Read the operator’s manual entirely. When you see this symbol, the subsequent instructions and warnings are serious - follow without exception. Your life and the lives of others depend on it!

Cover illustration may show optional equipment not supplied with standard unit.
## Table of Contents

### Important Safety Information
- Personal Safety Equipment

### Introduction
- Description of Unit
- Intended Usage
- Using This Manual
- Definitions
- Owner Assistance

### Assembly and Setup
- Before You Start
- Tractor/Sprayer Hook-Up
- Tractor/Great Plains
  - PTO Pump 1000-1 3/4” Hook-Up
  - Tractor/Hydraulic Pump Hook-Up
  - Tractor / PTO Shaft Hook-Up
- Axle Adjustment
- Control Box Assembly
- Manual Control Systems Only

### Operating Instructions
- General Notes For Field Operation
- Operating Checklist
- Using Handwash Tank
- Agitation
- Manual Pressure Valve
- Operating Whirlfilter®
  - Clean-out the solution Whirlfilter®
  - Clean out the tank-fill Whirlfilter®
- Filling Tank Procedures
- Operating Pump
- Hydraulic Elevator Option
- Transporting
- Parking
- Tank Rinse and Flush System
- Optional Equipment
- Inductor (Optional Equipment)
- Tank Fill Using Existing Pump Operations

### Adjustments
- General Field Adjustments
  - Boom Height
  - Nozzle Pressure
  - Tank Straps
  - Throttling Valve Adjustment
  - Agitation Adjustment
  - Agitation Adjustment with Tank Rinse
    - (Optional Equipment)
  - Pressure Adjustments
    - (Manual Control System Only)
  - Hydraulic Elevator
  - Boom Height

### Troubleshooting

### Maintenance and Lubrication
- Maintenance
  - Equipment Cleanup
  - General Information
  - Great Plains Pump
  - Scott and Ace Pumps
  - Tank Agitation
  - Storage
  - Lubrication
  - Four Wheel Bearings
  - Two Wheel Bearings

### Options
- Chemical Inductor
- Foam Marker

### Specifications

### Appendix
- Tire Inflation Chart
- Torque Values Chart for Common Bolt Sizes
- Warranty

© Copyright 1999 All rights Reserved

Great Plains Manufacturing, Inc. provides this publication “as is” without warranty of any kind, either expressed or implied. While every precaution has been taken in the preparation of this manual, Great Plains Manufacturing, Inc. assumes no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from the use of the information contained herein. Great Plains Manufacturing, Inc. reserves the right to revise and improve its products as it sees fit. This publication describes the state of this product at the time of its publication, and may not reflect the product in the future.

Great Plains Manufacturing, Incorporated Trademarks
The following are trademarks of Great Plains Mfg., Inc.: Application Systems, Ausherman, Land Pride, Great Plains
All other brands and product names are trademarks or registered trademarks of their respective holders. 

Printed in the United States of America.
Important Safety Information

Be Aware of Signal Words

The word that designates a degree or level of hazard seriousness. The signal words are:

⚠️ DANGER!
Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is limited to the most extreme situations, typically for machine components that, for functional purposes, cannot be guarded.

⚠️ WARNING!
Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.

⚠️ CAUTION!
Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

For Your Protection

⚠️ Thoroughly read and understand the “Safety Decals” section, read all instructions noted on them.

Keep Riders Off Machinery

⚠️ Riders obstruct the operator’s view they could be struck by foreign objects or thrown from the machine.
⚠️ Never allow children to operate equipment.

Use Safety Lights and Devices

⚠️ Slow moving tractors, self-propelled equipment, and towed implements can create a hazard when driven on public roads. They are difficult to see, especially at night.
⚠️ Flashing warning lights and turn signals are recommended whenever driving on public roads. Use lights and devices provided with implement.

Shutdown and Storage

⚠️ Disengage power, put tractor in park, turn off engine, and remove the key.
⚠️ Detach and store sprayer in an area where children normally do not play. Secure sprayer by using blocks and supports.
Use A Safety Chain

▲ A safety chain will help control drawn machinery should it separate from the tractor drawbar.
▲ Use a chain with the strength rating equal to or greater than the gross weight of the towed machinery.
▲ Attach the chain to the tractor drawbar support or other specified anchor location. Allow only enough slack in the chain to permit turning.
▲ Do not use safety chain for towing.

Use A Safety Chain

▲ A safety chain will help control drawn machinery should it separate from the tractor drawbar.
▲ Use a chain with the strength rating equal to or greater than the gross weight of the towed machinery.
▲ Attach the chain to the tractor drawbar support or other specified anchor location. Allow only enough slack in the chain to permit turning.
▲ Do not use safety chain for towing.

Transport Machinery Safely

▲ Comply with state and local laws.
▲ Maximum transport speed for implement is 20 mph. DO NOT EXCEED. Never travel at a speed which does not allow adequate control of steering and stopping. Some rough terrains require a slower speed.
▲ Sudden braking can cause a towed load to swerve and upset. Reduce speed if towed load is not equipped with brakes.
▲ Do not transport sprayer when filled with chemicals.
▲ Do not tow an implement that weighs more than 1.5 times the weight of towing vehicle.

Practice Safe Maintenance

▲ Understand procedure before doing work. Use proper tools and equipment, refer to Operator’s Manual for additional information.
▲ Work in a clean dry area.
▲ Disengage power, put tractor in park, turn off engine, and remove key before preforming maintenance.
▲ Make sure all moving parts have stopped and all pressure in the system is relieved.
▲ Allow sprayer to cool completely.
▲ Do not work on hoses, nozzles or plumbing components (with the exception of throttling valve and chemical inductor) while pump is running or hoses are pressurized. Disengage pump and release hose pressure by turning boom section switches on before working on individual components.
▲ Do not grease or oil sprayer while it is in operation.
▲ Disconnect battery ground cable (-) before servicing or adjusting electrical systems or before welding on sprayer.
▲ Inspect all parts. Make sure parts are in good condition & installed properly.
▲ Remove buildup of grease, oil or debris.
▲ Remove all tools and unused parts from sprayer before operation.

Prepare for Emergencies

▲ Be prepared if a fire starts. It is recommended that the operator of this sprayer carry a minimum five-pound ABC fire extinguisher.
▲ Keep a first aid kit.
▲ Keep emergency numbers for doctor, ambulance, hospital and fire department near phone.

Prepare for Emergencies

▲ Be prepared if a fire starts. It is recommended that the operator of this sprayer carry a minimum five-pound ABC fire extinguisher.
▲ Keep a first aid kit.
▲ Keep emergency numbers for doctor, ambulance, hospital and fire department near phone.
Important Safety Information

Handle Chemicals Properly

- Read and follow Chemical Manufacturer's instructions.
- Protective clothing should be worn.
- Handle all chemicals with care.
- Agricultural chemicals can be dangerous. Improper use can seriously injure persons, animals, plants, soil, and property.
- Inhaling smoke from any type of chemical fire is a serious health hazard.
- Store or dispose of unused chemicals as specified by the chemical manufacturer.
- Before adding chemical to the tank, make sure tank is at least half full. Concentrate should not be poured into an empty tank.
- Never leave fill hose attached to the sprayer after filling tank. Chemicals in tank can siphon out of tank and contaminate freshwater source.

Safety at All Times

Thoroughly read and understand the instructions given in this manual before operation. Refer to the "Safety Decals" section, read all instructions noted on them.

- Operator should be familiar with all functions of the unit. This sprayer can be dangerous and can cause bodily harm if not properly used or guarded.
- Keep others away from sprayer when in operation.
- Operate sprayer from the driver's seat only.
- Use only water without pesticides added to calibrate the sprayer.
- Do not exceed the calibrated sprayer speed and pressure when operating.
- Do not leave tractor or sprayer unattended with engine running.
- Dismounting from a moving tractor could cause serious injury or death.
- Do not stand between the tractor and sprayer during hitching.

Avoid High Pressure Fluids Hazard

- Always keep handwash tank filled with clean water and have soap available in case of an emergency. Flush any area of the body that is contaminated by chemicals immediately and thoroughly.
- Do not touch sprayer components with mouth or lips.
- If chemical is swallowed, carefully follow the chemical manufacturer's recommendations and consult with a doctor.
- If persons are exposed to a chemical in a way that could affect their health, consult a doctor immediately with the chemical label or container in hand. Any delay could cause serious illness or death.
- Dispose of empty chemical containers properly. By law rinsing of the used chemical container must be repeated three times. The container should then be punctured to prevent future use. An alternative is to jet-rinse or pressure rinse the container.

- Wash hands and face before eating when working with chemicals. Shower as soon as spraying is completed for the day.
- Spray only with acceptable wind conditions. Make sure wind drift of chemicals will not affect any surrounding land, people or animals.
- Never wash the sprayer tank out within 100 feet of any freshwater source or in a car wash.
- Rinse out the tank and spray rinse water on the last field sprayed.

