

# OWNER'S MANUAL

***Model 442-M***  
***25 Gallon & 55 Gallon (100 & 220 Litre)***  
***for Case IH RB, RBX & New Holland BR***

#010-0442M

**Rev 01-08**

# HARVEST TEC 442 MANUAL INDEX

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The Harvest Tec **Model 442** applicator is designed to apply buffered acid-based hay preservatives. It can also be used to apply water-soluble inoculants, but must be flushed on a regular basis when applying these types of products. There are two models of the 442, a 25-gallon (100 litre) version and a 55- gallon (220 litre) version. Before installation, make sure you have the correct version for your baler:

## REFERENCE CHART

<u>BALER MODEL</u>	<u>HARVEST TEC MODEL</u>
<b>CASE IH</b>	
RBX 452 & 453	447-25 GALLON (100 litre)
RB 454	447-25 GALLON (100 litre)
RBX 462 & 463	447-25 GALLON (100 litre)
RB 464	447-25 GALLON (100 litre)
RBX 552 & 553	447-55 GALLON (220 litre)
RB 554	447-55 GALLON (220 litre)
RBX 562 & 563	447-55 GALLON (220 litre)
RB 564	447-55 GALLON (220 litre)
<b>NEW HOLLAND</b>	
BR740 & 740A	447-25 GALLON (100 litre)
BR 7060	447-25 GALLON (100 litre)
BR750 & 750A	447-25 GALLON (100 litre)
BR 7070	447-25 GALLON (100 litre)
BR770 & 770A	447-55 GALLON (220 litre)
BR 7080	447-55 GALLON (220 litre)
BR780 & 780 A	447-55 GALLON (220 litre)
BR 7090	447-55 GALLON (220 litre)

## TOOLS NEEDED

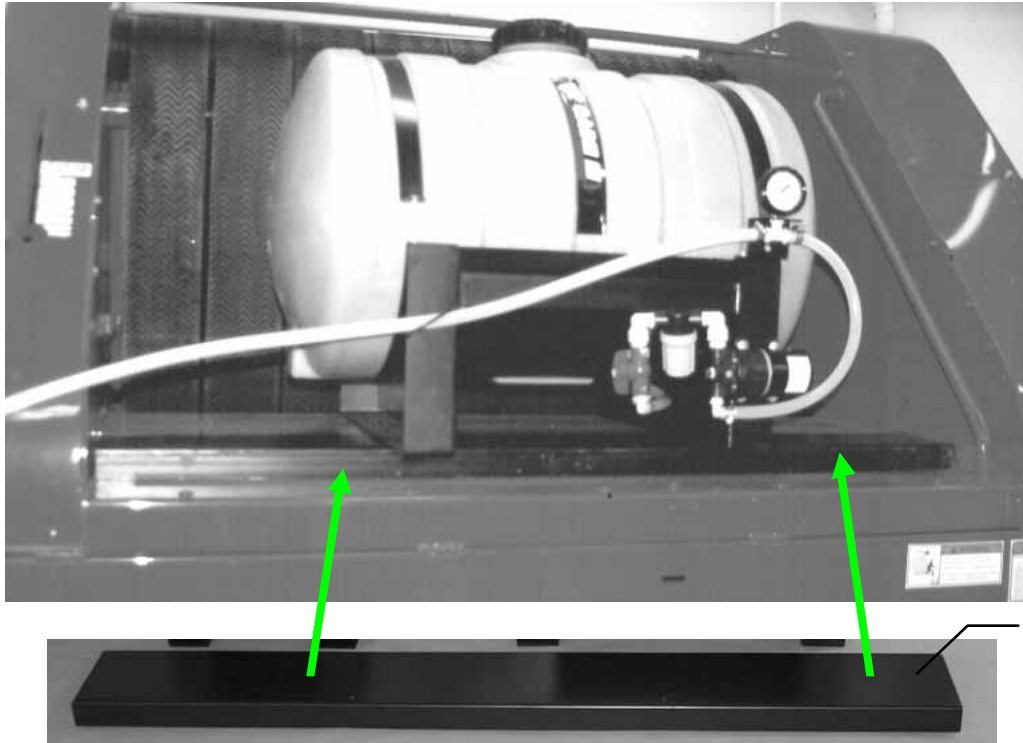
For installation of this applicator, the following tools will be required:

