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.
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Look for Safety Symbol
The SAFETY ALERT SYMBOL indicates there is a potential hazard to personal safety involved and extra safety precaution must be taken. When you see this symbol, be alert and carefully read the message that follows it. In addition to design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of equipment.

Be Aware of Signal Words
Signal words designate a degree or level of hazard seriousness.

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.
Be Familiar with Safety Decals
△ Read and understand “Safety Decals,” thoroughly.
△ Read all instructions noted on the decals.

Keep Riders Off Machinery
Riders obstruct the operator’s view. Riders could be struck by foreign objects or thrown from the machine.
△ Never allow children to operate equipment.
△ Keep all bystanders away from machine during operation.

Use Safety Lights and Devices
Slow-moving tractors and towed implements can create a hazard when driven on public roads. They are difficult to see, especially at night.
△ Use flashing warning lights and turn signals whenever driving on public roads.
△ Use lights and devices provided with implement.

Use A Safety Chain
△ Use a safety chain to help control drawn machinery should it separate from tractor drawbar.
△ Use a chain with a strength rating equal to or greater than the gross weight of towed machinery.
△ Attach chain to tractor drawbar support or other specified anchor location. Allow only enough slack in chain to permit turning.
△ Replace chain if any links or end fittings are broken, stretched or damaged.
△ Do not use safety chain for towing.
Transport Machinery Safely
Maximum transport speed for implement is 20 mph. Some rough terrains require a slower speed. Sudden braking can cause a towed load to swerve and upset.

▲ Do not exceed 20 mph. Never travel at a speed which does not allow adequate control of steering and stopping. Reduce speed if towed load is not equipped with brakes.

▲ Comply with state and local laws.

▲ Do not tow an implement that, when fully loaded, weighs more than 1.5 times the weight of towing vehicle.

▲ Carry reflectors or flags to mark implement in case of breakdown on the road.

▲ Keep clear of overhead power lines and other obstructions when transporting.

▲ Do not fold or unfold the sprayer while the tractor is moving.

Avoid High Pressure Fluids
Escaping fluid under pressure can penetrate the skin, causing serious injury.

▲ Avoid the hazard by relieving pressure before disconnecting hydraulic lines.

▲ Use a piece of paper or cardboard, NOT BODY PARTS, to check for suspected leaks.

▲ 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.
Practice Safe Maintenance

▲ Understand procedure before doing work. Use proper tools and equipment. Refer to this manual for additional information.
▲ Work in a clean, dry area.
▲ Put tractor in park, turn off engine, and remove key before performing maintenance.
▲ Make sure all moving parts have stopped and all system pressure is relieved.
▲ Allow sprayer to cool completely.
▲ 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 and 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.
▲ Keep a first aid kit and fire extinguisher handy.
▲ Keep emergency numbers for doctor, ambulance, hospital and fire department near phone.

Tire Safety

Tire changing can be dangerous and should be performed by trained personnel using correct tools and equipment.

▲ When inflating tires, use a clip-on chuck and extension hose long enough for you to stand to one side—not in front of or over tire assembly. Use a safety cage if available.
▲ When removing and installing wheels, use wheel-handling equipment adequate for weight involved.
Wear Protective Equipment

Great Plains advises all users of chemical pesticides or herbicides to use the following personal safety equipment.

▲ 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
▲ 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 must be destroyed according to state and local regulations. Read chemical label for specific instructions.
▲ Wear clothing and equipment appropriate for the job. Avoid loose-fitting clothing.
▲ Prolonged exposure to loud noise can cause hearing impairment or loss. Wear suitable hearing protection such as earmuffs or earplugs.
▲ Avoid wearing radio headphones while operating machinery. Operating equipment safely requires the full attention of the operator.
Handle Chemicals Properly

▲ Read and follow chemical manufacturer’s instructions.

▲ Wear protective clothing.

▲ 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. Do not pour concentrate 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.

▲ Always keep hand-wash tank filled with clean water and have soap available in case of an emergency. Immediately and thoroughly flush any area of the body that is contaminated by chemicals.

▲ 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. Puncture the container to prevent future use. An alternative is to jet-rinse or pressure rinse the container.

▲ Spray only with acceptable wind conditions. Wind speed must be below 5 mph. Make sure wind drift of chemicals will not affect any surrounding land, people or animals.

▲ Never wash out the sprayer tank within 100 feet of any freshwater source or in a car wash.

▲ Rinse out the tank. Spray rinse water on last field sprayed.

