Operation Manual

Model 491BB

115 Gallon Preservative Applicator
For New Holland BigBaler and Case IH LB 4

HARVEST TEC
Equipment and Products for Quality Hay.™

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Harvest Tec Model 491 Operation Table of Contents

Introduction

Thank you and Congratulations on purchasing a Harvest Tec Model 491 Applicator. This applicator is designed to apply a buffered propionic acid on to the forage crop as it is being baled. The applicator is designed to allow the operator to adjust the rate of preservative on the go for changing moisture and baler throughput. This manual will take you through the steps of operation 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 operate 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 applicator is designed to apply Harvest Tec buffered propionic acid.

Right and Left sides are determined by facing in the direction of forward travel.

Model Reference

BALER MAKE	MODEL	INSTALL KIT
Case IH	LB 234 2 x 3 standard	030-4532
	LB 334 3 x 3 standard packer	030-4533
	LB 334 3 x 3 roto cut	030-4535
	LB 434 4 x 3 standard packer	030-4534
	LB 434 4 x 3 roto cut	030-4536
New Holland	BB 230 2 x 3 standard	030-4532
	BB 330 3 x 3 standard packer	030-4533
	BB 330 3 x 3 roto cut	030-4535
	BB 340 3 x 4 standard packer	030-4534
	BB 340 3 x 4 roto cut	030-4536

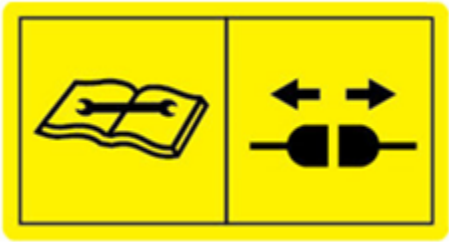
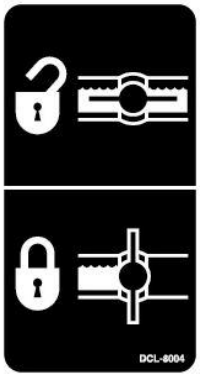
Safety

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 baler safety signs before installing or servicing the baler. Always use the supplied safety equipment on the baler to service the applicator.

Safety Decals

	Number 1 Spraying hazard. Disconnect power before servicing the applicator Part no. DCL-8003
	Number 2 Falling hazard. Do not step in this area. Part no. DCL-8002
	Number 3 Use caution when working around chemicals. **Wear all protective equipment according to the label of the product.** Part no. DCL-8001
	Number 4 Read and understand the operator's manual before using or working around the equipment. Part no. DCL-8000
	Number 5 Open (unlocked) and closed (locked) position of the ball valve. Part no. DCL-8004

Safety Decal Locations

2, 3, 4, 5

1

3, 5

Preparing the Applicator for Operation

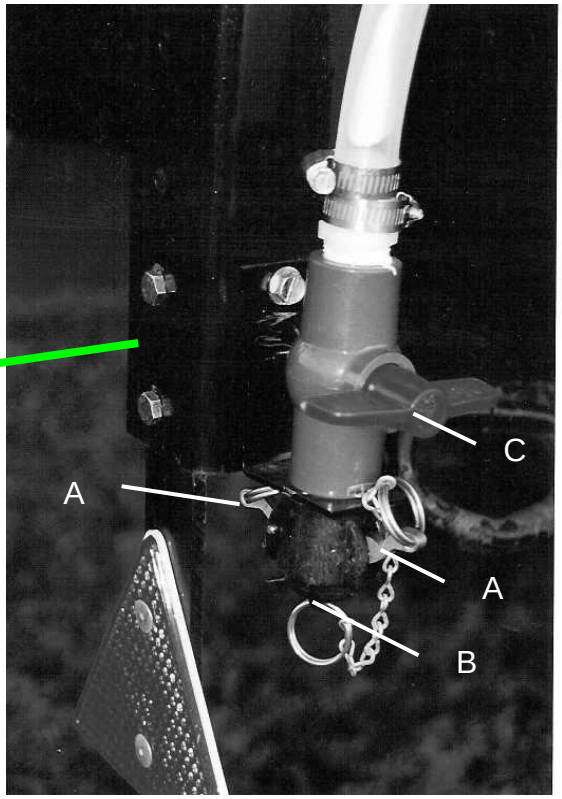
After the Applicator has been installed on the baler, follow the below steps to prepare for operating the applicator both safely and correctly.

Filling the tank:

Read the label of the product being filled into the tank to determine what individual protective measures need to be taken. Locate the drain/fill line on the baler. Open the cam-couplers (A) and remove the protective plug (B). Insert the male coupler (found on transfer pump) into the female cam and close the cams (A). To open the ball valve (C) turn the handle so it is vertical. After the ball valve has been turned on switch the pump to the On position. Monitor the level on the tank visually and shut off the pump before over filling. Once the pump is turned off, close the ball valve and remove the male coupler. The handle of the ball valve (C) will be horizontal when closed. Reinstall the protective plug and close the cams. The Harvest Tec model 9212 transfer pump is recommended for this process.

Water is recommended for first time and annual start up procedures.

