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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Printed in the United States of America
Important Safety Information

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” on page 6, thoroughly.
▲ Read all instructions noted on the decals.
▲ Keep decals clean. Replace damaged, faded and illegible 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.
Handle Chemicals Properly

Agricultural chemicals can be dangerous. Improper use can seriously injure persons, animals, plants, soil and property.

▲ Read and follow chemical manufacturer’s instructions.
▲ Wear protective clothing.
▲ Handle all chemicals with care.
▲ Avoid inhaling smoke from any type of chemical fire.
▲ Never add chemical concentrates to an empty tank. Start with tank half full of water.
▲ Rinse out tank tanks and discard rinse water on last field treated.
▲ Never drain, rinse or wash tank or its plumbing within 100 feet of a freshwater source, nor at a car wash.
▲ Store or dispose of unused chemicals as specified by chemical manufacturer.
▲ Dispose of empty chemical containers properly. Laws generally require power rinsing or rinsing three times, followed by perforation of the container to prevent re-use.

Wear Protective Equipment

▲ Wear protective clothing and equipment specified by chemical manufacturer.
▲ Wear clothing and equipment appropriate for the job. Avoid loose-fitting clothing.
▲ Routine tank valve operation requires operator presence under the cart. Wear a chemical-resistant hard hat.
▲ Because prolonged exposure to loud noise can cause hearing impairment or hearing loss, wear suitable hearing protection such as earmuffs or earplugs.
▲ Because operating equipment safely requires your full attention, avoid wearing entertainment headphones while operating machinery.
▲ Make sure your respiration cartridges are suitable for the chemicals, and not expired or clogged.
▲ Waterproof unlined gloves are essential for any workers handling tank cart controls or hoses. Neoprene is recommended.
▲ Chemical jackets, gowns or aprons are essential for workers loading chemicals or working beneath the cart.
▲ All workers need waterproof boots or foot coverings, to avoid contact with both spilled and applied chemicals.
Shutdown and Storage

- Drain and safely store or dispose of residual liquids.
- Flush tank(s) and lines with water. Winterize if freezing weather is possible before next use.
- Secure cart using blocks at wheels.
- Detach and store cart in an area where children normally do not play.

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

Transport Machinery Safely

Maximum transport speed for implement is 20 mph, 13 mph in turns. Some rough terrains require a slower speed. Sudden braking can cause a towed load to swerve and upset.

- Use the safety chain provided with the cart.
- Never transport the cart in train with the planter unless the tanks are completely empty.
- 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.
- Do not attempt to back up with cart attached to planter. Castering of the planter’s rear wheels, and the cart’s lead wheel, make precise directional control difficult.
- Comply with state and local laws.
- Do not tow an implement train that, when fully loaded, weights more than 1.5 times the weight of towing vehicle.
- Carry reflectors or flags to mark cart in case of breakdown on the road.
- Keep clear of overhead power lines and other obstructions when transporting. Refer to transport dimensions under “Specifications and Capacities” on page 42.
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 cart pump to cool completely.
▲ Disconnect battery ground cable (-) before servicing or adjusting electrical systems or before welding on cart.
▲ 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 cart 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.
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 cart functions.
▲ Operate machinery from the driver’s seat only.
▲ Do not leave cart 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 cart or planter and cart 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 cart. Make sure all persons are clear of working area.
Safety Decals

Safety Reflectors and Decals

Your implement comes equipped with all lights, safety reflectors and decals in place. They were designed to help you safely operate your implement.

▲ Read and follow decal directions.
▲ Keep lights in operating condition.
▲ Keep all safety decals clean and legible.
▲ Replace all damaged or missing decals. Order new decals from your Great Plains dealer. Refer to this section for proper decal placement.
▲ When ordering new parts or components, also request corresponding safety decals.

To install new decals:
1. Clean the area on which the decal is to be placed.
2. Peel backing from decal. Press firmly on surface, being careful not to cause air bubbles under decal.

818-055C

Slow Moving Vehicle Reflector
On the back of the cart, frame center; 1 total

838-266C

Red Reflectors
On the main frame back, each side; two total
838-255C

Amber Reflectors
On the main frame sides, front and back, on the main frame front, each side; six total.

818-188C

WARNING
EXCESSIVE SPEED HAZARD
To Prevent Serious Injury or Death:
- Do Not exceed 20 mph maximum transport speed. Loss of vehicle control and/or machine can result.

Warning: Transport Speed
On tongue, one total

848-047C

CAUTION
To Avoid Injury or Death: Damage from Improper Tire Inflation or Tearing of Sheet Bodies;
- Minimum inflation pressure of tires is 35 psi.
- Torque sheet bolts to 200 lb-ft.

Caution: Tire Pressure & Torque
Inside rim of front caster wheel; one total
Caution: Tire Pressure & Torque

Inside rim of main wheels; two total
Introduction

Great Plains welcomes you to its growing family of new product owners. Your PFC1600 or PFC2000 Planter Fertilizer Cart 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.

Document Family

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<th>Document Title</th>
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<td>407-158P</td>
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<tr>
<td>(Note1)</td>
<td>Pump Instruction/Parts Manual</td>
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<tr>
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<td>Planter Operator's Manual</td>
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<tr>
<td>(Note1)</td>
<td>DICKEY-john Seed Monitor Manual</td>
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1 Pump and seed monitor manuals supplied by their respective manufacturers, and not separately orderable from Great Plains.
2 There may be more than one Great Plains Planter that supports these tank carts. The planter manual may include important tank setup and operating information.

Description of Unit

The PFC1600/2000 Cart is a pull-type implement for supplying liquid fertilizer to specific supporting models of Great Plains planters. At time of publication, the following planter models accepted PFC1600/2000 Carts:

- YP2425  60ft Yield-Pro Planter

Use with any planter requires:

- Trailing pintle hook hitch
- 3-inlet “Hi-Rate” fertilizer manifold
- On-planter fertilizer pump if single-inlet “Starter” manifold is also installed

If your planter does not have these prerequisite systems and features, it may be possible to add them. Consult your Great Plains dealer.

Intended Usage

Use the PFC1600/2000 Cart to apply liquid fertilizer to production-agriculture crops only.

Do not use the cart to store, transport or apply herbicides or insecticides, nor to store or transport water for potable uses.

Do not modify the cart for use with planters or attachments other than Great Plains products specified for use with the PFC1600/2000 Cart.

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.

NOTICE

A crucial point of information related to the preceding topic. Read and follow the directions to remain safe, avoid serious damage to equipment and ensure desired field results.

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.

Refer to Figure 1

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 on the left end of the seed cart tool bar, as shown.

Record your PFC1600/2000 Cart model and serial number here for quick reference:

Model Number:__________________________
Serial Number:__________________________

Further Assistance

Great Plains Manufacturing, Inc. and your Great Plains dealer want you to be satisfied with your new product. If for any reason you do not understand any part of this manual or are otherwise dissatisfied, please take the following actions first:

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.

If your dealer is unable to resolve the problem or the issue is parts related, please contact:

Great Plains Service Department
1525 E. North St.
P.O. Box 5060
Salina, KS 67402-5060

Or go to www.greatplainsag.com and follow the contact information at the bottom of your screen for our service department.
Preparation and Setup

This section helps you prepare your tractor and PFC1600/2000 Cart for use, and covers tasks that need to be done only once per hitch, seasonally, or when the tractor/cart configuration changes.

Before using the PFC1600/2000 Cart in the field, you must hitch the cart to a compatible planter. Periodically thereafter, maintenance is required.

Pre-Setup Checklist
1. Read and understand “Important Safety Information” on page 1.
2. Check that all working parts are moving freely, bolts are tight, and cotter pins are spread.
3. Check that all grease fittings are in place and lubricated. See “Lubrication” on page 39.
4. Check that all safety decals and reflectors are correctly located and legible. Replace if damaged. See “Safety Decals” on page 6.
5. Inflate tires to pressure recommended and tighten wheel bolts as specified. See “Tire Inflation Chart” on page 42.

Planter Preparation
The PFC1600/2000 Carts are designed to be towed, in train, behind the Great Plains YP2425 planter. The planter must be ordered with, or upgraded to include:
- rear pintle hitch (1 in Figure 2), and
- the “Hi-Rate” fertilizer manifold, which includes 3 inlet ports at the back of the planter (2 in Figure 2) and if the PFC2000 tank, intended for dual materials:
  - “Starter” manifold system (single inlet), and
  - ground drive fertilizer pumps
If the PFC1600/2000 Cart was purchased on the same order with the YP2425, two cart-supporting cable assemblies (4 in Figure 2) and one pressure gauge line (3 in Figure 2) will have been installed on the planter at the factory. These assemblies extend the lighting and CANbus circuits to the rear pintle hitch on the planter, and extend pressure status to the planter.

If the PFC1600/2000 Cart was ordered separately, these assemblies are supplied in a carton with the cart, and must be installed on the planter prior to first cart use. See “Planter Assembly Installation” on page 46.

