GRAINVAC VRX

OPERATOR'S MANUAL

ORIGINAL INSTRUCTIONS

Read this manual before using product. Failure to follow instructions and safety precautions can result in serious injury, death, or property damage. Keep manual for future reference.

Part Number: 9000-00-0040 R12

Revised: Feb/21

This product has been designed and constructed according to general engineering standards[a]. Other local regulations may apply and must be followed by the operator. We strongly recommend that all personnel associated with this equipment be trained in the correct operational and safety procedures required for this product. Periodic reviews of this manual with all employees should be standard practice. For your convenience, we include this sign-off sheet so you can record your periodic reviews.

Date	Employee Signature	Employer Signature

a. Standards include organizations such as the American Society of Agricultural and Biological Engineers, American National Standards Institute, Canadian Standards Association, International Organization for Standardization, EN Standards, and/or others.

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1. Introduction

Thank you for purchasing a AGI GrainVac VRX. This equipment will allow safe and efficient operation when you read and follow all of the instructions contained in this manual. With proper care, your GrainVac VRX will provide you with many years of trouble-free operation.

Keep this manual handy for frequent reference and to review with new personnel. A sign-off form is provided on the inside front cover for your convenience. If any information in this manual is not understood or if you need additional information, please contact your local distributor or dealer for assistance.

This manual should be regarded as part of the equipment. Suppliers of both new and second-hand equipment are advised to retain documentary evidence that this manual was provided with the equipment.

Figure 1.1 Serial Number Plate Location

Always give your dealer the serial number on your equipment (shown above) when ordering parts or requesting service or other information. Please record this information in the table below for easy reference.

Model Number	
Serial Number	
Date Received	

1.1. Equipment Purpose

1.1.1. General Description

The GrainVac VRX is a high capacity air fan that creates a vacuum for picking up and moving grain. The GrainVac VRX is designed and manufactured to move grain from grain storage facilities into grain transport vehicles.

1.2. Intended Use

This equipment is designed solely for use in customary agricultural or similar operations. Use in any other way is considered as contrary to the intended use. Compliance with and strict adherence to the conditions of operation and maintenance as specified by the manufacturer, also constitute essential elements of the intended use.

This equipment should be operated, maintained, serviced, and repaired only by persons who are familiar with its particular characteristics and who are acquainted with the relevant safety procedures.

Accident prevention regulations and all other generally recognized regulations on safety and occupational medicine must be observed at all times.

Any modifications carried out to this equipment may relieve the manufacturer of liability for any resulting damage or injury.

1.2.1. Misuse

Running material such as sand, dirt, fertilizer, water, rocks, etc. is considered misuse, will cause severe damage to the GrainVac, and will void the warranty.

1.3. Components Overview

Throughout this manual, names are referred to of various components which together make up the GrainVac VRX and are identified in Figure 1.2.

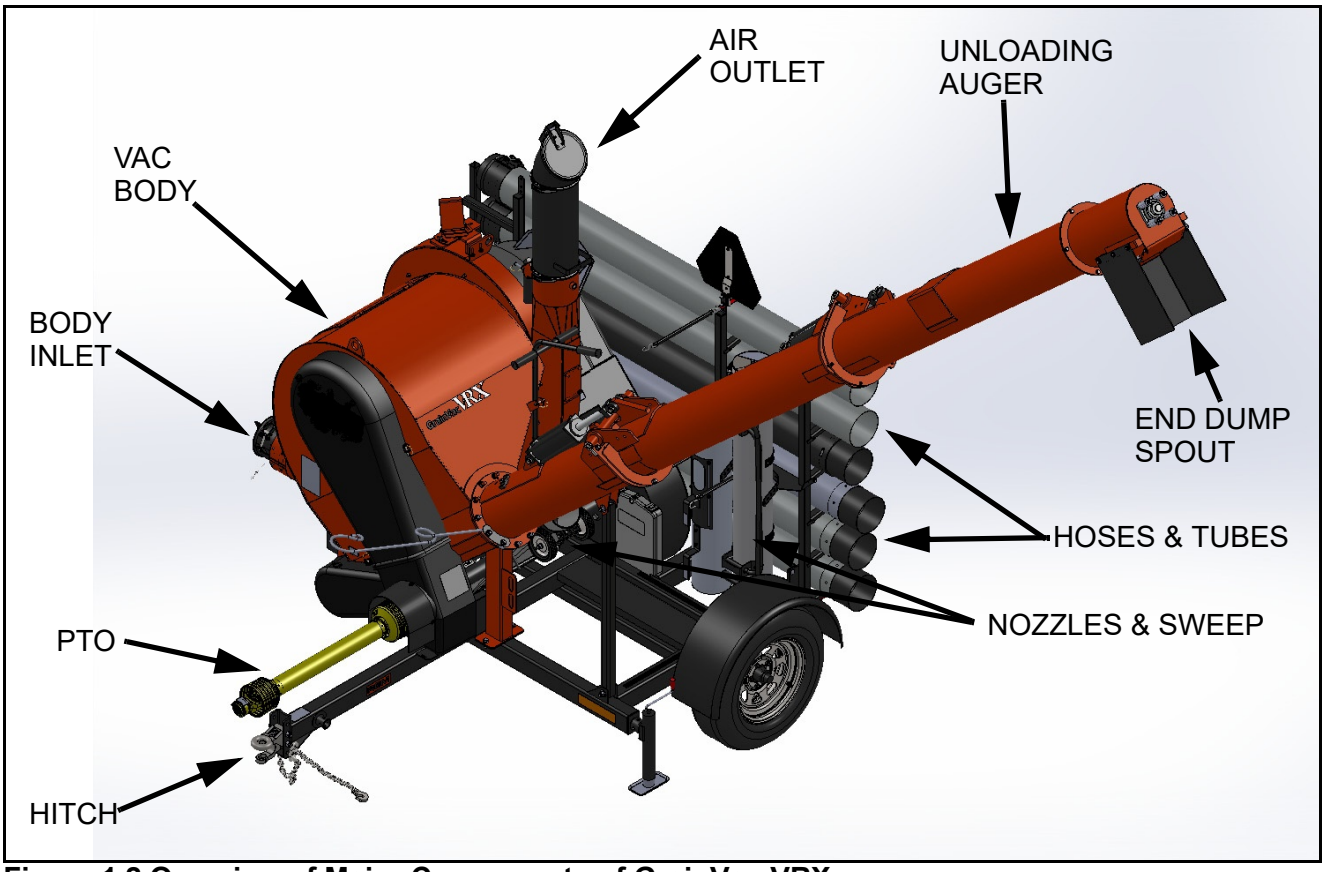


Figure 1.2 Overview of Major Components of GrainVac VRX

Equipment Orientation: The directions left, right, front, and rear, as mentioned throughout the manual, are as seen from the tractor driver seat and facing in the direction of travel when the equipment is being transported.

1.3.1. Functional Overview

The GrainVac is a simple and reliable system. It uses a vacuum to produce a flow of air that conveys grain or material to the body of the machine. The flow of grain is directed into an auger that conveys it to the transport vehicle. The heart of the system is the rotor(s) (also known as blower(s) or fan(s)). The rotor(s) (A) remove air from the body and places the entire system under vacuum. This vacuum causes air and grain to enter through the intake (D) and flow through the hose (C), into the body (E) of the machine. When the stream of air and grain reaches the body (E) of the GrainVac, it is separated by the drum (B).

The stream of material is directed into the auger flighting, moved up the auger tube (F) and discharged out the end dump double doors (G). The stream of air is cleaned of large particles by the rotating drum and the air continues on through the drum into the rotor(s) (A). The rotor(s) force the air out of the body into the exhaust (I) and out the air outlet (H).

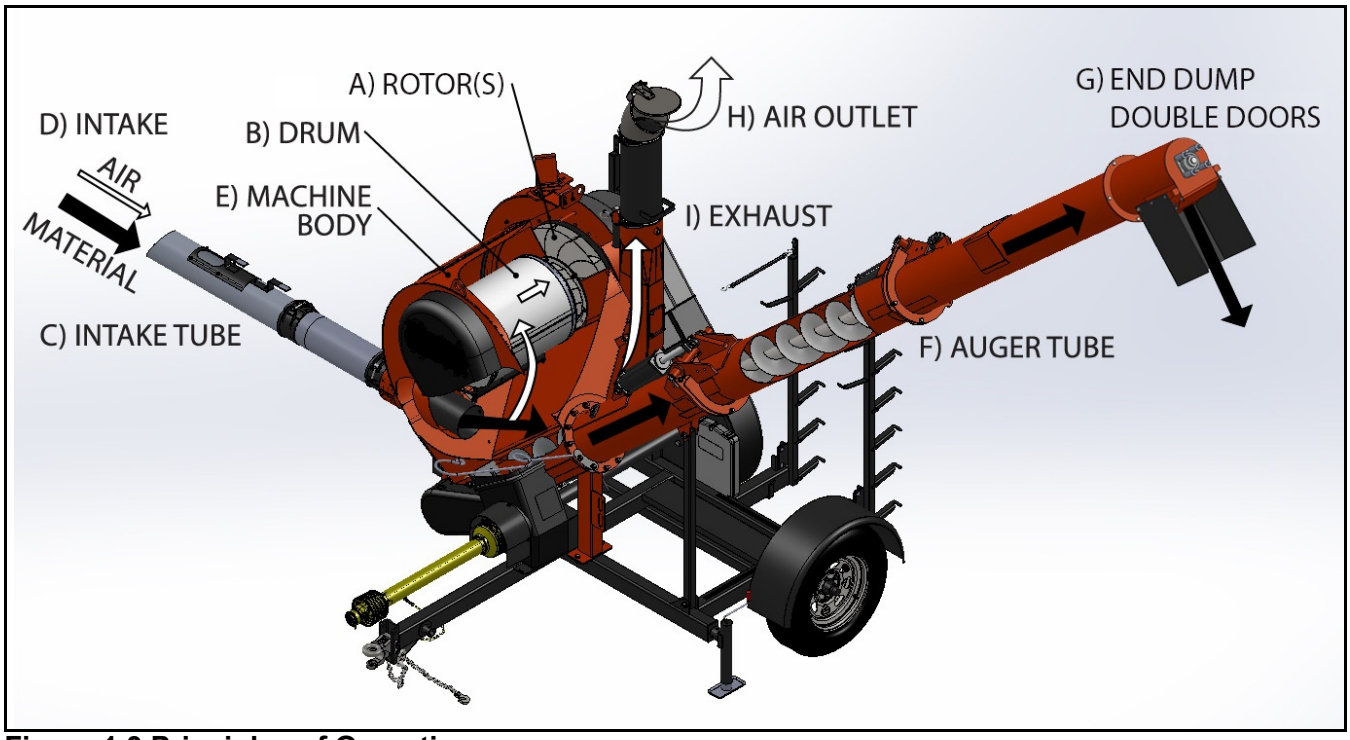


Figure 1.3 Principles of Operation

2. Safety

2.1. Safety Alert Symbol and Signal Words

This safety alert symbol indicates important safety messages in this manual. When you see this symbol, be alert to the possibility of injury or death, carefully read the message that follows, and inform others.

SIGNAL WORDS: Note the use of the signal words **DANGER**, **WARNING**, **CAUTION**, and **NOTICE** with the safety messages. The appropriate signal word for each message has been selected using the definitions below as a guideline.

DANGER Indicates an imminently hazardous situation that, if not avoided, will result in serious injury or death.

WARNING Indicates a hazardous situation that, if not avoided, could result in serious injury or death.

CAUTION Indicates a hazardous situation that, if not avoided, may result in minor or moderate injury.

NOTICE Indicates a potentially hazardous situation that, if not avoided, may result in property damage.

2.2. General Safety

The safety information found throughout this complete Safety Section of the manual applies to all safety practices. Additional instructions specific to a certain safety practice (such as Operation Safety), can be found in the appropriate section.

YOU are responsible for the **SAFE** use and maintenance of your equipment. **YOU** must ensure that you and anyone else who is going to work around the equipment understands all procedures and related **SAFETY** information contained in this manual.

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. All accidents can be avoided.

- It is the equipment owner, operator, and maintenance personnel's responsibility to read and understand **ALL** safety instructions, safety decals, and manuals and follow them when assembling, operating, or maintaining the equipment.
- Equipment owners must give instructions and review the information initially and annually with all personnel before allowing them to operate this product. Untrained users/operators expose themselves and bystanders to possible serious injury or death.
- This equipment is not intended to be used by children.
- Use this equipment for its intended purposes only.
- Do not modify the equipment in any way without written permission from the manufacturer. Unauthorized modification may impair the function and/or safety, and could affect the life of the equipment. Any unauthorized modification of the equipment will void the warranty.

2.2.1. Personal Protective Equipment (Required to be Worn)

Ear Protection

- Wear ear protection to prevent hearing damage.

Hard Hat

- Wear a hard hat to help protect your head.

Safety Glasses

- Wear safety glasses at all times to protect eyes from debris.

Work Gloves

- Wear work gloves to protect your hands from sharp and rough edges.

Coveralls

- Wear coveralls to protect skin.

Steel-Toe Boots

- Wear steel-toe boots to protect feet from falling debris.

Respirator

- A respirator may be needed to prevent breathing potentially harmful fumes and dust.

2.2.2. Safety Equipment Required

First-Aid Kit

- Have a properly-stocked first-aid kit available for use should the need arise, and know how to use it.

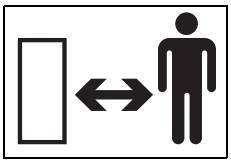
Fire Extinguisher

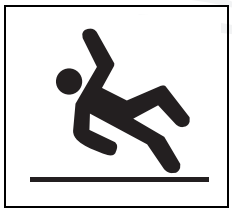
- Provide a fire extinguisher for use in case of an accident. Store in a highly visible and accessible place.

2.3. Work Area Safety

⚠ WARNING

- Have another trained person nearby who can shut down the equipment in case of accident.
- The work area should be kept clear of bystanders.
- Before raising/lowering/moving/adjusting the equipment, make sure the area around the equipment is clear of obstructions and/or untrained personnel. Never allow anyone to stand on or beneath the equipment when it is being placed.





- Place equipment on reasonably level ground when raising, lowering, positioning, or operating.
- Chock wheels after placement.
- Lower equipment at completion of operation or when not in use.
- Keep the work area clean and free of debris.
- Keep out from under equipment and undercarriage area.
- Keep away from the unloading auger when moving, adjusting, or setting (due to pinch points). Keep others away.

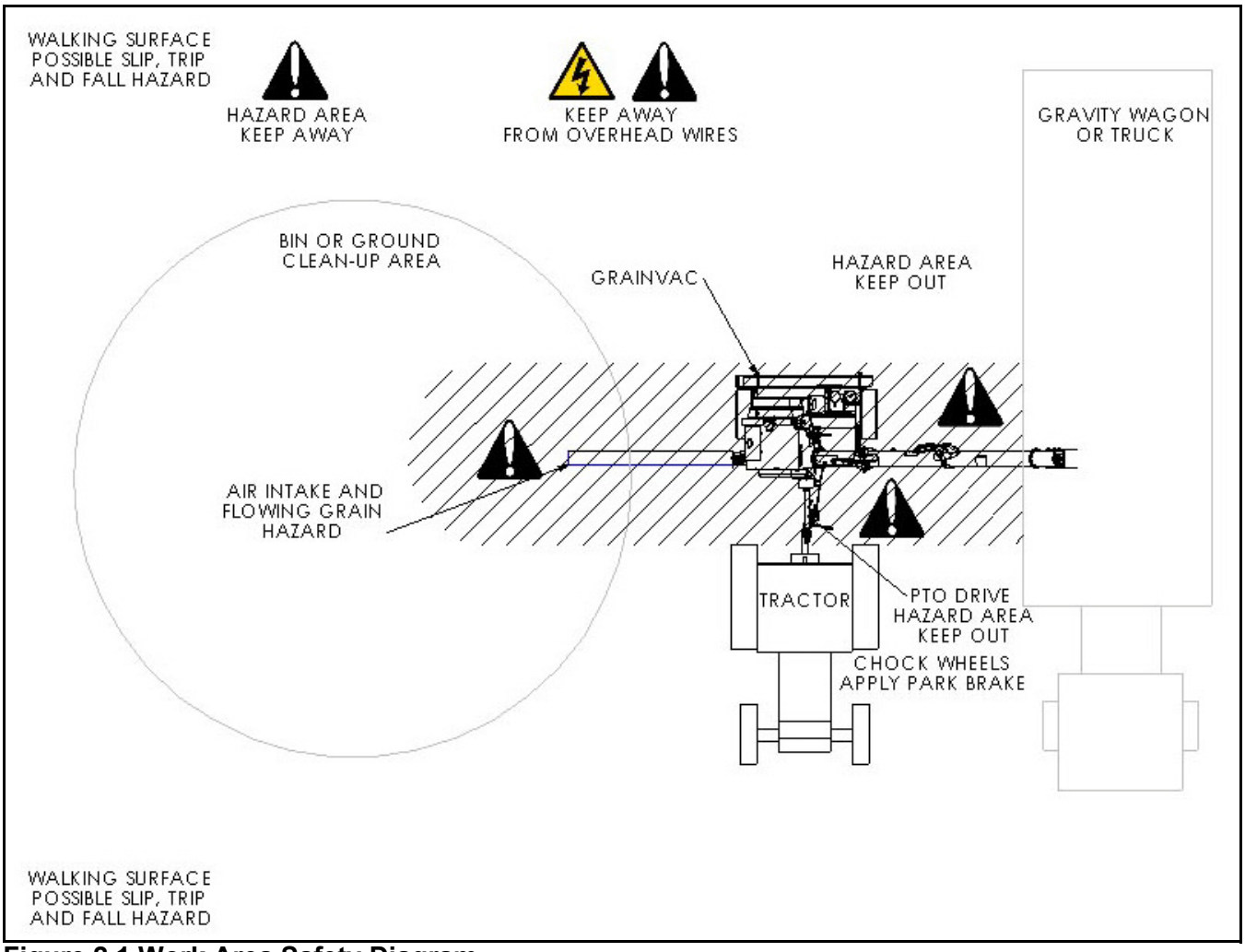


Figure 2.1 Work Area Safety Diagram

2.4. Overhead Power Lines

⚠ DANGER

- When operating or moving, keep equipment away from overhead power lines and devices.
- This equipment is not insulated.
- Electrocution can occur without direct contact.

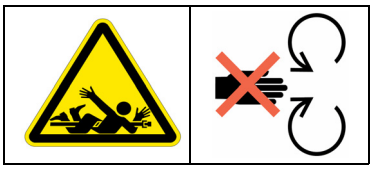
2.5. Drives and Lockout Safety

Inspect the power source(s) before using and know how to shut down in an emergency. Whenever you service or adjust your equipment, make sure you shut down and lock out your power source to prevent inadvertent start-up and hazardous energy release. Know the procedure(s) that applies to your equipment from the following power sources.

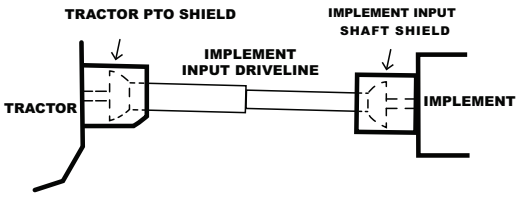
2.5.1. PTO Driveline Safety

⚠ WARNING

Drive



- Keep body, hair, and clothing away from rotating PTO (power take-off) driveline.
- Make certain the driveline shields telescope and rotate freely on driveline before attaching.
- Make certain the driveline is securely attached at both ends.



- Do not operate equipment unless all driveline, tractor, and equipment shields are in place and in good working order.
- Do not exceed operating speed of 1000 rpm.
- Keep u-joint angles small and equal. Do not exceed maximum recommended length for PTO driveline.
- Engage tractor park brake and/or chock wheels.

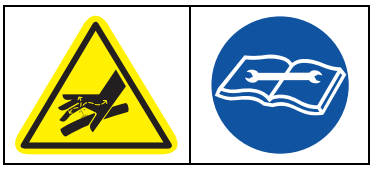
Lockout

- Position all controls in neutral, shut off tractor's engine, and remove key from tractor.
- If removing key is impossible, remove PTO driveline from tractor.

2.5.2. Hydraulic Power Safety

⚠ WARNING

Power Source



- Refer to the rules and regulations applicable to the power source operating your hydraulic drive.
- Do not connect or disconnect hydraulic lines while system is under pressure.
- Keep all hydraulic lines away from moving parts.
- Escaping hydraulic fluid under pressure will cause serious injury if it penetrates the skin surface (serious infection or toxic reaction can develop). See a doctor immediately if injured.
- Use metal or wood as a backstop when searching for hydraulic leaks and wear proper hand and eye protection.

- Check all hydraulic components are tight and in good condition. Replace any worn, cut, abraded, flattened, or crimped hoses.
- Clean the connections before connecting to equipment.
- Do not attempt any makeshift repairs to the hydraulic fittings or hoses with tape, clamps, or adhesive. The hydraulic system operates under extremely high pressure; such repairs will fail suddenly and create a hazardous and unsafe condition.

Lockout

- Always place all hydraulic controls in neutral and relieve system pressure before disconnecting or working on hydraulic system.

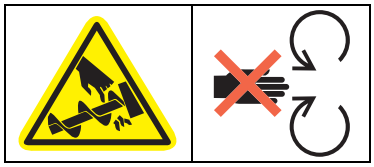
2.6. Rotating Parts Safety

⚠ WARNING

- Keep body, hair, and clothing away from rotating pulleys, belts, chains, and sprockets.
- Do not operate with any guard removed or modified. Keep guards in good working order.
- Shut off and remove key or lock out power source before inspecting or servicing machine.

2.7. Rotating Flighting Safety

⚠ DANGER



- KEEP AWAY from rotating flighting.
- DO NOT remove or modify flighting guards, doors, or covers. Keep in good working order. Have replaced if damaged.
- DO NOT operate the equipment without all guards, doors, and covers in place.
- NEVER touch the flighting. Use a stick or other tool to remove an obstruction or clean out.
- Shut off and lock out power to adjust, service, or clean.

2.8. Tire Safety

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

- When replacing worn tires, make sure they meet the original tire specifications. Never undersize the replacement tire.
- DO NOT weld to the tire rim with the tire mounted on the rim. This action may cause an explosion which could result in serious injury or death.
- Inflate tires to the manufacturer's recommended pressure.
- Tires should not be operated at speeds higher than their rated speed.
- Keep wheel lug nuts tightened to manufacturer's recommendations.
- Never reinflate a tire that has been run flat or seriously under-inflated without removing the tire from the wheel. Have the tire and wheel closely inspected for damage before remounting.

2.9. Safety Decals

- Keep safety decals clean and legible at all times.
- Replace safety decals that are missing or have become illegible. See decal location figures that follow.
- Replaced parts must display the same decal(s) as the original part.
- Replacement safety decals are available **free of charge** from your distributor, dealer, or factory.

2.9.1. Decal Installation/Replacement

1. Decal area must be clean and dry, with a temperature above 50°F (10°C).
2. Decide on the exact position before you remove the backing paper.
3. Align the decal over the specified area and carefully press the small portion with the exposed sticky backing in place.
4. Slowly peel back the remaining paper and carefully smooth the remaining portion of the decal in place.
5. Small air pockets can be pierced with a pin and smoothed out using the sign backing paper.

2.9.2. Safety Decal Locations and Details

Replicas of the safety decals that are attached to the equipment and their messages are shown in the figure(s) that follow. Safe operation of the equipment requires that you familiarize yourself with the various safety decals and the areas or particular functions that the decals apply to, as well as the safety precautions that must be taken to avoid serious injury, death, or damage.

AGI reserves the right to update safety decals without notice. Safety decals may not be exactly as shown.

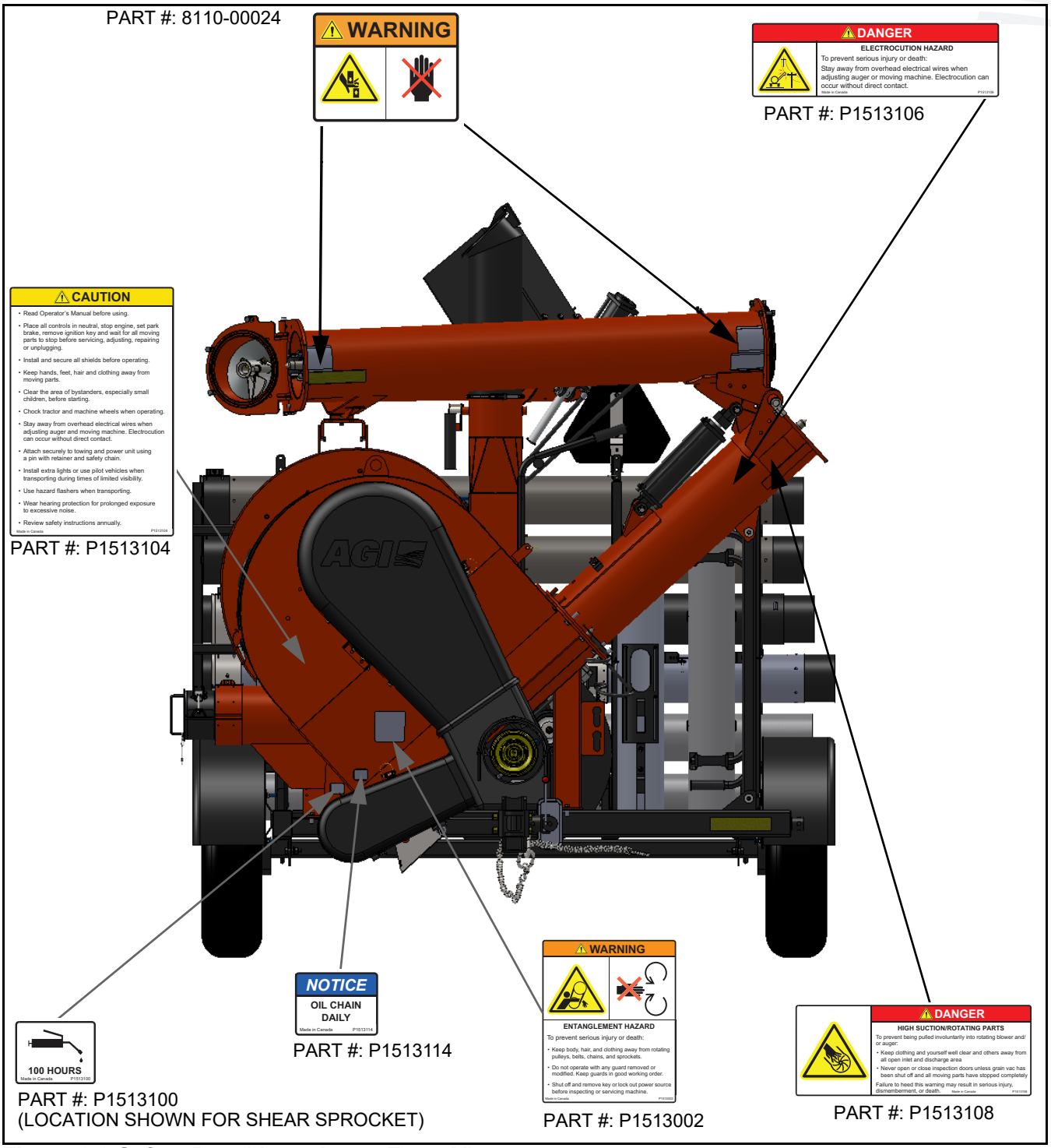


Figure 2.2 Safety Decal Locations - Front View

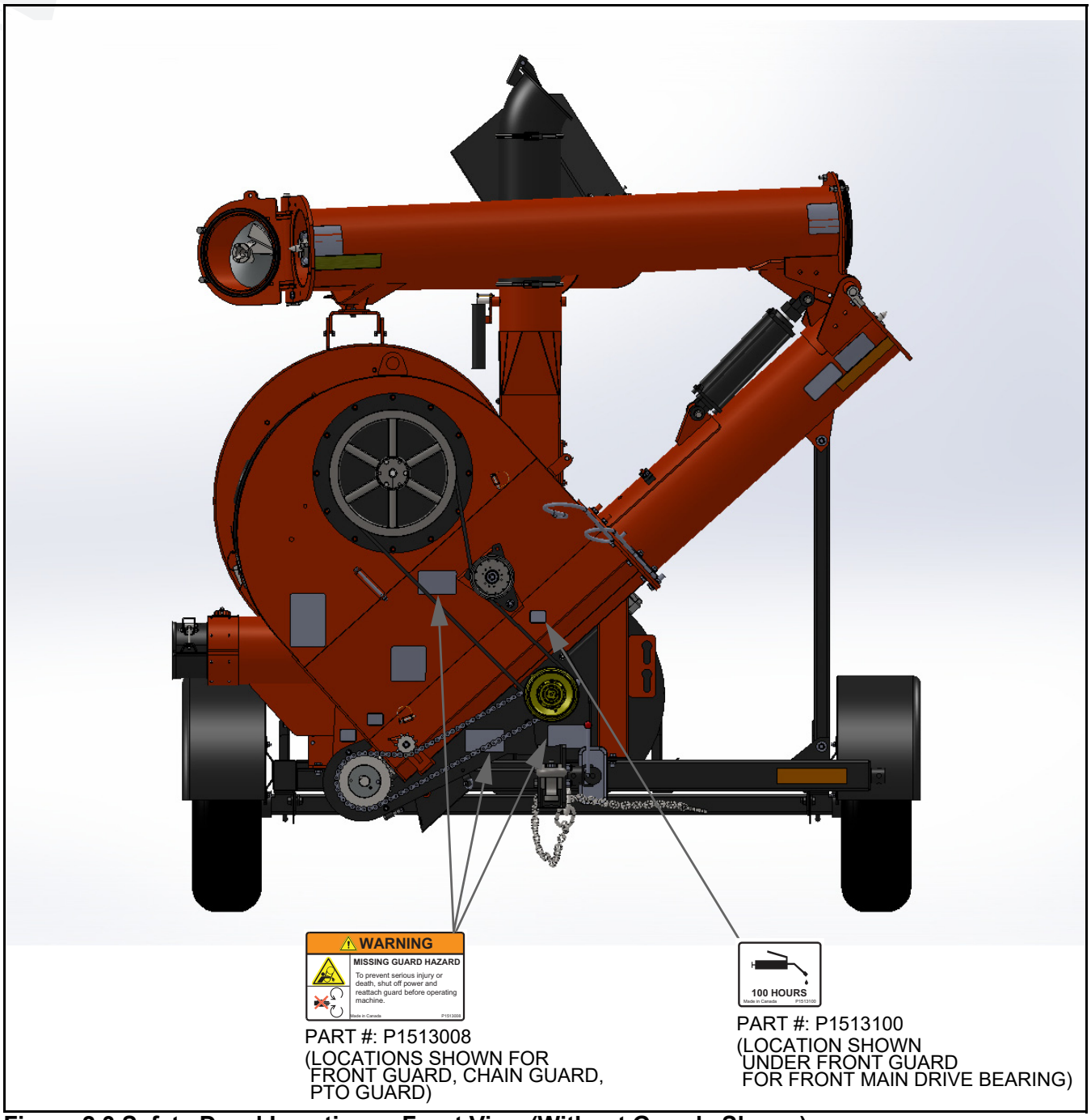


Figure 2.3 Safety Decal Locations - Front View (Without Guards Shown)

