Pre-Delivery Manual

Nutri-Pro® NP1330, NP1340, NP1540, NP2330, and NP2540/Bedded 30- and 40-Foot Fertilizer Applicators

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!

Illustrations may show optional equipment not supplied with standard unit, or may show anhydrous, or conventional liquid models where the topic function is identical.
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Printed in the United States of America
Lift Hydraulics: ..........................................................61
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.

Introduce No Anhydrous

For pre-delivery of Nutri-Pro (anhydrous ammonia) models:

▲ Do not introduce any liquid or gaseous NH₃ prior to final delivery to customer or otherwise prior to placing this unit into field service.

Pre-delivery steps may include meter harness routing, and minor connection items for NH₃ applicator tubing, but these items do not need to be tested with actual anhydrous ammonia.

If there are any concerns about the metering system, contact Great Plains. Deliver to the end user an implement that has never had NH₃ in it.

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. Have contact numbers available.
Be Familiar with Safety Decals

▲ Read and understand the “Safety Decals” in the Operator manual.
▲ Read all instructions noted on the decals.
▲ Keep decals clean. Replace damaged, faded and illegible decals.

Avoid High Pressure Fluids

Escaping fluid under pressure can penetrate the skin, causing serious injury. This product requires a Power-Beyond port, which is always under pressure when the tractor is running.

▲ Avoid the hazard by relieving pressure at other remotes, and shutting down tractor before connecting, disconnecting or inspecting 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, seek immediate medical assistance from a physician familiar with this type of injury.

Shutdown and Storage

▲ Lower product, put tractor in park, turn off engine, and remove the key.
▲ Secure product using blocks and supports provided.
▲ Detach and store product in an area where children normally do not play.

Tire Safety

Tire changing can be dangerous. Employ 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.
Introduction

The Nutri-Pro® Fertilizer Applicators have been designed with care and built by skilled workers using quality materials. Proper setup, maintenance, and safe operating practices will help the customer get years of satisfactory use from the machine.

This manual will familiarize you with planning, unloading, and assembly of this product. Most operating information is contained in the Operator manual.

Description of Unit

The Nutri-Pro® NP1330, NP1340, NP1540, NP2330 and NP2540 Applicators are precision implements for sub-soil application of anhydrous ammonia (NH₃) or conventional liquid fertilizer from a user-provisioned nurse tank cart. The NP1330-40, NP1540, NP2330, and NP2540/Bedded offer a choice of pull-type, or lift-assist 2-point hitching.

Intended Usage

Use the Nutri-Pro Applicator to apply liquid anhydrous ammonia, or to apply conventional liquid fertilizer. Do not modify Great Plains-provisioned components, or install after-market components, except as authorized or recommended by Great Plains.

Document Family

The documents delivered with the implement vary by model and options installed.

Documents

- 417-459M: Operator Manuals
- 417-477M: Using Anhydrous Ammonia Safely
- 417-480M: Parts manuals
- 407-551M: Pre-Delivery manual
- 417-459P: CDS-John Blue NGP Pump Parts and Instructional manual
- 417-477P: CDS-John Blue IP-1300/1800 Impellicone parts
- 417-480P: Raven AccuFlow™ Operator manual
- 12-M-43: Raven SCS-450 Installation, Operation and Service manual
- 12-M-29: Squibb-Taylor Flo-Max manual
- 016-0159-403: CDS-John Blue NGP Pump Parts
- 016-0159-831: CDS-John Blue IP-1300/1800 Impellicone parts
- FVC062: Raven AccuFlow™ Operator manual
- 12-M-29: Raven SCS-450 Installation, Operation and Service manual
- FVC062: Squibb-Taylor Flo-Max manual

NOTICE

Deliver All Documents:
Do not discard any documents, including any not listed on this page. Implement operation and customer safety rely on having ALL documents. If any are damaged or appear to be missing, contact Great Plains for replacement copies.
## Models Covered

### Anhydrous Ammonia Models
- NP1330AA-11C30  
  30-Foot, 11-Row, NH₃ CLTR
- NP1330AA-11S30  
  30-Foot, 11-Row, NH₃ SPRIN
- NP1330AA-12C30  
  30-Foot, 12-Row, NH₃ CLTR
- NP1330AA-12S30  
  30-Foot, 12-Row, NH₃ SPRIN
- NP1330AA-13C30  
  30-Foot, 13-Row, NH₃ CLTR
- NP1330AA-13S30  
  30-Foot, 13-Row, NH₃ SPRIN
- NP1330AA-18C20  
  30-Foot, 18-Row, NH₃ CLTR
- NP1330AA-25C15  
  30-Foot, 25-Row, NH₃ CLTR
- NP1340AA-15C30  
  40-Foot, 15-Row, NH₃ CLTR
- NP1340AA-15S30  
  40-Foot, 15-Row, NH₃ SPRIN
- NP1340AA-31C15  
  40-Foot, 31-Row, NH₃ CLTR
- NP1540AA-16C30  
  40-Foot, 16-Row, NH₃ CLTR
- NP1540AA-16S30  
  40-Foot, 16-Row, NH₃ SPRIN
- NP1540AA-17C30  
  40-Foot, 17-Row, NH₃ CLTR
- NP1540AA-17S30  
  40-Foot, 17-Row, NH₃ SPRIN
- NP1540AA-25C20  
  40-Foot, 25-Row, NH₃ CLTR
- NP2330AA-12C30  
  30-Foot, 12-Row NH₃ CLTR
- NP2330AA-12S30  
  30-Foot, 12-Row, NH₃ SPRIN
- NP2540AA-16C30  
  40-Foot, 16-Row, NH₃ CLTR
- NP2540AA-16S30  
  40-Foot, 16-Row, NH₃ SPRIN
- NP2540AA-17S30  
  40-Foot, 17-Row, NH₃ SPRIN
- NP2540AA-24C20  
  40-Foot, 24-Row, NH₃ CLTR
- NP2540AA-25C20  
  40-Foot, 25-Row, NH₃ CLTR
- NP2540BL-12V38  
  40-Foot, Bedded 38 Inches, LIQ
- NP2540BL-12V40  
  40-Foot, Bedded 40 Inches, LIQ

### Conventional Liquid Fertilizer Models
- NP1330LL-11V30  
  30-Foot, 11-Row, LIQ.
- NP1330LL-12V30  
  30-Foot, 12-Row, LIQ.
- NP1330LL-13V30  
  30-Foot, 13-Row, LIQ.
- NP1330LL-18V20  
  30-Foot, 18-Row, LIQ.
- NP1340LL-31V15  
  40-Foot, 31-Row, LIQ.
- NP1540LL-16V30  
  40-Foot, 16-Row, LIQ.
- NP1540LL-17V30  
  40-Foot, 17-Row, LIQ.
- NP2330LL-12V30  
  40-Foot, 12-Row, LIQ.
- NP2330LL-18V20  
  40-Foot, 18-Row, LIQ.
- NP2540LL-16V30  
  40-Foot, 16-Row, LIQ.
- NP2540LL-24V20  
  40-Foot, 17-Row, LIQ.
Using This Manual

This manual will familiarize you with unloading, assembly and initial setup of the implement. Read this manual and follow the recommendations to help ensure safe and efficient delivery preparation.

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.

**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.

Useful information related to the preceding topic.

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.

An orientation rose in some line art illustrations shows the directions of: Up, Back, Left, Down, Front, Right.

**Call-Outs**

Single-character callouts in the ranges 1-9, a-z or A-Z identify elements from only the most recently referenced Figure or Figures. These numbers and letters may be used for other elements on other pages.

Two-digit callouts in the range 11 to 81 reference the same Great Plains part numbers throughout this manual.

**Tags**

Some parts have engraved metal tags attached. These tags are for parts ID and may be removed and discarded as the part is installed. In some cases, the tag must be removed or it will interfere with part installation. Parts may alternatively be marked with grease pencil. These marks may be left on and removed at close-out.

**NOTICE**

*Great Plains not Responsible for After-market Integration:*

Great Plains disclaims all liability for products whose final assembly (other than “Pre-Delivery” items and installation of supported accessories) includes subsystems not provided by Great Plains. Warranty claims may be disallowed if, in the opinion of Great Plains, damage resulted from installation or use of third-party components not supplied or supported by Great Plains.

**Further Assistance**

Great Plains Manufacturing, Inc. wants 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 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.

**Figures**

*Photo Advisory:*

None of the photographs in this manual were taken during a pre-delivery. They may include parts, assemblies, and other artifacts that will not be present at the same point in an actual pre-delivery. Rely on the text narrative. Rely on the Figures only insofar as they support the text narrative.

