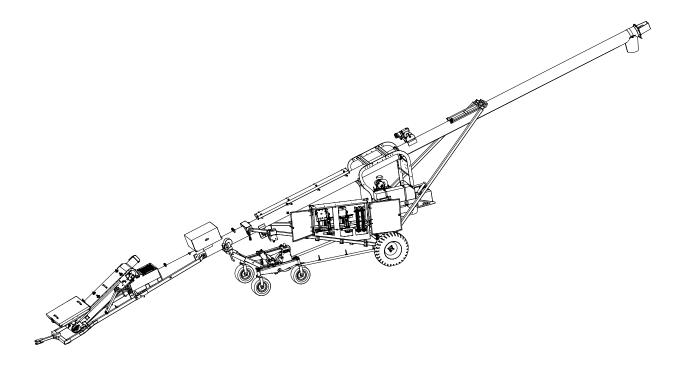
# AGIS STORM

# **FX<sup>2</sup> Series**

Seed Treater Operator's Manual





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: 8210-00058 R0 Revised: December 2024 Original Instructions This product has been designed and manufactured to meet general engineering standards. Other local regulations may apply and must be followed by the operator. All personnel must be trained in the correct operational and safety procedures for this product. Use the sign-off sheet below to record initial and periodic reviews of this manual with all personnel.

Date	Employee Name and Signature	Employer Name and Signature

# **CONTENTS**

1. Introduction	6
1.1 Serial Number Location	6
1.2 Intended Use	
1.2.1 Misuse	7
2. Safety	8
2.1 Safety Alert Symbol and Signal Words	
2.2 General Safety Information	
2.3 Rotating Flighting Safety	
2.4 Overhead Power Lines	
2.5 Cleated Conveyor Belt Safety	
2.6 Upending	
2.7 Seed Treatment Safety	
2.8 Rotating Parts Safety.	
2.9 Guards Safety	
2.10 Raising and Lowering the Seed Treater	
2.11 Hydraulic Winch Safety	. 11
2.12 Hand Winch Safety	. 11
2.13 Positioning the Seed Treater	. 12
2.14 Towing the Seed Treater	. 12
2.15 Drives and Lockout Safety	
2.15.1 Gas Engine Safety	
2.15.2 Electric Motor Safety	
2.15.3 Hydraulic Power Safety	
2.16 Tire Safety	
2.17 Battery Safety	
2.18 Work Area Safety	
2.19 Personal Protective Equipment	
2.20 Safety Equipment	
2.21 Safety Decals 2.21.1 Decal Installation/Replacement	
2.21.2 Safety Decal Locations and Details	
3. Features	
3.1 Main Components	
3.2 Controls	. 22
4. Preparation	. 23
4.1 Emergency Response Plan	
4.2 Safety Training	
4.3 Containment	
5. Transport	
5.1 Transport Safety	
5.2 Transport Procedure	. 25
6. Placement	
6.1 Placement Safety	
6.2 Position the Seed Treater	. 28
7. Operation	. 30

	7.1 Operation Safety	
	7.2 Preparing the Operator's Station for Use	30
	7.3 Providing Power to the Control System	32
	7.4 Operating a Generator	32
	7.5 Pre-Season Tasks	33
	7.6 Pre-Season System Check	33
	7.7 Conveyor Break-In	34
	7.8 Treating Seed	35
	7.8.1 Configure the Pump Hoses	35
	7.8.2 Engage and Disengage Pump Hoses	35
	7.8.3 Create a Job	
	7.8.4 Calibrate the Pumps	39
	7.8.5 Overview of Mixer Operation	42
	7.8.6 Operate the Treater & Treat Seed	42
	7.8.7 Update the Calibration	43
	7.9 Emergency Stop	44
	7.10 Restarting a Full Seed Treater	
	7.11 General Clean-Out Procedure	44
	7.12 Chemical Spill Cleanup	
	7.13 Storing the Seed Treater	
8. Soft	ware Screens	
	8.1 Electronic Controls	
	8.2 View and Configure Current Date and Time	
	8.3 View Software Version	
	8.4 View and Configure Pump Setup	
	8.5 View and Configure Advanced Pump Setup	
	8.6 View and Configure Conveyor Options	
	8.7 Viewing Configured Jobs	
	8.8 Deleting a Job	
	8.9 Viewing Job Parameters	
	8.10 Viewing Treating History (All Jobs)	
	8.11 Viewing Treating History (Specific Job)	
	8.12 Calibrate a One Pump Job	
	8.13 Calibrate a Two Pump Job	
	8.14 Calibration Results	
	8.15 Calibration Successful.	
	8.16 Overriding the Pump Speed Setpoint	
	8.17 Viewing Amount of Seed Treated While Operating (Job Specific)	
	8.18 Viewing Amount of Treatment Used While Operating (Job Specific)	
	8.19 Seed Flow Correction	
	8.20 Flush Out	
	8.21 View Lifetime Total Use	
	8.22 View Diagnostics	
	8.23 Alarms	75
9. Maiı	ntenance	78
	9.1 Maintenance Safety	
	9.2 Maintenance Schedule	
	9.3 Checking System Software	
	9.4 Visually Inspect the Seed Treater	
	· · · · · · · · · · · · · · · · · · ·	

9.5 Grease the Bearings	
9.6 Check the Gearbox Oil	
9.7 Change the Gearbox Oil	
9.8 Clean the Calibration Cylinders	
9.9 Coat the Calibration Cylinders	83
9.10 Inspect the Calibration Cylinder Wiper	83
9.11 Inspect, Clean, and Align Nozzles	
9.12 Clean the Mixing Boot and Chemical Hoses	85
9.13 Check the Chemical Pump Rollers	86
9.14 Clean the Filter Strainers	87
9.15 Fill the System with Antifreeze	
9.16 Drain Antifreeze from the System	88
9.17 Clean the Conveyor Belt	88
9.18 Check and Maintain the Containment System	89
9.19 Advanced Mixer Clean-Out	
9.20 Check and Replace the Pump's Chemical Hoses	
9.20.1 Pump Tubing Break-In	
9.21 Inspect/Replace the Conveyor Rollers and Bearings	
9.22 Tension the Conveyor Belt	
9.23 Align the Conveyor Belt	
9.23.1 Adjusting the Rollers	
9.24 Tension the Drive Belts	
9.25 Align the Drive Belts	
9.26 Replace the Drive Belts	
9.27 Clean and Wash the Equipment	
9.28 Inspect Belt Lacing	
9.29 Replace the Belt Lacing	
9.30 Replace the Conveyor Belt	
9.31 Inspect and Service the Hand Winch and Lift Cable	
9.32 Inspect and Service the Hydraulic Winch and Lift Cable	
9.33 Adjusting the Mover Kit Ram and Travel Speed	
9.34 Adjusting the Mover Kit Pinion Gear	
9.35 Change the Hydraulic Oil	
9.36 Change the Hydraulic Oil Filter	
9.37 Remove/Replace the Shear Bolt	102
10. Troubleshooting	103
11. Appendix	112
11.1 Test Weight Procedure	
11.2 Updating System Software	
11.2.1 Formatting a USB	
11.2.2 Downloading Software	
11.2.3 Installing Software	
12. Specifications	
13. STORM Warranty	
10. 0. 0. Clark walland	

# **1. Introduction**

Follow the instructions in this manual for safe use of this seed treater. Following proper operation and maintenance will help to keep the seed treater running in optimal condition.

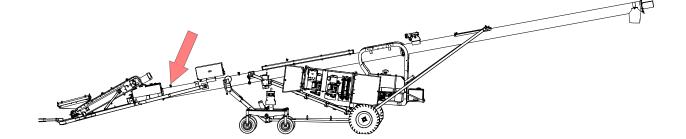
Keep this manual handy for frequent reference and to review with new personnel. A sign-off form is provided on the inside front cover for your convenience. If any information in this manual is not understood or if you need additional information, please contact AGI or your representative for assistance.

This manual should be regarded as part of the equipment.

# **1.1. Serial Number Location**

The serial number location for your seed treater is shown in the figure below. Have the serial number ready when ordering parts or requesting service or other information. Record information in the table below for easy reference.

Model Number	
Serial Number	
Date Received	



# 1.2. Intended Use

The seed treater is intended for use as listed below and described throughout this manual. Use in any other way is considered contrary to the intended use and is not covered by the warranty.

#### Intended use for the seed treater

- seed and product types as detailed on the system Operation Screen.
- temperatures warmer than 32°F (0°C).
- a suitable hopper bin or truck hopper.

### 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 Safety Information

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.
- Modification of the seed treater in any way without written permission from the manufacturer is not covered by the warranty.
- Follow a health and safety program for your worksite. Contact your local occupational health and safety organization for information.
- Follow applicable local codes and regulations.

# 2.3. Rotating Flighting Safety

#### **A 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

#### 

- 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

#### 

- 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. Upending

#### **WARNING**

- Anchor intake end and/or support discharge end to prevent upending.
  - Intake end must always have downward weight. Do not release until attached to tow bar or resting on ground.
  - Do not raise intake end above tow bar height.
  - Empty the seed treater and fully lower before moving.







# 2.7. 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.

#### MARNING 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.

# 2.8. Rotating Parts Safety

#### 

- Keep body, hair, and clothing away from rotating shafts, pulleys, belts, chains, and sprockets.
- Do not operate with any guard removed or modified. Keep guards in good working order.



• Shut off and lock out power source before inspecting or servicing machine.

# 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. Hydraulic Winch Safety

# • Keep away from rotating cable drum and winch cable. Do not touch or grab cable while winch is being operated or use hands to guide the cable.

- Inspect cable and cable clamps before using hydraulic winch. Replace cable if frayed or damaged. Tighten cable clamps if necessary.
- Check the cable anchor on the winch drum is tight.
- Confirm hydraulic hoses are in good condition.
- Do not continue to supply power to hydraulic winch after the seed treater has reached full up position.
- Do not disconnect hydraulic quick couplers when lines are pressurized.
- Make sure lift cable is seated properly.
- Always keep a minimum of 3 cable wraps on the cable drum.

### 2.12. Hand Winch Safety

# • Inspect lift cable before using. Replace if frayed or damaged. Make sure lift cable is seated and tracking properly and cable clamps are secure.

- Tighten brake lock by turning winch handle clockwise at least two clicks after lowering the seed treater.
- Lower the seed treater fully before towing, then rotate winch handle until cable has light tension.
- Do not lubricate winch brake discs.

# 2.13. Positioning the Seed Treater

- 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.

# 2.14. 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 20 mph (32 km/h). 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.

# 2.15. 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.



### 2.15.1 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.

### 2.15.2 Electric Motor Safety

#### **MARNING** 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.



### 2.15.3 Hydraulic Power Safety

#### **WARNING** Power Source

- Refer to the rules and regulations applicable to the power source operating the hydraulic system.
- 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.



# 2.16. Tire Safety

#### 

Failure to follow proper procedures when mounting a tire on a wheel or rim can produce an explosion that may result in serious injury or death.

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

# 2.17. Battery Safety

#### 

- 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.









# 2.18. Work Area Safety

- Have another trained person nearby who can shut down the seed treater in case of accident.
- Do not allow any unauthorized persons in the work area.
- 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
- 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.

# 2.19. Personal Protective Equipment

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

Safety Glasses



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

Coveralls



Wear coveralls to protect skin.

Hard Hat



Wear a hard hat to help protect your head.

Hearing Protection



Wear ear protection to prevent hearing damage.

#### 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.

# 2.20. 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.

• Salvage Container



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

#### • Aluminum Shovel and Broom



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

#### • First-Aid Kit



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

#### Absorbent Materials



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

#### 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.

# 2.21. Safety Decals

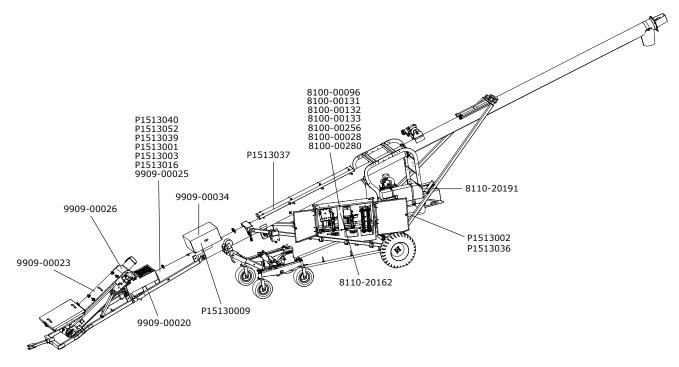
- Keep safety decals clean and legible at all times.
- Replace safety decals that are missing or have become illegible. See decal location figures that follow.
- Replaced parts must display the same decal(s) as the original part.
- Replacement safety decals are available free of charge from your distributor,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

# 2.21.1 Decal Installation/Replacement

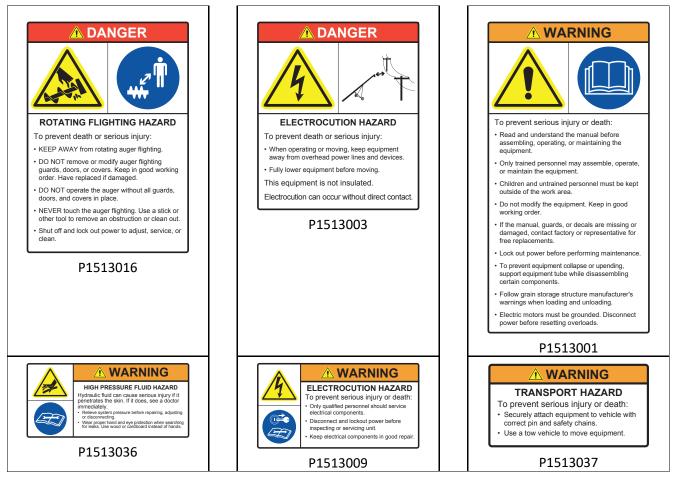
- 1. Decal area must be clean and dry, with a temperature above 50°F (10°C).
- 2. Decide on the exact position before you remove the backing paper.
- 3. Align the decal over the specified area and carefully press the small portion with the exposed sticky backing in place.
- 4. Slowly peel back the remaining 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 decal backing paper.

# 2.21.2 Safety Decal Locations and Details

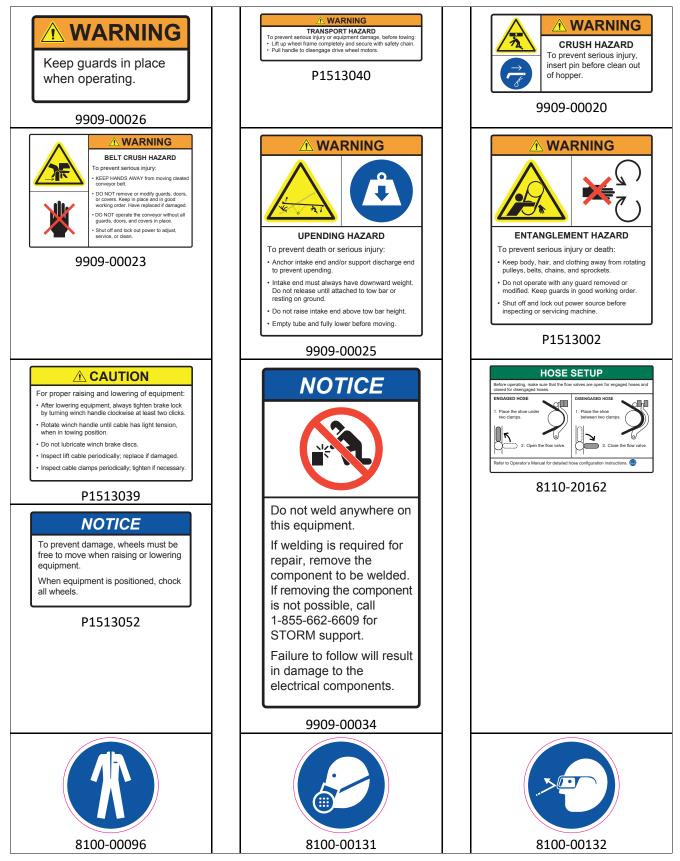
Replicas of the safety decals that are attached to the seed treater and their messages are shown in the figure(s) that follow. Safe operation and use of the seed treater requires that you familiarize yourself with the various safety decals and the areas or particular functions that the decals apply to,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



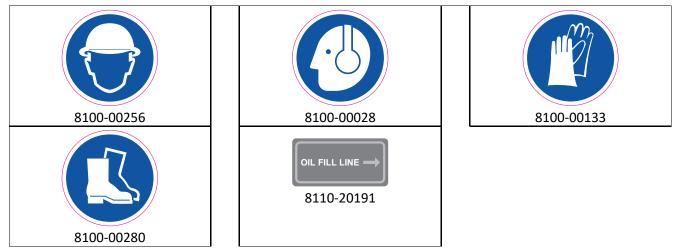
#### Table 1. Safety Decal Details



#### Table 1 Safety Decal Details (continued)



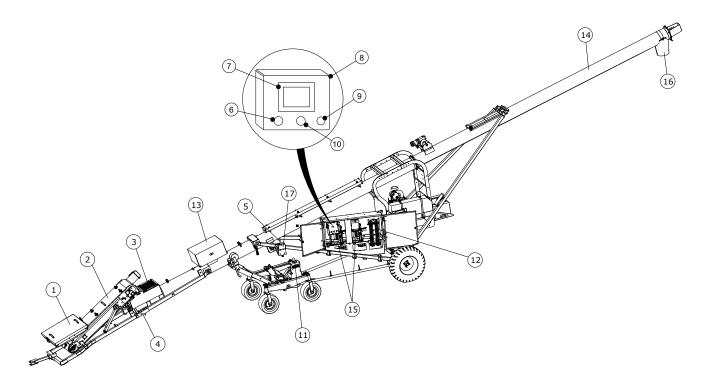
### Table 1 Safety Decal Details (continued)



# **3. Features**

# 3.1. Main Components

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



Item	Description	Item	Description	
1	Conveyor Intake	10	Alarm	
2	Conveyor	11	Controls (positioning)	
3	Mixer Boot	12	Calibration Cylinders	
4	Transport Lock	13	Control Box	
5	Mixer Valve	14	Mixer	
6	USB Port (for updating software and exporting data)	15	Seed Treatment Metering Pumps	
7	Operation Screen	16	Discharge Spout	
8	Control Panel	17	Engine Control Box (Engine Ignition,	
9	Emergency Stop / Pause Button		Throttle Switch, and Worklight Switch)	

# 3.2. Controls

The STORM mixer section has the following controls:

#### **Mechanical Controls**

- Engine throttle with toggle switch that moves a linear actuator.
- Mover kit controls move/steer the unit and raise/lower the mixer tube.
- Conveyor winch to raise and lower the conveyor.
- Calibration Valves.
- Valve to operate the flighting.

