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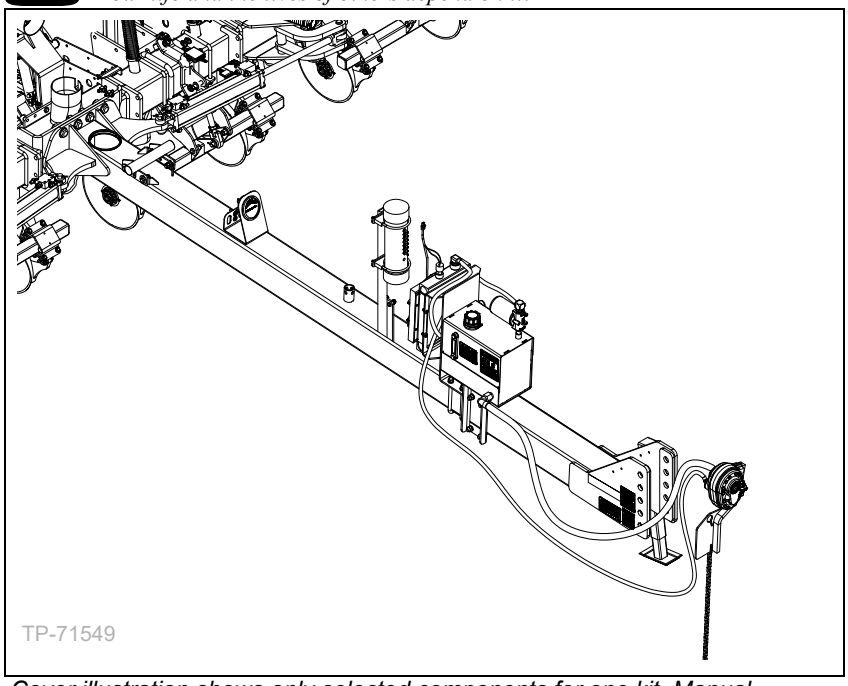
Installation and Maintenance Manual

PL5500 PTO Pump Assembly Kit

Great Plains Manufacturing, Inc.
www.greatplainsmfg.com

Read the installation 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 shows only selected components for one kit. Manual illustrations may show various Yield-Pro® planter models and configurations where installation details are identical for the immediate topic.

ORIGINAL INSTRUCTIONS

EN

Printed 2023-05-04 411-774M

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Important Safety Information

PTO-Specific Hazards

Even if you are experienced in PTO operations, review the "**Using PTO Safely**" topic on page 2. Topics in this manual dealing with PTO hazards include this PTO alert symbol and the standard alert symbol below.
PTO hazards include:

- ***Entanglement:***
  resulting in abrasions, lacerations, crushing, dismemberment, or death. Loose clothing, cuffs, frays, laces, coattails, drawstrings, hair, or scarves are taken up by a PTO faster than you can react, and with overpowering torque.
- ***Flailing machinery:***
  resulting from an unsecured torque arm, resulting in serious injury or death.
- ***High pressure fluid sprays:***
  due to hydraulic hose failure, resulting from PTO shaft over-speed or damaged hoses.

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.

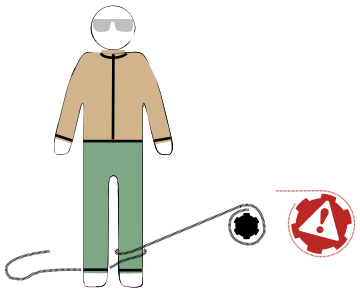
CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

Using PTO Safely

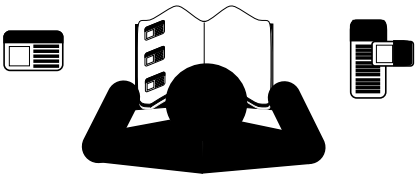
The accessories covered by this manual rely on PTO power to operate, and require an adjustment at the implement while the PTO is running. The PTO pump is designed to work on a stub shaft PTO, and leaves no exposed shaft in use.

- *Use only a tractor with an approved master shield for the PTO.*
- *Use all guards provided for the tractor PTO. Have minimal or NO shaft exposed after connecting the PTO pump.*
- *Use only a rear-facing PTO. The provided hoses and torque arms are not designed for use with a tractor-front or tractor-side PTO.*
- *Use only the correct 540 rpm PTO, or an adjustable PTO set to the correct rpm. Running at a higher speed could result in equipment failure, and serious injury.*

- *Do not use any other adaptor, coupler, driveline, extender, or external gearbox.*
- *Use only a "live" or "independent" PTO. If the PTO only operates when the tractor is in motion, there is no safe way to set the fan speed.*
- *Ensure that all involved personnel are trained on PTO operations and hazards. Always know where all team members are before, during, and after PTO operations.*
- *Allow only essential personnel near the PTO during setup, adjustment, operation, and disconnection.*



- *Prior to PTO setup, remove any stray wire, rope, or twine found nearby. Should a loose end encounter the PTO stub, it is taken up at up to 14 feet per second, and could wrap around someone and pull them in.*
- *Wear only snug-fitting clothes, with no scarves, loose strings, cords, ties, and no frays, when working near a PTO.*
- *Tie long hair back or gather it up under a well-secured hat.*
- *Shut the tractor off for PTO connections or disconnections. Do not trust your life to clutches and throw-outs.*



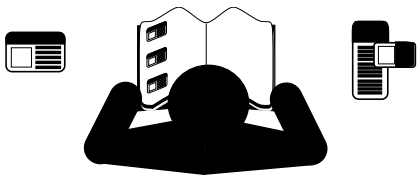
- *A PTO shaft is a hazard at any speed, even when well below rated shaft rpm, coasting to a stop, or idling.*
- *Never step on or over the master shield or installed PTO pump.*
- *Be extra vigilant if any tractor PTO controls are external, and in proximity to the PTO.*
- *Elevate pump hose slack so that ground contact is not possible during transport or field operations.*
- *Keep all PTO safety decals clean and legible. Replace any that are faded or damaged.*

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.*

Be Familiar with Safety Decals

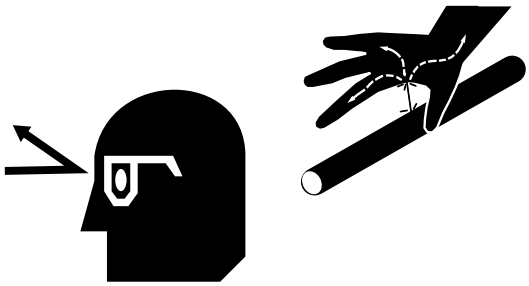
- *Read and understand "**Safety Decals**" in the Operator manual.*
- *Read all instructions noted on the decals.*
- *Keep decals clean. Replace damaged, faded, and illegible decals.*



Avoid High Pressure Fluids

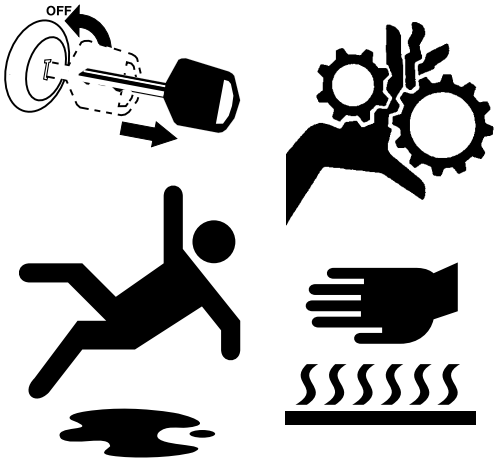
Observe normal precautions for hitch hydraulic connections and disconnections. Escaping fluid under pressure can penetrate the skin, causing serious injury.

- *Avoid the hazard by relieving pressure before disconnecting hydraulic lines.*
- *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.*



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.*
- *Lower the PL5500 planter, 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.*
- *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 PL5500 planter before operation.*



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 implement functions.*
- *Operate machinery from the driver's seat only.*
- *Do not leave implement unattended with tractor engine running.*
- *Wear snug-fitting clothing to avoid entanglement with moving parts.*

Safety Decals

Kit components are shipped with all safety decals in place. They are intended to help you safely operate your implement.

- ▲ *Read and follow decal directions.*
- ▲ *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.

