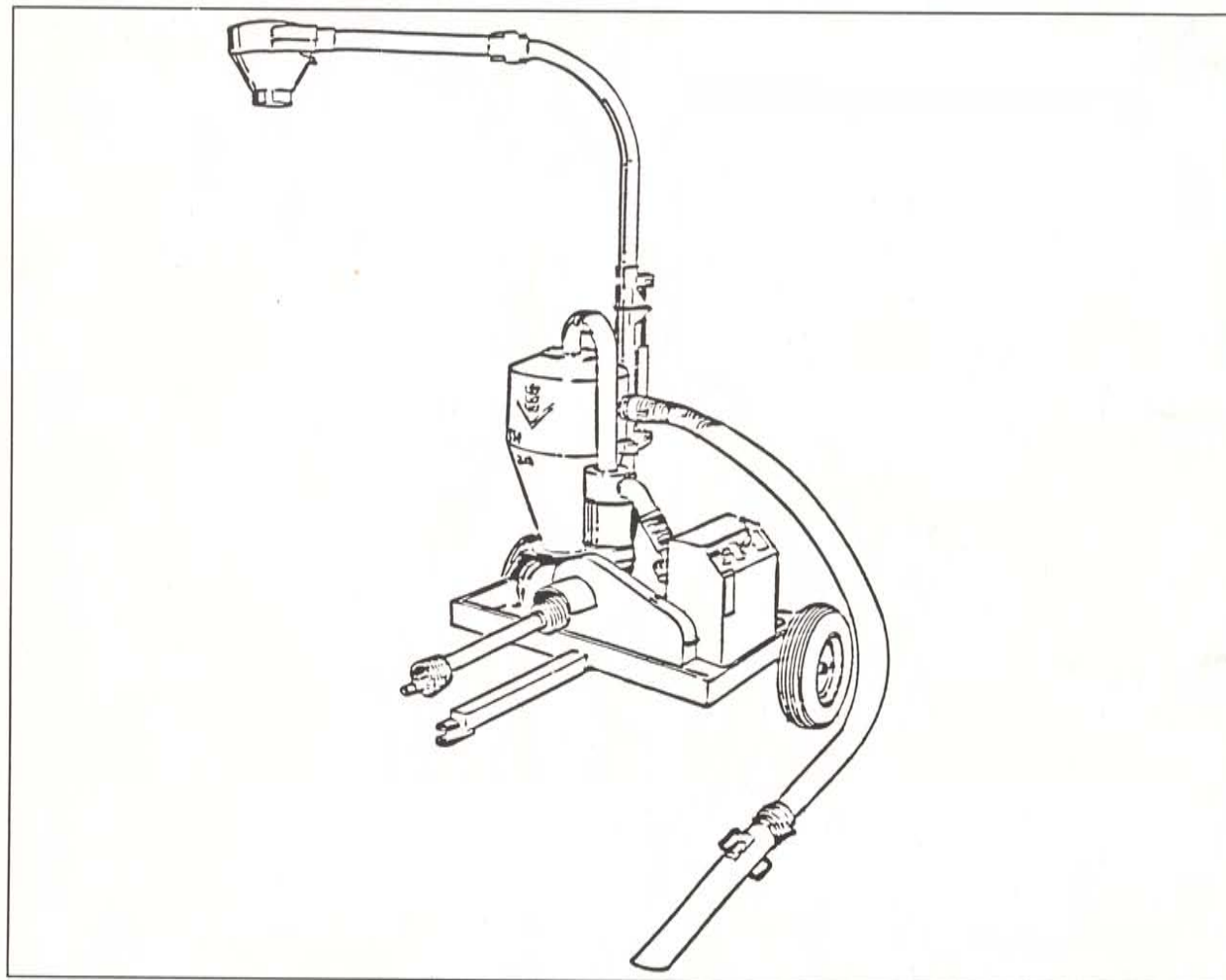




MANUFACTURING LTD.



**GRAIN VAC
MODELS 1975, 2970,
3005, 3505, (SERIES II)
4005 AND 4505 (SERIES II)**

OPERATOR'S MANUAL

CONVEYAIR GRAIN VAC

WARRANTY REGISTRATION FORM & INSPECTION REPORT

WARRANTY REGISTRATION

This form must be filled out by the dealer and signed by both the dealer and the customer at the time of delivery.

Customer's Name _____	Dealer _____
Address _____	Address _____
City, State, Zip _____	City, State, Zip _____
CONVEYAIR MODEL # _____	DATE PURCHASED _____
CONVEYAIR SERIAL # _____	
AIR PUMP SERIAL # _____	CHECK ONE:
AIRLOCK SERIAL # _____	COMMERCIAL _____
	FARM USE _____

INSPECTION REPORT

Date _____ Inspected By _____
(PRINT NAME)

- ☐ BELT TENSION & ALIGNMENT
- ☐ HYDRAULIC FITTINGS
- ☐ HYDRAULIC LINES
- ☐ ALL LIGHTS AND REFLECTORS IN PLACE
- ☐ WHEEL BOLTS TIGHT
- ☐ TIRE AIR PRESSURE (25 PSI)
- ☐ ALL GREASE FITTINGS GREASED
- ☐ CAM LOCK COUPLERS OPERATE FREELY
- ☐ PTO SHAFT INSTALLED PROPERLY
- ☐ ALL SHIELDS IN PLACE

AIR PUMP RESERVOIR LEVELS

- ☐ FRONT
- ☐ REAR

SELF CONTAINED HYDRAULICS

- ☐ HYDRAULIC OIL LEVEL
- ☐ HYDRAULIC CONTROL OPERATION

SAFETY

- ☐ ALL SAFETY PROCEDURES HAVE BEEN REVIEWED WITH CUSTOMER
- ☐ ALL WARNING DECALS ARE IN PLACE, CLEAN AND LEGIBLE
- ☐ INSTRUCT CUSTOMER TO REVIEW SAFETY AND OPERATING PROCEDURES WITH ALL OPERATORS ANNUALLY

I have thoroughly inspected the machine and made adjustments and corrections as needed.

Signature _____ (Dealer Inspector)

I have thoroughly instructed the buyer on the above described equipment which review included the Operator's Manual content, equipment care, adjustments, safe operation and applicable warranty policy.

Date _____ Dealer's Rep. Signature _____

The above equipment and Operator's Manual have been received by me and I have been thoroughly instructed as to care, adjustments, safe operation and applicable warranty policy.

Date _____ Owner's Signature _____

WHITE	YELLOW	PINK
THOR MFG.	DEALER	CUSTOMER

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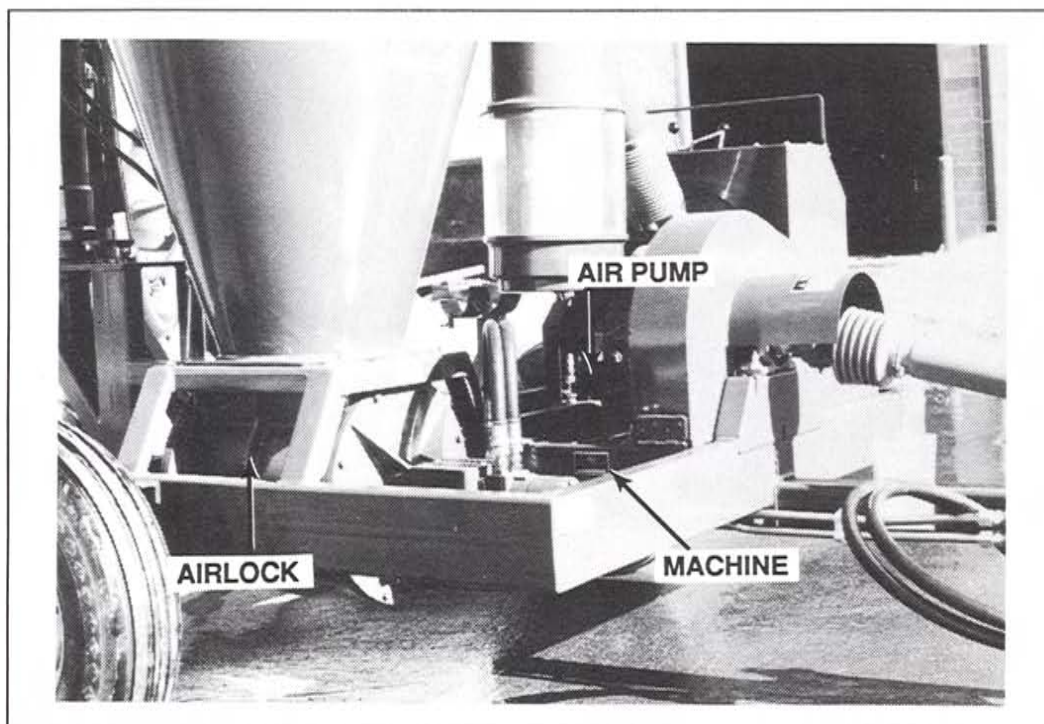
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SERIAL NUMBER LOCATION

Always give your dealer the serial number of your Conveyair Grain Vac when ordering parts or requesting service or other information.

The serial number plates are located where indicated. Please mark the number in the space provided for easy reference.



MACHINE, BLOWER AND AIRLOCK SERIAL NUMBER LOCATION

Machine Serial Number _____

Airlock Serial Number _____

Blower Serial Number _____

1 INTRODUCTION

Congratulations on your choice of a new Conveyair grain vac to complement your farming operation. This equipment has been designed and manufactured to meet the needs of a discerning Agricultural industry for the efficient moving of grain.

Safe, efficient and trouble-free operation of your Conveyair requires that you and anyone else who will be operating or maintaining the machine read and understand all of the safety, operation, maintenance and trouble shooting information contained in this Operator's Manual.



This manual covers the Models 1975 and 2970. Models 3005, 3505, 4005 and 4505 all Series II. Differences are covered and explained where appropriate. Use the Table of Contents as a guide to locate required information.

Keep this manual handy for frequent reference and to pass on to new operators and owners. Call your Conveyair dealer or distributor if you need assistance, information or additional copies of the manuals.

OPERATOR ORIENTATION - The directions left, right, front and rear, as mentioned throughout the manual are as seen from the rear of the machine (opposite hitch end).

2 SAFETY

SAFETY ALERT SYMBOL

This Safety Alert symbol means
ATTENTION! BECOME ALERT!
YOUR SAFETY IS INVOLVED!



The Safety Alert symbol identifies important safety messages on the Conveyair Grain Vac and in the manual. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

Why is SAFETY important to you?

3 Big Reasons

Accidents Disable and Kill
Accidents Cost
Accidents Can Be Avoided

SIGNAL WORDS:

Note the use of the signal words **DANGER**, **WARNING** and **CAUTION** with the safety messages. The appropriate signal word for each message has been selected using the following guide-lines:

DANGER - An immediate and specific hazard which **WILL** result in severe personal injury or death if the proper precautions are not taken.

WARNING - A specific hazard or unsafe practice which **COULD** result in severe personal injury or death if proper precautions are not taken.

CAUTION - Unsafe practices which **COULD** result in personal injury if proper practices are not taken, or as a reminder of good safety practices.

SAFETY

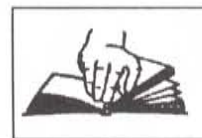
YOU are responsible for the **SAFE** operation and maintenance of your Conveyor grain vac. **YOU** must ensure that you and anyone else who is going to operate, maintain or work around the machine be familiar with the operating and maintenance procedures and related **SAFETY** information contained in this manual. This manual will take you step-by-step through your working day and alerts you to all good safety practices that should be adhered to while operating the grain vac.

Remember, **YOU** are the key to safety. Good safety practices not only protect you but also the people around you. Make these practices a working part of your safety program. Be certain that **EVERYONE** operating this equipment is familiar with the recommended operating and maintenance procedures and follows all the safety precautions. Most accidents can be prevented. Do not risk injury or death by ignoring good safety practices.

- Grain vac owners must give operating instructions to operators or employees before allowing them to operate the machine, and at least annually thereafter per OSHA (Occupational Safety and Health Administration) regulation 1928.57.
- The most important safety device on this equipment is a **SAFE** operator. It is the operator's responsibility to read and understand **ALL** Safety and Operating instructions in the manual and to follow these. All accidents can be avoided.
- A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes himself and bystanders to possible serious injury or death.
- Do not modify the equipment in any way. Unauthorized modification may impair the function and/or safety and could affect the life of the equipment.
- Think **SAFETY!** Work **SAFELY!**

2.1 GENERAL SAFETY

1. Read and understand the Operator's Manual and all safety signs before operating, maintaining, adjusting or unplugging the grain vac.
2. Provide a first-aid kit for use in case of an accident. Store in a highly visible place.
3. Provide a fire extinguisher for use in case of an accident. Store in a highly visible place.



4. Wear appropriate protective gear. This list includes but is not limited to:

- A hard hat
- Protective shoes with slip resistant soles
- Protective glasses or goggles
- Heavy gloves
- Wet weather gear
- Hearing protection
- Respirator or filter mask



5. Install and secure all guards before starting.
6. Do not allow riders.
7. Wear appropriate ear protection for prolonged exposure to excessive noise.



8. Place all controls in neutral, stop tractor engine, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
9. Clear the area of people, especially small children, before starting the unit.
10. Always know where all overhead electrical wires are located and stay away from them.
11. Review safety related items annually with all personnel who will be operating or maintaining the grain vac.

2.2 OPERATING SAFETY

1. Read and understand the Operator's Manual and all safety signs before operating, servicing, adjusting, repairing or unplugging.
2. Do not allow riders.
3. Install and secure all guards and shields before starting or operating.
4. Keep hands, feet, hair and clothing away from moving parts.
5. Place all controls in neutral, stop tractor engine, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
6. Place all tractor and machine controls in neutral before starting.
7. Never operate the Conveyair and power unit inside a closed building.
8. Clear the area of bystanders, especially small children, before starting.
9. Stay away from PTO shaft, intake nozzle and discharge when engaging PTO.
10. Keep all hydraulic lines, fittings and couplers tight and free of leaks.
11. Clean reflectors, SMV and lights before transporting.
12. Use hazard flashers on tractor when transporting.
13. Use a retainer on drawbar pin, secure PTO shaft and install safety chain when attaching to tractor.
14. Stay away from overhead electrical wires when operating boom or when moving.
15. Do not open receiver inspection door while tractor is running.
16. Do not remove elbow from airlock outlet when tractor is running.
17. Stay clear of truck loading boom when folding truck loading kit.
18. Review safety instructions with all operators annually.

2.3 MAINTENANCE SAFETY

1. Follow ALL the operating, maintenance and safety information in the manual.
2. Support the machine with blocks or safety stands when changing tires or working beneath it.
3. Place all controls in neutral, stop tractor engine, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
4. Use only tools, jacks and hoists of sufficient capacity for the job.
5. Make sure all guards are in place and properly secured when maintenance work is completed.
6. Never wear ill-fitting, baggy or frayed clothing when working around or on any of the drive system components.
7. Before applying pressure to a hydraulic system, make sure all lines, fittings and couplers are tight and in good condition.
8. Relieve pressure from hydraulic circuit before servicing or disconnecting from tractor.
9. Keep hands, feet, hair and clothing away from moving or rotating parts.
10. Clear the area of bystanders, especially small children, when carrying out any maintenance and repairs or making any adjustments.

2.4 HYDRAULIC SAFETY

1. Make sure that all components in the hydraulic system are kept in good condition and are clean.
 2. Replace any worn, cut, abraded, flattened or crimped hoses and metal lines.
 3. Do not attempt any makeshift repairs to the hydraulic lines, fittings or hoses by using tape, clamps or cements. The hydraulic system operates under high-pressure. Such repairs will fail suddenly and create a hazardous and unsafe condition.
 4. Wear proper hand and eye protection when searching for a high-pressure hydraulic leak. Use a piece of wood or cardboard as a backstop instead of hands to isolate and identify a leak.
 5. If injured by a concentrated high-pressure stream of hydraulic fluid, seek medical attention immediately. Serious infection or toxic reaction can develop from hydraulic fluid piercing the skin surface.
 6. Before applying pressure to the system, make sure all components are tight and that lines, hoses and couplings are not damaged.
- Think SAFETY! Work SAFELY!



2.5 TRANSPORT SAFETY

1. Make sure you are in compliance with all local regulations regarding transporting equipment on public roads and highways.
2. Make sure the SMV (Slow Moving Vehicle) emblem and all the lights and reflectors that are required by the local highway and transport authorities are in place, are clean and can be seen clearly by all overtaking and oncoming traffic.
3. Do not allow anyone to ride on the grain vac or tractor during transport.
4. Do not exceed 32 km/h (20 mph). Reduce speed on rough roads and surfaces.
5. Use a retainer on the drawbar pin and install the safety chain before transporting.
6. Always use hazard flashers on the tractor when transporting.
7. Stay away from overhead electrical wires. Electrocutation can occur without direct contact.

2.6 STORAGE SAFETY

1. Store the machine in an area away from human activity.
2. Do not permit children to play on or around the stored machine.
3. Make sure the unit is sitting, or blocked up firm and solid and will not tip or sink into a soft area.

2.7 TIRE SAFETY

1. Failure to follow proper procedures when mounting a tire on a wheel or rim can produce an explosion which may result in serious injury or death.
2. Do not attempt to mount a tire unless you have the proper equipment and experience to do the job.
3. Have a qualified tire dealer or repair service perform required tire maintenance.

2.8 SAFETY DECALS

1. Keep safety decals and signs clean and legible at all times.
2. Replace safety decals and signs that are missing or have become illegible.
3. Replaced parts that displayed a safety sign should also display the current sign.
4. Safety decals or signs are available from your Dealer Parts Department.

How to Install Safety Decals:

- Be sure that the installation area is clean and dry.
- Decide on the exact position before you remove the backing paper.
- Remove the smallest portion of the split backing paper.
- Align the decal over the specified area and carefully press the small portion with the exposed sticky backing in place.
- Slowly peel back the remaining paper and carefully smooth the remaining portion of the decal in place.
- Small air pockets can be pierced with a pin and smoothed out using the piece of decal backing paper.

2.9 SIGN-OFF FORM

Thor Manufacturing follows the general Safety Standards specified by the American Society of Agricultural Engineers (ASAE) and the Occupational Safety and Health Administration (OSHA). Anyone who will be operating and/or maintaining the Grain Vac must read and clearly understand ALL Safety, Operating and Maintenance information presented in this manual.

Do not operate or allow anyone else to operate this equipment until such information has been reviewed. Annually review this information before the season start-up.

Make these periodic reviews of SAFETY and OPERATION a standard practice for all of your equipment. We feel that an untrained operator is unqualified to operate this machine.

A sign-off sheet is provided for your record keeping to show that all personnel who will be working with the equipment have read and understand the information in the Operator's Manual and have been instructed in the operation of the equipment.

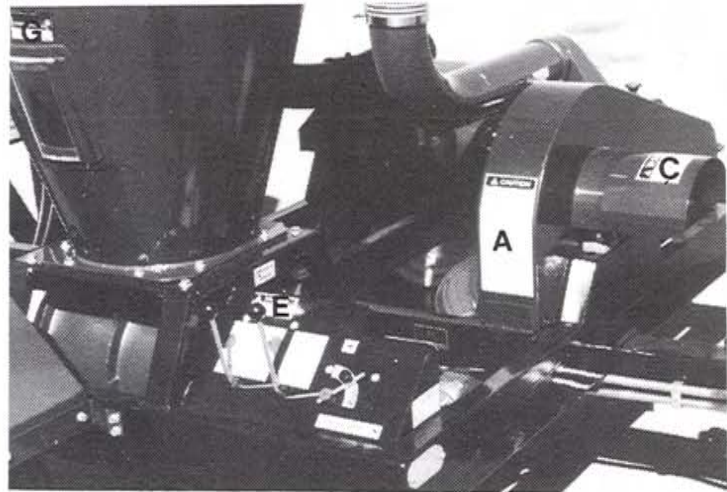
SIGN-OFF FORM

[illegible]

3 SAFETY DECAL LOCATIONS

The types of decals and locations on the equipment are shown in the illustration below. Good safety requires that you familiarize yourself with the various Safety Decals, the type of warning and the area, or particular function related to that area, that requires your SAFETY AWARENESS.

- Think SAFETY! Work SAFELY!



A

CAUTION

1. Read and understand the Operator's Manual before starting and operating.
2. Never operate the machine inside a closed building.
3. Install and secure all shields before operating.
4. Clear the area of people, especially small children, and the machine of foreign objects before using.
5. Keep hands, feet, clothing and hair away from moving parts and inlet nozzle.
6. Place all controls in neutral, stop engine, remove key and wait for all moving parts to stop before servicing, lubricating, adjusting or unplugging.
7. Watch for overhead electrical wires and obstructions. Electrocutation can occur without direct contact.
8. Never operate machine with hydraulic leaks.
9. Secure hitch, fasten safety chain and connect lights before transporting.
10. Wear suitable ear protection for prolonged exposure to excessive noise.
11. Chock wheel and block hitch before operating.
12. Review safety items with all operators annually.

68.050

B

DANGER

**ROTATING DRIVELINE
CONTACT CAN CAUSE DEATH
KEEP AWAY!**

DO NOT OPERATE WITHOUT -

- ALL DRIVELINE, TRACTOR AND EQUIPMENT SHIELDS IN PLACE
- DRIVELINES SECURELY ATTACHED AT BOTH ENDS
- DRIVELINE SHIELDS THAT TURN FREELY ON DRIVELINE

383333

C

DANGER

ROTATING DRIVELINE HAZARD

To prevent serious injury or death from rotating driveline:

1. Keep all guards in place when operating.
2. Operate only at 1000 RPM.
3. Keep hands, feet, clothing and hair away from moving parts.

