AIRSTREAM GRAIN CONDITIONING SYSTEMS

# OWNER'S MANUAL AIRSTREAM ASPIRATOR







THE GSI GROUP



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The symbol shown is used to call your attention to instructions concerning your personal safety. Watch for this symbol; it points out important safety precautions. It means "ATTENTION", "WARNING", "CAU-TION", and "DANGER". Read the message and be cautious to the possibility of personal injury or death.



#### WARNING! BE ALERT!

Personnel operating or working around electric fans should 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.

Grain Systems, Inc. recommends contacting your local power company, and having a representative survey your installation so the wiring is compatible with their system, and adequate power is supplied to your unit.

Safety decals should be read and understood by all people in the grain handling area. The decal at the right should be present on both sides of the blower unit housing. If a decal is damaged or is missing contact:

Grain Systems, Inc. 1004 E. Illinois St. Assumption, IL 62510 217-226-4421

A free replacement will be sent to you.

#### SAFETY ALERT DECALS





### APPLICATIONS

### A basic Aspirator unit pulls material from the discharge auger only.

The Airstream Aspirator is designed to remove bees wings and dust particles from the grain as it exits the dryer. The unit utilizes a 3 hp aspirating fan to remove the material from the discharge box via a settling chamber. The fan blows the material to the polyethylene cyclone that separates the material from the air and settles it to a customer supplied holding container (i.e. a wagon).

The Airstream Aspirator was designed to fit onto any portable dryer manufactured by Airstream. The unit is sold in kit form to accommodate installations as necessary. Parts included in the kit allow installation onto an Airstream dryer.





Custom installations may be done as needed by using component parts purchased from GSI/Airstream. Dealers may supply alternate parts if they match Airstream specifications. The most common use of dealer supplied parts is 6.00" galvanized tubing for extending the Aspirator pipe sections. This can occur with front fill dryers.

An expanded Aspirator unit pulls material from both the top and the bottom augers.

#### **Discharge Box Modifications**

The discharge box on the rear of the dryer may need to be modified to accept the parts of the settling chamber. If the Aspirator is ordered with the dryer, these modifications may have been done at the factory as the dryer was manufactured. If the kit was purchased to install on an existing dryer, these modifications must be performed to install the Aspirator unit. The following procedure outlines the necessary steps for modifying the discharge box assembly.



Modified discharge box with side discharge chute.

Determine which side of the dryer the Aspirator will be mounted.

Remove the side of the discharge box that is on the same side that the Aspirator will be mounted.

Install the new Discharge Box Side and the Discharge Box Bypass Chute. GSI recommends mounting on the left side for the best performance, however, the Aspirator can be mounted on either the left or right hand side of the dryer. This is done to fit most dryer sites where other equipment (unloading equipment) may be installed around the dryer. Some dryers have ladders on the rear bulkheads that must be taken into account before mounting the Aspirator. Do not compromise safety for convenience.

Remove the **"Huck" bolts (14)** that hold the box side to the box. Cut the collar (inside box) with a hand-held grinder down the centerline of

the bolt, then across the bolt. Hit each one with a hammer to pop it out of the hole.

Remove the side of the discharge box that is to be replaced.

Install the **Discharge Box Side** onto the inside of the discharge box with the large rectangular slot down.

Install the **Discharge Box Bypass Chute** onto the outside of the discharge box.

Bolt these parts in with the **1/4**" **bolts, locknuts,** and **washers.** Check that all bolts are tight and discharge box lid moves freely on its hinge.

### Vacuum Option for the Basic Aspirator



#### **Vacuum Hose Option**

The Vacuum Hose Option provides and additional cleaning function. This option allows quick clean-up of the dryer location and the inside of the dryer plenum. An air cutoff slide plate is included with this option. The air cutoff plate removes the settling chamber from the system providing maximum vacuum to the vacuum hose. It is not recommended that objects such as rocks be vacuumed into the system as damage to the fan will occur.

Vacuum Option Installed for the Basic Aspirator.

**NOTE:** This step should be completed before the Aspirator Settling Box is assembled.

Drill the dimples on the	Set the <b>Settling Box Fan Side</b> so the 6" hole side is up.	
Settling Box Fan Side.	Drill the dimples located around the $6$ " hole using a $3/8$ " drill bit.	
Bolt the Vacuum Hose Adapter Weldment to the Settling Box Fan Side.	<ul> <li>Place the Slide Valve Spacers (2) onto the Settling Box Fan Side with holes aligned.</li> <li>Place the Slide Plate onto the box side between the spacers with the angle away from the 6" hole.</li> <li>Align the slide plate end of Vacuum Hose Adapter Weldment with Settling Box Fan Side so the 2" tube points down.</li> <li>Bolt the Vacuum Hose Adapter Weldment to the Settling Box Fan Side using the 5/16" Whiz Nuts and Bolts provided.</li> <li>Check slide plate movement. The plate should fit snugly as not to move</li> </ul>	
Attach the <b>Vacuum Hose</b> to the <b>Vacuum Hose Adapter</b> <b>Weldment.</b>	Attach the <b>Vacuum Hose</b> to the 2" tube on the bottom of the <b>Vacuum Hose Adapter Weldment.</b> Work the hose in a back and forth twisting motion to work 1.00" of the	
	hose onto the tube.	

### Vacuum Option for the Expanded Aspirator



#### **Vacuum Hose Option**

The Vacuum Hose Option provides and additional cleaning function. This option allows quick clean-up of the dryer location and the inside of the dryer plenum. An air cutoff slide plate is included with this option. The air cutoff slide removes the settling chamber from the system providing maximum vacuum to the vacuum hose. When using the vacuum hose, the T-valve should be set so the suction to the top duct is removed from the system. It is not recommended that objects such as rocks be vacuumed into the system as damage to the fan will occur.