Drain/Fill line on the baler

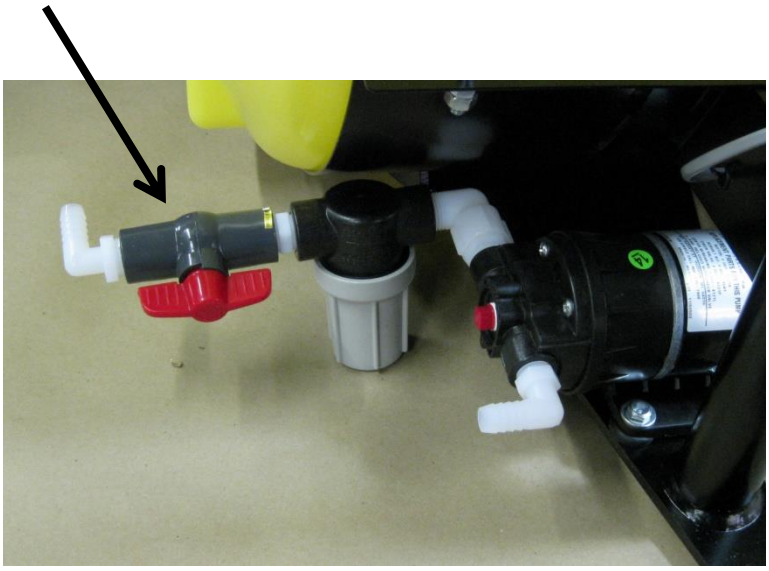


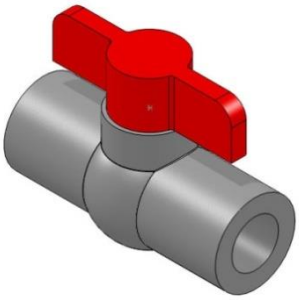
Enlarged view of the drain/fill line valve and cam-coupler assembly.

Operation of the main ball valve

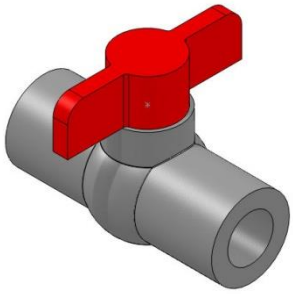
The ball valve should be closed at all times when the applicator is not being used. The valve should also be closed when any service work is being done to the baler or applicator.

The valve is located next to the pump and by the applicator tank. The arrow below points at the valve.





Valve open



Valve closed

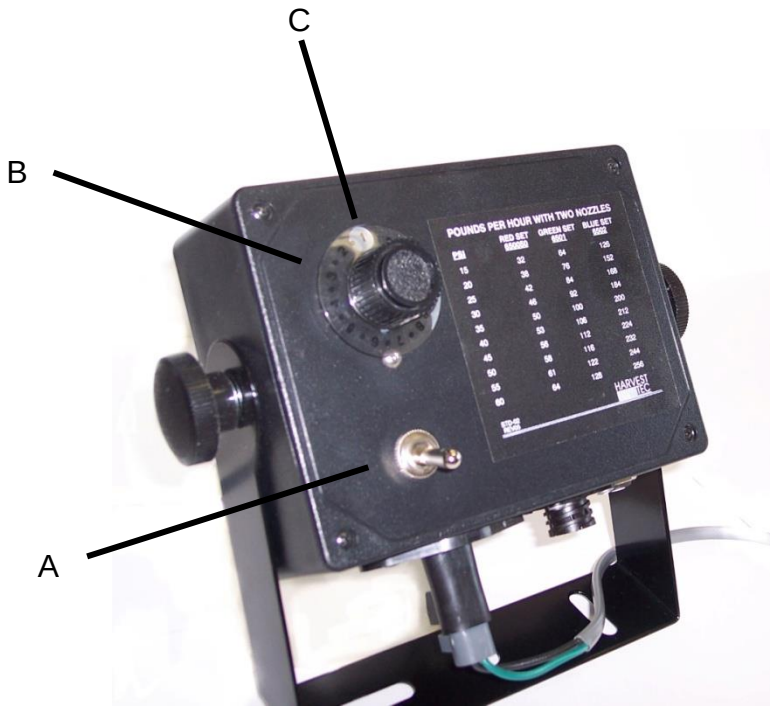
Connecting the power harness

The power harness that supplies power from the tractor battery to the applicator pump has a disconnect at the hitch. Connect the two together for operation. Always disconnect before servicing the applicator or baler.

Operation of the control

Understanding and using the control

The model 457 control is pictured below. The toggle switch (A) is used to supply and cut off power to the pump. With the switch in down (shown) the power is off. Lift the switch up to supply power. The dial (B) is used to adjust the pressure to the tips when power is applied. Use the numbers on the dial only as reference. The PSI on the gauge determines the exact flow. Apply the correct rate decal found with your manual to the front of the control box. The message light (C) will always be illuminated when the power is on. If the light ever blinks during operation please reference the manual section “Message light”.



Message Light

The LED under the speed dial will be steady on when the applicator is running under normal situations. If the light blinks on and off use the below information for the message.

Slow steady on and off blink: The system is attached to hay indicators (474A) or a foot switch. This message means that the pump is paused. The light will come on constant once the baler is back in the windrow.

