CB PNEUMATICS

APLINGTON, IA

Operator's Manual

Grain Vac Systems

Model# CB68MTO

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1. Introduction

1.1. Message From The Manufacturer

Our team at Custom Built Pneumatics thanks you for your purchase of our PTO driven grain vac system. We strive to provide you with the best grain vaccing experience possible. Each vac is custom made in the USA with quality, durability, and serviceability in mind. With over 40 years of experience manufacturing pneumatics systems and over 20 years of experience in the grain handling industry, we know what it takes to keep grain vacs running safely and efficiently.

To get the most out of your grain vac system, we **HIGHLY** recommend reading over this manual start to finish **BEFORE** operating. You will find helpful information on safety, operation, and maintenance all vitally important to operating your system.

1.2. Serial Number Registration

System Serial Number .....

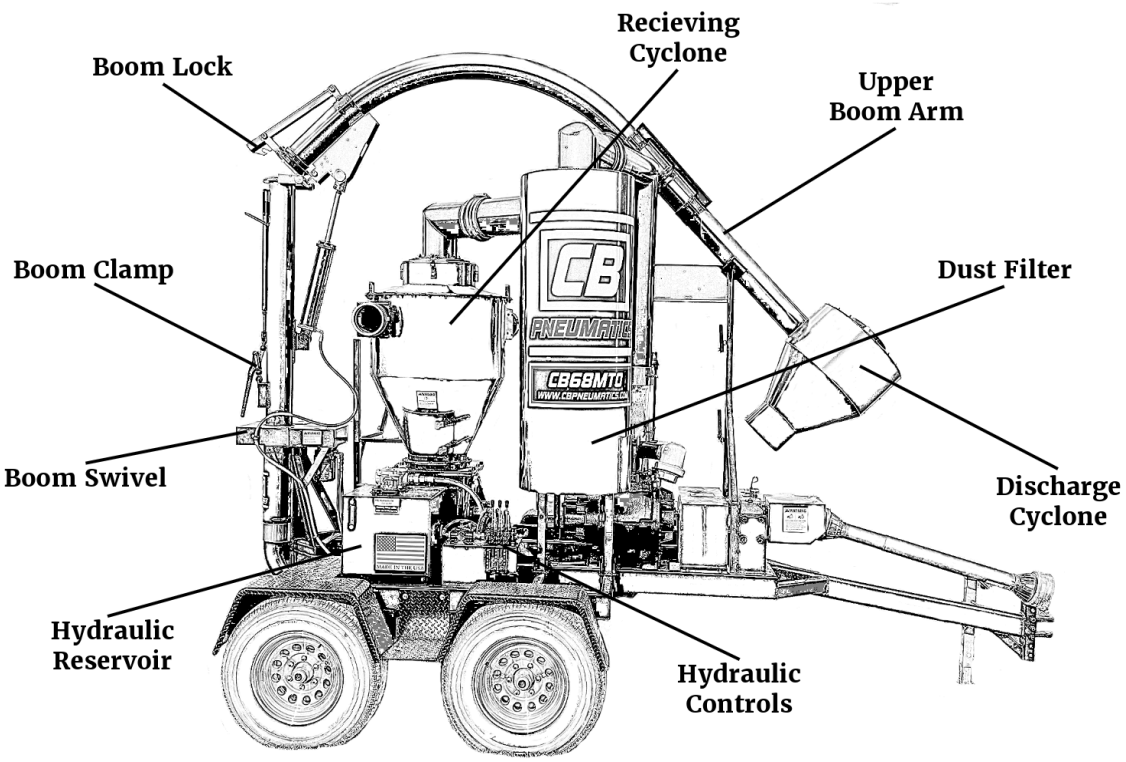
Pump Drive Serial Number .....

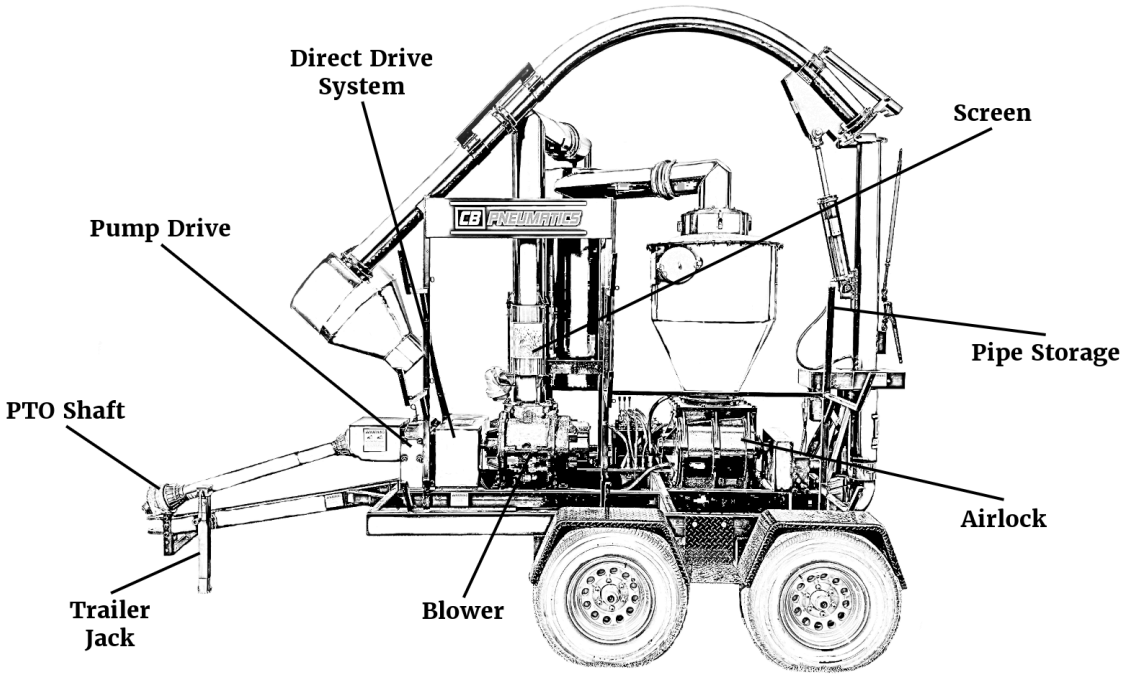
Blower Serial Number .....

