16" GRAIN PUMP

OWNER'S & OPERATOR'S MANUAL

Effective August 9, 2001

Publication No. 1017543

THIS MANUAL IS FOR AUGERS WITH SERIAL NUMBERS OF 901310 OR HIGHER.

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Hutchinson/Mayrath
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1) Improper assembly, including failure to properly install all safety equipment.
2) Improper installation (power & wiring included).
3) Unauthorized alterations 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, non-abrasive and dry materials, as intended.
8) Damaged through abusive use or accident.

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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 that 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 and be alert to the possibility of personal injury or death.

BE ALERT! YOUR SAFETY IS INVOLVED.

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.

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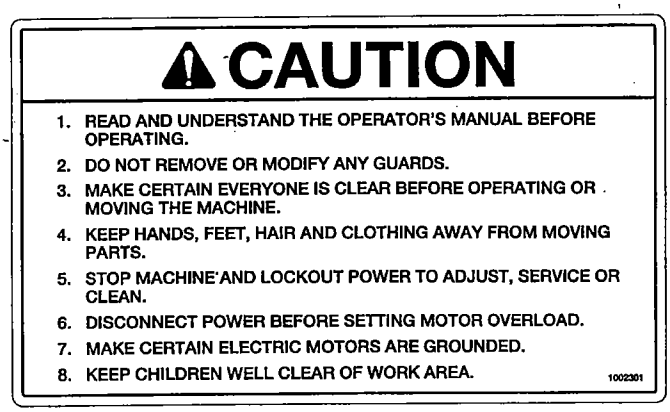
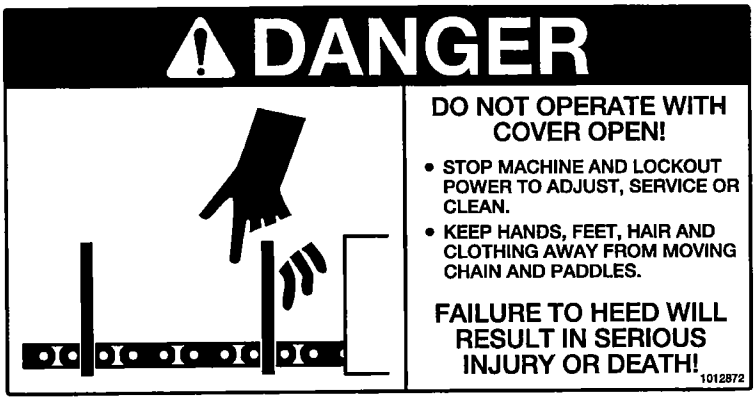
SAFETY DECALS

Check components as specified below to insure that safety decals are present and in good condition. If a decal cannot be easily read for any reason or has been painted over, replace it immediately. Decals may be ordered through your Hutchinson Dealer.



"CAUTION" DECAL NO. 1002301
One located on take-up corner.
One located on drive corner.



"DANGER" DECAL NO. 1012872
Two located on take-up corner.
Two located on 90° corner.
One located on drive corner.

OPERATOR QUALIFICATIONS

Operation of this Grain Pump Conveyor shall be limited to competent and experienced persons. In addition, anyone who will operate or work around a Grain Pump 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 Grain Pump Conveyors. 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 operaiton 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 recordkeeping.

DATE	EMPLOYER SIGNATURE	EMPLOYEE SIGNATURE

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. See page 18.
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 from your Hutchinson Dealer or ordered from the factory.
7. Check that the belt guard is installed and the door latch closed.

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.

RULES FOR SAFE WORK AREA

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.

OPERATING PROCEDURES

START-UP AND BREAK-IN OPERATIONS

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.

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 Conveyor under load, especially before the housing becomes well polished, as this may cause the unit to stall.

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

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 Work Area and check that all personnel are out of Hazard Areas before adding power.

OPERATING PROCEDURES

FULL LOAD OPERATING PROCEDURES

A. Operation of the Grain Pump 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. It is possible to use more than one inlet component at the same time, such as when blending is desired or simply during the break-in period, the operator should watch for any unusual vibrations or noise.

B. Start the conveyor and allow it to come up to operating speed before introducing any grain.

C. Open an outlet gate so grain can drop out of the conveyor at the desired location before allowing any grain to enter the conveyor.

D. Gradually open an inlet component or the truck gate and allow grain to flow into the pump. Bring the pump up to maximum operating capacity gradually. Make small increases in flow by opening the gates small amounts. Remember, it may take over a minute for grain to reach the outlet from the inlet point, so do not make flow increases at a greater frequency. Observe the motor loading meters and do not exceed maximum levels.

E. Never stop the Grain Pump until after flow into the conveyor has been shut off and the pump has been allowed to clean out. It may require a minute or more for clean out after flow into the pump has been stopped. Do not start or stop the Grain Pump Conveyor under load, as this may cause the unit to stall. High stresses at individual paddles result when attempting to start under load and damage to paddles and/or chain can result.

F. Avoid overloads and resulting plugging of the pump. The following situations or events can lead to a plug and conveyor stall:

1. Failure to open an outlet gate. This results in the pump filling throughout it's length and then additionally filling as grain returns to the inlet point. This overloading will eventually stall the pump. Close attention to the load meters by the operator at start-up could alert the operator to close the inlet until the problem is identified.

2. Excessive flow of grain into the pump at an inlet. The pump will likely tolerate an overflow into the pump for a short period. An overload and stall from this overfilling will probably not occur until this load reaches the vertical portion of the pump. The vertical requires much more horsepower per foot than the horizontal sections.

3. The excessive flow of grain into the pump may be from another conveyor. Make certain the delivering conveyor will not bring more grain than the pump will handle. The delivering conveyor may be another pump of the same size and speed. This can result in an overload situation from the receiving pump when the delivering pump is carrying grain a shorter distance. Maximum horsepower on the short pump will likely carry more grain than maximum horsepower on the long pump.

4. Be particularly careful of overload when multiple inlets are used. This could be a desired blending situation with grain from more than one bin or when multiple intermediate wells are opened.

G. General operation

1. It should be possible to establish maximum inlet openings for a commodity after there is experience operating with that commodity. However, when conveying distances change, an adjustment in gate opening is expected.

2. With electrically operated gates, the operator can monitor the pump and make flow adjustments. The controls for inlets must be of a type that is proportional where opening amounts can be selected. With manually operated gates, an additional person to operate the gates may be necessary, while in contact with the operator. Grain is discharged from the conveyor through outlets with moveable gates for opening and closing the outlets. Optional ground controls are available for operating the gates.

