respective freight line. All damage claims must be submitted within 30 days of delivery receipt.
- Shortages:** All shortages must be noted at time of delivery. Shortages must be noted on the freight bill of lading before signing. Hutchinson/Mayrath must be advised of all concealed shortages upon discovery. Once notified of concealed shortages Hutchinson/Mayrath will advise corrective action to be taken.
- Return of Goods:** All returns must be approved by Hutchinson/Mayrath prior to shipment. All return requests will be issued a return authorization number. **NO RETURNS WILL BE ACCEPTED WITHOUT A RETURN AUTHORIZATION NUMBER AND PRIOR AUTHORIZATION FROM THE FACTORY.** All returns must be shipped prepaid. A 15% restocking charge will be applied to all returned merchandise. Custom Products may not be returned for credit. Only current products in new and salable condition may be returned. No safety devices may be returned for credit.
- Modifications:** It is the policy of Hutchinson/Mayrath to improve its product whenever possible and practical to do so. We reserve the right to make changes, improvements and modifications at any time without incurring the obligation to make such changes, improvements and modifications on any equipment sold previously.
- Limited Warranty:**
- (a) For a period of (1) year after receipt of goods by the original consumer buyer, Hutchinson/Mayrath will supply free of charge replacement parts for parts that prove defective in workmanship or material. Defective parts must be returned freight prepaid to a specified Hutchinson/Mayrath location. Only Hutchinson/Mayrath original repair parts may be used for warranty repairs.
  - (b) This limited warranty does not extend to parts designed to wear in normal operation and be replaced periodically; or to damage caused by negligence, accident, abuse or improper installation or operation.
  - (c) **GOODS NOT MANUFACTURED BY HUTCHINSON/MAYRATH CARRY ONLY THE MANUFACTURER'S WARRANTY.**
  - (d) **THIS UNDERTAKING IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**
- FAILURE TO FOLLOW THE INSTRUCTIONS CONTAINED IN THE OWNER'S & OPERATOR'S MANUALS AND THE ITEMS LISTED BELOW WILL RESULT IN THE VOIDING OF THIS LIMITED WARRANTY.**
- (1) Improper assembly, including failure to properly install all safety equipment.
  - (2) Improper installation.
  - (3) Unauthorized alternations of goods.
  - (4) Goods operated when obviously in need of repair.
  - (5) Use of unauthorized repair parts.
  - (6) Irresponsible operation.
  - (7) Used to handle materials other than free flowing, nonabrasive and dry materials, as intended.
  - (8) Damaged through abusive use or accident.
- Limitation of Liability:** BUYER AGREES THAT IN NO EVENT SHALL HUTCHINSON/MAYRATH HAVE LIABILITY FOR DIRECT DAMAGES THE EXCESS OF THE CONTRACT PRICE OF THE GOODS IN RESPECT OF WHICH CLAIM IS MADE. BUYER FURTHER AGREES THAT IN NO EVENT SHALL HUTCHINSON/MAYRATH ON ANY CLAIM OF ANY KIND HAVE LIABILITY FOR LOSS OF USE, LOSS OF PROFITS, OR FOR ANY INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES.

## GENERAL SAFETY STATEMENT

This manual was written with the safety of the operator and others who work with the equipment as our prime concern. The instructions presented will help the reader learn **SAFE** day to day work practices. We want you as our partner in safety.

It is your responsibility as an owner, operator or supervisor to know what specific safety requirements and precautions exist and to make these known to all other personnel working with the equipment or in the area, so that they too may safely perform their duties and avoid any potentially hazardous situations.

Please remember safety equipment provides important protection for persons around a grain handling system that is in operation. Be sure **ALL** safety shields and protection devices are installed and properly maintained. If any shields or guards are damaged or missing, contact your dealer to obtain the correct items.

Avoid any alterations of the equipment. Such alterations may create a dangerous situation where serious injury or death may occur.

## SAFETY ALERT SYMBOL

The symbol shown below is used to call your attention to instructions concerning your personal safety.

Watch this symbol - it points out important safety precautions. It means - **ATTENTION! Become alert! Your personal safety is involved!** Read the message that follows the symbol when a warning is given, be alert to the possibility of personal injury or death.



## SAFETY DECALS

Check to ensure all Safety Decals are present and in good condition. If a decal cannot easily be read for any reason, or has been painted over, replace the decal immediately. Safety decals are offered free of charge, and can be ordered through your Hutchinson/Mayrath dealer or directly from the factory.



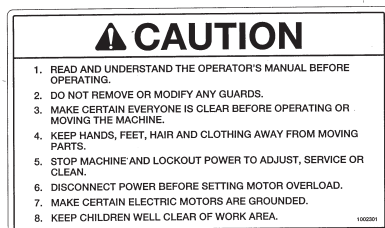
**“DANGER” Decal No. 1012872**

Located on: Take-up corner, Drive Corner, 90° Corner and on the 90° Discharge Assembly.



**“DANGER” Decal No. 1002310**

Located on: Inside of Inlet Dump Hopper



**“CAUTION” DECAL NO. 1002301**

One located on take-up corner.  
One located on drive corner.

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## OPERATOR QUALIFICATIONS



### **WARNING**

Anyone who will operate or work around this machine shall first read this manual! This manual must be delivered with the equipment to its owner. Failure to read this manual and its safety instructions is a misuse of the equipment.

Operation of this portable conveyor shall be limited to competent and experienced persons. In addition, anyone who will operate or work around a conveyor must use good common sense. In order to be qualified, he must also know and meet all other requirements, such as:

1. Some regulations specify that no one under the age of 16 may operate power machinery. This includes this conveyor. It is your responsibility to know what these regulations are in your area or situation.
2. Current OSHA regulations state in part: "At the time of initial assignment and at least annually thereafter, the employer shall instruct every employee in safe operation and servicing of all equipment with which the employee is, or will be involved."\*
3. Unqualified persons are to stay out of the work area. See Page 4.
4. A person who has not read and understood all operating and safety instructions is not qualified to operate the machine.

\*Federal Occupational Safety & Health Standards for Agriculture Subpart D, Section 1928.57 (a) (6).

## SIGN OFF SHEET

As a requirement of OSHA, it is necessary for the employer to train the employee in the safe operation and safety procedures with this conveyor. We include this sign off sheet for your convenience and personal record keeping.

DATE	EMPLOYER SIGNATURE	EMPLOYEE SIGNATURE

## SERIAL NUMBER

To ensure efficient and prompt service, please furnish us with the model and serial number of your conveyor in all correspondence or other contact. The serial plate is located on the support frame weldment on 35' models and on the inside of the lower undercarriage arms on 60', 70' & 85' models.

## RIGHT AND LEFT DESIGNATION

When determining which is the left or right hand side of the unit, it is as if a person were standing at the intake end and looking toward the discharge end.

**MACHINE INSPECTION**

After delivery of your new conveyor and/or completion of assembly and before each use, inspection of the machine is mandatory. This inspection should include, but not be limited to:

1. Inspect the conveyor for loose bolts, missing chain parts, missing or damaged paddles and the overall chain condition.
2. Check chain tension.
3. Check the condition and tension of drive belts and adjust as necessary.
4. Inspect sheaves for alignment and see that they are securely fastened.
5. Check oil level in drive reducer.
6. Check all safety signs and replace any that are worn, missing or illegible. The safety signs are listed in the front of this manual. Safety signs may be obtained free of charge from your dealer or ordered from the factory.
7. Check that all safety devices, guards and shields are installed and that all inspection doors are latched closed.
8. Check auto take-up corner, if so equipped. See that the sprocket carriage is free to move up and down. Lubricate, as necessary.

Obtain any needed replacement parts from your dealer and install before using the machine.

**START-UP and  
BREAK-IN INFORMATION**

**WARNING!** During initial start-up and break-in period, the operator shall be aware of any unusual vibrations or noises that would indicate a need for service or repair.



Keep all safety shields and devices in place. Keep hands, feet, and clothing away from moving parts.



The operator should have a full view of the auger work area and check that all personnel are free from designated work areas before adding power.

It is essential to inspect your conveyor and drive components before adding power and to know how to shut down in an emergency. During the operation of your conveyor, one person shall be in a position to monitor the operation.

**START-UP and BREAK-IN INFORMATION (con't.)**

Any conveyor, when it is new or after it sits idle for a season, should go through a "break-in" period. It should be run at partial capacity at full speed until the inside of the housing becomes polished, before attempting full capacity. A failure will most likely occur when it is run at full capacity before it has a chance to "shine up".

If at all possible, do not start or stop the Grain Pump<sup>®</sup> Conveyor under load, especially before the housing becomes well polished, as this may cause the unit to stall. If so equipped, inspect and lubricate the automatic take-up corner. Be sure that the sprocket carriage is free to move up and down.

During the initial start-up and break-in period, the operator should watch for any unusual vibrations or noises.

**DESIGNATED WORK AREA**

The area around the conveyor and inside the grain storage units is considered the work area. Use the following to ensure a safe working environment.



**WARNING!** Under no circumstances should persons not involved in the operation be allowed to trespass into the work area.



It shall be the duty of all operators to see that children and/or other persons stay out of the work area! Trespass into the work area by anyone not involved in the actual operation, or trespass into a hazard area by anyone shall result in an immediate shutdown by the operator.



It shall be the responsibility of all operators to see that the work area has secure footing, is clean and free of all debris and tools which might cause accidental tripping and/or falling. It shall also be their responsibility to keep the work area clean and orderly during the operation.

## CONVEYOR HORSEPOWER INFORMATION

The height and length of a loop system are limited by the combined horsepower required to move grain those distances. The vertical component requires greater horsepower per foot, so taller units will be more limited in horizontal length. System lengths of several hundred feet are common. However, relatively small systems to accomplish more specific tasks are often built.

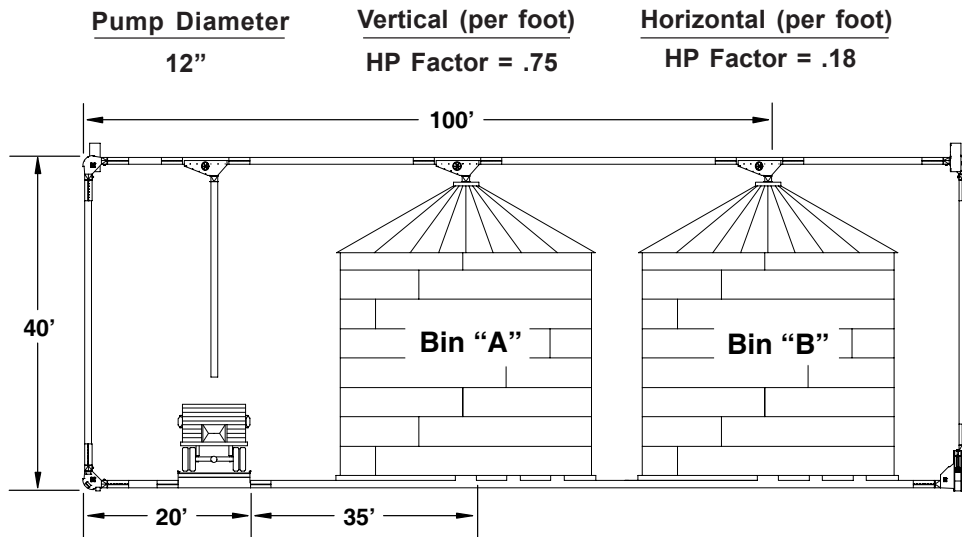
Loop units are provided with one or two gear reducer drives to be driven by one or two electric motors. There are maximum horsepower limits for each drive, but when greater horsepower than can be provided by one drive is needed, a second drive can often be added. Drives are always located at upper corners. A single drive must always be located at the down stream end toward which the upper horizontal loop portion is moving.

Overfeeding a grain pump loop may cause plugging. The intake rate should not exceed the capacity of the loop being used. Hutchinson recommends the loading rate be monitored by an amp meter on the electric motor drive. The Grain Pump<sup>®</sup> will operate more smoothly, move more grain and last longer if loaded 90% of fill or less, instead of an uncontrolled approach to 100% of fill.

## HOW TO CALCULATE TOTAL HORSEPOWER

NOTE: The horsepower recommendations are for conveying reasonably dry grain at approximately 45 lbs. per cu. ft. High moisture grain (above 15%) will require greater power and maximum possible capacity could be less.

1. Determine the vertical height of the system (usually the peak height of the tallest bin plus 3'). **Multiply the vertical height by the vertical HP factor (.75) to determine the vertical horsepower requirement.**
2. Add the total upper and lower horizontal length of conveyor that will contain material during operation. If you plan to recirculate the grain at full capacity from one storage structure to another, it may add length to the horsepower calculation. **Multiply the total horizontal length by the horizontal HP factor (.18) to determine the horizontal horsepower requirement.**
3. Add the vertical and horizontal horsepower together to find the total system horsepower required.



In this example, there is 40 ft. of vertical conveyor and 120 ft. of horizontal conveyor that will contain grain.


Vertical HP Requirement 40' x .75 (HP Factor)	= 30
Horizontal HP Requirement 120' x .18 (HP Factor)	= 21.6
<b>Total Horsepower - Vertical + Horizontal</b>	<b>= 51.6</b>
Electric Motor size required	= 60 HP

If there were plans to transfer grain from Bin A to Bin B, an additional 35 ft. of horizontal length must be added to the calculation.


Horizontal Horsepower requirement, 35' x .18 (HP Factor)	= 6.3 (added to the previous total of 51.6)
<b>Total Horsepower - Vertical + Horizontal</b>	<b>= 57.9</b>
Electric Motor Size Required	= 60 HP

# GENERAL INFORMATION


## ELECTRIC MOTOR DRIVE INFORMATION

 **WARNING! A main power disconnect switch that can be locked in only the “OFF” position shall be provided. This shall be locked whenever work is being done on the conveyor.**

**The reset and starting controls must be located so that the operator has full view of the entire operation.**

 **Do Not enter the grain bin unless all power driven equipment has been shut down and locked out.**

**Make certain electric motor is grounded.**

 **Disconnect power before resetting motor overloads.**

**Shut off power and lockout whenever cleaning or servicing the conveyor.**

Always use a motor with required H.P. as calculated on Page 5. Use a motor that operates at 1750 RPM.

Electrical motor and controls shall be installed by a qualified electrician and must meet the standards set by the National Electrical Code and all local and state codes.

A magnetic starter should be used to protect your motor when starting and stopping. It should stop the motor in case of power interruption, conductor fault, low voltage, circuit interruption or motor overload. Then the motor must be restarted manual.

Some motors have built-in thermal overload protection. If this type motor is used, use only those with a manual reset.

Install with an ampmeter on motor or motors, so that the load can always be monitored to prevent overloading. A main power disconnect switch that can be locked only in the “Off” position shall be provided. This shall be locked whenever work is being done to the conveyor.

## FULL LOAD OPERATION INFORMATION

Operation of the Grain Pump<sup>®</sup> Conveyor will generally include moving grain into or out of grain storage structures.

Grain will enter the conveyor through a dump hopper or through bin wells in grain bins. There are flow control devices included with these components that should be used to control grain flow rates into the conveyor.


## FULL LOAD OPERATION INFORMATION (con't.)


It is possible to use more than one inlet component at the same time, such as when blending is desired or simply to increase the flow rate into the conveyor.

Grain is discharged from the conveyor through outlets with movable gates for opening and closing the outlets. Optional ground controls are available for operating the gates. All gates should be closed except the one at the selected discharge point.

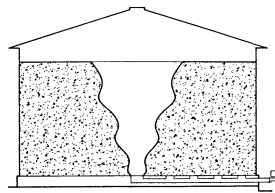
A sweep auger may be placed in the bin after all the grain has been removed that will gravity-flow through the center well. The grain remaining should appear as in Fig. 3. Shut down and lock out the Grain Pump<sup>®</sup> before installing the sweep auger.

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. See Fig. 4. Shut down and lock out the Grain Pump<sup>®</sup> before installing the sweep auger.

