

OWNER'S MANUAL

Model 436 *25 Gallon Preservative Applicators*

HARVEST
TEC *Equipment and Products
for Quality Hay.™*

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Congratulations on purchasing a Harvest Tec Model 436 applicator. This applicator is designed to apply Harvest Tec buffered acid. The model 436 base kit includes the following parts: tank, frame, pump, gauge, hose, electronic control box, and miscellaneous hardware. For your convenience we have included a parts break down for the model 436 applicator. If something goes wrong bring this manual into the dealer so they can order the correct parts for you. Ordering the correct part number is very important. It will save you time, money, and your crop.

REFERENCE CHART

BALER MAKE	BALER MODEL	INSTALLATION KIT
Kuhn	VB 2160 & VB 2190	030-0436-SO

TOOLS NEEDED

For installation of this applicator, the following tools will be required:

- Standard wrench set
- Standard socket set
- Standard screw driver or 5/16" nut driver
- Side cutter
- Hose cutter
- Crescent wrench
- Hammer

INSTALLATION OF APPLICATOR

1. INSTALLATION OF MOUNTING BRACKETS, TANK, AND DRAIN/FILL LINE

Locate tank saddle legs (001-4442K & 001-4442D) as shown in figure 1. Fasten leg 001-4442D to 001-4442K with two 3/8 x 1 1/4" bolts, locks, flats, and nuts at point A.

Secure 001-4442K to the baler using a 3/8 x 1 1/4" bolt, flat, and nut through the existing hole shown at point B on figure 2. Allow the gusset flange lip to rest on top of the baler tongue. Clamp both legs to secure bracket to baler and drill six 9/16" on 001-4442K and two 9/16" holes on 001-4442D, using the bracket as a guide. Secure the legs to the baler frame with eight 1/2 X 1 1/4" bolts, locks, flats, and nuts. Tighten all hardware.

Locate the legs support bracket (001-4442E). Fasten the support to the baler, in the existing holes, as shown at point C in figure 3. Use two 5/16 x 1" bolts, flats, locks and nuts. Tighten all hardware.