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

## INSTALLTION OF CROSS SUPPORT

### For 55 Gallon Models Only

Locate the cross support on the front shelf of the baler as pictured below. It will butt up against the step-up on the shelf and line up flush with its upper surface. Mark and drill a 9/16" hole on each side sheet to hold the cross piece in place with two 1/2" by 1 1/4" bolts and secure with lock washers, fender washers, and nuts provided.



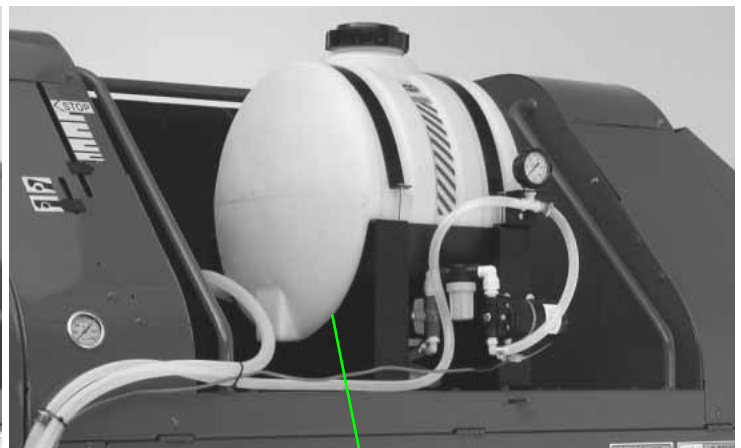
## INSTALLATION OF APPLICATOR

### For 25 and 55 Gallon Models

Locate the tank and frame on the shelf. Center it from side to side. On 55-gallon models, the tank positioning going from front to back is set by lining up the front base holes with the holes in the cross support. On 25-gallon models, line up the front tank legs with the front corner of the baler's shelf. Mark and drill all base holes with a 9/16" drill. Use the 1/2" by 1 1/4" bolts, lock washers, fender washers, and nuts provided to secure the frame.



