

HARVEST TEC
MODEL 443
25 GALLON AUTOMATIC PRESERVATIVE APPLICATOR
FOR HAY BALERS
INSTALLATION AND OPERATION
INSTRUCTION MANUAL

HARVEST TEC, LLC.
P.O. BOX 63
2821 HARVEY STREET
HUDSON, WI 54016
715-386-9100

HARVEST TEC 443 MANUAL INDEX

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INTRODUCTION

Congratulations on purchasing a Harvest Tec Model 443 applicator. This applicator is designed to apply straight propionic acid, acid blends, buffered acids, and hay inoculants. The model 443 base kit includes the following parts: tank, frame, pump, hose, gauge, automatic control box, moisture sensor, and miscellaneous hardware. The applicator can be installed on most balers with the proper installation kit. Before installing the unit on the baler, make sure you have the proper installation kit. (See the chart below.) If you are unsure about your installation kit contact your local dealer for specifications. For your convenience we have included a parts break down for the model 443 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.

INSTALLATION KIT REFERENCE CHART

BALER MAKE	BALER MODEL	INSTALLATION KIT
CASE IH	(2002 AND NEWER) SBX520, SBX530, SBX540, SBX550 CONVENTIONAL SQUARE BALERS	4411A
CASE IH	(2002) RBX451, RBX461, RBX561 ROUND BALERS	4486A-RBX
CASE IH	(2001 AND OLDER) ALL CONVENTIONAL SQUARE BALERS	4485A
CASE IH	(2001 AND OLDER) ALL ROUND BALERS	4484A
CHALLENGER	SB34, SB36, & SB44 CONVENTIONAL BALERS	4484A
CHALLENGER	RB34, RB44, RB46, & RB56 ROUND BALERS	4485A
HESSTON	ALL ROUND BALERS	4484A
HESSTON	ALL CONVENTIONAL SQUARE BALERS	4485A
JOHN DEERE	ALL CONVENTIONAL SQUARE BALERS	4410A
JOHN DEERE	410-510 & 430-530 ROUND BALERS	4484A
JOHN DEERE	ALL 5, 6, & 7 SERIES ROUND BALERS	4483A
NEW HOLLAND	ALL CONVENTIONAL SQUARE BALERS	4411A
NEW HOLLAND	640-688 ROUND BALERS	4486A
NEW HOLLAND	630-638 ROUND BALERS	4484A
VERMEER	K & L SERIES	4484A
VERMEER	ALL OTHER ROUND BALERS	4484A
OTHER	CONVENTIONAL SQUARE BALERS	4409A
OTHER	ROUND BALERS	4484A

TOOLS NEEDED

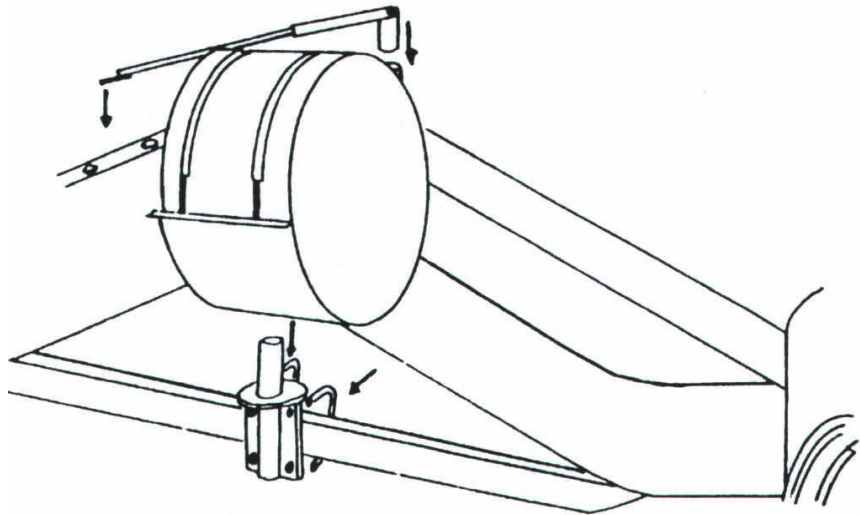
- Standard wrench set
- Standard socket set
- Standard screw driver or 5/16" nut driver
- Side cutter
- Hose cutter
- Crescent wrench
- Hammer

INSTALLATION OF APPLICATOR

1. INSTALLATION OF MOUNTING BRACKETS SMALL SQUARE BALERS

A. 4409A, 4410A, AND 4411A, ON ALL JOHN DEERE, NEW HOLLAND, & CASE IH SBX SMALL SQUARE BALERS(2002 & NEWER)

Mount the unit on the diagonal frame behind the twine box, as pictured using the base clamp and u-bolts. Locate the top reach rod in a position opposing the overhanging tank. Bolt one end to the top stub pipe on the tank saddle and the other end to a secure location on the baler.

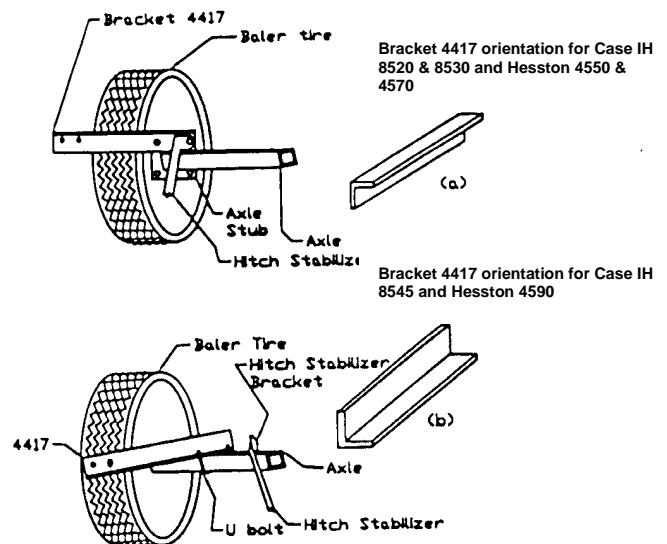


4409A, 4410A, AND 4411A

B. INSTALLATION ON CASE IH 8520 & 8530, CHALLENGER SB34 &36, AND HESSTON 4550 & 4570 BALERS.

On the left hand axle stub, remove the top 5/16" nut from the front and rear bolts. Twist hitch stabilizer (if equipped) clear of bolts. Place bracket 4417 as pictured (a) Attach hitch stabilizer to bracket 4417 and tighten nuts.

