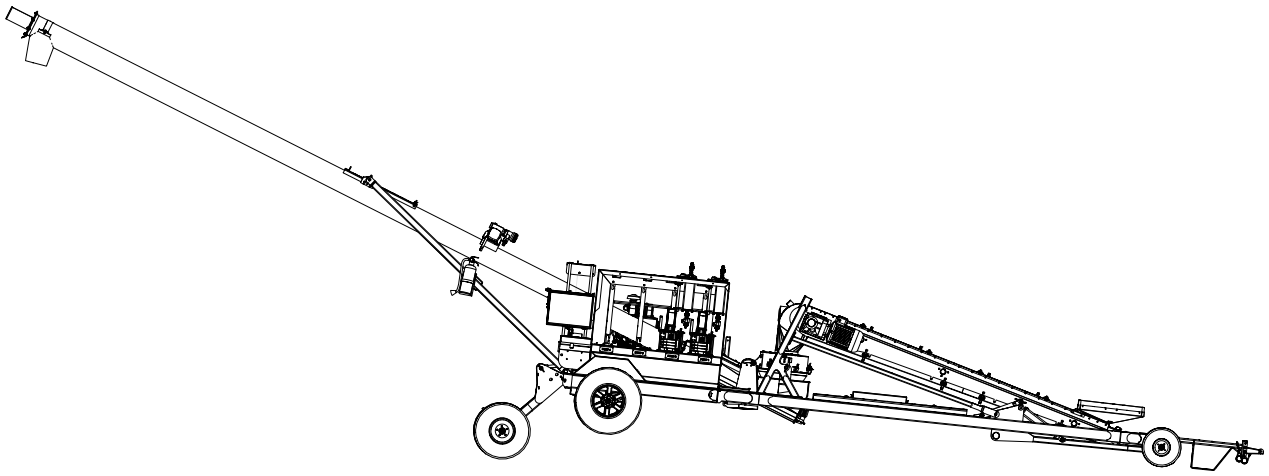
AGI STORM

Professional Series – 2020

Seed Treater
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: 4400-90006 R0

Revised: January 2020

We strongly recommend that all personnel associated with this equipment be trained in the correct operational and safety procedures required for this product. This product has been designed and constructed according to general engineering standards, other local regulations may apply and must be followed by the operator. Use the sign-off sheet below to record initial and periodic reviews of this manual with all such personnel.

Date	Employee Signature	Employer Signature

CONTENTS

1. Introduction

Thank you for purchasing a STORM Seed Treater. 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 seed treater 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.

1.1. Serial Number Location

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

Serial Number	
Date Received	

1.2. Intended Use

The seed treater is designed solely for use in the intended agricultural use as listed below. 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.

The seed treater 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 occupational health and safety must be observed at all times.

Any modifications made to the seed treater may relieve the manufacturer of liability for any resulting damage or injury.

Intended use for the seed treater:

- seed types as detailed on the system Operation Screen.
- temperatures warmer than 32°F (0°C).
- capacity at 22.5-45 bu/min (1350-2700 bu/hr).
- a suitable hopper bin or truck hopper.

Use in any other way is considered as contrary to the intended use and is not covered by the warranty.

1.2.1 Misuse

Do not install/use the seed treater for/with:

- lifting or using as a hoist or crane.
- any purpose other than treating seed.
- treating oilseeds such as canola.
- normal loading or unloading of grain.

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 Product Safety

It is the owner, operator, and maintenance personnel's responsibility to read and understand all safety instructions, safety decals, and manuals and follow them when operating or maintaining the equipment.

- Owners must give instructions and review the information initially and annually with all personnel before allowing them in the work area. Untrained users/operators expose themselves and bystanders to possible serious injury or death.

- Use for intended purposes only.
- Do not modify the seed treater in any way without written permission from the manufacturer. Unauthorized modification may impair the function and/or safety. Any unauthorized modification will void the warranty.
- Follow a health and safety program for your worksite. Contact your local occupational health and safety organization for information.

2.3. 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 seed treater 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.

2.4. Overhead Power Lines

DANGER

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

2.5. Cleated Conveyor Belt Safety

WARNING

- KEEP HANDS AWAY from moving cleated conveyor belt.
- DO NOT remove or modify guards, doors, or covers. Keep in place and in good working order. Have replaced if damaged.
- DO NOT operate the conveyor without all guards, doors, and covers in place.
- Shut off and lock out power to adjust, service, or clean.

2.6. Seed Treatment Safety

Hazards associated with handling, sorting, mixing and storage of treated seed and seed treatments can be minimized by following the safety precautions listed below. The below are guidelines only and vary based on the type of seed treatment being used. Consult the seed treatment information sheets for full details.

⚠ WARNING

- Before treating seed, follow and have a written plan in place to manage volumes of contaminated water and/or other liquids used in the cleaning/flushing of the seed treating equipment.
- Use personal protective equipment as described on the seed treatment product label.
- Use the seed treater only outdoors, do not use inside a building or structure.
- Thoroughly clean the seed treater after use. Some seed treatments are corrosive and others may plug the equipment. Do not run contaminated water into a stream, public sewer, or in a location where it could contaminate the groundwater or come into contact with people or animals.

2.7. 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.

2.8. Work Area Safety

- Have another trained person nearby who can shut down the seed treater in case of accident.
- The work area should be kept clear of bystanders, including children.
- Keep the work area clean and free of debris.
- Keep the required personal protective equipment (PPE) and emergency equipment in its designated location.
- Never smoke, drink, or eat in the seed treatment area
- Do not operate with the seed treater in water.
- Keep lighting in place where seed treatment activities are being undertaken during hours of the day when natural light is not present.
- Have an emergency response plan and keep a copy of the plan in the product manual holder.
- Post a sign identifying the name of the company, applicable management phone numbers, and emergency response numbers.

2.9. Guards Safety

⚠ WARNING

- Keep guards in place. Do not operate with guard removed.
- Do not walk on, step on, or damage guards.
- Lock out power before removing a guard.
- Ensure all guards are replaced after performing maintenance.

2.10. Raising and Lowering the Seed Treater

⚠ WARNING

- Before raising/lowering/moving/adjusting the seed treater, make sure the area around the seed treater is clear of obstructions and/or untrained personnel. Never allow anyone to stand on or beneath the seed treater when it is being placed.
- Lower the seed treater to its lowest position when not in use.
- Empty the seed treater before raising or lowering.
- Do not get on or beneath the seed treater when raising or lowering.
- Raise and lower seed treater on reasonably level ground only.
- Never attempt to increase height of the seed treater by positioning wheels on lumber, blocks, or by any other means. To do so will result in damage to seed treater and/or serious injury.
- Do not raise the seed treater in high winds.

2.11. Positioning the Seed Treater

⚠ WARNING

- Transport and place equipment on reasonably level ground when raising, lowering, positioning, or operating.
- Move the seed treater into position slowly. Do not unhitch and attempt to move by hand.
- Chock wheels and anchor intake end after placement.

2.12. Towing the Seed Treater

⚠ WARNING

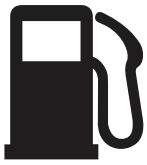
- Check with local authorities regarding transport on public roads. Obey all applicable laws and regulations.
- Always travel at a safe speed, the seed treater can be transported up to a maximum of 60 mph (100 km/h) where permitted. Reduce speed on rough surfaces. Use caution when turning corners or meeting traffic.
- Reduce speed on rough surfaces.
- Do not transport on slopes greater than 20°.
- Use caution when turning corners or meeting traffic.
- Do not allow riders on the seed treater or towing vehicle during transport.
- Always attach safety chain(s) for transport on roadways.
- Place the seed treater in the transport position before moving on roads.

2.13. 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 the power source and follow lockout and tagout procedures to prevent inadvertent start-up and hazardous energy release. Know the procedure(s) that applies to your equipment from the following power source(s). Ensure that only 1 key exists for each assigned lock, and that you are the only one that holds that key. Ensure that all personnel are clear before turning on power to equipment.

2.13.1 Gas Engine Safety

WARNING **Power Source**



- Keep guards in place and secure.
- Properly ventilate surrounding area.
- Never fill the fuel tank with the engine running, while smoking, or near an open flame. Always shut down and allow engine to cool before filling with fuel.
- Never overfill the tank or spill fuel. If fuel is spilled, clean it up immediately.
- Be sure to use the correct type and grade of fuel. Ground the fuel funnel or nozzle against the filler neck to prevent sparks that could ignite fuel vapors.
- Be sure to replace the fuel fill cap when you are done.

Lockout

- For engines with an electric start, remove the ignition key, the spark plug wire, or the spark plug.
- For engines with a rope or crank start, remove the spark plug wire or the spark plug.

2.13.2 Electric Motor Safety

WARNING **Power Source**

- Electric motors and controls shall be installed and serviced by a qualified electrician and must meet all local codes and standards.
- Guards must be in place and secure.
- Ensure electrical wiring and cords remain in good condition; replace if necessary.

2.13.3 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 and pinch points.
- 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.

2.14. Tire Safety

⚠ WARNING 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.

2.15. Battery Safety

⚠ WARNING

- Wear safety glasses and protective gloves when working near batteries.
- Make certain the battery or terminal covers are in place and in good working order.
- Keep all sparks and flames away from batteries; gas given off by electrolyte is explosive.
- Avoid contact with battery electrolyte. Wash off any spilled electrolyte immediately.
- Do not tip batteries more than 45° to avoid electrolyte loss.
- To avoid injury from sparks or short circuits, disconnect battery ground cable before servicing any part of an electrical system.

2.16. Personal Protective Equipment

The following Personal Protective Equipment (PPE) should be worn when operating or maintaining the equipment.

Safety Goggles

- Wear safety goggles at all times to protect eyes from chemicals.

Coveralls

- Wear coveralls to protect skin.

Hard Hat

- Wear a hard hat to help protect your head.

Rubber Boots

- Wear rubber boots to prevent contact with chemicals.

Chemically Resistant Gloves

- Wear chemically resistant gloves to protect your hands from chemicals.

Respirator

- Wear a respirator with chemical cartridges to prevent breathing potentially harmful vapors.

Hearing Protection

- Wear ear protection to prevent hearing damage.

2.17. Safety Equipment

The following safety equipment should be kept on site:

Fire Extinguisher

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

First-Aid Kit

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

Eyewash Kit

- Keep a portable eye wash kit available or make sure a permanent eyewash station is available should the need arise to flush materials from the eyes. Review instructions for use before working with the seed treater.

Salvage Container

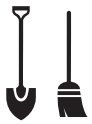
- Keep a sealable salvage container on site, such as a spill containment pallet.

Absorbent Materials

- Keep granular absorbent materials on hand to clean up any chemical spills.

Aluminum Shovel and Broom

- Keep an aluminum shovel and broom for cleanup of spilled materials.



2.18. 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 as applicable.

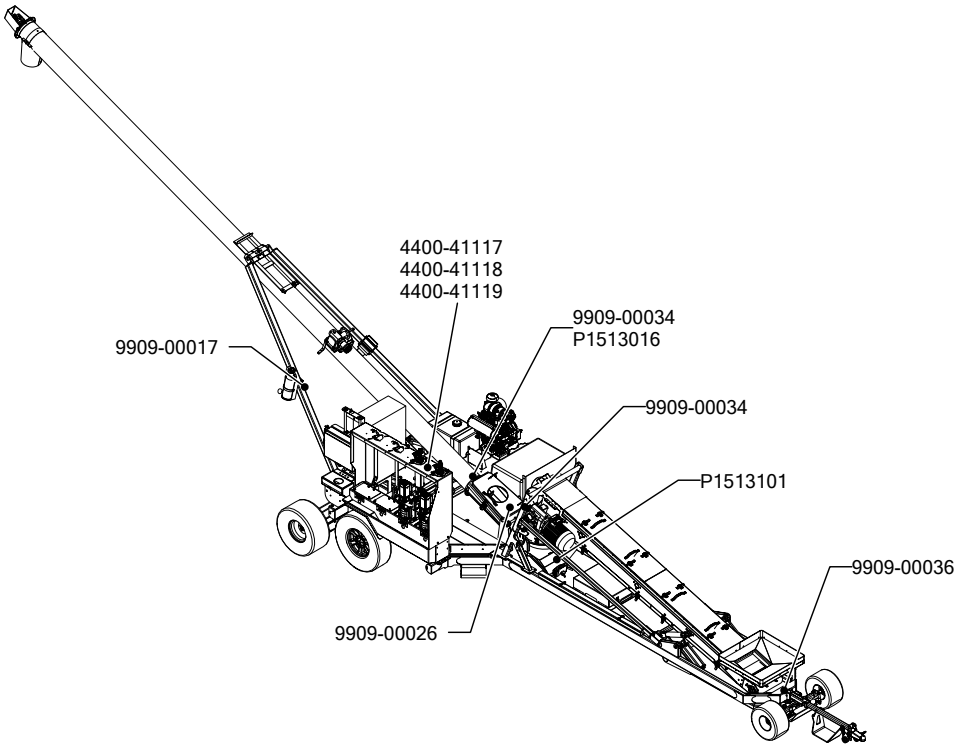
2.18.1 Decal Installation/Replacement

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.

2.18.2 Safety Decal Locations and Details

Replicas of the safety decals that are attached to the seed treater and their messages are shown in the figure(s) that follow. Safe operation and use of the seed treater 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.