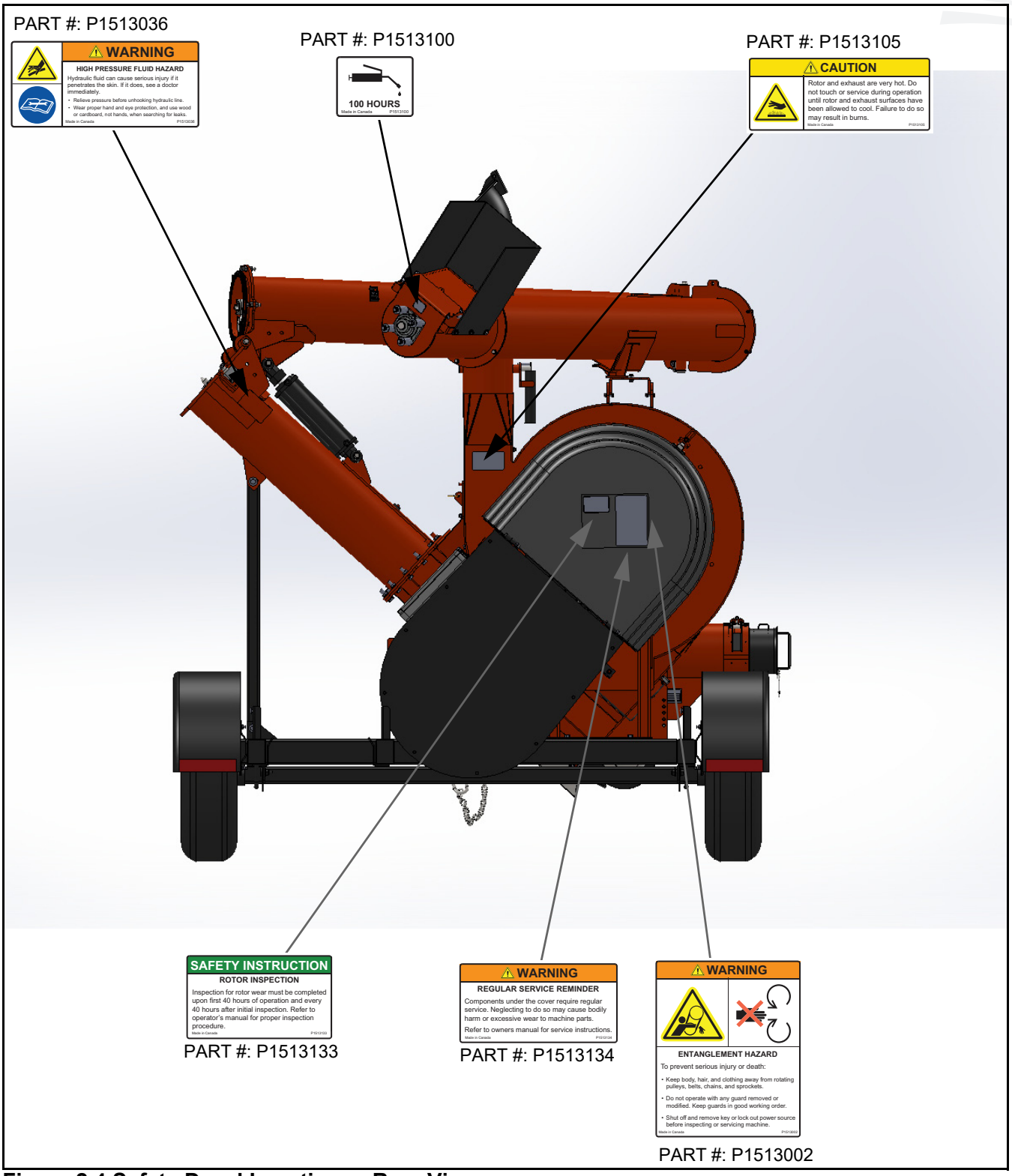


Figure 2.4 Safety Decal Locations - Rear View

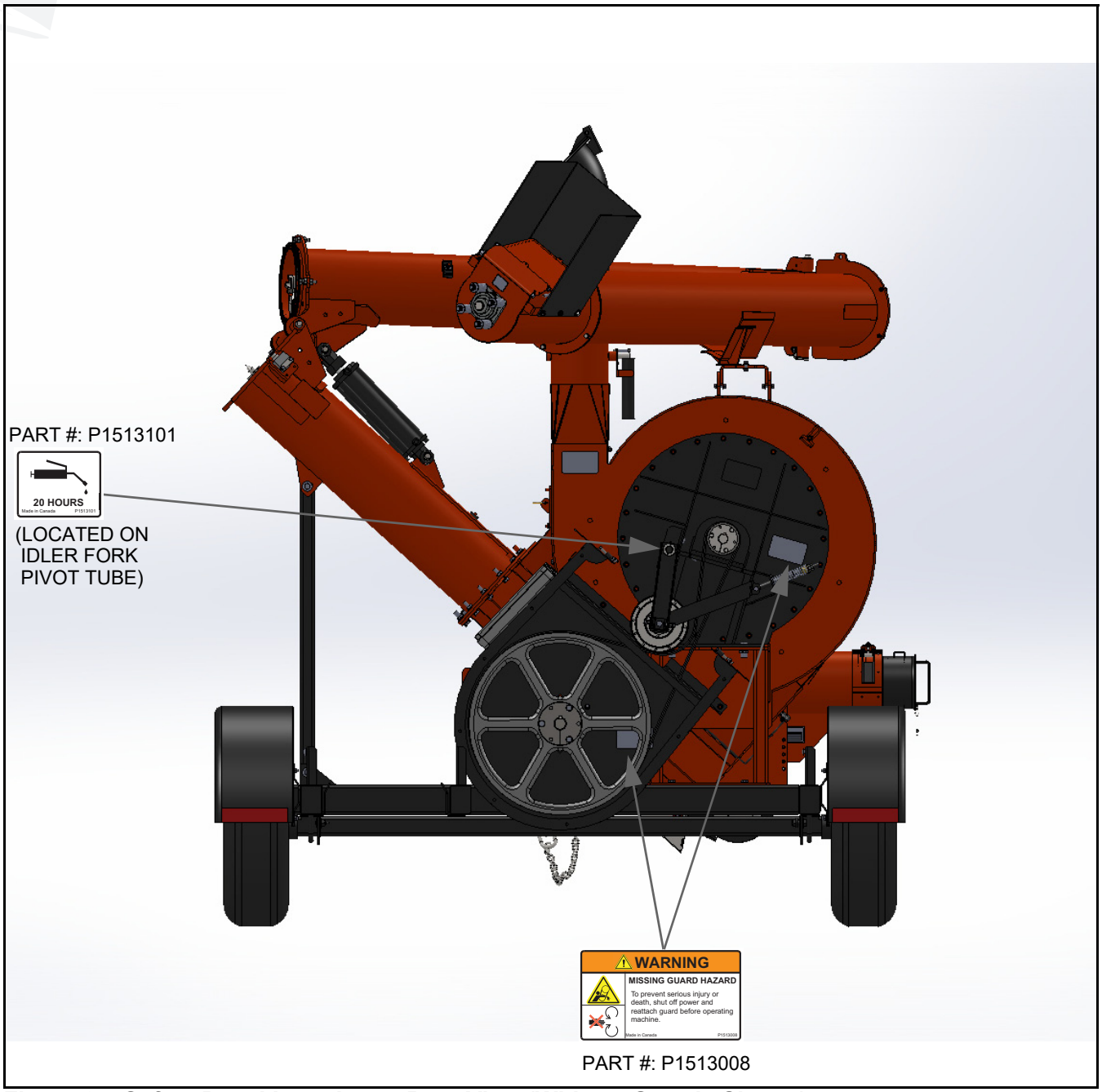


Figure 2.5 Safety Decal Locations - Rear View (Without Guards Shown)

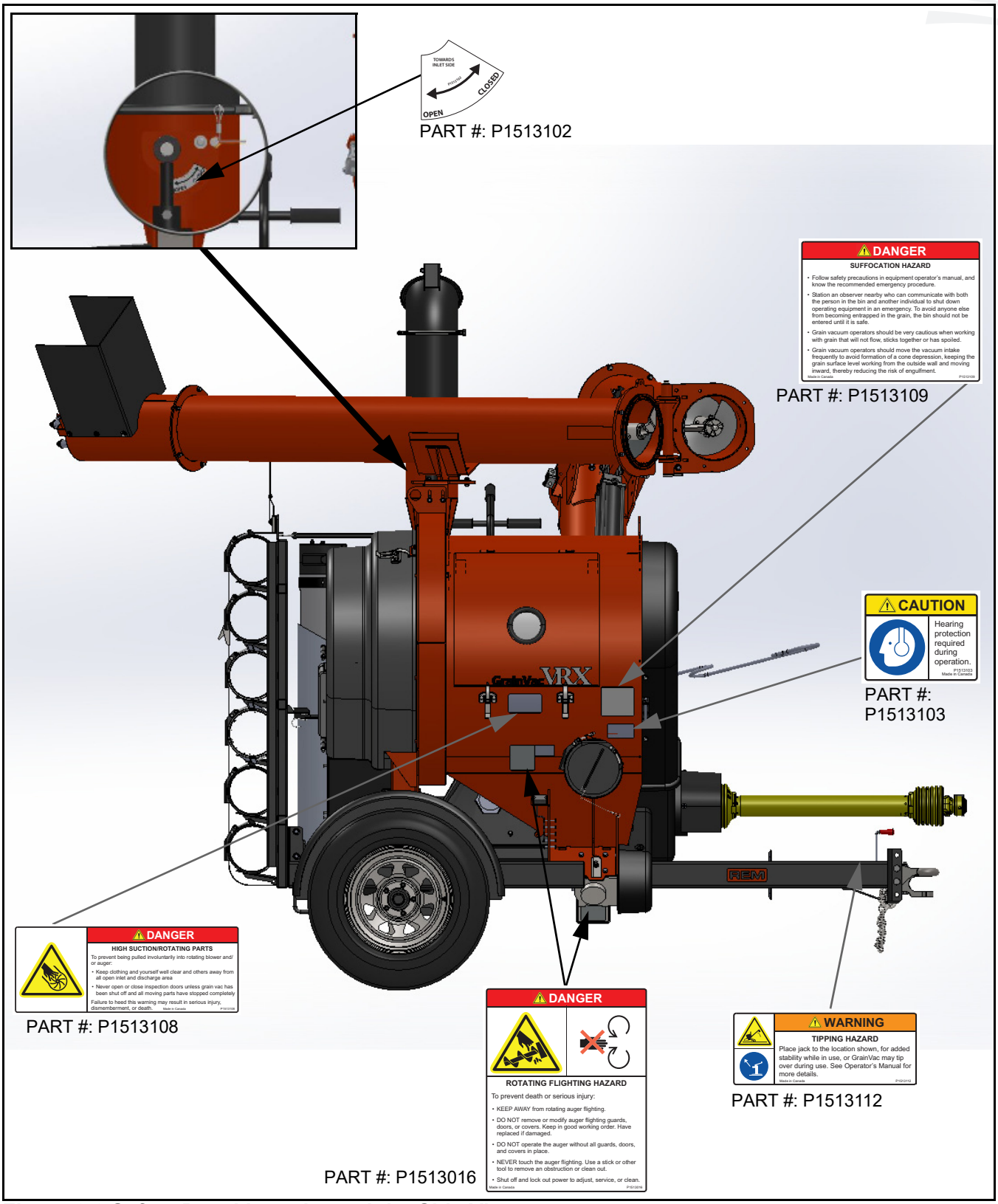


Figure 2.6 Safety Decal Locations - Inlet Side View

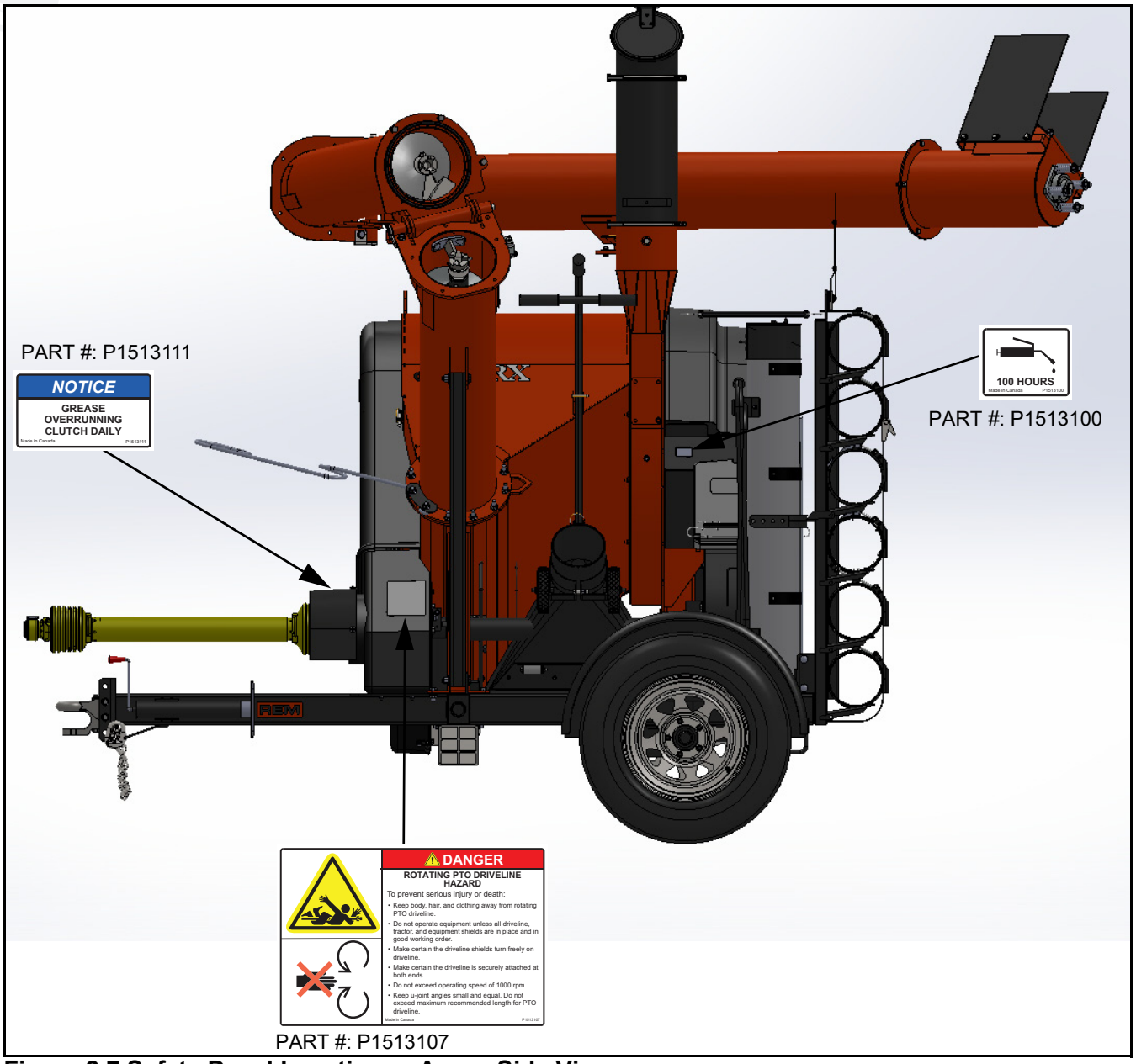


Figure 2.7 Safety Decal Locations - Auger Side View

DANGER

SUFFOCATION HAZARD

- Follow safety precautions in equipment operator's manual, and know the recommended emergency procedure.
- Station an observer nearby who can communicate with both the person in the bin and another individual to shut down operating equipment in an emergency. To avoid anyone else from becoming entrapped in the grain, the bin should not be entered until it is safe.
- Grain vacuum operators should be very cautious when working with grain that will not flow, sticks together or has spoiled.
- Grain vacuum operators should move the vacuum intake frequently to avoid formation of a cone depression, keeping the grain surface level working from the outside wall and moving inward, thereby reducing the risk of engulfment.

Made in Canada P1513109

PART #: P1513109

DANGER

HIGH SUCTION/ROTATING PARTS

To prevent being pulled involuntarily into rotating blower and/or auger:

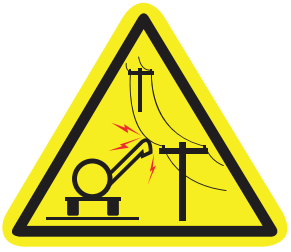
- Keep clothing and yourself well clear and others away from all open inlet and discharge area
- Never open or close inspection doors unless grain vac has been shut off and all moving parts have stopped completely

Failure to heed this warning may result in serious injury, dismemberment, or death. Made in Canada P1513108

PART #: P1513108

PART #: P1513106

DANGER



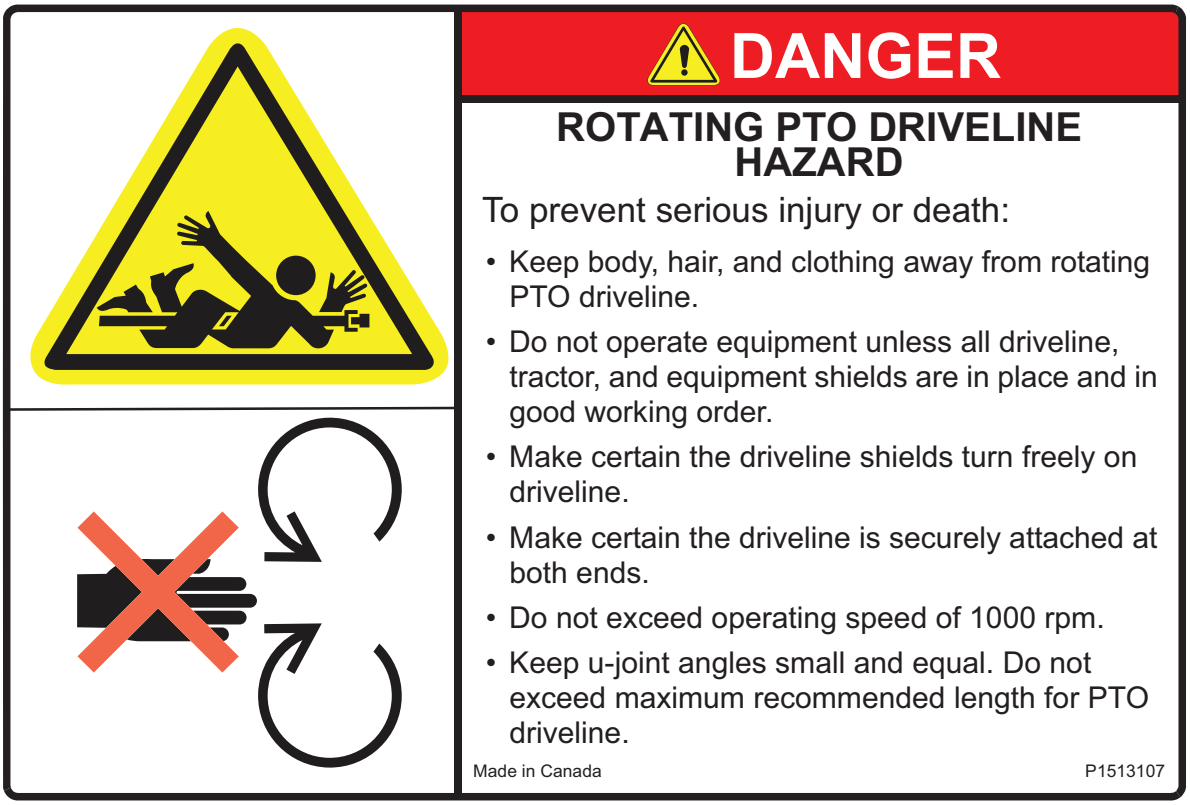
ELECTROCUTION HAZARD

To prevent serious injury or death:

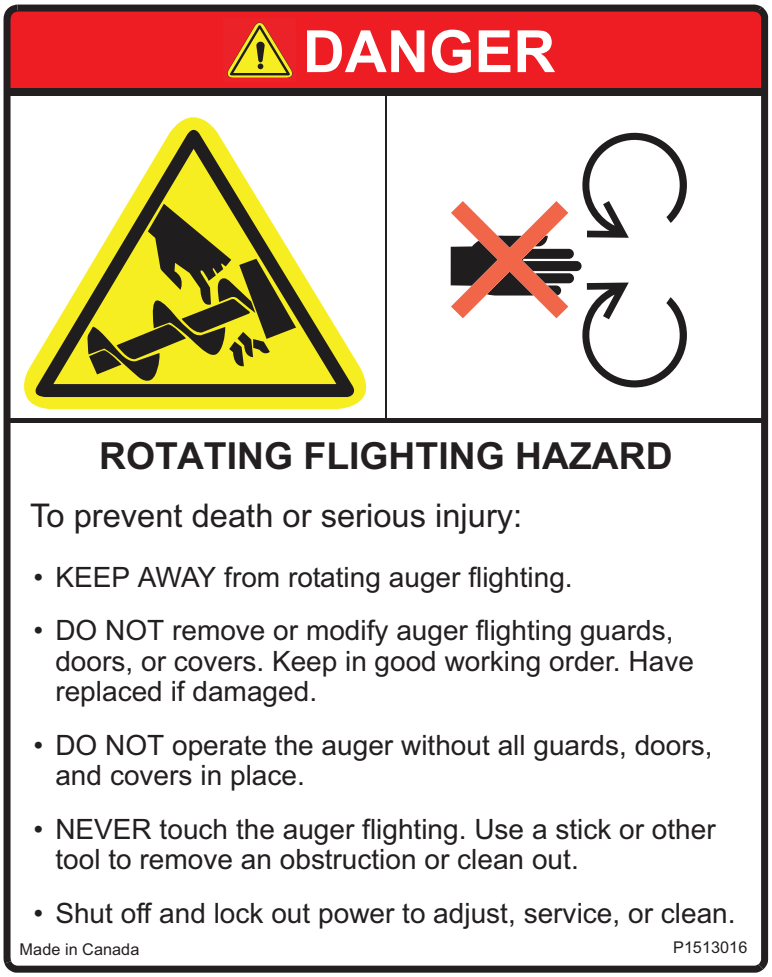
Stay away from overhead electrical wires when adjusting auger or moving machine. Electrocution can occur without direct contact.

Made in Canada P1513106

Figure 2.8 Safety Decal Details

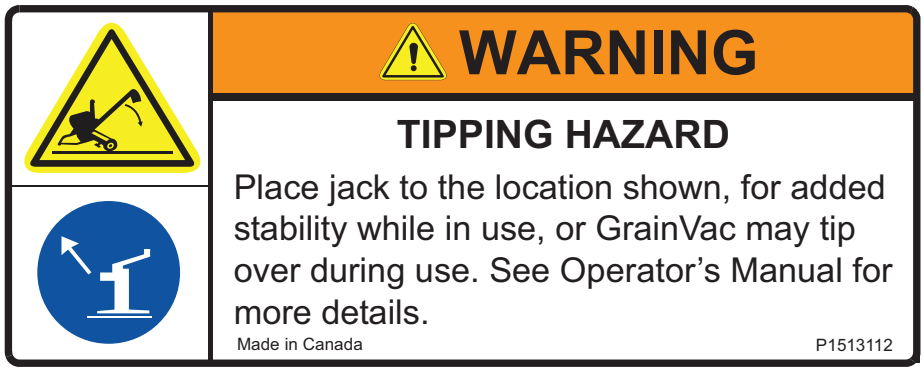


PART #: P1513107



PART #: P1513016

Figure 2.9 Safety Decal Details



PART #: P1513112

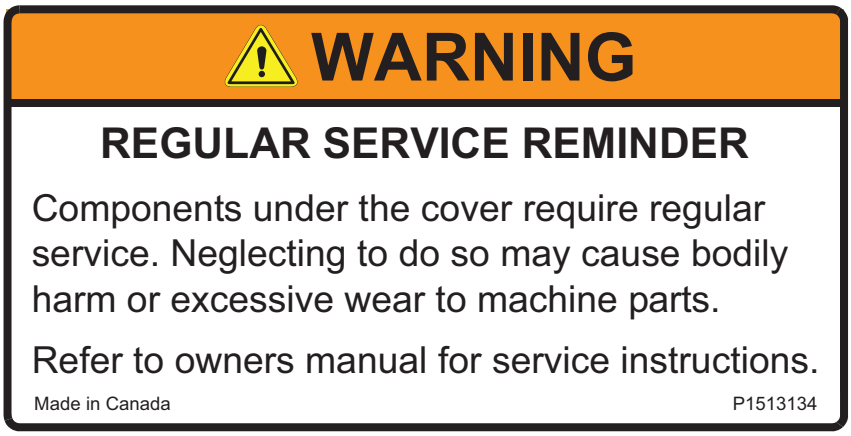
PART #: P1513036

PART #: P1513002

PART #: 8110-00024

Figure 2.10 Safety Decal Details

PART #: P1513008

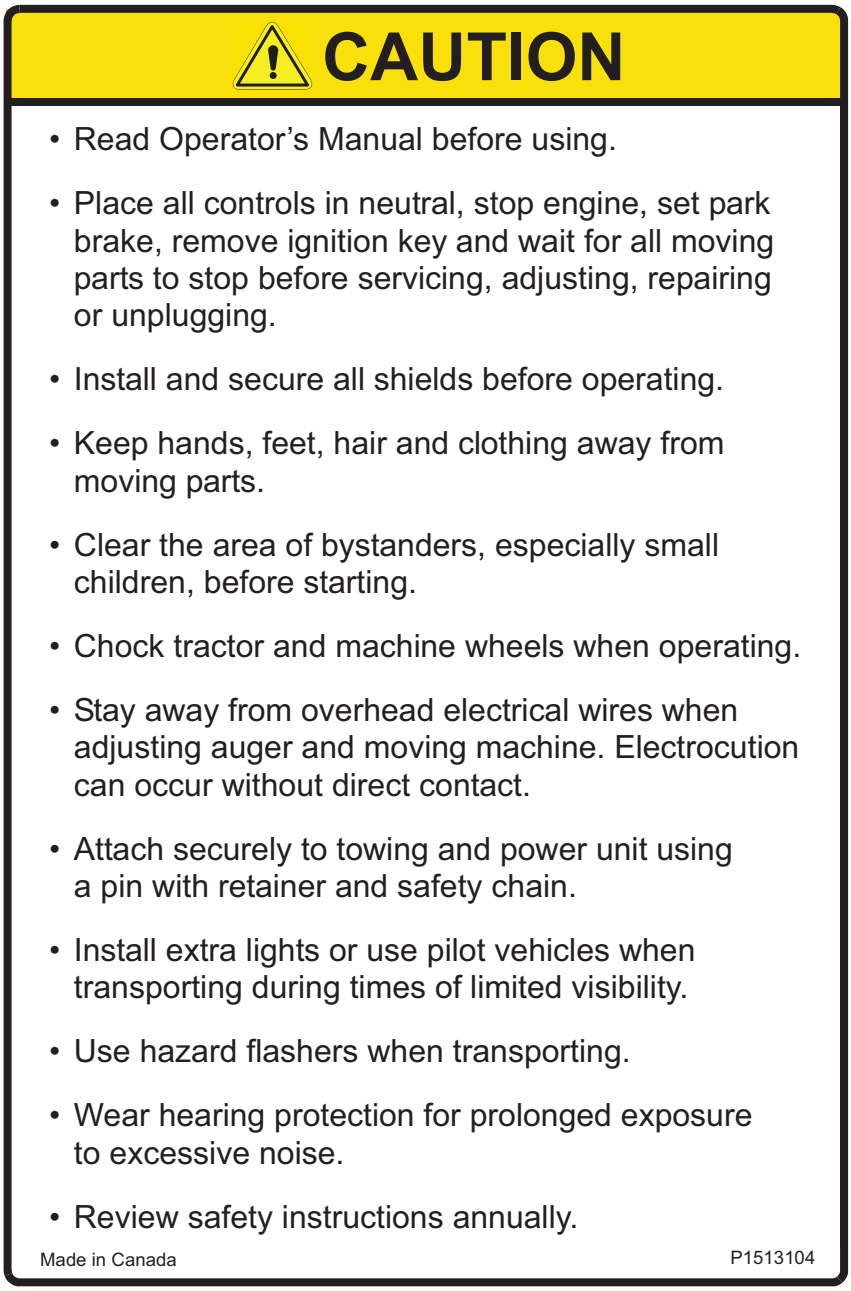


PART #: P1513134

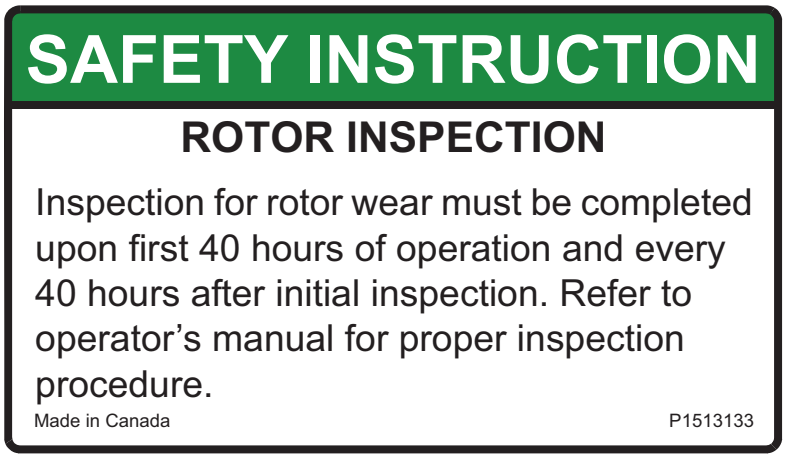
PART #: P1513105

PART #: P1513103

Figure 2.11 Safety Decal Details



PART #: P1513104



PART #: P1513133

Figure 2.12 Safety Decal Details

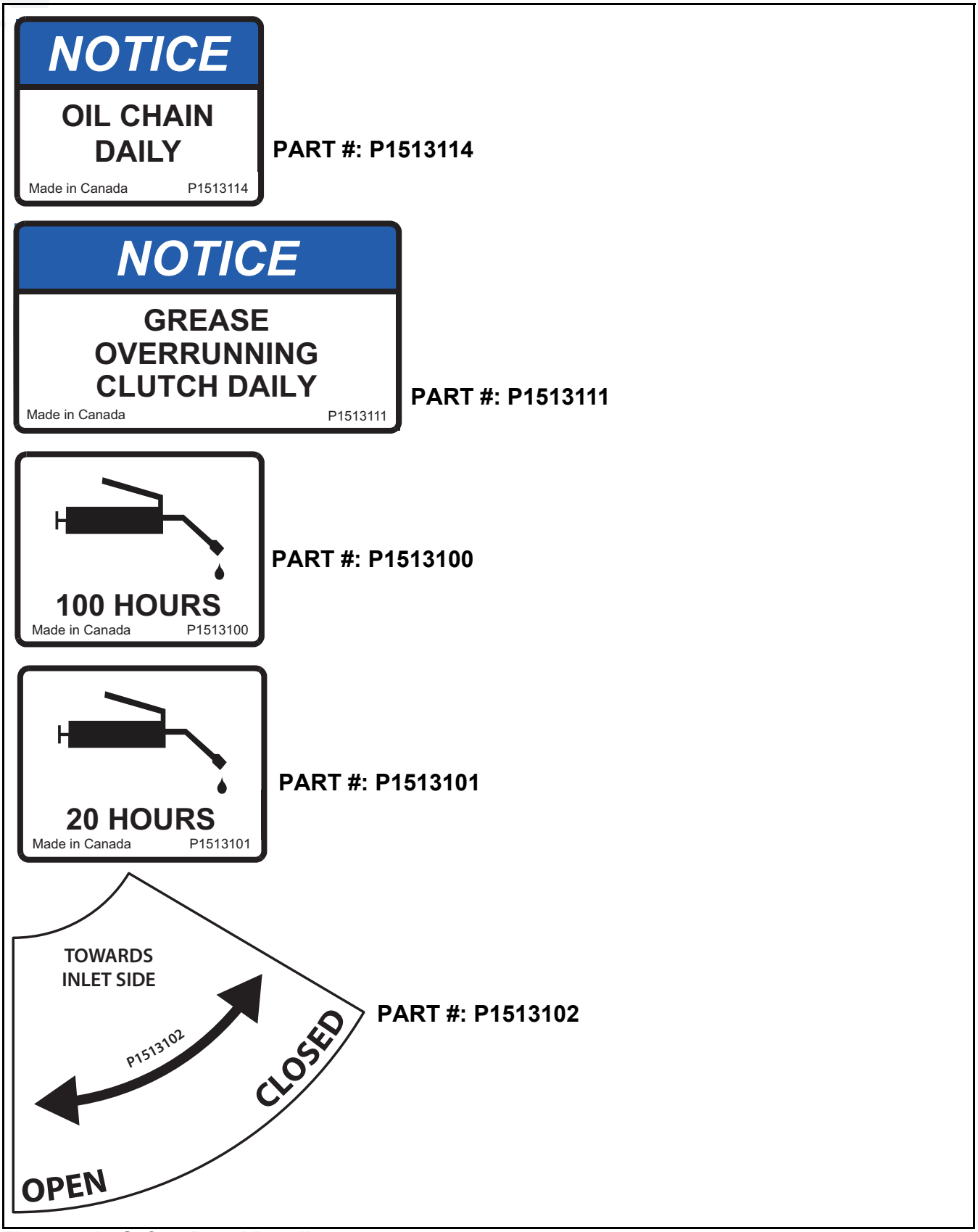


Figure 2.13 Safety Decal Details

3. Transport

Before continuing, ensure you have completely read and understood this manual's Safety chapter, in addition to the safety information in the section(s) below.

3.1. Transport Safety

⚠ WARNING

- Never move the GrainVac with the auger in working position. Ensure the auger is in transport position before transporting.
- Use a proper towing vehicle to move equipment.
- Never attempt to move the equipment manually. To do so will result in serious injury.
- Before starting, check with the local authorities to make sure you are in compliance with all local rules and regulations governing transporting agricultural equipment on public roads and highways. Consult your local law enforcement agency for details.
- If transporting below 40 mph (65 kph), attach an SMV (slow moving vehicle) sign before transporting. Use the necessary lights and reflectors for transportation where required by law, and keep them clean. Always use hazard warning flashers on the tractor/towing vehicle when transporting, unless prohibited by law.
- Securely attach equipment to towing vehicle with correct pin, mechanical retainer, and safety chains. Use a type of hitch pin that will not allow the equipment to separate from the towing vehicle during transport.
- Before transporting the equipment, make sure the area around the equipment is clear of obstructions and/or untrained personnel. Never allow anyone to stand on or beneath the equipment when it is being transported. Do not allow riders on the equipment or the towing vehicle.
- Never transport faster than highway speeds, or what the road surface conditions or towing vehicle safely allow. Provide ample clearance for obstacles and oncoming and overtaking traffic. Take special care and precautions when transporting during times of limited visibility such as rain, fog, snow, dusk, or at night.
- Know where overhead electrical lines are located and stay away from them. Electrocution can occur without direct contact.

3.2. Attaching & Transporting GrainVac with Tractor or Truck

1. Ensure that all components are securely stowed in position on the GrainVac by reviewing the steps outlined in Section 4.9.1. Normal Shutdown on page 41.
2. Clear all bystanders, especially children, from the working area.
3. Use the jack stand (see Figure 3.1) to raise or lower the hitch to the required height for attaching.