3. Overhead outlets should either be fully closed or fully open. It is a good practice to open the overhead outlet to a bin when grain is being taken from that bin through a bin well, particularly when loading trucks. Quick cut-off of flow to the truck may be necessary. To accomplish this, simply close the overhead outlet to the truck. The grain will carry back to the bin and drop out. This avoids shut-down of the pump under load. When this kind of operation is expected, make sure load levels are low enough so there is horsepower available to carry grain this additional distance.

4. Motor starting systems of the "soft start" type are recommended. This reduces the shock loads of a more conventional starter and allows the mass of chain, sprockets and paddles to come up to speed more gradually.

SHUTDOWN

NORMAL SHUTDOWN

1. Close flow controls in bin wells and allow the conveyor to empty before stopping the unit.
2. Before the operator leaves the work area, the power source shall be locked out.

EMERGENCY SHUTDOWN

1. Should the machine need to be immediately shut down under full load, disconnect and lock out the power source. Clear as much grain from the hopper and conveyor as possible.
2. Never attempt to restart when full. Starting the unit under full load may result in damage. Such damage is considered abuse of the equipment.

Whenever you must service or adjust the equipment, make sure you stop the motor and lock out your power source!

ELECTRIC MOTOR DRIVE INFORMATION

Always use a motor with required H.P. as calculated on page 9. Use a motor that operates at 1750 RPM.

1. 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.
2. 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.
3. Disconnect power before resetting motor overloads.
4. An ampmeter installed on the motor will allow the operator to monitor the load and thus prevent overloading.
5. Reset and motor starting controls must be located so that the operator has full view of the entire operation.
6. Make certain electric motors are grounded.
7. Shut off power to adjust, service or clean.
8. Keep all guards and shields in place.

Install with an ampmeter on motor or motors so that the load can always be monitored to prevent overloading.

Disconnect power before resetting motor overloads
Make certain electric motors are grounded.

LOCKOUT

If the operator must leave the work area, or whenever servicing or adjusting, the conveyor must be stopped and the power source turned off. Precaution should be made to prevent anyone from operating the conveyor when the operator is absent from the work area.

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

LUBRICATION & MAINTENANCE

For economical and efficient operation of your Grain Pump, 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.

Keep all safety shields and devices in place.
Never clean, adjust or lubricate a machine that is in operation.

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

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 SAE multipurpose type grease. Inspect bearings closely for wear and/or seal damage. Check that the bearings and lock collars or set collars are firmly fastened.

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 the grain flow to the unit and shut down after the unit has emptied. 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. See Fig. A on page 18. Proper chain tension should allow only minimum rotation of the paddle, approximately 10°. 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.

Use extreme caution; keep away from moving chain and paddles.

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 REDUCERS

IMPORTANT: Because 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 inhibiting (R & D) gear oil. Follow the instructions on the reducer name plate, warning tags, and in the installation manual.

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 to its proper level with new lubricant. **CAUTION: TOO MUCH OIL WILL CAUSE OVERHEATING AND TOO LITTLE 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.

LUBRICATION & MAINTENANCE

DRIVE BELTS

The drive belt tension should be checked regularly. To tighten belts, turn the 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.

Replace damaged or worn belts.

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. See page 18.
- (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 19.

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. See page 19.
- (C) Obstruction at intake.
- (D) There is grain returning to the intake. See Step 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.

6. Unit stalled or plugged
- (A) A stall, plug, or stop under load may occur in spite of the operator's best efforts. A power failure, bin overfill, mechanical or electrical breakdown, or operator error could be the cause.
  1. Shut down the pump immediately and lock out the power. Close the inlet(s) where grain was flowing into the pump.
  2. Determine the cause by a visual inspection if you can.
  3. If the stall is due to a grain overoad, remove the corner inspection door at the bottom of the vertical conveying up. Considerable grain will likely flow out. Remove the grain away from the pump corner. Allow all the grain that will flow out to do so.
  4. Leave the corner inspection door off. With everyone clear of the pump, attempt restart. If the pump starts. More grain willl push out of the door opening. If it does not start, lock out power and look for other causes. With the pump running, continue to operate until motor loads have reduced before shutting down. Once again, lock out the power before replacing the inspection door.
- (B) Effects of a Stall of Plug
  When the overload and stall is due to excessive grain amounts in the pump, the stall will usualy occur when those excess amounts enter the vertical part if the pump. As the pump approaches stall, the paddles at the lower corner of the vertical experience higher than normal loads due to the extra grain in that area and above. Once stoped, grain higher in the vertical flows down through the paddle openings forming a solid pack of grain extending up to 80% of the vertical height. Restart in this condition is virtually impossible. Restart attempted after only a portion of the vertical grain is drained away or when the lower corner inspection door has been closed will cause high paddle loads that should be avoided.

NOTE: A Grain Pump Loop must have an operator who is responsible for the operation of the conveyor. It is this person's responsibility to see the Grain Pump is operated properly.

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, two or three gear reducer drives, each to be driven by an electric motor. Drives are always located at upper corners, in two drive pumps with the third drive located at the lower corner with grain moving upward.

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 drives. The Grain Pump 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

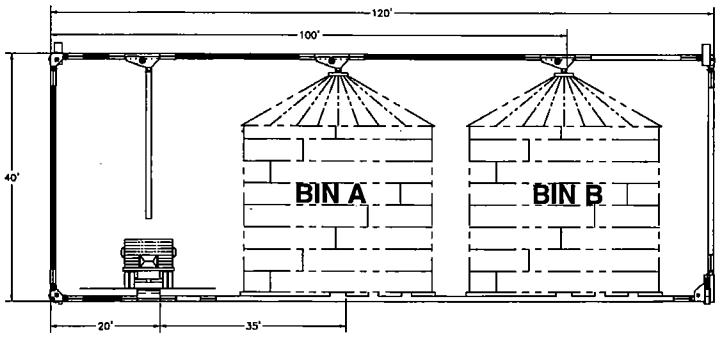
	Horsepower Factor	
Pump Diameter	Vertical (per foot)	Horizontal (per foot)
16"	1.35	.30

Step 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 to determine the vertical horsepower requirement.

Step 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 to determine the horizontal horsepower requirement.

Step 3. Add the vertical and horizontal horsepower together to find the total system horsepower required.

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.