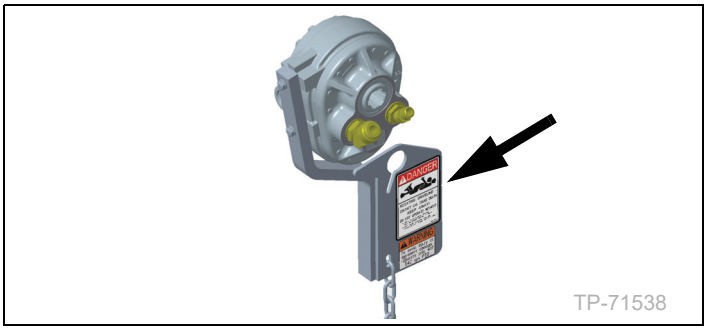
Danger Decals

858-005C

Danger: Rotating Driveline

On the PTO pump;

1 total



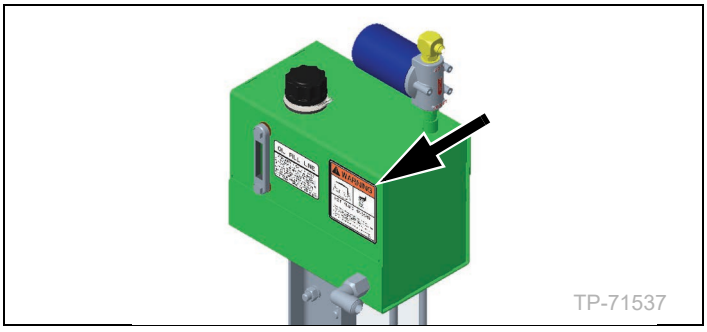
Warning Decals

858-004C

Warning: Hot Fluid

On the front face of oil reservoir;

1 total

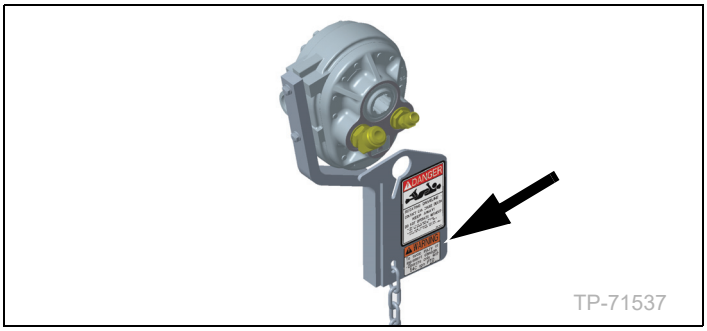


818-130C

Warning: 540 RPM PTO

On the front face of oil reservoir;

1 total



Introduction

Description of Unit

Power Take-Off (PTO) pump assembly kit converts the hydraulic fan power source from tractor hydraulic remote to tractor Power Take-Off (PTO).

Each PL5500 PTO Pump Kit includes:

- a flow control valve assembly for setting fan rpm,
- a tethered 540 rpm PTO pump with torque arm and safety chain (no gearbox is required),
- an oil reservoir with sight gauge, line filter, and 6.5 gallon capacity (5.5 gallons/21 liters, used),
- an oil cooler with an electrical harness and;
- all interconnecting hoses (not shown).

This kit has specifically been designed for use in the PL5500 planter.

Intended Use

A PTO pump assembly kit may be needed where:

- the tractor has an Open Center hydraulic system;
- the tractor has no remote port for the fan; or,
- the tractor is Closed Center, but the remotes offer insufficient oil flow to reliably operate the fan.

Related Documents

Description	Part Number
PTO pump assembly kit for PL5500 Maintenance and Installation Manual (this manual)	411-774M
PL5500 Operator Manual	411-633M
PL5500 Parts Manual	411-633P
Material Rate Manual for Individual Rate Control (IRC)	411-652B
Material Rate Manual for Contact Drive Material Rate	411-633B

Kit Covered

Description	Part Number
PL5500 PTO Kit for Open Center	403-919A

Using This Manual

This manual familiarizes you with safety, adjustments, maintenance, and assembly. Follow all recommendations and instructions to ensure safe and efficient operation. Refer to Operator Manual for operation instructions. It may be necessary to refer to your tractor's operator manual for information about hitching, connections, and PTO information, warnings, operation, and intended usage.

Definitions

The following terms are used throughout this manual.

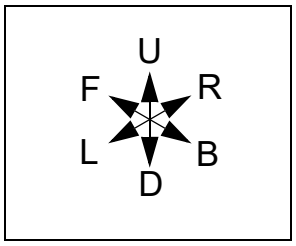
NOTE:
Paragraphs in this format provide useful information related to the current topic.

NOTICE

Liability, Economic, and Results Risks:

Paragraphs in this format present a crucial point of information related to the current topic. Read and follow the directions to: remain safe, avoid serious damage to equipment, and ensure desired field results.

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 (shown at right) depicts Up, Right, Back, Down, Left, and Front.

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

Owner Assistance

If you need customer service or repair parts, contact a Great Plains dealer. They have trained personnel, repair parts, and equipment specially designed for Great Plains products. Your machine's parts were specially designed and should only be replaced with Great Plains parts.

Record your PTO pump assembly kit model number here for quick reference:

Model Number:_____

Date Purchased:_____

Further Assistance

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

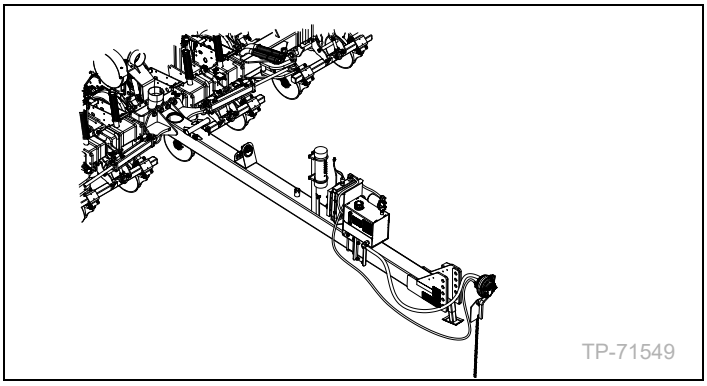
1. Discuss the matter with your dealership service manager. Make sure they are aware of any problems so they can assist you.
2. If you are still unsatisfied, seek out the owner or general manager of the dealership.

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.

Tractor Requirements



Tractor requirements can differ from PTO kit to PTO kit. The following information is for the PTO pump assembly kit (411-919A) designed specifically for the PL5500 planter.

The PTO pump assembly kit requires a tractor with:

- a rear-facing ASABE or ASAE Type 1 PTO stub shaft with master shield,
  shaft: $1^{3}/_{8}$ inch (35 mm) 6 spline,
  clockwise rotation (as viewed from tractor rear, facing forward),
- a live or independent PTO drive system, that can be operated with the tractor stationary,
- a fixed or available shaft speed of 540 rpm, and an available PTO power output of 5 hp (3.7 kW),
- a drawbar that engages the torque arm of the PTO pump assembly, and
- a chain anchor point, a stable, non-moving component of the tractor, within reach of the pump's torque arm chain.

540 rpm PTO Clearance

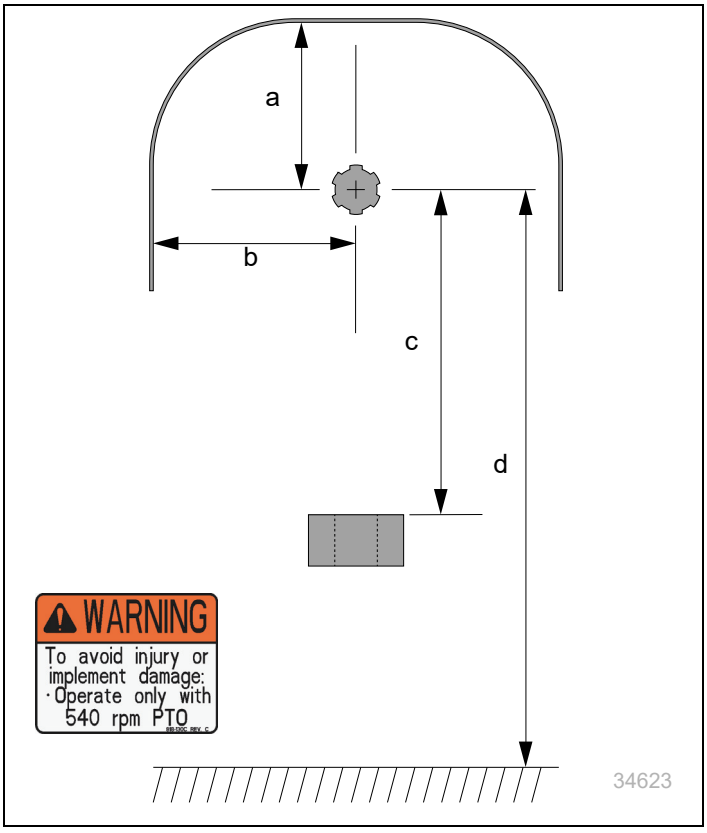
If the tractor PTO is not known to conform to Type 1 specifications, check the following pump-specific clearance dimensions:

a. Shaft to master shield top:
   3.5 inches (8.9 cm) minimum
   or hinged lid

b. Shaft to master shield sides:
   5.0 inches (12.7 cm) minimum

c. Shaft to drawbar top:
   9 inches (22.8 cm) minimum
   15 inches (38.1 cm) maximum
   It may be necessary to invert an offset drawbar, or relocate or remove any clevis installed on the drawbar.