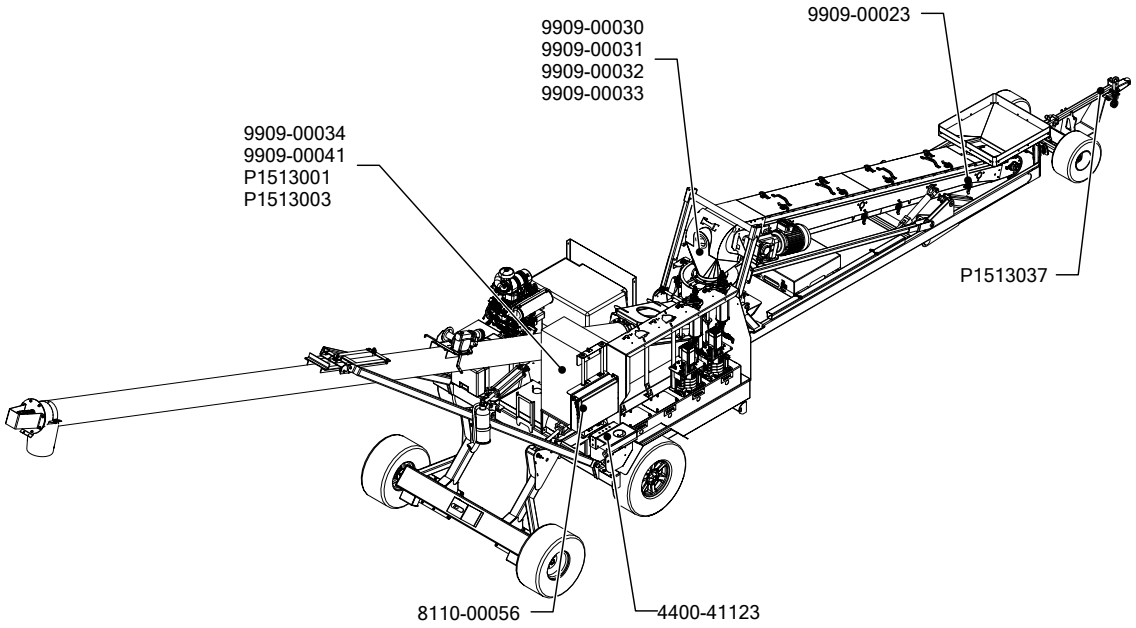

9909-00023
9909-00030
9909-00031
9909-00032
9909-00033
9909-00034
9909-00041
P1513001
P1513003
P1513037
8110-00056
4400-41123

Table 1. Safety Decals

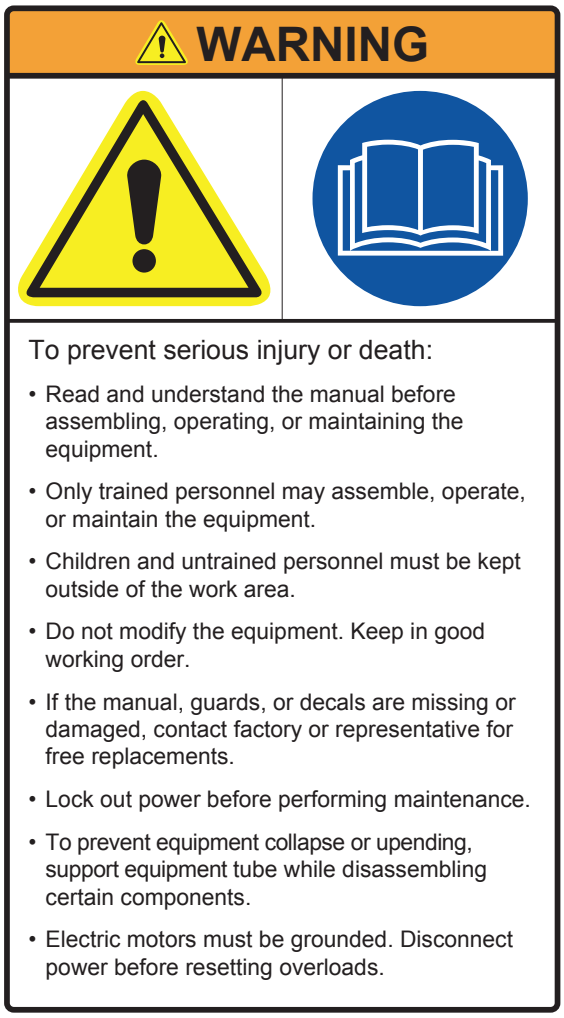
Part Number	Description
P1513001	

Table 1 Safety Decals (continued)

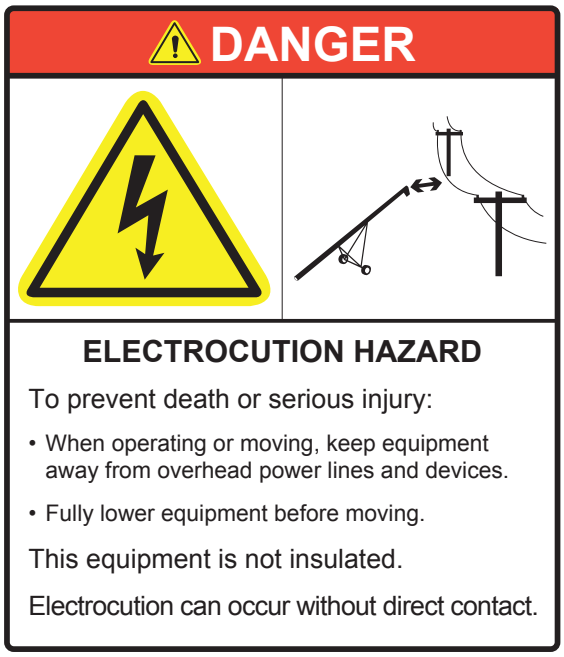
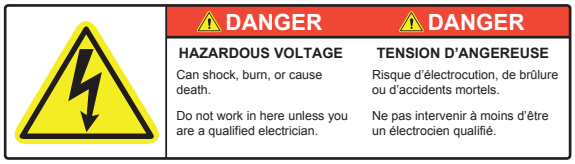
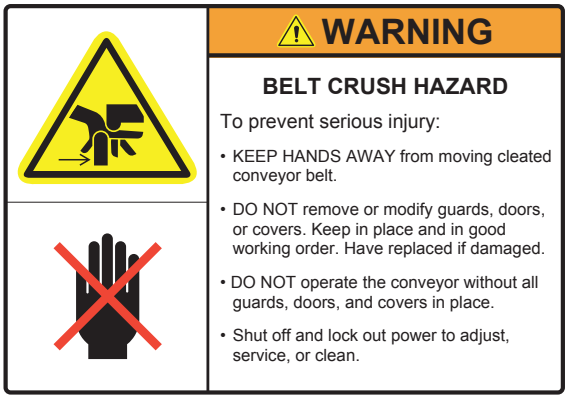
Part Number	Description
P1513003	
8110–00056	
P1513037	
9909-00023	

Table 1 Safety Decals (continued)

Part Number	Description
9909-00030	
9909-00031	

Table 1 Safety Decals (continued)

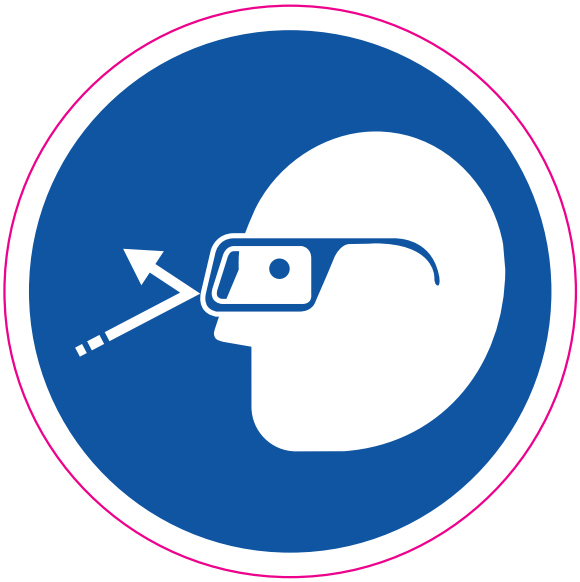
Part Number	Description
9909-00032	
9909-00033	

Table 1 Safety Decals (continued)

Part Number	Description
9909-00034	

Table 1 Safety Decals (continued)

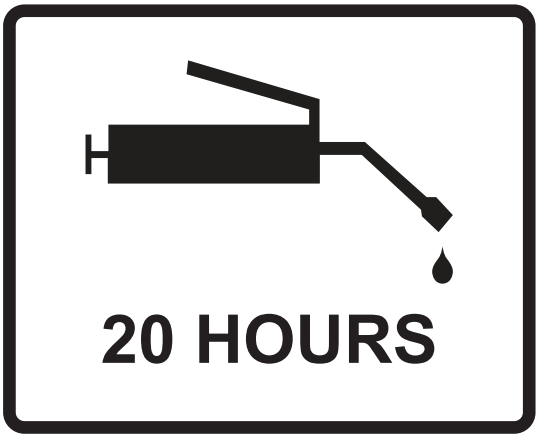
Part Number	Description
P1513101	
P1513016	

Table 1 Safety Decals (continued)

Part Number	Description
9909-00017	
9909-00026	
9909-00036	

Table 1 Safety Decals (continued)

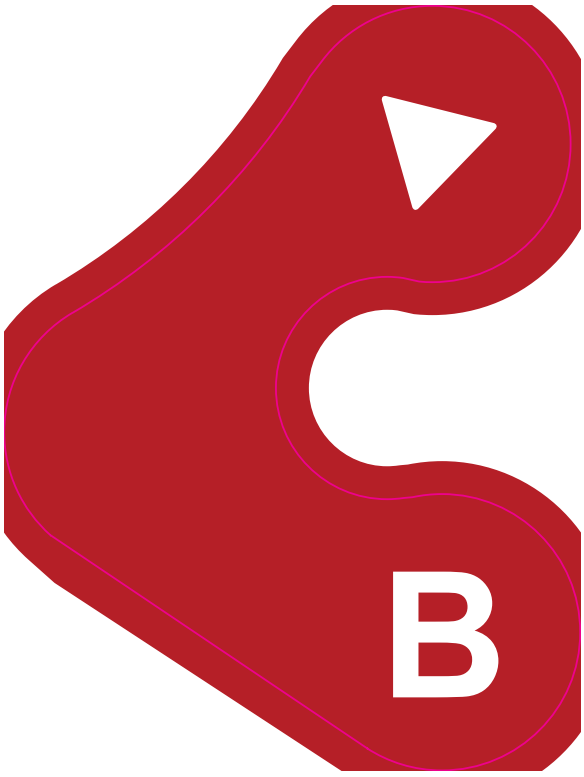
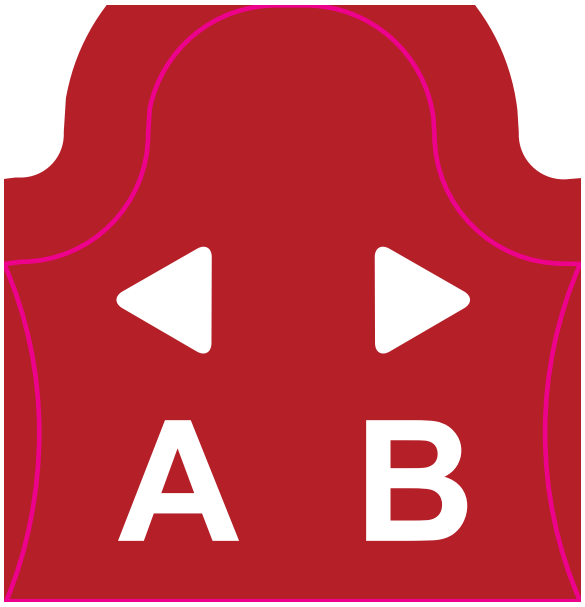
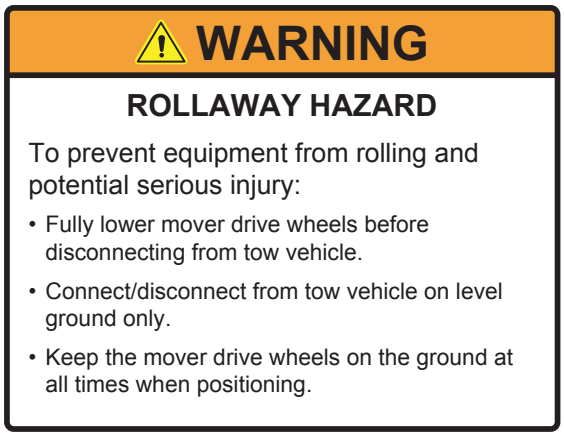
Part Number	Description
9909-00041	
4400-41117	
4400-41118	

Table 1 Safety Decals (continued)

Part Number	Description
4400-41119	
4400-41123	

3. Features

This section covers the main features of the seed treater.

3.1. Main Components

The figure and table below covers the main components of the seed treater.

Figure 1. Main Components

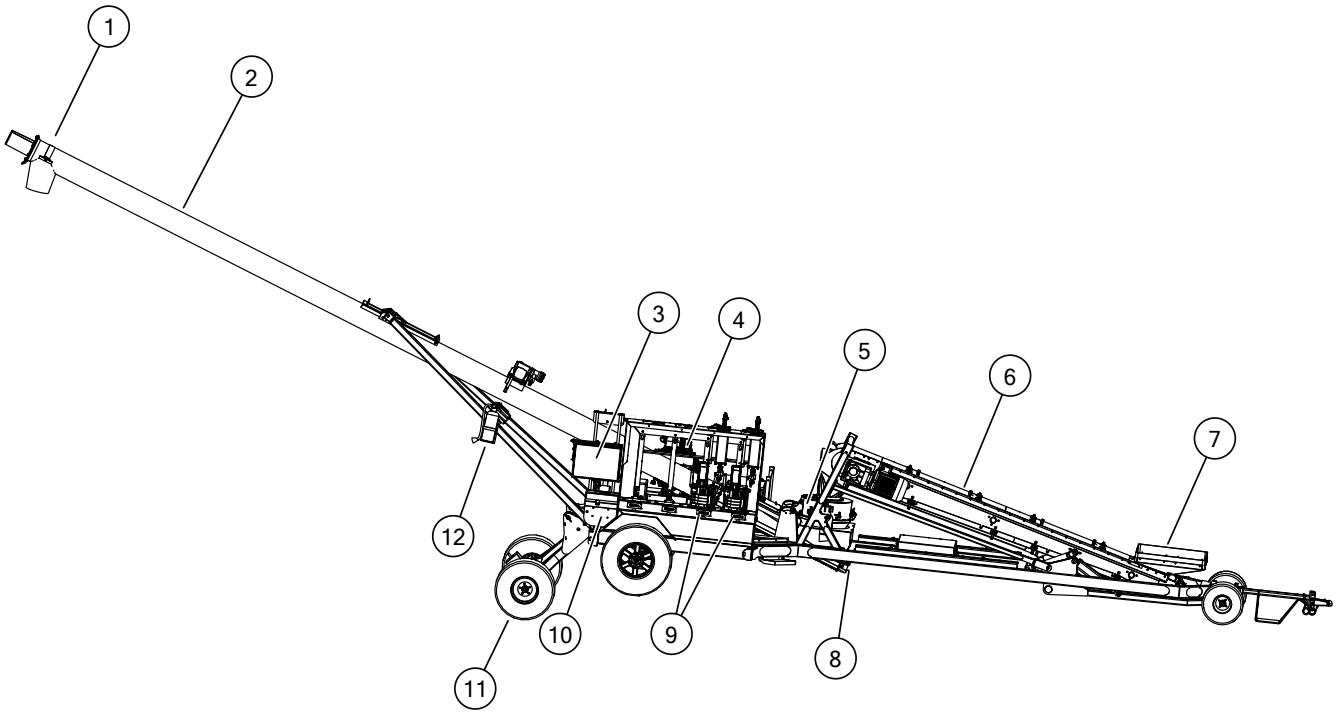


Table 2. Main Components

Item	Description	Item	Description	Item	Description
1	Discharge Spout	6	Conveyor	10	Transport Wheels
2	Mixer	7	Hopper	11	Mover Controls
3	Control Screen	8	Steering Wheels	12	Mover Wheels
4	Engine	9	Pumps	13	Fire Extinguisher
5	Atomizer				

Figure 2. Operator Station

Figure 3. Mover Controls

3.2. Controls

The STORM mixer section has the following controls:

Mechanical Controls

- Engine throttle with variable RPM.
- Gas generator for control system (start/stop/prime switch and hour display)
- Mover kit controls move/steer the unit.
- Electric switches for positioning.
- Key to start Vanguard engine and display (RPM, etc.).
- Electric switch for positioning the control screen.
- Lighting switch.
- Emergency Stop: Front of control panel.
- Lever to operate the mixer flighting (forward/reverse).