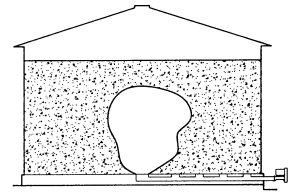
 **WARNING! Do Not enter the bin if the grain has “Bridged” or has not flowed normally out of the bin, See Fig’s. 1 & 2. The grain may suddenly break loose and bury resulting in suffocation.**

 **Do Not enter the bin unless all power driven equipment has been shut down and locked out.**

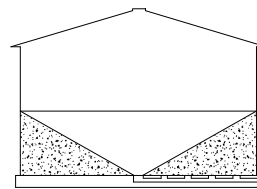
**Never enter the bin unless monitored by another person.**



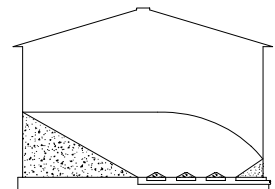
**Fig. 1**  
(Abnormal Flow)



**Fig. 2**  
 (“Bridging”)



**Fig. 3**  
Grain Flow Through  
Center Bin Well



**Fig. 4**  
Grain Flow Through  
Intermediate Wells

## OPERATING PROCEDURES



**WARNING!** Make certain everyone is clear before operating the equipment.

The operator shall be aware of any unusual vibrations or noises that would indicate the need for service or repair.

Keep all safety shields in place.

Keep hands, feet and clothing away from moving parts.



The operator shall have a full view of the entire work area and check that all personnel are clear of the designated work area before adding power.

If the operator must leave the work area, or whenever servicing or adjusting, the conveyor must be stopped and the power source turned off and locked out.



Precaution should be made to prevent anyone from operating the conveyor when the operator is absent from the work area.

The reset and starting controls must be located so that the operator has full view of the entire operation.

Do Not enter the grain bin unless all power driven equipment has been shut down and locked out.

Make certain electric motor is grounded.



Disconnect power before resetting motor overloads.

Shut off power and lockout whenever cleaning or servicing the conveyor.

Never enter the bin when the sweep auger is in operation. Never attempt to control the operation of the sweep auger by pushing on an operating sweep auger with shovels, brooms or other devices.



Do Not attempt to restrain the movement of the sweep auger by attaching ropes, bars or other devices to be held by an operator.

1. Start the conveyor for operation. Open the conveyor outlet gate for the desired discharge point (all gates should be closed except the one at the selected discharge point).

2. If moving grain from bins or storage structures, gradually open the gate in the center well until desired flow is established. **Do Not** overload the conveyor. If intermediate wells are used, they should be opened **after** grain has stopped flowing into the center well. When the desired amount of grain has been moved or unloaded, close all bin wells and allow the conveyor to clean itself out. **Shut down and lock out power source.**
3. If moving grain through a dump hopper, begin unloading grain from dump vehicle in small increments and gradually build up to desired flow. **Do Not** overload conveyor. After grain flow from dump vehicle has stopped, allow the conveyor to clean itself out and close outlet gate. **Shut down and lock out power source.**

### EMERGENCY SHUTDOWN

Should the machine need to be immediately shut down under full load, **disconnect** and **lockout** the power source. Clear as much grain from the hopper and conveyor as possible. Use the release door provided in the standard corner to drain the vertical tube after the dump hopper.

**Never attempt to restart when full. Starting the unit under full load may result in damage.** Such damage is considered abuse of the equipment and will not be warranted.

### NORMAL SHUTDOWN

Close flow controls in bin wells and allow the conveyor to empty before stopping the unit.

**Before the operator leaves the work area, the power source shall be locked out.**

### INTERMITTENT SHUTDOWN

When a conveyor is stopped and started under full load, it may result in damage to the conveyor. Therefore, if intermittent operation is to be carried out, it is advisable to reduce the load level.

If a conveyor is kept from absolute filling, it will make start-up easier and will convey grain more efficiently.

### LOCKOUT

The power source shall have a main disconnect box that can be locked only in the “**Off**” position. This is what “shutdown and lockout” refers to, shut off the main power source and lock handle or breaker switch in the “**Off**” position.

**GENERAL MAINTENANCE INFORMATION**

**WARNING!** A main power disconnect switch that can be locked in only the "OFF" position shall be provided. This shall be locked whenever work is being done on the conveyor.



Keep all safety shields and devices in place.

Never clean, adjust or lubricate a machine that is in operation.



Disconnect power before resetting motor overloads.

Shut off power and lockout whenever cleaning or servicing the conveyor.

Keep hands, feet and clothing away from moving parts.

For economical and efficient operation of your Grain Pump<sup>®</sup>, maintain regular and correct lubrication. Neglect leads to reduced efficiency, excessive wear, and needless down time. Regular inspections should be established in order to ensure that the equipment is in good operating condition at all times. Use the "Machine Inspection" list on page 4 for guidelines.

The following information will detail the parts that require lubrication and the various conditions that determine the frequency span.

**CONVEYOR CHAIN**

It is important not to overtighten the conveyor chain. However, if the chain is not sufficiently tight, it will slip at the drive sprocket as capacity is increased. Should this occur, shut off grain flow to the unit and allow conveyor to clean itself out. **Shutdown and lockout the power source.**

To check conveyor chain tension, open the inspection door, grasp one of the paddles and attempt to rotate it up toward the chain. Proper chain tension should allow only minimum rotation of the paddle (See Fig. 5).

Inspect the conveyor chain for loose bolts, missing chain parts, missing or damaged chain paddles and the overall chain condition.

**IMPORTANT SERVICE - MAINTENANCE NOTICE:**

The life of the conveyor chain will be shortened when the chain is allowed to sit in water or is operated in acidic conditions, so avoid these situations.

To extend chain life, spray a light coat of oil on the chain after each season's use.

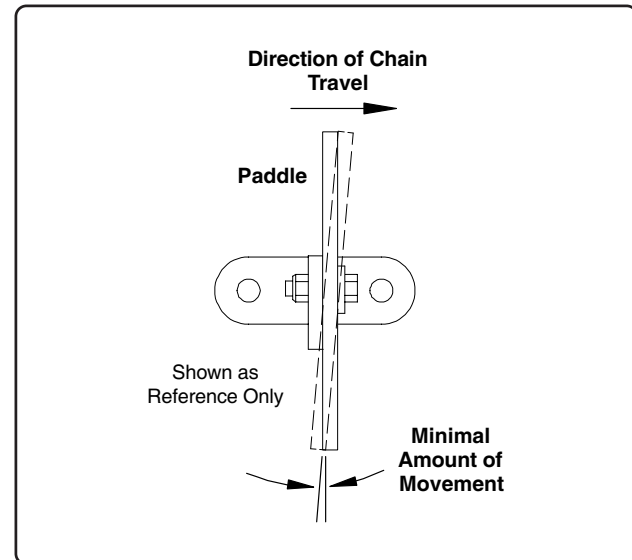


Fig. 5

**SPROCKET SHAFT BEARING**

The sprocket shaft bearings are self-aligning, sealed ball bearings which have been packed at the factory. They should be lubricated at approximately **fifty (50) hour intervals** with an SAE multipurpose type grease. Inspect bearings closely for wear and/or seal damage. Check that the bearings and lock collars are firmly fastened.

These bearings use an eccentric type lock collar. To tighten this type of lock collar, first slide it against cam end of the inner ring of the bearing. Rotate the collar in the direction of shaft rotation until the cams engage. Tap the collar further into this rotation to lock it, then tighten the setscrew.

**DRIVE AND CORNER SPROCKETS**

The conveyor chain sprockets should be occasionally checked against sliding on the shaft. The sprockets must be centered in the middle of the housing.

The setscrews in the sprocket hub should secure the sprocket to the shaft.

## **GEAR REDUCER**

**IMPORTANT!** Because the gear reducer is shipped **without oil**, it is necessary to add the proper amount of oil before conveyor operation. Use a high grade petroleum base, rust and oxidation inhibiting (R & D) gear oil. **Follow the instructions on the reducer name plate, warning tags, and in the installation manual provided with the reducer.**

Under normal industrial operating conditions, the lubricant should be changed every **2500 hours of operation or every six (6) months**, whichever occurs first. Drain the reducer and flush it with kerosene, clean the magnetic drain plug and refill reducer to its proper level with new lubricant.

**CAUTION: Too much oil will cause overheating and too little oil will result in gear failure. Check oil level regularly**

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

## **DRIVE BELTS**

The drive belt tension should be checked regularly. Check belts for tightness, cracking, fraying or other damage. Replace as necessary.

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 top of conveyor trunking.

Sheaves must be aligned with each other. Check alignment by placing straight edge across the outer face of both sheaves.

Check that drive keys are properly installed and mounting bolts in sheave taper lock bushings are tight.

## **AUTO TAKE-UP CORNER**

If the conveyor is equipped with an Auto Take-up on the inspection corner, the take-up mechanism needs to be inspected and lubricated regularly.

The sprocket carriage assembly will go through an up/down cycle when the conveyor is started; therefore the free travel of the sprocket carriage must be maintained.

Be sure that the sprocket carriage is not fully bottomed out. If the carriage is in the full down position, then it may be necessary to shorten the chain by removing one or more links to tighten the chain. (Refer to "Conveyor Chain" information for proper chain tension.)

## **TROUBLE SHOOTING**

### **1. Extreme noise from housing.**

- A. Conveyor chain is too loose. Chain is slipping at drive sprocket. Check chain tension and adjust, as necessary.
- B. Improper assembly or misalignment of housing. Locate tube connection(s) that is the source of noise and disassemble. Check for end smoothness and grind, if necessary.
- C. A conveyor sprocket is not centered in a corner unit causing paddles to rub hard on conveyor sides. Sprocket must be moved on shaft to center position and locked.

### **2. Belt slippage on electric drive.**

- A. Incorrect belt tension. Turn the adjustment bolts on the motor mount until proper tension is reached.
- B. Unit is plugged. Clear the grain and any obstructions from the machine as is possible.

### **3. Grain returning to the intake.**

- A. All discharge spout gates may be closed. Make sure the proper gate is open.
- B. Partially blocked discharge; remove obstruction.
- C. Chain travel is too fast causing grain carry-over. See page 21.

### **4. Unit not running to full capacity.**

- A. Grain is high in moisture causing lower capacity. Excessive feeding of high moisture grain can cause plugging.
- B. Chain speed is too slow.
- C. Obstruction at intake.
- D. There is grain returning to the intake. See 3. above.

### **5. Paddle breaking or bending.**

- A. Paddles may be coming loose from the chain. Keep paddles securely connected to chain.
- B. Housing misalignment.
- C. Frequent starts under loads. Allow machine to clean out before shutting down.
- D. Sprockets may be off center. Align in center of housing.
- E. Overfeeding; adjust the feeding of the unit to allow less grain to enter while maintaining full speed.

**INSTALLATION**

The purpose of this section is to advise and instruct owners on how the equipment can be installed.

A millwright or other experienced contractor should perform the installation. **The installer should read this manual and understand the complete operation of the equipment.**

**LAYOUT**

The Grain Pump® conveyor can be used in many different ways and operation can vary from installation to installation.

Thought given to proper grain system layout prior to conveyor installation can prevent later problems in the grain flow plan and avoid possible “bottle-necks”.

A layout should be made to determine the exact location of conveyor, inlets, outlets, power source, support and mounting locations.

Dimensional information of components is found on pages P1 - P7 in the Parts Section.

**LAYOUT CONSIDERATIONS**

Following are major items that should be considered when laying out the system:

- A. Type of material to be conveyed.
- B. Volume of material to be conveyed (bushels per hour).
- C. Location and amount of material fed into system.
- D. Location and number of outlets.
- E. How will the conveyor be supported?
- F. Further expansion. Will more bins be added and where?
- G. The direction of grain flow.

**Use these general guidelines to help layout your conveyor system:**

- Grain Pumps are designed to move grain in one direction only.
- Leave adequate room to perform periodic maintenance.
- The conveyor will handle a wide range of free flowing grains. It should not be used with highly corrosive material, such as fertilizer. The life of the conveyor chain will be shortened when the chain is allowed to sit in water or is operated in acidic conditions, so avoid these situations.
- Be sure not to overfeed the conveyor. This will cause plugging. Intake rate should not exceed the particular capacity of the conveyor.
- It is important that a firm, level foundation or support structure be provided on which the conveyor can be mounted. This support should be ample to carry the load of the conveyor when fully loaded.
- Locate outlets where connecting bands will not interfere with outlets or control. **Do Not** cut or modify tube connecting bands.

Grain Pump Systems are usually installed around rows of storage structures, with access for vehicle or rail traffic and other devices.

Grain bins may be conventional or elevated on a supporting structure with hopper bottoms.

Grain dryers, cleaners or other devices may have access to the system.

Systems have been used to transfer between trucks and rail cars with several temporary storage tanks included.

## INSTALLATION INFORMATION

- All systems require the joining of four or more sections of tubular conveyor housing.
- All systems will include four 90° corners.
- The 90° discharge with gate includes an 8 ft. long section of tubular conveyor housing that must be fit within other tubular conveyor so the discharge is located properly.
- The inlet dump hoppers include a length of tubular conveyor housing that must be fit within other tubular conveyor so the hopper is located properly.
- Wells used in grain bin floors fasten onto standard tubular conveyor housing. Access openings must be cut in the tubing to install wells.

## SYSTEM SUPPORT INFORMATION

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 illustration below), the individual corners and other components, particularly the ones with drives which weigh considerably more.

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 side walls or from the bin roof at the peak. **Consult the bin manufacturer concerning their recommendations for loads their bin will support in these areas.**

### **Weight per foot of tubular conveyor:**

Conveyor Tubing Empty - 24 lbs.

Conveyor Tubing Fully Loaded - 48 lbs.

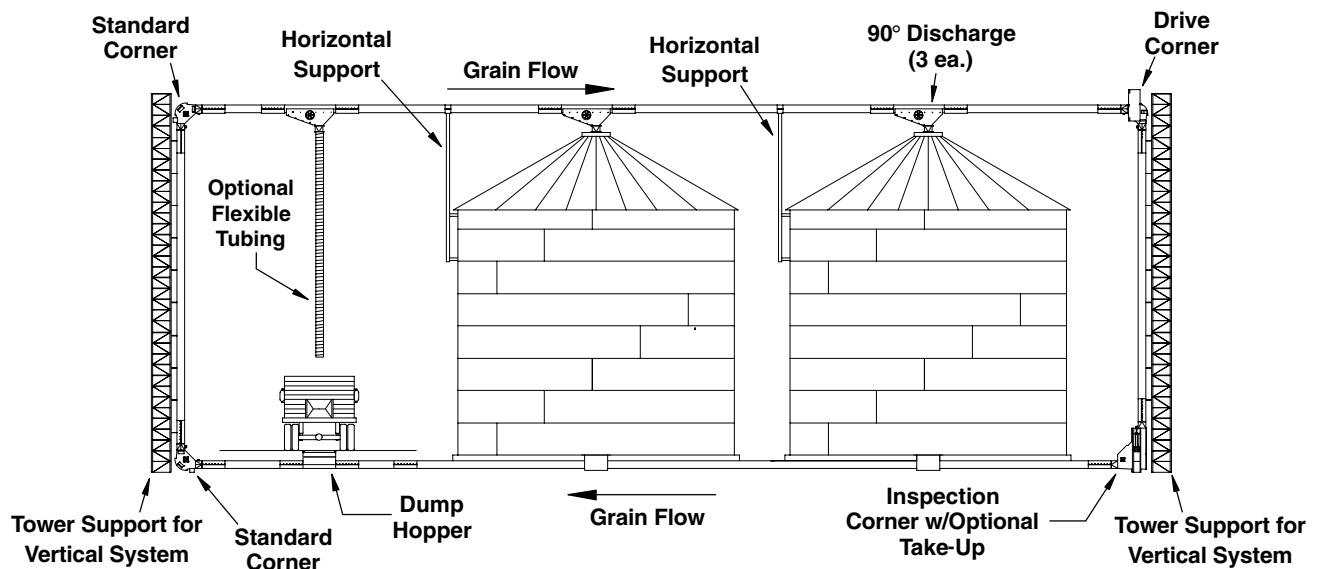
## GRAIN FLOW AND DRIVE CORNER LOCATION

Grain Pump® Loop Systems will include one or two drive corners. The drive corner, on systems with one (shown in the illustration below), must be located at the overhead point toward which the overhead chain will travel. On systems with two drive corners locate them at the two overhead positions.