On Case IH 8545, Challenger SB 44, and Hesston 4590 balers, attach bracket 4417 to left hand side as pictured in (b) with 1/2" x 4 1/2" "U" bolt, washers, and nuts.

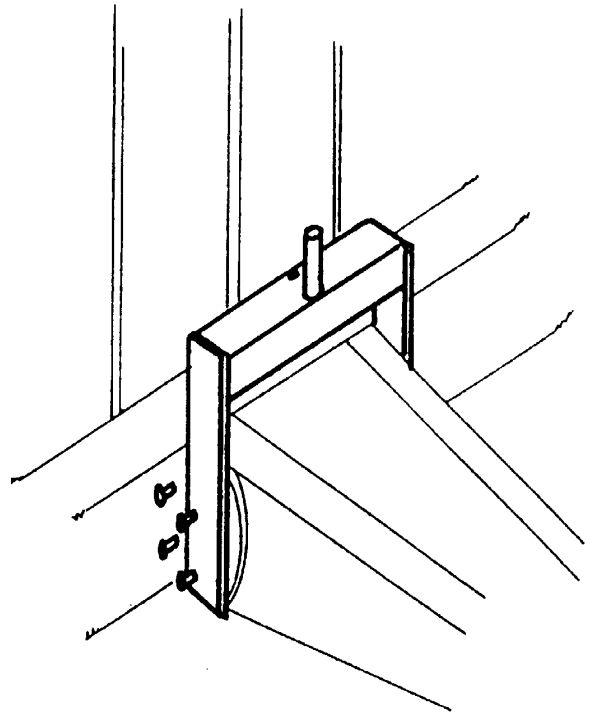


4485A

ROUND BALERS

A. 4483A ON ALL JOHN DEERE 5,6,& 7 SERIES ROUND BALERS

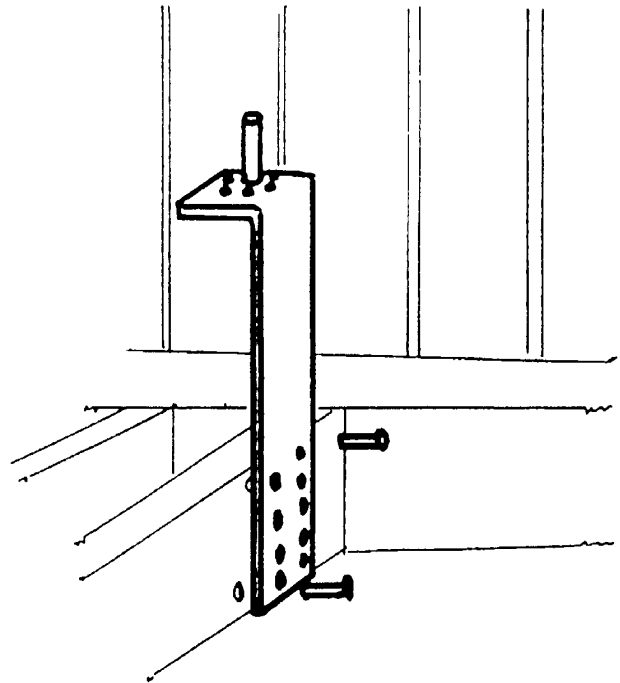
The base bracket straddles the baler's tongue up against the tongue's intersection with the baler's cross frame. The bracket is bolted to the baler using the four bolts on each side that hold the tongue to the cross frame. Replace each of these bolts with the longer bolts provided. First, loosen all bolts. Second, take out front four bolts and keep rear bolts in place so you will not lose alignment. Third, slide bracket in place onto rear bolts and insert longer bolts into front holes. Fourth, take out rear bolts and insert longer bolts. Lastly, tighten down bracket.



4483A

B. 4484A ON CASE IH(2001 & OLDER), HESSTON, CHALLENGER RB34,44,46, & 56, AND ALL OTHER LARGE ROUND BALERS

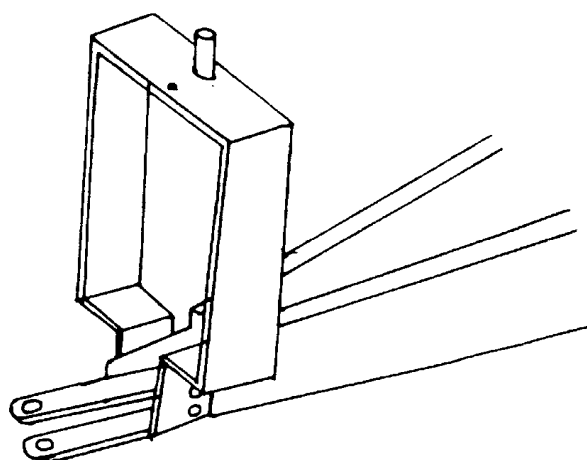
Locate the base bracket on the baler's tongue or cross frame. Care must be taken to make sure the applicator will be clear of the balers moving parts and the rear wheels of the tractor.



4484A

C. 4486A ON NEW HOLLAND 640, 650, 660, 644, 654, 664, 648, 668, 688, & CASE IH RBX ROUND BALERS (2002)

Locate the mounting bracket on the front of the baler's tongue where it joins the hitch acceptor. Use the bolts included to join the two parts of the baler. Orient the bracket with the stub pipe behind the mounting holes so that the applicator will be facing rearward. Check for drive shaft clearance between the brackets by turning the tractor until its rear wheels touch the tongue. If the drive shaft hits the applicator contact your dealer.



4486A

2. INSTALLATION OF TANK

- A. Mount the tank and frame on the mounting bracket. Insert stub pipe on mounting bracket into bottom of tank-frame assembly. After doing so, use ½" bolt to align and tighten down tank-frame assembly to mounting bracket hole. If your install kit includes reach rods, connect them to a sturdy part of the baler and then to the flat stub pipe on the tank frame.

3. INSTALLATION OF GAUGE

- A. Locate the gauge where it can be viewed from the tractor's operating platform.