d. Shaft to ground:
   16 inches (40.6 cm) minimum



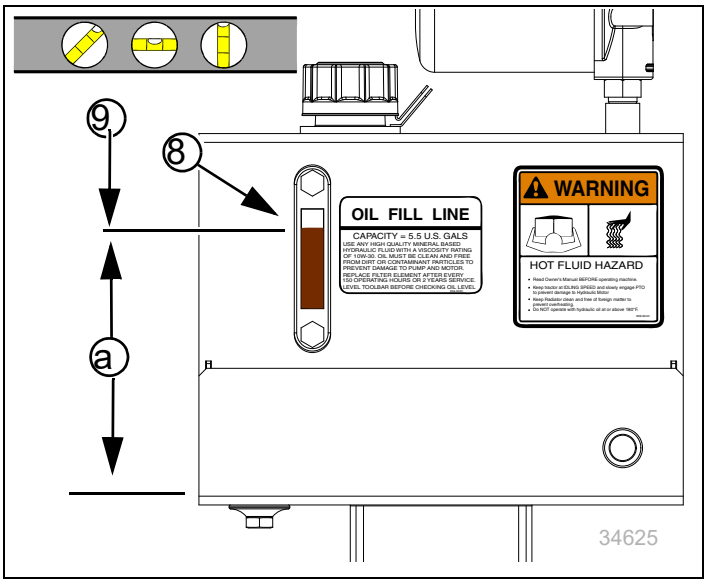
DANGER

Entanglement and Flailing Equipment Hazards:
Do not use a driveline, shaft extension, adaptor, or external gearbox with the PTO pump. Use only a native 540 rpm 6-spline stub shaft. Extra fittings create entanglement hazards. Fittings also destabilize the shaft, and may make it impossible to adequately secure the pump against torque and shaft slip.

PTO Troubleshooting

Symptom	Cause	Remedy
Seed meter pressure too low	Flow control adjusted too low.	Increase flow control. “**Flow Control Valve Adjustment**” on page 10.
	Fan butterfly valve closed or set at too high an angle.	Reduce to 30.
	PTO rpm too low.	Bring up PTO rpm, but do not exceed 540 rpm.
	Fan running in reverse (multiple possible causes).	See “**Fan running in reverse**” below.
	Pump cavitating.	Check oil level “**Check Oil Level**” on page 10.
	No blank disks in unused seed meters.	Install blank disks to balance pressure.
	Seed inlet shutters open too wide.	Verify setting vs., rate charts. Adjust as need for actual seed pool.
	Oil filter clogged.	Replace oil filter and oil “**Oil and Filter Change**” on page 10.
	Magnehelic® gauge disconnected or sample line(s) leaking.	Check air gauging system.
	Magnehelic® gauge uncalibrated.	Re-zero (see Operator Manual).
	Flow control valve failure or malfunction.	Repair or replace valve.
	Fan seals damaged.	Repair or replace fan motor.
	PTO rotation and fan or valve hoses reversed (highly unlikely).	Set tractor controls for clockwise PTO. Reconnect hoses.
	Fan cooler plugged.	Clean or replace fan cooler.
Pressure correct on Magnehelic®, but skips or doubles	Pressure gauge disconnected or sample line(s) leaking.	Check air gauging system.
	Magnehelic® gauge uncalibrated.	Re-zero (see Operator manual).
	Seed variety may require adjustment.	Check all other possible pressure errors, then fine tune pressure for one seed per disk cell.
Oil overheating	Oil filter clogged.	Replace oil filter and oil “**Oil and Filter Change**” on page 10.
	PTO rpm too high.	Adjust system for ideal pressure at lower PTO rpm.
	Fan butterfly valve angle too high.	Reduce to 30.
Fan running	PTO shaft turning counter-clockwise.	Set tractor controls for clockwise PTO.
	Hoses reversed.	Check hose routing from pump to valve, to tank and fan Parts Manual.
Fan doesn’t run at all	Low oil level in tank.	Top off tank. Check system for leaks.
	Flow control valve closed.	Adjust valve. “**Flow Control Valve Adjustment**” on page 10.
	Battery connections are weak or poor.	Clean or replace parts as needed to make a solid connection to the tractor battery.
	Hoses are not properly connected.	Review installation. “**Appendix A - Installation**” starting on page 13.
Tractor battery is dead	PTO pump electrical harness remained connected to the tractor battery.	Unplug the PTO Pump electrical harness whenever the planter is not in use or is in store or transport.

Hydraulic Maintenance



DANGER

Entanglement and Crushing Hazard:
Use extreme caution in the hitch area when the PTO is operating. Maintenance should only be conducted with the electrical harness is disconnected from the tractor battery. If necessary to briefly run the PTO Pump during maintenance, check essential personnel for long hair, scarfs, cords, frays, loose flaps, and anything else that might become entangled. It is not necessary to run the PTO at the full 540 rpm. You may run it any lower speed that provides sufficient meter pressurization (page 15).

Check Oil Level

1. Verify that the PL5500 planter is level front to back and side to side.
2. Inspect the sight gauge (8) on the pump system reservoir tank. The oil level (9) must be aligned with the center border of the OIL FILL LINE decal.

WARNING

Hot Surface and Hot Fluid Hazards:
Assess the tank temperature before adjusting oil level. Draining excess hot oil could result in a severe burn. If the PTO has been operated recently, the oil temperature could be as high as 180°F (82°C).

3. Add or drain oil as needed to obtain the correct amount. Some adjustment is normally required with a new system, or after a filter change.

📖 **NOTE:**
The fill level dimension from tank bottom is:
(a) 9.15 inches (23.2 cm)
If the decal requires replacement, adjust the center border line to this height.

Inspect Hoses and Fittings

4. Check that all hydraulic fittings are tight and dry. Inspect all hoses for damage, wear, and fatigue. The PTO pump system is a closed system; any visible fluid may be an indication of a leak.

Oil and Filter Change

Oil Fill

A dry or fully drained system item may require as much as 6.5 gallons (25 liters) of oil to charge the cooler, pump, motor, hoses, filter, and valve, and leave 5.5 gallons (21 liters) in the reservoir.

Before adding oil, check that the drain plug, located at the bottom of the oil reservoir, is secure, and there are no signs of leaks in hoses or at any system fittings.

Oil Specification

10W-30 good quality mineral base hydraulic fluid, viscosity 70 to 250 SUS at 210°F (100°C).

1. Remove the filler cap (2).
2. Add oil until the oil level in the tank, as observed on the sight gauge (3), reaches the fill line on the decal (the horizontal mid-border of the decal).

   The fill line is:
   9.15 inches (23.2 cm)
   above the tank bottom.

📖 If the decal (858-003C) requires replacement, adjust the center border line to this height.

3. Operate the PTO system briefly, or until the tank level stops changing. Refer to Operator Manual for operation instructions.
4. Recheck the sight gauge. As necessary, add oil to fill line.

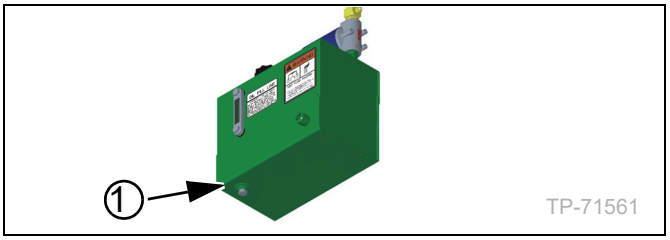
WARNING

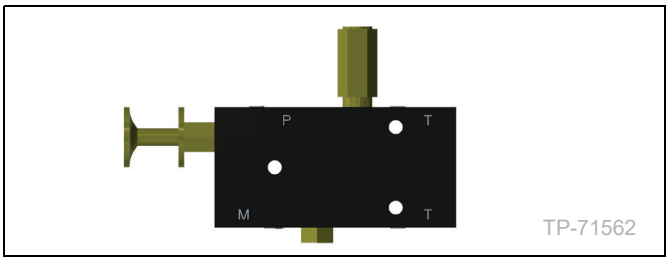
Hot Surface and Hot Fluid Hazards:
Asses the tank temperature before adjusting oil level. Draining excess hot oil could result in a severe burn. If the PTO has been operated recently, the oil temperature could be as high as 180° F (82° C).

Oil and Filter Change

At a regularly scheduled oil change, also change the filter. At initial system flush, no filter change is required.

1. Wait for the oil to cool before changing the oil.
2. Place a container under the drain plug (1) of the reservoir, with at least a capacity of:
   7 gallons (26 liters).
3. Carefully remove the drain plug.
4. Allow several minutes for oil in the filter to drain into and out of the reservoir. Change filter as required. See page 13 for filter size. Seat filter per instructions on filter.
5. Thread the plug back into the tank. Seating torque is 27 to 43 foot-pounds (37 to 58 N-m).