The inspection corner includes the adjustable slide that is used to tighten the conveyor chain. Locate the inspection corner on the bottom at the end where the conveyor chain travels down from top to bottom. The inspection corner also provides access to the conveyor chain and paddles for periodic maintenance.

There will be one or two standard corners, depending on the number of drive corners. They will be located at the end where the conveyor chain moves up carrying grain from the bottom to the top. When there are two drives, there is only one standard corner located at the bottom.

The system should be laid out to minimize the distance grain must be moved to perform the necessary loading and unloading operation. In the example, the dump hopper is located next to the end where the grain will be carried up to the overhead part of the system. If the dump hopper were located at the other end of the system the grain must travel a greater distance in the system to reach a bin. Grain would also travel a greater distance to the load out point when unloading bins.

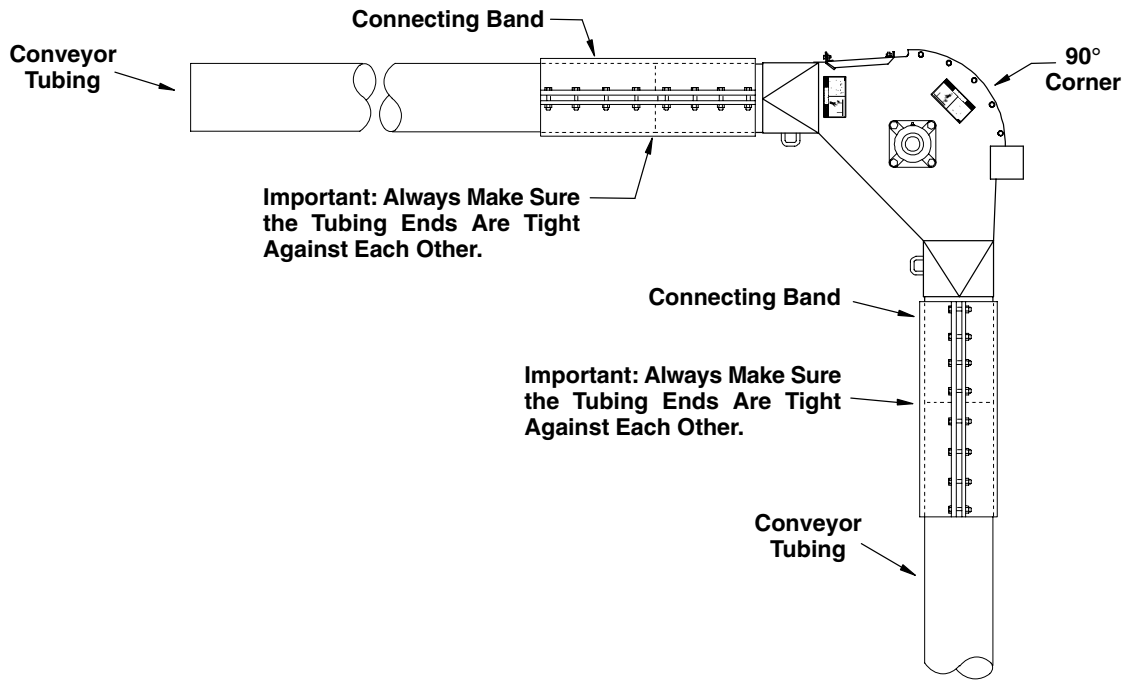


# ASSEMBLY INSTRUCTIONS

## TUBE AND CORNER ASSEMBLY

Lay the tubing and corner 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 removed. 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.

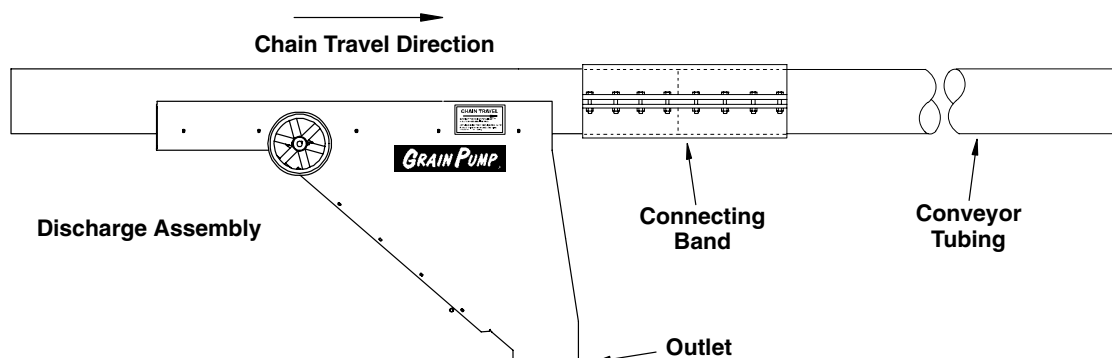


## DISCHARGE WITH GATE ASSEMBLY

The discharge unit includes an 8 ft. long section of conveyor. Locate the outlet of the discharge in the desired location. It may be necessary to cut exact lengths of other tube conveyor sections to locate the discharge unit in its proper place.

The discharge with gate is designed for chain travel through in only one direction. Make sure it is oriented properly by comparing the appearance to the diagram or referring to a label on the discharge unit. Operation in the wrong direction can cause paddle damage.

Fasten the discharge in place within the tubular conveyor with connecting bands.



## **BIN WELL ASSEMBLY**

Lay the sections of conveyor tubing in the bin according to your particular application (for example: will tubing be passing through the bin below a floor, or through a concrete trough under the bin). Whatever method is used, the tubing needs to pass exactly through the center of the bin. Use connecting bands to attach the tubing together.

Position the center bin well on top of the conveyor tube so the bin sweep mounting tube is in the exact center of the bin (See Fig. 6), make sure the flow control gate is in a direction that can be pulled by the control rods.

The intermediate wells will be positioned between the center well and the bin wall. Fig. 6 shows the minimum spacing allowed from the center well to the intermediate well and from the intermediate wells in relation to each other. Use the chart as a guideline, but keep in mind if a sweep tractor is to be used, you do not want the tractor to travel over the top of a well, so it may be necessary to position an intermediate well in a location other than the recommended spacing (if the well does have to be moved, keep it as close to the intended measurement as possible). Also, note that it may be necessary to reposition an intermediate well from its intended position because of the location of the connecting band attaching the tubes together.

Position the wells so the flow control gate can be opened when pulled by the control rods.

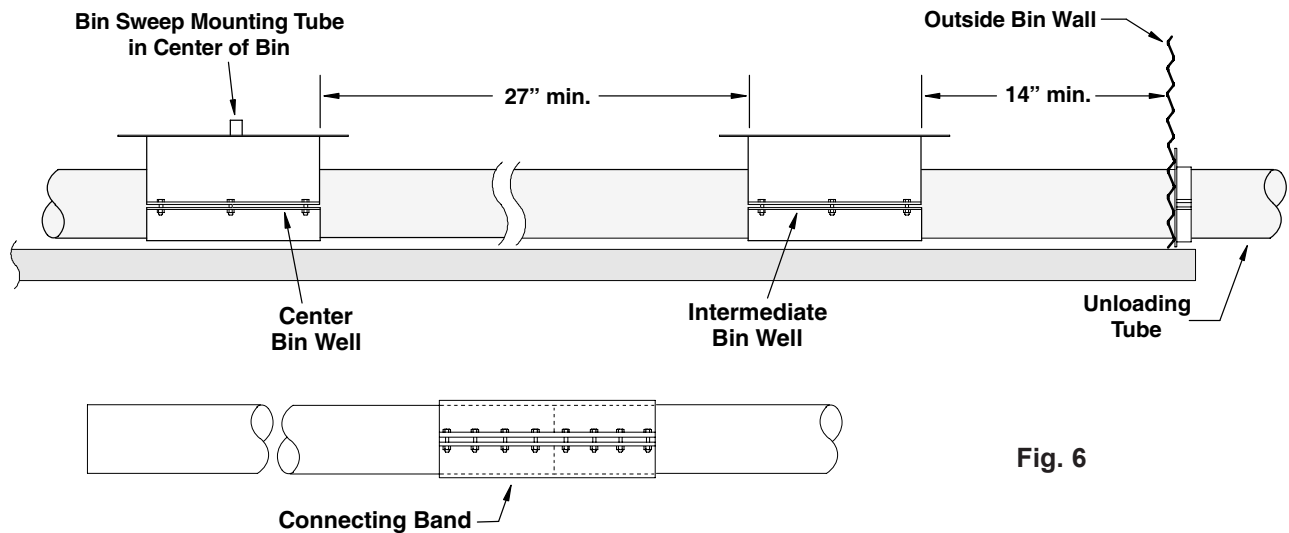


Fig. 6

When well locations are determined on the conveyor tubing, cut an opening in the tube for each well. There should be about a 1/2" tube left all around the inside of the well (See Fig. 7). Grain will leak if the opening is cut too large.

**NOTE: DO NOT cut the tube openings when the chain and paddles are inside the tube. Damage to the chain and/or paddles can occur.**

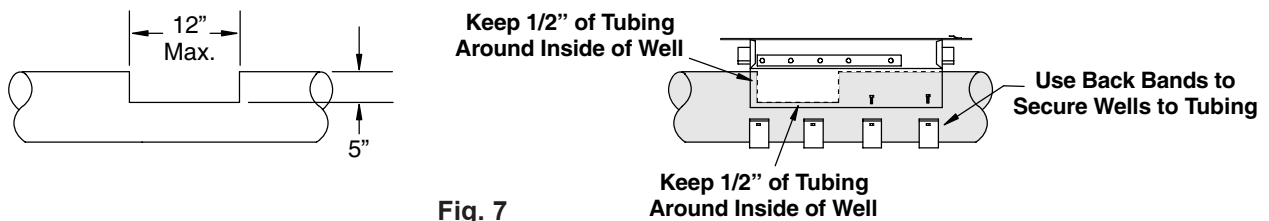


Fig. 7

Secure the bin wells to the tubing using the back bands and eight 5/16" x 1-1/2" bolts and non-lock nuts. Be sure the tops of the wells are level after they have been attached to the conveyor tube. The wells and tubing need to be supported from below by blocks or other adequate support material.

# ASSEMBLY INSTRUCTIONS

## PIPE CONTROL KIT ASSEMBLY

### (Center Bin Wells)

The Control Pipe Kit contains assembly information as well as a chart that shows the recommended spacing for well location and control pipe lengths.

Refer to the chart to determine the proper section length(s) required for attachment to the center well control gate. If more than one length (section) of pipe is required, a threaded connector is provided for attaching the pipe together.

Some sections of control pipes are predrilled with a 3/8" hole at one end (this is for installation of the roll pin). Use the drilled end when attaching the control rod to the gate. The ends of the pipe that are not drilled can be used on the outside of the bin where attachment to the rack & pinion, or other opening device, is needed. The control rod can then be cut and drilled to the proper length required for attachment.

There are also ends that have been threaded on the inside of the pipe, use the threaded connector for attaching these ends of the control rods together.

1. Remove the front cover plate from the top of the center and intermediate bin wells.
2. Insert the control pipe into the center well through the opening on the front side of the well and attach the rod to the control gate as shown in Fig. 8 (the control pipe may need to be inserted from the outside of the bin and through the intermediate wells before it can be inserted into the center well). **Note: In some applications the 1/2" dia. center well control pipe will be inserted into the 1" dia. intermediate well control pipe.**
3. Position the gate clamp over the end of the pipe and align the holes drilled through the pipe with the holes in the sides of the clamp. Install the roll pin, so there is an equal amount of the roll pin extending past each side of the clamp. Secure the clamp to the top side of the control gate using two 5/16" x 3/4" carriage bolts, flat washers, lock washers and non-lock nuts (insert bolts from the bottom side of the gate).

When unloading bin, start unload auger, open center well first. Open gradually until desired flow is obtained. When flow stops from center well, leave center well gate open and begin gradually opening intermediate wells, begin from center of bin working towards bin wall.

**Do Not** open intermediate wells until center well has stopped flowing. Excessive stress to the bin walls can occur causing dangerous situations.

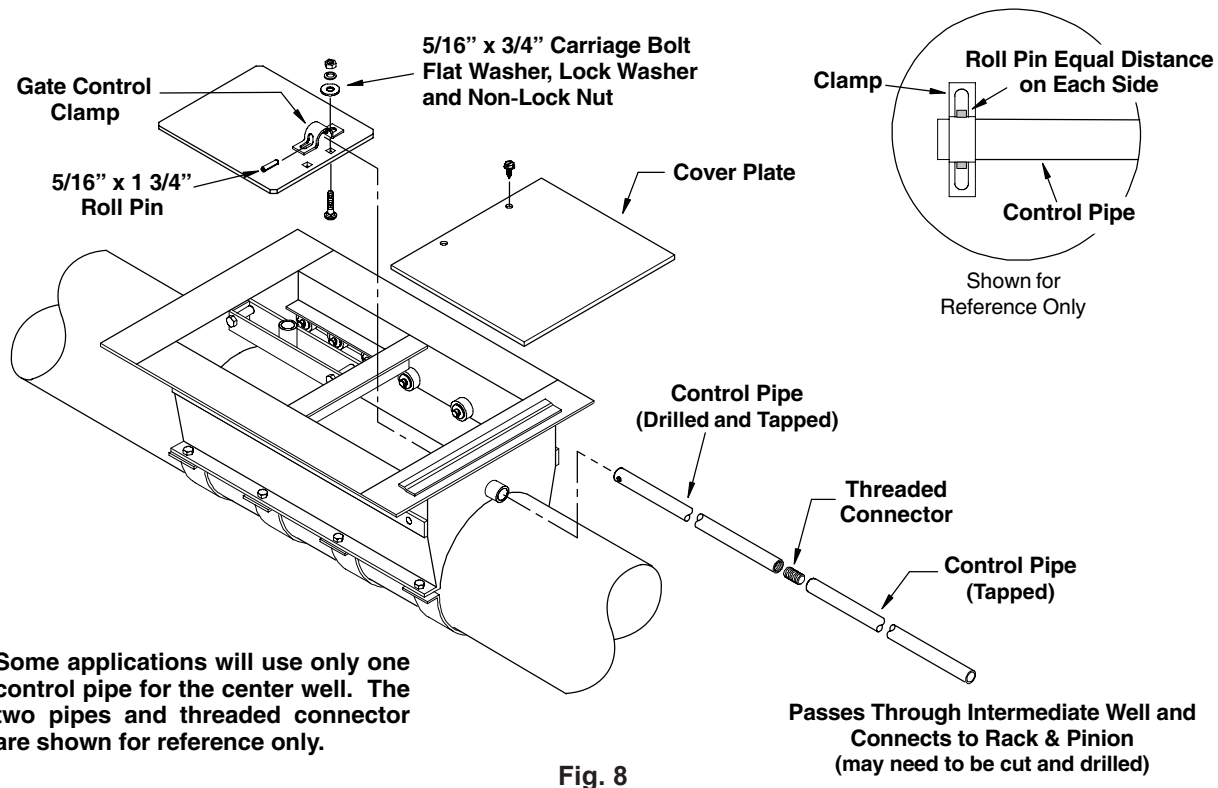


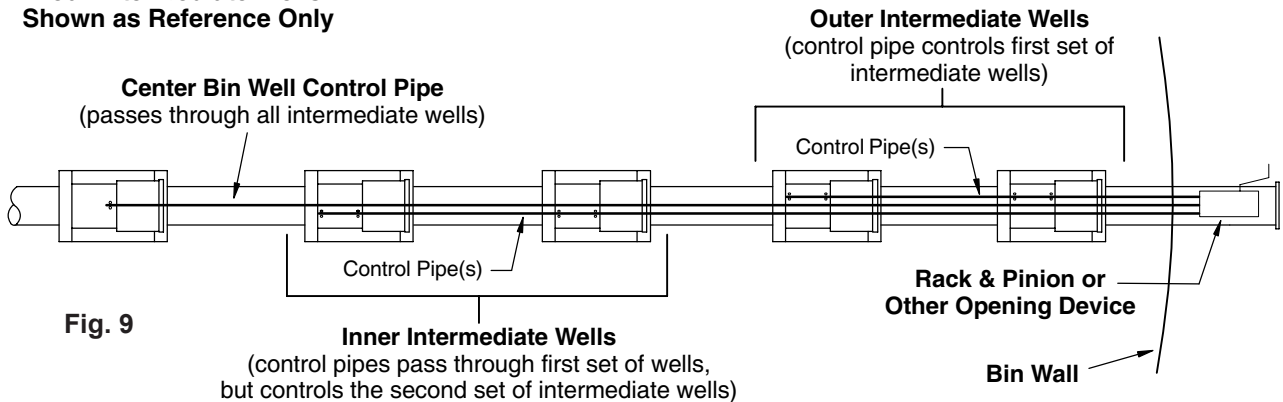
Fig. 8

## PIPE CONTROL KIT ASSEMBLY

### (Intermediate Bin Wells)

Depending on the bin diameter, the number of intermediate wells will vary. It may be necessary to separate the wells into inner and outer groups of two or more so that each group is controlled by its own control pipe. For instance: if four intermediate wells are used, the first two wells would be attached to the same control pipe and the last two wells would be attached to their own control pipe (See Fig. 9).

