



Gravity Screener

Installation and Operation Manual

PNEG-2128

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PNEG-2128

All information, illustrations, photos and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

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1. Introduction

This manual covers the installation and operation for the Gravity Screener. This manual provides guidelines for installing the product. You must retain a qualified contractor to provide on-site expertise. Intersystems is not responsible for the installation of this product.

InterSystems reserves the right to improve its product whenever possible and practical to do so. We reserve the right to change, improve and modify products at any time without obligation to make changes, improvements and modifications on equipment sold previously.

General Safety Statements

1. The Gravity Screener is designed and manufactured with operator safety in mind. However, residual hazards remain due to the nature of material handling and specific material hazards. Use extreme caution at all times.
2. Modifications to equipment may cause extremely dangerous situations that could result in damage to the equipment as well as serious injury or death. Never modify the equipment.
3. InterSystems recommends that you contact the local power company to have a representative survey the installation to ensure wiring is compatible with their system and adequate power is supplied to the unit.

Replacement or Substitute Screens

The section identifies components likely to require replacement. Replacements for any other components, including the various urethane liner panels and structural members can be supplied upon request.

As indicated in table below, screens for all models of grain screeners can be furnished in any of three (3) standard mesh sizes to accommodate most grains. Other meshes and wire sizes are available as special order options.

Screener Screen Data

Screener Model #	Area (in square inch) *
PC-1500	1607
PC-3500	2717
PC-5500	4406
PC-8500	6615
PC-11500	9933
PC-16000	25101
PC-25000	29629
PC-40000	34466
* Active screen area, does not include edging	

Grain	Mesh Size	Wire Diameters
Corn	Mesh Size 3-1/2	0.063" Wire x 0.2277 Opening (3-1/2 Openings/Inch)
Soybean	Mesh Size 5	0.047" Wire x 0.1530 Opening (5 Openings/Inch)
Wheat	Mesh Size 7	0.041" Wire x 0.1019 Opening (7 Openings/Inch)
Consult InterSystem Engineering for materials not listed here.		

Parts orders or requests for technical assistance to your sales representative or to:

InterSystems

9575 No. 109th Ave.

Omaha, NE. 68142

Phone: (402) 330-1500

FAX: (402) 330-3350

Please have available the MODEL NUMBER, SERIAL NUMBER and CUSTOMER ORDER NUMBER of the equipment in question as well as the location where the truck probe is INSTALLED.

Safety Guidelines

Safety guidelines are general-to-specific safety rules that must be followed at all times. This manual is written to help you understand safe operating procedures and problems that can be encountered by the operator and other personnel when using this equipment. Save these safety guidelines for future reference.

As owner or operator, you are responsible for understanding the requirements, hazards, and precautions that exist and to inform others as required. Unqualified persons must stay out of the work area at all times.

Alterations must not be made to the equipment. Alterations can produce dangerous situations resulting in **SERIOUS INJURY** or **DEATH**.

This equipment must be installed in accordance with the current installation codes and applicable regulations, which must be carefully followed in all cases. Authorities having jurisdiction must be consulted before installations are made.

When necessary, you must consider the installation location relative to electrical, fuel and water utilities.

Personnel operating or working around equipment must read this manual. This manual must be delivered with equipment to its owner. Failure to read this manual and its safety instructions is a misuse of the equipment.

ST-0001-3

Cautionary Symbol Definitions

Cautionary symbols appear in this manual and on product decals. The symbols alert the user of potential safety hazards, prohibited activities and mandatory actions. To help you recognize this information, we use the symbols that are defined below.



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



This symbol indicates a potentially hazardous situation which, if not avoided, **can result in serious injury or death.**



This symbol indicates a potentially hazardous situation which, if not avoided, **can result in minor or moderate injury.**



This symbol is used to address practices not related to personal injury.



This symbol indicates a general hazard.



This symbol indicates a prohibited activity.



This symbol indicates a mandatory action.

ST-0005-2

Safety Cautions

Use Personal Protective Equipment

- Use appropriate personal protective equipment:

Eye Protection



Respiratory Protection



Foot Protection



Hearing Protection



Head Protection



Fall Protection



Hand Protection



- Wear clothing appropriate to the job.
- Remove all jewelry.
- Tie long hair up and back.

ST-0004-1

Follow Safety Instructions

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



ST-0002-1

Maintain Equipment and Work Area

- Understand service procedures before doing work. Keep area clean and dry.
- Never service equipment while it is operating. Keep hands, feet, and clothing away from moving parts.
- Keep your equipment in proper working condition. Replace worn or broken parts immediately.



ST-0003-1

Stay Clear of Hoisted Equipment

- Always use proper lifting or hoisting equipment when assembling or disassembling equipment.
- Do not walk or stand under hoisted equipment.
- Always use sturdy and stable supports when needed for installation. Not following these safety precautions creates the risk of falling equipment, which could crush personnel and cause serious injury or death.



ST-0047-1

Sharp Edge Hazard

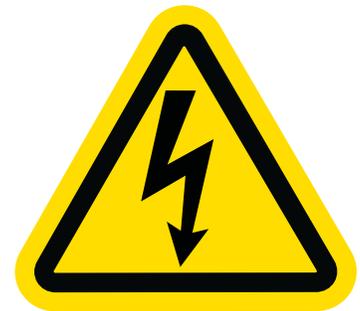
- This product has sharp edges, which can cause serious injury.
- To avoid injury, handle sharp edges with caution and always use proper protective clothing and equipment



ST-0036-2

Install and Operate Electrical Equipment Properly

- Electrical controls must be installed by a qualified electrician and must meet the standards set by applicable local codes (National Electrical Code for the US, Canadian Electric Code, or EN60204 along with applicable European Directives for Europe).
- Lock-out power source before making adjustments, cleaning, or maintaining equipment.
- Make sure all equipment is properly grounded.



ST-0027-4

Flying Material Hazard

- Flying material can cause severe eye injury or blindness.
- Wear safety glasses around operating equipment.



ST-0074-1

The safety decals on your equipment are safety indicators which must be carefully read and understood by all personnel involved in the installation, operation, service and maintenance of the equipment. To replace a damaged or missing decal, contact us to receive a free replacement.

InterSystems

9575 N. 109th Ave.
Omaha, Nebraska 68142
Toll Free: (800) 228-1483

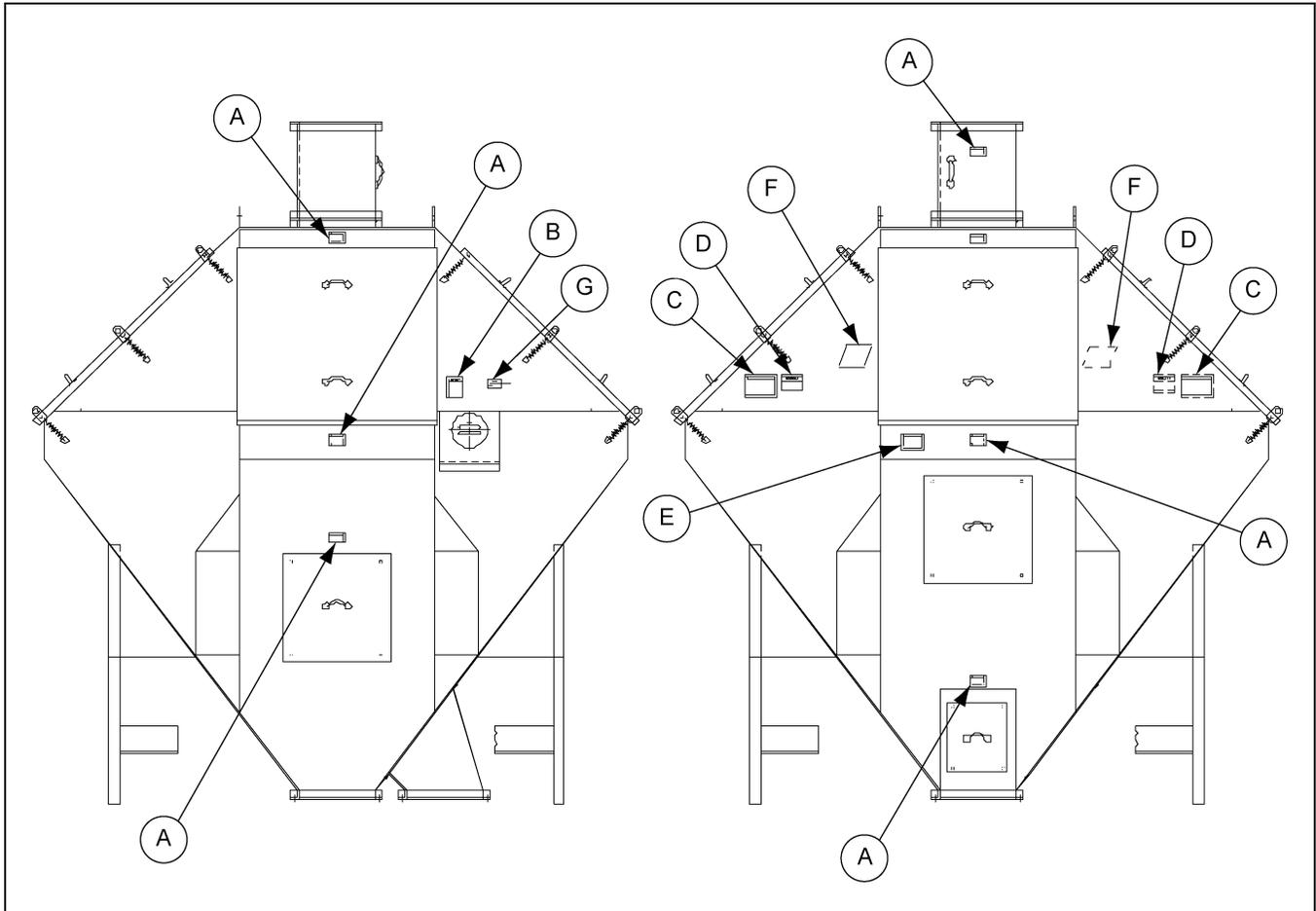


Figure 3A Safety Label Locations for Screener Models PC-1500 - PC-11500

NOTE: These signs must never be removed, tampered with, painted over or obscured in anyway. If labels are damaged or became unreadable, replacement labels are available from Intersystems.