Touch-Screen Controls

- Configure, calibrate, run and stop jobs.
- View job information and system status.
- Prepare pumps and conveyor for treating.
- Control pumps and conveyor for clean up.

3.3. Tablet and Smartphone Connection

You can connect to the STORM's equipped wifi and operate the seed treater remotely from a nearby location. To connect, simply use your device and select STORM wifi, then enter the password storm2020.

⚠ WARNING When operating remotely, make sure you have a clear view of the seed treater and surrounding area and ensure that no one is in the work area.

4. Preparation

4.1. Emergency Response Plan

A response plan must be developed before using the seed treater the first time to be prepared in the event of an emergency. Keep a copy of the plan in the safety products storage box. This section provides guidance on developing your emergency response plan.

When developing an emergency response plan, include the following:

Potential Emergencies

Emergencies that could occur are:

- Safety: cutting, severing, crushing, entanglement, electrocution, hydraulic fluid injection, chemical contact/ irritation, burns.
- Environmental: site contamination, chemical spills, seed spills, treated seed spill.

Training and Procedures for Emergency Response

When training employees on an emergency response plan, know the following:

- Collect employee information including contact numbers, next-of-kin, and medical care. Keep this information in the manual container.
- Know who to call, information about the employee, and the nature of the emergency.
- Complete emergency response training prior to the start of each treating season.
- Test employees to be sure they know what to do in an emergency situation.
- Keep records of training and trained employees.
- Know the location and use of common emergency equipment.
- Know the potential emergencies (see above) that could occur, and how to respond.
- A worker at the site should be trained in First Aid and CPR.
- Know how to use the provided safety equipment.
- Know how to contain and properly clean up a small chemical spill to minimize or prevent environmental damage.
- Review and understand applicable product labels and Material Safety Data Sheets (MSDS) for chemicals that are being used.

4.2. Safety Training

After reading this manual and completing training, an operator must be able to:

	Explain the established procedures for the use and care of emergency and safety equipment including: • Personal Protective Equipment (PPE) • The first aid kit • The eyewash station • The fire extinguisher
	Explain procedures for: • Safe and effective application of seed treatment products • Care, operation, and cleaning of seed treatment equipment • Labelling of treated seed
	Describe spill cleanup procedures and know where the emergency supplies and equipment are located.
	Describe the components of the Emergency Response Plan, including: • safety or environmental hazards that could occur • how to respond in the event of an emergency

4.3. Containment

The STORM seed treater is designed to contain potential treatment escape/spills. Set up of additional containment areas is not necessary, but may be set up on-site, if desired. The containment pan is equipped with drain valves to assist with cleanout. Keep the containment pan drain valves closed prior to treating seed.

5. Transport

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

5.1. Transport Safety

WARNING

- Check with local authorities regarding transport on public roads. Obey all applicable laws and regulations.
- Always travel at a safe speed; the seed treater can be transported up to a maximum of 50 mph (80 km/h) where permitted by law.
- Yield to other drivers and allow faster traffic to pass.
- Make sure all the lights and reflectors that are required by local authorities are in place, are clean, and can be seen by all over-taking and oncoming traffic.
- Do not transport during times of limited visibility such as fog, snow, or heavy rain. Take extra precautions at night and at dusk.
- Keep others away from the transport vehicle and seed treater.
- Do not allow riders on the seed treater or towing vehicle during transport.
- Stay away from overhead obstructions and power lines when operating and transporting. Electrocution can occur without direct contact.
- Fully lower the seed treater before transporting, and only raise when next to storage facility.
- Always attach safety cables for transport on roadways.
- Empty seed treater of all grain or seed before transporting. Transporting a full seed treater will place excessive loads on the tube, frame, axle, hitch, and tow vehicle.
- Do not transport on slopes greater than 20°.
- Do not transport with an under-inflated tire(s).
- If the seed treater wheels are partially or fully buried in snow or grain, failure to clear area around the wheels before transporting may cause damage to the seed treater or result in serious injury.
- Do not detach the seed treater from the transport vehicle on uneven ground.
- Ensure the mover wheels are engaged and bearing weight before detaching the seed treater from the transport vehicle

5.2. Transport Procedure

1. Lower the mixer to its lowest position.
2. Lower the conveyor to its lowest position.
3. Use the steering lift control to raise the seed treater hitch.

Note

Keep the frame level.

4. Use the joystick to move the seed treater and align the hitch and tow vehicle ball hitch.
5. Remove the pin and slide the hitch lock into the unlocked position on the seed treater.
6. Use the steering lift control to lower the hitch onto the ball of the vehicle hitch.
7. Slide the hitch lock forward, and replace the square pin.
8. Use the steering lift to lower the hitch until the transport tires are lifted off the ground and the transport pin can be installed.
9. Turn off engine.
10. Connect the safety cables securely to the towing vehicle, crossing underneath. Leave cables slack enough for angular movement.

    ⚠ WARNING Do not tow with a worn or damaged safety cable.

11. Connect the transport lights and test each function before transporting.

Figure 4. Positioning Controls

Figure 5. Transport Position/ Location of Transport Pin

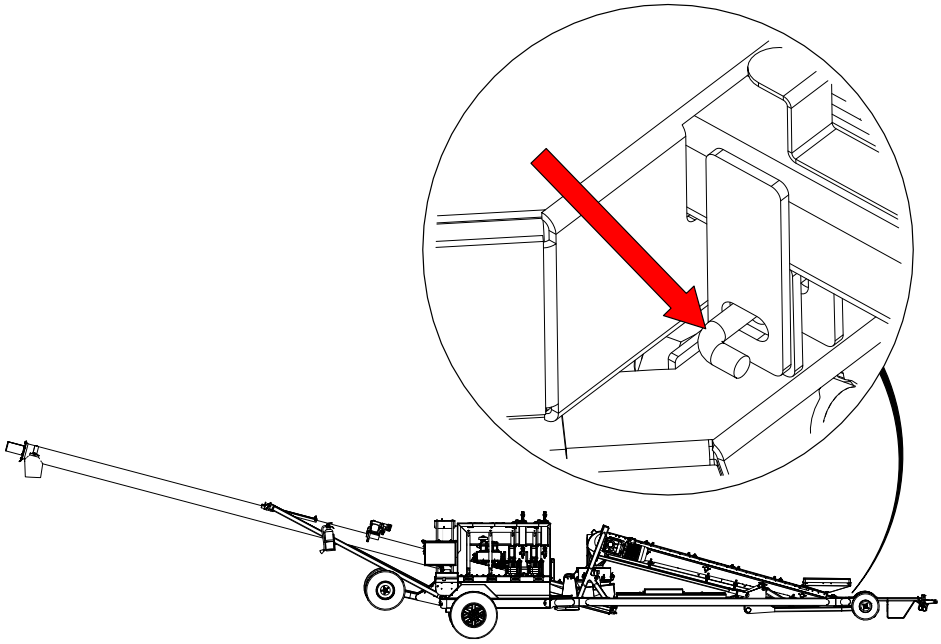
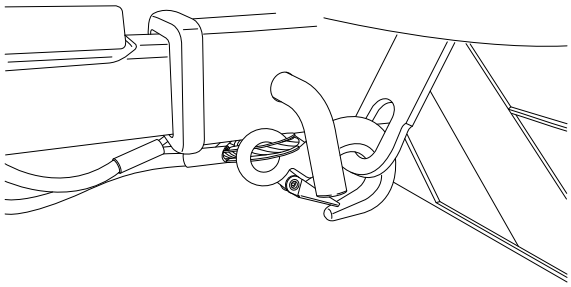


Figure 6. Correct Safety Cable Connection



6. Placement

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

6.1. Placement Safety

WARNING

- Anchor intake end before using.
- Place the seed treater on reasonably level ground before operating. The seed treater could topple if ground is too uneven.
- Chock the seed treater wheels after placement.
- Check that wheels are free to move before raising or lowering the seed treater.
- Never attempt to increase height of the seed treater by positioning wheels on lumber, blocks, or by any other means.
- Do not permit anyone to stand beneath the seed treater when raising or lowering.
- Move the seed treater into position slowly. Do not unhitch and attempt to move by hand.

6.2. Position the Seed Treater

When properly positioned for treating, the conveyor frame will be level with the ground and the conveyor intake will be under the seed discharge (hopper bin).

1. Use the drive and positioning controls to raise and lower the frame to ensure the equipment does not drag on the ground, or impact the bin support legs and foundation.

   Important

   Keep the frame as level as possible. The atomizing chamber must be positioned vertically or treatment quality will be affected.

2. Use the joystick to move the seed treater slowly towards the bin until:
   a. the conveyor intake is directly under the bin discharge.
   b. the flow of grain from the bin is directed onto the cleated area.
3. Use the mover and positioning lifts to engage the bin.
4. Use the mixer control to raise the discharge spout above the truck. Keep some clearance between the bottom of the discharge spout and the truck.
5. Adjust the conveyor intake next to the seed discharge (hopper bin) so that it is nearly contacting it.

   Note

   This allows the conveyor to be flood filled and improves treating accuracy.

Figure 7. Positioning Controls

Figure 8. Placement Position

7. Operation

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

7.1. Operation Safety

WARNING

- Keep away from rotating and moving parts, including the conveyor belt, auger flighting, drive components, shafts, and bearings.
- Do not enter the grain bin or truck while the seed treater is operating.
- Always operate with guards, covers, and shields in place.
- Have another trained person nearby who can shut down the equipment in case of accident.
- Keep the work area clear of bystanders.
- Keep the work area clean and free of debris.
- Ensure maintenance has been performed and is up to date.

7.2. Pre-Season Tasks

Complete the following tasks annually before starting each treating season.

- Review the Emergency Response Plan with all personnel who will be operating and assisting with operation of the seed treater, see Section 4.1 – Emergency Response Plan on page 31.
- Check for and Install control system software updates, see Section 10.2 – Updating System Software on page 72.
- Complete pre-season maintenance, see Section 8.2 – Maintenance Schedule on page 47.
- Run the system with a "dummy job" (without seed and using water instead of treatment). This will allow you to make sure the system is running properly/verify liquid amounts with no leaks before using treatment chemical which can be messy. Refer to the Operation sections that follow.

7.3. Conveyor Break-In

Table 3 lists the recommended break-in activities for the conveyor assembly.

Table 3. Recommended Conveyor Break-in Activities

Time	Treating Speed	Activity
30 min	70%	Run the conveyor unloaded to ensure it is aligned and to identify other problems.
10 min	100%	Run the conveyor at full speed with seed (if possible), but do not run pumps. During this time the mixer should also be run at the highest speed.
1st Treatment	50%	Run the treater at 50% treating speed for 1st treatment run of the season to help with mixer flow.

It is normal for small chunks of rubber to separate from the intake seals and conveyor belt during break-in.

Ensure the belt is tracking in the center of the conveyor. Wing seals should contact the rubbers on both sides of the conveyor intake.

If any unusual noises or vibrations are encountered, determine the source, shut the mixer off, lock out the power source, and adjust. If unsure of the problem, or the procedure to fix it, contact AGI.

7.4. Treating Seed

Overview

To treat seed, you need to perform a test weight procedure, create a job, calibrate the pumps, apply treatment and run the mixer, shut down the seed treater, and finally clean up the site. These options are covered in the sections that follow.

The control screen powers on within one minute of the generator being started.

7.4.1 Create a Job

To create a new job, first give it a name, then enter information about the seed, followed by selecting or entering treatment information. A maximum or 20 jobs can be configured and stored for use.

Turn on the generator and engine.

1. Go to the Job screen and follow the prompts to start a New Job.

   Note

   New jobs can be created either by starting from a job with all parameters blank, or by copying an existing job and continuing to use it with a different name.

2. Enter a Job Name (description).

   Note

   Use the treatment type and seed product as the job name, such as “Wheat— Raxil Pro.”

3. Enter the seed information including seed type, density (grams per 0.5 L), and target treating speed. For seed density measurement procedure, refer to Section 10.1 – Test Weight Procedure on page 71.

   Note

   Run the treating speed at 50% for 2–4 hours while breaking-in new equipment, or when running the equipment after prolonged storage.

4. Enter treatment information including treatment name and application rate (label rate). There may be pre-programmed treatments listed or custom treatments can be entered.

   Note

   Custom treatments require a treatment name, application rate, and dilution amount to be entered. Dilutions are considered based on the treatment product. Adding equal parts of water to a treatment is considered 100% dilution. Custom treatments can be saved and used in subsequent jobs.

The job is now created. Next, calibrate the pumps before operating the treater and treating seed.

7.4.2 Calibrate the Pumps

Calibrating the pumps enables the seed treater to provide the correct amount of treatment for the anticipated seed. Calibration requires the use of the calibration cylinders, treatment products, and the calibration control screens accessed via the touchscreen display.

The pumps need to be calibrated when:

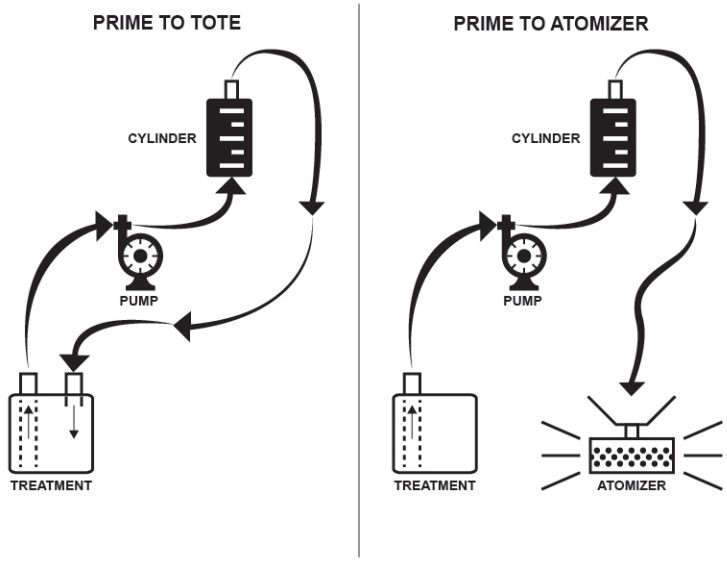
- a job is created
- the temperature changes. For example, colder weather will increase the viscosity of the treatment.
- pump tubing wear may impact pump output.
- the treating speed in a job has been changed due to a seed flow correction.

Note

If a “9” is displayed in front of the three digit calibration number (rpm), this means that the pumps are using an estimated value for calibration and should be re-calibrated. The “9” will disappear once the system is re-calibrated.

To Calibrate the Pumps:

Prime the pump and purge the air from the system.



Important

Calibrate the most viscous treatment first.

1. Apply petroleum jelly to the coupler
2. Connect to the seed treatment product container using the coupler.
3. Remove the hoses from the storage tray and place them on the ground.

   Note

   This will help to ensure that air is removed from the hoses.