#### **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. On the front panel of the control box is an emergency stop (pause) button. Pressing this button stops the pumps and conveyor.

# **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 product manual holder. 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/inhalation, 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

Explain the established procedures for the use and care of emergency and safety equipment including:
Personal Protective Equipment (PPE)
First aid kits
Eyewash stations
Fire extinguishers
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
<ul> <li>how to respond in the event of an emergency</li> </ul>

# 4.3. Containment

The STORM seed treater is designed to contain spills to protect both personnel and the environment. Below are the containment measures integrated into the STORM seed treater.

- **Drain pan.** The pump station is equipped with drain pan to manage spills from the pumps and calibration system. The drain valve, located at the bottom right corner of the pan, allows to capture and hold the spill material.
- Clean-out door. The clean-out door in the boot is properly sealed to avoid any leaks onto the ground.

#### Important

Follow the maintenance in Section 9.18 – Check and Maintain the Containment System on page 89 to help ensure that the containment system is working effectively.

# 5. Transport

When transporting, follow all safety precautions and use a proper tow vehicle to help ensure safe transport of the seed treater.

# 5.1. Transport Safety

• Check with local authorities regarding transport on public roads. Obey all applicable laws and regulations.

- Always travel at a safe speed, never exceeding 20 mph (32 km/h). Reduce speed on rough surfaces. Use caution when turning corners or meeting traffic.
- Yield to other drivers and allow faster traffic to pass.
- Make sure the SMV (slow moving vehicle) emblem, maximum transport speed sign, and 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. Always use hazard-warning flashers on tractor/towing vehicle when transporting unless prohibited by law.
- 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.
- Attach to a proper towing vehicle with a hitch pin and retainer. Always attach safety chains.
- Do not raise the intake end above drawbar, upending may occur.
- 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.

# 5.2. Transport Procedure

The seed treater must be set into its transport position by securing the mover kit and proper connection to a tow vehicle.

1. Lower the conveyor intake using the hand winch until the stops on the conveyor contact the transport frame (see Figure 6 on page 29 for the location of the winch).

#### Note

Leave some slack in the cable after lowering.

- 2. Lower the mixer tube fully using the controls, see Figure 1.
- 3. Use the controls to raise the seed treater hitch.

#### Note

Confirm the conveyor lugs catch under the tow frame transport stops (see Figure 2).

- 4. Insert pins in the tow frame.
- 5. Use the joystick to move the seed treater, aligning the hitch to the tow vehicle.
- 6. Connect to the tow vehicle, see Section 12. Specifications on page 116 for pin information.

#### Note

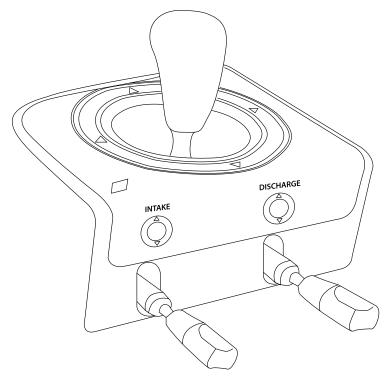
Hitch pin has a 1" diameter and a 3" minimum effective length.

- 7. Raise the mover kit fully and secure it using the pin (see Figure 3).
- 8. Turn off engine.
- 9. Use the levers on each drive wheel to disengage the two hydraulic wheel drive motors.
- 10. Insert the pins in the lock out position (see Figure 2).
- 11. Connect the safety chain (not supplied) securely to the towing vehicle, crossing underneath. Leave chains slack enough for angular movement.

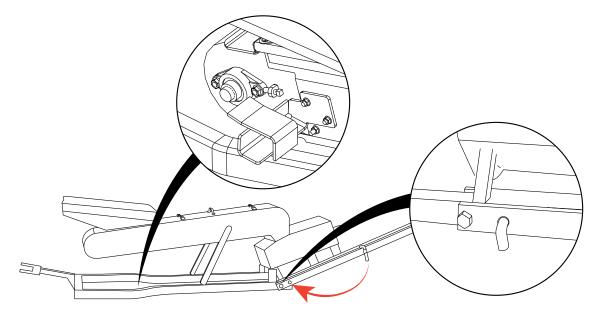
**WARNING** Do not tow with a worn or damaged safety chain.

12. If towing on a public roadway, connect transport lights (not supplied) and test each function before transporting.

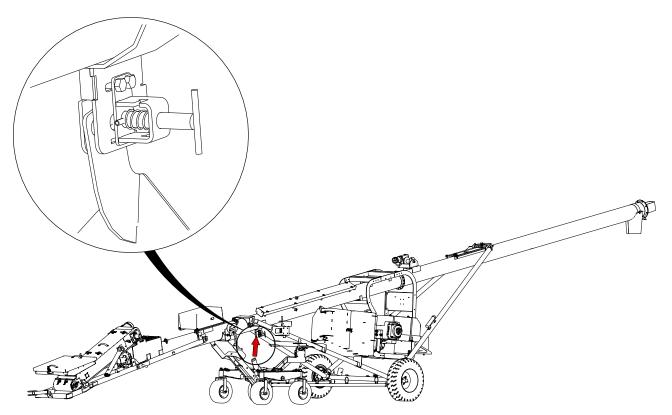
#### Figure 1. Positioning Controls



### Figure 2. Conveyor Frame and Mover Kit Transport Locks







# 6. Placement

# 6.1. Placement Safety

# • The seed treater is not insulated, keep away from overhead power lines. Electrocution can occur without direct contact.

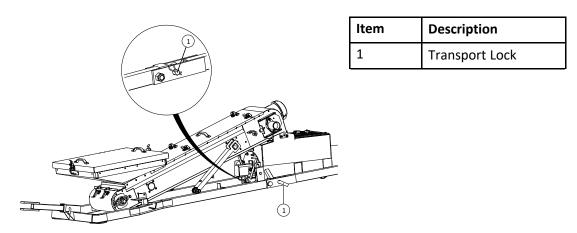
- Anchor intake end before using.
- Place the seed treater on reasonably level ground before operating. The seed treater could topple if ground is too uneven.
- Chock the seed treater wheels after placement.
- Check that wheels are free to move before raising or lowering the seed treater.
- Never attempt 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.
- Do not leave seed treater in raised position when not in use.
- Do not place in standing water.
- Ensure the supply cord is in good condition and that you are using a properly grounded outlet.

# 6.2. Position the Seed Treater

Follow the placement procedure below to ensure proper position of the conveyor intake. When properly positioned for treating, the transport frame will be on the ground and the conveyor intake will be under the seed discharge (hopper bin). In this position, the conveyor intake can be flooded without spilling seed, allowing the seed treater to operate at its designed capacity.

1. With the transport frame off the ground, remove and store the transport lock pins, see Figure 4.

#### Figure 4. Transport Lock Locations



- 2. Remove the hitch and place in the transport rest.
- 3. Use the controls to position the seed treater partly under the bin, resting the intake end on the ground, see Figure 5.
- 4. Use the joystick to move the seed treater fully under the bin and position the conveyor intake under the bin.
- 5. Use the intake control level to rest the transport frame on the ground.

#### Important

If you cannot adjust the equipment to ensure the transport frame contacts the ground, place wheel chocks under the main drive wheels to prevent the equipment from shifting during operation.

- 6. Use the mixer discharge control to raise the discharge spout above the truck. Keep some clearance between the bottom of the discharge spout and the truck.
- 7. Adjust the conveyor intake next to the seed discharge (hopper bin) so that it is nearly contacting it. Use the manual winch to raise/lower the conveyor, see Figure 6.

#### Note

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

#### Figure 5. Positioning Controls

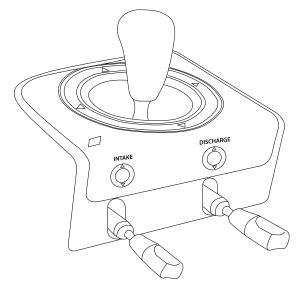
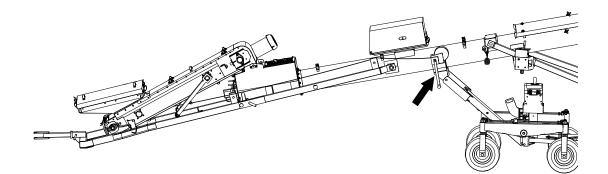


Figure 6. Manual Winch Location



# 7. Operation

For optimal operation, follow the safety precautions, checklists, and instructions in this section.

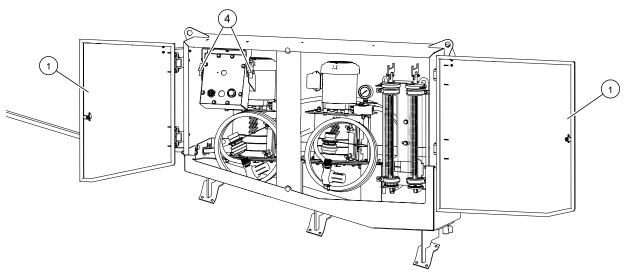
# 7.1. Operation Safety

- WARNING
   Keep away from rotating and moving parts, including the conveyor belt, auger flighting, drive components, shafts, and bearings.
  - Do not put hands in the intake of the metering conveyor while it is operating or during cleaning out.
  - Do not enter the grain bin or truck while the seed treater is operating.
  - Always operate with guards, covers, and shields in place.
  - Ensure hoses connecting treatment containers to the equipment do not pose a tripping hazard.
  - 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. Preparing the Operator's Station for Use

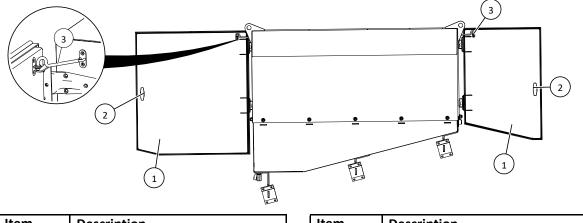
The STORM FX2 features an enclosed operator's station that provides protection for the treatment metering system and the control panel. This section covers the steps for preparing the operator's station and the subsequent steps to be taken after work is completed.

#### Figure 7. Operator's Station



Front View

#### **Rear View**



Item	Description	Item	Description
1	Access Door	3	Swinging Hook Latch
2	Handle	4	Кпор

- 1. With the machine in the operating position, open the two access doors for the operator station by turning the handles counterclockwise.
- 2. Use the swinging hook latch, located on each side of the cabinet, to keep the access doors in the open position.
- 3. Use the black knobs, located on the side of the control panel, to adjust the HMI screen angle for optimal viewing. After adjustment, fully tighten the knobs to prevent any movement.
- 4. Remove the couplers from their rests and unwind the intake hoses to connect to the treatment containers.
- 5. When ready to use, use the work light switch on the ignition panel to illuminate the cabinet lights when greater visibility is needed.

#### Note

When cleaning the operator station, take care to prevent the control panel from getting wet. Cover the screen with a suitable plastic bag before washing the station.

#### **Closing the Operator's Station**

It is recommended to close the operator's station after treatment is complete and to protect the components inside.

- 1. Turn off the work lights when not in use.
- 2. Roll up the treatment hoses and place the intake couplers in their rests.
- 3. Loosen the two knobs on the side of the control panel to readjust the control panel to a vertical position, not at an angle. Tighten the knobs fully to prevent movement.
- 4. Release the swinging hook latches and close the two access doors. Make sure that the swinging hook does not get caught in the door when closing it.
- 5. Latch the doors by turning the knobs clockwise.

#### Note

The access door latches have two positions and must be turned fully clockwise to properly seal the cabinet.

- The first position catches the door.
- The second position will tighten the door against the seal.

# 7.3. Providing Power to the Control System

#### Important

Before connecting the control system to the power supply, verify that the power source has the appropriate voltage and amperage as detailed below, and that it is protected by an appropriately sized circuit breaker. Failure to adhere to these requirements will void your warranty on the control box and associated electrical components.

1. Have a qualified electrician check and verify that the voltage and current ratings of the power source match with the requirements of the control system.

**NOTICE** The control system requires a single-phase power supply of 210 to 240 VAC with an amperage of 30 A. Operating it beyond this range may lead to equipment failure. Any voltage above 250 VAC, even for a brief moment, may cause damage to the sensitive electronic components.

- 2. If you are using a generator, ensure that the generator meets the specifications listed below and operate it as outlined in Section 7.4 Operating a Generator on page 32.
  - The generator should provide 220 to 240 VAC with an amperage of 20 A or continuous power output of 5,000 W or more.
  - A generator equipped with automatic voltage regulation (AVR) is highly recommended.
  - An inverter generator is not required. If using an inverter generator, ensure it has a pure sine wave output. Modified sine wave inverters may cause erratic operation and damage the controls.
  - An adapter must be specifically configured to your generator. Contact a certified electrician to create the adapter for you.

# 7.4. Operating a Generator

- 1. Shut off Auto Idle and Eco Mode if they are in use. Enabling these features will cause a reduction in power to the STORM FX2 and will interrupt control function.
- 2. To start up the STORM FX2:
  - a. Switch off the generator breaker.
  - b. Start up and warm up the generator.
  - c. Plug in the STORM FX2 Controls.
  - d. Switch on the generator breaker.
- 3. To shut down the STORM FX2:
  - a. Switch off the generator breaker.
  - b. Unplug the STORM FX2 Controls.
  - c. Cool down the generator.
  - d. Turn off the generator.

**CAUTION** To prevent electrical hazard and damage to the equipment:

- Never start or stop the generator when the breaker is engaged.
- Never plug in the STORM FX2 Controls with the breaker engaged.

# 7.5. 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 23.
- Check for and install control system software updates, see Section 11.2 Updating System Software on page 113.
- Complete pre-season maintenance, see Section 9.2 Maintenance Schedule on page 79.

# 7.6. Pre-Season System Check

This section covers the steps to be performed before operating the system with the treatment. This will help ensure that the system is in proper working condition and ready for use before the actual season begins.

#### Note

If the machine is brand new, ensure that you perform the break-in procedure before putting the machine into full operation (refer to Section 7.7 – Conveyor Break-In on page 34).

- 1. Make sure that the operator is familiar with software setup, controls and operating procedures.
- 2. Go to the Job screen and create a job. Use water for the treatment and operate the treater without seed. While performing this functionality test, check for:
  - **Conveyor belt tension and alignment.** If adjustment is needed, refer to Section 9.22 Tension the Conveyor Belt on page 91 and Section 9.23 Align the Conveyor Belt on page 93.
  - **Pump operation**. Ensure that each pump is able to purge air from the treatment lines and fill the calibration cylinder with 1000 mL water.
  - **Nozzle spray pattern and alignment**. Verify that the nozzles are operating at the recommended pressure, and observe the spray pattern for uniformity and distribution. Refer to Figure 55 on page 84 and Figure 56 on page 85.
  - Treatment leaks. Visually inspect all tubing, valves, fittings and connections for any signs of moisture.
  - **Mixer operation.** Verify that the auger can reach at least 400 rpm. If excessive noise or vibration is observed, stop the mixer and investigate the cause. Refer Section 10. Troubleshooting on page 103.
- 3. Operate the system 10 to 20 minutes to identify other potential issues. Check for:
  - Liquid delivery of each pump. Operate the pump one at a time, and for each pump, collect the water delivered by the spray nozzles. Compare the water collected to the volume displayed on the Pump Screen to determine if the pumps are delivering liquid as expected.