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

Vertical Horsepower Requirement	40' x HP Factor	= 54
Horizontal Horsepower Requirement	120' x HP Factor	= 36
Total Horsepower Vertical + Horizontal		
Electric Motor Horsepower Required		= 90

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.

	35' x HP Factor	= 10.5
Total Horsepower Vertical + Horizontal		= 100.5
Electric Motor Horsepower Required	Round to	= 100

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.

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.
- The location of the operator's workstation is usually the truck dump area. Controls for starting and stopping the pump, as well as ammeters that indicate the driver motor loading levels must be located there. It may be necessary to establish a second workstation location where an expanded control panel is located. This will likely be necessary when there are electrically operated inlet and outlet gates on the pump.
- 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, 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

- 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 11 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.

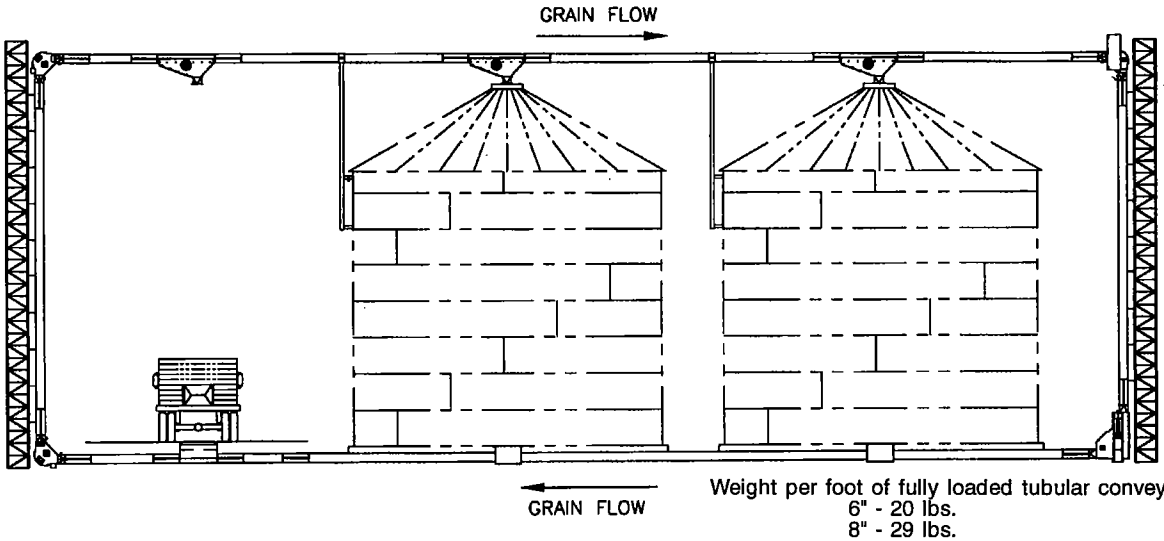
GRAIN FLOW AND DRIVE CORNER LOCATION

Grain Pump Loop Systems will include one, two or three drive corners. The drive corner, on systems with one, 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. On systems with three drive corners, locate them at the two overhead positions and one lower position toward which the lower chain will travel.

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, two or no 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.



Weight per foot of fully loaded tubular conveyor:
6" - 20 lbs.
8" - 29 lbs.
10" - 40 lbs.
16" - 105 lbs.

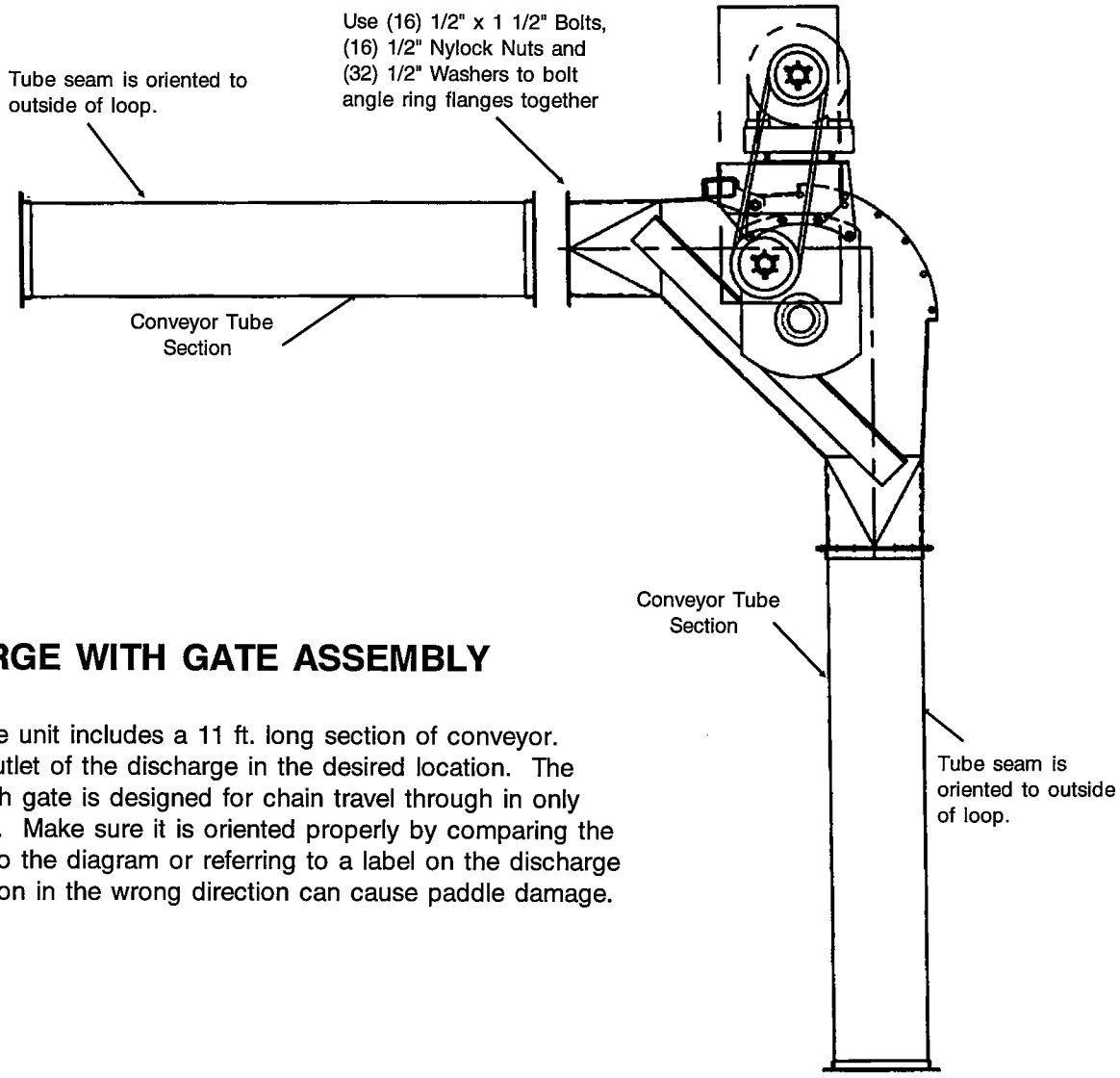
SYSTEM SUPPORT INFORMATION

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 fully loaded tubular conveyor. The individual corners and other components, particularly the ones with drives 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