Spill hazard/Tank damage risk:
Periodically check the tension of the straps for the fertilizer tank. Strap tension will change as outside air temperature changes. Adjust tension as necessary to prevent personal injury or damage to the fertilizer tank.
Hitching Cart to Planter

⚠️ DANGER ⚠️

Exercise extreme care in hitching.

▲ The rear wheels and rear hitch of the YP2425 planter move during planter raise/lower operations.
▲ If planter movements are required, it will be difficult for the tractor operator to see the tank cart hitch and anyone near it.
▲ If the planter is moved, both tractor operator and hitch observer must be within sight of each other for pre-arranged hand signals, or must be in continuous electronic communication.
▲ Hitch only on level ground. The tank cart has no brakes.

Plan The Hitch

There are some situations to avoid in preparing the planter/tank for the field:

• Spot the planter so that only forward moves are required after hitching the cart. It is difficult to control reverse steering of the train.
• When the cart is loaded with fertilizer, it generally cannot be moved by hand safely. If extra power equipment is not available, plan to hitch the tank cart by hand-moving the cart when empty.
• When the cart is hitched to the planter, it prevents fork-lift access to the back of the planter for loading seed in bulk boxes. The planter can be side-loaded (when folded), but only if the fork lift is rated for the long reach required.
• If seed is pre-loaded before planter highway movement, steering and braking hazards increase (as well as wear on wheel bearings). If fertilizer is also loaded before highway movement, you will exceed the control ability of any tractor.

Load fertilizer in the field. If this is not possible, tow the pre-loaded cart to the field by itself, and not in train with the planter.

If using Bulk Boxes
1. Move empty planter and tank cart to field.
2. Load boxed seed on planter.
3. Hitch empty tank cart to planter.
4. Load fertilizer.

If Using Bulk Hoppers
1. Move empty planter and tank cart to field.
2. Install seed hoppers.
3. Load seed with auger.
4. Hitch empty tank cart to planter.
5. Load fertilizer.
Hitching With Empty Tank

1. Position planter for forward-only movement after hitching. Set parking brake on tractor and shut off tractor. Planter may be raised or lowered.
2. Have two people move the cart to engage the tongue loop with the pintle hitch.
3. Secure the safety chain around the rear hitch weldment frame.
4. Remove wheel chocks.

Hitching With Loaded Tank

⚠️ DANGER

*Only do this for immediate field operations, and not transport. The planter plus a loaded tank cart is not safe to move any distance on public roads, even if the tractor is rated for 80,000 pounds.*

1. Raise and fold the planter, so that the hitch observer does not need to stand beyond the unfolded wing ends. Position planter for forward-only movement after hitching.
2. Pick a spot for the hitch point, about six feet behind the planter’s rear hitch. Place a small object at the spot.
3. Using another towing implement pull the cart toward the hitching point at an angle, from the rear, and to the side of the planter. Stop when the tongue loop is over the hitching point.
4. Disconnect the cart, lower the tongue loop to the ground, and swing it back away from the planter.
5. Have the hitch observer stand clear of the planter and signal to the tractor operator to back the planter up slowly.
6. Signal stop when the pintle hitch is over the hitching spot.
7. Set the parking brake on the tractor and shut it off.
8. Engage the tongue loop with the pintle hitch.
9. Secure the safety chain around the hitch weldment frame.
10. Remove wheel chocks.
Electrical and Monitor Connections

Monitor Setup
Before using the cart for the first time, it is necessary to configure the planter seed monitor to correctly process cart signals and correctly control the clutch and manifold valves.

For the 3-inlet Hi-Rate" manifold, this configuration includes telling the monitor which row number range is served by each inlet. If your manifold system has one drop line per row unit, Clutch Switch Coverage table in the planter Operator’s Manual shows the row unit numbers for Left/Center/Right.

Making Electrical Connections
Refer to Figure 4
Make sure tractor is shut down with accessory power off before making connections.

11. Mate the lighting plug 1 to the outlet connector on the planter.

12. Mate the pump control cable 2 to the DICKEY-john outlet on the planter.

13. Secure cables so they do not get caught in pintle hitch. Failure to do so could cause cables to be crushed, requiring cable replacement, and possible electrical damage to systems.
Make Fertilizer Connections

CAUTION
Always wear chemical gloves and other protective apparel and equipment specified for the materials to be applied.

Material hose connections depend on your planter configuration, cart model, and intended application.

Refer to Figure 5 and to Figure 23 and Figure 24 on pages 44 and 45.

Cart Connection Overview
1. Manifold port 1, 2in CAM
   This hose supplies the “Hi-Rate” manifold section on the left side of the planter.
2. Manifold port 2, 2in CAM
   This hose supplies the “Hi-Rate” manifold section in the center section of the planter.
3. Manifold port 3, 2in CAM
   This hose supplies the “Hi-Rate” manifold section on the right side of the planter.
4. Manifold port 4, no hose
   By-pass to 1600 gallon tank. Opened by seed monitor whenever any of ports 1, 2 or 3 are closed.
5. Gauge line, 3/4in CAM
   Supplies pressure gauge on planter
6. 400 Gallon Tank line, 2in CAM
   Present only on model PFC2000, supplies single line to ground drive pumps of “Starter” system on planter.

Planter Connection Overview
L. Left Side, 2in CAM receptacle
   Hi-rate inlet for planter left wing.
C. Center, 2in CAM receptacle
   Hi-rate inlet for planter center section.
R. Right Side, 2in CAM receptacle
   Hi-rate inlet for planter right wing.
S. Starter, 2in CAM receptacle
   Inlet for entire starter fertilizer manifold. Present as only if starter manifold installed; otherwise gauge line inlet is mounted at this position.
G. Gauge Line, 3/4in CAM receptacle
   Gauge (only) line for tank cart pump. Supplied with tank cart. May be factory-installed. Tied to other hoses if no bracket position available.
Making Fertilizer Connections

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<th>Planter Inlet</th>
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<td><img src="image1.png" alt="Diagram" /></td>
<td><img src="image2.png" alt="Diagram" /></td>
</tr>
</tbody>
</table>

PFC2000 Cart, YP2425 Planter with Starter and Hi-rate Manifolds, & Ground Drive Pumps

1. Wear chemical gloves and protective apparel.
2. Close all shut-off valves on hoses and inlets.
3. Clean any debris from outlets and inlets.
4. Make hose connections as shown in the table above.
5. Secure any unused hoses as shown in Figure 7. Fold them back and secure them to the cart tongue so that the outlet valves point slightly downward (to prevent collecting the dust thrown up during normal planter operation).
6. Do not re-open connection valves until ready to plant, and cart's pump selector valve has been set to desired tank.

Figure 7
Secure Extra Hoses
Bleeding Gauge Line

Refer to Figure 8

When operating the tank for the first time air must be bled from the hose of “Hi-Rate” fertilizer gauge line 1. Releasing air from this line makes the gauge reading more reliable.

1. Open the bleed valve 2 at the magnetic gauge on the planter wing.
2. Plant and fertilize until fluid is observed exiting the dump line 3.
3. Stop planting, close the bleed valve, and resume planting.

Figure 8
Gauge Bleed Valve
Operating Instructions

This section covers general operating procedures. Experience, machine familiarity, and the following information will lead to efficient operation and good working habits. Always operate farm machinery with safety in mind.

Pre-Start Checklist
Perform the following steps before transporting the PFC1600/2000 Cart to the field.

- Carefully read “Important Safety Information” on page 1.
- Review the application instructions and Material Safety Data Sheet (MSDS) for the fertilizer(s).
- Review the plumbing location/control diagram for your tank cart.
- Lubricate cart as indicated under “Lubrication” on page 39.
- Check all tires for proper inflation. See “Tire Inflation Chart” on page 42.
- Check all bolts, pins, and fasteners. Torque as shown in “Torque Values Chart” on page 43.
- Check cart for worn or damaged parts. Repair or replace parts before going to the field.
- Check tank hoops and straps to be sure they are tight and tanks are secure.
- Check fertilizer hoses, fittings, and valves for leaks. Repair or replace before going to the field.
- Always inspect the tanks before use.

Tank Inspection
1. Wear a respirator suitable for the material presently in or previously dispensed from the tank(s).
2. Swing the ladder down from its storage position on the walkboard.
3. Remove the lid on each tank and inspect for:
   - residual fertilizer incompatible with next use
   - contaminants
   - debris that might clog filters
   - trapped animals lost tools, etc.

   If it is necessary to flush a tank, or remove debris too large to flush, see “Tank Cleaning” on page 38.
4. Re-secure each lid and stow the ladder.

CAUTION
Spill hazard/Tank damage risk:
Periodically check the tension of the straps for the fertilizer tank. Strap tension will change as outside air temperature changes. Adjust tension as necessary to prevent personal injury or damage to the fertilizer tank.
Transporting the Cart

If heading to the field, before departing, ensure that fertilizer rate has been determined, or that the necessary data is with you.