#### Four Intermediate Wells Shown as Reference Only



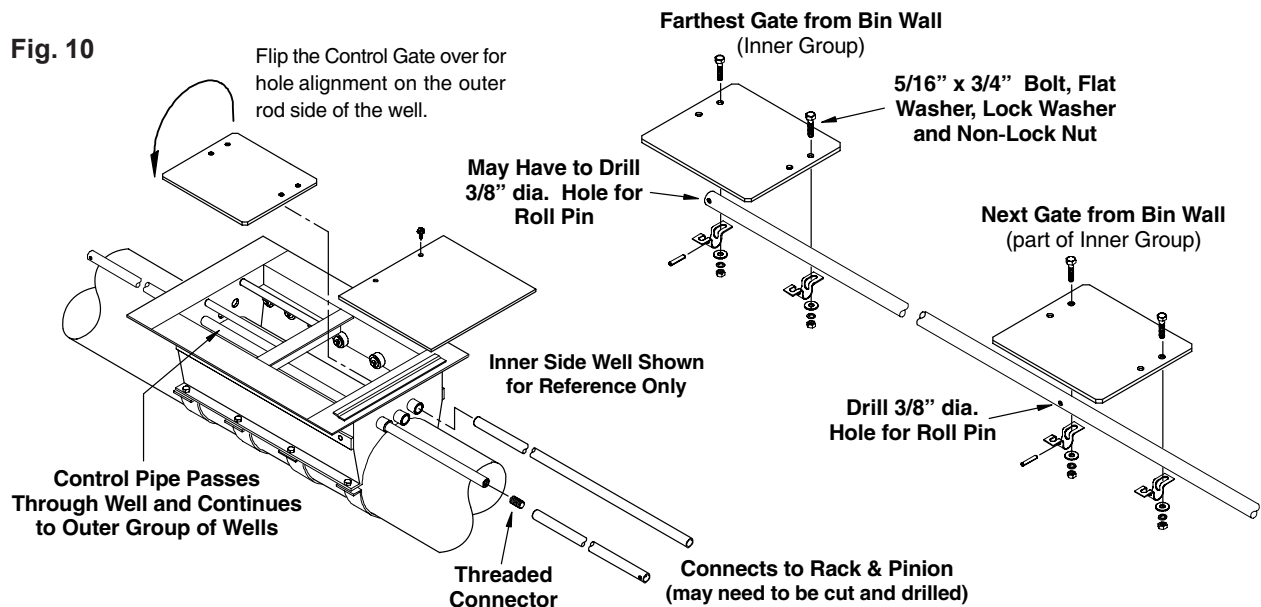
Slide the control pipe(s) into position for attachment to the control gates. Keep the amount of pipe extending outside the bin wall to a minimum (approx. 14").

Attach the end of the control pipe to the farthest control gate using two clamps, one 5/16" x 1-3/4" roll pin, four 5/16" x 3/4" bolts, flat washers, lock washers and non-lock nuts (See Fig. 10).

**NOTE: The mounting holes on the intermediate well control gates are offset to match whatever side the control pipe is on. The gate will work for either the inner or outer wells simply by turning the gate over, thereby putting the mounting holes on the side required for control pipe attachment.**

When attaching the control pipe to the other gates in the same group, it may be necessary to drill a 3/8" dia. hole for installation of the roll pin (although two clamps will be used, only one roll pin is needed for each gate).

Check gate operation by pulling and pushing on the control rods to ensure gates slide freely. **Make sure all control gates in the same group will be in the closed and/or open position at the same time.**



**RACK & PINION INSTALLATION**

The Rack & Pinion Control was designed to aid in the opening and closing of the bin well control gates. The device is set up for operating up to three sets of control pipes. The center sleeve operates the control pipe for the center bin well, and the two outside sleeves operate the control pipes for the intermediate wells (up to three wells can be operated with each of the outside controls sleeves).

1. Make sure all the bin well control gates are in the closed position.

Crank the handle on the rack and pinion unit so the control sleeves pull back into the housing. With the control sleeves facing the bin wall, position the unit onto the unloading tube near the flange end.

Turn the handle so the control sleeves extend out as far as possible (the holes drilled through the sleeves will be used to attach the control rods from the bin well gates, the control rods should be measured and cut so they extend at least 1-1/4" past these holes, See Fig. 11).

2. With the bin well gates completely closed and the controls sleeves fully extended, determine how long each of the bin well control pipes need to be when extended 1-1/4" past the holes in the control sleeves.

Cut the control rods to length and reposition the rack and pinion unit onto the loading tube. Insert the control pipes into their appropriate sleeves while sliding the unit onto the pipes until the ends of the pipes reach that 1-1/4" mark.

Secure the rack & pinion unit to the unloading tube using two half bands and eight 5/16" x 1" bolts and non-lock nuts.

3. Using the holes in the control sleeves as a template, drill a 3/8" dia. hole through each of the control pipes. The bin well control pipes can then be attached to the control sleeves with either a snap pin or a bolt and nut.

To operate only the center bin well gate, remove the pins (or bolts) from the two outside control sleeves leaving the center sleeve attached to the center bin well control pipe.

To operate only the intermediate bin well gates, remove the pin (or bolt) from the center control sleeve.

4. Check that all well gates open and close freely, and make sure they close completely when the control sleeves are fully extended.

**IMPORTANT!**

**Make sure all bin wells are closed before filling bin with grain.**

**Start unloading auger before opening gates.**

**Close all bin well gates before stopping unloading auger.**

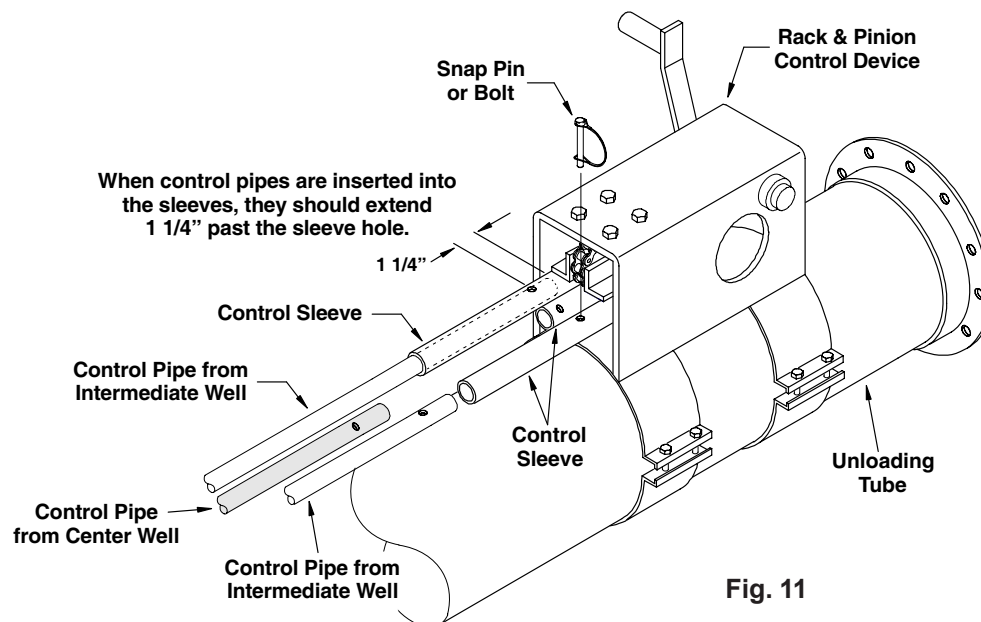


Fig. 11

## INLET DUMP HOPPER ASSEMBLY

The dump hopper will include conveyor tubing from 8 ft. to 14 ft. 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 chains mounted at each end.

A dump hopper is to receive grain into the Grain Pump<sup>®</sup> 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 into the system (See Fig. 12).

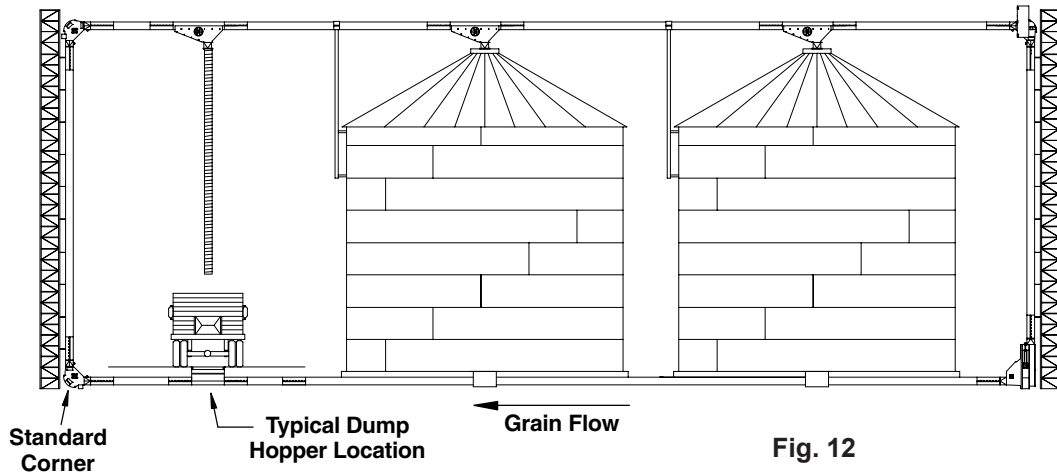


Fig. 12

A hopper with top safety screen may be used in non-drive over situations. The top safety screen **will not** support vehicles. Make sure either the top safety screen or drive over grating is in place on the hopper at all times.

For drive-over systems the grate must be supported by a concrete structure, such as shown below. Even if the dump hopper is not used for a drive-over system it will still need some type of support structure.

Once the location of the dump hopper has been determined, and properly installed, attach the hopper to the loop system conveyor tubes using the connecting bands provided.

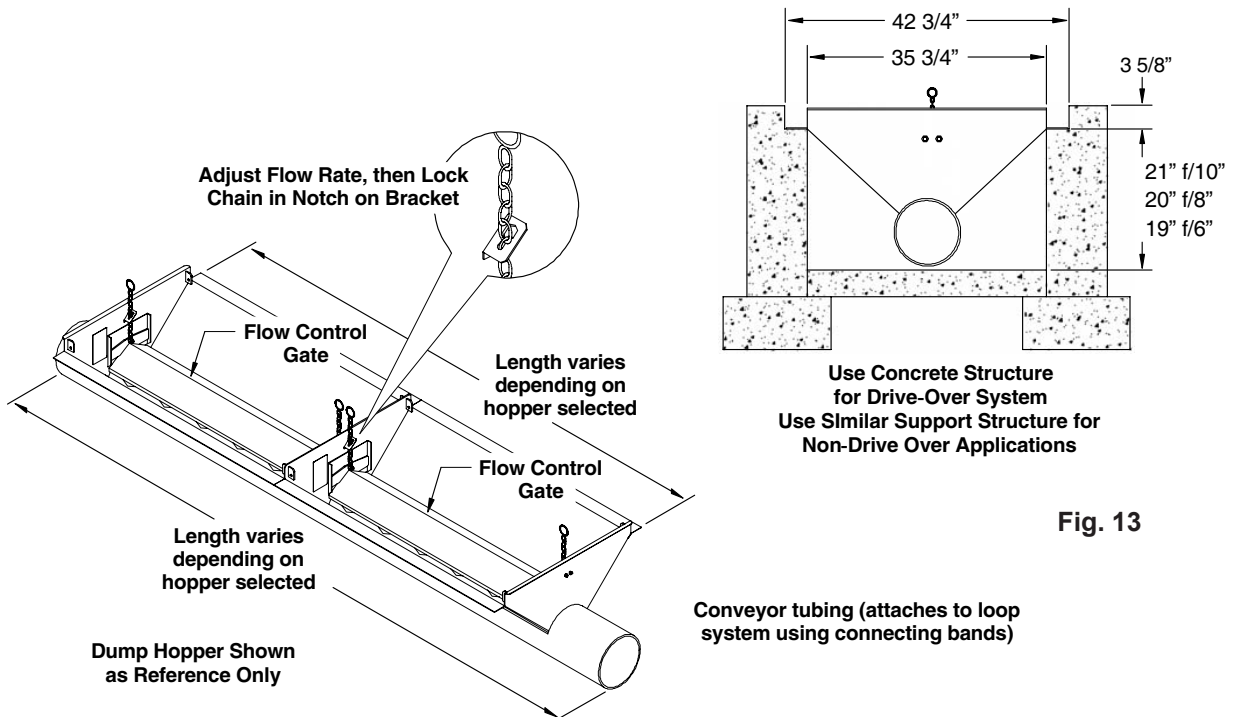


Fig. 13

**AUTO TAKE-UP CORNER ASSEMBLY**

After the location for the corner assembly has been determined, attach the upper and lower tubing sections to the conveyor tube system and secure using the connecting bands provided.

1. Install the winch onto the mounting bracket located on the inside face of the corner assembly. Secure the winch using three  $3/8" \times 1"$  bolts and nylon locknuts. Attach the winch handle to the winch.
2. Mount the weights onto the auto take-up carriage. Place a single weight on one side, then another weight on the opposite side. Repeat until all eight weights have been placed onto the auto take-up carriage. To keep the weights from sliding off, install a  $3/8" \times 1-1/2"$  bolt and nylon locknut onto each end of the take-up carriage.
3. Assemble the pulley using the provided pulley wheel, side plates, bushing and  $1/2" \times 2"$  bolt and nylon locknut. Hang the pulley assembly from the pulley bracket mounting tabs and secure using one  $1/2" \times 2-1/2"$  bolt and nylon locknut.
4. Fasten the pulley bracket w/pulley onto the vertical tube above the auto take-up weights, as shown below. Position the pulley bracket approximately 34" above the tubings' square-to-round connecting point and using one halfband and six  $3/8" \times 1-1/2"$  bolts and non-lock nuts, secure the pulley bracket to the tube. (Make sure the pulley hangs directly above the large hole centered between the two sides of the auto take-up carriage).
5. Attach the lift cable to the winch drum as shown below. Wind the cable onto the drum such that the cable wraps around the drum three times. (The cable should wrap from the bottom of the drum when the handle is turned in a clockwise direction).