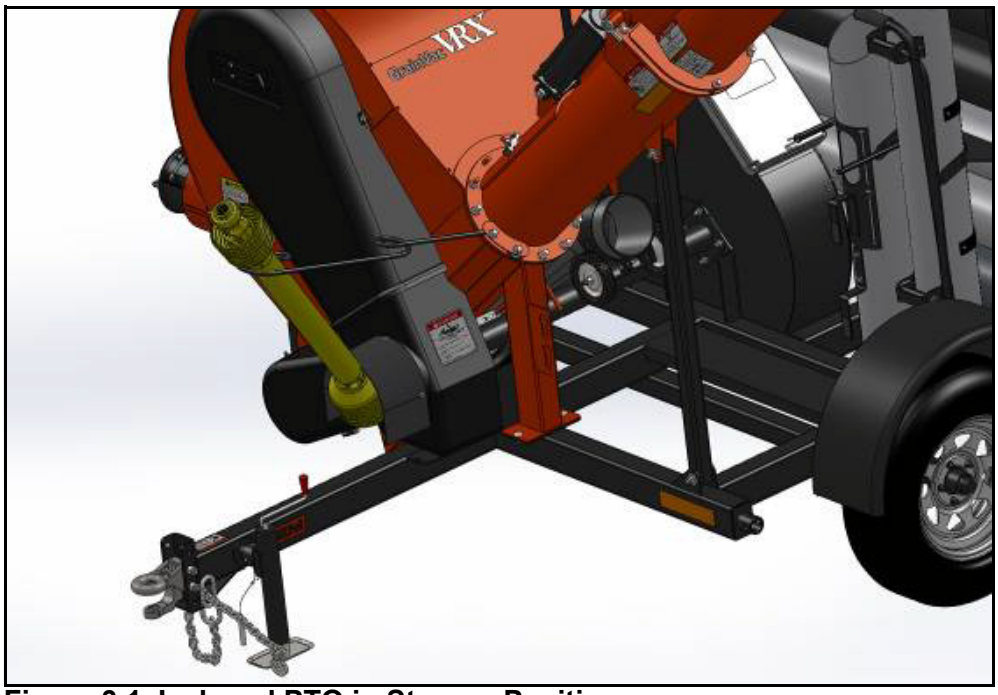


Figure 3.1 Jack and PTO in Storage Position

4. Slowly back the towing vehicle up to the GrainVac.
5. Care must be taken when attaching the GrainVac to the towing vehicle, using a drawbar pin with a mechanical retainer. Install the mechanical retainer. Properly place hitch pin. Use a type of hitch pin that will not allow the GrainVac to separate from the towing vehicle. Securely attach the safety chain to the towing vehicle drawbar.
6. Use the jack to lower the hitch onto the drawbar. When the jack no longer supports the hitch, stow it out of the way by removing the retaining pin in its mounting bracket. Rotate the jack 90° and replace the retaining pin.
7. Ensure the PTO remains stowed in its holder for transport. It should not be hooked up to the tractor.

NOTICE Failure to disconnect the PTO from the tractor before transport may result in damage to the PTO components during turning.

8. Clean the reflectors.
9. Slow Moving Vehicle (SMV) sign:
   a. If transporting below 40 mph (65 kph), secure and display the SMV sign in the bracket located on the hose rack (see Figure 3.2).

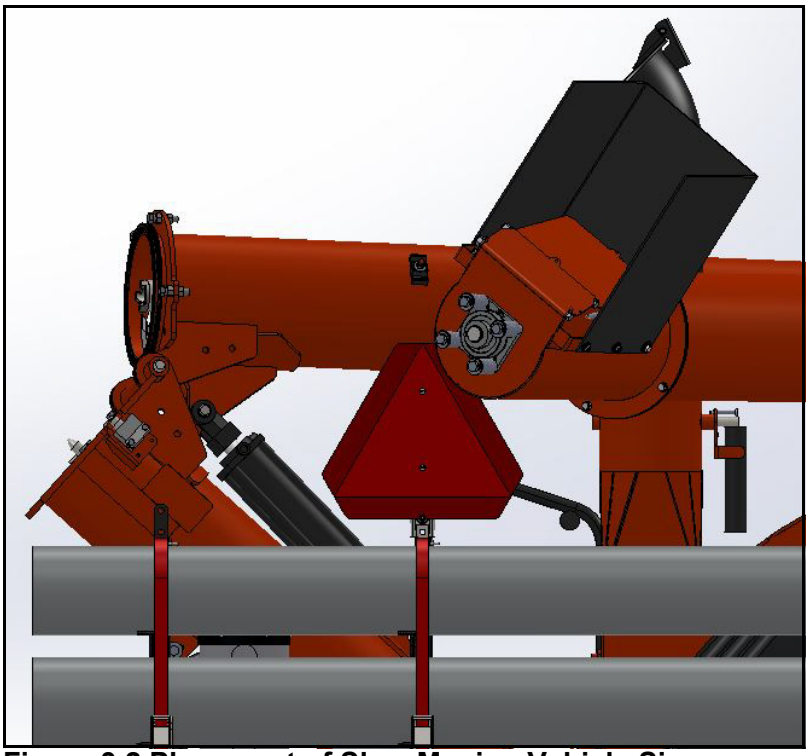


Figure 3.2 Placement of Slow Moving Vehicle Sign

b. If transporting above 40 mph (65 kph), the SMV sign should be covered (not displayed).

10. Use the hazard flashers on the tractor unless prohibited by law in your area.

The GrainVac is now ready for road transport or to be moved to the job site.

4. Operation

Before continuing, ensure you have completely read and understood this manual's Safety chapter, in addition to the safety information in the section(s) below.

4.1. Operating Safety

⚠ WARNING

- Keep away from rotating and moving parts, including the drive components, shafts, and bearings.
- Always operate with guards, covers, and shields in place.
- Shut down and lock out all power before maintaining, adjusting, or unplugging the equipment.
- Have another trained person nearby who can shut down the equipment in case of accident.
- The work area should be kept clear of bystanders.
- Place equipment on reasonably level ground before operating.
- Chock wheels after placement.
- Keep the work area clean and free of debris.
- Ensure that the GrainVac hitch is securely attached to the tractor drawbar using a properly sized draw pin with a secure mechanical retainer. Ensure pin is properly placed. Ensure safety chain is securely attached. Use a type of hitch pin that will not allow the GrainVac to separate from the tractor.
- Stay away from overhead obstructions and power lines. Electrocution can occur without direct contact.

4.2. Pre-Operational Checklist

Before initially operating the GrainVac and each time thereafter, the operator must confirm the following:

- Proper maintenance has been performed.
- All fasteners (except tapered hubs) are torqued to the values in Section 9.2. on page 102.
- PTO driveline is connected and secure. Check both ends of the PTO to ensure that it is locked fully onto the tractor and the GrainVac respectively.
- PTO driveline shield rotates freely.
- Hydraulic hoses are in good condition.
- Hydraulic connections are in place and secure.
- All safety guards and service doors are in place and secure.
- Ensure the end dump double doors seal the auger discharge completely.
- GrainVac body, intake hoses, and tubes are free of wear, restrictions, or foreign material.

- GrainVac wheels are chocked, and, if necessary, tractor wheels are chocked or the parking brake has been engaged.
- Air throttle rotates freely.
- Know how to safely shut down the GrainVac in an emergency. Refer to Section 4.9.2. on page 44.

Note: Oil the auger drive chain daily.

4.3. GrainVac Lockout

Important: If shear bolt fails, shut down and lock out tractor to replace bolt. Follow instructions in Section 5.4.1. Shear Bolt – Replacement on page 48.

Note: Spare shear bolts are located below the inlet.

The GrainVac uses a Bolt - Hex 1/4” - 20 UNC x 1-5/8” Gr 5 through the inner hub. Part 38-112427 includes Nut Nylock Jam 1/4” Gr 5.

⚠ WARNING Before maintaining, adjusting, or unplugging the GrainVac, place all the controls in neutral, turn off the PTO, set the park brake, stop the engine, remove the ignition key, and wait for all the moving parts to stop.

If the GrainVac becomes plugged during operation, see Section 8. Troubleshooting on page 97.

4.4. Machine Break-In

When using the GrainVac for the first time, it is recommended that the following mechanical items be checked:

1. Before starting or pre-delivery inspection:
   a. Read the Operation Manual.
2. After operating 10 hours:
   a. Stop the GrainVac and lock out the power unit before checking the drum, rotor, gearbox, and drive chain tension.
   b. Refer to Section 5.2. Maintenance Schedule on page 46.
3. After operating 40 hours:
   a. Check wear on rotor and wear wrap (see Section 5.4.9. on page 60).
4. After operating 100 hours:
   a. Change the oil in the gearbox (refer to Section 5.4.13. Gearbox – Maintenance Instructions on page 63).
   b. Refer to Section 5.2. Maintenance Schedule on page 46.

Once the GrainVac is broken in, the Pre-Operational Checklist (page 27) should be part of the daily routine before operating.

4.5. Tractor Requirements

The GrainVac is designed to be used with agricultural tractors. To ensure optimal performance, the following list of tractor specifications must be met:

1. Horsepower:
   - Minimum of 110 hp (82 kW) for clean-up.
   - Minimum of 85 hp (63 kW) for full bin load-out.
2. Drawbar Dimensions:
   - The tractor drawbar dimension must be 16” (406 mm) between the end of the tractor PTO shaft and drawbar pinhole center for the 1000 rpm (see Figure 4.1). This will provide sufficient clearance for turning and allow telescoping of the shaft. Consult your tractor manual for the drawbar adjustment procedure.

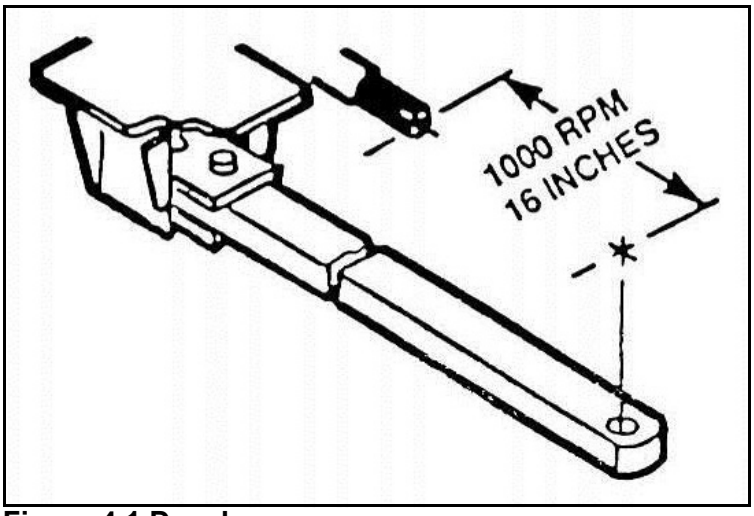


Figure 4.1 Drawbar

3. PTO Shaft:
   - The tractor PTO shaft must be 1000 rpm, 21 spline, and 1-3/8” (35 mm) diameter. Do not use on a tractor with a 540 rpm PTO because there will be insufficient output capacity.

4.6. Positioning and Set-Up

1. Attach the GrainVac to the tractor as detailed in Section 3.2. on page 24.
2. Transport or move the GrainVac to the job site.
3. Set the tractor’s park brake, stop the engine, and remove the ignition key.
4. Take the PTO driveline from its storage position by lifting the shaft out of its PTO holder.
5. As shown in Figure 4.2, compress the collar on the yoke to retract the inner locking pin. Connect the yoke over the tractor shaft, rotate the shaft to align the splines if required. Slide the yoke on the shaft with the collar released until the lock pin clicks into position. Make sure the driveline is attached firmly to prevent unexpected separation.

Figure 4.2 PTO Attached to Tractor

6. Attach PTO safety shield chain to a mounting point on the tractor (e.g., drawbar cage or lift arms)**.**
7. Assess the site while keeping in mind that a truck or grain cart must be able to easily drive under the auger once in working position (see Figure 4.3).

   a. Possible Situation #1:

   - If the ground is level and the opening of the bin is within approximately 6” (152 mm) in height to that of the GrainVac inlet:
   - Select the 29” (737 mm) stainless steel hose and use its over-center clamp to attach to the aluminum bin load-out nozzle. Insert the angled end of the load-out nozzle into the grain so that the sliding air door is not submerged and can easily be adjusted.

   b. Possible Situation #2:

   - If the ground is not level and the bin door is not within 6” (152 mm) of the GrainVac inlet height, or the GrainVac has to be parked at some angle to the bin opening:
   - Select the 81” (2057 mm) stainless steel flex hose and using the over-center clamp, attach the flex hose to the aluminum load-out nozzle. Insert the angled end of the aluminum load-out nozzle into the grain so that the sliding air door is not submerged. Adjust the stainless steel hose to minimize sharp bends or curves. This will maximize capacity and minimize hose wear.

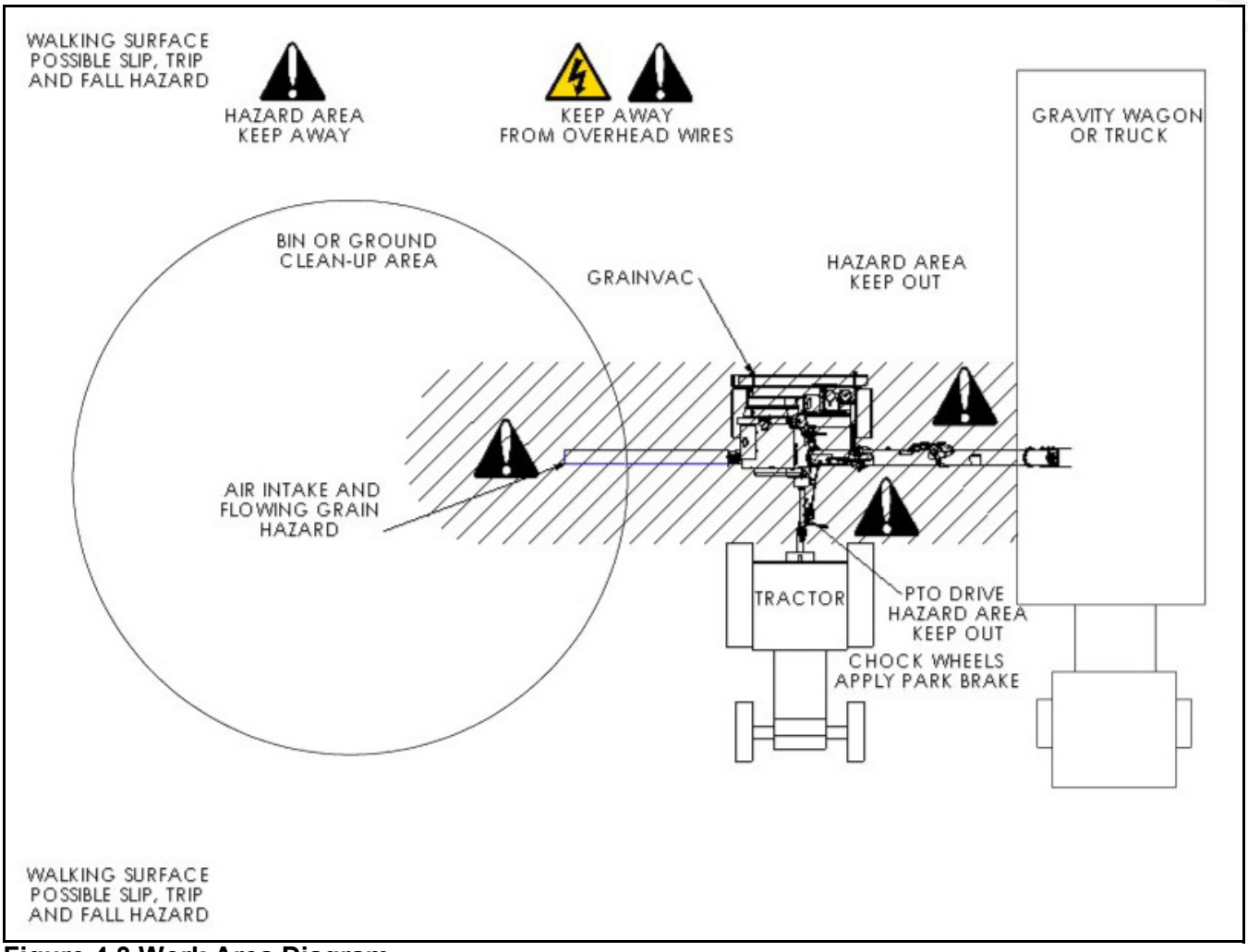


Figure 4.3 Work Area Diagram

NOTICE Always open the lid on top of the bin or silo to prevent the bin or silo from crumpling or sucking in due to GrainVac air suction.

8. Once the hose(s) is/are secured in the bin access door, drive the GrainVac to the grain pile such that the inlet is in line with the hose. Ensure the hoses are positioned as flat and level as possible.
9. For optimum performance, ensure the GrainVac is level in all directions.

Note: The angle between the GrainVac and the tractor should be as small as possible. A small angle (or no angle) means less vibration through the tractor and the GrainVac which ensures longer life of both pieces of equipment.

Note: To obtain the best performance and operational life on hoses, try to avoid sharp angles and bends.

10. Place all controls in neutral, turn off the PTO, set the park brake, stop the engine, remove the ignition key, and chock the wheels before proceeding.
11. Release the over-center clamp on the vac body inlet tube and remove the plug.
12. Release the over-center clamp that allows the telescoping inlet to slide. While holding the end of the stainless steel flex hose in line with the inlet of the vac body, slide the telescoping inlet towards the flex hose. Lock the over-center clamp of the telescoping inlet onto the stainless steel flex hose, and then lock the over-center clamp that allows the telescoping inlet to slide.

4.6.1. Jack Stabilizer Set-up

1. Remove the jack from its stowed position near the hitch.
2. Attach the jack (in a vertical, working position) to the mounting bracket on the left side frame rail, directly in front of the left fender (see Figure 4.4); use the jack retaining pin to fasten to the jack mount bracket.

⚠ WARNING The jack must be moved to the location shown in Figure 4.4 for added stability before the unloading auger is raised to working position. Failure to follow these instructions may result in the GrainVac instability and possible tip over.

⚠ WARNING Only use the jack supplied with the GrainVac. If the jack is damaged, contact your local dealer to get a replacement from AGI.

Figure 4.4 Jack in Working Position

3. Rotate the jack handle to lower the jack base plate onto the ground, so that a small amount of weight is transferred from the left tire to the jack.

NOTICE DO NOT move the GrainVac while the jack is in vertical working position and/or in contact with the ground. Retract augers to transport position and raise the jack before moving the GrainVac.

4.6.2. Auger Hydraulic Lift

1. The GrainVac is equipped with a hydraulic lift system for the auger. Before operation, check the system for leaks. Ensure the hydraulic hoses are attached properly.

⚠ WARNING Wear proper hand and face protection when searching for hydraulic leaks. Escaping fluid under pressure can penetrate the skin and cause serious injury. In case of accident, see a doctor immediately.

⚠ WARNING Fluid leaks in the hydraulic lift cylinders and/or hydraulic hoses will allow the auger to lower inadvertently. Repair all leaks and breaks immediately.

⚠ DANGER Know where overhead electrical lines are located and stay away from them. Electrocution can occur without direct contact.

2. Engage the hydraulics gently. The auger will lift in a two-stage process. The middle auger will lift first. The upper auger will swing out last.

DANGER Stay away from auger tubes when opening/closing (due to pinch points). Keep others away. Failure to do so may result in serious injury or death.

3. After the augers are fully raised, check to ensure that they are properly seated (see Figure 4.5). The auger ends should be parallel to each other without any gaps. If gap is present, lower the auger fully and inspect for obstruction.

Figure 4.5 Plunger Valve in Working Position (hydraulic hoses not shown)

Note: If both auger hydraulic cylinders extend or retract at the same time, stop activating the hydraulics. When this occurs, it is because the plunger valve adjustment is not set properly. To resolve this problem, first fully lower all the auger sections into the transport position (see Figure 4.6). Then raise only the middle auger into its working position. Then to adjust the plunger valve, adjust the bolt until the plunger valve depresses approximately 1/16” (1.6 mm).

NOTICE Do not fully depress the valve as this will cause damage from the heavy weight applied by the auger tubes.

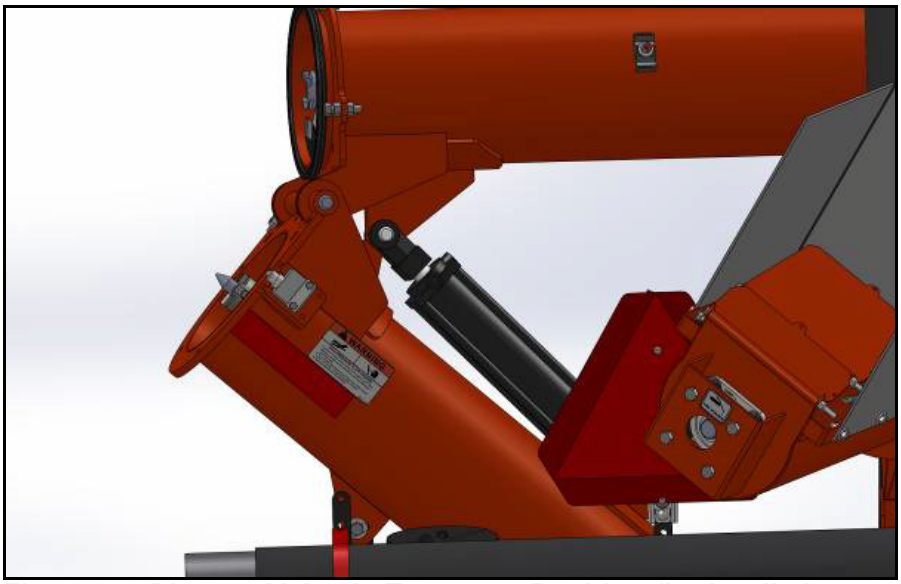


Figure 4.6 Plunger Valve in Transport Position (hydraulic hoses not shown)

4.7. Tachometer / Hour Meter

The standard tachometer / hour meter (see Figure 4.7) operates in hour meter mode when the machine is not running. This aids in meeting maintenance schedules in this manual.

The unit functions in tachometer mode when the machine is in operation. The tachometer will help to ensure you operate the GrainVac safely and at optimum capacity.

The tachometer / hour meter has a battery life of approximately ten years in normal operating conditions.

Figure 4.7 Tachometer

4.8. Grain Vacuum Operation Procedure

The GrainVac has been attached to the tractor, positioned, and set-up at the work site. Position the grain truck or grain cart under the end dump spout of the GrainVac unloading auger.

To operate grain vacuum, proceed as follows:

1. Check all items on the Pre-Operational Checklist (see page 27).
2. Make sure you and others in the work area are wearing the proper personal protective equipment (see page 6).

Important: Read Section 4.8.1. Applications & Characteristics of Hoses & Tubes on page 40 for the best use of the supplied hoses.

Important: Read Section 4.8.2. The “9 S’s of GrainVac Performance” on page 41 for detailed instructions on maintaining the highest level of performance.

3. Prepare your hoses prior to starting the tractor or GrainVac, and lay them near or on the grain.

Note: Preparation of hoses prior to starting the tractor or GrainVac minimizes the time involved in hose changes later.

4. Insert tractor ignition key and make sure park brake is set and controls are in neutral. Start the tractor.
5. With the tractor engine at low idle, SLOWLY turn on the PTO clutch.

NOTICE Always start the machine gently at low speed to prevent component overloading and for maximum GrainVac lifespan.

NOTICE Do not operate GrainVac in excess of 1000 rpm. Failure to follow these instructions may result in machine component damage or failure.

6. Slowly bring the PTO speed up to 1000 rpm.
7. Using the combination of hoses shown in Figure 4.8, insert the end of the intake hose into the grain and proceed with vacuuming the grain to draw down the grain in the bin.

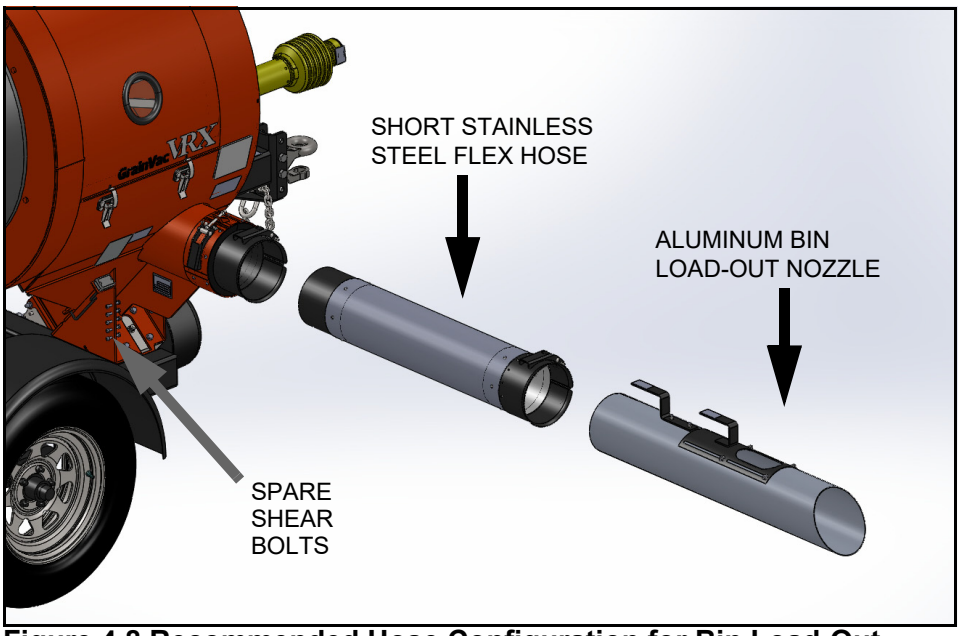


Figure 4.8 Recommended Hose Configuration for Bin Load-Out

8. The grain is conveyed into the GrainVac in a stream of air. As a consequence, it is necessary to allow some air to enter at the intake. This can be done by not completely filling or covering the end of the hose with grain. Try different techniques until you are satisfied that the machine is operating at maximum capacity.

Note: During operation, if the GrainVac body is showing grain buildup (seen through inspection window), adjust the air throttle**.** Refer to the steps below for air throttle adjustment instructions.

Important: During operation, if the GrainVac becomes plugged, see Section 8. Troubleshooting on page 97.

⚠ WARNING Shut down and lock out all power before maintaining, adjusting, or unplugging the equipment.

9. Although the GrainVac is a precision piece of equipment, it is relatively sensitive to dirt and other foreign particles. Keep dirt and foreign particles to a minimum.
10. Any dust from moving grain inside the bin is drawn into the intake. This mode of grain handling provides the operator with a virtually dust-free environment inside the bin, in contrast to bin sweeps. Dust is expelled from the GrainVac either through the exhaust or from the optional dust collector.

    a. Optional Dust Collector (see Figure 4.9): Dust and air enter the cyclone and while clean air is expelled from the top, dust is expelled from the bottom. A pail must be placed beneath the dust collector and emptied once it becomes full. This option provides the operator with a virtually dust-free environment outside the bin while loading.

Note: The dust collector may reduce GrainVac capacity by up to 10%.

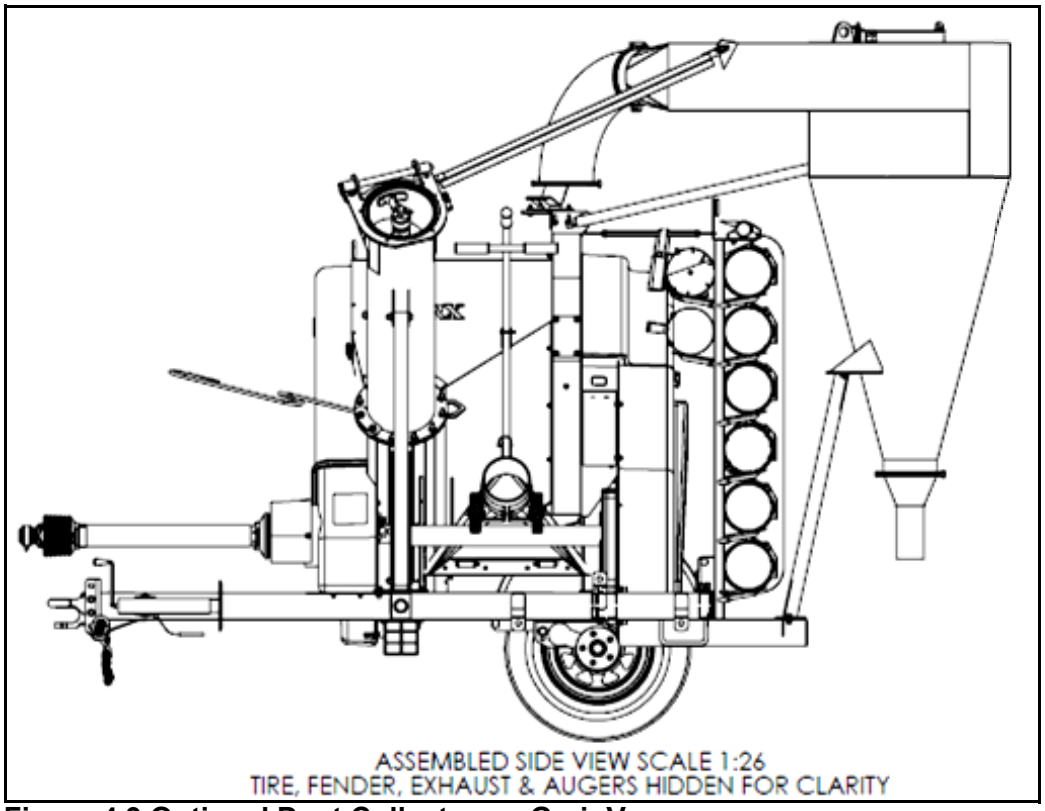


Figure 4.9 Optional Dust Collector on GrainVac

11. Damp or wet grain is more difficult to move than dry grain due to increased weight and friction between the kernels and the machine. Always allow more air than grain to enter the intake in these conditions to prevent plugging.
12. Do not allow water, snow or other forms of moisture to enter the machine. They can damage the inner working parts and cause plugging by caking up the material. If these do enter the machine, slow the feed rate by increasing the airflow for a time to allow the machine to clear itself.
13. By being able to adjust the air throttle, it gives the operator complete control on how much grain can enter into the tank.
    a. In **light grains** such as sunflowers, oats, or barley, you will be able to vacuum more grain into the machine than the auger can physically take away. In cases like this, you will want to keep your auger speed going as fast as possible by keeping the GrainVac at 1000 rpm, but limit the suction by adjusting the air throttle to a more closed position (see Figure 4.10). To achieve maximum capacity in light grains, start by locking your air throttle so the lock pin is in the 4th hole from the bottom. If you don't see grain rising up in the inspection door window, continue adjusting the air throttle down one hole at a time until you see it rising up in the window. If you see it rising up in the window, raise the air throttle by one hole. By doing this, you will find the maximum capacity where you will not plug the machine, but the auger is completely full.

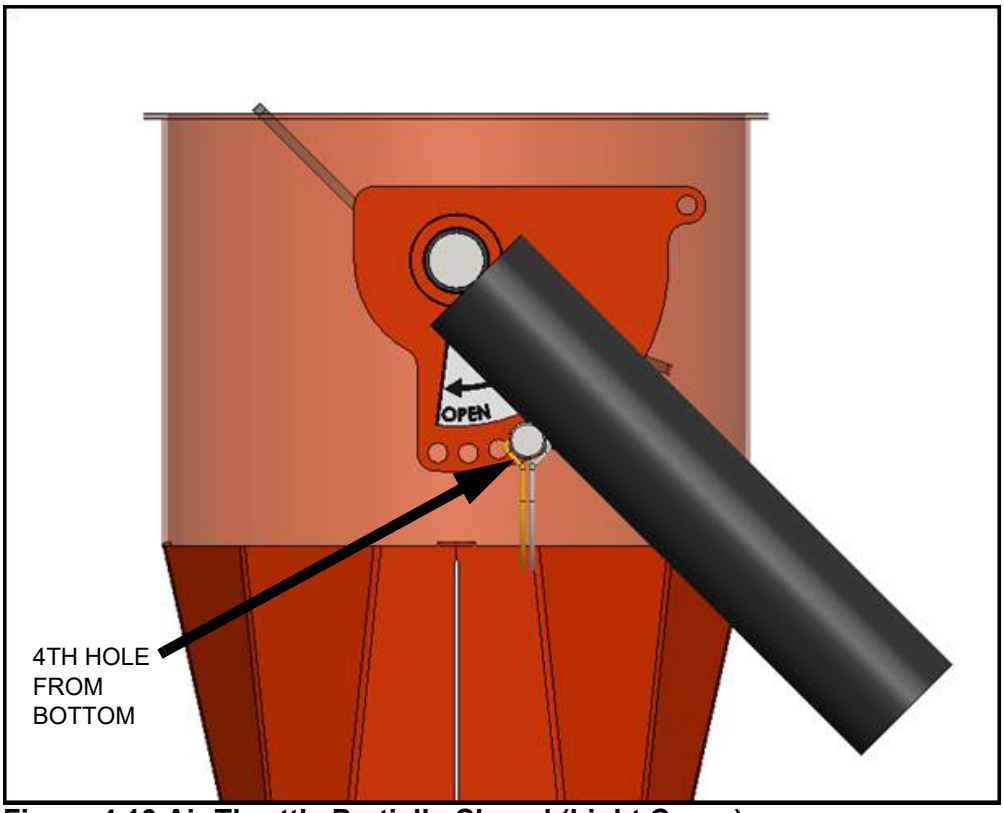


Figure 4.10 Air Throttle Partially Closed (Light Crops)

b. For **regular grains**, fully open the air throttle (it is floating; see Figure 4.11).