*Two quick blinks***:** The pump motor or pump harness is shorted.

*Three quick blinks***:** Pump motor is over the current limit (10 amps).

*Four quick blinks***:** Power is under current from a bad connection.

The control box must have the on/off switch toggled to clear the message after the fault has been fixed to clear.

First time and annual start up

After familiarizing yourself with the model 457 control, fill the tank with 5 gallons of water. Turn on the power to the pump by pushing the toggle switch up. You might hear the buzzing of the motor. Turn the dial on the control box until the pressure gauge starts to climb. By turning the dial clockwise the pressure will go up. By turning the dial counter clockwise the pressure will decrease. With the applicator spraying at about 30 PSI, look for leaks at all the hose connections and fittings. When you are comfortable with the operation of the controls you can set the applicator to apply the amount of chemical you would like it to put on.

Field operation

Determining your tons per hour

1. Time 3 bales and average the time it takes to make a bale.
2. Estimate the weight of the bale.
3. Use the Bale Rate Chart below to determine the tons you are harvesting per hour.

Example: You are baling 1000 pound bales, with 2 minutes of time per bale. Looking at the chart below your tons per hour is 14.

Large Square Bale Rate Chart (tons per hour)

Weight per bale

Average time to make a bale	600	800	1000	1200	1400	1600	1800	2000
1.0 MN	18	24	30	36	42	48	54	60
1.5 MN	12	16	20	24	28	32	36	40
2.0 MN	9	12	14	18	21	24	27	30
2.5 MN	7	10	12	14	17	19	22	25
3.0 MN	6	8	10	12	14	16	18	20
4.0 MN	5	6	8	9	10	12	14	16
5.0 MN	4	5	6	7	8	9	11	13
6.0 MN	3	4	5	6	7	8	9	10
8.0 MN	3	3	4	5	5	6	7	8
10.0 MN	2	3	3	4	4	5	6	7

Determine the Rate of Chemical

The number of pounds of chemical required to be applied to a given ton of hay, depends on the moisture and the type of chemical used. The moisture of the hay is important in determining how much chemical to use. By knowing the moisture, you can make sure you are treating the hay correctly. Under applying will save money but spoilage most likely occurs. Over applying will waste money however, the hay will be saved. Some chemicals require more or less to treat the same amount of hay. To find the exact number of pounds required, for a given hay moisture, refer to the label on the drum or contact the manufacture. Harvest Tec applicators come with a set of low, medium, and high tips. If your chemical requires rates other than what these tips deliver you will need to purchase them through your dealer.

Selecting Tips and Setting Pressure

Once you have determined your tons per hour and the amount of chemical needed for the moisture you are applying at, you can select your tips and determine your gauge settings.

1. Multiply the tons per hour by the amount of chemical required for the moisture you are applying at. This sum will give you the application rate.
2. Select the proper set of tips from the application rate chart and install them.
3. For the tips you have selected, you will need to keep the gauge at the recommended PSI to achieve the proper application rate.
4. Set the pressure by adjusting the dial on the control box and by reading the pressure of the gauge to match the desired rates. The numbers on the dial are for reference only. Rate is determined by watching the pressure gauge.

Example: You are baling at 12 tons per hour with your large square baler. The moisture that you are baling at requires you to apply 6 pounds per ton. Multiply the 12 tons x 6lbs. = 72 lbs. per hour. Using the chart on page 13 you will notice the orange set of tips at 20 PSI will give you that output.

Calibration Reminders

*Watch the pressure gauge, as the setting will vary with tractor's electrical output, temperature and other factors.

*Check your application rate by measuring product used against actual tons baled.

REMEMBER, ONLY YOU CAN CONTROL HOW MUCH PRODUCT IS APPLIED AND THAT WILL DETERMINE IF YOUR HAY WILL KEEP!!!

General calibration charts

POUNDS (LITRES) PER HOUR WITH TWO NOZZLES

PSI	PINK SET 8001	BROWN SET 80015	RED SET 8003	YELLOW SET 8005
15	64 (29L)	95 (43L)	196 (88.L)	323 (145L)
20	74 (33L)	111 (50L)	222 (100L)	376 (169L)
25	80 (36L)	122 (55L)	249 (112L)	413 (186L)
30	90 (41L)	138 (62L)	275 (124L)	461 (208L)
35	98 (44L)	148 (67L)	296 (133L)	
40	106 (48L)	159 (72L)	317 (143L)	
45	111 (50L)	170 (77L)	336 (151L)	
50	117 (53L)	180 (81L)	354 (159L)	
55	122 (55L)	188 (85L)	370 (167L)	
60	127 (57L)	196 (88L)	386 (174L)	

GALLONS (LITRES) PER HOUR WITH TWO NOZZLES

PSI	PINK SET 8001	BROWN SET 80015	RED SET 8003	YELLOW SET 8005
15	7.3 (28L)	10.7 (40L)	22.0 (83L)	31.9 (121L)
20	8.4 (32L)	12.7 (48L)	24.1 (91L)	42.2 (160L)
25	9.5 (36L)	14.1 (53L)	28.3 (107L)	47.3 (179L)
30	10.3 (39L)	15.5 (59L)	31.0 (117L)	52.2 (197L)
35	11.3 (43L)	16.6 (63L)	33.5 (127L)	
40	12.2 (46L)	17.8 (67L)	36.0 (136L)	
45	12.6 (48L)	19.2 (73L)	38.3 (145L)	
50	13.2 (50L)	20.6 (78L)	40.7 (154L)	
55	13.8 (52L)	21.3 (81L)	42.5 (161L)	
60	14.4 (54L)	22.0 (83L)	44.4 (168L)	

REMEMBER, ONLY YOU CAN DETERMINE HOW MUCH PRODUCT IS APPLIED, AND THAT WILL DETERMINE IF YOU HAY WILL KEEP.