Empty, the cart adds 5,900 pounds. If towing in train with the YP2425 planter, make sure that this does not exceed the braking capability of the tractor.

If towing in train, plan the move so that no reverse moves will be required. Direction in reverse cannot be reliably controlled for distances more than a few feet.

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**DANGER**

Never transport the cart, in train, if there is any liquid in the tanks. Full, the cart weighs nearly 30,000 pounds and makes the train uncontrollable on roads regardless of tractor capability.

3. Always have lights on for highway operation.
4. Comply with all federal, state and local safety laws when traveling on public roads.
5. Travel with caution.
6. Keep train length in mind when clearing intersections. The YP2425 plus PFC1600/2000 Cart add nearly 75 feet to the length of your tractor.

**CAUTION**

Do not exceed 20 mph when driving straight.

**CAUTION**

Do not exceed 13 mph in turns.

**CAUTION**

Do not exceed 3 mph in reverse when towing separately.

**CAUTION**

Avoid all reverse moves when towing in train.

---

Spill hazard/Tank damage risk:
Periodically check the tension of the straps for the fertilizer tank. Strap tension will change as outside air temperature changes. Adjust tension as necessary to prevent personal injury or damage to the fertilizer tank.
Loading Fertilizer

⚠️ CAUTION ⚠️
Always wear recommended protective apparel and equipment specified for the materials to be applied.

NOTICE
Use only liquid fertilizer.
This cart is not designed for dry fertilizer mixes.

The PFC1600/2000 Carts are designed to be loaded using the 2in CAM quick-fill inlet at the left rear of the cart. If for any reason you cannot use that inlet, you can also load material via the ladder, walkboard and top hatches. Hatches are threaded and unscrew.

Note: The fitting at 7 of Figure 10 and Figure 12 is a filter, and not an alternate threaded inlet. Do not remove it during filling.

Have seed loaded in planter, and cart hitched and connected to planter before loading fertilizer.

Determine how to monitor tank fill level. If the day is bright, or loading at night with a bright light available, it is possible to see the fluid level through the semi-translucent tank walls. Otherwise, it is necessary to have an observer monitor through the tank hatch.

Note: Is it not possible to use the cart pump to load material, as it only pumps when the cart is in motion. If the fertilizer source has no pump, the YP2425 planter has auxiliary hydraulic power at the rear hitch, which may be used to operate a hydraulic pump.

Be familiar with the location of plumbing valves on the tank cart. Common task require setting as many as three valves. See pages 44 and 45.
Loading 1600 Gallon Tank

Refer to Figure 10

1. Close quick-fill shutoff valve 3:
   - Handle pointing back: no flow at inlet
   - Handle pointing left: inlet open
2. If cart is model PFC2000, set selector valve 4 to 1600 gallon tank:
   - Handle forward: quick-fill to 400 gallon tank
   - Handle down: no flow from quick-fill inlet
   - Handle back: quick-fill to 1600 gallon tank

Note: This valve is not present (or needed) on tank model PFC 1600.

Refer to Figure 10 and Figure 11

1. Set the inlet valve 8 of the 1600 gallon tank to the fill position:
   - Handle left: tank inlet open to quick-fill
   - Handle back: no flow to or from tank
   - Handle right: tank inlet open to cart pump
2. Remove cap 5 at inlet 6.
3. Connect supply hose to 2in CAM inlet 5.
4. If monitoring fill level at hatch, swing down walkboard ladder and position observer (in suitable protective apparel).
5. Open quick-fill shutoff valve 3. Also open any valve(s) on the supply hose(s).
6. Using an external pump (usually on the fertilizer supply tank), pump fertilizer to desired level in tank.
7. Shut off pump when tank is at desired level.
9. Close valve(s) on supply hose(s) and disconnect fertilizer source.
10. If cart is model PFC2000, set selector valve 4 off.
11. Set the discharge valve 8 of the 1600 gallon tank to closed (back) or to pump (right), depending on the next planned task.
Loading 400 Gallon Tank
(Model PFC2000 only)

Refer to Figure 12
1. Close quick-fill shutoff valve ③:
   Handle pointing back: no flow at inlet
   Handle pointing left: inlet open
2. Set selector valve ④ to 400 gallon tank:
   Handle forward: quick-fill to 400 gallon tank
   Handle down: no flow from quick-fill inlet
   Handle back: quick-fill to 1600 gallon tank

Refer to Figure 12 and Figure 13
1. Close the outlet valve ② of the 400 gallon tank:
   Handle forward: outlet supplies planter
   Handle down: outlet closed / no flow from tank
   Handle back: outlet supplies cart pump
2. Set the inlet valve ① of the 400 gallon tank to the fill position:
   Handle down: no flow at tank inlet
   Handle forward: tank inlet open to quick-fill
3. Remove cap ⑤ at inlet ⑥.
4. Connect supply hose to 2in CAM quick-fill inlet ⑥.
5. If monitoring fill level at hatch, swing down walkboard ladder and position observer (in suitable protective apparel).
6. Open quick-fill shutoff valve ③. Also open any valve(s) on the supply hose(s).
7. Using an external pump (usually on the fertilizer supply tank), pump fertilizer to desired level in tank.
8. Shut off pump when tank is at desired level.
10. Close valve(s) on supply hose(s) and disconnect fertilizer source.
11. Set selector valve ④ off.
12. Set the 400 gallon tank inlet valve ① to closed (handle down).
13. Set the 400 gallon tank outlet valve ② to planter (forward) or pump (back) depending on next planned task.
Field Pumping
Regardless of the tank(s) and manifolds to be used, perform the following:

1. Make all pre-use maintenance and safety checks.
2. Determine and make the cart pump dial setting (if cart pump to be used). See “Pump Setting Determination” on page 33.
3. Hitch the cart to the planter; make and check all electrical and plumbing connections.
4. Load fertilizer in the tank(s) to be used; shut off and cap the quick-fill inlet. PFC2000 only: Set quick-fill selector valve to OFF.
5. Configure the seed monitor to apply fertilizer, but have the “Fert. Pump” switch OFF for the moment.
6. Open the (four or five) hose valves on both sides (planter/cart) of the connections at the planter rear hitch.

PFC2000 Pumping From 1600 Only
Configuration:
PFC2000 Tank Cart
YP2425 with 3-inlet “Hi-Rate” Manifold
all 3 inlets and section booms in use on planter

Refer to Figure 23 on page 44

1. Set 400 gallon inlet and outlet valves to OFF.
2. Set valve at 1600 gallon tank discharge to feed pump.
3. Set pump inlet selector valve to 1600 tank.
4. Set CFM “Fert. Pump” switch to ON and begin planting.

The ground drive pump on the cart will pump fertilizer to all three planter manifold sections when planter is lowered and cart is in motion, unless commanded off by the seed monitor or CFM “Fert. Pump” switch.

PFC2000 Point Row Pumping from 1600
If it is necessary to disable fertilizer application for one or two planter sections, such as for point rows, use the Clutch Folding Module switches. When you disable the clutches for any seed meters, the monitor also closes the manifold valve for that planter section. This provides automatic fertilizer control for point rows.

Whenever one or two of the cart manifold valves (#1, 2, 3) are closed, the bypass valve (#4) is open. This prevents over-pressure in the planter manifolds. The bypass line is connected to the cart pump inlet when pumping from the 1600 gallon tank. The bypass is also connected to the tank discharge line.
PFC1600 Pumping
Configuration:
YP2425 with 3-inlet “Hi-Rate” Manifold
PFC1600 Tank Cart
Refer to Figure 24 on page 45
1. Set valve \( \overline{14} \) at 1600 gallon tank discharge to feed pump.
2. Set CFM “Fert.Pump” switch to ON and begin planting.

The ground drive pump on the cart will pump fertilizer to all three planter manifold sections when planter is lowered and cart is in motion, unless commanded off by the seed monitor or CFM “Fert.Pump” switch.

PFC1600 Point Row Pumping from 1600
If it is necessary to disable fertilizer application for one or two planter sections, such as for point rows, use the Clutch Folding Module switches. When you disable the clutches for any seed meters, the monitor also closes the manifold valve for that planter section. This provides automatic fertilizer control for point rows.

Whenever one or two of the cart manifold valves (\( \overline{1}, \overline{2}, \overline{3} \)) are closed, the bypass valve (\( \overline{4} \)) is open. This prevents over-pressure in the planter manifolds. The bypass line \( \overline{18} \) is connected to the cart pump inlet at all times when pumping from the 1600 gallon tank (valve \( \overline{14} \) set to pump). The bypass is also connected to the tank discharge line.

Pumping From 400 only
In the normal mode, the 400 gallon tank is pumped by the ground-drive pumps on the planter, and is pumped to the single-inlet “Starter” manifold system.

In a reserve-tank or small-application scenario, the 400 gallon tank may be pumped by the cart. It will pump to the “Hi-rate” 3-inlet manifold system.

Is it not possible to pump to the same planter manifold from both tanks simultaneously. The pump inlet selector valve is open to only one tank at a time, and there is no tank cross-feed line.