68.051

REMEMBER - If Safety Decals have been damaged, removed, become illegible or parts replaced without decals, new decals must be applied. New decals are available from your authorized dealer.

The types of decals and locations on the equipment are shown in the illustration below. Good safety requires that you familiarize yourself with the various Safety Decals, the type of warning and the area, or particular function related to that area, that requires your SAFETY AWARENESS.

- Think SAFETY! Work SAFELY!

D



WARNING

Do not place intake tube near feet when standing on top of grain. Sufficient material can be removed to draw operator and intake tube into grain. Submersion in grain can cause suffocation.

68.057

E



DANGER

ELECTROCUTION HAZARD

To prevent serious injury or death from electrocution:

Stay away from overhead electrical wires when operating the discharge boom. Electrocution can occur without direct contact.

68.056

F



WARNING

ROTATING AIRLOCK HAZARD

To prevent serious injury or death from airlock blades:

1. Do not place hands in airlock when it is turning.
2. Shut-off engine and wait for moving parts to stop before removing elbow from airlock discharge.

68.055

G



WARNING

ROTATING AIRLOCK HAZARD

To prevent serious injury or death from airlock blades:

1. Do not place hands in tank when airlock is turning.
2. Shut-off engine and wait for moving parts to stop before opening door to adjust, service or unplug.

68.054

H



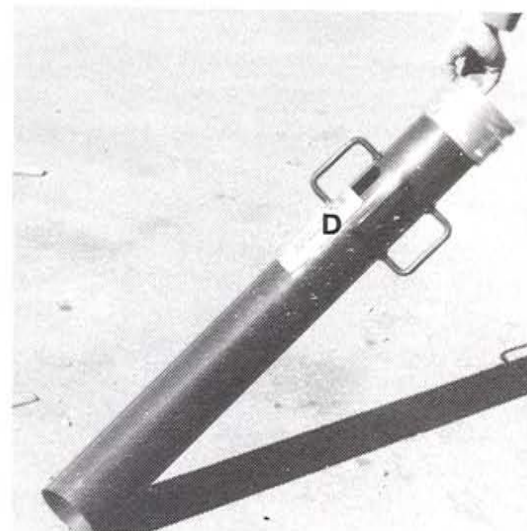
WARNING

ROTATING PART HAZARD

To prevent serious injury or death from rotating parts:

1. Close and secure guard before operating.
2. Shut-off engine and wait for moving parts to stop before opening to adjust, service, lubricate or unplug.
3. Keep hands, feet, clothing and hair away from moving parts.

68.053



REMEMBER - If Safety Decals have been damaged, removed, become illegible or parts replaced without decals, new decals must be applied. New decals are available from your authorized dealer.

4 OPERATION



OPERATING SAFETY

1. Read and understand the Operator's Manual and all safety signs before operating, servicing, adjusting, repairing or unplugging.
2. Do not allow riders.
3. Install and secure all guards and shields before starting or operating.
4. Keep hands, feet, hair and clothing away from moving parts.
5. Place all controls in neutral, stop tractor engine, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
6. Place all tractor and machine controls in neutral before starting.
7. Never operate the Conveyair and power unit inside a closed building.
8. Clear the area of bystanders, especially small children, before starting.
9. Stay away from PTO shaft, intake nozzle and discharge when engaging PTO.
10. Keep all hydraulic lines, fittings and couplers tight and free of leaks.
11. Clean reflectors, SMV and lights before transporting.
12. Use hazard flashers on tractor when transporting.
13. Use a retainer on drawbar pin, secure PTO shaft and install safety chain when attaching to tractor.
14. Stay away from overhead electrical wires when operating boom or when moving.
15. Do not open receiver inspection door while tractor is running.
16. Do not remove elbow from airlock outlet when tractor is running.
17. Stay clear of truck loading boom when folding truck loading kit.
18. Review safety instructions with all operators annually.

4.1 TO THE NEW OPERATOR OR OWNER

The Conveyair grain vac from Thor Manufacturing has been designed to efficiently move grain in a stream of air. Air to move the grain is supplied by a heavy duty air pump. Be familiar with the machine before starting.

It is the responsibility of the owner and operator to read this manual and be familiar with the safety and operating instructions. Safety is everyone's business. By following recommended procedures, a safe working environment is provided for the operator and bystanders.

Many features incorporated into this machine are the result of suggestions made by customers like you. Read this manual carefully to learn how to operate the machine safely and how to set it to provide maximum field efficiency. By following the operating instructions in conjunction with a good maintenance program, your grain vac will provide many years of trouble-free service.

4.2 PRINCIPLE COMPONENTS

The heart of the Conveyair grain vac is the air pump and the air lock. Both components must be operating at their recommended speeds to obtain maximum efficiency from the machine.

Air movement is created with a vacuum in the lines between the pump and the receiver tank above the air lock. The outlet line of the air pump to the airlock and the truck loading kit contains pressurized air. Because of the vacuum created in the receiver tank, air and grain enter through the intake lines. Gravity and centrifugal force combine to move the grain down in the receiver tank to the air lock.

Air flows through the intake lines and receiver tank to the air pump. After the air goes through the air pump, it becomes pressurized. The pressurized air goes to the air lock where it picks up grain in the air lock segments. The grain and pressurized air are discharged through the truck loading kit into the receiving unit or into lines to storage bins.

The air pump is driven by a belt and pulley system from the PTO on a tractor. The airlock is driven by a hydraulic motor powered by the hydraulic system on the tractor or by a self contained hydraulic system.

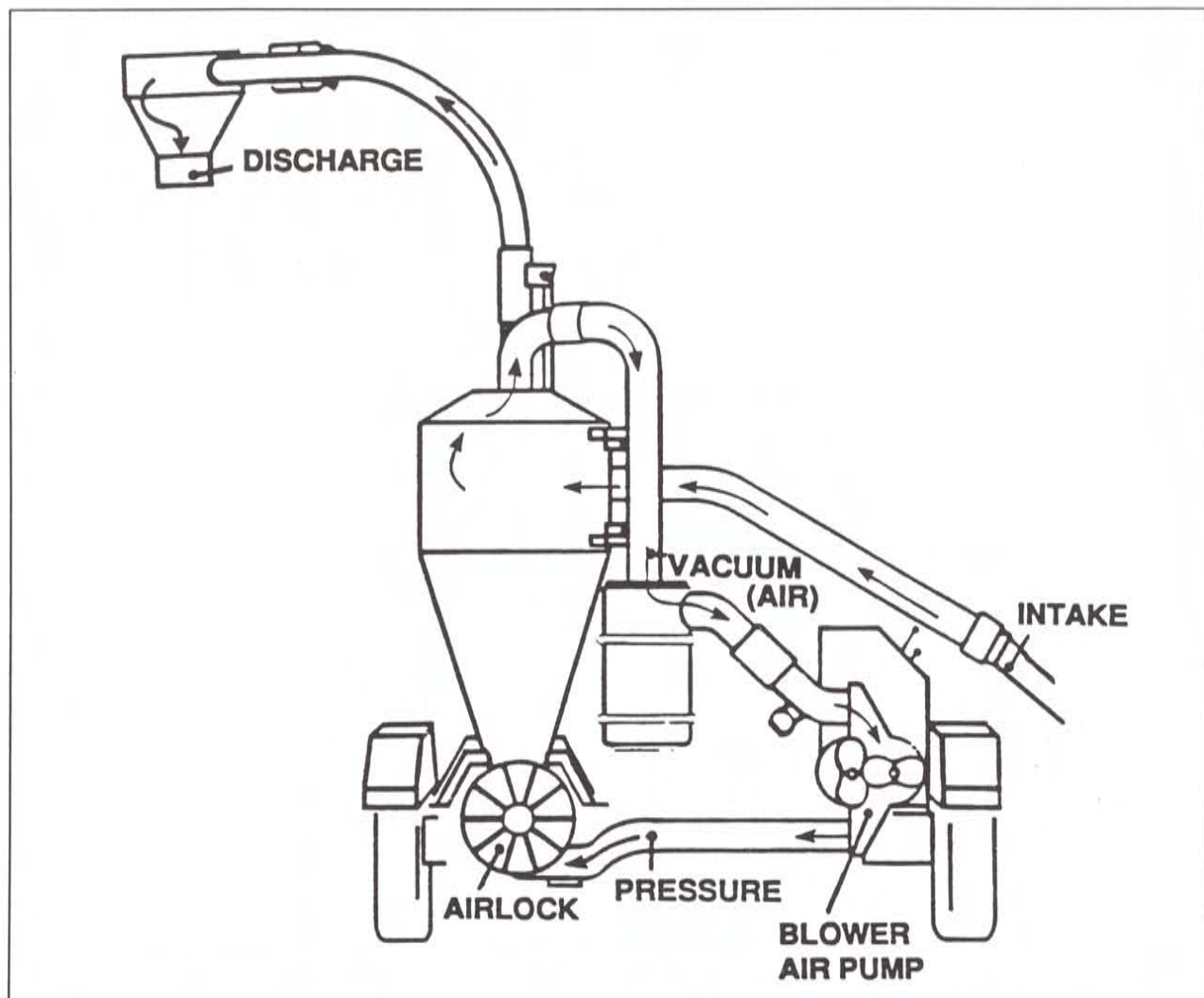
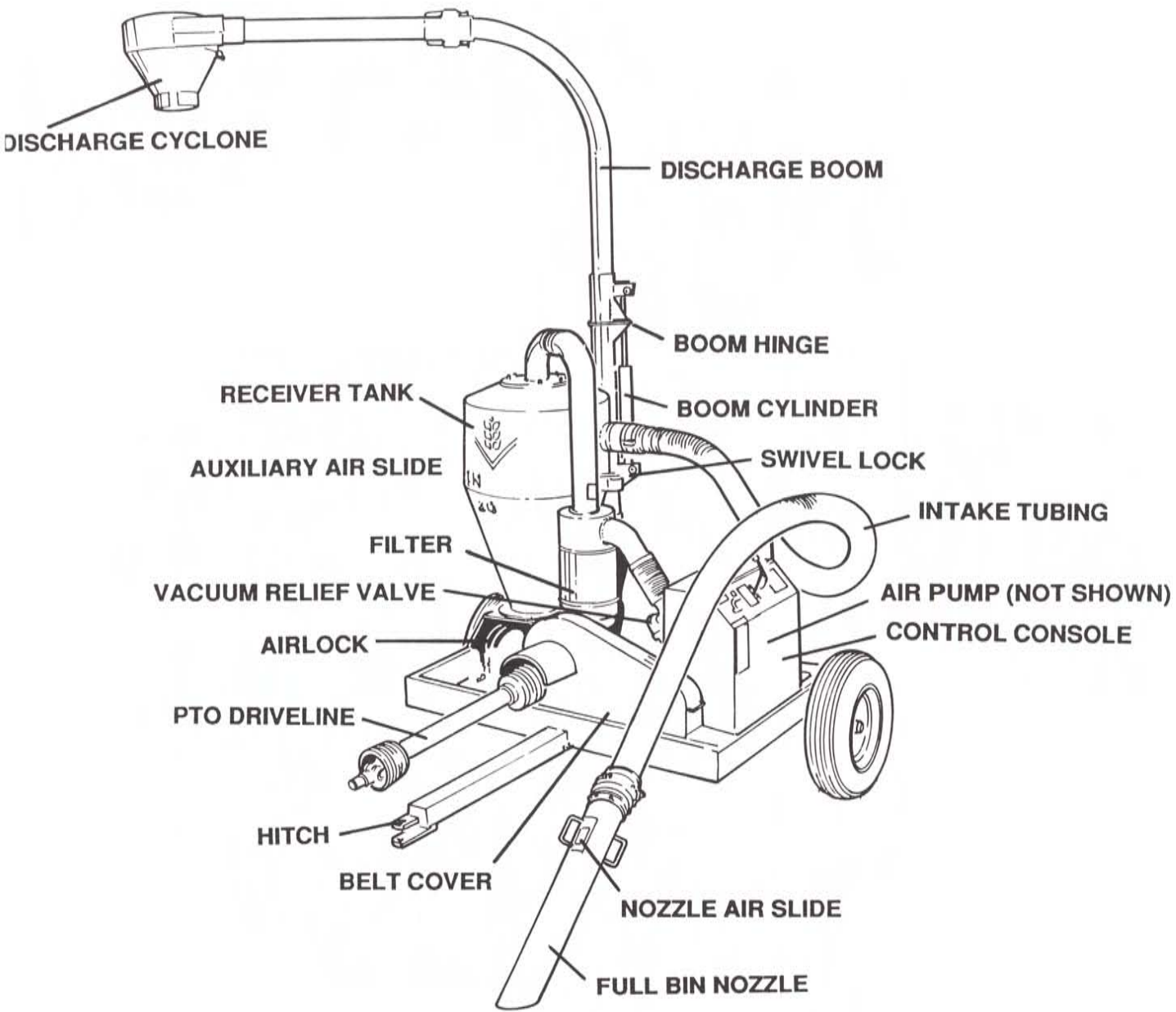


Fig. 1 PRINCIPLE COMPONENTS



4.4 BREAK-IN

Although the machine has been operated for a short time at the factory, it can not be considered broken in. It normally takes 5 to 10 hours of operation for all the internal parts to be polished by the grain stream and for the machine to come up to full capacity. During these first hours, the following checks are recommended:

A. Before starting or pre-delivery inspection:

1. Read the Operator's Manual.
2. Turn the large pulley by hand to check that the air pump turns freely.
3. Check that the air pump oil reservoirs are filled to the right level with the proper oil.
4. Tighten wheel bolts to their specified torque.
5. Check all fasteners and be sure they are tightened to their specified torque levels.
6. Check that the hydraulic lines are routed where they will not contact moving parts. Be sure they are clipped, taped or tied in position.

B. After operating for 1/2 hour:

1. Check for overheated bearing. Lubricate or adjust as required.
2. Check for oil leaks. Tighten or replace part and add oil as required.
3. Retorque all hardware.
4. Check belt tension and adjust as required.
5. Check the oil levels in the air pump reservoirs. If low, correct leak before proceeding. Add oil as required.

C. After operating for 2 and 10 hours:

1. Perform the same checks and inspections as done at 1/2 hour.
2. After the 10 hour inspection, go to the normal service and maintenance procedure as outlined in this manual.

4.5 PRE-OPERATION CHECKLIST

Efficient and safe operation of the Conveyair grain vac requires that each operator reads and understands the operating procedures and all related safety precautions outlined in this manual. A pre-operation checklist is provided for the operator. It is important for both personal safety and maintaining the good mechanical condition of the machine that this checklist is followed.

Before operating the grain vac and each time thereafter, the following areas should be checked off:

1. Lubricate the machine per the schedule outlined in the Maintenance Section.
2. Use only a tractor with sufficient power and adequate hydraulic capacity to properly operate the machine.
3. Be sure that the machine is properly attached to the tractor.
 - a. A retainer should be installed in the draw-bar pin.
 - b. The PTO shaft should be pinned in its groove on the tractor shaft.
 - c. The safety chain should be attached.
 - d. The hydraulic lines should be locked in the couplers.
4. Be sure that the shield on the PTO shaft is anchored to the frame.
5. Check for entangled material. Remove as required.
6. Rotate the large pulley by hand to check that the air pump turns freely.
7. Be sure all shields are closed and secured.
8. Be sure that the hydraulic lines are routed away from rotating parts.
9. Check for debris in the filter. Clean as required.
10. Check the oil level in the air pump reservoirs. Add as required.
11. Check that all hydraulic fittings and connections are tight and in good condition.

4.6 EQUIPMENT MATCHING

The Conveyair grain vac is designed to be used on agricultural tractors. To insure good field performance, the following list of specifications must be met:

1. Drawbar Dimension:

The tractor drawbar dimension must be 16 inches between the end of the shaft and drawbar pin hole center for the 1000 RPM model and 14 inches for the 540 RPM model. This will provide sufficient clearance for turning and allow telescoping of the shaft. Consult your tractor manual for the drawbar adjustment procedure.

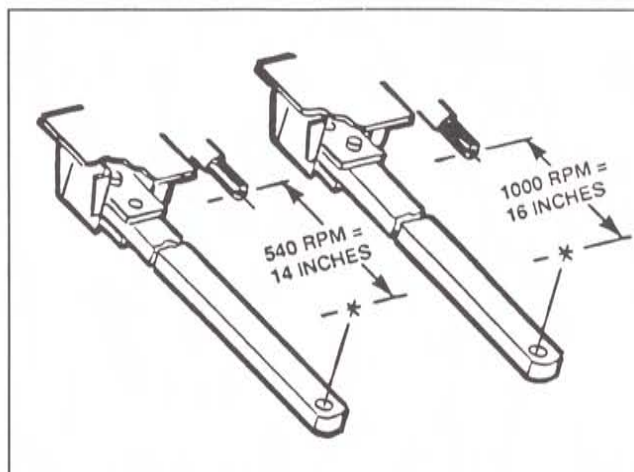


Fig. 2 DRAWBAR

2. Tractor Horsepower:

Use Table 1 as a guide in selecting the appropriate horsepower level for the machine.

Table 1 Minimum Horsepower

Model	Minimum Horsepower	PTO RPM
1975	60	540
2970	80	1000
3005 Series II	80	1000
3505 Series II	90	1000
4005 Series II	100	1000
4505 Series II	110	1000

3. PTO Shaft:

The tractor PTO shaft must meet these specifications:

- 540 RPM - 6 spline, 1 3/8 inch dia.
- 1000 RPM - 21 spline, 1 3/8 inch dia.

4. Hydraulic System:

The power unit must have one remote hydraulic outlet to operate the airlock motor and the boom lift circuit. The system must be capable of 8 gpm (30 lpm) @ 1200 psi (8250 kPa).

IMPORTANT

It is not recommended that shaft adaptors be used on the tractor shaft to prevent operating at the wrong RPM. Use extra care when using a tractor with a shiftable PTO speed.

IMPORTANT

An optional self-contained hydraulic package is available if the tractor is not equipped with a hydraulic system. Consult your dealer or the factory for details.

4.7 CONTROLS

All hydraulic controls of the Series II are located in the console on the left hand side of the machine and on the right side for the 1975 and 2970. All operators should review this section of the manual to familiarize themselves with control function and movement before starting.

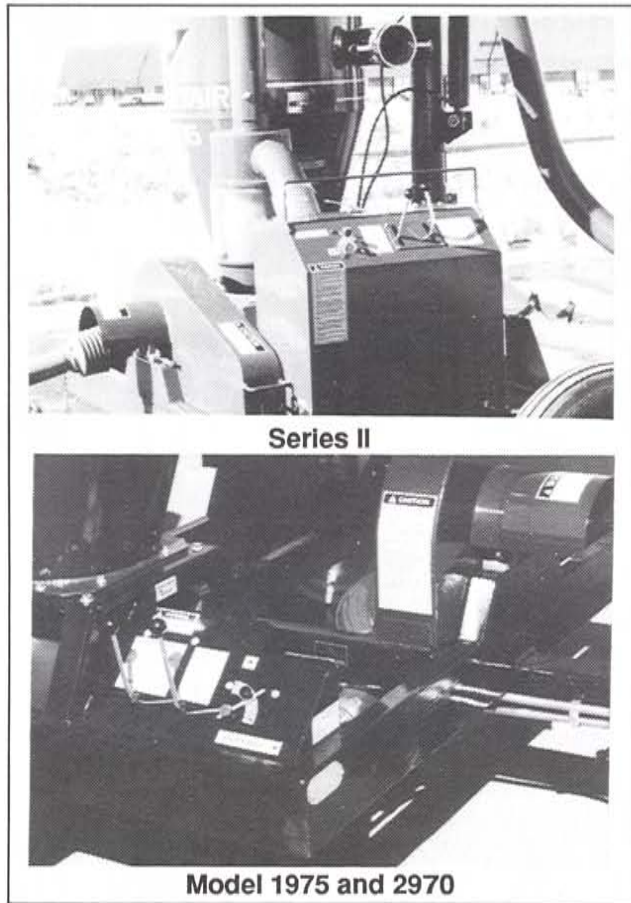


Fig. 3 CONSOLE

1. Airlock Rotation (Direction):

The left lever on the console controls the direction of the flow of oil to the hydraulic motor on the airlock for the Series II. Use the right lever on the 1975 and 2970. Move the lever up to turn the airlock in the forward direction. Place in the center position for neutral. Pull the control down to reverse the direction of rotation. This feature is helpful when unplugging the airlock.

IMPORTANT

Do not run the airlock with the control in the reverse direction. In this direction the circuit is not protected with a relief valve should the airlock plug and stop.