**About Parts**

**Fasteners**

Fasteners called out are often loosely installed in one of the two parts to be joined, and must be removed before the parts are mated. To avoid mix-ups and misplaced parts, do not remove fasteners from shipping locations until the “Select” instruction that calls for those parts.
Pre-Delivery Planning

To meet highway clearance requirements, Nutri-Pro® implements are shipped with a few components and/or sub-assemblies uninstalled. The exact list and status of uninstalled components varies with implement model, implement width, hitch type and options ordered. Shipping configuration may change over time.

This manual assumes a hypothetical extreme case of disassembly. Inspect the delivered implement, and skip steps that are already completed or that do not apply to the present implement.

Tools Required

- One or more lifters with a combined capacity of 12,000 to 20,000 pounds (5450-9100 kg)
- 1 1/4in hitch pin (for drive-off unload of 2-Point or Pull-Type implements at pit or side dock)
- Adjustable stands or supports.
- Hydraulic oil (3 to 5 gallons, 11 to 19 liters)
- Basic hand tools

Work Space Requirements

Final assembly of the applicator requires a well-lit, flat surface space large enough to accommodate the fully unfolded implement, any wing extensions, any pull-type tongue, any rear casters, and lifter access from all sides.

Delivery Cycle

Standard Great Plains deliveries do not include time for implement assembly while still on the trailer bed. If you are reviewing this manual prior to delivery, and you anticipate that you might have a problem implementing the unload instructions, notify Great Plains prior to shipment.
Unload Trailer

Plan the Unload

Refer to Figure 2

Inspect the load. Plan the unload.

How to conduct the unload depends on:

- what type of dock is available (side dock or pit dock provides the greatest options), and
- what type of power equipment is available, the lifting capacity, and if only fork-lifts, the number available.

Unfolded Delivery

Applicators are shipped unfolded, except for the outer wings on 5-section applicators. Make sure there is enough space to park the machine and the forward tool bar support

Applicators with a 2-point hitch are shipped resting on their own parking stands in front. These swing-down adjustable height parking stands remain with the applicator.

Pull-Type applicators are shipped with temporary shipping stands under the front tool bar. These are not attached to the implement. They are also returned to Great Plains. Plan to support the front of the frame after the unload.

Pull-Type Applicator Wheels

Pull-Type applicators may be shipped with the caster wheels and/or lift-assist wheels removed.

If the lift-assist wheels are installed, a 2-point tractor can remove the implement at a side dock or pit dock.

The parallel arms on the front caster wheels are floating. They are not supporting any implement weight, do not have lock channels or spacers installed, and the cylinders may not be charged with hydraulic oil.

NOTICE

Equipment Damage Risk:
Do not fold the implement while on the trailer. Do not unfold the out wings while on the trailer. The hydraulic system is not charged, and the wings could fall suddenly. Folded inner wings could obstruct hoist lines, making unload more difficult.

NOTICE

Equipment Damage Risk:
Plan to relocate temporary shipping stands early in the implement move. Temporary shipping stands under the front tool bars are NOT attached to the tool bars. Unfolded and pull-type implements, that have no optional coulters, require front support until front wheels are installed.

NOTICE

Equipment Damage Risk:
Install cylinder lock channels or spacers if lifting at the caster pivots. Without a stop on the cylinder rod, the arms are likely to swing up during lift.
Unload Miscellaneous Components

Refer to Figure 3
1. Use hoists or fork lifts to remove all pallets, crates and loose sub-assemblies from the trailer bed.
2. Check serial numbers on components and crates against the serial number plate of the implement. If the shipment included multiple implements, particularly for multiple destinations, it is critical to unload all (but only) the extra components for the implement.

⚠️ WARNING ⚠️

Falling Implement Hazard:
Do not release any chains or straps securing the applicator itself to the trailer bed until the applicator is fully supported by the lifter(s). Some applicator configurations could tip to one side or the other if not tied down or fully supported. This could result in equipment damage, serious injury or death.

Pre-Lift Inspection

Pull-Type Anhydrous without Coulters

Have stands or supports available for Pull-Type anhydrous implements that have no coulters. This configuration does not have any front support until after the front wheels are installed.

5-Section Wing Pivot Blocks

Refer to Figure 5

Verify that there are wing pivot blocks at both inner wing pivots. If a wing pivot block is missing at either wing, contact the factory. If the wings are not blocked, they will droop at lift, and coulter/knife damage is possible when the implement is set down.
Execute the Unload

Hoist Unload

Refer to Figure 6 and Figure 7

Recommended line attachment points vary with implement hitch type. Key objectives are:

- Use four attach points for safety.
- Use attach points inboard of the wing pivots.
- Use implement structures designed for the implement weight (such as hitches or caster mount points).
- Keep the implement center of gravity inside the four lines.
- Attach so that lines cannot slip toward center.
- Use lines that are individually rated for at least half the load.
- Secure lines to implement to avoid implement damage.

Hoist Unload Steps:

1. Support the implement with the hoist.
2. Release the straps or chains securing the implement to the trailer bed. Remove loose stands.
3. To avoid hazards associated with swinging loads, lift the implement, and have the truck driven out from under it.
4. Lower the implement to the ground.

Figure 6: Hoist Points:
2-Point Hitch Type (Center Section)

Figure 7: Hoist Points:
Pull-Type (Center Section)
Two Forklift Unload

*Refer to Figure 8, Figure 9 and Figure 10*

Recommended lift points vary with implement hitch type. Key objectives are:

- Use two lifters for safety.
- Spread the forks as wide as possible without striking implement components.
- Strap the implement frame, at the fork contact point, to the fork, to prevent tilting and shifting.
- Use implement structures designed for the implement weight.
- Keep the implement center of gravity inside the four forks.
- Use lifters that are individually rated for the entire load.

**Forklift Unload Steps:**

1. Support the implement with the lifters.
2. Release the straps or chains securing the implement to the trailer bed. Remove loose stands.
3. Lift the implement, and have the truck driven out from under it.
4. Lower the implement to the ground. Do not attempt to drive both fork lifts while supporting the implement.

---

**CAUTION**

*Tip-Over Hazard:*

Use two lifters. Unloading with a single fork lift is not recommended. Even if the lifter is rated for the implement weight, the width of the trailer bed, plus the front-to-back width of the implement, places the center of gravity well out on the forks, and is a tip-over hazard.

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**Figure 8**

Two Forklift

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**Figure 9:** Fork Lift Points:

2-Point Hitch Type (Center Section)

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**Figure 10:** Fork Lift Points:

Pull-Type (Center Section)
Install Components

**WARNING**

**Crushing and Machine Damage Hazards:**
Hydraulic lines are not to be charged prior to shipment. Operating systems with air in the lines can result in jerky movements and sudden falls of frame or wings. Anyone nearby could be seriously injured or killed. Machine damage is likely.

Not all topics of this manual section will apply to the implement at hand. Each topic includes a continue-at instruction if the topic does not apply, and may end with a further continue-at instruction if the next topic would not apply, based on the current topic.

**NOTICE**

**Loss of Time Risk:**
Don’t install out of order. To ensure safety and reduce effort, the topics must be completed in the order presented. Later topics rely on earlier topics having been completed. Some steps cannot be performed at all if required prior steps are not yet completed.

Before beginning installation steps:

- the implement must be unloaded from the trailer,
- the hydraulic systems must not be charged until after the components are installed, and
- the implement is presumed to be unfolded, except for the outer wings on the 5-section applicators.
Install Rear Lift-Assist Wheels

This applies to Pull-Type implements only. These may be shipped with just the wheel assembly removed.

For a Pull-Type with the lift-assist wheels already installed, continue at "Install Caster Wheels" on page 13.

• Do not activate the lift circuit as part of this installation.
• Do not install lock channels as part of this installation.

Refer to Figure 12

1. At each wheel mount where a wheel/arm assembly is to be installed, remove and save six sets of:
   67 803-021C NUT HEX 5/8-11 PLT
   64 804-022C WASHER LOCK SPRING 5/8 PLT
   49 802-057C HHCS 5/8-11X2 1/4 GR5
two:
   12 161-040D AXLE TUBE BUSHING MACH.
   and one set of:
   17 2A0134 MW COTTER PIN
   67 805-124C PIN CLEVIS 1 X 3 11/16 GR5 PLT

2. Hoist a wheel arm tube into alignment with the mount holes. Secure the alignment by inserting the axle tubes 12.

3. Secure the axle tubes with bolts 49, lock washers 64 and nuts 67.

4. Align the arm lug 1 with the clevis of the cylinder rod. Secure with clevis pin 67 and cotter pin 17.

5. Repeat step 2 through step 4 for the other rear lift-assist wheel.

Continue at topic "Install Caster Wheels" on page 13.
Install Caster Wheels

This applies to the front caster wheels for pull-type and the rear lift-assist wheels for 2-point implements.

If the caster wheels are already installed, continue at “Install Transport Rest” on page 14.