Vacuum Option installed for Expanded Aspirator.

## **NOTE:** This step should be completed before the Aspirator Settling Box is assembled.

Drill the dimples on the Settling Box Fan Side.

Bolt the Vacuum Hose Adapter Weldment to the Settling Box Fan Side.



Attach the Vacuum Hose to the Vacuum Hose Adapter Weldment.

Set the **Settling Box Fan Side** so the 6" hole side is up. Drill the dimples located around the 6" hole using a 3/8" drill bit.

Place the **Slide Valve Spacers (2)** onto the **Settling Box Fan Side** with holes aligned.

Place the **Slide Plate** onto the box side between the spacers with the angle away from the 6" hole.

Align the slide plate end of **Vacuum Hose Adapter Weldment** with **Settling Box Fan Side** so the 2" tube points down.

Bolt the Vacuum Hose Adapter Weldment to the Settling Box Fan Side using the 5/16" Whiz Nuts and Bolts provided.

Check slide plate movement. The plate should fit snugly as not to move when it is in the closed position.

Attach the **Vacuum Hose** to the 2" tube on the bottom of the **Vacuum Hose Adapter Weldment.** 

Work the hose in a back and forth twisting motion to work 1.00" of the hose onto the tube.



Settling Chamber installed with "fresh air" vent open.

Attach the Settling Box Fan Side to the Discharge Bypass Chute.

Bolt the Inlet Duct Weldment onto the Settling Box Fan Side.

Attach Grille Vent & Gasket to the Settling Box Top Side.

Attach the Settling Box Top Side to the Settling Box Fan Side.



**Settling Chamber Assembly** 

The Settling Chamber Assembly reduces the suction force being generated at the discharge box to prevent any kernels from being pulled into the system. A "fresh air" vent is provided to also control the suction force. The Settling Chamber Assembly can be modified with the Vacuum Hose Kit. This kit provides a hose and adapter for cleanup around the dryer. It can also be used to vacuum the inside of the dryer plenum. This kit is purchased separately from the main Aspirator unit.

The inlet duct connects to the settling chamber with an angle ring.

Position the **Settling Box Fan Side** around the outside of the **Discharge Bypass Chute.** Secure the **Settling Box Fan Side** with the **5/16**" **Self Tapping Screws (13)** provided.

Bolt the angle ring end of the **Inlet Duct Weldment** to the **Settling Box Fan Side** with the **5/16**" **Whiz Nuts and Bolts** provided.

Position the **Grille Vent & Gasket** onto the **Settling Box Top Side**. Secure the **Grille Vent** with the **#6 Phillips Head Screws (4)** provided. Check movement of **Grille Vent** mechanism so that it opens freely.

Position the **Settling Box Top Side** around the outside of the **Settling Box Fan Side**.

Check that the angle at the bottom of the top side is under the discharge box lid.

Secure the **Settling Box Top Side** with the **5/16**" **Self Tapping Screws (24)** provided.



The discharge box lid is part of the safety features of the dryer. The rear discharge safety switch mounted on the lid is an emergency shutdown switch if the unloading equipment operates incorrectly. Check that the discharge box lid will open and close freely on its hinge. IF the discharge box does not open and close freely, THEN adjust the **Settling Box Top Side**,

so it operates correctly.





Overhead view of the settling box mounted on the dryer.





Simple mounting of the 3 hp blower unit for the Basic Aspirator.

#### **Installing the Blower Basic Aspirator**

The 3 hp Blower Unit generates the vacuum force needed to extract the debris from the discharging grain. Preassembled and tested at GSI, the blower is ready to install upon delivery. Standard wiring of the 3 hp motor eases the time of installation. A control option is available to utilize the dryer control circuit to operate the Aspirator when the dryer is in operation.



Remove these bolts for mounting bracket.

Mount the **Blower Mounting Bracket** to the back of the dryer.

Bolt the **3 hp Blower Unit** to the Blower Mounting Bracket and Inlet Tube Weldment.

of the bracket. Center the slots onto the bolts for correct positioning. Drill the remaining holes that fall on the dryer bulkhead with a 9/32" drill bit.

Mount the **Blower Mounting Bracket** using these bolts through the top holes

Remove the 3 bolts of the dryer column that will be used to mount the **Blower** 

Mounting Bracket. These are the bottom 2 bolts on the outside wall sheet

seam and the bottom bolt of the plenum wall sheet seam.

Use the 5/16" Self Tapping Screws in the 9/32" holes to completely secure the **Blower Mounting Bracket** to the dryer.

Align the inlet side of the **3 hp Blower Unit** with the **Inlet Tube Weldment**. Bolt the blower to the **Blower Mounting Bracket** using the 5/16" Whiz Nuts and Bolts provided.

Note: Not all holes on the blower or mounting bracket are used. Align the blower horizontally and vertically with the dryer and settling chamber. Secure the **Inlet Tube Weldment** to the fan using the **3/8**" Whiz Nuts provided.

Wire the 3 hp Blower Unit.

Wire the **3 hp Blower Motor** according to the wiring diagram of the motor.

#### Assembling the T-valve. Expanded Aspirator

The Expanded Aspirator uses a rotary value to control the direction of the suction force generated by the blower. It can be set for top only, bottom only, or top and bottom suction. The value mounts directly to the blower for simple mounting.



Inside of the T-valve Assembly.

Mount the **T-valve Outer Can Weldment** to the inlet side of the blower.

Complete the **T-valve** Assembly.



Simple mounting of the T-valve and 3 hp Blower combination.