INSTALLATION

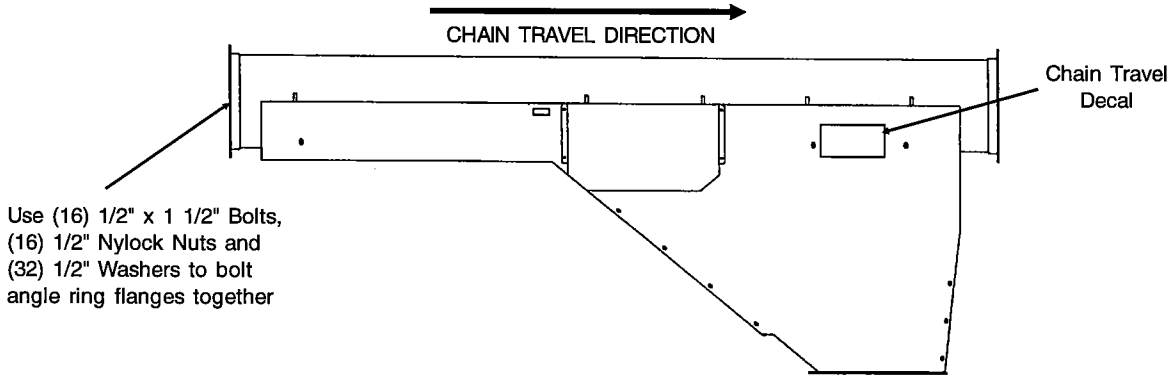
TUBE AND CORNER ASSEMBLY

Lay the sections out in order so as to determine what portions to assemble prior to actual placement in the system.



DISCHARGE WITH GATE ASSEMBLY

The discharge unit includes a 11 ft. long section of conveyor. Locate the outlet of the discharge in the desired location. 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.



INSTALLATION

BIN WELL ASSEMBLY

Locate the center bin well so the bin sweep mounting tube is in the exact center of the bin. See Fig. 4 on page 14. It will obviously be necessary for the conveyor tube passing under or through the bin to pass through the exact bin center for this to be accomplished. When one or more intermediate bin wells are to be used they may be placed on the tubular conveyor between the center well and the bin wall. Observe the minimum spacings shown in Fig. 4. Wells should be positioned on the conveyor tube so the gates open when control pipes are pulled.

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

NOTE: Do not cut tube openings when chain or paddles are inside the tube to avoid damage. Fasten bin wells to the conveyor tube using back bands and (12) 3/8" x 1 3/4" long bolts and nuts. Be sure the tops of all bin wells are level.

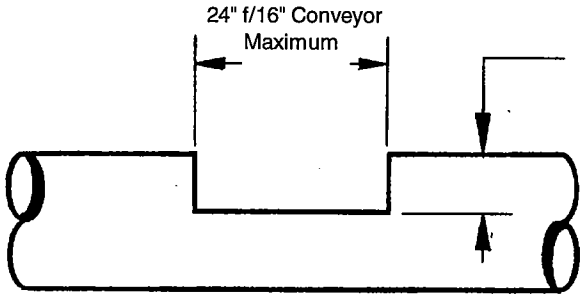


FIG. 1

Attach the intermediate bin well gate(s) to 2 3/8" O.D. control pipe. See diagram on page 16.

A. Shut the intermediate bin well gate(s).
B. Check length of control pipe by sliding it into place. Be sure there is at least 28" of control pipe extending past the back end of the last intermediate well, so when the gate is opened the end of the control pipe will not be drawn into the well. See diagram on Page 16.
C. Drill a 7/16" dia. hole through one side of the 2 3/8" O.D. control pipe. The bolt on the control gate clamp will fit into this hole. Determine the hole location by seeing where the bolt will hit the control pipe when it is dropped in place.
D. Fasten the control gate clamp to the control gate and control pipe. Secure in place by using two carriage bolts and nuts.

Attach the center well gate to center well control bar. See diagram on page 15.

A. Shut the center control gate.
B. Check length of control pipe by sliding it through the control pipe of intermediate well(s). When the control pipe is fastened to the control gate clamp, the center well control pipe should extend past the end of the intermediate well control pipe a minimum of 3". See Fig. 3.
D. Attach control gate clamp to control pipe by sliding 1/2 x 3" long HHCS through clamp and control bar.

Keep the amount of control pipe extending outside the bin short. This will permit opening the bin well gates without the control pipe striking another bin or structure. If you are using a factory control pipe kit, it may be necessary to shorten the center control pipe and redrill the holes depending on exact bin size.

Configure the control pipe ends as shown in Fig. 3 when all bin well gates are closed. The intermediate well(s) is opened by placing a bolt through the intermediate control end and the center control and then operating the center well control pipe. Intermediate wells should not be opened until the bin has emptied to where grain will no longer flow into the center well.

Check gate operation by separately pulling on the control pipes, control gates should slide freely.

CONTROL PIPE KIT ASSEMBLY

A control pipe kit may be ordered from the factory. Follow the specifications given if the control pipes are provided locally.

For the center well use 1 1/2 inch Sch. 40 pipe (about 1.9" O.D.). For the intermediate well(s) use 2 inch Sch. 40 pipe (about 2 3/8" O.D.). The control pipe for the center well will slide inside the control pipe for the intermediate well(s).

It will be necessary to support the bin well(s) and/or conveying tube from below with blocks or other material.

The extending flange at the top of the bin wells is intended to lay on top of the bin floor. Consult the manufacturer of the bin floor for direction on cutting openings in the floor for bin wells, for sealing around bin wells and for proper support of the floor around the bin wells and conveying tube.