Maintenance

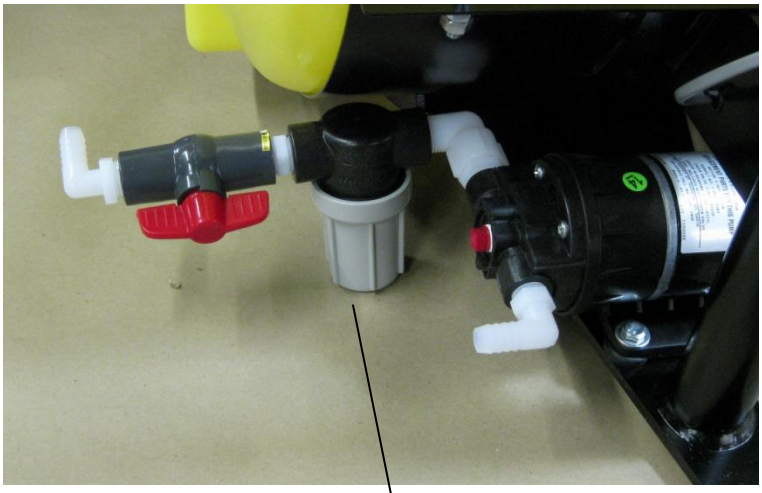
- **If you are unsure how to perform any of the maintenance steps have your local authorized dealer perform the tasks.**

Maintenance Schedule

	Daily	10 hrs	400 hrs	Weekly	Monthly	Season
Filter bowl cleaning		X				X
Tips & tip screen cleaning		X				X
Tank lid cleaning		X				X
Dielectric grease connections					X	X
Rebuild pump			X			
Battery connections				X		X
Visually inspect hoses				X		X

Filter bowl cleaning: Before cleaning the filter bowl all personal protective equipment must be worn (Face shield or goggles, chemically resistant apron, boots, and gloves).

Verify that the ball valve located next to the pump is turned off. Locate the filter bowl on the side of the pump manifold (A). Unscrew the bottom section of the filter bowl and remove the strainer. (B) Clean off any debris and soak in warm water with a mild soap if necessary. Once the screen is clean reinstall by following the directions in reverse.



A

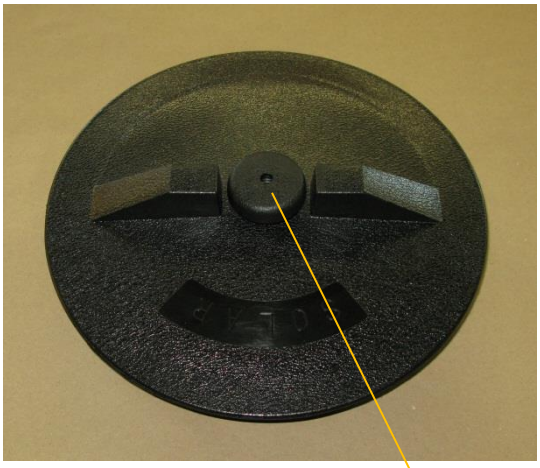
B

Tips & tip screen cleaning: Before cleaning the tips and screens all personal protective equipment must be worn (Face shield or goggles, chemically resistant apron, boots, and gloves).

Verify that the ball valve located next to the pump is turned off. Disconnect spray shield from hangers if possible or remove tips in place. Remove the tip, and screen. Some models may require a wrench to remove. Clean off any debris and soak tip and screen in warm water with a mild soap if necessary. Once the tips and screens are cleaned reinstall by following the directions in reverse.

Tank lid cleaning: Before cleaning the tank lid all personal protective equipment must be worn (Face shield or goggles, chemically resistant apron, boots, and gloves).

The tank lid is located on the top of the tank. Use the supplied handle on the tank to secure your person and use the other hand to remove any debris from the top of the tank. Unscrew the tank lid and bring down ground level. Use compressed air clean out the tank breather (D). Once the breather is cleaned reinstall the cover.



D

Dielectric grease connections: Disconnect all harnesses on the applicator, clean the connections, and repack with dielectric grease.

Rebuild pump: If the pump is not working up to specifications a pump rebuild kit may fix the problems.

Verify that the ball valve is turned off. Before working around the pump all personal protective equipment must be worn (Face shield or goggles, chemically resistant apron, boots, and gloves). Disconnect all pump fittings and remove pump from saddle. Follow rebuild instructions supplied with pump rebuild kit. Reinstall after rebuild is complete.

Battery connections: Follow the batteries safety warnings and clean the battery connections. If the connections cannot be cleaned, replace harness.