Place the **Blower Inlet Plate Weldment** onto the **3 hp Blower Unit**. It should fit over the studs on the inlet side of the blower. Place the **T-valve Outer Can Weldment** over the studs and the **Blower Inlet Plate Weldment** so the angle ring is at the top of the assembly. Secure with the **3/8" Whiz Nuts** provided.

IF the **PR-331 Handle** is not installed on the **T-Valve Inner Can Weldment**, THEN install it now with the **5/16**" **Whiz Nuts and Bolts** provided. Insert the **T-valve Inner Can Weldment** into the outer can weldment. Bolt the **T-Valve Handle End Plate** to the T-valve assembly using the **5/16**" **Whiz Nuts and Bolts** provided.

Check that the **T-valve Inner Can Weldment** rotates freely in the assembly. IF the can does not rotate freely,

THEN check for interference between cans, check roundness of cans, or add some grease to help rotation.



Mount the **Blower Mounting** 

Bracket.

#### **Installing the Blower Expanded Aspirator**

The 3 hp Blower Unit generates the vacuum force needed to extract the debris from the discharging grain. Preassembled and tested at GSI, the blower is ready to install upon delivery. Standard wiring of the 3 hp motor eases the time of installation. A control option is available to utilize the dryer control circuit to operate the Aspirator when the dryer is in operation.

Motor side view of the 3 hp Bl	ower for the Expanded Aspirator.	
ount the <b>Blower Mounting</b>	Remove the bolts on the dryer that will hold the	-
racket.	Blower Mounting Bracket to the bulkhead.	treet.
	Outside column: bolts 3, 4, 5, and 6 from the	
	bottom on the vertical seam.	
	Inside column, holts 2, 3, 1, and 5 from the	

Outside column bottom on the u Inside column: bolts 2, 3, 4, and 5 from the bottom on the vertical seam. Attach the **Blower Mounting Bracket** to the bulkhead of the dryer using the bolts that were Remove these bolts. removed. Install the 90 • Elbow and 6" Place a 6" Compression Clamp onto the end of the tube extending from **Compression Clamps** for the the settling chamber so the pipe edge is at the center of the clamp. pipe from the settling chamber Tighten the first bolt at the pipe end of this clamp to hold it in place. to the blower. Insert a 90° Elbow into the 6" Compression Clamp so it points toward the location of the fan. Tighten the bolts of the clamp to hold the elbow in place. Place a 6" Compression Clamp onto the end of the 90° Elbow. Tighten the first bolt at the elbow end of this clamp to hold it in place. Install the 3 hp Blower and T-Align the **3 hp Blower** and **T-valve Assembly** with the **90° Elbow** and the valve Assembly. **Blower Mounting Bracket**. Insert the bottom tube of the **T-valve Assembly** into the clamp on the elbow. Bolt the **3 hp Blower** and **T-valve Assembly** to the **Blower Mounting** Bracket with the 5/16" Whiz Nuts and Bolts provided. Note: Not all holes on the blower or mounting bracket are used. Align the blower horizontally and vertically with the dryer. Tighten the bolts of the clamp to hold the elbow to the T-valve Assembly. Wire the **3 hp Blower Motor** according to the wiring diagram of the motor. Wire the 3 hp Blower Unit.



Several views of the installed 3 hp Blower on the Expanded Aspirator.



The Expanded Aspirator uses a modified fill hopper box to pull debris from the top auger as the dryer is loaded. Debris is pulled up from the fill box and then turned to fall to the T-valve Assembly. The blower then expels the particles to the cyclone for collection.



The Expanded Aspirator pulls from the top auger.

Mount the <b>Fill Hopper</b>	Remove the existing <b>Fill Hopper</b> and the <b>Top</b>	
Assembly.	Auger Cover directly in front of the hopper.	Contraction of the local division of the loc
	Bolt the Fill Hopper Assembly onto the top	
	auger at the same location as the original	121
	hopper box using the bolts that were removed.	
	Measure the space in front of the box.	Fill Hopper Box
	Cut the <b>Top Auger Cover</b> that was removed to this	length.
	Replace the modified <b>Top Auger Cover</b> onto the <b>To</b>	op Auger Housing.
Polt the Fill Honner Adapter	Bolt the <b>Fill Honner Adapter Weldment</b> to the	
to the <b>Fill Honner</b> Assembly	Fill Honnor Accomply using the 5/16" Whig	
to the <b>Fut Hopper</b> Assembly.	Nuts and Bolts provided.	
Install the 90° Elbow and 6''	Slide a 6" Compression Clamp over the Fill	
Compression Clamps to the	Hopper Adapter so the tube is inserted to the	1.5
Fill Hopper Adapter.	center of the clamp.	Concession of the local division of the loca
	Tighten the bolt closest to the fill hopper box to	
	hold the clamp in place.	1
	Insert a <b>90° Elbow</b> into the clamp, but leave loose.	90° Elbow and Clamps
	Slide another 6" Compression Clamp onto the elb	DOW.
	Tighten the bolt closest to the elbow to hold the clamp in place.	