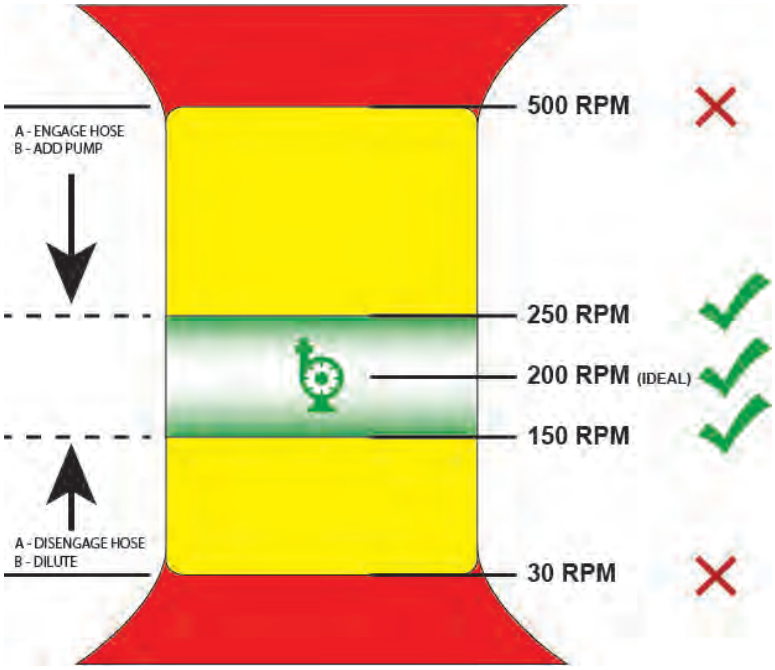
4. Prime the pumps.

   Note

   If the cylinder movement is jerky and not smooth, there may be air trapped in the system. Look for leaks, run backwards, and reprime.

5. The pump will run, filling the cylinder until it is fully extended.
6. Follow the prompts on the screen.

Figure 9. Setting the Pump RPM



Note

To disengage a hose, close that hose's valve and put its shoe in the storage position.

7. The controls will now automatically calibrate the seed treater by operating the pump forwards and backwards, attempting to reach 98–102% of the pump flow.
8. Each cycle is timed and after each test, the pump speed is automatically adjusted until the cylinder is filled in the correct amount of time.
    a. If the correct amount of time to fill is achieved, the results screen appears allowing the operator to accept the results or continue calibrating.
    b. If the result is less than or equal to 2% difference, a results screen will be displayed allowing the user to do two or more of the following:
        - continue calibrating until the time is satisfied
        - accept the result

Repeat the calibration procedure for multiple pumps (if applicable).

7.4.3 Operate the Treater & Treat Seed

When operating the seed treater for the first time, the chemical hoses may be filled with antifreeze and will need to be flushed out. Refer to the appropriate procedures in the Maintenance section.

1. Ensure the intake hopper is flooded with seed.
2. Select the job to use and verify that the seed and treatment parameters are correct for the application.
3. Connect the seed treatment containers to the pumps.
4. Prime the pumps. Make sure treatment is at the atomizer.

5. Jog the conveyor until seed is at the atomizing chamber / nozzles.
6. Continue to the operation screen.
7. Set the minimum mixer speed.
8. Start the mixer empty and set it at 400 rpm (forward direction) by adjusting the engine throttle knob.
9. Enter a specific amount of seed to be treated if desired. The treater will run until the amount is reached or the operator stops the machine.
10. Start treating seed.
11. Adjust mixer rpm to ensure that it is adequate for the application.

    Note

    Typically, 350 rpm is a good starting point. Mixing may be improved by increasing the angle of the mixer (higher angle results in more mixing) or changing the mixing speed.

12. Run until the desired amount of treated seed is obtained. Stop treater. Do not stop the mixer until the it is empty.
13. Adjust the seed flow calibration, if required.

7.4.4 Update the Calibration

After a batch of seed is treated or continuous operation has ended, a seed flow correction screen will be displayed showing the estimated weight of seed that was treated and will prompt the operator for actual weight of seed treated. Entering the actual weight will improve treating precision for the next job.

1. Weigh the actual amount of seed that was treated.

    Note

    If you don’t know or are unable to determine the exact amount of seed that was treated, you can use the amount estimated on the screen.

2. Enter the actual weight. The electronics will recalculate the seed delivery and required treatment flows and correct the pump rpm automatically.

    Note

    Corrected rpm is displayed with a “9” prefix indicating they are estimates.

3. The system will then ask you to re-calibrate to verify that its adjustments are correct. Re-calibrate as required, see Section 7.4.2 – Calibrate the Pumps on page 40.
4. The corrections will be saved for use the next time the job is utilized.

7.5. Emergency Stop

Although it is recommended that the seed treater be emptied before stopping, in an emergency situation press the emergency stop button. The emergency stop will stop the conveyor, seed treatment metering pumps, and atomizer. To stop the mixer, use the hydraulic controls.

Do not use the emergency stop as a lockout for equipment service or maintenance. Use the hydraulic lever to stop the mixer.

For the location of the emergency stop button, refer to Section 3. – Features on page 27.

7.6. Restarting a Full Seed Treater

The seed treater may be filled with material if it is shut down inadvertently or for an emergency. To restart:

1. Stop treating.
2. Run the mixer tube until empty. If that isn't possible, lower the discharge. If lowering the discharge doesn't work, lift the mixer boot, place a catch pan underneath, open the boot clean-out, and then run mixer flighting backwards.
3. Close any clean-out doors, return the seed treater back to its operating position, re-start the system and resume treating.

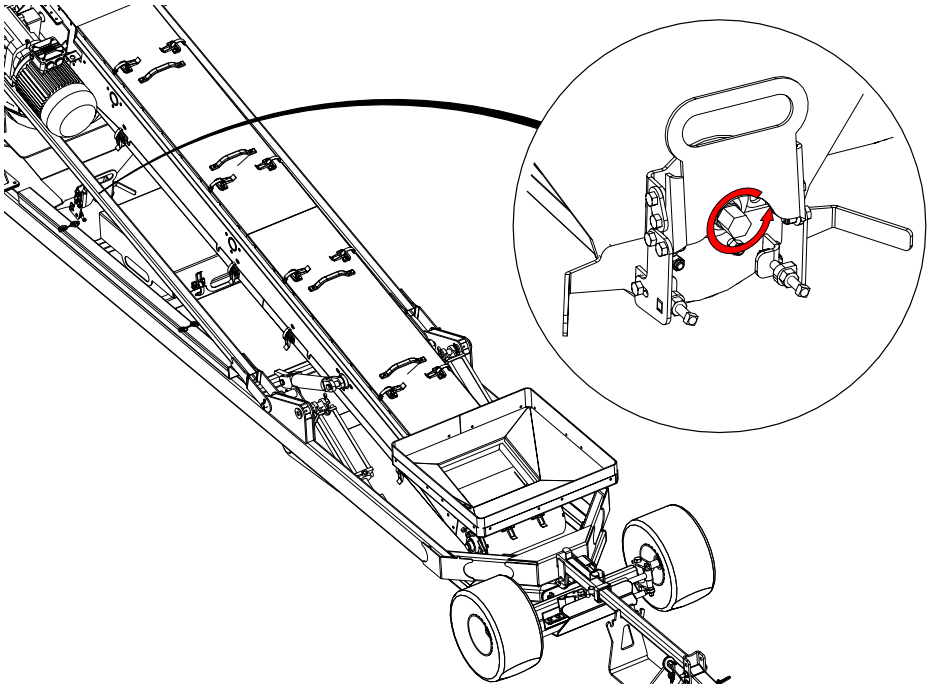
To unplug the mixer manually:

1. Lift the mixer boot to its maximum raised position.
2. Turn off the motor.
3. Open the cleanout door at the boot of the mixer.
4. Attach wrench to the 1" hex and turn counter-clockwise to empty mixer.

NOTICE Possible damage to the mixer when removing dried seed.

Do not allow seed to dry in the mixer. Clean material from the mixer after treating is complete.

Figure 10. Mixer Boot Hex



7.7. General Clean-Out Procedure

Complete a general clean-out after each treatment is completed or before switching treatment types. A more thorough, advanced clean-out should be completed at the end of each day, or more often if desired, see Maintenance section for that procedure.

1. Go to the cleanout screen on the HMI.
2. Run the mixer forward until empty.
3. Lift the mixer boot off ground and place a catch pan under the boot clean-out door.

   Note

   Run the mixer at a low speed with the engine at idle.
4. Raise the mixer (for better flow back). Open the mixer boot door and run the mixer backwards until it is empty.
5. Run metering pumps backwards until empty.
6. Unscrew the filter caps and empty the remaining treatment into the container.
7. Choose calibration position and run water through the system.

   Note

   Male couplers are included to allow for connection.
8. Choose treating position and run water through the system.
9. Undo the atomizer latches.

   ⚠ WARNING To avoid injury, lock out power to the mixer by turning off the engine.
10. Open the atomizing chamber.

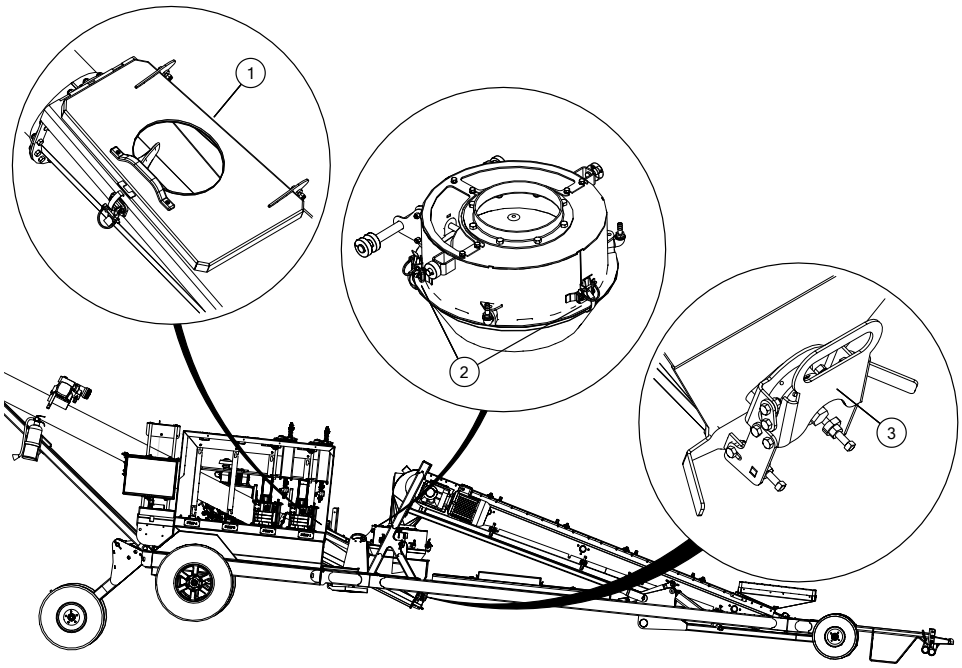
    NOTICE To avoid damage to the equipment ,pin the atomizer latches in the open position.
11. Use compressed air or water to clean out the atomizing chamber and mixer boot

Figure 11. Atomizer in Cleanout Position

12. Go to the clean-out screen.
13. Open the conveyor covers to remove remaining untreated seed.
14. Clean the filter strainers, see Section 8.9 – Clean the Filter Strainers on page 52.

15. Dispose of collected waste in accordance to local standards and/or as defined by seed treatment product labels.

Figure 12. Cleanout Access



Item	Description
1	Mixer Inspection Door
2	Atomizer Latches
3	Mixer Boot Cleanout Door

7.8. Chemical Spill Cleanup

The seed treater is equipped with spill clean-up gear including an aluminum shovel, broom, bag of absorbent material, and paper towel.

It is recommended to also carry heavy duty garbage bags, water, and other clean-up materials as recommended by the seed treatment manufacturer. Ammonia or bleach cleaners can be helpful when cleaning up treatment stains.

Seed Treatment Spill - Small

1. User paper towel and wipe up or use a shovel and broom as applicable.
2. Dispose of waste as per seed treatment manufacturer’s label instructions or at an approved chemical waste disposal site.

Seed Treatment Spill - Large

1. User a combination of absorbent material and paper towel to soak up the spill or use a shovel and broom as applicable.

2. Dispose of waste as per seed treatment manufacturer's label instructions or at an approved chemical waste disposal site.

Treated Seed Spill

Use shovel and broom to retrieve and dispose of treated seed as per the treatment manufacturer's label recommendations.

7.9. Storage

After the season's use, the seed treater should be thoroughly inspected and prepared for storage. Repair or replace any worn or damaged components and perform maintenance as described in the Maintenance Section to prevent any unnecessary downtime at the start of the next season.

To ensure a long, trouble-free life, this procedure should be followed when preparing the unit for storage.

1. Remove all residual material from the mixer and mixer boot, conveyor and conveyor intake.
2. Wash the entire seed treater thoroughly using a water hose or pressure washer to remove all dirt, mud, debris, or residue.
3. Inspect all moving or rotating parts to see if anything has become entangled in them. Remove any entangled material.
4. Touch up all paint nicks and scratches to prevent rusting.
5. Check tire pressure and inflate. For inflation pressure, refer to Section 11. – Specifications on page 76.
6. Inspect the seed treater for cracks, tightness of fittings and fasteners, hydraulic hose cracks (if applicable). Have required repairs performed to replace worn or damaged components.
7. Store in an area that is dry, level, free of debris, and away from human activity. Store inside if possible.
8. Cover the conveyor intake and motor with a waterproof tarpaulin if stored outside to protect from weather.
9. Chock wheels.
10. Support intake on blocks to eliminate prolonged contact with the ground.
11. Coat exposed hydraulic cylinder shaft(s) with a light film of grease to protect from the environment.
12. Open the pump shoes to release pressure on the tubing.
13. Place the seed treater in its transport position.

8. Maintenance

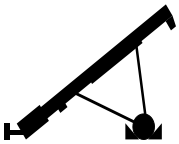
Before continuing, ensure you have completely read and understood this manual's Safety section, in addition to the safety information in the section(s) below.

8.1. 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 written authorization from the manufacturer. Modification can be dangerous and result in serious injuries.
- Shut down and lock out power before maintaining equipment.
- After maintenance is complete, replace all guards, service doors, and/or covers.
- Use only genuine STORM replacement parts or equivalent. Use of unauthorized parts will void warranty. If in doubt, contact STORM or your local dealer.

Before attempting maintenance of any kind:



- Lower the seed treater fully.
- Chock wheels.
- Support tube if performing maintenance on the undercarriage assembly.
- **If equipped with hydraulics:** Before applying pressure to a hydraulic system, make sure all components are tight and that hoses and couplings are in good condition.

8.2. Maintenance Schedule

Proper maintenance habits mean a longer life, better efficiency, and safer operation. Please follow the Maintenance Schedule below. Keep good records of the hours the seed treater has been operated and the maintenance performed.

For Maintenance of the gas engine or generator, consult the engine Operator's Manual.