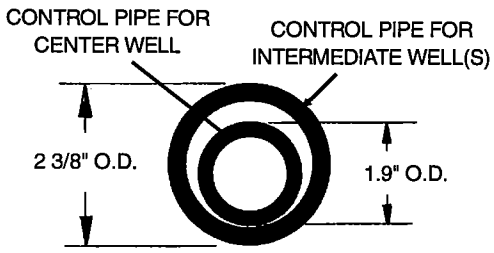


FIG. 2

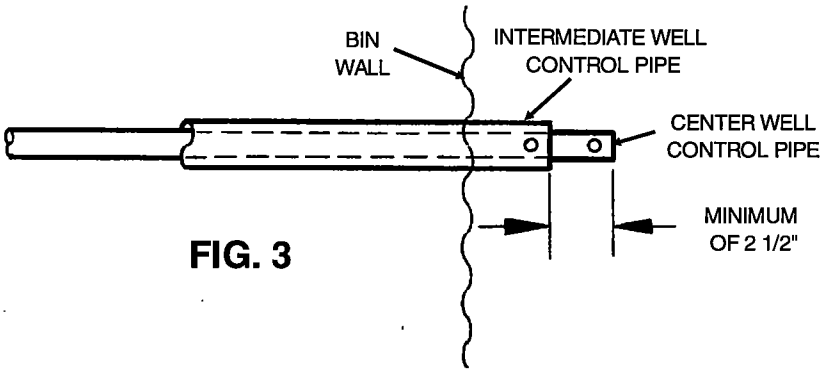


FIG. 3