- Keep hands, feet, and clothing away from power-driven parts.
- Wear snug fitting clothing to avoid entanglement with moving parts.
- Turning tractor too tight may cause implement to ride up on wheels. This could result in injury or equipment damage.
- When using a PTO pump, be sure that (1) PTO shield is in place on the tractor, (2) PTO coupler bolts are torqued to the correct specification, and (3) torque bar is properly chained to tractor drawbar.
- When inductor tank is not being used, keep inductor tank valve closed to prevent chemical overflow.
- Run pump when using inductor tank. Failure to do so will cause chemical overflow.

- Wear protective gloves and safety glasses or goggles when working with hydraulic systems.
- If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result.

Handle Chemicals Properly

- Read and follow Chemical Manufacturer's instructions.
- Protective clothing should be worn.
- Handle all chemicals with care.
- Agricultural chemicals can be dangerous. Improper use can seriously injure persons, animals, plants, soil, and property.
- Inhaling smoke from any type of chemical fire is a serious health hazard.
- Store or dispose of unused chemicals as specified by the chemical manufacturer.
- Before adding chemical to the tank, make sure tank is at least half full. Concentrate should not be poured into an empty tank.
- Never leave fill hose attached to the sprayer after filling tank. Chemicals in tank can siphon out of tank and contaminate freshwater source.

Safety at All Times

Thoroughly read and understand the instructions given in this manual before operation. Refer to the "Safety Decals" section, read all instructions noted on them.

- Operator should be familiar with all functions of the unit. This sprayer can be dangerous and can cause bodily harm if not properly used or guarded.
- Keep others away from sprayer when in operation.
- Operate sprayer from the driver's seat only.
- Use only water without pesticides added to calibrate the sprayer.
- Do not exceed the calibrated sprayer speed and pressure when operating.
- Do not leave tractor or sprayer unattended with engine running.
- Dismounting from a moving tractor could cause serious injury or death.
- Do not stand between the tractor and sprayer during hitching.

Avoid High Pressure Fluids Hazard

- Always keep handwash tank filled with clean water and have soap available in case of an emergency. Flush any area of the body that is contaminated by chemicals immediately and thoroughly.
- Do not touch sprayer components with mouth or lips.
- If chemical is swallowed, carefully follow the chemical manufacturer's recommendations and consult with a doctor.
- If persons are exposed to a chemical in a way that could affect their health, consult a doctor immediately with the chemical label or container in hand. Any delay could cause serious illness or death.
- Dispose of empty chemical containers properly. By law rinsing of the used chemical container must be repeated three times. The container should then be punctured to prevent future use. An alternative is to jet-rinse or pressure rinse the container.

- Wash hands and face before eating when working with chemicals. Shower as soon as spraying is completed for the day.
- Spray only with acceptable wind conditions. Make sure wind drift of chemicals will not affect any surrounding land, people or animals.
- Never wash the sprayer tank out within 100 feet of any freshwater source or in a car wash.
- Rinse out the tank and spray rinse water on the last field sprayed.

- Keep hands, feet, and clothing away from power-driven parts.
- Wear snug fitting clothing to avoid entanglement with moving parts.
- Turning tractor too tight may cause implement to ride up on wheels. This could result in injury or equipment damage.
- When using a PTO pump, be sure that (1) PTO shield is in place on the tractor, (2) PTO coupler bolts are torqued to the correct specification, and (3) torque bar is properly chained to tractor drawbar.
- When inductor tank is not being used, keep inductor tank valve closed to prevent chemical overflow.
- Run pump when using inductor tank. Failure to do so will cause chemical overflow.

- Wear protective gloves and safety glasses or goggles when working with hydraulic systems.
- If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result.
Wear Protective Equipment

▲ Protective clothing and equipment should be worn.
▲ Do not wear contaminated clothing. Wash protective clothing and equipment with soap and water after each use. Personal clothing must be laundered separately from household articles.
▲ Clothing contaminated with certain pesticides (read the label) must be destroyed according to state and local regulations.

▲ Wear clothing and equipment appropriate for the job. Avoid loose fitting clothing.
▲ Prolonged exposure to loud noise can cause hearing impairment or hearing loss. Wear suitable hearing protection such as earmuffs or earplugs.
▲ Operating equipment safely requires the full attention of the operator. Avoid wearing radio headphones while operating machinery.

Tire Safety

▲ Tire changing can be dangerous and should be performed by trained personnel using the correct tools and equipment.
▲ When inflating tires, use a clip-on chuck and extension hose long enough to allow operator to stand to one side and NOT in front of or over the tire assembly. Use a safety cage if available.
▲ When removing and installing wheels, use wheel handling equipment adequate for the weight involved.

Personal Safety Equipment

Great Plains advises all users of chemical pesticides or herbicides to use the following personal safety equipment. Always follow the chemical label instructions, operator safety and the effectiveness of the product depends upon operator actions.

▲ Waterproof, wide-brimmed hat

▲ Waterproof apron

▲ Face shield, goggles or full face respirator. Goggles with side shields or a full face respirator is required if handling or applying dusts, wettable powders, or granules or if being exposed to spray mist.

▲ Cartridge-type respirator approved for pesticide vapors unless label specifies another type of respirator.

▲ Waterproof, unlined gloves. Neoprene gloves are recommended.

▲ Cloth coveralls/outer clothing changed daily; waterproof items if there is a chance of becoming wet with spray

▲ Waterproof boots or foot coverings
Safety Decals
Your implement comes equipped with all safety decals in place. They were designed to help you safely operate your implement.
1. Read and follow decal directions.
2. Keep all safety decals clean and legible.
3. Replace all damaged or missing decals. Order new decals from your Great Plains dealer. Refer to this section for proper decal placement.
4. When ordering new parts or components, also request corresponding safety decals.
5. To install new decals:
   a. Clean the area on which the decal is to be placed.
   b. Peel backing from decal. Press firmly on surface, being careful not to cause air bubbles under decal.

---

**Safety Decals**

1. **Rotating Driveline**
   - [Image of a driveline]
   - **818-142C** Rotating Driveline
   - **15852**

2. **Driveline Shield Missing**
   - [Image of a driveline shield]
   - **818-187C** Driveline Shield Missing
   - **15851**

3. **Excessive Speed Hazard**
   - [Image of a speed hazard]
   - **818-188C** Excessive Speed Hazard
   - **13862**
838-265C
Amber Reflector

818-303C
Chemical Overflow

WARNING
CHEMICAL OVERFLOW HAZARD
To Prevent Serious Injury or Death from chemical overflow:
- Keep indicator tank valve closed when not in use.
- Run pump when indicator is in use.

818-305C
Inflation & Torquing Caution
Important Safety Information

818-323C
Personal Safety Equipment
Danger

818-324C
General Caution

818-339C
High Pressure Fluid Warning

818-365C
Tire Inflation & Torquing Caution
818-381C
Tire Inflation & Torquing Caution

818-548C
Inflation & Torquing Caution

818-576C
Personal Safety Equipment Danger

818-696C
Water Contaminate Warning
Important Safety Information

383333
Rotating Driveline

383334
Guard Missing
Introduction

This implement has been designed with care and built by skilled workers using quality materials. Proper setup, maintenance and safe operating practices will help you get years of satisfactory use from the machine.

Description of Unit
The TS750 and TS1000 are pull-type sprayer units.

Intended Usage
Use sprayer to apply chemicals to agricultural-production crops only. Do not modify sprayer for use with attachments other than those approved by Great Plains.

Using This Manual
This manual will familiarize you with safety, assembly, operation, adjustments, troubleshooting and maintenance. Read this manual and follow the recommendations to help ensure safe and efficient operation.

The information in this manual is current at printing. Some parts may change to assure top performance.

Definitions
The following terms are used throughout this manual.

Right-hand and left-hand as used in this manual are determined by facing the direction the machine will travel while in use unless otherwise stated.

IMPORTANT: A crucial point of information related to the preceding topic. For safe and correct operation, read and follow the directions provided before continuing.

NOTE: Useful information related to the preceding topic.

Owner Assistance
If you need customer service or repair parts, contact a Great Plains dealer. They have trained personnel, repair parts and equipment specially designed for Great Plains products.

Your machine's parts were specially designed and should only be replaced with Great Plains parts. Always use the serial and model number when ordering parts from your Great Plains dealer. The serial-number plate is located as shown in Figure A.

Record your sprayer model and serial number here for quick reference:
Model Number: _________________________________
Serial Number: _________________________________

Your Great Plains dealer wants you to be satisfied with your new machine. If you do not understand any part of this manual or are not satisfied with the service received, please take the following actions.

1. Discuss the matter with your dealership service manager. Make sure they are aware of any problems so they can assist you.
2. If you are still unsatisfied, seek out the owner or general manager of the dealership.
3. For further assistance write to:

Product Support
Great Plains Mfg. Inc., Service Department
PO Box 5060
Salina, KS 67402-5060
Assembly and Setup

Before You Start
1. Find an open, flat area to assemble the sprayer.
2. Read all the instructions and understand them before assembling the sprayer.
3. Have the adequate tools necessary.