Item	Pre-Season	Daily	Weekly	Two Weeks	Yearly (or end of Season)	As Required
Section 8.3 – Visually Inspect the Seed Treater on page 48	x	x			x	
Check motor oil, generator oil, hydraulic oil, and fuel.						x
Section 8.15 – Check and Replace the Pump's Chemical Hoses on page 56	x					
Section 8.13 – Check and Maintain the Containment System on page 54	x			x		
Section 8.8 – Check the Chemical Pump Rollers and Main Pump Bearing on page 51	x					
Section 8.7 – Clean the Atomizer and Chemical Hoses on page 50			x			
Section 8.14 – Advanced Mixer Clean-Out on page 55		x				
Section 8.12 – Clean the Conveyor Belt on page 53		x				
Section 8.9 – Clean the Filter Strainers on page 52		x		x		
Section 8.11 – Drain Antifreeze from the System on page 53	x					
Section 8.10 – Fill the System with Antifreeze on page 52					x	
Section 8.4 – Grease the Bearings on page 49	x				x	
	x				x	
Section 8.16 – Inspect/Replace the Conveyor Rollers and Bearings on page 58	x					
Section 8.17 – Tension the Conveyor Belt on page 59	x	x				
Section 8.18 – Align the Conveyor Belt on page 60	x	x				
Section 8.19 – Clean and Wash the Equipment on page 62	x			x	x	
Section 8.20 – Inspect Belt Lacing on page 62	x					
						x

8.3. Visually Inspect the Seed Treater

⚠ WARNING Lock out power before inspecting.

Check the following during a visual inspection:

1. Ensure all guards are in place and in good working order.

2. Examine the seed treater for damage or unusual wear.
3. Check tightness of bolts/nuts, fasteners, and hardware (re-torque if necessary).
4. Be sure all safety decals are in place and are legible.
5. Check that the discharge and intake area are free of obstructions.
6. Inspect all moving or rotating parts to see if anything has become entangled in them. Remove any entangled material.
7. Inspect hydraulic hoses and fittings for leaks and wear. Fix or replace where necessary.
8. Check wheel bolts are tight and examine tires for gashes, uneven wear, or loss of air pressure. See Section 11. – Specifications on page 76 for recommended tire pressure and torque information.
9. Check all operating, lifting, and transport components. Replace damaged or worn parts before using the seed treater.
10. Make sure access, service, and cleanout covers are in place and secure.

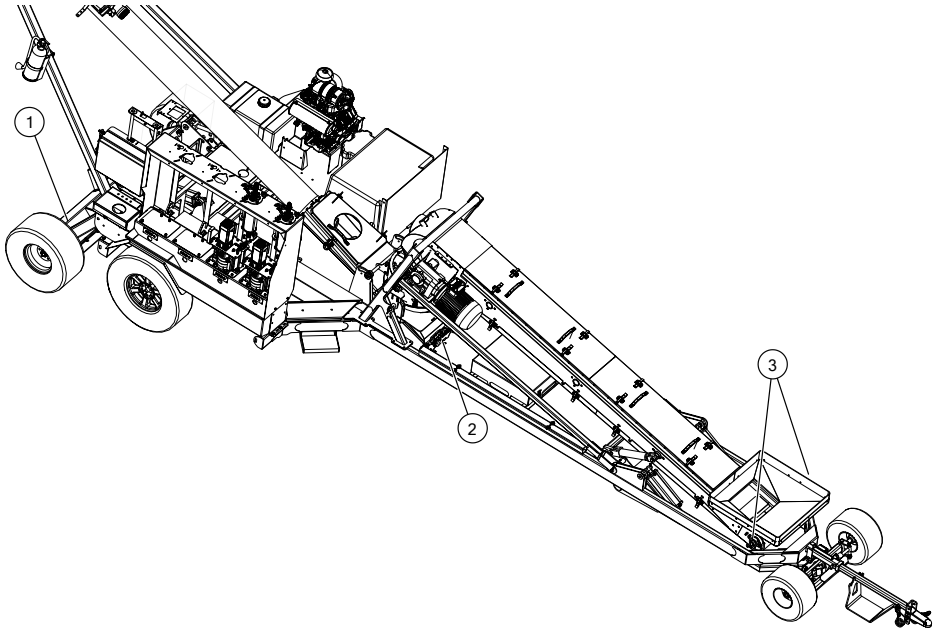
8.4. Grease the Bearings

To keep the system operating effectively, check all grease points (bearings, zerks, chains) and ensure that they are sufficiently well greased.

Refer to Section 11. – Specifications on page 76 for grease and oil types.

1. Clear the chain coupler of debris and spray with chain oil.
2. Grease the conveyor bearings (3).
3. Grease the mixer lower bearing (2).
4. Grease the front wheel move pivot (1).

Figure 13. Bearing Locations



8.5. Remove and Clean the Calibration Cylinder

1. Remove the actuator lock knob.
2. Rotate the actuator out of the way.
3. Loosen the two hold down knobs and slide them out of the way.
4. Disconnect the 2–way ball valve by releasing quick coupler.
5. Release the lower quick coupler then slide the calibration cylinder up and out of the frame.

   NOTICE The limit switch installed in the calibration cylinder can be damaged during this procedure. Take care to while removing and cleaning the cylinder.
6. Remove the three tie rods from the cylinder.
7. Open the cylinder lid.
8. Rinse residue off the top of the piston.
9. Pull out the piston and rinse it.

   Note

   Dispose of waste water.
10. Inspect the piston for scoring and/or seal damage then replace damage elements.
11. Reinstall the cylinder, working backwards from step 9 of this procedure.

8.6. Test Calibration Cylinder Limit Switch

1. Go to sensor test in the cleanout and maintenance tab.
2. Open the two way valves.
3. Set the three-way valves to Calibrate (Cal.).

   Note

   Ensure the cylinders are reaching their full extension and retraction when setting sensors. Ensure the sure cylinder is clean and empty; residue in the cylinder could affect the setting.
4. Open the pump shoes.
5. Install the male half of the quick coupler on the intake line.
6. Move the piston to the top and bottom of its stroke making sure that the sensor activates on the screen (turns green from red)

8.7. Clean the Atomizer and Chemical Hoses

After operating the seed treater, thoroughly clean the system to ensure efficient operation for the next treating application.

Use the Flush Out function on the system maintenance screen.

Refer to 2.6 Seed Treatment Safety, page 8 for information on safe disposal of contaminated rinse water.

1. Place the seed treater in the clean-out position. Place a container under the seed treater to catch runoff.

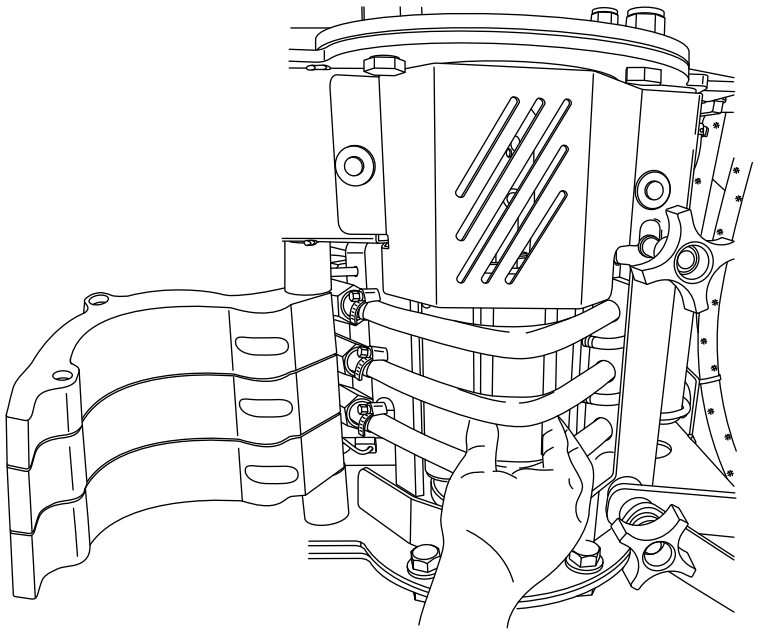
2. Open all clean-out doors and covers.
3. Use the system pumps to run water to flush the hoses and clean out the atomizer.
4. Use an additional water hose to flush out the atomizer chamber.

Figure 14. Clean-Out Position

8.8. Check the Chemical Pump Rollers and Main Pump Bearing

1. Ensure the power is off.
2. Open the covers and confirm the pump rollers move freely.
3. Check for up and down movement of main pump bearing. Movement should not exceed 1/8".
4. Ensure the bearing rotates smoothly and without noise.

Figure 15. Chemical Pump Rollers

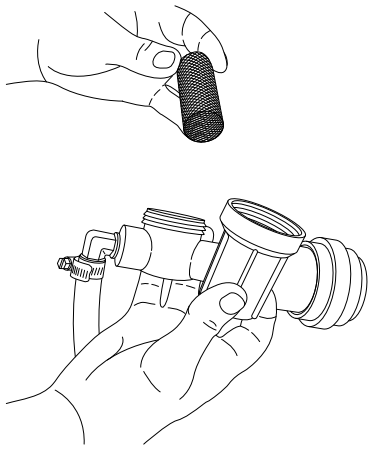


8.9. Clean the Filter Strainers

1. Unscrew the cap and rinse residue from strainer and replace. Replace the cartridge if it is damaged.

   Note
   Watch for the rubber seal that seals the cup to the body, it can get lost easily when cleaning.

Figure 16. Strainer



8.10. Fill the System with Antifreeze

At the end of each treating season, fill the chemical hoses with antifreeze to keep them in good condition.

Use the Flush Out function on the system maintenance screen.

1. Place hose ends in antifreeze.

2. Turn the pumps on, run antifreeze through the system.

   Note

   Use the sensor test screen to router liquid through the calibration cylinder.

8.11. Drain Antifreeze from the System

At the start of each treating season, drain antifreeze by flushing the Pumps, Hoses, Filters, and Coupler. Run the pumps until clear.

Use the Flush Out function on the system maintenance screen.

1. Drain and collect antifreeze from treatment lines and filters.
2. Store the antifreeze for further use or dispose of safely.
3. Flush all hoses and lines with water, and dispose of rinse-water safely (it will contain anti-freeze).
4. Ensure pump shoes are closed.
5. Run pumps forward and backward, and check for any unusual noise or actions.

8.12. Clean the Conveyor Belt

1. Remove the four conveyor covers and underside door.
2. Lift conveyor out of frame using the "Conveyor lift" button, see Figure 17.
3. Run the conveyor using the **Flush Out** function; use compress air to remove build-up.
4. Check the belt and lacing and corners for seed residue and blow all dust out the conveyor with high pressure air.

Figure 17. Clean-Out Position

8.13. Check and Maintain the Containment System

Chemical Hoses

Ensure nothing is caught in the hoses, if there is, flush out with water or replace the line if necessary.

Catch Containers

Replace if these are worn or contain cracks/holes.

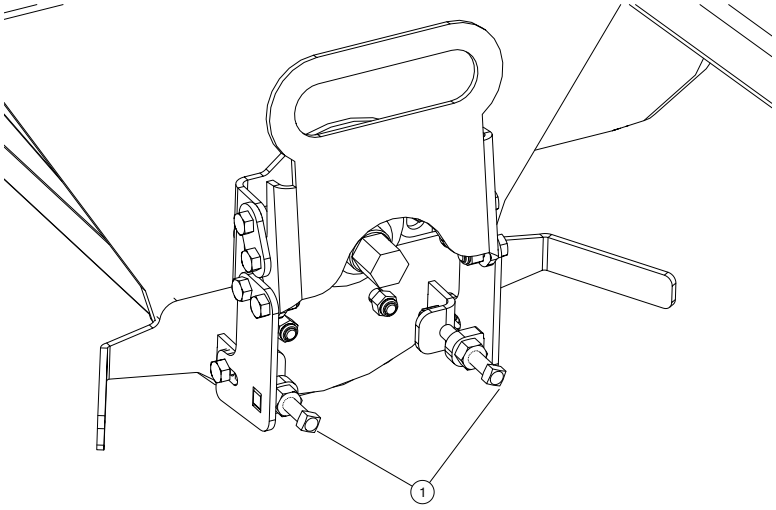
Fittings

Check for leaks at intake filters and other connection points, replace if cracked or worn.

Mixer Boot Clean-out Door

Make sure the neoprene seal is in good condition, replace if damaged. Ensure the adjustments bolts (1) exert equal pressure.

Figure 18. Mixer Boot Clean-out Door Seal



8.14. Advanced Mixer Clean-Out

Complete this procedure as required to keep the seed treater operating effectively.

1. Position the equipment to provide access to the end of the mixer/discharge spout.
2. Lockout power to the mixer.
3. Unplug the encoder.
4. Remove the crossbolt at the bottom of the flighting.
5. Remove guard, encoder, and flange from spout end.
6. Slide flighting out of the mixer through the spout end.
7. Clean mixer with compressed air or water.
8. Reassemble.

Figure 19. Location of Crossbolt

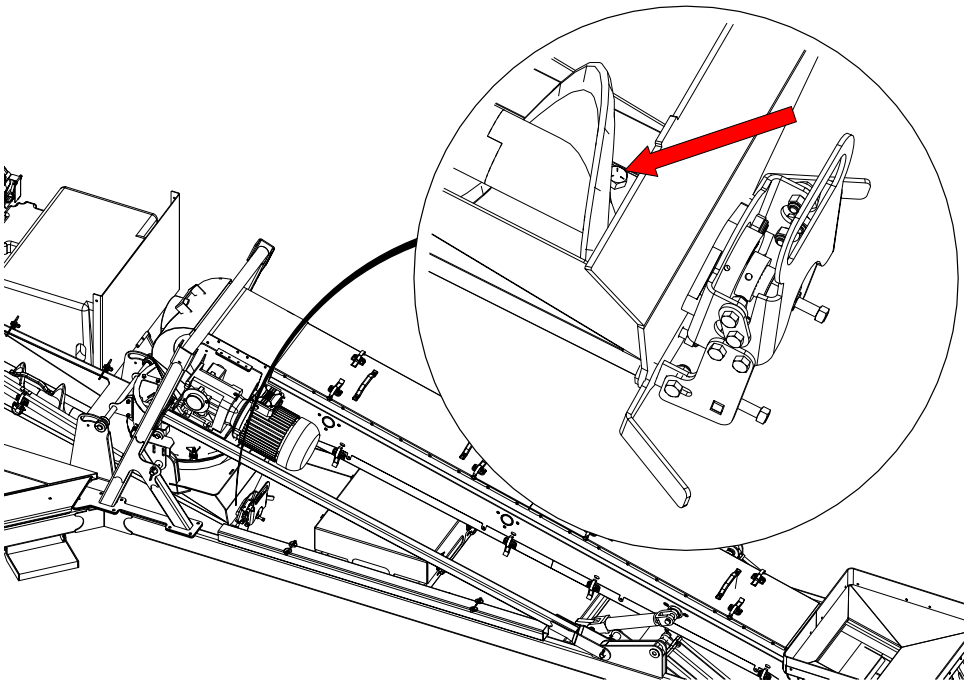
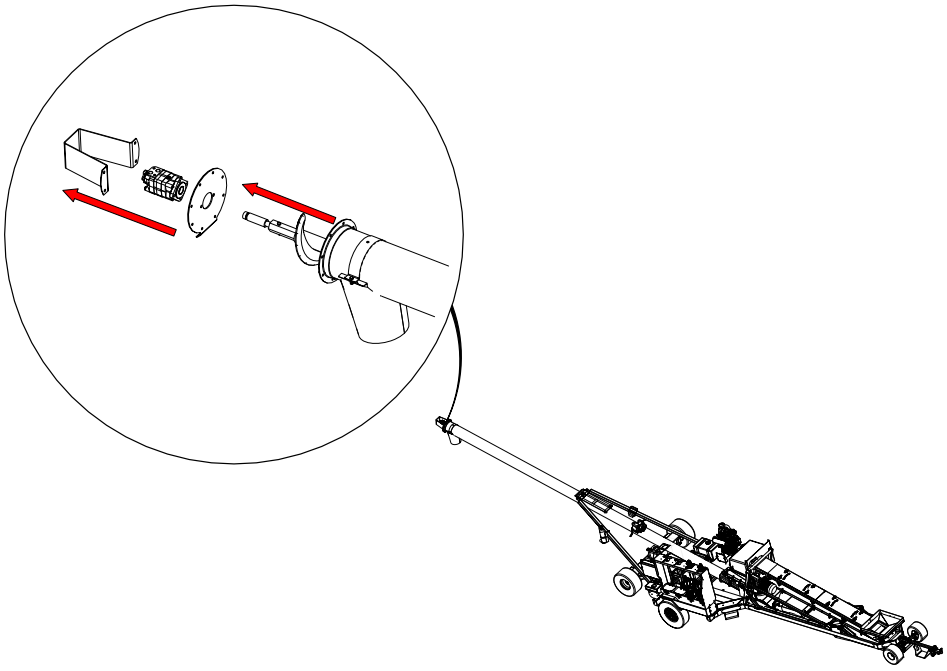


Figure 20. Removing the Flighting



8.15. Check and Replace the Pump's Chemical Hoses

To prevent chemical leaks/spills and ensure accurate metering, change pump tubing annually or if there are kinks, wear, or leaks.