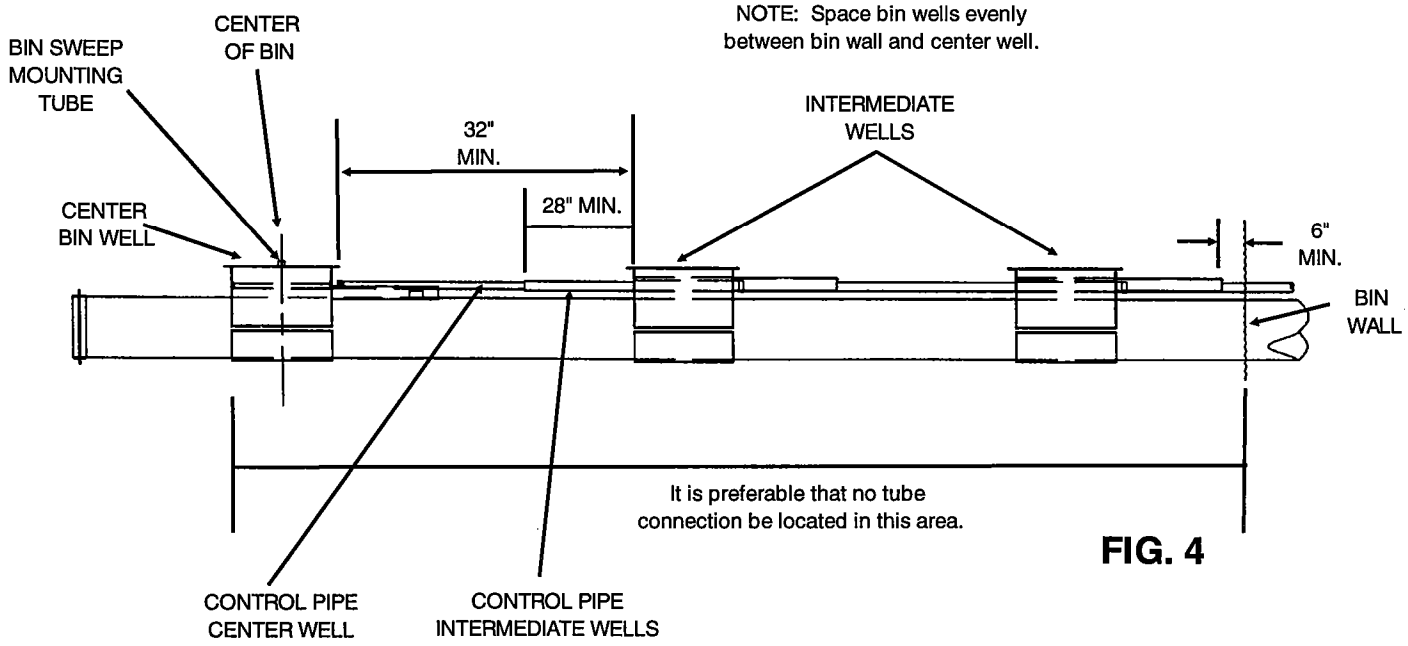
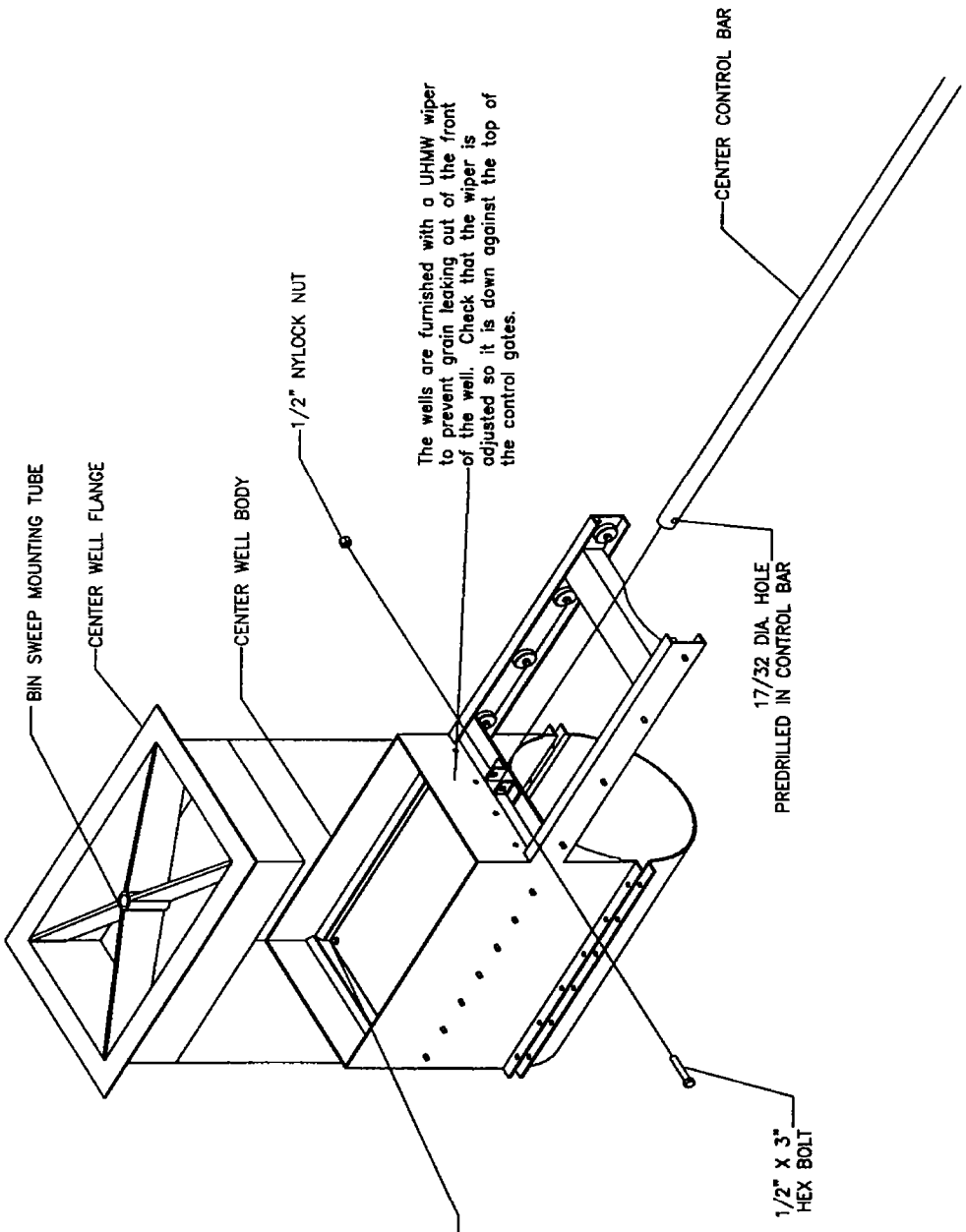
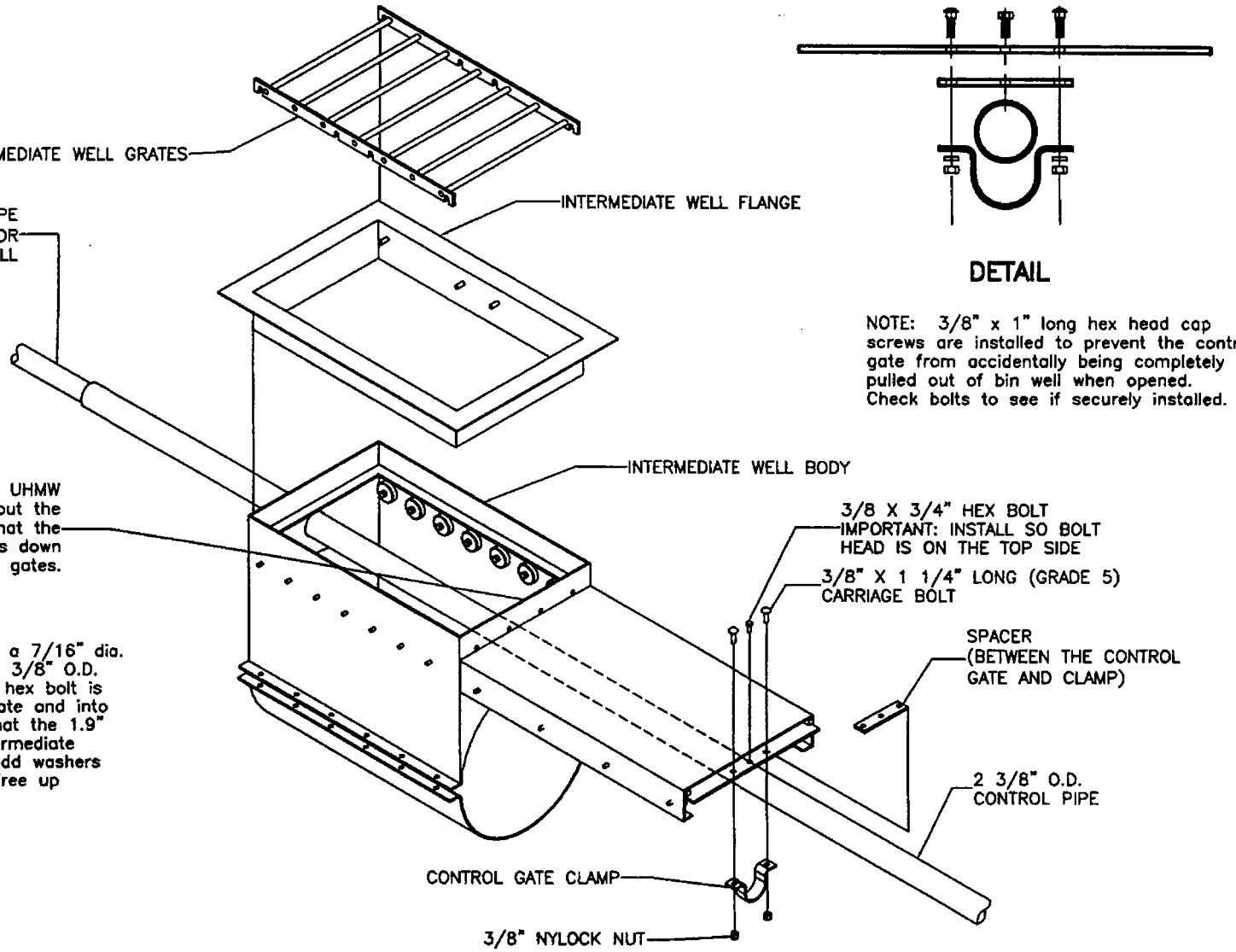