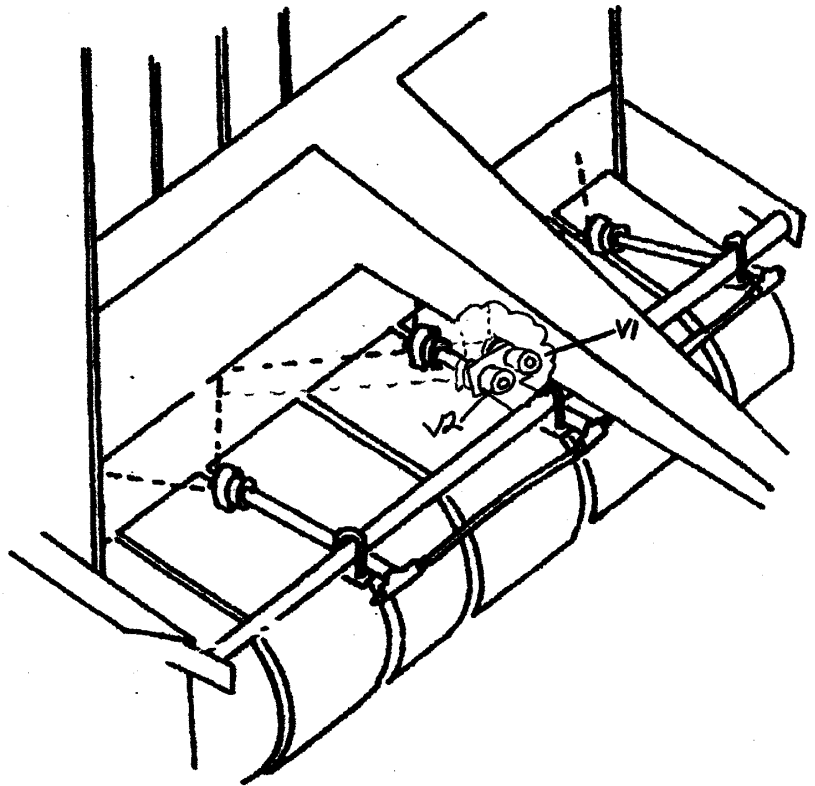
4. PLACEMENT OF SPRAY ASSEMBLY

A. LARGE ROUND BALERS

On most large round balers the cross bar on the wind guard above the pick-up head provides a mounting point for the nozzle pipes. Space the nozzles by the chart below. If your "U" bolts do not fit around the cross bar, you may need to mount a 1 inch diameter pipe to your balers tongue to mount them.

PICK-UP HEAD WIDTH	LEFT SIDE (Use elbow fitting)	CENTER (Use 2-way fitting)	RIGHT SIDE (Use 2-way fitting)
48"	12" from left	Center	12" from right
60"	14" from left	Center	14" from right
72"	15" from left	Center	15" from right

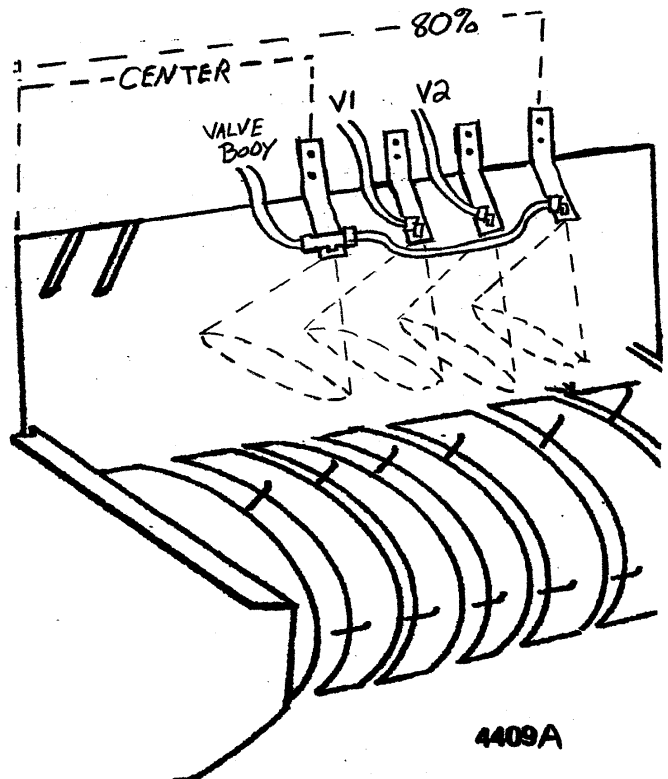
Aim the nozzle pipes up so that the tip sprays in a generally horizontal direction and is pointed toward the intake rolls of the baler at the end of the pick-up head. The tips should be located so they will be somewhere between 14" and 18" from the normal path of hay. Make sure the tubes do not interfere with the tying mechanism.



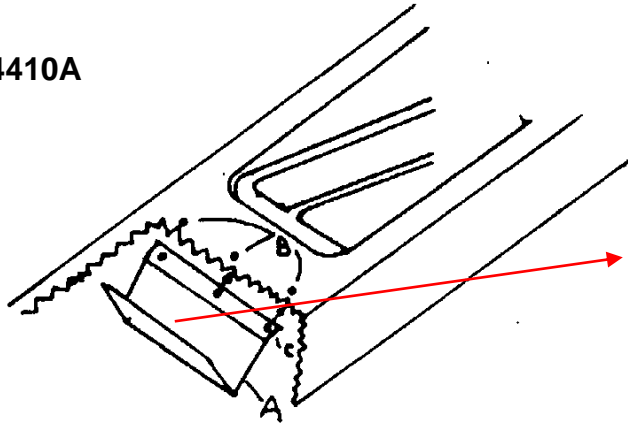
B. CONVENTIONAL SQUARE BALERS 4409A ON ALL CONVENTIONAL BALERS WITHOUT SPECIFIC KITS

Conventional baler with gathering forks.

1. Mount the left hand 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"x80".)
2. Mount the right hand nozzle so that it is approximately centered on the pickup head.
3. Place the two auxiliary nozzle straps in between the first two straps.
4. Bend the nozzle bar in so that the tip is pointed in toward the bottom of the gathering chamber and about 16" above the sheet metal base of the chamber. Twist the nozzle so the tip is tilted 45 degrees from horizontal.



4410A

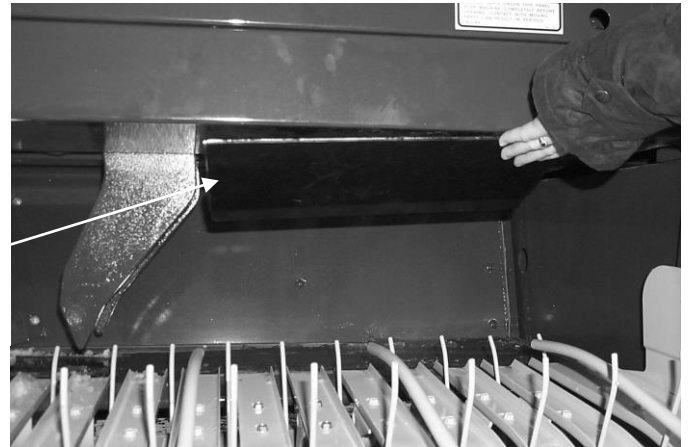


4410A ON ALL JOHN DEERE CONVENTIONAL SQUARE BALERS

Bolt the nozzle holder (A) up under the baler's hood. Use two bolts (B) on the baler to fasten lip (C) securely in place. The supply line can be run through the balers gathering fork cut out.

