

Super Low Volume Application System



Installation Manual





APC500-INST **MARCH 2015**

CE

DECLARATION OF INCORPORATION FOR A PARTIALLY COMPLETED MACHINE: Pioneer Appli-Pro[®] C500 System.

MANUFACTURER: Harvest Tec, Inc., 2821 Harvey St, P.O. Box 63, Hudson, WI, 54016, U.S.A.

MACHINE DESCRIPTION: An implement mounted machine that applies inoculants to forage crops.

DECLARATION OF APPLICATION OF ESSENTIAL REQUIREMENTS OF THE DIRECTIVE 2006/42/ EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL OF 17, MAY, 2006 AND OTHER RELEVANT EU DIRECTIVES: The Pioneer Appli-Pro[®] C500 System conforms with the Directive and other relevant EU directives.

SERVICE DUTY OF THE PARTIALLY COMPLETED MACHINE: The Pioneer Appli-Pro[®] C500 System will only be put into service after installed on a forage harvester that has been declared to conform with the Directive.

Noise from the Pioneer Appli-Pro® C500 System does not exceed 70 dB (A).

MANUFACTURERS NAME PLATE

(sample name plate)



PERSON AUTHORIZED TO PROVIDE INFORMATION ON THE MACHINE AND WHO MAKES THIS DECLARATION:

ffn8 Kolus

Jeffery S. Roberts, President, Harvest Tec, Inc.

Signed in Hudson, WI, USA on May 21, 2011

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Introduction

The **Appli-Pro**[®] **SLV C500** (Super Low Volume Tank Mix) Application System was built for DuPont Pioneer by a leading agricultural manufacturer. The C500 is an integrated system, designed and calibrated specifically for Pioneer[®] brand products. This manual will take you through the steps of installation of the applicator and also point out all safety precautions that need to be made while using the applicator. Read this manual carefully to learn how to install the equipment correctly. Failure to do this can result in personal injury or equipment malfunction. If you are unsure about operating the system after consulting this manual, contact your local authorized dealership for additional assistance. If you are in need of parts for the system please see the parts breakdown in the back of this manual and contact your local authorized dealer to order the parts.

This unique system was developed to offer you the following advantages:

- Treat up to 500 tons with 5 liters of water.
- Operator time savings with fewer stops due to switching bottles
- Unique back-flush system makes cleaning easy.
- System works without the use of solenoids for reduced maintenance.
- Basic product delivery system is identical to SLV which provides excellent rate and distribution based on SLV experience.
- Tank can be removed for easier cleaning.
- John Deere GreenStar compatible.
- Dedicated compressor air intake for prolonged compressor life.

Tools Needed for Installation and Service

- 8 mm wrench
- 9 mm wrench
- 10 mm wrench
- 14 mm wrench
- Phillips screwdriver
- Flat screwdriver
- Pliers
- Drill
- Drill Bits
- Tube/Hose cutter
- Safety Glasses
- 9/16" wrench
- Two 7/16" wrenches
- Silicone Spray
- Marker or pencil

Hardware Needed for Installation and Not Included

- Bolts needed to mount control box (two 1/4" or 6mm bolts, nuts, flat, and lock washers).
- Bolts needed to mount tower to machine (six 3/8" or 10mm bolts, nuts, flat, and lock washers).
- Bolts needed to mount line strainer (two 1/4" X 1" bolts with split locking washers length may vary).
- Thread tape for line strainer installation.
- Plastic cable ties (black are best for use in direct sunlight) for line strainer installation.

<u>Safety</u>

Carefully read all the safety signs in this manual and on the applicator before use. Keep signs clean and in good working order. Replace missing or damaged safety signs. Replacement signs are available from your local authorized dealer. See your installation manual for under the replacement parts section for the correct part numbers.

Keep your applicator in proper working condition. Unauthorized modifications to the applicator may impair the function and/or safety of the machine.

Carefully read and understand all of the applicator safety signs before installing or servicing the applicator. Always use the supplied safety equipment on the forage harvester to service the applicator.