FIG. 4

BAND-ON CENTER
CONTROL GATE ASSEMBLY



BAND-ON INTERMEDIATE CONTROL GATE ASSEMBLY



DETAIL

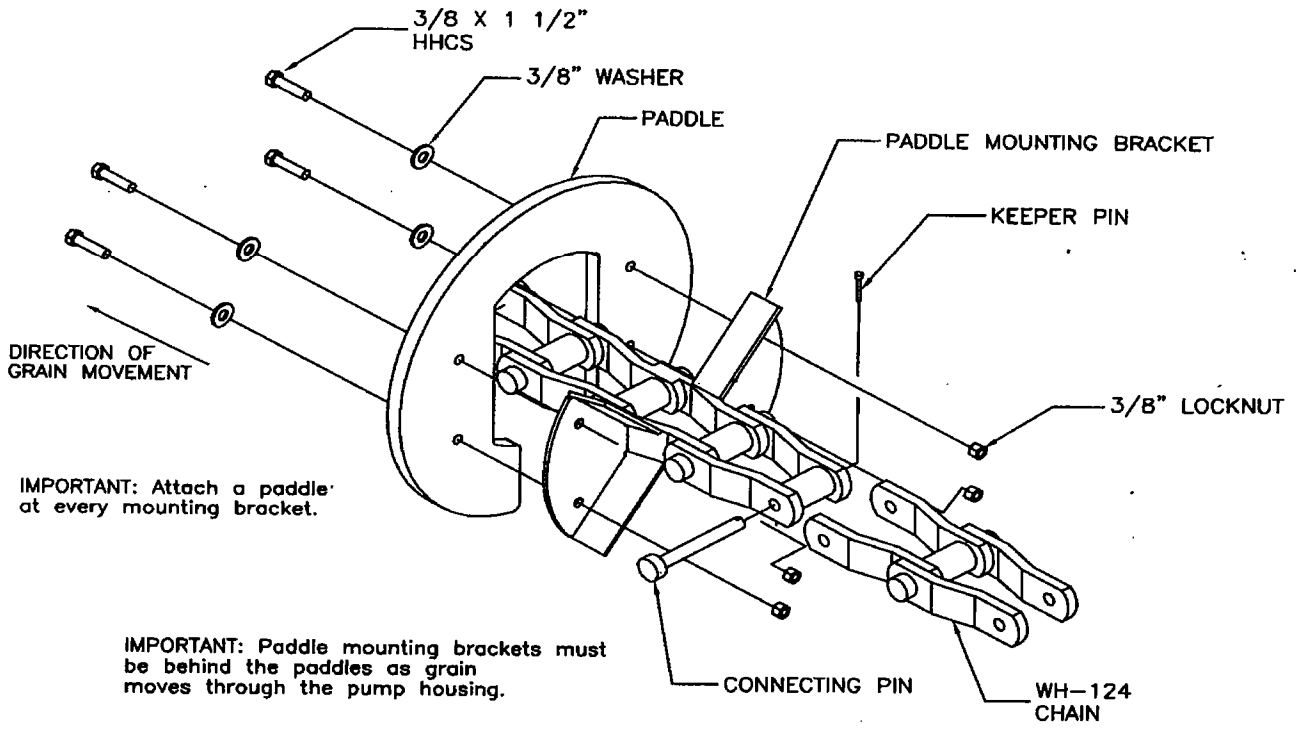
NOTE: 3/8" x 1" long hex head cap screws are installed to prevent the control gate from accidentally being completely pulled out of bin well when opened. Check bolts to see if securely installed.

The wells are furnished with a UHMW wiper to prevent grain leaking out the front of the well. Check that the UHMW wiper is adjusted so it is down against the top of the control gates.

IMPORTANT: Customer must drill a 7/16" dia. hole through one side of the 1 3/8" O.D. control pipe. The 3/8 x 3/4" hex bolt is threaded through the spacer plate and into this 7/16" dia. hole. Check that the 1.9" O.D. pipe slides freely past intermediate well gate connection. If not, add washers or grind bolt as necessary to free up center pipe.

CONVEYOR CHAIN AND PADDLE ASSEMBLY

The paddles may be bolted to the chain before installation of the chain into the system or after. There are access doors on each corner that can be utilized for paddle assembly. See the assembly diagram for correct paddle to chain assembly.



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

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 pull through between corners. Use inspection doors at discharge gates and openings into bin wells to observe the chain position along the length of conveyor.

After installing the chain through the tubular housing and around the corner sprockets connect the chain ends at the inspection corner. Make sure the inspection corner sprocket is adjusted all the way up. Join chain ends with a connecting link. Pull as much slack from the chain as possible before making the connection

Adjust the inspection corner sprocket down to increase conveyor chain tension. To adjust, loosen the jam nuts at the top connection of the adjusting screws and turn the screws so the bearing slide moves down. Turn the adjusting screws on each side in equal amounts so the shaft and sprocket will be square inside the inspection corner. Check by measuring the relative position of the bearing on each side to see they are the same.

CONVEYOR CHAIN AND PADDLE ASSEMBLY - CONT.

To check conveyor chain tension, open the inspection door, grasp one of the paddles and attempt to rotate it toward the chain. See Fig. A. Proper chain tension should allow only minimum rotation of the paddle, approximately 10°. If the chain is still too loose after adjusting the inspection corner sprocket full down, it may be necessary to remove one or more links from the chain. When adjustment of chain tension is complete, tighten the jam nuts at the top of the adjusting screws.