▲ Wash hands and face before eating after working with chemicals. Shower as soon as spraying is completed for the day.
Safety At All Times

Thoroughly read and understand the instructions in this manual before operation. Read all instructions noted on the safety decals.

▲ Be familiar with all Electric Hydraulic Boom Solenoid functions.
▲ Operate machinery from the driver's seat only.
▲ Do not leave sprayer unattended with tractor engine running.
▲ Do not dismount a moving tractor. Dismounting a moving tractor could cause serious injury or death.
▲ Do not stand between the tractor and sprayer during hitching.
▲ Keep hands, feet and clothing away from power-driven parts.
▲ Wear snug-fitting clothing to avoid entanglement with moving parts.
▲ Watch out for wires, trees, etc., when folding and raising sprayer. Make sure all persons are clear of working area.
▲ Do not turn tractor too tightly, causing sprayer to ride up on wheels. This could cause personal injury or equipment damage.
▲ Use only water without pesticides added to calibrate the sprayer. Do not exceed the calibrated sprayer speed and pressure when operating.
▲ When using a PTO pump, be sure that PTO shield is in place on the tractor, PTO coupler bolts are torqued to the correct specification, and torque bar is properly chained to tractor drawbar.
▲ Spray with the boom in the unfolded position only.
▲ The boom has many pinch points during field operation and folding. Keep all bystanders away.
Introduction

Great Plains welcomes you to its growing family of new product owners. This Electric Hydraulic Boom Solenoid 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.

Intended Usage

Use this Electric Hydraulic Boom Solenoid as part of a pressurized sprayer system to apply liquid pesticides, herbicides or fertilizers to production-agriculture crops only. Do not modify sprayer for use with attachments other than those approved by Great Plains.

Models Covered

Electric Hydraulic Boom Solenoid

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.

Record your 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
Preparation and Setup

Tractor Requirements
To operate your Great Plains Sprayer, a tractor using a 12 volt electrical system must be used.

The tractor will need two hydraulic outlets (one pair).

Before You Start
Read and understand the owners manual for your sprayer. A basic understanding of how the sprayer works will aid in the assembly, setup and operation of your sprayer.

Before attempting to assemble the sprayer, use the following as a checklist. Having all the needed parts and equipment readily at hand will speed up your assembly task and will make the job as safe as possible.

1. □ Check for all sprayer components and hardware.

2. □ If a bolt, pin or other component has been removed, or if you are unsure about where it is used, refer to the parts section of this manual to identify it.

Trailer Sprayer
Control Box Assembly
The Trailer Sprayer control box incorporates the option for the electric/hydraulic solenoid option within the control box of the sprayer. The switches and wiring harness need to be assembled into the Trailer Sprayer control box.

Refer to Figure 1

1. Remove the control box cover (1) and remove the plug (2) out of the back of the control box.

2. Route the 833-040C wiring harness through the hole where the plug was so that the terminals are inside the box and the receptacle is on the outside of the box.

Figure 1
Trailer Sprayer Control Box Wiring Schematic
1. Remove the switch blanks (3) from the control box cover (1).

2. Assemble the wires as illustrated onto the switches (4). The wiring illustration is shown as you look into the back of the control box cover (5) and the switches are shown in the orientation they will be assembled on the cover (5). Make sure that you keep the orientation correct.

3. After the terminals are securely tightened onto the switches, assemble the three switches (4) into the control box cover. Make sure that you keep the correct orientation and placement of the switch.

4. Secure the control box cover back onto the control box. Make sure that you move the excess wire to a vacant spot in the box so that the cover can be easily assembled.

5. Pull the 833-040C harness out the back of the control box and assemble the strain relief (6) onto the cable by squeezing it with pliers and pushing it into the control box hole.

Solenoid Control Box Mount (Units Other Than TS Sprayers)

Refer to Figure 2

Mount the control base (1) in a position above and to the right of your right leg where your right hand can easily access the switches while driving the tractor. This will generally be by the tractor controls. There are several brackets included with the control base that can be used to mount it. The SMV socket (2) can be used so the control base can be easily removed while the socket is permanently mounted. Use any configuration and combination of the brackets and hardware to mount the control base in a position that is acceptable for your tractor.

Hook up the power terminals on your control box with the red terminal on the (+) positive battery terminal and the black wire on the (-) negative battery terminal.

IMPORTANT: Power & ground wires must be attached to battery terminals with the red wire on the positive (+) and the black wire on the negative (-). Failure to directly attach to battery will cause solenoid valve problems. Route the battery cable into the cab of your tractor in a way that will not cause crushing, kinking, or shearing on the electrical cable.