#### Note

If the amount collected is within 98% to 102% of the displayed value on the screen, it indicates that the system is operating correctly.

- Hydraulic leaks. Visually inspect all tubing, valves, fittings and connections for any signs of seepage.
- **Gearbox.** Ensure that the gearbox operating temperature is within the acceptable limits. Check the manufacturer's temperature recommendation to prevent overheating.
- Mixer lower bearing. Inspect bearing for wear and proper lubrication.
- 4. Go to the Flush-out screen.
- 5. Run metering pumps backwards until empty. Collect the water in a bucket.

# 7.7. Conveyor Break-In

This section covers the general guidelines for using the newly acquired conveyor or after a major service has been performed on the machine.

Follow the recommended break-in activities listed in Table 2 to help ensure the reliability and optimal performance of the machine.

Figure 8. Setup Screen

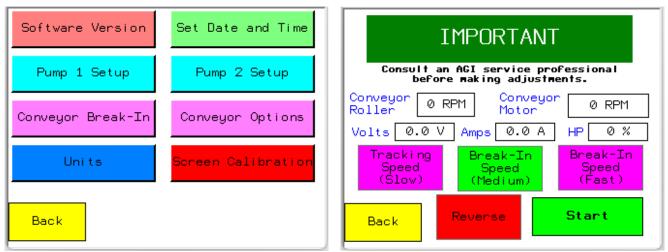


Figure 9. Conveyor Break-In Screen

#### Table 2. Recommended Conveyor Break-in Activities

Time	Speed	Activity	
5 min	Slow	Track belt before the seals are installed.	
As needed	Medium–Fast	Install the seals and run until the HP drops below 60% at medium speed.	

#### Note

Tension may need to be adjusted as the belt stretches. Always verify alignment after adjusting the belt tension.

It is normal for small chunks of rubber to separate from the cleated belt and intake seals 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 conveyor off, lock out the power source, and adjust. If unsure of the problem, or the procedure to fix it, contact your local dealer.

# 7.8. 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.

### 7.8.1 Configure the Pump Hoses

Each pump is equipped with two hoses. The number of hoses required while treating depends on the characteristics of the treatment and the desired application rates. As a general guideline, always start calibrating each pump by engaging both hoses. After calibration, the result shows up in the pump calibration screen. If the system is not calibrating due to speed being too low, it is recommended to disengage a hose.

The following section covers the steps on how to engage and disengage a hose.

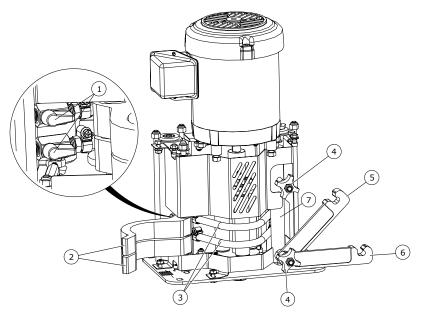
#### Important

After engaging or disengaging a hose, update the pump configuration and re-calibrate the pumps.

### 7.8.2 Engage and Disengage Pump Hoses

The seed treater has a simple two position configuration for engaging and disengaging the pumps.

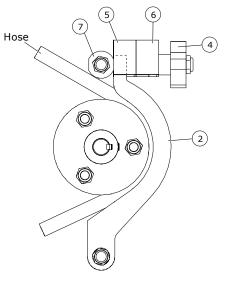
#### Figure 10. Pump Overview



Item	Description
1	Flow Valve (1 per hose)
2	Pump Shoe (1 per hose)
3	Pump Hose
4	Locking Knob

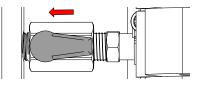
Item	Description	
5	Inner Pump Shoe Retainer	
6	Outer Pump Shoe Retainer	
7	Shoe Stop	

- 1. Loosen the two locking knobs (4) holding the pump shoe retainers (5,6).
- 2. Swing the pump shoe retainers down and out of the way.
- 3. Select the hoses (3) to be engaged.
- 4. To engage a hose:
  - a. Place the shoe (2) against the shoe stop (7) and swing both pump shoe retainers into place.In this configuration, engaged hose is being squeezed between the shoe and the pump roller.



Item	Description
2	Pump Shoe (1 per hose)
4	Locking Knob
5	Inner Pump Shoe Retainer
6	Outer Pump Shoe Retainer
7	Shoe Stop

b. Turn the flow valve to the "open" position.

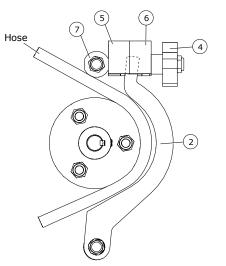


#### Important

Squeezed or engaged hose needs to line up with open valve.

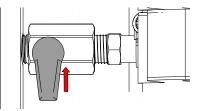
- 5. To disengage a hose:
  - a. Place the end of the corresponding shoe (2) between the inner pump shoe retainer (5) and outer pump shoe retainer (6).

In this configuration, disengaged hose is not being squeezed between the shoe and the pump roller.



Item	Description	
2	Pump Shoe (1 per hose)	
4	Locking Knob	
5	Inner Pump Shoe Retainer	
6	Outer Pump Shoe Retainer	
7	Shoe Stop	

b. Turn the flow valve to the "closed" position.



### Important

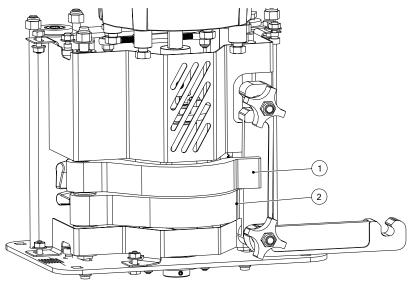
Do not forget to open the valves of the engaged hoses and to close the valves of the disengaged hoses. See Figure 11 and Figure 12.

- Engaged hoses with valves closed will prevent metering and will also damage the hoses.
- Disengaged hoses with valves open will prevent metering.
- 6. Tighten the two locking knobs until the pump shoes are fixed firmly in place.
- 7. After engaging or disengaging a hose, update the Pump Setup and re-calibrate the pumps.

### Important

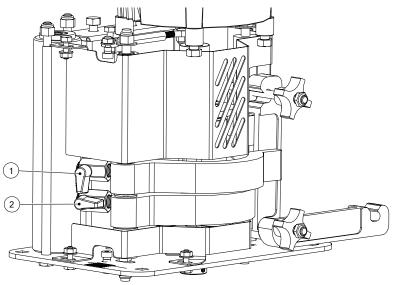
- Ensure that you update the Pump Setup as it is crucial in the calibration process. If the program thinks that one hose is engaged when there are actually two, the calibration cylinder will overflow. The reverse of this situation will make the pump calibration longer.
- After updating the Pump Setup, click save to keep the changes you have made. The Pump setup must match with pump configurations that are saved for a job to avoid improper application.

# Figure 11. Pump Shoe Engaged and Disengaged Positions



Item	Description	
1	Pump Shoe in Disengaged Position	
2	Pump Shoe in Engaged Position	

# Figure 12. Flow Valve Open and Closed Positions



Item	Description
1	Flow Valve in Closed Position
2	Flow Valve in Open Position

# 7.8.3 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 of 20 jobs can be configured and stored for use.

The gas engine does not have to run to create a job.

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 desired treating speed. For seed density measurement procedure, refer to Section 11.1 Test Weight Procedure on page 112.
- 4. Enter treatment information including treatment name, application rate (label rate), and dilution 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.

# 7.8.4 Calibrate the Pumps

Calibrating the pumps enables the seed treater to provide the correct amount of treatment for the anticipated seed flow. 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 outdoor temperature changes. For example, colder weather will increase the viscosity of some treatments and make the pump less efficient.
- pump tubing wear may impact pump output.
- the treating speed in a job has been changed due to a seed flow correction.

The calibration procedure is divided into the topics that follow.

# **Prepare for Calibration**

If you will be using both pumps, using pump one for the more viscous (thickest) product will speed up the calibration process.

1. Connect to the seed treatment product container.

#### Important

Air leaks in the connection between treatment product and intake lines affect the accuracy of the calibration and treatment processes. Contact the manufacturer of the treatment product container to determine connection requirements. If the container has a one way valve, it is recommended to use an alternate container.

- **CAUTION** When emptying the calibration cylinder back into a container with one way valve, follow the manufacturer's guidelines for fitting and connections and recommended procedure for liquid transfer to help minimize the risks due to pressure-related failures.
- 2. Set the valve to the calibrate position for the pump(s) being calibrated.

### Collect 1000 mL

The foundation of the calibration procedure is the collection of product in the calibration cylinder. Each time you perform a test, the seed treater attempts to collect 1000 ml of product. Successfully collecting 1000 ml allows you to run your job with the parameters you set during its creation. Collecting less or more than 1000 ml results in parameters that differ from your target.

### Set the Treating Speed

Understanding the following variables is crucial to effective calibration:

**Target Treating Speed:** The target treating speed is set as a constant in the job parameters. By default, the target treating speed is 80%. Collecting 1000 ml during a test results in a successful calibration that matches the target treating speed. When the calibration is successful, the system displays a Calibration Successful Outcome Screen. On the Calibration Successful Outcome Screen you can view the treating speed used for the job, and may proceed to calibrate a second pump, or proceed to save the job parameters and begin treatment.

**Resulting Treating Speed:** The resulting treating speed is the treating speed achieved from a calibration test. It may be more or less than the target treating speed you set when creating the job. The software system allows you to use the resulting treating speed in place of the target treating speed.

#### Note

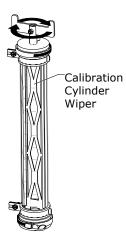
If the resulting treating speed is outside the physical capabilities of the equipment, an invalid result message appears on the results screen.

### **Re-Calibrate the Pumps**

After the initial calibration, each time a job is run, it is recommended that you re-calibrate the pumps. The system saves the treating speed and pump calibration parameters after a calibration is performed, and uses those values the next time the job is run. Re-calibrating before a job is run again ensures you are treating accurately.

### Important

After each iteration in the calibration, use calibration cylinder wiper to clean the inside of the calibration cylinder. This will ensure visibility of the level within the cylinder.



### **Correct Calibration Errors**

It is possible that the treating speeds achieved in the calibration tests are not exact matches. This results in an error which is displayed on-screen as a percentage. The percentage indicates the degree of inaccuracy in product application that will occur if you run the job without correcting the error. You may choose to accept the error and proceed with the job. You can continue with a calibration to eliminate the error. The software system informs you when you have accepted an error.

#### 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.

### **Complete Second Pump Calibration and Prepare for Treating Seed**

- 1. Repeat the calibration procedure for multiple pumps (if applicable).
- 2. Switch the calibration valve from the "calibrate" position to the "treating" position.

# 7.8.5 Overview of Mixer Operation

During steady-state operation, the suggested system pressure is less than 2,500 psi, while the system relief setting is set at 2,900 psi. If the system pressure reaches the relief setting, the mixer will stop turning and will potentially plug. It is important to maintain the pressure within the safe range to prevent any unnecessary downtime. Refer to Figure 13 on page 43 to illustrate the hydraulic mixer pressure gauge's placement.

Factors that influence the mixer operation:

- Seed type. Denser seeds such as lentils take more power to mix.
- **Seed condition.** Seeds with significant amount of dust and debris can lead to high mixer power requirements.
- Treatments. Some treatments are quite thick and sticky, creating additional resistance during mixing.

#### Note

Low application rates can also make the treated seed sticky. If recommended by the treatment manufacturer, add dilution water to reduce stickiness.

• Application rates. Too high application rates can also increase power requirements.

# 7.8.6 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. Start the engine and bring to operating temperature.

#### Note

Consult the gas engine operating manual for proper procedure for starting the engine.

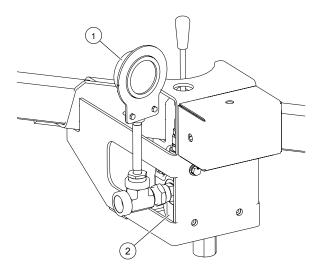
- 2. Flood the intake hopper completely with seed.
- 3. Select the job to use and verify that the seed and treatment parameters are correct for the application.
- 4. Connect the seed treatment containers to the pumps.
- 5. Prime the pumps. Make sure treatment is at the mixer boot/nozzles.
- 6. Prime the conveyor with seed. Make sure that seed is at the mixer boot/nozzles.
- 7. Continue to the operation screen.
- 8. Start the mixer empty and set it at 350 mixer rpm, forward direction.

#### Note

It is best practice to stop and start the mixer with the engine at its idle speed and increase throttle to achieve a mixer rpm of 350. This procedure helps to prevent potential damage to the mixer and hydraulic components.

- 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—conveyor, mixer, and pumps will start running.
- 11. Adjust mixer rpm by increasing or decreasing engine speed with the throttle toggle switch to ensure that it is adequate for the application.
- 12. Check the system pressure gauge located beside the mixing valve. Ensure that the pressure remains below 2,500 psi. If it exceeds this threshold, it is preferred to start a new job with lower treating speed. Repeat this step until the pressure falls within a safe range.

### Figure 13. Hydraulic Mixer Pressure Gauge



ltem	Description	
1	Pressure Gauge	
2	Mixing Valve	

- 13. Run until the desired amount of treated seed is obtained.
- 14. Stop the treater.
- 15. Do not stop the mixer until it is empty.

#### Important

Do not leave the mixer full and allow it dry. If the treatment sets up, restarting the mixer can be difficult, and it may become impossible to pull the flighting during the Advanced Mixer Clean-out without causing damage.

16. Adjust the seed flow calibration, if required.

# 7.8.7 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.
- 3. The system will then ask you to re-calibrate the pumps to verify that its adjustments are correct. Recalibrate as required, see Section 7.8.4 – Calibrate the Pumps on page 39.
- 4. The corrections will be saved for use the next time the job is utilized.

# 7.9. 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 spray nozzles. The mixer has a manual hydraulic shut off valve located directly next to the touch screen controls.

Do not use the emergency stop as a lockout for equipment service or maintenance.

Do not use the emergency stop to shut the equipment down in place of the control panel stop button. Records may be lost.

For the location of the emergency stop button, refer to Section 3. – Features on page 21.

# 7.10. 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 operation. This will cause the conveyor and the pumps to come to a stop.
- 2. Run the mixer tube until empty. If that isn't possible, lift the mixer boot and lift the mixer to the maximum possible angle to help the product to flow backwards. Place a catch pan underneath, open the boot cleanout, 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.

# 7.11. 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 advanced procedure.

- 1. Stop the flow of material from the bin or truck hopper.
- 2. Run the conveyor and mixer until empty.
- 3. Lift the mixer boot off ground and place a catch pan under the boot clean-out door.
- 4. Raise the mixer (for better flow back). Open the mixer boot door and run the mixer backwards until it is empty.
- 5. Go to the flush-out screen.
- 6. Run metering pumps backwards until empty.
- 7. Connect the pump intake lines to a rinse water source and run the pumps backwards and forwards until lines are clear.

#### Note

Male couplers are included to allow for connection.

- 8. Open the boot cover. Use compressed air or water to clean out the mixer boot.
- 9. Open the conveyor covers to remove remaining untreated seed.
- 10. Clean the filter strainers, see Section 9.14 Clean the Filter Strainers on page 87.
- 11. Dispose of collected waste in accordance to local standards and/or as defined by seed treatment product labels.

# 7.12. Chemical Spill Cleanup

When operating the seed treater, keep spill clean-up gear at the work area. At minimum, have an aluminum shovel, broom, bag of absorbent material, and paper towel available.

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.

### **Small Seed Treatment Spill**

- 1. Use 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.

### Large Seed Treatment Spill

- 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.

# 7.13. Storing the Seed Treater

After the season's use, thoroughly inspect the seed treater and prepare it for storage. Repair or replace any worn or damaged components and perform maintenance to prevent downtime at the start of the next season.

To ensure a long, trouble-free life, follow the below procedure.

- 1. Remove all residual material from the mixer and mixer boot, conveyor and conveyor intake.
- 2. Flush pumps, filters, treatment lines, calibration cylinders and valves, and nozzles with clean water to remove any treatment residue.
- 3. Wash the seed treater thoroughly using a water hose or pressure washer to remove all dirt, mud, debris, or residue. Be careful to not contact electronic controls with high pressure water.
- 4. Inspect all moving or rotating parts to see if anything has become entangled in them. Remove any entangled material.
- 5. Winterize the equipment according to Section 9.15 Fill the System with Antifreeze on page 87.
- 6. Open the pump shoes to release pressure on the tubing.
- 7. Touch up all paint nicks and scratches to prevent rusting.
- 8. Check tire pressure and inflate. For inflation pressure, refer to Section 12. Specifications on page 116.
- 9. Inspect the seed treater for cracks, tightness of fittings and fasteners, and hydraulic hose cracks (if applicable). Have required repairs performed to replace worn or damaged components.
- 10. Store in an area that is dry, level, free of debris, and away from human activity. Store inside if possible.
- 11. Ensure that the steel conveyor intake cover is securely latched in place.