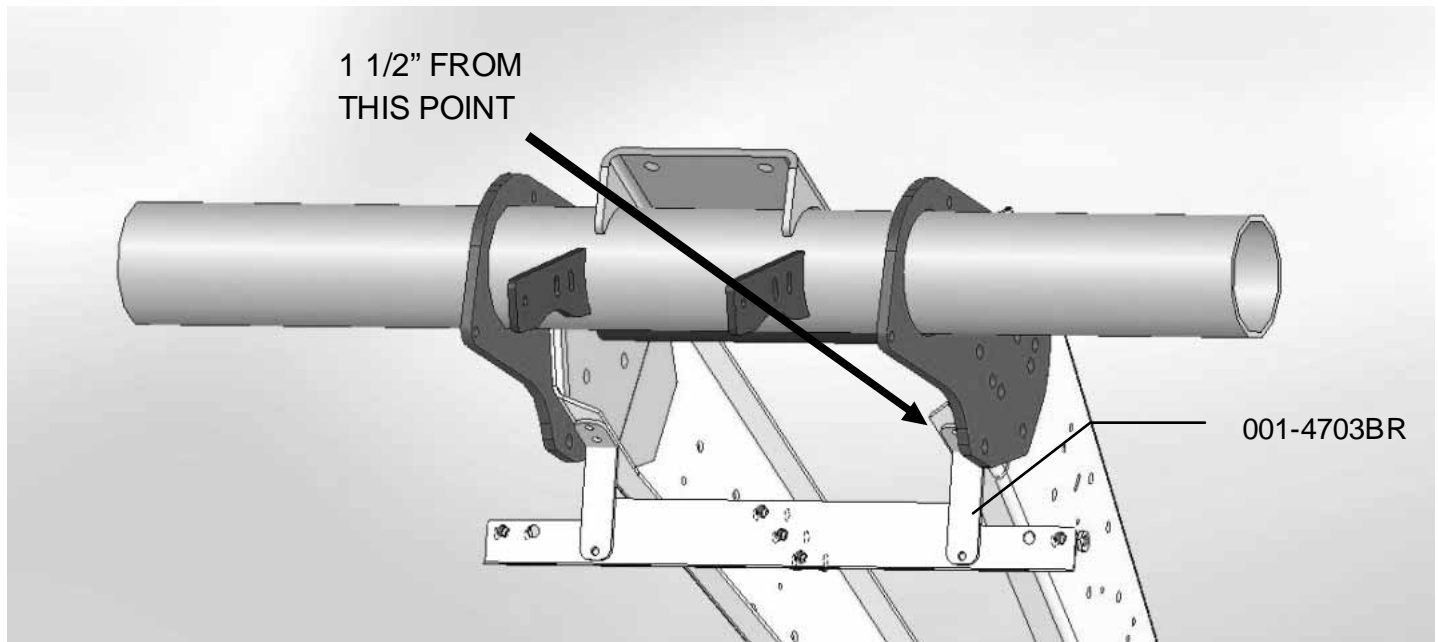
55-Gallon System



25-Gallon System

## INSTALLATION OF SPRAY SHIELD ASSEMBLY

Locate the two 001-4703BR spray shield hangers and attach them to the 001-4810B spray shield using the supplied lynch pins. Place the assembled spray shield in the indicated position under the drawbar and locate the end of the hanger 1 1/2" from the inside edge of the frame. Mark the four holes, remove the spray shield assembly and drill using a 3/8" drill bit. Reassemble using the four included 5/16 x 1 1/2 bolts, washers, locks and nuts.



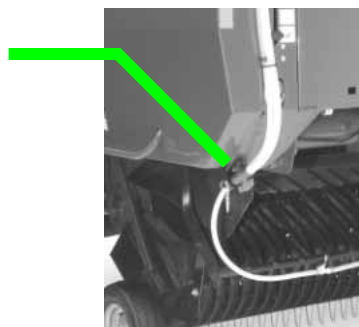
## INSTALLATION OF HOSES AND GAUGE

On the 55 gallon unit connect the 1/2" hose between the tank and the intake side to the pump/filter side. 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 right hand nozzle. The line will be routed along the front sheeting of the baler next to the bale size indicator. Secure with padded jiffy clips using the padded jiffy clips provided. They will be secured with two of the carriage bolts used on the baler's sheet metal. Run the line to the center and left-hand nozzle. Use hose clamps on all connections.

## INSTALLATION OF FILL VALVE

Locate the fill valve bracket and quick coupler on the right hand side of the baler. Bolt it to the sheet metal above the pick-up using the corner bolt of the sheet metal. Route the line into side fitting at the right hand of the tank. Secure the transfer line to nozzle line using the black ties and padded jiffy clips provided. Use the larger hose clamps provided at both ends.

Valve  
bracket  
and quick  
coupler



## INSTALLTION OF WIRING

Run the wiring down the right hand side of the baler with the plumbing lines and into the hitch. It will meet up with the harness from the cab control at the draw bar.

## INSTALLATION OF CONTROLS

### A. APPLY RATE DECAL

Apply rate decal that came with your installation kit just to the right of the speed dial.