pper Box

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Bolt the 8' Tube Weldment to the T-valve Assembly.	Bolt the <b>8' Tube Weldment</b> to the angle ring on top of the <b>T-valve</b> <b>Assembly</b> using the <b>5/16" Whiz</b> <b>Nuts and Bolts.</b> Slide a <b>6" Compression Clamp</b> onto the end of the <b>8' Tube</b> <b>Weldment</b> so the tube is inserted to the center of the clamp. Tighten the bolt closest to the pipe to hold the clamp in place.	
Install a 90° Elbow and a 6'' Compression Clamp onto the 8' Tube Weldment.	Insert a <b>90° Elbow</b> into the clamp at the top of the <b>8' Tube Weldment.</b> Leave the bolts loose to align the elbows on the top section. Completely slide a <b>6'' Compression</b> <b>Clamp</b> onto the end of the elbow until the end can be seen.	Tubing to the top.
Install the <b>27.5'' Tube Section</b> to complete the horizontal run of the top tubing sections.	Insert the <b>27.5</b> " <b>Tube Section</b> into the <b>6</b> " <b>Compression Clamp</b> on the elbow that is attached to the fill hopper box. Tighten the bolts on the clamp to hold the tube to the elbow. Align the <b>27.5</b> " <b>Tube Section</b> with the <b>90° Elbow</b> attached to the <b>8'</b> <b>Tube Weldment.</b> Center the <b>6</b> " <b>Compression Clamp</b> over the splice where the <b>27.5</b> " <b>Tube Section</b> and <b>90° Elbow</b> meet. Tighten the bolts of the clamp to hold the components in place.	
Check that all <b>6'' Compression</b> Clamp bolts are tight.	Check that all <b>6" Compression Clam</b> the correct position and the bolts are tig	<b>ps</b> that have been installed are in ht.



Closeup view of the two elbows at the top of the Expanded Aspirator.



The Aspirator utilizes a polyethylene cyclone to separate the removed particles from the airflow. A 3 foot section of tubing is designed into the exhaust tubing. This additional tubing provides clearance between the cyclone location and the side of the dryer. The extra clearance allows a wagon to be placed next to the dryer for collecting the material that falls from the cyclone's lower exit hole.



Basic Aspirator cyclone and exhaust tubing.

#### Attach the **Tubing Mounting Bracket** to the bulkhead of the dryer directly above the blower.



Blower with top cover.

Bolt the **6' Tube Weldment** onto the **3 hp Blower.** 

Install the U-bolts to the Tubing Mounting Brackets.



U-bolt installation.

Remove the bolts on the dryer that will hold the **Tubing Mounting Bracket.** 

Outside column: bolts 1 & 2 from the top of the vertical seam. Inside column: bolt 1 from the top of the inside vertical seam.

Attach the Tubing Mounting

**Bracket** to the bulkhead of the dryer using the bolts that were removed. Drill the last hole for the bracket using a **9/32**" drill bit.



Remove these bolts.

Secure with a 5/16" Self Tapping Screw.

Bolt the **6' Tube Weldment** to the discharge of the **3 hp Blower Unit** using the **5/16" Whiz Nuts and Bolts** provided.

Check that the **3 hp Blower Unit** has a top cover and that all bolts are installed.

Place the **U-bolts (2)** around the **6' Tube Weldment** and into the holes on the **Tubing Mounting Brackets**. Place two **U-bolt Nuts** onto each of the U-bolt threads so the nuts are on the inside of the **Tubing Mounting Bracket**.

Secure the **6' Tube Weldment** to the **Tubing Mounting Bracket** by running

the first nut down the threaded portion of the U-bolt. Tighten the second nut to lock the first nut in place.



U-bolt holding 6" tubing.

Install the <b>90° Elbow</b> .	Slide a <b>6" Compression Clamp</b> over the end of the <b>6' Tube</b> <b>Weldment</b> so the tube extends to the center of the clamp. Tighten the bolt closest to the tube to hold the clamp in place. Insert the <b>90° Elbow</b> into the clamp. Align the elbow so the tube runs perpendicular to the screen side of the dryer. Tighten the remaining clamp bolts to hold the elbow in place.
Install the 3' Tube Section.	Slide a <b>6" Compression Clamp</b> over the end of the <b>90° Elbow</b> so the elbow extends to the center of the clamp. Tighten the bolt closest to the elbow to hold the clamp in place. Insert the <b>3' Tube Section</b> into the <b>6" Compression Clamp.</b> Tighten the remaining clamp bolts to hold the tube in place.
Place the <b>Cyclone Assembly</b> onto the end of the <b>3' Tube</b> <b>Section</b> .	<ul> <li>Position the <b>6</b>" Compression Clamp on the Cyclone Assembly so half of the clamp is on the end of the tube.</li> <li>Tighten the bolt closest to the cyclone to hold the clamp in place.</li> <li>Position the Cyclone Assembly onto the end of the <b>3' Tube Section.</b></li> <li>Align the Cyclone Assembly vertically with the dryer.</li> <li>Tighten the remaining clamp bolts to hold the cyclone in place.</li> </ul>
Install the Cyclone Support.	<ul> <li>Bolt the Cyclone Support to the Cyclone Assembly using the 3/8" x</li> <li>4.00" Bolt and 3/8" Wide Flange Whiz Nut provided.</li> <li>Bolt the other end of the Cyclone Support to the closest bolt on the dryer that the support will reach when rotated to the dryer.</li> <li>Note: This bolt is usually the bolt directly above the Blower Mounting Bracket on the outer seam of the basket, however, a 9/32" hole may have to be drilled and a 5/16" Self Tapping Screw used to secure this support to the dryer.</li> </ul>



Basic Aspirator cyclone and exhaust tubing.



**Cyclone Assembly** 



Expanded Aspirator cyclone and exhaust tubing.