Flow Control Valve Adjustment

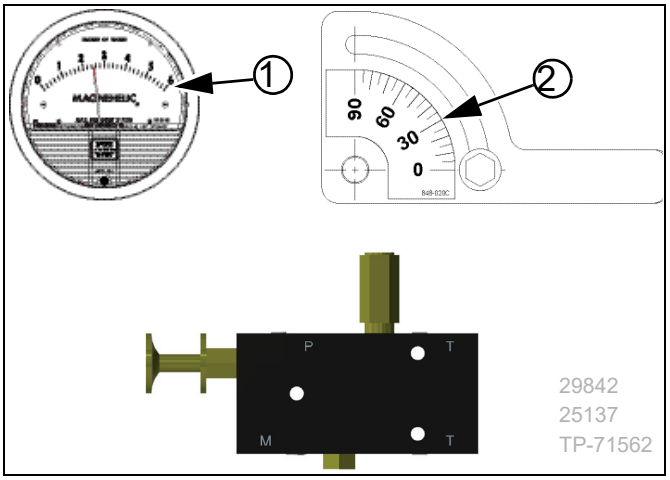
The flow control valve adjusts the percent of PTO pump output that is supplied to the PL5500 planter hydraulic motors. The total pump flow, in gpm or liters/min, is also directly proportional to PTO shaft rpm.

Adjustment typically requires two persons. Pump oil flow is ideally adjusted with all motors active under simulated field workload, relying on Magnehelic® pressure gauge (2) readout, and in some cases, seed monitor rpm readout.

Setting Meter Pressurization

DANGER

Entanglement and Crushing Hazard:
Use extreme caution in the hitch area when the PTO is operating.

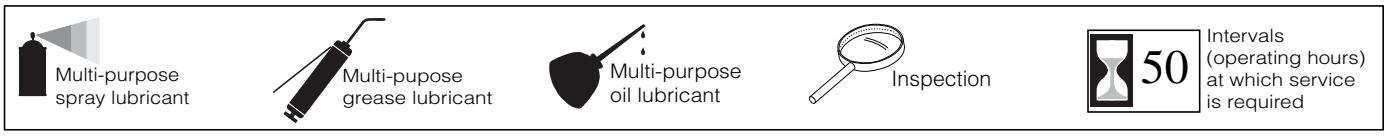


Meter pressurization is set as for a standard PL5500 planter, using the PTO kit valve rather than a lever for a tractor hydraulic remote. This adjustment is normally made with the seed meters full of seed.

1. Shut off the tractor and remove the key.
2. Consult your PL5500 planter Seed Rate Manual for the correct seed disk, meter inlet shutter setting, and recommended initial pressure as reported by Magnehelic® gauge (1). Check that the inlet butterfly valve handle is set to 30 (2)·. If not, loosen the pivot bolt, reset handle, and re-secure bolt.
3. Mount the PTO pump. See “**Mount PTO Pump**” on page 17.
4. Consult your PL5500 planter Seed Rate Manual for the intended crop, noting:
   •Range and Transmission sprockets required,
   • correct Air-Pro® seed disk (not shown),
   • initial inlet shutter setting (not shown), and
   • initial meter pressurization.

5. Install seed disks. Leave rain covers off meters.
6. Set meter inlet shutters per the Seed Rate manual.
7. Open any slide gates under hoppers.
8. Load enough seed to completely fill the meter inlet tubes, and at least partially fill every hopper.
9. Set out containers, under row unit seed tubes, to collect seed metered during setup.
10. Clear the hitch area of non-essential persons.
11. Check essential personnel for long hair, scarves, cords, frays, loose flaps, and anything else that might get entangled.
12. Clear the area of dangling or loose wires, straps, cords, and other lines that might become entangled and pull someone in.

Lubrication and Scheduled Maintenance

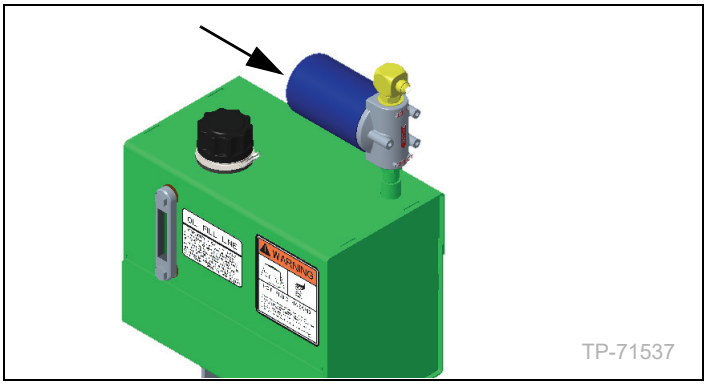


Oil Filter

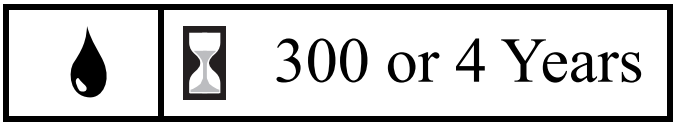
1 liter

Type: Great Plains (891-110C)
Fleetguard HF6610
Pall HC 9540S UJ4H
Zinga HE-10

Change filter after first 25 hours, and then every 2 years, or 150 hours.

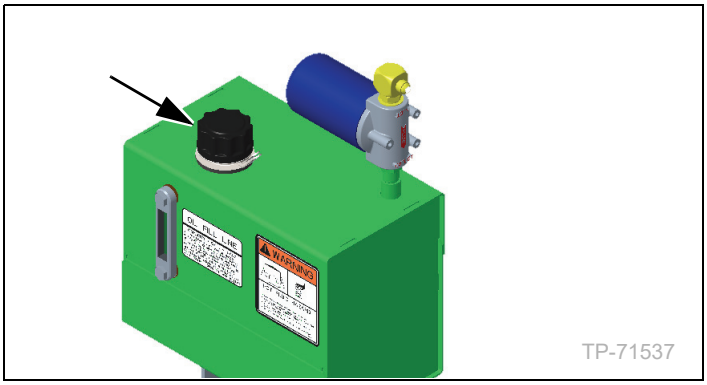


PTO Pump Oil



1 tank

Change oil when changing filter, except at initial system flush.

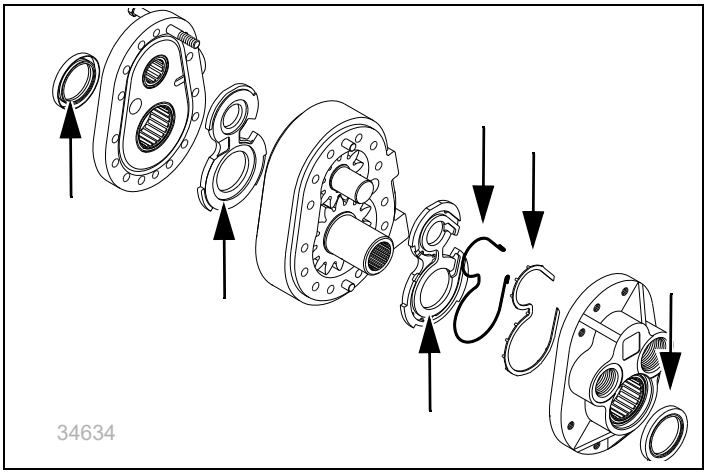


540 rpm Seal Kit

1 kit per PL5500 planter

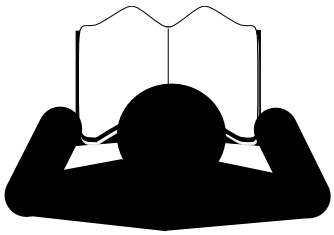
Type: Great Plains 810-904C
Prince PMCK-PTO-1A

Consult the PTO Series Pump Parts Manual, available from Prince Manufacturing Corp:
www.princehyd.com



Appendix A - Installation

Before You Start



Most accidents are the result of negligence and carelessness, usually caused by failure of the installer to follow simple but necessary safety precautions. Allow no one to install the PTO pump before carefully reading this manual.