Miscellaneous Maintenance:

1. Depending on the product being used, the system may need to be flushed with water at a regular interval (consult with manufacturer of the chemical.) If Harvest Tec product is being used, flushing is not necessary.
2. Although the pump can run dry, extended operation of a dry pump will increase wear. Watch the preservative level in the tank.
3. If you are using bacterial inoculants, flush your system daily after every use.

Winter Storage

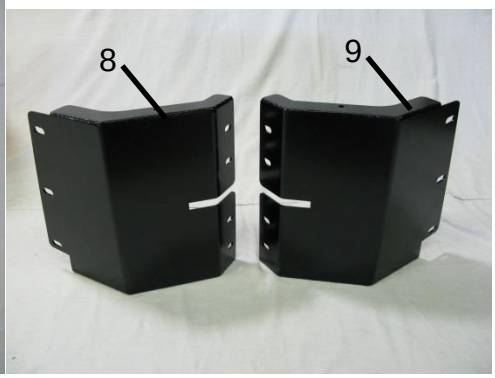
1. Thoroughly flush the system with water.
2. Remove the filter bowl and run dry until the water has cleared out of the intake side.
3. Remove the red plug from the bottom of the pump, drain, and run the pump for 30 seconds or until it is dry.
4. Drain all lines on the outlet side.
5. Never use oils or alcohol based anti-freeze in the system.
6. For spring start-up, if the pump is frozen, turn off the power immediately to avoid burning the motor out or blowing a fuse. The pump head can be disassembled and freed or rebuilt in most cases. Check the fuses after the pump has been freed.
7. Disconnect power from the Precision Information Processor.
8. Remove display from tractor and store in a warm, dry place.

Troubleshooting

Problem	Possible cause	Solution
Pump will not run.	1. Circuit breaker tripped on electronic unit.	1. Check for short, low voltage, and reset breaker.
	2. Pump locked up.	2. Clean or rebuild pump if motor is OK.
	3. Damaged wire.	3. Repair damaged wire.
Pump runs but will not prime.	1. Air leak in intake.	1. Tighten fittings on intake side.
	2. Clogged intake.	2. Clean.
	3. Restricted outlet.	3. Check and clean tips.
	4. Check valve on outlet stuck closed.	4. Clean or repair check valve.
	5. Dirt inside pump.	5. Replace pump check valve.
	6. Vapor locked.	6. Loosen hose by check valve at gauge and bleed air.
Pump does not develop enough output.	1. Air leaks or clogs on inlet side.	1. Tighten or clean filter bowl assembly.
	2. Electronic box out of adjustment.	2. Refer to box adjustment page.
	3. Pump worn or dirty.	3. Rebuild pump.
	4. Low supply voltage. (Pump requires 12v minimum)	4. Check voltage at connection with voltmeter.
	5. Bad gauge.	5. Gauge should read less than 10 PSI when not in use. Also tips should lose spray pattern below 10 PSI. Check accuracy.
Pump output varies.	1. Clogged or restricted inlet.	1. Clean
	2. Worn pump parts.	2. Rebuild pump.
Message light blinks two times	1. Pump or wire harness shorted.	1. Check harness running to pump and verify no shorts or problems. 2. Check to see if pump motor is locked up. Repair or replace.
Message light blinks three times	1. Pump is drawing greater than 10 amps.	1. Check to see if motor is running correctly. Repair or replace.
Message light blinks four times	1. Undercurrent coming to control box.	1. Check all battery connections and connections running up to control box.

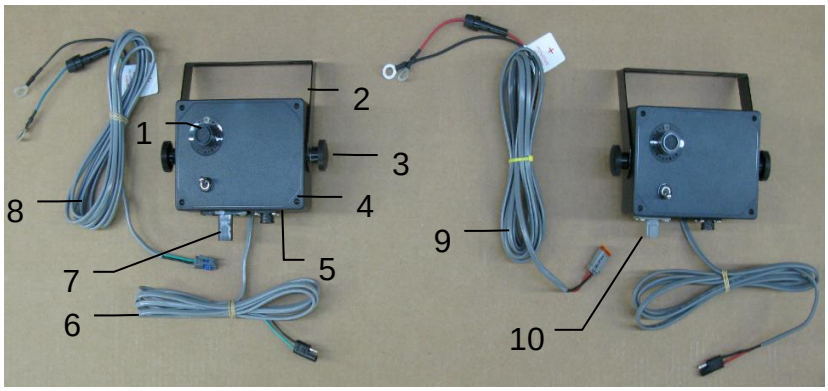
Parts Breakdown

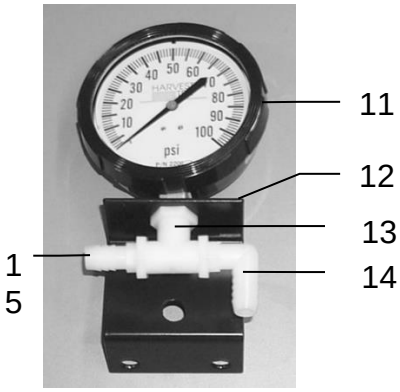
Tank, Saddle & Saddle Legs



Ref	Description	Part#	Qty	Ref	Description	Part#	Qty
1	Tank	005-9218	1	9	Right saddle leg	001-6707MR	1
2	1/2" tank fitting	005-9104	2	10	1/2" hose	002-9001	2
3	Elbow	003-EL1212	2	NP	Elbow	003-EL3434	1
4	Tank straps	001-6707P	2	NP	Elbow	003-EL3412	1
5	Tank saddle	001-6707N	1	NP	Tank lid strainer	005-9022HBS	1
6	Handrail	001-6707HR	1	NP	3/4" tank fitting	005-9100	2
7	Tank lid	005-9022H	1	NP	Pump Mount	001-6707Q	1
8	Left saddle leg	001-6707ML	1				

