First Time and Annual Start Up

After familiarizing yourself with the model 457 control box, 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

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 tons per hour. Finally you need to know what tips to use and at what pressure to set the gauge.

Determining tons per hour for small square balers (two tie)

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 tons per hour.

CONVENTIONAL BALE RATE CHART (TONS PER HOUR)

BALES MADE	WEIGHT PER BALE								
IN 3 MINUTES	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

Determining tons per hour for small square balers (three tie)

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 90 lbs. Using the following chart cross reference 11 bales and 90lbs and you will find the rate to be 9.9 tons/hr.

Three Tie Bale Rate Chart (Tons per Hour)

Bales Made in Three Minutes	Weight per Baler								
	70	***75***	***80***	***85***	***90***	***100***	***110***	***120***	***130***
6	4.2	4.5	4.8	5.1	5.4	6.0	6.6	7.2	7.8
7	4.9	5.3	5.6	6.0	6.3	7.0	7.7	8.4	9.1
8	5.6	6.0	6.4	6.8	7.2	8.0	8.8	9.6	10.4
9	6.3	6.8	7.2	7.7	8.1	9.0	9.9	10.8	11.7
10	7.0	7.5	8.0	8.5	9.0	10.0	11.0	12.0	13.0
11	7.7	8.3	8.8	9.4	9.9	11.0	12.1	13.2	14.3
12	8.4	9.0	9.6	10.2	10.8	12.0	13.2	14.4	15.6
13	9.1	9.8	10.4	11.1	11.7	13.0	14.3	15.6	16.9
14	9.8	10.5	11.2	11.9	12.6	14.0	15.4	16.8	18.2
15	10.5	11.3	12.0	12.8	13.5	15.0	16.5	18.0	19.5
16	11.2	12.0	12.8	13.6	14.4	16.0	17.6	19.2	20.8
17	11.9	12.8	13.6	14.5	15.3	17.0	18.7	20.4	22.1
18	12.6	13.5	14.4	15.3	16.2	18.0	19.8	21.6	23.4
19	13.3	14.3	15.2	16.2	17.1	19.0	20.9	22.8	24.7
20	14.0	15.0	16.0	17.0	18.0	20.0	22.0	24.0	26.0
21	14.7	15.8	16.8	17.9	18.9	21.0	23.1	25.2	27.3
22	15.4	16.5	17.6	18.7	19.8	22.0	24.2	26.4	28.6
23	16.1	17.3	18.4	19.6	20.7	23.0	25.3	27.6	29.9
24	16.8	18.0	19.2	20.4	21.6	24.0	26.4	28.8	31.2
25	17.5	18.8	20.0	21.3	22.5	25.0	27.5	30.0	32.5
26	18.2	19.5	20.8	22.1	23.4	26.0	28.6	31.2	33.8
27	18.9	20.3	21.6	23.0	24.3	27.0	29.7	32.4	35.1
28	19.6	21.0	22.4	23.8	25.2	28.0	30.8	33.6	36.4
29	20.3	21.8	23.2	24.7	26.1	29.0	31.9	34.8	37.7
30	21.0	22.5	24.0	25.5	27.0	30.0	33.0	36.0	39.0
31	21.7	23.3	24.8	26.4	27.9	31.0	34.1	37.2	40.3
32	22.4	24.0	25.6	27.2	28.8	32.0	35.2	38.4	41.6
33	23.1	24.8	26.4	28.1	29.7	33.0	36.3	39.6	42.9
34	23.8	25.5	27.2	28.9	30.6	34.0	37.4	40.8	44.2
35	24.5	26.3	28.0	29.8	31.5	35.0	38.5	42.0	45.5

Determining tons per hour for 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 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 below, cross-reference 2 minutes with 1000lb. and you will come up with 15 ton per hour.

Round Baler (Tons per Hour)

