

OWNER'S MANUAL

Model 458

5 Gallon Preservative Applicator

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

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#010-0458

REVISED 6/22

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Introduction

Thank you for purchasing a Harvest Tec 458 electronic applicator designed specifically for the application of hay preservative on conventional balers as well as round balers. By following these installation and operating instructions, the effectiveness of the hay preservative and the applicators life will be maximized. For applications of products other than hay preservative or the use of this applicator on implements other than hay balers, contact your dealer for further recommendations.

Step 1. Installation of Applicator's Main Frame on the Baler

Conventional Square Balers

The preferred location is on the top shield toward the baler's right hand side. Position the frame so that the four base mounting bolts can be reached from the under side of the top shield once they have been drilled. Locate the frame so that the product jug can easily be placed in the frame. On electronic units the pressure gauge may have to be rotated to be visible from the tractors seat. After making sure that the mounting holes are clear of moving parts, electrical and hydraulic lines, mark and drill the 3/8" holes. Use the supplied 5/16" bolts washers, locks and nuts to bolt the unit down.



Round Balers with Platforms

Some round balers have a platform that will allow you to mount the applicator just like the conventional balers. If there is, use the Conventional Square Balers Mounting instructions.



Round Balers without Platforms

If your round baler does not have a flat platform big enough for the applicators frame you will need to use the two triangle mounts. First locate a strong structural frame piece of the baler. This maybe the tongue of the baler or a support piece that runs up the front of the baler. Attach the triangle brackets to the machine so they are next to each other. After making sure that the mounting holes are clear of moving parts, electrical and hydraulic lines, mark and drill the four 3/8" holes. (Hardware not included). This will make a shelf that the applicator can sit on. Place the applicators main frame on the brackets and transfer the holes to the bottom of the main frame. Drill the holes in the main frame with a 3/8" drill. Attach the main frame to the triangle brackets with the included 5/16" bolts, washers, locks and nuts. On electronic units the pressure gauge may have to be rotated to be visible from the tractors seat.



Step 2. Location of the Spray Tips on the Baler

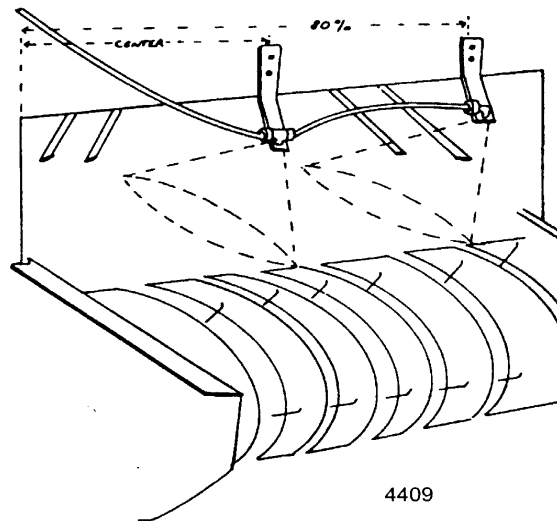
Nozzle holders are provided for each required spray tip: Locate the tips and adjust the direction of spray by bending the nozzle holders. Adjustable wrenches work well for this. Use the following guidelines for locating tips. (Note: 458's are shipped as a two nozzle set up. If your baler requires more you will need to order additional parts)

Conventional Square Balers

Mount the left hand nozzle. Locate the nozzle so that it is approximately 80% across the width of the pick-up head. Example: If the head is 60" wide, locate the nozzle 48" from the right side of the head ($60" \times 80\% = 48"$)

Bend the nozzle bar in so that the tip is pointed in toward the bottom of the gathering chamber and is about 16" above the sheet metal base of the chamber. Twist the nozzle so that the tip is tilted 45 degrees from horizontal.