Airlock Serial Number .....

Clutch Serial Number .....

1.3. Components Overview





1.4. System Specifications

PTO RPM..... 1000 RPM
System RPM..... 1800 RPM
Bushel Per Hour..... 4000 BPH*APR*
Decibels..... 88 DB
Length..... 15’ 5”
Width..... 8’ 2”
Transport Height..... 12’ 2”
Loading Clearance..... 12’ 4”
Weight..... 5450 LBS
Tongue Weight..... 1080 LBS
Tire Size..... 235/80 R16
Tire Pressure..... 80 PSI

1.5. Storage

1. Store each system in an area with no human activity.
2. Do not allow children to play on or around the stored system.
3. To ensure the longest life possible, store your system in a dry area.
4. Make sure you store your system on a level surface.
5. Trailer jack should be placed upright on a solid surface.
6. Place wheel chock in front and behind the driver side and passenger side tires.

2. Safety

2.1. Safety Signals, Symbols, and Decals

Custom Built Pneumatics is dedicated to the safety of grain vac operators and the prevention of accidents involved in the use of grain vacs. Safe and proper use of this system will help prevent accidents. Make sure that anyone who plans on operating, maintaining, or servicing your CB68MTO has read through this manual before handling this system.

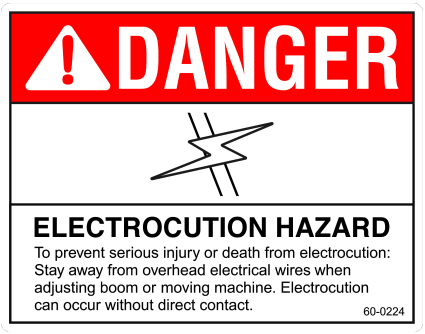
 This Safety Alert Symbol identifies important safety messages in regards to your CB68MTO. Be attentive and alert whenever you see this symbol, your safety is involved. There are 3 signal words to be aware of when looking at potential hazards.

Danger
- An immediate hazardous situation that could result in serious personal injury or death if not avoided.

Warning
- A hazardous situation that could result in serious personal injury or death if not avoided.

Caution
- A hazardous situation that could result in moderate injury or the damage to personal property.

Remember Safety Alert Signals are there to help you avoid and prevent accidents. On the next page you will see all the Safety Alert Signals on your grain vac system and where each one is located. These symbols can be located in multiple different areas.



Electrocution Hazard Decal Locations
- Hydraulic Controls
- Loading Arm Latch
- Discharge Cyclone

Shield Hazard Decal Locations
- Direct Drive Shaft
- Airlock Drive Shaft
- Loading Arm Swivel

Open Filter Warning Decal Location
- Dust Filter

Rotating Airlock Hazard Decal Location
- Receiving Cyclone

Rotating Part Hazard Decal Locations
- Airlock Drive Chain
- Loading Arm Swivel Chain

Rotating Shaft Hazard Decal Locations
- PTO Shield Cover

1000 RPM Max Decal Location
- PTO Shield Cover

If any of these decals are damaged, unreadable, or removed, call the manufacturer to get replacement decals.

2.2. Personal Protective Equipment

Hearing Protection
-Wear hearing protection to help prevent hearing damage.

Hard Hat
- Wear a hard hat to help protect your head.

Safety Glasses
- Wear safety glasses to help protect your eyes from debris.

Protective Boots With Slip Resistant Soles
- Wear protective boots to help protect your feet from falling objects.

Work Gloves
- Wear work gloves to help protect your hands from sharp or rough objects.

Respirator
- Wear a respirator to help protect your lungs from dust and harmful fumes.

2.3. General Safety

As the owner of this grain vac system, **YOU** are responsible for the **SAFE** operation, maintenance, and service of your CB Pneumatics CB68MTO. It is **YOUR** responsibility to ensure that **YOU** and **EVERYONE ELSE** who will operate or maintain this system is familiar with all procedures and safety information contained in this manual.

Remember, **YOU** are the key to **SAFETY**. Establishing good safety practices not only protects you, but also the people around you. For safer operation, make the following practices part of your safety program.

1. It is the responsibility of the equipment owner, operators, and maintenance personnel to read and understand all safety, operation, maintenance, and service sections of this manual prior to handling this system.