Bolt the 42.5" Tube Weldment onto the 3 hp Blower.	Bolt the <b>42.5</b> " <b>Tube Weldment</b> to the discharge of the <b>3 hp Blower</b> <b>Unit</b> using the <b>5/16</b> " <b>Whiz Nuts</b> <b>and Bolts</b> provided. Check that the <b>3 hp Blower Unit</b> has a top cover and that all bolts are installed.	
Install the 90° Elbow.	Slide a <b>6</b> " <b>Compression Clamp</b> over the end of the <b>6' Tube</b> <b>Blower with top cover.</b> <b>Blower with top cover.</b>	
Install the 3' Tube Section.	Slide a <b>6" Compression Clamp</b> over the end of the <b>90° Elbow</b> so the elbow extends to the center of the clamp. Tighten the bolt closest to the elbow to hold the clamp in place. Insert the <b>3' Tube Section</b> into the <b>6" Compression Clamp.</b> Tighten the remaining clamp bolts to hold the tube in place.	
Place the <b>Cyclone Assembly</b> onto the end of the <b>3' Tube</b> <b>Section.</b>	<ul> <li>Position the <b>6</b>" <b>Compression Clamp</b> on the <b>Cyclone Assembly</b> so half of the clamp is on the end of the tube.</li> <li>Tighten the bolt closest to the cyclone to hold the clamp in place.</li> <li>Position the <b>Cyclone Assembly</b> onto the end of the <b>3' Tube Section.</b></li> <li>Align the <b>Cyclone Assembly</b> vertically with the dryer.</li> <li>Tighten the remaining clamp bolts to hold the cyclone in place.</li> </ul>	

#### Installing the Cyclone Section Expanded Aspirator

The Aspirator utilizes a polyethylene cyclone to separate the removed particles from the airflow. A 3 foot section of tubing is designed into the exhaust tubing. This additional tubing provides clearance between the cyclone location and the side of the dryer. The extra clearance allows a wagon to be placed next to the dryer for collecting the material that falls from the cyclone's lower exit hole. Install the Cyclone Support.



Cyclone support bolt location.

Bolt the **Cyclone Support** to the **Cyclone Assembly** using the **3/8**" **x 4.00**" **Bolt** and **3/8**" **Wide Flange Whiz Nut** provided. Bolt the other end of the **Cyclone Support** to the closest bolt on the dryer that the support will reach when rotated to the dryer. *Note:* This bolt is usually the bolt directly above the Blower

te: This bolt is usually the bolt directly above the Blower Mounting Bracket on the inner seam of the basket, however, a 9/32" hole may have to be drilled and a 5/16" Self Tapping Screw used to secure this support to the dryer.



The Expanded Aspirator on the back of an Airstream 1122 Dryer.

### Control Option for the Aspirator

Use this diagram to install the Aspirator Control Option.

The Aspirator can be wired to the control circuits of the dryer. This wiring allows the Aspirator to run only when the augers of the dryer run. When the dryer experiences a safety shutdown, the Aspirator will shutdown also.



### **OPERATION**

Operating the Basic Aspirator.	The Basic Aspirator is designed to pull bees wings, chaff, and dust from the grain as the dryer discharges grain at the end of the drying process. The foreign material is in its lightest state and is easily removed. The Aspirator utilizes a vacuum force to create suction on the discharge auger box. This suction force carries the debris from the discharge, through the settling chamber and fan, and expels it through the cyclone.
Test the system.	The Aspirator unit should be tested upon completion of the assembly and wiring process. It should also be tested at the beginning of every operating season. For safety reasons the dryer should not be running during this check. Stop the dryer. Lockout power to all components except the <b>3 hp Blower Unit</b> . Check that all bolts and clamps are in place. Check that the motor is wired correctly. Close the <b>Butterfly Vent</b> . Start the Blower. Check that air is being pulled out of the discharge. Check that air is being vented out of the cyclone. Open the <b>Butterfly Vent</b> . If air is not moving freely through the components, THEN check for leaks or a blockage in the tube.
Basic Operation.	Run the <b>Basic Aspirator Unit</b> when the dryer is in operation. <i>Open</i> the <b>Butterfly Vent</b> to <i>decrease</i> the suction force at the discharge auger box. <i>Close</i> the <b>Butterfly Vent</b> to <i>increase</i> the suction force at the discharge auger box.
Periodic Maintenance.	Check the component parts periodically for wear and for the buildup of material. Components free of buildup work more efficiently and last longer. Replace worn out parts to obtain the best operating performance.

Operating the Expanded Aspirator.	The Expanded Aspirator is designed to pull bees wings, chaff, and dust from the grain during filling and emptying of the dryer. The Aspirator utilizes a vacuum force to create suction on the fill and discharge auger boxes. This suction force carries the debris from the dryer through the T-valve and fan, and expels it through the cyclone.
Test the system.	The Aspirator unit should be tested upon completion of the assembly and wiring process. It should also be tested at the beginning of every operating season. For safety reasons the dryer should not be running during this check. Stop the dryer. Lockout power to all components except the <b>3 hp Blower Unit</b> . Check that all bolts and clamps are in place. Check that the motor is wired correctly. Close the <b>Butterfly Vent</b> . Start the Blower. Check that air is being pulled out of the discharge. Check that air is being pulled out of the fill hopper box. Check that air is being vented out of the cyclone. Open the <b>Butterfly Vent</b> . Check that air is flowing into the vent. IF air is not moving freely through the components,
	THEN check for leaks or a blockage in the tube. Check that the T-valve rotates freely and provides proper settings.
Expanded Operation.	Run the <b>Expanded Aspirator Unit</b> when the dryer is in operation. <i>Open</i> the <b>Butterfly Vent</b> to <i>decrease</i> the suction force at the discharge auger box. <i>Close</i> the <b>Butterfly Vent</b> to <i>increase</i> the suction force at the discharge auger box.
T-valve Control Settings.	Align the arrow on the inner can with the word <b>"BOTH"</b> on the outer can to provide suction to both the top and the bottom. Align the arrow on the inner can with the word <b>"TOP"</b> on the outer can to provide suction to the top only. Align the arrow on the inner can with the word <b>"BOTTOM"</b> on the outer can to provide suction to the bottom only.
Periodic Maintenance.	Check the component parts periodically for buildup of material or excessive wear. Components free of buildup work more efficiently and last longer. Replace worn out parts to obtain the best operating performance.