- 12. Chock wheels.
- 13. Support intake on blocks to eliminate prolonged contact with the ground.
- 14. Coat exposed hydraulic cylinder shaft(s) with a light film of grease to protect from the environment.
- 15. Place the seed treater in its transport position.
- 16. Remove treatment records, see Section 8.10 Viewing Treating History (All Jobs) on page 55.
- 17. Ensure control box door and control box cover panel are closed and securely latched, see Closing the Operator's Station on page 31.
- 18. Ensure that the pump station doors are closed and securely latched.
- 19. Store gas engine as per manufacturer's recommendations.

# 8. Software Screens

This section describes all of the software screens and how to navigate through them.

# **8.1. Electronic Controls**

Treatment application is controlled through the system software.

The main menu, which shows the graphical buttons for the four main control sub menus, can be seen in Figure 14.





# 8.2. View and Configure Current Date and Time

### Note

Date and time persist in the control unit memory after power is removed from the system, and generally does not need to be adjusted, with the exception of correcting for time zones and local daylight savings.

From the main menu, tap: Setup — Set Date And Time

- Set the date and time using the touch screen.
- Tap Save Changes to save the new settings and return to the Setup menu.
- Tap **Back** to abandon any changes and return to the Setup menu.

#### Figure 15. Set Date and Time

02/08/2023	10:14:59	
Date	Time	
Day Month Year 02 08 23	Hour Minute Seconds 10 15 23	
To set the Date and Time, simply touch the appropriate box.		
The Hour uses a	24 hour clock.	
Back	Save Changes	

# 8.3. View Software Version

From the main menu, tap:

#### Setup — Software Version

• Tap **Back** to return to the Setup menu.

#### Figure 16. View Software Version

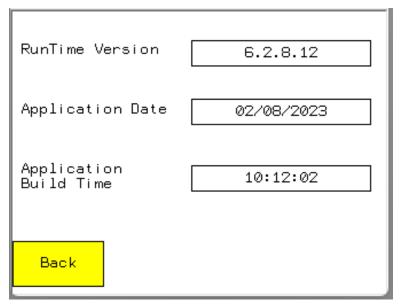


Table 3. View Software Version

Item	Description	
Runtime Version	The release number of the operating system that runs the STORM application software.	
Application Date	The release date of the currently loaded STORM application software.	
Application Build Time	The time of day that the current application software was compiled for release.	

# 8.4. View and Configure Pump Setup

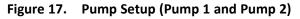
Pump setup informs the system about what pumps and pump tubing sizes are in use, which allows the system to accurately warn the operator when a job is not compatible with the current pump/tubing setup.

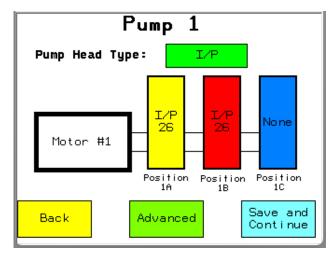
A default configuration is pre-programmed with factory settings that are typical for general use. Always update pump setup to reflect actual pump configuration for the job every time the STORM is powered up to perform seed treating.

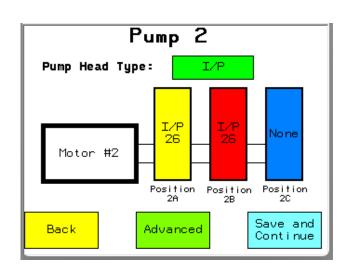
From the main menu, tap:

Setup — Pump 1 Setup or Pump 2 Setup

- Tap the tubing type (I/P) to reflect the physical setup of the system.
- Tap Back to abandon any changes and return to the Setup menu.
- Tap Save and Continue to save changes and return to the Setup menu.
- Tap **Advanced** to view or make changes to advanced pump setup parameters under the guidance of AGI service staff.







#### Table 4.Pump Setup Screen Fields

Item	Description
Motor	Indicates the motor/pump position: #1 or #2 (Pump 1 or Pump 2)
Position	Indicates the ganged pump position: 1A, 1B, (for Pump 1) or 2A, 2B (for Pump 2).
	"A" indicates the inner pump position and "B" the outer pump position.
	The pump tubing type for each pump position is displayed as one of the following: I/P 26, I/P 73, or NONE. Each tubing type must match the pump it is used on. NONE indicates that the pump head is not used (and may not actually be installed).

# 8.5. View and Configure Advanced Pump Setup

#### Note

Do not adjust any advanced pump parameters unless directed to do so by an AGI service professional.

From the main menu, tap:

Setup — Pump 1 Setup or Pump 2 Setup — Advanced

- Tap and change the low and high speed limits according to the direction of an AGI service professional.
- Tap **Back** to abandon any changes and return to the Setup menu.
- Tap Save and Continue to save changes and return to the Setup menu.

### Figure 18. Advanced Pump Setup

	IMPORTANT		
	Advanced pump parameters should not be adjusted from the defaults unless guided by an AGI Service Professional.		
Pu Sp	ump 2 Low eed Limit 60 RPM (Default is 60 R	PM>	
	mp 2 High 500 RPM (Default is 500 R	PM>	
	Back Continu	nd Je	

# 8.6. View and Configure Conveyor Options

### Important

Do not adjust any conveyor parameters unless directed to do so by an AGI service professional.

## From the main menu, tap:

### Setup — Conveyor Options

- Tap and change the Conveyor Drive Ratio and Conveyor Correction Factor according to the direction of an AGI service professional.
- Tap **Back** to abandon any changes and return to the Setup menu.
- Tap Save and Continue to save changes and return to the Setup menu.

#### Note

Default Conveyor Drive Ratio is 10:1. The Default Conveyor Correction factor is 1000 (100%) with limits of 800 to 1200 (+ or - 20%).

### Figure 19. Conveyor Options

IMPORTANT		
Consult an AGI service professional before making adjustments.		
Changing the Drive Ratio Value is not recommended.		
Changing the Conveyor Correction Factor can seriously affect all metering functions of the STORM.		
Conveyor Drive Ratio Conveyor		
Correction 1000 (Default is 1000) Factor		
Back Continue		

# 8.7. Viewing Configured Jobs

From the main menu, tap Jobs.

Jobs are displayed in several pages. Use **More** and **Back** to page through configured jobs.

Newest created jobs will appear highest in the list.

Selecting a job from the list will take you to Job Options Screen.

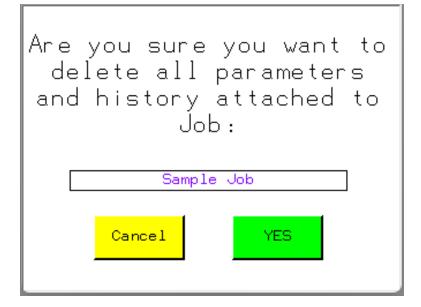
#### Figure 20. Jobs Screen

	Jobs 3	1 - 5	
Sample Job			
Deels	Start		Meine
Back	New Job	History	More

# 8.8. Deleting a Job

From the main screen, tap Jobs — <select job> — Delete — Yes

#### Figure 21. Confirm Job Delete



# 8.9. Viewing Job Parameters

#### From the main screen, tap **Jobs** — **<select job>** — **Start Treating**:

The first job parameter screens are the pump configuration screens, which appear only if the current pump configurations are different than those for the selected job.

#### Important

Always adjust to the pump configurations that are saved for a job to avoid improper application.

Tap **Continue** to view the Job parameters Screen 1, and then tap **Continue** again to view Job parameters Screen 2.

#### Sample Job Sample Job Job: Job: Raxi 1\_PR0 Pump 1 Wheat Seed Type 325.0 mL/100kg Application Rate Seed Weight 412.0 g/0.5L Calibration 238 0.0 % Error Treating Speed 100.0 % Raxil Pro Shield Pump 2 375.0 mL/100kg Application Rate Calibration Seed Flow Correction 1000 274 0.0 % Error Back Cont i nue ReCalibrate Pumps Cont i nue

#### Figure 22. Job Parameters

# Table 5. Viewing Job Parameters

Field	Description	Value
dof	The name of the job, used to uniquely identify the job from all other configured jobs.	1–30 letters and characters
Seed Type	The type of seed configured for the job.	wheat, barley, oats, peas, lentils, etc.
Seed Weight	The configured seed weight for the job.	160–500 g/0.5 L
Treating Speed	The configured conveyor speed for the job.	50–100% (can be as high as 102% based on pump calibration).
Seed Flow Correction	Used only for all seeds. Represents the cumulative seed flow correction for the seed used in the job.	_
Pump	Indicates the pump for the adjacent information fields, and displays the name of the treatment assigned to the pump.	Pump 1 or Pump 2
Application Rate	Displays the application rate configured for the job.	10 to 1200 ml/100 kg
Calibration	Displays the current calibration number for the job.	60–600
Error	Only used in two pump calibration to indicate a difference in the treating speed obtained by one of the pumps. Illustrates the results over (+) or under (-) application of treatment.	-20% to 20% (The system indicates that a job has been run without recalibrating by adding a 9 in front of the value)

# 8.10. Viewing Treating History (All Jobs)

From the main screen, tap **Jobs** — **History**:

The treating history maintains the details of the 40 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 (see Figure 23).

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).

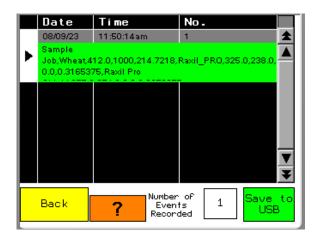
If the system estimates that there is five or fewer treatment entries remaining, the following warning message is displayed:

• "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 23. 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

# 8.11. Viewing Treating History (Specific Job)

From the main screen, tap **Jobs** — **<select job>** — **Job History**:

The job treating history maintains the details of the last three times that the selected job has been run to completion. Treating history also displays:

- the total number of times the job has been used
- the total amount of seed used by the job
- the total amount of treatment used by the job

The newest entry is at the top of the list, and the oldest entry at the bottom is replaced when a new batch is complete.

# Figure 24. Job Treating History

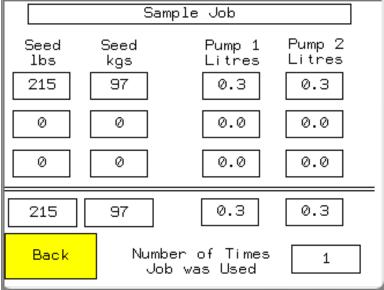
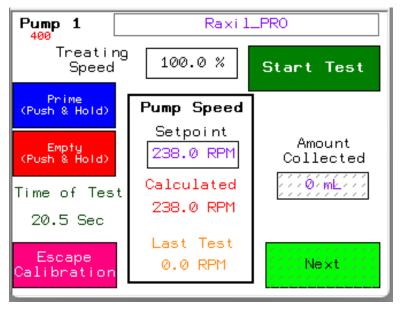


Table 6. Viewing Job Treating History Parameters

Field	Description
Job	The name of the job.
Date / Time	The date and time that the job was run.
Seed lbs	The actual (if entered after a batch completes) or estimated weight of seed treated when the job was complete.
Pump 1 Litres	The amount of treatment fluid used in this instance of treating for Pump 1.
Pump 2 Litres	The amount of treatment fluid used in this instance of treating for Pump 2.
Totals	Provides totals for Seed lbs, Pump 1 Litres, Pump 2 Litres for all uses of the job (not just the totals for the three most recent uses).
Number of times Job was used	Indicates the number of times the job has run.

# 8.12. Calibrate a One Pump Job

Figure 25. Calibration Test Screen



- 1. Connect the pumps to the treatment containers
- 2. Set the valve associated with the pump to the calibrate position.
- 3. From the Job Parameters Screen (see Figure 22 on page 53), tap **Calibrate Pumps** to open the calibration test screen (see Figure 25).
- 4. Tap and hold **Prime** until 1000 ml of product has been collected in the calibration cylinder.

#### Note

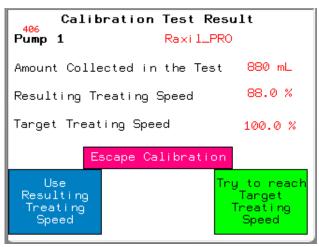
Ensure there are no air bubbles in the line.

- 5. Tap and hold **Empty** until the liquid is at the zero mark.
- 6. Tap **Start Test** to start the countdown.
- 7. After the countdown is complete, tap the flashing **Amount Collected** box and enter the number of ml collected in the cylinder during the test.
- 8. Tap Next.
- 9. Review the screen generated by the system and decide your next action. The system will generate one of the following screens:

Figure 26. Calibration Successful Outcome Screen



Figure 27. Calibration Results Screen



10. Tap and hold **Empty** (see Figure 28).

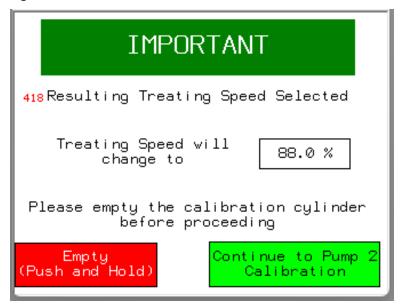
This screen appears when you collected 1000 ml and achieved your target treating speed.

- Tap **Empty** to empty the calibration cylinder.
- Tap **Continue** to return to the Jobs Screen.

This screen appears if you did not achieve your target treating speed.

- Tap Try to reach Target Treating Speed to perform another test and return to step 3.
- Tap Use Resulting Treating Speed to accept the treating speed achieved during the test and proceed to step 9.
- Tap **Escape Calibration** to quit the calibration procedure.

Figure 28. Calibration Outcome Screen



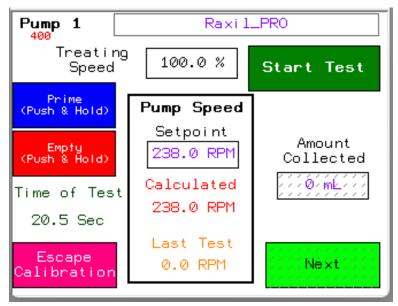
11. Tap **Continue** to end the calibration procedure and return to the Job Screen.

# 8.13. Calibrate a Two Pump Job

Set both valves to the calibrate position.

### **Calibrate Pump One**

#### Figure 29. Calibration Test Screen



- 1. Connect the pumps to the treatment containers.
- 2. Set the valves associated with each pump to the calibrate position.
- 3. From the Job Screen, tap Calibrate Pumps to open the calibration test screen (see Figure 29).

4. Tap and hold **Prime** until 1000 ml of product has been collected in the calibration cylinder 1.

### Note

Ensure there are no air bubbles in the line.

- 5. Tap and hold **Empty** until the liquid is at the zero mark.
- 6. Tap Start Test to start the countdown.
- 7. After the countdown is complete, tap the flashing **Amount Collected** box and enter the number of ml collected in the cylinder 1 during the test.
- 8. Tap Next.
- 9. Review the screen generated by the system and decide your next action. The system will generate one of the following screens:

Figure 30. Calibration Successful Outcome Screen

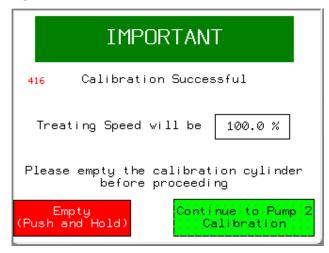
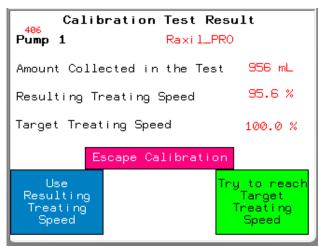


Figure 31. Calibration Results Screen



10. Tap and hold **Empty** (see Figure 30).

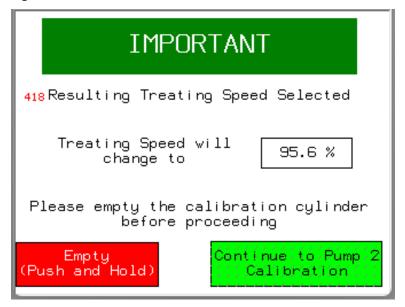
This screen appears when you collected 1000 ml and achieved your target treating speed.

- Tap **Empty** to empty the calibration cylinder 1.
- Tap **Continue to Pump 2 Calibration** to proceed to Calibrate Pump Two on page 61.

This screen appears if you did not achieve your target treating speed.

- Tap **Try to reach Target Treating Speed** to perform another test and returns to step 3.
- Tap Use Resulting Treating Speed to accept the treating speed achieved during the test and proceed to step 9.
- Tap **Escape Calibration** to quit the calibration procedure.