Hydraulic Valve/Boom Mount

The hydraulic solenoid is mounted on the center section of your Great Plains 50 or 60 foot Cross Fold Boom. Before you start to assemble the hydraulic solenoid, it is recommended to park your sprayer in an open, flat area and assemble the solenoid with the boom unfolded. If you are assembling the boom, mount the center section onto the sprayer and then proceed to mount the hydraulic solenoid before you fold the boom wings.
Refer to Figure 3

1. Assemble the solenoid mount (1) onto the center section of the boom using the u-bolts and nuts provided.

Refer to Figure 4

NOTE: On the CF600, first install mounting tube (1) between frame and wet-boom tube. U-bolt solenoid mount onto the mounting tube.

Refer to Figure 3

2. Assemble the hydraulic solenoid (2) onto the solenoid mount (1) with the two 5/16 bolts and nuts provided. If equipped with the 506-127A Bypass valve option, refer to the "Bypass Valve Assembly Instructions".

3. Mount the hydraulic elbows (3) onto the inlet and outlet ports of the solenoid. (If not equipped with Bypass Valve Assembly 506-127A.)

4. Use the feed-line hydraulic hoses from your elevator to supply the hydraulics to the solenoid. Route the hydraulic hoses from the hitch, in the left outer frame channel back to the elevator. Loop the hydraulic hoses around the outside left portion of the elevator and attach the hoses to the boom carrier to prevent damage when the elevator is raised and lowered. Make sure you leave enough slack in the loop around the elevator that when the elevator is fully extended, there is enough slack in the hose.

5. Hook the pressure outlet hose to the “P” port and the return hose to the “T” port stamped on the block. If equipped with a bypass valve on the solenoid, hook the pressure outlet hose to the “V2” port and the return hose to the “V1” port stamped on the manifold. (With the hydraulic lever in the forward position, the pressure port is the one with the short cylinder illustration on the tractor, and the return port is the one with the long cylinder.)

Figure 3
Electric/Hydraulic Boom Solenoid Assembly

Figure 4
Solenoid Mounting on CF600
Refer to Figure 5

1. Assemble the existing hoses from the boom fold cylinders as well as the elevator and attach them to the hydraulic solenoid, you will need to detach them from the existing elbows in each hydraulic hose.

2. Assemble the hydraulic solenoid wiring harness (5) to the solenoids according to the wire colors shown. Route your wiring harness from the hitch to the solenoid valve in a manner that prevents kinking, drooping, or damage to the harness. If you have a TS sprayer, route the harness next to the existing sprayer harness. Loop the harness around the left side of the elevator similar to the routing of the hydraulic hoses. Make sure the wiring harness has enough slack around the elevator when the elevator is raises.

3. Hook up the power terminals on your control box with the red terminal on the (+) positive battery terminal and the black wire on the (-) negative battery terminal.

4. Make sure your hydraulic cylinders are primed with hydraulic fluid, and the cylinders are cycled at least two strokes before attempting to fold the boom.

**WARNING**
Failure to prime the cylinders with hydraulic oil before folding a boom that has just been assembled can cause serious injury or death to bystanders and serious damage to the boom.

5. Use the control box to actuate the hydraulic solenoid valves and see if the boom is operating correctly. To use, engage the hydraulic lever on the remote that has the hydraulic hoses attached that feed the hydraulic solenoid valves, and then operate the switches.

6. After checking the function of the solenoid valves, place the cover (4) on the solenoid mount (1) with the bolts and washers provided.

**Bypass Valve Assembly Instructions**
The bypass valve is used when you have an open-center hydraulic system or a flow-compensated hydraulic system on your tractor. The valve allows flow back into the hydraulic reservoir on the tractor and keeps the hydraulics from going through the relief valve on the tractor. To assemble the bypass valve on the existing solenoid valve, follow the following instructions.
Refer to Figure 6

1. The Bypass valve (1) is most easily assembled with the solenoid valve (2) off of the mounting plate (3). If the solenoid valve (2) is already assembled, remove it to assemble the bypass valve (1).

2. Place the o-rings (4) in the groove around the ports of the solenoid valve (2).

3. Assemble the bypass valve (1) onto the solenoid valve (2) with the four bolts (5) and washers included. Tighten the bolts to the correct torque requirement.