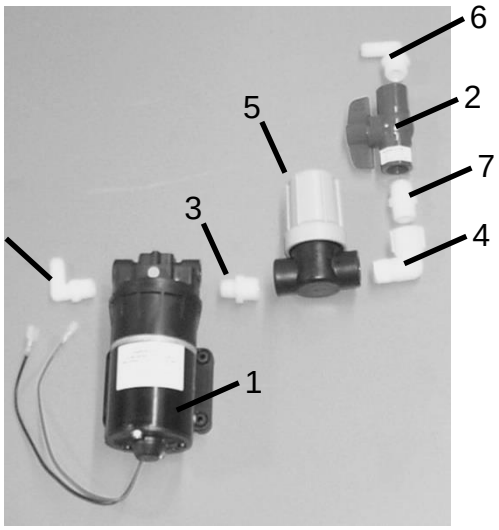
Control Box and Wiring Harnesses, Gauge, and Pump Assembly

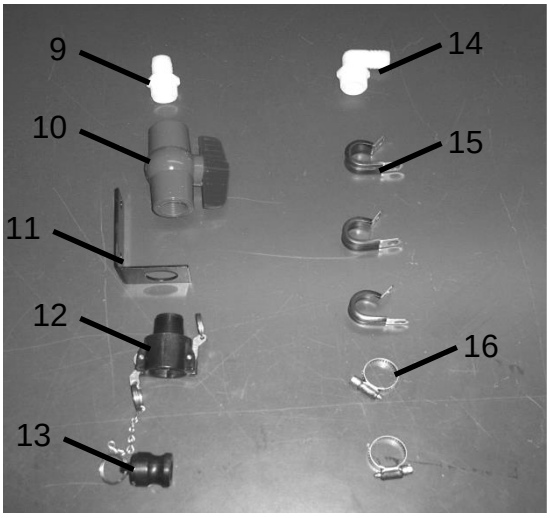




Ref	Description	Part #	Qty
1	Speed dial	006-2022A	1
2	U-bracket	001-2012E	1
3	Control box knob	008-0923	2
4	Control box enclosure	006-2015A	1
5	Control box cover	006-2015B	1
6	Pump lead	006-4583	1
7	Box Plug	006-4581	
	Pre-Serial # 4549		
8	Power lead	006-4580C	1
	Pre-Serial # 4549		

Ref	Description	Part #	Qty
9	Power lead	006-4580M	1
	After Serial # 4550		
10	Box Plug	006-4581M	1
	After Serial # 4550		
11	Gauge	002-2208Z	1
12	Gauge Bracket	001-4714	1
13	Tee	004-TT14	1
14	Elbow Fitting	003-EL1412	1
15	Straight Fitting	003-A1212	1