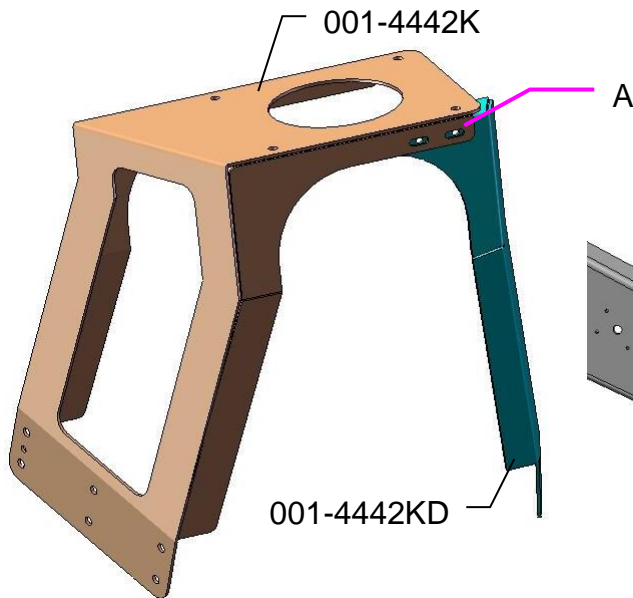


Figure 1

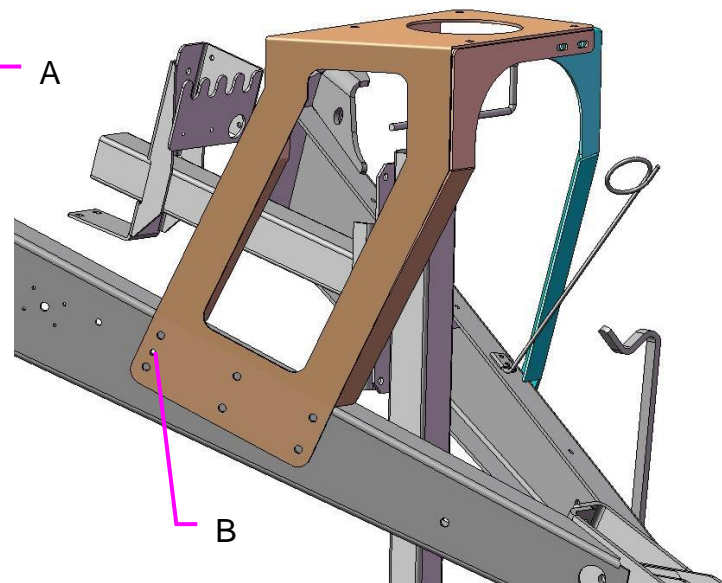


Figure 2

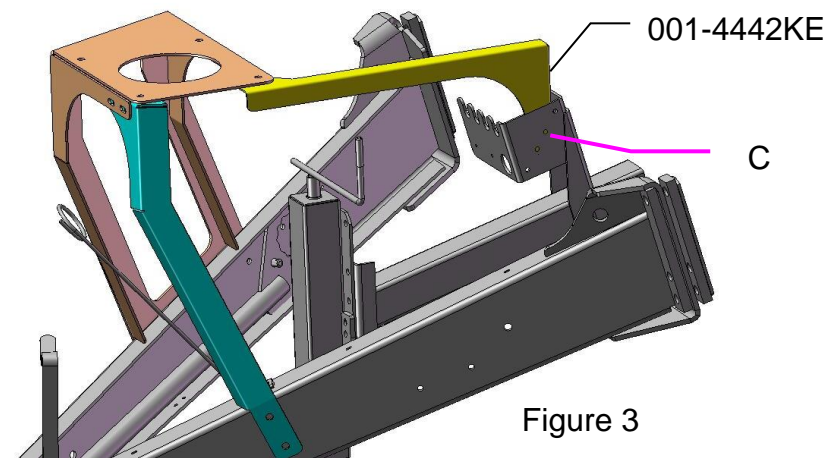


Figure 3

INSTALLATION OF MOUNTING BRACKETS, TANK, AND DRAIN/FILL LINE

Locate the tank and saddle assembly. Position the tank and saddle so that the side tank fitting is towards the right side of the baler. The additional two weld-nuts on the saddle will then be facing forward as shown in point E on figure 4. Fasten the tank saddle to the frame using four 1/2 x 1 1/4" bolts, locks, flats, and nuts. Tighten all hardware.

Locate the pump plate assembly. Remove the four flange bolts holding the two pieces of the pump plate together. Mount the pump plate mounting bracket (001-4646C) as shown below point E in figure 5. Attach the bracket to the saddle using two 3/8 x 1" bolts, locks, and flat washers. Tighten all hardware. Attach the remaining half of the pump and secure with the four 3/8 x 3/4" flange bolts.

Locate the drain/fill 3/4" hose, 3/4" elbow, 3/4" straight fitting, valve, quick coupler and mounting bracket. Thread 3/4" elbow fitting (#003-EL3434) into side tank fitting. Run 3/4" hose from the elbow down the frame to the bottom of the baler. Drill 1/4" holes to accept the valve holder bracket and use 5/16" x 1 1/4" self-tapping screws. Connect valve assembly to other end of hose. Place hose clamps on both ends.