Safety Sign Locations





<u>Safety Signs</u>

	Number 1 Spraying hazard. Disconnect power before servicing the applicator Part no. DCL-8003
	Number 2 Read and understand the operator's manual before using or working around the equipment. Part no. DCL-8000
KI-107	Number 3 Falling hazard. Do Not Step in this area. Part no. DCL-8002
	Number 4 Eye protection. Pressure Relief Valve. Part no. DCL-8005

Assembly of Applicator

- 1. Remove C500 from shipping box.
- 2. Thread gauge into brass cross. Do not fully tighten until unit is mounted to machine.
- 3. Thread pre-filter into gray bulkhead. *Note:* You may want to disassemble pre-filter for easier installation.



4. Attach quick coupler assembly to quarter-turn fitting on top of C500 box.

Complete Assembly



Installation of Applicator

- 1. It is recommended for Self-Propelled forage harvesters to mount the C500 on the right fender of the harvester. *Note:* Make sure you can see the gauge from the operator's platform.
- 2. After finding a sturdy mounting location for the C500 on the fender, remove the tank and mounting bracket. Use the mounting bracket as a template and drill (6) 7/16" diameter holes to mount the C500.



- 3. Secure the enclosure with six 3/8" or 10mm bolts, nuts, flat, and lock washers (not included).
- 4. Re-attach the tank and secure C500 to mounting bracket.
- 5. Finish tightening gauge so you can see it from the operator's platform.

Recommended Spray

Nozzle Positions

Claas Jaguar SPFH

1. Locate the air intake on the back -side of the blower (right).

- 2. Loosen one bolt on the intake hole. Connect strap to that bolt. Make sure spray tip is centered in opening.
- 3. Install spray tip and strainer.



Claas Jaguar

1. Locate the air intake on the back -side of the blower (right).

- 2. Loosen one bolt on the intake hole. Connect strap to that bolt. Make sure spray tip is centered in opening.
- 3. Install spray tip and strainer.



John Deere 7000

- 1. Locate the accelerator.
- 2. Install spray tip, strainer and tubing to nozzle strap.
- Without removing the nuts, place nozzle strap over existing bolts and nuts (right). Fasten in place with additional nuts and lockwashers.



John Deere 8000

- 1. Locate the suction hole.
- 2. Install spray tip, strainer and tubing to nozzle strap.
- 3. position tip as shown on the picture, laterally on suction hole.



Tip position in suction hole

<u>Krone</u>

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- 1. Locate the suction hole.
- 2. Install spray tip, strainer and tubing to nozzle strap.
- Removing only one nut, place nozzle strap over existing bolt and nut. Locate tip in a central position.



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New Holland

- 1. Locate the accelerator.
- 2. Install spray tip, strainer and tubing to nozzle strap.
- 3. drill a hole in the flap and attach the tubing from the outside and the nozzle head from the inside. Central position.

Fendt

- 1. Die Düse im Wartungsraum am Wurfbeschleuniger positionieren (Foto).
- 2. Düsenkopf, Filter und Schlauch am Düsenhalterblech anbringen.





Alternative Düsen-Position

Frontmontage der Düse



John Deere



New Holland FX & FR

Das Düsenhalterblech am Rahmen der Einzugswalze anschrauben. Die Düse so positionieren, dass sie direkt auf die Einzugswalzen sprühen kann.

Alternative Mounting Location

Front Mount Installation of the Spray Nozzle



John Deere



New Holland FX & FR

Bolt the nozzle strap to the feed roll frame with the supplied hardware. Position the nozzle so it sprays directly in front of the feed rolls.

Installation of Filter Bowl (Line Strainer)

The filter bowl <u>must</u> be placed in the 1/4" EVA tubing between the quick disconnect and the nozzle strap. **Note:** In these instructions, the term **Machine** refers to the harvester.