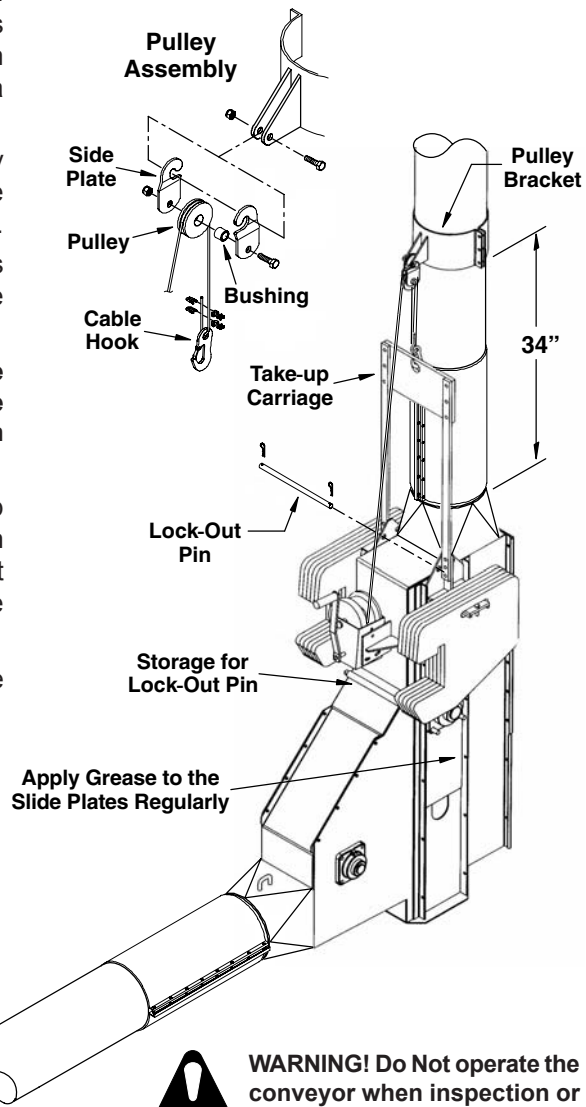
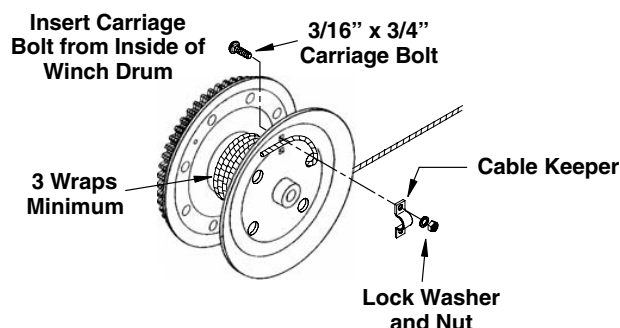
String the loose end of the cable up and through the pulley previously installed above the take-up carriage. Attach the cable hook to the cable and leave a little slack in the cable.

Secure the ends of the cable using the two cable clamps provided. (Make sure the u-bolt portion of the clamps are against the loose end of the cable).

**IMPORTANT! When the weights and take-up carriage are in the full down position, there needs to be some slack in the cable. This allows the chain tension sprocket to provide proper pressure on the chain.**

6. Operate the winch and check to see that the take-up carriage travels through its entire range of travel. (When the take-up carriage is in its full raised position, a lockout pin will be inserted through the slide plates to support the carriage when servicing the unit is required).

When lowered to its full down position, there needs to be some slack in the cable.



**WARNING! Do Not operate the conveyor when inspection or access doors are open.**

## DRIVE CORNER



**WARNING! Whenever you must service or adjust the equipment, make sure to stop the motor and lockout the power source.**



**A main disconnect switch capable of being locked only in the "OFF" position shall be provided. This shall be locked whenever work is being done to the conveyor.**

The Grain Pump<sup>®</sup> Loop System is powered by an electric motor. Always use a motor with required horsepower as calculated on Page 5. Use a motor that operates at 1750 RPM. (See also "Electric Motor Drive Information" and "Lockout" on Pages 6 and 7).

**Electrical motors and controls must be installed by a qualified electrician and must meet the standards set by the National Electrical Code and all state and local codes.**

**IMPORTANT!** Use the motor sheave furnished with the conveyor system. If another size sheave is used or substituted, improper chain speed and unsatisfactory conveyor operation will result.

**IMPORTANT!** Use the proper size and speed motor to ensure satisfactory conveyor operation. Too small of a motor will not supply the horsepower required to achieve capacity and possible damage to the motor may occur.

Too large of a motor may cause high stress on conveyor components resulting in shorter life for those components. See page 9 for motor size specifications.

1. 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.
2. 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 of the conveyor.
3. Check all fasteners to see that they are tight.
4. Close and latch belt guard.



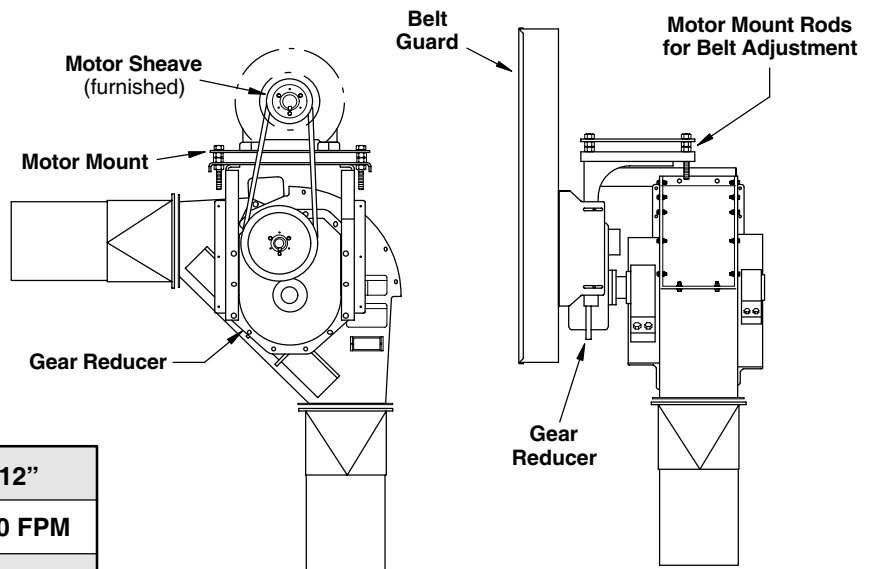
**WARNING! Keep all safety shields, guards and devices in place.**

**IMPORTANT:** The gear reducer is shipped **without oil**. It is necessary to add the proper amount of oil before unit operation. Use a high grade petroleum based, rust oxidizing (R & O) gear oil. Follow the instructions on the reducer name plate, warning tags and in the installation manual attached to the reducer.

**Too much oil will cause overheating and too little oil will result in gear failure. Check oil level regularly.**

### Typical Drive Corner Assembly

**Make sure to use a motor with the required horsepower.**



Unit Size	12"
Recommended Chain Speed	400 FPM
Corner Shaft RPM	83 RPM

**CONVEYOR CHAIN & PADDLE****ASSEMBLY**

**CAUTION!** The areas around the sprockets and tension wheels can create pinch points causing personal injury. Use caution when working around these areas.



The take-up carriage is provided with a lock-out pin. To avoid serious injury. **Do Not** attempt to access or service the chain, paddles or other parts within the inspection corner without the lock-out pin in place.

The paddles may be bolted to the chain before installation of the chain into the system or after the chain has been installed. There are access doors on each corner that can be utilized for paddle assembly. **Use caution around the sprockets and traction wheel areas, as these areas create pinch points which can cause personal injury.**

Install the paddles so that the paddle mounting brackets are behind the paddles as grain is being moved through the conveying tubes.

To string the chain through the conveyor tube sections, it will be necessary to use an electrical fish tape, wire, or rope to pull the chain through the tubing. Use the access doors at each corner unit to accomplish this task.

It is recommended to begin and end at the auto take-up inspection corner, as this will be where chain tension will be determined. Using the winch, raise the take-up carriage and weights high enough so the lock-out pin can be inserted through the slide plates to support the raised carriage.

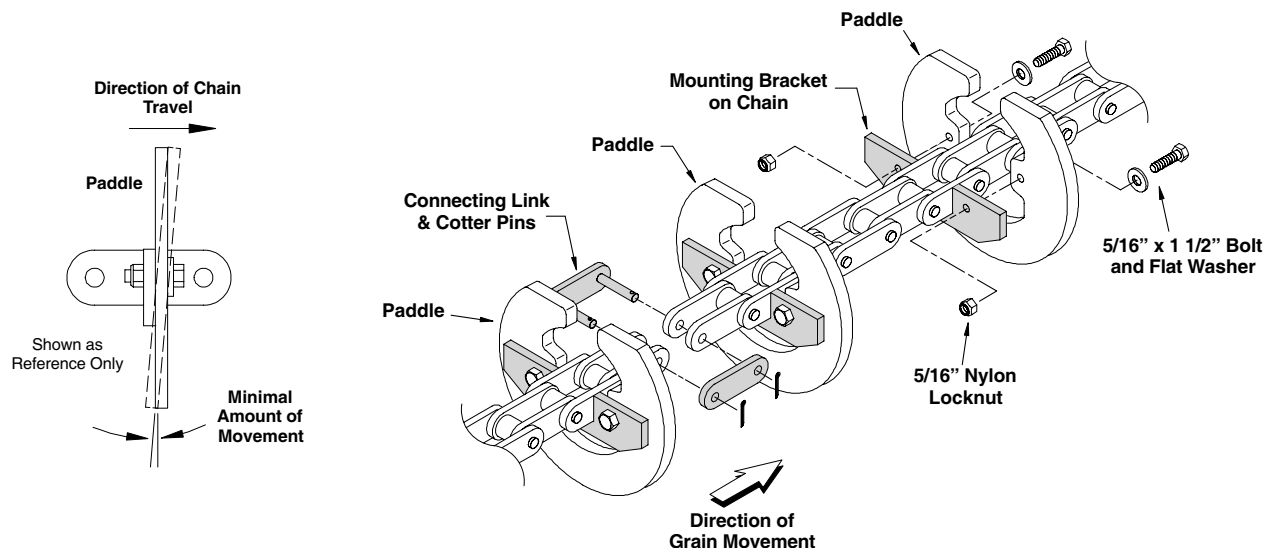
**IMPORTANT!** Make certain the chain does not become twisted between corners. On long horizontal runs it is possible for the chain to rotate 360° during the pull-through between corners. Use inspection doors at discharge gates and openings in bin wells to observe the chain position along the length of the conveyor sections.

After installing the chain through the conveyor housing and around the corner sprockets, connect the chain ends together at the inspection corner using the connecting link and cotter pins provided. If paddles have not yet been installed, do so now.


The paddles will attach to the mounting brackets using two 5/16" x 1-1/2" bolts, two flat washers and two 5/16" nylon locknuts. Make sure a paddle is attached to every mounting bracket.


Once the paddles have been installed, remove the lock-out pin and slowly lower the take-up carriage aligning the sprocket and the chain. Continue lowering the carriage until the sprocket is down as far as it can go, the full weight of the carriage will be resting on the chain and there should be a bit of slack in the lift cable (**if the lift cable is tight during operation proper chain tension will not be maintained**).


Check chain tension. Grasp one of the paddles and attempt to rotate it towards the chain. Proper tension should only allow minimal movement of the paddle. If there is more movement than recommended and all weight is resting on the chain, it may be necessary to remove more links from the chain (**if less tension is desired, remove weights in pairs, one from each side until desired tension is achieved**).



## DISCHARGE HOPPER WITH CONTROL GATES

 **CAUTION!** Metal parts may have sharp edges and can create flying debris when filed, cut or drilled. Use proper safety equipment, such as gloves, eye protection and hearing protection when working with metal materials.

 Use caution when working in areas above the ground. Metal buildings and their surfaces can be slippery, especially when surfaces are wet. This can create hazardous working conditions.



The location of the discharge controls and routing of the control cables (or ropes) should have been determined before ordering the Grain Pump® Loop System.

The discharge gate controls must be located in line with the conveyor tube so the control cable, or rope will track properly on the control wheels. The control cable, or rope must be anchored to both the upper and lower wheels to provide positive control and to prevent the cable or rope, from slipping on the control wheels.

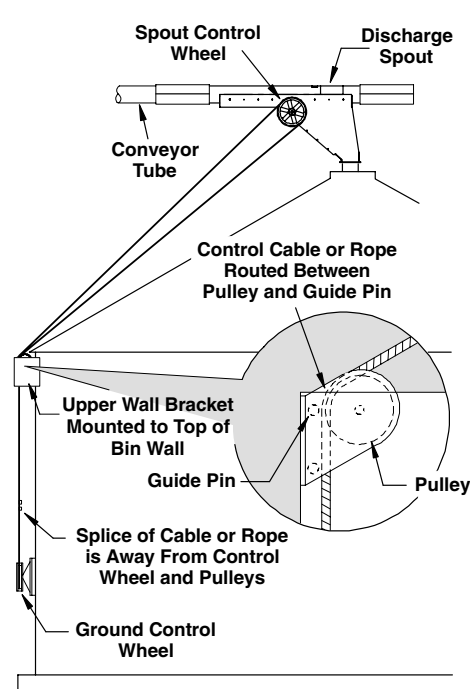
The cable, or rope should be one continuous length. If splicing is necessary, splice the ends together with cable clamps.

Plan where the splice(s) in the control cable, or rope are to be located. Avoid splicing where the splice will be pulled onto a control wheel or through a pulley while the gate is being opened or closed.

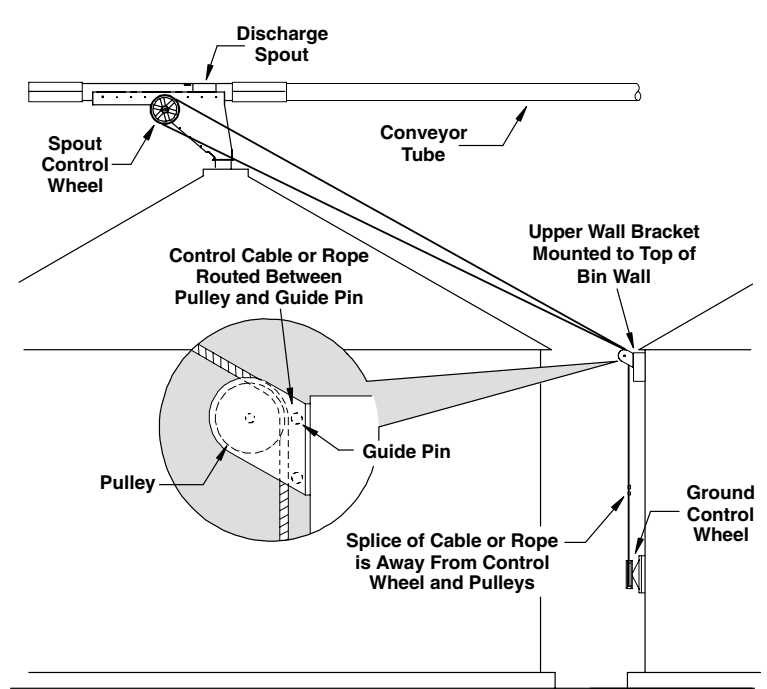
The wall brackets are designed to be mounted directly to the grain bin wall. Locate the control wheel about 5' off the ground (or at a height that is easy and convenient to reach). Locate the upper wall bracket (with pulleys) at the top of the bin wall so the control cable, or rope will clear the eave of the roof or other hanging structures.

The ground control wheel can be mounted to the same bin that the discharge spout is attached to (Example 1), or the ground control wheel can be mounted to an adjacent bin (Example 2).