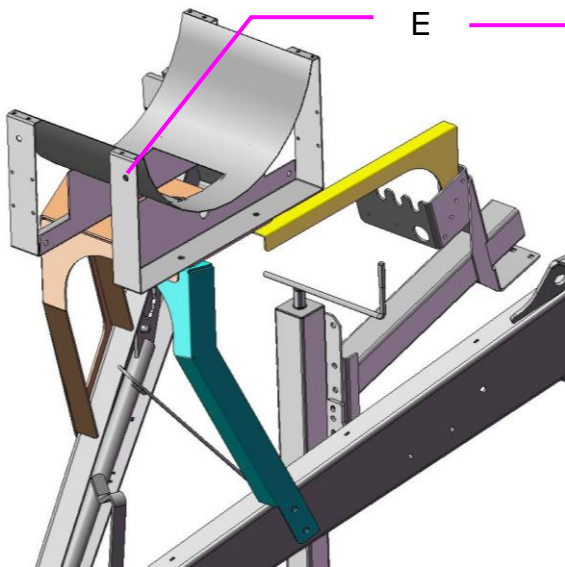


Figure 4

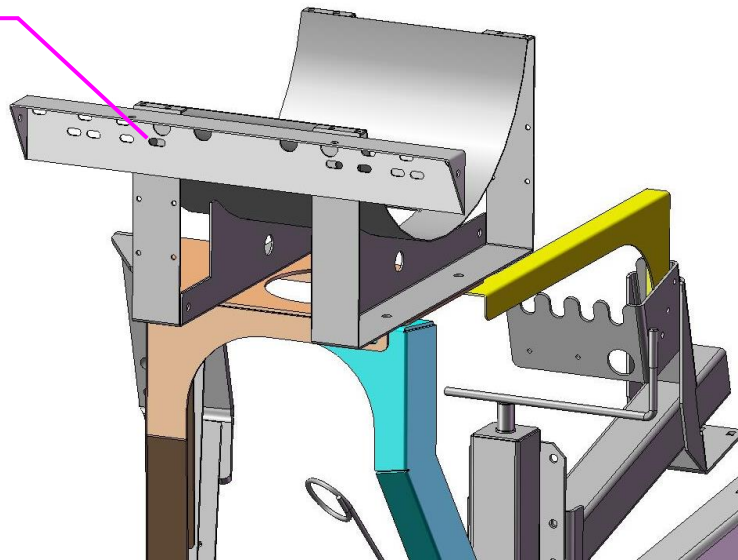


Figure 5

2. PLACEMENT OF SPRAY NOZZLE ASSEMBLY

Locate the spray shield holder (001-4704E2) and spray shield (001-4703GK). Center the spray shield holder over the rotor. Clamp the bracket and drill two 7/16" holes point F on figure 6. Secure the bracket using two 3/8 x 1 1/4 bolts, locks, flats, and nuts. Tighten all hardware. Install the shield and secure using the two lynch pins (008-4576).

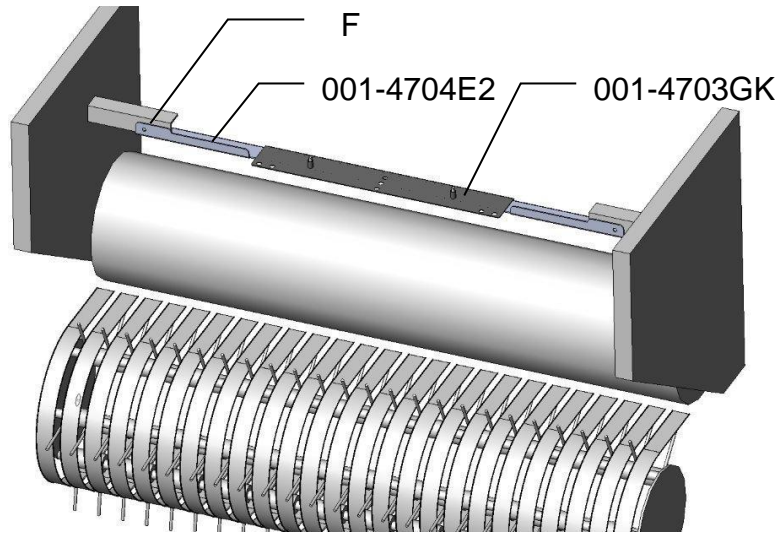


Figure 6

3. INSTALLATION OF HOSES AND GAUGE

Mount the gauge to the tank frame or the frame of the baler. If you mount the gauge to the baler make sure it does not interfere with any of the baler's operation, or be in an area where it could be tripped over when servicing the baler. Connect the hose between the pump and the gauge. Run the plumbing from the gauge to the check valve on the spray shield. Connect the disconnect to the end of the hose from the gauge and to the check valve. The line will be routed along the front sheeting of the baler next to the bale size indicator. Secure to baler using the padded jiffy clips provided. They will be secured with two of the carriage bolts used on the baler's sheet metal. Use hose clamps on all connections.