- 1. Locate a section in the tubing that is visible from the operator's seat.
- 2. Make sure that there is good framing available to attach the Jiffy Clips to the machine in this chosen area. The filter needs to be mounted so that the clear bowl is under the housing and can be taken on and off with out hitting any framework.
- 3. Thread both 1/4" MPT 1/4"HB fittings into the filter bowl (thread tape is recommended). Use 9/16" wrench to tighten.
- 4. Locate the direction arrow on the filter bowl housing. The Arrow should point toward the nozzle strap.
- 5. Cut the EVA tubing where the line strainer is to be installed.
- 6. Slide the hose clamps over the tube. One clamp goes toward the tower and one clamp goes toward the nozzle strap.
- 7. Slide the Jiffy Clips over the tube with one Jiffy Clip going toward the tower and the other toward the gauge. <u>Note:</u> The flat tab of the jiffy clip, will lay flat against the frame work where you plan to attach.
- 8. Using Silicone spray, lubricate the inside of the hose and the outside of the hose barbs.
- 9. Slide the tubing onto the hose barbs as far as it will go.
- 10. Slide the Jiffy Clips over the filter housing.
- 11. Slide the hose clamps over the hose barbs and tighten with straight screw driver.
- 12. Position the Jiffy clip tabs with the holes in the up position.
- 13. Place the filter bowl against the frame work where it is to be mounted.
- 14. Using a marker or pencil, mark where the holes are to be drilled. **Warning: Make sure that there are no electric or hydraulic lines located on the back side of the frame work**!
- 15. With safety glasses on, drill the holes.
- 16. Install the bolts with split locking washers under the nuts. Tighten the hardware.
- 17. If you are unable to mount the filter bowl to framework that is visible from the operators seat. You can use two heavy cable ties to attach the filter to a hand rail. However, filter should not be higher than the quick-disconnect. The tubing should always flow down-hill to allow for total clean out.

Installation of Plumbing

Care should be taken when routing the tubing on the machine. Considerations as you select a route for your tube: 1) be sure to avoid interference with moving parts or hot hydraulic lines that could damage the tubing, 2) route tubing in a way to prevent low spots (traps) in the line, 3) for best results the finished run should have a continual "down-flow" from the tank to the nozzle without any looping or coiling of additional tube. Cut tube to the length that you will need.

- 1. Locate the 20ft length of 1/4" EVA tubing.
- 2. Remove the compression nut on the end of the spray nozzle assembly.
- 3. Place the compression nut over one end of the tubing so 1/4" of it extends through the nut.
- 4. Begin to thread the compression nut back onto the spray nozzle assembly. Before the nut is tight, push the tubing in as far as possible. Tighten the nut the rest of the way.
- 5. Route tubing to the filter bowl assembly. Cut tubing to length and secure with a hose clamp. Secure the filter bowl assembly to the forage harvester. Continue running the tubing from the filter bowl assembly to the C500.
- 6. Cut to length and locate female coupler from the parts bag. Secure coupler to tubing with a hose clamp. Place rubber o-ring into coupler. Attach the coupler to the C500.
- 7. Secure tubing to machine with supplied jiffy clips.



Installation of the Control Box



- 1. Locate the C500 control box.
- 2. Locate a place for the control box on the front right corner post of the cab or along any support in the front right part of the cab. Recommended to mount within easy reach of the operator.
- 3. Secure control box bracket to one of these locations with two 1/4" or 6 mm bolts.
- 4. Attach control box to bracket, secure with control box knobs and lock washers from parts bag.
- 5. Final mount of control box should provide a firm solid support with minimal vibration.
- 6. Included is a suction cup mount that can allow you to attach the control box to the window.

Installation of the Cables

Power Cable

- 1. Locate power cable (006-4640P).
- 2. Connect the power cable to the machines battery using the orange wire on the positive side and the black wire on the negative side. DO NOT REVERSE POLARITY. DO NOT CONNECT TO A KEY SWITCH. THE CLEANING FUNCTION DEPENDS ON LIVE POWER ALL THE TIME.
- 3. Run the cable into the cab where it will be installed on the bottom of the control box.