For this component, two lifters, or a single lifter and a set of tall supports are required. Plan the installation based on the available tools. These instructions assume a single lifter and supports. The caster yoke can be lifted by strapping a lifter fork under the yoke.

1. If connected, disconnect the rod ends of the hydraulic cylinders.

2. Loosen caster stabilizer jam nuts. Back the adjuster bolts most of the way out. Secure with jam nut finger-tight.

3. Locate two sets of the caster stabilizer internal components:
   - 266-012D PLATE RND 3/16" THK 1 7/8" DIA
   - 807-143C SPRING COMP 1.88OD x .362W
   - 266-020D UHMW RND 2.0 DIA X 2.0 LONG

4. Hoist one of the caster weldments high enough that the caster yoke and wheel assembly 407-317L CASTER LOCKUP ASSEMBLY can be positioned under it.

   Install supports at parallel arms or secure the hoist.

5. On one of the casters, remove and save two sets of:
   - 802-034C HHCS 1/2-13X1 1/4 GR5
   - 804-015C WASHER LOCK SPRING 1/2 PLT
   - and one:
   - 161-231D NTA CASTER RETAINER CAP

   Do not remove the:
   - 804-102C PIVOT THRUST WASHER

6. Lift the caster yoke. Align the vertical shaft with the pivot. Raise yoke one or two inches into pivot.

7. Insert into the stabilizer tube, in this order, one each:
   - 266-012D PLATE RND 3/16" THK 1 7/8" DIA
   - 807-143C SPRING COMP 1.88OD x .362W
   - 266-020D UHMW RND 2.0 DIA X 2.0 LONG

8. Fully raise the yoke into the caster weldment. Secure with one cap, and two sets of lock washers and bolts.

9. Loosen the stabilizer jam nut. Turn the adjuster bolt until it contacts the plate and spring. Tighten one more inch. Secure jam nut.

10. Refer to Figure 14 inset. Use the 2 inch space between the head of the bolt to the welded nut inset as a starting point for adjusting the caster.

11. Repeat step 4 through step 10 for the other caster(s).

12. Do not connect the cylinders at this time.
Install Transport Rest

Transport Rest, 3-Section Applicators, Except NP2330

Refer to Figure 15

1. Select two:
   - 806-039C U-BOLT 5/8-11 X 6 1/32 X 7 3/4
   - eight sets:
     - 803-021C NUT HEX 5/8-11 PLT
     - 804-022C WASHER LOCK SPRING 5/8 PLT
2. With the cross plate to the rear, hoist the transport rest to implement center, over the middle tool bars 6 of the mainframe.
3. Check that the rest's base plates are equal distances from implement center-line. Secure with U-bolts 72, lock washers 64 and nuts 57.

Do not install the SMV reflector until “Install SMV Reflector” on page 32.

Transport Rest, NP2330

Refer to Figure 16

1. Select one:
2. 407-528H TRANSPORT REST
2. Select two:
   - 806-039C U-BOLT 5/8-11 X 6 1/32 X 7 3/4
   - eight sets:
     - 803-021C NUT HEX 5/8-11 PLT
     - 804-022C WASHER LOCK SPRING 5/8 PLT
3. Hoist the transport rest to implement center, over the middle tool bars 6 of the mainframe.
4. Check that the rest's base plates are equal distances from implement center-line. Secure with U-bolts 72, lock washers 64 and nuts 57.

Do not install the SMV reflector until “Install SMV Reflector” on page 32.
Transport Rest, 5-Section Applicators

Refer to Figure 17

1. Select two:
   - 806-015C U-BOLT 5/8-11 x 4 1/32 x 8
   - and four sets:
     - 802-053C HHCS 5/8-11 x 1 3/4 GR5
     - 803-021C NUT HEX 5/8-11 PLT
     - 804-022C WASHER LOCK SPRING 5/8 PLT

2. Align the transport rest ① with the welded frame plate ②. Insert bolts ③, washers ④ and nuts ⑤ and tighten.

3. Affix other end of transport rest with U-bolt ⑥, lock washers ④ and nuts ⑤. Tighten firmly.

4. Repeat the procedure for the opposite transport rest.

Install 2-Point Wing Gauge Wheels

If all the gauge wheels are already installed, continue at topic "Install Wing Extensions" on page 21.

If not installed for shipment, the gauge wheel assemblies may be fully dismounted at the tool bar, or may have only the wheels removed. If only the wheels need to be installed, continue at topic "Install 2PT Gauge Wheels" on page 17.
Install Gauge Wheel Mounts

Refer to Figure 18

The mounts for the 2-point gauge wheel assembly are installed on the frame. Install the gauge wheel assemblies as shown in Figure 19 or Figure 20.

Before installing, determine the location for each gauge wheel, which varies by row count.

Gauge wheels mount at row center-lines. This may place one U-bolt against a rib. Do not straddle a rib.

1. Select two:
   - 407-586S 2PT GW ASSEMBLY
   - and four:
   - 806-016C U-BOLT 5/8-11 X 6 1/32 X 5 3/4
   - and eight sets:
   - 803-021C NUT HEX 5/8-11 PLT
   - 804-022C WASHER LOCK SPRING 5/8 PLT

2. Secure the mounts at the gauge wheel stations for NP2330 shown in Figure 19.
NP2540 Only

Refer to Figure 20

The distance from the machine center varies based on your machine model.

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Distance from center of machine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-BL NP2540</td>
<td>165 inches</td>
</tr>
<tr>
<td>NP2540BL-12V38</td>
<td>152 inches</td>
</tr>
<tr>
<td>NP2540BL-12V40</td>
<td>160 inches</td>
</tr>
</tbody>
</table>

Bracket is factory-installed in the correct location.

Continue at topic “Install Wing Extensions” on page 21.

Install 2PT Gauge Wheels

Refer to Figure 21

1. Locate two:
   - 596-065K TIRE 20.5 X 8 10 PLY 6 BOLT with hub assemblies installed.
2. Remove and save at each wheel, two sets:
   - 802-064C HHCS 3/4-10X2 GR5
   - 804-023C WASHER LOCK SPRING 3/4 PLT
3. Install the wheel assemblies at each gauge wheel arm 23.

Continue at topic “Install Wing Extensions” on page 21.
Install Pull-Type Wing Caster Wheels

Installation is slightly different for right-hand wing and left-hand wing. The left-hand side cylinder rod has a depth stop assembly.

Refer to Figure 22

4. Loosen caster stabilizer jam nuts 58. Back the adjuster bolts 51 most of the way out. Secure with jam nut finger-tight.

5. Locate two sets of the caster stabilizer internal components:
   - 266-012D PLATE RND 3/16" THK 1 7/8" DIA
   - 807-143C SPRING COMP 1.88OD x .362W
   - 266-020D UHMW RND 2.0 DIA X 2.0 LONG

6. Hoist the right-hand caster weldment 20 high enough that the caster yoke and wheel assembly 407-317L CASTER LOCKUP ASSEMBLY can be positioned under it.
   Install supports at parallel arms or secure the hoist.

7. On the caster weldment, remove and save two sets of:
   - 802-034C HHCS 1/2-13X1 1/4 GR5
   - 804-015C WASHER LOCK SPRING 1/2 PLT
   and one:
   - 161-231D NTA CASTER RETAINER CAP
   Do not remove the:
   - 804-102C PIVOT THRUST WASHER

8. Lift the caster yoke 22. Align the vertical shaft 29 with the pivot. Raise yoke one or two inches into pivot.

9. Insert into the stabilizer tube, in this order, one each:
   - 266-012D PLATE RND 3/16" THK 1 7/8" DIA
   - 807-143C SPRING COMP 1.88OD x .362W
   - 266-020D UHMW RND 2.0 DIA X 2.0 LONG

10. Fully raise the yoke into the caster weldment. Secure with one cap 13, and two sets of lock washers 62 and bolts 47.

11. Loosen the stabilizer jam nut 58. Turn the adjuster bolt 51 until it contacts the plate 15 and spring 77. Tighten 1/16 inch more. Secure jam nut.
   □ Apply light pressure only to wing caster wheels to allow for easier swiveling of casters during turning.

12. Refer to Figure 22 inset. Use the 2 inch space between the head of the bolt 51 to the welded nut 58 inset as a starting point for adjusting the caster.
Refer to Figure 23

13. Repeat step 6 through step 12 for the left-hand caster wheel.
14. Rotate the depth stop clevis 19 so that it is to the front.
15. Align the arm lug 3 with the clevis of the cylinder rod.
16. Secure rod clevis with clevis pin 67 and cotter pin. Do not activate the lift hydraulics at this time. Do not install wing lift lock channels.

**NOTICE**

Machine Damage Risk:
Never install a lock channel on the depth stop cylinder unless the depth stop clevis has been rotated clear of the cylinder rod. Lowering the implement onto a lock channel with the clevis in place will damage the clevis.