4. INSTALLATION OF CONTROLS

APPLY RATE DECAL

Apply the rate decal that came in the bag with this book and place it just to the right of the speed dial.

LOCATION OF CONTROL BOX

Locate the control where it can be easily reached from the tractor's seat. Adjustments for baling speed and windrow conditions can be made as the baler is operated.

WIRING

Route the wire to the starter solenoid on all 12v tractors. Connect the green lead marked + to the hot terminal on the starter. Connect the black lead to a good ground. **DO NOT REVERSE THE LEADS.** Be sure to use a voltmeter to verify that you do have 12 volts running to the box.

NOTE: For tractors with 24v starters, connect the power leads to the tractor's right hand battery. Do not connect the leads to the starter. Connect the lead marked + to the positive battery terminal and the lead marked - to the negative on the battery. Wiring connections to the battery normally results in corrosion; terminal coating is recommended.

CAUTION: Do not run a pump or use an electronic control box directly off a battery charger. For stationary use, the applicator can be connected to a new battery and the battery connected to a charger.

OPERATION

The 436 applicator is very simple to operate. After installing the applicator, fill the tank with 5 gallons of water. With control box connected to the applicator and the power cord hooked to the 12-volt battery we can start the test. First flip on the toggle switch. You might hear the buzzing of the motor. Turn the dial on the control box until the 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. Using water in this step instead of chemical will save you from wasting chemical and making a mess if leaks are found. When you are comfortable with the operation of the controls you can set the applicator to the amount of chemical you would like it to put on.

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.

CALIBRATION

There are three things that you need to know when calibrating your applicator. First you need know how many tons per hour you bale. Second you need to know the rate, or how many pounds of product to apply for a given ton per hour. Finally you need to know what tips to use and at what pressure to set the gauge.

DETERMINING TONS PER HOUR

Round Balers

1. Time 3 bales and average the time it takes to make a bale. Don't include tying time.
2. Estimate the weight of the bale.
3. Use the bale rate chart below to determine the tons you are baling per hour.

Example: You made 3 round bales and it took you an average of 2 minutes a piece to bale each of them. Your baler's operator manual tells you that an average bale made by your machine weighs 1000lb. (Remember if the hay is dry it will weigh less and if the hay is wet it will weigh more.) Using the chart on the following page, cross-reference 2 minutes with 1000lbs and you will come up with 14 ton per hour.

ROUND BALE RATE CHART (TONS PER HOUR)

AVERAGE TIME TO MAKE A BALE	WEIGHT PER BALE						
	600#	800#	1000#	1200#	1400#	1600#	1800#
1 Min.	18	24	30	36	42	48	54
1.5 Min.	12	16	20	24	28	32	36
2 Min.	9	12	14	18	21	24	27
2.5 Min.	7	10	12	14	17	19	22
3 Min.	6	8	10	12	14	16	18
4 Min.	5	6	8	9	10	12	14
5 Min.	4	5	6	7	8	9	11
6 Min.	3	4	5	6	7	8	9
8 Min.	3	3	4	5	5	6	7
10 Min.	2	3	3	4	4	5	6

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. The wetter the hay the more product is needed, the dryer the hay the less product is needed. 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 the red, green, and blue sets of 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 12.5 tons per hour with your round baler. The moisture that you are baling at requires you to apply 8 pounds per ton. Multiply the 12.5 tons x 8lbs. = 100lbs per hour. Using the chart (lbs/hr) on the following page, you will notice the red set of tips at 35 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 CHART IN POUNDS PER HOUR

Use the following chart for all applications that require pounds measurements.