3. Decals

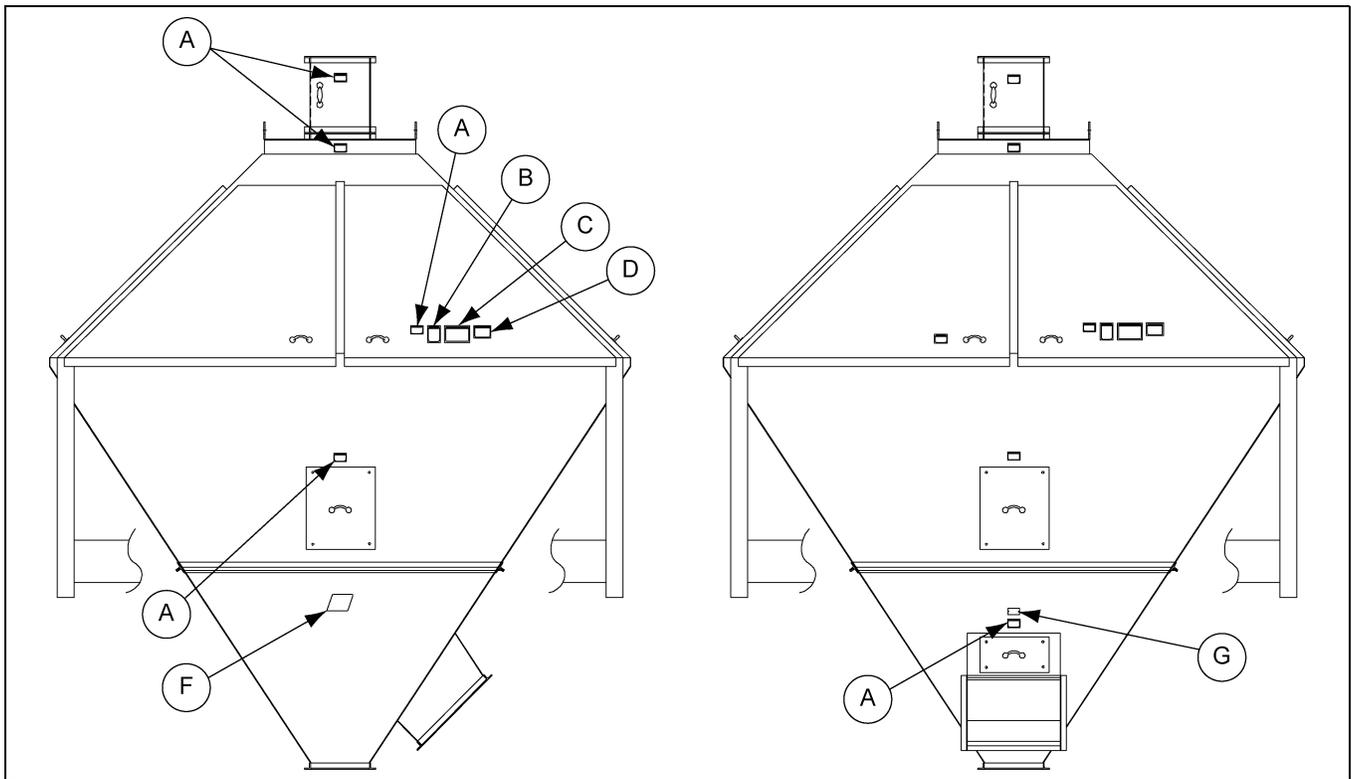
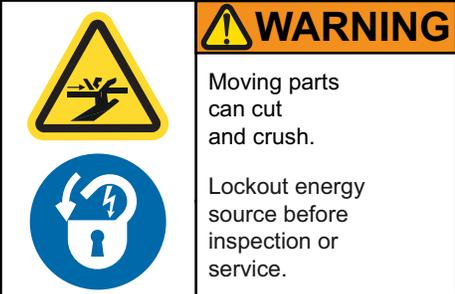


Figure 3B Safety Label Locations, Screener Models PC-16000 - PC-40000

Ref #	Decal #	Decals	Description
A	EMC 28 J3	 <p>© Clarion 15025 No. EMC 28 J3</p>	Eye Protection
B	EMC 402 34	 <p>© Clarion Clarionsafety.com 16089 Reorder No. EMC 402 34</p>	Lock Out Machine

Ref #	Decal #	Decals	Description
C	EMC 31 J3		Platform Collapse
D	IS 504X3		Platform Limits For I.S. Platform Only
E	EMC 30 J3		Moving Parts
F	IS 526X4		InterSystems Logo
G			InterSystems Serial Number Tag

4. General Information

Description

Intersystems Gravity Screeners are simple, efficient devices in which material flows over a sloped set of screens in order to separate smaller particles, such as dust, fines, broken and other foreign material from the stream. As shown in [Figure 4A on Page 15](#), material to be cleaned (screened) is admitted through the top of a screener and flows over upper and lower banks of screens where foreign material (F/M) is separated. Cleaned material (C/M) and F/M are discharged from the bottom of the screener through separate outlets.

The upper flow belts evenly distribute the material over the full width of all four (4) screening areas as well as reduce excess dust from entering these areas during full bypass. The lower screen flaps are used to reduce dust and other airborne material from entering the screen areas from below. The vertically adjustable diverter paddles can be easily raised or lowered to regulate the depth of material that flows over the screens on each of the four (4) sides of the screener. In screener Models PC-1500 through PC-11500, the diverter paddles are white UHMW (teflon). In screener Models PC-16000 through PC-40000, the diverter paddles are a combination of steel tabs and blue urethane.

An internal bypass gate allows continuous and infinitely variable control of the percentage of material which is to be cleaned and the percentage to be bypassed (without being cleaned) to achieve the required quality level.

[Figure 4A on Page 15](#) illustrates maximum cleaning possible with the bypass gate completely closed, while [Figure 4B on Page 16](#) shows full by-passing of the material. [Figure 4C on Page 17](#) illustrates infinitely variable or proportional cleaning by regulating the amount of by-passed material through the internal by-pass gate.

Screener Models PC-1500 through PC-11500, [Figure 3A on Page 11](#) are shipped completely assembled except for the inlet tube. Models PC-16000, PC-25000 and PC-40000, [Figure 3B on Page 12](#) are shipped in three (3) sections: the upper main body with shipping stand, the lower discharge outlet section and the inlet tube.

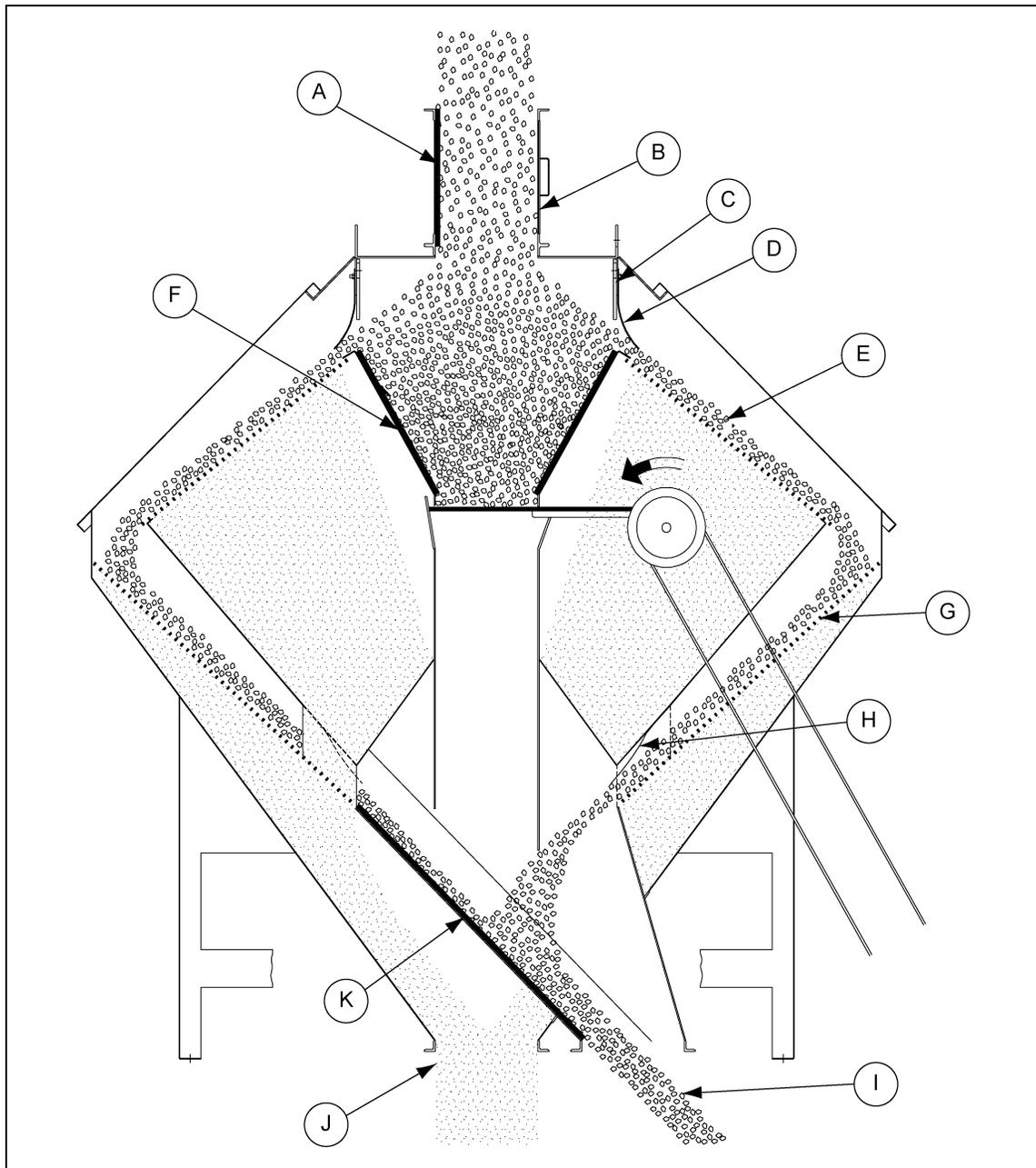


Figure 4A Cleaning Position

Ref #	Description
A	Inlet Liner Three (3) Sides
B	Inlet
C	Vertically Adjustable Diverter Paddle
D	Upper Flow Belts
E	Upper Screens
F	Valve Hopper Liner

Ref #	Description
G	Lower Screens
H	Lower Screen Flaps
I	C/M Discharge
J	F/M Discharge
K	Discharge Liner Three (3) Sides

4. General Information

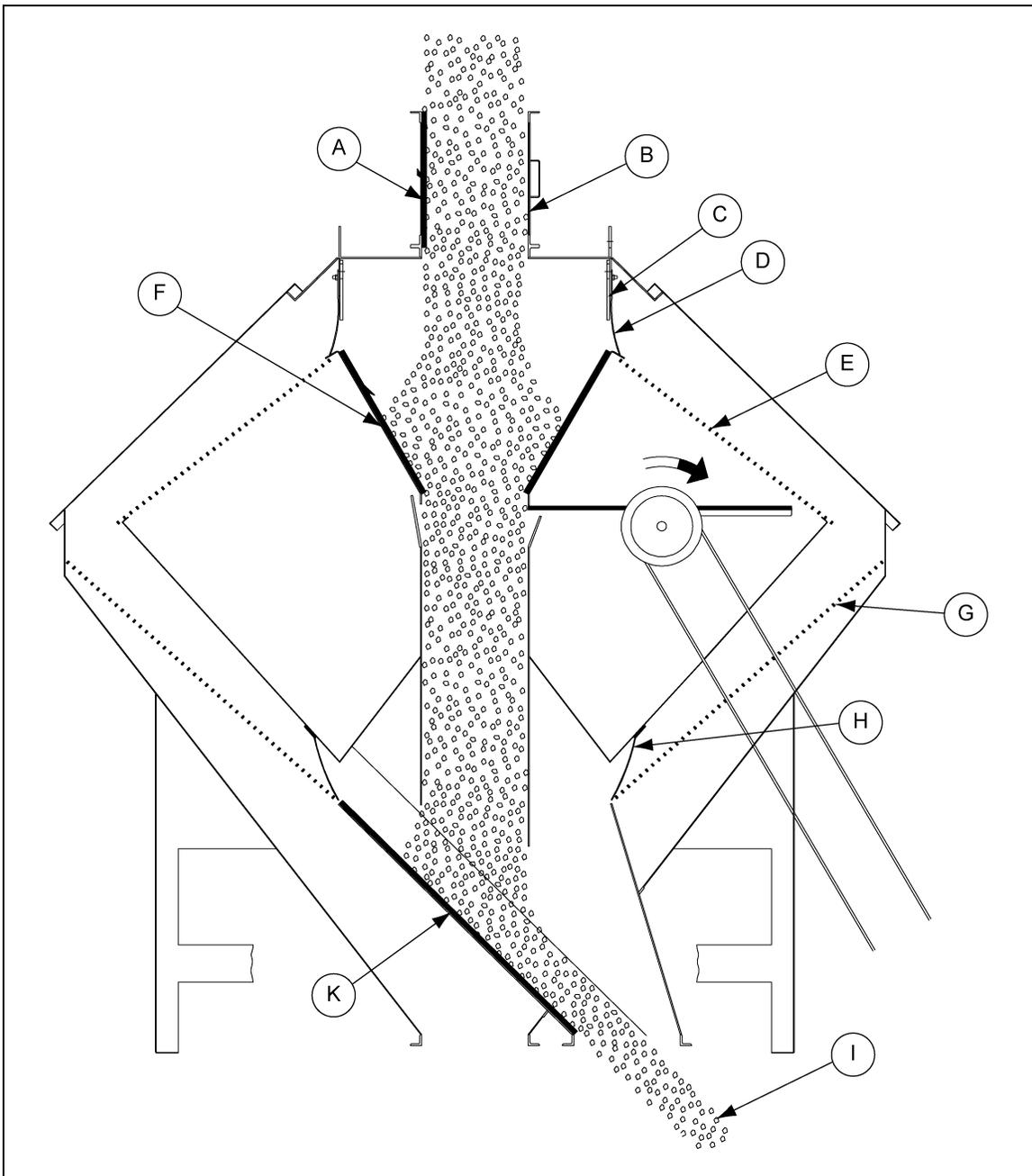


Figure 4B By-Pass Position

Ref #	Description
A	Inlet Liner Three (3) Sides
B	Inlet
C	Vertically Adjustable Diverter Paddle
D	Upper Flow Belts
E	Upper Screens