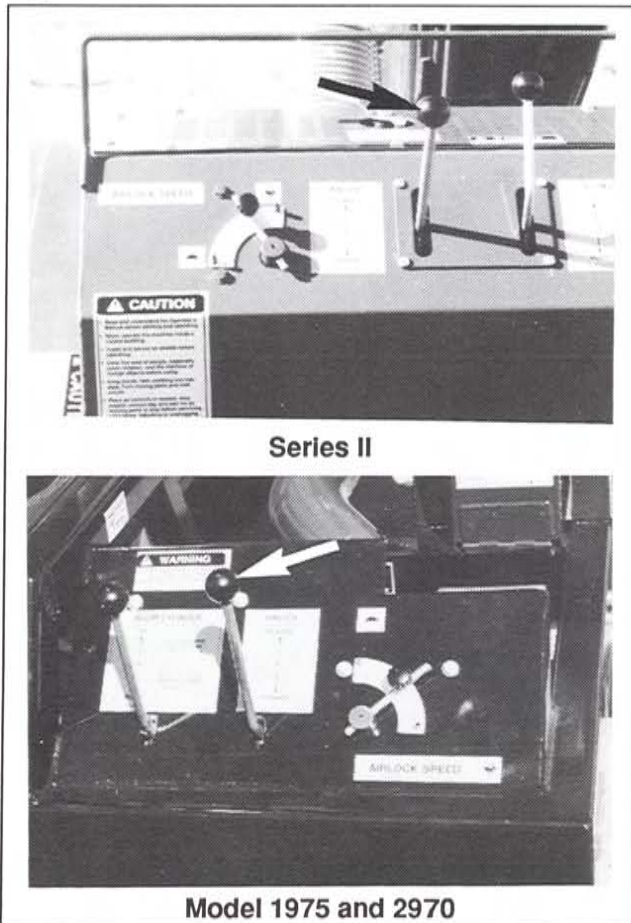


Fig. 4 AIRLOCK CONTROLS

2. Airlock Speed:

The airlock speed of rotation is set by a flow divider control that is to the left of the airlock control lever on the Series II and the right for the 1975 and 2970. Move the lever in a clockwise direction toward the rabbit to increase the speed. Move toward the turtle to decrease the speed.

NOTE

When setting lock speed, move the control in small increments. A small movement will make a significant change in airlock speed.

Use Table 2 as a guide when setting airlock speed.

Table 2 Material vs Airlock Speed

Material	Airlock Speed (RPM)
Barley	55 - 65
Canola	35 - 45
Corn	45 - 55
Flax	35 - 45
Wheat	45 - 55

Material consistency varies widely in the field. Try different airlock speeds, using Table 2 as a guide, to obtain maximum performance.

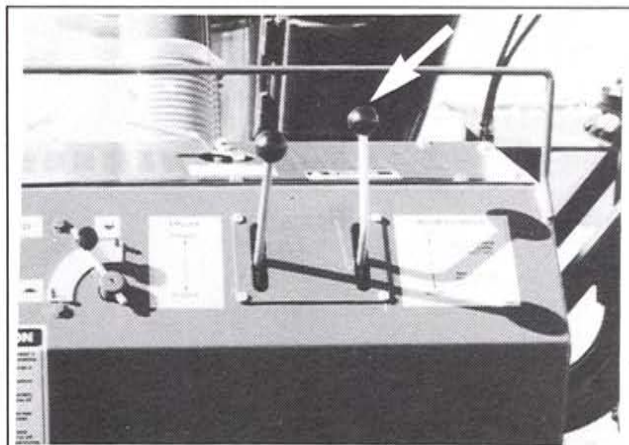
3. Boom Lift:

The lever on the right side of the console controls the boom lift function. The lever on the left side on the model 1975 and 2970 controls the boom lift. Move the lever up to raise the boom from the storage into working position. Move the lever down to place the boom into the storage position.

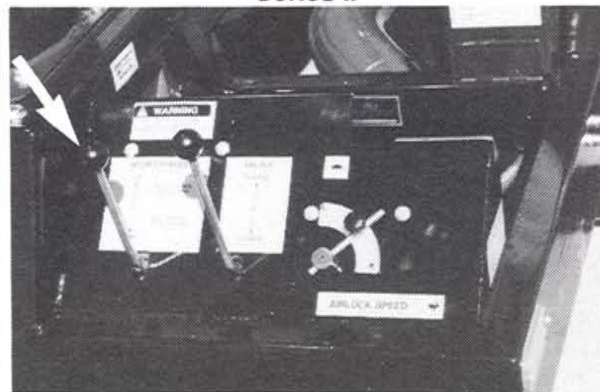


DANGER

Stay at least 15 feet (5 m) away from overhead power lines when moving the boom. Electrocutation can occur without direct contact.



Series II



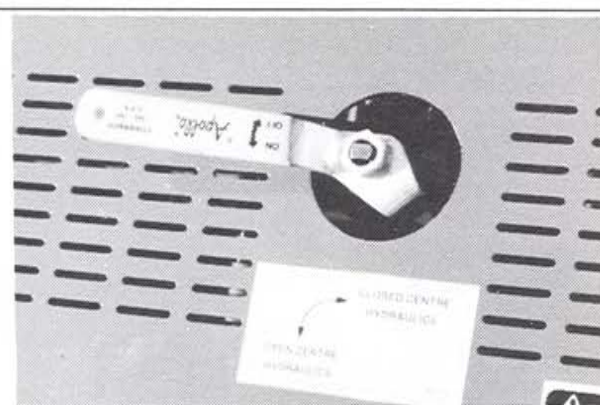
Model 1975 and 2970

Fig. 5 BOOM LIFT

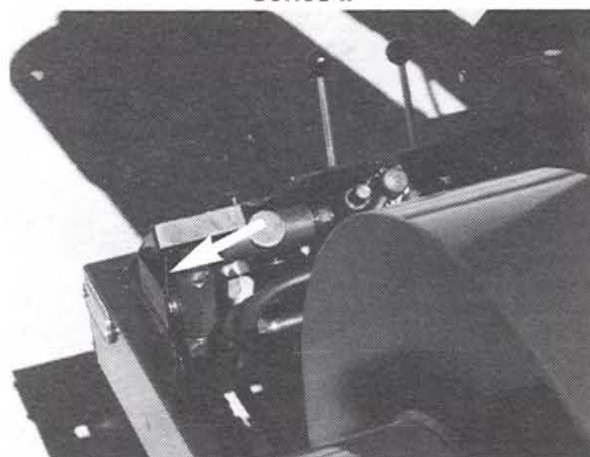
4. Hydraulic System Matching:

Tractors are equipped with open or closed-center hydraulic systems. The machine can be set to operate with either system.

Move the valve to the ON position (parallel to the console) when using with an open center system. Move to the OFF (90° to console) for a closed-center system. Always set before starting. Refer to tractor manual for system information.



Series II



Model 1975 and 2970

Fig. 6 HYDRAULIC SYSTEM MATCHING

5. Air Flow:

Material is conveyed by the stream of air through the machine. Some air is always present and is pulled in through the grain as it goes into the inlet. There are 3 methods available to vary or control the amount of air going through the machine:

- a. Allow some air to enter the intake tube while working.
- b. Open the slide on the intake tube to allow extra air into the system at all times. Open 1/2 inch (12 mm) increments until the flow stabilizes.

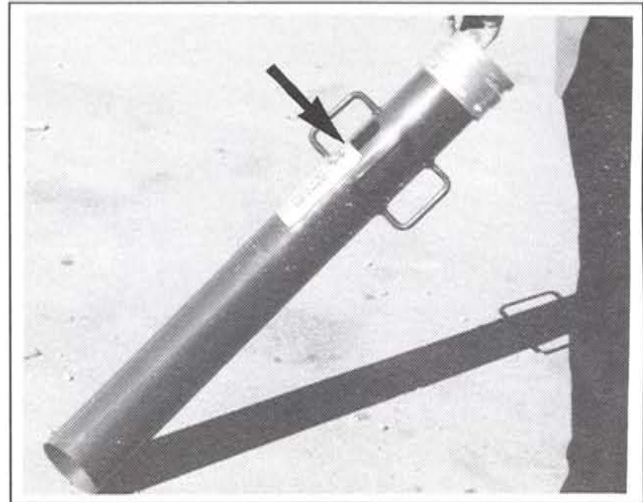


Fig. 7 INTAKE SLIDE

- c. Open the slide on the line above the filter to add extra air to the system. This air slide is used primarily for long distance blowing applications. Opening this slide will allow more air to enter the push side of the system helping to balance the inlet and outlet sides. The general rule is for every 100' of distance, open the slide 1/4" - 1/2".



Fig. 8 SLIDE ABOVE FILTER

6. Pressure Relief Valve:

A relief valve is located on the air line between the air pump and the airlock to prevent system damage should the lines plug. It is not a serviceable component. The relief valve will automatically reset after it has been opened.

7. Vacuum Relief Valve:

A relief valve is located on the air line between the filter and the air pump inlet to prevent system damage should the vacuum lines become plugged or if the system is receiving an inadequate air supply. The relief valve is not a serviceable component. The relief valve will automatically reset after it has been opened.

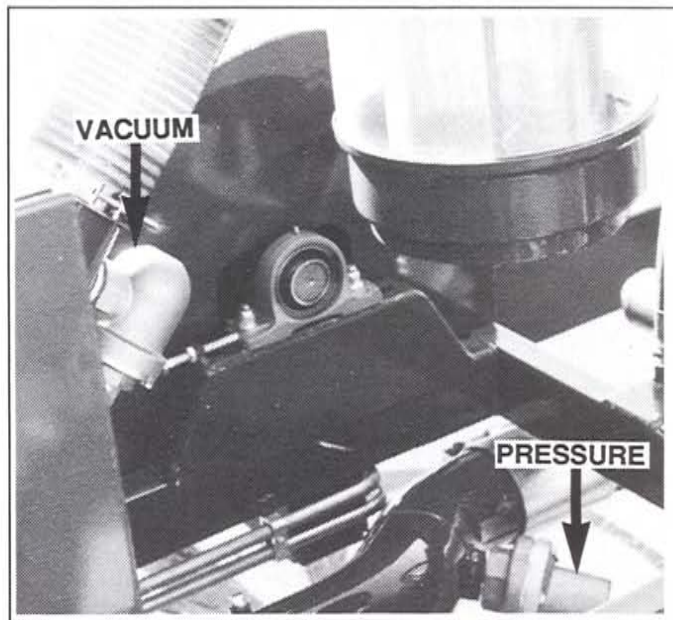


Fig. 9 RELIEF VALVES

8. Boom Position

The lever on the boom swivel locks the boom and discharge cyclone into position. To swivel the boom, raise the lever to unlock the swivel. Use the lever to help turn the boom to the desired position. Lower the lever until it seats in one of the locking grooves.

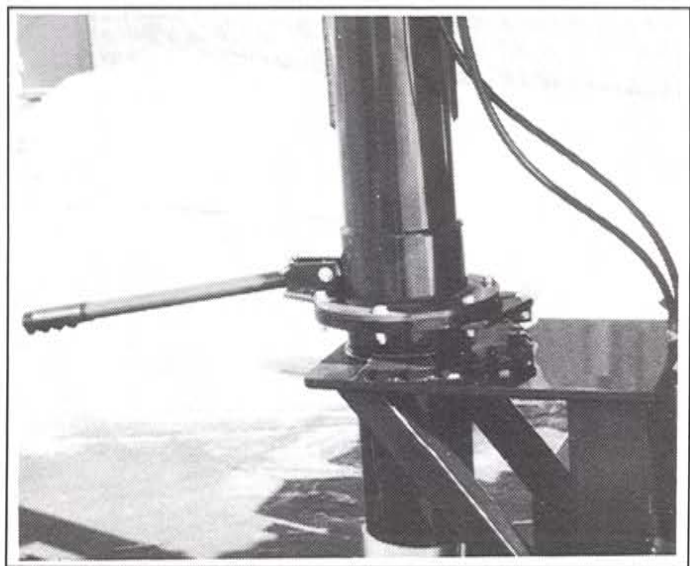


Fig. 10 BOOM SWIVEL

4.8 ATTACHING/UNHOOKING TRACTOR

Follow this procedure when attaching the grain vac to a tractor:

1. Clear the area of bystanders, especially small children before starting.
2. Make sure there is sufficient room and clearance to back up to the machine.
3. Use the jack on the hitch to adjust the height of the hitch to the drawbar.
4. Slowly back up to the machine and align the drawbar with the hitch.
5. Place all controls in neutral, stop tractor engine, set the park brake, remove ignition key and wait for all moving parts to stop before dismounting.
6. Insert a 1 inch by 6 inch (25 mm x 150 mm) hardened drawbar pin and install a retainer such as a Klik pin.



Fig. 11 MACHINE

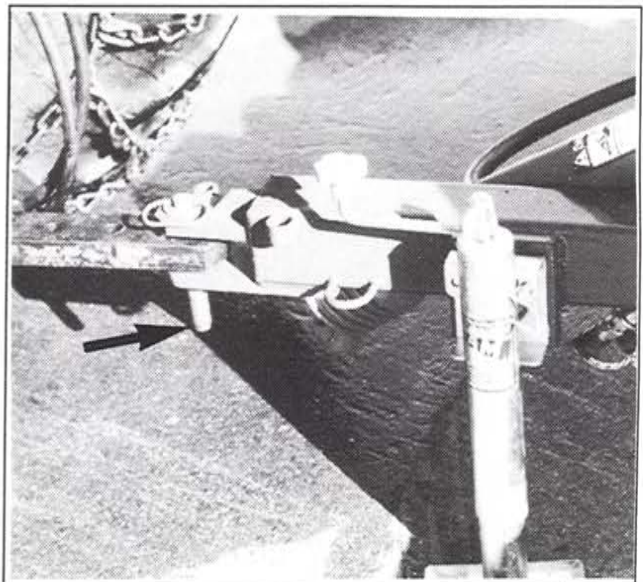


Fig. 12 DRAWBAR PIN

7. Attach the safety chain securely around the drawbar cage.
8. Open the belt cover and rotate the large pulley by hand to be sure the air pump turns freely.



CAUTION

Machine is shown with guard open for illustrative purposes only. Do not operate machine with guard open.

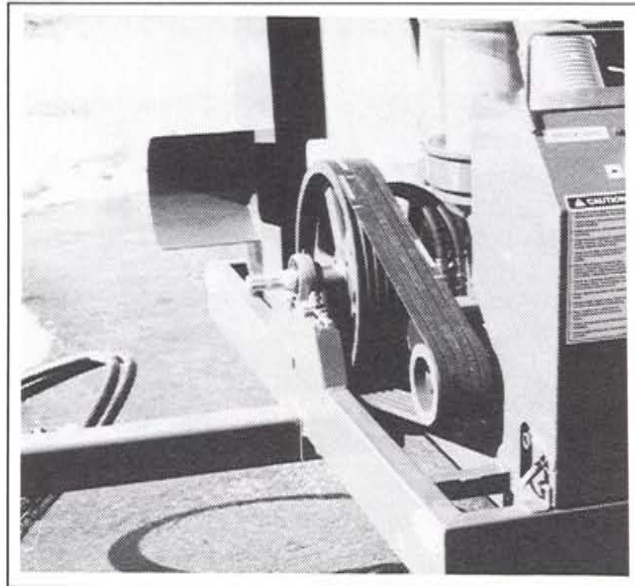


Fig. 13 PULLEY

9. Attach the PTO shaft:
 - a. Clean the splined yokes on the driveline.
 - b. Check that the driveline telescopes easily and that the shield turns freely on the shaft. Lubricate or clean before attaching if it does not move freely. See Maintenance Section.
 - c. Depress the locking pin on the yoke and slide the yoke over the tractor PTO shaft.
 - d. Depress the locking pin on the yoke and slide the yoke over the splined shaft of the large pulley. Rotate the pulley by hand as needed to align the splines of the yoke and the shaft.
 - e. Be sure the locking pin clicks into its locking groove on the shaft.
 - f. Attach the shield anchor chain to the frame.

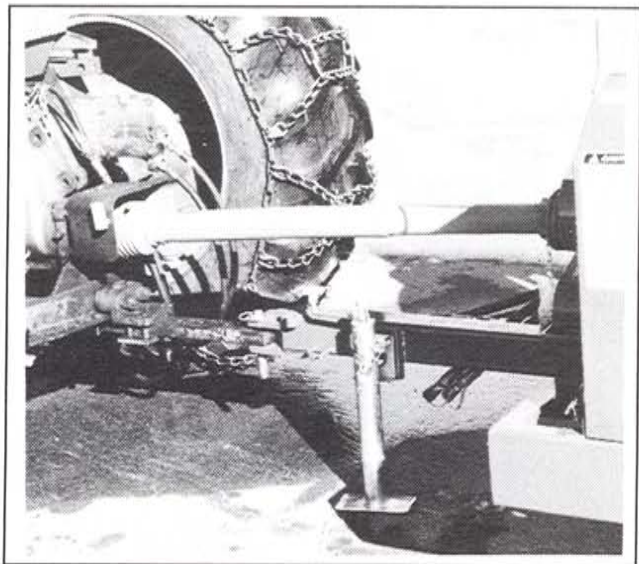


Fig. 14 DRIVELINE

10. Close and secure the belt cover.

11. Attach the hydraulic lines:

- a. Use a clean cloth or paper towel to clean the dirt and build-up from around the couplers.
- b. Clean the male tips as well.
- c. Insert the male tips into the couplers. Be sure they are locked in place.

NOTE

All machines are equipped from the factory with Standard 150 tips unless the unit has a self-contained hydraulic system.

- d. Route the hydraulic hoses along the hitch and away from moving parts. Secure in position with clips or ties. Be sure the hoses will not be pinched or crimped.

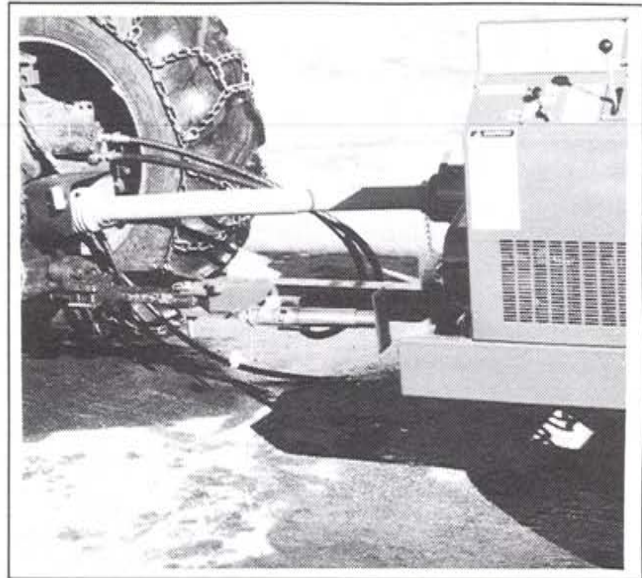


Fig. 15 ATTACHED

12. Retract the hitch jack and stow in its transport position.

13. Reverse the above procedure when unhooking from the tractor.

4.9 MACHINE SET-UP

Although the Conveyair is simple and easy to use, it is necessary to follow this set-up procedure before starting to operate:

1. Clear the area of bystanders, especially small children before starting.
2. The machine should be moved to an area free from overhead obstructions and overhead power lines for set-up. Stay well away from overhead objects to prevent damaging the machine or being electrocuted.
3. While in the open area, set the park brake and run the tractor at low idle engine RPM. Place all controls in neutral.
4. Use the control lever in the cab to engage the remote hydraulic circuit.
5. Dismount. Be sure park brake is set.
6. Unlatch the transport clamp holding the boom in position.
7. Swing the boom back until it clears the frame.

NOTE

It may be necessary to lift the boom pivot locking lever to move the boom.

8. Unlatch the discharge cyclone and remove from its storage position.



Fig. 16 BOOM/CYCLONE STORAGE

9. Place the discharge cyclone over the end of the boom outlet and secure in position using the overcenter clamps. Install the locking Klik pins.

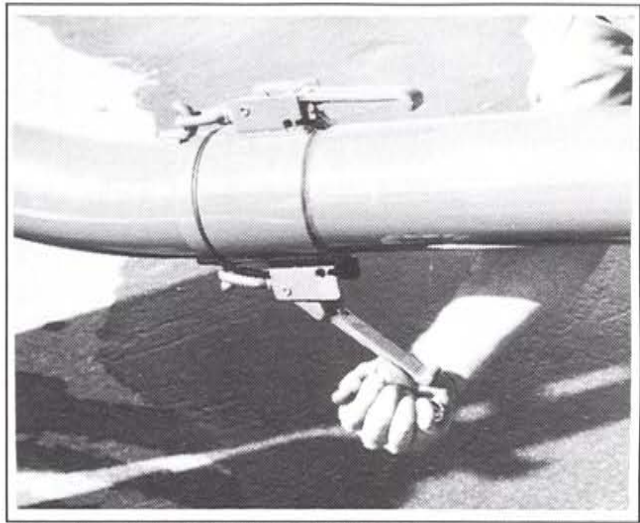


Fig. 17 ATTACHING CYCLONE

10. Move to the control console.
11. Slowly and carefully move to boom control lever to raise the boom into working position.



DANGER

Stay away from overhead electrical wires.
Electrocution can occur without direct contact.