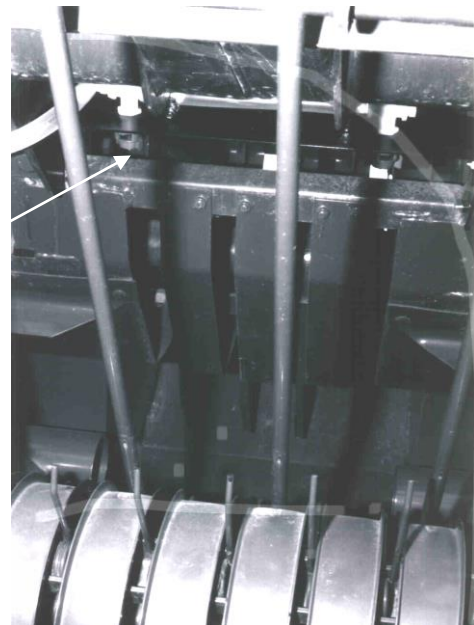
4411A ON ALL CASE CONVENTIONAL SQUARE BALERS (2002 & NEWER)

Locate the nozzle holder up under the top surface of the balers gathering chamber. On the later model balers, 2 existing bolts can be used to fasten the nozzle holder in place. One hole needs to be drilled. On older models locate and drill the 3 holes so that the holder is 10"-14" to the right of the baler cut-off knife. Use lynch pins to secure the spray shield.



4485A ON ALL IN-LINE CASE-IH AND HESSTON BALERS

Locate the nozzle holder under the tongue behind the flywheel. Use one existing hole on the right and two existing bolt holes on the left to secure the holder.



5. INSTALLATION OF PLUMBING

A. INTAKE

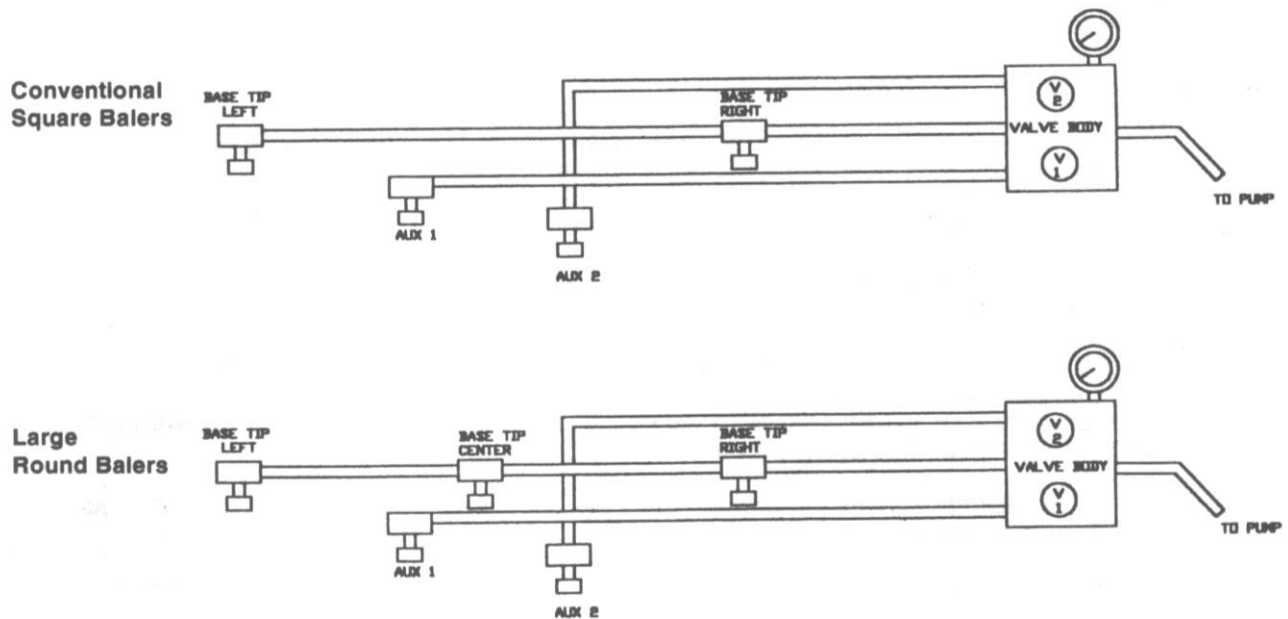
Screw the 003-EL3412(3/4" to 1/2" elbow) into the bottom of the tank. Second screw the 002-2212(1/2" ball valve) with elbow into the filter assembly. Lastly, route the 005-9001(1/2" hose) from bottom of the tank to ball valve.

B. OUTLET

Run hose from the pump outlet to the gauge. After gauge run the hose to the spray tips.

CONVENTIONAL SQUARE AND LARGE ROUND BALERS

Run the lines to the auxiliary nozzles according to the diagrams below.



6. INSTALLATION OF CONTROL AND WIRING

INSTALL THE MOUNTING BRACKET INSIDE THE TRACTOR CAB.

Use two 1/4" bolts and two 1/4" (1/2" O.D.) flat washers. Pass the bolt/washer pair through each of the slots in the bottom of the bracket and then attach the bracket to the tractor. Drill two holes (9/32") in the tractor if necessary.

Adjust the bracket position as required to provide easy display viewing before tightening the screws.

INSTALL CONTROLLER CABLE HARNESS

Locate each end of the cable harness. Note which ends match up to the plugs in the control box. Route this end of the harness in close proximity to the mounting bracket installed previously. Allow enough service loop to facilitate installation and removal of the 454 unit.

CONNECT THE MAIN POWER LEADS

Locate the fused power leads of the harness. The RED wire is the POSITIVE power feed. Check the fuseholder to verify the fuse type and installation.

NOTE: USE a 10A Slo-Blo, 3AG type (Littlefuse #313010 or eq.)!!! REPLACING THE FUSE WITH AN IMPROPER TYPE MAY RESULT IN EQUIPMENT DAMAGE AND/OR FAILURE AND WILL VOID THE WARRANTY!!!