2. The owner of this system must give initial and annual instructions to all personnel before allowing them to operate this system. All untrained operators pose a serious risk of injury or death not only to themselves, but to others.

3. Under no circumstances should you modify this system without the written consent of the manufacturer. Unauthorized modification to this system may impair the function and/or safety of this system. Any modifications made to this system without the written consent of the manufacturer will void the warranty.

4. Use this system for its intended use only.

5. In case of an accident or emergency, always have a first aid kit and fire extinguisher present when operating the system.

6. All individuals under the age of 18 years old should not operate this system.

2.4. Operating Safety

1. Read through and understand the owner's manual and all safety signs before operating this system.

2. Shut down and lock out all power before maintaining or adjusting equipment.

3. Ensure you are wearing all necessary PPE and never wear loose fitted clothing.

4. Park on reasonably level ground and chock wheels after placement.

5. Do not operate if any of the guards, covers, or shields have been removed.

6. Do not operate if the PTO driveline guard is not telescoping or rotating freely on the PTO shaft.

7. Keep hands, feet, hair, and clothing away from all rotating and moving parts.

8. Use extreme caution when maneuvering around the PTO shaft.

9. Clear the area of all bystanders prior to starting the power unit.

10. Do not allow riders on the machine at any time.

11. Have an additional trained individual nearby to shut off the system in case of an emergency.

12. Never operate the power unit inside of a closed building.

13. Know where all overhead electrical lines and wires are located prior to lifting the boom up. Electrocution can occur without direct contact.

14. Stay clear of the unloading arm when adjusting or moving into position.

15. Do not operate if there are leaks in the hydraulic system.

16. Do not place the intake nozzle under or by feet when standing on top of grain.

17. Review all safety instructions with operators annually.

2.5. Hydraulic Safety

1. Ensure all components are clean and kept in good condition.

2. Immediately replace any worn, cut, abraded, flattened, or crimped hoses and metal lines.

3. Before working on the hydraulic system, relieve pressure.

4. Before applying pressure to the hydraulic system, make sure all components are tight and the lines, fittings, and hoses are not damaged.

5. Wear hand and eye protection when searching for hydraulic system leaks.

6. Always properly repair your hydraulic system. Do not attempt to fix hydraulic lines, fittings, and hoses with tape, clamps, or cements.

7. Seek professional medical attention if injured by a concentrated high pressure stream of hydraulic fluid.

2.6. Transportation Safety

1. Check to make sure you are compliant with all local laws, rules, and regulations for transporting agricultural equipment on all roads and highways.

2. Use a proper vehicle capable of moving your system.

3. Do not attempt to move the system manually. Serious injury can occur.

4. Insure systems wheel bolts are torqued at 110-120 FT/LBS (149-163 Nm).

5. Make sure the PTO shaft is properly secured to the unit or remove PTO shaft for transport.

6. Attach system to towing vehicle with proper pin and safety chains. You must use a hitch pin that will not allow separation from the towing vehicle during transport.

7. Do **NOT** transport with the boom arm extended. Boom must be securely attached with the ratchet system before moving.

8. Always be aware of overhead obstructions and power lines. Electrocution can occur without direct contact.

9. Do not allow riders on the machine while transporting.

10. Never transport faster than the recommended speed of the roadway or what road surface conditions permit for safe towing.

11. If transporting at speeds lower than 40 MPH, attach a slow moving vehicle sign to the system. Always use hazard warning flashers on towing vehicles when transporting at low speeds.

2.7. Maintenance Safety

1. Read through and understand the owner's manual and all safety signs before maintaining your system.

2. Make sure your working area is clean, dry, and has adequate lighting.

3. Ensure there are no bystanders when carrying out maintenance and repairs.

4. Do not modify any parts or components without the authorized consent of the manufacturer. Modifications can be dangerous and cause serious injury.

5. Only use genuine OEM replacement parts when maintaining your system. Use of unauthorized parts and fluids could void the warranty. Contact the manufacturer with any parts or fluids questions.

6. Use proper tools, jacks, stands, hoists, and lifts of sufficient capacity for the task you are performing.

7. Always support the system with blocks or safety stands when changing tires or working beneath the system.

8. The power unit must be shut off and locked out before maintaining, adjusting, or servicing the unit.

9. Before applying pressure to the hydraulic system, check all lines, fittings, and couplers to make sure they are tight and in good condition.

10. After maintenance, make sure all guards, doors, and shields are in place and properly secured before operation.

11. Keep hands, feet, hair, and clothing away from all rotating and moving parts.

3. Operation

3.1. Attaching/ Detaching

1. Clear the area of all bystanders and foreign objects from the working area prior to attaching the grain vac to the tractor.
2. Ensure there is room to back up the tractor to the hitch point.
3. Start the tractor and slowly back up to the hitch point.
4. Shut down the engine, remove the key, and lock out the engine.
5. Position the drawbar to align the hitch pin hole with the drawbar pin hole.
6. Lower the hitch pole with the jack up or down to align the pin holes.
7. Place a hitch pin into the pin holes. Use a Klik pin to secure the connection.
8. Inspect the PTO driveline guard to ensure it is telescoping and rotating freely on the PTO shaft.
9. Attach the driveline to the tractor. Be sure the PTO shaft is locked into position.
10. Connect the anchor chain between the shield on the PTO shaft and the frame.
11. Place the hitch jack in the stowed position by raising the jack and rotating it 90 degrees.
12. To detach the grain vac from the tractor, reverse the steps shown above.