Pumping 400 (Only) With Planter Pumps
Configuration:
PFC2000 Tank Cart
YP2425 with single-inlet “Starter” Manifold
Tank hose line \( \overline{6} \) is connected to planter “Starter” inlet.
Refer to Figure 23 on page 44
1. Set 1600 gallon discharge valve \( \overline{14} \) to OFF (unless applying two materials, in which case see page 26).
2. Set 400 gallon inlet valve \( \overline{15} \) OFF
3. Set pump inlet selector valve \( \overline{17} \) OFF
4. Set 400 gallon outlet valve \( \overline{16} \) at to feed hose line \( \overline{6} \)
5. Set CFM “Fert.Pump” switch OFF and begin planting.

NOTICE

Steps must be taken to prevent the cart’s ground drive clutch from engaging. If you fail to at least set the CFM switch OFF, the cart pump may run against closed valves, collapse or burst hoses/lines, run dry and itself be damaged.

Alternatives to the “Fert.Pump” switch include setting seed monitor “Hi-Rate” material liquid channels OFF. (leave the Starter channel ON), setting 1600 gallon tank quantity to zero, or disconnecting monitor cable to cart.

The ground drive pumps on the planter will pump fertilizer to the entire planter “Starter” manifold when planter is lowered and cart is in motion.

Point Row Pumping with Planter Pumps
The planter ground drive pumps operate whenever the planter is lowered and moving. The CFM “Fert.Pump” switch has no effect on these pumps. There are also no shutoff valves in the lines.

You can disable either half of the “Starter” system by removing a chain or sprocket. This may not be practical on frequent point row turns.
Pumping 400 With Cart Pump

Although optimized for two-material application through the single-inlet “Starter” manifold on the planter, the 400 gallon tank can also be used to feed the 3-inlet “Hi-Rate” manifold.

This might be done using the 400 gallon tank as a reserve, or because the task requires less than 400 gallons.

Configuration:
PFC2000 Tank Cart
YP2425 with 3-inlet “Hi-Rate” Manifold

Note: Do not use cart pump to supply the single-inlet “Starter” manifold.

This is the “reserve” or small job situation, using the small tank to supply the “Hi-Rate” boom. If you are relying on quantity-remaining/low-alerts on the seed monitor, be sure to enter the correct initial tank quantity.

Refer to Figure 23 on page 44

1. If the planter has a “Starter” manifold, with wing-mounted ground-drive pumps, disable those pumps. Tie up the wheel arms or remove chains.
2. Set 1600 gallon discharge valve to OFF.
3. Set 400 gallon inlet valve OFF.
4. Set 400 gallon outlet valve at to feed pump.
5. Set pump inlet selector valve to 400 tank.
6. Set CFM “Fert.Pump” switch to ON and begin planting.

The ground drive pump on the cart will pump fertilizer to all three planter manifold sections when planter is lowered and cart is in motion, unless commanded off by the seed monitor or CFM “Fert.Pump” switch.

Point Row Pumping from 400 via Cart

**CAUTION**

It must be acceptable for modest quantities of the material in the 400 gallon tank to be bypassed into the 1600 gallon tank. If this is not the case, do not disable, or let the seed monitor disable, any of feed lines 1, 2 or 3.

If it is necessary to disable fertilizer application for one or two planter sections, such as for point rows, use the Clutch Folding Module switches. When you disable the clutches for any seed meters, the monitor also closes the manifold valve for that planter section. This provides automatic fertilizer control for point rows.

Note: Also use the following valve settings to ensure bypass protection for the cart pump.

1. Set 1600 gallon discharge valve to pump.
2. Set 400 gallon inlet valve OFF.
3. Set 400 gallon outlet valve at to feed pump.
4. Set pump inlet selector valve to 400 tank.
5. Set CFM “Fert.Pump” switch to ON and begin planting.

Whenever one or two of the cart manifold valves (#1, 2, 3) are closed, the bypass valve (#4) is open. This prevents over-pressure in the planter manifolds. Excess material is pumped into the 1600 gallon tank.

If the 400 gallon tank is emptied before the task is complete, switch back to 1600 gallon mode and use the bypassed material.
Pumping From Both Tanks

Configuration:
PFC2000 Tank Cart
YP2425 with 3-inlet “Hi-Rate” Manifold and single-inlet “Starter” manifold.

This situation presumes that two different materials are being applied at the same time. The 3-inlet “Hi-rate” boom is pumped by the cart pump. The single-inlet “Starter” boom is pumped by the planter’s ground drive pumps.

Refer to Figure 23 on page 44
1. Set 400 gallon tank inlet valve 15 to OFF.
2. Set 400 gallon tank outlet valve 16 to hose line #6 (forward hose).
3. Set 1600 gallon tank discharge valve 14 to feed pump.
4. Set pump inlet selector valve 17 to 1600 tank.
5. Set CFM “Fert.Pump” switch to ON and begin planting.

The ground drive pump on the cart pumps fertilizer to all three “Hi-Rate” planter manifold sections when planter is lowered and cart is in motion, unless commanded off by the seed monitor, CFM point row clutch switches or CFM “Fert.Pump” switch.

Point Row Pumping From 1600 in Both Mode
If it is necessary to disable fertilizer application for one or two planter sections, such as for point rows, use the Clutch Folding Module switches. When you disable the clutches for any seed meters, the monitor also closes the manifold valve for that planter section. This provides automatic fertilizer control for point rows.

Whenever one or two of the cart manifold valves (#1, 2, 3) are closed, the bypass valve (#4) is open. This prevents over-pressure in the pump line. The bypass line (16) is connected to the cart pump inlet when pumping from the 1600 gallon tank. The bypass is also connected to the tank discharge line.

Point Row Pumping From 400 in Both Mode
The planter ground drive pumps operate whenever the planter is lowered and moving. The CFM “Fert.Pump” switch has no effect on these pumps. There are also no shutoff valves in the lines.

You can disable either half of the “Starter” system by removing a chain or sprocket.
Field Set-Up Checklist
Use the following tables to develop a final checklist for your tractor/cart configuration. Additional or fewer steps may be necessary depending on tractor features, cart options and planting accessories.

### Mechanical
- Pintle hitch closed on tongue loop 13
- Chain secured to planter hitch 13
- Tank hoops and straps tight. Tanks secure. -
- Parking chocks removed from wheels -
- Walkboard ladder stowed 18

### Electrical
- Verify electrical hookups solid 14
- Power up seed monitor and observe any diagnostic messages *
- Running/braking/turning lamps all working -

* Refer to monitor manual.

### Plumbing
- Hose circuits to be used, secured to correct planter inlets 16
- Unused hoses secured on tongue and protected from dust/debris 16
- Closed: Quick-fill shut-off valve 21, 22
- Open: Outlet/discharge valve on tank to be used -
- PFC2000: pump selector valve set to tank to be used 23
- Open: valve(s) on hose lines to planter 23
- Open: valve(s) on planter inlet(s) 23
- Fertilizer rate setting computed and set on pump 23
- Check for leaks at all fittings and connections, and under tanks generally -

### Fertilizer
- Check for correct orifice plates *
- Check unused rows correctly closed off -
  - Check all row unit lines are connected, free of kinks, and discharge tube/nozzles are clear -

* Refer to Seed Rate manual.

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Field Operation
Because tank cart operation is largely automatic, few steps need to be added to planter operations. Tank operations during planter motion are covered in the YP2425 Operator's Manual.
**Planting**

When all checklist items are complete, tank operation during a planting pass normally is automatic and requires no operator intervention to control pumps.

Lowering and raising the planter automatically engages and disengages the ground drive pumps on the planter.

Lowering and raising the planter operates a height switch on the planter that signals the seed monitor to engage and disengage the pump clutch on the cart.

All pumps stop when planter motion stops.

The cart pump (only) may be disengaged under the control of the seed monitor, either by CFM switches, or commanding channels off.

See “Field Pumping” on page 23 for details on using various tank configurations.

Planting at speeds recommended for the seed also results in reliable pumping rates.

When reloading seed, check fertilizer consumption against anticipated use to that point.

**Electric Clutch Operation**

The PFC1600/2000 Cart has a clutch in the pump drive system. In normal operation, the planter’s seed monitor system controls the clutch. When the planter is lowered for planting, the clutch is engaged.

Refer to Figure 15

The “Fert.Pump” switch ① on the cab Clutch Folding Module (CFM) can independently disable the cart clutch.

Note: This does not shut off any wing-mounted ground drive pumps (which have no clutches). To disable one or both ground drive pumps, remove a sprocket or tie-up the drive wheel arm. Do not merely close valves.

In the normal (up) position, the clutch is controlled by the seed monitor. The LED above the switch is on only when the switch is up AND the seed monitor has engaged the pump clutch.

In the off (down) position, the clutch is off at all times.