Average time to make a bale (min.)	Weight per Baler								
	600	***800***	***1000***	***1200***	***1400***	***1600***	***1800***	***2000***	***2200***
0.5	36.0	48.0	60.0	72.0	84.0	96.0	108.0	120.0	132.0
1	18.0	24.0	30.0	36.0	42.0	48.0	54.0	60.0	66.0
1.5	12.0	16.0	20.0	24.0	28.0	32.0	36.0	40.0	44.0
2	9.0	12.0	15.0	18.0	21.0	24.0	27.0	30.0	33.0
2.5	7.2	9.6	12.0	14.4	16.8	19.2	21.6	24.0	26.4
3	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	22.0
3.5	5.1	6.9	8.6	10.3	12.0	13.7	15.4	17.1	18.9
4	4.5	6.0	7.5	9.0	10.5	12.0	13.5	15.0	16.5
4.5	4.0	5.3	6.7	8.0	9.3	10.7	12.0	13.3	14.7
5	3.6	4.8	6.0	7.2	8.4	9.6	10.8	12.0	13.2
5.5	3.3	4.4	5.5	6.5	7.6	8.7	9.8	10.9	12.0
6	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0
6.5	2.8	3.7	4.6	5.5	6.5	7.4	8.3	9.2	10.2
7	2.6	3.4	4.3	5.1	6.0	6.9	7.7	8.6	9.4
7.5	2.4	3.2	4.0	4.8	5.6	6.4	7.2	8.0	8.8
8	2.3	3.0	3.8	4.5	5.3	6.0	6.8	7.5	8.3
8.5	2.1	2.8	3.5	4.2	4.9	5.6	6.4	7.1	7.8
9	2.0	2.7	3.3	4.0	4.7	5.3	6.0	6.7	7.3
9.5	1.9	2.5	3.2	3.8	4.4	5.1	5.7	6.3	6.9
10	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.6

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 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 low, medium, and high 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 two and three tie small square 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. (Pg.19-20)
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 conventional square baler. The moisture t 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, found on page 22 and 23 of this manual, 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!!!

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. (Pg.21)
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 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, found on page 24 of this manual, 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!!!

GENERAL CALIBRATION CHART FOR ONE NOZZLE

Use the following chart for install kit 4415 & 4415-SO

POUNDS PER HOUR WITH ONE NOZZLE

		INCLUDED IN KIT		
		LOW	**MEDIUM**	**HIGH**
	Blue	***Orange***	***Blue***	***Yellow***
	TX-SS-4	TX-SS-6	TX-SS-12	TX-SS-26
PSI				
15	21 (9.5L)	32 (14.4L)	64 (28.8L)	105 (47.3L)
20	25 (11.2L)	38 (17.1L)	76 (34.2L)	120 (54L)
25	28 (12.6L)	42 (19L)	84 (37.8L)	135 (60.8L)
30	30 (13.5L)	46 (20.7L)	92 (41.4L)	145 (65.3L)
35	33 (14.5L)	50 (22.5L)	100 (45L)	165 (74.3L)
40	35 (15.8L)	53 (23.9L)	106 (47.7L)	174 (78.3L)
45	37 (16.7L)	56 (25.2L)	112 (50.4L)	185 (83.3L)
50	38 (17.1L)	58 (26.1L)	116 (52.2L)	195 (87.8L)
55	40 (18L)	61 (27.5L)	122 (54.9L)	200 (90L)
60	42 (19L)	64 (28.8L)	128 (57.6L)	210 (94.5L)

GALLONS PER HOUR WITH ONE NOZZLE

		INCLUDED IN KIT		
		LOW	**MEDIUM**	**HIGH**
	Blue	***Orange***	***Blue***	***Yellow***
	TX-SS-4	TX-SS-6	TX-SS-12	TX-SS-26
PSI				
15	2.4 (9.1L)	3.6 (13.6L)	7.2 (27.2L)	11.9 (45L)
20	2.6 (9.8L)	4.2 (15.9L)	8.6 (32.5L)	13.6 (51.4L)
25	3.2 (12.1L)	4.6 (17.4L)	9.4 (35.5L)	15.3 (57.8L)
30	3.4 (12.9L)	5.2 (19.7L)	10.4 (39.3L)	16.4 (62L)
35	3.8 (14.4L)	5.6 (21.2L)	11.2 (42.3L)	18.7 (70.7L)
40	4.0 (15.1L)	6.0 (22.7L)	12.0 (45.4L)	19.7 (74.5L)
45	4.2 (15.9L)	6.2 (23.4L)	12.8 (48.4L)	21.0 (79.4L)
50	4.4 (16.7L)	6.6 (24.9L)	13.4 (50.7L)	22.1 (83.5L)
55	4.6 (17.4L)	7.0 (26.5L)	14.0 (52.9L)	22.7 (85.8L)
60	4.8 (18.2L)	7.2 (27.2L)	14.8 (55.9L)	23.8 (90L)

GENERAL CALIBRATION CHART FOR TWO NOZZLES

Use the following chart for install kits 4409, 4410, 4416, 4482, 4485, 4502, 4506, 4507, & 4546