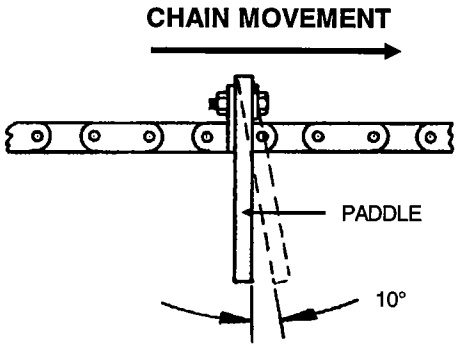
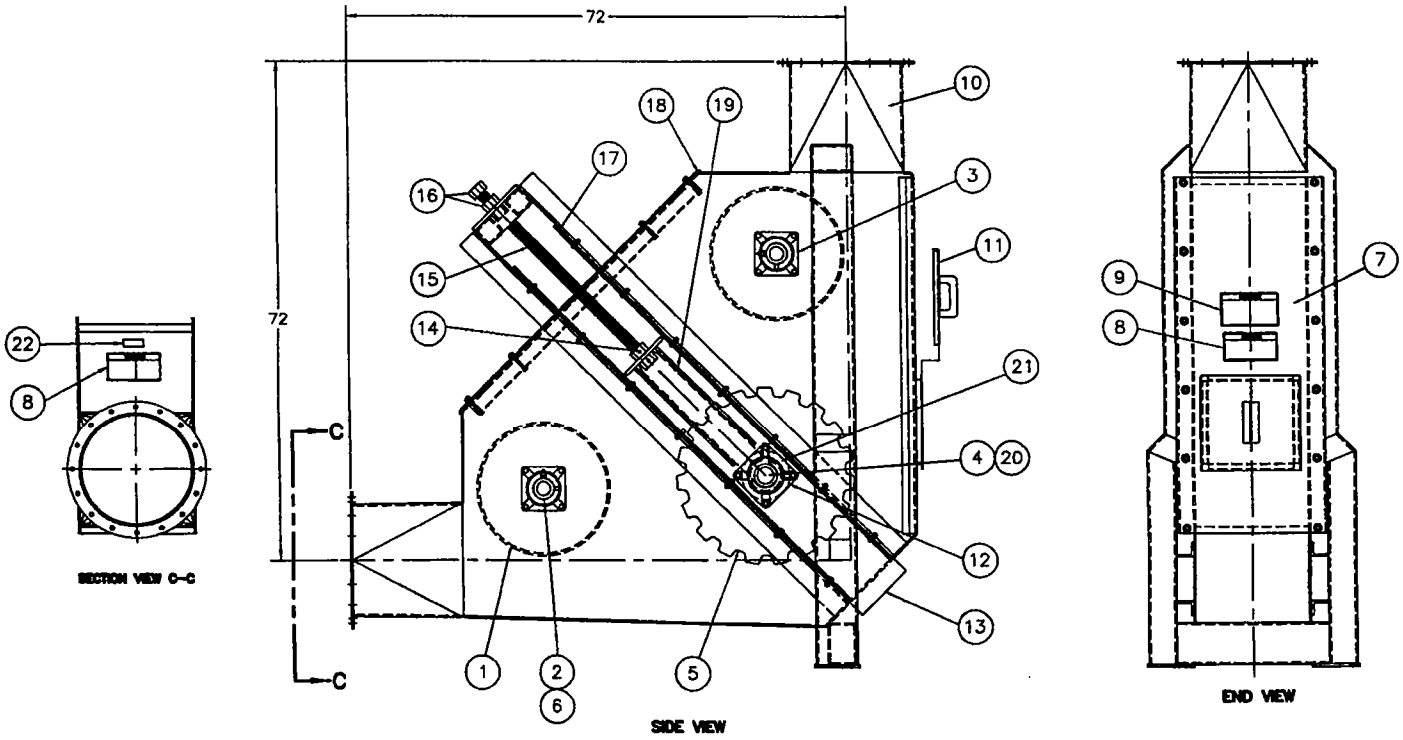


FIG. A

CAUTION: DO NOT OPERATE THE CONVEYOR WHEN THE INSPECTION OR ACCESS DOORS ARE OPEN.



DRIVE ASSEMBLY

The Grain Pump conveyor is powered by electric motor. Use 1750 RPM motor.

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 will 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.

IMPORTANT: Use the motor sheave furnished. If other size sheave is used or substituted, improper chain speed and unsatisfactory conveyor 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 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.

Check all fasteners to see that they are tight.
Close and latch belt guard.

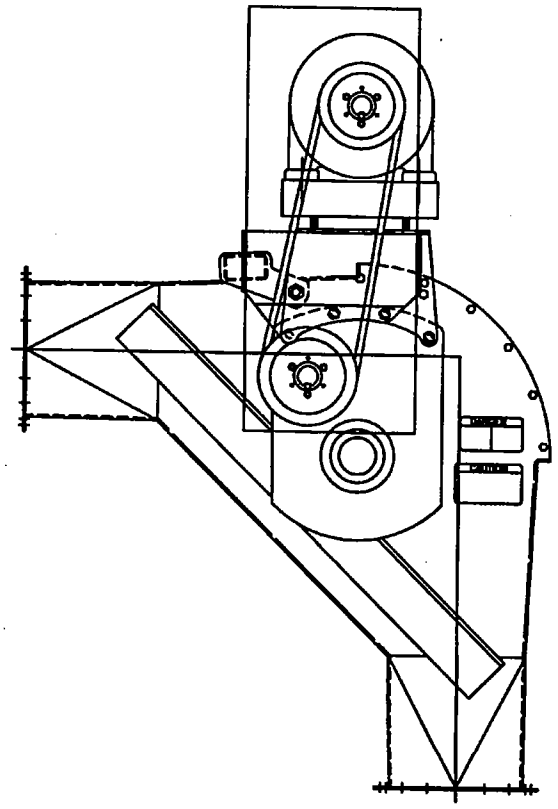
Keep all safety shields and devices in place.

DRIVE ASSEMBLY - CONT.

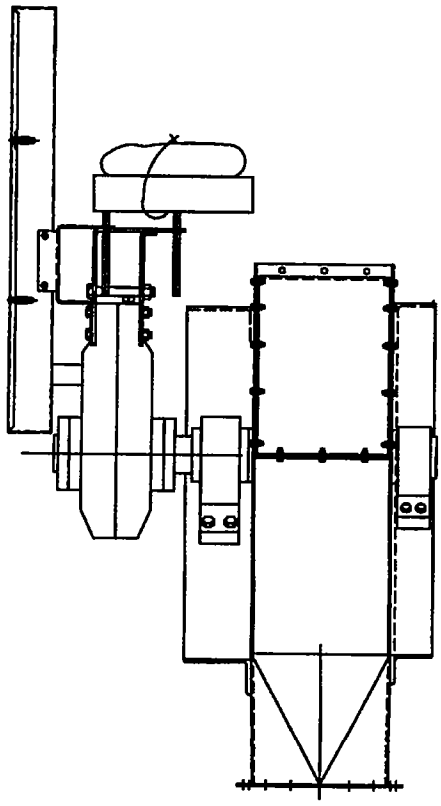
The gear reducer is shipped without oil. It is necessary to add the proper amount of oil before running. Use a high grade petroleum base, rust and oxidation inhibited R & O) gear oil. Follow the instructions on the reducer name plate, warning tags and in the installation manual attached to the reducer.

CAUTION: TOO MUCH OIL WILL CAUSE OVERHEATING AND TOO LITTLE WILL RESULT IN GEAR FAILURE, CHECK OIL LEVEL REGULARLY.

See also "Electric Motor Drive Information" and "Lockout" on page 6.



SIDE VIEW



END VIEW

Unit size	6"	8"	10"	16"
Recommended chain speed	325	325	325	400
Corner shaft RPM	124	93	93	63

Hutchinson/Mayrath

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