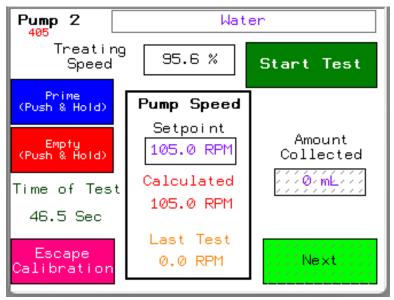
Figure 32. Calibration Outcome Screen



11. Tap **Continue to Pump 2 Calibration** to proceed to Calibrate Pump Two on page 61.

#### Calibrate Pump Two

### Figure 33. Calibration Test Screen



1. Tap and hold **Prime** until 1000 ml of product has been collected in the calibration cylinder 2.

#### Note

Ensure there are no air bubbles in the line.

- 2. Tap and hold **Empty** until the liquid is at the zero mark.
- 3. Tap Start Test to start the countdown.
- 4. After the countdown is complete, tap the flashing **Amount Collected** box and enter the number of ml collected in the cylinder 2 during the test.

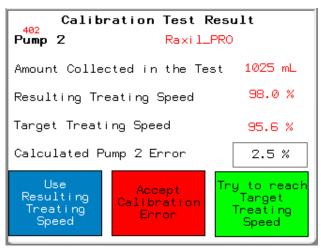
### 5. Tap Next.

6. Review the screen generated by the system and decide your next action. The system will generate one of the following screens:

### Figure 34. Calibration Successful



### Figure 35. Calibration Results Screen



- 7. Tap and hold **Empty** (see Figure 34).
- 8. Tap **Continue** to accept the error in the treatment application of pump 2 and return to the Job Screen.

### Important

The maximum allowable error is 20%.

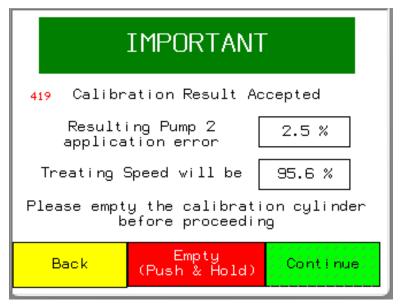
This screen appears when you collected 1000 ml and achieved your target treating speed.

- Tap **Empty** to empty the calibration cylinder 2.
- Tap **Continue** to return to the Jobs Screen.

This screen appears if you did not achieve your target treating speed.

- Tap Try to reach Target Treating Speed to perform another test and return to step 1.
- Tap Use Resulting Treating Speed to accept the treating speed achieved during the test and proceed to Recalibrate Pump One on page 63.
- Tap Accept Calibration Error to continue to step 7.

#### Figure 36. Calibration Outcome Screen



#### **Recalibrate Pump One**

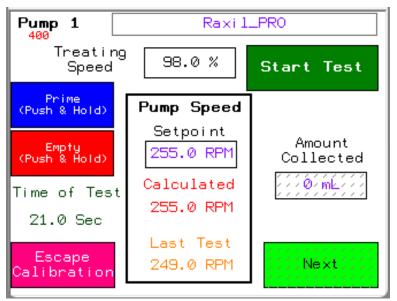
- 1. Tap and hold **Empty** (see Figure 37).
- 2. Tap Recalibrate Pump 1.

Figure 37. Calibration Outcome Screen

IMPORTANT				
You have chosen to change the Treating Speed to 98.0 %				
Please empty the calibration cylinder before proceeding				
You will need to recalibrate Pump 1		Recalibrate		
Back	Empty (Push & Hold)	Pump 1		

- 3. Tap and hold Prime until 1000 ml of product has been collected in the calibration cylinder 1 (see Figure 38).
- 4. Tap and hold **Empty** until the liquid is at the zero mark.
- 5. Tap **Start Test** to start the countdown.
- 6. After the countdown is complete, tap the flashing **Amount Collected** box and enter the number of ml collected in the cylinder 1 during the test.
- 7. Tap Next.

#### Figure 38. Calibration Test Screen



8. Review the screen generated by the system and decide your next action. The system will generate one of the following screens:

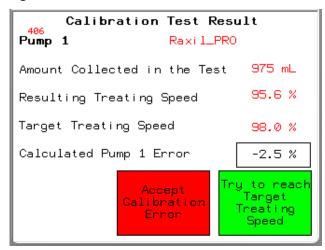
### Figure 39. Calibration Successful



This screen appears when you collected 1000 ml and achieved your target treating speed.

- Tap **Empty** to empty the calibration cylinder 1.
- Tap **Continue** to return to the Jobs Screen.

Figure 40. Calibration Results Screen



- 9. Tap and hold **Empty** (see Figure 41).
- 10. Tap **Accept Calibration Error** to accept the error in the treatment application of pump 1 and return to the Job Screen.

Figure 41. Calibration Outcome Screen

IMPORTANT				
421 Calibration Result Accepted				
Resulting Pump 1 application error		-2.5 %		
Treating Speed will be 98.0 %		98.0 %		
Please empty the calibration cylinder before proceeding				
в	ack	Empty (Push & Hold)	Accept Calibration Error	

This screen appears if you did not achieve your target treating speed.

- Tap **Try to reach Target Treating Speed** to perform another test and return to step 3.
- Tap Accept Calibration Error to proceed to step 9.

# 8.14. Calibration Results

### **Reading the Results Screen**

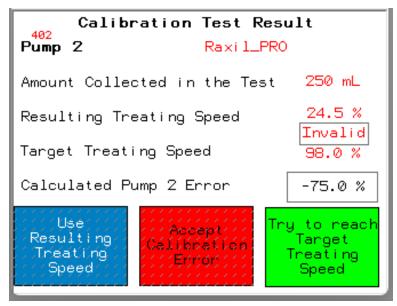
Any test that does not achieve the target treating speed generates a results screen. The results screen displays the following information:

- The amount of product collected during the test.
- The resulting treating speed achieved during the test.
- The target treating speed chosen during the creation of the job.
- Errors in the application of treatment that will occur if you accept the resulting treating speed.

#### Note

Errors only appear in two pump calibrations (see Correct Calibration Errors on page 41).

Figure 42. Example of a Results Screen



#### Note

The results screen will flash invalid if outside the seed flow range.

### **Applying the Results**

After reviewing the information on the results screen, you must decide the next action. The actions you can take vary depending on the results screen generated by the STORM software system. Keep these general principals in mind when deciding your next action:

- It is normal to perform several calibration tests before successfully collecting 1000 ml; the STORM software
  automatically makes adjustments to the pump speed between tests to help you achieve your target treating
  speed.
- In a two pump calibration, the treating speed achieved when calibrating the second pump may impact the treating speed of the first pump. The system allows you to return and re-calibrate the first pump in this case.
- If you do not achieve your target treating speed, you may accept the resulting treating speed and proceed.
- Tap Accept Calibration Error to continue to the treating screen without recalibrating.

# 8.15. Calibration Successful

When the calibration is complete, the system displays a Calibration Successful Outcome Screen. On the Calibration Successful Outcome Screen you can view the treating speed used for the job, and may proceed to calibrate a second pump, or proceed to save the job parameters and begin treatment.

Figure 43. Calibration Successful Outcome Screen

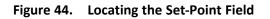
IMPORTANT		
416 Calibration Successful		
Treating Speed will be 100.0 %		
Please empty the calibration cylinder before proceeding		
Empty (Push and Hold) Continue to Pump 2 (Push and Hold)		

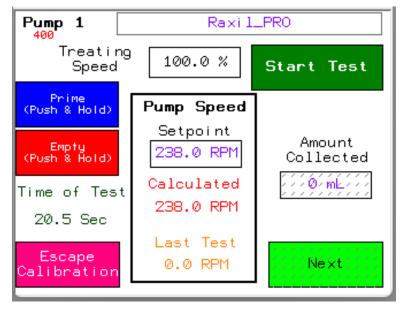
# 8.16. Overriding the Pump Speed Setpoint

Users who are familiar with both the product being calibrated and the STORM calibration procedure may wish to override the calculated pump speed. Adjusting the Setpoint may reduce the number of times a test needs to be performed before collecting the desired 1000 ml result.

### Important

Entering a value that is higher than the generated value can result in the calibration cylinder overflowing. If the cylinder overflows, tap **Stop Test** to stop the pumps, then **Empty** to empty the cylinder. Tap **Escape Calibration** to return to the Job Screen; from the Job Screen, you may attempt to calibrate again.

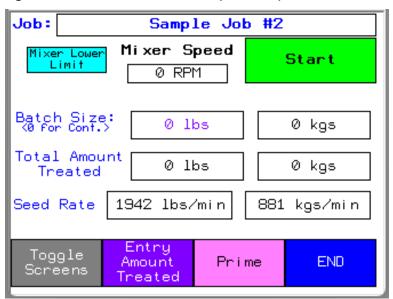




# 8.17. Viewing Amount of Seed Treated While Operating (Job Specific)

- 1. From the operation screen, tap **Seed**.
- 2. Toggle Entry Amount Treated/Total Amount Treated.
  - Entry Amount Treated shows the amount of seed treated so far for the batch in progress (in lbs and kg).
  - Total Amount Treated shows the amount of seed treated in the full history of the selected job (in lbs and kg).

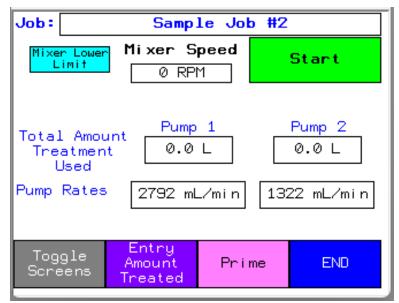
Figure 45. Total Amount Treated (Seed Tab)



# 8.18. Viewing Amount of Treatment Used While Operating (Job Specific)

- 1. From the operation screen, tap **Toggle Screens** until you view the pumps screen.
- 2. Toggle Entry Amount Treated button to Total Amount:
  - Entry Amount shows the amount of treatment so far applied to the batch in progress (in litres).
  - Total Amount shows the amount of treatment each pump has ever applied in the full history of the selected job (in litres).





# 8.19. Seed Flow Correction

The default value for seed flow is 1000.

Seed flow correction represents the adjustment to treating speed made between batches by the STORM software; this adjustment occurs when there is a difference between the STORM metering system's estimated amount of seed treated and the actual amount of seed treated. The adjustment ensures that the treating speed of the job remains optimal and accurate.

The difference may be caused by:

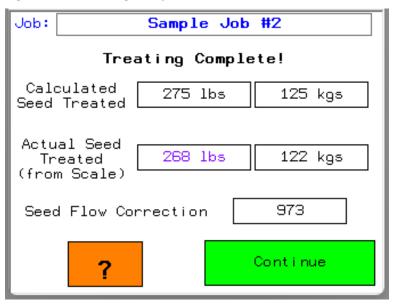
- unique seed characteristics,
- conveyor intake conditions,
- environmental factors.

### The Treating Complete Screen

When treating in batches, the system returns a screen informing you that the batch is complete. The Treating Complete screen (see Figure 47) provides the following information:

- the job name,
- the amount of seed the system estimated will be treated based on the seed weight you defined when creating the job,
- a box for you to enter the actual amount of seed that was treated after the batch completed,
- a correction factor based on the difference between the estimated and actual amount of seed treated.

#### Figure 47. Treating Complete



#### Note

The value in the Actual Seed Treated (from Scale) box is recorded in the job history.

#### Note

If you want to enter the actual amount of seed treated, you must enter it on this screen; tapping **Continue** prevents the ability to enter the actual amount of seed treated.

### How Seed Flow Correction Affects Further Treating

The system automatically adjusts parameters to ensure optimum treatment the next time the job is run. It is important to recalibrate the pumps after a seed flow correction has occurred. While it is possible to treat using the system's estimated calibration values, it is not recommended.

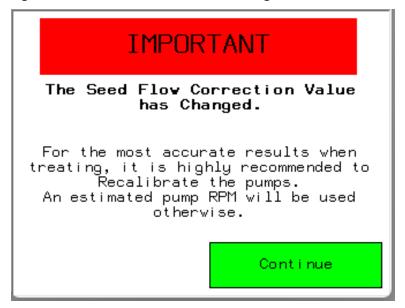
The system indicates that you are treating with estimated calibration values. On the Job Details screen (see Figure 48) the system places a "9" as a prefix to the Calibration value.

Figure 48.	Job Details Screen	<b>Indicating Estimated</b>	Calibration
------------	--------------------	-----------------------------	-------------

Job:	Sample Job #2		
Pump 1	Raxi 1_PR0		
Applicat	ion Rate 325.0 mL/100kg		
Calibrat	ion 9238 Error -2.5 %		
Pump 2	Water		
Application Rate 150.0 mL/100kg			
Calibration 9102 Error 0.0 %			
ReCali	orate Pumps Continue		

Tapping **Continue** allows you to run the batch with the estimated calibration values. The system provides a final indication that a seed flow correction has occurred with a Seed Flow Correction Warning screen (see Figure 49).

Figure 49. Seed Flow Correction Warning



# 8.20. Flush Out

The **Flush Out** function allows the operator to set pump and the conveyor direction (forward or reverse), and specify the state (on or off) for each when **START** is pressed.

# From the main menu, tap:

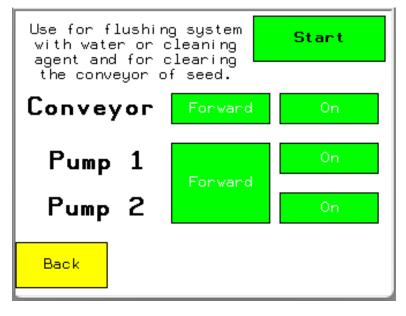
# Maintenance — Flush Out

Set the conveyor direction (forward or reverse) and state (on or off) to reflect the conveyor action when **START** is selected.

Set the pumps direction (**Forward** or **Reverse**, to apply to both pumps) and state (on or off for each pump) to reflect the pump action when **START** is tapped.

- Tap **START** to engage the setting.
- Tap **STOP** to disengage the settings.
- Tap **BACK** to return to the maintenance screen.

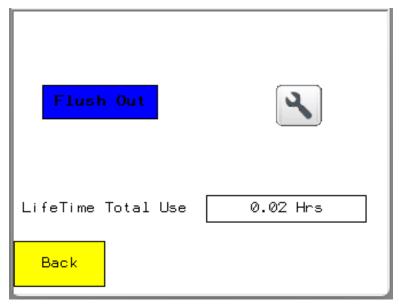
#### Figure 50. Flush Out Menu



### 8.21. View Lifetime Total Use

Lifetime total use is the amount of time that the STORM has spent actively treating seed, and does not include the amount of time spent powered up but not treating seed. From the main menu, tap **Maintenance**.

#### Figure 51. Maintenance Menu



#### Table 7. Maintenance Menu Information

Item	Description
Lifetime Total Use	Shows the total number of hours the unit has actively treated seeds (0–999999 hrs) since the software was last updated.

#### Note

Record the value displayed in the Lifetime Total Use field before updating the software; the value is set to zero when the software is updated.

## 8.22. View Diagnostics

- **Pre-operational diagnostics** can be viewed before operating the system, and are used to verify that the conveyor and pumps are reporting adequate supply voltages before a job is running.
- **Operational diagnostics** are viewed while a job is running, and can be used to determine if the overall system performance is adequate by providing information related to system performance under operational load.

To view pre-operational diagnostics, from the main menu tap:

Maintenance —

To view operational diagnostics, tap **Toggle Screens** to cycle between operation screens.

#### Table 8. Pre-Operational Diagnostics Screens

Item	Description
Mains voltage conveyor	The voltage supply measured at the conveyor.
	Should be between 210 and 240 VAC.
Mains voltage Pump 1	The voltage supply measured at the Pump 1 motor. Should be between 210 and 240 VAC.
Mains voltage Pump 2	The voltage supply measured at the Pump 2 motor. Should be between 210 and 240 VAC.
Conveyor status	Conveyor motor status.
Pump 1 status	Pump 1 motor status.
Pump 2 status	Pump 2 motor status.

### Important

The status displayed for the conveyor and pumps must end in a "1"; if the status differs, consult a service technician.

#### Table 9. Operational Diagnostics Screens

Item	Description
Conveyor	Conveyor speed (belt RPM).
Conveyor Motor	Conveyor motor speed (RPM).
Pump 1	Pump 1 motor speed (RPM).
Pump 2	Pump 2 motor speed (RPM).
Mains Voltage	Supply voltage, as detected by the control box. Should be between 210 VAC and 240 VAC while motors are running under load.
Total Amps	Total system power draw, as measured by the control box (Amps).

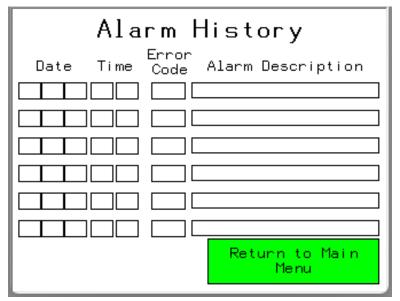
### 8.23. Alarms

The alarms screen displays the last six control box errors, listed with the newest alarm on the top of the list. When the list is full, the oldest alarm entry is erased as a new alarm is recorded.