**Refer to the following page, Page 22, for assembly procedures of the wall brackets, pulleys and control wheels.**



**Example 1**  
**Controls Mounted on Bin**  
**Where Spout is Located**  
 (pulley mounted on inside of bracket)



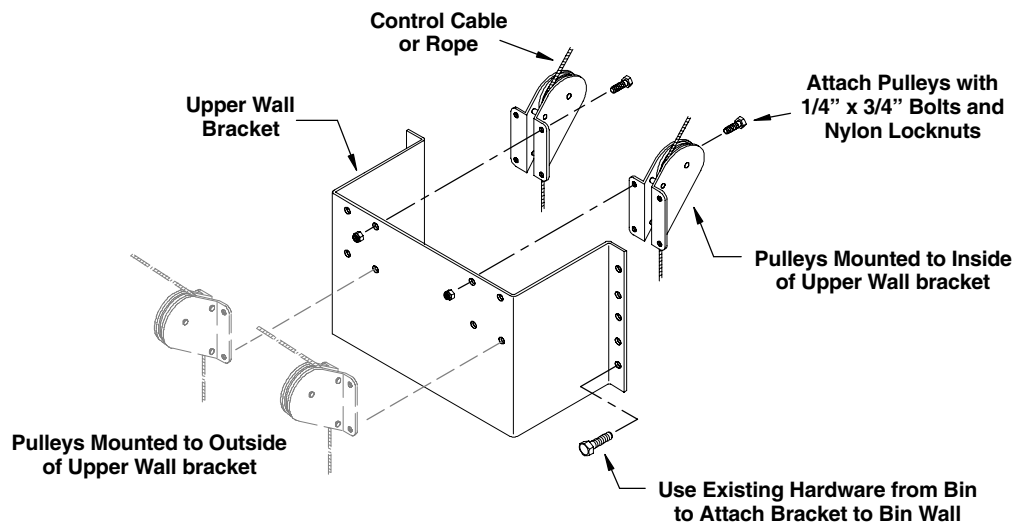
**Example 2**  
**Controls Mounted**  
**on Adjacent Bin**  
 (pulley mounted on outside of bracket)

# ASSEMBLY INSTRUCTIONS

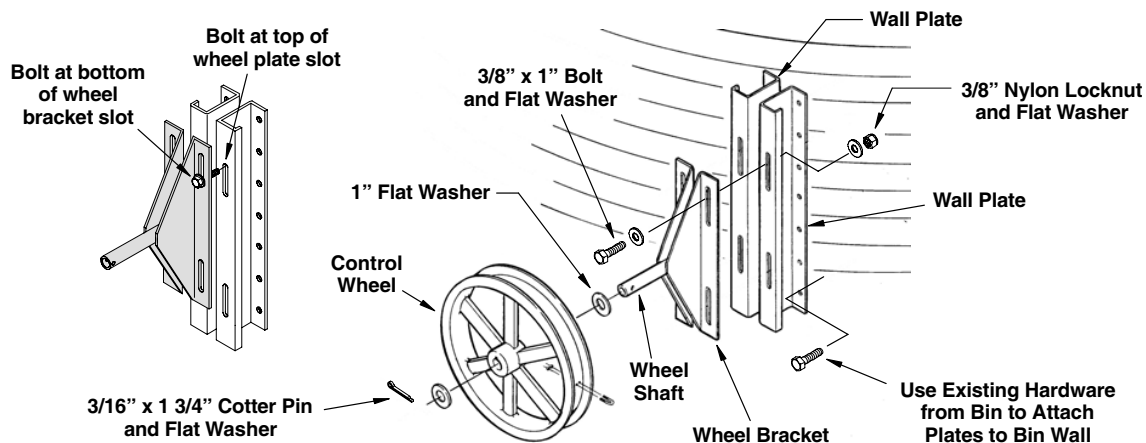
## DISCHARGE WITH GATE CONTROLS ASSEMBLY

The upper wall bracket and the ground control wall plate are designed to be mounted directly to the grain bin wall. Use the existing hardware from the bin wall to fasten the bracket and plate to the bin.

1. Attach the two pulleys to the upper wall bracket using four  $1/4"$  x  $3/4"$  bolts and nylon locknuts for each pulley.  
**NOTE: Mount the pulleys so both of them are either on the inside or on the outside of the wall bracket.**
  - A. If the controls are mounted on the same bin that the discharge spout is attached to, then mount the pulleys on the inside of the wall bracket (See Example 1 on Page 21).
  - B. If the controls are mounted to an adjacent bin, then mount the pulleys on the outside of the wall bracket (See Example 2 on Page 21).
2. Locate the wall bracket and pulleys so they are in line with the discharge spout control wheel (this will allow the cable, or rope to properly track onto the spout control wheel). Attach the wall bracket to the top of bin wall in a position that allows the cable, or rope to clear the eave of the bin.



3. Attach each wall plate to the wheel bracket as shown below. Secure each bracket using two  $3/8"$  x  $1"$  bolts, four flat washers and two nylon locknuts (be sure to use a flat washer over each slot). Slide the wheel bracket up so the bolts are at the bottom of the wheel bracket slots, but at the top of the wall plate slots.
4. Determine the location of the ground control wheel and attach the wall plates to the bin wall (use the existing hardware from the bin to mount the plates).
5. Slide a  $1"$  flat washer over the shaft on the wheel bracket and install the control wheel. Slide another  $1"$  flat washer onto the shaft and secure using a  $3/16"$  x  $1-3/4"$  cotter pin.



## DISCHARGE HOPPER WITH CONTROL GATES (con't.)

- Route the control cable through one of the pulleys on the wall bracket and up to the discharge spout control wheel (make sure cable is routed between the pulley and the guide pin).

Leave a good portion of the cable hanging below the pulley on the wall bracket. This will be the end of the cable that will be spliced (**this location is only a reference, it does not mean the splice has to be at this location. Just keep in mind that the splice needs to be far enough away from the control wheels and pulleys so that it cannot become wrapped onto them**).

- Once the cable is routed to the discharge spout control wheel, start to wrap the cable around the wheel until it reaches the two holes in the groove on the control wheel (wrap the cable around the control wheel at least 7-1/2 times and route the remaining cable length back down to the pulley on the wall bracket).

Secure the cable to the control wheel using only the u-bolt, lock washers and nuts (See illustration below).

**NOTE: The discharge spout gate moves 45° to fully open the gate. This is 6-1/2 turns on the control wheel, thus the reason for wrapping the cable at least 7-1/2 around the wheel. This will allow the gate to open and close fully. DO NOT use more wraps than necessary, as cable build up on the wheel can slide off the edge.**

- Route the cable behind the remaining pulley on the wall bracket, keeping the cable between the pulley groove and the guide pin. Continue the cable down to the ground control wheel.

Wrap the cable around the wheel at least 7 1/2 times until it reaches the two holes for the cable clamp. Anchor the cable to the wheel using the same method used on the spout control wheel.

Take the excess length of cable and route it to the end of the hanging cable. Keeping the cable fairly taut, connect the two cable ends together using two 3/8" cable clamps. Cut off the excess cable.

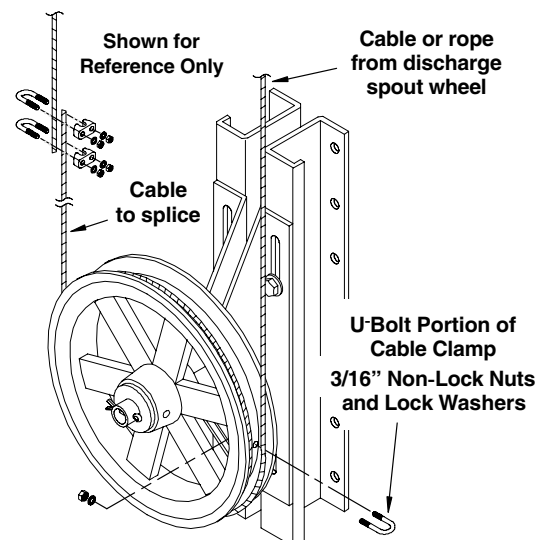
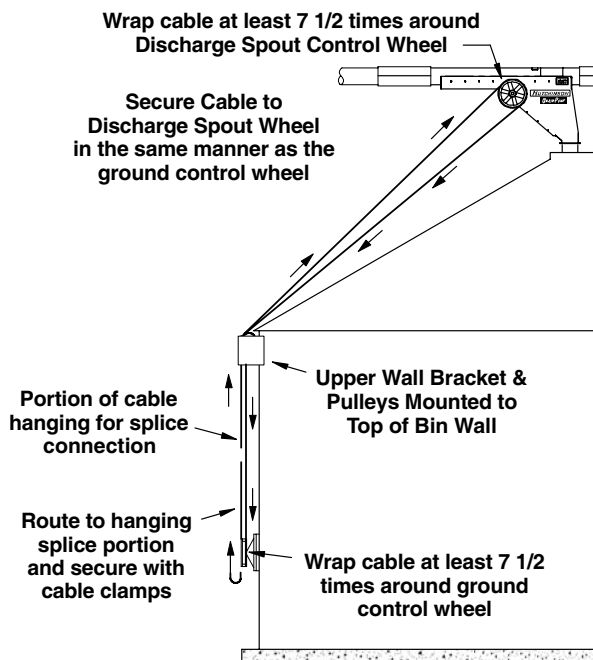
- Loosen the bolts securing the ground control wheel bracket to the wall plates. Slide the wheel and bracket down to tighten the control cable. (The cable needs to be tight to prevent it from unwrapping off the control wheel.) When the control cable is tight, retighten the bolts securing the wheel bracket to the wall plates.

### OPERATION NOTES:

The controls should be clearly marked as to which spout they control to prevent accidentally discharging grain into the wrong bin.

Controls should be marked to indicate when a spout is open or closed.

The ground control wheel has two setscrews in the hub that can be locked down to prevent the controls from accidentally vibrating open or shut.



# ASSEMBLY INSTRUCTIONS

## INLET HOPPERS

Inlet hoppers can be used for various applications with the Grain Pump<sup>®</sup> Loop System. They can be positioned in the conveyor system as extra inspection doors or can be used in hard to reach places for clean-out purposes.

The hoppers can also be used as an alternative inlet hopper for allowing grain to enter into the conveyor system at locations other than the dump hopper.

1. To install the inlet hopper, position the hopper onto the conveyor tube.

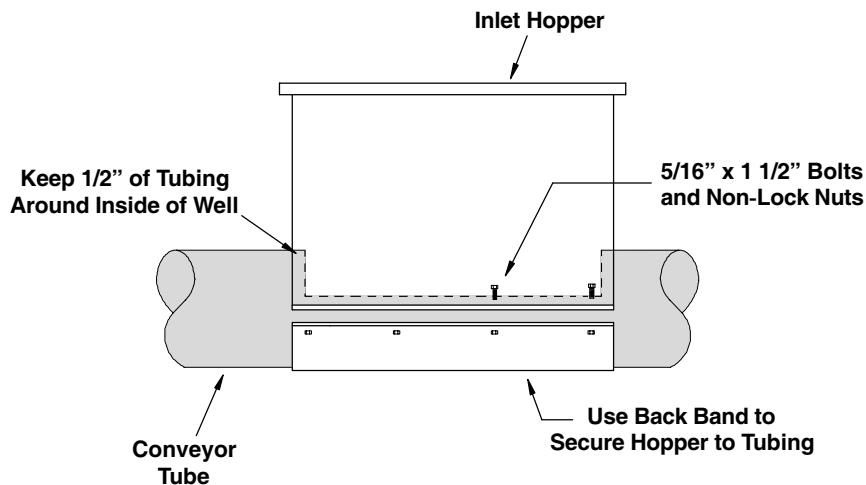
Mark the conveyor tube from inside the hopper leaving at least 1/2" of conveyor tube extending inside the hopper on all four sides (See illustration below).

2. Verify the marks do not extend past the sides of the hopper (**grain will leak out of the hopper if the opening is cut too large**).

3. Cut and remove the section of conveyor tube previously marked making sure to retrieve all pieces of the cut material from inside the tube.

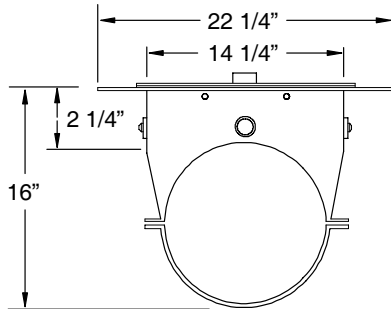
**NOTE: Do Not cut openings in the conveyor tube when the chain and paddles are inside the tube. Damage to the chain and/or paddles can occur.**

4. Secure the hopper to the conveyor tube using the provided back band and eight 5/16" x 1 1/2" bolts and non-lock nuts.

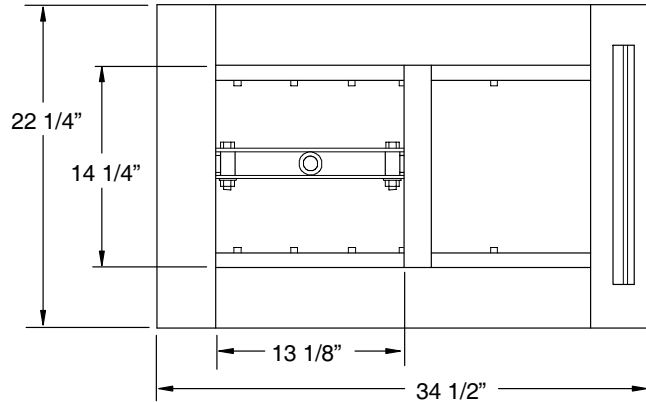


## COMPONENT DIMENSIONAL INFORMATION and PARTS LIST

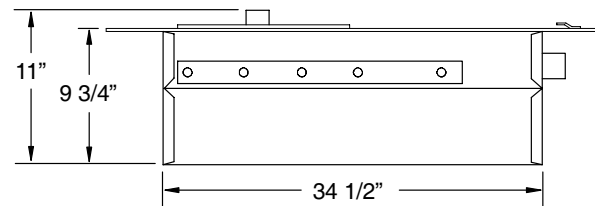
### 12" CENTER BIN WELL and CONTROL RODS



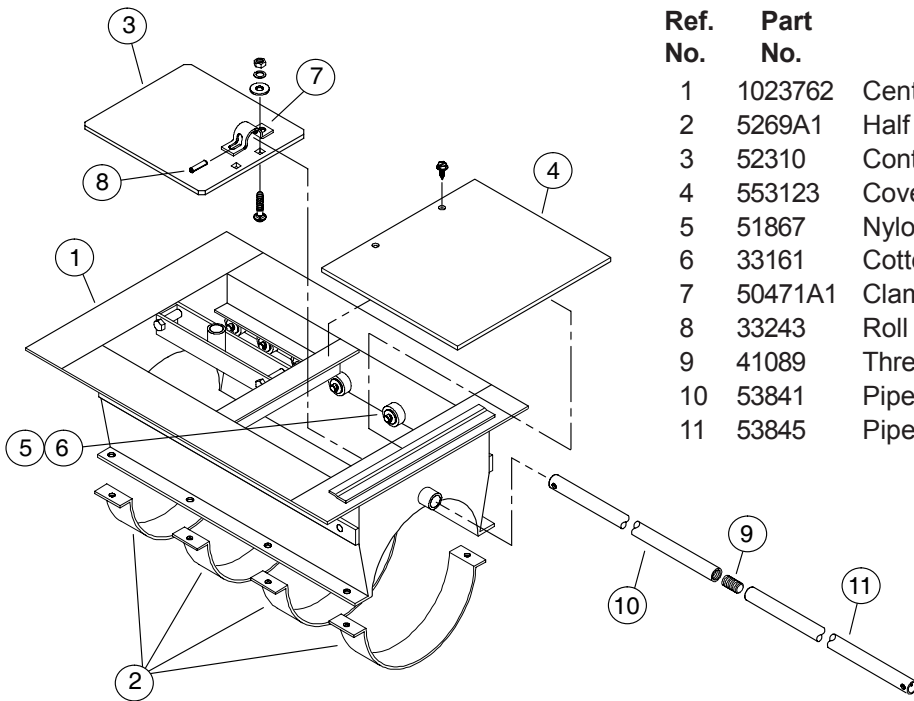
END VIEW



TOP VIEW



SIDE VIEW

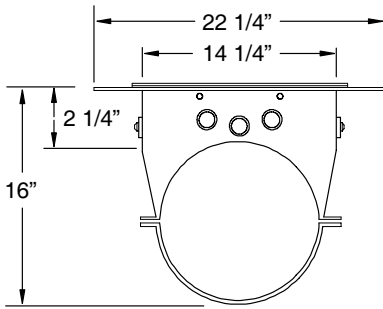


Ref. No.	Part No.	Description
1	1023762	Center Bin Well Weldment
2	5269A1	Half Bands, 12" x 2" wide
3	52310	Control Gate, 12" Center Well
4	553123	Cover, 12" Center Bin Well
5	51867	Nylon Wheel
6	33161	Cotter Pin, .125" x 1"
7	50471A1	Clamp, Control Gate
8	33243	Roll Pin, 5/16" x 1-3/4"
9	41089	Threaded Coupler, Pipe Control
10	53841	Pipe, Bin Control, 18'-9.5' tapped
11	53845	Pipe, Bin Control, 21'-0" dr. & tap