Front Caster Wheel and Rear Lift Assist Locations

Refer to Figure 24, Figure 25, Figure 26, and Figure 27
Figure 26
Model 1540

Figure 27
Model 1540 20-Inch
Install Wing Extensions

Some models may have wing extensions shipped loose for ease of transport.

Install Wing Frame

Refer to Figure 28

1. Select one:
   - 407-331H BOLT ON WING FRAME
   and eight sets:
   - 802-055C HHCS 5/8-11X2 GR5
   - 804-022C WASHER LOCK SPRING 5/8 PLT
   - 803-021C NUT HEX 5/8-11 PLT

2. Orient the extension so that any decals are upright. Attach it loosely to the wing end with bolts 48, lock washers 64 and nuts 57. Bring nuts to snug.

3. Adjust position of extension to make mating end plates flush at front, top, and rear.

4. Tighten the nuts

Mount Outside Coulters

If the implement is ordered without coulters, continue at "Mount Outside Knives" on page 22.

Refer to Figure 29

⚠️ CAUTION ⚠️

Sharp Object Hazard:
Exercise caution when near or handling coulter disks. Wear gloves. Edge of coulter disk can be sharp.

On 5-section models, the outside coulter clamps 11 are installed, but the coulters 14 are not.

1. Loosen all four nuts 57 securing an end row clamp 11 to the frame. Be careful to avoid moving the clamp on the frame.

2. Select one of the crated coulters 14. Insert the shank into the coulter clamp.

3. Elevate coulter, setting distance 6 from the bottom of the frame to the top of the coulter casting to:
   - 7.5 in. (19.1 cm).

4. Maintaining elevation, rotate shank in clamp so that coulter blade is straight forward when centered in the casting slot 6.

5. Secure clamp nuts 57.
Mount Outside Knives

1. Select two:
   - 75 806-154C U-BOLT 3/4-10 X 4 1/32 X 7 1/2
   - 59 803-181C NUT HEX FLANGE LOCK 3/4-10 PLT

2. Loosely mount the shank assembly 80 on the rear tool bar.

3. Adjust the horizontal position to be exactly one row space © from the nearest factory-installed row.

4. Secure the flange nuts 59.

Figure 30
Mount Knife Shank
Mount Raven Accuflow Cooler

The Raven Accuflow cooler (single or dual) is shipped assembled and crated separately from the Nutri-Pro machine. It must be mounted on the machine.

Attach Accuflow Frame Mount Brackets

Attach the two Accuflow frame mount brackets to the center section.

Refer to Figure 31

1. Select two:
   - 407-689D ACCUFLOW FRAME MOUNT BRACKET
   - 407-611D ACCUFLOW FRAME MOUNT BRACKET
   and eight each:
   - 806-060C U-BOLT 1/2-13 X 6 1/32 X 7 1/4
   and sixteen each:
   - 803-020C NUT HEX 1/2-13 PLT
   - 804-015C WASHER LOCK SPRING 1/2 PLT

2. Using U-bolts (3), attach both frame mount brackets (56) to middle of the 6x6 frame tube, position inside of cylinder lugs (3).

3. Secure loosely (until coolers are positioned correctly in next step) with nuts (56) and lock spring washers (62).

Attach Cooler Assembly

Refer to Figure 32

1. Select cooler (either single or dual):
   - 407-341L SINGLE COOLER ASSY (not shown)
   or
   - 407-477L RAVEN DUAL COOLER ASSY
   and eight (for dual cooler), four (for single):
   - 802-091C HHCS 1/2-13X1 1/2 GR5
   - 804-016C WASHER FLAT 1/2 SAE PLT
   - 804-015C WASHER LOCK SPRING 1/2 PLT
   - 803-020C NUT HEX 1/2-13 PLT

2. Install the cooler assembly in the slots on the mount brackets just attached (56) and center left to right on the machine.

When installing the single cooler assembly attach it in the forward most slots of the brackets.

3. Secure with bolts (53), washers (53, washers (53), and nuts (56), making sure of clearance around transport rest.
Install Delivery Tubing

Refer to Figure 33 and Figure 34

The NH$_3$ $3/8$ inch EPDM tubing is to be run from the Impellicone flow divider ④ to the shank knives.

Take note of the extra length needed for tubing in the hinge pivot areas. The hoses must not bind or pinch when the applicator is folding or unfolding.

1. Starting with the knife located furthest from Impellicone flow divider. Run the $3/8$ inch EPDM tubing from the flow divider along the frame tubing to the knife shank. Make allowances for frame fold-up in the hinge pivot areas.

2. Run the tubing down the shank under the closer and attach to the knife outlet tube ⑤ with the hose clamp ④.

Before securing this first hose, measure the total length and record. Cut all remaining knife tubes to this furthest length.

**NOTICE**

*Rate Imbalance Risk:*

It is **very important** that the EPDM tubes for the knife tubes are cut to the same length as the longest hose. Do this to maintain equal rate to each knife.

3. Coil any excess tubing inboard of the shank. Secure with tie ④. Secure all other ties. Do not over tighten. Avoid crushing or cutting the tubing.

4. Continue to run each EDPM tube, securing to the rear frame tubes and shanks with cable ties ④ and ④ as needed.

Two vapor overflow outlets ⑥ exist on each cooler. These outlets are $3/4$ inch EPDM tubing and are run to the dual outlet knives on the center section.

5. Attach the $3/4$ inch EVA tubing to the outlet hose barbs on the Accuflow coolers and run the tubing to the larger outlet tube on the knives. Secure the tubing in the same manner as the $3/8$ inch EDPM tubing.

Shipped hoses are black. White hoses used for clarity in the photo.

Continue at “Install Nurse Tank Hitch” on page 29.
Dual Tine Delivery/Vapor Tube Connections
Fasten the delivery tubing ① onto the delivery tine end ② using the spring clamp ③.
Slide the tube ④ onto the tine ⑤ and fasten with the screw clamp ⑥.

Liquid Applicators
VisaGage Plumbing
The majority of the VisaGage plumbing (if ordered) has been prepared for your Nutri-Pro® applicator. Hoses and other tubing have not been installed on the machine.

Refer to Figure 36
1. Each VisaGage monitor contains five (5) balls: one (1) each, green plastic, black plastic, blue plastic, blue glass, and stainless steel. See machine Operator Manual for installation and use.
   Monitor installation shown in 36 is typical. Your assembly may have more, or fewer monitors mounted depending on number of row units.
2. Supply hoses are push/pull fit into the back of each VisaGage monitor ①.
3. Refer to Figure 37 Figure shows typical mounting locations for VisaGage towers.
Refer to Figure 38

4. The VisaGage uses 3/8 inch diameter Nylon hose and push/pull type fittings.

5. The top hose (not shown) is connected to the VisaGage monitor and to the top fitting 2 in the coupler.

Coupler is factory pre-installed in the fertilizer tine.

6. The bottom hose is connected to the bottom fitting 3 in the coupler to the lower fitting 4.

When removing the hose from the lower fitting 3 on the coupler always use a nozzle shutoff cap (not shown) to plug the nozzle to keep out debris.
VisaGage Hose Routing

A roll of 3/8-inch, 1-inch and a roll of 1-1/2-inch plumbing hose is supplied with machines having the VisaGage option. Each hose must be measured and cut to fit.

Make sure before cutting any hose that enough slack has been added to ensure that the hose will not be stretched, crimped or cut when folding the machine.

Refer to Figure 39

1. Loosen or remove the 3/4- and 1-inch mounts ④, and ⑤ as well as the hose tray clamp bars ⑥.
2. Run the prepared sections of hose along the frame using the clamps as a routing guide.
3. Route the 1-inch hose ① using mounts ④ as a guide.
4. Route the 3/8-inch hoses ② using mounts ⑤ as a guide.
5. Install and tighten clamps.
6. Install fertilizer tanks on mounting supports ⑥ with fertilizer tank straps and hardware provided.
From Fertilizer Tank to Towers

Refer to Figure 40

The main fertilizer hose ① runs from the fertilizer tank to the fertilizer pump ② mounted on the frame.

From the fertilizer pump, the hose ③ runs to the valve-rate units ④.

These are sections of the 1-1/2 inch hose shown in “VisaGage Hose Routing” on page 27 and must be cut to fit.

Refer to Figure 41

From the regulators, the 1-inch hoses ⑤ travel to each monitor tower ⑥.
Install Nurse Tank Hitch
(NP1330, NP1340, NP1540)

If the implement was ordered without a rear hitch, continue at “Install Tongue (Pull-Type Models)” on page 32. If it is a 2-point model (on which the hitch should already be installed), continue at topic “Install SMV Reflector” on page 32.

Refer to Figure 42

For shipping of other configurations, at least the hitch mount is removed. The hitch extension may also be removed, in which case the break-away coupler needs to be relocated.