# CAUTION

Do not vacuum dense objects such as rocks into the Aspirator. These objects will cause damage to the fan and to the dryer unloading equipment. Inspect the components of the Aspirator for damage immediately if this does occur.

Operating the Basic	The Basic Aspirator Vacuum Kit provides a convenient method of	
Aspirator Vacuum Kit.	cleaning the inside of the dryer plenum and the area around the outside of the dryer.	
Close the <b>Slide Plate</b> .	To use the vacuum kit: Attach the <b>Vacuum Hose</b> to the <b>Vacuum Hose Adapter</b> . Close the <b>Slide Plate</b> located on the side of the <b>Settling</b> <b>Chamber</b> . The slide plate isolates the suction force to the vacuum hose for maximum vacuum performance.	

Operating the Expanded Aspirator Vacuum Kit.	The Basic Aspirator Vacuum Kit provides a convenient method of cleaning the inside of the dryer plenum and the area around the outside of the dryer.
Close the Slide Plate.	To use the vacuum kit: Attach the <b>Vacuum Hose</b> to the <b>Vacuum Hose Adapter</b> . Close the <b>Slide Plate</b> located on the side of the <b>Settling</b> <b>Chamber</b> . The slide plate isolates the suction force to the vacuum hose for maximum vacuum performance.
Set the <b>T-valve</b> for "Bottom Only" operation.	Rotate the <b>T-valve Inner Can</b> so the arrow is aligned with the word <i>"BOTTOM"</i> on the outer can. This isolates the suction forces to the bottom half of the Expanded Aspirator.

The motors used in the Airstream Aspirator units are all standard NEMA frame motors and are specially designed for use in crop drying applications. Most replacement parts for these motors are handled by authorized service centers of the various motor manufacturers. Remember these important points when servicing an electric fan.



1. Always disconnect and lock out power BEFORE working on or around fan motor and electrical components.

**2.** Malfunctioning electrical components should be checked by a qualified electrician.

**3.** For extra motor life, any electric motor should be run once a month for 30 minutes. This will help eliminate any damaging moisture build-up in the motor and bearings.

**4.** If excess vibrations show up at some point when the fan has been running smoothly, check the blade for these possible conditions.

**A.** Fans setting idle in the summer offer an excellent place for mud dobbers to build their nests. A mud dobber nest on the back of the fan blade will cause the fan to be out of balance and vibrate.

**B.** Mice have been known to nest in the back of a blade. When the fan is started, the centrifugal force kills the mouse and throws the blade out of balance.

#### NOTE: Hub bolt torque requirement for fan blade.

3 hp fan blade.....63 ft lbs. (Trantorque)

### TROUBLESHOOTING

#### **Fan Service**

SYMPTOM	POSSIBLE CAUSE	REMEDY
Fan will not run	Blown fuse or breaker in disconnect switch.	Replace fuses or reset breakers.
	Main power not turned on	Turn power on at all. disconnects ahead of the unit.
	Defective wiring or loose connection	Follow wiring diagram and tighten any loose connections.
	Incorrect wire size	See wire size chart for proper wire size and change if needed
	Overload kicked out	Check manual reset, push in to reset.
	Defective motor	Replace motor.
	Defective magnetic contactor	Check the magnetic contactor.
Fan runs for a short period of time then it shuts off	Undersized wiring	Check to see that power supply wires are the proper size, contact your local power company.
	Low line voltage at the installation. Power failure.	Call power company after making sure wire size is correct.
	Magnetic contactor malfunctioning.	Change magnetic contactor.
	Wrong heater strip	Replace with proper heater strip.
Fan vibrates.	Fan not mounted securely to mounts.	Mount fan securely
	Fan has dirt deposits on blade.	Clean blade.
	Motor shaft bent.	Replace motor.
	Blade not properly mounted on shaft.	Mount blade properly on shaft.
	Blade out of balance.	Replace or have blade balanced.
Fan makes ticking noise.	Motor bearing bad	Replace motor bearing.
	Fan blade hitting fan housing	Stop fan and turn off power. Remove motor and blade assembly from the housing. Check for rub marks on blade and fan housing. Adjust motor for proper clearance.

#### **Aspirator Service**

SYMPTOM	POSSIBLE CAUSE	REMEDY
Grain being pulled into the system.	Suction too great on discharge box.	Open butterfly valve on settling chamber to let more fresh air in
No debris exits cyclone.	Excessive buildup in cyclone. Blocked tube or restricted tube. Fan not operating correctly	Clean inside of cyclone. Check tubes and clean if blocked. Check fan for proper rotation and speed.
Expanded Aspirator does not pull from desired locations.	T-valve control is not set correctly. T-valve may have excessive buildup of dirt.	Rotate the T-valve to correct location. Remove Inner Can and clean parts thoroughly.