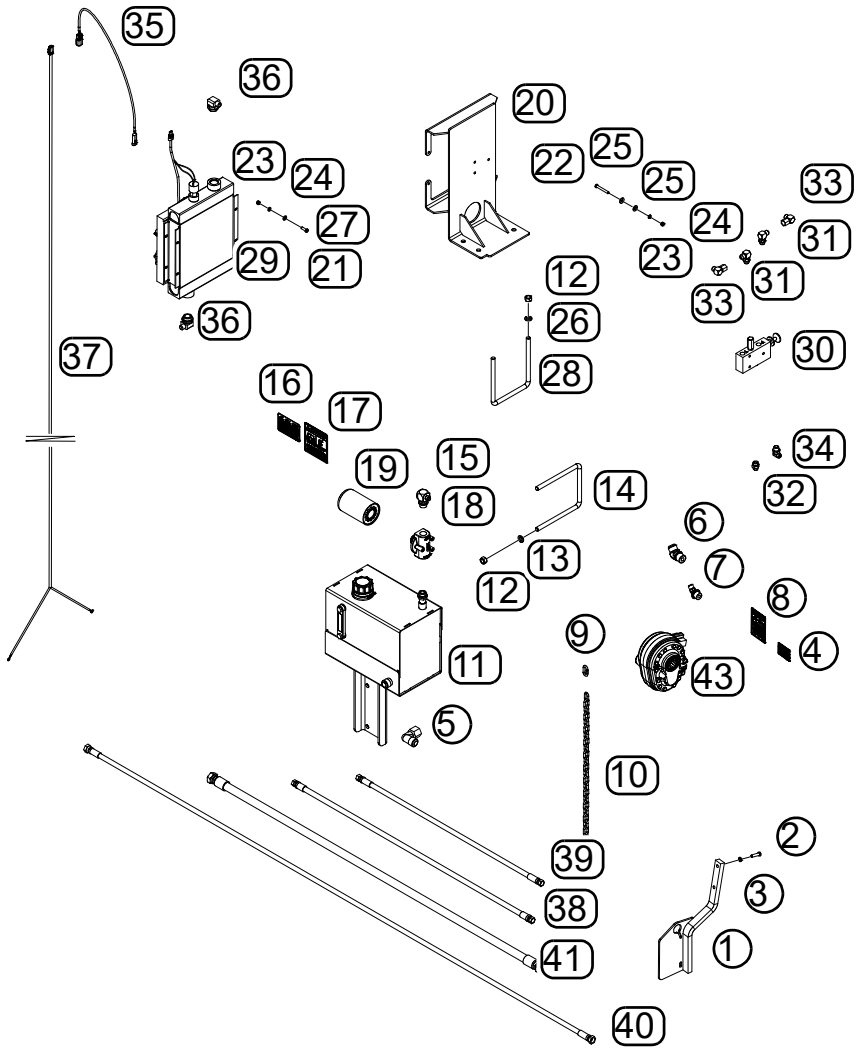
Fasteners may be loosely assembled. Remove fastners before mounting the component. Due to evolving manufacturing practices, sub-assemblies may already be completely pre-assembled. If so, check that fasteners are tight, and skip the unneeded assembly steps.

📖 Torque values for fasteners are shown on page 23. One PTO pump assembly kit is required per PL5500 planter. Inventory to make sure all parts are present before installing. Make sure you have assembled all required tools prior to install.

Tools Required

- basic hand tools,
- 6 to 12 gallons of good quality 10-W30 mineral base hydraulic fluid, viscosity from 70-250 SUS range at 210°F (100°C),
- bucket for collecting oil,
- hose marker, such as white electrical tape and indelible marker,
- grease pencil,
- a measuring tape with clear, linear-measurement markings,
- power equipment with a compatible PTO for flushing and charging the system,
- the PL5500 planter Operator and Parts manuals (see page 6), and
- protective footwear if the PL5500 planter has coulters or row cleaners installed.

Kit Contents (403-919A)



Reference Number	Description	Part Number	Quantity
1	PTO PUMP TORQUE ARM WLDMNT	401-836H	1
2	HHCS 3/8-16x1 1/2 GR5	802-022C	2
3	WASHER LOCK SPRING 3/8 PLT	804-013C	2
4	DECAL CAUTION 540 RPM	818-130C	1
5	EL 1 5/16FJIC 1 5/16MJIC	841-815C	1
6	EL 45 1 5/16MORB 1 5/16MJIC	841-653C	1
7	EL 45 3/4MJIC 1 1/16MORB	841-814C	1
8	DECAL DANGER PTO PUMP	858-005C	1
9	1/4 QUICK LINK	890-628C	1
10	CHAIN WELD 1/4 GR 43 X 24 LINK	891-313C	1

11	HYD RES TANK ASSY	401-841S	1
12	NUT HEX 5/8-1 1 PLT	803-021C	8
13	WASHER LOCK SPRING 5/8 PLT	803-022C	4
14	U-BOLT 5/8-1 1 X 7 1/32 X 9	806-027C	2
15	EL 3/4MJIC 1 1/16MORB	811-091C	1
16	DECAL 5.5 GAL OIL FILL LINE	858-003C	1
17	DECAL HOT FLUID PTO RES	858-004C	1
18	FILTER HEAD	891-109C	1
19	FILTER ELEMENT SPIN ON	891-110C	1
20	PL5500 PTO FAN MOUNT	411-742H	1
21	HHCS 5/16 - 18 X 1 GR5	802-159C	4
22	HHCS 5/16 - 18 X 2 GR5	802-172C	3
23	NUT HEX 5/16-18 PLT	803-008C	7
24	WASHER LOCK SPRING 5/16 PLT	804-009C	7
25	WASHER FLAT 5/16 USS PLT	804-010C	6
26	WASHER LOCK SPRING 5/8 PLT	804-022C	4
27	WASHER FLAT 5/16 SAE PLT	804-036C	4
28	U-BOLT 5/8-11 X 7 1/32 X 8 1/2	806-052C	2
29	OIL COOLER 3025	810-703C	1
30	PRESSURE FLOW CONTROL VALVE	810-813C	1
31	EL 3/4MJIC 3/4MORB	811-063C	2
32	AD 3/4MORB /3/4MJIC	811-088C	1
33	EL 3/4FJIC 3/43/4MJIC	811-150C	2
34	EL 45 3/4 MORB 3/4MJIC	811-690C	1
35	HRN DTP04-2P 14GA 2WPS /5’	823-439C	1
36	EL 1 5/16 MORB 3/4MJIC	841-973C	2
37	COOLER TRACTOR PWR HRN	843-194C	1
38	HH1/2R2 052 3/4FJIC	811-053C	1
39	HH1/2R2 040 3/4FJIC	841-574C	1
40	HH1/2R2 110 3/4FJIC	841-623C	1
41	HHIR4 72 1 5/16FJIC	861-731C	1
42	PL5500 PTO Pump Assembly Installation and Maintenance Manual (this manual; not shown)	411-774m	1
43	PTO Pump 3.6 CI/REV.	831-101C	1

Pre-Delivery Setup

If you are installing the PTO pump assembly kit on a newly-shipped PL5500 planter, it may be more convenient to install the PTO pump assembly kit during the pre-delivery setup:

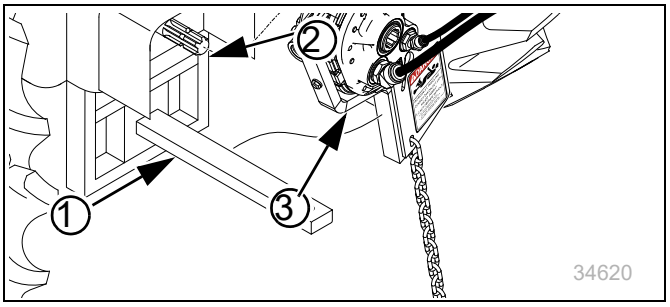
- Install the PTO pump system *after* installing the tongue (pull-type only). The tongue must be in place for hose re-routing.
- Install the PTO pump system *after* mounting a fertilizer sub-frame (option, pull-type only). This sub-frame must be in place for flow control valve mounting, and in some cases, reservoir mounting.
- Install the PTO pump system *before* installing frame-mounted row options. This improves foot room and reduces sharp object hazards while working near tool bars.
- Install the PTO pump system *before* installing row-mounted coulters or row cleaners. This improves foot room and reduces sharp object hazards while working near tool bars.
- Install the PTO pump system *before* installing markers. This eliminates an overhead sharp object hazard, and improves working space at the mainframe.

Prepare Planter

- Read and understand "**Important Safety Information**" starting on page 1.
- Position the PL5500 planter on a level surface, in a well lighted location, suitable for the installation. A clear surface beneath makes it easier to recover any dropped parts. If markers are already installed, choose an area with enough room to unfold them.
- Configure the PL5500 planter for Parking, as instructed in the PL5500 planter Operator Manual.
- If markers are already installed, unfold them.
- Unhitch the PL5500 planter.
- Shut off tractor and remove the key.

Mount PTO Pump

1. Turn the tractor off and remove the key.
2. Make any necessary adjustment to the tractor drawbar (1). This might include:
   inverting an offset drawbar, and/or
   relocating a clevis assembly (not shown).
3. Clear the PTO shaft (2) of any pins or wires that might prevent the PTO pump from fully seating on the shaft.

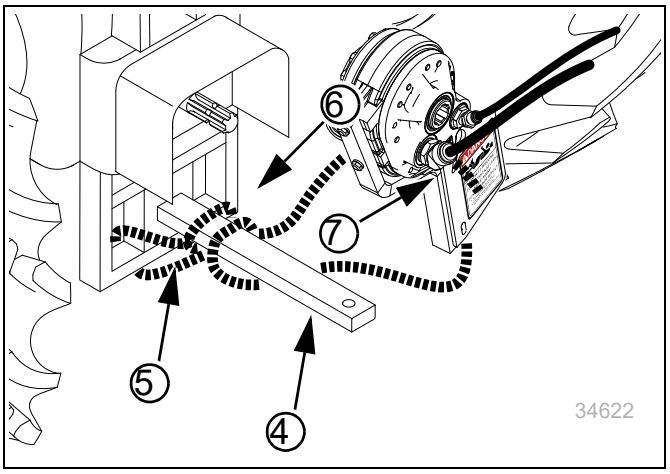


4. With hydraulic hoses to rear, and torque arm to right of drawbar, slide the pump assembly fully onto the PTO shaft (2).