### B. LOCATION OF CONTROL BOX

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

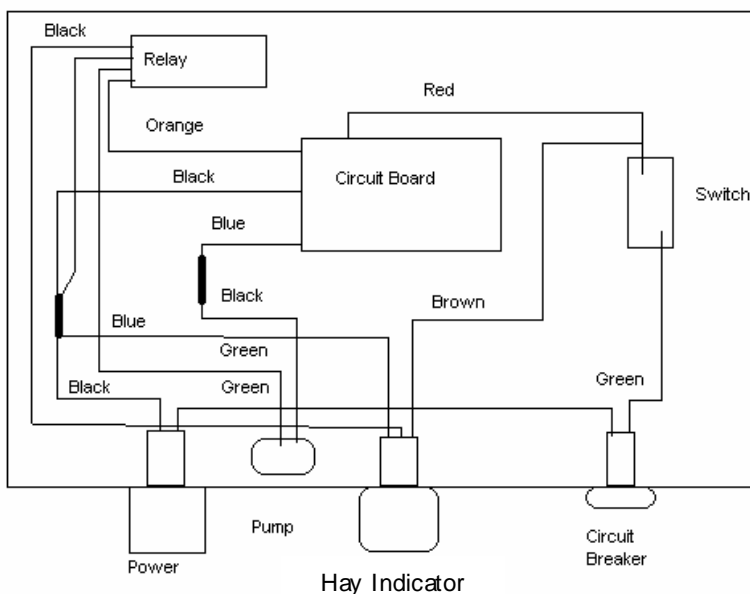
### C. WIRING

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. CONNECTION OF THE GROUND-LEAD TO A HOT TERMINAL ON THE TRACTOR WILL TRIP THE CIRCUIT BREAKER.** Be sure to use a voltmeter to verify that you do have 12 volts running to the box.

**NOTE:** For tractors with 24v starters (most John Deere 3020 and 4020 diesels,) 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.

## 457 Wiring Diagram

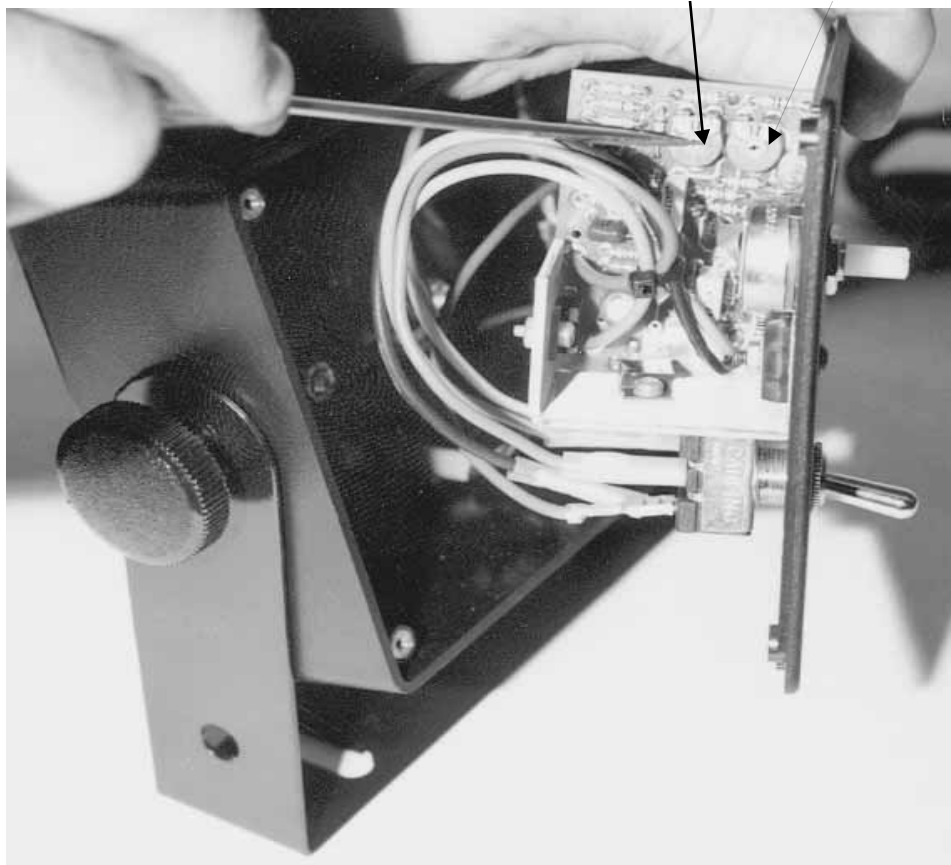


### Relay wiring order :

- 1-Blue
- 2-Black
- 3-Orange
- 4-Green
- 5-Not used

### Hay Indicator wiring order :

- 1-Brown
- 2-Blue
- 3-Black
- 4-White (not used)