There is no standard provision to force the clutch on when the seed monitor would have it off. There is a mechanical lock-up capability at the clutch housing, described in the following section.
Electric Clutch Lock-Up

Refer to Figure 16 and Figure 17

During system flushing/winterizing, or in case of electric clutch failure, the electric clutch can be mechanically engaged. If metric bolts required cannot be located, borrow three from storage locations near the clutches on the YP2425 planter.

1. Align the cutouts ① with the holes ②.
2. Insert M8-1.25×14mm long metric bolts ③.

If you observe half the hole obstructed by a metal disc ④, you are not at a cutout.

If the entire hole is obstructed by a metal disc ④, you are not at a cutout.

When at a cutout, the bolt will screw in with minimal resistance until the bolt head reaches the clutch face.

Note: Use only 14mm length bolts. Longer bolts will damage the clutch. Shorter bolts may not effect a lock-up.

**NOTICE**

Clutch lock-up for field operations introduces risks of spill and/or equipment damage. With the clutch locked-up, perform:

- no highway movements,
- no reverse movements,
- no movements with planter hitched but seed monitor off (valves will close),
- no movements unhitched from the planter unless gauge line is open, and
- no empty-tank (dry pump) movements.

In lock-up, the pump will be operating whenever the main cart wheels are turning.
Parking and Storage

Residual fertilizer in the cart represents a corrosion and freezing risk to planter components. The pump is further at risk from exposure to air if run dry, or drained and not properly prepared for storage (even for just a few days).

This section repeats some cautions and steps from the pump manual supplied with the cart. This is not a substitute for that material. Read and follow the instructions in the pump manual.

**NOTICE**

*Failure to properly care for your pump and other cart components can lead to serious equipment damage in a relatively short span of time.*

**Stopping/Standing**

If suspending operation, but leaving the cart hitched to the planter, no specific items require attention.

**Short-Term Parking**

If parking the cart, for less than 24 hours, unhitched from the planter:

1. Choose a location with level firm ground. Do not unhitch on a slope.
2. Close valves on both sides of the hose connections. There may be fertilizer under pressure in the lines, particularly the gauge line.
3. Wear chemical gloves and face protection. Disconnect the hoses, and tie them off the ground at the cart.
4. Disconnect the electrical connections.
5. Tighten tanks lids.
6. Remove the cart’s safety chain from the planter and open the pintle hitch.
7. Pull the tongue to the side and lower it to the ground.
Extended Parking

When parking for more than 24 hours, residual fertilizer must be flushed from the pump, otherwise salts in the fertilizer will corrode the pump. In general, this means that residual fertilizer in the tank(s) first needs to be recovered or drained.

Operating the pump without the planter requires clutch lockup. See “Electric Clutch Lock-Up” on page 29. The cart may be towed for this pumping, or the right wheel may be raised on a stable jack-stand, and the right wheel turned by hand.

8. First perform step 1 through step 7 of “Short-Term Parking” on page 30, but position the cart at a location where residual fertilizer may be safely recovered or drained from the tanks and lines.

Drain Bulk Material

If a modest or substantial quantity of fertilizer remains in either tank, drain it via quick-fill inlet.

9. Connect a hose to the inlet, or place a large container there. Make sure the inlet shut-off valve is closed.

10. Open the shut-off valve at the inlet to the tank to be drained.

11. On the PFC2000, set the fill selector valve to the tank to be drained.

12. Slowly open the quick-fill inlet shut-off valve, and drain until flow ceases.

13. On the PFC2000, repeat for the other tank.

Drain Lines

Even after tank drain-back, several gallons of materials are likely to be present in the hoses, and trapped between valves in the various circuits. A low bucket is needed for thorough gravity draining of hose lines.

14. Loosen the flange clamp at the outlet of each manifold valve (#1, 2 & 3), to admit air.

15. Place the bucket or collection pan under each forward hose. Slowly open the connector valve to fully open and drain the line. If any part of the hose line is lower than the connector, lift the hose moving from back to front, to drain the line. Close the valve. Repeat for each 2in hose.

16. Repeat step 15 for the 3/4in gauge line. This will not fully drain this line, as it is open through the manifold and back to the pump. It will be further flushed with the pump.

17. Set the collection pan or bucket on a raised platform/stool just below the drain line at each tank inlet. Loosen the flange clamp on the drain cap, and drain the lines at that area. Operate adjacent valves to drain any fluid in nearby lines.

18. Set the collection pan or bucket on a raised platform/stool just below manifold valve #4 (the recirculation line). Remove the flange clamp connecting the recirculation line to the manifold, and drain the line. Operate valves at the 1600 gallon tank discharge line to introduce air and further drain that line.

19. Close all valves and re-tighten the flange clamps at the drains. Fill the tanks with several gallons of clean water. Using waste water containers, repeat step 9 through step 18.

20. Hitch the cart to a tractor, and lock-up the cart’s electric clutch. See “Electric Clutch Lock-Up” on page 29. Adjust the cart pump to setting 10.

21. Close all valves. Refill the tanks with about twice as much water as for the previous flushing.

22. Fully open the hose valve on the gauge line. This line is open through the manifold back to the pump.

23. On the PFC2000, set the pump selector valve for the 1600 gallon tank.

24. At the 1600 gallon tank, set the discharge selector valve to the pump line.

25. Pull the cart with the tug until most (but not all) of the water has been pumped from the tank.

26. On PFC2000, set the pump selector valve for the 400 gallon tank. At the 400 gallon tank, set the outlet selector valve to the pump line.

27. Pull the cart with the tug until most (but not all) of the water has been pumped from the tank.

28. Remove the bolts from the clutch.
Seasonal Storage

Do not leave water, even clean water, in the pump for extended periods. Do not leave water in the lines if freezing is possible prior to next tank use. Replace the water with RV antifreeze.


30. Perform step 21 through step 28, substituting RV antifreeze for water in this second flushing.

Note: If freezing is imminent, and performing an anti-freeze flush is not possible in time, remove the pump from the cart and store it in a warm location. Use two people. The pump is heavy.

31. Consider loosening the flange clamps at the tank drains and leaving them that way in storage. Be sure to tag them for tightening at next use. By leaving the clamps loose, any fluid collecting in the tank will drain off rather than become a freezing, contamination or safety hazard.

   Fluid build-up can occur from condensation, or from rain if a tank lid is left askew.

32. Clean cart of mud, dirt, excess oil and grease.

The PFC1600/2000 Cart itself has two adjustments:

1. The setting on the pump (in Figure 18). This setting controls the stroke length of the piston, and the flow rate through the valve.
2. Strainer mesh screen sizes.

There are several adjustments on the planter that affect fertilizer application:
- orifice selection
- ground drive pump sprockets
- relief valve setting

The planter adjustments are described in the planter’s Seed Rate charts and Operator’s Manual.

**Pump Setting Determination**

1. Using the application recommendations for the fertilizer, and knowledge of local conditions, choose the desired material application rate in gallons per acre.

Refer to Figure 19

2. On the pump slide chart ①, set the top sliding scale to the Loaded Radius and Sprocket Ratio values shown in the table at right.
3. Note the Maximum Ground Speed.
4. On the bottom scale, set the Swath Width at the line through diamond indicator below Ground Speed.
5. On the lower NGP-7055 scale, find the desired gallons per acre.
6. Above the gallons per acre rate, read the Pump Setting.

The pump setting dial scale is in arbitrary units. The setting controls volume per pump revolution. The slide chart is required because the relationship is not linear. The slide chart is not specific to the PFC1600/2000 Cart. The information at right is needed to use the chart.

Note: The pump slide chart does not anticipate the actual 172/18 ratio and 33.6in loaded radius of the PFC1600/2000 Cart. The sprocket pairing and loaded radius values shown at right have been mutually adjusted to within scale range so that the chart calculates correct results.
Liquid Fertilizer Strainers

The PFC1600/2000 Cart system includes two strainers; one at the quick-fill inlet, and one at the pump outlet. You need to check that the pump screen is an appropriate size for the orifice plates you plan to use.

Pump Strainer

Refer to Figure 20

The pump strainer was delivered with an 80 mesh screen. Other screen sizes are available from Banjo Corporation.

DANGER

Wear protective gloves when changing screens.

If changing screen sizes, keep in mind the following:

- Generally, select a mesh screen the same or slightly smaller than the orifice size.
- A substantially smaller mesh (e.g. 100) will reduce manifold orifice plates plugging so often, but the strainer screen will have to be cleaned more often.
- A much larger mesh (e.g. 50 or 30) will pass more material but should only be considered when using large manifold orifice plates.
- A plugged or partially plugged screen will result in a reduced application rate. It may also result in back-pressure at the pump, and possible seal damage.
- Mesh sizes: (Smallest) 100, 80, 50, 30 (Largest)

Quick-Fill Strainer

Refer to Figure 21

The inlet strainer was delivered with a 12 mesh screen. In general, it is not necessary to replace the screen with a different size. If the screen becomes clogged and cannot be cleaned, replace it with another 12 mesh.

DANGER

Wear protective gloves when changing screens.