For hose type and length, refer to Section 11. – Specifications on page 76.

To replace the pump's chemical hoses:

1. Remove clamps and hoses.
2. Check the length of the new hose is identical to the hose being replaced.

   Important

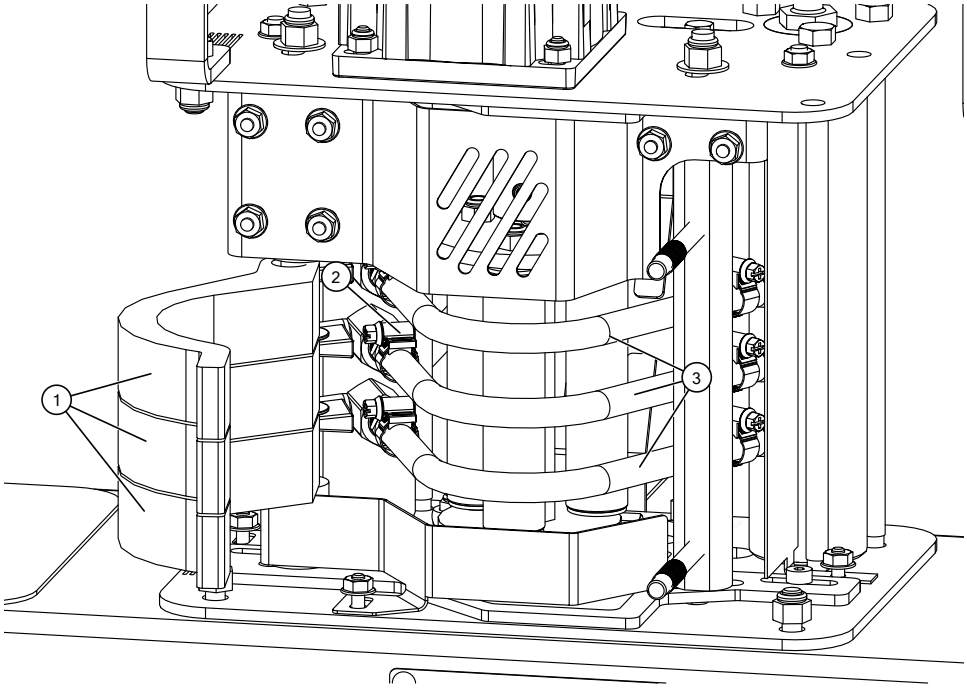
   Replacement hoses must be identical in type and length or the pump may not meter treatment correctly.

3. Slide the new hoses on and reconnect the clamps.

   Note

   Use rubbing alcohol or soapy water to aid in getting hoses on.

Figure 21. Clamps and Hoses



Item	Description
1	Hose Clamps
2	Pump Shoes
3	Hoses

8.15.1 Pump Tubing Break-In

The pump tubing elements require a minimum 30 minute break-in period in order to meter consistently. If proper break-in is not performed, the system will not calibrate correctly.

This procedure must be repeated each time that pump tubing is changed.

For each new pump tubing element:

1. Go to Cleanout and place the system into the Calibrate system.
2. Disconnect the hoses from the fittings on the 3–way valve block.

3. Connect a male coupler to the dry-break coupler of the associated pump, and place the couplers in a suitably large-volume container of water.
4. Route the hoses from the top of the calibration cylinders into the pail of water.
5. On the touch screen, select **Flush Out** from the Maintenance screen.
6. Ensure that the pump with the tubing element that is intended for break-in is set to On and in the Forward direction.
7. Ensure that the pump with the tubing not intended for break-in is set to Off.
8. Press **Start** and run the pump for a minimum of 30 minutes circulating water the entire time.

8.16. Inspect/Replace the Conveyor Rollers and Bearings

Inspecting the Conveyor Rollers and Bearings

To inspect the rollers, listen for the belt slipping (squealing sound) from the drive roller on the conveyor.

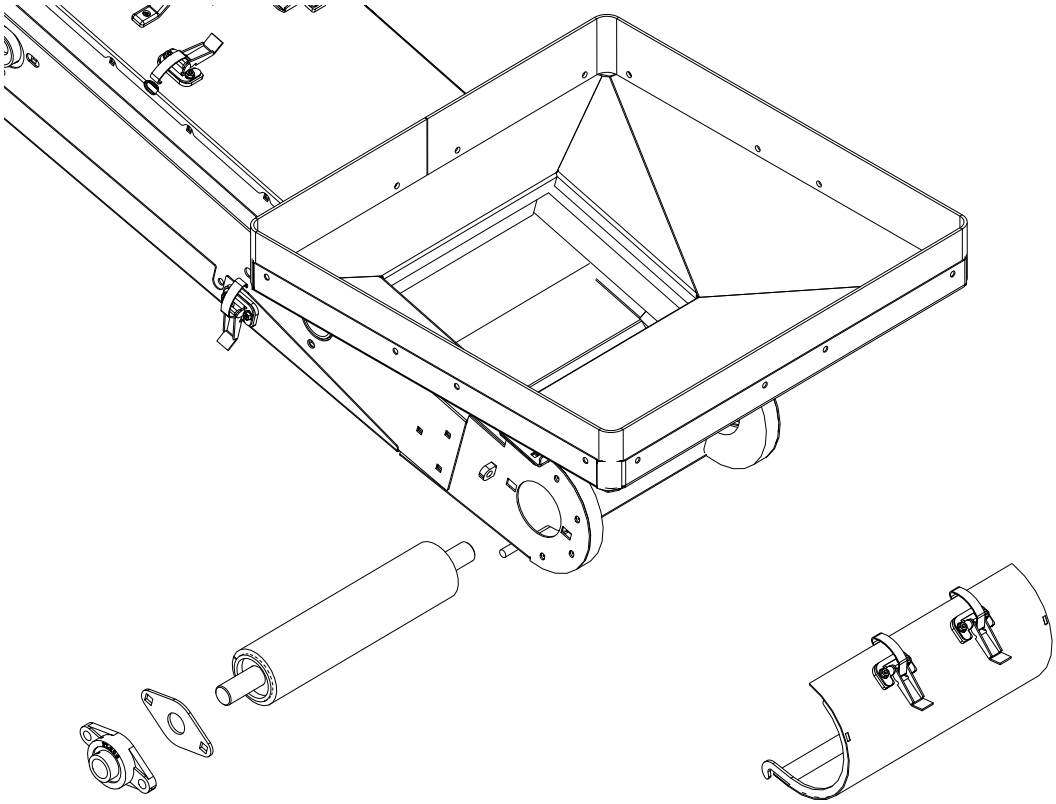
NOTICE Operating the conveyor with a damaged roller will result in a damaged conveyor belt.

Check the roller bearings for wear. Any rollers making noise, getting hot while running, or that give should be replaced.

Replacing a Conveyor Roller and Bearing

1. Remove and replace the components as shown in Figure 22

Figure 22. Replacing a Conveyor Roller



8.17. Tension the Conveyor Belt

A correctly tensioned conveyor belt is essential for metering accuracy.

Ensure the belt is thoroughly clean prior to tensioning or aligning the belt. Foreign materials may affect tension and alignment. Refer to Section 8.12 – Clean the Conveyor Belt on page 53.

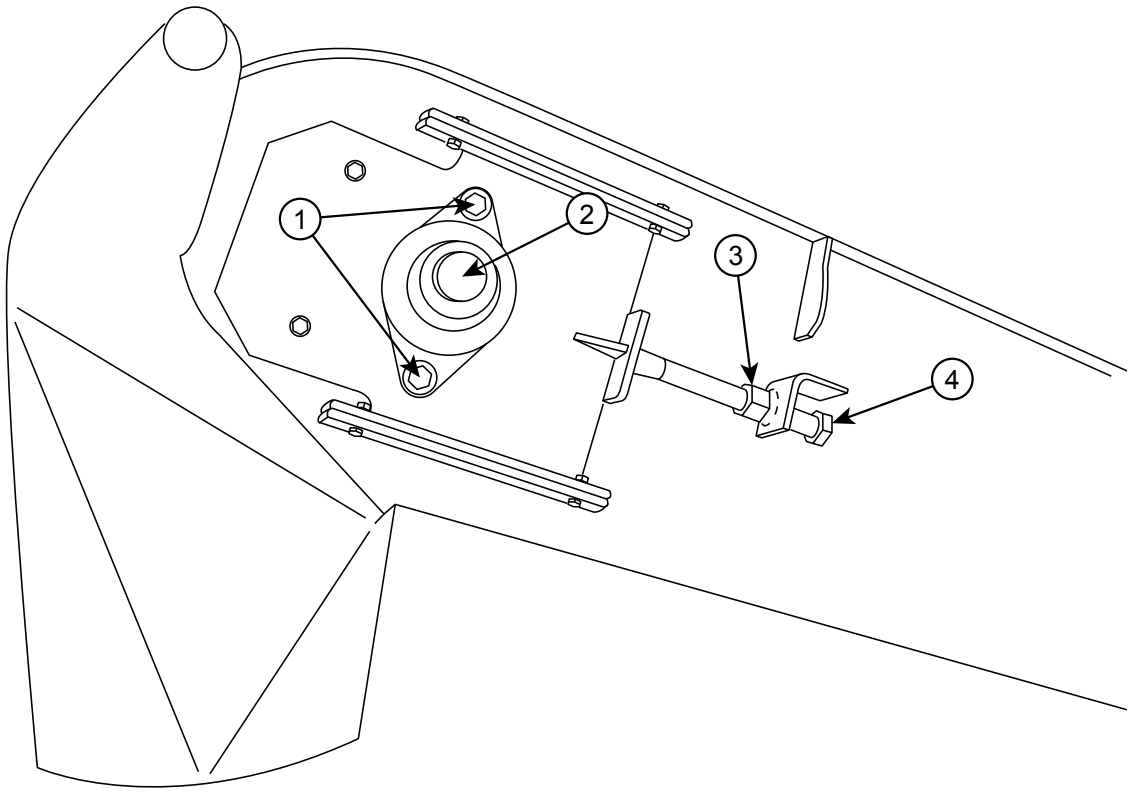
The conveyor belt only needs to be tight enough to not slip on the drive roller. If the belt is too loose, it will slip on the drive roller making a noticeable sound, slowing the belt down. The conveyor belt should pull roughly level with the conveyor side channel with 5–10lb of force, otherwise the belt will require tensioning, or loosening from being too tight.

NOTICE Failure to stop using a conveyor with a slipping belt will damage it and/or the drive roller lagging. In extreme cases, sections of burnt belt will have to be replaced. This type of damage is not covered by warranty.

To set correct conveyor belt tension:

1. Loosen the bearing bolts and jam nut at the spout roller, see Figure 23 on page 60.
2. Tighten the tightener bolts equally, use a tape measure to verify.
3. Tighten the bearing bolts and jam nut (if included).
4. Ensure the hopper roller is tensioned equally by using a tape measure to check both sides.
5. Check the belt tension by running the conveyor for one minute. If the conveyor belt is not slipping, then proceed to next step; otherwise repeat from step 1.
6. After the conveyor belt has been tensioned, check the alignment of all rollers, see Section 8.18 – Align the Conveyor Belt on page 60.
7. If the conveyor belt is still loose after tensioning, the belt needs to be shortened or replaced (depending on wear).

Figure 23. Conveyor Hopper



Item	Description
1	Bearing Bolt and Nut
2	Spout Roller
3	Jam Nut
4	Tightener Bolt

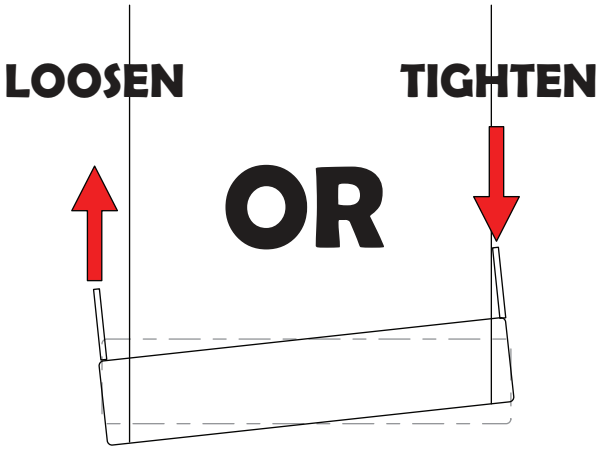
8.18. Align the Conveyor Belt

Basic Conveyor Belt Alignment:

The conveyor belt will run straight when all of the rollers are straight.

Loosen or tighten the adjustment bolt(s) to align the conveyor belt. Tighten the side the belt has moved toward, or loosen the side the belt has moved away from.

Figure 24. Roller out of Alignment



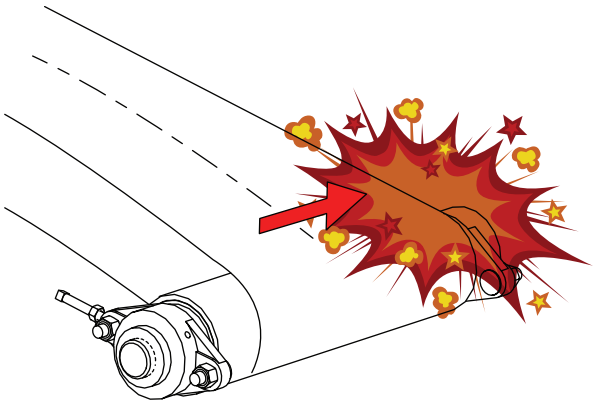
Before Aligning the Belt:

- The conveyor must be empty of all grain.
- Wait until the belt makes a complete revolution before adjusting the rollers. Some belts may have uneven edges, appearing misaligned.