Ref #	Description
F	Valve Hopper Liner
G	Lower Screens
H	Lower Screen Flaps
I	C/M Discharge
K	Discharge Liner Three (3) Sides

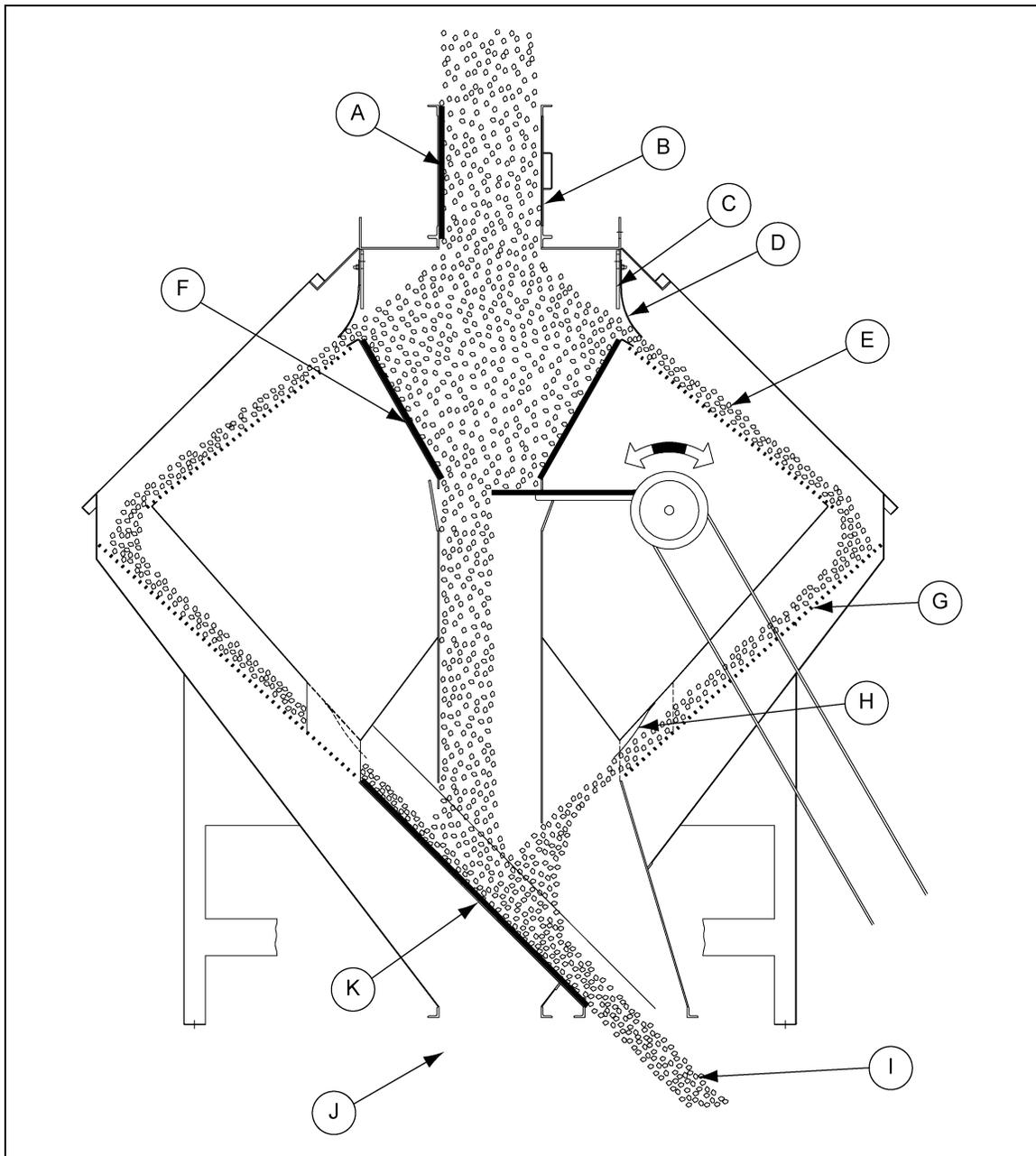


Figure 4C Proportioning Position Infinitely Variable

Ref #	Description
A	Inlet Liner Three (3) Sides
B	Inlet
C	Vertically Adjustable Diverter Paddle
D	Upper Flow Belts
E	Upper Screens
F	Valve Hopper Liner

Ref #	Description
G	Lower Screens
H	Lower Screen Flaps
I	C/M Discharge
J	F/M Discharge
K	Discharge Liner Three (3) Sides

4. General Information

Screener Capacities

The model number (PC-) of each screener indicates its MOST EFFICIENT cleaning capacity in BPH. The maximum throughput of a screener is higher but with the penalty of less effective cleaning action.

Contrary to popular belief, a screener DOES NOT do a better job of cleaning grain if operated well below its rated capacity; just the opposite is true. As the BPH rate actually being cleaned falls below the rated capacity, particularly when it falls below 80%, the velocity of the grain over the screens increases.

There are a number of undesirable effects:

1. Grain is damaged due to the velocity at which kernels strike the screens and other internal surfaces.
2. Air stream velocity in the screener increases, suspending more F/M, less cleaning occurs.
3. Internal screener wear is accelerated due to high velocity grain impact.
4. Screen blinding increases as large particles are forcibly driven into the screen mesh.
5. Elevated work area noise level.

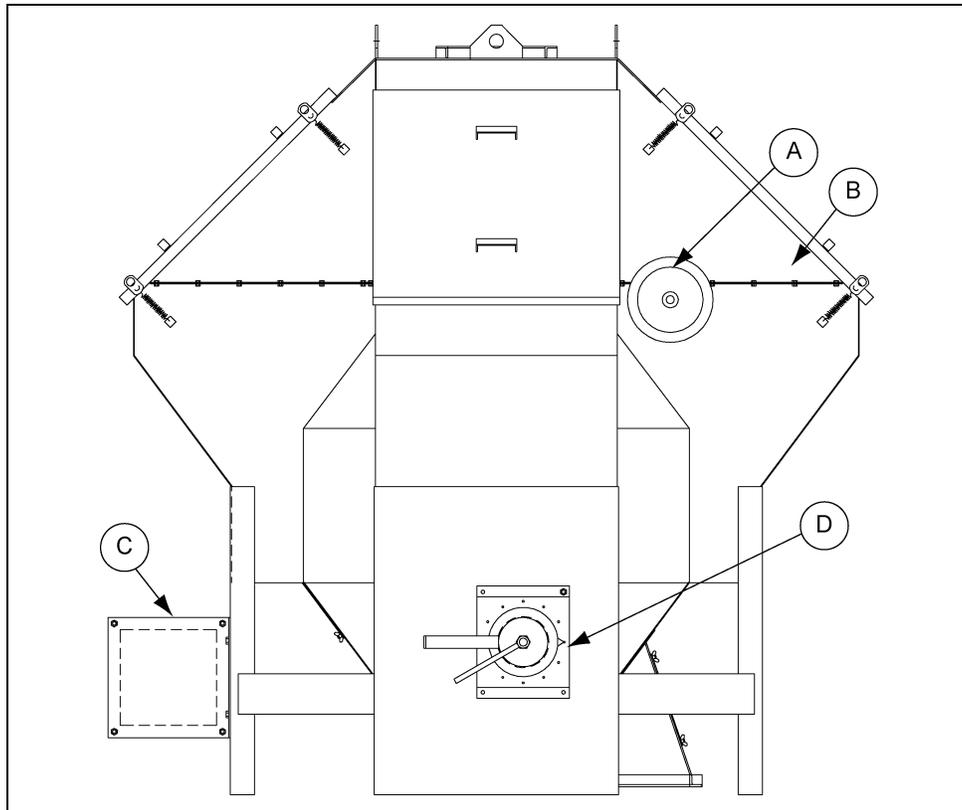


Figure 4D Screener Models PC-1500-PC-11500 as Shipped

Ref #	Description
A	Internal By-Pass Control (Refer to Page 30 for Electrical Actuator Installation.)
B	Main Screener Body
C	Inlet Tube
D	Lower Cable Control

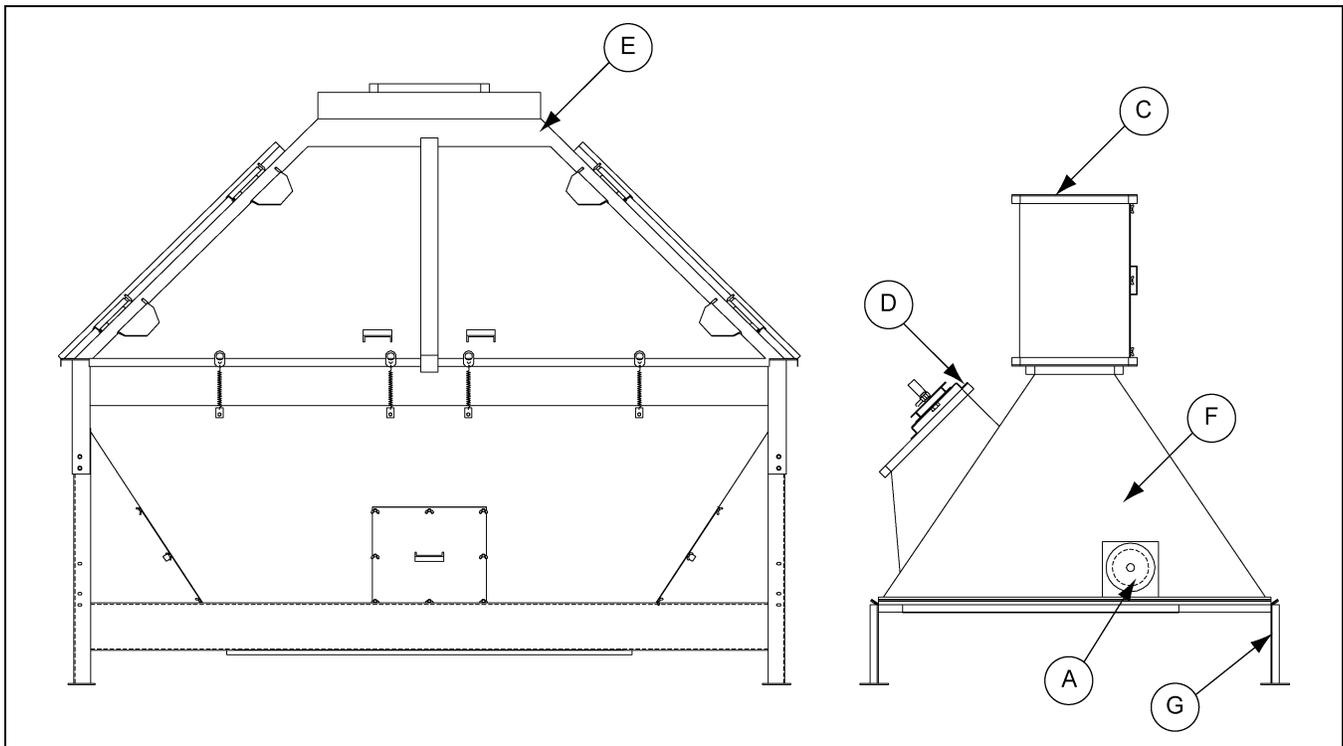


Figure 4E Screener Models PC-16000, PC-25000, PC-40000 as Shipped

Ref #	Description
A	Internal By-Pass Control (Refer to Page 31 for Electrical Actuator Installation.)
C	Inlet Tube
D	Lower Cable Control
E	Upper Main Body
F	Lower Discharge Outlet Section
G	Shipping Stand

Screener Screens Available

Refer to Replacement or Substitute Screens [on Page 4](#).