POUNDS PER HOUR WITH TWO NOZZLES

		INCLUDED IN KIT			
		LOW	MEDIUM	HIGH	
	Silver	***Silver***	***Pink/Gray***	***Orange/Gray***	***Red/Gray***
	T650033-SS	T650050-SS	T6501-PT	T6502-PT	T6503-PT
PSI					
15	21 (9.5L)	32 (14.4L)	64 (28.8L)	128 (57.6L)	192 (86.4L)
20	25 (11.2L)	38 (17.1L)	76 (34.2L)	152 (68.L)	228 (102.6L)
25	28 (12.6L)	42 (19L)	84 (37.8L)	168 (75.6L)	252 (113.4L)
30	30 (13.5L)	46 (20.7L)	92 (41.4L)	184 (82.8L)	276 (124.2L)
35	33 (14.5L)	50 (22.5L)	100 (45L)	200 (90L)	300 (135L)
40	35 (15.8L)	53 (23.9L)	106 (47.7L)	212 (95.4L)	318 (143.1L)
45	37 (16.7L)	56 (25.2L)	112 (50.4L)	224 (100.8L)	336 (151.2L)
50	38 (17.1L)	58 (26.1L)	116 (52.2L)	232 (104.4L)	348 (156.6L)
55	40 (18L)	61 (27.5L)	122 (54.9L)	244 (109.8L)	366 (164.7L)
60	42 (19L)	64 (28.8L)	128 (57.6L)	256 (115.2L)	384 (172.8L)

GALLONS PER HOUR WITH TWO NOZZLES

		INCLUDED IN KIT			
	Silver	***Silver***	***Pink/Gray***	***Orange/Gray***	***Red/Gray***
	T650033-SS	T650050-SS	T6501-PT	T6502-PT	T6503-PT
PSI					
15	2.4 (9.1L)	3.6 (13.6L)	7.2 (27.2L)	14.4 (54.4L)	21.6 (81.6L)
20	2.6 (9.8L)	4.2 (15.9L)	8.6 (32.5L)	17.2 (65L)	25.8 (97.5L)
25	3.2 (12.1L)	4.6 (17.4L)	9.4 (35.5L)	18.8 (71.1L)	28.2 (106.6L)
30	3.4 (12.9L)	5.2 (19.7L)	10.4 (39.3L)	20.8 (78.6L)	31.2 (117.9L)
35	3.8 (14.4L)	5.6 (21.2L)	11.2 (42.3L)	22.4 (84.7L)	33.6 (127L)
40	4.0 (15.1L)	6.0 (22.7L)	12.0 (45.4L)	24.0 (90.7L)	36.0 (136.1L)
45	4.2 (15.9L)	6.2 (23.4L)	12.8 (48.4L)	25.6 (96.8L)	38.4 (145.2L)
50	4.4 (16.7L)	6.6 (24.9L)	13.4 (50.7L)	26.8 (101.3L)	40.2 (152L)
55	4.6 (17.4L)	7.0 (26.5L)	14.0 (52.9L)	28.0 (105.8L)	42.0 (158.8L)
60	4.8 (18.2L)	7.2 (27.2L)	14.8 (55.9L)	29.6 (111.9L)	44.4 (167.8L)

CALIBRATION CHART FOR JOHN DEERE 8 & 9 SERIES, VERMEER 445Z

Use the following chart for install kits 4516, 4517, 445Z Baler

POUNDS PER HOUR WITH TWO NOZZLES

		INCLUDED IN KIT			
	Yellow	***Red***	***Green***	***Blue***	***Black***
	800067	XR11001	XR11002	XR11003	XR11001
PSI					
15	53 (23.9L)	64 (28.8L)	112 (50.4L)	192 (86.4L)	320 (144L)
20	63 (28.4L)	76 (34.2L)	133 (59.9L)	228 (102.6L)	380 (171L)
25	70 (31.5L)	84 (37.8L)	147 (66.2L)	252 (113.4L)	420 (189L)
30	77 (34.7L)	92 (41.4L)	161 (72.5L)	276 (124.2L)	460 (207L)
35	84 (37.8L)	100 (45L)	175 (78.8L)	300 (135L)	N/A
40	89 (40.1L)	106 (47.7L)	186 (83.7L)	318 (143.1L)	N/A
45	94 (42.3L)	112 (50.4L)	196 (88.2L)	336 (151.2L)	N/A
50	97 (43.7L)	116 (52.2L)	203 (91.4L)	348 (156.6L)	N/A
55	102 (45.9L)	122 (54.9L)	214 (96.3L)	366 (164.7)	N/A
60	107 (128L)	128 (57.6L)	224 (100.8L)	384 (172.8L)	N/A