Free Break-Away Coupler

Hitch extension is used on 2-Point and Pull-Type models. If there is no hitch extension for this implement, and the breakaway coupler is already installed at the center of the rear-most tool bar, continue at topic “Install Hitch”.

1. At the break-away coupler mount, remove and save two sets:
   - 803-020C NUT HEX 1/2-13 PLT
   - 804-015C WASHER LOCK SPRING 1/2 PLT
   and one:
   - 806-034C U-BOLT 1/2-13 X 6 1/32 X 5 1/4

   Set the coupler assembly out of the way.

Install Hitch Extension

If there is no hitch extension, but the hitch is not mounted, continue at topic “Install Hitch”.

1. Select one:
   - 407-273H HITCH EXTENSION

   and six:
   - 806-016C U-BOLT 5/8-11 X 6 1/32 X 5 3/4

   and twelve sets:
   - 804-022C WASHER LOCK SPRING 5/8 PLT
   - 803-021C NUT HEX 5/8-11 PLT

2. Position the hitch extension at the center of the rear-most tool bar. If the hitch is already installed on the hitch extension, orient the entire assembly with the red handle down. Secure with six U-bolts, lock washers and nuts.

Relocate Break-Away Coupler

This applies to anhydrous models only. For other models, or if the breakaway coupler was not removed at step 1, continue at topic “Install Tongue (Pull-Type Models)” on page 32.

1. Select the set-aside:
   - 407-322S FLO-MAX BREAKAWAY COUPLER ASY

   and one:
   - 806-016C U-BOLT 5/8-11 X 6 1/32 X 5 3/4

   and two sets:
   - 804-022C WASHER LOCK SPRING 5/8 PLT
   - 803-021C NUT HEX 5/8-11 PLT

2. At the rear tube of the hitch extension (if or none, the rear most tool bar), orient the mount with the break up and to the rear. Secure to tube or tool bar with U-bolt, lock washers and nuts.

3. Orient break-away so that inlet Acme cap is to implement rear.
Shift 2-Point Hitch

NP2330/NP2540

Refer to Figure 43, Figure 44 and Figure 45

This machine comes from the factory at the pre-emergent setting of 16.09 inches from machine center.

1. For side dress installation, loosen or remove all twelve nuts per hitch.
2. Move each hitch to align on the frame as shown in Figure 44.
3. Tighten nuts to torque specification shown on decal.

Figure 45 shows hitch offset for the NP2540, 20-inch, 24-row model only.
Shift-able Hitches
Refer to Figure 46 and 47

Shift-able hitches are available (option) for NP2540 (A) and NP2330 (B) applicators.
Install on rear of lift assist carrier, centered as much as possible.
Install Tongue (Pull-Type Models)

Refer to Figure 48

1. Select two sets:
   - 805-168C PIN HITCH 1 7/16 X 8 3/8 PLT
   - 805-185C PIN COTTER .186 WIRE DIA
2. Raise the rear of the tongue into alignment with the lower holes of the 2-point hitch. Secure with pins and cotter pins.

Route Hoses and Cables

Refer to Figure 49

1. On pull-type applicators, loosen fasteners at hose clamps on tongue. Route the implement hydraulic hoses under clamps. Leave enough slack at pins for tongue to allow for movement of the tongue on hills.
2. Route lighting harness and controller harness (Option) through clips on top of hose clamp stacks.
   - The harness for the fold/field switch will be routed through the same clips when installed.
3. Coil excess hose and cable in the wire loop.
4. Store the lighting connector in the rain cap.
5. Store two hydraulic hoses in the caddy keyholes.

Install SMV Reflector

NP1330 and NP1340 Models

Refer to Figure 50

1. Select one:
   - 407-512D SMV POST
   and two sets:
   - 802-091C HHCS 1/2-13X1 1/2 GR5
   - 804-015C WASHER LOCK SPRING 1/2 PLT
   - 803-020C NUT HEX 1/2-13 PLT
2. With the SMV reflector up and facing rear, mount the SMV post on the rear face of the transport rest.
NP2330 Model

Refer to Figure 51

1. Select one:
   - 818-055C DECAL SLOW MOVING-GALV. BACKED
   - 407-688D SMV POST
   - 806-056C U-BOLT 1/2-13X4 1/32X 5 1/4
   and two sets:
     - 804-015C WASHER LOCK SPRING 1/2 PLT
     - 803-020C NUT HEX 1/2-13 PLT
     - 802-005C HHCS 1/4-20x1 GR5
     - 804-006C WASHER LOCK SPRING 1/2 PLT
     - 803-006C NUT HEX 1/4-20 PLT

2. Slide the U-bolt onto the crossmember of the transport rest. Install the SMV post on the U-bolt. Install the washers and nuts.

3. With the SMV reflector up and facing the rear, mount the SMV on the SMV post. Install the bolts, washers, and nuts.

NP2540 and NP1540 Models

Refer to Figure 52

4. Select one:
   - 119-300D SMV BLADE MOUNT
   - 818-055C DECAL SLOW MOVING-GALV. BACKED
   and two sets:
     - 802-092C RHSNB 5/16-18 x 3/4 GR5
     - 804-009C WASHER LOCK SPRING 5/16 PLT
     - 803-008C NUT HEX 5/16-18 PLT
     - 801-018C SCREW RD HD 1/4-20 x 5/8
     - 804-006C WASHER LOCK SPRING 1/4 PLT
     - 803-006C NUT HEX 1/4-20 PLT

5. With the SMV reflector up and facing rear, mount the SMV post on the mounting bracket located on the rear of the frame.
Install Reflectors and Lighting
NP2540B (Bedded) S/N C1087J+

Refer to Figure 53

1. Select two:
   - 417-826D LIGHT MOUNT
   - 591-221D DECAL MOUNT

   Select four:
   - 838-266C DECAL REFLECTOR RED 2X9
   - 838-265C DECAL REFLECTOR AMBER 2X9

   Select six:
   - 838-267C DECAL REFLECTOR DAYTIME 2X9

2. Mark the two decal mounts, one as right-hand and one as left-hand.

3. Apply one red reflector and one amber reflector to each decal mount.
   \(\text{\textcopyright} \text{NOTE: Refer to the illustration for correct positions of the reflectors. Right-hand and left-hand installations are different.}\)

4. Mark the two light mounts, one as right-hand and one as left-hand.

5. Apply one red reflector, one amber reflector, to the rear of each light mount.
   \(\text{\textcopyright} \text{NOTE: Refer to the illustration for correct positions of the reflectors. Right-hand and left-hand installations are different.}\)

6. Apply one daytime reflector to the front of each light mount. Align a vertical edge of each daytime reflector with the outer edges of the light mounts.

7. Apply daytime reflectors to both sides of both caster frames.

Figure 53
Decal Installation, NP2540 (Bedded)
Refer to Figure 54

8. Start by install the components listed below on the left-hand lift assist mount as shown.

9. For one lift assist mount, select one:
   - 401-521D LONG LIGHT MOUNT TUBE
   - 149-113D SHORT LIGHT MOUNT TUBE
   - 417-826D LIGHT MOUNT
   - 833-696C RED LIGHT
   - 833-697C AMBER LIGHT
   - 591-221D DECAL MOUNT
   and four each:
   - 806-268C U-BOLT 5/16-18X2 1/32X2 11/16
   - 802-041C HHCS 1/2-13X3 1/2 GR5
   - 804-015C WASHER LOCK SPRING
   - 803 020C NUT HEX 1/2-13 PLT
   - 802-224C HHCS 1/4-20X1 1/4 GR5
   - 802-225C NUT NYLOCK 1/4-20
   - 806-147C U-BOLT 1/4-20x2 9/32x3 GRD2
   - 803-255C NUT NYLOCK 1/4-20
   and eight each:
   - 804-009C WASHER LOCKING SPRING 5/16 PLT
   - 803-008C NUT HEX 5/16-18 PLT

10. Put the long light mount tube in position on the outboard side of the left-hand lift assist mount. Install the two bolts, washers, and nuts.

   NOTE: The illustration shows the installation on the left-hand lift assist.

11. Put the light mount in position on the bottom of the long light mount tube. Make sure the red reflector is outboard and toward the rear of the machine. Install the U-bolts, washers, and nuts.

   NOTE: Make sure the red reflector is on the outboard side and to the rear. Refer to Figure 53

12. Put the amber lamp in position on the bottom of the long light mount tube. Install the four HHCS and Nylock nuts.

13. Put the short light mount tube in position on the inboard side of the lift assist mount. Install the two bolts, washers, and nuts.


15. Put the decal mount on the bottom of the short light mount tube. Make sure the amber reflector is toward the rear and toward the center of the machine. Install the U-bolts, washers, and nuts.

16. Repeat the procedure to install the lights on the right-hand lift assist mount.

17. Connect the lighting harness to the four lamps.
NP2540 S/NC1087J+

Reflectors and Lighting

Note: For bedded model, see page 34.