Wiring Cable

- 1. Locate wiring harness (006-4524HG).
- 2. Note that the plugs on both ends are the same, one plug has a 3" long green pigtail wire with disconnect on it, and a cable with a triangle shaped plug. Connect this end to the control box.
- 3. Connect the end of the wiring harness without the green pig-tail to the C500 pumping unit.

Installation of End-of-Row

- 1. The C500 is designed to operate using the harvester's end-of-row capabilities for automatic on/off operation.
- 2. Connect 12V+ from your end-of-row switch to the green 3" pigtail where the wiring harness connects to the control box with a quick disconnect.
- 3. The control box will not start application until the machine is running with its head down, and the feed rolls are engaged.

A. John Deere 7000 Series (Not Used with Green Star)

- 1. The self-propelled forage harvester should have been ordered with code 6024 or you will need to order bundle B713547.
- 2. Locate harness (AZ100126) that came with the Forage Harvester. It has a green wire (065), black wire (310) and red wire (122).
- 3. Connect green wire of harness to the green wire on control box end of C500 harness (006-4524HG).
- 4. Red wire is not used. Terminate it so it doesn't spark. This wire will supply 12 VDC all the time.
- 5. Plug harness (AZ100126) into socket located underneath headlights on the right fender.



- 6. To operate unit using the machines input, press the Liquid Injection Pump Switch <u>ONCE</u> (located on right hand arm rest control panel). All of the following has to be present before the power is supplied to the sprayer:
 - The road safety switch is in field operating mode.
 - The forage harvester is traveling forward.
 - The ground speed is greater than 1.25 mph.
 - The feed rolls are turning in forward direction.
- 7. To operate unit using the machines input, press the Liquid Injection Pump Switch <u>ONCE</u> (located on right hand arm rest control panel). All of the following has to be present before the power is supplied to the sprayer:
 - The road safety switch is in field operating mode.
 - The forage harvester is traveling forward.
 - The ground speed is greater than 1.25 mph.
 - The feed rolls are turning in forward direction.
- To allow C500 to run all of the time, press the Liquid Injection Pump Switch <u>TWICE</u>.
 Note: When the Liquid Injection Pump Switch is in standby mode, the tank indicator icon on the corner post will flash. When the pump is running, the icon will display solid. Also there is a light next to the switch that will light up when the switch is activated.

For more information refer to the 7000 Series Operators Manual.

B. John Deere 6000 Series



- 1. The following John Deere parts are necessary:
 - AL57901 Rocker switch
 - Z52626 Lens insert
 - RE11344 Plug
- 2. The switch is to be located in position 8 (shown below). Knock out the panel plug in position 8. Connect the switch to the connector labeled 534. (If the 534 label is not found, look for the connector having a brown wire #231.) Snap the rocker switch into the panel with tank symbol forward and refer to the operator's manual for the switch operating information. The switch has three positions:

(REAR) ON (CENTER) OFF (FRONT) ON WHEN FEED ROLLS ENGAGE



3. Connect the green wire on the control box end of the C500 harness (006-4524HG) to the center pole of the plug (RE11344 not included). Connect the plug to the socket behind the cab.

C. Claas

- 1. The following Claas parts are required for the end of row function:
 - 2337950 Plug
 - 1787620 Plug pins
- 2. For Claas choppers (830 990), connect the green wire on the control box end of the C500 harness (006-4524HG) to the "T" shaped plug hanging above blower next to the automatic oilier. The plug will have a brown and white wire leading into it. Connect the end of row wire to the white wire on the plug. The chopper will turn on the box when the feed rolls are engaged, head down, and the machine is moving forward.



D. New Holland FX Series

- 1. The following New Holland part is required to utilize the end of row feature:
 - 86508819 Plug
- 2. Connect a wire to the green wire on the control box end of the C500 harness (006-4524HG) and attach the other end to the center pole of the 86508819 plug with enough wire to reach out of the cab to the socket under the main fuse box behind the cab.