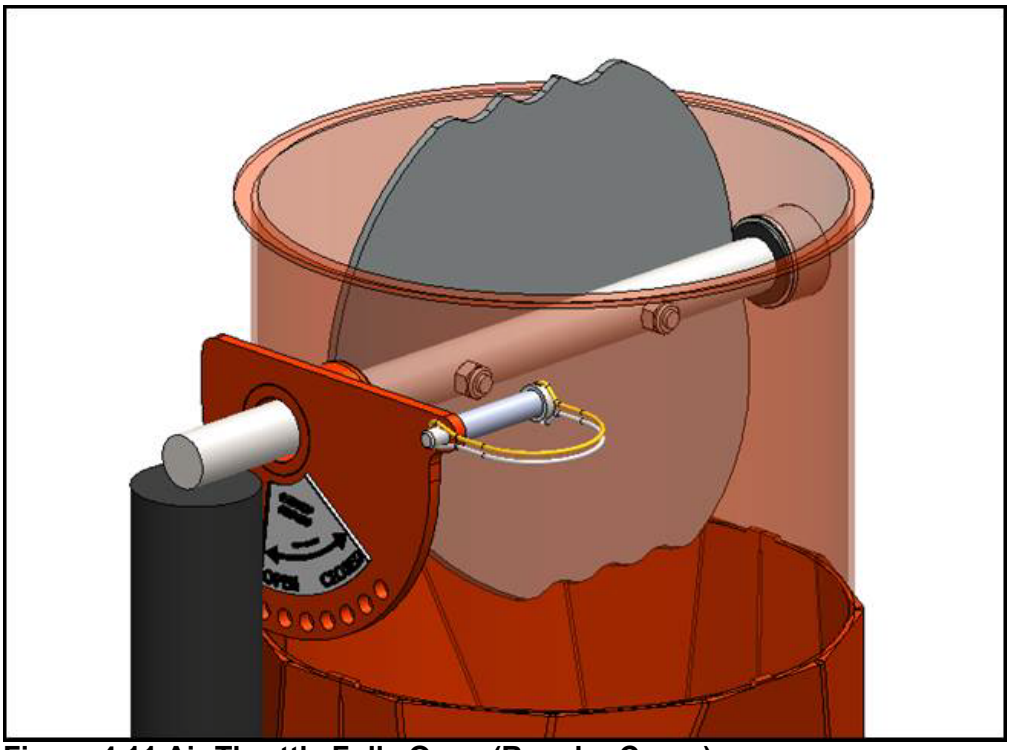


Figure 4.11 Air Throttle Fully Open (Regular Crops)

⚠ CAUTION The machine generates heat through the action of the rotor. This heat is carried out of the machine in the exhaust air. Do not touch or service until after operation when rotor and exhaust surfaces have been allowed to cool. Failure to follow these instructions may result in burns.

14. After the bin draw down is complete and the grain no longer flows into the intake hose, add the straight aluminum tube to machine and move the steel flex hose into the bin to pick up the majority of the grain pile (for this reason, the GrainVac is also the ideal machine to clean up grain piles in the open or on a pad). In some cases it may be necessary to combine these two hose options (see Figure 4.12) to obtain the best performance. As the bin nears empty, additional lengths of hoses & tubes will be required. Attach an additional steel tube or flex hose as required for the job to be done. As the intake hose gets longer, it will be necessary to allow more air to enter the intake hose to provide the necessary airflow.

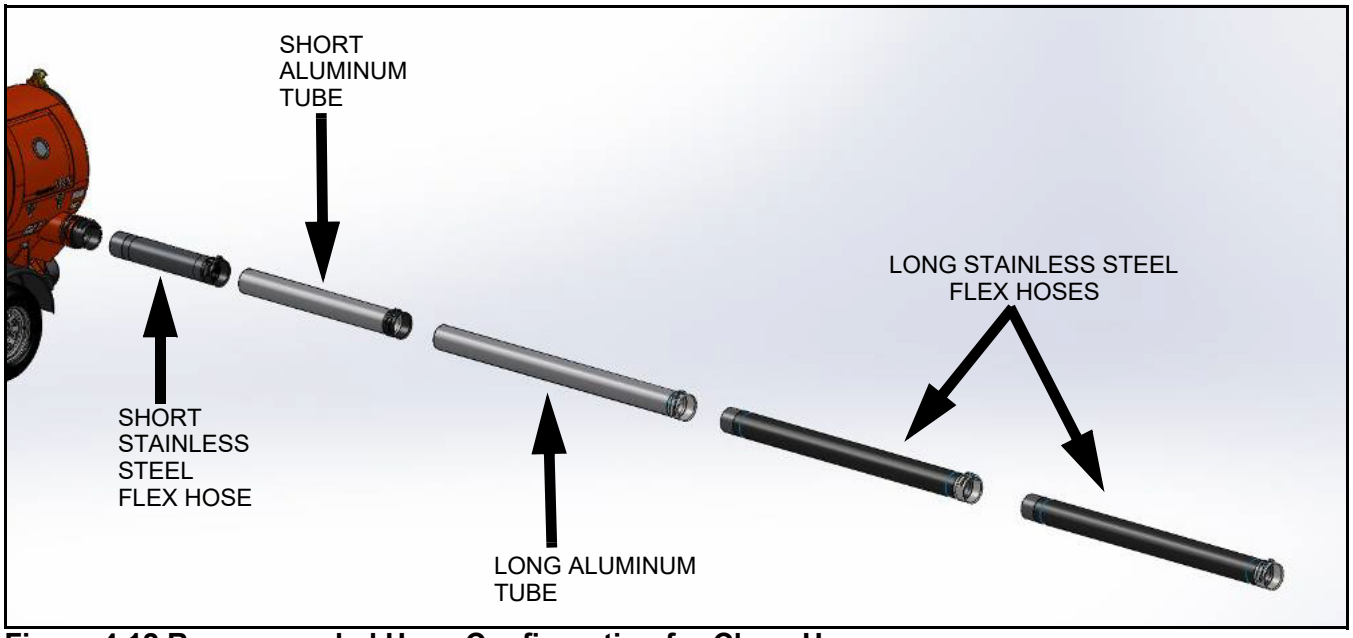


Figure 4.12 Recommended Hose Configuration for Clean-Up

15. As the bin is emptied, there will be grain on the floor and in the corners. Attach the standing floor sweep (see Figure 4.13) onto the end of the steel flex hose (which was attached to the straight aluminum tube). Although the longer hose adds friction to the system, with practice, the user can achieve optimal capacity. Move the standing floor sweep along the bottom of the bin and into the corners. The standing floor sweep has a long slot all the way along the bottom of itself to draw in the grain. Also, the standardly supplied air restrictor (optimizer) can be attached to the intake end of the standing floor sweep. The air restrictor can be closed to enable air and grain to enter only the floor sweep's bottom slot, or the air restrictor can be partially opened to allow air and some grain to enter the end (in addition to the bottom slot), or the air restrictor can be removed from the end of the standing floor sweep to enable larger amounts of grain to be drawn into the end of the standing floor sweep.

Figure 4.13 Standing Floor Sweep and Air Restrictor

16. To assist in final clean-up of the remainder of the grain, remove the standing floor sweep and attach the clean-up nozzle to the rubber/durathane (basketweave) hose (see Figure 4.14).

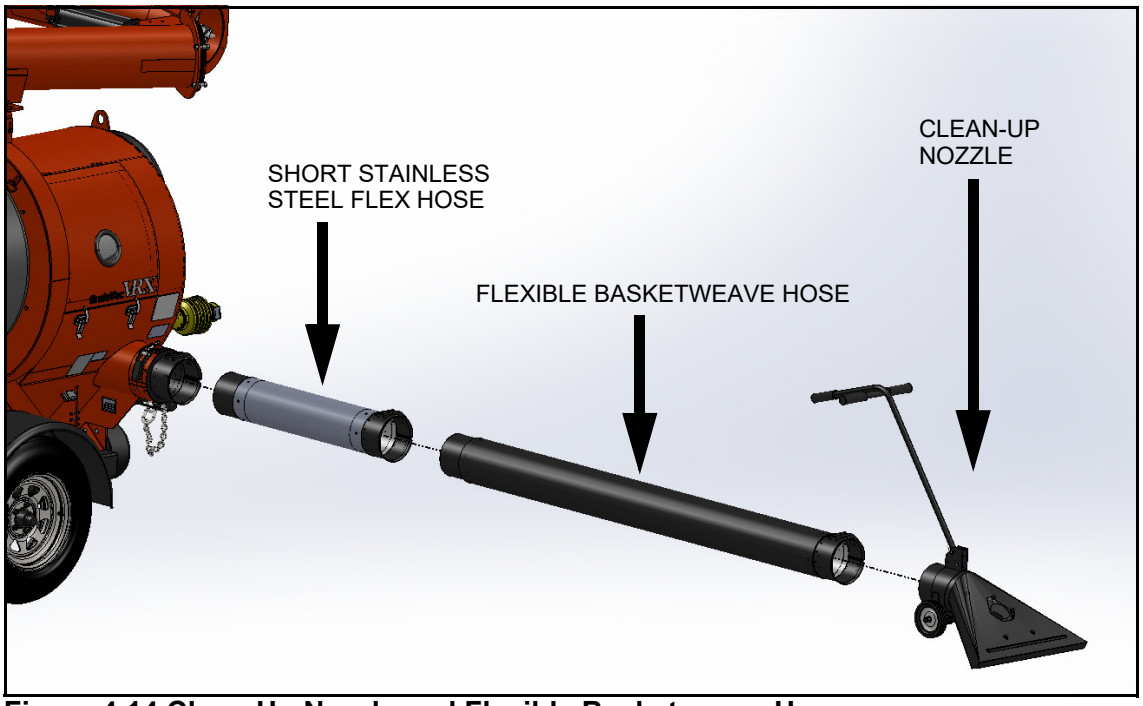


Figure 4.14 Clean-Up Nozzle and Flexible Basketweave Hose

4.8.1. Applications & Characteristics of Hoses & Tubes

The GrainVac is supplied with 7 standard hoses & tubes. Proper use of hoses & tubes will maximize the performance, capacity, and life of all hoses & tubes.

Note: Hoses & tubes are a wear item and are *NOT* covered by the warranty.

- Two(2) 7” x 7’ (178 x 2134 mm) aluminum tube and one(1) 7” x 4-1/2’ (178 x 1371 mm) aluminum tube. These tubes are most commonly used to enter the bin once the grain level is low enough that clean-up is required. These tubes have the least amount of friction and therefore promote the best capacity and longevity of all the different hoses & tubes.
- Two(2) 7” x 81” (178 x 2057 mm) stainless steel flexible hoses. The stainless steel flexible hoses give you good capacity with limited movement. This is most commonly used for direct loading from bins through small doorways, where the solid tubes will be difficult to handle. Often these hoses are used in combination with an aluminum tube and the bin load-out nozzle to reach piles far back in the bin.
- One(1) 7” x 29” (179 x 737 mm) stainless steel flexible hose. This hose is ideal to attach directly to the GrainVac inlet to allow for easy movement when close to a bin.
- One(1) 7” x 7-1/2’ (179 x 2286 mm) flexible rubber/durathane (basketweave) hose. This hose is best used for final clean-up.
- Telescoping inlet (permanently mounted directly in GrainVac inlet). This tube is adjustable with a useable travel length of 15-1/2” (394 mm). It can be used at any time. Adjustable tube length makes GrainVac operation simpler.

The hoses & tubes must always be securely clamped in position to minimize air leakage. Make sure that any hoses & tubes are slid all the way into the clamps. Air leakage can significantly reduce machine capacity. Maintain hose & tube clamps in good condition.

4.8.2. The “9 S’s of GrainVac Performance”

S1: Short – position the GrainVac as close to the source of the material as possible and keep the length of piping **short**. The shorter the distance, the less piping friction and the greater the GrainVac capacity.

S2: Smooth – smooth pipes (interior walls) also reduce resistance to air and grain movement. Where possible, use aluminum tubes first, then stainless steel flex hoses, last of all use rubber or urethane (for cleanup only), as this convenient lightweight hose is not at all **smooth.**

S3: Straight – a 90° bend in the piping is the equivalent of adding 20’ (6096 mm) or more of straight piping. Reduce bends in the piping as much as possible, and keep the grain moving **straight.**

S4: Slope – if possible, lay out the piping to keep it at the same height over the length of run. Resistance to material flow is created in piping “hills and valleys”. Grain does not move uphill easily, so remember to minimize the **slopes.**

S5: Seal – air leaks in the GrainVac reduce capacity at the nozzle end of the pipe. Keep all neoprene foam seals (on the auger flanges and body doors and ports) in good condition and keep the door and hose clamps adjusted snug in order to ensure a good air **seal.**

S6: Suction – grain moves only when air moves. (No flow, no go). You may be required to retract the hose end or nozzle slightly from the grain pile, meter the grain into the nozzle, or pull the nozzle air slide open to ensure no loss of **suction.**

S7: Speed – the GrainVac has been designed to run with optimum suction when your power unit PTO is at a maximum **speed** of 1000 rpm.

S8: Sweep – don’t work so hard. Once you are in the bin, use the light aluminum standing floor sweep. First draw down the large piles, then in a pattern of semicircular “sweeps” across the floor, adding hose & tube lengths, as required, to increase your sweeping diameter. With the GrainVac, you will make every job a clean **sweep.**

S9: Sparkle – to ensure good airflow, keep the rotor blades, inlet and exhaust piping, and drum screen, clean and free of buildup. Remove debris and make the interior components **sparkle.**

4.9. Shutdown Procedures

4.9.1. Normal Shutdown

When the job is complete, use the following steps for proper shutdown of the GrainVac:

1. Retract the intake hose from the grain and allow the machine to run for 1 to 2 minutes to completely clean out.
2. Shut down the PTO, wait for all the moving parts to stop, and lock out all power, before doing anything to the GrainVac.
3. Remove PTO and its safety chain from tractor and place it in its holder.
4. Remove and store hoses, tubes, and nozzles in their original locations (see Figures 4.15 & 4.16).

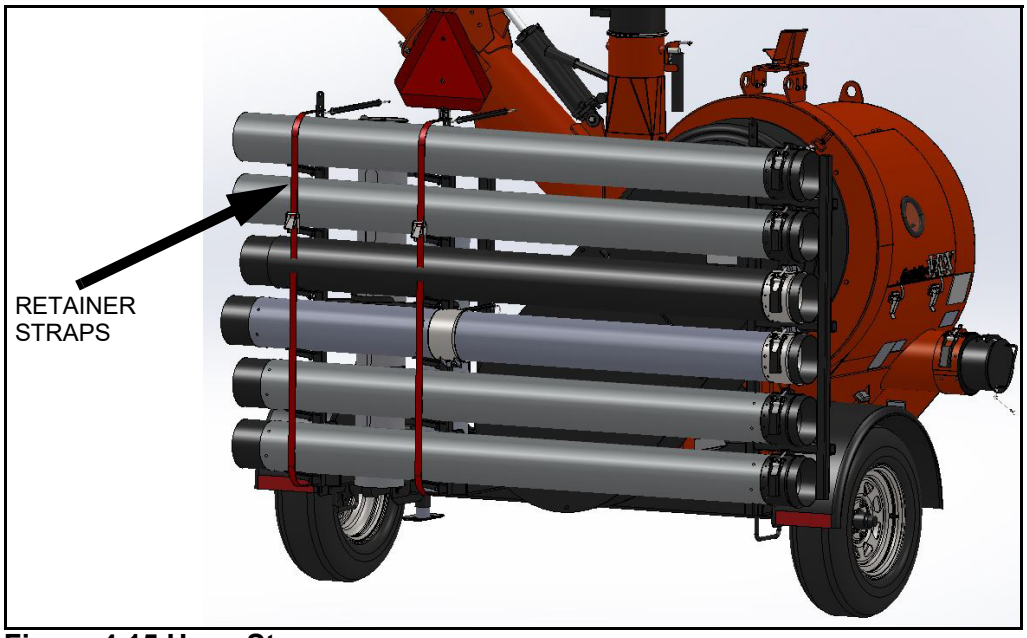


Figure 4.15 Hose Storage

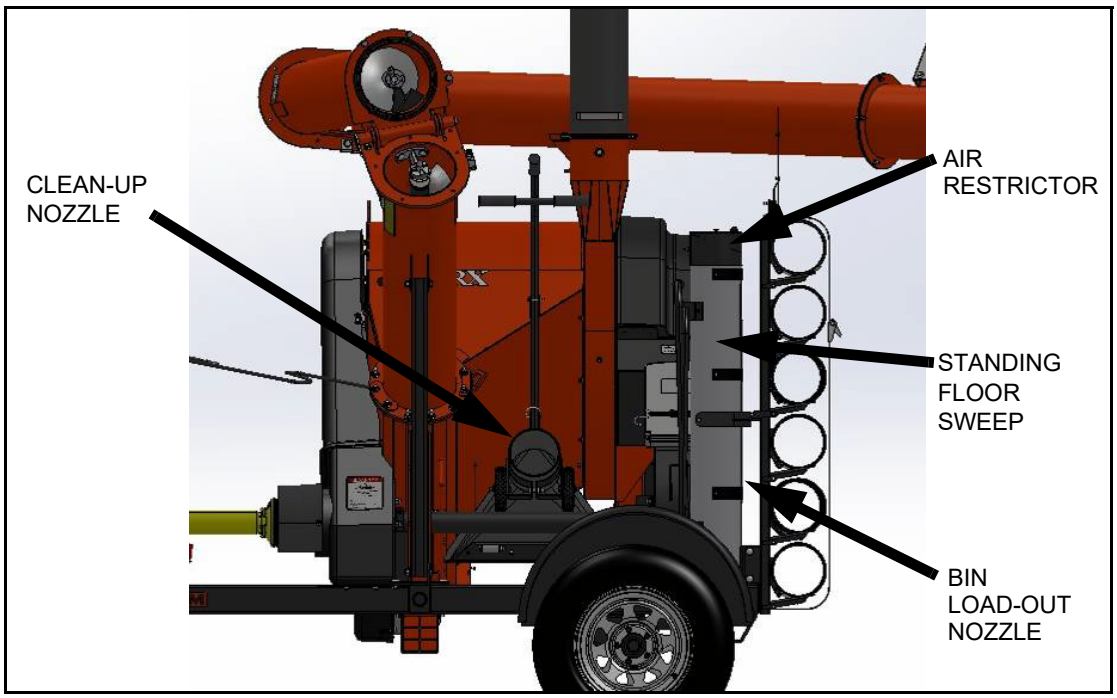


Figure 4.16 Storage of Nozzles and Standing Floor Sweep

5. Open the auger clean-out door by pulling the handle located under the first auger section tube and check to ensure the grain drains out and does not bridge around the mesh (see Figure 4.17).

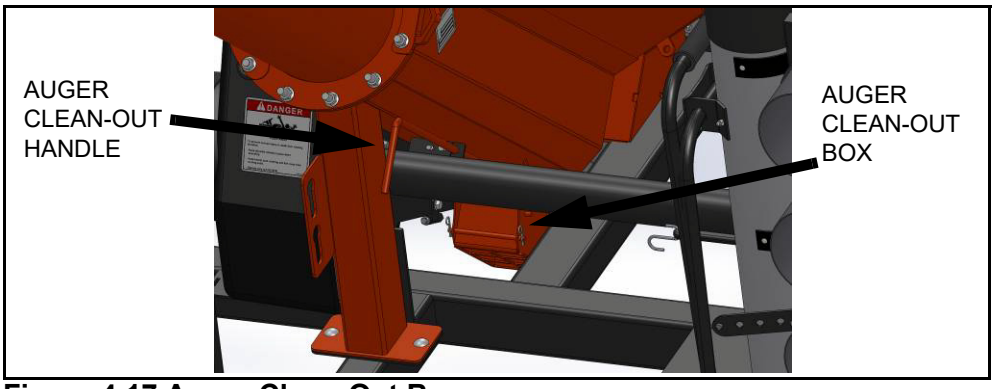


Figure 4.17 Auger Clean-Out Box

6. Insert the plug into the vac body inlet and secure using the over-center clamp.
7. Check for overhead obstructions to ensure there is adequate clearance to lower the auger tube into transport position.

⚠ DANGER Know where the overhead electrical lines are located and stay away from them. Electrocution can occur without direct contact.

If clear, gently lower the auger tubes using the hydraulics from the tractor cab. Ensure the tubes are seated in the auger transport rest (see Figure 4.18). If the upper auger tube is not fully seated in the auger transport cradle:

a. Raise the auger to working position.
b. Loosen the auger transport cradle and adjust positioning to get the best fit.
c. Lower the auger to transport position.
d. Tighten all the auger transport cradle hardware.
e. Cycle the auger up and down two times.

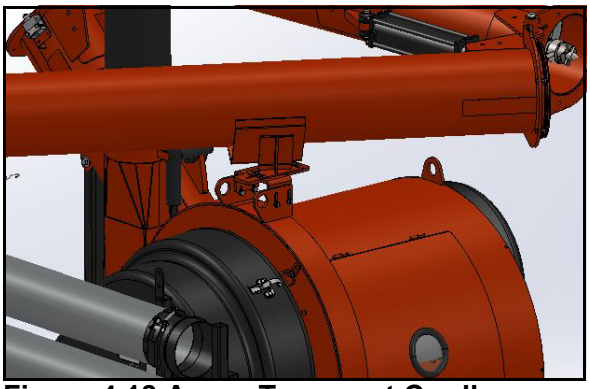


Figure 4.18 Auger Transport Cradle

8. Rotate the handle of the jack on the left frame rail mounting bracket to raise the jack base plate from the ground. Remove the jack.
9. Replace the jack onto the hitch in the stowed position using the jack retaining pin.

⚠ DANGER The GrainVac should never be disconnected from towing vehicle without the auger fully folded into transport position. Failure to follow these instructions may result in the GrainVac tipping over.

10. Prepare for transport or storage (see appropriate chapter for more information).

4.9.2. Emergency Shutdown

In case of emergency:

1. Immediately shut off the GrainVac power source (turn tractor or diesel engine key to OFF position). This will eliminate all suction and rotation hazards that may contribute to an emergency situation.
2. Remove the ignition key.

5. Maintenance

Before continuing, ensure you have completely read and understood this manual's Safety chapter, in addition to the safety information in the section(s) below.

5.1. Maintenance Safety

⚠ WARNING

- Keep components in good condition. Follow the maintenance procedures.
- Ensure the service area is clean, dry, and has sufficient lighting.
- Do not modify any components without authorization from the manufacturer. Modification can be dangerous and result in serious injuries.
- After maintenance is complete, replace all guards, service doors, and/or covers.
- Shut down and lock out power before maintaining.
- Use only genuine AGI replacement parts or equivalent. Use of unauthorized parts will void warranty. If in doubt, contact the manufacturer or your local dealer.
- Shut down and lock out all power before maintaining, adjusting, or unplugging the equipment.
- Support the GrainVac with blocks or safety stands when changing tires or working beneath the GrainVac.
- Before attempting any maintenance, chock wheels.
- Make sure you have sufficient lighting for the work area.
- Do not take chances with safety. The components are large, heavy, and can be hard to handle. Always use the proper tools, stands, jacks, hoists, slings, spreaders, and lifting points for the job.
- Before applying pressure to a hydraulic system, make sure all components are tight and that hoses and couplings are in good condition.

Important: In the figures in this Maintenance chapter, the guards are often removed for illustrative purposes only. Replace the guards before operating the GrainVac.

5.2. Maintenance Schedule

Follow the checklist in the table below to perform maintenance. Keep good records of the number of hours the equipment has been operated and of the maintenance performed. Proper maintenance provides longer life, greater efficiency, and safer operation of the equipment.

The GrainVac VRX is a simple and reliable system that requires minimal maintenance.

Table 5.1. Maintenance Schedule

	Every 8 hours or Daily	Every 10 hours or Daily	Every 20 hours	Every 40 hours	Every 100 hours or Annually
Lubricate — PTO universal joints, shields, and overrunning clutch (see Section 5.4.2. on page 50)	✓				
Check — wear, alignment, tension of drum drive belt (see Section 5.4.3. on page 52)		✓			
Check — wear, alignment, tension of rotor drive belt (see Section 5.4.4. on page 52 and Section 5.4.5. on page 54)		✓			
Lubricate & Check (tension) — auger drive chain (see Section 5.4.6. on page 56)		✓			
Check — seal on clean-out door (see Figure 7.3)		✓			
Check — seal on inspection door (see Figure 7.1)		✓			
Check — seal on end dump double doors (see Section 5.4.7. on page 58)		✓			
Check — rubber seal on auger sections (see Figure 4.5)		✓			
Check — bearing cartridge oil level				✓	
Check — auger drive dogs (inspect between flighting sections to ensure there has not been interference or excess wear) (see Figure 4.6)		✓			
Lubricate — rotor drive belt idler arm pivot tube (see Section 5.4.8. on page 59)			✓		

Table 5.1. Maintenance Schedule

	Every 8 hours or Daily	Every 10 hours or Daily	Every 20 hours	Every 40 hours	Every 100 hours or Annually
Check — end dump liner for signs of wear				✓	
Check — wear on rotor and wear wrap (see Section 5.4.9. on page 60)				✓	
Check — condition of rotor drive bearing cartridge (see Section 5.4.10. on page 61)					✓
Clean, Lubricate — PTO safety shields (see Section 5.4.2. on page 50)					✓
Lubricate — front & back bearings on main drive shaft (see Section 5.4.11. on page 61)					✓
Check — spring tension on end dump double doors (see Section 5.4.7. on page 58)					✓
Lubricate — end dump double doors (see Section 5.4.7. on page 58)					✓
Lubricate — top auger bearing (see Figure 5.13)					✓
Check — condition / tension of auger drive chain (see Section 5.4.6. on page 56)					✓
Check, Clean, Lubricate — shear sprocket (see Section 5.4.12. on page 62)					✓
Check — gearbox oil level (see Section 5.4.13. on page 63)					✓
Clean — gearbox reservoir breather (see Section 5.4.13. on page 63)					✓
Check — tires for signs of wear, and retighten lug nuts					✓
Lubricate — axle hubs (grease wheel bearings by removing rubber cover on dust cap)					✓

5.3. Fluids & Lubricants

Gearbox Oil: Use a SAE 80W90 gear oil. The capacity is 25.5 oz (0.75 L).

Bearing Cartridge: Use SAE 75W90 gear oil, see Section 5.4.14. Rotor Bearing Cartridge Oil Bath – Checking Oil Level on page 66 for recommended oil level.

Grease: Use a SAE multi-purpose high temperature grease with extreme pressure (EP) performance. Also acceptable is an SAE multipurpose lithium-based grease.

Storage & Handling

- Always follow manufacturer's guidelines for the safe and effective storage and handling of fluids and lubricants.
- Your equipment can operate at top efficiency only if clean fluids and lubricants are used. Use clean containers to handle all fluids and lubricants. Store them in an area protected from dust, moisture, and other contaminants.

Greasing Procedure

- Wipe grease fittings with a clean cloth before greasing, to avoid injecting dirt and grit.
- Use a hand-held grease gun for all greasing.
- If fittings will not take grease, remove and clean thoroughly. Also, clean the lubricant passageway.
- Replace or repair broken fittings immediately.

5.4. Maintenance Procedures

5.4.1. Shear Bolt – Replacement

The auger drive components are protected from damage by a replaceable shear bolt (see Figure 5.1) in the shear sprocket assembly found on the input shaft of the gearbox. This bolt can shear as a result of a foreign object jamming the auger. Therefore it is important to determine the cause of shearing before replacing the shear bolt.

When the failure of the shear bolt is not noticed immediately, the GrainVac body may fill with grain and cause the rotating drum screen to stall which could burn out the drum drive belt. The drive belt should be checked for damage. If replacement is required, refer to Section 5.4.3. Drum Drive Belt – Checking, Tensioning, & Replacement on page 52.

⚠ WARNING Shut down and lock out all power before maintaining, adjusting, or unplugging the equipment.

To replace the shear bolt, proceed as follows:

1. Shut down the PTO, stop the tractor engine, and remove the PTO shaft from tractor.
2. Open the auger clean-out door at the bottom of the body. Check for foreign material. Check to see that the middle auger section and the upper auger section rotate freely.
3. Disconnect the grain hoses from the inlet so that more grain is not suctioned into the body.
4. Open the chain guard.

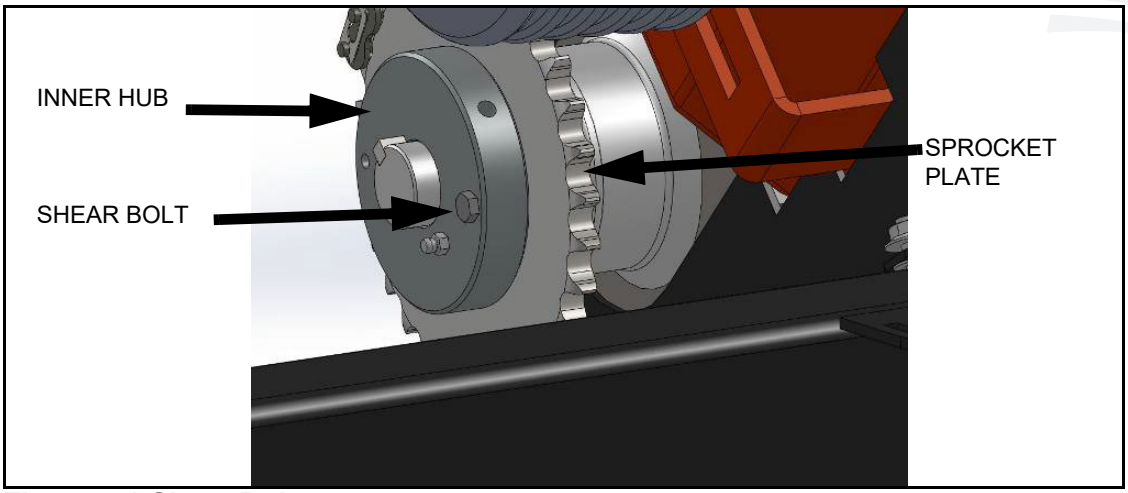


Figure 5.1 Shear Bolt

5. Remove the broken head end of the shear bolt if it is still in place.
6. Rotate the PTO shaft by hand to align the sheared bolt in the sprocket plate with either of the two holes in the inner hub.
7. Once aligned, use a hammer and punch to drive the broken part of the shear bolt out of the sprocket plate.
8. Insert the new shear bolt from the front of the inner hub and install the nut on the back.
9. Using the rotor drive belt, rotate the driveline to see that the auger drive turns freely. Rotating the belt clockwise from behind the machine will rotate the auger in the normal direction; counterclockwise will reverse the auger which may help to clear any obstructions.
10. Replace the chain guard and rear upper guard. Close the auger clean-out door.
11. Reconnect the PTO shaft to the tractor.
12. Start the tractor engine. Engage the PTO slowly; be sure that the auger is turning and allow it to clear all the grain from the GrainVac body.

If the shear bolt breaks again, repeat the above process, being sure to determine the cause of shear bolt failure.

5.4.2. PTO – Lubrication & Cleaning

Every 8 Hours or Daily:

1. Lubricate the 2 universal joints on the PTO (one at each end of the shaft) (see Figure 5.2).

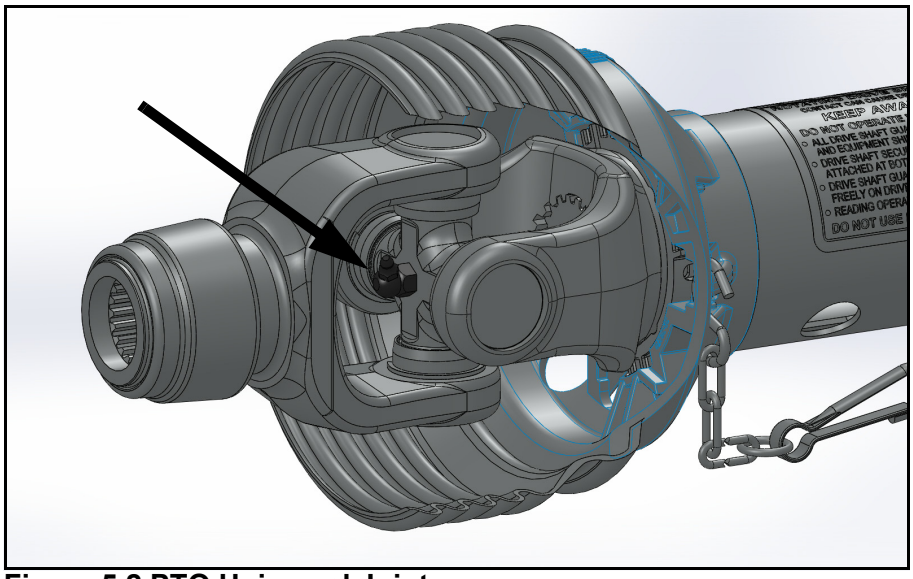


Figure 5.2 PTO Universal Joint

2. Lubricate the 2 safety shields on the PTO (one at each end of the shaft) (see Figure 5.3). This is important to ensure the safe operation of the shield components rotating freely over the PTO shaft.
3. Lubricate the 1 grease zerk on the overrunning clutch on the GrainVac end of the PTO shaft (see Figure 5.3).