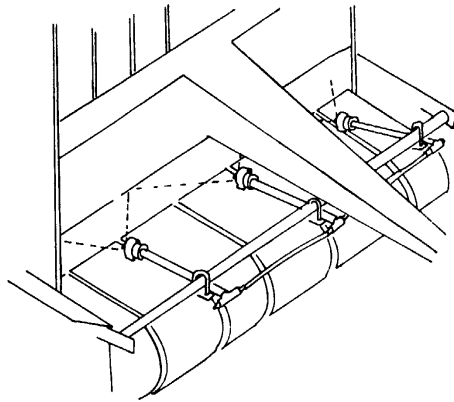
Mount the right hand nozzle. Locate the nozzle so that it is approximately centered on the pick-up head. Again, Bend the nozzle bar in so that the tip is pointed toward the bottom of the gathering chamber and the tip will be about 16" above the sheet metal base of the chamber. Twist the nozzles so that the tip is tilted 45 degrees from the horizontal.



Round Balers

On most Large Round balers the cross bar on the hay compressor above the pick-up head provides a mounting point by wrapping the nozzle holders around the bar. Space the nozzles by the following chart.

<u>Pick-Up Head Width</u>	<u>Left Side</u>	<u>Middle</u>	<u>Right</u>
48"	12" from left	Center	12" from right
60"	15" from left	Center	15" from right
72"	15" from left	Center	15" from right.



Bend the nozzle bars up so that the tip sprays in the generally horizontal direction and is pointed toward the intake rolls of the baler at the end of the pick-up head. The tips should be located so that they will be somewhere between 14" and 18" from the normal path of hay.

Step 3. Completion of the Plumbing.

Attach the 1/4" tubing between each nozzle strap and then run it to the discharge of the gauge. The hose connections are made by loosening the fitting nuts, sliding the hose into the fitting until it reaches the stop, and then tightening the nut. **TIGHTEN NUTS BY HAND ONLY!** After making a connection, test it by pulling firmly on the hose. If it releases, Cut a short section of the hose off and try again. Secure the line with the wraps and jiffy clips provided. Make sure tubing is clear from moving parts so it will not get caught in passing hay, or hydraulic lines that could melt the tubing.

Step 4. Location of the Controls and Wiring to the Implement.

A. Location of Control Box

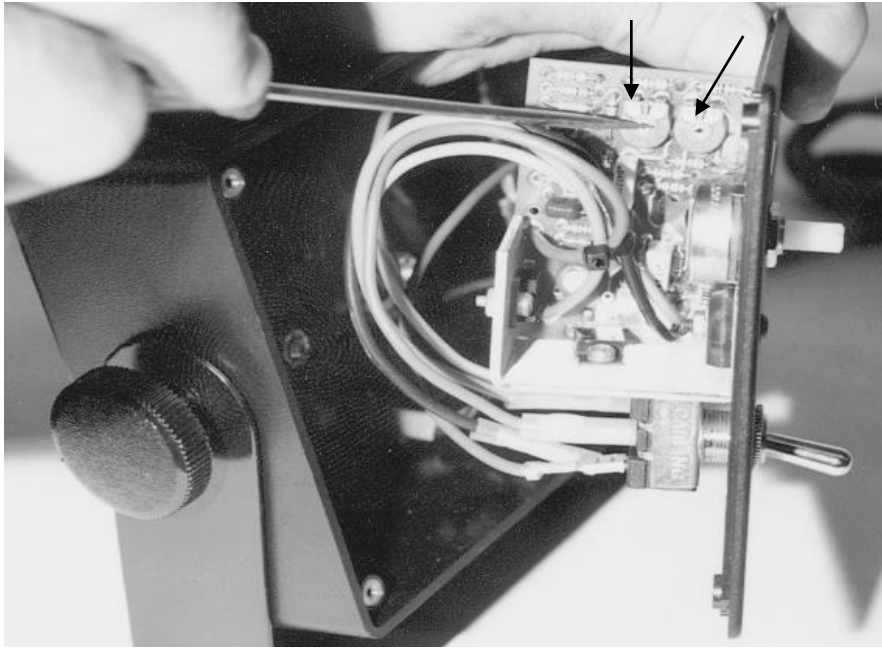
Locate the control where it can be easily reached from the tractor's seat. Adjustments for baling speed and windrow conditions can be made as the baler is operated.

B. 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.



C. 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

- 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.

Step 5. Operation

The 458 applicator is very simple to operate. After installing the applicator, fill a jug with 2 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.