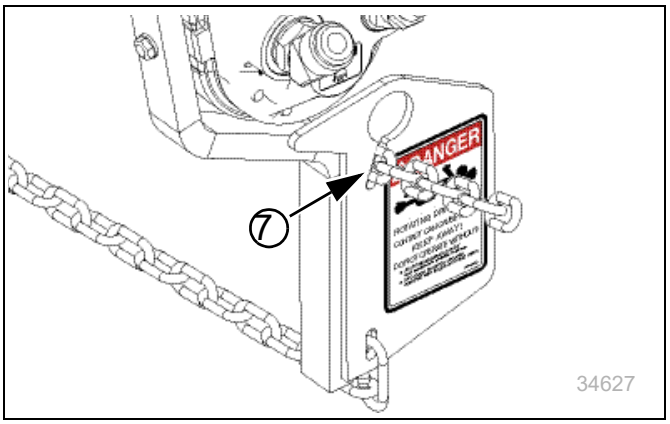
Secure PTO Pump

DANGER

Entanglement and Flailing Equipment Hazards:
Do not use a driveline, shaft extension, adaptor, or external gearbox with the PTO pump. Extra fittings create entanglement hazards. Fittings also destabilize the shaft, and may make it impossible to adequately secure the pump against torque and shaft slip. Never alter or remove any existing guards on the tractor or PL5500 planter at any point of PTO pump assembly kit installation. Contact your Great Plains dealer for service.



5. With the torque arm firmly against the drawbar:
   loop the chain once (4) around the drawbar,
   then through the anchor point (5),
   then around the drawbar (4) at least once more,
   then through the keyhole slot (7) in the torque plate.
   The drawbar loops prevent pump rotation.
   The anchor loop retains the pump on the PTO shaft.
6. At least one full chain link must be exposed at the slot (7) on the decal side of the torque arm plate.



🕮 If there are more than a few chain loops left at the plate keyhole, route any excess chain through the anchor point and/or around the drawbar.

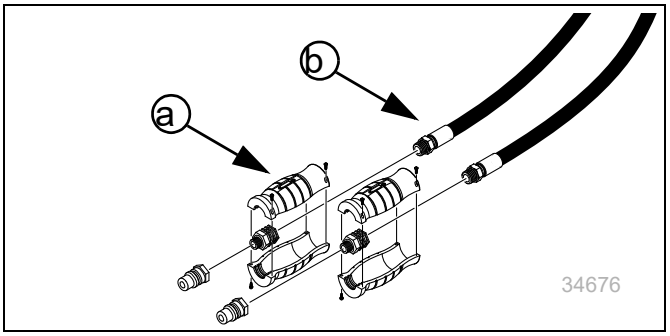
🕮 Do NOT use any pins, cross-bolts, or wires to secure the pump to the PTO shaft. Such fasteners are not required for safe pump operation, and would add a needless entanglement hazard.

7. Pull and twist the pump assembly to verify that the chain is sufficiently taut to prevent excess pump rotation or sliding along the PTO shaft.

Prepare Fan

Disconnect Existing Fan Hoses

The PL5500 planters have two existing hydraulic hoses (861-544C) from the fan assembly; they run from the fan to the hitch. These two hydraulic hoses will continued to be used with the PTO pump assembly kit. Additionally, hydraulic hose (841-196C) remains part of the existing fan assembly.



1. Set out a collection bucket near the ends of the hydraulic hoses (861-544C) closest to the hitch.
2. Remove any hose handle housings (a).
3. Disconnect the hoses from the hitch fittings at the JIC connections (b). Set aside the fittings (804-022C) as these will not be used for the PTO pump assembly kit. Do not remove any of the connections to adapters on the fan assembly, only at the hitch.
4. Set the open hose ends in the bucket to catch any fluids.

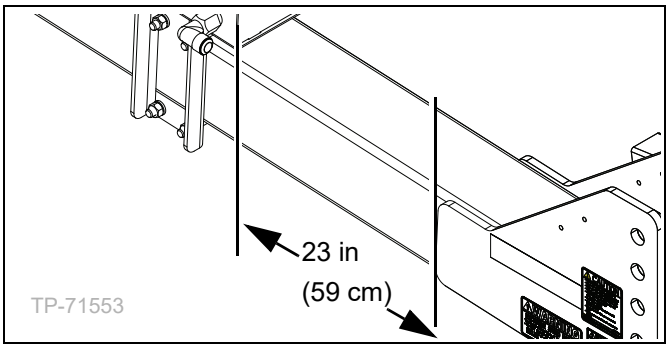
Install Oil Reservoir

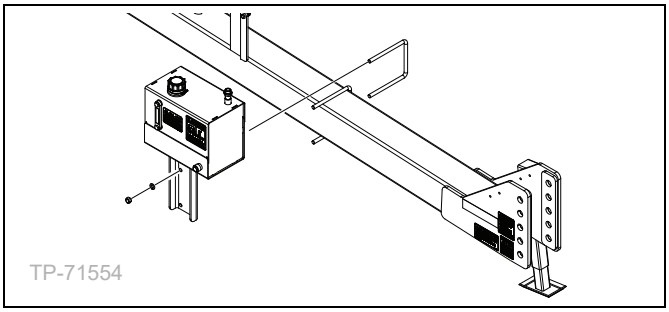
The Oil Reservoir is to be installed on the tongue at the hitch.

1. Using a measuring tape and grease pencil, measure 23 in (59 cm) from the edge of the hitch plate as shown. Mark the measurement.

📖 It is important to accurately measure the distance on the hitch, if the oil reservoir is mounted too close to the end of the hitch, it may become damaged when turning the PL5500 planter.

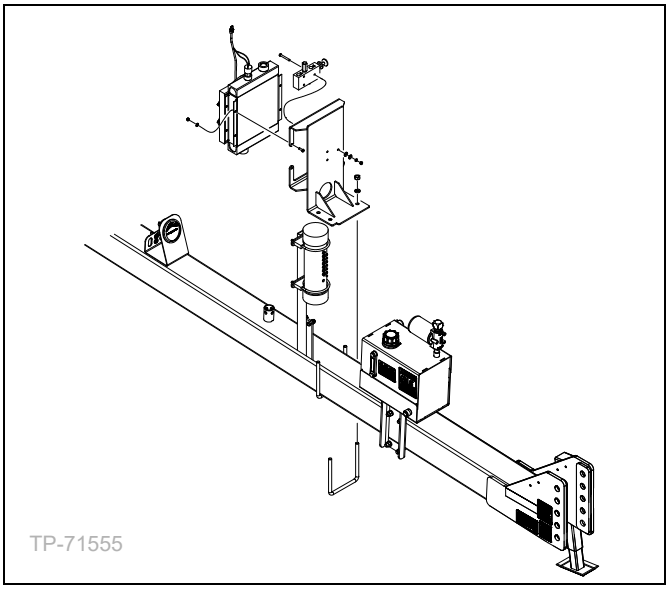
2. Secure the oil reservoir with two u-bolts (14), four washers (13), and four nuts (12) to the oil reservoir tank (11) to the tongue.



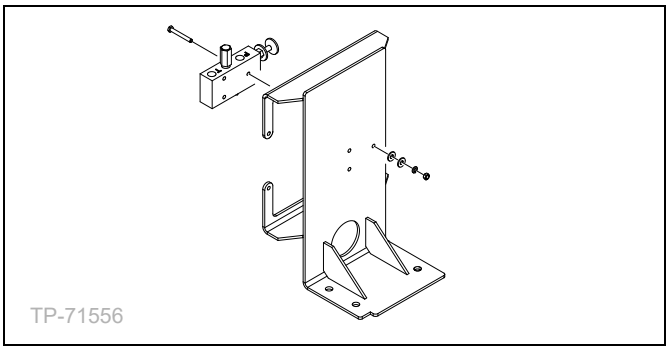


Install Oil Cooler

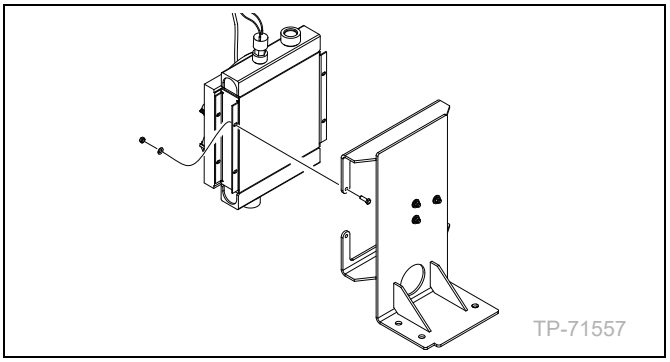
The PL5500 planter PTO pump assembly kit contains an oil cooler assembly. It is to be installed on the tongue near the hitch; about 5 inches (13 cm) behind the oil reservoir.