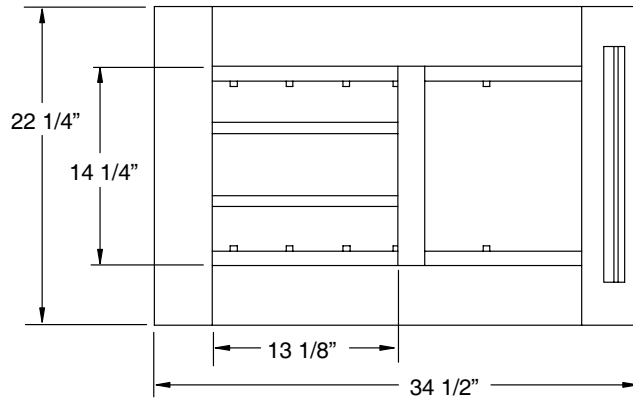
# PARTS LIST

## COMPONENT DIMENSIONAL INFORMATION and PARTS LIST

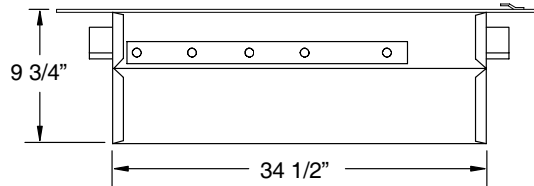
### 12" INTERMEDIATE BIN WELL and CONTROL RODS



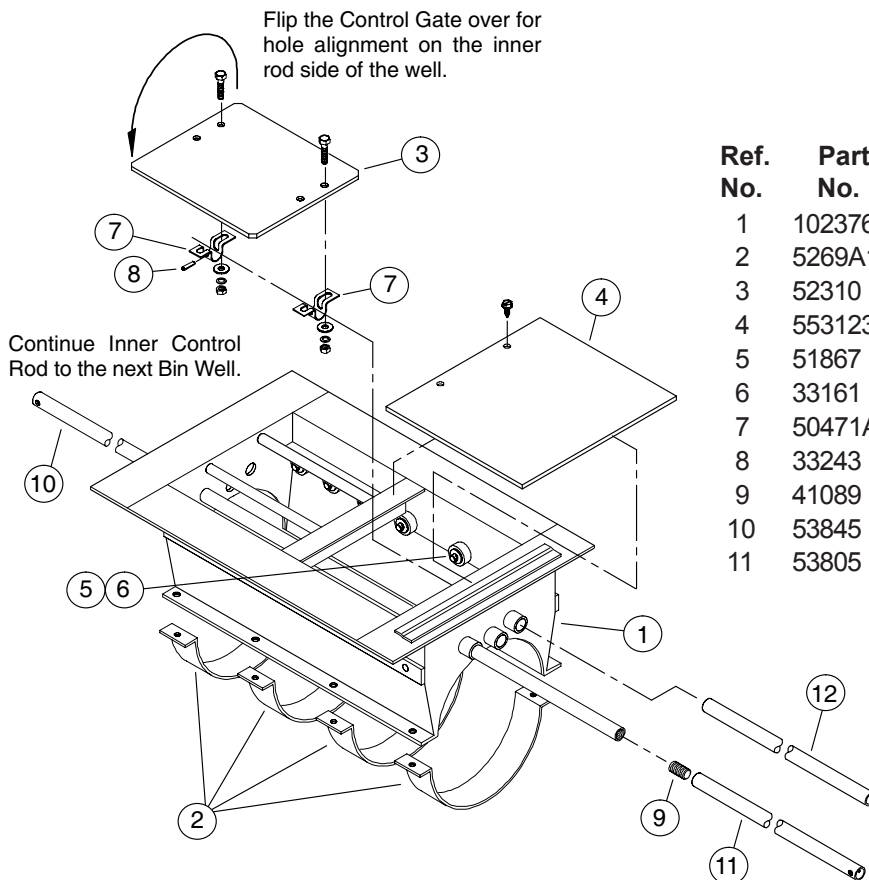
END VIEW



TOP VIEW



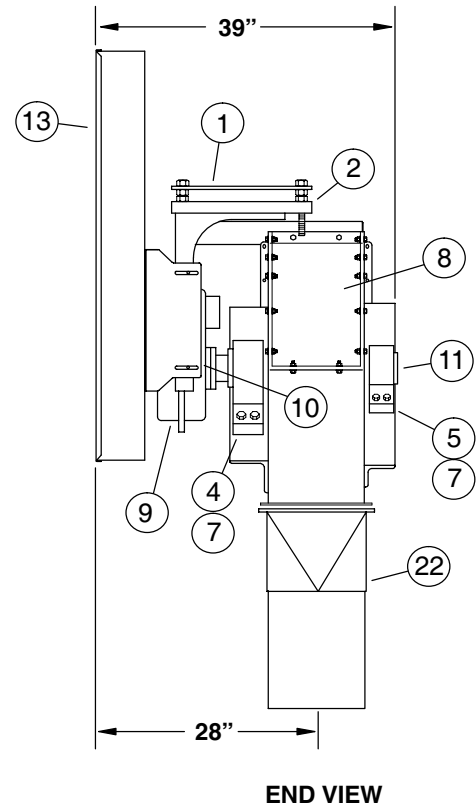
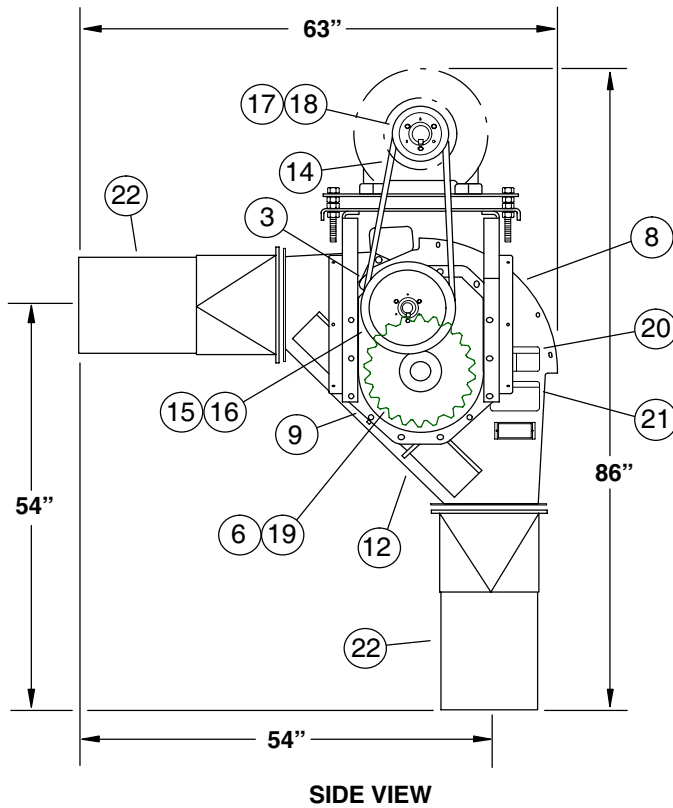
SIDE VIEW



Ref. No.	Part No.	Description
1	1023762	Intermediate Bin Well Weldment
2	5269A1	Half Bands, 12" x 2" wide
3	52310	Control Gate, 12" Center Well
4	553123	Cover, 12" Center Bin Well
5	51867	Nylon Wheel
6	33161	Cotter Pin, .125" x 1"
7	50471A1	Clamp, Control Gate
8	33243	Roll Pin, 5/16" x 1-3/4"
9	41089	Threaded Coupler, Pipe Control
10	53845	Pipe, Bin Control, 121'-0" dr. & tap
11	53805	Pipe, Bin Control, 14'-10.5"

## COMPONENT DIMENSIONAL INFORMATION and PARTS LIST

### 12" DRIVE CORNER ASSEMBLY



Ref. No.	Part No.	Description
1	1023250	Motor Mount
2	1023781	Motor Mount Frame
3	1023795	Bracket, Reducer Mounting
4	1023252	Bearing, 3-7/16" Bore
5	1023253	Bearing, 2-7/16" Bore
6	1023255	Sprocket, 81C 22t, 3-7/16" Bore
7	1023299	Seal, 1/2" Plastic
8	1023314	Inspection Hole Cover
9	1023780	Reducer, TA5215H15
10	1023783	Bushing Kit for Reducer
11	1023784	Shaft, Corner Drive

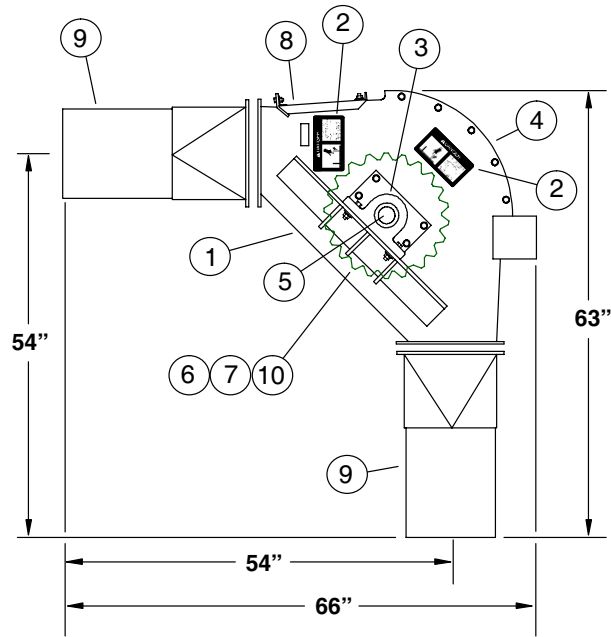
Ref. No.	Part No.	Description
12	1023793	Drive Corner Weldment
13	1023782	Belt Guard
14	40130	Drive Belt, B-88 (4 req'd.)
15	3091A1	Sheave QD 4B 12.4" PD
16	3192A1	Bushing QD SK 1.625" Bore
17	3273A1	Sheave QD 4B 8.6" PD
18	3281A1	Bushing QD SK 2.125" Bore
19	1017144	Key, 7/8" x 5" square cut
20	1012872	Safety Sign, Danger
21	1002301	Safety Sign, Caution
22	1023291	Adapter, square-to-round

# PARTS LIST

## COMPONENT DIMENSIONAL INFORMATION and PARTS LIST

### STANDARD CORNER

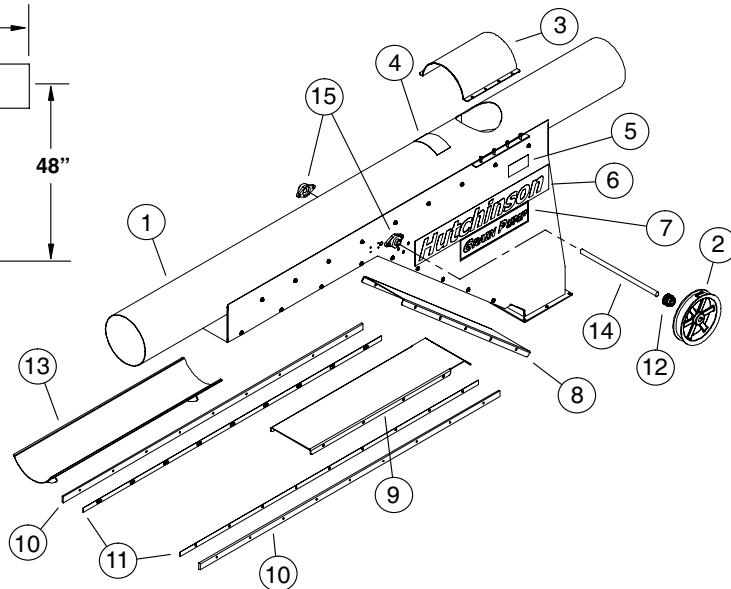
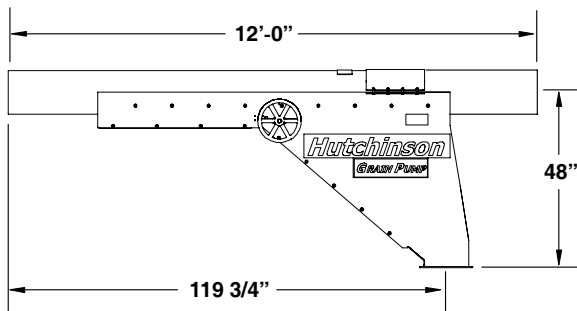
Ref. No.	Part No.	Description
1	1023352	Corner Weldment
2	1012872	Safety Sign, Danger
3	1023254	Bearing, 2-7/16" Bore
4	1023314	Inspection Cover
5	1023357	Corner Shaft
6	1023255	Sprocket, 81C 22T, 3-7/16" Bore
7	1017144	Key, 7/8" x 5" long, square cut
8	1023355	Hinged Access Door
9	1023291	Adapter, square-to-round
10	1023299	Seal, 1/2" plastic



### 90° DISCHARGE WITH GATE

Ref. No.	Part No.	Description
1	1033302	Drop Discharge Complete
2	1034255	Control Wheel, f/ spout
3	1023340	Inspection Cover
4	1012872	Warning Label, Cover
5	1012785	Instructional Sign, Chain Travel
6	1001127	Label, Hutchinson
7	34349	Label, Grain Pump
8	1033324	Access Panel

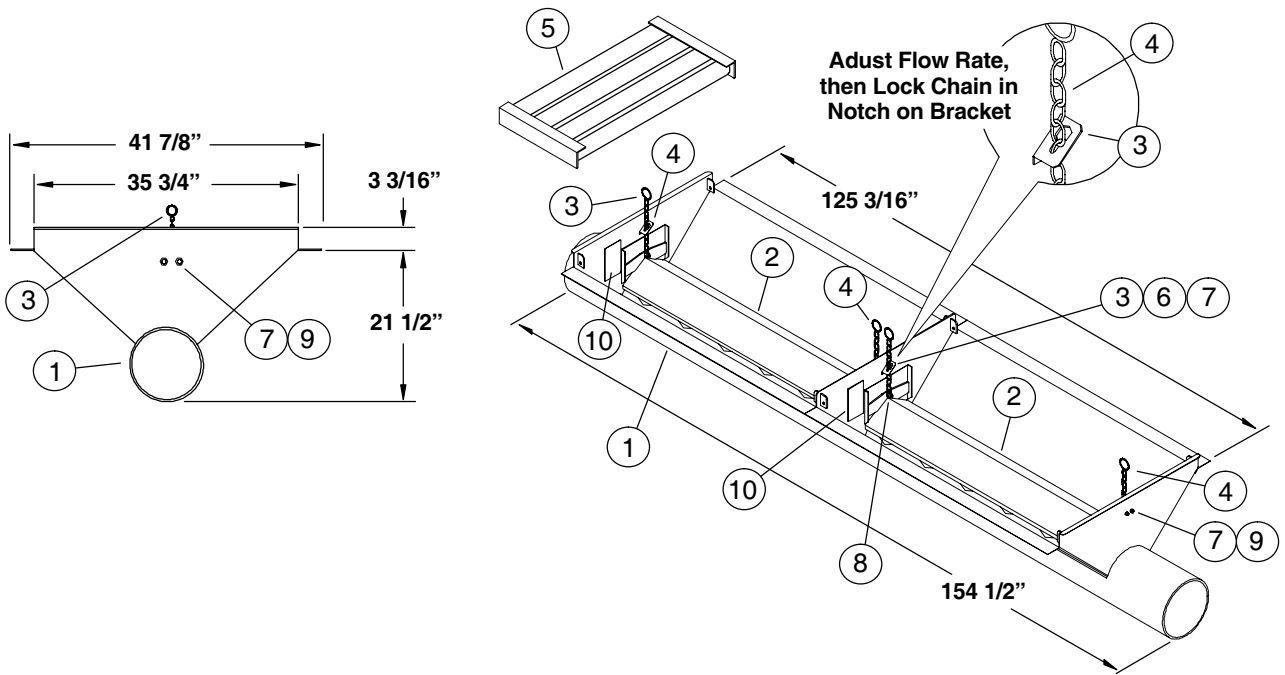
Ref. No.	Part No.	Description
9	1038960	Upper Access Panel
10	1038948	Rail f/ Gate, UHMW
11	1038954	Shim f/ Gate Rail
12	1023294	Pinion Gear
13	1033288	Slide Gate
14	1038990	Shaft
15	6818D	Bearing