3.2. Pre-Operational Checklist

Pre-operational inspections of your system are vital to the function and longevity of your unit. All operators of the CB68MTO must read and understand the safety standards and operational procedures of this section. Before operating, make sure you check all items in the checklist below.

1. Inspect the PTO driveline guard to ensure it is telescoping and rotating freely on the PTO shaft.

2. Ensure the vac system is properly attached to the tractor.

3. Make sure all safety shields, guards, and doors are properly secured or fastened.

4. Ensure system tire pressure is inflated to system specifications.

5. Check gaskets and clamps on the receiving cyclone, dust filter, and boom to ensure proper system seal.

6. Check pump drive fluid levels.

7. Ensure the screen above the blower is clean.

8. Make sure the dust filter is empty.

9. Check the lubricant level in the sight glass of the blower reservoir.

10. Ensure the blower gearcase breather is free of debris.

11. Ensure relief valves for the blower are tight.

12. Inspect the hydraulic hoses and fittings to ensure they are in good condition.

13. Check hydraulic fluid levels.

3.3. Positioning and Setup

For optimum performance, it is recommended that you place your system no further than 25 feet away from the storage facility. The farther from the storage facility your system is positioned, the lower your BPH (bushel per hour) capacity will be.

1. Clear the area of all bystanders.

2. Ensure the area you select has enough room for you to operate your system comfortably and provides enough clearance for your truck or wagon to get in position under the discharge cyclone.

3. Position the unit 10-25 feet from the storage facility on reasonably level ground.

4. Chock wheels to ensure the trailer is stable and will not move.

5. Place a cam lock cap and lock the receiving cyclone cover, opposite of the storage facility.

6. Attach the appropriate amount of piping and fittings to the receiving cyclone intake with the coupler system.

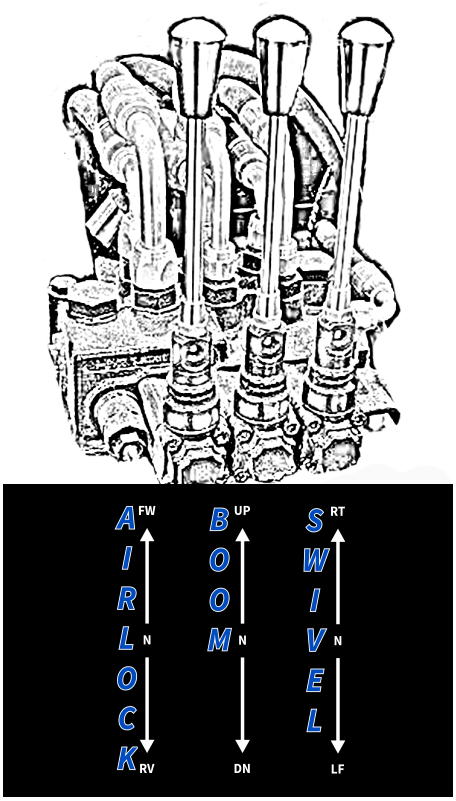
7. Take off the ratchet strap on the discharge cyclone.

8. Start the tractor and engage the PTO at idle. Raise the upper boom arm with the hydraulic system. Do not throttle up the engine at this time. Once the upper boom arm is raised, use the boom clamp and lock the boom into place. (Stay clear of overhead wires to prevent electrocution.)

9. After the boom arm is locked in place, use the hydraulic system to position the discharge cyclone for loading your truck or wagon.

3.4. Controls

To operate the hydraulic system, turn on the tractor and engage the PTO in idle. On older tractors, you may need to slightly increase RPM's to use the hydraulic system. The hydraulic system controls the airlock, lifting the boom, and rotating the boom.



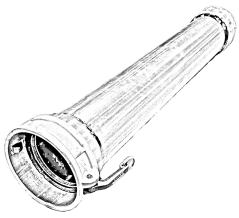
Airlock
- To start the rotation of the airlock, push the left lever forward. To stop the airlock, pull back to center. In case of obstruction, pull lever backward to reverse airlock.

Boom
- To raise the boom arm up, push the center level forward. To lower the boom arm, pull the lever backward. Do not rotate the boom over 270 degrees in any direction.

Swivel
- To rotate the boom clockwise, push forward on the right lever. To rotate the boom counterclockwise, pull the lever backwards.

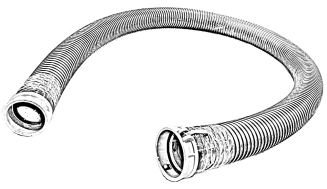
3.5. Piping and Piping Set-up

Below are the pipes, hoses, and nozzles we recommend having on the job site.