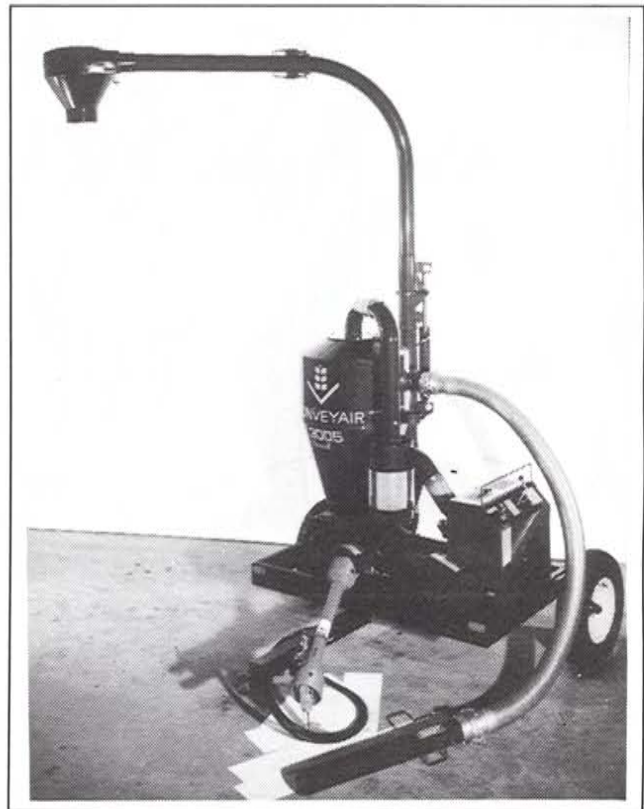


Fig. 18 BOOM EXTENDED

12. Do not stand under the boom when swinging into working position. Keep others away.
13. The machine is now ready to move into working position.
14. Attach the suction line to the receiver tank intake coupler. Secure with the cam lock couplers.
15. **Work site:**

The work site should comply with the following recommendations to obtain the most efficient performance.

 - a. Remove all debris and foreign objects from the work site.
 - b. Be sure there are no overhead electrical wires.
 - c. Be sure the working area is reasonably level and as dry as possible.
 - d. If the unit is being used to load trucks, make sure there is adequate room for the receiving vehicle to get under the discharge cyclone.
 - e. The tractor should be positioned to have the driveline angles at a minimum.
 - f. The Conveyair should be located so the intake line is as straight and as short as possible to obtain maximum capacity.

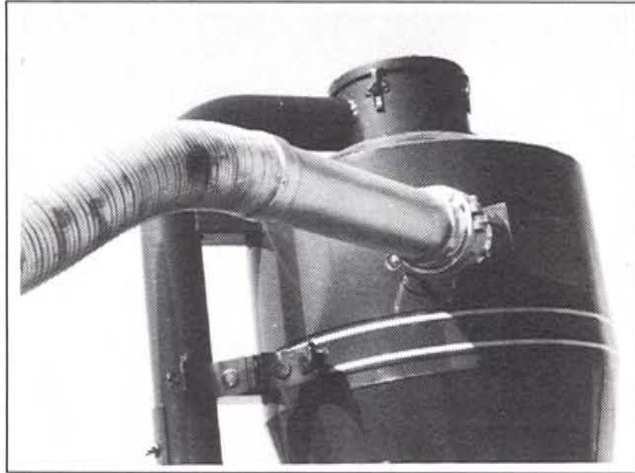


Fig. 19 RECEIVER INTAKE

4.10 OPERATING

By reviewing and following the instructions in the previous section, the machine is set-up and positioned to give maximum performance. When starting to operate, follow this procedure:

1. Clear the area of bystanders, especially small children before starting.
2. Clear foreign objects from the machine and working area.
3. Lubricate the machine per the schedule in the Maintenance Section.
4. Review and follow the pre-operation checklist.
5. Place the airlock and boom lift controls in neutral.
6. Place chocks ahead and behind the rear tractor tires to prevent machine movement.
7. Place all cab controls in neutral before starting the tractor.
8. Start the tractor and let it run at low idle RPM.
9. Move the lever to activate the hydraulic system. Be sure engine is running at low idle and dismount.
10. Slowly engage the airlock control on the console while watching the yellow coupler on the airlock drive under the screen. The drive coupler should turn in the counter-clockwise direction as the arrow indicates.

NOTE

If the airlock rotates the wrong direction, stop and reverse the direction of the control lever on the tractor. Or shut down the hydraulic system and reverse the couplers.

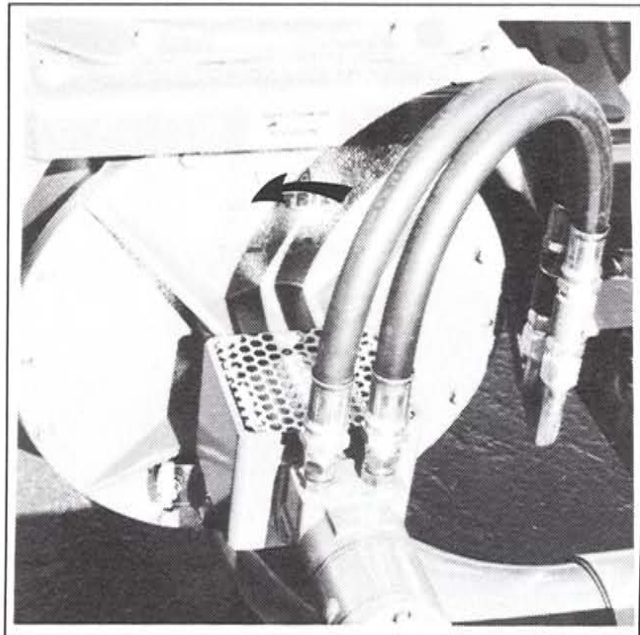


Fig. 20 AIRLOCK ROTATION

11. Airlock Speed:

Table 2 Material vs Airlock Speed

Material	Airlock Speed (RPM)
Barley	55 - 65
Canola	35 - 45
Corn	45 - 55
Flax	35 - 45
Wheat	45 - 55

The speed of the airlock is variable from 0 to 75 RPM and its optimum speed is dependent upon the material being moved. As a general rule, the larger and heavier the kernel, the faster the airlock should turn. Airlock speed is also affected by suction and discharge lengths, the moisture content and density (bushel weight) of the material. Although Table 2 should be used as a guide to setting airlock speed, it is recommended that the operator experiment with the speed to determine its optimum setting.

12. Count the number of times you can see the coupler turn over a known period of time. Use the flow control on the console to set the speed.

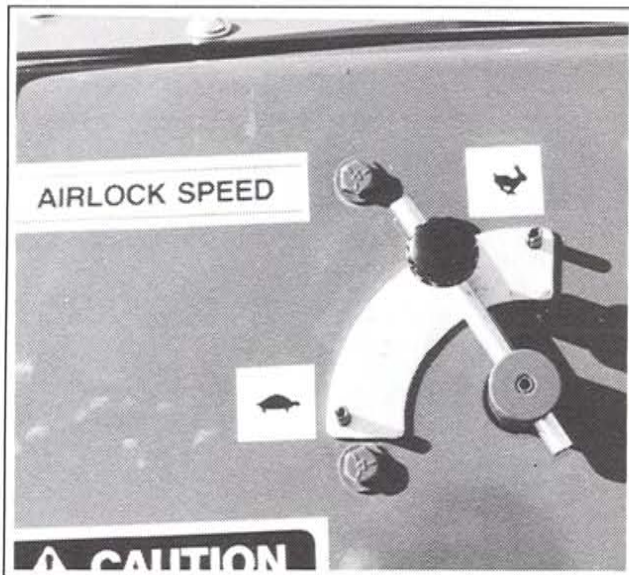


Fig. 21 SPEED CONTROL

13. With the tractor at low idle engine RPM, slowly engage the PTO control.

IMPORTANT

Slowly engage PTO at low idle engine RPM to obtain maximum belt and machine life.

14. Slowly increase engine RPM until rated PTO speed is reached.
15. Before dismounting, be sure the park brake is set and the wheels are chocked.
16. Open the air slide on the full bin nozzle approximately 2 inches (51 mm).
17. Insert the nozzle into the grain.

NOTE

Ensure that the air slide is not covered by grain.

NOTE

A Conveyair nozzle with an airslide must be used at all times when grain is being conveyed.

18. To obtain maximum capacity, slowly close the air slide on the intake nozzle until the machine starts to surge.
19. Slowly open the air slide until the surging stops.
20. In most cases, it is now necessary to reset the airlock speed. The airlock speed determines the level of the grain the receiver tank above the airlock. Maintaining a proper level insures that a proper balance is achieved between vacuum and pressure in the system to efficiently move the grain.

The access door in the receiver tank should be 1/2 to 2/3 covered with grain to obtain maximum efficiency of the machine. The line of the grain can be horizontal, angled or vertical. It's the amount of coverage that's important. How the grain is positioned can vary due to the type of grain, condition of the grain and atmospheric conditions such as temperature, humidity and altitude. Use the height of the grain visible through the access door to determine if the airlock is turning at the correct speed. Running too fast or too slow will result in the grain covering the door.

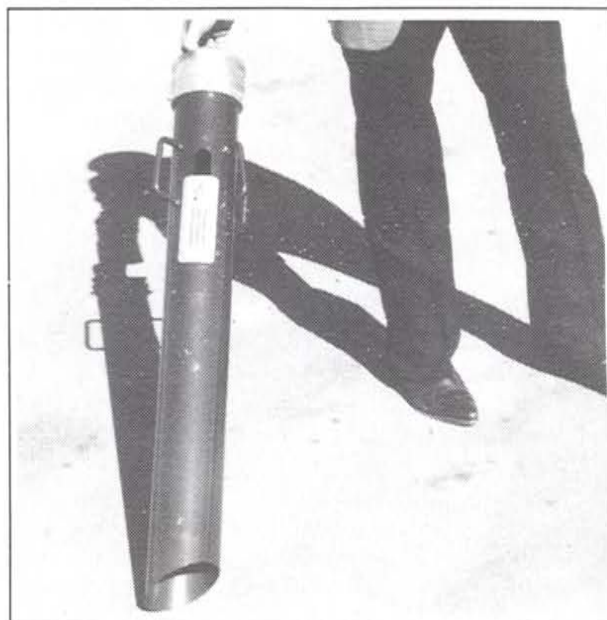


Fig. 22 FULL BIN NOZZLE

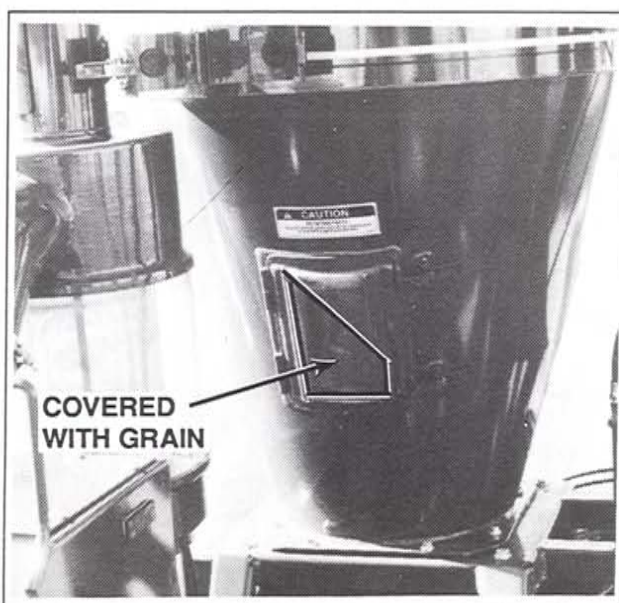


Fig. 23 GRAIN LEVEL

21. If the grain level in the tank goes above the receiver tank door and the airlock is turning faster than 65 RPM reduce speed until the correct level is achieved. As well, if the grain level in the tank goes above the receiver tank door and the airlock is turning slower than 30 RPM, increase speed until the correct level is achieved. If airlock speed is too slow, build up in the tank will take place because of a reduced transfer of grain from the vacuum to the pressure side of the airlock. If the airlock turns too fast the segments of the airlock will not fill completely, causing grain to build up in the tank because of reduced efficiency in transfer of grain from the vacuum to the pressure side of the airlock.
22. If the receiver tank fills with grain before the airlock speed can be set, the excess grain will flow into the filter and plug it.

When this happens on the Series II.

- a. Pull the intake nozzle out of the grain and stop the PTO on the tractor. Remove the wing nut holding the cover to the bottom of the filter.
- b. Restart the PTO until the machine cleans itself out.
- c. Shut the PTO and hydraulics off on the tractor.
- d. Install the cover on the bottom of the filter. Tighten the wing nut.
- e. Set the airlock speed when resuming work.

When this happens on the 1975 and 2970:

- a. Pull the intake nozzle out of the grain and stop the PTO on the tractor.
- b. Remove the clips on the cover of the filter and pull the filter out of the cannister.
- c. Clean the filter and reinstall it. Secure the 4 latches.
- d. Restart the machine and set the airlock speed when resuming work.

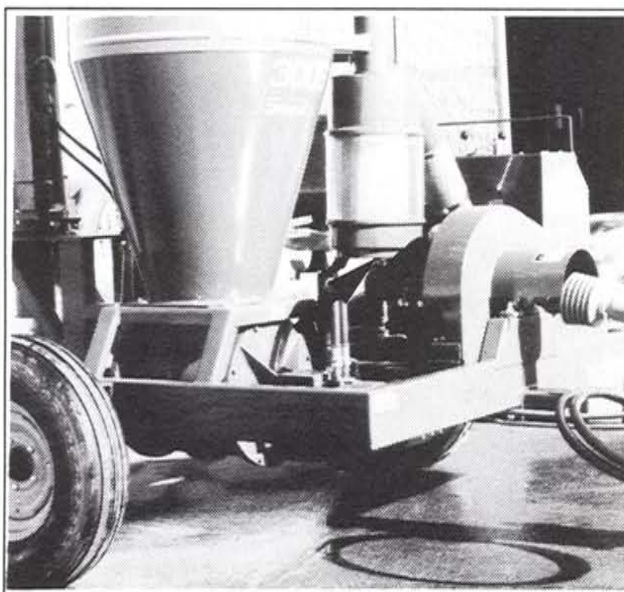


Fig. 24 FILTER (EXTERNAL)

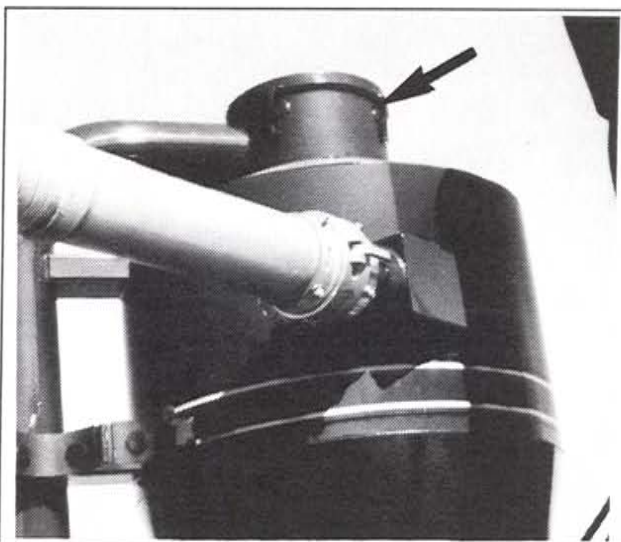


Fig. 25 FILTER (INTERNAL)

23. Operating hints:

- a. Try to keep the machine full when operating to obtain maximum efficiency.
- b. The receiver tank can be used to store a small quantity of grain when the machine is used for clean-up or when changing trucks.
- c. Do not use plastic or PVC lines in the system. These pipes can not be grounded and resulting the static build-up can cause an explosion.
- d. Stop PTO and hydraulics to airlock before opening receiver access door or rear airlock discharge elbow.
- e. It normally is not necessary to readjust airlock speed when changing trucks under the discharge cyclone.
- f. Reset airlock speed when:
 - i. Changing tractors.
 - ii. Changing type of grain.
 - iii. Changing suction or discharge line length or layout.
- g. Keep suction and discharge lines as short as possible to achieve maximum capacity.
- h. Ensure that the tractor has adequate H.P. to operate the Conveyair.
- i. Ensure that the PTO is the tractor is the correct RPM. At rated speed of the engine the correct RPM is achieved.
- j. Use poly clean up hose for clean up only.

Boel

4.11 APPLICATIONS

4.11.1 GENERAL

1. When transferring granular material with your Conveyair always try to keep the suction line as short as possible and minimize the number of bends. This will reduce the wear on elbows and flexible hose and will maximize the capacity of the machine.
2. When the machine does not need to be used at full capacity, e.g. when cleaning bins, the tractor can be throttled down approximately 30 to 40%.
3. For best capacity the tractor PTO should run at full RPM, 540 or 1000 RPM depending on model, and the airlock between 45 and 55 RPM. The grain level in the receiver section should be kept to approximately the level of the receiver access door.

4.11.2 LONG DISTANCE BLOWING

An air slide located on the air line between the receiver tank and the air pump (See Fig. 26) is used to assist in long distance blowing and also in cooling the air pump. This air slide should only be used if the air pump or the pressure line between the air pump and the airlock is getting too hot to touch, or if discharge length is in excess of 40 ft. (12 m). The rule of thumb in long distance blowing is to open the slide 1/4" - 1/2" (6 - 12 mm) for every 100 ft. (30 m) of distance. This may change according to type of grain or if grain is being moved vertically or horizontally. Remember, opening the air slide too far can affect capacity as adversely as not opening it at all.



WARNING

For long distance suction and blowing applications do not use P.V.C. or other plastic tubing. This type of tubing can not be properly grounded and a build-up of static electricity could lead to an explosion.



Fig. 26 AUXILLIARY AIRSLIDE

4.11.3 LONG DISTANCE SUCTION

When sucking grain more than thirty feet try to avoid using flex line. Instead use straight piping. Remember, the straighter the suction line the greater the efficiency of the Conveyor.



WARNING

For long distance suction and blowing applications do not use P.V.C. or other plastic tubing. This type of tubing can not be properly grounded and a build-up of static electricity could lead to an explosion.

4.11.4 CLEAN UP

When using the machine to clean up, use a combination of steel flex line, straight piping and poly hose. This will give the needed flexibility to easily get into corners and around obstructions for clean up. It is not recommended to use steel flex and poly hose for regular moving of grain because flow is restricted due to the rougher tube walls and bends associated with flex line. Capacity can be lowered by 20% to 40% with flex line as compared to straight piping.

IMPORTANT

Poly hose is meant for clean up only. Avoid storing the poly hose in direct sunlight. When using the poly hose ensure that there are no sharp obstructions that could cut or puncture the poly hose. Do not dent or stretch steel flex line excessively or attempt to bend it more than 90 degrees.

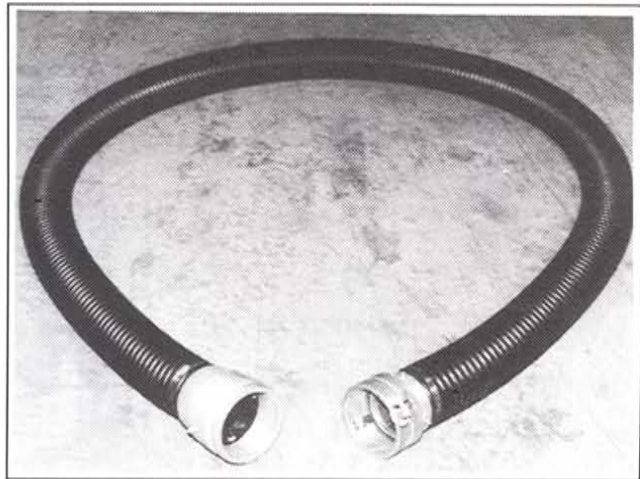


Fig. 27 POLY INTAKE HOSE

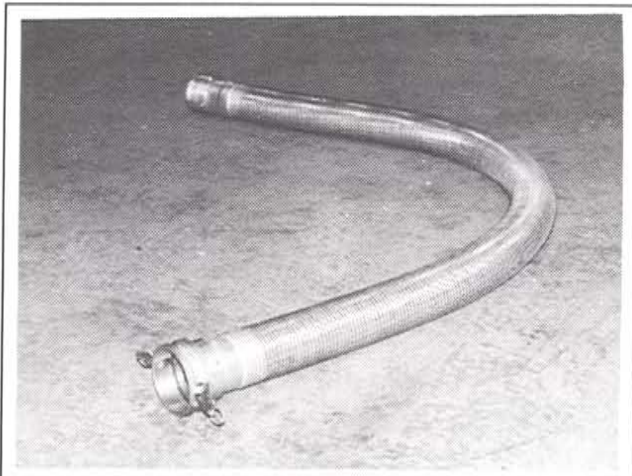


Fig. 28 STEEL FLEX HOSE

d. Bin Accessories:

1. 5" or 6" diameter (14 or 16 ga.) wall thickness, horizontal pipe section. Available painted or galvanized.
2. 5" or 6" diameter vertical pipe section, same specs as above. Depending on length, one or more sections may be used. Sections may be welded or coupled together with 3-bolt clamp.
3. Bin-top cyclone. For permanent installations, cyclones come equipped with a rain cap and can also double as aeration vents. The cyclone may be attached to the pipe by a 3-bolt clamp. For temporary installations, we recommend a lightweight poly cyclone attached with quick couplers.
4. Special 90 degree long radius elbow made of 11 ga. steel. It can be welded in place or secured with 3-bolt clamps.
5. 5" or 6" female quick couplers.
6. Delivery line from Conveyair. This can be steel flex only or a combination steel flex and long radius 90 degree elbow.
7. Side wall bin brackets.
8. 5" or 6" adjustable angle top mount bracket.
9. 5" or 6" 3-bolt clamp.