## COMPONENT DIMENSIONAL INFORMATION and PARTS LIST

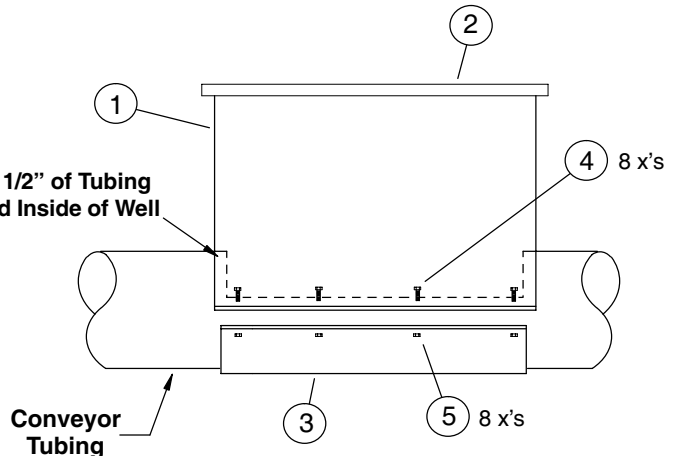
### INLET DUMP HOPPER (DRIVE OVER)

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	1023791	Hopper Weldment	7	33135	Nut, 5/16"-18 Nylon Lock, plt.
2	1023384	Flow Control Gate	8	33136	Nut, 3/8"-16 Nylon Lock, plt.
3	1012669	Chain Bracket	9	4701-1	Bolt, 5/16"-18 x 3/4" (Gr. 5 plt.)
4	1012466	Chain, Control Gate	10	1002310	Decal, Danger: Do Not Operate Without Cover In Place
5	6064L1	Grate, Hopper Drive Over			
6	33046	Bolt, 5/16"-18 x 1" (Gr 5, plt.)			



### INLET HOPPER

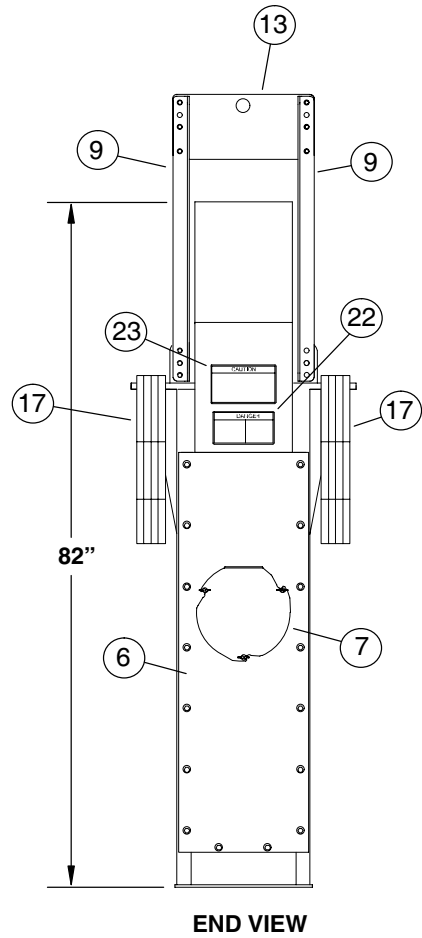
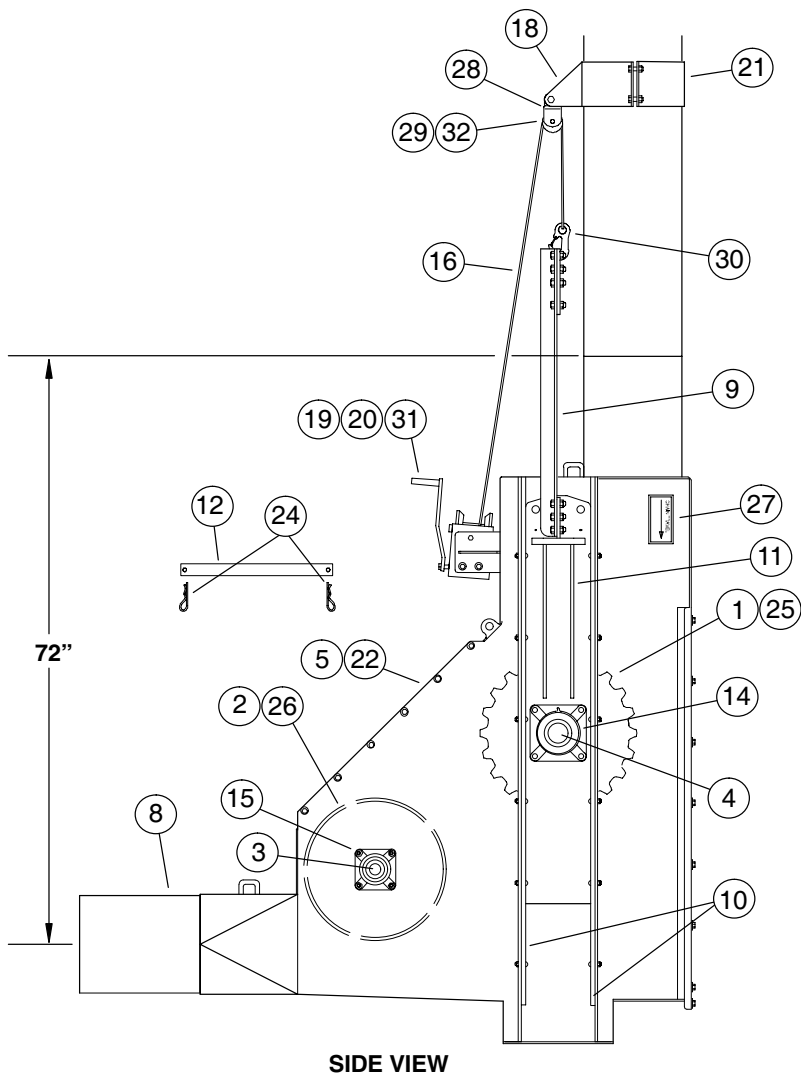
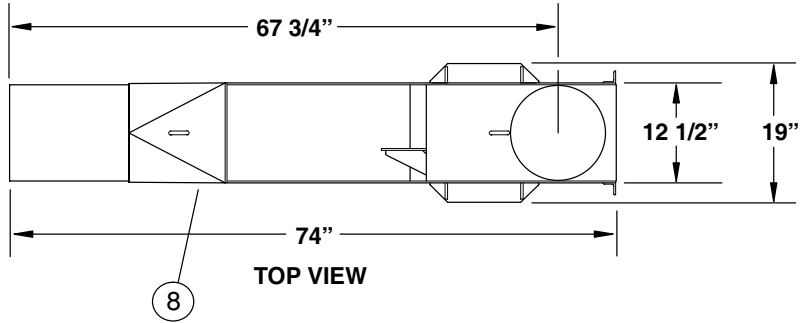
Ref. No.	Part No.	Description
1	60046A1	Hopper Weldment
2	2225A	Hopper Cover
3	2242C	Back Band, 12" x 18" long
4	4736	Bolt, 5/16"-18 x 1-1/2" (Gr. 5 plt.)
5	33151	Nut 5/16"-18, plt.



# PARTS LIST

## COMPONENT DIMENSIONAL INFORMATION and PARTS LIST

### 12" INSPECTION CORNER ASSEMBLY



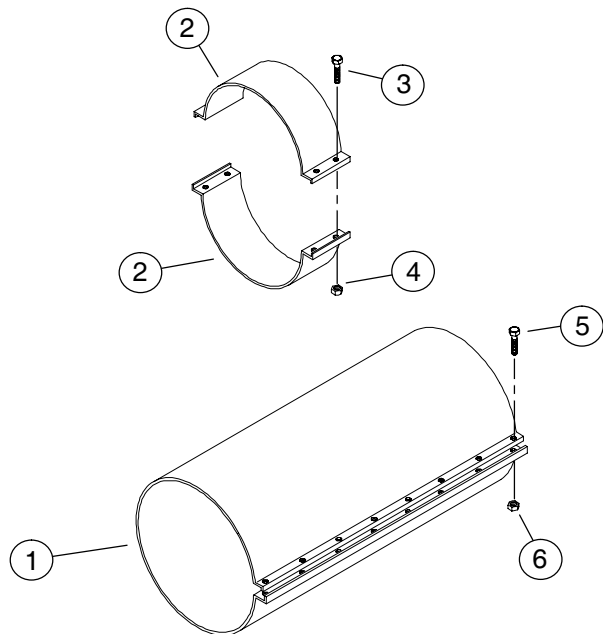
## COMPONENT DIMENSIONAL INFORMATION and PARTS LIST

### 12" INSPECTION CORNER ASSEMBLY

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	1023255	Sprocket, 81C 22T, 3-7/16" Bore	17	1022554	Weights, 50 lbs. each
2	1023296	Traction Wheel	18	1025284	Pulley Bracket Weldment
3	1023389	Shaft, Idler Sprocket	19	3335A1	Winch Assembly, K1550
4	1023390	Shaft, Inspection Corner	20	41595	Winch Handle, K1550
5	1023391	Top Cover, Inspection Corner	21	5931A1	Half Band, 12" x 4" wide
6	1023392	Inspection Door (rear)	22	1012872	Safety Sign, Danger
7	1023397	Peek Hole Cover	23	1002301	Safety Sign, Caution
8	1026142	Inspection Corner w/ATU	24	635164	Hair Pin, .094" dia. x 2" long
9	1026144	Side Lift Angle, for 12" ATU	25	1017144	Key, 7/8" x 5" long, square cut
10	1026147	Slide Guide Strap	26	4021L1	Key, 1/2" x 2-3/4" long, square cut
11	1026148	Slide Weldment	27	1012785	Decal, Chain Travel
12	1026150	Block Out Bar	28	1007890	Cable Pulley Side
13	1026151	Lifting Plate, for 12" ATU	29	1008195	Cable Pulley, 1/4" x 3" O.D.
14	3090L1	Bearing, 4-hole flange, 2-7/16" Bore	30	106411	Hook with Safety Clip
15	1010A	Bearing, 4-hole flange, 1-1/2" Bore	31	41600	Keeper Kit for Winch
16	1011852	Cable, .250" dia. x 10'-0" long	32	50079A1	Bushing, 1" O.D. x 5/8" long

### CONNECTING BANDS & HALF BANDS

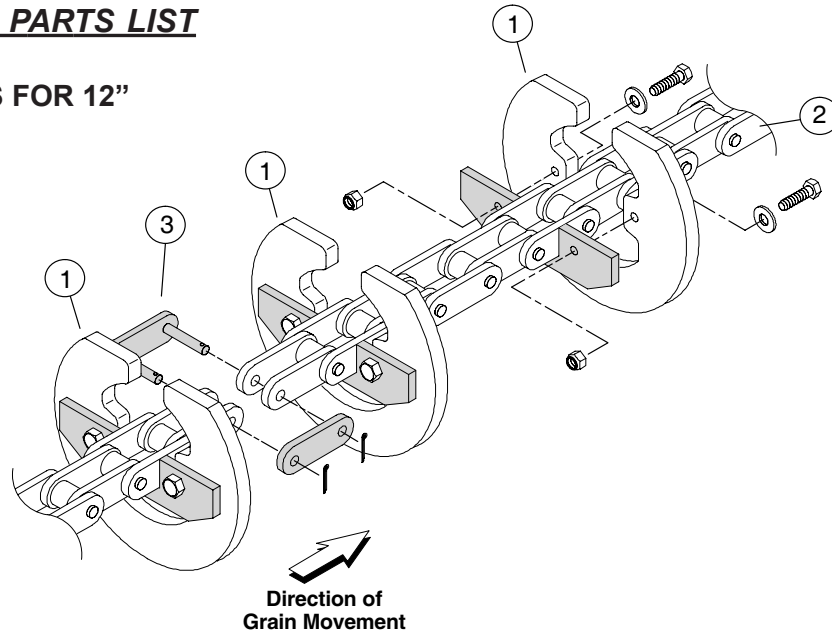
Ref. No.	Part No.	Description
1	1224D	Connecting Band, 12" x 30" long
2	5270A1	Half Band, 4" Wide
3	4736	Bolt, 5-16"-18 x 1-1/2" (Gr. 5, plt.)
4	33151	Nut, 5/16"-18 Non-lock, plt.
5	33310	Bolt, 3/8"-16 x 1-1/2" (Gr. 5, plt.)
6	D1149	Nut, 3/8"-16 Non-lock, plt.



# PARTS LIST

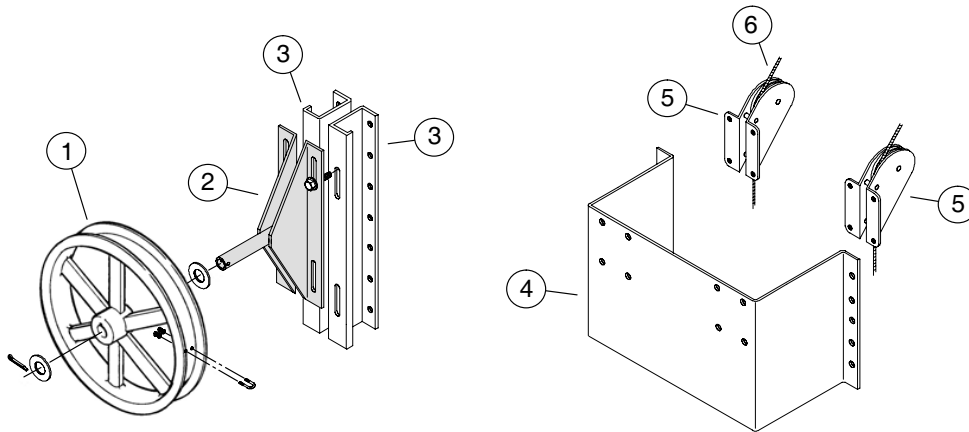
## COMPONENT DIMENSIONAL INFORMATION and PARTS LIST

### CHAIN and PADDLES FOR 12"



Ref. No.	Part No.	Description
1	1023056	Conveyor Paddle
2	1038008	Conveyor Chain 81XHH, Roll 10' - 2 7/32" long (48 pitches) (Includes 12 mounting bracket f/paddles)
3	1017077	Chain Connecting Link
--	1034495	Chain Offset Link (Not Shown)

**NOTE:** Paddles connect to chain using two (2) 5/16" x 1-1/2" bolts (Part No. 4736), two (2) 5/16" lock nuts (Part No. 33135) and two (2) 5/16" flat washers (Part No. 33033).



### GROUND CONTROL WHEEL KIT

Complete Kit, Part No. 1025844

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	1034255	Control Wheel, 2 9/16" wide	4	1011742	Upper Wall Bracket
2	1011745	Wheel Support Bracket	5	1006876	Pulley, Hot House, 2 1/2"
3	1011743	Binwall Mount Plate	6	1025845	Cable, 3/16" dia. x 150'





## ***Hutchinson/Mayrath***

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