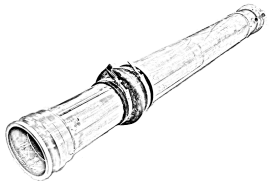


Straight Aluminum Piping

Stainless Steel Flex Piping

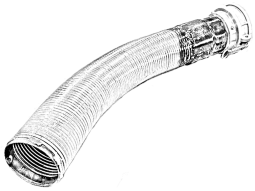


Rubber Clean Up Hose

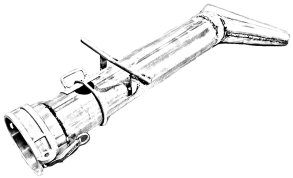


5-8 FT Telescoping Pipe

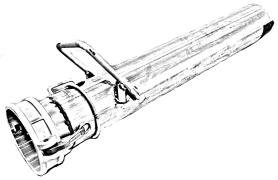
Adjustable Air Door



Stainless Steel Flex Nozzle



Clean Up Nozzle



Straight Round Nozzle

Using the correct piping is very important for the overall output of your grain vac system. Following these steps will help increase the overall efficiency of the system.

1. Do not attempt to connect piping while the system is running.

2. Position your system following the steps provided on page 16. If you do not have a telescoping pipe and are vaccing from outside the storage facility, insert the flex nozzle into the storage facility prior to finalizing your position.

3. Attach a Stainless Steel Flex Pipe to the receiving cyclone.

4. Connect the appropriate distance of Straight Aluminum Piping to get you to the storage facility. Include your Telescoping Pipe in this section if applicable.

5. Attach the Adjustable Air Door to the Straight Aluminum Pipe or the Telescoping Pipe.

6. Connect the Flex Nozzle to the Adjustable Air Door and position the Flex Nozzle in the storage facility.

7. Once complete, use the steps found in System Operation to adjust the air door.

8. To add piping when going into a storage facility, shut off the system. Always use safe practices when entering and operating the vac system inside of a storage facility.

9. Detach the Telescoping Pipe, Air Door, and Flex Nozzle.

10. Attach Straight Aluminum Pipe 1-3 feet into the storage facility entrance.

11. Attach a Stainless Steel Flex Pipe as the first pipe in the storage facility.

12. Connect your Rubber Clean Up Hose and attach the Straight Round Nozzle for materials in large piles or your Clean Up Nozzle for small piles and storage facility floor. Each of these nozzles has a built-in adjustable air door.

13. In large storage facilities you may need to add more Straight Aluminum Piping before attaching your Rubber Clean Up Hose.

3.6. System Operation

1. Ensure the area is clear of all bystanders before starting.

2. Go over the pre-operation checklist.

3. Make sure the system is properly positioned and set up.

4. Make sure you have the proper piping placed for the job at hand.

5. After starting the tractor and engaging the PTO to position the boom arm, use the hydraulic system to start the rotation of your airlock. Do not engage the airlock if the receiving cyclone or dust filter doors are open.

6. Check to make sure the air door on your piping system is wide open.

7. Slowly throttle up the tractor till you reach 1000 RPM and start material intake.

8. Slowly close the air door until the system starts to make a pulsating noise. Once you hear the pulsating, stop closing the air door and slightly open till the pulsating stops.

9. After every 3,000 bushel (approximately 45 minutes), clean out the dust filter.

10. Open the dust filter door to remove the dust from the system. Make sure the door is sealed when done and continue operating.

Do not operate the vac system in wet material conditions. Operating in wet conditions could cause serious damage.

3.7. System Shutdown

1. Remove the nozzle from the material and completely open the air door on the nozzle or the air door piping.

2. Throttle down the tractor and disengage the airlock by pulling it back to the neutral position.

3. Open the dust filter and remove the dust from the system.

4. Use the hydraulic boom swivel lever to line up the upper boom arm with the front right side of the trailer.

5. Once the upper boom is over the front right side of the trailer, unlock the boom clamp.

6. Slowly use the boom lever to lower the boom into the resting cradle. Be careful, you may need to still use the swivel to align the boom into the cradle.

7. Once the boom is lowered into the cradle, secure with a ratchet strap.

8. Disengage the PTO and shut off the tractor.

9. Unclamp and pick up all piping, hoses, and nozzles and place them in their designated storage area.

4. Maintenance

4.1. System Break-in

While operating your system for the first time, it is important to leave the air door wide open for the first ½ hour. This helps break in the blower. Once completed, resume normal operation procedures.

A. After Operating System For ½ Hour:

1. Retorque all wheel bolts, and check all clamps.
2. Ensure no hoses are ripped, pinched, rubbing, or crimped. Reposition or fix if needed.
3. Check for oil and fluid leaks in the pump drive, blower, and hydraulic systems. Tighten or replace parts if needed.
4. Check the oil and fluid levels in the pump drive, blower, and hydraulic system. Add if required.

B. After Operating System For 2-5 Hours:

1. Repeat the same procedure as the ½ hour inspection.
2. Inspect all seals and gaskets.
3. Lubricate all grease fittings.
4. After this inspection, return to the normal maintenance schedule.

4.2. Service Schedule

Read through the owner's manual for all components on your vac system. For all service past 500 hours, refer to the components owner’s manual.