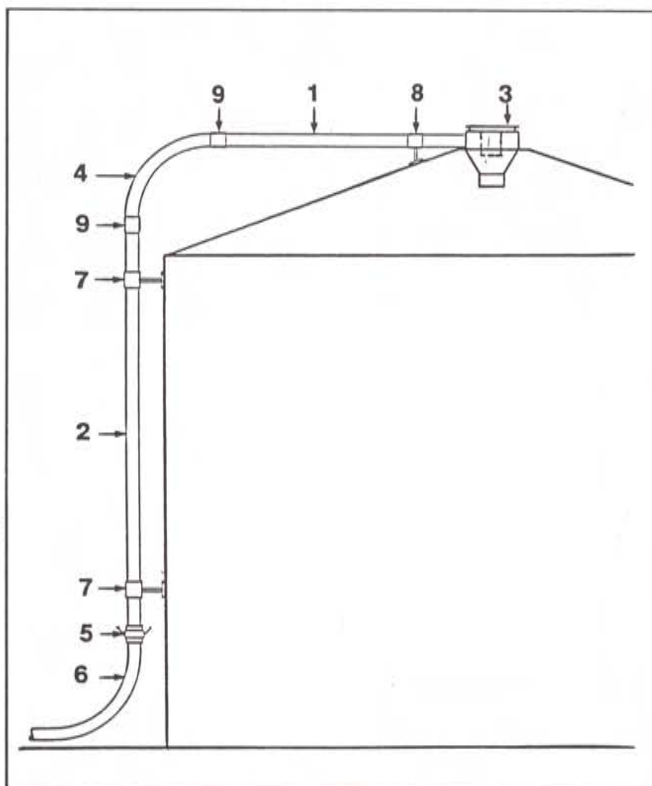


Fig. 34 BIN ACCESSORIES

4.11.7 CLEAN UP OF SPILLS AND GROUND STORED GRAIN

When cleaning up spills or grain stored on dirt, extreme caution should be exercised. Sand and dirt are very abrasive and cause excessive wear to air pumps and air locks. If care in operation is not taken the life expectancy of the Conveyair can be reduced significantly.

IMPORTANT

Avoid passing dirt, sand or other abrasive materials through the Conveyair grain vac.

4.11.8 UNLOADING BINS FROM THE TOP

When unloading bins from the top, some special precautions should be followed:

1. Do not enter the top of the bin alone. Always have 2 men working together.
2. Attach a safety line to the man on the grain. Grain in a bin can bridge or crust over and the man on top can fall through the crust into the cavity and be suffocated.
3. Do not place the intake nozzle between your feet when picking up grain. The grain can be drawn in so fast that the operator can be pulled down and submerged under the grain.



WARNING

Do not place intake tube near feet when standing on top of grain. Sufficient material can be removed to draw operator and intake tube into grain. Submersion in grain can cause suffocation.

4.12 SHUT DOWN

When the job has been completed the following steps should be followed for proper shut down of the grain vac.

1. Remove the nozzle from the material.
2. Allow all the material to be moved from the machine into the receiving unit.
3. Throttle down the tractor to an idle for 4 -5 minutes to allow a complete clean out and cool down of the unit.
4. If the purpose of the shut down is to change receiving units, simply throttle the tractor down, disengage PTO and hydraulics then change receiving unit. To start up again, engage hydraulics and PTO, increase engine speed to rated PTO speed.
5. If the Conveyair is being shut down and will be stored for an extended period of time it is necessary to clean the unit completely, as stated above. Run the engine at idle with the PTO engaged, open the lubrication port and inject a cleaning and lubricating agent. This will clean the dust and dirt from the inside of the air pump and also lubricate the metal parts to prevent corrosion. Close the lube port when finished.
6. If the Conveyair has been operated in a high oil content crop e.g. sunflowers, canola or flaxseed the injection of a cleaning agent through the lube port may be necessary to remove the build-up of oil and dust. Follow the above described procedure.

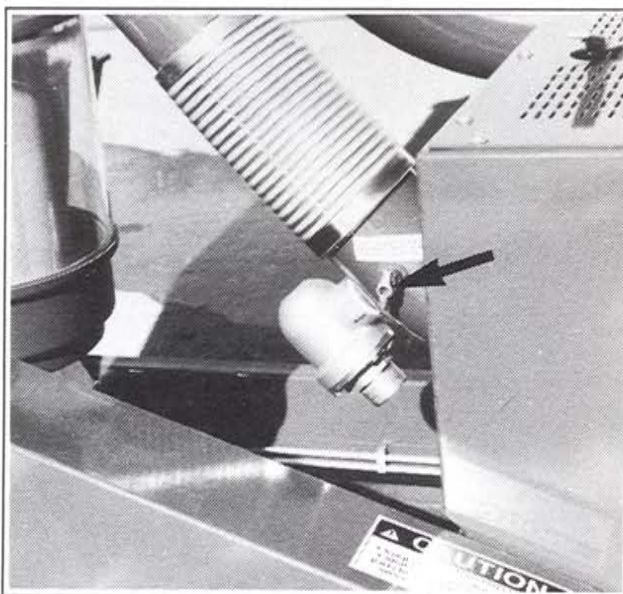


Fig. 35 CLEANING PORT



WARNING

Do not use a flammable fluid for cleaning.

NOTE

Close lubrication port when completed.

4.13 TRANSPORT



TRANSPORT SAFETY

1. Make sure you are in compliance with all local regulations regarding transporting equipment on public roads and highways.
2. Make sure the SMV (Slow Moving Vehicle) emblem and all the lights and reflectors that are required by the local highway and transport authorities are in place, are clean and can be seen clearly by all overtaking and oncoming traffic.
3. Do not allow anyone to ride on the grain vac or tractor during transport.
4. Do not exceed 32 km/h (20 mph). Reduce speed on rough roads and surfaces.
5. Use a retainer on the drawbar pin and install the safety chain before transporting.
6. Always use hazard flashers on the tractor when transporting.
7. Stay away from overhead electrical wires. Electrocution can occur without direct contact.

The Conveyair grain vac is designed to be easily moved from location to location. When transporting, follow this procedure:

1. Be sure all bystanders are clear of the machine.
2. Attach to the tractor using a drawbar pin with provisions for a mechanical retainer such as a Klik pin.
3. When using a ball and socket, make sure the locking jaws are pinned securely in position.
4. Secure the safety chain to the towing unit before moving.

5. Keep to the right and yield the right-of-way to allow faster traffic to pass. Drive on the road shoulder, if permitted by law.
6. Make sure the SMV (Slow Moving Vehicle) emblem and all the lights and reflectors that are required by the local highway and transport authorities are in place, are clean and can be seen clearly by all overtaking and oncoming traffic.
7. When it is necessary to frequently transport on a public road, it is recommended that the customer purchase the optional 7-pin connector light package to provide extra lighting. Use the optional lighting package during times of limited visibility.
8. Make sure all components and accessories are retracted and securely stowed before moving.
9. Stay away from overhead electrical wires and obstacles when moving.
10. The machine is equipped with implement tires and should not be towed over 30 km/h (20 mph). Table 3 gives the acceptable transport speed as the ratio of tractor weight to Conveyair weight.

Table 3 Speed vs Weight Ratio

<u>Road Speed</u>	<u>Weight of fully equipped or loaded implement(s) relative to weight of towing machine</u>
Up to 32 km/h (20 mph)	1 to 1, or less
Up to 16 km/h (10 mph)	2 to 1, or less
Do not tow	More than 2 to 1

11. Do not allow riders.
12. Always use hazard flashers on the tractor when transporting unless prohibited by law.
13. Always remove and stow PTO shaft when towing with a truck.

4.14 STORAGE



STORAGE SAFETY

1. Store the machine in an area away from human activity.
2. Do not permit children to play on or around the stored machine.
3. Make sure the unit is sitting, or blocked up firm and solid and will not tip or sink into a soft area.

At the end of the season, the machine should be thoroughly inspected and prepared for storage. Repair or replace any worn or damaged components to prevent any unnecessary down time at the start of the next season. Follow this procedure:

1. Thoroughly wash the machine using a water hose or pressure washer to remove all dirt, mud, trash or residue.
2. Run the machine at low idle for 2 - 3 minutes to dry the internal components.
3. While the machine is running, open the cleaning port and inject a cleaning agent such as WD40 for 45 - 60 seconds. This will coat the inside of the air pump and prevent rusting.

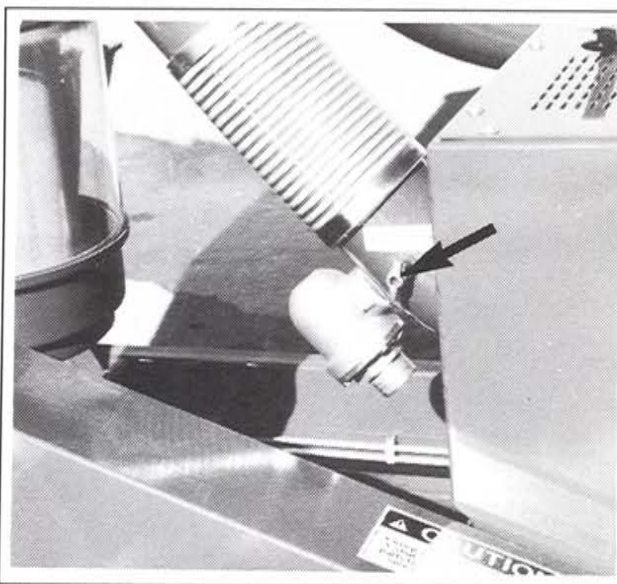


Fig. 36 CLEANING PORT

4. Lubricate all grease points. Make sure all grease cavities have been filled with grease to remove any water residue from the washing.
5. Retract and stow all components and accessories. Secure in position.
6. Install cover over the boom pivot area and secure in position.
7. Remove the PTO shaft from the machine and store inside.

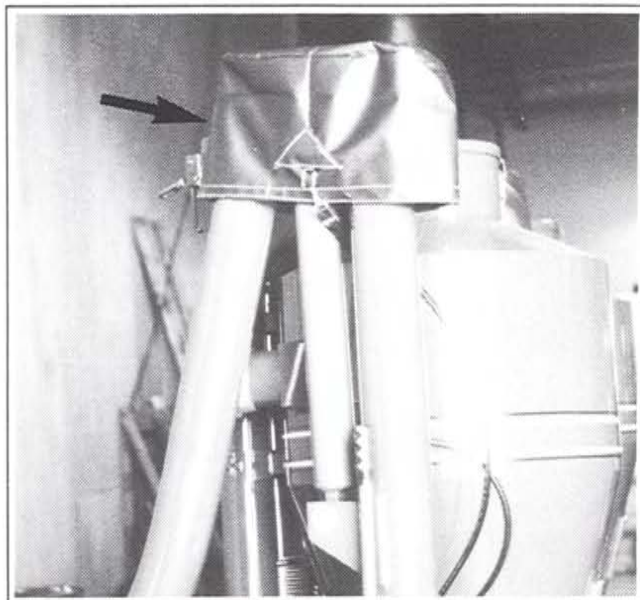


Fig. 37 PIVOT COVER

8. Inspect all the hydraulic hoses, couplers, fittings and lines. Tighten any loose fittings. Replace any hose that is badly cut, nicked, abraded or is separating from a fitting.
9. Inspect the system filter. Clean or empty if it has gathered any material.
10. Check the fluid level in air pump oil reservoirs. Add as required.
11. Touch up all paint nicks and scratches to prevent rusting.
12. Move the machine to its storage position.
13. Select an area that is dry, level and free of debris.
14. Place planks under the jack for added support.
15. Unhook the machine from the tractor (See Section 4.8).

5 SERVICE AND MAINTENANCE



MAINTENANCE SAFETY

1. Follow ALL the operating, maintenance and safety information in the manual.
2. Support the machine with blocks or safety stands when changing tires or working beneath it.
3. Place all controls in neutral, stop tractor engine, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
4. Use only tools, jacks and hoists of sufficient capacity for the job.
5. Make sure all guards are in place and properly secured when maintenance work is completed.
6. Never wear ill-fitting, baggy or frayed clothing when working around or on any of the drive system components.
7. Before applying pressure to a hydraulic system, make sure all lines, fittings and couplers are tight and in good condition.
8. Relieve pressure from hydraulic circuit before servicing or disconnecting from tractor.
9. Keep hands, feet, hair and clothing away from moving or rotating parts.
10. Clear the area of bystanders, especially small children, when carrying out any maintenance and repairs or making any adjustments.

5.1 SERVICE

5.1.1 FLUIDS AND LUBRICANTS

1. Grease
Use an SAE multi-purpose high temperature grease with extreme pressure (EP) performances and containing at least 1.5% molybdenum disulfide. Also acceptable is an SAE Multi-Purpose Lithium Base Grease.

2. Oil
In either the front or rear blower gearbox, use only 15W40 multi-grade oil that equals or exceeds the SAE "SF" specification.

Oil reservoir capacities:

Model 1975, 2970, 3005 and 3505

Front and rear - 800 cc (0.87 qt. U.S.)

Model 4005 and 4505

Front - 800 cc (0.87 qt. U.S.)

Rear - 1100 cc (1.00 qt. U.S.)

3. Cleaning Agent
WD40 or equivalent
4. Storing Lubricants
Your machine can operate at top efficiency only if clean lubricants are used. Use clean containers to handle all lubricants. Store them in an area protected from dust, moisture and other contaminants.

5.1.2 GREASING

Refer to Section 5.1.1 for recommended grease. Use the Maintenance Checklist provided to keep a record of all scheduled maintenance.

1. Use only a hand-held grease gun for all greasing. Air powered greasing systems can damage the seals on bearings and lead to early bearing failure.

IMPORTANT

Over-greasing can damage bearing seals. A damaged seal will lead to early bearing failure. Replace all bearings with damaged seals immediately.

2. Wipe grease fitting with a clean cloth before greasing, to avoid injecting dirt and grit.
3. Replace and repair broken fittings immediately.
4. If a fitting will not take grease, remove and clean thoroughly. Also clean lubricant passageway. Replace fitting if necessary.

5.1.3 SERVICING INTERVALS

8 Hours or Daily

1. Grease PTO shaft (7 locations).

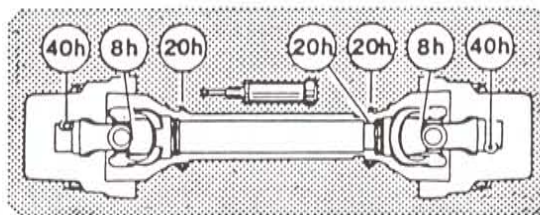


Fig. 38 PTO SHAFT

2. Grease input pulley shaft front and rear (2 locations).



CAUTION

Machine is shown with guard open for illustrative purposes only. Do not operate machine with guard open.

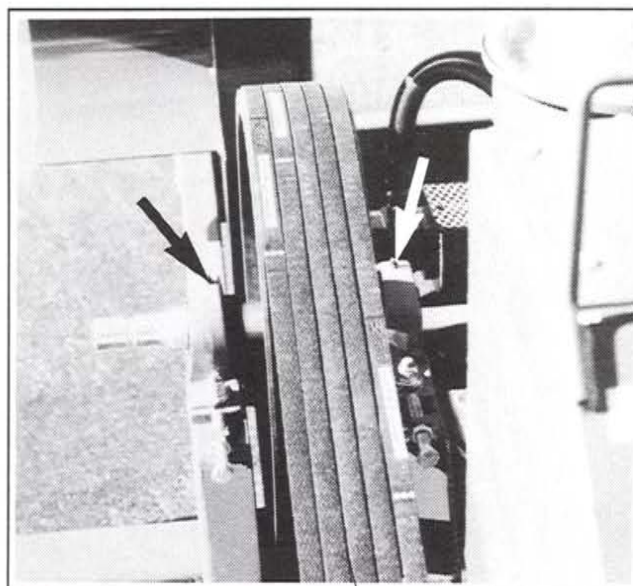


Fig. 39 INPUT SHAFT

3. Check V belt tension. Adjust as required.

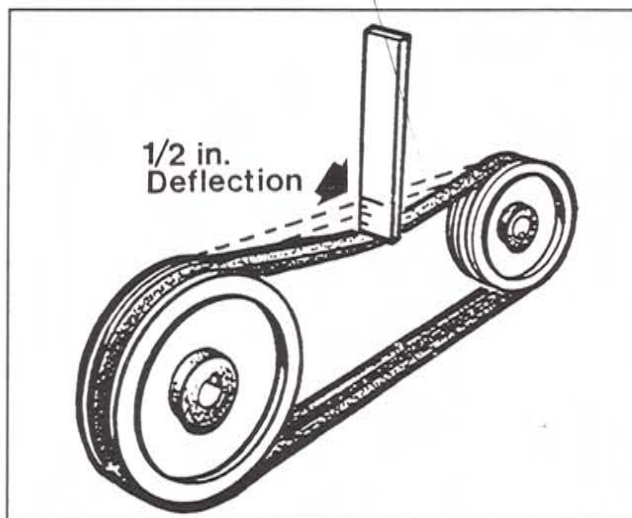


Fig. 40 V BELT

4. Check air pump oil level in reservoirs front and rear (2 locations). Add as required.

NOTE

Check when the oil is cold and the machine is level.

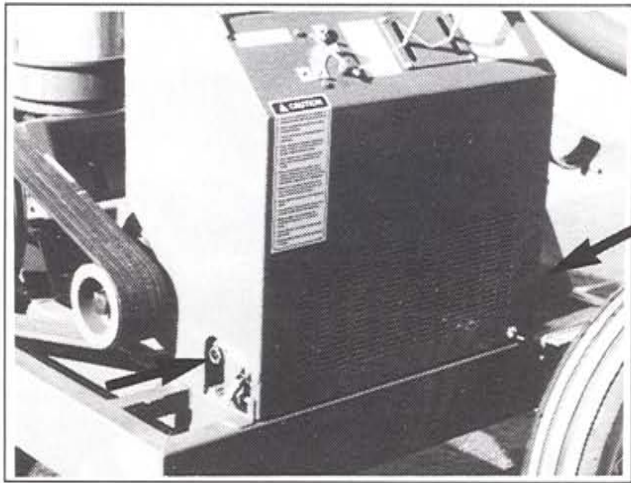


Fig. 41 OIL RESERVOIRS

5. Check and clean the system filter.

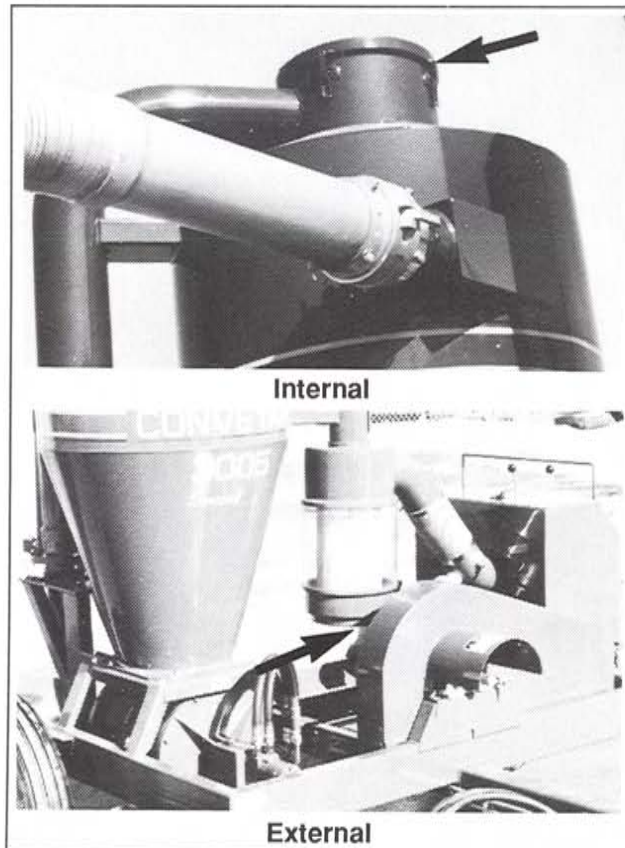


Fig. 42 FILTER

6. Grease air pump input shaft on 1975.

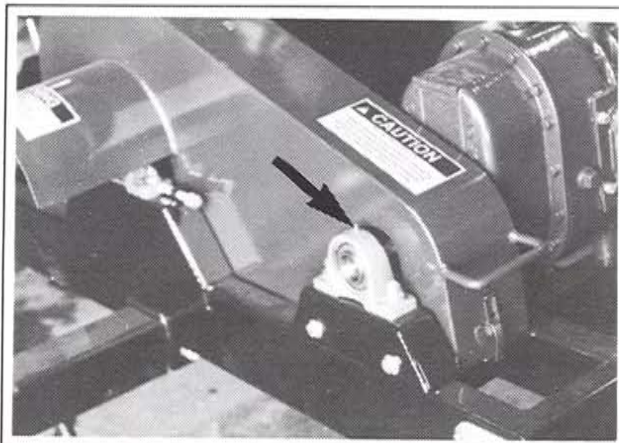


Fig. 43 INPUT SHAFT

50 Hours

1. Clean oil reservoir breather caps (2 locations).

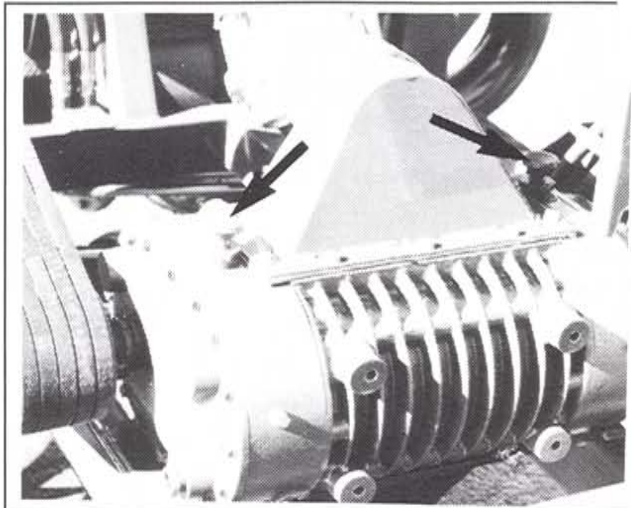


Fig. 44 BREATHER CAPS

2. Lubricate truck loading kit swivel with grease (2 locations).

Rotate the boom to a number of positions while greasing to ensure that grease is applied evenly to all areas of the swivel.