Automatic Bypass Control

All screeners can be supplied with an electric rotary actuator to permit automatic operation of the proportioning gate which controls the percentage of material bypassing the screens between 0% and 100%. An actuator can also be retrofitted to an existing screener. Refer to electrically-actuated bypass gates [on Page 29](#).

5. Installation

Receiving Inspection

1. Carefully inspect the shipment comprising the screener for damage as soon as it is received. Also verify that the quantity of parts or packages actually received corresponds to the quantity shown on the packing slip. If a screener is ordered with extra screens, they may have been placed inside the screener, on top of the installed screens.
2. The extra screens must be removed before cleaning is started, otherwise little or no cleaning will result.
3. Report any damage or shortage to the delivering carrier as soon as possible. Intersystems responsibility for damage to the equipment ended with acceptance by the delivering carrier.
4. Refer to the bill of lading. Save all paperwork and all documentation furnished with the screener and its components.

Pre-Installation Preparation

1. Before starting screener installation, study this manual, the certified drawing(s) furnished with the screener and other applicable documents, including but not limited to, OSHA Regulations; the National Electrical Code; and all other applicable federal, state and local codes and regulations.
2. Unless circumstances dictate otherwise, plan to assemble the optional service platform, if furnished, to the screener **before** hoisting the screener into position. Refer to Platform Assembly and Installation [on Page 24](#).

Type of Supporting Structure

Screeners are most often installed immediately below a bucket elevator discharge. Elevators ARE NOT designed and MUST NOT be used to support the weight of ANY OTHER equipment. Consult the elevator manufacturer to determine if their equipment will SAFELY support the screener's weight.

The lift eyes welded to each screener ARE intended to be used to hoist ONLY the screener and I-S built platform into position for installation.



Hoisting a screener with any other equipment or structures attached will cause the lifting brackets to break off, dropping the equipment. Death or serious injury can result. Lifting brackets are intended to lift ONLY the screener and Intersystems' supplied platform.

Screener Support

An Intersystems Screener, Model PC-1500 through PC-11500, is designed to be installed so the weight of the unit bears vertically downward on the factory-welded support frame. The support frame also is the support and attachment point for an optional service platform, if ordered. ([See Figure 5A on Page 21](#) and [Figure 5B on Page 21](#).)

The larger screeners, Models PC-16000, PC-25000 and PC-40000 are shipped in three (3) sections: ([See Figure 4E on Page 19](#).)

1. The main structure resting upon a shipping stand. The stand can be unfastened from the support frame uprights or it can be used as the permanent support when installed.
2. The lower section including the discharge outlets and the intermediate shaft assembly.
3. The inlet tube.

As with the smaller models, the weight of the screener must bear vertically downward on the support frame as shown in [Figure 5A](#) and [Figure 5B](#).

When assembling a Model PC-16000, PC-25000 or PC-40000 Screener, Intersystems recommends applying a continuous bead of caulking along the joint of the upper and lower sections as shown in [Figure 5C](#) on [Page 22](#).

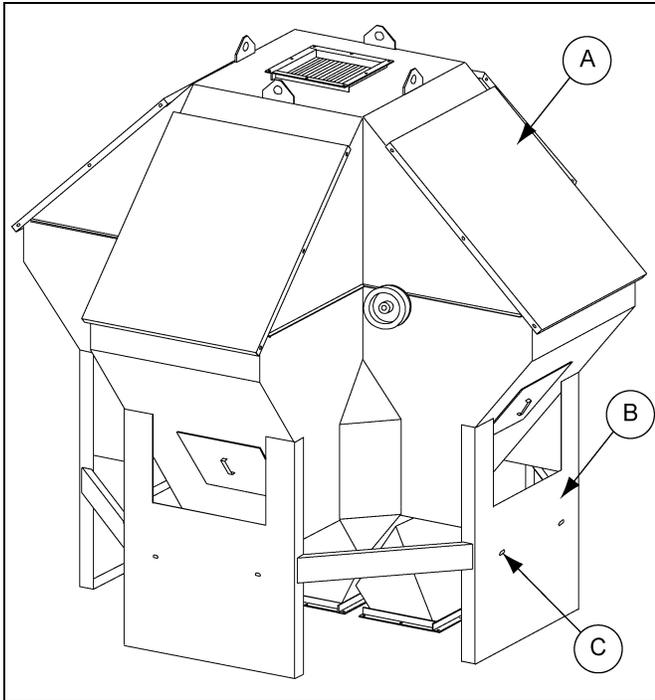


Figure 5A Screener Support
(Models PC-1500 - PC-11500)

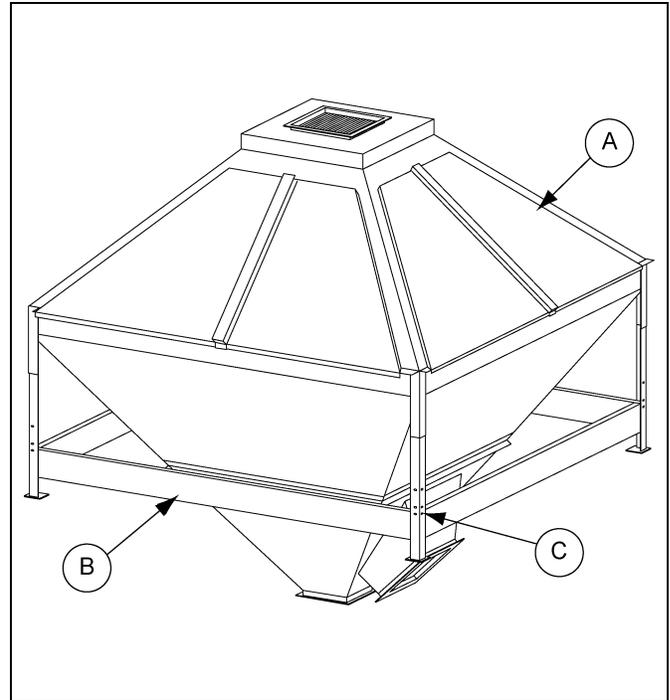
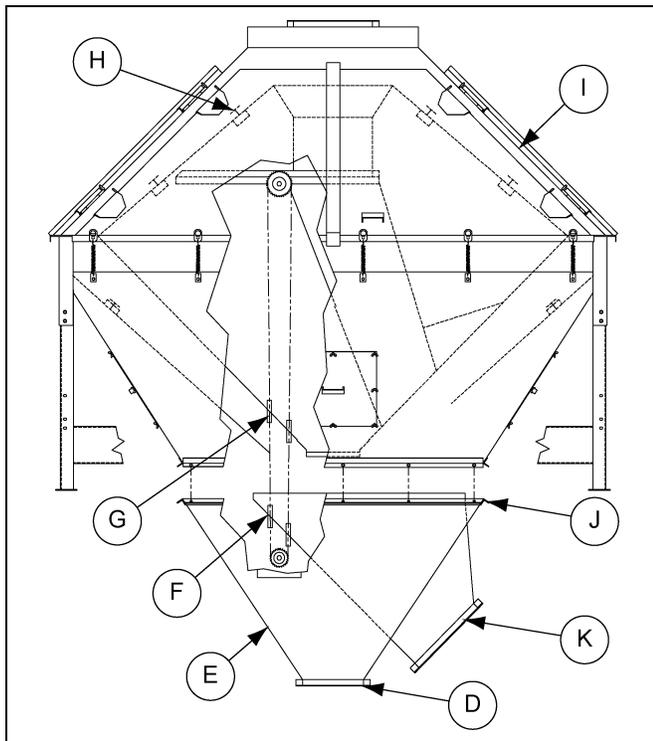


Figure 5B Screener Support
(Models PC-16000 - PC-40000)

Ref #	Description
A	Cleaner
B	Support Frame
C	Mounting Holes for Platform (Optional)

5. Installation



Ref #	Description
D	F/M Discharge
E	Lower Discharge Section
F	Lower Chain Guide Tubes
G	Upper Chain Guide Tubes
H	T-Handle and Hold-Down
I	Upper Section
J	Continuous Bead of Caulking (Before Assembling)
K	C/M Discharge

Figure 5C Orientation of Screener's Upper and Lower Sections

Screener Inlet Arrangement

Refer to [Figure 5D on Page 23](#), [Figure 5F](#) and [Figure 5E on Page 23](#). The elevator discharge, spout, chute, screw conveyor, etc. which feeds material into the screener **MUST** enter the inlet tube at a minimum angle of 45° from horizontal. This is to ensure even distribution of material to all screener screens and to prevent clogging the inlet. The inlet tube furnished with the screener **helps the material form a vertical flow and must** be installed atop the screener inlet. Without the inlet tube installed, it will be difficult or impossible to achieve even distribution of material to all screener screens.

NOTE: *The offset material outlet and cable guide tubes in the lower section must align with the material passage and guide tubes in the upper section as shown in [Figure 5C](#). Damage will result if the sections are forced together while they are incorrectly oriented.*

In nearly all installations, material enters the inlet tube at an angle. The inlet tube is to be attached to the screener so material entering the tube strikes one of the tube's three (3) lined or partially lined sides. The inspection door which forms the fourth side of the inlet tube is not lined. If the force of the incoming material will be directed against the door, it will wear through very quickly. In this case, unbolt the inlet tube and rotate 90° or 180° so the incoming material will contact a lined surface. **Observe all safety precautions before unbolting inlet tube.**

Screener Outlet Arrangement

Intersystems Screeners are designed in light of the fact that in most installations, material enters from and is discharged in the same direction, i.e, from an elevator. In ALL cases, the spout, etc. that carries away clean material must exit screener at a minimum angle of 45° from horizontal. (See Figure 5G on Page 24.) A shallow discharge angle slows material exiting the screener and will very likely block the outlet. The spout or chute that carries away foreign material MUST exit the screener at a minimum angle of 60° from horizontal. Foreign material is almost always lighter and finer than clean material and has a greater tendency to clump, especially if moist. A shallow discharge angle slows foreign material exiting the screener and will undoubtedly block the outlet.

NOTE: A model PC-1500 screener has its inlet tube permanently welded to the top of the unit at the factory and is oriented so the inspection door is on the same side of the screener as the discharge outlet. Orient the screener so the material will contact the lined surfaces of the inlet tube.