#### **Viewing Alarms**

To view Alarms, tap **Alarms** from the main menu.





Alarms are service-affecting, and interrupt operator activity with an error screen.

The last six alarms are displayed on the Alarm History screen. The unit will not run with an alarm. Correcting an alarm does not remove it from the Alarm History Screen.

To attempt to correct an alarm, see the alarm descriptions in Table 10, and follow any instructions, including those provided on the STORM display. Be prepared to contact an AGI service professional as required.

#### Table 10. Alarm Descriptions

Alarm #	Error	Controller Display (AGI Service Only)	What it means	Action(s)
5	ModBus Communication Error <sup>1</sup>	SLF1	HMI is unable to communicate with motor controller(s).	Reboot Controller. Unplug the Control Box and wait for 30 seconds before plugging back in.
9	OverCurrent Error <sup>2</sup>	OCF	Motor is drawing too much current. Motor is overloaded.	Let unit cool down. Reduce load by lowering treating speeds if problem persists.
16	Drive Over-Heat Error <sup>3</sup>	OHF	Motor Controller has overheated.	Let unit cool down. Reduce load by lowering treating

Table 10 Alarm Descriptions (continued)

Alarm #	Error	Controller Display (AGI Service Only)	What it means	Action(s)
				speeds if problem persists.
17	Motor OverLoad Error <sup>4</sup>	OLF	Motor is overloaded.	Let unit cool down. Reduce load by lowering treating speeds if problem persists.
19	Mains OverVoltage Error	OSF	Input Voltage Fault. Input voltage exceeds 240 Volt limit.	Check power supply. If using a generator check for an over- speed condition.
20 or 33	Output Phase Loss Error	OPF1 OPF2	Loose Wire on the output side of the motor controller.	Check motor electrical connections. Check motor supply cables for damage. If problem persists, contact an AGI Service Specialist.
21	Input Phase Loss Error	PHF	Loss of Input power.	If problem persists, contact an AGI Service Specialist.
22	UnderVoltage Error	USF	Input Voltage Fault— voltage too low. Power source inadequate.	Check power source. Source unable to provide adequate power. Supply cable exceeds recommended maximum length or gauge too high. Power source is not dedicated to STORM.
23 or 56	Motor Short Circuit Error	SCF1 or SCF5	Motor Shorted. Could be caused by a loose wire or a motor failure.	Check for loose wiring at motor. Replace motor if failed.

#### Table 10 Alarm Descriptions (continued)

Alarm #	Error	Controller Display (AGI Service Only)	What it means	Action(s)
25	AutoTuning Error	tnF	Controller did not initialize properly.	Reboot Controller. Unplug the Control Box and wait for 30 seconds before plugging back in.
32	Circuit Shorted to Ground Error	SCF3	Supply wires to the motors shorted.	Check motor electrical connections. Check motor supply cables for damage. If problem persists, contact an AGI Service Specialist.

1. Often occurs when control box is not powered down for 30 seconds after a software upload.

2. May occur if conveyor or pumps have excessive drag.

3. May occur if conveyor or pumps have excessive drag.

4. May occur if conveyor or pumps have excessive drag.

# 9. Maintenance

Proper maintenance will improve safety, efficiency, and will keep the seed treater operating reliably.

### 9.1. 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 the tube if performing maintenance on the undercarriage assembly.
- Before applying pressure to a hydraulic system, make sure all components are tight and that hoses and couplings are in good condition.





## 9.2. Maintenance Schedule

Follow the maintenance procedures below. Keep records of the hours the seed treater has been operated and the maintenance performed.

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

Pre-Season:
Section 9.3 – Checking System Software on page 80
Section 9.4 – Visually Inspect the Seed Treater on page 81
Section 9.5 – Grease the Bearings on page 81
Section 9.7 – Change the Gearbox Oil on page 82
Section 9.8 – Clean the Calibration Cylinders on page 82
Section 9.10 – Inspect the Calibration Cylinder Wiper on page 83
Section 9.11 – Inspect, Clean, and Align Nozzles on page 83
Section 9.13 – Check the Chemical Pump Rollers on page 86
Section 9.16 – Drain Antifreeze from the System on page 88
Section 9.18 – Check and Maintain the Containment System on page 89
Section 9.20 – Check and Replace the Pump's Chemical Hoses on page 90
Section 9.21 – Inspect/Replace the Conveyor Rollers and Bearings on page 91
Section 9.22 – Tension the Conveyor Belt on page 91
Section 9.23 – Align the Conveyor Belt on page 93
Section 9.24 – Tension the Drive Belts on page 95
Section 9.25 – Align the Drive Belts on page 95
Section 9.27 – Clean and Wash the Equipment on page 96
Section 9.28 – Inspect Belt Lacing on page 96
Section 9.32 – Inspect and Service the Hydraulic Winch and Lift Cable on page 98
Daily:
Section 9.4 – Visually Inspect the Seed Treater on page 81
Section 9.8 – Clean the Calibration Cylinders on page 82
Section 9.11 – Inspect, Clean, and Align Nozzles on page 83
Section 9.12 – Clean the Mixing Boot and Chemical Hoses on page 85
Section 9.14 – Clean the Filter Strainers on page 87
Section 9.17 – Clean the Conveyor Belt on page 88
Section 9.23 – Align the Conveyor Belt on page 93
Section 9.27 – Clean and Wash the Equipment on page 96

Weekly:
Section 9.9 – Coat the Calibration Cylinders on page 83
2 Weeks:
Section 9.18 – Check and Maintain the Containment System on page 89
End of Season:
Section 9.4 – Visually Inspect the Seed Treater on page 81
Section 9.5 – Grease the Bearings on page 81
Section 9.6 – Check the Gearbox Oil on page 82
Section 9.15 – Fill the System with Antifreeze on page 87
Section 9.27 – Clean and Wash the Equipment on page 96
Section 9.32 – Inspect and Service the Hydraulic Winch and Lift Cable on page 98
2 Years:
Section 9.36 – Change the Hydraulic Oil Filter on page 101
As Required:
Section 9.3 – Checking System Software on page 80
Section 9.7 – Change the Gearbox Oil on page 82
Section 9.19 – Advanced Mixer Clean-Out on page 89
Section 9.26 – Replace the Drive Belts on page 95
Section 9.29 – Replace the Belt Lacing on page 96
Section 9.30 – Replace the Conveyor Belt on page 96
Section 9.31 – Inspect and Service the Hand Winch and Lift Cable on page 98
Section 9.32 – Inspect and Service the Hydraulic Winch and Lift Cable on page 98
Section 9.33 – Adjusting the Mover Kit Ram and Travel Speed on page 99
Section 9.34 – Adjusting the Mover Kit Pinion Gear on page 101
Section 9.35 – Change the Hydraulic Oil on page 101

# 9.3. Checking System Software

At the start of each seed treating season, make sure to perform the following tasks to ensure your STORM Seed Treater is operating at optimum levels.

- Check the latest software version and install it to your seed treater, see Section 11.2 Updating System Software on page 113.
- Verify that the records from the previous season were removed.

### 9.4. Visually Inspect the Seed Treater

A WARNING Lock out power before inspecting.

Check the following during a visual inspection:

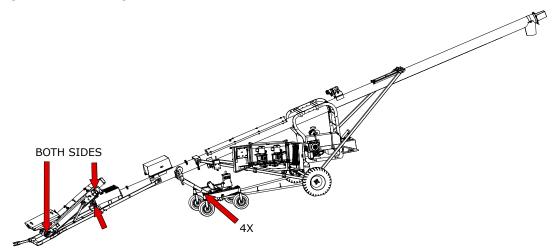
- 1. Ensure all guards are in place and in good working order.
- 2. Examine the seed treater for damage or unusual wear.
- 3. Check tightness of bolts/nuts, fasteners, and hardware (re-torque if necessary).
- 4. Be sure all safety decals are in place and are legible.
- 5. Check that the discharge and 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 12. Specifications on page 116 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.

### 9.5. Grease the Bearings

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

Refer to Section 12. – Specifications on page 116 for grease and oil types.

#### Figure 53. Greasing Locations



### 9.6. Check the Gearbox Oil

- 1. Remove fill/vent plug to check gearbox oil level. Insert an improvised dipstick (rolled paper or plastic tie) into the oil filler hole to determine the oil level.
- 2. Note the level and the condition of the oil. Maintain oil level at half full (center of cross shaft), adding as necessary or drain and refill if condition is poor.

Refer to Section 12. – Specifications on page 116 for gearbox oil information.

- 3. Ensure gearbox is level when checking or refilling.
- 4. Do not overfill when adding oil.
- 5. Replace fill/vent plug.

## 9.7. Change the Gearbox Oil

Refer to Section 12. – Specifications on page 116 for gearbox oil information.

- 1. Remove gearbox from the seed treater.
- 2. Place a pan under the drain plug.
- 3. Use a wrench and remove the drain plug.
- 4. Loosen the filler plug so air can enter the gearbox and the oil will drain freely.
- 5. Allow the oil to drain completely.
- 6. Replace the drain plug.
- 7. Add oil until the gearbox is half full (center of cross shaft) and replace filler plug. A flexible funnel may be required. Gearbox should be level when checking or refilling. **Do not overfill.**
- 8. Reinstall the gearbox and guards.

### 9.8. Clean the Calibration Cylinders

Clean the calibration cylinders whenever the level of treatment becomes difficult to read.

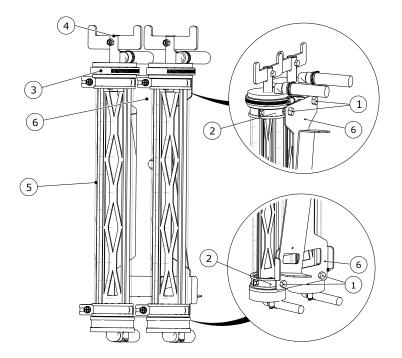
- 1. Remove the two bolts (1) securing the threaded clamp hanger (2) to release each of the cylinders from the bracket (6).
- 2. Loosen the hose clamp (3) located at the top of the calibration cylinder.
- 3. Pull the wiper handle (4) up until the wiper is out of the cylinder.
- 4. Remove the calibration cylinder (5).
- 5. Scrub the cylinder with a disposable rag and flush with water.

#### Note

Follow the manufacturers' instructions on disposal of waste water.

- 6. Put the calibration cylinder back in place then secure hose clamps.
- 7. Put the wipers, clamps, and associated hardware back in place.

#### Figure 54. Calibration Chamber



ltem	Description
1	Bolt
2	Threaded clamp hanger
3	Hose clamp
4	Wiper handle
5	Calibration cylinder
6	Cylinder mount bracket

### 9.9. Coat the Calibration Cylinders

- 1. Remove and clean the calibration cylinder, see Section 9.8 Clean the Calibration Cylinders on page 82.
- 2. Dry the cylinder and use a rag to coat a thin layer of petroleum jelly to its interior surface.

### 9.10. Inspect the Calibration Cylinder Wiper

- Remove calibration cylinder wiper from the calibration chamber. Refer to Section 9.8 Clean the Calibration Cylinders on page 82 for instructions on how to remove the calibration cylinder wiper.
- 2. Wipe the rubber edge of the wiper using a rag to remove any treatment residue.
- 3. Inspect the rubber and the wiper backbone for wear or damage. Install a new wiper as needed.

### 9.11. Inspect, Clean, and Align Nozzles

1. Remove the nozzles from the boot.

### Note

There are two nozzles positioned at both the bottom of the boot (rear) and top of the boot (front).

- 2. Clean any build-up/residue from the external surface of the nozzles.
- 3. Check the nozzle assemblies for cracks or leaking fittings.
- 4. Connect Pump 1 and Pump 2 to water.
- 5. Use the flush-out function to run water through each set of nozzles.

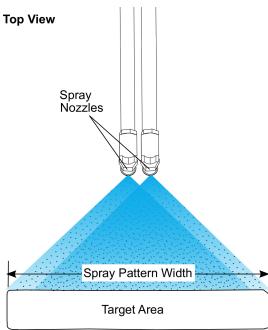
- 6. Spray the water into the bucket.
- 7. Check the pressure of the pumps and spray pattern.
  - a. If the pressure in either pump is greater than 25 psi, turn off the pump and investigate the issue. The high pressure could be attributed to a pinched hose or a potential blockage. Inspect all hoses for kinks and follow the steps below to remove a blockage.
    - i. Remove the nozzles on the pump that exceeded the recommended pressure.
    - ii. Inspect the nozzles for any debris or blockages.
    - iii. Clean the nozzles with water or an appropriate cleaning solution and blow them out with compressed air.
    - iv. Reinstall the nozzles.
  - b. Inspect the spray pattern.

#### Note

Correct spray pattern is important in achieving consistent, effective, and efficient treatment process. Below are some attributes of a correct spray pattern:

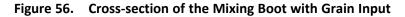
- i. **Centered to the nozzle assembly.** If the spray pattern is not centered to the nozzle assembly, adjust the nozzle to position it at the center of the assembly, see Figure 55.
- ii. Consistent and uniform coverage. If the spray pattern is uneven or inconsistent, check for:
  - blockages and debris
  - worn out or damaged nozzle
  - pressure
- iii. **Covers the desired spray width.** If the spray pattern is not covering the desired width, check the alignment of the nozzles, see Step i.

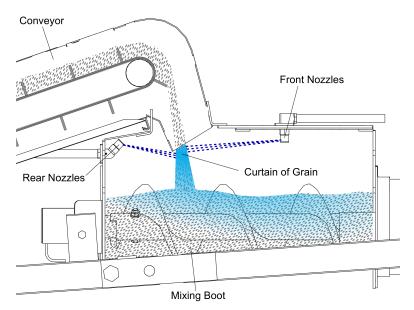
### Figure 55. Spray Pattern



8. Reinstall the nozzles to the boot.

9. Check the spray pattern by viewing through the boot polycarbonate cover to confirm that the nozzles are working as intended.





#### Important

Properly aligned nozzles will cover the intended width and will deliver uniform and right amount of spray, minimizing build-up in the boot.

- The rear nozzles should be directed to spray towards the discharge of the conveyor.
- The front nozzles should be directed to spray towards the discharge of the metering conveyor.

### 9.12. Clean the Mixing Boot and Chemical Hoses

It is recommended to clean the seed treater immediately after use to prevent the treatment products from drying and sticking to the equipment. Thoroughly cleaning the system ensures efficient operation for the next treating application.

WARNING Ensure power is locked out when accessing the boot or mixer flighting.



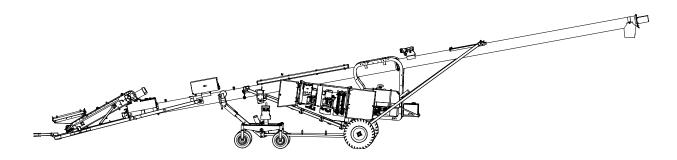
Refer to 2.7 Seed Treatment Safety, page 10 for information on safe disposal of contaminated rinse water.

Use the Flush Out function on the system maintenance screen.

- 1. Place the seed treater in the clean-out position. Place a container under the boot to catch runoff.
- 2. Close the clean-out door.
- 3. Remove the top cover.
- 4. Fill the boot halfway with water.
- 5. Replace the top cover.
- 6. Start the engine and at an idle, operate the mixer in reverse.
- 7. After 5 minutes, stop the mixer and turn off the engine.

- 8. Drain the boot.
- 9. Inspect the boot. If there are remaining residue, repeat the cleaning steps as needed.

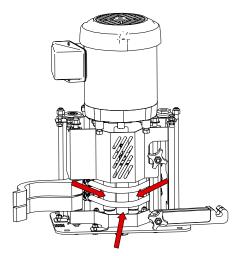
### Figure 57. Clean-Out Position



# 9.13. Check the Chemical Pump Rollers

1. Open the covers and confirm the pump rollers move freely.

#### Figure 58. Chemical Pump Rollers



## 9.14. 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 59. Strainer



### 9.15. 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.
- 3. Set ball valves to calibrate.
- 4. Coat calibration cylinders with antifreeze.
- 5. Drain antifreeze.
- 6. Set ball valves to treat.
- 7. Run antifreeze through the system.
- 8. Operate the pumps in the reverse direction to remove any excess antifreeze from the lines.
- 9. Disengage pump hoses when not in use.
- 10. Close and secure the pump station doors when not in use.

# 9.16. 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.

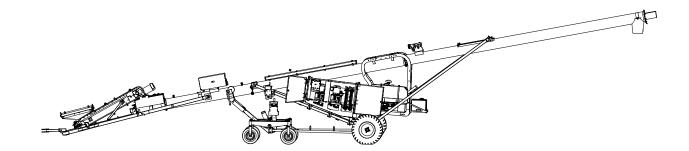
Use the Flush Out function on the system maintenance screen.