To Align the Belt:

If your belt is tracking off-center, follow the sections and steps in the order following to center it.

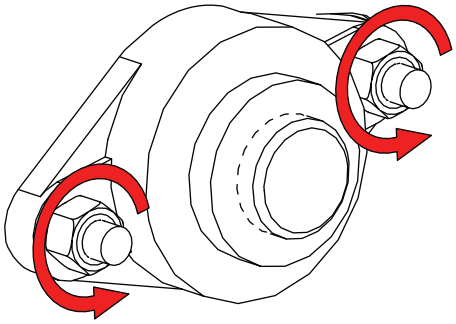
Figure 25. Belt Tracking to One Side



8.18.1 Adjust the Rollers

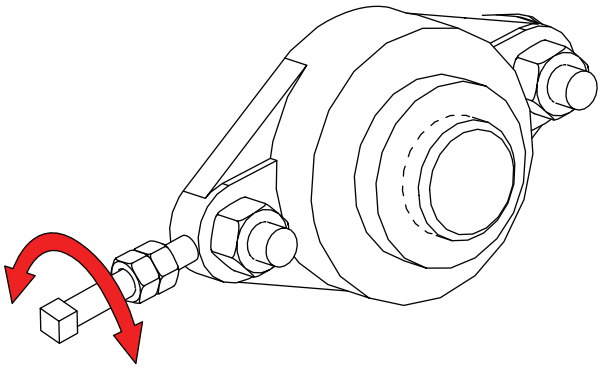
1. Loosen bearing nuts and jam nuts (if equipped).

Figure 26. Loosen the Bearing Nuts



2. Rotate adjustment bolt 1/2 turn.

Figure 27. Rotate the Adjustment Bolt



3. Restart conveyor and run empty for 1 minute.
4. Stop the conveyor and remove ignition key or lock out the power source.
5. If the belt has centered, move to next step. If not, repeat Step 2 to Step 4 until the belt is centered.
6. Tighten the bearing bolts and jam nut (if equipped).
7. Replace any guards that were removed.

8.19. Clean and Wash the Equipment

1. Clean out excess grain from all areas of the seed treater.
2. Make sure water can drain from the seed treater tube and intake, then wash the tube with a water hose or pressure washer until all dirt, mud, debris, or residue is gone.

   Important

   Do not contact electronic controls with high pressure washer.
3. Provide sufficient time for the water to drain from the seed treater.

8.20. Inspect Belt Lacing

Inspect the condition of the belt lacing, if any clips are worn through, contact qualified service personnel for replacement.

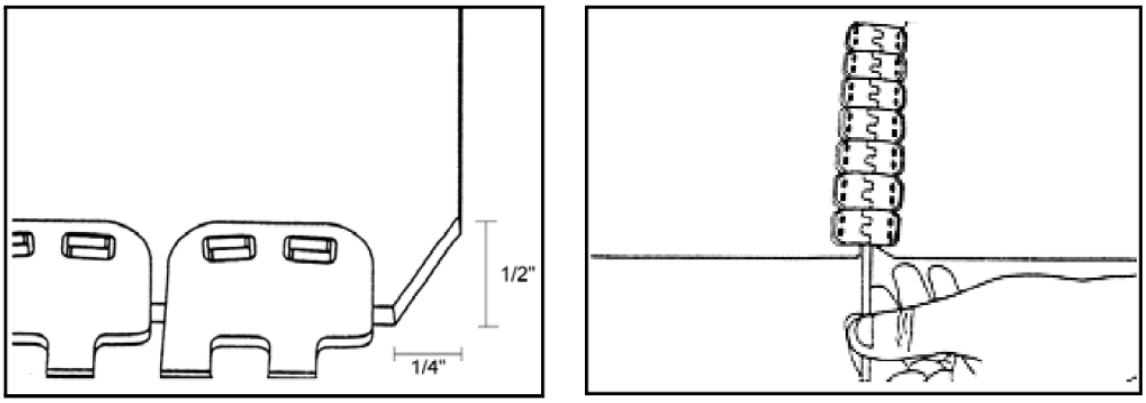
8.21. Replace the Conveyor Belt

1. Remove the conveyor cover and rotate the conveyor belt until the lacing is by the hopper or is easily accessible.
2. Move the tension roller to its loosest position.
3. Pull all the slack to the lacing area.
4. Remove the lacing retainer clip and pin.
5. Attach one end of the replacement belt to the belt end being removed, closest to the hopper.
6. Pull the old belt out and the new belt will be threaded into place.
7. Disconnect the old belt.
8. Reattach conveyor belt ends together.

   Note

   Replace the top UHMW seeds if they damaged.
9. Install the lacing pin and crimp the retainer clips onto each end of the lacing pin.
10. Tighten the conveyor belt, see Section 8.17 – Tension the Conveyor Belt on page 59.
11. Check and set the belt alignment, see Section 8.18 – Align the Conveyor Belt on page 60.
12. Engage the conveyor drive. Allow it to run for 30 seconds, then shut down the conveyor and inspect the lacing.

Figure 28. Lacing the Conveyor Belt



8.22. Change the Hydraulic Oil and Filter

Change the hydraulic oil and filter to remove any accumulation of dirt or condensation in the system. Do not over-fill the reservoir. Leave space to allow for level fluctuation. Refer to Section 11. – Specifications on page 76 for oil type.

9. Troubleshooting

9.1.

⚠ WARNING Shut down and lock out all power sources before diagnosing any of the causes or attempting any of the solutions below.

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

If you encounter a problem that is difficult to solve, even after having read through this section, please contact STORM Customer Service at 1-855-662-6609. Before you contact them, please have this operation manual and the serial number from your machine ready.

Problem	**Cause**	**Solution**

⚠ WARNING Shut down and lock out all power sources before diagnosing any of the causes or attempting any of the solutions below.

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

If you encounter a problem that is difficult to solve, even after having read through this section, please contact your local dealer or distributor. Before you contact them, please have this operation manual and the serial number from your machine ready.

Seed Treating Issues

Problem	Cause	Solution
Seed rates are outside of the expected +/-5%	Cleated conveyor belt is slipping on the drive rollers or catching on conveyor frame.	Adjust belt tension and tracking.
	Inconsistent feed rate to conveyor	During operation, ensure that the metering conveyor is full across the cleats.
		Check for blockage of the conveyor intake.
		Ensure that the seed supply gate is fully opened and completely flooding the intake of the conveyor
		Center the conveyor intake under the seed supply opening.
		In a non-typical situation when the conveyor is not being flood fed, like when supplying the conveyor from a truck with a rear opening, the height of the seed in the intake must be the same as the height of the fully deployed and flooded intake hopper.

	Conveyor intake wiper is out of adjustment.	Hopper bent, call customer service.
	Inaccurate Density Measurement	Perform density test as perSection 10.1 – . on page 71
	Contaminated Seed	Dust and fines will affect metering densities. Be aware that samples taken at the bottom of seed hoppers may not represent the seed due to the accumulation of dust and fines. Perform a seed flow correction by weighing a load to increase calibration accuracy.
	Electronics not achieving proper conveyor motor speeds.	Check Conveyor Drive ratio setting. It should be at the default value of 16.19:1.
		Ensure that the Conveyor Correction Factor is set at 1000.
		Generator not providing the correct voltage. Check voltage levels.
		Conveyor belt misaligned. Adjust belt alignment.
		Conveyor belt overtightened creating high amounts of drag. Reduce belt tension.
		VFD running in a fault condition. Check VFD screen in control box for status if not reported on HMI.
Pump won't calibrate	Limit switches out of adjustment	Set limit switches as per the Limit Switch Adjustment Procedure found in Section 8.6 – Test Calibration Cylinder Limit Switch on page 50
	Quick Couplers connecting the intake hose to the treatment totes not fully engaged	Check that all quick couplers are engaged. A coupler not engaged may eliminate a necessary flow path required in the calibration procedure.
	Faulty 2-way valve not sealing / locking the piston.	Go to Sensor Test Screen. Close 2-way valve in question. Put 3-way valve in Calibrate position. Run same pump with coupler directing flow from cylinder into container. If piston does not move, and liquid is flowing through valve, then valve is faulty. Replace valve.
	Faulty 3-way valve not directing the flow to the calibration cylinder.	Go to Sensor Test Screen. Put the 3-way valve in Calibrate position. Put 2 way valve in open position. Run same pump with coupler directing flow from cylinder into a container. If liquid is not flowing into the

		container, but is going into the atomizer, then valve is faulty. Check wiring and connections. Potentially replace valve.
	Build-up in the calibration cylinder	Remove and clean the calibration cylinder. Inspect seal for damage. Attach couplers to provide an open flow path and test cylinder. Piston should move up and down freely by hand.
	Cal cylinder is faulty	Remove and clean the calibration cylinder. Inspect seal for damage. Attach couplers to provide an open flow path and test cylinder. Piston should move up and down freely by hand.
	Air leaks in Calibration Apparatus	Look for small liquid leaks. Tighten hose clamps. Check fittings for tightness.
Pump won't prime	Air leak on intake.	Check treatment container connectors for correct fit, damage or manufacturing problems.
		Check filter is tight and seal is installed.
	Pump shoe is not fully engaged.	Tighten pump shoe knobs.
Pump output is inconsistent and outside of the expected +/-5%, or pump is difficult to calibrate	There is an air leak in the fittings on the intake line.	Confirm the location of air leak by removing the tubing from the connector assembly and placing it directly into the product. If calibration is normal, the leak is located in the connector assembly; replace the connector assembly.
		Check that the dry break couplers are fully engaged. Apply petroleum jelly and re-engage if required.
		Check the condition of the pump hose, especially inside of the pump and on the intake side of the pump. Ensure it is not cracked or badly distorted.
		Check for loose connections on the intake side of the pump. Tighten loose fittings and hose clamps. Check for cracked fittings or fittings that may not be have been assembled with pipe thread sealant. Replace and reassemble as necessary.
		Ensure the container attached to the pump is free of air leaks, including the connector assembly and drop tube.

		Check for filter seal and that filter body is tight.
	The line is restricted on the intake or output side of the pump.	Check the condition of the pump hose. Ensure it has not collapsed, has become plugged, or is worn-out.
		Check filter and nozzles for plugging.
		If in freezing conditions, check for frozen deposits in the lines.
		If using a slurried product, check for product settling in the lines.
	Pump is operating too slowly.	Some application rates, combined with low seed densities and slow treating speeds can result in slow pump operating speeds. Pump speeds under 10 rpm result in inconsistent flows and are not allowed by the software system. If possible, increase product application rate by diluting in order to increase pump speeds or re-configure pump to use less lines.
		Increase treating speed to increase pump speed if operating below 100%.
	Pump is operating too fast.	Viscous (thick) products with high application rates, combined with high seed densities and high treating speeds can result in the pump operating inefficiently. Decrease treating speed to reduce pump speed or re-configure pump to use more hoses, or split the flow between the pumps.
	Calibration results were outside 98–102%	Recalibrate to ensure the results fall within 98–102%.
		Verify the system is not adding a 9 as a prefix to the Calibration field on the Job Details screen. This prefix indicates the system is using an estimated value.
	Product condition is inconsistent.	Inadequate mixing may result in product stratification. Ensure that the product has been properly mixed prior to pumping the product with the STORM.
		Over-mixing can cause some products to foam. Consult with the product manufacturer for proper handling recommendations

	Product is too thick to meter properly.	Dilute product, if possible, to reduce viscosity. Re-calibrate as required to ensure accuracy of application.
		Some treatment products change in viscosity with temperature. Ensure calibrations are performed for the conditions at the time of treating.
	Pump is damaged.	Pump components may be damaged, worn, or warped. Replace if required.
Seed coverage is poor	Atomizer not spinning.	Check connections or for damage to the atomizer.
	Atomizer basket or mixing chamber is plugged.	Remove and clean components.
	Application rates are lower than 300 ml/100 kg of seed.	Consider increasing dilution of treating product or use second pump (if not being utilized) to add water to application.
		Coverage is best for wheat, peas and lentils at application rates of 400 to 600 ml/100kg.
		Coverage is best for barley and oats at application rates of 500 to 700 ml/100kg.
	Application rates are not being obtained.	Check seed delivery and pump rates and ensure they are being met.
	Seed condition is affecting coverage.	Dusty seed, dry seed, and frozen seed can affect coverage of many seed treatments.
	Treating speed is not optimal for mixer speed.	Running the mixer (auger throttle) too quickly or too slowly can result in insufficient mixing and result in poor coverage.
	Treatment product is too thick.	Thick treatment products may not cover seed adequately. Consult treatment product manufacturer for recommendations and dilute to reduce viscosity if possible
Excessive build-up in atomizing chamber and application boot.	Seed condition is poor (dusty, dry, etc.).	Dirty or dusty seed will cause build-up. Avoid using excessively dirty or dusty seed.
	Treatment product is too thick.	Thick treatment products can increase build-up. Consult treatment product manufacturer and dilute treatment if possible.

Build-up of treatment on metering conveyor belt.	Treatment is flowing when seed is not.	Check for interrupted seed flow. Do not operate the pumps with no seed flow.
	Seed is dusty.	Seed treatment will readily bind to the dust in the seed. Airborne particulates may stick to the conveyor belt.

Mixer

Problem	Cause	Solution
Mixer not getting up to speed.	Oil is cold.	Warm up oil before starting to treat.
	Low oil.	Ensure the system has adequate oil
	Plugged hydraulic filter.	Ensure filter is clean.
	Faulty components.	Contact customer service.
Mixer plugs.	Oil Cold. Mixer not getting up to speed.	Warm-up oil before starting to treat. Ensure 380–400 rpm can be achieved with the mixer. Lower treating speed if rpm range cannot be reached and adjust higher as oil warms.
	Mixer Tube not broken-in.	Begin the treating season by running the treater at 50% treating speed for two to four hours to eliminate any build-up in the tube that may hinder proper flow.
	Mixer coated with treatment residue and fines.	Some treatment and seed combinations and dust may cause build-up on the inside of the mixer tube. Clean with a water.
	Build-up in atomizer and boot.	Excessive Build-up in atomizing chamber and boot can prevent proper flow of seed. Cleanout.
	Hydraulic oil is hot.	Check oil. If too hot. Check hydraulic cooler for correct operation. Check fuse on fan. Check connections to battery, thermostat, and fan.
	Hydraulic oil level is low.	Add oil. Use correct oil for application as found in the specifications section of this manual.
	Shear pin broke or coupler has come loose.	Check that hydraulic motor is turning the flighting. Ensure shear bolt is correct part for the machine.
	Bearing Faulty.	Check condition of bottom flighting bearing. Inspect and grease daily. Replace as required.
	Obstruction in the tube	Identify and remove obstruction.

	Relief pressure set low.	Ensure relief setting is 2,800 – 2,900 psi.
	Too much treatment liquid in boot at start-up.	Ensure when priming the system that only a small amount of liquid is pumped into the atomizing chamber. Best practice is to recirculate back to the treatment tote to eliminate air from the system prior to calibration.