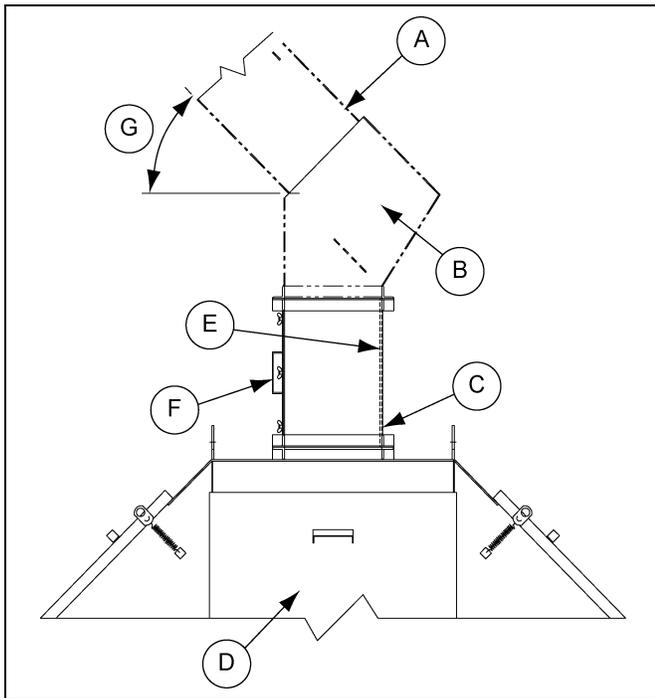


Figure 5D Recommended Inlet Configuration

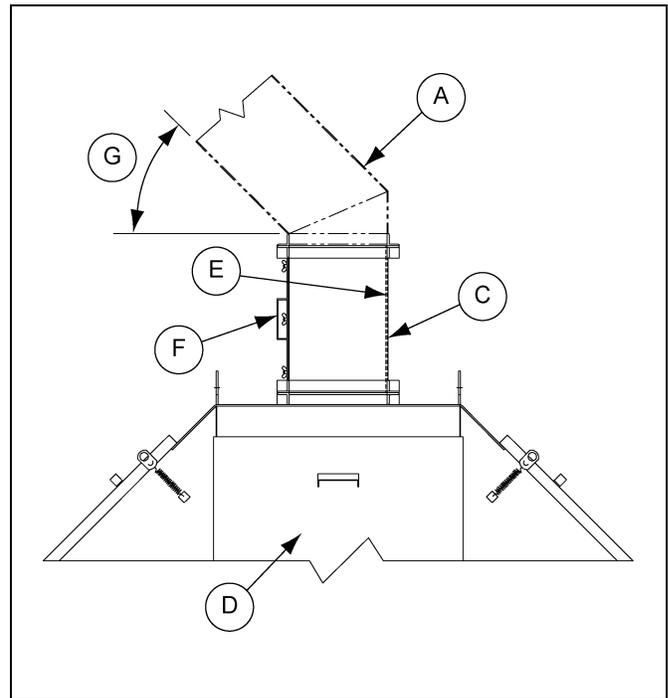


Figure 5F Minimum Acceptable Inlet Configuration

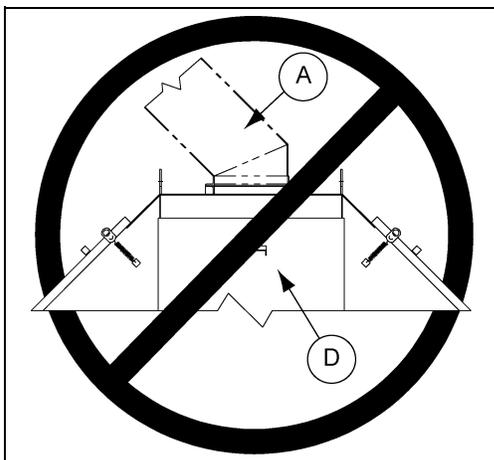


Figure 5E Unacceptable Inlet Configuration

Ref #	Description
A	Incoming Material Spout
B	Cushion Box
C	Inlet Tube Body
D	Main Screener Body
E	Inlet Tube Lining (Three (3) Sides)
F	Inspection Door (Unlined)
G	45° or Greater, Dependent on Material Characteristics

5. Installation

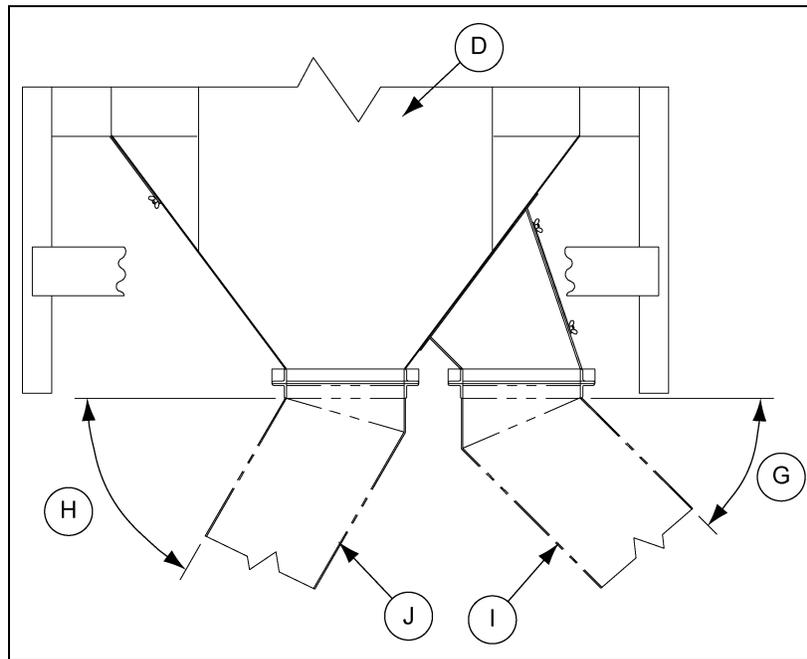


Figure 5G Screener Outlet Arrangement

Ref #	Description
D	Main Screener Body
G	45° or Greater, Dependent on Material Characteristics
H	60° or Greater, Dependent on Material Characteristics
I	C/M Discharge Spout
J	F/M Discharge Spout

Screener Vertical Alignment

A screener must be vertically plumb within 1° for maximum efficiency and throughput. Significant tilt prevents even distribution of material to all four (4) screens and may interfere with material and F/M discharge.

Platform Assembly and Installation



Service platform or siderails separating from the screener will cause death or serious injury. Double check that all fasteners have been securely tightened. After platform assembly is complete, field weld platform to screener support frame.

Models PC-1500 Through PC-11500

Notice that the narrow section of deck is to be positioned on the clean material discharge outlet side of the screener. (See Figure 5H on Page 25.)

Models PC-16000, PC-25000 and PC- 40000

These platforms are symmetrical unless special cutouts are provided to clear an obstruction in your installation. (See Figure 5I on Page 26.)

Lower Control Assembly, Manual Gate

Screeners, Model PC-1500, PC-3500, PC-5500, PC-8500 and PC-11500

When the screener is secured in its installed position, unfasten the lower control sheave assembly from the screener. Then determine the permanent location for the control assembly which will be connected to the upper sheave on the gate shaft by means of a loop of aircraft cable.

A straight line-of-sight cable path between the upper and lower sheaves is recommended. If site conditions make a dogleg cable path necessary, each cable strand should be supported at each bend by a ball-bearing cable sheave to minimize friction and prevent rapid cable fraying.

As shown in [Figure 5J on Page 27](#), the cable should be wound around the sheaves in a 540° loop to prevent cable slippage. Rather than a plain cable splice, Intersystems recommends forming the ends of the cable into loops with cable clips and thimbles. An extension spring can then be used to connect the cable ends; the spring maintains tension on the cable to compensate for variations in cable length due to temperature variations or permanent stretch.

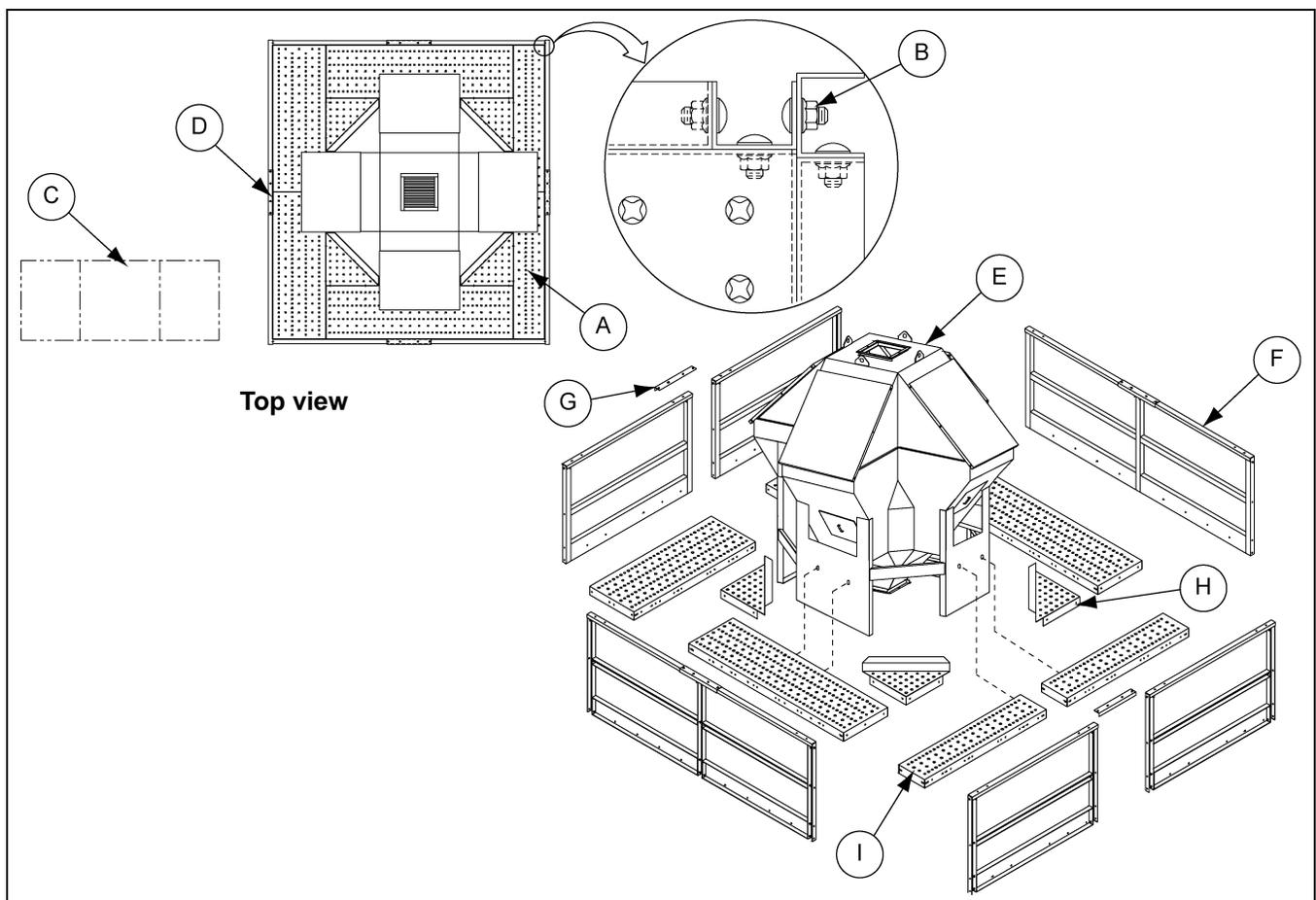


Figure 5H Platform Assembly and Installation (Models PC-1500 Through PC-11500)

Ref #	Description
A	Short Side
B	3/8" Bolts
C	Legs
D	Platform Deck and Handrail Spliced (Required on 11500 only)
E	Screener

Ref #	Description
F	Handrail
G	Handrail Splice (Required on 11500 only)
H	Corner Deck
I	Platform Deck