#### **Basic Aspirator (PGC-1) Parts List**

Quantity	Component	Description
1	CD-0439	3 hp Blower Unit Less Motor
1	CD-0438	3 hp Blower Fan Housing Assembly
1	CD-0444	3 hp Blower Blade Assembly
1	CD-0473	Inlet Tube Weldment
1	D01-1263	Discharge Box Side, Straight Discharge
1	D01-1267	Blower Mounting Bracket
1	D01-1268	Tubing Mounting Bracket
1	D01-1269	6' Pipe Section Weldment
1	D01-1270	3' Pipe Section
1	D01-1272	Cyclone Support
1	D01-1390	Discharge Box Side, Flanged Discharge
2	D03-0278	6" Compression Coupling
1	D03-0279	6" 90° Elbow
1	D03-0286	Grille Vent with Gasket
1	D04-0130	Cyclone Assembly
1	CD-0459	11.688" Tube
1	D01-1295	Cyclone PVC Shim (6" OD)
1	D01-1332	Cyclone Wear Plate
4	D03-0158	Bolt, 5/16-18x3/4 SS Whiz-LK
4	D03-0159	Nut, 5/16-18 Flanged Whiz SS
1	D03-0272	Cyclone
1	D03-0278	6" Compression Coupling
3	S-6495	
3	S-7335	Screw, 1/4" X 3/4" self Drill TEK
1	5-7221	Discharge Side Chute Assembly
1		Discharge Side Chute Assembly
1	D01-1391	Discharge Side Chute Bollom
1	D01-1392	Dischargo Sido Chuto I H Sido
1	D01-1393	Discharge Side Chute BH Side
1	D01-1394	Discharge Side Chute Bypass Plate
14	S-3611	Nut 5/16-18 Flanged Whiz
14	S-6606	Bolt 5/16-18x3/4 HHW HD Gr 5
18	S-7176	Huck Bolt
18	S-7177	Huck Collar
1	D04-0181	Settling Box Assembly
1	D01-1396	Settling Box Fan Side
1	D01-1397	Settling Box Top Side
2	D01-1398	Settling Box Cover Plate
1	D03-0286	Grille Vent w/Gasket
1	DC-592	Decal, GSI Logo for Dryer
54	S-2606	Screw, #6-32x3/8 Phillips Pan Head
1	PNEG-577	Manual, Airstream Aspirator
42	S-3611	Nut, 5/16-18 Flanged Whiz
2	S-6501	Bolt, 3/8-16x4" HH Tap Bolt
42	S-6606	Bolt, 5/16-18x3/4 Hex Washer HD
4	S-6495	Screw, 5/16-18x3/4 HH Type "F"
2	S-7936	U-bolt, 5/8-11x6
4	5-968	NUT, 3/8-16 WIDE Flange Whiz Lock
	Motors	
	FH-5474	Motor 3 hp single phase 60 Hz 115-208/230 volt
	FH-5475	Motor, 3 hp three phase 60 Hz 208-230/460 volt
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#### Expanded Aspirator (PGC-2) Parts List

Quantity	Component	Description
1	CD-0439	3 hp Blower Unit Less Motor
1	CD-0438	3 hp Blower Fan Housing Assembly
1	CD-0444	3 hp Blower Blade Assembly
1	D01-1236	Fill Hopper Adapter Weldment
1	D01-1263	Discharge Box Side
1	D01-1267	Blower Mounting Bracket
1	D01-1270	3' Pipe Section
1	D01-1272	Cyclone Support
1	D01-1283	8' Tube Weldment
1	D01-1285	42.5" Tube Weldment
1	D01-1293	27.5" Tube Section
1	D01-1417	Settling Box Adpater Tube
8	D03-0278	6" Compression Coupling
4	D03-0279	6" 90° Elbow
1	D04-0100	Fill Hopper Assembly
1	D04-0101	T-valve Assembly
1	D04-0130	Cyclone Assembly
1	CD-0459	11.688" Tube
1	D01-1295	Cyclone PVC Shim (6" OD)
1	D01-1332	Cyclone Wear Plate
4	D03-0158	Bolt, 5/16-18X3/4 SS Whiz-LK
4	D03-0159	Nut, 5/16-18 Flanged Whiz 55
1	D03-0272	Cyclolle 6" Compression Coupling
3	DU3-0278	Scrow 5/16-18x3/4 HH Type "E"
3	3-0495 S-7335	Screw, $3/10-1000/4$ mm type 1 Screw, $1/4" \times 3/4"$ solf Drill TEK
3	S-7000	Screw 5/16x3/4 Type "AB" self
1	D04-0171	Discharge Side Chute Assembly
. 1	D01-1391	Discharge Side Chute Bottom
1	D01-1392	Discharge Side Chute Back
1	D01-1393	Discharge Side Chute LH Side
1	D01-1394	Discharge Side Chute RH Side
1	D01-1395	Discharge Side Chute Bypass Plate
14	S-3611	Nut 5/16-18 Flanged Whiz
14	S-6606	Bolt 5/16-18x3/4 HHW HD Gr. 5
18	S-7176	Huck Bolt
18	S-7177	Huck Collar
1	D04-0181	Settling Box Assembly
1	D01-1396	Settling Box Fan Side
1	D01-1397	Settling Box Top Side
2	D01-1398	Settling Box Cover Plate
1	D03-0286	Grille Vent w/Gasket
1	DC-592	Decal, GSI Logo for Dryer
54	S-2606	Screw, #6-32x3/8 Phillips Pan Head
1	PNEG-577	Manual, Airstream Aspirator
60	S-3611	Nut, 5/16-18 Flanged Whiz
4	5-6501	Doll, $3/6 - 10x4$ HT Tap Doll Bolt $5/16$ $18x2/4$ Hey Weeber HD
2	5-6606	Borow 5/16 19x2/4 HU Tupo "E"
4	S-0495	3/8-16 Wide Elange Whiz Lock
7	0-900 I	ore to while hange while LOOK
	Motors	
	FH-5474	Motor, 3 hp single phase 60 Hz 115-208/230 volt
	FH-5475	Motor, 3 hp three phase 60 Hz 208-230/460 volt