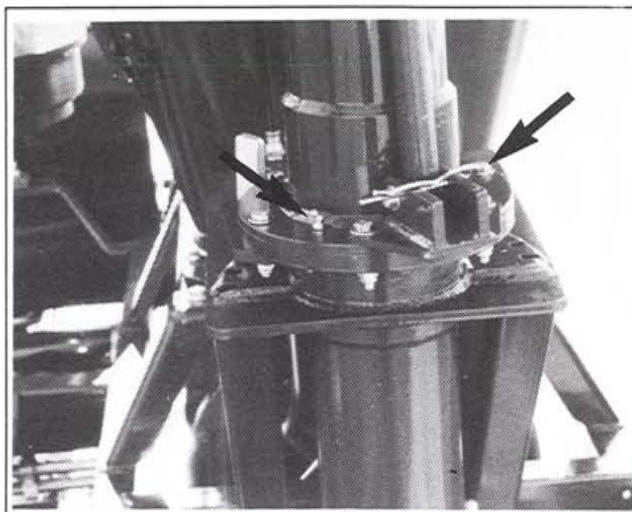


Fig. 45 BOOM SWIVEL

3. Lubricate truck loading boom hinges with one shot of grease (2 locations).

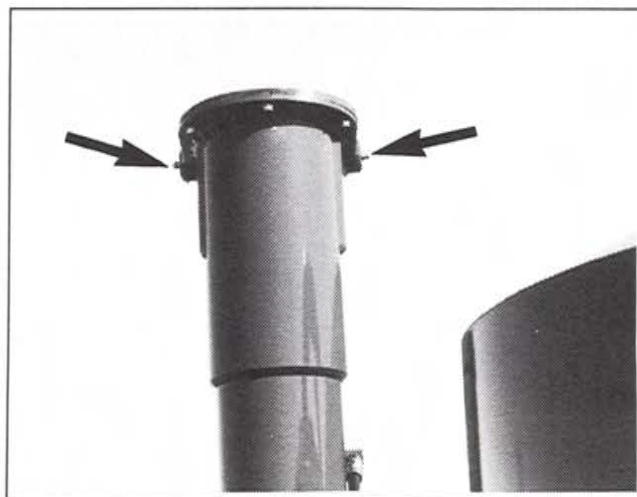


Fig. 46 BOOM HINGES

100 Hours or 6 Months

1. Change the oil in air pump reservoirs (front and rear).

NOTE

Change every 30 hours if operating in very dusty conditions.

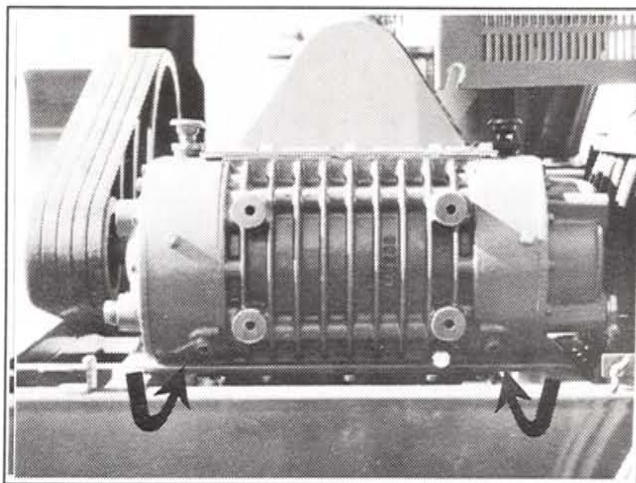


Fig. 47 RESERVOIR DRAIN

200 Hours or Annually

1. Repack wheel bearings (2 locations).



Fig. 48 WHEELS

2. Change filter on self-contained hydraulic system.

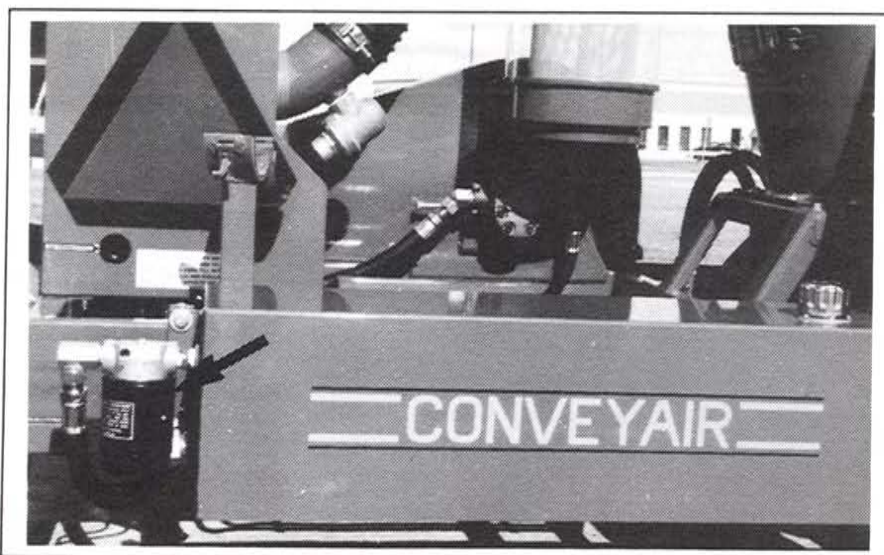


Fig. 49 FILTER (SELF-CONTAINED HYDRAULICS)

3. Wash machine.

5.1.4 SERVICE RECORD

See Lubrication and Maintenance sections for details of service. Copy this page to continue record.

ACTION CODE: ✓ CHECK C CHANGE CL CLEAN
 L LUBRICATE R REPACK D DISINFECT

MAINTENANCE HOURS SERVICED BY																			
8 Hours or Daily																			
L PTO Shaft (7)																			
L Input Pulley Shaft Frt. & Rr. (2)																			
✓ V Belt Tension																			
✓ Air Pump Oil Lvl. in Rsvor. (2)																			
✓ + CL System Filter																			
L Air Pump Input Shaft (1975)																			
50 Hours																			
CL Oil Rsvor. Breather Caps (2)																			
L Truck Loading Kit Swivel (2)																			
L Truck Loading Bm. Hinges (2)																			
100 Hours or 6 Months																			
C Oil in Air Pump Rsvor Frt. & R																			
Annually																			
R Wheel Bearings (2)																			
C Filter - Self-Cont. Hyd. Systm.																			
CL Machine																			

5.2 MAINTENANCE

By following a careful service and maintenance program for your machine, you will enjoy many years of trouble-free operation.

5.2.1 V-BELT TENSION

The V-belts on the input drive should always be adjusted to have approximately 1 inch (25 mm) deflection in the center. If the belts are too loose they will start to slip which will cause heat build up and excessive wear of the belts. If the belts are too tight they will cause the bearings to overload which will result in premature failure of the main shaft and lower bearings.

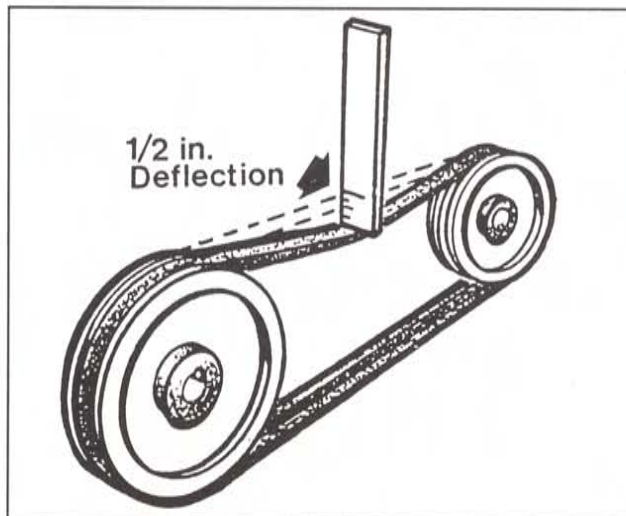


Fig. 50 BELT TENSION

To adjust the belt tension, proceed as follows:

1. Place PTO and hydraulic controls in neutral and shut-off engine. Disconnect the PTO shaft from the tractor.
2. Unlatch belt shield cover and open cover.
3. Loosen jam nut on adjuster bolts and loosen the bearing mounting bolts.
4. Use the adjusting bolts to move the pulley assembly to apply the proper tension to the belts and also to properly align the pulleys with each other.



CAUTION

Machine is shown with guard open for illustrative purposes only. Do not operate machine with guard open.



Fig. 51 ADJUSTING BOLTS

5. Place a straight edge across the faces of the two pulleys. Maximum allowable misalignment is 1/16" (2 mm) on any of the pulley edges. Adjust as required.

6. Be sure the belt tension is correct.
7. Tighten the bearing mount bolts and the jam nuts.
8. Close and latch the belt cover.

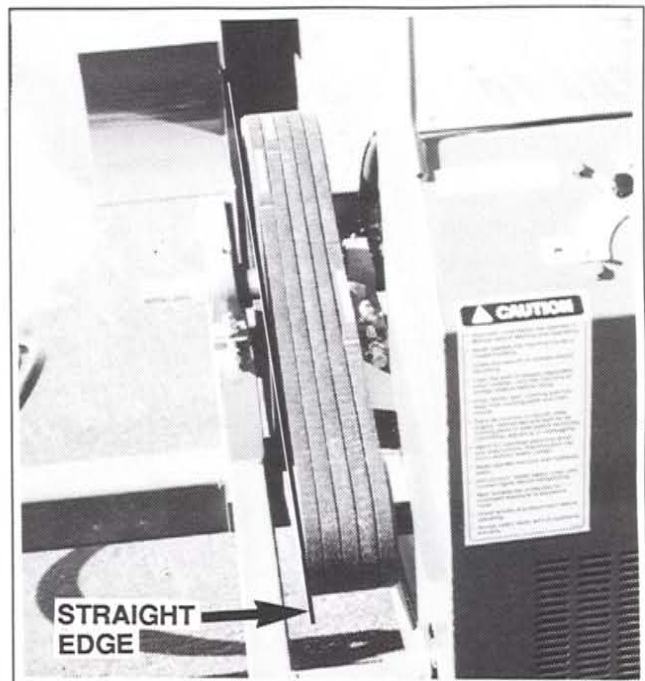


Fig. 52 ALIGNMENT

IMPORTANT

Be sure the belt tension is right
and pulleys are aligned properly.
Do not overtighten belts.



WARNING

Always close and latch belt cover before
operating.

5.2.2 AIRLOCK TIPS

A. Checking Clearance

For maximum machine efficiency and capacity the clearance between the airlock tips and the inside of the airlock shell must be maintained within a maximum allowable tolerance. When a noticeable drop in capacity of the Conveyair has been experienced the airlock clearances should be checked. When checking the clearances proceed as follows:

1. Disengage PTO and hydraulic power and shut off engine. Wait for all moving parts to stop.
2. Relieve the pressure in the hydraulic lines and disconnect from the tractor.
3. Remove hydraulic lines from the airlock drive motor to allow rotation of the airlock.



WARNING

High-pressure fluids can penetrate the skin and cause infection and toxic reaction.

4. Open the inspection door on the receiver tank. Use a feel gauge to check the clearance between the tips and the shell.

IMPORTANT

For best performance the clearance should not exceed 0.38 mm (0.015"); if the clearance is more, it must be adjusted.

B. Airlock Tip Adjustment

When the airlock tips need adjusting, proceed as follows:

1. Loosen the poly connector on the air line between the filter and the blower to allow it to move as required.
2. Attach an overhead hoist to the receiver tank.
3. Remove the eight bolts securing the receiver tank to the airlock mount plate. Remove the receiver tank from the frame. Be sure the hoist is of sufficient size to handle the receiver tank.
4. The airlock is now accessible for measuring and adjustment. To adjust, proceed as follows:
 - a. Position tip next to top of shell.
 - b. Loosen the 5 bolts attaching the tip to the blade of the airlock slightly.
 - c. Move the tip outward, towards the shell until you have 0.007" (0.18 mm) clearance.
 - d. Check that the clearance between the tip end and endplate of the airlock is 0.007" (0.18 mm).
 - e. Tighten the five bolts and torque to 34 - 40 Nm (20 - 25 ft. lbs.).
 - f. Mark the tip as done and rotate the rotor to ensure that there is no contact between the tip and the shell. If contact occurs it is necessary to increase the clearance slightly. If there is no contact proceed to the remaining tips until all ten tips have been adjusted.
 - g. Replace the receiver tank and check that all connections are airtight.

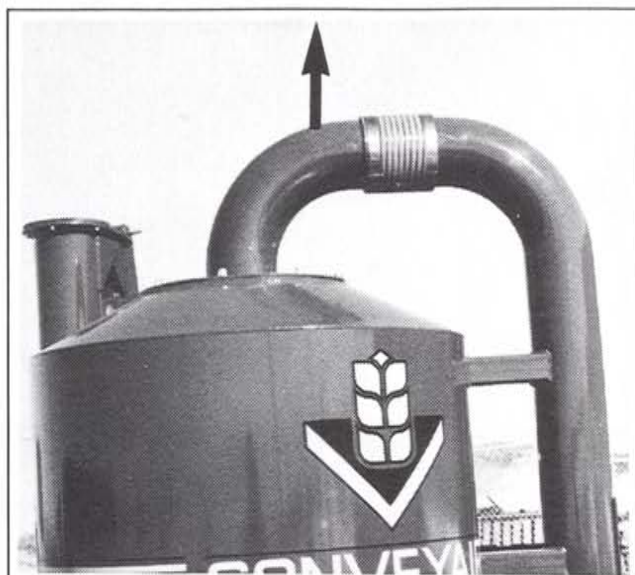


Fig. 53 LIFTING RECEIVER

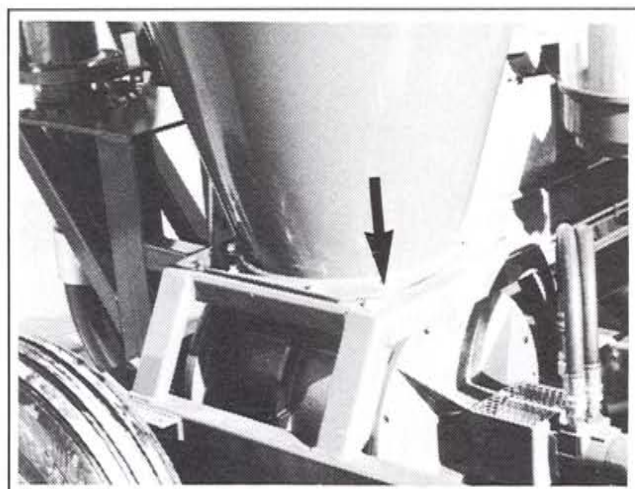


Fig. 54 MOUNTING BOLTS

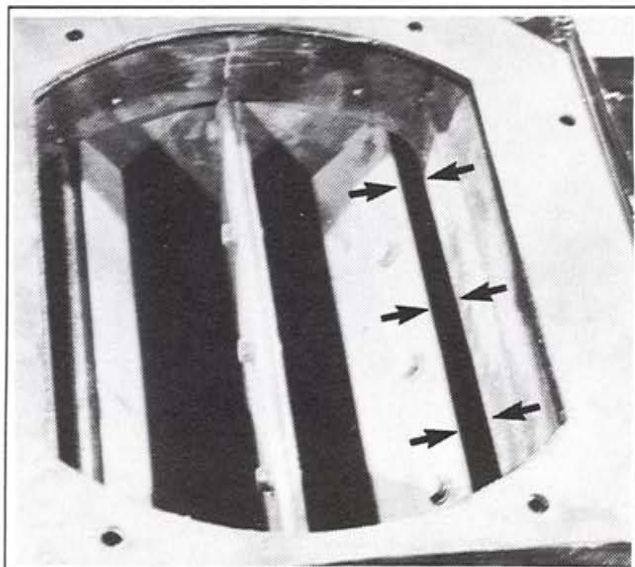


Fig. 55 TIPS

5.2.3 RESERVOIR BREATHER

Every 50 hours the oil reservoir breathers need to be cleaned to allow the pressure to equalize with the outside as the temperatures change. To clean the breathers, follow this procedure:

1. Unlatch and open the console.
2. Remove breathers from the top of the reservoirs.



CAUTION

Machine is shown with guard open for illustrative purposes only. Do not operate machine with guard open.

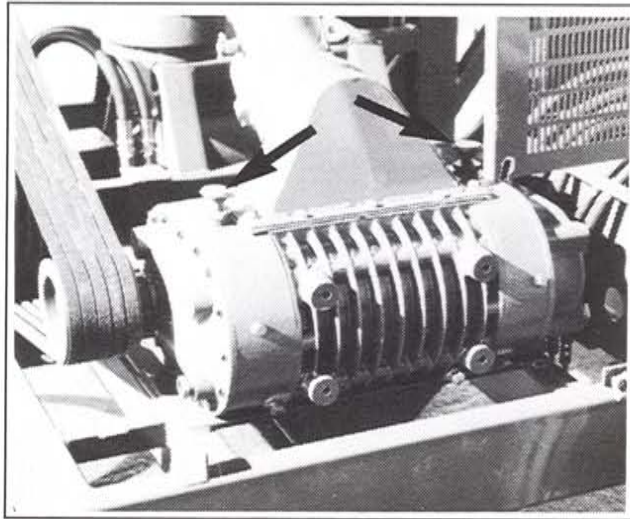


Fig. 56 BREATHER

3. Wash in a good grade of solvent.
4. Dry with an air hose.
5. If the breathers are heavily caked with dirt it may be necessary to soak them in solvent for an hour to loosen the caked material.
6. Again dry with an air hose.
7. Install on each reservoir.
8. Close and latch the console.

5.2.4 RESERVOIR OIL CHANGING

Every 100 hours (or oftener if conditions are extremely dusty) the oil in the air pump oil reservoirs should be changed. To change, follow this procedure:

1. Unlatch and open the console.
2. Place a small pan under the drain plug.

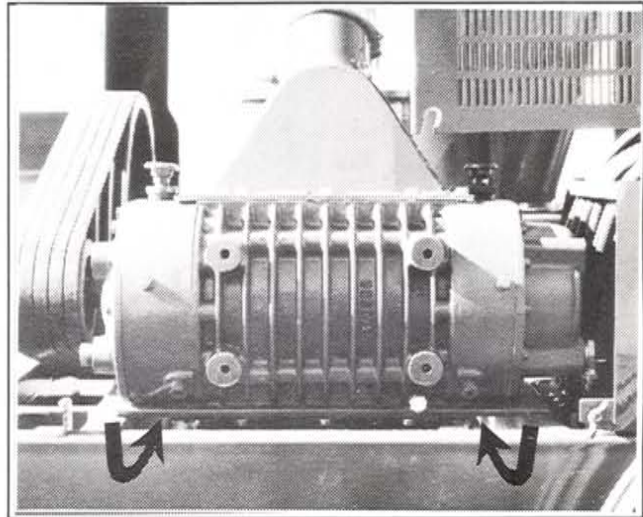


Fig. 57 DRAIN PLUG

3. Remove the drain plug and drain for 10 minutes.
4. Install and tighten the drain plug.
5. Remove breather and add oil through the breather hole.
6. Add until the oil level comes to the center of the sight glass.

IMPORTANT

Fill to the center of the sight glass. Overfilling causes heating from oil churning. Underfilling causes heating from lack of lubrication.