5. Installation

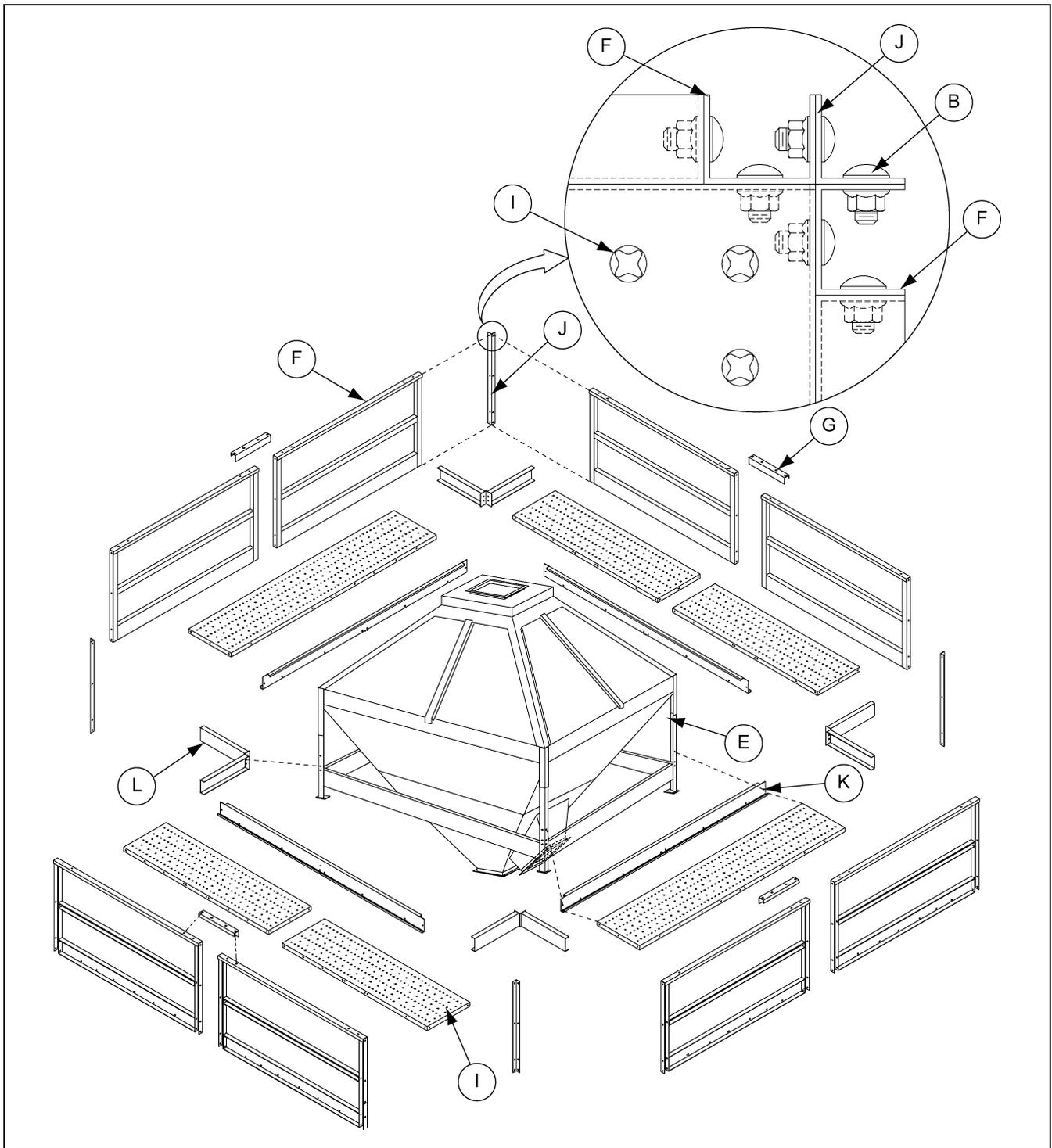


Figure 5I Platform Assembly and Installation (Models PC-16000, PC-25000 and PC-40000)

Ref #	Description
B	3/8" Bolts
E	Screener
F	Handrail
G	Handrail Splice

Ref #	Description
I	Platform Deck
J	Corner Angle
K	Inside Toe board
L	Platform Support Bracket

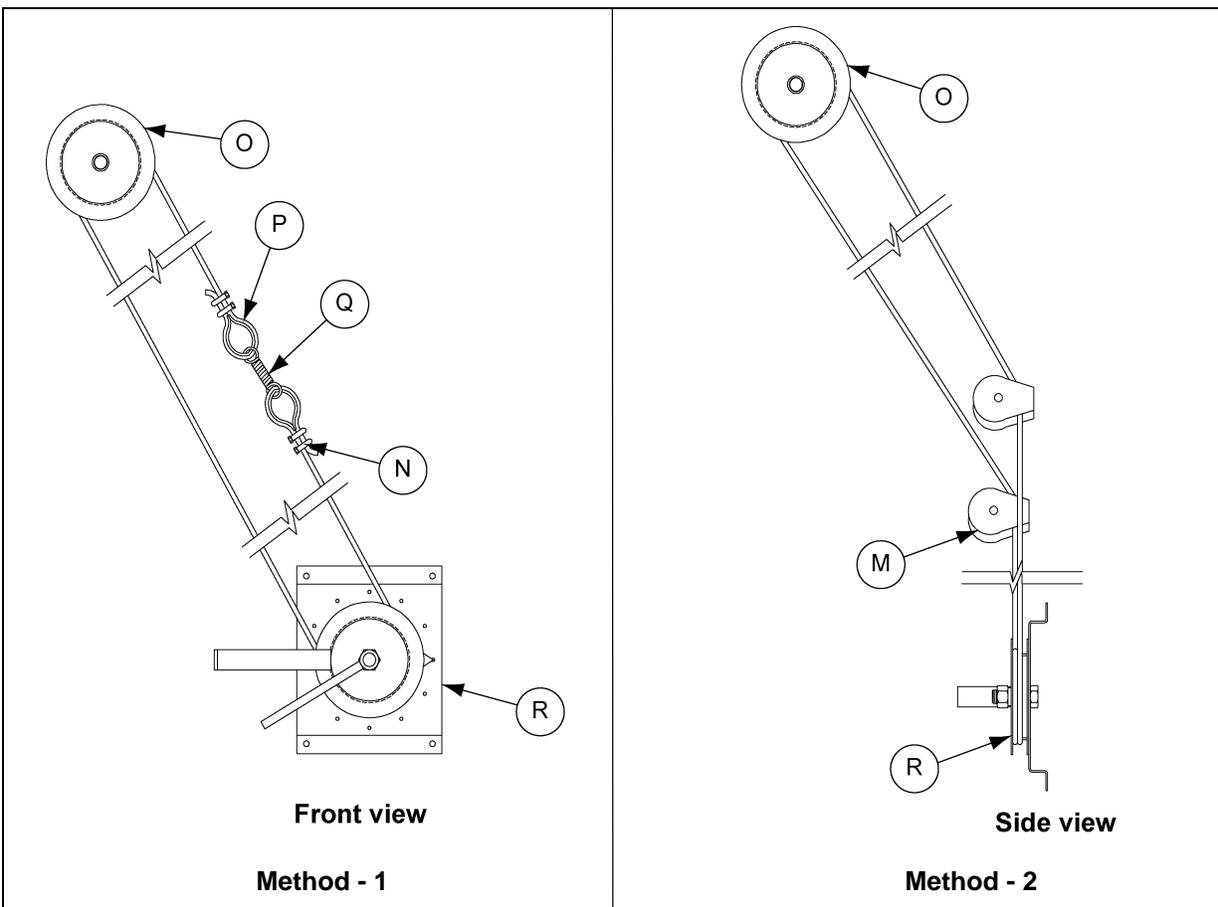


Figure 5J Control Cable Assembly and Routing (Models PC-1500 Through PC-11500)

Ref #	Description
M	Pivot Pulley
N	Cable Clip
O	Upper Control Wheel (On Gate Shaft, Minimum 540° Cable Wrap)

Ref #	Description
P	Cable Thimble
Q	Heavy Extension Spring
R	Lower Cable Control (Minimum 540° Cable Wrap)

Regardless of the method employed to splice or connect cable ends, the connector should be positioned to permit full bypass gate movement between fully open and completely closed.

Notice that the lower sheave has a pointer and a series of holes drilled in the mounting bracket. These holes are a handy reference to indicate discrete increments of bypass gate movement between fully open and fully closed. Operators customarily mark or label the bracket in light of their experience after the screener has been operated for a period of time.

NOTE:

1. With the sheaves installed per these instructions, clockwise rotation of the pointer opens the bypass gate and counter clockwise rotation closes it.
2. The holes in the lower sheave mounting bracket do not indicate any percentage of flow. They are for reference only. The screener operator must assign the significance to the holes and identify them accordingly.
3. It is not necessary to align the pointer with the holes. Gate position is infinitely variable between fully open and completely closed.

5. Installation

Screeners, Model PC-16000, PC-25000 and PC-40000

These screeners all feature a lower control assembly consisting of a cable sheave with a crank handle and a locking lever mounted on a mounting plate. The control assembly is attached to the screener for shipping.

Gate Control Chain Assembly

These larger size screeners employ a chain assembly and sprockets to connect the upper and intermediate gate control shafts. (*See Figure 5C on Page 22 and Figure 5K on Page 29.*)

1. Turn the upper gate shaft so the gate is fully open.
2. Route the chain assembly around the sprockets and through the guide tubes as shown in *Figure 5C on Page 22 and Figure 5K on Page 29*. The chain tightener must be positioned to the right of the sprocket and 2" below the centerline of the upper sprocket.
3. Block the gate to prevent its moving. Tighten the adjuster to eliminate **most** of the slack from the chain.

NOTE: *Apply only enough tension to prevent the chain from jumping sprocket teeth. Excessive tension will cause the chain, sprockets and shaft bearings to wear rapidly. Excessive tension will also bend the shafts and cause the gate to jam.*

Lower to Intermediate Shaft Cable

Follow procedure outlined in Models PC-1500 Through PC-11500 *on Page 24* for installation of lower cable control assembly.

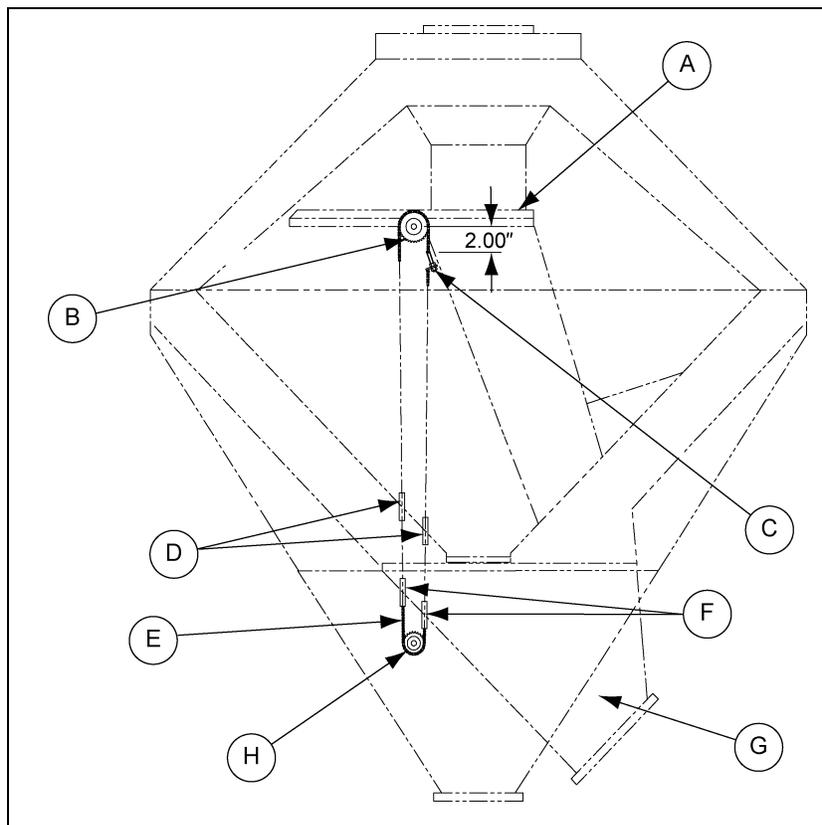


Figure 5K Internal Chain Assembly (Models PC-16000, PC-25000 and PC-40000)

Ref #	Description	Ref #	Description
A	By-Pass Gate	E	Chain
B	Upper Sprocket	F	Lower Section Guide Tubes
C	Chain Tightener	G	C/M Discharge
D	Upper Section Guide Tubes	H	Lower Sprocket

Electrically-Actuated Bypass Gates

All Intersystems Screeners can be ordered with the bypass gate operated by an electric rotary actuator. An actuator can also be retrofitted to an existing screener. All screeners, as shipped, are arranged for manual gate control. The screener gate can be manually controlled and later retrofitted with electric controls. Follow instructions which come with each actuator. All actuators are factory adjusted to zero distance travel to avoid stripping gears upon initial installation and use. Calibrate the actuator to the proper stroke after installation.