E. New Holland FR Series

- 1. Depending on the year of the machine the plug will be found at the back of the machine on the right side above the rear axel (2008 and older) or behind the cab (2009 & up). The harness can also be traced to the cab and connected closer to the control box.
- 2. Connect a wire to the green wire on the control box end of the C500 harness (006-4524HG) to the white wire on the plug.





2008 and Older

2009 and Newer

Installation of the SLV to John Deere 70 0 0 S e rie s SP FH's e quipped with Greenstar

Before starting, check to see if your Self Propelled Forage Harvester is wired correctly for the Pioneer C500. The John Deere harness connecting the GS monitor to the bulkhead fitting is located in the upper right corner of the cab. It must be JD Part# PF81126. Any other harness will not allow communication to Com Port 2.

- 1. Locate and remove the "D" shaped cover on the outer right side of the cab. Looking inside locate the triangle shaped 3-pin plug that will receive the 3-pin plug on the Pioneer harness. The correct plug will have a clear bag containing extra plug parts tied to it. This plug is **ComPort 2**.
- 2. Feed the John Deere 3-pin plug and wire harness through a rectangular hole, locate under the righthand side of the seat and just above the cab floor. (An additional partner may make this step easier pulling the plug into the outer, unpressurized section of the cab). The harness must pass through a rubber bulkhead that helps keep dust out and allows the cab to pressurize.
- 3. Locate and mount the SLV control box within 5 feet of the GreenStar control or within reach of plug and harness referenced in step 2.
- 4. Attach the C500 communication cable between the tower and the SLV control box. Note: The end that has the triangle plug needs to be attached to the control side.
- 5. Attach the C500 power harness to the battery of the machine. Do not reverse polarity. Do not
- connect to a key switch. The system's cleaning function depends on constant live power direct from battery.
- 6. Attach the cable with the triangle plug to the GreenStar's triangle plug.
- 7. Re-install the "D" shaped cover. Do not over tighten the cover bolts.

The installer may choose to route the main wiring harness, leading to the applicator, through this same path. Alterations to the "D" shaped cover must be made to allow the harness to pass through and not be cut, pinched, or receive damage due to abrasion from sharp edges. Do not smash or crush the wiring harness under this cover.

Plug Diagrams

Control Box (Tower / Control Plug)

Pin 1	Blue	Communication to GreenStar (Control Box End Only)
Pin 2	Red	Compressor/Relay Power
Pin 3	Blue	Pump Positive
Pin 4	Yellow	Reversing Relay
Pin 5		Not Used
Pin 6	Brown	Pump Ground
Pin 7	Green	End of Row (Control Box End Only)
Pin 8	Red	Communication from GreenStar (Control Box End Only)
Pin 9	Black	Compressor Ground
Pin 10	Black	GreenStar Ground (Control Box End Only)

Control Box (Tower Harness)

Pin 1 Pin 2 Pin 3 Pin 4	Blue Red Blue Yellow	Communication to GreenStar (Control Box End Only) Compressor/Relay Power Pump Positive Reversing Relay
Pin 5 Pin 6 Din 7	Brown	Not Used Pump Ground
Pin 7 Pin 8 Pin 9	Green Red Black	Communication from GreenStar (Control Box End Only)
Pin 3 Pin 10	Black	GreenStar Ground (Control Box End Only)





GreenStar Harness & Plug

Pin A	Red	Communication from GreenStar
Pin B	Black	GreenStar Ground
Pin C	Blue	Communication to GreenStar



T D\N ER W IRING DIAGRAM



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Wiring and Plumbing



<u>Ref #</u>	Description
1	Wire Harness
2	1/4" EVA Tubing
3	Power Harness
4	Jiffv Clip

- Hose Clamp Filter Bowl 5
- 6
- Adapter 1/4" MPT x 1/4" HB 003-A1414 7

<u>Part #</u>	Qty
006-4524HG	1
002-9006	20ft
006-4640P	1
008-9010	2
003-9002	2
002-4314	1
003-41414	2