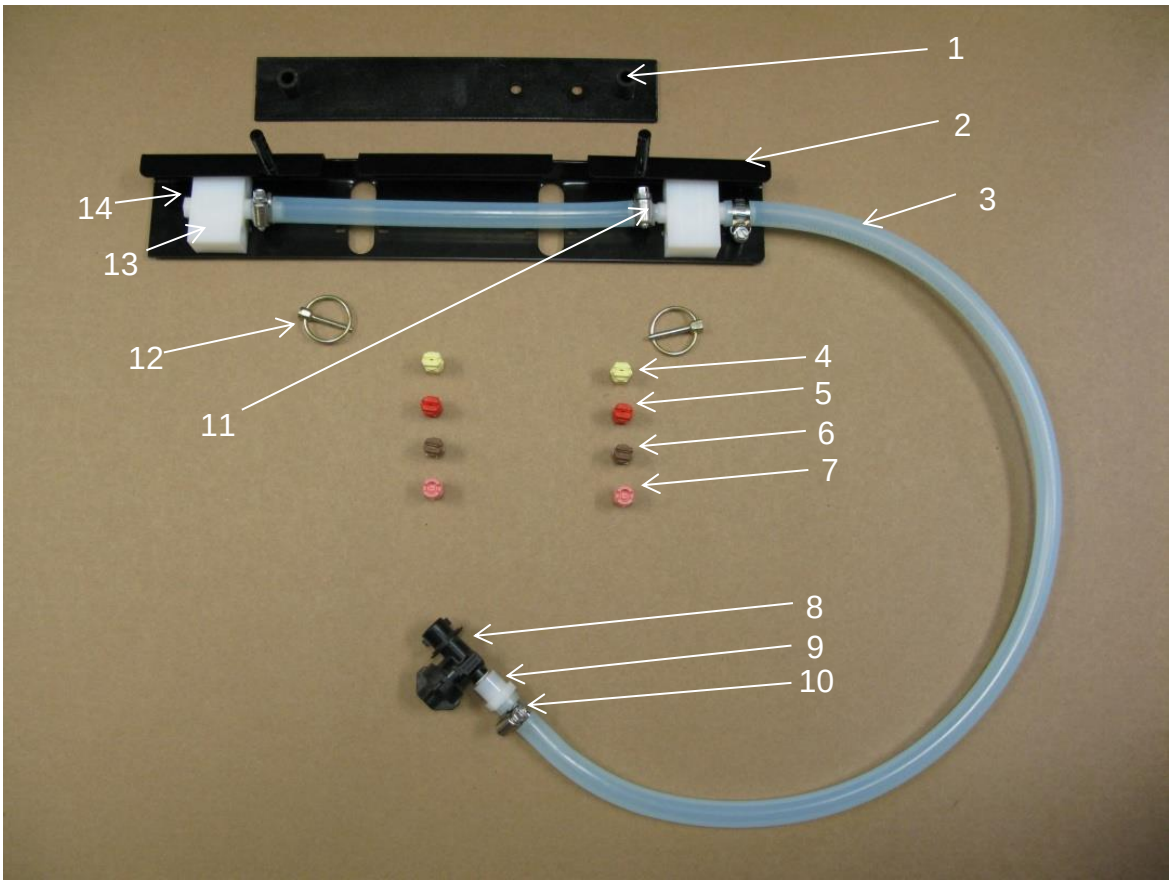




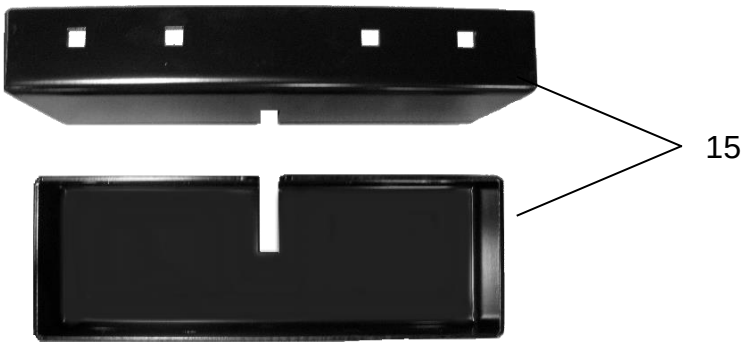
Ref	Description	Part#	Qty
1	Pump	007-4120S	1
2	Ball valve	002-2212	1
3	Reducing nipple	006-M1238	1
4	Street elbow	003-SE12	1
5	Filter bowl	002-4315	1
6	Elbow	003-EL1212	1
7	Nipple	003-M1212	1
8	Elbow	003-EL3812	1
NP	Straight fitting	003-A1212	1

Ref	Description	Part#	Qty
9	Straight fitting	003-A3434	1
10	Ball valve	002-2200	1
11	Valve holder	001-6702H	1
12	Female coupler	002-2204A	1
13	Male coupler	002-2205G	1
14	Elbow	003-EL3434	1
15	Jiffy clip	008-9010	3
16	Hose clamp	002-9004	2

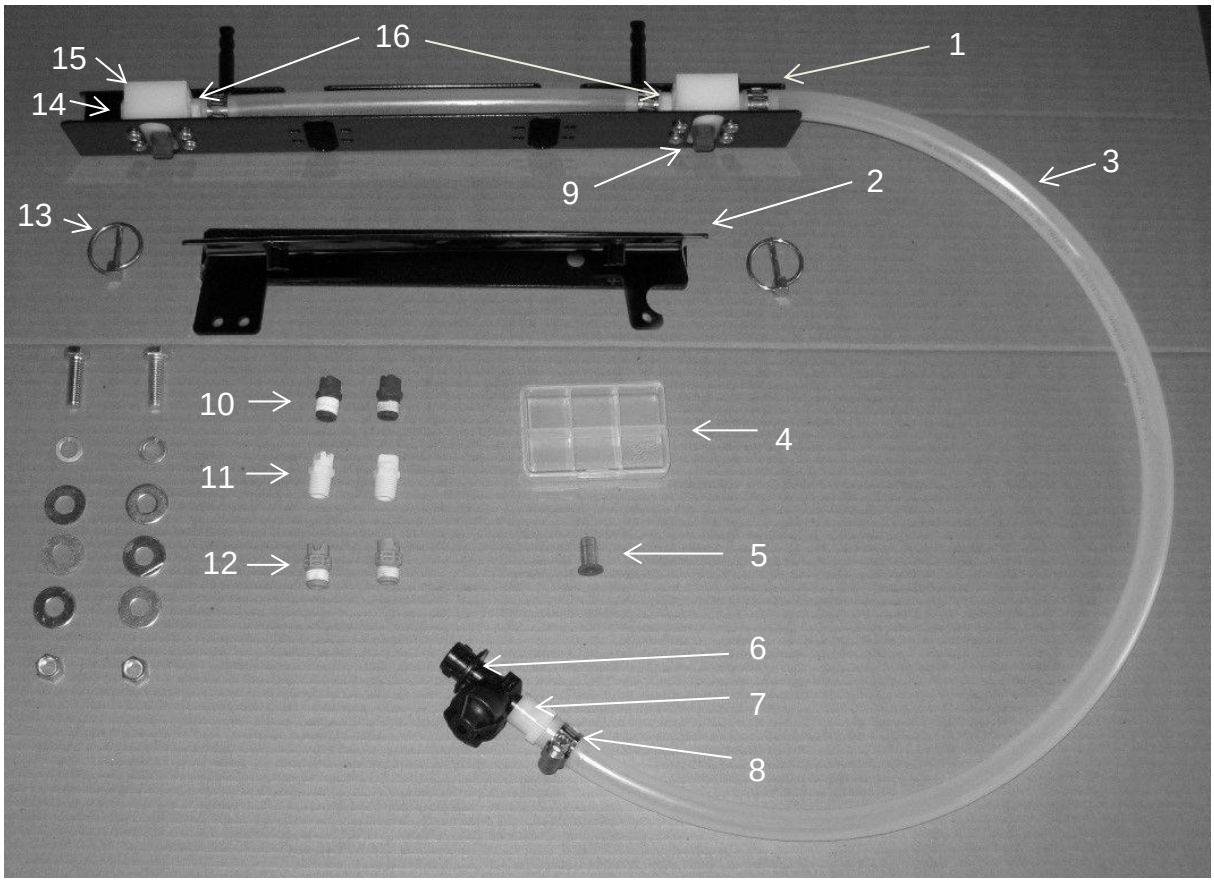
Harvest Tec Model 4532, 4533 and 4534 Installation Kit
(4534 pictured)
(4533 has shorter EVA tube between Manifold Blocks)