Refer to Figure 55

1. Select two:
   - (88) 417-826D LIGHT MOUNT
   - (112) 591-221D LONG DECAL MOUNT
   - (113) 838-266C DECAL REFLECTOR RED 2X9
   - (114) 838-265C DECAL REFLECTOR AMBER 2X9
   - (115) 838-267C DECAL REFLECTOR DAYTIME 2X9
   - (116) 591-222D SHORT DECAL MOUNT

2. Mark the two light mounts (98), one as right-hand and one as left-hand.

3. Apply one red reflector (113) and one amber reflector (114) to the rear of each light mount. The red reflectors must be closest to the outer edge of the light mounts.

4. Apply one daytime reflector (115) to the front of both light mounts. Align the vertical edges of the daytime reflectors with the outer edges of the light mounts.

5. Mark the two long decal mounts (112), one as right-hand and one as left-hand.

6. Apply one red reflector (113) and one amber reflector (114) to the rear of the long decal mounts. The red reflectors must be closest to the outer edge of the long decal mounts.

7. Apply one daytime reflector (115) to the outboard sides of the short decal mounts (116).

Figure 55
Decal Installation, NP2540 (Bedded)
Refer to Figure 56

8. For one lift assist mount, select one:
- 417-826D LIGHT MOUNT
- 833-696C RED LIGHT
- 833-697C AMBER LIGHT
- 149-113D LIGHT BAR TUBE
- 417-852D LEFT-HAND LIGHT MOUNT
- 802-045C HHCS 1/2-13X5 GR5
- 802-039C HHCS 1/2-13X3 GR5
- 591-221D LONG DECAL MOUNT
- 591-222D SHORT DECAL MOUNT

and two each:
- 806-268C U-BOLT 5/16-18X2 1/32X2 11/16
- 806-147C U-BOLT 1/4-20X2 9/32X3 GR2
- 803-147C NUT HEX NYLOCK 1/2-13

and four each:
- 803-006C NUT HEX 1/4-20 PLT
- 804-006C WASHER LOCH SPRING 1/4 PLT
- 804-009C WASHER LOCKING SPRING 5/16 PLT
- 803-008C NUT HEX 5/16-18 PLT
- 802-224C HHCS 1/4-20X1 1/4 GR5
- 802-225C NUT HEX NYLOCK 1/4-20

NOTE: The illustration shows the installation on the left-hand side of the lift assist frame.

9. Find the mounting flange on the left-hand side of the lift assist frame. Put the light bar tube in position against the rear of the mounting flange. Install a bolt and a Nylock nut in the outboard hole.

10. Put the left-hand light mount in position against the light bar tube. Install a bolt and a nut.

11. Put the light mount in position on the bottom of the light bar tube. Make sure the red reflector is toward the rear of the machine and to the outside. Install the U-bolts, washers, and nuts.

12. Put the amber lamp in position on the bottom of the light mount. Install the four HHCS, lock washers, and nuts.

13. Slide the two U-bolts on the left-hand light mount. Install the red lamp on the U-bolts. Install the Nylock nuts on the U-bolts.

14. Slide the two U-bolts over the left-hand light mount. Install the long decal mount on the U-bolts. Make sure the red reflector is toward the rear of the machine and to the outside.

15. Install the short decal mount on the outer U-bolt. Make sure the daytime reflector is toward the outside of the machine.

16. Install the four lock washers and nuts.
17. Repeat the procedure to install the lights on the right-hand side of the lift assist mount. Use the same parts as above, except substitute one 417-827D RIGHT-HAND LIGHT MOUNT (Not shown) for the 417-852D LEFT-HAND LIGHT MOUNT

18. Connect the lighting harness to the four lamps.

Mount Ground Drive Wheel

If the implement is an anhydrous model, or was ordered without a ground drive pump, continue at section “Prepare Hydraulics” on page 39

**CAUTION**

*Sharp Object Hazard:*

*Use a hoist or two people. Wear gloves. The wheel is heavy and the tines are sharp.*

*Refer to Figure 57*

1. Select one:
   - 407-473D GROUND DRIVE WHEEL
   and three sets:
   - 802-331C RHSNB 1/2-13X1 3/4 GR5
   - 804-015C WASHER LOCK SPRING 1/2 PLT
   - 803-020C NUT HEX 1/2-13 PLT

2. At the ground drive hub 26, orient the wheel so that at the top, the vertical face of the top tooth is to the rear, and the longer angled face is to the front.

3. Secure the wheel 31 to the hub with bolts 54, lock washers 62 and nuts 56.
Prepare Hydraulics

**WARNING**

**Crushing Hazards/Equipment Damage Risk:**
If there is air in any part of the systems, wings could fall suddenly, and sections could lift unevenly, or fall suddenly. Anyone in the path of movement could be seriously injured or killed. Major equipment damage is possible.

**WARNING**

**High Pressure Fluid Hazard:**
Relieve pressure before disconnecting hydraulic lines. Wear protective gloves and safety glasses or goggles when working with hydraulic systems. Use a piece of paper or cardboard, NOT BODY PARTS, to check for suspected leaks. Escaping fluid under pressure can penetrate the skin, causing serious injury. If an accident occurs, seek immediate medical assistance from a physician familiar with this type of injury.

**NOTICE**

Do not connect a nurse tank to the applicator until after the applicator is delivered to the customer.

**JIC Torque Chart**

<table>
<thead>
<tr>
<th>Size</th>
<th>Foot-Pounds</th>
<th>N-m</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/16-20</td>
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<td>15-16</td>
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</tr>
<tr>
<td>11/16-12</td>
<td>79-87</td>
<td>108-119</td>
</tr>
</tbody>
</table>

Bleed only at JIC and NPT fittings. Never try to bleed a QD (Quick Disconnect) fitting. Avoid bleeding at ORB fittings. The O-ring is likely to be torn if any pressure remains in the circuit.

**NOTICE**

**Over-Torque and Leak Risks:**
JIC (Joint Industry Conference 37° Flare) fittings do not require high torque. Excess torque causes leaks. JIC and ORB (O-Ring Boss) fittings do not require sealant.

5-Section Wing Pivot Blocks

*Refer to Figure 5*

Remove the wing pivot blocks at both inner wing pivots. The wing pivot blocks are only used for shipping.
Connect a Tractor

A tractor must be connected to the applicator for the remainder of the procedure. Refer to the applicator Operator Manual and connect a tractor.

Do not have a nurse tank connected to the applicator.

The fold/lift circuit for the NP2540 is designed for tractors having closed center hydraulics. It is incompatible with open center systems.

Fold/Field Switch Installation

Refer to Figure 59 and Figure 60.

Late production applicators are equipped with a fold/field switch. The fold/field switch must be installed prior to operating the hydraulic system.

All of the applicators except the NP2330/NP2540 have a two position fold/field switch. The NP2330/NP2540 has a three position fold/field switch.

1. Place the fold/field switch in the tractor cab. Mount the fold/field switch where the operator can easily access the fold/field switch while observing the operation of the applicator.

2. Connect the power harness for the fold/switch to a switched power source in the tractor.

NP2330/NP2540 only: If the fold/field switch is connected to an unswitched power source, use the PARK position on the fold/field switch for parking. This will save tractor battery power. However, with the switch in PARK, any hydraulic flow to the fold/lift circuit can have undesired results.

3. Route the switch harness for the fold/field switch out of the tractor.

4. If the machine is a pull-type:
   - Route the switch harness down the right-hand tongue tube. Use the hose clamps to fasten the switch harness to the tongue.
   - Be sure to leave enough slack at the hitch to allow for turns.
   - Route the switch harness across the rear of the tongue.
   - Leave enough slack at pins for tongue to allow for movement of the tongue on hills.
   - Connect the switch wiring harness to the applicator wiring harness.
   - If necessary, use the extension harness provide with the fold/field switch.

5. If the applicator has a 2-point hitch, route the switch wiring harness to the applicator wiring harness. Connect the two harnesses.
Unfolding Outer Wings, 5-Section Applicators

The 5-section applicators are shipped with the outer wing folded.

1. Disable the weight-transfer system.
   The weight-transfer system must be disabled when operating the hydraulic system. This provides full hydraulic pressure for charging the hydraulic system. Refer to "Disabling the Weight-Transfer System".

2. On 2-Point hitch applicators, fully extend parking stands.

3. On 2-Point hitch applicators, install lift cylinder lock channels.

4. Lower implement onto the applicator stands, shipping stands, and/or lock channels.

5. Adjust work stands to the height to match the raised center section. Set one beyond, but not in the path of each outer wing.

6. On 5-section applicators:
   - Slowly extend the fold circuit to begin unfolding the outer wings.
   - If the outer wings did not fall all the way, stop the wings just above level. Install the stands to support the outer wings.
   - If the outer wings fell, raise the outer wings to just above level and install the work stands.