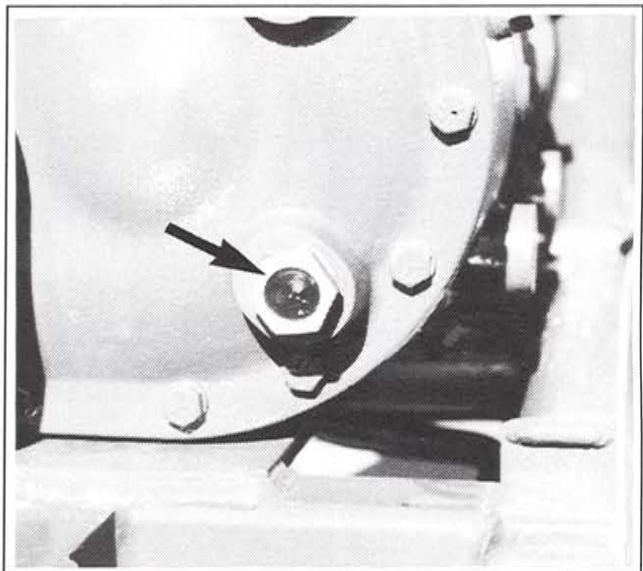


Fig. 58 SIGHT GLASS

7. Install the breather and tighten.
8. Repeat on the other reservoir.
9. Close and latch the console.

5.2.5 FILTER CLEANING (EXTERNAL)

When trash or material builds up in the filter, it needs to be cleaned. To clean follow this procedure:

1. Remove the wing nut holding the cover on the bottom of the filter.

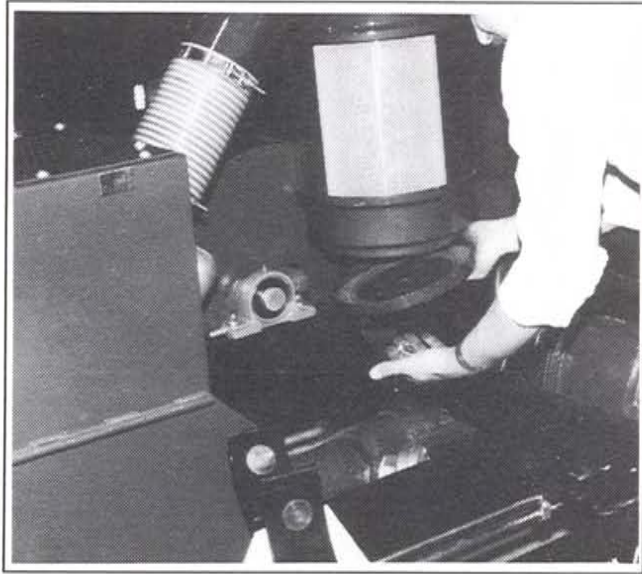


Fig. 59 FILTER

2. Remove cover to allow the material to fall from the filter.
3. A sharp rap with the heel of the hand may be needed to dislodge any material that may be hung up.
4. Install the filter cover and tighten the wing nut.

5.2.6 FILTER CLEANING (INTERNAL)

To clean the internal filter, follow this procedure:

1. Access the internal filter by using the non-slip step treads on the frame members at the rear of the machine.

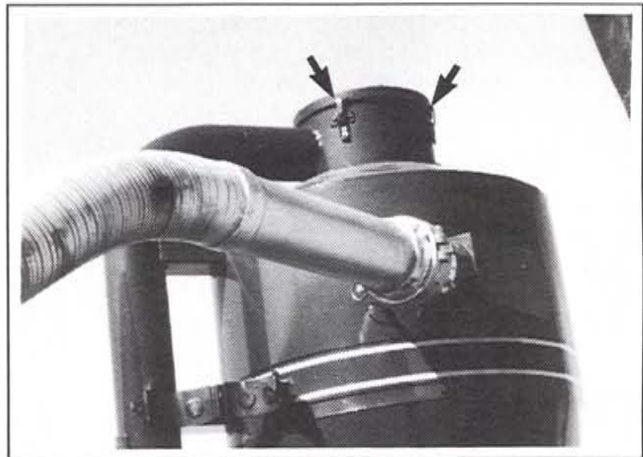


Fig. 60 INTERNAL FILTER RETAINERS

2. Loosen the internal filter retainers.

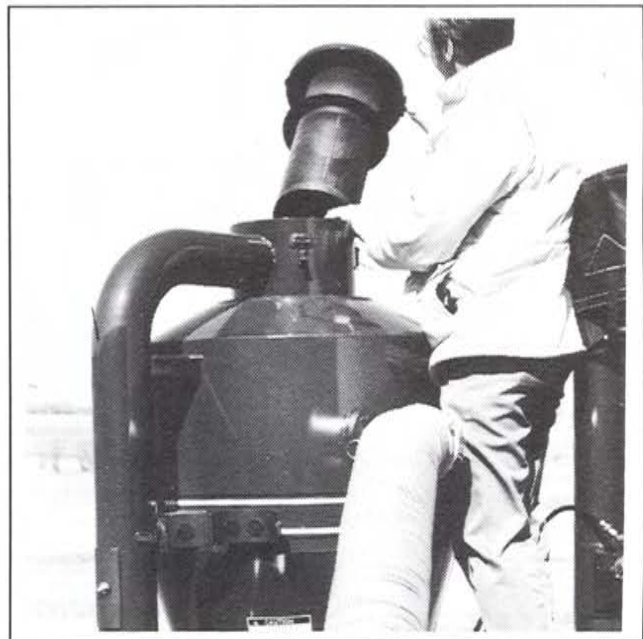


Fig. 61 FILTER ASSEMBLY

3. Raise the filter assembly out of the receiver tank.
4. Brush any accumulated material from the outside of the filter.
5. Inspect the gasket inside the filter cover to insure there are no possible leaks.

NOTE

Do not strike the screen with a piece of wood or other hard object as damage to the screen could cause loss of effectiveness.

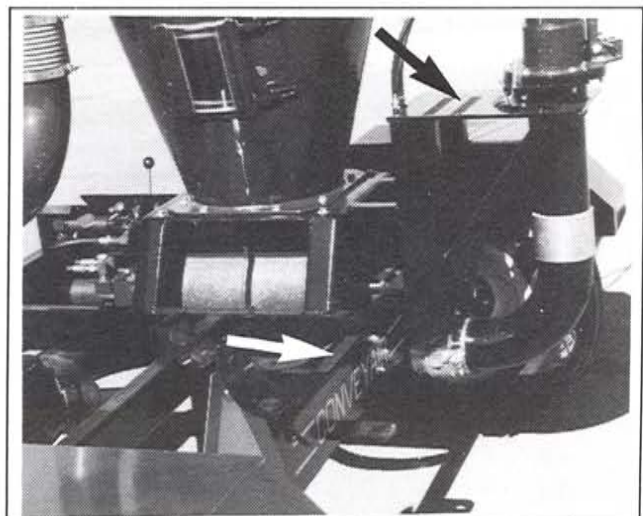


Fig. 62 STEPS

5.2.7 SHEAR BOLT

A shear pin is provided in the PTO shaft to protect the drive system during an overload. To change the shear pin, follow this procedure:

1. Place all controls in neutral, stop engine, set park brake, remove ignition key and wait for all moving parts to stop before dismounting.
2. Disconnect the PTO shaft from the tractor and lay to the side to provide maximum clearance for the shear bolt.

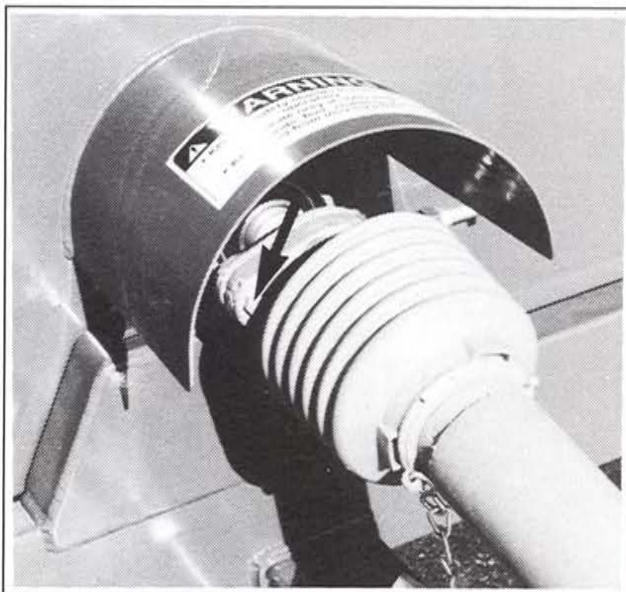


Fig. 63 SHEAR BOLT

3. Carefully remove remaining shear bolt using a hammer and punch if necessary. Be careful not to enlarge the holes.
4. Install the new shear bolt and tighten.

IMPORTANT

Use only genuine Thor parts. These shear bolts are specially designed to provide protection for the drive system. Do not install just any bolt.

6 ACCESSORIES

6.1 ACCESSORY CARRIER PACKAGE

An accessory carrier package is available for all Conveyair grain vacs, this package can be factory installed on a new unit or can be added by the dealer. Figure 64 shows the carrier installed and the accessories mounted for transport or storage. With the use of the accessory carrier the need for an extra vehicle to carry the accessories is eliminated.



Fig. 64 ACCESSORY CARRIER

6.2 FRONT TRANSPORT TARP

The transport tarp is available to protect the front of the machine from stone chips when transporting down the road.



Fig. 65 TRANSPORT TARP

6.3 DUAL INLET

The dual inlet is available on all Conveyair grain vacs as a factory installed option, offering you the convenience of grain intake from either side of the grain vac.



Fig. 66 DUAL INLET

6.4 CYCLONE DOWN SOCK

A cyclone down sock is available for all Conveyair grain vacs. This down sock is to be used where a lower than normal receiving unit is used or where there are extremely windy conditions.



Fig. 67 CYCLONE SOCK

6.5 SIX INCH CLEAN UP NOZZLE

A special six inch clean up nozzle and poly hose is available for all six inch machines to allow faster clean up of grain storage facilities.



Fig. 68 NOZZLE

6.6 24" CLEAN UP FLAIR

A 24" clean up flair is available for the five inch clean up nozzle to allow faster clean out of grain storage facilities.

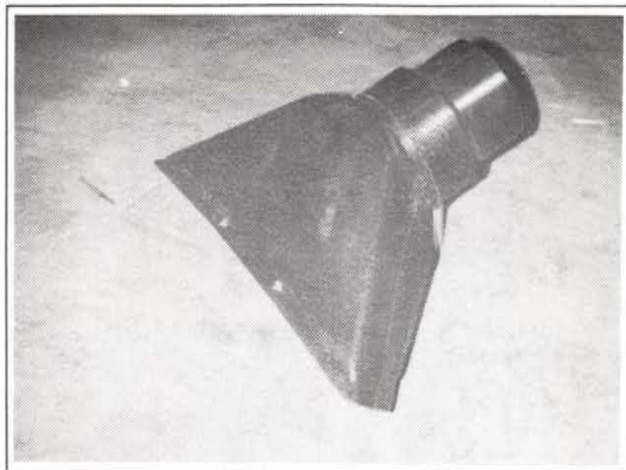


Fig. 69 FLAIR

6.7 BIN PIPING

A complete range of piping, elbows, cyclones, brackets etc. are available to allow the piping of most grain storage facilities. Contact your nearest dealer for assistance with your piping plans.

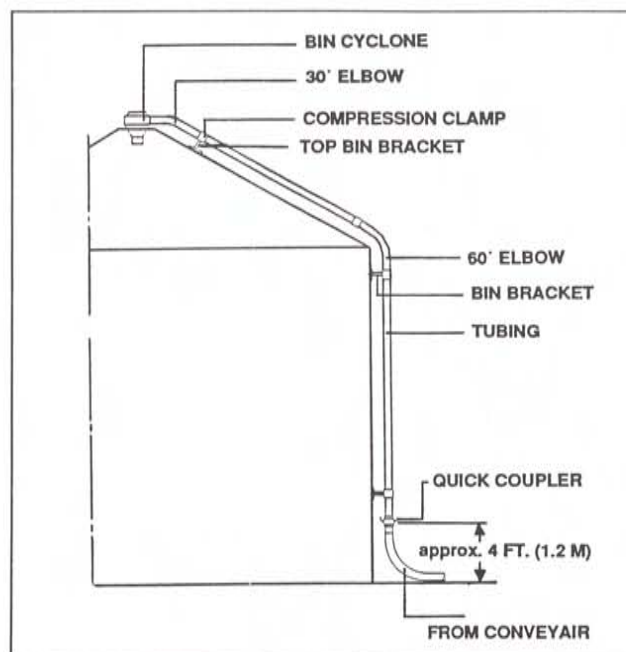


Fig. 70 PIPING

6.8 SEED DRILL CLEAN OUT KIT

A nozzle and flex tube is available for cleaning out a seed drill or other small spaces.



Fig. 71 SEED DRILL CLEAN OUT KIT

6.9 SILENCER

A silencer is available to go between the air pump and airlock to reduce the noise level.

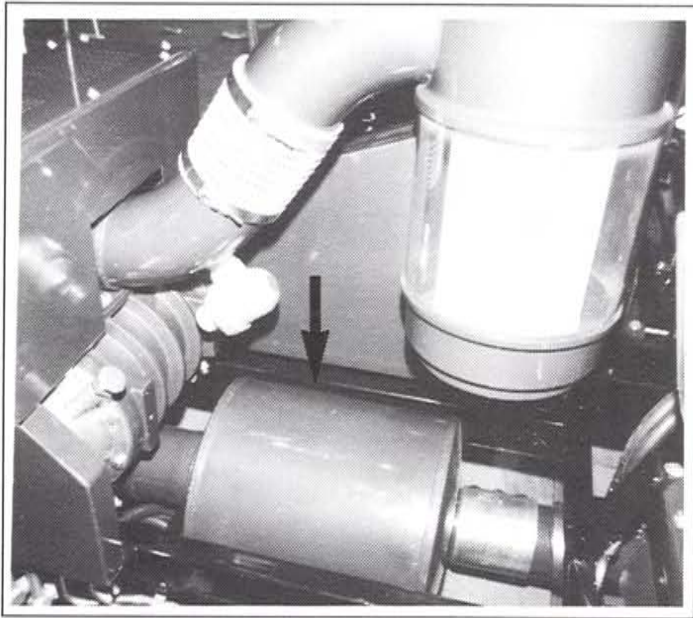


Fig. 72 SILENCER

6.10 FENDERS

Fenders are available to fit over the tires to deflect objects picked up by the tires.

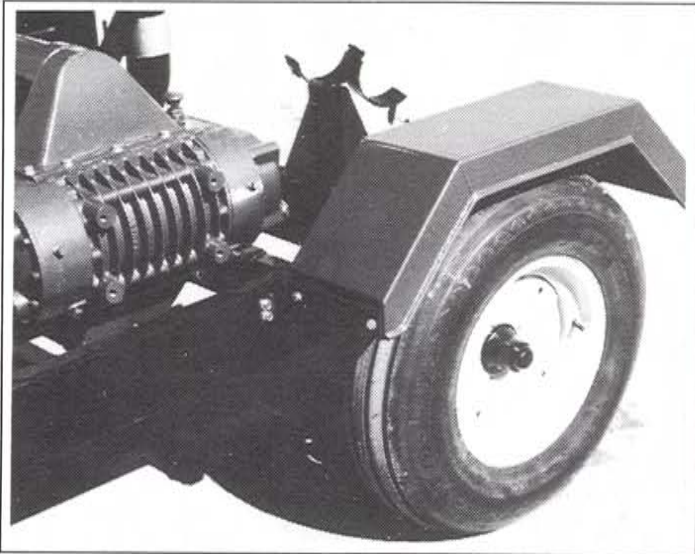


Fig. 73 FENDERS

6.11 RECEIVER INTAKE ASSEMBLY

A steel flex tube is available to go on the receiver intake. All other intake components attach to this flex tube.

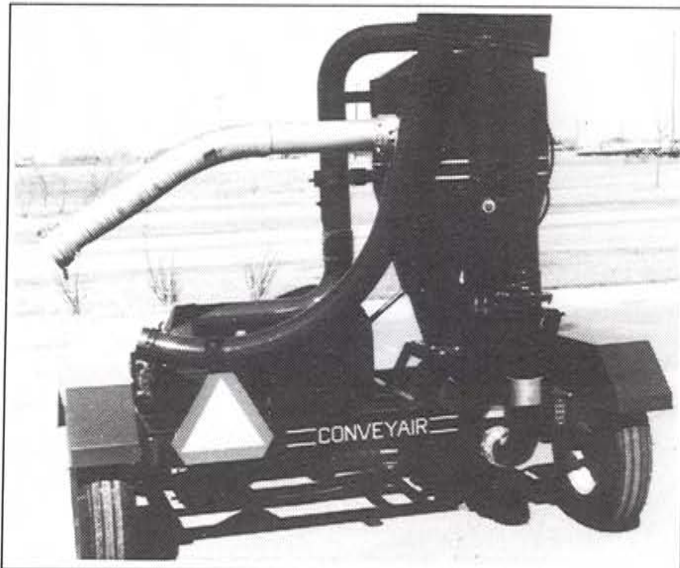


Fig. 74 RECEIVER INTAKE ASSEMBLY

6.12 CAM LOCK COUPLERS

Cam lock couplers are available for the ends of all pipes and tubing to make connecting easy and convenient.



Fig. 75 CAM LOCK COUPLERS

6.13 SELF-CONTAINED HYDRAULICS

A self-contained hydraulic package is available when the tractor is not equipped with a hydraulic system.



Fig. 76 SELF-CONTAINED HYDRAULICS

6 TROUBLE SHOOTING

The Conveyair grain vac uses an air pump to create a vacuum and pressurized circuit to move grain. It is a simple and reliable system that requires minimal maintenance.

In the following section, we have listed many of the problems, causes and solutions to the problems that you may encounter.

If you encounter a problem that is difficult to solve, even after having read through this trouble shooting section, please call your local dealer or the factory. Before you call, please have this Operator's Manual and the serial number from your grain vac ready.

PROBLEM	CAUSE	SOLUTION
Low capacity.	Tractor PTO runs slow.	Speed up tractor PTO to rated RPM for the model.
	540 RPM rather than 1000 RPM.	Change tractor or PTO speed shaft.
	Belts are slipping.	Tighten belts.
	Airlock runs too fast.	Slow down airlock speed until grain builds up to the level of inspection door.
	Improper air intake.	Adjust air intake.
	Improper use of nozzle.	Use full bin nozzle for larger piles and full bins. Use cleanup nozzle with flair for cleanup only. Do not submerge airslide in grain.
	Air leaks intake.	Check for worn coupler levers or missing coupler gaskets.
		Check flex hose and tubing.
	Air leaks machine.	Check filter, receiver section, and airlock gaskets.
		Check pressure and vacuum relief valve.
	Improper piping.	Check clamps on airline between receiver tank and air pump.
		Keep suction lines as short as possible. Minimize bends. Use straight lengths of pipe wherever possible. Use the poly hose for clean up only.

PROBLEM

CAUSE

SOLUTION

Low capacity (cont'd).

Filter plugged.

Remove bottom cover and clean out filter. Filter excessively dirty. Remove and clean filter.

Airlock tip clearance.

Adjust airlock tips.

Airlock end plate clearance.

If rotor to end plate clearance is more than 0.015", consult the dealer or factory.

Excessive grain damage.

Too much air intake.

Adjust air at intake nozzle.

PTO running too fast.

Throttle down tractor.

Damaged tubing or flexline.

Repair and replace when necessary.

Insufficient grain supply.

Reposition nozzle or open grain supply doors.

Pulsation.

Insufficient air at intake.

Open slide until grain flow becomes even.

Airlock turning too fast.

Adjust airlock speed until grain is at level of the inspection door.

Improper piping.

Replace steel flex or poly hose with rigid tubing wherever possible.

Suction line too small.

Use proper line size.

PTO running too slow.

Increase PTO RPM.

Belts are slipping.

Tighten belts.

Excessive airlock tip clearance.

Adjust airlock tips.

Airlock turning too slow.

Adjust airlock speed until grain is at proper level of inspection door.

Obstruction in suction.

Shut down machine and clear line obstruction.

PROBLEM	CAUSE	SOLUTION
Filter plugs.	Airlock turning too slowly.	Increase airlock speed until grain is at the level on the inspection door.
	Airlock turning too fast.	Decrease airlock speed until the grain is at the proper level on the inspection door.
	Airlock not turning.	Check for proper hydraulic hook-up. Check for and remove obstruction from airlock.
Airlock not turning at all.	Flow control valve wrong.	Reset flow control to increase airlock.
	Tractor hydraulic not properly engaged.	Reset tractor hydraulics.
	Obstruction in airlock.	Shift airlock control from FORWARD to REVERSE and back to FORWARD. Repeat if obstruction does not clear up. If obstruction does not clear up, shut off tractor and machine, open inspection door and remove the cause of obstruction.
Hydraulic oil heating up excessively.	Faulty tractor hydraulics.	Use different tractor.
	Low oil level.	Add oil.
	Improper system selection.	Check if hydraulic system of tractor is open or closed and set Conveyair accordingly.
Excessive wear on air lines.	Improper piping.	Minimize bends.
	Too much air flow.	Adjust airslides and airlock speed.
	Insufficient grain supply.	Reposition intake nozzle. Open grain supply doors.
	Excessive PTO speed.	Operate at proper recommended PTO speed.

8 SPECIFICATIONS

8.1 MECHANICAL

Length	2.69 m (8' 10")	2.77 m (9' 1") (4505)
Width	2.34 m (7' 8") all	
Height Transport	2.36 m (7' 9")	2.41 m (7' 11") (4505)
Maximum Clearance Under Discharge Cyclone	3.70 m (12') all	
Weight	962 kg (2120 lbs.)	1020 kg (2250 lbs.) (4505)
Tire Size	7.60 x 15 all	
Tire Pressure	25 psi (172 kPa) all	

Model	Minimum Horsepower	PTO RPM
1975	60	540
2970	80	1000
3005 Series II	80	1000
3505 Series II	90	1000
4005 Series II	100	1000
4505 Series II	110	1000

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

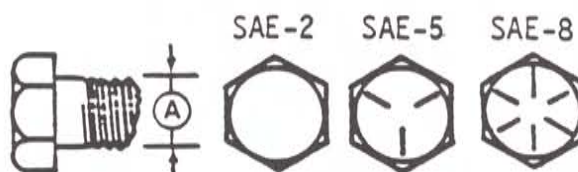
8.2 BOLT TORQUE

CHECKING BOLT TORQUE

The tables shown below give correct torque values for various bolts and capscrews. Tighten all bolts to the torques specified in chart unless otherwise noted. Check tightness of bolts periodically, using bolt torque chart as a guide. Replace hardware with the same strength bolt.