FOR NEGATIVE GROUND TRACTOR:

Connect the RED wire to an ignition switched POSITIVE terminal. Connect the BLACK wire to the chassis ground.

FOR POSITIVE GROUND TRACTOR:

Connect the BLACK wire to an ignition switched NEGATIVE terminal. Connect the RED wire to the POSITIVE ground.

CAUTION: THE OUTER SHELL OF THE COAXIAL SENSOR CONNECTOR (SHIELD) IS DIRECTLY CONNECTED TO THE "NEGATIVE" SUPPLY OF THE 454. FOR POSITIVE GROUND SYSTEMS, CARE MUST BE TAKEN TO AVOID ACCIDENTAL SHORTING OF THESE SURFACES WITH THE VEHICLE POSITIVE GROUND.

NOTE: IMPROPER POWER CONNECTION/POLARITY WILL RESULT IN UNIT FAILURE AND DAMAGE. BE SURE TO CHECK THE POLARITY WHEN INSTALLING.

NOTE: Some tractor alternators may generate DC power spikes in excess of 14 volts. These spikes may cause high moisture readings, resulting in excess product application. Check with your tractor dealer for T.V.P. (Transient Voltage Protection) if your alternator does not have spike protection built in.

INSTALL THE CONTROLLER UNIT

Install the unit to the mounting bracket by using the two black studded knobs. Make sure the rubber isolator blocks are in place between the control and the mounting bracket. Adjust the viewing angle as necessary and tighten the knobs to hold the unit in the place.

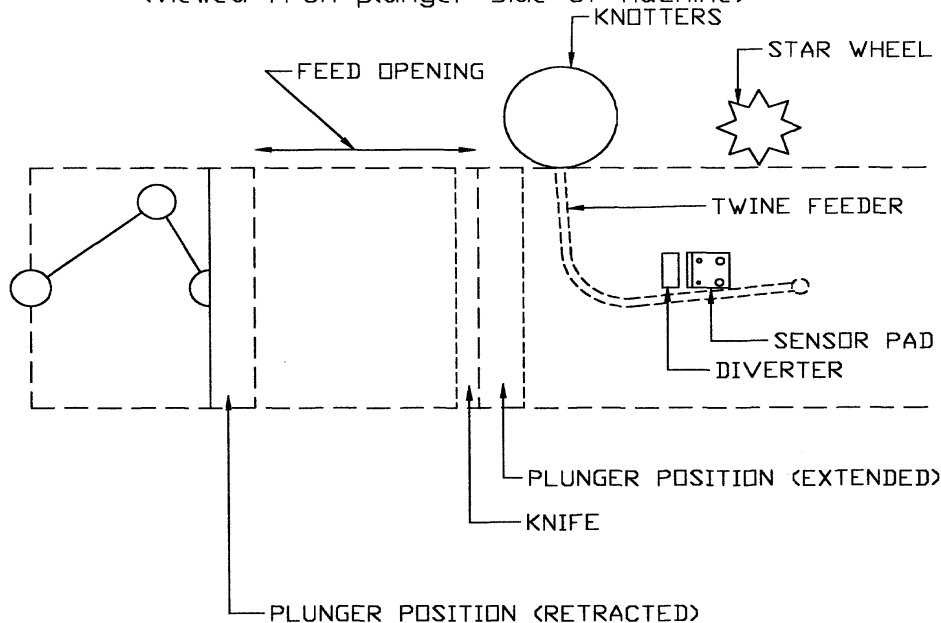
There are two receptacles on the rear of the unit for wiring connections. Connect the sensor cable and wiring harness to their appropriate receptacles.

7. INSTALLATION OF MOISTURE PADS

CONVENTIONAL SQUARE BALERS

The sensor pad and crop diverter need to be located in the baler chamber as close to the plunger face as possible. The sensor can be located on the smooth side (outside) or cut side (inside) with the same results for alfalfa hay. The cut side of the bale will give a more accurate reading in grasses or alfalfa/grass mixtures because the sensor will be able to see some of the inside plant moisture. A template has been included for marking and drilling the correct holes. Make sure before drilling that when the bolts come through the side of the chamber that they do not interfere or touch any other pieces of metal.

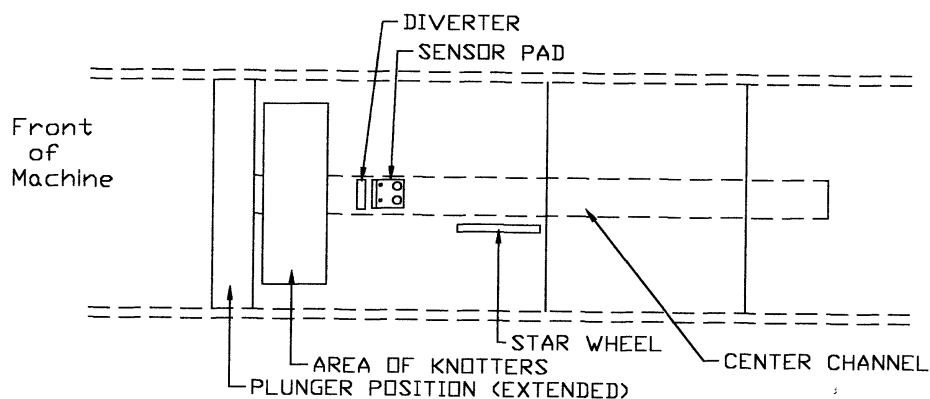
Cutaway View of Conventional Square Baler Chamber
(viewed from plunger side of machine)



INLINE OR CENTER LINE SMALL SQUARE BALERS

The sensor pad and crop diverter need to be located in the baler chamber as close to the plunger face as possible. The sensor can be located on the smooth side (top) or cut side (bottom) with the same results for alfalfa hay. The cut side of the bale will give a more accurate reading in grasses or alfalfa/grass mixtures because the sensor will be able to see some of the inside plant moisture. A template has been included for marking and drilling the correct holes. Make sure before drilling that when the bolts come through the side of the chamber that they do not interfere or touch any other pieces of metal. Note that if placing in the center channel you may need to cut an opening from the outside to be able to tighten down the nuts and secure the wire or use the longer bolts and spacers.