Ref	Description	Part #	Qty	Ref	Description	Part #	Qty
1	Holder	001-4435NCX	1	11	Fitting	003-A1412	3
2	Shield	001-4435NSX	1	12	Lynch Pin	008-4576	2
3	Hose-1/2”	002-9001	4 ft	13	Manifold Block	001-4435NSB	2
4	Tip-Yellow	004-T8005-PT	2	14	Fitting	003-F14	1
5	Tip-Red	004-T8003-PT	2	15	Leg Ext-Short Chamber	001-6707MX	2
6	Tip-Brown	004-T80015-PT	2		(Included in 4532B Kits Only)		
7	Tip-Pink	004-T8001-PT	2				
8	Check Valve	004-1207V	1	NP	Strainer	004-1203-100	1
9	Fitting	003-A1412F	1				
10	Hose Clamp	003-9003	4				



Harvest Tec Model 4535 and 4536 Installation Kit
(4536 pictured)
(4535 has shorter EVA tube between Manifold Blocks)



Ref	Description	Part #	Qty	Ref	Description	Part #	Qty
1	Shield	001-4435NSX	1	11	Tip-Yellow	004-T8005-PT	2
2	Holder	001-4435NC	1	12	Tip-Pink	004-T8001-PT	2
3	Hose – 1/2”	002-9001	4 ft	13	Lynch Pin	006-4576	2
4	Plano Box	008-9001	1	14	Fitting	003-F14	1
5	Strainer	004-1203-100	1	15	Manifold Block	001-4435NSB	2
6	Check Valve	004-1207V	2	16	Fitting	003-A1412	3
7	Fitting	003-A1412F	1				
8	Hose Clamp	003-9003	4				
9	Tip-Red	004-T8003-PT	2				
10	Tip-Brown	004-T80015-PT	2				

***Purchase common hardware locally**

NOTES:

NOTES:

Harvest Tec Inc. Warranty and Liability Agreement

Harvest Tec, Inc. will repair or replace components that are found to be defective within 12 months from the date of manufacture. Under no circumstances does this warranty cover any components which in the opinion of Harvest Tec, Inc. have been subjected to negligent use, misuse, alteration, accident, or if repairs have been made with parts other than those manufactured and obtainable from Harvest Tec, Inc.

Our obligation under this warranty is limited to repairing or replacing free of charge to the original purchaser any part that in our judgment shows evidence of defective or improper workmanship, provided the part is returned to Harvest Tec, Inc. within 30 days of the failure. If it is determined that a non-Harvest Tec branded hay preservative has been used inside the Harvest Tec applicator system where the failure occurred, then Harvest Tec reserves the right to deny the warranty request at their discretion. Parts must be returned through the selling dealer and distributor, transportation charges prepaid.

This warranty shall not be interpreted to render Harvest Tec, Inc. liable for injury or damages of any kind, direct, consequential, or contingent, to persons or property. Furthermore, this warranty does not extend to loss of crop, losses caused by delays or any expense prospective profits or for any other reason. Harvest Tec, Inc. shall not be liable for any recovery greater in amount than the cost or repair of defects in workmanship.

There are no warranties, either expressed or implied, of merchantability or fitness for particular purpose intended or fitness for any other reason.

This warranty cannot guarantee that existing conditions beyond the control of Harvest Tec, Inc. will not affect our ability to obtain materials or manufacture necessary replacement parts.

Harvest Tec, Inc. reserves the right to make design changes, improve design, or change specifications, at any time without any contingent obligation to purchasers of machines and parts previously sold.

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