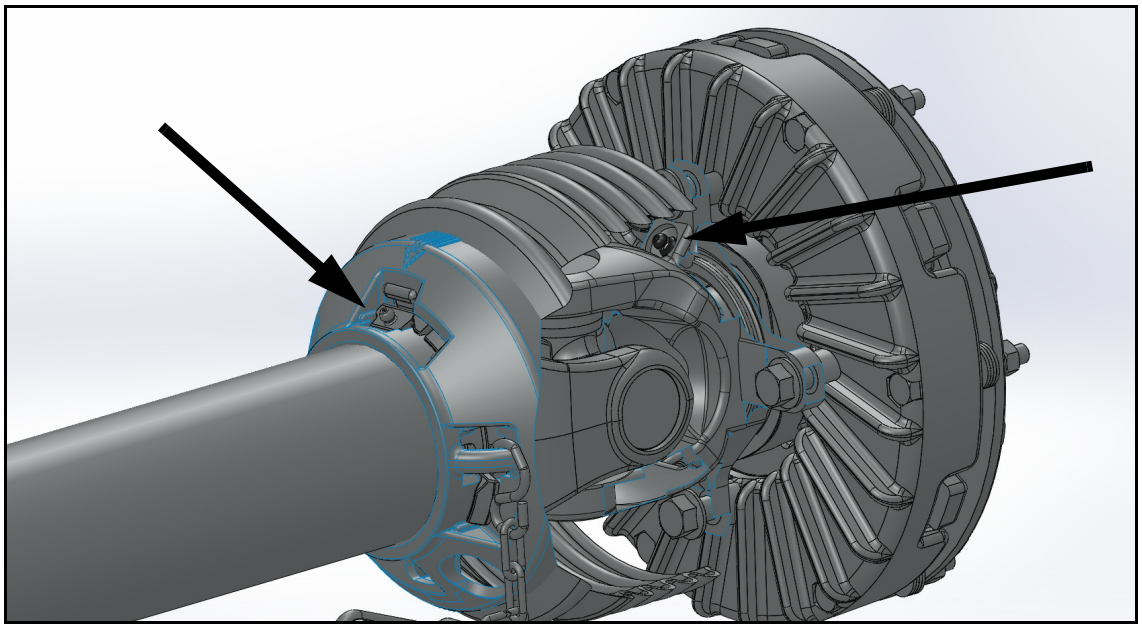


Figure 5.3 PTO Safety Shield and Overrunning Clutch

Every 100 Hours or Annually:

It is important to ensure the safe operation of the shield components rotating freely over the PTO shaft. Disassembly, cleaning, and lubricating of the safety shields (see Figures 5.4 and 5.5) should be performed annually or when they no longer rotate freely. Follow this procedure:

1. Press the cone down and release the collar catches with a screwdriver.
2. Spread the collar bearing and remove from the tube. Clean the collar and the yoke-bearing groove. After cleaning thoroughly, apply a generous coat of grease to the bearing groove.
3. Fit the collar bearing into the groove and the tube, ensuring that the collar catches are centered over the matching holes. The tube and bearing must rotate freely in the bearing groove.
4. Fasten the cone by lining up the cone grease fitting over the grease-filling hole on the collar bearing. Make sure that all catches are fastened and that the shield rotates freely over the shaft.

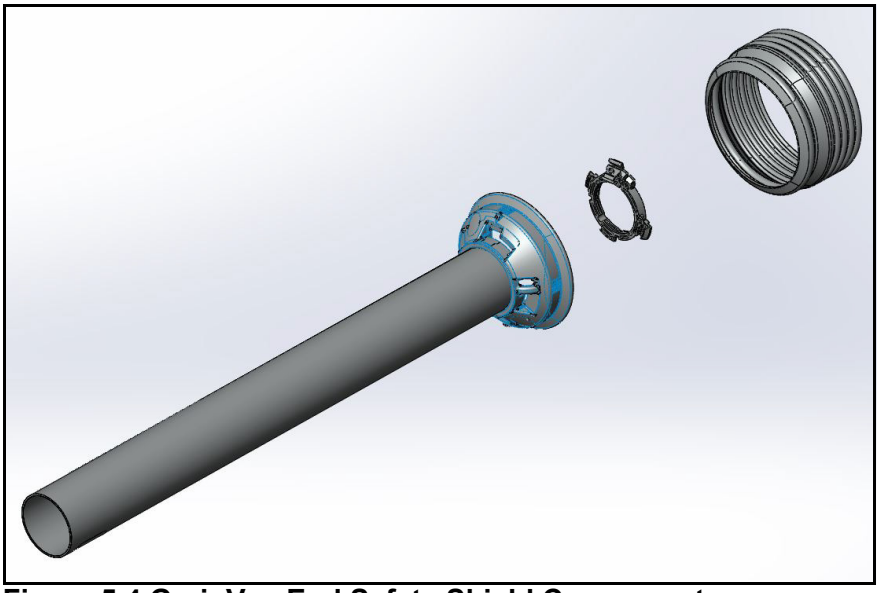


Figure 5.4 GrainVac End Safety Shield Components

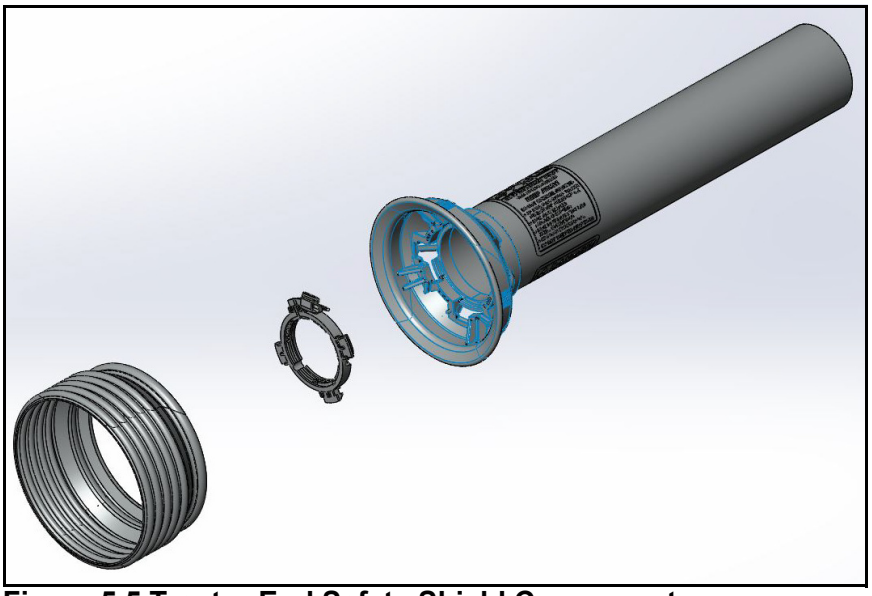


Figure 5.5 Tractor End Safety Shield Components

5.4.3. Drum Drive Belt – Checking, Tensioning, & Replacement

Check the belt for any signs of wear. As detailed below, ensure that the sheaves and idler are properly aligned and check the belt tension.

When the drum drive belt needs replacing, proceed as follows:

1. Disconnect the PTO shaft from the tractor.
2. Open the front guard.
3. Loosen the drum idler bracket.
4. Remove the belt and replace with an equivalent belt.
5. Check for pulley alignment by laying a straight edge along the sides of the pulleys. A pulley face that is out by more than 1/16” (1.6 mm) should be realigned.
6. The belt tightness should be checked with a straight edge and a fish scale on the slack side of the belt at the approximate center location. The belt should be deflected 1” (25 mm) from the straight edge. Fish scale reading should be in the range of 4 – 5 lb (1.8 – 2.3 kg) at 1” (25mm) deflection. If using a belt tension meter, the same 1” (25 mm) deflection measurement should be used.
7. To retighten, place a 3/8” socket wrench into the square hole in the back plate of the drum idler bracket and tighten the belt. While still holding onto 3/8” socket wrench, tighten the nut on the bolt in the adjustment slot.
8. Close the front guard and secure the latch.

5.4.4. Rotor Drive Belt – Checking, Tensioning, & Replacement

If the operator notices a decrease in capacity, a squealing sound, or the smell of rubber burning, the belt tension must be checked as detailed below in step 7. Check the belt for any signs of wear. Ensure that the sheaves and idler are properly aligned as detailed below.

If this belt needs replacing, proceed as follows:

1. Disconnect the PTO from the tractor.
2. Remove all the hoses from their holders.
3. Remove the rear guard and lower rear guard.
4. Remove the idler tightener, nuts, and spring.
5. Remove the rotor drive belt and replace with a new drive belt (see Figure 5.6). Ensure the belt is fully seated in both pulleys.

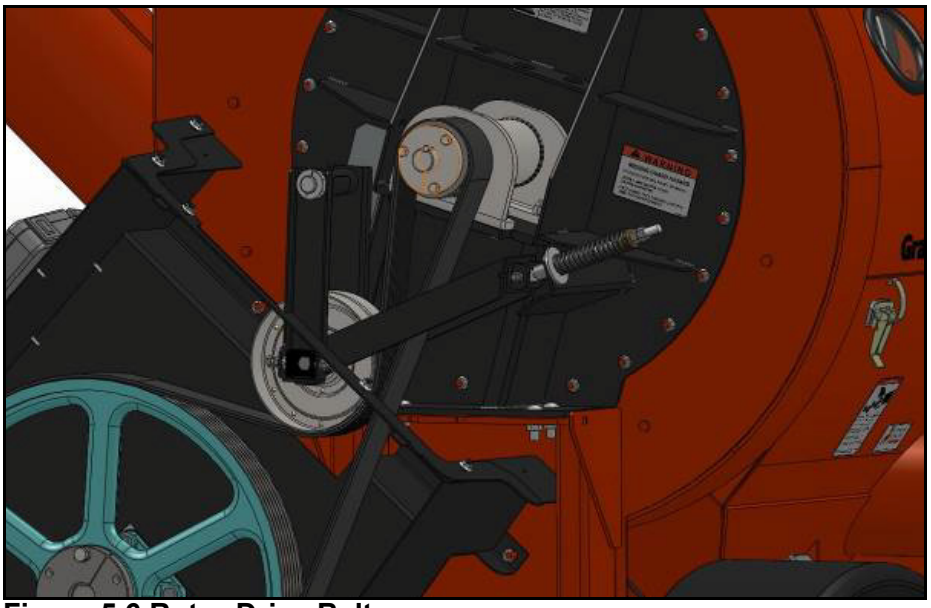


Figure 5.6 Rotor Drive Belt

6. Reinstall idler tightener, spring, and nuts.
7. Tighten the idler arm so the length of the spring is 3-7/8” (98 mm) from spring end to spring end (see Figure 5.7).

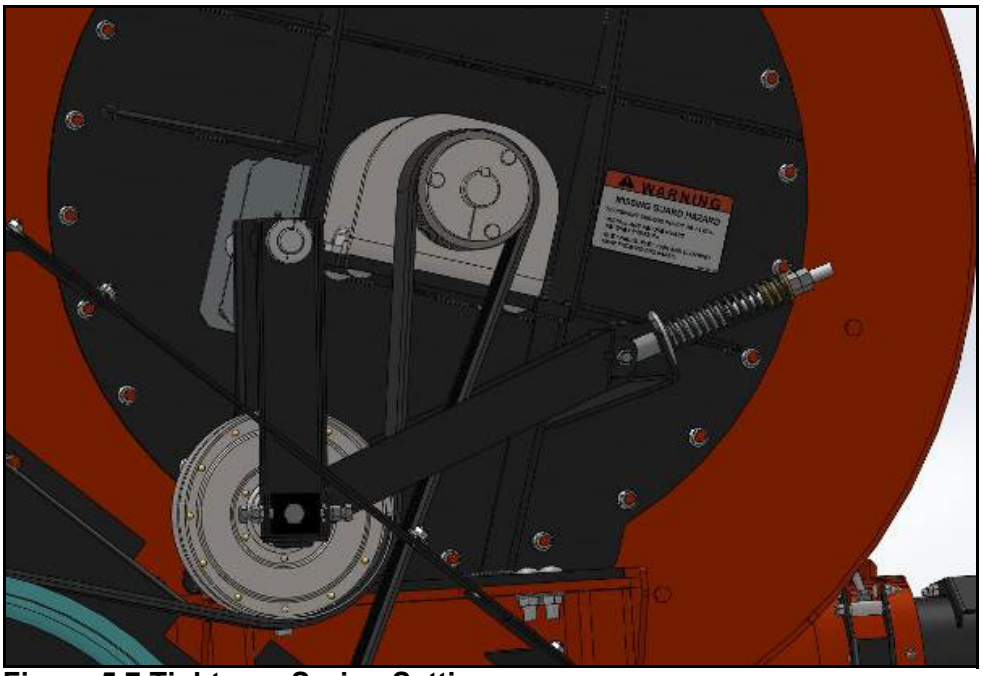


Figure 5.7 Tightener Spring Setting

8. Check for pulley alignment by laying a straight edge along the sides of the pulleys. A pulley face that is out more than 1/16” (1.6 mm) should be realigned. Ensure the idler is also aligned properly (see Section 5.4.5. Rotor Drive Belt Idler Pulley – Alignment on page 54).
9. Replace the rear guard and lower rear guard.

5.4.5. Rotor Drive Belt Idler Pulley – Alignment

1. Check the rotor drive belt idler pulley alignment by looking from the inlet side of the GrainVac (see Figure 5.8). Rotate the assembly by hand turning clockwise looking from the rear. Check to see if the belt runs straight as it passes over the idler or if it is pulled to either side. The edge of the belt, *where it passes over the idler pulley*, should be straight and parallel to the edge of the belt on the tight side of the belt.

Note: For best belt longevity, the belt should be placed on the idler pulley as close as possible to the center.

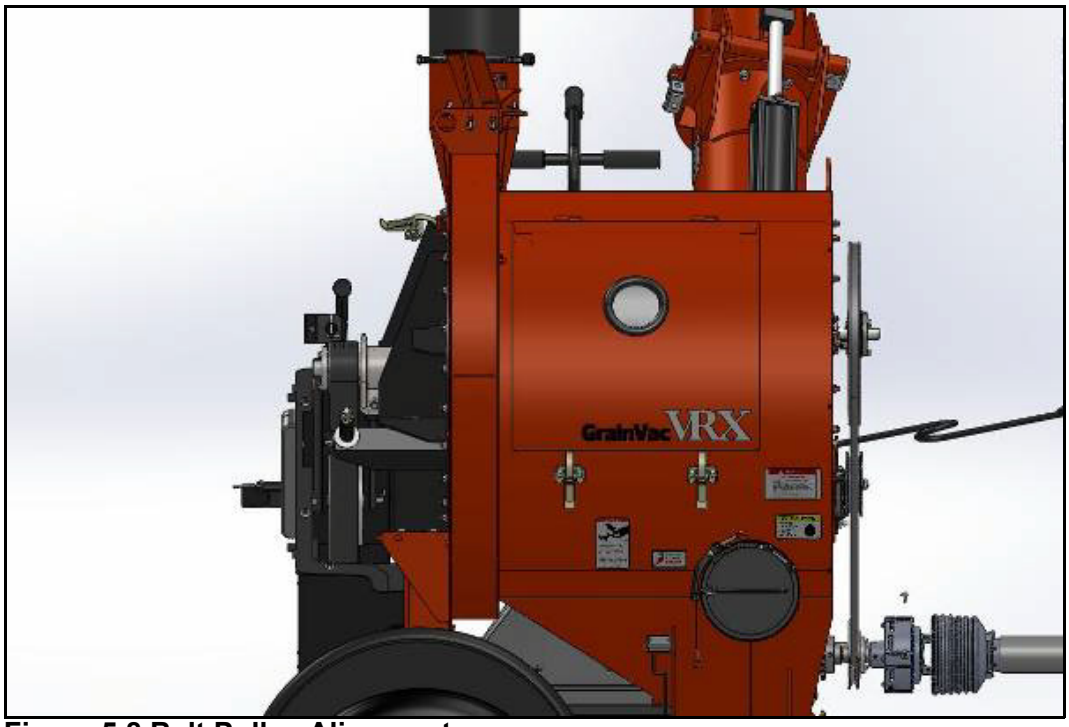


Figure 5.8 Belt Pulley Alignment

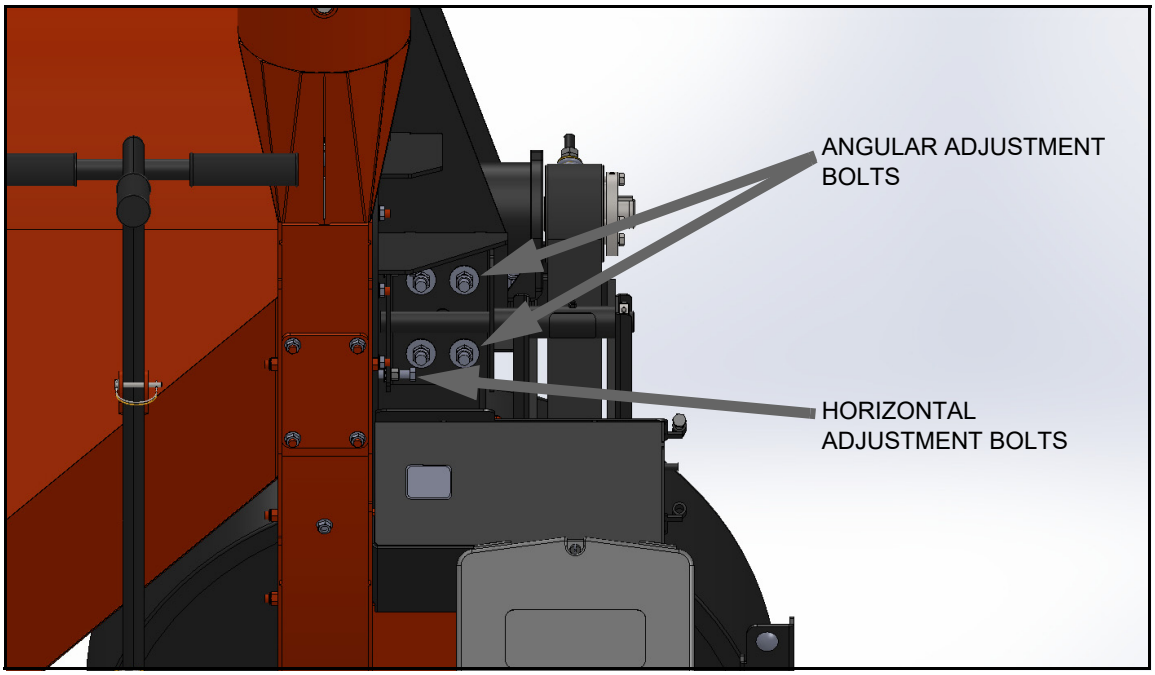


Figure 5.9 Angular Adjustment Bolts

2. If the belt is misaligned, first make the coarse or angular adjustment (see Figure 5.9). This is achieved by slightly loosening the 4 x 1/2” angular adjustment bolts that secure the shaft mount to the pedestal, and then by adjusting the two horizontal adjustment bolts to rotate the shaft mount. These bolts must be adjusted equally (in other words,1 turn in on the top bolt requires 1 turn out on the bottom bolt to maintain proper position of the idler). The pulley should be adjusted to be parallel to the belt edge on the tight side of the belt. Then retighten the 4 x 1/2” bolts.
   - If the belt remains misaligned in the same direction, then complete the fine pulley plane adjustment described in Step 3.
3. Fine (or pulley plane) adjustment of the idler pulley is achieved by first loosening the 1/2” idler axle bolt (see Figure 5.10). Next loosen the 2 x 3/8” jam nuts on the outside of the box-shaped idler arm, and then using the 3/8” pulley plane adjustment bolts against the pusher block, to adjust the pulley in the desired direction.
4. Following alignment, retighten all fasteners, and rotate the assembly in the normal direction of travel to ensure the belt, where it passes over the idler pulley, is not visible to either side of the belt on the tight side.

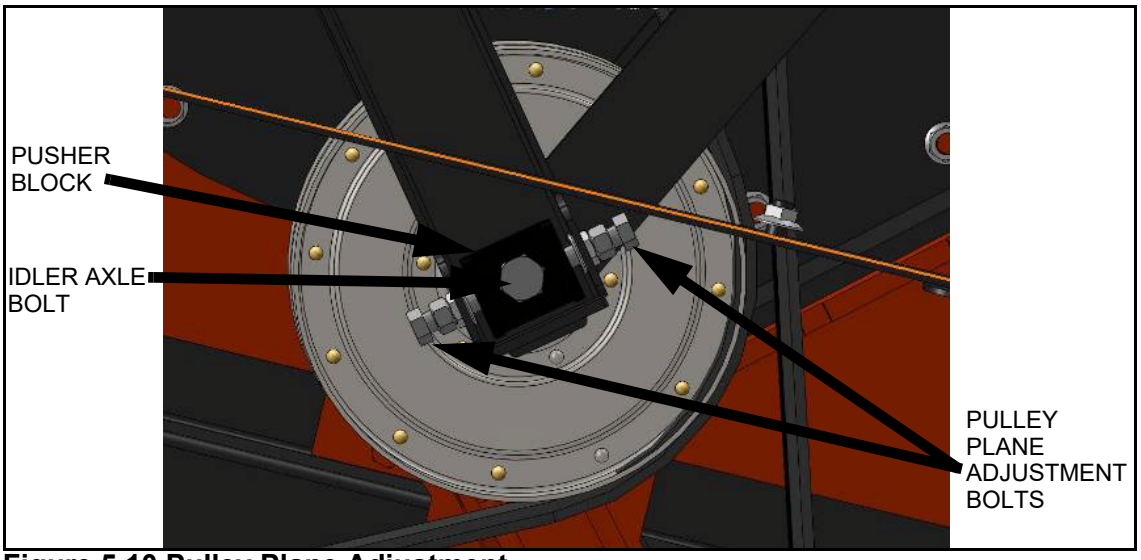


Figure 5.10 Pulley Plane Adjustment

5.4.6. Auger Drive Chain – Adjustment / Replacement

The proper chain tension is important to reduce premature wear of the auger drive chain itself and the sprockets that it runs over. It is more cost-effective to maintain/replace the chain and avoid having to replace the sprocket.

To properly tension auger drive chain (see Figure 5.11), proceed as follows:

1. Open the chain guard.
2. Loosen the bolt securing the chain idler sprocket enough to allow it to slide into the adjustment slot.

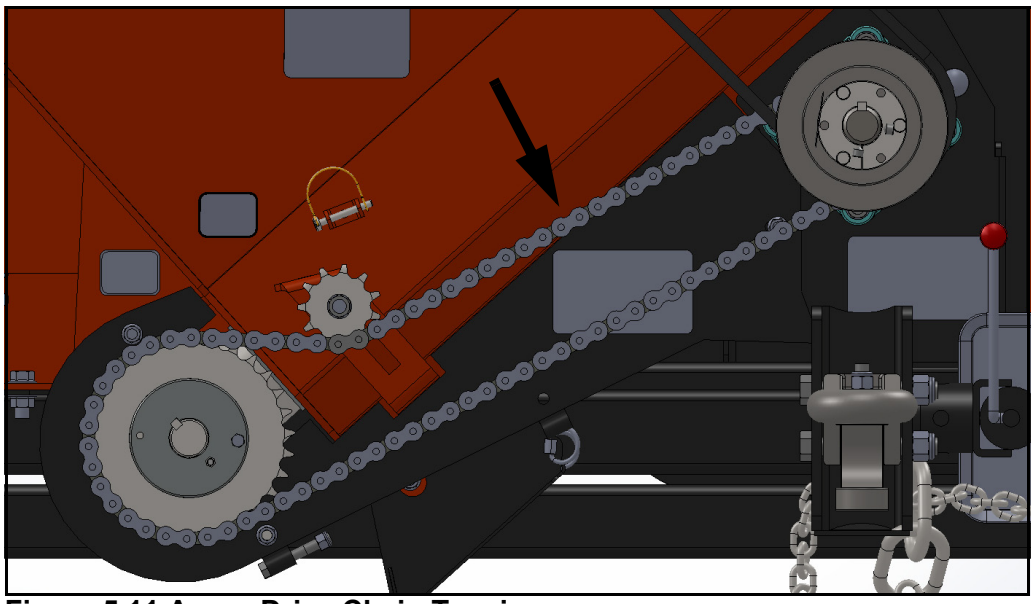


Figure 5.11 Auger Drive Chain Tension

3. Apply pressure down on the idler against the chain until there is approximately 3/4” (19 mm) deflection of the chain in the middle of the span between the idler and the top driving sprocket (as shown by arrow in Figure 5.11).
4. Tighten the idler adjustment bolt.
5. Recheck the deflection of the auger drive chain.
6. Close and latch the chain guard.

The auger drive chain may need to be replaced if the chain is stretched or worn excessively and can no longer be tensioned properly.

To replace the auger drive chain, proceed as follows:

a. Open the lower chain guard.

b. Remove the chain connector link and remove the auger drive chain from the sprockets.

c. Before installing a new chain, use a straight edge to ensure that all sprockets are properly aligned; adjust as necessary.

d. Install the new chain (95 chain links) over the sprockets; join with a new connector link.

e. Set the chain tension as described above.

f. Close and latch lower chain guard.

g. Check and adjust chain for proper deflection after 10 hours of operation or daily thereafter.

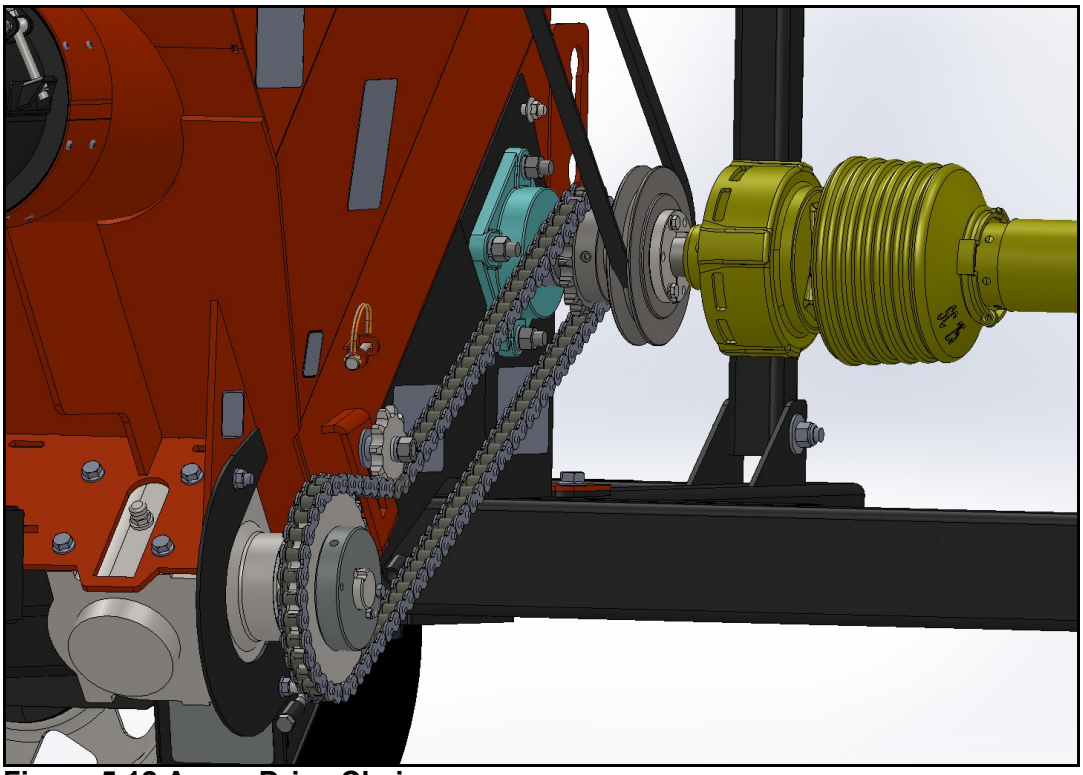


Figure 5.12 Auger Drive Chain

5.4.7. End Dump Double Doors – Seal, Tension, & Lubrication

The end dump double doors are located on the top of the auger (see Figure 5.13).

Seal: The doors must be inspected regularly to ensure that they seat properly and that no foreign material is hanging up in them. The doors seal (airlock) the system and ensure that air enters only through the intake port. Be sure the doors fully close when the machine is not running. Replace the end dump plate if it is bent or damaged in any way.

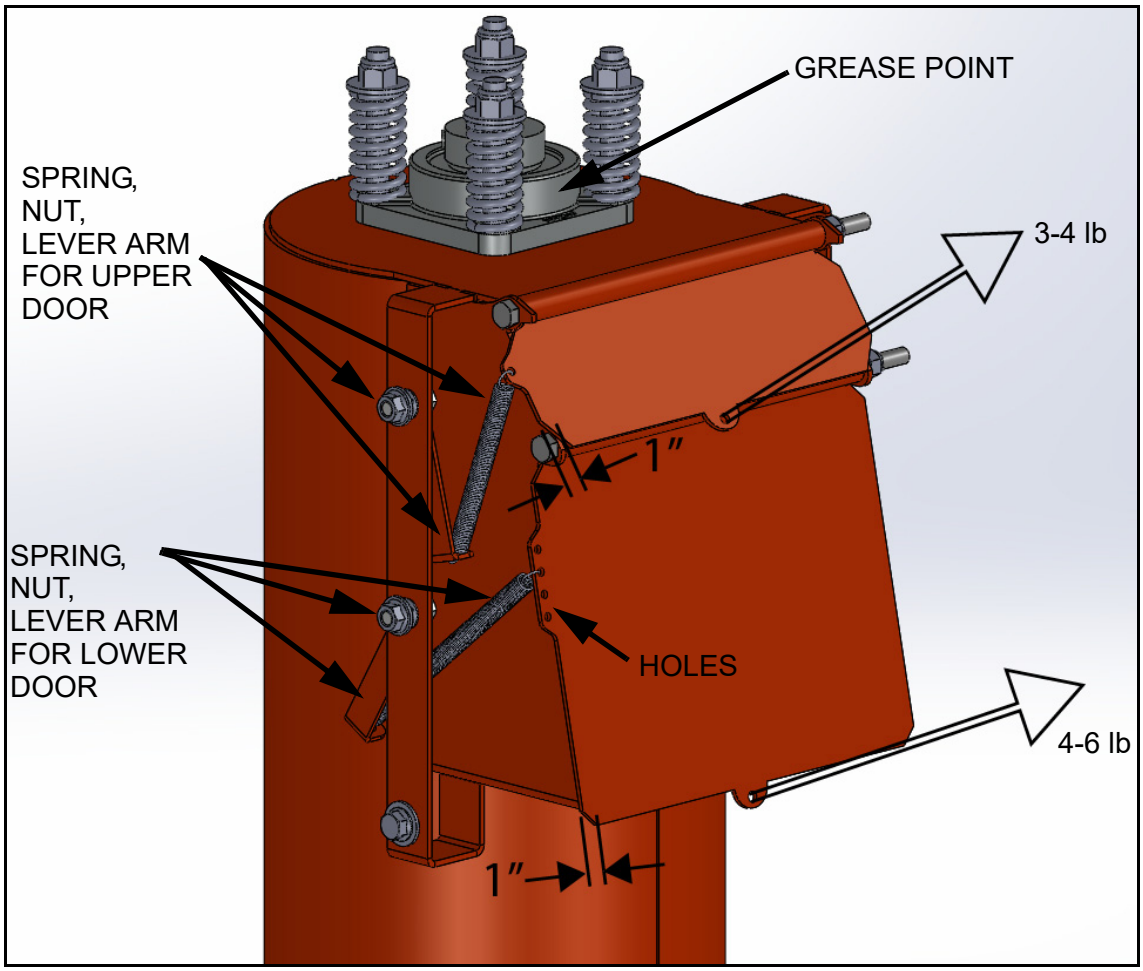


Figure 5.13 End Dump Double Doors Tension Reading

Tension: The dump doors must be set with the proper spring tension to minimize air loss and thus maximize the performance of the GrainVac. To ensure the proper tension:

1. Using a fish scale, attach the scale to the hole and at the center of each door and pull upward at a right angle. Pull just enough to open the door 1” (24 mm) and take a reading.
2. The scale needs to read 3-4 lb (1.4-1.8 kg) for the upper door and 4-6 lb (1.8-2.7 kg) for the lower door. If you need to increase spring tension, loosen the nut, rotate the lever arm, and retighten the nut. Also to adjust the lower door tension, different spring holes can be used.

Lubrication: To lubricate the bolts of the end dump double doors:

a. Remove the bolts.

b. Lubricate the bolts.

c. Reinstall the bolts.

5.4.8. Rotor Drive Belt Idler Arm Pivot Tube – Lubrication

Lubricate the idler arm pivot tube at grease zerk shown in Figure 5.14.

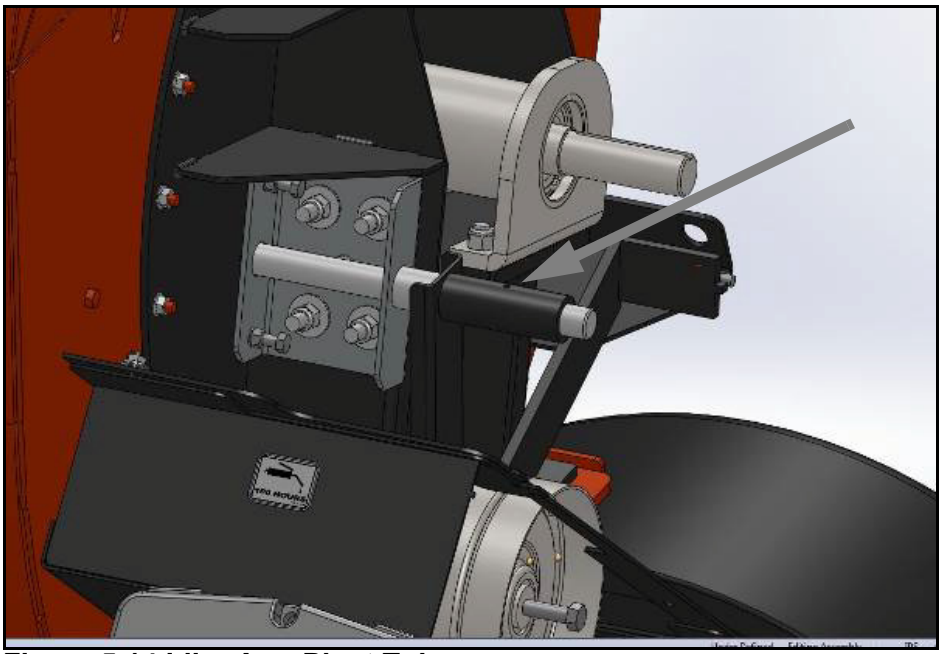


Figure 5.14 Idler Arm Pivot Tube

5.4.9. Rotor & Wear Wrap – Inspection

Check the rotor for missing/damaged rivets or balance weights. Inspection of the rotor and wear wrap for wear is especially important when highly abrasive materials are moved with the GrainVac.

1. Disconnect the PTO from the tractor.
2. Unclamp and remove the exhaust tube.

⚠ CAUTION The machine generates heat through the action of the rotor. This heat is carried out of the machine in the exhaust air. Do not touch or service until after operation when rotor and exhaust surfaces have been allowed to cool. Failure to follow these instructions may result in burns.