7. Set the circuit to the float position.

Wing locks engage during unfold on 5-section.
Wing-end coulters or knives are likely to contact the ground. Slow the unfold as this point nears.
Charging the Hydraulic System
Disabling the Weight-Transfer System

The weight-transfer system must be disabled when charging the hydraulic system. This provides full hydraulic pressure for charging the hydraulic system.

Machines without Fold/Field Switch

Refer to Figure 61
1. Close the weight-transfer shut-off valve ① (shown closed in Figure).
2. Release the locking discs (②, ③) on both valves.
3. Close the bypass valve ④ (the valve without the pressure gauge ⑤) by turning the control knob ⑥ fully clockwise.
4. Open the pressure reducing valve ⑦ by turning the control knob ⑧ fully counter-clockwise.

These settings are for hydraulic charge only. Initial field values are set later at “Set Rough Weight-Transfer” on page 48.

Machines with Fold/Field Switch

Refer to Figure 62
The fold/field switch must be installed prior to charging the hydraulic system. “Fold/Field Switch Installation”

All of the applicators except the NP2330/NP2540 have a two position fold/field switch with two indicator lamps. The positions are: FOLD/UNFOLD and FIELD.
Move the lever to the FOLD/UNFOLD position to charge the hydraulic system.

Refer to Figure 63
The NP2330/NP2540 has a three position fold/field switch with two indicator lamps. The positions are: FOLD/UNFOLD, PARK, and FIELD.
Move the lever to the FOLD/UNFOLD position to charge the hydraulic system.
Hydraulic Circuit Types

Refer to hydraulic schematics in the Appendix starting on page 57.

Separate Fold and Lift Circuits

NP1330, NP1340, and NP1540

The lift circuit is separate from the fold circuit. The lift circuit must be charged prior to charging the fold circuit. This allows the lift circuit to be available prior to the first use of the fold circuit.

Fold / Lift Assist Circuits

NP2330

The fold circuit and the lift-assist circuit are integrated. The fold and the lift-assist circuits operate in opposite directions. Both circuits must be charged at the same time.

NP2540

The fold and lift-assist cylinders share a single hydraulic circuit. Solenoid valves (controlled by the fold/field switch), one or more passive valves, and mechanical locks control hydraulic sequencing.

This system design provides a partial fold, as a single self-limiting hydraulic operation, during field lift, providing extra wing clearance in field turns.

If the hydraulic harness is not connected at the hitch, or the switch box is off, or power is off, most valves default to an Open state.
Charging A Lift Only Circuit

NP1330, NP1340, and NP1540

On some applicators, the lift circuit is separate from the fold circuit. On these applicators, the lift circuit must be charged prior to charging the fold circuit. This allows the lift circuit to be available prior to the first use of the fold circuit.

Refer to Figure 64

1. Check the level of the hydraulic oil in the tractor and add hydraulic oil as necessary.
2. Disable the weight-transfer system. Refer to page 42.
3. Disconnect rod ends of lift cylinders. Point rods so they cannot strike implement parts during extension. If possible, orient cylinders horizontally, with re-phasing orifices facing up.

Rod ends of the front wheel cylinders are already disconnected for shipment.
4. Slowly supply oil to the circuit to extend the lift cylinders.
5. If the lift cylinders are horizontal, hold at extended for several seconds to pass oil at the re-phasing orifices.

If the lift cylinders are not horizontal, hold extended at low flow, for several minutes.
6. Retract the lift cylinders. Do not hold.
7. Extend and hold.
8. Repeat step 3 through step 7 until lift cylinder extension and retraction is synchronized and smooth.
9. Connect rod ends of lift cylinders (only, do not install front wheels at this time).
10. Check the level of the hydraulic oil in the tractor and add hydraulic oil as necessary.
Charging a Fold Only Circuit
NP1330, NP1340, and NP1540

Refer to Figure 65 and Figure 66 on the next page.

Charge the lift circuit prior to the fold circuit, so that lift-assist is available prior to first fold or unfold.

1. Check the level of the hydraulic oil in the tractor and add hydraulic oil as necessary
2. Disable the weight-transfer system. Refer to page 42.
3. Disconnect the rod ends of the fold cylinders.
4. Elevate the rod ends relative to the fold cylinder bodies. Point and support them so that they cannot strike implement parts during extension.

This can be a slow operation. There are flow restricting orifice plates at each cylinder port.

5. Fully retract the fold cylinders. Make sure fold locks do not engage. Set circuit to Float.
6. Slightly loosen (crack) the JIC fittings at the base end of the fold cylinders.
7. Slowly extend fold cylinders. As oil appears at a cracked fitting, set the circuit to Neutral and secure the fitting.
8. Fully extend, then fully retract several times. Make sure fold locks do not engage.
9. When the last fitting has been secured, if this is:
   • an unfolded implement, or
   • a 30-foot implement folded to transport rest, operate circuit to position fold cylinder rods for attachment. Do not attempt, at this time, to connect rod ends on cross-folded wings.
10. Check the level of the hydraulic oil in the tractor and add hydraulic oil as necessary.
Figure 65
Typical 3-Section Fold System

Figure 66
Typical 5-Section Fold System
Charging A Fold/Lift-Assist Circuit

**NP2330 and NP2540**

- **On 40-foot models delivered cross-folded (no transport rest), the rod ends of the fold cylinders are disconnected for shipment.**

1. Check the level of the hydraulic oil in the tractor and add hydraulic oil as necessary.
2. Disable the weight-transfer system. Refer to page 42.
3. Disconnect the rod ends of the lift and fold cylinders (six rods).
   - Orient lift cylinder rods so that they are lower than the cylinder base ends.
   - Orient fold cylinder rods so that they are higher than cylinder base ends.
   - Make sure no rods can strike implement parts during extension.
4. Operate the circuit to fully retract the lift cylinders (this causes the fold cylinders to extend).
   - This can be a slow operation. There are flow restricting orifice plates at each fold cylinder port.
5. Set circuit to Float.
6. Slightly loosen (crack) the JIC fittings at the base end of the lift cylinders (two places).
7. Slowly extend cylinders. As oil appears at a cracked fitting, set the circuit to Neutral and secure the fitting.
8. When the last lift fitting has been secured, operate circuit to fully extend the fold cylinders.
9. Slightly loosen (crack) the JIC fittings at the base end of the fold cylinders (four or six places).
10. Slowly extend cylinders. As oil appears at a cracked fitting, set the circuit to Neutral and secure the fitting.
11. When the last lift fitting has been secured, operate circuit to position lift rods for attachment.
12. If this is:
   - an unfolded implement, or
   - a 30-foot implement folded to transport rest, operate circuit to position fold cylinder rods for attachment. **Do not attempt**, at this time, to connect rod ends on cross-folded wings.
13. Check the level of the hydraulic oil in the tractor and add hydraulic oil as necessary.
Set Rough Weight-Transfer

**DANGER**

**Crushing and High Pressure Fluid Hazards:**
This adjustment requires working near the unfolded and lowered implement with the hydraulic system active. Assign two people to this task, one in the tractor, ready to shut down on hand signal from adjuster or any unplanned event.

**WARNING**

**High Pressure Fluid Hazard:**
Escaping fluid under pressure can penetrate the skin causing serious injury. 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, seek immediate medical attention from a physician familiar with this type of injury.

**WARNING**

**Crushing Hazard:**
Keep body parts clear of wings, row cleaners and coulters while adjusting. Keep all bystanders well away. You will be seriously injured or killed if you are caught between lowering row implements and ground.

**CAUTION**

**Falling Hazard - Tires Not a Step:**
Do not use tires as steps or platforms. At some transfer settings, cylinders can lift wheels sufficiently for them to spin.
Machines Without Fold/Field Switch

Description of system

For circuit diagrams, refer to Appendix starting on Page 56.

Wing fold cylinders are extended during field operation to push the wings down using mainframe/center weight. On the 2330 the outer wing fold cylinders are also extended during field operation. The applicator has an integrated fold/lift system which includes a lift/assist valve (1). The fold and unfold operations are followed by lift and lower operations. This system uses a lift assist valve.

On the 2330, do not set or adjust the weight-transfer system if the outer wings are not level with the inner wings at unfold. Do not use the weight-transfer system to compensate for unfold stop adjustment issues.

Weight-transfer is enabled by opening the weight-transfer shut-off valve (2).

Weight-transfer is controlled by a pressure reducing valve (3) and a bypass valve (4).

In unfold mode, the fold circuit is set to continuous flow to maintain active weight-transfer.

The weight-transfer shut-off valve must be open for weight-transfer. When open, it bypasses the pressure reducing valve for faster fold cylinder operation (and faster 2-point lift-assist).