Step 6. 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

Conventional Small Square

1. Bale for three minutes.
2. Count the number of bales made in those three minutes.
3. Weigh several bales to determine the average weight.
4. Use the bale rate chart on the following page to determine the tons you are baling per hour.

Example: You baled 11 bales in three minutes. After weighing some of the bales you found the average bale weight to be 55 lbs. Using the following chart cross reference 11 bales and 55lbs and you will find the rate to be 6.0

CONVENTIONAL BALE RATE CHART (TONS PER HOUR)

BALES MADE IN 3 MINUTES	WEIGHT PER BALE								
	40#	45#	50#	55#	60#	65#	70#	75#	80#
9	3.6	4.0	4.5	5.0	5.4	5.8	6.3	6.7	7.2
10	4.0	4.0	5.0	5.5	6.0	6.5	7.0	7.5	8.0
11	4.4	5.0	5.5	6.0	6.6	7.1	7.7	8.2	8.8
12	4.8	5.4	6.0	6.6	7.2	7.8	8.4	9.0	9.6
13	5.2	5.8	6.5	7.1	7.8	8.4	9.1	9.7	10.4
14	5.6	6.3	7.0	7.7	8.4	9.1	9.8	10.5	11.2
15	6.0	6.7	7.5	8.2	9.0	9.7	10.7	11.2	12.0
16	6.4	7.2	8.0	8.8	9.6	10.4	11.2	12.0	12.8
17	6.8	7.6	8.5	9.3	10.2	11.0	11.9	12.7	13.6
18	7.2	8.1	9.0	9.9	10.8	11.7	12.6	13.5	14.4
19	7.6	8.5	9.5	10.4	11.4	12.3	13.3	14.2	15.2
20	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0

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 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 1000lb. 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

DETERMINING 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 amount required, for a given hay moisture, refer to the label on the drum or contact the manufacture. Harvest Tec applicators come with three 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 FOR ROUND BALERS

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 22 tons per hour with your round baler. The moisture that you are baling at requires you to apply 8 pounds per ton. Multiply the 22 tons x 8lbs. = 176lbs. per hour. Using the chart, lbs/hr with three nozzles, you will notice the green 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!!!

SELECTING TIPS AND SETTING PRESSURE FOR CONVENTIONAL SQUARE

Once you have determined your tons per hour and the amount of chemical needed for the moisture you are applying at, you can select nozzles 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.
3. Connect the hose manifold's check valve to the coupler of the bank of nozzles that were selected. Place the caps on the remaining two couplers.
4. For the tips you have selected, you will need to keep the gauge at the recommended PSI to achieve the proper application rate.
5. 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 conventional square 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 with two nozzles, on page 20, you will notice the medium or pink 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 CHARTS

POUNDS PER HOUR WITH TWO NOZZLES

PSI	INCLUDED IN KIT				
	YELLOW	LOW RED	MEDIUM GREEN	HIGH BLUE	BLACK
	650033-SS	650050-SS	6501-SS	6502-SS	6503-SS
15	21	32	64	128	192
20	25	38	76	152	228
25	28	42	84	168	252
30	30	46	92	184	276
35	33	50	100	200	300
40	35	53	106	212	318
45	37	56	112	224	336
50	38	58	116	232	348
55	40	61	122	244	366
60	42	64	128	256	384

POUNDS PER HOUR WITH THREE NOZZLES

PSI	YELLOW	RED	GREEN	BLUE	BLACK	CENTER OUTSIDE
	650067 650033	XR11001 650050	XR110015 6501	XR11002 6502	XR11004 6503	
	15	53	64	112	192	
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	