4. Assemble the solenoid valve assembly onto the mounting plate (3) with the two bolts and nuts provided.

5. Connect the bypass valve harness (6) onto the solenoids (2). Connect the terminal with the striped white wire coupled with the black wire and connect it to the solenoid on the bypass valve (1).
Refer to Figure 7

6. If the diodes are not installed in the bypass wiring harness assemble them as follows: On each diode there is a stripe painted on one end. Position on the blade closest to this stripe into the receptacle on the side labeled "B" - the other blade goes into the "A" side. Make sure the orientation is correct before placing the cap over the connection.

NOTE: If the diodes are not installed correctly the hydraulic valve will not function properly. It is important that the diode is installed correctly.

7. Use the control box to actuate the hydraulic solenoid valves and see if the boom is operating correctly. To use, engage the hydraulic lever on the remote that has the hydraulic hoses attached that feed the hydraulic solenoid valves, and then operate the switches.

8. Adjust the bypass valve so that the boom will respond at the desired rate you want it to. The bypass valve has a knob that adjusts the amount of return flow back to the tractor. As you screw the knob clockwise, more hydraulic flow will go back to the tractor, causing the hydraulics to respond slower. As you screw the knob counter-clockwise, the hydraulics will respond faster. Adjust the flow to an acceptable rate for your tractor.

Operating Instructions

To use the electric solenoid, engage the hydraulic lever on the remote that has the solenoid valve hydraulic hoses attached to it. Make sure the control box battery cable is attached to the battery (refer to section 2 for the battery cable assembly instructions) and operate the switches. The boom will start to move according to the switches you have engaged. When spraying a field with obstacles, keep the hydraulic lever engaged so you can move the boom wing upward and downward as you travel with the electric switches.

Adjustments

Bypass Valve Adjustment

If your solenoid is equipped with the bypass valve, the rate at which the hydraulic cylinders move can be adjusted by the knob on the bypass valve. If you switch tractors you might need to adjust this. To increase the hydraulic response for the hydraulic solenoid, turn the knob counter-clockwise, to decrease the speed turn the knob clockwise.
Solenoid Valves

Refer to Figure 8

The important parts of all hydraulic solenoids have precision components that don’t work well when there are contaminations present in the hydraulic oil. Make sure you have a good filtration system on your tractor and if there is a need to service the internal portions of the valve, work on the solenoid in a clean, and enclosed area.

Installing A Valve

When a valve has been removed to check or replace o-rings for instance, care must be taken before it is assembled. Make sure there is no dirt or grit in or around the manifold. Place a couple of drops of the Loc-Tite® hydraulic sealant, included in the o-ring seal kit, onto the threads of the valve. Assemble the valve into the top of the manifold, and torque to the following specifications listed in the “Torque Chart for Control Valves”.

Installing A Coil

When a coil nut has been loosened and is ready to be tightened on the solenoid valve, make sure to torque the nut only 3 foot pounds.

IMPORTANT: Overtightening the coil nut will cause the tube on the valve to stretch, causing the inside diameter of the valve to shrink and lock the actuation. If you overtighten this nut, the valve will be destroyed.

When reinstalling the coil-nut, be sure to use a few drops of Loc-Tite® (included in the seal kit) on the coil-nut to prevent the coil-nut from vibrating off.

Torque Chart for Control Valves

<table>
<thead>
<tr>
<th>Valve</th>
<th>Part Number</th>
<th>Part Description</th>
<th>Torque (ft lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Valve Icon" /></td>
<td>85002331</td>
<td>Delta 4W2P Valve</td>
<td>25-30</td>
</tr>
<tr>
<td><img src="image2.png" alt="Valve Icon" /></td>
<td>85002335</td>
<td>Delta 4W2P CL Cen Valve</td>
<td>25-30</td>
</tr>
<tr>
<td><img src="image3.png" alt="Valve Icon" /></td>
<td>85002252</td>
<td>2W N.O. Valve</td>
<td>25-30</td>
</tr>
<tr>
<td><img src="image4.png" alt="Valve Icon" /></td>
<td>87410024</td>
<td>Priority Flow Control Valve</td>
<td>60-70</td>
</tr>
<tr>
<td><img src="image5.png" alt="Valve Icon" /></td>
<td>33702025</td>
<td>4W2P Cavity Plug</td>
<td>25-30</td>
</tr>
<tr>
<td><img src="image6.png" alt="Valve Icon" /></td>
<td>85002006</td>
<td>Check Valve</td>
<td>25-30</td>
</tr>
<tr>
<td><img src="image7.png" alt="Valve Icon" /></td>
<td>33702007</td>
<td>2W Cavity Plug</td>
<td>25-30</td>
</tr>
</tbody>
</table>
Refer to Figure 9

The solenoid configurations and their functions are shown below. It also shows the wire color that actuates the solenoid.