- 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.

### 9.17. Clean the Conveyor Belt

- 1. Remove the conveyor covers.
- 2. Position the conveyor in clean out position, see Figure 60.
- 3. Remove the bottom covers.
- 4. Inspect the belt for a build-up of treatment residue.
- 5. Use a high-pressure washer to remove excessive treatment residue.

#### Figure 60. Clean-Out Position



# 9.18. Check and Maintain the Containment System

### **Chemical Hoses**

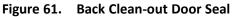
Ensure nothing is caught in the hoses, if there is, flush out with water or replace the line if necessary.

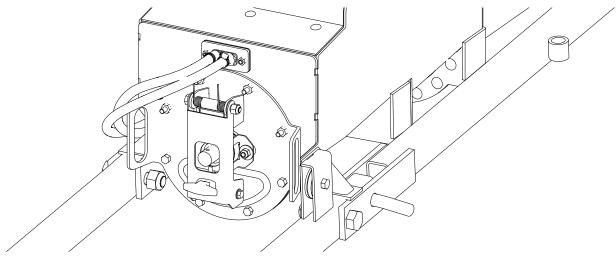
### Fittings

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

### **Back Clean-out Door Seal**

Make sure the rubber bulb seal is in good condition, replace if damaged.





### **Pump Station**

- Remove any debris from the drain pan and rinse with water.
- Ensure the drain valve is opening and closing properly. Replace if cracked or worn.
- Check the drain line for any blockages, if you find any, flush out with water or replace the line if necessary.

### 9.19. Advanced Mixer Clean-Out

Complete this procedure when dealing with excessive build-up in the mixer tube or on the flighting to keep the seed treater operating effectively.

- 1. Position the seed treater with the mover controls to allow for the full extraction of the mixer flighting with the mixer tube at a low angle, boot slightly raised, and conveyor intake at full height.
- 2. Lockout power to the mixer.
- 3. Remove the bolt at the mixer discharge.
- 4. Remove bolts holding bottom mixer bearing plate.
- 5. Pull the mixer flighting out.
- 6. Use detergent and pressure washer to loosen and remove the build-up.
- 7. Reassemble.

## 9.20. Check and Replace the Pump's Chemical Hoses

To maintain treating accuracy and safe handling of treatment chemicals, it is necessary to change pump tubing annually or if there are kinks, wear, or leaks.

For hose type, refer to Section 12. – Specifications on page 116.

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 operate correctly.

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

#### Note

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

### 9.20.1 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. Set the valves to the calibration positions for the pumps.
- 2. 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.
- 3. Remove the nozzles from the boot and place them in a large container.
- 4. On the touch screen, select Flush Out from the Maintenance screen.
- 5. Ensure that the pump with the tubing element that is intended for break-in is set to On and in the Forward direction.
- 6. Ensure that the pump with the tubing not intended for break-in is set to Off.
- 7. Press Start and run the pump for a minimum of 30 minutes circulating water the entire time. As the water discharges from the nozzles, you may have to return the discharged water back into the bucket that the intake hoses are in until 30 minutes is reached.

#### Note

The hoses will stretch as part of the break-in and during the first 1–8 hours of operation. Inspect the pump and ensure that the hoses are tracking down the centre of the pump shoes. If not, slightly trim the hoses as necessary.

## 9.21. 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.

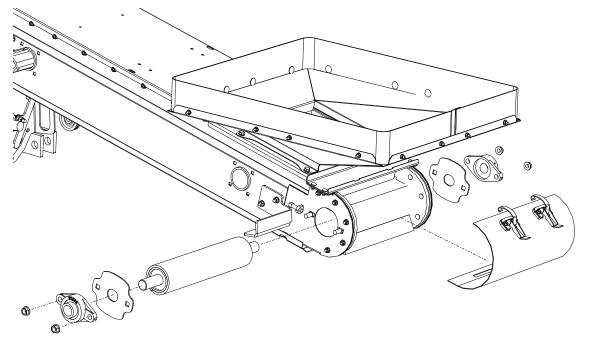
**NOTICE** Operating the conveyor with a damaged roller will result in a damaged conveyor belt.

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 62.

### Figure 62. Replacing a Conveyor Roller



### 9.22. Tension the Conveyor Belt

Adjusting your conveyor belt for proper tension helps to ensure trouble-free operation and long belt life.

Ensure the belt is thoroughly clean prior to tensioning or aligning the belt. Foreign materials may affect tension and alignment. Refer to Section 9.17 – Clean the Conveyor Belt on page 88.

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. If the belt is too tight, it can cause excessive loads on the drive motor and control components.

If the conveyor belt is properly tensioned, you should only be able to lift it 1/2" off the pan (top side of the conveyor) with a force of 5–10 lb, otherwise the belt will require tensioning, or loosening from being too tight.

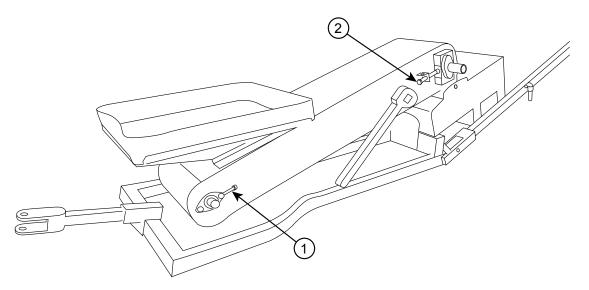
### NOTICE

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 63.
- 2. Adjust the tightener bolts equally until you can only lift the conveyor belt 1/2" off the pan (top side of the conveyor) with a force of 5–10 lb. Use a tape measure to confirm that the two tightener bolts are equally positioned.
- 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 9.23 Align the Conveyor Belt on page 93.
- 7. If the conveyor belt is still loose after tensioning, the belt needs to be replaced (depending on wear).

#### Figure 63. Conveyor Hopper



Item	Description	Item	Description
1	Adjustment Bolt (Belt Alignment)	2	Tightener Bolt (Belt Tension)

## 9.23. Align the Conveyor Belt

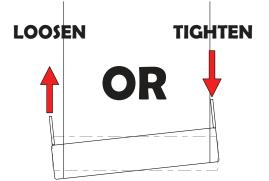
### **Basic Conveyor Belt Alignment:**

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.

Belt alignment is done while the belt is running.

#### Figure 64. Roller out of Alignment



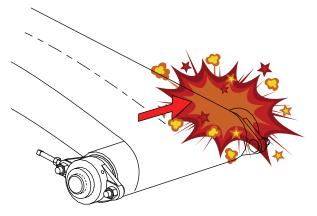
#### **Before Aligning the Belt:**

- 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.

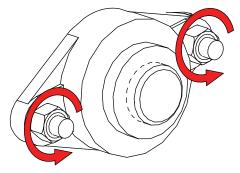
#### Figure 65. Belt Tracking to One Side



### 9.23.1 Adjusting the Rollers

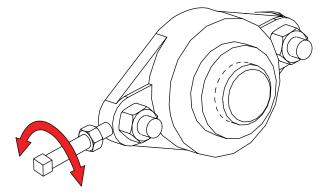
1. Loosen bearing nuts and jam nuts (if equipped).

### Figure 66. Loosen the Bearing Nuts



2. Rotate adjustment bolt 1/2 turn.

### Figure 67. Rotate the Adjustment Bolt

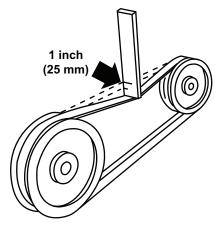


- 3. Restart conveyor and run empty for 1 minute.
- 4. Stop the conveyor and remove ignition key or lock out the power source.
- 5. If the belt has centered, move to next step. If not, repeat Step 2 to Step 4 until the belt is centered.
- 6. Tighten the bearing bolts and jam nut (if equipped).
- 7. Replace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

### 9.24. Tension the Drive Belts

1. Remove guard and push on the center of the belt span with a force of approximately 5 lb. The belts will deflect approximately 1" (25 mm) when properly tensioned.

Figure 68. Typical Drive Belt Tensioning



2. Tighten or loosen the drive belts (or idler pulley when equipped) to achieve the proper tension.

#### Important

The drive belt should be just tight enough to not slip on the drive pulley when operating. If the belt is too loose, it will slip, possibly causing a squeaking sound and slowing the belt down. If the belt is too tight, it will cause excess wear.

3. Reattach and secure guard. Start system to ensure proper operation.

### 9.25. Align the Drive Belts

- 1. Lay a straight edge across the pulley faces to check the alignment.
- 2. Use the pulley hub to move the pulley to the required position for alignment.
- 3. Tighten the hub bolts to secure pulley on the drive shaft.
- 4. Check the belt tension.
- 5. Reattach and secure the guard.

### 9.26. Replace the Drive Belts

- 1. Remove the guard.
- 2. Fully loosen the drive belts.
- 3. Remove and replace the old belts.
- 4. Tighten the drive belts as described in Belt Tension.
- 5. Align the drive belts as described in Belt Alignment.
- 6. Reattach and secure the guard.

# 9.27. 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.

### 9.28. Inspect Belt Lacing

Inspect the condition of the belt lacing, if any clips are worn through, replace all lacing.

### 9.29. Replace the Belt Lacing

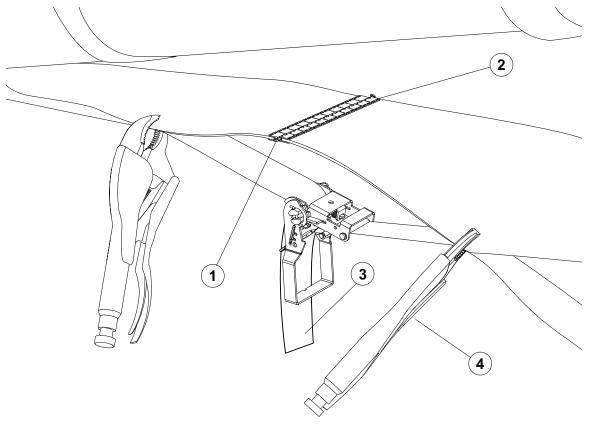
- 1. Remove the conveyor cover and rotate the conveyor belt until the lacing is by the hopper or is easily accessible.
- 2. Loosen the conveyor belt and remove the lacing retainer clip and pin.
- 3. Using a square and sharp knife, cut the lacing off right behind the lacing clips. The cut belt MUST have a square end.
- 4. Use a lacing tool to install new lacing clips. Lacing clips are one clip shorter than the belt width. For example: the lacing for a 15" wide belt is 14 clips. Center the lacing on the belt and install the lacing as per instructions on the lacing tool.
- 5. Reattach the conveyor belt ends together. If required, use a ratchet strap clamped to both ends of the belt to cinch the belting ends together. Figure 69 on page 97.
- 6. Install the lacing pin and crimp the retainer clips onto each end of the lacing pin. Figure 70 on page 98.
- 7. Remove the ratchet strap and tighten the conveyor belt, see Section 9.22 Tension the Conveyor Belt on page 91.
- 8. Check and set the belt alignment, see Section 9.23 Align the Conveyor Belt on page 93.
- 9. Engage the conveyor drive. Allow the conveyor to run for 30 seconds, then shut down the conveyor and inspect the lacing.

### 9.30. 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. If required, use a ratchet strap clamped to both ends of belt to cinch belting ends together. Figure 69.

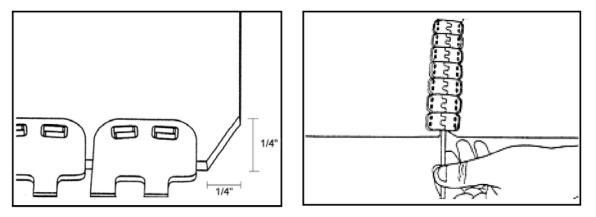
### Figure 69. Using the Ratchet Strap



ltem	Description	ltem	Description
1	Lacing Pin	3	Strap Puller
2	Belt Lacing	4	Vise-Grip

- 9. Install the lacing pin and crimp the retainer clips onto each end of the lacing pin, see Section 9.29 Replace the Belt Lacing on page 96.
- 10. Remove the ratchet strap and tighten the conveyor belt, see Section 9.22 Tension the Conveyor Belt on page 91.
- 11. Check and set the belt alignment, see Section 9.23 Align the Conveyor Belt on page 93.
- 12. Engage the conveyor drive. Allow it to run for 30 seconds, then shut down the conveyor and inspect the lacing.

#### Figure 70. Lacing the Conveyor Belt



13. Follow Section 7.7 – Conveyor Break-In on page 34 for the procedure to break in a newly installed conveyor belt.

### 9.31. Inspect and Service the Hand Winch and Lift Cable

MARNING Place seed treater in fully lowered position with cable slack.

- 1. Inspect the cable for damage such as fraying, kinking, or unwinding. Replace if damaged (see below).
- 2. Check to make sure cable clamps are secure.
- 3. Oil cable pulleys as needed.
- 4. Keep a film of grease on the gears. Occasionally oil the bushings, drum shaft, and ratchet.
- 5. Do not get oil or grease on brake discs.
- 6. Replace brake discs if less than 1/16" (1.6 mm) thick.
- 7. Check for proper ratchet pawl operation:
  - When cranking in (clockwise) = loud clicking
  - When cranking out (counterclockwise) = no clicking and ratchet pawl fully engaged into gear teeth.

### To Replace the Lift Cable:

- 1. Unwind the winch drum until cable is slack and remove all cable clamps.
- 2. Free the cable from the winch and pulleys.
- 3. Remove the cable clamps that secure the hook in place.
- 4. Reverse the above steps to install the new cable.

### 9.32. Inspect and Service the Hydraulic Winch and Lift Cable

**WARNING** Place the seed treater in the fully lowered position with the cable slack.

#### To Inspect the Lift Cable:

1. Inspect the cable for damage such as fraying, kinking, or unwinding. Replace if damaged (see below).

- 2. Check to make sure the cable clamps are secure.
- 3. Oil the cable pulleys as needed.
- 4. Occasionally oil the bushings and drum shaft.

### To Replace the Lift Cable:

- 1. Unwind the winch drum until the cable is slack and remove the cable clamps.
- 2. Free the cable from the winch and pulleys.
- 3. Remove the cable clamps that secure the hook in place.
- 4. Reverse the above steps to install the new cable.

### 9.33. Adjusting the Mover Kit Ram and Travel Speed

MARNING Place the seed treater on level surface and fully lower the intake and discharge ends. Ensure the engine is in idle and the seed treater drive is disengaged before adjusting.

### **Hydraulic Pressure Adjustment**

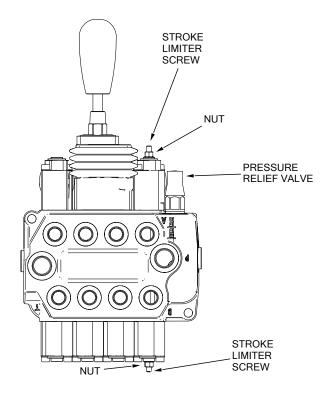
If the controls are "jerky" or act too fast, it may be necessary to adjust the hydraulic pressure on the wheel move.

- **To decrease hydraulic pressure:** Loosen the nut on the four spool valve (bottom right side of valve) and turn the adjustment screw out (counter-clockwise). Tighten the nut.
- **To increase hydraulic pressure:** Loosen the nut on the four spool valve (bottom right side of valve) and turn the adjustment screw in (clockwise). Tighten the nut.

### **RAM Speed Adjustment**

Ram speed in each direction of travel is regulated at the control valve. Adjust the stroke limiter screws and jam nuts until the desired rate of travel is achieved.

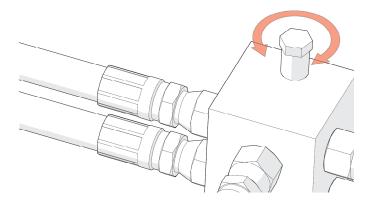
- Turning the screws inward results in a slower speed.
- Turning the screws outward results in a faster speed.



### **Travel Speed Adjustment**

To control the speed of the mover, the cushion valve can be adjusted:

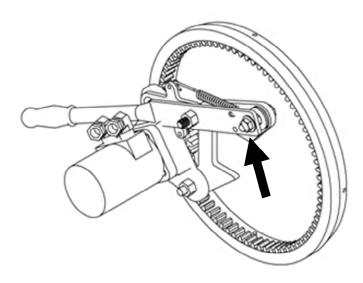
- screwed in for increased speed.
- screwed out for decreased speed.



### 9.34. Adjusting the Mover Kit Pinion Gear

The pinion gear must mesh fully with the ring gear to provide maximum contact.

- 1. Adjust the handle slot bolt (which bolts to the drive mount clamp) so full meshing of the pinion gear is achieved when the handle is in the over-center position. The pinion gear will need adjustment when gear teeth bind or are not meshing sufficiently.
  - **Gear teeth binding:** If the handle will not lock into over-center position, loosen the slot bolt nuts and slide the handle away from the tire.
  - **Insufficient Meshing:** If the pinion gear barely meshes with the ring gear, loosen the slot bolt jam nuts and slide the handle towards the tire until the gears fully mesh.