If changing screen sizes, keep in mind the following:

- Using a substantially smaller mesh may slow tank filling.
- Using a larger mesh increases the risk of clogging the pump strainer.
## Troubleshooting

### General Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Flow (Pump Lines 1, 2 or 3) and Gauge Reads zero</td>
<td>Closed Valve(s)</td>
<td>Check planter inlet, cart hose outlet, tank discharge/outlet, pump inlet selector (PFC2000 only)</td>
</tr>
<tr>
<td></td>
<td>Disconnected control cable or seed monitor not configured</td>
<td>Check control cable. Use seed monitor menus to confirm that cart clutch and manifold valves are detected and configured.</td>
</tr>
<tr>
<td></td>
<td>“Fert.Pump” switch off</td>
<td>Turn switch on (up).</td>
</tr>
<tr>
<td></td>
<td>Seed monitor not configured to deliver fertilizer.</td>
<td>Review menus.</td>
</tr>
<tr>
<td></td>
<td>Tank empty</td>
<td>Refill tank</td>
</tr>
<tr>
<td></td>
<td>Failed electric clutch</td>
<td>If planting cannot wait for repairs, lock-up clutch until it can be repaired or replaced.</td>
</tr>
<tr>
<td></td>
<td>Tank contents have gelled, coagulated or frozen</td>
<td>If warming does not improve flow, drain tank(s) and refill.</td>
</tr>
<tr>
<td></td>
<td>Failed/stuck manifold valve</td>
<td>Repair or replace valve.</td>
</tr>
<tr>
<td></td>
<td>Broken drive chain</td>
<td>Repair or replace chain</td>
</tr>
<tr>
<td></td>
<td>Failed pump</td>
<td>See pump manual</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Flow (400 Gallon line 6)</td>
<td>Closed valve(s)</td>
<td>Check planter gauge line inlet, cart hose outlet, and tank outlet selector</td>
</tr>
<tr>
<td></td>
<td>Tank empty</td>
<td>Refill tank</td>
</tr>
<tr>
<td></td>
<td>Tank contents have gelled, coagulated or frozen</td>
<td>If warming does not improve flow, drain tank(s) and refill.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Pressure Reading or Erratic Reading (Pump Line)</td>
<td>Closed valve(s)</td>
<td>Check planter gauge line inlet, cart hose outlet</td>
</tr>
<tr>
<td></td>
<td>Gauge is correct</td>
<td>Review “No Flow” troubleshooting items</td>
</tr>
<tr>
<td></td>
<td>Air in line can cause erratic reading.</td>
<td>Loosen fitting at gauge and plant until fertilizer emerges there.</td>
</tr>
<tr>
<td></td>
<td>Failed gauge</td>
<td>Replace gauge</td>
</tr>
<tr>
<td></td>
<td>Tank contents have gelled, coagulated or frozen</td>
<td>If warming does not improve flow, drain tank(s) and refill.</td>
</tr>
<tr>
<td>Problem</td>
<td>Cause</td>
<td>Solution</td>
</tr>
<tr>
<td>---------</td>
<td>-------</td>
<td>----------</td>
</tr>
<tr>
<td><strong>Flow Too Low</strong>&lt;br&gt;(Pump Lines 1, 2 or 3)</td>
<td>Incorrect pump setting</td>
<td>Review desired application rate, and re-run calculation with slide chart.</td>
</tr>
<tr>
<td></td>
<td>Tire under-inflated</td>
<td>Check tire pressure.</td>
</tr>
<tr>
<td></td>
<td>Clogged strainer</td>
<td>Close valves. Inspect and flush strainer.</td>
</tr>
<tr>
<td></td>
<td>Orifice size too small</td>
<td>Review recommended size in Seed Rate manual.</td>
</tr>
<tr>
<td></td>
<td>Valve not fully open</td>
<td>Check same valves as for “No Flow”. Open valve.</td>
</tr>
<tr>
<td></td>
<td>Ground drive wheel slipping</td>
<td>If tires are correctly inflated, wait for improved field conditions. If that is not an option, and slippage is constant, adjust pump setting to compensate.</td>
</tr>
<tr>
<td></td>
<td>Bypass line #4 open when it should not be (if hoses 1, 2 &amp; 3 are in active use, bypass #4 should be closed).</td>
<td>Repair or replace valve.</td>
</tr>
<tr>
<td></td>
<td>Tank contents have gelled, coagulated or frozen</td>
<td>If warming does not improve flow, drain tank(s) and refill.</td>
</tr>
<tr>
<td></td>
<td>Pump wearing</td>
<td>See pump manual.</td>
</tr>
<tr>
<td></td>
<td>System leaks result in insufficient flow to row units</td>
<td>Inspect tank and hose paths to row units. Tighten or repair any leaks.</td>
</tr>
<tr>
<td><strong>Flow Too High</strong>&lt;br&gt;(Pump Lines 1, 2 or 3)</td>
<td>Incorrect pump setting</td>
<td>Review desired application rate, and re-run calculation with slide chart.</td>
</tr>
<tr>
<td></td>
<td>Orifice size too large</td>
<td>Review recommended size in Seed Rate manual.</td>
</tr>
<tr>
<td><strong>Flow Too Low</strong>&lt;br&gt;(400 gal Line 6)</td>
<td>Incorrect ground drive setting on planter</td>
<td>Review recommended sprockets in Seed Rate manual.</td>
</tr>
<tr>
<td></td>
<td>Orifice size too small</td>
<td>Review recommended size in Seed Rate manual.</td>
</tr>
<tr>
<td></td>
<td>Relief valve set too low. Material is flowing, but out dump line.</td>
<td>Re-adjust relief valve. See planter seed rate manual.</td>
</tr>
<tr>
<td></td>
<td>Valve not fully open</td>
<td>Check same valves as for “No Flow”. Open valve.</td>
</tr>
<tr>
<td></td>
<td>Tank contents have gelled, coagulated or frozen</td>
<td>If warming does not improve flow, drain tank(s) and refill.</td>
</tr>
<tr>
<td><strong>Flow Too High</strong>&lt;br&gt;(400 gal Line 6)</td>
<td>Incorrect ground drive setting on planter</td>
<td>Review recommended sprockets in Seed Rate manual.</td>
</tr>
<tr>
<td></td>
<td>Orifice size too large</td>
<td>Review recommended size in Seed Rate manual.</td>
</tr>
</tbody>
</table>
Maintenance and Lubrication

Maintenance

Proper servicing and maintenance is the key to long implement life. With careful and systematic inspection, you can avoid costly maintenance, downtime, and repair.

⚠️ CAUTION ⚠️

The line from the pump outlet, through the pump strainer, manifold through gauge line #5 to gauge on the planter may be pressurized even when not pumping. Open any connections on this line slowly to avoid spraying.

Always turn off and remove the tractor key before making any adjustments or performing any maintenance when hitched.

1. After using your cart for several hours, check all bolts to be sure they are tight.
2. Remove excess slack from chain. Clean and use chain lube on all roller chains as needed.
3. Maintain proper air pressure in cart tires.
4. Clean cart on a regular basis. Regular and thorough cleaning will lengthen equipment life and reduce maintenance and repair.
5. Lubricate areas listed under “Lubrication” on page 93.
6. Replace any worn, damaged, or illegible safety labels by obtaining new labels from your Great Plains dealer.

⚠️ CAUTION ⚠️

Spill hazard/Tank damage risk:
Periodically check the tension of the straps for the fertilizer tank. Strap tension will change as outside air temperature changes. Adjust tension as necessary to prevent personal injury or damage to the fertilizer tank.

NOTICE

Do not run pump without fluid flowing through it. Mechanical seal damage will occur. When pump is operating, allow the fluid to circulate through agitation.
Fertilizer Plumbing Maintenance

Depending on the time before next use, and the weather possible during that period, follow the steps beginning at “Parking and Storage” on page 30.

Tank Cleaning

1. Wear protective apparel, including footwear, as the ground under the cart will get damp.
2. Perform the steps at “Parking and Storage” on page 30.
3. Remove the drain caps from all tanks.
4. On the 1600 gallon tank, set the tank discharge valve to select the pump side.
5. Open the tank lids and rinse the inside of each tank with a strong stream of water from a hose.
6. Re-attach the drain caps, but leave them loose to permit drainage of residual moisture, and any that may collect. Tag the caps for tightening at next tank use.
7. Add a few cups of anti-freeze to each tank. Most of it will drain out, but what remains will protect any hoses or fittings that did not otherwise drain.
8. Secure the tank lids.

Strainer Maintenance

**WARNING**

Some chemicals will cause serious burns, lung damage, and death. Avoid contact with skin or eyes. Wear proper protective equipment as required by chemical manufacturer. Avoid prolonged breathing of chemical fumes. Wear respirator as required by chemical manufacturer. Seek medical assistance immediately if accident occurs. Know what to do in case of an accident.

Refer to Figure 22

There are two strainers, of different types, on the cart. Once is at the quick-fill inlet, and the other at the pump outlet.