Read and understand the Operator’s Manual for the sprayer. A basic understanding of how the sprayer works will aid in the assembly, setup and operation of the sprayer. Find an open, flat area to assemble the sprayer and attach it to the tractor.

Tractor/Sprayer Hook-Up
The Great Plains Sprayer is equipped with a ball hitch on sprayers equipped with a PTO driveline pump.

A single tang hitch is used in place of the ball hitch on other pump options. If the sprayer has a single tang hitch, attach it to the tractor using a hitch pin with a retaining hair pin. Park the sprayer in a open, flat area. With the jack in the park position, figure 2. Skip instructions 1-4 and proceed with 5.

If the sprayer is equipped with the ball hitch, use the instructions 1-4 to assemble the hitch plate.

Refer to Figure 1
1. Remove the hammer-strap on the tractor. Assemble the ball hitch plate (1) to the drawbar by placing the 1” x 5” long bolt (2) through the drawbar hole using flat washers on both ends.
2. Secure the 3/4” x 5” long bolts (3) in the slots of the ball hitch plate (1) and in the slots of the backup plate (4) using the flange nuts provided. Orient the backup plate (4) with the slots in the opposite direction of the ball hitch plate.

Refer to Figure 2
3. Park the sprayer in an open, flat area with the jack in the park position.
4. Back the tractor up to the sprayer and hook up the sprayer ball hitch onto the stud (5) mounted on the ball hitch plate (1). Secure the ball hitch with the flat washer (6) and the lynch pin (7).
Refer to Figure 3

5. Now that the sprayer is attached to the tractor, prepare to level the frame of the sprayer by securely supporting the front of the frame with a hoist.

6. Adjust the frame by moving the adjustment bolts (1) to a position where the frame is sloping to the front about one degree. This will allow the fluid in the tank to drain into the sump when the sprayer is in use. Securely fasten the adjustment bolts (1) using the Torque Values Chart in the “Appendix” section on page 33.

Tractor/Great Plains PTO Pump 1000-1 3/4” Hook-Up

1. Position the PTO pump on the tractor’s PTO shaft with the coupler bolt removed on the splined end.
2. Push the coupler of the pump on to align with notch in the tractor PTO shaft and install bolt.
3. Make sure there is adequate hose length to reach the pump.
4. On the 1000 rpm 1 3/4 inch spline PTO pump, torque the 5/8 inch Grade 8 coupler bolt to 210 ft-lbs and the other 1/2 inch Grade 8 coupler bolt to 105 ft-lbs.
5. Rotate the PTO shaft by hand to make sure the bolts clear the PTO shielding.
6. Attach the torque bar chain to the drawbar securely.
7. Hook the tarp strap in such a way that the slack in the chain is taken up slowly when the PTO is engaged so the torque bar does not bang.
8. Tie up any loose hoses with cable ties to prevent hose damage.
9. With water in the sprayer tank and the pump, engage PTO shaft slowly with tractor engine idling. Once the system builds pressure, close agitation valve, shut off boom-section switches and close throttling valves (if applicable). Sprayers with automatic controllers do not have throttling valves. The pump is now at deadhead pressure. Adjust engine RPM so the spray pressure reaches 80 PSI maximum on the nozzle pressure gauge, or the PTO speed reaches the rated RPM (1000), whichever is first. Never exceed the rated tractor PTO RPM. This is the RPM needed to spray at to prevent excess pressure on the sprayer’s plumbing.

Tractor/Hydraulic Pump Hook-Up

The hydraulic motor used on all liquid pumps is a 6 GPM motor. If the tractor used on the sprayer does not have the capabilities to adjust the remotes down to this flow, then a hydraulic flow divider kit must be installed so that flow can be controlled and to prevent operating the pump at excessive speeds. See a Great Plains dealer.

To hook up the pump conduct the following instructions:

1. The pressure hose coming out of the tractor remotes must be connected to the “A” port of the motor and the return line connected to the “B” port. Before operating, place a stop in the neutral position for the tractor hydraulics so that the hydraulic lever can only be moved to the float and down positions. Refer to the tractor’s operator manual or tractor dealer on information for the neutral stop.

NOTE: Do not move the hydraulic lever into the neutral position while the hydraulic pump is running. To do so may cause damage to the hydraulic pump.

2. To determine the correct setting of the flow rate, start out with the hydraulic flow control valve set at a minimum flow for the pair of outlets that operate the pump.
3. With water in the sprayer tank and in the pump, place the hydraulic lever in the float position.
4. Open up the sprayer flow control valve to its maximum setting.
5. Start the tractor and engage the pump by placing the hydraulic lever in the down (forward) position.
6. Once the system builds pressure, close the agitation valve, shut off the boom section switches, and close the throttling valves (if applicable).
7. The pump is now at dead head pressure and the hydraulic control valve must be adjusted so the spray pressure reaches 80 PSI maximum on the nozzle pressure gauge. This process should be done with the tractor throttle set at normal operating speed. Mark this setting on the hydraulic control valve for future reference.
8. Open up the agitation valve and reset the throttling valves (if applicable). Refer to Throttling Valve Adjustment in the “Adjustments” section on page 21.
Tractor / PTO Shaft Hook-Up

**DANGER!**
Rotating driveline contact can cause death. KEEP AWAY! Do not operate without guards attached and driveline securely attached at both ends.

Refer to Figures 4 and 5

1. The tractor drawbar should be adjusted to ASAE standard or as shown.
   Adjust implement driveline to a position which is level with the tractor PTO.

   ![Figure 4](image1)
   **Figure 4**
   Tractor Drawbar Adjustment (540 RPM only)

   ![Figure 5](image2)
   **Figure 5**
   Tractor Drawbar Adjustment (1000 RPM only)

2. Position PTO shaft on tractor. Be sure shaft is coupled on tractor.
   Refer to Figure 6

3. Adjust the vertical position of the pump driveshaft on the sprayer so that it is level, to slightly higher than level with the PTO shaft on the tractor. This reduces driveline vibration when turning a corner. Adjust the vertical position by moving the four bolts supporting the driveshaft bracket.

   ![Figure 6](image3)
   **Figure 6**
   Hitch Height Adjustment

Axle Adjustment
When using the 50 and 60 foot Cross-Fold Booms, leave the axle in the rear most position.

**CAUTION!**
Axle position must be located correctly to avoid excessive tongue weight or negative tongue weight which could cause mechanical failure resulting in personal injury.

Refer to Figure 7
The wheel spacing of the axle can also be adjusted for differing row spacings.

**CAUTION!**
Do not adjust the wheel spacing wider than 120". To do so may cause a falling axle hazard while the sprayer is in service.

![Figure 7](image4)
**Figure 7**
Sprayer Axle Assembly
Control Box Assembly
Manual Control Systems Only

Refer to Figure 8

To assemble the control box and attachments onto the sprayer proceed with the following instructions:

1. Connect brown wire to positive terminal and the blue wire to the negative terminal on the tractor battery.
2. Route the battery cable into the cab of the tractor making sure there are no sharp edges for the wires to short out on.

⚠️ CAUTION! Do not position the battery cables so there could be shorting caused by binding or cutting on electrical wires. Failure to do so could cause injury by fire or fire damage to tractor.

3. Connect the control box harness to the harness attached on the sprayer.
4. Route the control box harness into the cab of the tractor through the rear window, or opening provided in the tractor and attach the harness to the control box.
5. Using pipe sealant, place a small portion of pipe sealant on the pressure gauge threads and assemble the reduction fitting (1) onto the gauge. Make sure that the gauge hole does not get clogged with pipe sealant.
6. Screw the 1/8" threaded quick coupling (2) into the reduction fitting (1) on the back of the control box.
7. Place the gauge protector magnet mount (3) on the back of the tractor so that it does not interfere with the operation of the tractor, but is easily accessible.
8. Estimate the amount of tube needed from the mounted control box in the tractor to the gauge protector magnet mount (3) and cut that length of the tube. Make sure the tube is routed in a safe place where it won’t be damaged while in operation.

IMPORTANT: The 50/50 mixture in the following steps is a 50/50 mixture of antifreeze and water.

9. With the control box laying face down, fill the gauge, the reduction fitting (1) and the quick coupling (2) with the 50/50 mixture, brim full.
10. Insert the tube into quick coupling (4).
11. Fill the gauge protector on the magnet mount brim full with the 50/50 mixture.
12. Fill the clear tubing with the 50/50 mixture using a short piece of 1/2 I.D. rubber hose and a small funnel.
13. With the tube completely full of the 50/50 mixture, as well as the pressure gauge and gauge protector, insert the tube into the coupling (2). Make sure that there is no air in the tubing when the tube is installed. The tube will automatically lock in the coupling (2) after insertion.
14. When removing the control box from the tractor cab, disconnect the hose at the gauge protector quick disconnect (5) and take the magnet mount with the control box so that the fluid-filled tube does not have to be disconnected.
15. Save the coupling (6) in case of tube damage to make a splice.
16. Assemble the 3/8" hose from the valve bank to the magnet mount (3) and attach with the hose clamp provided.