Main Unit





<u>Ref #</u>	Description	<u>Part #</u>	<u>Qtv</u>
1		002-4522	1
2	C500 Enclosure	001-4590	1
3	Air Hose 1/2"	002-9000	1ft
	4 Box Air Filter	002-452	12
	5 Elbow 1/4" MPT x 1/2	" HB Brass003-EL	1412B 1
	6 Compressor	⁻ 007-4530	1
	7 Compressor N	lounts 007-4530	Л 4
	8 Jaco Fitting	003-JA1414	2
9	Tee 1/4" HB x 1/4" HB x 1/4" MPT	003-T1414TB	1
10	Air Hose 1/4"	002-9012	4ft
11	Hose Clamp	003-9004	2
12	Tank	005-9216	1
	13 Mounting Brac	ket 001-458	21
	14 Back Cover	001-4592	1
	15 Bottle Straps	001-4593	2
16	Knobs	008-0923	4
17	1/4" Hose Clamp	003-9001	4
	18 Tank Legs	001-4595	2
	19 Tank Cap	005-9022CP	1

Control Box and Spray Parts



Ref #	Description	<u>Part #</u>	Qty
1	Jaco Elbow	003-JEL1414F	1
2	Jaco Nut	003-JN14	3
3	Strap	001-4216	1
4	Nozzle Body	004-4722	1
5	Strainer	004-1203-50	1
6	Tip	004-TX-10	1
7	Nozzle Cap	004-4723	1
8	Female Coupler	004-1207H	2
9	Washer	004-1207W	3
10	Elbow 1/4" MPT x 1/4" HB	003-EL1414	1
11	Control Box	006-4525G	1
12	Control Box Knob	008-0923	6
13	Control Box Bracket	001-2012E	1
14	Jiffy Clip	008-9012	2
15	Tubing Key	007-4523	1
16	Jaco Fitting	003-JA1414	2
NP	Suction Cup Mount	001-2012SCM	1

Pump and Wiring



<u>Ref #</u>	Description	<u>Part #</u>	<u>Qtv</u>
1	Jaco Nut 1/8"	003-JN18	2
2	Street Elbow	003-SE4514	3
3	Tee 1/4" FPT	003-TT14	1
4	Adapter 1/4" MPT x 1/4" HB	003-A1414	4
5	Female Coupler	004-1207G	2
6	Jaco Nut 1/4"	003-JN14	3
7	Relay to Pump Wire	006-4524Q	2
8	Reversing Relay	006-2187	1
9	Wiring Harness Connector	006-4524P3	1
10	Injection Motor	007-4533A	1
11	C500 Pump Plate	001-4591	1
12	Squeeze Tube	002-9011	2ft
13	Injection Pump	007-4533B	1
14	Fitting Stops	001-4594	2
15	Jaco Fitting	003-JA1814	2
16	Jaco Fitting	003-JA1414	2

Intake and Gauge

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<u>Qtv</u>

004-TXP2



20 Air Agitation Tip

Hardware

QuantityItem43/16" Fender Washer

- 2 6/32" x 1/2" Philips Machine Screw
- 2 6/32" Nylon Lock Nut
- 4 10/32" x 1/2" Philips Machine Screw
- 8 10/32 Nylon Lock Nut
- 22 M6 x 16 Flange Bolt
- 6 M6 Flange Nut
- 8 M10 x 20 Flange Bolt
- 2 1/4" x 1 1/4" Self Tapping Bolts
- 4 #8 x 3/8" Plastite Screw
- 2 1/2" SAE Washer
- 6 5/16" Internal Tooth Washer
- 4 5/16" x 5/8" Button Head Socket Bolt
- 4 5/16" Lock Washers

Where used

Compressor Mount Relay Relay Injection Pump Mount Injection Pump Mount, Compressor Cover, Injection Pump Plate, Bottlehanger "Y" block Holder, Injection Pump Plate C500 Mounting Bracket Nozzle Strap Wire Harness Plug Pump Plate, Airline Control, Bottle Bottle Bottle



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