GALLONS PER HOUR WITH TWO NOZZLES

		INCLUDED IN KIT			
	Yellow	***Red***	***Green***	***Blue***	***Black***
	800067	XR11001	XR11002	XR11003	XR11005
PSI					
15	5.2 (19.7L)	7.3 (27.6L)	12.9 (48.8L)	22.0 (83.2L)	31.9 (120.6L)
20	5.6 (21.2L)	8.4 (31.8L)	15.1 (57.1L)	24.1 (91.1L)	42.2 (159.5L)
25	6.3 (23.8L)	9.5 (35.9L)	16.7 (63.1L)	28.3 (107L)	47.3 (178.8L)
30	7.0 (26.5L)	10.6 (40.1L)	18.6 (70.3L)	31.0 (117.2L)	52.2 (197.3L)
35	7.5 (28.4L)	11.3 (42.7)	19.7 (74.5L)	33.5 (126.6L)	N/A
40	8.0 (30.2L)	12.0 (45.4L)	21.0 (79.4L)	36.0 (136.1L)	N/A
45	8.4 (31.8L)	12.6 (47.6L)	22.3 (84.3L)	38.3 (144.8L)	N/A
50	8.9 (33.6L)	13.2 (49.9L)	23.6 (89.2L)	40.7 (153.8L)	N/A
55	9.3 (35.2L)	13.8 (52.2L)	24.5 (92.6L)	42.5 (160.7L)	N/A
60	9.7 (36.7L)	14.4 (54.4L)	25.6 (96.8L)	44.4 (167.8L)	N/A

GENERAL CALIBRATION CHART FOR THREE NOZZLES

Use the following chart for all install kits 442-SO, 4483, 4484, 4486, 4503, 4504, 4505, 4508, 4516, 4517, 4523, 4524, and 4400C

POUNDS PER HOUR WITH THREE NOZZLES

		INCLUDED IN KIT				
	Yellow	**Red**	**Green**	**Blue**	**Black**	
	650067 650033	XR11001 650050	XR110015 6501	XR11002 6502	XR11004 6503	CENTER OUTSIDE
PSI						
15	53 (23.9L)	64 (28.8L)	112 (50.4L)	192 (86.4L)	320 (144L)	
20	63 (28.4L)	76 (34.2L)	133 (59.9L)	228 (102.6L)	380 (171L)	
25	70 (31.5L)	84 (37.8L)	147 (66.2L)	252 (113.4L)	420 (189L)	
30	77 (34.7L)	92 (41.4L)	161 (72.5L)	276 (124.2L)	460 (207L)	
35	84 (37.8L)	100 (45L)	175 (78.8L)	300 (135L)	N/A	
40	89 (40.1L)	106 (47.7L)	186 (83.7L)	318 (143.1L)	N/A	
45	94 (42.3L)	112 (50.4L)	196 (88.2L)	336 (151.2L)	N/A	
50	97 (43.7L)	116 (52.2L)	203 (91.4L)	348 (156.6L)	N/A	
55	102 (45.9L)	122 (54.9L)	214 (96.3L)	366 (164.7)	N/A	
60	107 (128L)	128 (57.6L)	224 (100.8L)	384 (172.8L)	N/A	

GALLONS PER HOUR WITH THREE NOZZLES

		INCLUDED IN KIT				
	Yellow	**Red**	**Green**	**Blue**	**Black**	
	650067 650033	XR11001 650050	XR110015 6501	XR11002 6502	XR11004 6503	CENTER OUTSIDE
PSI						
15	5.2 (19.7L)	7.3 (27.6L)	12.9 (48.8L)	22.0 (83.2L)	31.9 (120.6L)	
20	5.6 (21.2L)	8.4 (31.8L)	15.1 (57.1L)	24.1 (91.1L)	42.2 (159.5L)	
25	6.3 (23.8L)	9.5 (35.9L)	16.7 (63.1L)	28.3 (107L)	47.3 (178.8L)	
30	7.0 (26.5L)	10.6 (40.1L)	18.6 (70.3L)	31.0 (117.2L)	52.2 (197.3L)	
35	7.5 (28.4L)	11.3 (42.7)	19.7 (74.5L)	33.5 (126.6L)	N/A	
40	8.0 (30.2L)	12.0 (45.4L)	21.0 (79.4L)	36.0 (136.1L)	N/A	
45	8.4 (31.8L)	12.6 (47.6L)	22.3 (84.3L)	38.3 (144.8L)	N/A	
50	8.9 (33.6L)	13.2 (49.9L)	23.6 (89.2L)	40.7 (153.8L)	N/A	
55	9.3 (35.2L)	13.8 (52.2L)	24.5 (92.6L)	42.5 (160.7L)	N/A	
60	9.7 (36.7L)	14.4 (54.4L)	25.6 (96.8L)	44.4 (167.8L)	N/A	