#### D. BOX ADJUSTMENT

Electronic units control application rate by regulating pump speed. The control box is factory set, but from time to time may require readjustment. First **TURN OFF POWER**. Second, remove the control box cover. Lastly, turn the power back on and make the following adjustments:

1. **MAXIMUM OUTPUT:** Can be adjusted with the right-hand adjusting dial. Clockwise adjustment will increase output. With speed dial turned up do not exceed **90 PSI** during operation.
2. **MINIMUM OUTPUT:** Set with red tips in and control all the way down. Adjust with the left hand adjusting dial. Counter-clock wise adjustment will decrease output. Set to **10 PSI** at low end. Make adjustments with a small screwdriver. The settings are sensitive and only a small amount of adjustment turn is required.

## OPERATION

The 442 applicator is very simple to operate. After installing the applicator, fill the tank with 5 gallons (20 litres) 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.

## CALIBRATION

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

## DETERMINING TONNES PER HOUR

### Round Balers

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 on the next page to determine the tonnes 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 550 kg. (Remember if the hay is dry it will weigh less and if the hay is wet it will weigh more.) Using the chart below, cross-reference 2 minutes with 550 kg. and you will come up with 17 tonnes per hour.

AVERAGE TIME TO MAKE A BALE (MIN)	WEIGHT PER BALE (KG)								
	250	350	450	550	650	750	850	950	1050
1	15	21	27	33	39	45	51	57	63
1.5	10	14	18	22	26	30	34	38	42
2	8	11	14	17	20	23	26	29	32
2.5	6	8	11	13	16	18	20	23	25
3	5	7	9	11	13	15	17	19	21
4	4	5	7	8	10	11	13	14	16
5	3	4	5	7	8	9	10	11	13
6	3	4	5	6	7	8	9	10	11
7	2	3	4	5	6	6	7	8	9
8	2	3	3	4	5	6	6	7	8
9	2	2	3	4	4	5	6	6	7
10	2	2	3	3	4	5	5	6	6

## **SELECTING TIPS AND SETTING PRESSURE**

Once you have determined your tonnes 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 tonnes 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 20 tonnes per hour with your round baler. The moisture that you are baling at requires you to apply 4 litres per tonne. Multiply the 20 tonnes x 4 litres = 80 litres per hour. Using the chart, litres per hour with three nozzles, on the following page, you will notice the green set of tips at 40 PSI will give you that output.

## **DETERMINING THE RATE OF CHEMICAL**

The number of litres of chemical required to be applied to a given tonne 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.

## **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 tonnes baled.

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

## LITRES PER HOUR WITH THREE NOZZLES

	<b>YELLOW SET</b>	<b>RED SET</b>	<b>GREEN SET</b>	<b>BLUE SET</b>	<b>BLACK SET</b>
CENTER	650067	XR11001	XR110015	XR11002	XR11004
OUTSIDE	650033	650050	6501	6502	6503
PSI	<hr/>				
15	19.7	27.6	48.8	83.3	120.7
20	21.2	31.8	57.2	91.2	159.7
25	23.8	36.0	63.2	107.1	179.0
30	26.5	40.1	70.4	117.3	197.6
35	28.4	42.8	74.6	126.8	N/A
40	30.3	45.4	79.5	136.3	N/A
45	31.8	47.7	84.4	145.0	N/A
50	33.7	50.0	89.3	154.0	N/A
55	35.2	52.2	92.7	160.9	N/A
60	36.7	54.5	96.9	168.1	N/A

## TROUBLE SHOOTING CHECKS

<u>PROBLEM</u>	<u>POSSIBLE CAUSE</u>	<u>SOLUTION</u>
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 gauge 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.