Figure 8
Control Box Assembly
Operating Instructions

General Notes For Field Operation

DANGER!
Read and follow chemical manufacturer’s instructions. Some chemicals and cause serious burns, lung damage and even death.

1. Securely hitch the sprayer to the tractor and fasten the safety chain. Make sure the hitch is adjusted so that the liquid in the tank will drain to the sump of the tank. Refer to Tractor/Sprayer Hook-Up in the “Assembly and Set-up” section on page 11.

2. Check the tire pressure in each tire. Refer to the Tire Inflation Chart in the “Appendix” section on page 33.

3. Lubricate the sprayer as needed. Refer to the Lubrication portion of the “Maintenance and Lubrication” section starting on page 25.

4. Hook-Up the pump to the tractor. Refer to Operating Pump in this section on page 17 and follow the instructions.

5. When transporting the sprayer, DO NOT exceed 20 mph and DO NOT transport with chemical in the tank. Fasten the level-float pin in the lock position BEFORE folding the boom and transporting it if boom is not equipped with an automatic latch.

6. NEVER allow anyone to ride on the sprayer.

7. Make sure all tank shut off valves are turned on.

8. Calibrate sprayer with water only, not chemical and water. Calibrate with the sprayer tank half full of water. Refer to the calibration procedures in the Application Guide.

9. Adjust throttling valves on the boom valves, and the manual pressure adjustment valve (if applicable). Adjust the boom height required for the nozzles and spacing to be used. (Refer to nozzle tables in the Application Guide.)

10. Check and clean, if necessary, pump, nozzles and Whirlfilters®.

11. Safely and carefully add the chemical to the sprayer tank. ALWAYS wear personal safety equipment as shown in the Personal Safety Equipment portion of the “Important Safety Information” section on page 4. By law rinsing of the used chemical container must be repeated three times. The container should then be punctured to prevent future use. An alternative is to jet-rinse or pressure rinse the container. When adding chemical, remain at least 100 feet from any water well or fresh water source. Follow chemical manufacturer’s recommendations for safe handling of chemicals.

12. If possible, work crosswise to the wind, starting from the downwind side of the field. This will prevent heading directly into the chemical fumes.

13. Check the sprayer initially and periodically for loose bolts, pins and hose clamps. Check the hoses, pumps, valves and fittings for leaks.

14. Make sure that the hand wash tank is full of clean water.

Operating Checklist
Each time the sprayer is used, check the following:

- [ ] Check tire pressure, wear and overall condition.
- [ ] Check the tractor’s brakes to make sure they operate properly.
- [ ] Make sure all lights and turn signals are working properly.
- [ ] Lubricate sprayer as needed.
- [ ] Booms must be locked in place before transporting.
- [ ] Inspect tank. Make sure the hitch is adjusted so that the solution drains to the sump.
- [ ] Use safety equipment as listed on page 4.
- [ ] Fill with water and calibrate sprayer BEFORE adding chemical to the tank.
- [ ] Check the position of the ball valves in the plumbing to see if they are in the correct position.
- [ ] Check hoses, pumps and valves for any leaks.
- [ ] Check nozzle pattern for streaks and non-uniformity.
- [ ] Check the sprayer initially and periodically for loose bolts and pins.
- [ ] Follow “Important Safety Information” on page 1 of this Manual.
- [ ] Make sure the handwash tank is full of clean water.
**Using Handwash Tank**

In the event of an accidental spill of chemicals on skin or in eyes, use the Handwash Tank to flush away chemicals.

1. Open the tank valve and use the hose to direct the clean water on all contaminated areas. Wash all contaminated areas of skin with soap and water. To flush chemicals from eyes, point the hose and water stream upward while lowering eyes into the stream of flowing water.
2. Close the tank valve and refill the handwash tank with fresh water when finished.
3. Periodically refill the handwash tank with fresh water. ALWAYS keep the handwash tank clean.