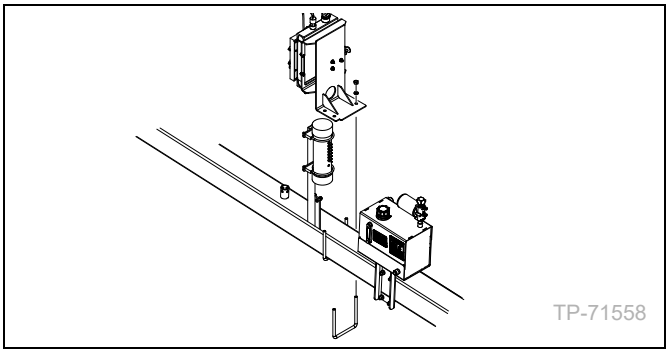
1. Secure the pressure flow control valve (30) to the fan mount (27) using three bolts (22), three locking washers (24), six washers (25), and three nuts (23).



2. Secure the oil cooler (29) to the fan mount (20) using four bolts (21), four washers (27), and four nuts (23).
3. Using a measuring tape and grease pencil, measure 5 in (13 cm) from edge of the oil reservoir and mark the measurement.

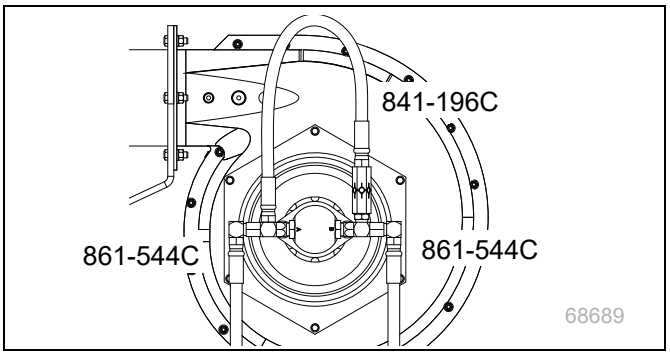


4. Secure the fan mount (20) to the tongue about 5 in (13 cm) behind the Oil Reservoir using two u-bolts (28), four locking washers (26), and four nuts (12).

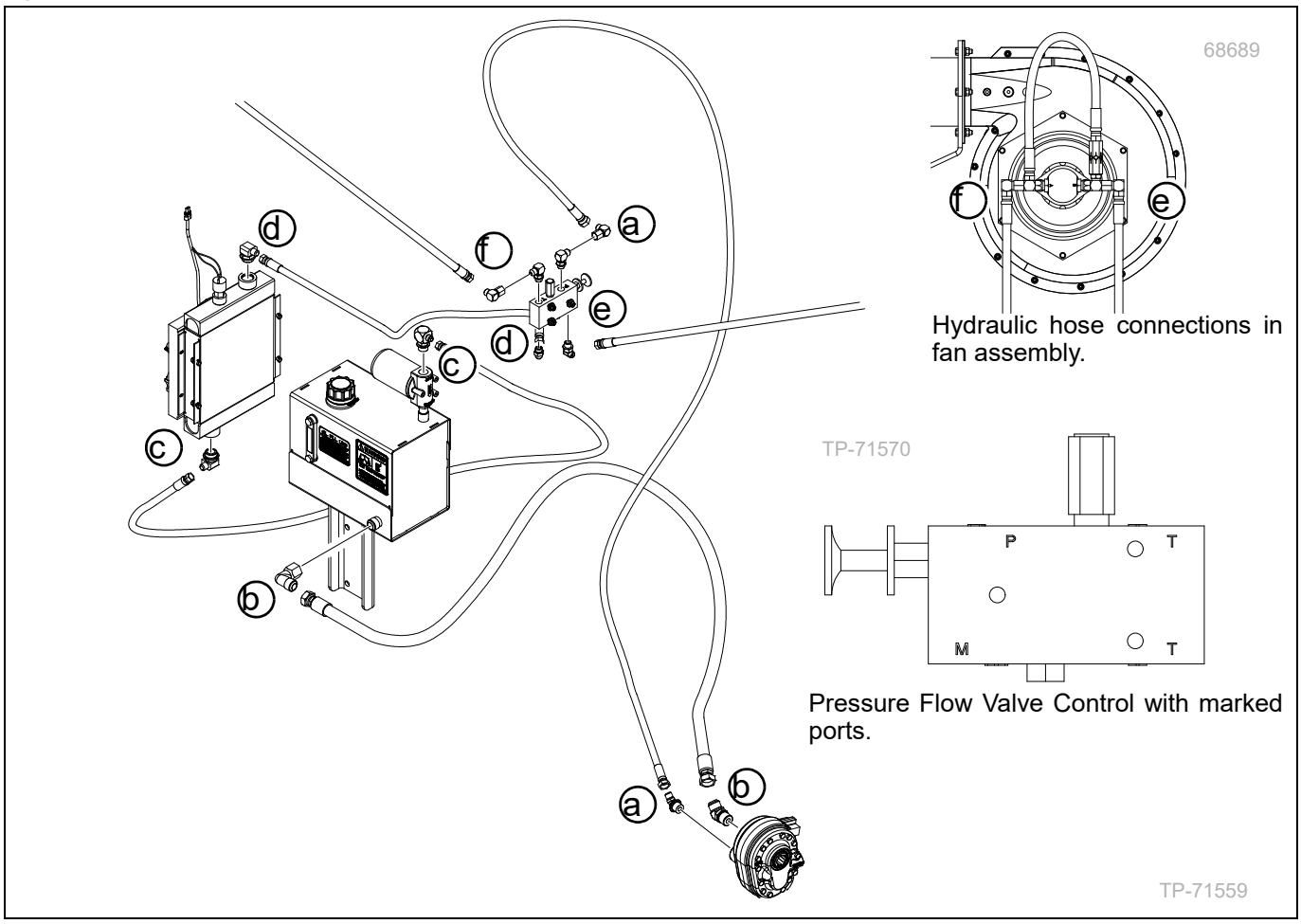


Install Hydraulic Hoses

The new hoses may be installed in any order. Secure the hoses with any available clamps along their routes. Remember there are three hydraulic hoses already connected to the fan assembly. These hoses will remain in placed and are necessary to install PTO pump assembly kit. It is recommended to mark all hydraulic hoses for convenience.



Hydraulic Hose Connection Routes



	Hydraulic Hose Routing Description
a	PTO pump (43) to adapter (7) to hydraulic hose (40) to adapter (33) to adapter (31) to pressure flow control valve port “P” (30).
b	PTO pump (43) to adapter (6) hydraulic hose (41) to adapter (5) to oil reservoir (11)
c	Oil cooler (29) to adapter (36) to hydraulic hose (38) to adapter (15) to oil reservoir (11)
d	Oil cooler (29) to adapter (36) to hydraulic hose (36) to adapter (32) to adapter (31) to pressure flow control valve port bottom “T” (30).
e*	Pressure flow control valve port “M” (30) to adapter (32) to hydraulic hose* to fan assembly.
f*	Pressure flow control valve port top “T” (30) to adapter (31) to adapter (33) to hydraulic hose* to fan assembly.
*	These two hydraulic hoses (861-544C) are part of the existing fan assembly and are not included in PTO pump assembly kit (403-919A).

Connect Oil Cooler Electrical Harness

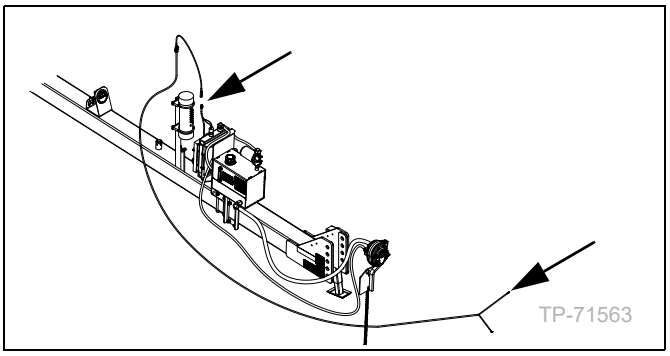
The PTO pump assembly kit is equipped with an oil cooler which will automatically turn on the oil cooler whenever the temperature reaches 140° F (60° C). The electrical harness for the oil cooler connects directly into the tractor battery. When not in use, the oil cooler must be disconnected from the tractor battery.

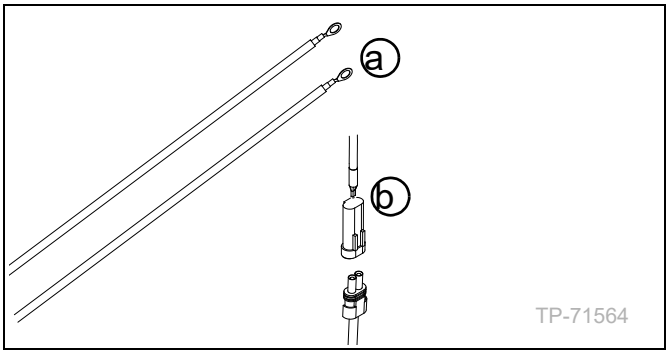
NOTICE

Equipment Damage Risk:
Oil cooler electrical harness should be disconnected from tractor battery whenever not in use; failure to do so may result in damages to the tractor battery. If not properly disconnected when not in use or during maintenance, storage, and transport, the oil cooler may unexpectedly operate.