## 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

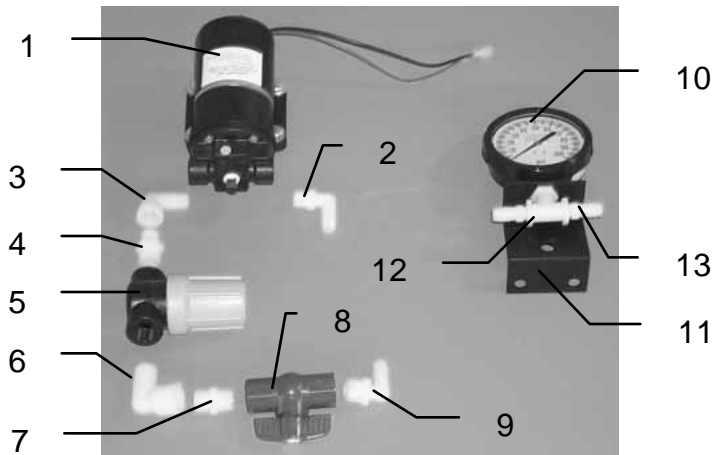
1. Thoroughly flush the system with water.
2. Remove the filter bowl and run dry until the water has cleared out of the intake side.
3. Remove the red plug from the bottom of the pump, drain, and run the pump for 30 seconds or until it is dry.
4. Drain all lines on the outlet side.
5. Never use oils 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.

# MODEL 442 BASE KIT

## 25 & 55 GALLON – ELECTRONIC CONTROL



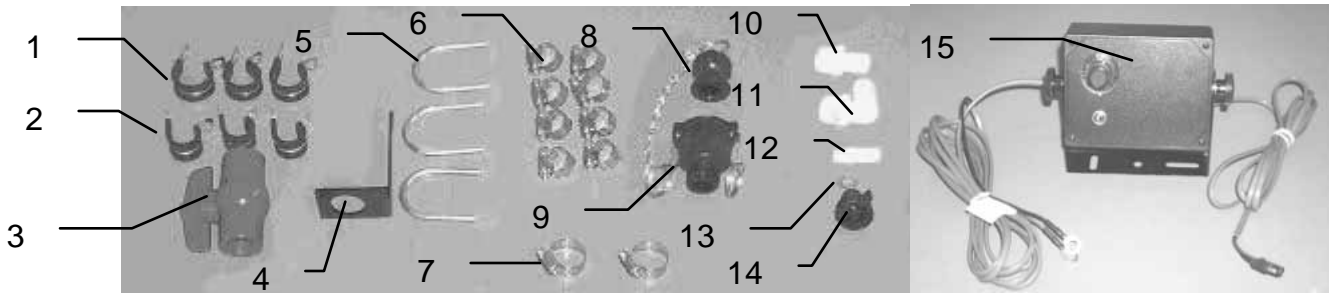
<u>Ref</u>	<u>Description</u>	<u>Part#</u>	<u>Qty</u>
1	25 gallon tank	005-9022	1
2	25 gallon saddle	001-4442	1
3	55 gallon tank	005-9203	1
4	55 gallon saddle	001-4445A	1
5	Cross support bracket (55 gallon only)	001-4445B	1
6	Tank strap	001-4402	2
7	Tank lid	005-9022C	1
	Tank lid gasket	005-9022CG	1
8	Tank fitting	005-9100	1