**Agitation**

Refer to Figure 9

To adjust the agitation, adjust the Agitation Valve. Refer to the agitation gauge to set a reference pressure for the agitation.

```
<table>
<thead>
<tr>
<th>Manual Pressure</th>
<th>Agitation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

**Manual Pressure Valve**

Refer to Figure 9

When the manual pressure valve is wide open, the pressure adjustment can be very sensitive. If sprayer is equipped with an automatic controller, the butterfly valve will have to move more often causing additional wear. If sprayer is equipped with manual controls plumbing, the pressure adjustment switch on the control box will be more sensitive and it will be hard to set the pressure. To decrease the sensitivity, set the manual pressure adjustment valve as follows:

1. Open the control valve so that it is wide open and there is full flow to the sprayer booms. On a sprayer with manual controls, adjust the pressure switch. On an automatic controller, open the butterfly valve until it is full open.
2. Shut the manual pressure adjustment valve down so the pressure is about 20 PSI greater than the pressure you will spray at. The pressure the spray will be applied at is determined when calibrating sprayer. Refer to the Application Guide.

With this valve set, it will decrease the flow through the electric ball valve and reduce the sensitivity of the pressure adjustment switch.

**Operating Whirlfilter®**

There are two Whirlfilters® on the Great Plains Sprayer. One filters the water entering the tank and the other filters the chemical solution being sprayed.

Refer to Figure 10

**Clean-out the solution Whirlfilter®**

1. Fill the sprayer tank with water and turn the pump on.
2. With the pump running, slowly open the clean-out valve and allow the grit to flow out into a bucket. Clean out the solution Whirlfilter® only when the sprayer tank is filled with water and no chemical has been added.
3. Close the clean-out valve and turn off the pump.
4. Dispose of the grit and water in the same manner described on the manufacturer’s label of the latest chemical used in the sprayer.

**Clean out the tank-fill Whirlfilter®**

1. Start with an empty sprayer tank.
2. Position a bucket under the plug in the sump of the Whirlfilter® and allow the grit to fall out.
3. Screw the plug back in using pipe thread sealant to seal the plug.
4. Dispose of the grit and water in the same manner described on the manufacturer’s label of the latest chemical used in the sprayer.
Filling Tank Procedures

CAUTION!
When filling the sprayer tank, use a check valve or anti-siphon device to prevent the solution in the tank from infiltrating into the fresh water source and contaminating it.

The Great Plains Sprayer fills the tank from the bottom of the tank and uses a standard 2 inch cam-lock coupler to connect to the freshwater hose.

1. To fill the tank, hook up the freshwater hose to the quick-fill camlock coupler with the quick-fill ball valve in the closed position. Refer back to figure 10 on page 16.

2. Turn the water on and open the quick-fill ball valve for the freshwater to enter the tank. When using a positive displacement pump to fill the tank, open the quick fill ball valve first and then pump water into the tank.

CAUTION!
Add the chemical only at the field, just prior to spraying. When adding chemical, follow the manufacturer’s instructions for mixing the spray solution in order to achieve the desired application rate.

3. Before adding the chemical to the tank, make sure the tank is at least one half full. The concentrate should not be poured into an empty tank.

4. Keep the spray solution away from all skin. Wear protective clothing and goggles. If the solutions comes in contact with the body, wash off the contaminated area with soap and water.

5. Keep chemical containers low when pouring.

6. Make sure the wind is blowing the fumes and dust away from the operator while pouring chemical.

7. Do not smoke while handling chemicals.

Operating Pump

DANGER!
Rotating driveline contact can cause death. KEEP AWAY! Do not operate without guards attached and driveline securely attached at both ends.

To operate the PTO pumps, engage the PTO shaft slowly at the tractor’s idle throttle position. Slowly accelerate to the desired PTO RPM. On a 540 RPM pump, the RPM of the PTO would be the speed at which the dead head pressure reaches 80 PSI, refer to Tractor/PTO Pump Hook-up in the “Assembly and Set-up” section page 12, or 540 RPM. On a 1000 RPM pump, the RPM of the PTO would be the speed at which the dead head pressure reaches 80 PSI or 1000 RPM.

WARNING!
Never operate the PTO pump without the pump tongue bar firmly chained in place.

To operate the hydraulic pump, first make sure that the hydraulic hoses are routed correctly so that the pump turns in the correct direction. See the Tractor/PTO Pump Hook-up in the “Assembly and Set-up” section on page 12, for more details. To run the pump, push the hydraulic lever in the “down” position. To stop the pump, push the hydraulic lever in the “float” position.

NOTE: Do not move the hydraulic lever to the neutral position while the hydraulic pump is running. To do so may cause damage to the hydraulic pump.

Hydraulic Elevator Option
Raise and lower to the desired boom height using the tractor hydraulics. Use the height gauge on the elevator to use as an easy-to-read height reference from the tractor seat. Make sure the boom doesn’t settle hydraulically (lower in height) during the operation of the sprayer.

Transporting
1. Park the sprayer in an open area where power lines, buildings, etc. will not come in contact with the folded boom.

2. Secure the level-float pin in the lock position on the boom before folding.

3. Make sure the safety chain is securely fastened to the tractor draw bar and the retaining clip is fastened to the hitch pin.

4. Never allow riders when transporting the sprayer.

5. When transporting the sprayer, be sure to watch the height clearances for the folded boom to prevent damage and possible injury.

DANGER!
Contact with electrical power lines by booms can cause death by electrocution.

6. Do not exceed 20 mph transporting the sprayer.

7. Do not transport sprayer while filled with chemical mixture.

Parking
The following steps should be followed when unhitching the sprayer. See Storage in the “Maintenance and Lubrication” section on page 29, for more information on long term storage of the sprayer.
1. Drain the sprayer tank of any excess water or chemical. Dispose of or store chemical properly by instructions on the chemical label.
2. Park the sprayer on a level, solid area. 
   Refer to Figure 11 and 12
3. Remove the jack from the transport position and move to the parking position.

   Figure 11
   Jack In Parking Position

   Figure 12
   Jack In Transport Position

1. If the ground is soft, place a board or plate under the jack to widen the ground contact area.
2. Extend the jack until the weight of the tongue is off the tractor drawbar and is supported by the jack.

3. Unplug the hydraulic lines from the hydraulic pump.
4. Remove the hitch pin and safety chain from the tractor drawbar.

   IMPORTANT: Refer to Tractor/Sprayer Hook-Up in the “Assembly and Set-up” section on page 11 when preparing to hitch the sprayer to the tractor.

   IMPORTANT: If the sprayer is being hitched up and operated for the first time, it is important to follow the safety, set up, adjustment, and operating information in the front of this manual

Tank Rinse and Flush System
Optional Equipment
The Tank Rinse and Flush is a factory installed option that will flush the tank and plumbing with clean water. The Tank Rinse and Flush option will use the fresh water in the 100 gallon flush tank to rinse out the main sprayer tank in the field.

Refer to Figure 13
Before operation make sure the flush tank is filled with fresh, clean water. To operate the Tank Rinse and Flush option, refer to the following instructions:
1. Completely empty the chemical in the main sprayer tank by turning the agitation off the last pass and spraying it out in the field.
2. Make sure all boom valves and pump are turned off.
3. Turn the agitation valve (located underneath the Flush Tank to the left of the Whirlfilter®) to “TANK FLUSH”, and rotate the flush tank suction valve from “SPRAY” to “FLUSH.”

   Figure 13
   Agitation Valve with Tank Rinse Plumbing
4. Operate the pump with the sprayer stationary, and rinse the tank until 1/3 of the flush tank volume (33 gallons) is consumed and then stop the pump.

5. With the sprayer pump off, turn the agitation valve from “TANK FLUSH” to “OFF”.

Refer to Figure 14
6. Rotate the flush tank suction valve from “FLUSH” to “SPRAY”.

7. Operate the pump and spray out the full volume of liquid (deposited into the main sprayer tank from the Flush Tank) in the field just finished.

8. Repeat steps two through seven twice more until the flush tank is empty and the main sprayer tank has been rinsed completely three times.

9. Reset the agitation pressure before filling the main sprayer tank again.

Inductor (Optional Equipment)
The chemical inductor provides a safe and easy way to put the chemical into the tank which keeps an operator from having to climb up on the walkboard and dispense the chemical into the tank from the tank lid. Placing the chemical into the inductor tank allows it to transfer the chemical into the sprayer tank. Follow the following instructions to use the inductor tank.

Refer to Figure 15
1. Fill the main sprayer tank with the carrier needed and transport the sprayer to the field where the sprayer will be used.
2. Make sure the boom section valve switches are all off and operate the pump.
3. Turn the Product Valve from “OFF” to “INDUCT”.
4. Add chemical to inductor tank.

5. Turn Inductor Valve from “INDUCTOR OFF” to “INDUCTOR ON”.
6. Add additional chemical as needed into the inductor tank.
7. When finished, turn Inductor Valve from “INDUCTOR ON” to “INDUCTOR OFF”, rotate Product valve from “INDUCT” to “OFF”, and turn off pump in that order.
Tank Fill Using Existing Pump Operations

The Tank Fill can be used to fill the main sprayer tank using the existing sprayer pump. To do so refer to the following instructions:

1. Make sure sprayer pump is off and insert supply tank hose into the walk-board quick-fill coupler. Leave quick-fill valve off.

Refer to Figure 16

2. Turn the Sump Valve from “SPRAY” to “TANK FILL”.

3. Open supply tank valve making sure that positive head pressure is maintained at the quick-fill to prevent back-flow from the sprayer tank.

⚠️ WARNING! ⚠️

Make sure the supply tank is higher than the sprayer tank. Failure to do so can cause back-flow from the sprayer tank causing sickness, serious injury or death from water contamination.

4. Open quick-fill valve under the walk-board.

Refer to Figure 17

5. Turn Product Valve from “OFF” to “TANK FILL”.