10 Hours or Daily
Check Pump Drive Oil
Check Blower Lubricant Level
Check Vacuum/ Pressure Relief Valves
Clean Blower Breathers
Clean Blower Screen
Check Hydraulic Fluid Levels
Inspect Hydraulic Hoses/ Fittings
Check Gaskets/ Clamps/ Seals
Grease clutch Release Bearings

50 Hours or Weekly
Grease Clutch Fittings
Check Clutch Engagement Force
Grease Boom Arm Fittings
Grease Blower Fittings
Check Tension On Airlock/ Swivel Chains
Lubricate Airlock/ Swivel Chains
Lubricate Door Hinges/ Latches

250 Hours or Semi- Annually
Change Pump Drive Oil
Change Blower Lubricant
Inspect Cyclone Liners
Inspect Airlock Tips/ Endplate Clearance
Grease Wheel Bearings
Inspect Trailer Brakes

500 Hours or Annually
Change Hydraulic Fluid/ Fluid Filter

4.3. Oils, Fluids, and Lubricants

For more detailed information see the owner's manual of each component.

Pump Drive Oil
- Use an ISO 80W 90.

Blower Lubricant
- Use AEON PD-XD Extreme Duty Synthetic Lubricant.

Hydraulic Fluid
- Use an ISO 32 AW.

Chain and Hinge Lubricant
- Use an all purpose chain and cable lubricant.

4.4. Greasing

All grease fittings and wheel bearings can be lubricated with a general purpose grease.

- Clean off all grease fittings with a cloth prior to greasing.

- Only grease with a hand held grease gun.

- If the fitting will not take grease, clean, repair, or replace the fitting immediately.

4.5. Gaskets, Clamps, and Seals

Grain Vac Systems rely on a tight seal for the most effective operation. Any breach of air from a damaged or removed gasket, clamp, or seal can be crippling to your system.

- Check gaskets, clamps, and seals daily.

- Ensure they are clean, secure, and damage free.

- If damaged or removed, replace immediately.

Gasket Locations
- Female Camlock Couplers
- Boom Arm Upper

Clamp Locations
- Boom Arm Lower Connection
- Dust Filter Pipe Connections
- Blower Screen Connection
- Receiving Cyclone To Dust Filter
- Blower To Dust Filter

Seal Location
- Dust Filter Door
- Receiving Cyclone Door

5. Service

5.1. Pump Drive

For all service needs on your Funk 28000 Series Pump Drive, refer to the pump drive operator's manual.

5.2. Blower

For all service needs on your Gardner Denver Legend Series Blower, refer to the blower's operating and service manual.

5.3. Airlock

Checking the clearance of your airlock tips and endplates is a vital part of maintaining the performance of your grain vac system. When clearance exceeds 0.015" (0.38 mm), adjust them back to 0.006"(0.15 mm). We HIGHLY recommend all airlock services be performed by your CB Pneumatics dealer or our manufacturing team.

A. Checking Tip And Endplate Clearance

1. Shut down the engine, remove the key, and lock out the engine.
2. Remove the cover from the airlock drive chain.
3. Loosen the chain idler sprocket and remove the chain to allow rotation of the airlock.
4. Open the door of the receiving cyclone.
5. Use a feeler gauge to check the clearance between the tips and the shell.

B. Airlock Tip Adjustment

1. Remove the rubber clamp connecting the receiving cyclone to the dust filter.

2. Securely attach an overhead hoist to the receiving cyclone.

3. Remove the bolts securing the receiving cyclone to the airlock.

4. Carefully remove the receiving cyclone and remove it from the working area.

5. Rotate the tips and inspect each one to ensure there are no gouges or ridges. If you see gouges or ridges, use a metal file to shave them flush with the rest of the tip.

6. Rotate the tip to the top of the shell.

7. Slightly loosen the bolts connecting the tip to the airlock blade. Do not completely remove bolts.

8. Adjust the tip to 0.006" (0.15 mm) of clearance between the tip and the shell.

9. Retighten the bolts and torque them to 22-27 FT/LBS (35-45 Nm).

10. Rotate the tip and ensure there is no contact on the shell. If there is contact, adjust until there is no contact with the shell.

11. Complete this process until all airlock tips have been adjusted.

12. Once adjusted remove the old sealant from the airlock bolt plate and the receiving cyclone bolt plate.

13. Add a new layer of sealant to the airlock bolt plate and bolt airlock back into position.

14. Remove the overhead hoist from the receiving cyclone.

15. Reconnect rubber clamp connecting the receiving cyclone to the dust filter.

CB Pneumatics airlock can be flipped for extended life. Call our service team for more information on how to do these services.

5.4. Hydraulics

The hydraulic system requires minimal maintenance. Here are the steps of how to regulate airlock flow and replace the hydraulic fluid and filter.

A. Regulating Hydraulic Flow

1. Turn on the engine and run on a high idle.
2. Loosen the set screw knob to the left of the control levers.
3. Adjust forward or backwards until the airlock is rotating at 40 RPM.
4. Once the airlock is rotating at 40 RPM, tighten the set screw.
5. Shut down the engine and remove the key.

B. Hydraulic Fluid and Filter Replacement

1. Shut down the engine, remove the key, and lock out the engine.
2. Place an oil pan under the hydraulic fluid reservoir.
3. Remove the drain plug located underneath the reservoir and drain fluid.
4. Loosen filter housing bolts located on the top of the hydraulic fluid reservoir.
5. Turn the filtration housing lid counterclockwise to remove.
6. Remove the old filter from housing and replace it with the new filter.
7. Place the filter housing back over bolts and turn clockwise to get it into position.
8. Once all fluids and the filter have been removed, reinstall the drain plug to the reservoir with pipe sealant.
9. Securely bolt the filter housing in place.