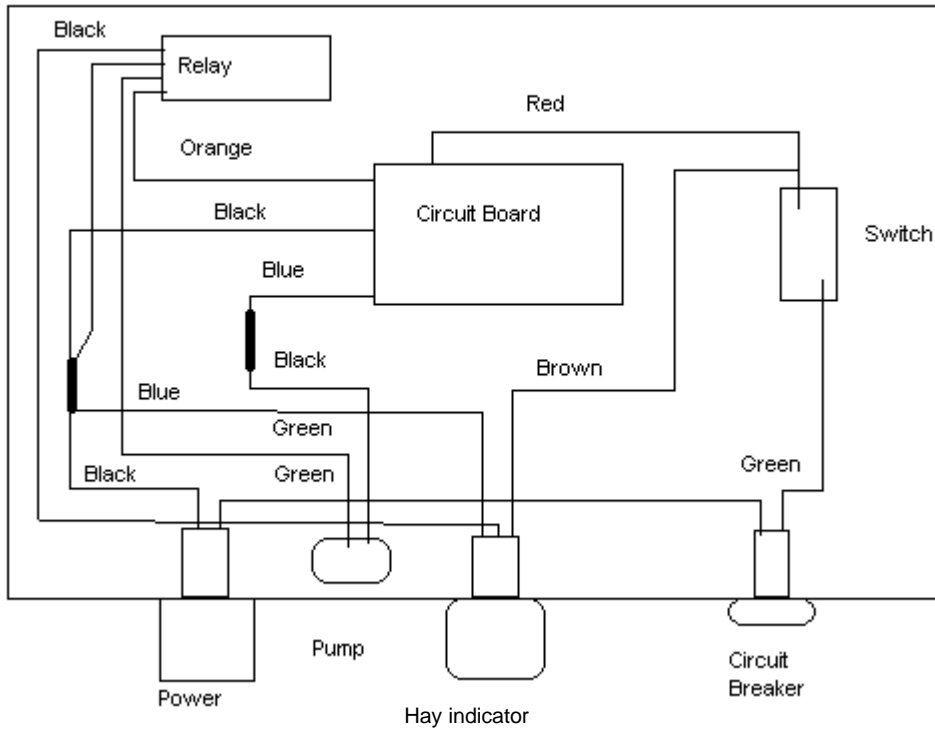
LITRES PER HOUR WITH TWO NOZZLES

PSI	RED	GREEN	BLUE
	<u>650050</u>	<u>6501</u>	<u>6502</u>
15	13.6	27.3	54.5
20	15.9	32.6	65.1
25	17.4	35.6	71.2
30	19.7	39.4	78.7
35	21.2	42.4	84.8
40	22.7	45.4	90.8
45	23.5	48.4	96.9
50	25	50.7	101.4
55	26.5	53	106
60	27.3	56	112

ML PER MINUTE WITH TWO NOZZLES

PSI	RED	GREEN	BLUE
	<u>650050</u>	<u>6501</u>	<u>6502</u>
15	230	460	910
20	270	540	1090
25	290	590	1190
30	330	660	1310
35	350	710	1410
40	380	760	1510
45	390	810	1620
50	420	850	1690
55	440	880	1770
60	460	930	1870

ELECTRONIC CONTROL BOX 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)

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.)
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.