6. Make sure the boom section valve switches are all off, start the pump and fill the tank.

7. When finished, turn off pump, rotate Product Valve from “TANK FILL” to “OFF”, shut quick-fill valve, shut off supply tank valve, and rotate Sump Valve from “TANK FILL” to “SPRAY” in that order. Make sure that there is positive head pressure from the supply tank during this procedure.
Adjustments

General Field Adjustments

Boom Height
After calibrating the sprayer for the specific nozzle that will be used at a desired pressure and tractor speed, the main field adjustment is the boom height. Refer to Hydraulic Elevator Option in the “Operating Instructions” section on page 17. Depending on which type of nozzle is being used, set the boom height so that the correct overlap for that specific nozzle is achieved. If the crop canopy is taller in some fields than others adjust the boom height accordingly. Refer to the Nozzle Charts in the Application Guide located in this manual to determine the height of the boom needed.

EXAMPLE: A 2.5 MeterCone nozzle at 20 inch spacing is being used. From the Nozzle Chart (refer to the Application Guide), a height of 19 to 21 inches above the top of the crop is required. If the crop is 6 inches off the ground, the boom height should be set to 25 to 27 inches off the ground.

After setting the boom height, adjust the fold latch height, so the booms may be easily folded. Refer to Figure 2-5 on page 19. If a hose fitting or nozzle is positioned where the fold latch is located, the fold latch needs to be offset with the carrier extension provided. The carrier extension can be mounted in the forward or rearward direction. After repositioning the fold latch, be sure to torque bolts to the specifications listed in the Torque Values Chart in the “Appendix” section on page 33. If the boom height is in the lower ranges, raise the boom for transport. Refer to Manual Elevator Option or Hydraulic Elevator Option on page 17.

Nozzle Pressure
Another area that will need some field adjustments is the nozzle pressure. As the tank level decreases the boom pressure may need to be adjusted to keep the pressure at the same magnitude for what the sprayer was calibrated for if the sprayer is not equipped with a monitor. Watch the pressure gauge and be aware of changes in the pressure.

Tank Straps
The tank straps that wrap around the sprayer tank may become loose after the first few hours of operation. This occurs when the tank settles in the saddle. Polyethylene tanks are especially susceptible to this. Retighten the tank straps to secure the tank.

Throttling Valve Adjustment
(Manual Control System Only)
The boom valves used to turn on the individual boom sections are three way valves. These valves route the flow to the boom sections or back into the tank, depending on whether the boom section switches on the control box are turned on or off.

When a boom section switch is turned to the off position, the boom valve for that switch diverts the flow back into the inlet of the pump. To insure that the flow going to the boom section and the flow going back to the inlet of the pump are the same, a throttling valve is used to adjust the flow going to the inlet of the pump. If these flows were not equal, every time the boom section switch if flipped, the pressure will either rise or decrease in the other boom sections, causing the sprayer to over or under apply chemical in those boom sections.

To set the three throttling valves, complete the following:

Refer to Figure 18

1. Adjust all three of the throttling valves until they are closed.

2. Turn all the boom section switches on with the tank filled with water (no chemical added) and the pump running. Adjust the boom pressure until the boom pressure gauge reaches the selected calibration pressure.

3. Turn the left boom section switch off and keep the center and right section switches on. Unscrew the throttling valve for the left boom section until the pressure on the boom pressure gauge reaches the calibration pressure. Flip the left boom section switch a few times and adjust the throttling valve so that the pressure remains at the selected calibration pressure.

4. Turn the left boom section switch on. With the left and right boom sections on, turn the center boom section off and adjust the throttling valve as described in step 3.

5. Adjust the throttling valve for the right boom section with the left and center boom sections on as described in step 3.

6. With all throttling valves adjusted, it should be possible to flip any combination of boom section switches with the pressure remaining constant.
Agitation Adjustment
The agitation valve is used to adjust the pressure to the agitation nozzles in the tank. Refer to the agitation gauge, and adjust the pressure to a desired rate. Different chemicals require different agitation pressures to keep the chemical in suspension.

⚠️ CAUTION!
If using liquid fertilizer or any other chemical that will corrode brass, install a gauge protector under the brass agitation gauge or plug the gauge hole. Failure to do so will eventually cause the gauge to fail and chemical to be expelled from the gauge.

Agitation Adjustment with Tank Rinse
(Optional Equipment)
Refer to Figure 19
The agitation is adjusted the same way when the sprayer has the Tank Flush option. The only difference is the plumbing to adjust it. Rotate the agitation valve to achieve the desired pressure on the agitation gauge.

Pressure Adjustments
(Manual Control System Only)
One of the most important areas of controlling the sprayer accuracy is to have the proper pressure when spraying. The pressure is determined when the sprayer is calibrated. Refer to Calibration Procedures in the Application Guide.

The electric ball valve is used to adjust the pressure to the booms. It is controlled with the pressure adjust switch on the control box. The boom pressure is displayed by the boom pressure gauge.

To adjust the pressure, hold the pressure adjust toggle switch up for more pressure, down for less pressure.

As the tank level decreases, the boom pressure may change. Check boom pressure gauge frequently and make sure that the pressure doesn’t change. Generally, the boom pressure will need to be adjusted up slightly when the tank level decreases.
WARNING!
Crushing hazard. The boom could fall and cause serious injury or death. Before performing any maintenance, secure boom to parking stands if provided.

Hydraulic Elevator

Refer to Figure 21
Periodically check the slide pads (A) for wear. As the pads wear, tighten 1/2-inch bolts (B) on both sides of elevator frame (C) until pads just touch frame.

Boom Height
After calibrating sprayer for your nozzles, desired pressure and tractor speed, the main field adjustment is boom height. Set boom height to achieve correct overlap for your nozzle. If the crop canopy is taller in some fields than others, adjust boom height accordingly.

Refer to nozzle tables in the Application Guide to determine correct boom height.

Figure 21
Hydraulic Elevator
## Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Problem Area</th>
<th>Specific Checks</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure decreasing</td>
<td>Between gauge and liquid supply</td>
<td>Pump wearing</td>
<td>Rebuild or replace pump</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Plugged suction or pump to pressure head hose</td>
<td>Clean hose and reduce cause of clogging</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Plugged Whirlfilter</td>
<td>Clean out Whirlfilter</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Plugged gauge</td>
<td>Remove the quick disconnect fitting and flush gauge protector</td>
</tr>
<tr>
<td>Pressure fluctuating</td>
<td>Between pump outlet and liquid</td>
<td>Check suction hose &amp; fittings for air leaks. Air in system is indicated by buffs of air at nozzles</td>
<td>Remove obstruction from clogged area</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vortex in tank suction</td>
<td>Align agitators properly</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cracked pump housing</td>
<td>Replace pump housing</td>
</tr>
<tr>
<td>Pressure increasing</td>
<td>Between gauge and nozzle</td>
<td>Nozzle screens clogged</td>
<td>Clean screens</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nozzle orifices plugged</td>
<td>Remove material with soft brush or air</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Boom hoses becoming clogged</td>
<td>Remove obstruction from clogged area</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Boom hoses pinched</td>
<td>Use cable ties to position hose so it will not kink</td>
</tr>
<tr>
<td>Pressure cannot increase</td>
<td>Pump or electric ball valve</td>
<td>From nozzle charts check liquid demand against pump capacity (nozzle requirement + agitation requirement)</td>
<td>Reduce swath width by nozzle reduction; install smaller nozzles and drive at a lower rate of speed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Electric ball valve or gauge not functional</td>
<td>Replace or repair</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pressure adjust switch faulty</td>
<td>Test switch &amp; replace if faulty</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fuse is out in control box</td>
<td>Replace fuse</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Manual pressure adjustment valve not all the way open</td>
<td>Open the manual pressure valve all the way and allow the electric ball valve to govern the pressure</td>
</tr>
<tr>
<td>No pressure</td>
<td>Plumbing</td>
<td>Tank shut-off valves off</td>
<td>Make sure all tank shut-off valves are open</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Loose fittings</td>
<td>Tighten fittings so shut-off valve can prime</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Collapsed suction hose to pump</td>
<td>Replace hose</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Obstruction in suction hose or tank</td>
<td>Remove obstruction</td>
</tr>
<tr>
<td>No pressure</td>
<td>Pump</td>
<td>Hydraulic pump running in the wrong direction</td>
<td>Switch hydraulic hoses in the tractor outlet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PTO pump coupler loose</td>
<td>Tighten PTO coupler</td>
</tr>
<tr>
<td>Pressure cannot decrease</td>
<td>Pump or electric ball valve</td>
<td>Tank agitation restricted</td>
<td>Check that the agitator valve is open and that the liquid is being agitated</td>
</tr>
<tr>
<td>Liquid will not induct</td>
<td>Chemical Inductor</td>
<td>Make sure the valve below the inductor tank is open</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Make sure the pump is in operation and has prime</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Make sure the venturi bypass valve is open</td>
<td></td>
</tr>
<tr>
<td>Inductor overflow</td>
<td>Chemical Inductor</td>
<td>Close valve below inductor tank until pump is running, has pressure and venturi valve is open</td>