10. Twist off the hydraulic fluid lid, located on the top of the reservoir and pour in new hydraulic fluid.

11. Once fluid is to its fill point, securely tighten the lid back to the reservoir.

5.5. Boom Arm

90° boom arm elbows are some of the highest wear points on a grain vac system. Below you will find instructions on how to replace the boom arm elbows.

A. Replacing Lower Boom Arm Elbow

1. Throttle down the PTO and shut off the tractor, remove the key, and lock out the tractor.

2. Remove the clamp located at the top of the 90° elbow.

3. Unlatch the camlock coupler and remove the elbow completely

4. Align the new boom arm elbow with the boom arm above and latch the camlock to secure the elbow to the system.

5. Place your clamp so that it is evenly distributed on the new elbow and the boom arm. Tighten the clamp by hand until secure.

B. Replacing Upper Boom Arm Elbow

1. Throttle down the PTO and shut off the tractor, remove the key, and lock out the tractor.

2. Remove the ratchet strap located on the discharge cyclone.

3. Start the tractor and engage the PTO at an idle. Leave the tractor on idle.

4. Using your hydraulic system, swivel the discharge cyclone to an open area and gently place it onto the ground.

5. Throttle down the PTO and shut off the tractor, remove the key, and lock out the tractor.

6. Securely attach an overhead hoist to the upper boom arm.

7. Remove the bolts on the clamp connected to the 90° elbow and remove clamp.

8. Remove the flange bolts connecting the 90° elbow and the upper boom arm. Remove the upper boom arm/ discharge cyclone from the working area.

9. Start the tractor and engage the PTO at an idle. Leave the tractor on idle.

10. Using your hydraulic system, gently lower the 90° elbow to the ground.

11. Throttle down the PTO and shut off the tractor, remove the key, and lock out the tractor.

12. Remove the bolts from the top clamp on the 90° elbow and remove clamp.

13. Loosen the lower locking bolt on the boom arm lock.

14. Remove the flange bolts connecting the 90° elbow to the locking bracket and take off the 90° elbow.

15. Remove the old sealant from the upper boom arm flange and the lower locking bracket flange.

16. Using a sealant, seal the lower locking bracket flange and bolt on the new 90° elbow.

17. Securely bolt the top clamp to the new 90° elbow.

18. Tighten the lower locking bolt on the boom arm lock.

19. Start the tractor and engage the PTO at an idle. Leave the tractor on idle.

20. Using your hydraulic system, gently raise the 90° elbow off the ground. Raise the elbow until you can align the upper boom arm/ discharge cyclone below.

21. Throttle down the PTO and shut off the tractor, remove the key, and lock out the tractor.

22. Using a sealant, seal the 90° elbow flange, then bolt the 90° elbow flange and upper boom arm flange together.

23. Bolt the clamp back on to the 90° elbow.

24. Remove the overhead hoist from the upper boom arm.

25. Start the tractor and engage the PTO at an idle. Leave the tractor on idle.

26. Using your hydraulic system, gently place the boom arm back into the boom cradle and attach the ratchet strap.

27. Throttle down the PTO and shut off the tractor, then remove the key.

5.6. Cyclones

To slow down the wear on your systems receiving and discharging cyclones, they are lined with urethane material. Over time, this material wears thin and needs to be replaced. Below are instructions to help replace those liners.

A. Replacing Receiving Cyclone Liner

1. Throttle down the PTO and shut off the tractor, remove the key, and lock out the tractor.

2. Loosen the rubber clamp connecting the receiving cyclone to the dust filter and slide towards the dust filter.

3. Securely attach an overhead hoist to the receiving cyclone.

4. Remove the bolts securing the receiving cyclone to the airlock and carefully remove.

5. Set the receiving cyclone into a new working area with space to freely walk around the cyclone.

6. Remove the bolts securing the receiving cyclone lid to the cyclone.

7. Remove and dispose of the bolts connecting the liner to the side walls of the receiving cyclone and the cyclone door.

8. Remove any sealant that is stuck to the cyclone walls, lid, or base.

9. Place the new liner inside the cyclone. Once the liner is in place, using the cyclone wall bolt holes, pre drill the holes into the new liner.

10. Using new bolts secure the cyclone liner to the receiving cyclone walls.

11. Once the liner is secure, use sealant to fill in all cracks between the liner sections.

12. Place a new layer of sealant around the receiving cyclone lid and bolt back onto the cyclone. Make sure the alignment is correct before bolting.

13. Add a new layer of sealant to the airlock bolt plate and bolt airlock back into position.

14. Remove the overhead hoist from the receiving cyclone.

15. Reconnect rubber clamp connecting the receiving cyclone to the dust filter.

B. Replacing Discharge Cyclone Liner

1. Throttle down the PTO and shut off the tractor, remove the key, and lock out the tractor.

2. Remove the ratchet strap located on the discharge cyclone.

3. Start the tractor and engage the PTO at an idle. Leave the tractor on idle.

4. Using your hydraulic system, swivel the discharge cyclone to an open area and gently place it onto the ground.

5. Throttle down the PTO and shut off the tractor, remove the key, and lock out the tractor.

6. Remove the bolts securing the discharge cyclone to the upper boom arm.

7. Remove the bolts securing the discharge cyclone lid to the cyclone.

8. Remove and dispose of the bolts connecting the liner to the side walls of the discharge cyclone.

9. Remove any sealant that is stuck to the cyclone walls and lid.

10. Place the new liner inside the cyclone. Once the liner is in place, using the cyclone wall bolt holes, pre drill the holes into the new liner.