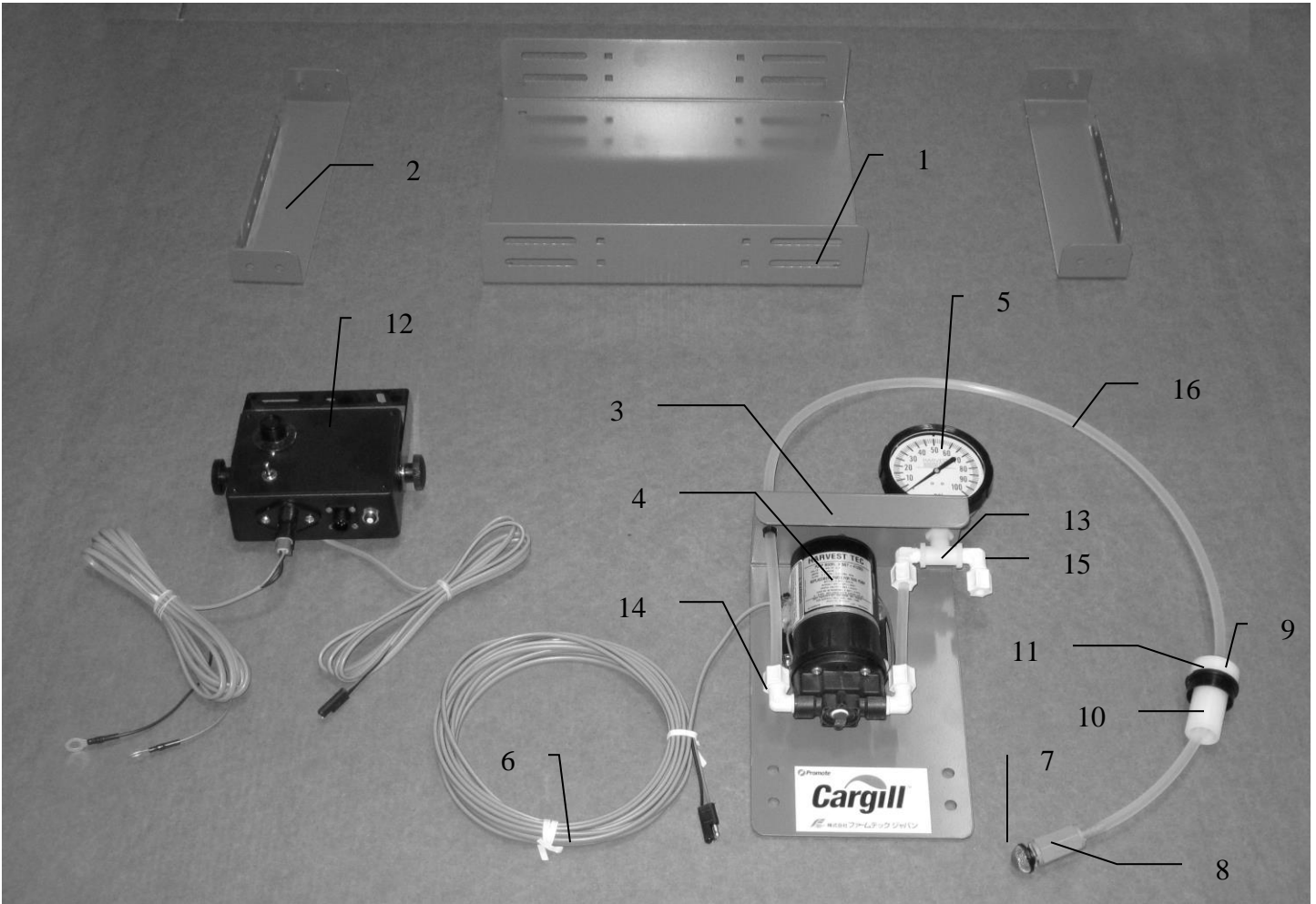
WINTER STORAGE

1. Thoroughly flush the system with water.
2. Remove the intake line 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