<td></td>
</tr>
</tbody>
</table>
Maintenance and Lubrication

Maintenance

Proper servicing and adjustment is the key to long life for any implement. With careful and systematic inspection, costly maintenance, repairs and down time can be avoided.

**WARNING!**

*Before working on, servicing or making adjustments on sprayer, always disengage power, shut off tractor engine, make sure all moving parts have stopped, and all pressure in the system is relieved.*

- Always wear rubber gloves when making repairs or adjustments.
- Make sure all safety equipment mentioned in the *Personal Safety Equipment* portion of the “Important Safety Information” section on page 4., are stored in an easily accessible place but protected from potential contamination from dust or chemicals.

**Equipment Cleanup**

**DANGER!**

*Read and follow chemical manufacturer’s instructions. Some chemicals and cause serious burns, lung damage and even death.*

Nozzles should be cleaned with a low pressure (less than 30 psi) air hose, and periodically replaced. Haul a supply tank of water so cleaning of the spray tank and applicator can be done in the field. NEVER wash tank out in the yard or at a car wash.

Dispose of leftover chemical in the same manner described on the manufacturer’s label of the chemical last used in the sprayer. Rinse out the tank and spray the rinse water on the last field that was sprayed.

Flush the sprayer with fresh water and spray the water in the field that was last sprayed. While the sprayer is being flushed at the field, turn the boom section switches “on” to flush the nozzles, then turn them “off” to flush out the throttling valves and bypass lines (if equipped). Repeat this procedure several times. Periodically clean each throttling valve by unscrewing its gray knob until it stops. Flush it with the fresh water by operating the pump with the boom section switches “off”. Reset the solenoid throttling valves as described in *Throttling Valve Adjustment* on page 21.

*Refer to Figure 22*

The magnet-mount gauge protector can be cleaned out periodically to prevent chemical build-up under the gauge protector. To clean out the chemical under the gauge protector (1), remove the quick disconnect fitting (2) and flush the gauge hose out into a clean bucket. Dispose of this material in the same manner described as the chemical that built up in the hose. Using the personal safety equipment needed (see the *Personal Safety Equipment* portion of the “Important Safety Information” section on page 4.) rinse bottom of gauge protector (1) in the same manner by disposing of the chemical as stated by the chemical manufacturer.

**General Information**

If equipment is to be used in freezing or near freezing conditions, protect pump and plumbing system by thoroughly draining liquid and pumping antifreeze solution through the plumbing system.

The cast iron pump must be either full of antifreeze or completely empty of all liquid to avoid corrosion. If the contents of the pump is unclear it is advisable to drain the pump, remove it, and place it in a warm dry, environment during the winter.

Check the condition of the sprayer hoses and clamps. Fix all leaks by tightening hose clamps or fittings. If the pump is leaking, refer to the pump maintenance section. If the hoses are dragging when the sprayer is operated use cable ties to fix their position. Make sure the hoses do not bind or kink when the boom is folded or raised. If so, route the hoses to prevent kinking and binding. If hoses are damaged, replace as necessary. Periodically check for loose bolts and tighten.

Inspect all parts of the sprayer for wear and rust. Repair and paint parts as necessary.

**Great Plains Pump**

This Great Plains pump is designed for long life and service. Through the years there may be a need to replace the mechanical seal or service some component of the pump. A mechanical seal may weep slightly, but if it starts to drip the pump will have to be disassembled. Before disassembling the pump be sure to wash it out with fresh water.

The following is an instruction list for how to reassemble the pump after it has been disassembled and repaired. Refer to the parts manual for the components of the pump.
Refer to Figure 23

If the pump is leaking, before removing it from the sprayer, run the pump with adequate water in the tank to diagnose the actual pump problem. If fluid leaks out between the front suction housing (5) and the rear volute housing (8), the housing gasket may be dried out. Give the gasket (6) adequate time to absorb moisture and swell up. If necessary, retighten the volute housing (8) by alternating on opposite sides until all nuts (9) are torqued to 16 - 18 ft.-lbs. It is a good practice to apply grease to both sides of the gasket (6) to prevent shrinkage.

If seal replacement is required:
1. Disassemble pump and clean all components.
2. Assemble the ceramic ring seat of the mechanical seal (7) into the volute housing (8) of the pump. Make sure the ceramic seat is positioned square into the volute housing.
3. Clean off any grease or dirt from pump shaft (10) and dry the shaft so the rubber bellows on the mechanical seal will adhere to the shaft properly when assembled.
4. Bolt up the pump input bearing housing (not shown) to the volute housing (8) using bolts (2), (3) and (4) with spacers (not furnished) for alignment and assembly of the shaft seal.
5. Assemble the seal (7) without its spring, on the pump shaft by pushing on the inside rubber portion of the seal using water as the lubrication. The graphite seal face should touch the white ceramic seat face. The rubber bellows adhering to the pump shaft should not protrude more than 1/16" beyond the stainless steel ring located on the impeller side of the seal.
6. Assemble the seal’s spring and the impeller, being careful not to move the mechanical seal that has been positioned on the pump shaft. Torque the impeller bolt (1) 16 - 18 ft./lbs.
7. Remove the three bolts and spacers. Using gun grease, lubricate the gasket (6). Assemble the gasket (6) and suction housing (5) using bolts, flat washers and locknuts. Torque nuts 16 - 18 ft./lbs.
Scott and Ace Pumps

The centrifugal pump is designed for long life and service. Through the years, there may be a need to replace the mechanical seal or service some component of the pump. A mechanical seal may weep slightly, but if it starts to drip, the pump will have to be disassembled. Before disassembling the pump, be sure to wash it out with fresh water.

If the pump is leaking, before removing it from the sprayer, run the pump with adequate water in the tank to diagnose the actual pump problem.

Refer to Figure 24 for Scott Pump Seal Replacement

The following are instructions for how to reassemble the pump after it has been disassembled and repaired. Refer to the parts manual for the components of the pump.

If seal replacement is required:

1. Disassemble pump and clean all components.
2. Assemble the ceramic ring seat of the mechanical seal (3) into the adapter (4) of the pump. Make sure the ceramic seat is positioned square into the volute housing.
3. Clean off any grease or dirt from the pump sleeve (1) and dry the sleeve so the rubber bellows on the mechanical seal will adhere to the sleeve properly when assembled.
4. Assemble the seal (2) with its spring, on the sleeve by pushing on the inside rubber portion of the seal using water as the lubrication. Make sure to align the notches in the mechanical seal with the notches in the sleeve. Assemble the mechanical seal/sleeve assembly on the pump shaft. The graphite seal face should touch the white ceramic seat face.
5. Assemble the impeller, being careful not to jar the mechanical seal that has been positioned on the pump shaft.
6. Assemble the rest of the pump.
Refer to Figure 25 for Ace Pump Seal Replacement

If seal replacement is required:

1. Loosen 4 3/8" x 3/4" long hex screws (1) which attach the pump volute (2) to the mounting frame. Remove volute from mounting frame.

2. Remove impeller (3) from pump shaft. Use file or similar tool to unscrew in clockwise direction (left hand thread).

3. Ceramic rotating portion of the seal (4) may now be removed.

4. Using two screwdrivers inserted in mounting frame weep holes, pry nonrotating portion of the seal (5) toward the threaded part of the shaft and finish removing by hand.

5. If seal case is difficult to extract from the mounting frame seal bore, two screwdrivers may be used to further dislodge the seal.

6. Apply a small portion of nonhardening sealant to new seal case to assure good seal to mounting frame bore. Insert case into bore.

7. Make sure nonrotating seal portion is properly seated by tapping lightly with suitable tool.

8. Place o-ring over pump shaft and slide downward. Oil face of new ceramic portion with light lubricating oil and place over o-ring and press downward to contact with the stationary portion.

9. Install impeller on shaft (left hand thread). Tighten by inserting a file or similar tool into impeller vane and turn counterclockwise while holding shaft steady.

10. Replace gasket (6), volute and four 3/8" x 3/4" long hex screws.
Tank Agitation

Refer to Figure 26

There are two tank agitators in the sprayer tank that shoot jets of liquid out at a high velocity. This keeps the pesticides in suspension. Each agitator has four holes and is oriented as shown. To ensure that the tank gets proper agitation, make sure the agitators are always kept in the orientation shown.

Storage

1. Empty solution from the tank, clean the chemical inductor (if included), and store or dispose of the chemical as recommended by the manufacturer’s chemical label.
2. Flush the entire sprayer system with clean water.
3. Clean out Whirlfilters®. Refer to Operating Whirlfilter® in the “Operating Instructions” section on page 16.
4. Circulate 3 - 5 gallons of antifreeze through the system including the pump, hoses and nozzles. Drain the sprayer and properly dispose of antifreeze.

5. The cast iron pump must be either full of antifreeze or completely empty of all liquid to avoid corrosion. If the contents of the pump is unclear it is advisable to drain the pump, remove it, and place it in a warm dry, environment during the winter.

**WARNING!**

Regular antifreeze is harmful or fatal to animals and humans. Use carefully according to the label’s instructions.

6. Remove nozzles, disconnect the control box, and place them indoors with the pump.
7. Change filters in the tractor cab after finished.
8. Wash off the exterior of the sprayer thoroughly using a safe solvent or soap and water.
9. Inspect all parts of the sprayer for wear and rust. Repair and paint parts as necessary.
10. Store the sprayer in a dry area away from direct sunlight.
Lubrication

Legend

| Multipurpose spray lube | Multipurpose grease lube | Multipurpose oil lube | Intervals at which lubrication is required |