3. Pin the air throttle open.
4. Remove the nuts holding the inspection window plate (see Figure 5.15).

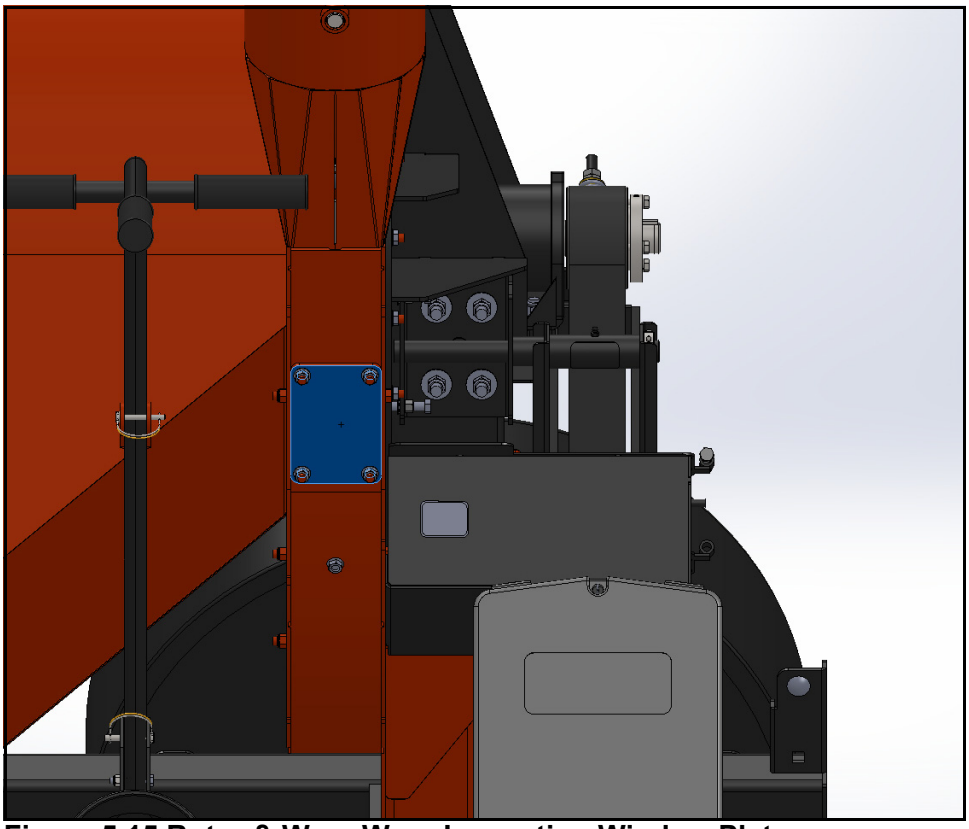


Figure 5.15 Rotor & Wear Wrap Inspection Window Plate

5. To inspect the wear wrap, reach inside the inspection window and feel the top side of the wear wrap as it curves around the rotor. Once grooves have worn through the wrap, it must be replaced.
6. For preliminary visual inspection of the rotor, insert a trouble light into the blower outlet. If there is a cut line worn through the end of the blades against the back plate, this rotor must be replaced.

5.4.10. Rotor Drive Bearing Cartridge – Checking

The condition of the rotor drive bearings should be checked by:

1. Remove the drive belt and rotate the pulley by hand. If a bearing develops a rough spot or is difficult to rotate, replace the complete bearing cartridge (see Section 6.5. on page 82). The bearings in the cartridge are not replaceable.

⚠ CAUTION The machine generates heat through the action of the rotors. This heat is carried out of the machine in the exhaust air. Do not touch or service until after operation when rotor and exhaust surfaces have been allowed to cool. Failure to follow these instructions may result in burns.

2. When a noise is heard in the rotor itself, it probably means the bearing cartridge needs replacement. Do not run the machine in this condition, as it will affect the mechanical integrity of the rotor.

NOTICE Never modify the rotor in any way. It is computer-balanced to operate at this high speed and modifications could adversely affect it. Any damaged rotor should be replaced immediately by your dealer.

NOTICE Do not operate GrainVac in excess of 1000 rpm. Failure to follow these instructions may result in machine component damage or failure.

5.4.11. Main Drive Shaft Bearings – Lubrication

1. Lubricate the front bearing on the main drive shaft (see Figure 5.16).

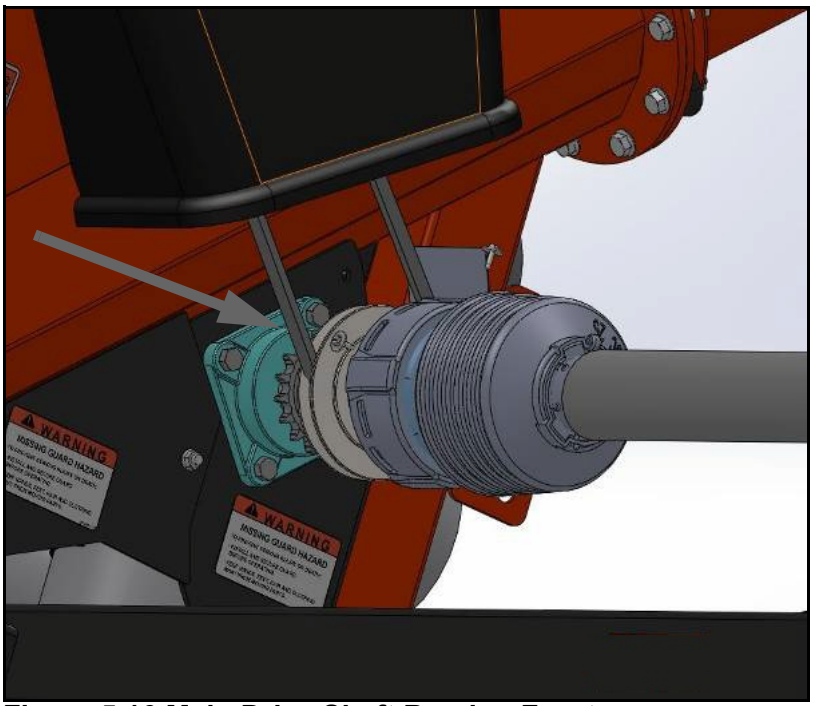


Figure 5.16 Main Drive Shaft Bearing Front

2. Lubricate the rear bearing on the main drive shaft (see Figure 5.17).

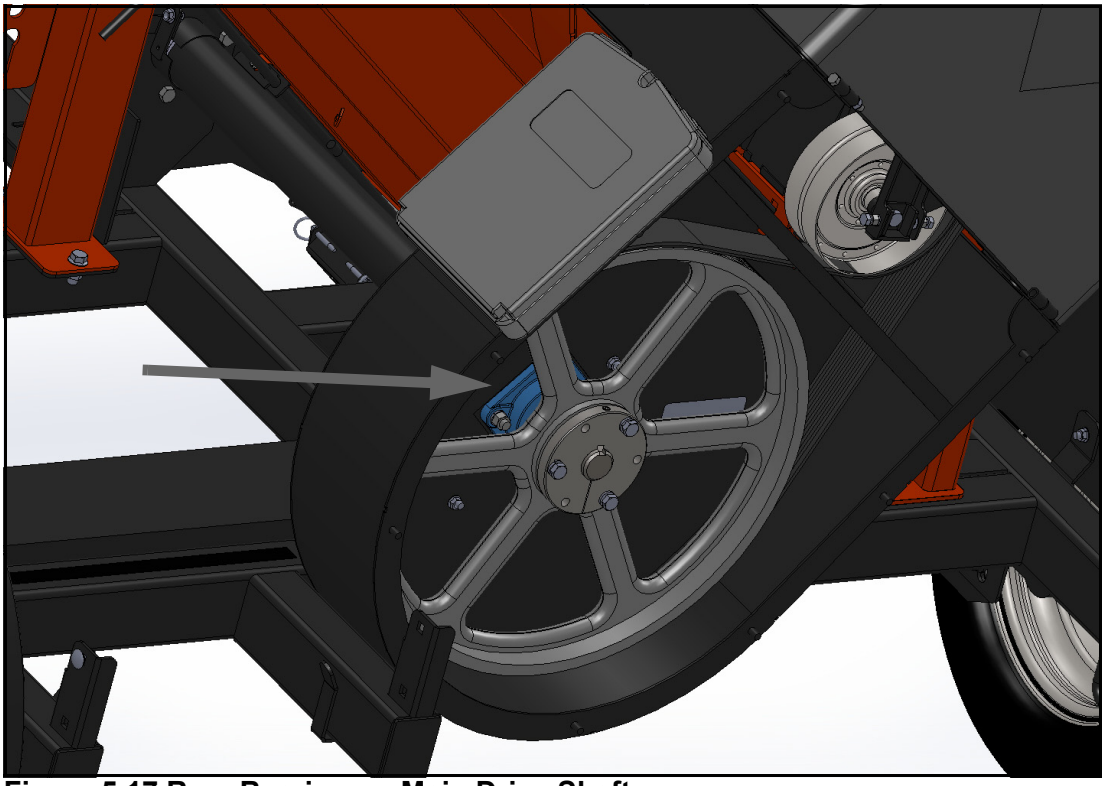


Figure 5.17 Rear Bearing on Main Drive Shaft

5.4.12. Shear Sprocket - Inspection, Cleaning, Lubrication

1. Inspect the sprocket. If teeth show signs of wear or hooking, the sprocket assembly should be replaced.
2. Clean and lubricate the shear sprocket using the grease zerk on the face of the shear hub (see Figure 5.18).

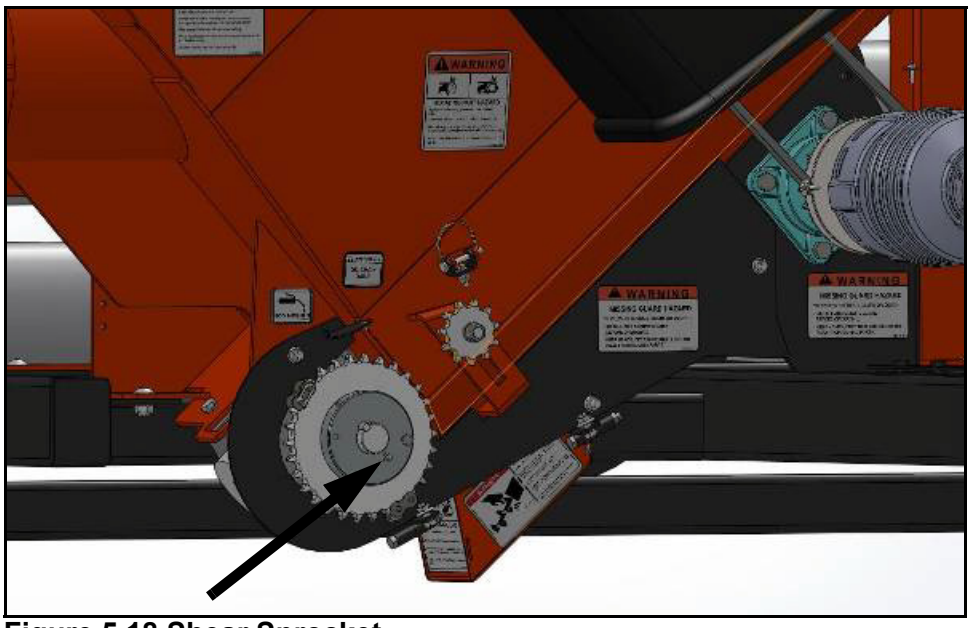


Figure 5.18 Shear Sprocket

5.4.13. Gearbox – Maintenance Instructions

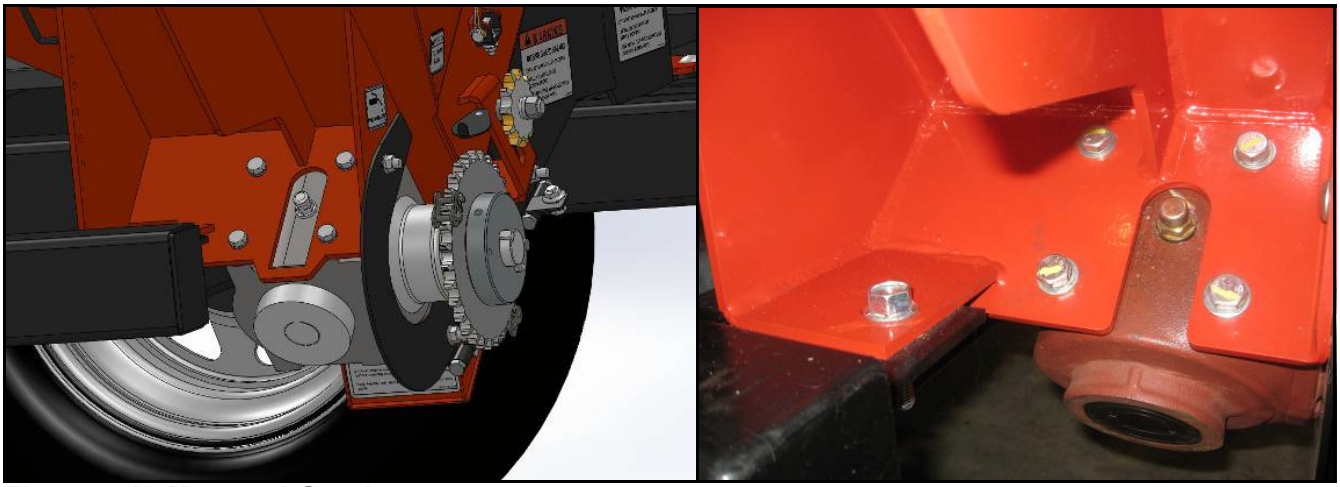


Figure 5.19 Mounted Gearbox

To perform maintenance on the gearbox, it may be necessary to remove the gearbox completely. The gearbox brand mounted on your GrainVac may be Walterscheid (red color) or Star (black color) (see Figure 5.20).

Gearbox Removal

1. Open the chain guard and remove the drive chain (see Figure 5.19).
2. Support the gearbox and remove the gearbox bolts.

⚠ WARNING The gearbox is heavy and should be supported before removing bolts. If the gearbox is not fully supported, the gearbox may fall and cause personal injury.

3. Once all the bolts are removed, the gearbox and gearbox seal are free to be lowered out of the GrainVac body.

Checking Oil Level

The oil level in the gearbox must be maintained at the recommended level to ensure efficient operation. Too much oil causes heating from the oil churning. Too little oil causes heating from lack of lubrication.

To check the oil level:

1. Remove the plug on the side of the gearbox nearest the front of the GrainVac (see Figure 5.20).

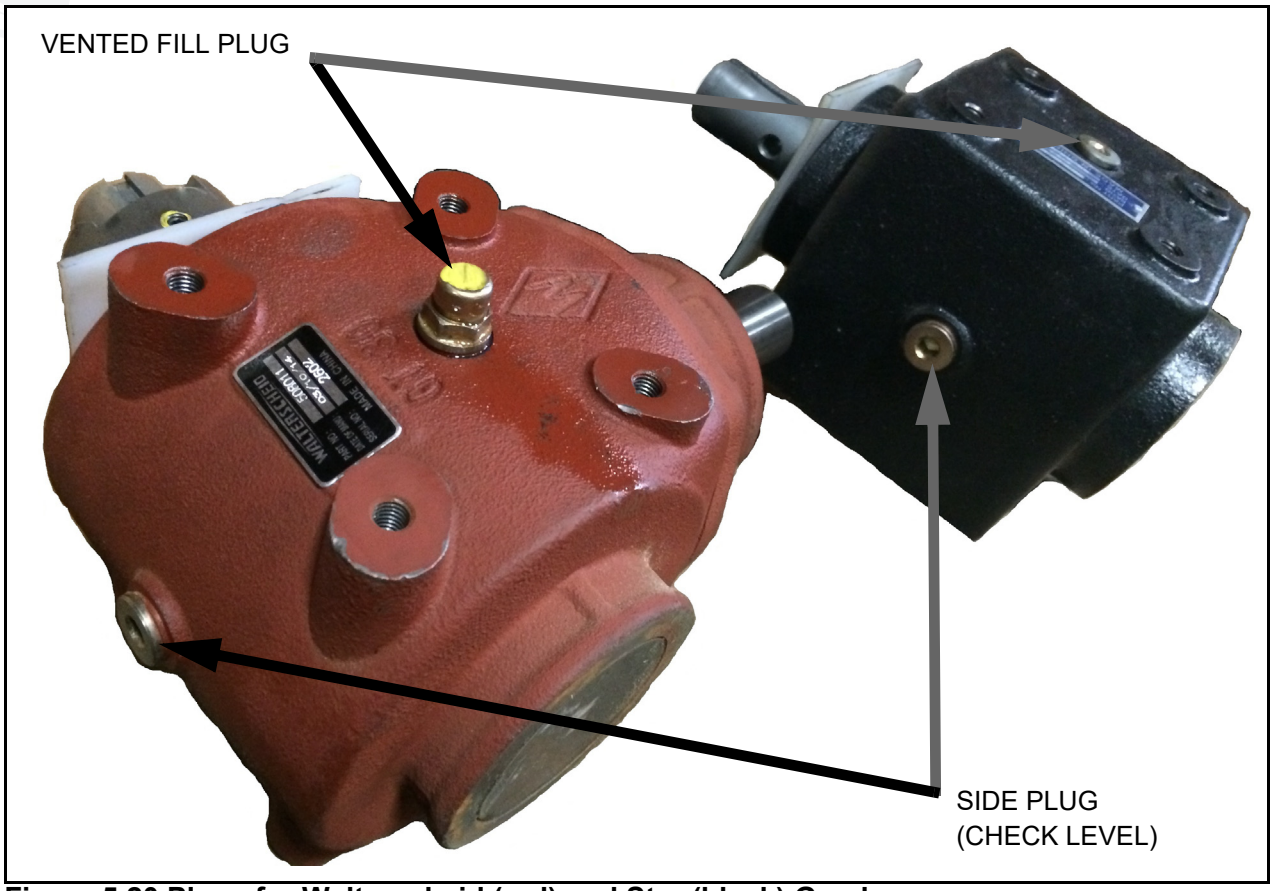


Figure 5.20 Plugs for Walterscheid (red) and Star (black) Gearboxes

2. The oil level should be high enough to allow the oil to come up to the lower edge of the front side hole when mounted at 45° angle. If required, add oil by removing the vented fill plug on the top of the gearbox and pouring oil into that hole.
3. Replace the plug(s).

Cleaning Reservoir Breather

The vented fill plug on top of the gearbox contains the breather for the reservoir (see Figure 5.20).

Important: This breather must function properly to prevent a pressure build-up that will cause the seals to leak. The breather should be cleaned annually and more frequently in very dusty, dirty operating conditions.

To clean the breather:

1. Remove the vented fill plug.
2. Soak the plug in good solvent for 1 hour.
3. Blow out the breather passage of the plug with compressed air to remove any dirt accumulation to ensure that it is open.
4. Reinstall and tighten the plug.

Inspecting Components

Before reinstalling the gearbox, inspect the plastic gearbox seal and drive dog for damage. Replace, if damaged.

Changing Oil

Flush and replace using SAE 80W90 gear oil in the reservoir for all working conditions. Gearbox oil capacity is 25.5 oz (0.75 L).

Gearbox Reinstallation

1. Lift the gearbox and insert the drive dog end into the bottom of the GrainVac body. While holding the gearbox, reinstall the metric bolts (M10 x 30 mm).
2. Use a pry bar to guide the gearbox up into the bottom of the GrainVac body until the plastic gearbox seal is tight. While holding the pry bar, tighten the gearbox bolts.
3. Reinstall the drive chain and reset the chain idler tightener.
4. Reinstall the chain guard.

5.4.14. Rotor Bearing Cartridge Oil Bath – Checking Oil Level

Important: *The oil level in the rotor bearing cartridge must be checked every 40 hours and maintained at the recommended level to ensure efficient operation.*

1. Place the GrainVac on a flat, even surface that will help ensure that the machine is as level as possible.
2. Remove the hoses from the hose racks.
3. Remove the rear upper guard to gain access to the bearing cartridge.
4. Remove the oil level check plug on the side of the bearing cartridge.

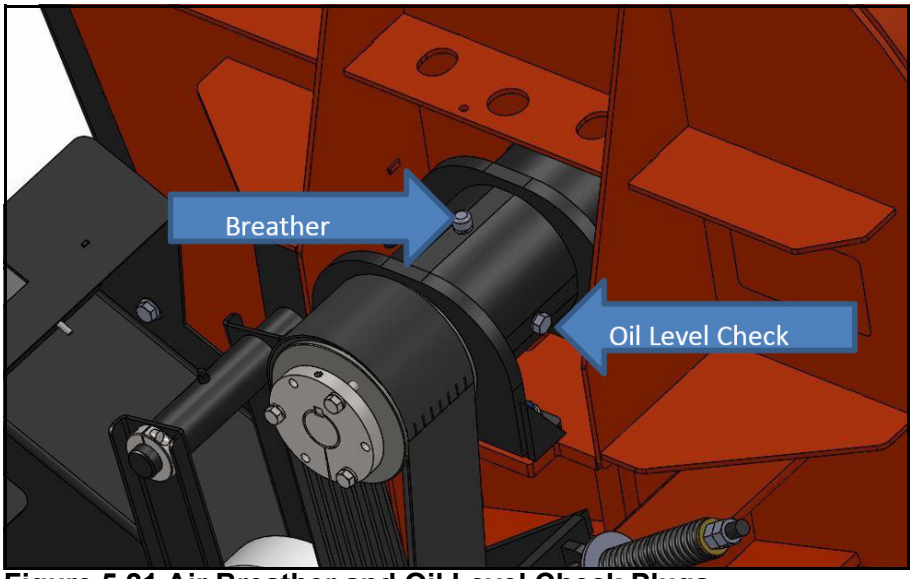


Figure 5.21 Air Breather and Oil Level Check Plugs

5. The oil level should come up to the lower edge of the check plug hole, which is the correct level while the bearing cartridge is at its installed angle (see Figure 5.22). If necessary, add oil through the breather plug hole (use SAE 75W90 synthetic gear oil) until the correct oil level is reached.

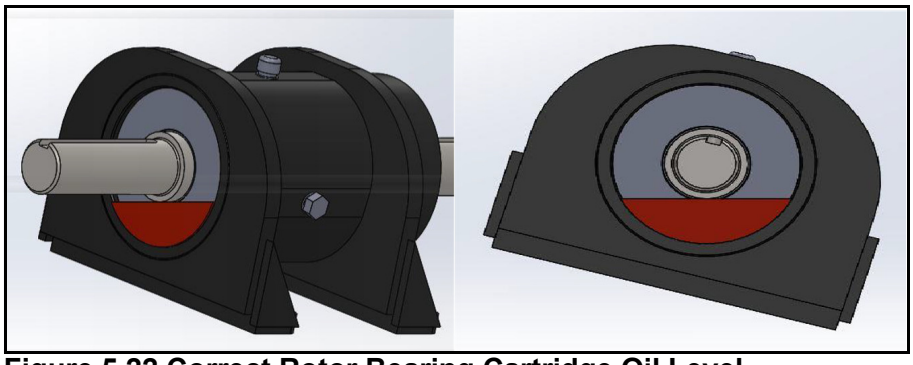


Figure 5.22 Correct Rotor Bearing Cartridge Oil Level

6. Re-install the air breather and oil level check plugs.

5.4.15. Rotor Bearing Cartridge Air Breather – Inspect and Clean

Important: *In clean conditions, the air breather plug should be cleaned every 100 hours of operation, or annually at a minimum. In dusty, dirty operating conditions, the plug must be checked and cleaned as often as it is necessary to keep the plug clean and open.*

1. Remove the air breather plug (see Figure 5.21).
2. Wash the plug with solvent.
3. Blow compressed air through the air breather plug passage to ensure that it is open.
4. Reinstall and tighten the air breather plug.

5.4.16. Rotor Bearing Cartridge Oil Bath – Replacing Oil

Note: *Rotor bearing cartridge oil must be changed every 100 hours (or annually), and requires approximately 2-5 fl oz (0.05 - 0.15 L) of SAE 75W90 synthetic gear oil.*

1. Place the VRX on a flat, even surface that will help ensure that the unit is as level as possible.
2. Remove the hoses from the hose racks.
3. Remove the rear upper guard to gain access to the bearing cartridge.
4. Remove the oil level check plug on the side and the breather plug from the top of the bearing cartridge (see Figure 5.21).
5. If equipped with a drain plug, pull the plug and allow the oil to drain from the bearing cartridge. If not equipped with a drain plug, use a plastic syringe and hose inserted into the breather plug hole to suction the oil out of the bearing cartridge.
6. Inspect the air breather plug, and clean if necessary (Section 5.4.2. PTO – Lubrication & Cleaning on page 50).
7. Slowly fill the bearing cartridge with SAE 75W90 synthetic gear oil. Stop filling when oil begins to flow out of the oil level check plug hole.
8. Re-install the oil level check plug and the air breather plug.

6. Service

Before continuing, ensure you have completely read and understood this manual's Safety chapter, in addition to the safety information in the section(s) below.

6.1. Maintenance Safety

⚠ WARNING

- Keep components in good condition. Follow the maintenance procedures.
- Ensure the service area is clean, dry, and has sufficient lighting.
- Do not modify any components without authorization from the manufacturer. Modification can be dangerous and result in serious injuries.
- After maintenance is complete, replace all guards, service doors, and/or covers.
- Shut down and lock out power before maintaining.
- Use only genuine AGI replacement parts or equivalent. Use of unauthorized parts will void warranty. If in doubt, contact the manufacturer or your local dealer.
- Shut down and lock out all power before maintaining or adjusting the equipment.
- Support the GrainVac with blocks or safety stands when changing tires or working beneath the GrainVac.
- Before attempting any maintenance, chock wheels.
- Make sure you have sufficient lighting for the work area.
- Do not take chances with safety. The components are large, heavy, and can be hard to handle. Always use the proper tools, stands, jacks, hoists, slings, spreaders, and lifting points for the job.
- Before applying pressure to a hydraulic system, make sure all components are tight and that hoses and couplings are in good condition.

Important: In the figures in this Maintenance chapter, the guards are often removed for illustrative purposes only. Replace the guards before operating the GrainVac.

6.2. Flighting Removal/Replacement

1. To remove and replace the lower and middle flighting, follow these steps:
   a. Remove the two bolts on the bearing support.
   b. Remove the flighting.
   c. To replace, slide the flighting back into the auger tube. Verify this by opening the side inspection door and verifying the drive dogs are fully engaged at the gearbox. Rotate the flighting until the gearbox drive dogs engage. Note: Middle flighting does not require drive dog alignment.
   d. Install the two bolts onto the bearing support.
2. To remove and replace the upper flighting section, follow these steps:
   a. Remove the snap ring on the end of the flighting.
   b. Loosen the lock collar on the bearing.
   c. Remove the flighting.
   d. To replace, slide the flighting all the way into the bearing and lock collar, install the snap ring, and pull the flighting down.
   e. Raise the auger to working position (fully raised).

⚠ DANGER Stay away from auger tubes when opening/closing (due to pinch points). Keep others away. Failure to do so may result in serious injury or death.

   f. Engage the GrainVac to activate the augers. Run for 1 minute at low engine idle.
   g. Lock out the power unit and inspect the top bearing. If the top bearing is not sealing to the end of the dumper, note the distance between them (example: 1/8” (3 mm)).
   h. Tighten the lock collar on the bearing.
   i. Lower the auger so that it fully rests on the auger transport rest. Lock out the power unit.
   j. On the upper auger, loosen the lock collar on the dumper bearing and slide the upper flighting up the distance that you noted with the augers in working position (fully raised).
   k. Tighten the lock collar on the bearing.
   l. Repeat step e. through step k. until the dumper bearing is seated fully against the end of the dumper.
   m. Ensure end dump bearing springs are adjusted to the dimension in Figure 6.1.

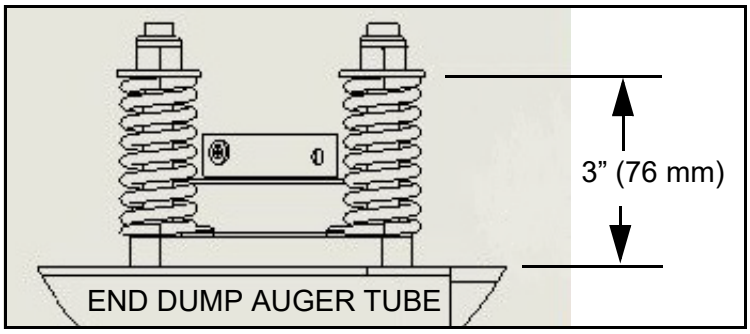


Figure 6.1 End Dump Bearing Spring Dimension

6.3. End Dump Liner Replacement

Preparing to replace an end dump liner:

1. Place the auger in transport position.
2. Shut down power to the GrainVac, detach the PTO from the tractor, and make sure the GrainVac is on flat ground with the wheels chocked.

⚠ DANGER Failure to disconnect the PTO could lead to accidental powering of the GrainVac auger, which may result in serious injury or death.

3. Measure how much of the upper auger shaft is sticking through the bearing. You will need this measurement to reset the flyting after the end dump liner is replaced.
4. Loosen the end dump (1) top bearing set screw and remove the snap ring from the end of the upper flyting shaft.
5. From the inlet side of the GrainVac, remove the flyting from the upper auger tube and set it aside on the ground.

⚠ CAUTION Use a minimum of two people to move the flyting, as it weighs close to 90lbs.

6. Support the end dump to prevent an uncontrolled drop, and remove the five bolts that hold the end dump to the upper auger tube.

⚠ CAUTION Be careful with the end dump after the five bolts are removed, as it weighs close to 60lbs.

To replace an existing end dump liner:

1. Remove the four screws (4) from the back of the end dump body.
2. Use a pry bar to separate the liner flange from the end dump, and remove the worn liner from the body of the end dump.
3. Inspect the interior of the end dump body for wear, looking for worn-through or weak spots. If significant wear is found, you may need to replace the end-dump body as well. Please contact your local distributor if this is the case.
4. Place the new liner (5) into the end dump body (1). You may need to place the liner in a pail of hot water for a few minutes until it is pliable enough to be rolled into a circle.
5. Fasten the liner in place using the existing four screws (4) through the back of the end dump body.
6. Replace the liner flange (2) on the bottom of the end dump to hold it in place.

To install (or replace) the end dump:

1. Position the end dump on the upper auger tube and fasten it in place with the five bolts (3) tightened to 33 ft-lbs.
2. Insert the upper flyting into the upper auger tube, sliding the upper shaft through the bearing on the end dump.
3. Install the snap ring to hold the flyting in the tube.
4. Move the flyting until the distance the shaft sticks through the bearing matches your previously-taken measurement.
5. Tighten the upper bearing locking collar set screw.
6. Raise the auger tube into working position, and lock out hydraulic power.
7. Use a safely positioned ladder to access the top of the end dump.

8. Loosen the upper bearing locking collar set screw, and check that the flyting is fully engaged and down as far as it will go.
9. Turn the locking collar in the direction of flyting rotation, lock it into place with a hammer and punch, then tighten the set screw to 104 in-lbs.

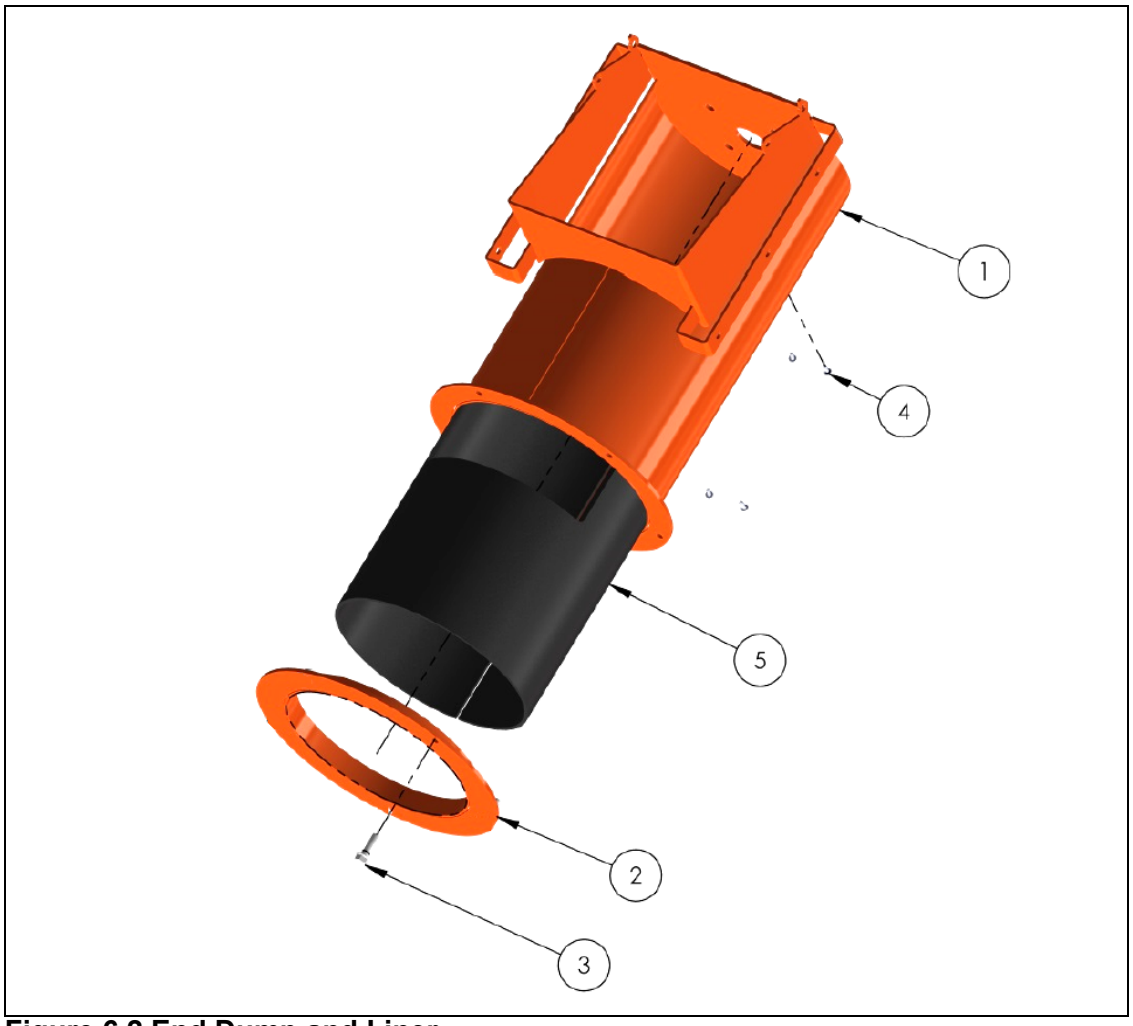


Figure 6.2 End Dump and Liner

6.4. Resetting the Auger Flytings

Perform this procedure each time a drive dog, flyting or auger tube is changed.