**Control Box**

<table>
<thead>
<tr>
<th>Solenoid</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>Reverses the hydraulic flow to the elevator. Elevator moves in the upward position. (brown wire)</td>
</tr>
<tr>
<td>S2</td>
<td>Turns elevator hydraulics on. Elevator moves in the downward direction. (red wire)</td>
</tr>
<tr>
<td>S3</td>
<td>Reverses the hydraulic flow to the left and right booms. The left and/or right boom will start to unfold. (green wire)</td>
</tr>
<tr>
<td>S4</td>
<td>Turns right wing hydraulics on. Right boom starts to fold. (blue wire)</td>
</tr>
<tr>
<td>S5</td>
<td>Turns the left wing hydraulics on. Boom starts to fold. (yellow wire)</td>
</tr>
</tbody>
</table>

**Outlet**

<table>
<thead>
<tr>
<th>Outlet</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Right Boom Rod End</td>
</tr>
<tr>
<td>A2</td>
<td>Left Boom Rod End</td>
</tr>
<tr>
<td>B1</td>
<td>Right Boom Base End</td>
</tr>
<tr>
<td>B2</td>
<td>Left Boom Base End</td>
</tr>
<tr>
<td>C1</td>
<td>Elevator Rod End</td>
</tr>
<tr>
<td>C2</td>
<td>Elevator Base End</td>
</tr>
</tbody>
</table>

**Figure 9**

Old & New Valve Configuration
There are two different control boxes that operate the hydraulic solenoids. One is the TS (Trailer Sprayer, either TS1000 or TS750) control box that has the option to have the hydraulic solenoids. The other is a stand alone control box that will be added to the existing control boxes in the tractor. To troubleshoot the wiring on the TS control box refer to Figure 1, page 9. The Figure above shows the wiring schematic for the stand alone control box. In both control boxes, the 833-040C wiring harness is used to conduct the electrical power to the solenoids, and the colored wires you see on the control box schematic correspond with the colored wires in Figure 5, page 12, the illustration showing how to hook up the individual connectors to the solenoids.
<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>The solenoids won’t function and there is no power to the solenoids when the switches are actuated.</td>
<td>Check to see if the fuse is blown in the battery terminal harness. If the fuse is good, check the electrical connectors on the harness. If they are connected, troubleshoot the wiring using Figure 1 or Figure 10 depending on what control box you have.</td>
</tr>
<tr>
<td>The solenoids won’t function and there is power to the solenoids when the switches are actuated.</td>
<td>Check to see if the coil is working by placing a wrench above the coil nut. If it is magnetized, the coil is okay and the valve isn’t operating properly. If the valve isn’t operating, it is due to contamination or the fact that the coil was tightened too tight. The coil is bad when there is power to the solenoid but there is no magnetism.</td>
</tr>
<tr>
<td>Hydraulic valves are operating when switches are not on.</td>
<td>Check the hydraulic solenoids to see if they are actuated by placing a wrench on top of the solenoid nut. There should be no magnetism if the solenoids are not actuated. If the solenoid is magnetized, the coil is energized and there is an electrical problem. If the coils aren’t energized, there could be a contamination problem, some damaged o-rings, or some damaged back-up rings.</td>
</tr>
<tr>
<td>The hydraulics work in the wrong direction.</td>
<td>Move the hydraulic lever in the tractor to the forward position. Check the hydraulic hose hook-up. The short cylinder diagram on the tractor outlet should connect to the “P” port on the solenoid or the “V2” port on the bypass valve (if equipped).</td>
</tr>
</tbody>
</table>
## Torque Values Chart

<table>
<thead>
<tr>
<th>Bolt Size (Inches)</th>
<th>Bolt Head Identification</th>
<th>5.8 bolts</th>
<th>8.8 bolts</th>
<th>10.9 bolts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Class 5.8</td>
<td>Class 8.8</td>
<td>Class 10.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N · m</td>
<td>ft-lb</td>
<td>N · m</td>
<td>ft-lb</td>
</tr>
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1 in-tpi = nominal thread diameter in inches-threads per inch
2 N·m = newton-meters
3 ft-lb= foot pounds
4 mm x pitch = nominal thread diameter in millimeters x thread pitch

Torque tolerance + 0%, -15% of torquing values. Unless otherwise specified use torque values listed above.
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.
Great Plains Manufacturing, Inc.
Corporate Office: P.O. Box 5060
Salina, Kansas 67402-5060 USA