Four Wheel Bearings
Repack and check the seals every 500 hours of use.

Type of Lubrication: Wheel bearing grease

Two Wheel Bearings
(Tandem Axle)
Repack and check the seals every 500 hours of use

Type of Lubrication: Wheel bearing grease
Options

Chemical Inductor
The chemical inductor provides a safe and easy way to put chemical into the tank, which keeps an operator from having to climb up on the walkboard and dispense the chemical into the tank from the tank lid. Placing the chemical into the inductor tank allows it to transfer the chemical into the sprayer tank.

For additional information refer to:
• “Important Safety Information” on page 1.
• “Operating Instructions” on page 15.
• “Troubleshooting” on page 24.
• “Maintenance and Lubrication” on page 25

Foam Marker
The High Volume Foam Marker is specifically for extreme residue conditions. It can be adjusted to produce a continuous stream of foam.
## Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
</table>
| **Wheel Spacing**             | Tandem 80"-120"  
|                               | Single Axle 80"-120"(TS1000P) / 72"-120"(TS750P)                      |
| **Tires: Standard Optional**  | Tandem 12.5L x 15"  
|                               | Single Axle 13.6 x 28 R1, 13.6 x 38 R1                               |
| **Transport Width**           | 12'8" (60’ Boom)                                                      |
| **Height**                    | 12'2" (60’ Boom)                                                      |
| **Length**                    | 225" (60’ Boom)                                                       |
| **Control Options**           | Manual Electric or Raven 440 Monitor                                   |
| **Constant Pressure Boom Plumbing** | STD with Manual Electric Controls                                    |
| **Great Plains Pump Options** | Hydraulic Drive, Frame Mount 540/1000 RPM                             |
| **Boom Option**               | CF60, CF50, MF45, MF40, MF30                                          |
| **Boom Elevator**             | 36” Hydraulic Lift                                                    |
| **Boom Height Adjustments**   | 15” to 55”                                                            |
| **Foam Marker**               | Optional                                                               |
| **Pull Through Hitch**        | N/A                                                                   |
| **Axle Clearance**            | 25" (13.6-28) / 29" (12.4-38 or 13.6-38)                              |
| **Loaded Weight Approx.**     | 13,130 lbs on TS1000P / 11,055 lbs on TS750P                           |
| **Hitch Options**             | Ball, Single strap                                                    |
| **Bottom Fill Kit**           | Standard                                                              |
| **Tractor Requirements**      |                                                                       |
| **Electrical System**         | 12-volt, negative ground                                              |
| **Hydraulic System**          | For hydraulic pump, one hydraulic remote that can restrict flow to 6 gpm.* |
|                               | For hydraulic elevator and hydraulic pump used in combination, two hydraulic remotes. |
| **Pumps**                     | Tractor mounted PTO pump - 540 RPM                                    |
|                               | Tractor mounted PTO pump - 1000 RPM 1 3/8” spline                    |
|                               | Tractor mounted PTO pump - 1000 RPM 1 3/4” spline                    |
|                               | Hydraulic pump                                                        |
|                               | Tractor mounted high volume PTO pump - 540 RPM                        |
|                               | Tractor mounted high volume PTO pump - 1000 RPM 1 3/8” spline        |

* If tractor cannot restrict flow to 6 gpm, purchase a flow-control kit from your Great Plains dealer.
† At 24 inches behind lower lift-arm balls.
## Appendix

### Tire Inflation Chart

<table>
<thead>
<tr>
<th>Tire Size</th>
<th>Inflation PSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.50 x 20&quot; 4-Ply Drill Rib</td>
<td>28</td>
</tr>
<tr>
<td>9.0 x 22.5 10-Ply Highway Service 70</td>
<td>70</td>
</tr>
<tr>
<td>9.0 x 24&quot; 8-Ply Rib Implement</td>
<td>40</td>
</tr>
<tr>
<td>9.5L x 15&quot; 6-Ply Rib Implement</td>
<td>32</td>
</tr>
<tr>
<td>9.5L x 15&quot; 8-Ply Rib Implement</td>
<td>44</td>
</tr>
<tr>
<td>9.5L x 15&quot; 12-Ply Rib Implement</td>
<td>60</td>
</tr>
<tr>
<td>13.6 x 28 R1 10 Ply</td>
<td>36</td>
</tr>
</tbody>
</table>

### Torque Values Chart for Common Bolt Sizes

<table>
<thead>
<tr>
<th>Bolt Size (Inches)</th>
<th>Bolt Head Identification</th>
<th>Bolt Size (Metric)</th>
<th>Bolt Head Identification</th>
</tr>
</thead>
<tbody>
<tr>
<td>N·m</td>
<td>ft-lb</td>
<td>N·m</td>
<td>ft-lb</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
<td>-----</td>
<td>------</td>
</tr>
<tr>
<td>1/4&quot; - 20</td>
<td>7.4</td>
<td>5.6</td>
<td>11</td>
</tr>
<tr>
<td>1/4&quot; - 28</td>
<td>8.5</td>
<td>6.0</td>
<td>13</td>
</tr>
<tr>
<td>5/16 - 18</td>
<td>15</td>
<td>11</td>
<td>24</td>
</tr>
<tr>
<td>5/16 - 24</td>
<td>17</td>
<td>13</td>
<td>26</td>
</tr>
<tr>
<td>3/8&quot; - 16</td>
<td>27</td>
<td>20</td>
<td>42</td>
</tr>
<tr>
<td>3/8&quot; - 24</td>
<td>31</td>
<td>22</td>
<td>47</td>
</tr>
<tr>
<td>7/16&quot; - 14</td>
<td>43</td>
<td>32</td>
<td>67</td>
</tr>
<tr>
<td>7/16&quot; - 20</td>
<td>49</td>
<td>36</td>
<td>75</td>
</tr>
<tr>
<td>1/2&quot; - 13</td>
<td>66</td>
<td>49</td>
<td>105</td>
</tr>
<tr>
<td>1/2&quot; - 20</td>
<td>75</td>
<td>55</td>
<td>115</td>
</tr>
<tr>
<td>9/16&quot; - 12</td>
<td>95</td>
<td>70</td>
<td>150</td>
</tr>
<tr>
<td>9/16&quot; - 18</td>
<td>105</td>
<td>79</td>
<td>165</td>
</tr>
<tr>
<td>5/8&quot; - 11</td>
<td>130</td>
<td>97</td>
<td>205</td>
</tr>
<tr>
<td>5/8&quot; - 18</td>
<td>150</td>
<td>110</td>
<td>230</td>
</tr>
<tr>
<td>3/4&quot; - 10</td>
<td>235</td>
<td>170</td>
<td>360</td>
</tr>
<tr>
<td>3/4&quot; - 16</td>
<td>260</td>
<td>190</td>
<td>405</td>
</tr>
<tr>
<td>7/8&quot; - 9</td>
<td>225</td>
<td>165</td>
<td>585</td>
</tr>
<tr>
<td>7/8&quot; - 14</td>
<td>250</td>
<td>185</td>
<td>640</td>
</tr>
<tr>
<td>1&quot; - 8</td>
<td>340</td>
<td>250</td>
<td>875</td>
</tr>
<tr>
<td>1&quot; - 12</td>
<td>370</td>
<td>275</td>
<td>955</td>
</tr>
<tr>
<td>1-1/8&quot; - 7</td>
<td>480</td>
<td>355</td>
<td>1080</td>
</tr>
<tr>
<td>1-1/8&quot; - 12</td>
<td>540</td>
<td>395</td>
<td>1210</td>
</tr>
<tr>
<td>1 1/4&quot; - 7</td>
<td>680</td>
<td>500</td>
<td>1520</td>
</tr>
<tr>
<td>1 1/4&quot; - 12</td>
<td>750</td>
<td>555</td>
<td>1680</td>
</tr>
<tr>
<td>1 3/8&quot; - 6</td>
<td>890</td>
<td>655</td>
<td>1990</td>
</tr>
<tr>
<td>1 3/8&quot; - 12</td>
<td>1010</td>
<td>745</td>
<td>2270</td>
</tr>
<tr>
<td>1 1/2&quot; - 6</td>
<td>1180</td>
<td>870</td>
<td>2640</td>
</tr>
<tr>
<td>1 1/2&quot; - 12</td>
<td>1330</td>
<td>980</td>
<td>2970</td>
</tr>
</tbody>
</table>

1 in-tpi = nominal thread dia. in inches - threads per inch
2 N·m = newton-meters
3 ft-lb = foot pounds
4 mm x pitch = nominal thread dia. in millimeters x thread pitch

Torque tolerance +0%, -15% of torquing values. Unless otherwise specified use torque values listed above.

---

### Great Plains Mfg., Inc.

#### Tire Inflation Chart

<table>
<thead>
<tr>
<th>Tire Size</th>
<th>Inflation PSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.50 x 20&quot; 4-Ply Drill Rib</td>
<td>28</td>
</tr>
<tr>
<td>9.0 x 22.5 10-Ply Highway Service 70</td>
<td>70</td>
</tr>
<tr>
<td>9.0 x 24&quot; 8-Ply Rib Implement</td>
<td>40</td>
</tr>
<tr>
<td>9.5L x 15&quot; 6-Ply Rib Implement</td>
<td>32</td>
</tr>
<tr>
<td>9.5L x 15&quot; 8-Ply Rib Implement</td>
<td>44</td>
</tr>
<tr>
<td>9.5L x 15&quot; 12-Ply Rib Implement</td>
<td>60</td>
</tr>
<tr>
<td>13.6 x 28 R1 10 Ply</td>
<td>36</td>
</tr>
</tbody>
</table>

---

### Great Plains Mfg., Inc.

#### Tire Inflation Chart

<table>
<thead>
<tr>
<th>Tire Size</th>
<th>Inflation PSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>11L x 15&quot; 6-Ply Rib Implement</td>
<td>28</td>
</tr>
<tr>
<td>11L x 15&quot; 12-Ply Rib Implement</td>
<td>52</td>
</tr>
<tr>
<td>12.5L x 15&quot; 8-Ply Rib Implement</td>
<td>36</td>
</tr>
<tr>
<td>12.5L x 15&quot; 10-Ply Rib Implement</td>
<td>44</td>
</tr>
<tr>
<td>16.5L x 16.1&quot; 10-Ply Rib Implement</td>
<td>36</td>
</tr>
<tr>
<td>41 x 15&quot; x 18 - 22-Ply Rib Implement</td>
<td>44</td>
</tr>
<tr>
<td>13.6 x 38 R1 6 Ply</td>
<td>22</td>
</tr>
</tbody>
</table>
Warranty

Great Plains Manufacturing, Incorporated warrants to the original purchaser that this spraying equipment will be free from defects in material and workmanship for a period of one year from the date of original purchase when used as intended and under normal service and conditions for personal use; 90 days for commercial or rental purposes. This Warranty is limited to the replacement of any defective part by Great Plains Manufacturing, Incorporated and the installation by the dealer of any such replacement part. Great Plains reserves the right to inspect any equipment or part which are claimed to have been defective in material or workmanship.

This Warranty does not apply to any part or product which in Great Plains’ judgement shall have been misused or damaged by accident or lack of normal maintenance or care, or which has been repaired or altered in a way which adversely affects its performance or reliability, or which has been used for a purpose for which the product is not designed. This Warranty shall not apply if the product is towed at a speed in excess of 20 miles per hour.

Claims under this Warranty must be made to the dealer which originally sold the product and all warranty adjustments must be made through such dealer. Great Plains reserves the right to make changes in materials or design of the product at any time without notice.

This Warranty shall not be interpreted to render Great Plains liable for damages of any kind, direct, consequential, or contingent, to property. Furthermore, Great Plains shall not be liable for damages resulting from any cause beyond its reasonable control. This Warranty does not extend to loss of crops, losses caused by harvest delays or any expense or loss for labor, supplies, rental machinery or for any other reason.

No other warranty of any kind whatsoever, express or implied, is made with respect to this sale; and all implied warranties of merchantability and fitness for a particular purpose which exceed the obligations set forth in this written warranty are hereby disclaimed and excluded from this sale.

This Warranty is not valid unless registered with Great Plains Manufacturing, Incorporated within 10 days from the date of original purchase.