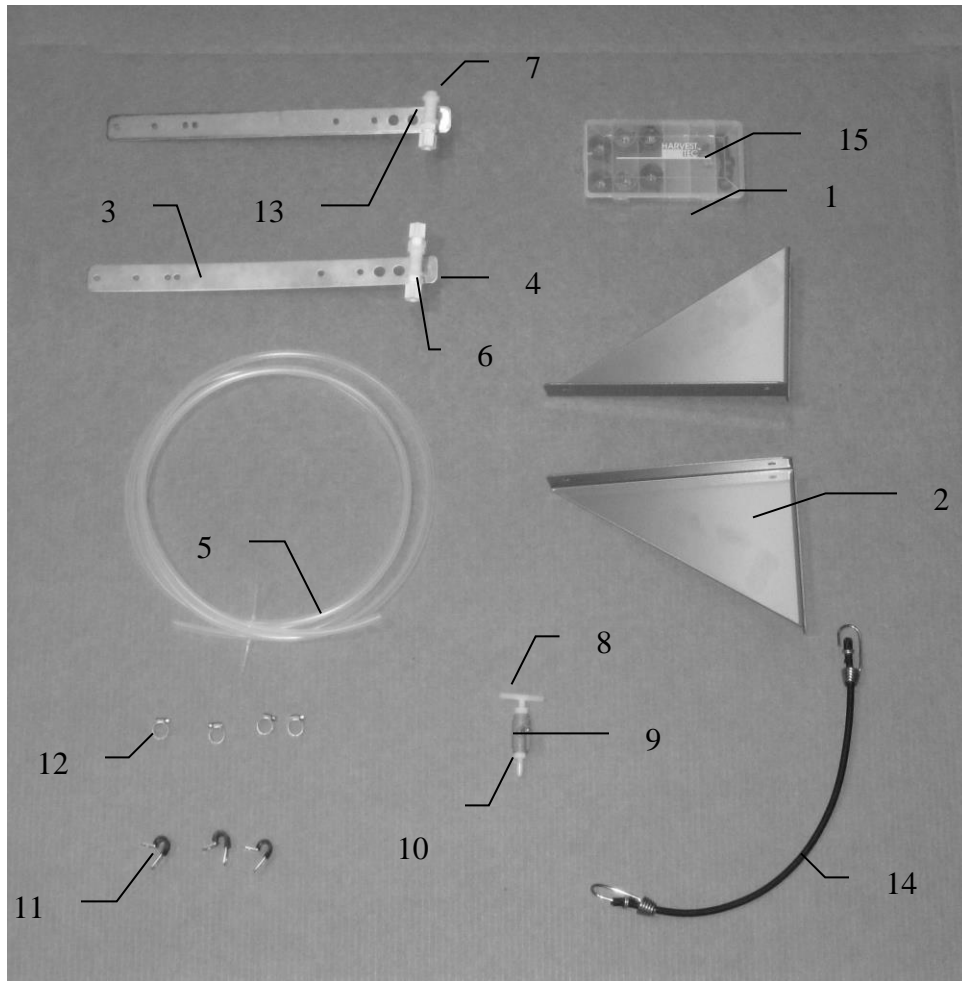
PROBLEM	POSSIBLE CAUSE	SOLUTION
Pump will not run.	1. Circuit breaker tripped on electronic unit.	1. Check for short, low voltage, and reset breaker.
	2. Pump locked up.	2. Clean or rebuild pump if motor is OK.
	3. Damaged wire.	3. Repair damaged wire.
	4. Vapor locked.	4. Loosen hose by check valve by nozzles or manifold 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 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. Check intake check valve.
	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.

MODEL 458 PARTS LIST



<u>Ref</u>	<u>Description</u>	<u>Part#</u>	<u>Qty</u>
1	Base	001-4501A	1
2	Bottle Holders	001-4501B	2
3	Pump Holders	001-4501C	1
4	Pump	007-4120S	1
5	Gauge	002-2208Z	1
6	Pump Wire Harness	006-4574	1
7	Intake Screen	002-4565	1
8	Intake Check Valve	002-4564	1
9	Flex Spout Manifold (M)	003-4508A	1
10	Flex Spout Manifold (F)	003-4508B	1
11	Jug Cap	003-4508C	1
12	Electronic Control box	030-0457	1
13	¼" FPT Tee	003-TT14	1
14	Jaco Elbow 3/8 x 1/4	003-JEL3814	2
15	Jaco Elbow ¼ x ¼	003-JEL1414	2
16	¼" Tubing (Hose)	002-9006	5 ft
NP	Suction Cup Mount	001-2012SCM	1

MODEL 458 PARTS LIST



<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	Left Holder	001-4501D	1	15	Tip Kit (Complete)	030-9001	1
2	Right Holder	001-4501E	1		Includes Following		
3	Nozzle Strap	001-4215	2		Plastic Box	008-9000	1
4	Nozzle Holders	004-4710	2		Red Cap	004-1207B	2
5	1/4" Tubing (Hose)	002-9006	15		Low Output Tip	004-650050-SS	2
6	Jaco Straight 1/4" x 1/4"	003-JA1414	3		Green Cap	004-1207A	2
7	1/4" Plug	003-F14	1		Medium Output Tip	004-6501-SS	2
8	HB to NPT 1/4" Tee	003-T1414T	1		Blue Cap	004-1207C	2
9	Valve	002-2216	1		High Output Tip	004-6502-SS	2
10	1/4" Straight Fitting	003-A1414	1		Washer	004-1207W	2
11	Jiffy Clips	008-9012	3		Tip Strainer	004-1203-100	2
12	Mini Hose Clamps	003-9002	4				
13	1/4" FPT Tee	003-TT14	2				
14	Tie Down Strap		2				

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.

Revised 6/22

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