Tools Required:

- Putty
- Rubber mallet
- Magnetic angle finder
- Snap ring pliers
- Punch
- Ball-peen hammer
- 2 x 3/4" wrenches, 3/16" Allen wrench

Safety PPE Required:

- Safety glasses
- Gloves
- Steel toed boots
- Hearing protection

⚠ CAUTION This procedure requires occasional use of hydraulic power. Always remove and lock-out hydraulic power when it is not actively in use.

1. Ensure that the GrainVac is on flat ground with the wheels chocked and the auger in transport position.
2. Ensure that the PTO is detached from the tractor.

⚠ DANGER Failure to disconnect the PTO could lead to accidental powering of the GrainVac auger, which may result in serious injury or death.

3. Ensure that the lower flyting gearbox shaft key is flush with the face of the lower drive dog, and that the 3/8" bolt and set screw are fully tight.

Figure 6.3 Key Position, 3/8” Bolt and Set Screw

4. Rotate the lower flyting by hand to ensure that there are no obstructions, and that it meshes with the gearbox drive dog properly.

5. Put a small piece of putty on the face of the lower flyting drive dog.

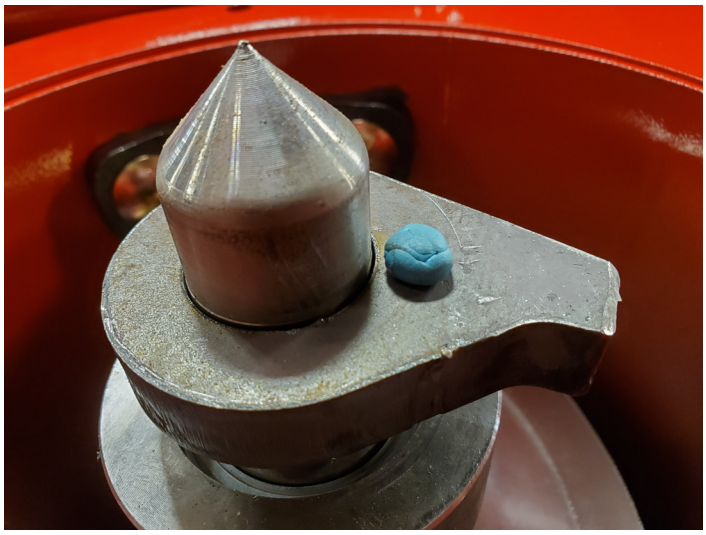


Figure 6.4 Place Putty on Drive Dog

6. Use the hydraulics to bring the middle tube to working position.

DANGER Stay away from auger tubes when opening/closing (due to pinch points). Keep others away. Failure to do so may result in serious injury or death.

Figure 6.5 Middle Tube in Working Position

7. Attach the magnetic digital angle finder to the underside of the lower auger tube, just below the top flange, and note the reading.

Figure 6.6 Attach Magnetic Digital Angle Finder

8. Move the angle finder across the flange to the bottom of the middle tube, just above the flange, and note the reading.

Figure 6.7 Take Middle Tube Angle Reading

9. Adjust the spacer bolts on the middle auger tube flange until the lower and middle tubes are at the same angle, within 0.5°.
10. Tighten the spacer bolt nuts to lock their position.
11. Check to ensure that the rubber gasket has a full seal around the flange, and verify that the angle remains set within 0.5°.

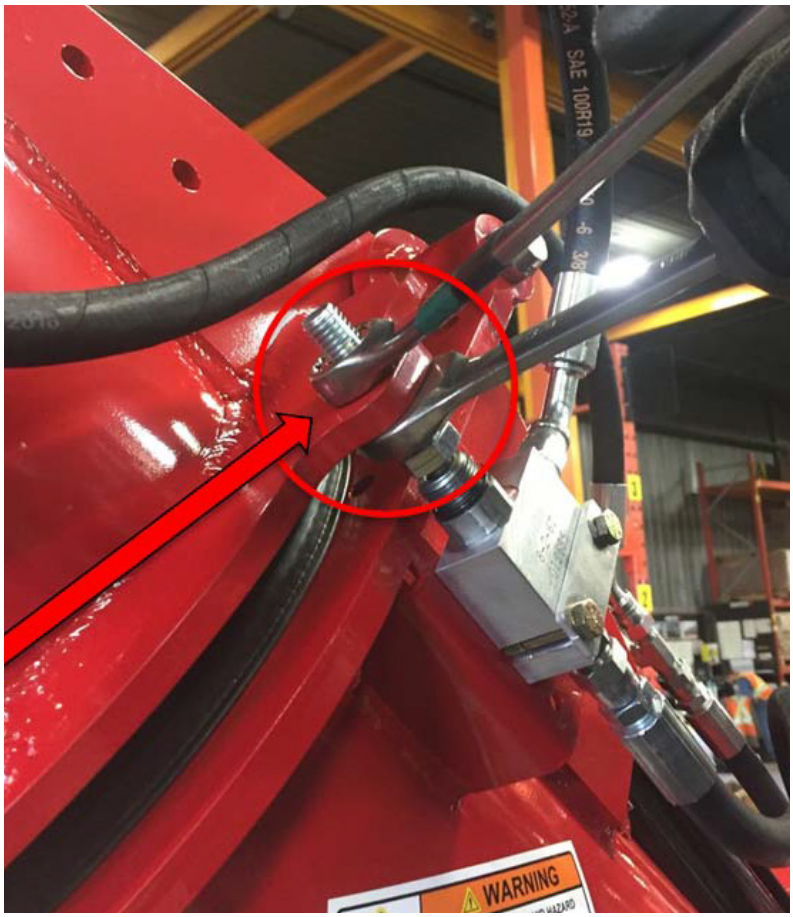


Figure 6.8 Adjust the Spacer Bolts

12. Adjust the plunge valve bolt.
    a. Adjust the bolt far enough to press the valve button down, but not to a full stop.
    b. Tighten the double nut.
    c. Rotate the flyting by hand to ensure the drive dogs engage and fall into position. The auger flyting should rotate freely with no obstructions.

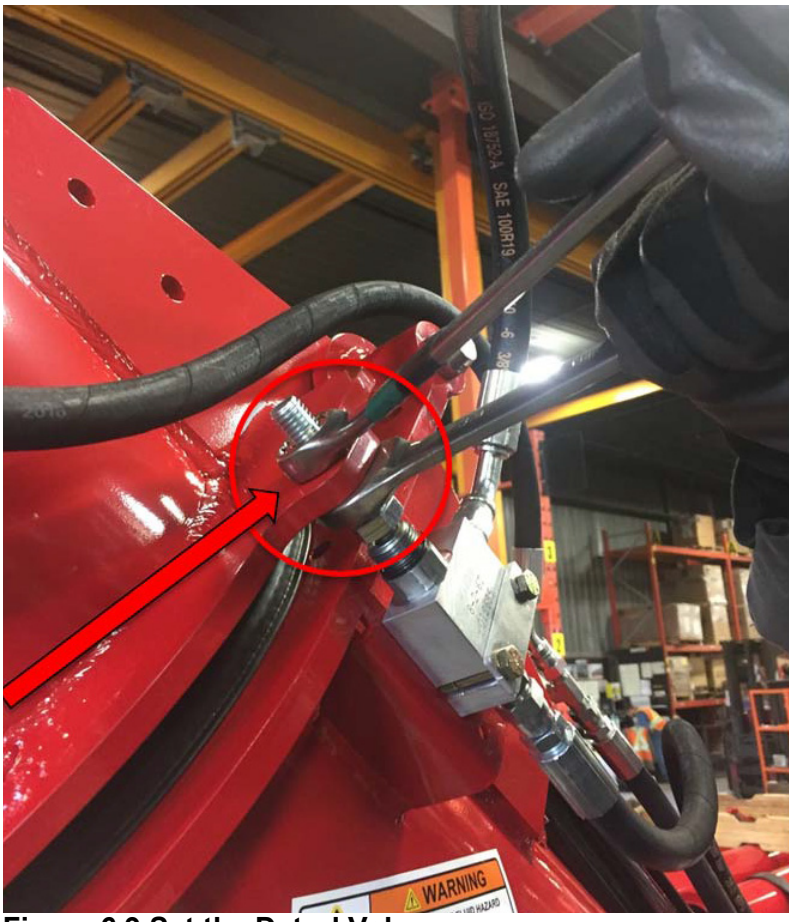


Figure 6.9 Set the Detrol Valve

13. For the upper tube, follow the same process that was used for the lower and middle tubes, ensuring that the upper tube is at the same angle as the lower tube, within 0.5°.

DANGER Stay away from auger tubes when opening/closing (due to pinch points). Keep others away. Failure to do so may result in serious injury or death.

14. Before resetting the upper flyting, first ensure that the end of the flyting shaft is sticking out of the end dump, with the snap-ring properly engaged in the groove at the end of the upper flying shaft, and ensure that the lock collar is on, tightened in the direction of rotation, with the set screw fully tightened.

Figure 6.10 Check Snap Ring Position

15. Put a small piece of putty on the face of the middle flyting drive dog.

Figure 6.11 Place Putty on Middle Flyting Drive Dog

16. Raise the upper auger tube to working position.
17. Use a steady and safely-positioned ladder to access a working position at the top of the end dump.

18. Loosen the set screw on the end dump bearing. When it is loose it should drop to the middle flyting. If it doesn't drop, use a rubber mallet to move it.
19. Open the large end dump door and rotate the flyting to ensure all the drive dogs are meshed together to working position. Use a prybar to turn it safely.

Figure 6.12 End Dump Flyting

20. If all of the auger flytings appear to be aligned, use the rubber mallet on the end of the upper flyting to ensure it is sitting flush and tight on the middle drive dog.
21. Turn the end dump bearing lock collar in the direction of rotation, lock it into place with a hammer and punch, then tighten the set screw.
22. Use the hydraulics to bring all the auger tubes down to transport position and check the two pieces of putty. They should be flattened if all the flyting and drive dogs have properly engaged.

NOTICE If the putty is not flattened, your flyting is not set correctly, and you must repeat the procedure.

6.5. Rotor Removal/Inspection & Bearing Cartridge Replacement

6.5.1. Rotor – Removal and Full Inspection

1. Disconnect the PTO from the tractor.
2. Chock the GrainVac wheels.

⚠ CAUTION The machine generates heat through the action of the rotor. This heat is carried out of the machine in the exhaust air. Do not touch or service until after operation when rotor and exhaust surfaces have been allowed to cool. Failure to follow these instructions may result in burns.

3. Remove the rear guard and cover plate.
4. Loosen and remove the spring tightener nuts, spring assembly, and idler tightener (see Figure 6.13).

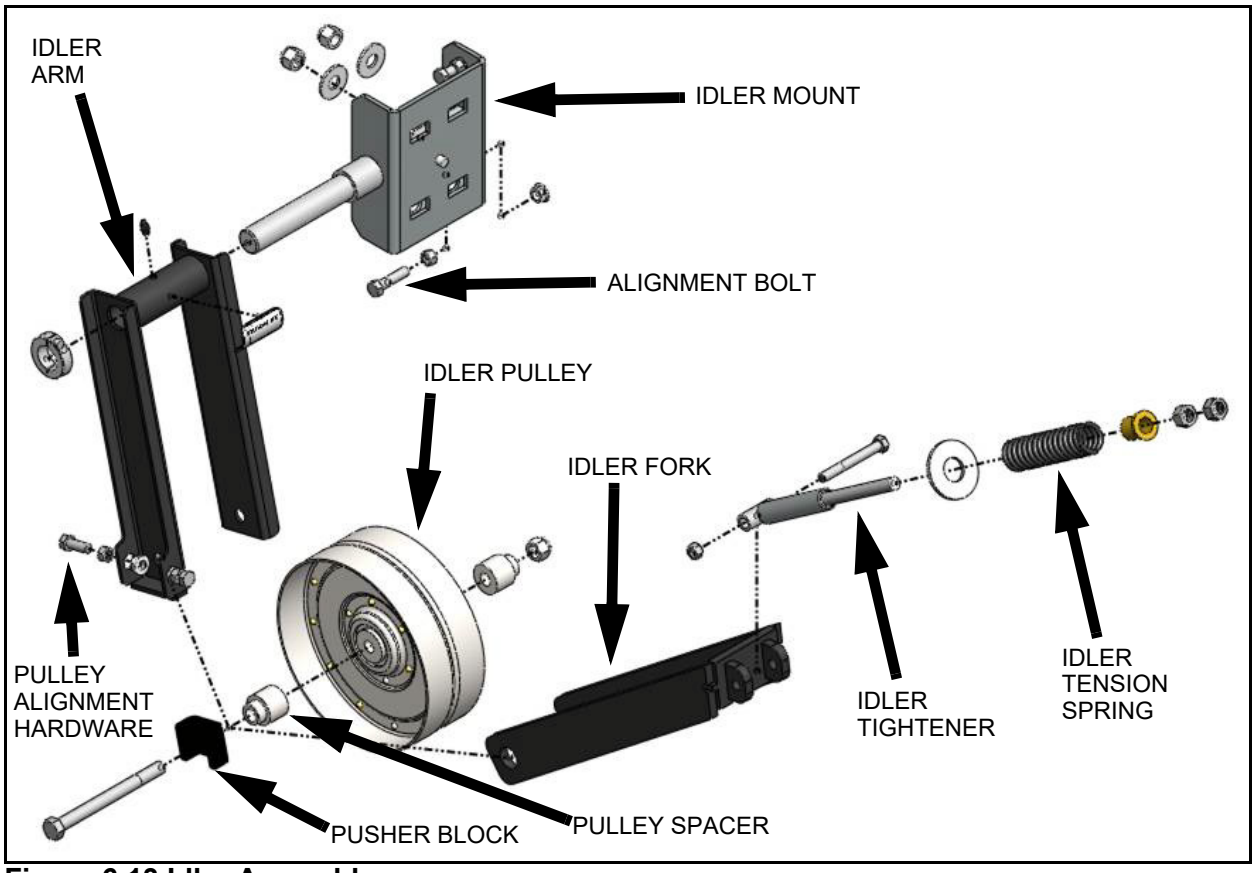


Figure 6.13 Idler Assembly

5. Remove the rotor drive belt.
6. Using a suitable lifting device with a minimum of 250 lb (113.4 kg) lifting capacity rating, fasten the lift strap/chain to the pedestal/rotor assembly.

⚠ WARNING Use extreme caution when handling heavy parts. Use a lifting device suitable for weight of part being lifted. Use a hook with a safety latch. Keep clear of heavy parts supported only by a lifting device.

7. Remove the nuts and bolts securing the perimeter flange of the pedestal to the rotor housing on the vac body.

8. Remove the nuts and bolts securing the pedestal base to the vac body.
9. Slide the pedestal/rotor assembly out of the rotor housing on the vac body.

NOTICE Ensure the pedestal/rotor assembly is slid completely out of the rotor housing before upwardly lifting the pedestal/rotor assembly. Failure to follow this instruction may result in damage to the rotor components if they collide with the top of the rotor housing.

10. Place the pedestal/rotor assembly on a flat working surface.

⚠ WARNING Due its heavy weight, make sure to clamp the pedestal/rotor assembly to the flat working surface to ensure it doesn't tip over on you while you are performing service on it.

11. Inspect the rotor for excessive wear or worn fasteners. Check the rotor for missing/damaged rivets or balance weights. Replace the rotor if excessive wear is found.

NOTICE Never modify the rotor in any way. It is computer-balanced to operate at this high speed and modifications could adversely affect it. Any damaged rotor should be replaced immediately by your dealer.

12. To reinstall, follow the steps above in reverse (11. to 1.). While reinstalling, perform the following:
    a. Before reinserting the pedestal/rotor assembly into the rotor housing on the vac body, check the foam seal between the perimeter flange of the pedestal and the perimeter flange of the rotor housing. If it is damaged, replace the foam.
    b. After reinserting the pedestal/rotor assembly into the rotor housing, and after reinstalling all the bolts and nuts, rotate the rotor by hand to ensure that there is no interference with the wear wrap, rotor housing, or any other components.
    c. When installing the belt, ensure it is fully seated in all the pulley grooves.
    d. Check the pulley and idler alignments and check spring tension and adjust as required as per Section 5.4.4. Rotor Drive Belt – Checking, Tensioning, & Replacement on page 52 and Section 5.4.5. Rotor Drive Belt Idler Pulley – Alignment on page 54.

6.5.2. Bearing Cartridge Replacement

To replace the bearing cartridge, follow the same steps as Section 6.5.1. Rotor – Removal and Full Inspection, as well as the following steps:

1. Remove the snap ring from the rotor on the rotor drive shaft (see Figure 6.14).

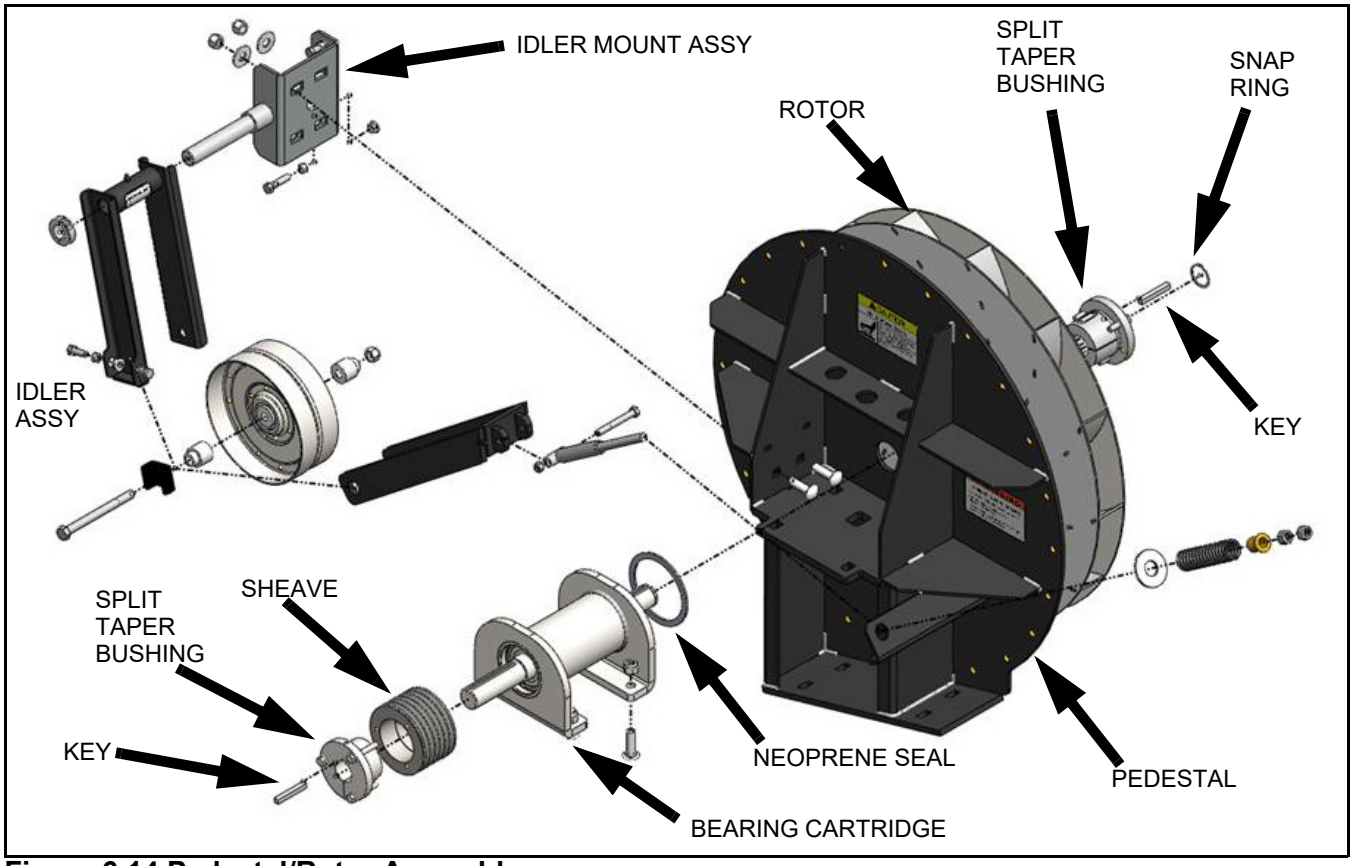


Figure 6.14 Pedestal/Rotor Assembly

2. Remove the bolts from the hub (split taper bushing) of the rotor. Install the bolts into rotor hub threaded holes. Using a hand wrench, tighten each bolt 1/2 a turn each in sequence until the hub and rotor become loosened from each other.
3. Carefully slide the hub and rotor off of the rotor drive shaft and place the rotor on a flat surface.

NOTICE Handle rotor with care, because it is balanced and can be easily unbalanced if it is bent or damaged.

4. Remove the 5/16” bolts from the hub (split taper bushing) of the pulley (sheave) (refer to Section 6.6. Split Taper Bushing – Removal & Installation on page 86). Install the bolts into rotor hub threaded holes. Using a hand wrench, tighten each bolt 1/2 a turn each in sequence until the hub and rotor become loosened from each other. Clean the bushing.
5. Unbolt the bearing cartridge from the pedestal.
6. To reinstall the new bearing cartridge, follow the steps above in reverse (5. to 1.). While reinstalling, perform the following:
   a. Before reinstalling the new bearing cartridge, check the foam seal (neoprene) between the bearing cartridge and the pedestal. If it is damaged, replace the foam.

b. Before tightening the new bearing cartridge hardware, use a pry bar to push the bearing cartridge up tight to the pedestal and tighten fasteners (see Figure 6.15).

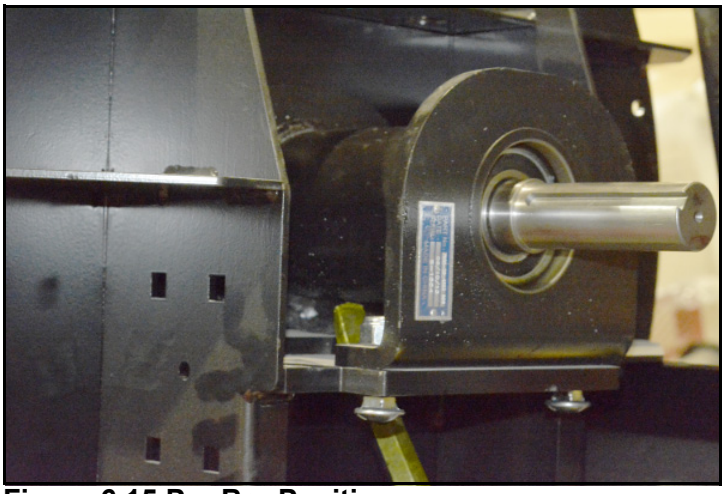


Figure 6.15 Pry Bar Position

c. Torque the drive pulley hub bolts to 15 ft·lb (20 N·m) (refer to Section 6.6. Split Taper Bushing – Removal & Installation on page 86).

d. Torque the rotor hub bolts to 30 ft·lb (41 N·m).

e. After reinstalling the rotor on the rotor drive shaft on the pedestal, rotate the rotor by hand to ensure that there is no interference with the pedestal or any other components.

7. To reinstall the pedestal/rotor assembly into the rotor housing on the vac body, and to reinstall the belt idler assembly, refer to step 12. in Section 6.5.1. Rotor – Removal and Full Inspection.

6.6. Split Taper Bushing – Removal & Installation

NOTICE Never allow the sheave to be drawn in contact with the flange of the bushing. This gap should measure from 1/8” to 1/4” (3.2 mm to 6.4 mm). If extreme screw tightening forces are applied, excess pressures will be created in the hub of the mounted sheave which may cause it to crack.

To remove bushing flange away from the machine:

- Remove the cap screws and thread into the tapped holes in the bushing flange. Tighten progressively until the bushing is free from the sheave taper.
- Remove the assembly from the shaft.

To install bushing flange away from the machine:

- Align the drilled holes in the bushing flange with the tapped holes in the sheave hub.
- Insert the cap screws through the drilled holes in the bushing flange and thread loosely into the tapped holes in the sheave hub.
- Position the assembly on the shaft and tighten the cap screws progressively and uniformly.

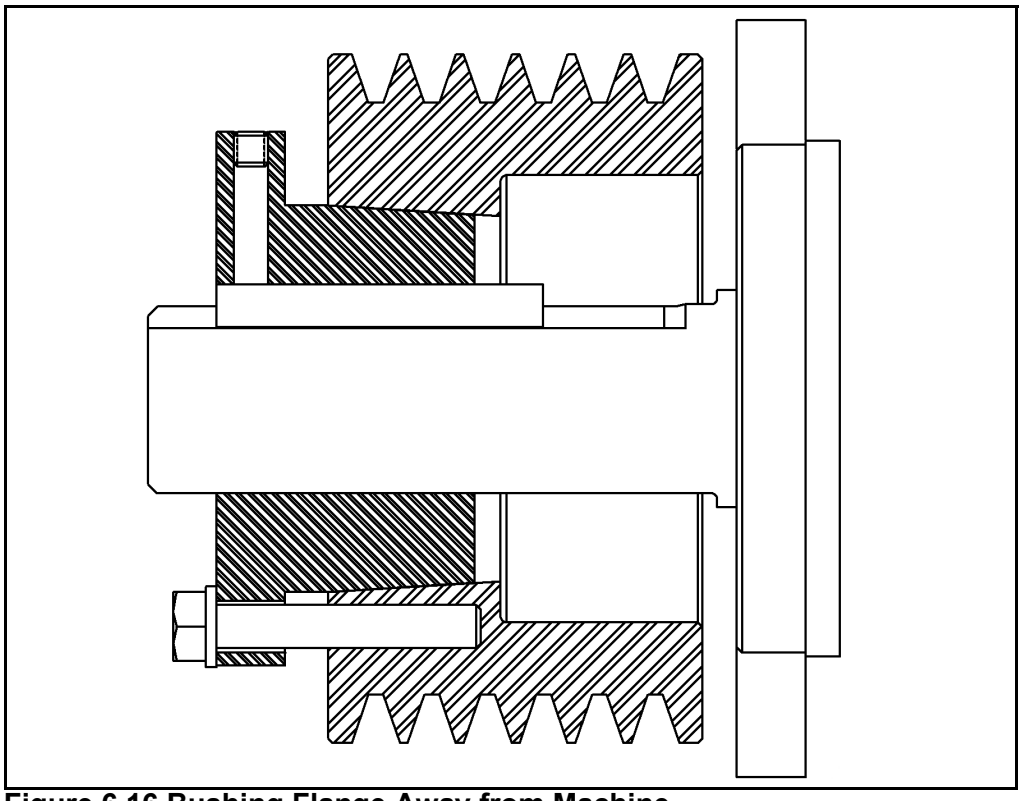


Figure 6.16 Bushing Flange Away from Machine

If the bushing is completely removed from the sheave, use the following cleaning procedure:

- Oil or grease may be removed with a suitable cleaner or solvent.

NOTICE The removal of all traces of oil or grease from the mating surfaces of the bushing or sheave is critical to prevent sheave failure during the assembly process.

6.7. Wear Wrap Replacement

⚠ CAUTION The machine generates heat through the action of the rotor. This heat is carried out of the machine in the exhaust air. Do not touch or service until after operation when rotor and exhaust surfaces have been allowed to cool. Failure to follow these instructions may result in burns.

1. Remove the pedestal/rotor assembly (refer to instructions in Section 6.5.1. on page 82).
2. Remove the air throttle:
   a. Release the clamp above the air throttle and remove the exhaust tube assembly.
   b. Loosen the 2 bolts and nuts on the throttle plate enough to enable the throttle shaft to slide out (see Figure 6.17).

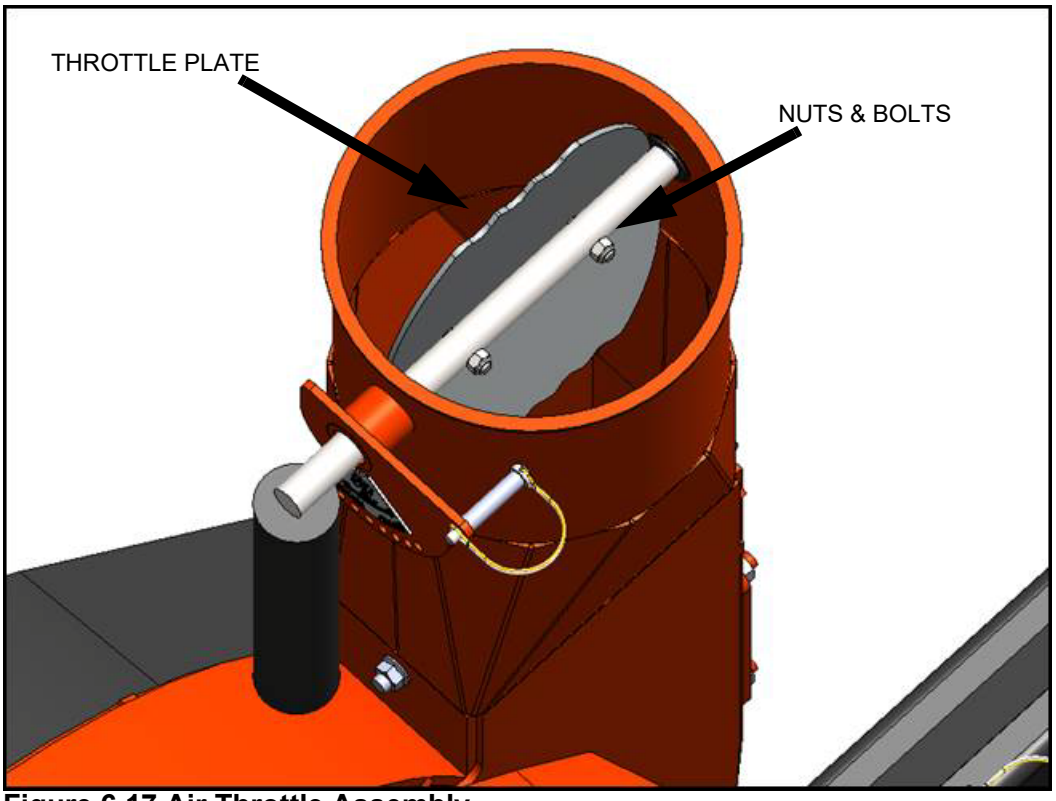


Figure 6.17 Air Throttle Assembly

   c. While holding onto the throttle plate, slide the throttle shaft out and remove the throttle plate from the rotor exhaust.
   d. Remove each throttle bushing.

Note: Ensure that the bushings do not fall down into the rotor.

3. Remove the rotor spacer bolt which is second from the top on the left side of the vac body (see Figure 6.18), as well as the pipe.

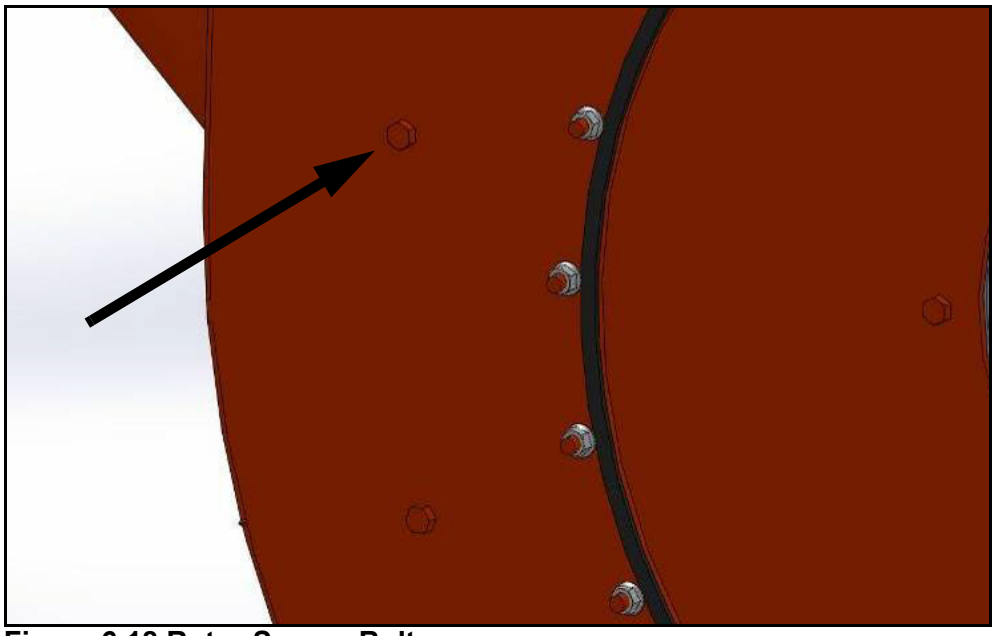


Figure 6.18 Rotor Spacer Bolt

4. Remove the carriage bolts retaining the worn wear wrap in the exhaust outlet.
5. Inspect each spacer pipe for wear (this can be done visually and/or with your hands). Replace any worn spacer pipes.
6. Push the "hooked" end of the wear wrap down into the housing and begin to work the wear wrap around so that the flat end is coming out through the exhaust. Continue to pull the old wear wrap out through the exhaust until it is removed.
7. CLEAN ALL DEBRIS out of the rotor housing. Inspect the housing for any excessive wear.
8. Insert the flat end of the new wear wrap up through exhaust (see Figure 6.19). Be sure to get the end of the wrap to the outside of the spacer pipe. Continue to feed the wear wrap through until you are able to get the "hooked" end down into the rotor housing.