The pressure reducing valve controls the flow to the cylinders.

The bypass valve returns excess oil to the tractor.

If adjusted when the tractor is cold, additional adjustment can be required when the oil warms. Monitor the pressure gauge during field operations.

Adjust the weight-transfer to keep the wings level with the center section for consistent coulter depth. If not enough weight is transferred, wing coulters may run higher than center section. If too much weight is transferred, center section may run high.
Adjusting the Weight-Transfer

See circuit diagrams in the Appendix starting on Page 56.

1. Connect a tractor to the applicator. (See the Operator Manual.)
2. Make sure the hydraulic system is charged. See Charging the Hydraulic System on page 42.
3. In field conditions, unfold the applicator.
4. Lower applicator and set or check application depth (see Operator manual for these steps).
5. Pull forward to put coulters in ground.
7. On the 2330, close the lift-assist valve (shown in Figure 71) by turning the knob fully clockwise.
8. Open the weight-transfer shut-off valve.
9. On the bypass valve, release lock disc. Turn the bypass valve knob fully clockwise to shut-off all bypass oil flow. Tighten lock disc.
10. Start the tractor engine. Set tractor to half throttle.
11. Adjust tractor flow control valve so that wings fold and unfold at a reasonable speed. Keep tractor running for step 12 through step 15.
13. At the pressure reducing valve, release the lock disc.
14. Adjust the knob for an initial value of 800 psi on the weight-transfer gauge. Tighten the lock disc.
15. At the bypass valve, release the lock disc.
   Adjust the bypass valve knob counter-clockwise until the pressure reading just begins to fall from the value set at step 14. Turn the knob clockwise 1/4 turn. Tighten the lock disc.
16. On the 2330, stop the tractor engine. Put tractor in Park and set parking brake. Open the lift-assist valve (shown in Figure 71) by turning the knob fully counterclockwise.
17. Continue operation. After oil is warm, adjust down-pressure as necessary by repeating step 7 through step 16. The bypass valve must be closed prior to any adjustment to increase weight-transfer.
18. During operation, observe applicator operation and adjust down-pressure as necessary.

   If the wings run high, increase the down pressure.

   If the center section runs high, decrease down the pressure.
Machines With Fold/Field Switch

Description of system

See circuit diagrams in the Appendix starting on Page 56.

Wing fold cylinders are extend during field operation to push the wings down using mainframe/center weight.

NP2330/NP2540 Only:

The fold/lift circuit is set to continuous flow (in unfold mode) to maintain the active weight-transfer. This system is designed for use with tractors having closed center hydraulics. It is incompatible with open center systems.

The outer wing fold cylinders are also extended during field operation. The applicator has an integrated fold/lift system. The fold and unfold operations are followed by lift and lower operations. This system uses a lift assist valve 1.

Do not set or adjust the weight-transfer system if the outer wings are not level with the inner wings at unfold. Do not use the weight-transfer system to compensate for unfold stop adjustment issues.

Weight-transfer is enabled by:

1. Setting the fold/field switch to FIELD.
2. Adjusting the weight-transfer valve.

If adjusted when the tractor is cold, additional adjustment may be required when the oil warms. Monitor the pressure gauges during field operations.

Adjust the weight-transfer to keep the wings level with the center section for consistent coulter depth. If not enough weight is transferred, wing coulters may run higher than center section. If too much weight is transferred, center section may run high.
Adjusting the Weight-Transfer

See circuit diagrams in the Appendix starting on Page 56.

1. Connect a tractor to the applicator. (See the Operator manual.)
2. Make sure the hydraulic system is charged.
3. In field conditions, unfold product.
4. Lower product and set or check application depth (see Operator manual for these steps).
5. Put the fold / field switch in the FIELD position.
6. Pull forward to put coulters in ground.
7. On the NP2330/NP2540, stop the tractor. Put tractor in Park and set parking brake. Close the lift-assist valve (1) (shown in Figure 75) by turning the knob fully clockwise. Start the tractor engine.
8. Set tractor to half throttle.
9. Put the tractor remote lever in the unfold position. Lock tractor remote lever for continuous operation.
10. Adjust tractor flow control valve so bypass gauge 2 needle is in the green zone (1000 to 1500 psi).
11. Release the lock disc 3.
12. Adjust the knob 4 for an initial down pressure of 800 psi on the weight-transfer gauge 5. Tighten the lock disc.
13. Check that bypass gauge 2 is still in the green zone. Adjust the tractor remote flow to put the bypass gauge in the green zone. Check the reading on the weight-transfer gauge 5 and adjust as necessary.
14. On the NP2330/NP2540, stop the tractor engine. Open the lift-assist valve (1) (shown in Figure 75) by turning the knob fully counterclockwise.
15. Continue operation. After oil is warm, adjust down-pressure as necessary by repeating step 6 through step 14.
16. During operation, observe applicator operation and adjust down-pressure as necessary.

If the wings run high, increase the down pressure.

If the center section runs high, decrease down the pressure.
Lift-Assist Valve Setup

This applies to applicators with 2-point lift-assist. On these applicators, lift cylinders and fold cylinders are integrated into one system.

The object is to find the point at which the wings fold to the wing locks prior to the applicator starting to lift

1. Hitch the applicator to a tractor.
2. Unfold the applicator.
3. Raise the applicator (as for parking).
4. Locate the one-way restrictor valve \(\text{1}\) at the tee that supplies the rear cylinder base ends.
5. Turn the knob fully counterclockwise, then clockwise one turn.
6. Start a lift/fold operation. Initially, the lift occurs before the fold. Stop. Lower.
7. Turn the valve clockwise one turn.

If the lift occurred before the fold, repeat step 7.

If the fold occurred before the lift, back the valve off (counterclockwise) a partial turn, and test lift/fold.

9. Adjust the lift-assist valve so the wings fold to the wing locks prior to the applicator starting to lift.

![Figure 77: Lift-Assist Valve](image)
Pre-Delivery Closeout

Lock Channels for Lift Cylinder

Install only the center section lock channels.

**CAUTION**

_Falling Hazard:_
Do not climb or stand on tires or wheels. Even at full extension on level ground, tires may not be in firm ground contact. They could spin without warning. A fall could result in serious injury.

_Refer to Figure 78 and Figure 79_

Lock channels are present on all wheel assemblies with hydraulic cylinders. Normally, only the center and rear lock channels are installed. To install lock channels:

1. Fully raise implement. Set lift circuit to Neutral.
2. At each rear lift-assist cylinder, and center lift cylinder, remove cotter pin and lock pin. Remove lock channel ① from storage location.
3. Install the lock channel on the cylinder rod. Install the lock pin and cotter pin in the lock channel.

**NOTICE**

_Machine Damage Risk:_
Lock only the center and lift-assist cylinders for pre-delivery. Do not install a lock channel on the left wing depth stop cylinder unless the clevis has been rotated clear of the cylinder rod. Lowering the implement onto a lock channel with the clevis in place will damage the clevis.

_Stowing Documents_

Place all documents in the Manual-Pak™️.

---

1. Manual-Pak™️ is a trademark of Custom-Pak, Inc.
Stowing Spacers

This topic applies to 2-Point models only.

1. Select two sets:
   810-242C STROKE CONTROL SPACERS 1 1/8

2. Clip each set around the wire loop 2 on each of the two lift-assist mounts.

Remove Pre-Assembly Markings

Remove all part tags. Wipe off all grease pencil part numbers.

Final Inspection

1. Check that all working parts are moving freely, bolts are tight, and cotter pins are spread.

2. Check that all grease fittings are in place and lubricated. See “Lubrication and Scheduled Maintenance” in the Operator Manual for the applicator.

3. Check that all safety decals and reflectors are correctly located and legible. Replace if damaged. See “Safety Decals” in the Operator Manual for the applicator.
## Appendix

### Torque Values Chart

<table>
<thead>
<tr>
<th>Bolt Size</th>
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<th>Grade 5</th>
<th>Grade 8</th>
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a. in-tpi = nominal thread diameter in inches_threads 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.
Hydraulic Diagrams

Fold Hydraulics:

NP1330 & NP1340 Pull-Type, 3-Section, without Fold/Field Switch
Fold Hydraulics:
NP1330 & NP1340 Pull-Type, 3-Section, with Fold/Field Switch
Fold Hydraulics:
NP1540 Pull-Type, 5-Section, without Fold/Field Switch
Fold Hydraulics:
NP1540 Pull-Type, 5-Section, with Fold/Field Switch
Lift Hydraulics:

Pull Type
Lift-Assist, Weight-Transfer and Fold Hydraulics for S/N C1050A+
Lift-Assist, Weight-Transfer and Fold Hydraulics for S/N C1049A-
Fold and Lift Hydraulics:
NP2330 2-Point, 3-Section
Fold and Lift Hydraulics:
NP2540 2-Point, 5-Section
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