NOTE: Do not remove actuator from the shipping container until ready for final installation. Actuators are subject to damage from moisture and are not watertight until completely installed, including conduit connections. As shown in [Figure 5L on Page 30](#) and [Figure 5M on Page 32](#), make sure that there is at least 6-7/8" clearance behind the actuator to permit removal of the cover for repair and adjustment.

5. Installation

Actuator Installation, PC-1500 Through PC-11500 (See Figure 5L.)

1. Loosen the set screw securing the upper sheave to the gate shaft. Remove the sheave. Save it for emergency use in case of actuator malfunction.

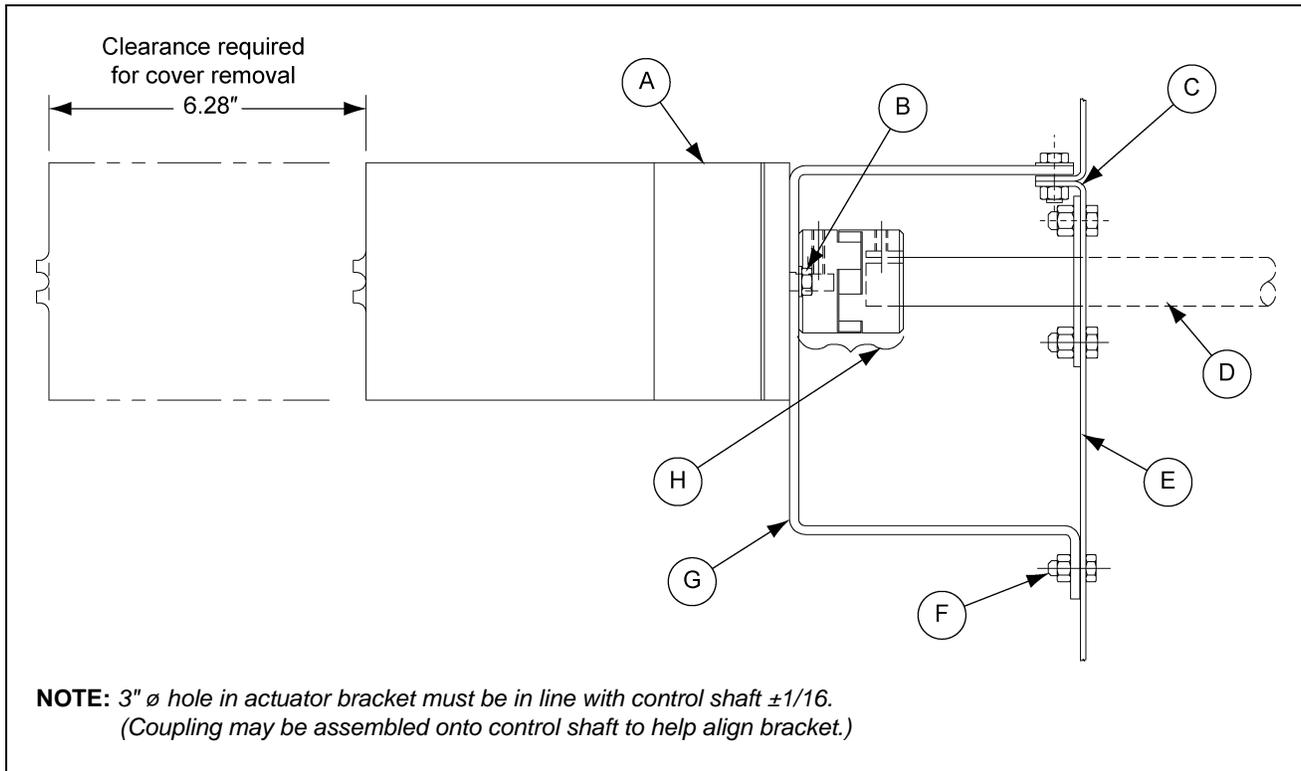


Figure 5L Rotary Actuator Installation (Models PC-1500 Through PC-11500)

Ref #	Description
A	Electric Actuator
B	Actuator Mount Bolt (1/4"-20 x 1/2" LG)
C	Split Line (8500 and 11500 only)
D	Control Shaft

Ref #	Description
E	Cleaner Side Panel
F	Bracket Mount Bolt (3/8"-16 x 1" LG)
G	Actuator Bracket
H	Coupling Halves and Spider

2. Fasten the rotary actuator to the actuator bracket. Three (3) 3/8"-16 x 3/4" hex head cap screws and lock washers are provided.
3. Assemble a 3/8" bore coupling to the actuator shaft. Make sure the flange set screw bears on the flat of the actuator's output shaft.
4. Mate the coupling spider and the 1" bore coupling half to the actuator shaft.
5. Slip the actuator, bracket and coupling over the end of the gate shaft so the actuator bracket rests against the screener's side panel.
6. Position the bracket until both coupling flanges are concentric within 1/16". Use a small straight edge for this alignment rather than sight. Improper alignment will cause the actuator and gate shaft bearings and coupling spider to fail prematurely.
7. Mark or transfer punch the location of the mounting holes on to the screener side panel.

8. Drill 13/32" holes in the screener side panel.
9. Rotate the gate shaft clockwise until the gate is fully open.
10. While observing all safety precautions, temporarily wire the actuator per the instructions furnished with it. Run the actuator until its output shaft has rotated to the open position, counter clockwise limit when viewed from the end of the output shaft. Disconnect the motor controls.
11. Temporarily bolt the bracket with the actuator to the screener with the 1" bore coupling flange engaging the gate shaft. Use the 3/8"-16 x 1" hex head cap screws, nuts and washers furnished.
12. Thread the 5/16" bolt into the gate shaft coupling flange to transfer the screw hole position mark to the shaft.
13. Remove the actuator and bracket. Spotface the gate shaft with a 5/16" diameter drill approximately 1/4" deep to form a seat for the coupling bolt to lock the flange on the shaft.
14. Reassemble the actuator, bracket and coupling to the screener, fastening it securely in position. Be sure to thread the 5/16" bolt through the coupling flange and into the spotface on the gate shaft.
15. Reconnect the wiring and test the actuator to verify that the gate moves smoothly between fully open and completely closed.

NOTE: *To avoid possible damage to actuator, recheck limit switches to ensure that actuator is de-energized at each end of stroke.*

Jordan/Rotork Actuator Installation, PC-16000 Through PC40000 (See [Figure 5M on Page 32.](#))

1. Loosen the set screw securing the cable sheave to the intermediate shaft, not the gate shaft. Remove the sheave. Save it for possible emergency use.
2. Fasten the rotary actuator to the actuator bracket. Three (3) 3/8"-16 x 3/4" hex head cap screws and lock washers are provided.
3. Assemble one of the coupling flanges to the actuator shaft. Both flanges have 1" bores. Make sure the flange set screw bears on the flat of the actuator's output shaft.
4. Mate the coupling spider and the other coupling half to the actuator.
5. Slip the coupling over the end of the intermediate shaft so that the actuator bracket rests against the screener's sloping side panel. (The lower section which includes the discharge outlets.)
6. Shift the bracket until both coupling flanges are concentric within 1/16". Improper alignment will cause the actuator and gate shaft bearings and coupling spider to fail prematurely.
7. Mark or transfer punch the location of the mounting holes.
8. Drill 13/32" or 7/16" holes in the screener's lower side panel.
9. Rotate intermediate shaft counter clockwise until the gate is fully open.
10. While observing all safety precautions, temporarily wire the actuator per the instructions furnished with it. Run the actuator until its output shaft has rotated to the open position, clockwise limit when viewed from the end of the output shaft. Disconnect the motor controls.

5. Installation

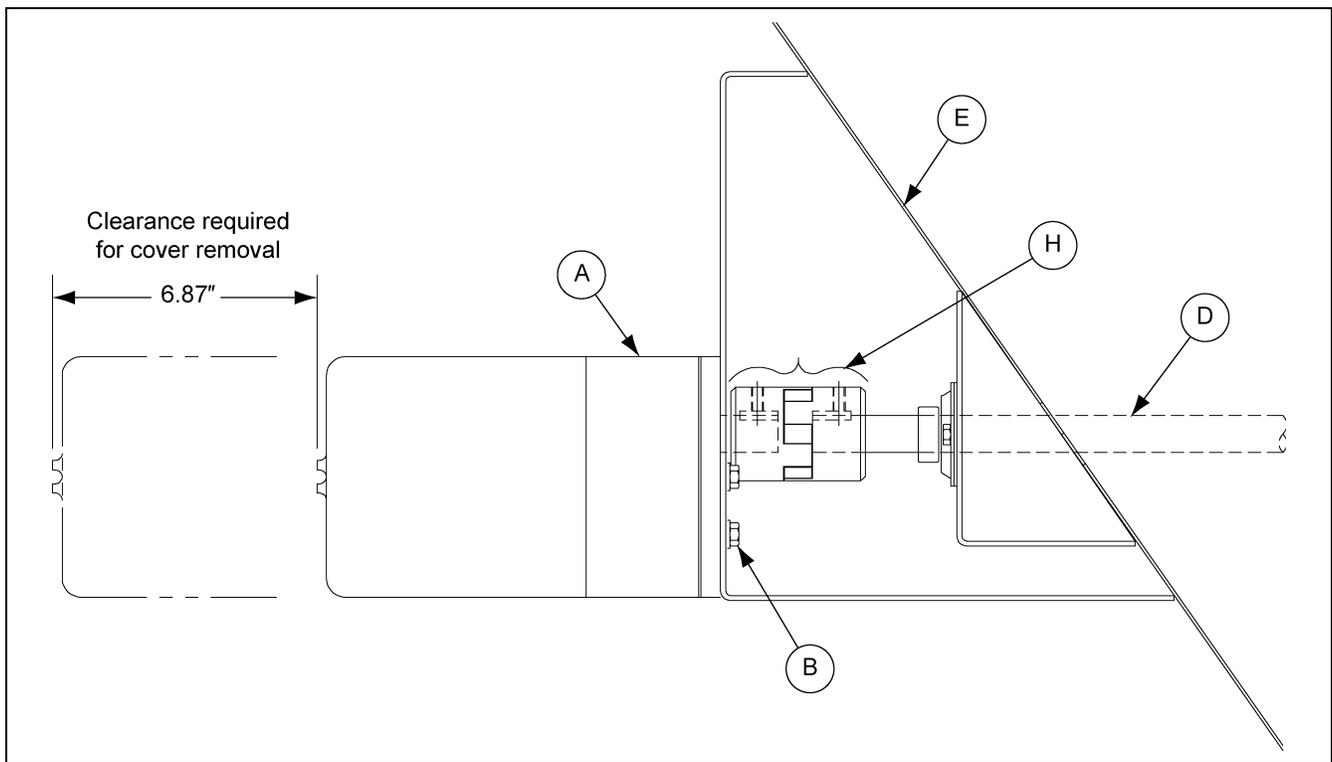


Figure 5M Rotary Actuator Installation (Models PC-16000, PC-25000 and PC-40000)

Ref #	Description
A	Electric Actuator
B	Actuator Mount Bolt (1/4"-20 x 1/2" LG)
D	Control Shaft

Ref #	Description
E	Cleaner Side Panel
H	Coupling Halves and Spider

11. Temporarily bolt the bracket with the actuator to the screener with the coupling engaging the gate shaft or the intermediate shaft. Use the 3/8"-16 x 1" hex head cap screws, nuts and washers furnished.
12. Thread the 5/16" hex socket head cap screw into the intermediate shaft coupling flange sufficiently tight to mark the shaft OR transfer punch the screw hole on the shaft.
13. Remove the actuator and bracket. Spotface the gate or intermediate shaft with a 5/16" diameter drill approximately 1/4" deep to form a seat for the cap screw to lock the flange on the shaft.
14. Re-assemble the actuator, bracket and coupling to the screener, fastening it securely in position. Be sure to thread the 5/16" cap screw through the coupling flange and into the spotface on the gate shaft. Double check tightness of all other fasteners.
15. Reconnect the wiring and test the actuator to verify that the gate moves smoothly between fully open and completely closed.