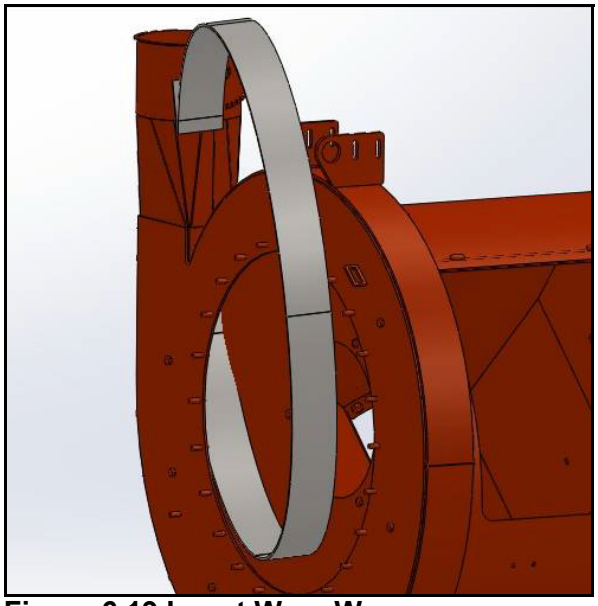


Figure 6.19 Insert Wear Wrap

9. Continue to feed the wear wrap out through the exhaust until you are able to get the hooked end to the outside of the third spacer pipe (see Figure 6.20).

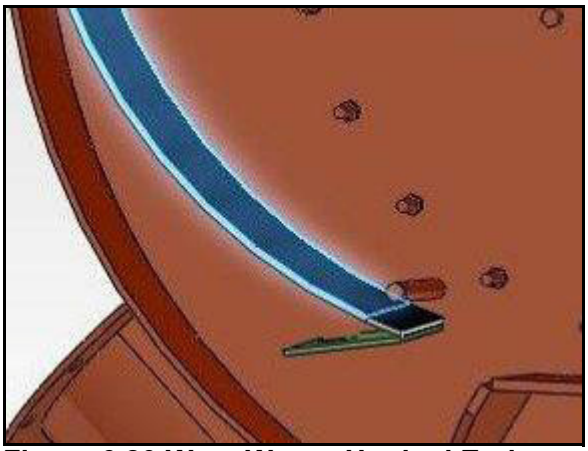


Figure 6.20 Wear Wrap - Hooked End

10. Now begin to pull the wear wrap around counterclockwise from the back of the machine, being sure to stay to the outside of the spacer pipes.
11. Continue all the way around until the "hooked" end slips over the exhaust cut-off.
12. You must now get the "hooked" end up as tight as possible to the rotor housing. Use a large pipe clamp down from the top or a bar to pry up against the spacer pipe. Once you have the wrap as tight as possible to the body, insert a new 3/8” x 1” carriage bolt and tighten with a whiznut (see Figure 6.21).

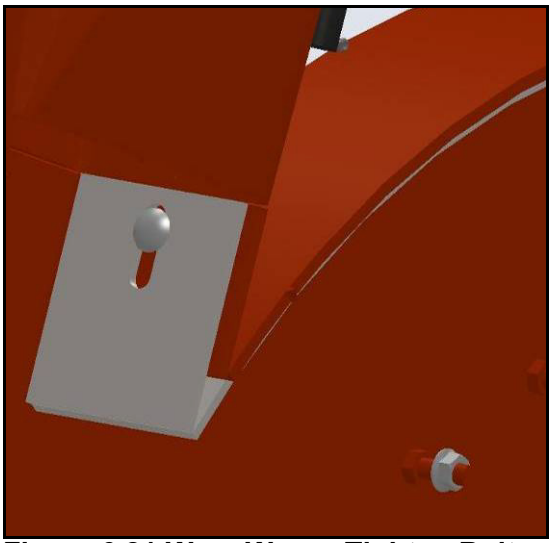


Figure 6.21 Wear Wrap - Tighten Bolt

13. Using a flat bar and hammer, drive the flat end of the wear wrap in as far as possible to ensure that it fits snugly all the way around the rotor housing (see Figure 6.22). Insert a new 3/8” x 1-1/2” carriage bolt and secure with 3/8” whiznut.

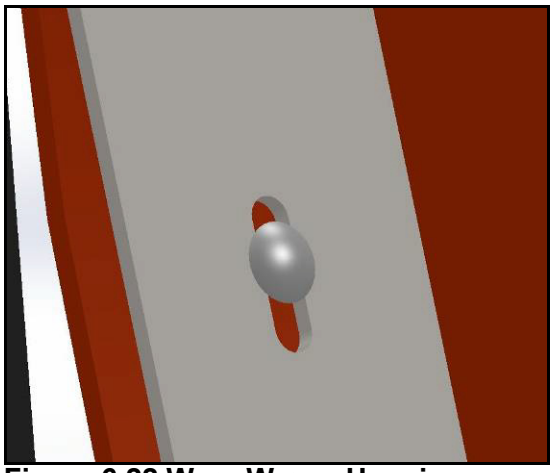


Figure 6.22 Wear Wrap - Housing

14. Replace the spacer bolts, if required.
15. To reassemble the air throttle, reverse the instructions in step 2. Points on throttle plate go straight up, with the bend on the bottom pointing forward.
    a. Ensure that the throttle rotates freely.
    b. Replace exhaust tube assembly and secure with draw clamp.
16. To reinstall the pedestal/rotor assembly into the rotor housing on the vac body, and to reinstall the belt idler assembly, refer to step 12. in Section 6.5.1. Rotor – Removal and Full Inspection.

6.8. Drum Removal/Maintenance

Under certain grain types and conditions it may be necessary to remove the drum from the GrainVac. The most common instances are:

- The drum openings become clogged or gummed up and require cleaning.
- The drum bearings fail.
- The straight inlet between the drum and rotor fails, or material becomes stuck between the two surfaces.

To remove the drum (see Figure 6.23):

1. Remove the front guard and lay to the side.
2. Loosen drum belt idler and remove the drum drive belt.
3. Loosen and remove the mounting nuts for the front body plate.
4. Remove the drum by pulling on the large sheave. The entire assembly will slide out.

NOTICE The seal area on the rear of the drum can easily be damaged. Care should be taken when removing and installing the drum screen.

5. Use a pressure washer to clean the drum if the holes are clogged or gummed up.
6. REMOVE ALL RESIDUAL MATERIAL FROM INSIDE THE DRUM.

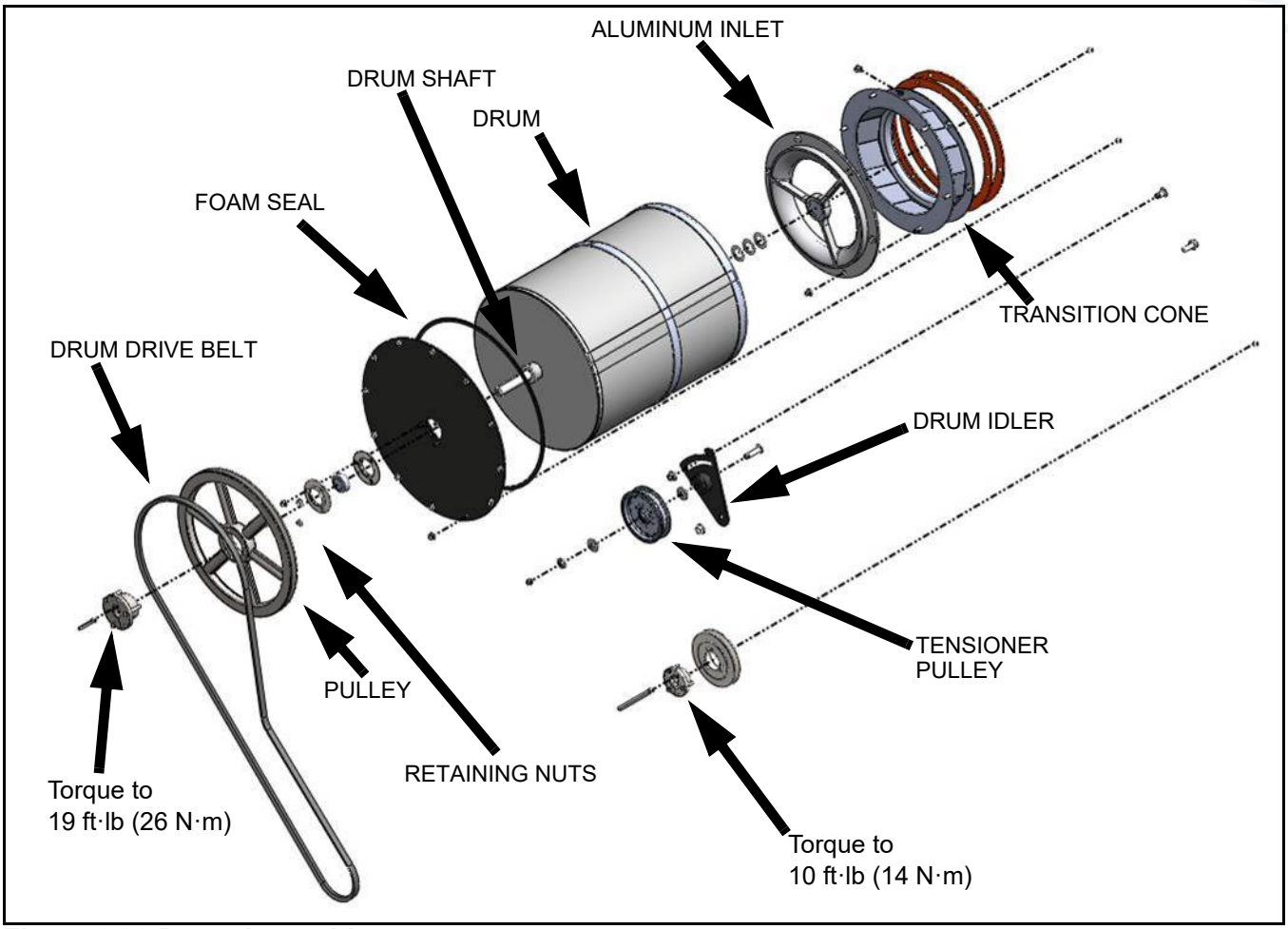


Figure 6.23 Drum Assembly

7. Check the bearings and replace if they are rough or seized.
8. Before reinstalling the drum, check the condition of the transition cone and the aluminum inlet. Replace, if necessary.
9. Replace the inlet if it is badly worn down or otherwise damaged.
10. Check the foam seal on the front of the GrainVac body for damage. Replace, if damaged.

Note: Time Saver: Slide a 4–5’ (1219 – 1524 mm) length of 1” (25.4 mm) standard pipe onto the end of the drum shaft to use as a handle. This will simplify removal and make alignment of the drum shaft to the rear bearing much easier on installation.

11. Reinstall the drum system and tighten in place. Ensure that the drum lip is 1/16” (1.6 mm) from inlet and doesn’t rub when drum is rotated.

Note: Be sure the spacers, washers, or snap rings are in place on the drum shaft, if required.

12. Align the pulleys on the belt drive using a straight edge. If a pulley needs to be realigned, ensure that it is torqued to the specifications shown in Figure 6.23 when reinstalling the hub.
13. Reinstall and tighten the drive belt.
14. Reinstall the front guard.

7. Storage

Before continuing, ensure you have completely read and understood this manual's Safety chapter, in addition to the safety information in the section(s) below.

7.1. Storage Safety

- Store the unit in an area away from human activity.
- Do not permit children to play on or around the stored equipment.
- Park the equipment on a firm, level, and dry surface.

7.2. Placing into Storage

After the season's use, inspect all the major systems and components of the machine. Repair or replace any damaged or worn components to prevent any unnecessary downtime at the start of the next season.

To prepare for storage, perform the following:

1. Ensure the PTO is not connected to the tractor and park brake is engaged.
2. Wash the machine thoroughly using a water hose or pressure washer to remove all dirt, mud, debris, or residue. Wash out the optional dust collector if the machine has been used to move wet grain that may have caused dust to build up inside the collector.

NOTICE To avoid damage, do not directly spray the tachometer / hour meter with a pressure washer.

3. Open the inspection door (from Figure 7.1 to 7.2).

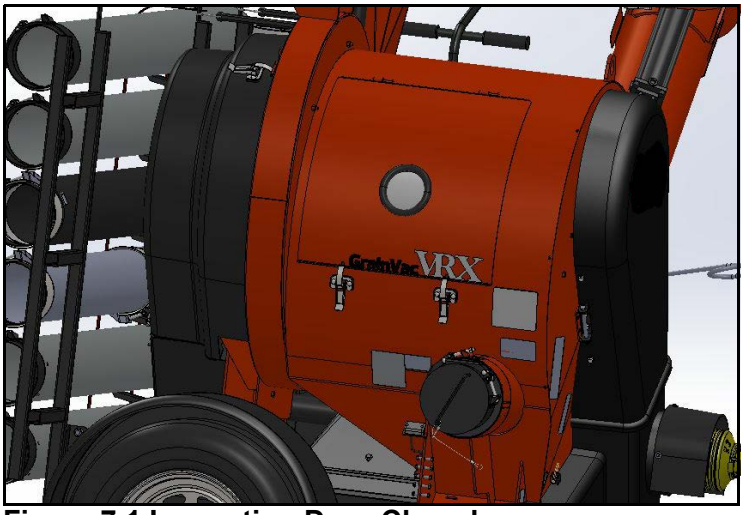


Figure 7.1 Inspection Door Closed

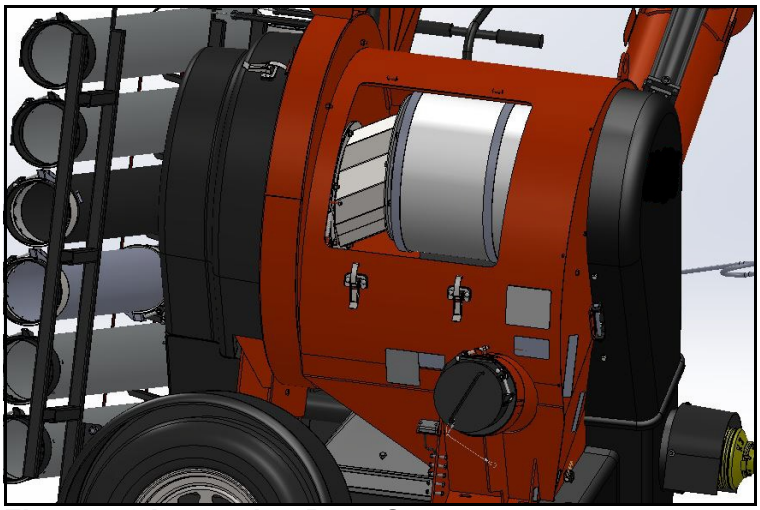


Figure 7.2 Inspection Door Open

Note: The inspection door is removed in Figure 7.2 for illustrative purposes only. Replace the inspection door before operating the GrainVac.

4. Remove any residual material caught or hung up in the body of the GrainVac.
5. Inspect the condition of the drum. If the holes are plugged with debris or gummed up, clean thoroughly. (It may be necessary to remove the drum completely to remove all debris; refer to Section 6.8. on page 90). Replace the inspection door.
6. Open the clean-out door at the bottom of the auger and clean out all residual grain left in the bottom (see Figure 7.3). The clean-out door should be left open so water can drain out.

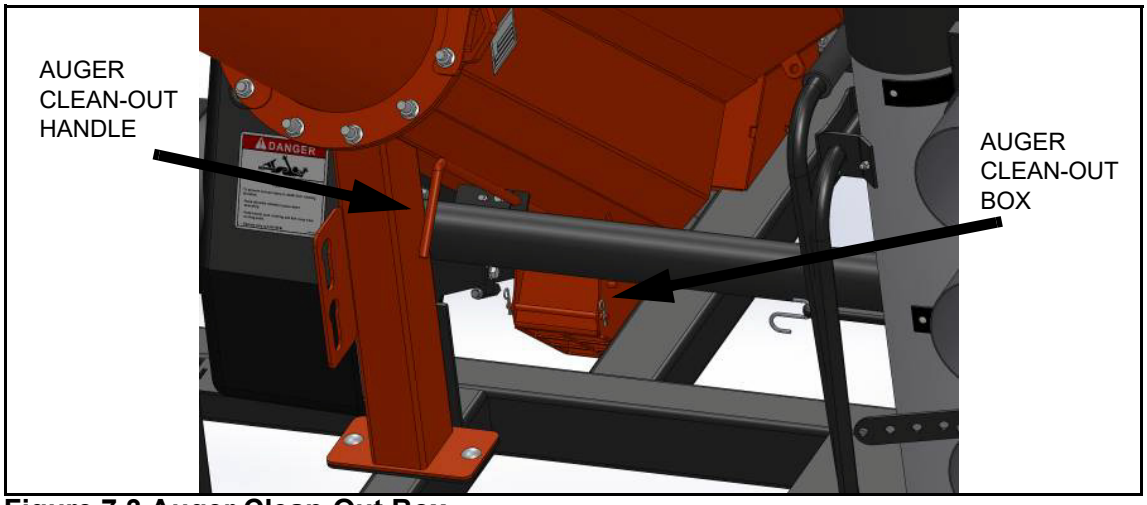


Figure 7.3 Auger Clean-Out Box

7. Remove any material caught at the auger joint.
8. Inspect the end dump double doors and remove any material in that area. Make sure they seat well and seal along the edges. Refer to Section 5.4.14. on page 66 for airlock adjustment instructions.
9. Grease all the fittings on the machine and driveline.
10. Oil the auger drive chain.
11. Touch up all paint chips and nicks to prevent rusting.
12. Ensure the exhaust lid is in place and closed to keep all moisture out of the exhaust and rotor housing.

13. Store the GrainVac away from areas of human activity.

Note: Over-exposure to the sun will cause deterioration of rubber/plastic hoses. Store all hoses inside a clean, dry environment, making sure that the rubber/plastic hose has no bends, and is lying in a straight, flat position.

7.3. Removing from Storage

1. Open the side plate inspection panel and remove debris.
2. Check the tension of the chain and belts. Adjust as required to the correct tension. Refer to Maintenance chapter on page 45.
3. Perform steps in Pre-Operational Checklist on page 27.

8. Troubleshooting

Before continuing, ensure you have completely read and understood this manual's Safety chapter, in addition to the safety information in the section(s) below.

The GrainVac VRX is a simple and reliable system. However, listed below are some possible causes and solutions to problems you may encounter with the equipment. If you encounter a problem that is difficult to solve, even after having read this chapter, please contact your local AGI dealer or distributor. Before contacting them, please have this operation manual and your machine's serial number handy.

⚠ WARNING Shut down and lock out all power before maintaining, adjusting, or unplugging the equipment.

PROBLEM	POSSIBLE CAUSE	SOLUTION
Suction Problems	Hose connection fitted incorrectly	Check all the joints in the suction tubes to ensure that no leaks exist. Readjust the clamp(s), if necessary, to ensure there is a tight seal on all joints. If the clamp is damaged, it should be repaired or replaced.
	Tractor not operating at proper PTO speed	Check the PTO rpm with a hand-held digital tachometer and adjust to 1000 rpm (maximum speed). Check the Tachometer to ensure it matches the hand-held tachometer for 1000 rpm.
	Steel flex hose connected incorrectly	Ensure the arrow indicator for flow direction (on exterior of steel tube) is indicating the correct direction of air flow. If the direction is incorrect, reverse the steel flex hose in the hose configuration.
	End dumper obstructions or missing spring	Clean out the end dump double doors. The doors must close completely and securely. Replace or readjust the tension spring to the correct tension. Refer to Section5.4.14. 5.4.7. on page 58 for correct spring tension.
	Incorrect vacuuming technique	Poor suction can result from incorrect use of the GrainVac. Review Chapter 4. Operation on page 27 to ensure all operating instructions are being followed accurately.
	Foam rubber seals in the auger joints are damaged and the air seal is breached, causing air to suction back down the auger	Replace the seals (see Figure 4.5).
	Loose or slipping belts/chain	Check the belt(s) for correct alignment. Tension the belts/chain to correct tension. Replace worn belts/chain if necessary. Refer to Chapter 5. Maintenance (page 45) for tolerance and tension guidelines.

PROBLEM	POSSIBLE CAUSE	SOLUTION
Suction Problems (continued)	Plugged drum	Remove the inspection door from the body of the machine and inspect the drum. Use a steel brush to remove foreign materials that have adhered to the drum screen. Use compressed air or a pressure washer to unplug the screen if small particles have wedged themselves into perforated areas. If the material is wedged in from the inside of the screen, check for holes in the drum. Repair or replace the drum. Ensure that drum inlet lip is within tolerance from machined cast inlet (refer to Section 6.8. Drum Removal/Maintenance on page 90).
	Plugged hoses	Locate the obstruction and remove.
	Damaged drum/rotor inlet due to worn cast aluminum inlet	Replace the cast aluminum inlet (refer to Section 6.8. on page 90).
	Damaged lining in steel flex tube	Repair or replace the tube.
	Air leak at inspection door or clean-out door	Ensure body inspection door and auger clean-out door are fully closed (see Figures 7.1 & 7.3).
Suction or Performance Problem	GrainVac surges or pulses	The GrainVac could be starved for air. Increase the air supply to allow enough air for a smooth flow of grain. A hose is plugged. Remove obstruction. Check the end dump double doors. The doors must close completely and securely. Adjust the spring tension. Refer to Section 5.4.7.5.4.14. on page 58 for correct spring tension. Replace the tension spring if it cannot be adjusted to proper tension.
	Static electricity build up causing poor performance	In some circumstances when operating the GrainVac, static electricity may develop. When this happens, product that is dirty or chaffy may build up on the rotary drum screen. Ground the GrainVac by allowing the jack to touch the ground. This happens in high humidity weather conditions most times. If the drum builds up with debris, replace a worn brush(s) on brush kit.
	Body is plugging	Refer to the Section 4.8. Grain Vacuum Operation Procedure on page 34 for air throttle adjustment instructions. Lubricate air throttle if sticking. Refer to Section 5.4.7. on page 58 to check end dump spring tension.

PROBLEM	POSSIBLE CAUSE	SOLUTION
GrainVac Plugging and Damaging Belts	Light grain being vacuumed into GrainVac body chamber plugging and stopping the rotary drum screen	Refer to the Section 4.8. Grain Vacuum Operation Procedure on page 34 for air throttle adjustment instructions.
	Auger has stopped and the shear pin has snapped. Foreign object has entered the machine and lodged in the auger.	Clean out the GrainVac body, remove the foreign object, and replace the shear pin (refer to Section 5.4.1. on page 48). Inspect the auger flighting for damage. Repair or replace the auger flighting if required (refer to Section 6.2. on page 70).
	Gearbox drive chain is broken	Clean out the GrainVac body and remove any foreign objects. Inspect the auger flighting for damage. Repair or replace the auger flighting if required (refer to Section 6.2. on page 70). Replace with a new chain and oil the chain (refer to Section 5.4.6. on page 56).
	Auger flighting is bent back impeding grain flow up the auger	Check all the auger flighting for bent auger tips and repair or replace the flighting (refer to Section 6.2. on page 70).
	Foam rubber seals in the auger joints are damaged or out of place, causing the air seal to be breached and air to suction back down auger	Ensure foam or rubber seals between auger tubes are in good condition and in place (see Figure 4.5).
	Breaking shear pin many times due to malfunctioning or seized gearbox	Remove the chain coupler that attaches gearbox to bottom auger along with the main drive chain that comes from the power shaft (see Figure 5.12) to see if the gearbox turns freely. Replace gearbox if necessary (refer to Section 5.4.13. on page 63).
	Breaking shear pin many times due auger full of grain and a tractor model which tends to engage PTO hard	Try to slowly feather the engagement of the PTO.
Augers fold extremely slow, or top section will not fold out	Small foreign object is obstructing an orifice in hydraulic system	Ensure hoses are pushed properly into tractor. Check for damaged hose tips and damaged tractor couplers. Clean out objects potentially lodged in orifice restrictions in hydraulic fittings at: male tips, lower lift cylinder, control valve. Check tractor flow controls.

PROBLEM	POSSIBLE CAUSE	SOLUTION
No material comes out of the end dump double doors and the end of the auger	End dump double doors are not sealing properly	If the end dump double doors do not seal properly, air will be sucked back down the auger tube. Be sure that the end dump double doors open and close freely. Adjust the tension on the spring. Refer to Section5.4.14. 5.4.7. on page 58 for correct spring tension.
	Loose or slipping belts or damaged chain	Tighten or replace the belts. Replace any damaged or worn chain. Check the sprockets for wear and replace if wear is excessive. Refer to Chapter 5. Maintenance (page 45) for further details.
	Auger is not turning (shear pin may be broken) because the drive dogs are not engaging due to misalignment	Realign the drive dog(s). Refer to Section 6.2. Flighting Removal/Replacement on page 70.
Excessive amount of material comes out of the exhaust	Drum screen is damaged	Check the drum for holes. Any large holes may allow material to pass through into the rotor and expel through the exhaust. Repair or replace the drum (refer to Section 6.8. on page 90).
	Damaged cast aluminum inlet on drum/rotor inlet	If the inlet is damaged, worn, or missing, material is allowed to pass around into the rotor and expel out through the exhaust. Replace the cast aluminum inlet (refer to Section 6.8. on page 90).
	Rear rotating drum screen bearing is damaged or failed, causing the drum to prematurely wear out the cast aluminum inlet	Replace the bearing and seal (refer to Section 6.8. on page 90).
	Grain size is smaller than hole size of the screen	Adjust the air throttle (see page 36).
Grain Damage	New machine may need short break-in period of approx. 5-10 hours	After 5-10 hours of use, hard-surfaced augers become smooth.
	Airlock (end dump double doors) spring tension is too tight	Loosen the airlock for special situations, but diminished capacity may be experienced. Refer to Section 5.4.7. on page 58 for correct spring tension.
	Grain type or condition is inherently sensitive	Can only try operating at lower PTO rpm.

9. Appendix

9.1. GrainVac VRX Specifications

Table 9.1. GrainVac VRX Specifications

Item	Measurement
Weight	2950 lb (1338 kg)
Hitch Weight	432 lb (196 kg)
Auger Discharge Height	178” (4521 mm)
Discharge Width	119” (3023 mm) horizontal from outer edge of driver side fender to end dump (excluding end dump spout)
Hydraulic Requirements	2 imperial gallons per minute @ 2000 psi (9 liters per minute @ 13 790 kPa)
Tractor HP Requirement	85 hp (63 kW) – Full Bin Load-Out 110 hp (82 kW) – Clean-Up
Transport Width	98-3/16” (2494 mm)
Transport Height	9’2” (2794 mm)
Transport Length	135-7/16” (3440 mm)
PTO Input Speed	1000 rpm maximum

Note: Specifications are subject to change without notice.

9.2. Bolt Torque Values

Tables 9.2 and 9.3 give correct torque values for various bolts and capscrews. The bolt diameter is measured to the outside of the threads. When tightening all bolts, tighten the nut on the bolt to the torque specified in the tables, unless otherwise specified. Do not replace or substitute bolts, nuts, or other hardware that is of lesser strength than the hardware supplied by the manufacturer.

Torque values indicated below are valid for non-greased or non-oiled threads and head, 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%.

Table 9.2 SAE Bolt Torque

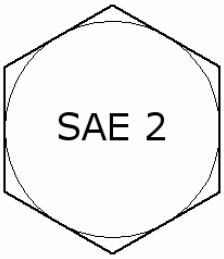
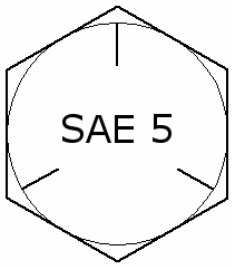
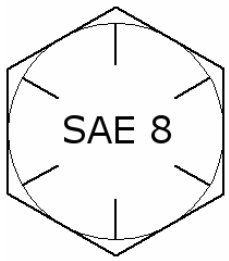
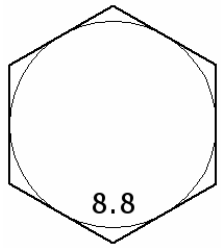
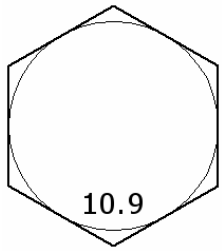
						
Bolt Diameter	**(N·m)**	**(ft·lb)**	**(N·m)**	**(ft·lb)**	**(N·m)**	**(ft·lb)**
1/4"	8	6	12	9	17	12
5/16"	13	10	25	19	36	27
3/8"	27	20	45	33	63	45
7/16"	41	30	72	53	100	75
1/2"	61	45	110	80	155	115
9/16"	95	60	155	115	220	165
5/8"	128	95	215	160	305	220
3/4"	225	165	390	290	540	400
7/8"	230	170	570	420	880	650
1"	345	225	850	630	1320	970

Table 9.3 Metric Bolt Torque

				
Bolt Diameter	**(N·m)**	**(ft·lb)**	**(N·m)**	**(ft·lb)**
M3	0.5	0.4	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
M16	225	166	310	229
M20	435	321	610	450
M24	750	553	1050	774
M30	1495	1103	2100	1550
M36	2600	1917	3675	2710

Important: These bolt torque values in Section 9.2. should not be used on tapered hubs.

9.3. Certifications

CE	EC Declaration of Conformity	

AGI

MANUFACTURER: AGI - 201 Industrial Drive, Swift Current, Saskatchewan, S9H 5R4, Canada
Phone: (306) 773-7779 website: www.aggrowth.com

Ag Growth Industries Partnership, part of the Ag Growth International Inc. Group 198 Commerce Drive, Winnipeg, Manitoba, R3P 0Z6
Phone: (204) 489-1855 Fax: (204) 488-6929

AUTHORIZED REPRESENTATIVE: General Manager, AGI-PTM Via Mario Tognato,10-35042 Este (PD), Italy
Phone: +39 0429 600973

PRODUCT DESCRIPTION: GrainVac VRX

APPLICABLE EUROPEAN DIRECTIVES AND STANDARDS:

Applicable Directives	Applicable Standards	Essential Requirements Applied and Fulfilled
Machinery Directive 2006/42/EC	EN ISO 12100:2010, EN ISO 14120:2015, EN ISO 4254-1:2013, EN ISO 13854:2019, EN 13857:2019, EN ISO 4414:2010	Refer to Technical File

NOTIFIED BODY - Not Applicable

The product described in this Declaration of Conformity complies with the Applicable European Directives and relevant sections of the Applicable International Standards. The signature on this document authorizes the distinctive European mark to be applied to the equipment described. A Technical Construction File is available for inspection by designated bodies.

LIMITED WARRANTY

This warranty relates to GrainVacs (the "Product") sold by AGI, (referred to herein as the "Seller") and applies only to the first user of the Product (meaning a purchaser directly from the Seller or from an authorized dealer or distributor of the Product, referred to herein as the "Buyer").

This warranty shall only be effective if properly registered with the Seller in accordance with information provided to the Buyer at the time of sale.

1. The Seller warrants to the Buyer that the Product is free from defects in material and workmanship **under normal and reasonable use** and in accordance with manufacturer's manual.

2. This warranty applies only to defects in materials and workmanship and not to damage incurred in shipping or handling, through normal wear and tear, or damage due to causes beyond the control of the Seller such as lightning, fire, flood, wind, earthquake, excessive voltage, mechanical shock, water damage, or damage arising out of abuse, alteration, improper assembly, improper installation, improper maintenance or improper repair of the Product.

3. **The warranty period for the Product shall be two years from delivery of the Product to the Buyer where the Product is used in a normal farm operation. First year of warranty coverage of parts and repair labour, second year warranty coverage of parts only. Warranty period for the Product shall be 90 days from delivery of the Product to the Buyer where the Product is used in a commercial operation.** In the event that any part incorporated into the Product is manufactured and sold to the Seller by a third party vendor, such part is only warranted to the extent of the warranty given by that third party.

4. This warranty does not obligate the Seller to bear costs of travel in replacing defective parts.

5. The obligations set forth in this warranty are conditional upon the Buyer promptly notifying the Seller of any defect and completing reasonably required documentation and, if required, promptly making the Product available for correction.

6. The total liability of the Seller on any claim, whether in contract, tort or otherwise, arising out of, connected with, or resulting from the manufacture, sale, delivery, repair, replacement or use of the Product or any part thereof **shall not exceed the price paid for the Product** and the Seller shall not be liable for any special indirect, incidental or consequential damages caused by reason of the installation, modification, use, repair, maintenance or mechanical failure of the Product. **Consequential or special damages as used herein include, but are not limited to, lost or damaged products or goods, costs of transportation, lost sales, lost orders, lost income, increased overhead, labor and incidental costs and operational inefficiencies.**

7. The foregoing warranty is the entire warranty of the Seller to the Buyer and the Buyer shall not be entitled to rely upon any representation or warranty contained in any marketing material of the Seller in respect of the Product. The Seller neither assumes, nor authorizes any other person purporting to act on its behalf to modify or to change this warranty, nor to assume for it any other warranty or liability concerning the Product.

WARRANTY VOID IF NOT REGISTERED

Shipping: 201 Industrial Drive, Swift Current, Saskatchewan S9H 5R4, CANADA
Mailing: Box 1750, Swift Current, Saskatchewan S9H 4J8, CANADA
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