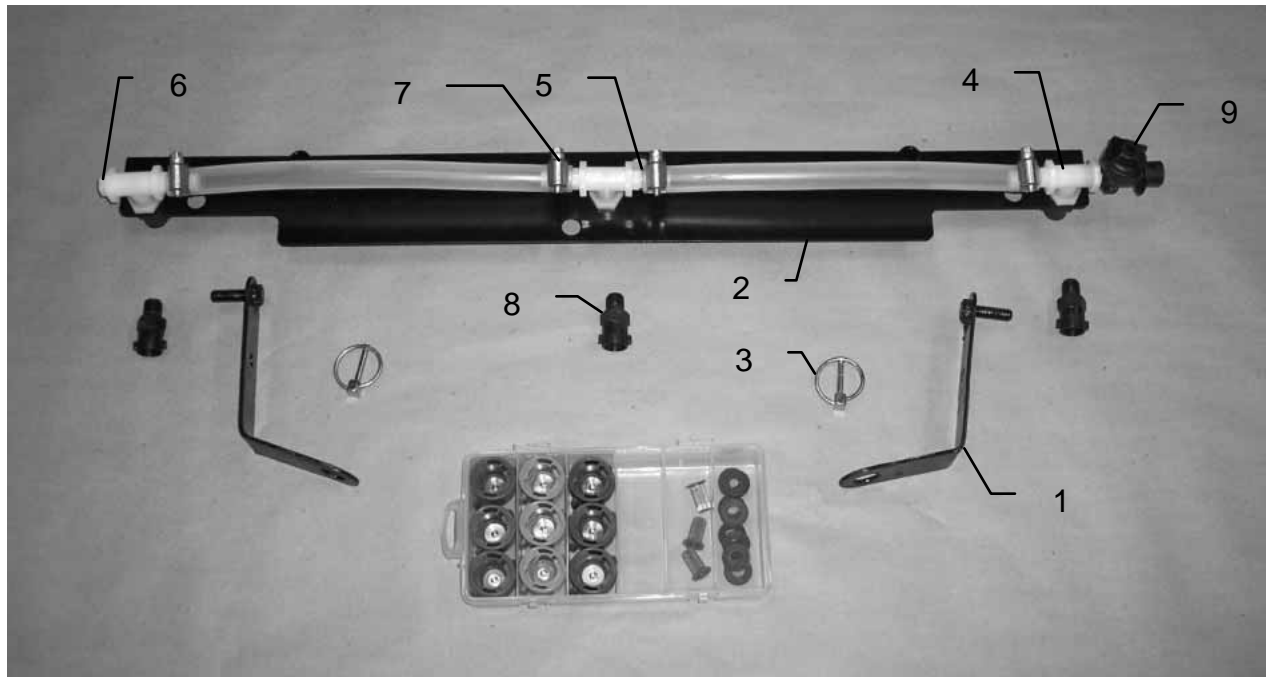
<u>Ref</u>	<u>Description</u>	<u>Part #</u>	<u>Qty</u>	<u>Ref</u>	<u>Description</u>	<u>Part #</u>	<u>Qty</u>
1	Pump	007-4120S	1	8	Ball valve	002-2212	1
2	Elbow fitting	003-EL3812	1	9	Elbow fitting	003-EL1212	1
3	Street elbow	003-SE38	1	10	Gauge	002-2208Z	1
4	Nipple fitting	003-M1238	1	11	Gauge bracket	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				

**\*Purchase common hardware locally**

# MODEL 442 DRAIN/FILL KIT, CONTROL BOX, & INSTALLATION 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	Jiffy clip-large	008-9009	3	8	Male shut-off	002-2205G	1
2	Jiffy clip-small	008-9010	3	9	Female coupler	002-2204A	1
3	Ball valve	002-2200	1	10	Straight fitting	003-A3434	1
4	Valve bracket	001-6702H	1	11	Elbow fitting	003-EL3434	1
5	U-bolt – small	001-4714UBS	2	12	Straight fitting	003-A1412	1
	U-bolt – large	001-4714UBL	1	13	Washer	004-1207W	1
6	Hose clamp	003-9003	8	14	Female disconnect	004-1207H	1
7	Hose clamp	003-9004	2	15	Control box**	030-0457	1



<u>Ref</u>	<u>Description</u>	<u>Part #</u>	<u>Qty</u>	<u>Description</u>	<u>Part #</u>	<u>Qty</u>
1	Shield bracket	001-4703BR	2	Tip Kit (Complete)	030-9002	1
2	Spray shield	001-4810B	1	Plastic Box	008-9000	1
3	Lynch pin	008-4576	2	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
				Outside Tip (Blue Set)	004-6502-SS	2
				Inside Tip (Blue Set)	004-XR11002VS	1
				Tip strainer	004-1203-100	3
				Washer	004-1207W	9

## NOTES:

## **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. 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.

Revised 01/03/06

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