11. Using new bolts, secure the cyclone liner to the discharge cyclone walls.

12. Once the liner is secure, use sealant to fill in all cracks between the liner sections.

13. Securly bolt on the discharge cyclone lid.

14. Place a new layer of sealant around the upper boom arm and securely bolt the discharge cyclone to the upper boom arm. Make sure the alignment is correct before bolting.

15. Start the tractor and engage the PTO at an idle. Leave the tractor on idle.

16. Using your hydraulic system, gently place the boom arm back into the boom cradle and attach the ratchet strap.

17. Throttle down the PTO and shut off the tractor, then remove the key.

6. Troubleshooting

When it comes to troubleshooting your grain vac, there are two main questions to ask. Are the materials still flowing slowly or has the flow of material completely stopped? Below you will find a step-by-step guide on how to walk through the answer to either of these questions.

6.1. Slow Material Flow

If the materials you are moving seem to be moving slowly, check for the following.

A. Pipe Distance

1. For optimal vac performance, you should try to use 25 feet of piping or less to the entry point of the materials. The further from the entry site you are, the slower your flow will be.

2. Avoid using your rubber clean up hose until necessary. The clean up hose significantly reduces flow.

3. Avoid sharp angles in your flex pipe. Angles greatly reduce flow.

B. Material Quality

1. Pour material quality is one of the leading factors in reduced flow. If the material is wet, damaged, or clumped together, the flow will be greatly reduced.

2. In wet conditions, keep a close eye on the pump screen and the receiving cyclone screen. There is a greater chance of blockages and build up.

C. Weather Conditions

1. Humid air conditions cause materials to stick together and run slower through the system.

D. Improper Seal

1. Check all camlock coupler seals and connections in piping. A broken seal, misaligned coupler, or unclamped connection can greatly reduce flow.

2. Ensure there are no holes worn in your piping, lower boom arm elbow, and upper boom arm elbow. Holes allow unwanted air in the system and reduce flow.

3. Make sure all clamps and rubber gaskets are properly tightened. A loose seal will reduce flow.

4. Check the seal on the receiving cyclone door and the dust filter door. A damaged or removed seal will greatly reduce flow.

E. Airlock Tolerance

1. Check the clearance of the adjustable airlock tips. If the clearance is greater than 0.015" (.038 mm) adjust them back within specs refer to the service section of the manual. Clearance outside of airlocks recommended torrance will greatly impact flow.

2. Check the clearance of the airlock endplates. If the clearance is greater than 0.015" (.038 mm) contact your local dealer or the manufacturer for information on how to proceed. Clearance outside of airlocks recommended torrance will greatly impact flow.

F. Pump Screen

1. Ensure there is not an abstraction or build up on the pump screen. Build up on the screen reduces air to your pump causing less airflow for your entire system.

G. Pressure Relief Valves

1. Check the relief valves to ensure they are not worn out or a spring is damaged. If the relief valves are worn out or damaged, they can not properly hold pressure effectively in the system.

H. Air Door Configuration

1. Make sure the air door is in the correct position. Refer to the system operations section of the manual on how to properly adjust your air door. If your air door is too open, it will cause reduced flow. If your air door is too closed, it can overwork your system.

I. Receiving Cyclone Screen

1. Ensure there is not an abstraction or build up on the receiving cyclone screen. Build up on the screen reduces air to your pump causing less airflow for your entire system.

J. Cyclone Liner Obstruction

1. Check to make sure your receiving cyclone and discharge cyclone liners are properly positioned. Over time, the wear of the liner can cause it to move and position itself in front of the cyclone inlets, causing a blockage reducing the flow of the system.

6.2. No Material Flow

A. Airlock Movement

1. Ensure the airlock's hydraulic lever is fully engaged.

2. Make sure the airlock does not have an obstruction. If the airlock is obstructed, use the airlock's hydraulic lever to reverse the airlock and remove the obstruction.

3. Check to make sure the drive chain is properly functioning. If the drive chain is missing or out of alignment, replace or realign chain.

B. Clutch Tension

1. Check to make sure the clutch tension is properly adjusted between 108 and 115 FT/LBS (146-156 NM). If your clutch is out of spec, refer to the maintenance section to recalibrate the clutch tension.

2. Ensure that your clutch has not been over greased. An over greased clutch will cause slipping and not allow the clutch to engage. If your clutch is over greased, remove excess grease from the clutch system.

3. Check the clutch for internal linkage failure. If internal linkage failure occurs, contact your local dealer or the manufacturer for information on how to proceed.

C. Lower Boom Arm Elbow

1. Check to make sure there is not an obstruction in the lower boom arm elbow. If the elbow is obstructed, remove the obstruction and secure the elbow back to the system.

D. Receiving Cyclone Cap

1. Ensure the receiving cyclone cap is securely fastened to the inlet opposite of the piping set up. If the cap is not fastened, fasten the cap to the receiving cyclone.

7. Manufacturer's Information

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