Top View of Inline or Centerline Small Square Baler



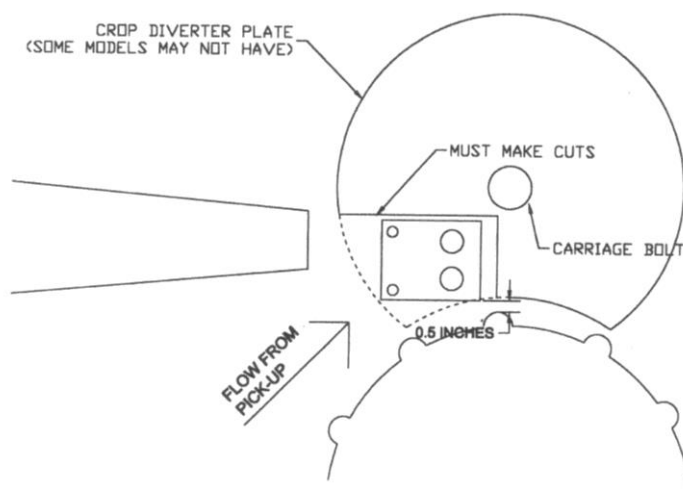
JOHN DEERE ROUND BALERS

Locate the sensor pad approximately 4.5" up from the bottom of the frame on the right hand side of the baler as indicated in Figure 1. The back edge of the sensor pad should be vertical so that the top rear corner of the sensor pad is approximately 3/8" forward from the rear edge of the upright frame tube (A). Using the hardware supplied in the kit, mount the sensor to the frame. Make sure that the beveled edge of the sensor pad is facing the front of the baler. Note you will have to use the longer carriage bolts and spacers.



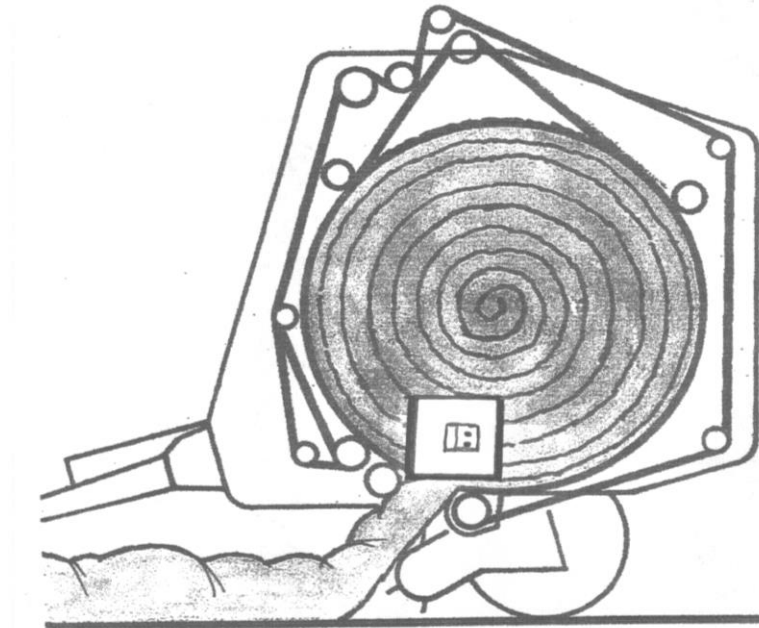
NEW HOLLAND AND CASE RBX ROUND BALERS

The sensor pad may be located on either side of the bale chamber. Your baler may contain a circular crop diverter plate. If it does it must be cut. A notch is cut in the plate as shown in the picture below. Re-install the plate, mark and drill holes. A template has been included for marking and drilling the correct holes. Make sure before drilling that when the bolts come through the side of the chamber that they do not interfere or touch any other pieces of metal



ALL OTHER ROUND BALERS

Using the diagram below locate your sensor in the area of the box. Note that it can be installed on either side of the baler. A template has been included for marking and drilling the correct holes. Make sure before drilling that when the bolts come through the side of the camber that they do not interfere or touch any other pieces of metal. Also look for natural diverters in the baler that could cause the bale to not make contact with the sensor. Remember that we want to get good even pressure against the pad. **(Note if you have a fixed chamber baler you will not get a good reading until the bale is almost complete. We do not recommend using an in chamber moisture tester for these balers)**



OPERATING INSTRUCTIONS

The 454 automatic control box lets the user:

- 1-Change the meter operation to MANUAL MODE OR AUTOMATIC MODE
- 2-Adjust the four set points
- 3-Reset the meter
- 4-Check meter calibration
- 5-Run an automatic self test
- 6-Adjust set time

Push the ON/OFF switch momentarily to turn the meter ON (push and hold the ON/OFF switch for a second to turn it OFF.) The "POWER" LED and the display should turn on. The three LEDs marked "PUMP," "VALV1," and "VALV2" should be off. *THE METER ALWAYS STARTS IN THE MONITOR/CONTROLLER MODE.*

After displaying the software version for a few seconds the display will read:"...W AIT...READING THE SENSOR."

After three seconds the average reading will be displayed along with the three set point values. A value of "-LO-" is displayed if the average M.C. is below 6% and a value of "-HI-" is displayed if the average M.C. is above 40%. The default SET POINTS VALUES are 18%, 22%, and 26% respectively for the PUMP, VALVE 1, and VALVE 2. The user can change these values using the procedure described below.

IF THE METER IS IN THE "AUTOMATIC" MODE and if the displayed reading is above the first set point value, the spray pump will be turned on. If the displayed reading is between the second and third set point values then the first valve will also be turned on. If the reading is above the third set point value, the second valve will also be turned on and all three LEDs will light. If the average M.C. is above 30% the buzzer will sound.

IF THE METER IS IN THE "MANUAL" MODE then the pump, both valves, and the buzzer will be turned off and remain off regardless of the moisture reading. The pump valve 1 and valve 2 can be manually turned on by pressing the "UP" arrow key, or turned off by pressing the "DOWN" arrow key.

CHANGING THE OPERATION MODE

As mentioned above, the meter can be used as an AUTOMATIC CONTROLLED or it can be used in a MANUAL MODE. Every time the meter is turned ON, it always starts in the AUTOMATIC MODE. To check and change the mode:

1. Press the "SELECT" key until the display shows the current operating mode.
2. Press the "ENTER" key to change the mode (otherwise press the down arrow key to return to end the function.) The new mode will be displayed for two seconds.

TO CHANGE THE SET POINTS

As previously mentioned, the default values for the set points are 18% for the pump, 22% for valve 1 and 26% for valve 2. However, the user can change these values as follows:

1. Press the "SELECT" key.
2. Press the "ENTER" key (within five seconds) when the display reads: "CHANGE SET POINT?(Press ENTER)"
3. Next the display will show:"S.P.(PUMP)=xx(Press UP/DOWN)"
Where "xx" is the current set point value for the pump (default is 18%).