POUNDS PER HOUR WITH THREE NOZZLES

PSI	YELLOW 650067 650033	INCLUDED IN KIT			BLACK XR11004 6503	CENTER OUTSIDE
		RED XR11001 650050	GREEN XR110015 6501	BLUE XR11002 6502		
		15	53	64		
20	63	76	133	228	380	
25	70	84	147	252	420	
30	77	92	161	276	460	
35	84	100	175	300	N/A	
40	89	106	186	318	N/A	
45	94	112	196	336	N/A	
50	97	116	203	348	N/A	
55	102	122	214	366	N/A	
60	107	128	224	384	N/A	

GENERAL CALIBRATION CHART IN GALLONS PER HOUR

Use the following chart for all applications that require volume measurements.

GALLONS PER HOUR WITH THREE NOZZLES

PSI	YELLOW 650067 650033	INCLUDED IN KIT			BLACK XR11004 6503	CENTER OUTSIDE
		RED XR11001 650050	GREEN XR110015 6501	BLUE XR11002 6502		
		15	5.2	7.3		
20	5.6	8.4	15.1	24.1	42.2	
25	6.3	9.5	16.7	28.3	47.3	
30	7.0	10.6	18.6	31.0	52.2	
35	7.5	11.3	19.7	33.5	N/A	
40	8.0	12.0	21.0	36.0	N/A	
45	8.4	12.6	22.3	38.3	N/A	
50	8.9	13.2	23.6	40.7	N/A	
55	9.3	13.8	24.5	42.5	N/A	
60	9.7	14.4	25.6	44.4	N/A	

ROUTINE MAINTENANCE

1. **Clean the tip strainers and main strainer** every 10 hours of operation or more frequently if required.
2. 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.
3. Although the pump can run dry, extended operation of a dry pump will increase wear. Watch the preservative level in the tank.
4. Cover the electronic cab control box on open station tractors if left outside.
5. Pump performance may start to decline after 400 hours of use. Rebuilding the pump is a simple procedure if the motor is not damaged. Order pump rebuilding kit #007-4581.
6. If you are using bacterial inoculants, flush out system daily after each use.
7. Clean tank cap breather every 20 hrs or more frequently if required.

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, or anytime the pump is frozen, turn off the power immediately to avoid burning the motor out. The pump head can be disassembled and freed or rebuilt in most cases.

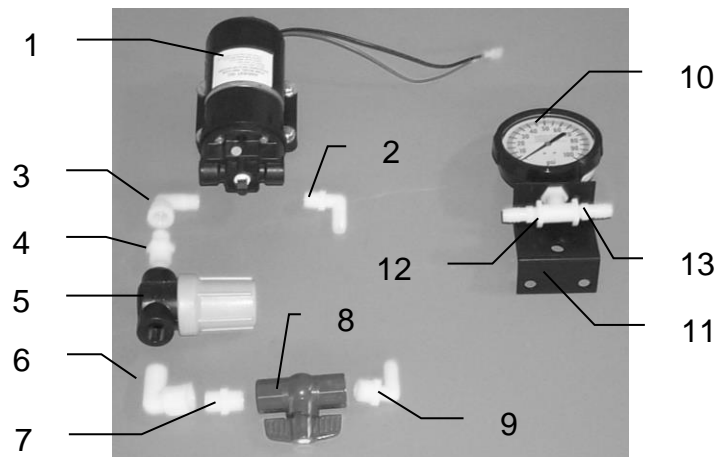
TROUBLE SHOOTING CHECKS

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.
	4. Vapor locked.	4. Loosen hose by check valve at spray shield and bleed air.
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.
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.