Mover and Lift Kit

Problem	Cause	Solution
Valve is leaking.	Loose/cracked fittings.	Tighten/replace fittings.
	Worn hose.	Replace hose.
	Valve spools are worn.	Replace valve.
Machine operates slowly.	Oil is hot.	Check oil level and add if required.
	Blockage in hydraulic lines.	Suction hose blocked or kinked.
	Power source is not producing enough oil volume and/or pressure.	Speed up the engine to produce more flow/pressure The power unit may not have enough capacity to operate properly.
	Filter plugged (if equipped).	Change filter.
Lift functions wont work	Fuse blown	Check fuse.
	Poor electrical connections.	Check power and ground connections at the Vanguard motor. Check electrical connections at the hydraulic valve. Check harness for worn through, pinched or damaged areas. Check connections in the switch box.
	Faulty Solenoid.	Test solenoid. Replace if faulty.
	Faulty switch in switch box.	Replace switch.
	Hydraulic oil level is low.	Add oil. Use correct oil for application as found in the specifications section of this manual.
	Lift cylinders faulty.	Check for leaks at the cylinder and repair and replace as required.

10. Appendix

10.1. Test Weight Procedure

Follow this procedure to achieve highly accurate seed density and highly accurate seed treatment application.

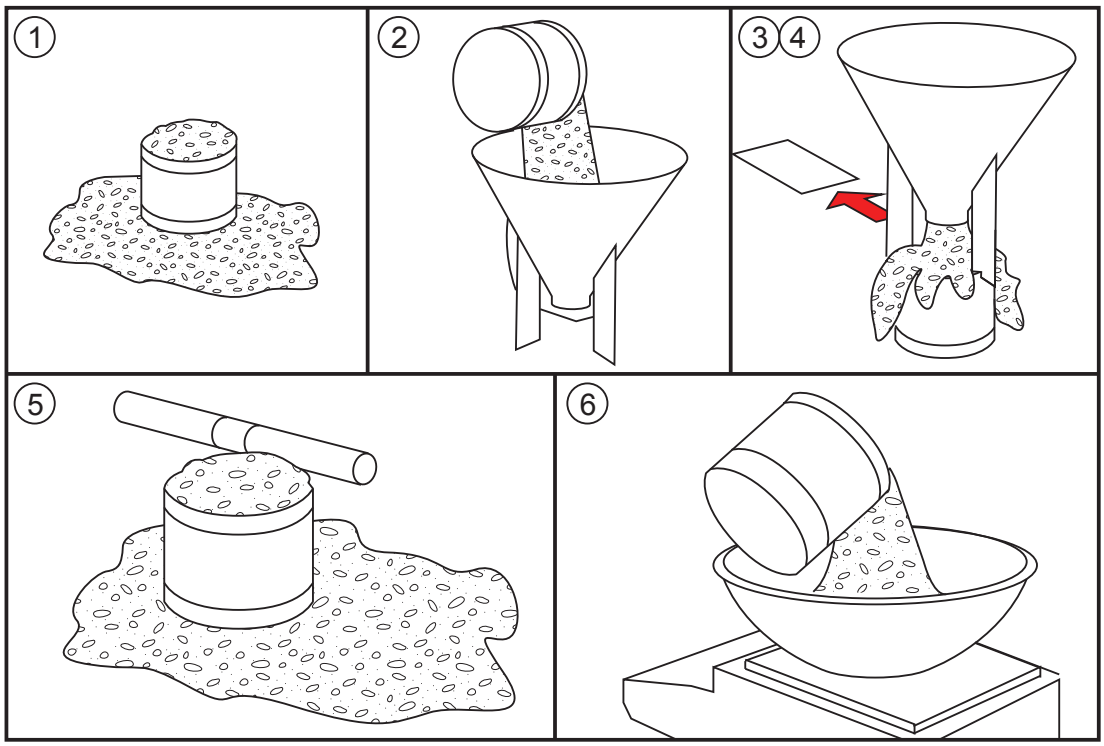
Repeat this procedure five times for best accuracy. Eliminate the highest and lowest value and average the three middle measurements for best results. The test should be performed on a representative sample. Seed collected from the bottom of the hopper bin may contain more dirt and fines and may not represent the actual seed.

1. Fill the 0.5 litre measure to overflowing with the grain to be tested.
2. Ensure the slide is inserted into the Cox funnel, then pour the contents of the 0.5 litre measure, plus an extra handful, into the Cox funnel.
3. Place the 0.5 litre measure on a solid base. Position the Cox funnel on top of the 0.5 litre measure so that the notched legs of the Cox funnel fit securely onto the measure's rim. Remove the slide on the Cox funnel quickly so that the grain drops evenly into the 0.5 litre measure.
4. Carefully remove the Cox funnel from the top of the 0.5 litre measure so as not to disturb the grain. Any jarring of the cup at this point will result in compaction of the grain in the 0.5 litre measure and could produce inaccurate results.
5. Place the hardwood striker on the rim of the 0.5 litre measure and, using three zigzag, equal motions, scalp off the excess grain in the measure.
6. Pour the grain remaining in the 0.5 litre measure into the scale pan. Determine the weight in grams of the grain in the scale pan.

Note

See www.labtronics.ca for further information, including test weight conversion charts.

Figure 29. Test Weight Procedure Steps



10.2. Updating System Software

To Ensure your STORM is operating at optimum levels, always install the most up-to-date software found on the "Downloading Software" tab.

The STORM control uses a USB Flash Drive to transfer treating history and to install new software. It is located under the USB port weather cap on the control box of your STORM.

Steps to Installing New Software

1. Ensure that important treating records and job information has been removed from the STORM controls. Updating the software will erase all data stored in the controls. To do this follow the instructions on the "Recording Treating History and Job Information" tab.
2. Format the USB flash drive by following the instructions on the "Formatting the USB Flash Drive" tab. Formatting will erase the entire contents of the USB flash drive.
3. Download the software and extract it to the USB flash drive by following the directions on the "Software Download Instructions" tab.
4. Install the software onto the STORM controls by following the instructions on the "Software Installation Instructions" tab.

If you are having issues with the download and installation process, please contact STORM Customer Service at 1.855.662.6609 or storm@aggrowth.com.

10.2.1 Viewing Treating History (All Jobs)

From the main screen, tap **Jobs — History**: The treating history maintains the details of the 100 most recent jobs. The treating history can be reviewed directly on the HMI by tapping the arrows and scroll bar to the right of the history details.

Tapping **Save to USB** allows you to save the history to a micro-USB flash drive installed in the USB port on the front panel. This button turns green then back to grey when the save is complete.

Tapping the **?** button displays the format in which the Treating History is saved.

Note

The STORM system saves the history file into the root directory of the USB flash drive unless the USB is storing software. In the event that the USB flash drive is storing software, the history file is saved as follows:

The STORM system saves the history file to the USB flash drive path “public/projects/magelis/data/alarm/eventgroup1”, with the file name:

AHyymmdd######.CSV

where:

AH is the prefix for all history files

yy is the year

mm is the month

dd is the day

is a six-digit number that identifies multiple files saved on the same day.

Important

The treating history file is saved in CSV (comma separated values) format, which can be opened in common spreadsheet software (e.g Microsoft Excel).

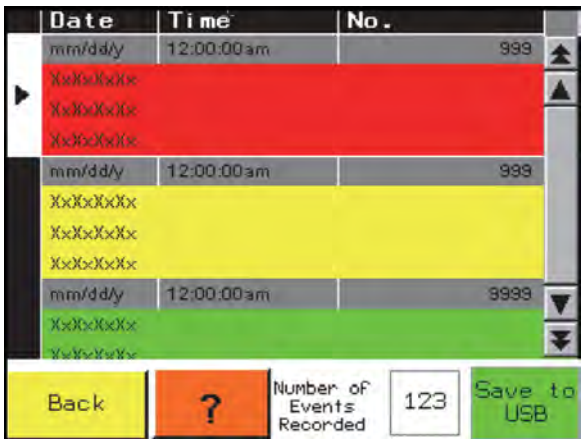
If the system estimates that there is five or fewer treatment entries remaining, the following warning message is displayed:

- “Treating History is almost full. Please save records to a USB flash drive to prevent loss of treating history.”

When treating history is completely full, the following warning message is displayed:

- “Treating History is FULL. Oldest treating records will be written over. Please save records to a USB flash drive to prevent loss of treating history.”

Figure 30. Treating History



Treating History Message Format
Date (yy/mm/dd), Time (24 hour), Job Name, Seed Type, Seed Calibration Weight, Seed Flow Correction, Seed Treated (lbs), Pump 1 Product Name, Pump 1 Application Rate, Pump 1 Calibration Number, Pump 1 Calibration Error Pump 1 Litres Used, Pump 2 Product Name, Pump 2 Application Rate, Pump 2 Calibration Number, Pump 2 Calibration Error, Pump 2 Litres Used, Pump 3 Product Name, Pump 3 Application Rate, Pump 3 Calibration Number, Pump 3 Calibration Error Pump 3 Litres Used, Pump 4 Product Name, Pump 4 Application Rate, Pump 4 Calibration Number, Pump 4 Calibration Error Pump 4 Litres Used

10.2.2 Formatting a USB

How to Format a USB Flash Drive Using a PC

1. Put your USB in the USB port on your computer.
2. Click the start-up icon on the lower left side of the screen.
3. Click on "Computer" on the right side.
4. Right click on "Removable Disk" or the name given to your USB.
5. Click "Format". Ensure that the file system type is selected as fat32 and that quick format has been selected for the formatting option.
6. Click "Start".

How to Format a USB Flash Drive Using a Mac

1. Insert USB flash drive into the USB port on the computer.
2. Click "Finder" -> "Applications" -> "Utilities" -> "Disk Utility".
3. On the left side, click your USB. Choose the root folder, and not the indented folder below it.
4. Click "Erase".
5. Click "Erase" again.

Note

Formatting can take a few seconds or a few minutes.

If you are having issues with the download and installation process, please contact STORM Customer Service at 1-855-662-6609 or storm@aggrowth.com.

10.2.3 Downloading Software

Steps to Downloading the Software

1. The STORM USB Flash Drive is located under the USB port weather cap on the control box of your STORM unit.
2. Once you have located the USB, insert it the USB port on your computer. The flash drive may appear on your desktop as removable drive.
3. If you have both the STORM FX and STORM PRO, please make sure you downloading the correct files for the model you will be updating.
4. Click the "Downloading Software" tab for the latest software version. Both .exe and .zip files are available for your convenience. Although the .exe file is recommended, some firewalls may prevent the file from being downloaded to your computer. We assure you that the files are virus free and safe for download. If you are not able to download the .exe file, a.zip file is available. Please note that with the .zip version, you will need to extract the data before saving it to your USB. This requires .zip software. Visit www.zipeg.com for more details.
5. When you click the software version of your choice, your browser will automatically download the file to your computer. Typically, the default folder will be "Downloads". You can create and select an alternate folder on your desktop labeled "STORM Software" for easy access.
6. If you have downloaded the .zip file you must first unpack the file and then save the contents to the USB. This requires .zip software. Visit www.zipeg.com for more details. You should have nine items on the USB before ejecting.

7. If you have downloaded the .exe file, please double click on the file, choose run, update the destination folder to your removable drive using the browse button and finally press the extract button. Please verify you have nine items on your USB before ejecting.

   Note

   Please ensure that the software file is not located inside another folder or with other files you may have on the flash drive.

If you are having issues with the download and installation process, please contact STORM Customer Service at 1-855-662-6609 or storm@aggrowth.com.

10.2.4 Installing Software

Important

Updating software will erase all job information. Manually write down recipes and other important information before completing the steps below.

1. Download the history from the Touchscreen onto the USB. Please consult the operator manual for your STORM model for step by step instructions. Instruction manuals can be found on the Literature tab above.
2. Record job parameters from "Jobs" on HMI.
3. Record total lifetime use.
4. Transfer history files to the computer.
5. Power up the STORM controls. The unit will automatically initialize the software. When complete, the main screen will be displayed. Plug the USB into the USB port .
6. The software update will start automatically. When asked "Do you want to install a new project from the USB drive?", Select "Yes" and the software will begin loading.
7. When the message "Installation Complete" appears, press "Restart" at the bottom of the screen. The unit will initialize the software again.
8. When the main screen is displayed on the STORM Classic and STORM FX, unplug the control box for 30 seconds. Power up the control box again and make sure the software loads properly. The main screen should be displayed if is has loaded properly.
9. **DO NOT REMOVE THE USB** - leave in and cover with the weather cap.

If you are having issues with the download and installation process, please contact STORM Customer Service at 1-855-662-6609 or storm@aggrowth.com.

11. Specifications

CAPACITY	
Seed Flow	22.5 to 45 bu/min with 70 lb/bu
Treatment Application Rate	10 to 1200 ml/100kg
Treatment Application Coverage Accuracy	+/- 5% (typical)
Tube Size of Mixer	10” (254 mm)
DIMENSIONS	
Transport	Length 50’ (15.2 m)
	Width 8’6” (2.59 m)
	Height 10’8” (3.25 m)
Discharge Clearance	Min 10’ (3.05 m)
	Max 17’5” (5.30 m)
TIRES	
Size/Type	ST235/80 R16
Inflation Pressure	80 PSI (551.5 kPa)
Wheel Bolt Torque	100 ftlbs
WEIGHT	
Hitch Tongue Weight	650 lbs (294.8 kg)
Total Weight	6600 lbs (2993.7 kg)
Ball Size	2–5/16”
POWER REQUIREMENTS	
Vanguard Gas Engine	37 HP (27.5 KW) / 3600 RPM max
Oran Generator	7000 w max / 29.2 A @ 240 V (60 hz)
Vanguard + Oran Battery (shared)	12 VDC
PART SPECIFICATIONS	
Treating Hoses	3 of IP26 Masterflex Norprene Food (9.5” – exact length critical)
Chemical Filter	30 Mesh
Fuel Tank Capacity	14 US Gal (53 L)
Hydraulic System Capacity	100 L (Universal Tractor Fluid)
Hydraulic Oil Filter	Ikron return line filter HF502 rate to 26 gpm

OTHER	
Fire Extinguisher	10lb 4A 60 BC

12. STORM Warranty

Ag Growth International (AGI) warrants products of its manufacture against defects in materials or workmanship under normal and reasonable use for a period of 18 months after date of delivery to the original purchaser.

Our obligation under this warranty is limited to repairing, replacing, or refunding defective part or parts which shall be returned to a distributor or a dealer of our Company, or to our factory, with transportation charges prepaid. This warranty does not obligate AGI to bear the cost of labor in replacing defective parts. Any defects must be reported to the Company before the end of the one year period.

This warranty shall not apply to equipment which has been altered, improperly assembled, improperly maintained, or improperly repaired so as to adversely affect its performance. AGI makes no express warranty of any character with respect to parts not of its manufacture.

The foregoing is in lieu of all other warranties, expressed or implied, including any warranties that extend beyond the description of the product, and the IMPLIED WARRANTY of MERCHANTABILITY is expressly excluded.

AGI STORM

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If you have any comments or questions on this manual, or find an error, email us at comments@aggrowth.com.
Please include the part number listed on the cover page in your message.