NOTE: To avoid possible damage to actuator, recheck limit switches to ensure that actuator is de-energized at each end of stroke.



Failure to observe all safety rules, written, implied and those suggested by obvious common sense, can result in death, serious injury and/or equipment damage.

Before Start-Up

Perform these tests and checks before each start-up and after any maintenance or repair has been performed.

1. Check the condition of screens. Replace any screens that are worn through, that have bent edging or that have been damaged. Check that all screens rest flat on their supports and that all the flexible plastic belts are lapping over the tops of the screens.

NOTE: *A lower screen set for a model PC-16000, PC-25000 or PC-40000 screener consists of three (3) long screens and one short screen. The short screen must be installed in the clean material discharge outlet side of the screener. If a short screen is installed in the wrong side of the screener, there will be a gap of several inches at the bottom screen edge. Good material will be lost into fines tanks if screens are worn or improperly installed.*

2. Check the screens for blinding. Some blinding or clogging is normal; usually 10% to 15% of openings. However, if wet material has been run through the screener, screens can become mostly or entirely blinded by caked material and F/M will have to be removed and cleaned.
3. Verify that the bypass gate opens and closes completely.
4. Periodically inspect the urethane wear liners. Replace any that are nearly worn through. If a liner wears through, the material will very quickly wear through the metal structure of the screener itself.
5. Replace any missing or worn plastic paddles or urethane belts. These help control the velocity and distribution of material in the screener and are vital to optimum screener performance.

Operation

1. Use the manual control sheave or the automatic controls to open or close the gate for the desired ratio of cleaned and bypassed material. The ratio can be infinitely varied between 0% and 100%.

Figure 6A on Page 34 is a nomograph indicating the approximate removal rates of all Intersystems screeners. Removal rates are based upon 100% of material being routed over the cleaning screens (0% bypass) of screeners operated at at least 80% of rated capacity. Rates as graphed are the composite performance of several units being used on a job and represent the minimum level of all models but are not guaranteed removal rates. A rule of thumb to approximate cleaning is that 60% of fines will be removed. In other words, if you begin with 10% fines, you will remove 60% of that or 6%, leaving you with 4% fines after cleaning.

6. Operation

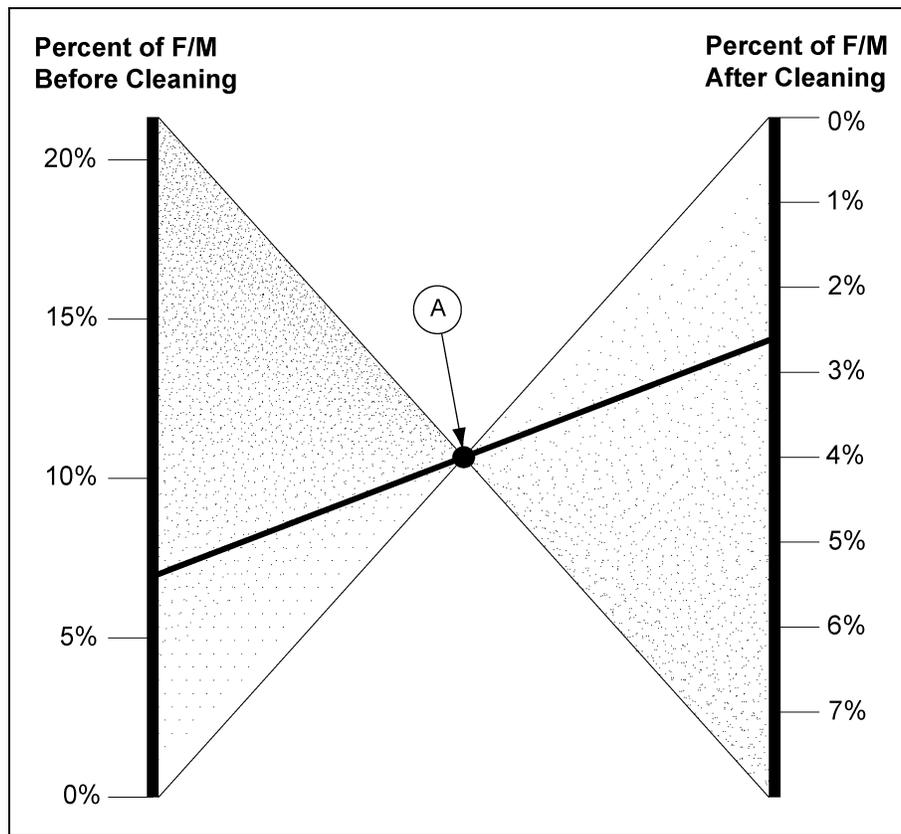


Figure 6A F/M Removal Nomograph

Ref #	Description
A	Index Point

The example graphed in [Figure 6A on Page 34](#) depicts one lot of material containing 7.5% F/M before cleaning and approximately 2.75% after cleaning. To determine other removal ratios, first select a Percent of F/M Before Cleaning on the left hand scale. Then draw a straight line from the selected percentage before cleaning through the Index Point. Finally, read the Percent of F/M After Cleaning on the right-hand scale.

- Determine the rate in BPH at which material will be fed into the screener. If the rate is less than 80% of the screener's rated capacity, consider adjusting one or more of the rigid UHMW paddles to block one or more sets of screens.

NOTE: *The numeric portion of the screener model number indicates the capacity, in BPH, of the most efficient cleaning rate, not the maximum throughput rate. A Model 8500 will remove the highest percentage of F/M at 8500 BHP.*

Lowering a paddle forces more grain from the associated set of screens. Begin with the paddle on the opposite side of the screener from which material enters the screener. Contrary to popular belief, a screener DOES NOT do a better job of cleaning if operated well below its rated capacity. The best cleaning occurs when the material flows over the screen in a layer, which limits bouncing and traps dust from flying. As the BPH rate actually being cleaned falls below the rated capacity, particularly below 80%, the velocity of the material over the screens increases., causing a number of undesirable effects.

- a. Material is damaged due to the velocity at which particles strike the screens and other internal surfaces.
 - b. Air stream velocity in the screener increases, releasing more F/M into the airflow and allowing less cleaning to occur.
 - c. Internal screener wear is accelerated due to high velocity grain impact.
 - d. Screen blinding increases as large particles are forcibly driven into the screen mesh.
 - e. Elevated noise level in the work area.
3. The bypass gate can be adjusted at any time if the proper screens are installed for the commodity being cleaned. It is not necessary to interrupt cleaning while adjusting the gate, either manually or automatically.
 4. It is entirely normal that approximately 10%- 15% of the screen area be blinded or clogged. The capacity of the screeners has in fact been calculated with this in mind. Over a period of time, particles lodged in the screen mesh will abrade and drop through into the F/M passages and will be replaced by other particles. The percentage of blinded screen area should remain fairly constant.
 5. While the screener is operating at or near capacity, check to see that material is distributed evenly to all four (4) sides of the screener.

NOTE: *Wear appropriate eye protection as well as an aspirator mask to protect against possible airborne material escaping the screener.*



Wear appropriate eye protection as well as an aspirator mask to protect against possible airborne material escaping the screener.

Post-Operation

Whenever the screener is idle, the bypass gate should be adjusted to the full open position. If the gate is left closed or only partially open, dust and material will accumulate in the screener. If allowed to build-up, accumulated dust and material attracts pests, vermin; and moisture which in-turn leads to rust, corrosion and fungus growth.

7. Maintenance and Repair



Failure to observe all safety rules, written, implied and those suggested by obvious common sense, can result in death, serious injury and/or equipment damage. Refer to general safety information from [Pages 6-10](#) before performing any maintenance on screener.

General Maintenance

A good screener maintenance program involves thorough general housekeeping and periodic inspections.

Periodic Inspection

At regularly scheduled intervals, while observing all safety precautions, observe the equipment as it operates. Inspect for:

1. Loose or missing hardware. Pay particular attention to
 - a. Broken or missing extension spring clips which hold covers in place.
 - b. Loose or missing T-handles and upper and lower screen hold downs on Model PC-16000 - PC-25000 and PC-40000.
2. Screen damage
 - a. Screens with bent edging that prevent the screens from lying flat on the supports.
 - b. Damaged or worn screens. These defects allow clean grain to flow under or through screens into F/M passages. Loss of clean grain is an unnecessary expense that can be prevented by timely inspection and replacement of defective screens.

NOTE: *A lower screen set for a model PC-16000, PC-25000 or PC-40000 screener consists of three (3) long screens and one short screen. The short screen must be installed in the clean grain discharge outlet side of the screener. If a short screen is installed in the wrong side of the screener, there will be a gap of several inches at the bottom screen edge. Good material will be lost into fines tanks if screens are worn or improperly installed.*

3. Bypass gate that won't close completely, allowing material to bypass the screens, thereby reducing overall cleaning efficiency. A gate that won't open fully, interferes with free passage of material through the screener when no cleaning is intended and allows material and dust to accumulate. If allowed to build-up, accumulated dust and material attracts pests, vermin and moisture which in-turn leads to rust, corrosion and fungus growth.
4. Damaged wiring, including exposed conductors and connections on screeners with an electric actuator.
5. Missing, damaged or incorrectly adjusted rigid paddles and flexible belts; screener efficiency is lower and damage to the grain and the screener will result.
6. Defective seals. Inspect and when indicated replace the seals on the screener covers and inspection doors. The seals prevent the escape of dust from the screener.
7. Abrasion-resistant liner condition. Any liner that appears to be worn through 75% of the original thickness should be replaced. If replacement is deferred, the liner can wear through completely, resulting in wear to the structure of the screener itself.
8. Structural damage.
9. Rust or corrosion.
10. Recheck limit switch settings on optional electric actuator to prevent damage from driving past gate travel.

Lubrication

The flange bearings and/or pillow blocks supporting bypass gate shafts of ALL screeners were permanently lubricated by the manufacturer. No further lubrication is possible. If a bearing fails, replace it.

Optional Electric Bypass Gate Actuator

Refer to the OEM manufacturers technical literature furnished with the actuator.

General Housekeeping

At frequent and regular intervals, remove the accumulated material residue and dirt from the F/M passages and the areas of the clean material passages which are not scoured by the movement of material. If allowed to build-up, accumulated dust and material attracts pests, vermin and moisture which in-turn leads to rust, corrosion and fungus growth.

Screener Liner Replacement

Certain high-wear areas of the screener are lined with expanded metal-backed urethane plastic sheeting. Liners are held in place by elevator bolts. When replacing a liner, tighten the nuts to draw the flat bolt heads down flush or nearly flush with the liner surface. It is neither necessary nor desirable to countersink the bolt holes in the liners, as this deforms the liner surface and causes premature wear.

NOTES

InterSystems, Inc. reserves the right to make changes in design or in construction of equipment and components without obligation to incorporate such changes in equipment and components previously ordered.

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This equipment shall be installed in accordance with the current installation codes and applicable regulations, which should be carefully followed in all cases. Authorities having jurisdiction should be consulted before installations are made.



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