HARVEST TEC MODEL 436 BASE KIT

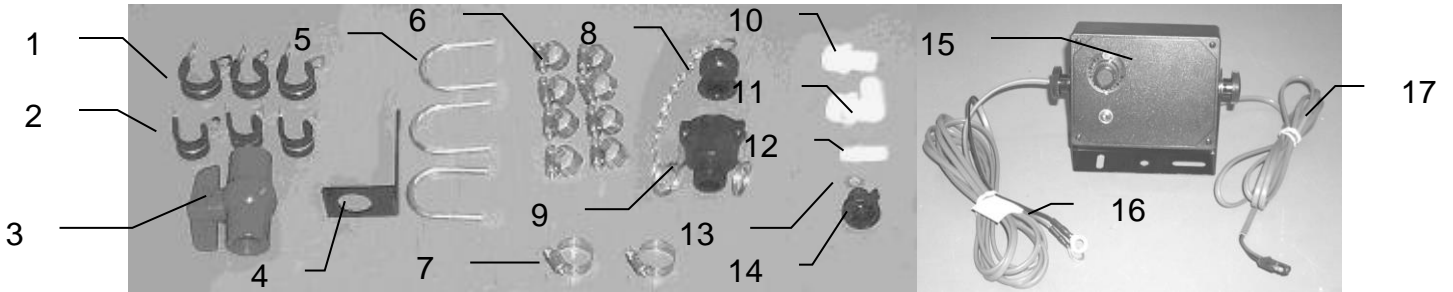


<u>Ref#</u>	<u>Description</u>	<u>Part #</u>	<u>Qty</u>	<u>Ref#</u>	<u>Description</u>	<u>Part #</u>	<u>Qty</u>
1	Tank Cap	005-9022C	1	5	Tank Fitting	005-9100	1
	Tank Cap Gasket	005-9022CG	1	6	Tank mount bracket	001-4442K	1
2	Tank Strap	001-4402	2	7	Tank support	001-4442KD	1
3	Tank	005-9022	1	8	Mounting support	001-4442KE	1
4	Saddle	001-4442	1				



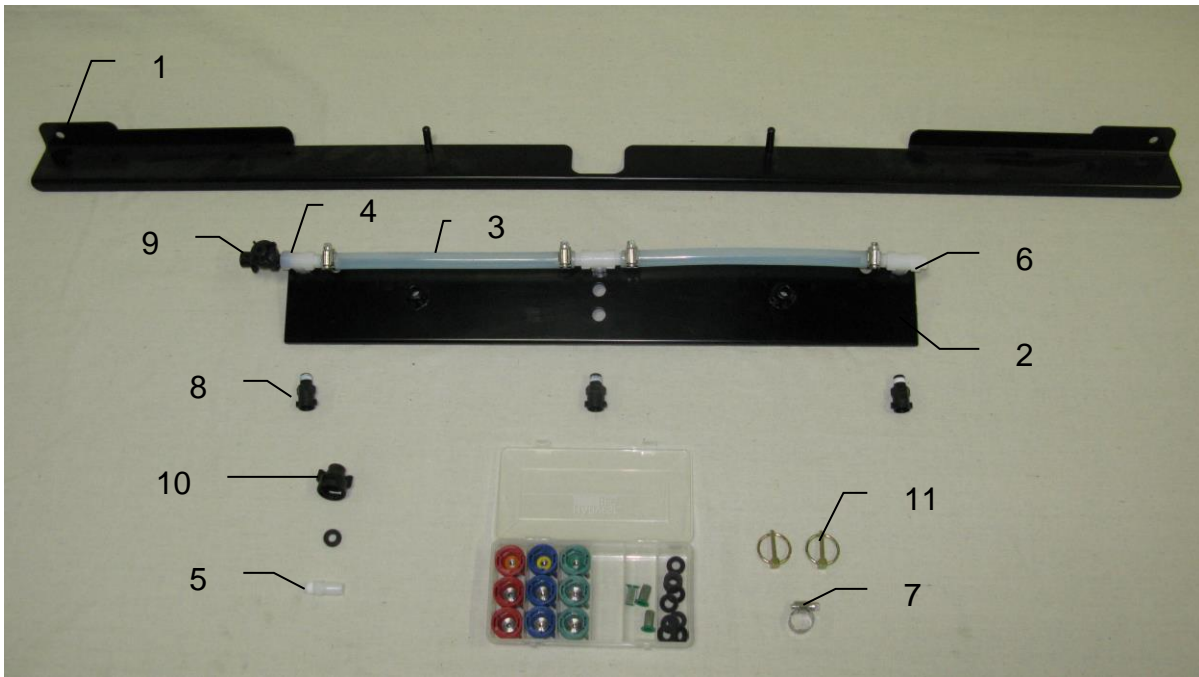
<u>Ref</u>	<u>Description</u>	<u>Part #</u>	<u>Qty</u>	<u>Ref</u>	<u>Description</u>	<u>Part #</u>	<u>Qty</u>
1	Pump	007-4120S	1	8	Ball valve	002-2212	1
2	Elbow fitting	003-EL3812	1	9	Elbow fitting	003-EL1212	1
3	Street elbow	003-SE38	1	10	Gauge	002-2208Z	1
4	Nipple fitting	003-M1238	1	11	Gauge bracket	001-4717	1
5	Filter bowl assembly	002-4315	1	12	Tee	003-TT14	1
6	Street elbow	003-SE12	1	13	Straight fitting	003-A1412	2
7	Nipple fitting	003-M1212	1				