1. Shut off valves on both sides of strainer.
2. Unscrew filter canister. Flush filter cartridge with water or replace with new cartridge if necessary.
3. Reinstall canister. Turn on valves as needed.
Lubrication

Ground Drive Fertilizer Pump

See pump manual.
Note: Pump requires gearbox oil and grease. Pump manual contains seasonal recommendations and servicing details.

Hitch : Tongue: Pivot

2 zerk
Type of Lubrication: Grease
Quantity: Until grease emerges

Front Caster: Wheel Hub

2 bearings
Type of Lubrication: Grease
Quantity: Re-pack

Intervals (operating hours) at which service is required

Seasonal

Seasonal
Front Caster: Wheel Pivot

<table>
<thead>
<tr>
<th>Seasonal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 zerk</td>
</tr>
<tr>
<td>Type of Lubrication: Grease</td>
</tr>
<tr>
<td>Quantity: Until grease emerges</td>
</tr>
</tbody>
</table>

Wheels: Hubs

<table>
<thead>
<tr>
<th>Seasonal</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 bearings; 2 each side</td>
</tr>
<tr>
<td>Type of Lubrication: Grease</td>
</tr>
<tr>
<td>Quantity: Re-pack</td>
</tr>
</tbody>
</table>

Ground Drive Wheel: Main Sprocket

<table>
<thead>
<tr>
<th>As Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 sprocket with double chain ring</td>
</tr>
<tr>
<td>Type of Lubrication: Chain Lube</td>
</tr>
<tr>
<td>Quantity = Coat thoroughly</td>
</tr>
</tbody>
</table>
Main Shaft to Pump Chain

1 chain, 2 sprockets
Type of Lubrication: Chain Lube
Quantity = Coat thoroughly

Note: Lubricate chains any time there is a chance of moisture, and when being stored at the end of the planting season.

Use of either tank with the PFC1600/2000 Cart requires the Trailer Hitch Weldment and at least one Fertilizer Manifold system. The 400 gal tank does not include a pump, and relies on the Ground Drive Fertilizer pump.
# Appendix

## Specifications and Capacities

<table>
<thead>
<tr>
<th></th>
<th>PFC2000</th>
<th>PFC1600</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HP Requirements</strong></td>
<td>300 hp, estimated minimum*</td>
<td></td>
</tr>
<tr>
<td><strong>Hydraulic Circuits</strong></td>
<td>none</td>
<td></td>
</tr>
<tr>
<td><strong>Hitch</strong></td>
<td>Pull-Type, Pintle</td>
<td></td>
</tr>
<tr>
<td><strong>Width</strong></td>
<td>11ft 8in</td>
<td></td>
</tr>
<tr>
<td><strong>Length</strong></td>
<td>24ft 4in</td>
<td></td>
</tr>
<tr>
<td><strong>Transport Clearance</strong></td>
<td>37(\frac{1}{2})in</td>
<td></td>
</tr>
<tr>
<td><strong>Height</strong></td>
<td>8ft 6in</td>
<td></td>
</tr>
<tr>
<td><strong>Weight (Approx.)</strong></td>
<td>5000 lbs empty</td>
<td>4650 lbs empty</td>
</tr>
<tr>
<td></td>
<td>29,500 lbs fully loaded</td>
<td>24,350 lbs fully loaded</td>
</tr>
<tr>
<td><strong>Tank Capacities</strong></td>
<td>1600 gallons</td>
<td>1600 gallons</td>
</tr>
<tr>
<td></td>
<td>400 gallons</td>
<td></td>
</tr>
<tr>
<td><strong>Pump Capacity</strong></td>
<td>34.2 gallons/min. maximum</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.076 gallons/revolution</td>
<td></td>
</tr>
<tr>
<td><strong>Tire Sizes</strong></td>
<td>Transport: 480/80R42</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Front Caster: 425/65R22.5</td>
<td></td>
</tr>
</tbody>
</table>

* This is for tractor pulling YP2425 planter plus loaded PFC1600/PFC2000 during planting.

## Tire Inflation Chart

<table>
<thead>
<tr>
<th>Wheel</th>
<th>Tire Size</th>
<th>Inflation</th>
<th>Tire Warranty Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport</td>
<td>480/80R42</td>
<td>110 psi</td>
<td>All tires are warranted by the original manufacturer of the tire. Tire warranty information is found in the brochures included with your Operator's and Parts Manuals or online at the manufacturer's websites listed below. For assistance or information, contact your nearest Authorized Farm Tire Retailer.</td>
</tr>
<tr>
<td>Caster</td>
<td>425/65R22.5</td>
<td>58 psi</td>
<td>Firestone: <a href="http://www.firestoneag.com">www.firestoneag.com</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Goodyear: Now: <a href="http://www.titan-intl.com">www.titan-intl.com</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Kumho: <a href="http://www.kumhotire.com">www.kumhotire.com</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Titan: <a href="http://www.titan-intl.com">www.titan-intl.com</a></td>
</tr>
</tbody>
</table>
## Torque Values Chart

<table>
<thead>
<tr>
<th>Bolt Size</th>
<th>Bolt Head Identification</th>
<th>Bolt Size</th>
<th>Bolt Head Identification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Grade 2</td>
<td>Grade 5</td>
<td>Grade 8</td>
</tr>
<tr>
<td>in-tpia²</td>
<td>N·m</td>
<td>ft-lb</td>
<td>N·m</td>
</tr>
<tr>
<td>1/4-20</td>
<td>7.4</td>
<td>5.6</td>
<td>11</td>
</tr>
<tr>
<td>1/4-28</td>
<td>8.5</td>
<td>6</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>5/8-16</td>
<td>27</td>
<td>20</td>
<td>42</td>
</tr>
<tr>
<td>5/8-24</td>
<td>31</td>
<td>22</td>
<td>47</td>
</tr>
<tr>
<td>7/16-14</td>
<td>43</td>
<td>32</td>
<td>67</td>
</tr>
<tr>
<td>7/16-20</td>
<td>49</td>
<td>36</td>
<td>75</td>
</tr>
<tr>
<td>1/2-13</td>
<td>66</td>
<td>49</td>
<td>105</td>
</tr>
<tr>
<td>1/2-20</td>
<td>75</td>
<td>55</td>
<td>115</td>
</tr>
<tr>
<td>9/16-12</td>
<td>95</td>
<td>70</td>
<td>150</td>
</tr>
<tr>
<td>9/16-18</td>
<td>105</td>
<td>79</td>
<td>165</td>
</tr>
<tr>
<td>9/8-11</td>
<td>130</td>
<td>97</td>
<td>205</td>
</tr>
<tr>
<td>9/8-18</td>
<td>150</td>
<td>110</td>
<td>230</td>
</tr>
<tr>
<td>3/4-10</td>
<td>235</td>
<td>170</td>
<td>360</td>
</tr>
<tr>
<td>3/4-16</td>
<td>260</td>
<td>190</td>
<td>405</td>
</tr>
<tr>
<td>9/16-9</td>
<td>225</td>
<td>165</td>
<td>585</td>
</tr>
<tr>
<td>9/8-14</td>
<td>250</td>
<td>185</td>
<td>640</td>
</tr>
<tr>
<td>1-8</td>
<td>340</td>
<td>250</td>
<td>875</td>
</tr>
<tr>
<td>1-12</td>
<td>370</td>
<td>275</td>
<td>955</td>
</tr>
<tr>
<td>11/16-7</td>
<td>480</td>
<td>355</td>
<td>1080</td>
</tr>
<tr>
<td>11/8-12</td>
<td>540</td>
<td>395</td>
<td>1210</td>
</tr>
<tr>
<td>1/2-7</td>
<td>680</td>
<td>500</td>
<td>1520</td>
</tr>
<tr>
<td>1/2-12</td>
<td>750</td>
<td>555</td>
<td>1680</td>
</tr>
<tr>
<td>13/16-6</td>
<td>890</td>
<td>655</td>
<td>1990</td>
</tr>
<tr>
<td>13/8-12</td>
<td>1010</td>
<td>745</td>
<td>2270</td>
</tr>
<tr>
<td>11/2-6</td>
<td>1180</td>
<td>870</td>
<td>2640</td>
</tr>
<tr>
<td>11/2-12</td>
<td>1330</td>
<td>980</td>
<td>2970</td>
</tr>
</tbody>
</table>

* a. in-tpi = nominal thread diameter in inches-threats per inch
* b. N·m = newton-meters
* c. mm x pitch = nominal thread diameter in mm x thread pitch
* d. ft-lb = foot pounds

Torque tolerance + 0%, -15% of torquing values. Unless otherwise specified use torque values listed above.
PFC2000 Plumbing

This figure shows the general location and a flow/control diagram of the plumbing system.