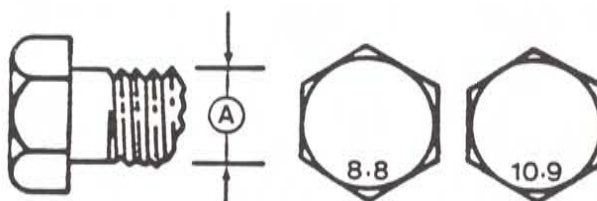
ENGLISH TORQUE SPECIFICATIONS

Bolt Diameter "A"	SAE 2		Bolt Torque *		SAE 8	
	N.m	(lb-ft)	SAE 5 N.m	(lb-ft)	N.m	(lb-ft)
1/4"	8	(6)	12	(9)	17	(12)
5/16"	13	(10)	25	(19)	36	(27)
3/8"	27	(20)	45	(33)	63	(45)
7/16"	41	(30)	72	(53)	100	(75)
1/2"	61	(45)	110	(80)	155	(115)
9/16"	95	(70)	155	(115)	220	(165)
5/8"	128	(95)	215	(160)	305	(220)
3/4"	225	(165)	390	(290)	540	(400)
7/8"	230	(170)	570	(420)	880	(650)
1"	345	(225)	850	(630)	1320	(970)



METRIC TORQUE SPECIFICATIONS

Bolt Diameter "A"	8.8		Bolt Torque *		10.9	
	N.m	(lb-ft)	N.m	(lb-ft)	N.m	(lb-ft)
M3	.5	(.4)	1.8	(1.3)		
M4	3	(2.2)	4.5	(3.3)		
M5	6	(4)	9	(7)		
M6	10	(7)	15	(11)		
M8	25	(18)	35	(26)		
M10	50	(37)	70	(52)		
M12	90	(66)	125	(92)		
M14	140	(103)	200	(148)		
M15	225	(166)	310	(228)		
M20	435	(321)	610	(450)		
M24	750	(553)	1050	(774)		



Torque figures indicated above are valid for non-greased or non-oiled threads and heads unless otherwise specified. Therefore, do not grease or oil bolts or capscrews unless otherwise specified in this manual. When using locking elements, increase torque values by 5%.

* Torque value for bolts and capscrews are identified by their head markings.

8.3 HYDRAULIC FITTING TORQUE

TIGHTENING FLARE TYPE TUBE FITTINGS *

1. Check flare and flare seat for defects that might cause leakage.
2. Align tube with fitting before tightening.
3. Lubricate connection and hand tighten swivel nut until snug.
4. To prevent twisting the tube(s), use two wrenches. Place one wrench on the connector body and with the second tighten the swivel nut to the torque shown.

* The torque values shown are based on lubricated connections as in reassembly.

Tube Size OD	Nut Size Across Flats	Torque Value*		Recommended Turns to Tighten (After Finger Tightening)	
		(N.m)	(lb-ft)	(Flats)	(Turns)
3/16	7/16	8	6	1	1/6
1/4	9/16	12	9	1	1/6
5/16	5/8	16	12	1	1/6
3/8	11/16	24	18	1	1/6
1/2	7/8	46	34	1	1/6
5/8	1	62	46	1	1/6
3/4	1-1/4	102	75	3/4	1/8
7/8	1-3/8	122	90	3/4	1/8

TIGHTENING FLARE TYPE TUBE FITTINGS *

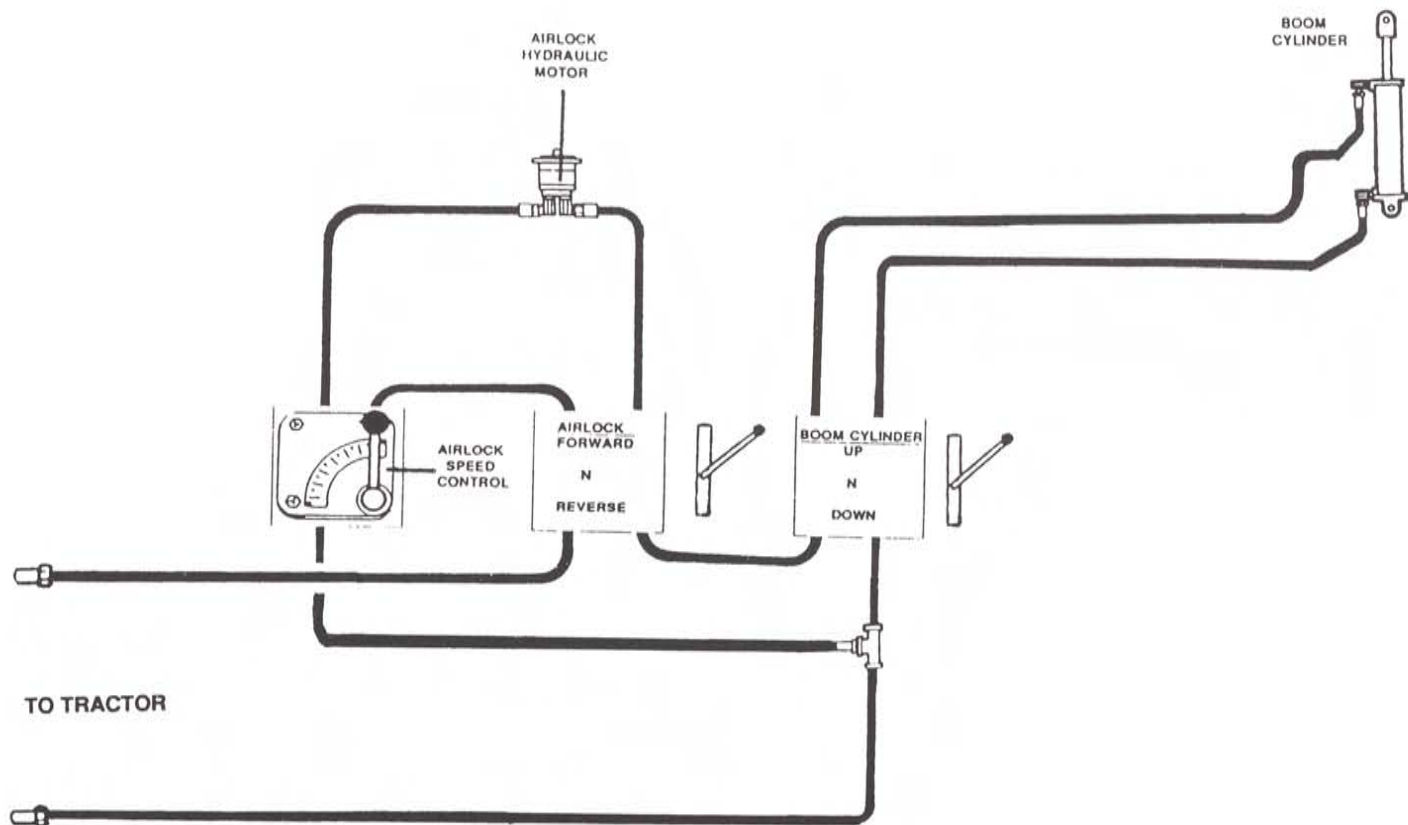
1. Check flare and flare seat for defects that might cause leakage.
2. Align tube with fitting before tightening.
3. Lubricate connection and hand tighten swivel nut until snug.
4. To prevent twisting the tube(s), use two wrenches. Place one wrench on the connector body and with the second tighten the swivel nut to the torque shown.

* The torque values shown are based on lubricated connections as in reassembly.

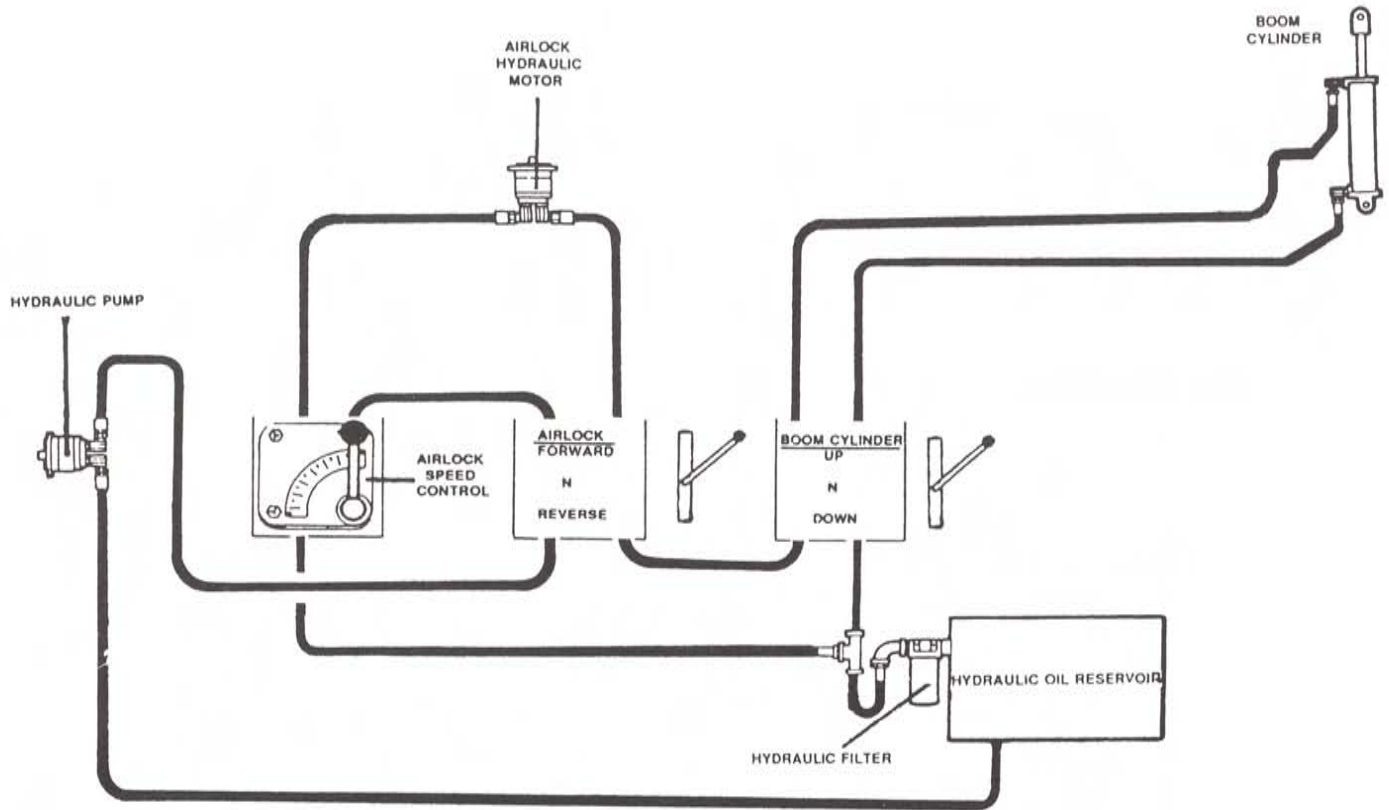
Tube Size OD	Nut Size Across Flats	Torque Value*		Recommended Turns to Tighten (After Finger Tightening)	
		(N.m)	(lb-ft)	(Flats)	(Turns)
3/16	7/16	8	6	1	1/6
1/4	9/16	12	9	1	1/6
5/16	5/8	16	12	1	1/6
3/8	11/16	24	18	1	1/6
1/2	7/8	46	34	1	1/6
5/8	1	62	46	1	1/6
3/4	1-1/4	102	75	3/4	1/8
7/8	1-3/8	122	90	3/4	1/8

8.4 HYDRAULIC SCHEMATIC

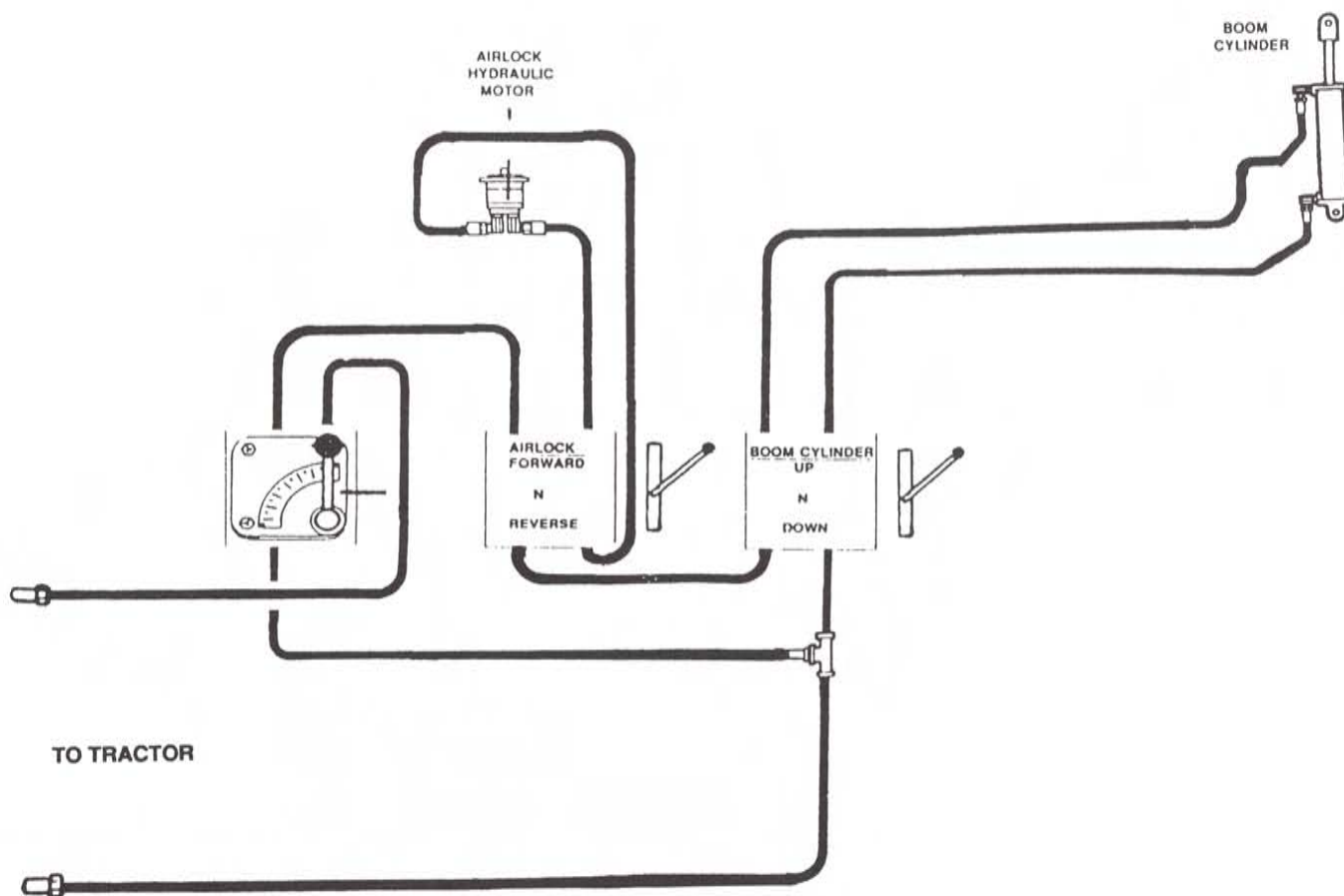
8.4.1 (3005, 3505, 4005, 4505) SERIES II



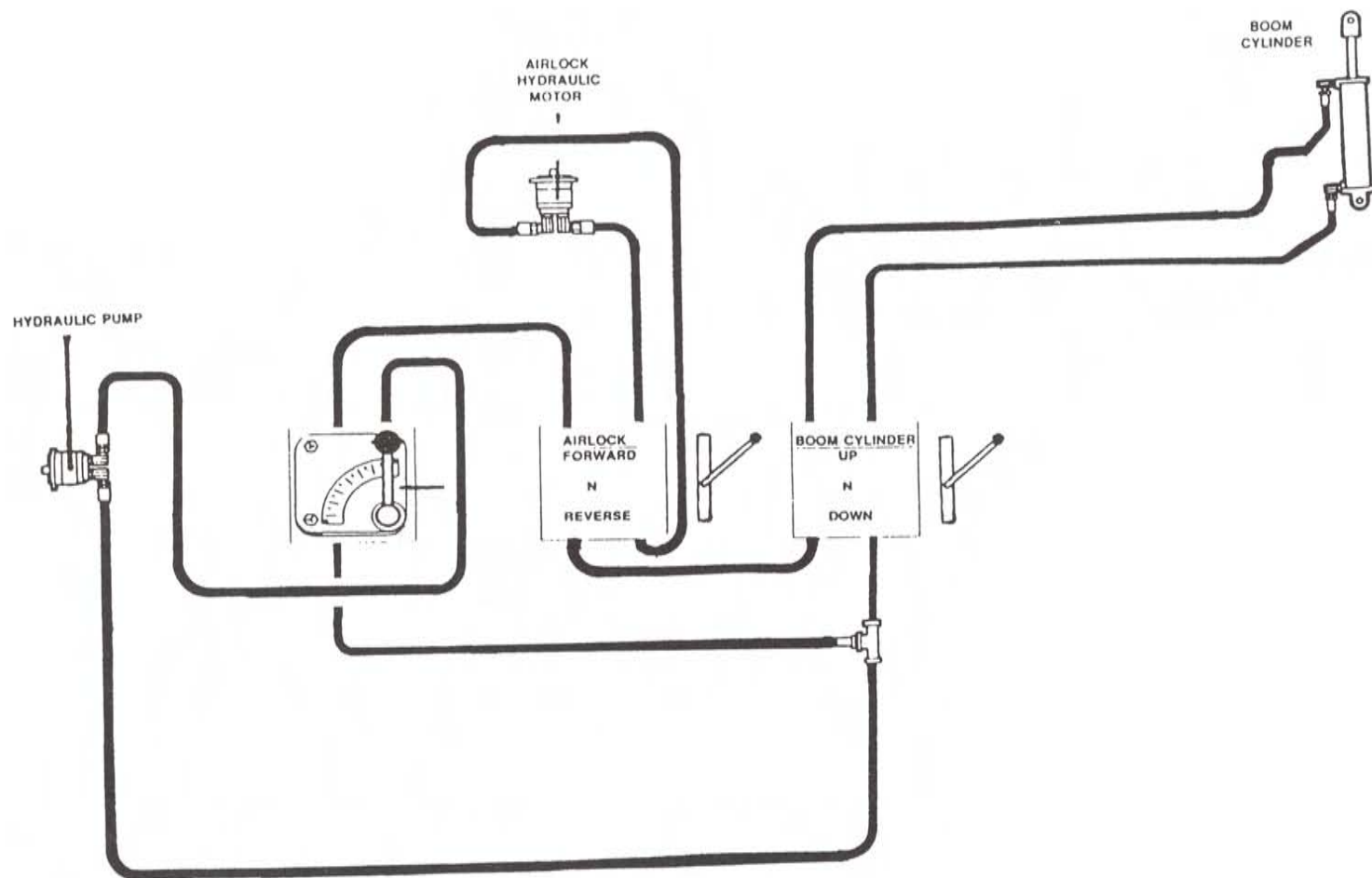
8.4.2 SELF-CONTAINED HYDRAULIC (OPTIONAL) SERIES II



8.4.3 MODELS 1975 AND 2970



8.4.4 MODELS 1975 AND 2970 SELF-CONTAINED HYDRAULICS (OPTIONAL)



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**THOR MANUFACTURING
CONVEYAIR GRAIN VAC**

LIMITED WARRANTY

Thor Manufacturing Ltd. ("Thor") warrants to the buyer that the new CONVEYAIR ("The new machinery") is free from defects in material and workmanship.

This warranty is only effective as to any new machinery, which has not been altered, changed, repaired or treated since its delivery to the buyer, other than by Thor or its authorized dealers or employees, and does not apply to accessories, attachments, tools, or parts, sold or operated with the new machinery, if they have not been manufactured by Thor.

Thor shall only be liable for defects in the materials or workmanship attributable to faulty material or bad workmanship that can be proved by the buyer, and specifically excludes liability for repairs arising as a result of normal wear and tear of the new machinery or in any other manner whatsoever, and without limiting the generality of the foregoing, excludes application or installation of parts not completed in accordance with Thor's Operator's Manual, specifications, or printed instructions.

Written notice shall be given, by registered mail, to Thor within seven (7) days after the defect shall have become apparent or the repairs shall have become necessary, addressed as follows:

Thor Manufacturing Ltd.
25 Paquin Road
Winnipeg, Manitoba, Canada R2J 3V9

This warranty shall expire one (1) year after the date of delivery of the new machinery.

If these conditions are fulfilled, Thor shall at its own cost and at its own option either repair or replace, any defective parts provided that the buyer shall be responsible for all expenses incurred as a result of repairs, labor, parts, transportation, or any other work, unless Thor has authorized such expenses in advance.

This warranty shall not extend to any repairs, changes, alteration, or replacements made to the new equipment other than by Thor or its authorized dealers or employees.

This warranty extends only to the original owner of the new equipment.

This warranty is limited to the terms stated herein and is in lieu of any other warranties whether express or implied, and without limiting the generality of the foregoing, excludes all warranties, express or implied or conditions whether statutory or otherwise as to quality and fitness for any purpose of the new equipment. Thor disclaims all liability for incidental or consequential damages.

**THOR MANUFACTURING
25 PAQUIN ROAD
WINNIPEG, MANITOBA
R2J 3V9**

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