MODEL 436 DRAIN/FILL KIT, & CONTROL BOX



<u>Ref</u>	<u>Description</u>	<u>Part #</u>	<u>Qty</u>	<u>Ref</u>	<u>Description</u>	<u>Part #</u>	<u>Qty</u>
1	Jiffy clip-large	008-9009	3	9	Female coupler	002-2204A	1
2	Jiffy clip-small	008-9010	3	10	Straight fitting	003-A3434	1
3	Ball valve	002-2200	1	11	Elbow fitting	003-EL3434	1
4	Valve bracket	001-6702H	1	12	Straight fitting	003-A1412	1
5	U-bolt – small	001-4714UBS	2	13	Washer	004-1207W	1
	U-bolt – large	001-4714UBL	1	14	Female disconnect	004-1207H	1
6	Hose clamp	003-9003	8	15	Control box	030-0457	1
7	Hose clamp	003-9004	2	16	Power harness	006-4580C	1
8	Male shut-off	002-2205G	1	17	Pump harness	006-4583	1

INSTALLATION KIT



<u>Ref</u>	<u>Description</u>	<u>Part #</u>	<u>Qty</u>	<u>Description</u>	<u>Part #</u>	<u>Qty</u>
1	Shield bracket	001-4704E2	1	Tip Kit (Complete)	030-9002	1
2	Spray shield	001-4703GK	1	Plastic Box	008-9000	1
3	Hose	002-9001	3	Red Cap	004-1207B	3
4	Tee	003-TT14	3	Outside Tip (Red Set)	004-650050-SS	2
5	Straight fitting	003-A1412	5	Inside Tip (Red Set)	004-XR11001VS	1
6	Plug	003-F14	1	Green Cap	004-1207A	3
7	Hose clamp	003-9003	5	Outside Tip (Green Set)	004-6501-SS	2
8	Male quick fitting	004-4710	3	Inside Tip (Green Set)	004-XR110015VS	1
9	Check valve	004-1207V	1	Blue Cap	004-1207C	3
10	Female disconnect	004-1207H	1	Outside Tip (Blue Set)	004-6502-SS	2
11	Lynch pin	008-4576	2	Inside Tip (Blue Set)	004-XR11002VS	1
				Tip strainer	004-1203-100	3
				Washer	004-1207W	9

Harvest Tec, LLC. Warranty and Liability Agreement.

Harvest Tec, LLC. 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, LLC. 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, LLC.

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, LLC. within 30 days of the failure. Parts must be returned through the selling dealer and distributor, transportation charges prepaid.

This warranty shall not be interpreted to render Harvest Tec, LLC. 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, LLC. 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, LLC. will not affect our ability to obtain materials or manufacture necessary replacement parts.

Harvest Tec, LLC. 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.

Note: The warranty registration card supplied with the installation manual must be filled out and returned to the manufacturer within fifteen days of purchase. Without record of receipt of warranty registration at the manufacturer, the warranty is not valid.

Revised 5/22

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