#### Fill Hopper Assembly Parts List (D04-0100)

Quantity	Component	Description
2	D01-0118	Fill Hopper End
2	D01-1230	Fill Hopper Box Side
1	D01-1231	Fill Hopper Box Top
1	DC-455	Decal, Danger Rotating Auger
19	S-3550	Bolt, 5/16-18x1 Carriage
19	S-5220	Nut, 5/16-18 Hex 3 way Lock
8	S-6495	Screw, 5/16-18x3/4 HH Type "F"
6	S-6497	Screw, 1/4-20x3/4 HWH TEK

#### **T-valve Assembly Parts List (D04-0101)**

Quantity	Component	Description
1	D01-1238	T-valve Outer Can Handle End
1	D01-1247	T-valve Inner Can Weldment
1	D01-1248	T-valve Outer Can Weldment
1	PR-331	Peak Cap Handle
10	S-3611	Nut, 5/16-18 Flanged Whiz
10	S-6606	Bolt, 5/16-18x3/4 Hex Washer Head

#### Basic Vacuum Hose Kit Parts List (PGC-1-VAC)

Quantity	Component	Description
1	CD-0450	Vacuum Hose Adapter Weldment
1	D01-1274	Slide Plate
2	D01-1275	Slide Valve Spacer
25	D03-0277	Hose, Vacuum 2" ID / foot
1	D03-0292	Coupling, 2" Hose End
8	S-3611	Nut, 5/16-18 Flanged Whiz
8	S-6606	Bolt, 5/16-18x3/4 Hex Washer Head

#### Expanded Vacuum Hose Kit Parts List (PGC-2-VAC)

Quantity	Component	Description
1	CD-0452	Vacuum Hose Adapter Weldment
1	D01-1274	Slide Plate
2	D01-1275	Slide Valve Spacer
25	D03-0277	Hose, Vacuum 2" ID / foot
1	D03-0292	Coupling, 2" Hose End
8	S-3611	Nut, 5/16-18 Flanged Whiz
8	S-6606	Bolt, 5/16-18x3/4 Hex Washer Head

1 p	hase	Control	Option	Kit	Parts	List	(D04-0132	2)
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Quantity	Component	Description
1	D04-0004	Breaker, 60amp 2 pole Circuit
1	D04-0009	Breaker, 2 pole Circuit Mounting Plate
1	FH-1003	Overload, CR124C028 w/CR124C026
2	FH-5443	Heater Strip, GE #C214B
4	FH-7031	Disconnect, 0.25 Insulated Female CSA
1	HH-1162	Contactor, GE # CR353FF2BA1BB
10	S-1158	Screw, #8-32x1/2 Phillips Pan Head
2	S-7128	Disconnect, 0.25 Double Male Single
6	WR-10BK	Wire, 10 gauge Stranded MTW Black
3	WR-20OR	Wire, 20 gauge Stranded MTW Orange
3	WR-20WH	Wire, 20 gauge Stranded MTW White

#### 3 phase 240 volt Control Option Kit Parts List (D04-0133)

Quantity	Component	Description
1	D04-0009	Breaker, 2 pole Circuit Mounting Plate
1	D05-0002	Overload, Relay Block 27amp 3ph
1	D35-0002	Breaker, 60 amp Circuit 3 pole 240 volt
1	D65-0003	Contactor, 60 amp 3 pole 115 volt Coil
3	FH-5735	Heater Strip, GE #C104B
4	FH-7031	Disconnect, 0.25 Insulated Female CSA
10	S-1158	Screw, #8-32x1/2 Phillips Pan Head
2	S-7128	Disconnect, 0.25 Double Male Single
9	WR-10BK	Wire, 10 gauge Stranded MTW Black
3	WR-20OR	Wire, 20 gauge Stranded MTW Orange
3	WR-20WH	Wire, 20 gauge Stranded MTW White

#### 3 phase 380 volt Control Option Kit Parts List (D04-0134)

Quantity	Component	Description
3	D03-0015	Heater Strip, GE #C592A
1	D03-0132	Breaker, Circuit 50 amp 3 pole
1	D04-0009	Breaker, 2 pole Circuit Mounting Plate
1	D05-0002	Overload, Relay Block 27amp 3ph
1	D05-0003	Contactor, 40 amp 3 phase 115 volt Coil
4	FH-7031	Disconnect, 0.25 Insulated Female CSA
10	S-1158	Screw, #8-32x1/2 Phillips Pan Head
2	S-7128	Disconnect, 0.25 Double Male Single
9	WR-10BK	Wire, 10 gauge Stranded MTW Black
3	WR-20OR	Wire, 20 gauge Stranded MTW Orange
3	WR-20WH	Wire, 20 gauge Stranded MTW White

### PARTS

### 3 phase 460 volt Control Option Kit Parts List (D04-0135)

Quantity	Component	Description
1	D03-0132	Breaker, Circuit 50 amp 3 pole
1	D04-0009	Breaker, 2 pole Circuit Mounting Plate
1	D05-0002	Overload, Relay Block 27amp 3ph
1	D05-0003	Contactor, 40 amp 3 phase 115 volt Coil
3	FH-5736	Heater Strip, GE #C526A
4	FH-7031	Disconnect, 0.25 Insulated Female CSA
10	S-1158	Screw, #8-32x1/2 Phillips Pan Head
2	S-7128	Disconnect, 0.25 Double Male Single
9	WR-10BK	Wire, 10 gauge Stranded MTW Black
3	WR-20OR	Wire, 20 gauge Stranded MTW Orange
3	WR-20WH	Wire, 20 gauge Stranded MTW White

### AIRSTREAM GRAIN CONDITIONING SYSTEMS





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