Figure 23
PFC2000 Plumbing

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Manifold valve #1 (planter L.)</td>
</tr>
<tr>
<td>4</td>
<td>Manifold valve #2 (planter C.)</td>
</tr>
<tr>
<td>5</td>
<td>Manifold valve #3 (planter R.)</td>
</tr>
<tr>
<td>6</td>
<td>Recirculation valve</td>
</tr>
<tr>
<td>7</td>
<td>Gauge line</td>
</tr>
<tr>
<td>8</td>
<td>400 gallon line to planter</td>
</tr>
<tr>
<td>9</td>
<td>Ground drive pump</td>
</tr>
<tr>
<td>10</td>
<td>Quick-fill strainer</td>
</tr>
<tr>
<td>11</td>
<td>Pump strainer</td>
</tr>
<tr>
<td>12</td>
<td>Quick-fill shut-off valve</td>
</tr>
<tr>
<td>13</td>
<td>Inlet selector valve</td>
</tr>
<tr>
<td>14</td>
<td>1600 gal discharge line valve</td>
</tr>
<tr>
<td>15</td>
<td>400 gal inlet shut-off valve</td>
</tr>
<tr>
<td>16</td>
<td>400 outlet selector valve</td>
</tr>
<tr>
<td>17</td>
<td>Pump selector valve</td>
</tr>
<tr>
<td>18</td>
<td>Recirculation line</td>
</tr>
<tr>
<td>19</td>
<td>400 gal drain cap</td>
</tr>
<tr>
<td>20</td>
<td>1600 gal drain cap</td>
</tr>
</tbody>
</table>
PFC1600 Plumbing

This figure shows the general location and a flow/control diagram of the plumbing system.

Figure 24
PFC1600 Plumbing
Planter Assembly Installation

These instructions are only needed if the lighting extension cables, CANbus extension cables and gauge line were not factory-installed on the planter. This can be the case if the tank cart was ordered separately from or later than the planter. If so, these assemblies are provided in a carton with the tank cart.

Planter Control Cable Extension

Refer to Figure 25 and Figure 26

1. On the right wing of the planter, locate the last WSMB ① (Working Set MemBer module). One side of the harness ① at this module has a CAN terminator ② plugged into the cable.
2. Lift the latch ③. Unplug/save the terminator ②.
3. Select the:
   - ① 800-082C CABLE TIE .31X21.5 6DIA 120LB
   - ② 823-270C PFC INTELLIG BOOM/PUMP CONTRL
   - ③ 467980126 CAN TERMINATOR
   - ④ 467980144 40' EXTENSION HARNESS
   - ⑤ 467980361 6' REAR HITCH HARNESS
4. Connect the plug end of the hitch harness ④ into the receptacle end of the extension harness ③.
5. Connect the plug end of the extension harness ③ to the harness receptacle ③ where the CAN terminator was just removed.
6. Route the extension/hitch harness toward the center of the planter. Near the center follow right fertilizer manifold feed line down to the hitch, to ensure safe placement and correct slack at the wing pivot. Loosely secure with cable ties ⑪.
   Note: Do not consume all the ties at this step. They are also needed for the lighting and gauge lines.
7. If the hitch connector can touch the ground, coil the excess under a tie near the hitch. Verify that the cart’s control cable has enough reach to make the connection and maintain it during tight turns.
8. Secure cable ties.
9. Locate the control cable harness at the Frame Control Module of the tank cart. This harness has a CAN receptacle identical to that on the planter.
10. Plug the saved CAN terminator ② into that cable receptacle.
Planter Lighting Cable Extension

<table>
<thead>
<tr>
<th>Callout</th>
<th>Quantity</th>
<th>Part No.</th>
<th>Part Description</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>1</td>
<td>890-390C</td>
<td>LIGHT HARNESS, 10' WISHBONE</td>
<td>Existing part on planter</td>
</tr>
<tr>
<td>16</td>
<td>2</td>
<td>890-600C</td>
<td>AG LIGHT HARNESS, EXT-15'</td>
<td>New parts</td>
</tr>
<tr>
<td>17</td>
<td>1</td>
<td>890-601C</td>
<td>AG LIGHT HARNESS, Y-CONN</td>
<td>New part</td>
</tr>
</tbody>
</table>

Refer to Figure 27 and Figure 27

11. Select the:
   - 17 890-601C AG LIGHT HARNESS, Y-CONN
   - and a few:
     - 11 800-082C CABLE TIE .31X21.5 6DIA 120LB

12. From one of the planter tail lights, follow a lead of existing Y-cable 15 back to its 4-pin Wesbar plug.

13. Disconnect the existing Y-cable and connect the new Y-harness 17 between the existing plug and receptacle.

14. Have ready:
   - 16 890-600C AG LIGHT HARNESS, EXT-15'

15. Route the Y harness 17 toward the planter’s rear hitch, securing with cable ties 11 every 18in or so.

16. Connect/secure extension harness cables 16 as needed until a receptacle end is at the hitch.

17. If the hitch connector can touch the ground, coil the excess under a tie near the hitch. Verify that the cart’s lighting cable has enough reach to make the connection and maintain it during tight turns.
Planter Pressure Gauge Installation

Refer to Figure 29
18. Find the right fertilizer valve mount 18 at the planter rear hitch. Note whether it has one or two 2in inlet valves 19 mounted on it, at positions 1 and 2.

Note: A planter with only a 3-inlet “Hi-Rate” fertilizer manifold will have only one valve 19 on the right side 1. The extra position 2 has mounting holes for the 3/4in valve 22 to be installed.

A planter with both optional fertilizer manifolds will already have all mount positions occupied by 2in valves. In this case, the line to be installed is tie-wrapped to the hose of the right-most valve.

Refer to Figure 30
19. Select the:
   22 829-010C VALVE - 3/4FNPT BALL POLYPROP
   23 830-082C AD 3/4MNPT X 3/8HB POLYPROP
   24 830-166C AD 3/4MNPT X 3/4FCL POLYPROP

20. Operate the valve handle. When open, the handle points to the outlet side of the valve.


22. Assemble the 3/4in quick-connect adaptor 24 on the inlet side of the valve 22.

23. Per step 18, if there is an open position on the mount, install the valve assembly there as shown in Figure 29. If there is no position, set the valve aside until step 25.

24. Select the:
   25 990-080R HOSE 3/8 ID 150PSI EPDM
   the remaining:
   11 800-082C CABLE TIE .31X21.5 6DIA 120LB
   and one:
   21 800-126C CLAMP WRM DRV #5 SS (.44-.70)
25. Connect one end of the hose 25 to the adaptor 23, and secure it with the clamp 21.

If the valve 22 was not attached to a mount, use a tie 11 to secure the valve end of the hose 25 to the hose of the right-most 2in valve on the mount. Tie it several inches back from the valves to allow slack for making connections.

26. Route the new hose 25 forward and out the right wing, securing loosely with ties 11.

One of the two hoses (or the only hose) at hitch right is the “Hi-Rate” line to the planter’s right wing. Follow this hose to assure clearance from moving parts/sharp edges, and to provide correct slack for planter operations.

27. Select the:
20 507-030K MAGNET MOUNT 3 1/2 GAUGE ASSY
and the remaining:
21 800-126C CLAMP WRM DRV #5 SS (.44-.70)

28. Find a position on the wing tool bar, within reach of the forward end of the new hose 25, and approximately near the point where the right pull-bar joins the wing.

29. Set the magnetic valve 20 on the tool bar, facing forward. Adjust the dump line from the purge valve 1 so that it points forward and down.

30. Re-adjust the valve position so that fluid from the dump line strikes no planter parts, including row unit components and frame-mounted row options.

31. Route the free end of the new hose 25 to the valve 2, and secure it with a clamp 21. Coil-up or cut off any excess hose length before making the connection.

32. Secure the hose installation by tightening ties 11.
Warranty

Great Plains (a division of Great Plains Manufacturing, Inc.) warrants to the original purchaser that this Great Plains unit will be free from defects in material and workmanship for a period of one year from the first use date when used as intended and under normal service and conditions for personal use; ninety days for custom/commercial or rental use. This Warranty is limited to the replacement of any defective part by Great Plains 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.

The following items and/or conditions are not covered under warranty: failures resulting from abuse or misuse of the equipment, failures occurring as a result of accidental damage or acts of God, failures resulting from alterations or modifications, failures caused by lack of normal maintenance as outlined in the operator’s manual, repairs made by non-authorized personnel, items replaced or repaired due to normal wear (such as wear items and ground engaging components), repeat repair due to improper diagnosis or repair by the dealer, temporary repairs, service calls and/or mileage to and from customer location, overtime premium, or unit hauling expenses. The warranty may be voided if the unit is towed at speeds in excess of 20 miles per hour (32 kilometers per hour), or is used in soils with rocks, stumps, or other obstructions.

Great Plains reserves the right to make changes in materials or design of the product at any time without notice. The warranty shall not be interpreted to render Great Plains liable for damages of any kind, direct or consequential or contingent to property. Furthermore, Great Plains shall not be liable for damages resulting from any cause beyond its control. This warranty does not extend to crop loss, losses caused by planting or harvest delays or any expense or loss of 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 the unit is registered with Great Plains within 10 days from the date of the original purchase.