4. Within five(5)seconds press either the “UP” arrow key to increase the value or the “DOWN” arrow key to decrease the value (between 15% and 22%.) When the proper value is displayed, press the “ENTER” key.

Press the “ENTER” key instead of the “UP” or “DOWN” key (or wait five seconds) if you do not want to change the set point value for the pump.

5. Next the meter will display: “S.P. (VLV 1)=XX(Press UP/DOWN)”
Where “xx” is the current set point value for valve 1(default is 22%.)
6. Within five seconds press the “UP” or “DOWN” arrow key to increase or decrease the value (between 18% and 26%.) Press “ENTER” when the proper value is displayed. Do not press the arrow key if you do not want to change the set point.
7. Next the meter will display: “S.P.(VLV 2)=xx(Press UP/DOWN)”
where “xx” is the current set point value for valve 2”(default is 26%.)
8. Within five seconds press the “UP” or “DOWN” arrow key to increase or decrease the value(between 22% and 30%.) Press “ENTER” when the proper value is displayed. Do not press the arrow key if you do not want to change the set point.
9. Next the meter will display: “S.P.(ALARM)=xx(Press UP/DOWN)”
10. Within five seconds press the “UP” or “DOWN” arrow key to change the point at which the alarm sounds.

The unit will retain these values even if it is turned OFF and the main power is removed. The values will be lost if the user *RESETS* the meter.

TO RESET THE SYSTEM

1. Press the “SELECT” key until “RESET THE METER?” displays.
2. Press the “ENTER” key when the display reads: “RESET the METER? (Press ENTER)”
3. The meter will reset itself. Default set point values will be restored. Both valves and the pump will be turned off.

TO CHECK CALIBRATION

1. Disconnect the coax cable from the meter.
2. Press first the “SELECT” key until “CHECK CAL.?” displays.
3. Press the “ENTER” key when the display reads: “CHECK CAL.? (Press ENTER)”
4. Display should read “CALIBRATION CHECK=20.0”
A tolerance of +or_ 0.5 (i.e. 19.5 to 20.5) is acceptable.

NOTE: ALTHOUGH THE SYSTEM SHOULD RETAIN ITS CALIBRATION INDEFINITELY, AN OCCASIONAL CHECK IS RECOMMENDED TO ASSURE THE OPERATOR THAT IT IS IN CALIBRATION.

RUNNING THE AUTO TEST

1. Turn the meter ON. Press the "SELECT" key until display reads "AUTO TEST?." Press the "ENTER" key within five seconds to start the test.
2. The meter will automatically activate the Pump, Valve 1, Valve 2, and the buzzer in sequence for a few seconds. Make sure that the devices turn on as expected, otherwise check the wiring connections.

CHANGING THE ADJUST TIME

The 454 controller takes 5 moisture readings per second. Adjustments can be made between 1 and 30 seconds. It is recommended that the adjustment rate be set at:

- Conventional Square Balers- 5 seconds
- Large Round Balers- 2 seconds
- Large Square Balers- 5 seconds

This is a function of the location of the sensor pad and the variation in the field to change set time.

1. Press the "SELECT" key until "NEW SAMPLE TIME" displays.
2. Press the "ENTER" key, then the up or down arrow to set the new time. Then the new mode will be displayed for two seconds.

PAUSING THE 454 CONTROLLER

A "PAUSE" feature is added which enables the operator to temporarily pause the monitor /controller operation.

To activate this feature:

1. Press the "ENTER/PAUSE" key *BEFORE* pressing any of the other keys.
2. Meter will display "....UNIT PAUSED...." The pump and all valves will be shut off and the buzzer will beep at one second intervals.
3. Press the "ENTER/PAUSE" key again to return to the normal mode. The meter will start operation from the point at which it was paused.

CALIBRATION

There are three things that you need to know when calibrating your applicator. First you need to 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.

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	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 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 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. If your chemical requires rates other than what these tips deliver you will need to purchase them through your dealer.

443 TIP AND CAP COLOR WITH OUTPUT

TIP NUMBER	COLOR CODED CAP	OUTPUT (lb./hr)
650033	WHITE	15
650050	BLACK	20
650067	BROWN	30
11001	ORANGE	45
110015	GREEN	65
11002	YELLOW	85
11003	BLUE	130
11004	RED	175

Set the tips up in the nozzles by selecting the application rates required and finding you baler's approximate harvesting rate from the application rate charts on the previous page. Note that application is not as dependent on baling rate as it is on the application levels desired. Application rate levels have been selected from some of the more common product labels currently on the market. If the application rates required are not on the following charts, tips can be re-combined from the preceding chart to achieve different levels of application at the setpoints entered into the controller.

APPLICATION RATE CHART - CONVENTIONAL SQUARE BALERS

BASE RATE • 2 tips - AUX 1 • 1 tip - Aux 2 • 1 tip

CHART 1: FOR APPLICATIONS OF 4 lb./ton • 8 lb./ton • 16 lb./ton

BALING RATE	LEFT TIP	RIGHT TIP	AUX 1	AUX 2
6 ton/hr.	White	White	Black	Orange
8 ton/hr.	Black	White	Brown	Green
10 ton/hr.	Black	Black	Orange	Yellow
12 ton/hr.	Brown	Black	Orange	Yellow
16 ton/hr.	Brown	Brown	Green	Blue
20 ton/hr.	Orange	Orange	Yellow	Red

CHART 2: FOR APPLICATIONS OF 2 lb./ton • 6 lb./ton • 12 lb./ton

6 ton/hr.	White	Shut-Off	Black	Brown
8 ton/hr.	White	Shut-Off	Brown	Orange
10 ton/hr.	Black	Shut Off	Orange	Green
12 ton/hr.	White	White	Orange	Yellow
16 ton/hr.	White	White	Green	Yellow
20 ton/hr.	Black	Black	Yellow	Blue

APPLICATION RATES ARE ACCURATE ONLY IF TIPS ARE KEPT CLEAN AND THE GAUGE READS BETWEEN 25 to 35 PSI.