### 9.35. Change the Hydraulic Oil

Change the hydraulic oil 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 12. – Specifications on page 116 for oil type.

### 9.36. Change the Hydraulic Oil Filter

Replace the oil filter every two years or 200 hours. Before changing the filter, ensure the equipment is off, and place a drip pan underneath to catch oil.

- 1. Unscrew filter from receptacle
- 2. Check for buildup; clean, if necessary.
- 3. Install new filter.
- 4. Check the hydraulic oil level and add the necessary amount of fluid to bring it back to the recommended level.

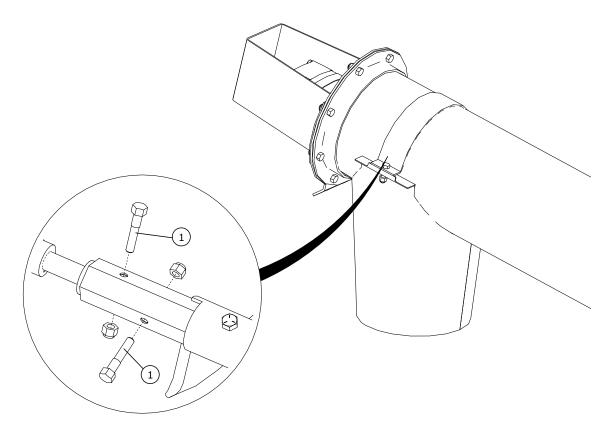
# 9.37. Remove/Replace the Shear Bolt

- 1. Position the seed treater with the mover controls to allow for the full extraction of the mixer flighting with the mixer tube at a low angle, boot slightly raised, and conveyor intake at full height. Lock ball valves to secure the seed treater.
- 2. Lockout power to the mixer.
- 3. Locate and remove/replace the shear bolt (1) through the discharge spout of the mixer tube.

#### Note

There are two 3/8" x 2-1/2" hex bolts (GR 8) and 3/8" lock nuts in this position.

#### Figure 71. Removing the Shear Bolts



# **10. Troubleshooting**

Find causes and solutions to common problems that can be encountered.

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

The following section covers some causes and solutions to some of the problems that may be encountered.

If there is a problem that is difficult to solve, even after having read through this section, please contact your representative or AGI. Have this manual and the serial number available.

Seed Treating Issues

Problem	Cause	Solution
Seed rates are outside of the expected +/-5%.	Conveyor intake wiper is out of adjustment.	Check hopper is installed properly and not bent.
	Cleated conveyor belt is slipping on the drive rollers.	Adjust belt tension and tracking. Ensure the wings on the cleats are evenly contacting the rubber sides in the intake hopper.
		Ensure that the cleat travel is not being impeded by an object protruding into the seed travel area.
	Inconsistent feed rate to conveyor.	During operation, ensure that the metering conveyor is full across the cleats by removing the inspection panel on the top of the conveyor.
		<b>WARNING</b> Keep hands away from moving conveyor belt.
		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.

Problem	Cause	Solution
	Electronics not achieving proper conveyor motor speeds.	Conveyor Drive ratio should be 10:1, adjust if not set correctly.
		Ensure that the Conveyor Correction Factor is set at 1000.
Pump won't prime, pump output is fluctuating.	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.	Ensure pump shoes are properly engaged.
		Check that pump valves are open on engaged pump hoses.
		Check that shoe retainer plates are properly seated and fully tightened.
	Pump lines are the incorrect length.	Ensure the pump lines are the correct length.
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. Re-engage if required.
		Important Smear petroleum jelly on coupler halves before engaging to ensure internal seals are lubricated to prevent air leaks.
		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 have been assembled with pipe thread sealant. Replace and reassemble as necessary.

Problem	Cause	Solution
		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 the filter body is tightly secured.
	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 at too high of a pressure.	Ensure system is operating at 25 psi or lower. Lower treating parameters, such as treating speed, to reduce system pressure.
		Ensure nozzles and filters are not plugged and hoses are not pinched.
	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 60 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 the pump.
		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 the pump.
	There are calibration errors.	Accepting calibration errors while calibrating a job results in inaccurate pump outputs when the job is run; recalibrate the pumps to eliminate the errors.

Problem	Cause	Solution
		The system signals a calibration error has occurred on the results screen during the calibration procedure.
		Running a job without adjusting for seed flow corrections results in inaccurate pump outputs; recalibrate the pumps to remove the estimated job parameters and replace them with calibrated parameters.
		The system signals it is using estimated values by adding a 9 as a prefix to the Calibration field on the Job Details screen.
	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 seed treater.
		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. Recalibrate 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 or out of adjustment.	Pump may be damaged or warped. Replace if required.
		Pump shoes may not be fully engaged.
Seed coverage is poor.	Nozzles are plugged or damaged.	Check for plugged nozzles, and clean as required.
	Nozzle(s) are misdirected.	Ensure nozzles are oriented correctly and spraying the full seed curtain.
	Nozzle(s) are not creating a spray pattern.	Excessively low pump flow (800 ml/min or lower per nozzle) can result in a poor spray pattern, depending on the treatment type. Increase treating parameters to gain an improved spray pattern. If product application rates are low, consider combining flows or diluting product to increase flow rate through the nozzles.

Problem	Cause	Solution
	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.
		Check condition of pump tubing; replace if there is visible warping or damage.
	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 can result 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 application chamber.	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.
	Nozzle(s) are misdirected.	Ensure nozzles are oriented correctly and spraying the full seed curtain.
System won't operate at higher conveyor speeds.	Pump max. speed limit has been met.	Lower product dilution if possible. Split treatment application to two pumps. Consult with AGI for metering options.

Problem	Cause	Solution
	Insufficient power supply.	Check advanced diagnostics during operation for voltage condition. If low, ensure that the STORM is powered by a dedicated circuit. Extension cords should be 12 gauge or heavier and should not exceed 100 feet in total length. Use a generator that provides a dedicated outlet rated at 240VAC and 30 Amps if power availability is limited.
	Conveyor out of adjustment causing excessive drag.	An improperly adjusted conveyor can increase power requirements. Adjust conveyor.

### Conveyor

Problem	Cause	Solution
Conveyor belt slipping.	Conveying belt loose.	Tension and align the conveyor belt, see Section 9.22 – Tension the Conveyor Belt
	Belt out of alignment.	on page 91 and Section 9.23 – Align the Conveyor Belt on page 93.
	Drive roller worn or damaged.	Replace drive roller, see dealer.
Excessive conveyor belt edge fraying.	Belt not aligned.	Align belt, see Belt Alignment in Maintenance.
Conveyor belt loose.	Belt stretches over time.	Re-tension belt, see Belt Tension in Maintenance.
		If belt is fully tensioned, you may need to shorten belt and re-lace, see Belt Relacing in Maintenance.
Grain leaking from conveyor hopper.	Belt not aligned (centered).	Align belt, see Belt Alignment in Maintenance.

### Mixer

Problem	Cause	Solution
Poor product flow, too	Input speed is too slow.	Increase engine rpm.
high of hydraulic pressure, or plugging.	Material is too wet or heavy.	Reduce treating speed if mixer cannot handle the product flow.

Problem	Cause	Solution
		Check that product calibrations are correct and proper application rates are being achieved.
		Some treatment products are very sticky. Dilute with water (if possible) to reduce stickiness. Contact treatment manufacturer if problems persist.
	Flighting is worn.	Repair or replace as required.
Excessive noise or vibration.	Top drive inadequately engaged.	Check shear pin.
*Remember to follow proper break-in procedures—flighting may run rough until tube is polished. If noise is extreme from outset or continuous after several loads of grain are fed, continue with troubleshooting.	Broken/distorted flighting sections.	Support seed treater and remove all flighting sections. Check for straightness of flight stubs by rolling across flat concrete section. Straighten stub or replace as necessary. Take care not to bend flighting when reinstalling.
The flighting does not turn.	Seed treater flighting is plugged or obstructed.	Identify and remove obstruction.
	Bearing is seized.	Identify the bearing and replace.
	Shear pin broken.	Replace shear pin.
	Hydraulic issue.	Check hydraulic and electric systems, call AGI Service for assistance.
Seed treater flighting is noisy.	Obstruction in the seed treater tube.	Identify and remove obstruction.
	Flighting shaft bolts are loose or damaged.	Tighten or replace bolts.
	Flighting shaft is bent.	Repair or replace flighting shaft.
	Flighting is damaged.	Repair or replace flighting.
	Worn bearing.	Repair or replace bearing.

Problem	Cause	Solution
Shear bolts fail repeatedly.	Incorrect shear bolt type.	Replace with correct part number. STORM shear bolts are specifically designed to provide correct driveline protection.
	Excessive loading during stops and starts.	Decrease engine throttle when starting and stopping the mixer.
Shear bolt hole worn ou round.		Frequent use of the incorrect shear bolt size can wear the mounting hole creating a "scissor effect," which will require replacement of the affected parts.

### Mover Kit with Hydraulic Winch Lift

Problem	Cause	Solution
Valve is leaking.	Loose/cracked fittings.	Tighten/replace fittings.
	Worn hose.	Replace hose.
	Valve spools are worn.	Replace valve.
Machine operates	Oil is hot.	Check oil level and add if required.
slowly.		Check hydraulic cooler fan. Check the fuse, if it is blown, replace with one of the same rating (see Section 12. – Specifications on page 116). Inspect all electrical connections.
	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.
	Cushion block needs adjusting.	Adjust valve on cushion block by turning inward 1/8 of a turn at a time, refer to Ram and Travel Speed Adjustment.
	Filter plugged (if equipped).	Change filter.
Hydraulic winch will not raise seed treater.	Relief valve pressure set too low.	Adjust relief valve pressure, refer to Ram and Travel Speed Adjustment.

Problem	Cause	Solution
	Oil level is too low.	Check oil level.
	Pump is worn out.	Replace pump.
Hydraulic cylinder leaking.	Worn seal.	Replace seal.
Winch coupler spins	Internal winch parts worn.	Replace worn parts.
off (Dutton winch).	Damage or obstruction on tracking.	Check tracking for damage or obstructions.
Seed treater doesn't drive.	Cushion block needs adjusting.	Adjust needle valve by turning clockwise 1/8 of a turn—try and repeat if necessary, refer to Ram and Travel Speed.
Pinion gear slipping or binding.	Pinion gear not adjusted properly.	Adjust the pinion gear. See Pinion Gear Adjustment.

#### Drive

Problem	Cause	Solution
Drive belts jumping off pulleys.	Motor misaligned.	Ensure drive and driven pulleys are correctly aligned.
	Belts mismatched.	Check Specifications section for correct belt sizes and only replace in pairs.
	Belt tension inadequate.	Adjust tension.

# **11. Appendix**

# **11.1. 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.

- 1. Level then power on the scale.
- 2. Place the (0.5 L) on the scale then tare the scale.
- 3. Fill the cup (0.5 L) to overflowing with the grain to be tested.
- 4. Ensure the slide is inserted into the cox funnel, then pour the contents of the cup (0.5 L) into the cox funnel.
- 5. Place the cup (0.5 L) on the catch pan for the overflow.

#### Note

Ensure the catch pan is on a level surface.

- 6. Position the cox funnel on top of the cup (0.5 L) so that the notched legs of the funnel fit securely on the cup's rim.
- 7. Remove the slide of the cox funnel quickly, allowing the contents of the funnel to empty into the cup (0.5 L).
- 8. Carefully remove the cox funnel from the cup's rim taking care not to disturb the grain.

#### Note

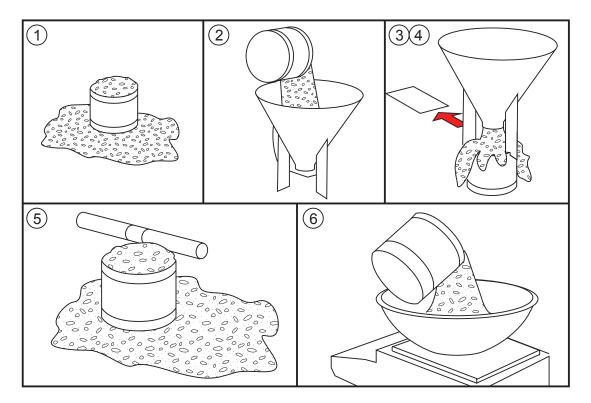
Jarring of the cup may result in the compaction of the grain which can lead to inaccurate results.

- 9. Place the hardwood striker on the rim of the cup (0.5 L) and, using three zigzag motions, remove the excess grain in the cup.
- 10. Place the cup (0.5 L) on the scale; the displayed units in grams in your seed density.

#### Note

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





## 11.2. 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 on the www.stormtreaters.com website/owner centre.

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.

### 11.2.1 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.

### 11.2.2 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 into the USB port on your computer. The flash drive may appear on your desktop as a removable drive.
- 3. Make sure you download the correct files for the model/year 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.
- 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.

## 11.2.3 Installing Software

#### Important

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

- 1. 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 .
- 2. 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.
- 3. When the message "Installation Complete" appears, press **Restart** at the bottom of the screen. The unit will initialize the software again.
- 4. When the main screen is displayed, 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 it has loaded properly.
- 5. 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.

1

# **12. Specifications**

Seed Flow15 to 30 bu/min [900 to 1,800 lb/min at 60 lb/bu] (408 to 816 kg/min [24.5 to 49 mt/h])Treatment Application Rate10 to 1,200 ml/100 kg*Treatment Application Coverage Accuracy+/- 5% (typical)Tube Size of Mixer10" (254 mm)TRANSPORT DIMENSIONSELength50'2" (15.3 m)Width8' (2.43 m)Height10'11" (3.33 m)DISCHARGE CLEARANCE DIMENSIONSMin11'10" (3.62 m)Max15'8" (4.78 m)TRANSPORT TIRESSize7.00-15 RadialInflation Pressure40 psi (276 kPa)Wheel Bolt Torque100 lb-ft (135.6 N·m)MOVER TIRESSize16x7.50-8Inflation Pressure20-24 psi (137-165 kPa)WEIGHT	
Treatment Application Coverage Accuracy+/- 5% (typical)Tube Size of Mixer10" (254 mm)TRANSPORT DIMENSIONSLength50'2" (15.3 m)Width8' (2.43 m)Height10'11" (3.33 m)DISCHARGE CLEARANCE DIMENSIONSMin11'10" (3.62 m)Max15'8" (4.78 m)TRANSPORT TIRESSize7.00-15 RadialInflation Pressure40 psi (276 kPa)Wheel Bolt Torque100 lb-ft (135.6 N·m)MOVER TIRESSize16x7.50-8Inflation Pressure20–24 psi (137–165 kPa)	
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MOVER TIRESSize16x7.50-8Inflation Pressure20–24 psi (137–165 kPa)	
Size         16x7.50-8           Inflation Pressure         20–24 psi (137–165 kPa)	
Inflation Pressure 20–24 psi (137–165 kPa)	
WEIGHT	
Hitch Tongue Weight 880 lb (400 kg)	
Total Weight 3640 lb (1,650 kg)	
POWER REQUIREMENTS	
Gas Engine 37 hp	
Control System Power 240 VAC X 30 A	
PART SPECIFICATIONS	
Hitch Pin1" dia. 3" effective length min.	
Treating Hoses 9" (229 mm) IP26 Masterflex Norprene Food (each h	ose)
Chemical Filter 30 Mesh	
Fuel Tank Capacity14 US Gal (53 L)	
Hydraulic System Capacity 40 L	

Shear Pin (top end of flighting)	3/8" x 2-1/2" hex bolt (Grade 8) and 3/8" lock nut
Gearbox Oil Type	Mobil SHC 634 or similar synthetic
Gearbox Oil Capacity	0.5–0.75 L
Grease Type	SAE multi-purpose high temperature grease with extreme pressure (EP) performance, OR use SAE multi- purpose lithium base grease
Cooler Fan Fuse	15 A ATC Blade Type
Engine Throttle Actuator Fuse	7.5 A ATC Blade Type
Hydraulic Oil	All weather anti-wear hydraulic oil (HVI 36)
Belt Size	B42

\* Rates are job specific, and may require adjustments including dilution, splitting between pumps, or changing of treating speed to accomplish.

118

# **13. 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.

#### STORM is an AGI Brand.

AGI is a leading provider of equipment solutions for agriculture bulk commodities including seed, fertilizer, grain, and feed systems with a growing platform in providing equipment and solutions for food processing facilities. AGI has manufacturing facilities in Canada, the United States, the United Kingdom, Brazil, South Africa, India and Italy and distributes its products globally.



201 Industrial Drive, Swift Current, SK, Canada S9H 5R4 P 877.667.7421 (Canada & USA) or 306.773.7779 | F 306.778.2524 | aggrowth.com/storm

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