1. Turn the tractor off and remove the key.
2. Inspect the tractor battery terminal posts, electrical wires, battery ring terminals, quick connections, etc for any wear, damages, rust, or corrosion. Clean, repair, and replace as necessary.
3. Grasp the positive battery ring terminal (a) and screw into the positive post terminal using the bolt on the corresponding battery post.
4. Grasp the negative battery ring terminal (a) and screw into the negative post terminal using the bolt on the corresponding battery post.

   The tractor battery terminal posts will likely be marked with a (+) and/or colored red for positive and with a (-) and/or color black for negative.
5. Connect the quick connection (b) from the electrical harness to the oil cooler.
6. Secure electrical harness so that it is not loose, dangling, or otherwise able to become tangled or dislodged by other moving parts.





Disconnect Oil Cooler Electrical Harness

The oil cooler electrical harness will need to be disconnected whenever the PTO is not in use; during maintenance, transport, and storage.

When disconnecting the oil cooler electrical harness, disconnect the negative terminal first and the positive terminal last.

Charge and Test

1. Fill the system. “**Oil Fill**” on page 11.
2. Operate the system, performing an initial valve adjustment, if possible. “**Flow Control Valve Adjustment**” on page 12.

Close-out

1. Remove any part numbering tags, grease pencil markings, and any parts no longer in use.
2. Consider responsibly recycling any unneeded fluids and waste.

Torque Values

Bolt Size	Bolt Head Identification: Grade 2		Grade 5		Grade 8	
in-tpi[a]	N-m[b]	ft-lb[d]	N-m	ft-lb	N-m	ft-lb
1/4-20	7.4	5.6	11	8	16	12
1/4-28	8.5	6	13	10	18	14
5/16-18	15	11	24	17	33	25
5/16-24	17	13	26	19	37	27
3/8-16	27	20	42	31	59	44
3/8-24	31	22	47	35	67	49
7/16-14	43	32	67	49	95	70
7/16-20	49	36	75	55	105	78
1/2-13	66	49	105	76	145	105
1/2-20	75	55	115	85	165	120
9/16-12	95	70	150	110	210	155
9/16-18	105	79	165	120	235	170
5/8-11	130	97	205	150	285	210
5/8-18	150	110	230	170	325	240
3/4-10	235	170	360	265	510	375
3/4-16	260	190	405	295	570	420
7/8-9	225	165	585	430	820	605
7/8-14	250	185	640	475	905	670
1-8	340	250	875	645	1230	910
1-12	370	275	955	705	1350	995
1 1/8-7	480	355	1080	795	1750	1290
1 1/8-12	540	395	1210	890	1960	1440
1 1/4-7	680	500	1520	1120	2460	1820
1 1/4-12	750	555	1680	1240	2730	2010
1 3/8-6	890	655	1990	1470	3230	2380
1 3/8-12	1010	745	2270	1670	3680	2710
1 1/2-6	1180	870	2640	1950	4290	3160
1 1/2-12	1330	980	2970	2190	4820	3560

Bolt Size	Bolt Head Identification: 5.8 Class 5.8		8.8 Class 8.8		10.9 Class 10.9	
mm x pitch[c]	N-m	ft-lb	N-m	ft-lb	N-m	ft-lb
M 5 X 0.8	4	3	6	5	9	7
M 6 X 1	7	5	11	8	15	11
M 8 X 1.25	17	12	26	19	36	27
M 8 X 1	18	13	28	21	39	29
M10 X 1.5	33	24	52	39	72	53
M10 X 0.75	39	29	61	45	85	62
M12 X 1.75	58	42	91	67	125	93
M12 X 1.5	60	44	95	70	130	97
M12 X 1	90	66	105	77	145	105
M14 X 2	92	68	145	105	200	150
M14 X 1.5	99	73	155	115	215	160
M16 X 2	145	105	225	165	315	230
M16 X 1.5	155	115	240	180	335	245
M18 X 2.5	195	145	310	230	405	300
M18 X 1.5	220	165	350	260	485	355
M20 X 2.5	280	205	440	325	610	450
M20 X 1.5	310	230	650	480	900	665
M24 X 3	480	355	760	560	1050	780
M24 X 2	525	390	830	610	1150	845
M30 X 3.5	960	705	1510	1120	2100	1550
M30 X 2	1060	785	1680	1240	2320	1710
M36 X 3.5	1730	1270	2650	1950	3660	2700
M36 X 2	1880	1380	2960	2190	4100	3220

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

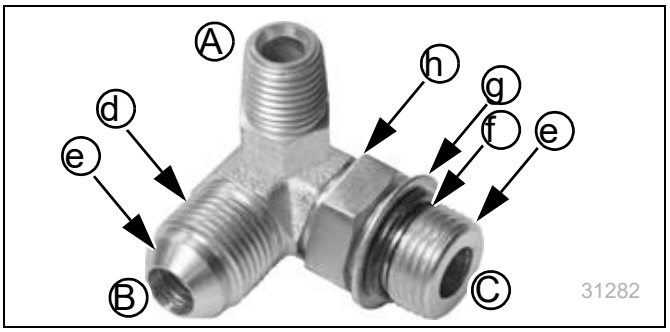
Torque tolerance + 0%, -15% of torquingvalues. Unless otherwise specified use torquevalues listed above. 25199

Hydraulic Fitting Torque

Connector Identification

Leave any protective caps in place until immediately prior to making a connection.

	Description
A	NPT - National Pip Thread Note tapered threads, no cone/flare, and no O-ring. Apply liquid pipe sealant for hydraulic applications (do not use tape sealant, which can foul filters).
B	JIC - Joint Industry Conference (SAE J514) Note straight threads (d) and the 37 cone (e) on “M” fittings (or 37 flare on “F” fittings). Use no sealants (tape or liquid) on JIC fittings.
C	ORB- O-Ring Boss (SAE J514) Note straight threads (e) and elastomer O-ring (f). Prior to installation, to prevent abrasion during tightening, lubricate O-ring with clean hydraulic fluid. Use no sealants (tape or liquid) on JIC fittings. ORB fittings that need orientation, such as the ell depicted, also have a washer (g) and jam nut (h) (adjustable thread port stud”).Back jam nut away from washer. Thread fitting into receptacle until O-ring contacts seats. Unscrew fitting to desired orientation. Tighten jam nut to torque specification.



Fitting	Ft-Lbs	N-m
$^{1}/_{4}$ NPT	1.5-3.0 turns past finger tight	
$^{9}/_{16}$ JIC	18-20	24-27
$^{9}/_{16}$ ORB w/jam nut	12-16	16-22
$^{9}/_{16}$ ORB straight	18-24	24-32
$^{3}/_{4}$ JIC	27-39	37-53
$^{3}/_{4}$ ORB w/jam nut	20-30	27-41
$^{3}/_{4}$ ORB straight	27-43	37-58

Abbreviations

Abbreviation	Description	Abbreviation	Description
3PT	Three Point (hitch)	JA	Bushing size
8RW	Eight Row	kW	Kilowatt
AD	Adaptor	LH	Left hand
ASABE	American Society of Agricultural and Biological Engineers	LIQ	Liquid
ASAE	American Society of Agricultural Engineers	MJIC	Male JIC
ASSY	Assembly	mm, MM	millimeter
BRKT	Bracket	MNT	Mount
CI	Cubic Inches	MORB	Male ORB
cm	Centimeters	MPH	Miles per Hour
CNTRL	Control	N-m	Newton-meters
CR	Cross	ORB	R-Ring Boss
DJ	DICKEY-john®	PL	Plug
EL	Elbow	PLNTR	Planter
FERT	Fertilizer	PLT	Plated or Plate
FJIC	Female JIC	PTO	Power Take-Off
FL	Flow	QD	Quick Disconnect
FLG	Flanged	RES	Reservoir
FORB	Female ORB	REV	Revolution
GAL	Gallon	RH	Right hand
GD	Ground Drive	RPM, rpm	Revolution Per Minute
Gnd	Ground	SAE	Society of Automotive Engineers
GR5, GR8	Grade 5, Grade 8, etc	SQ	Square
GSPD	Ground Speed	SUS	Saybolt Universal Seconds
H2O	Water	TE	Tee
HEX	Hexagonal	USS	United States Standard
HH	Hydraulic Hoses	W, W/	with
HHCS	Hex Head Cap Screw	WLDMNTS	Weldment
hp	horsepower	X	by
HYD	Hydraulic	YP	Yield-Pro®
IMPL	Implement	ZNYCR	Zinc Chromate
in, IN	inch		
INST	Installation		

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Great Plains, Mfg.
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