APPLICATION RATE CHART - LARGE ROUND BALERS

BASE RATE • 3 tips - Aux 1 • 1 tip - Aux 2 • 1 tip

CHART 1: FOR APPLICATIONS OF 4 lb./ton • 8 lb./ ton • 16 lb./ton

	LEFT NOZZLE	CENTER NOZZLE	VALVE 1 NOZZLE	VALVE 2 NOZZLE	RIGHT NOZZLE
12 ton/hr.	White	White	Orange	Yellow	White
16 ton/hr.	White	Orange	Green	Blue	White
20 ton/hr.	Black	Orange	Green	Blue	Black
24 ton/hr.	Black	Green	Yellow	Red	Black
28 tons/hr.	Brown	Green	Blue	Red	Brown

CHART 2: FOR APPLICATIONS OF 2 lb./ton • 6 lb./ton • 12 lb./ton

	LEFT NOZZLE	CENTER NOZZLE	VALVE 1 NOZZLE	VALVE 2 NOZZLE	RIGHT NOZZLE
12 ton/hr.	White	White	Orange	Yellow	White
16 ton/hr.	White	White	Orange	Yellow	White
20 ton/hr.	White	White	Green	Yellow	White
24 ton/hr.	White	White	Yellow	Blue	White
28 ton/hr.	White	Brown	Yellow	Blue	White

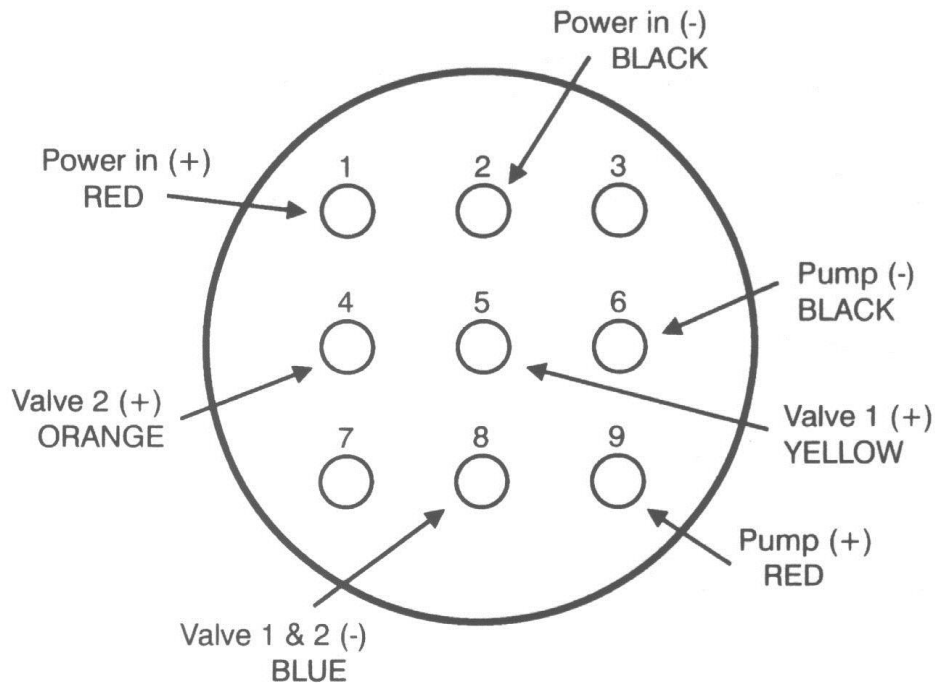
APPLICATIONS RATES WILL BE ACCURATE ONLY IF THE TIPS ARE KEPT CLEAN AND THE PRESSURE GAUGE READS 25 TO 35 PSI.

TROUBLE SHOOTING CHECKS

PROBLEM	POSSIBLE CAUSE	SOLUTION
Pump will not run.	1. Pump locked up.	1. Clean or rebuild pump if motor is OK.
	2. Damaged wire.	2. 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.
Pump does not develop enough output.	1. Air leaks or clogs on inlet side.	1. Tighten or clean filter bowl assembly.
	2. Pump worn or dirty.	2. Rebuild pump.
	3. Low supply voltage. (Pump requires 12v minimum)	3. Check voltage at connection with voltmeter.
	4. Bad gauge.	4. 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.
Moisture reads high all the time.	1. Baling to wet.	1. Wait for moisture level to go down.
	2. Electrodes touching each other or grounding out.	2. Keep electrodes clean. Clean chaff off bolts and from under the pad. Make sure the bolts are not touching metal.
	3. Tractor electronic interference.	3. Make sure power is hooked to battery or starter. Keep control away from 2-way radios.
Moisture reads low all the time.	1. No conductivity to bale sensor.	1. Inspect for loose connection or broken wires.
Moisture varies more than 10 points from reading to reading.	1. Hay is varying in windrow wide amount.	1. Improve mowing and raking .
		Increase read time interval.
	2. Loose connections or ground contact on sensor.	2. Inspect wiring.
Auxiliary tips are not coming on when the box lights show they should.	1. Loose wiring connections.	1. Inspect wire.
	2. Dirty tips.	2. Clean auxiliary tips and strainers.

WIRING DIAGRAM

Disconnects at cab box and inline



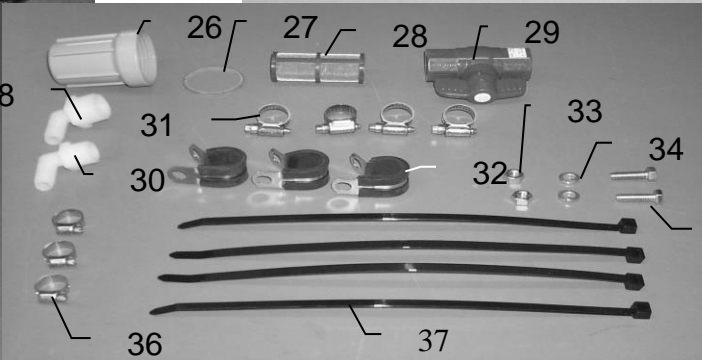
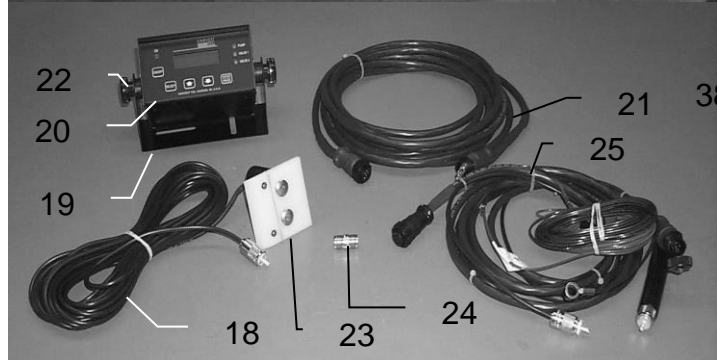
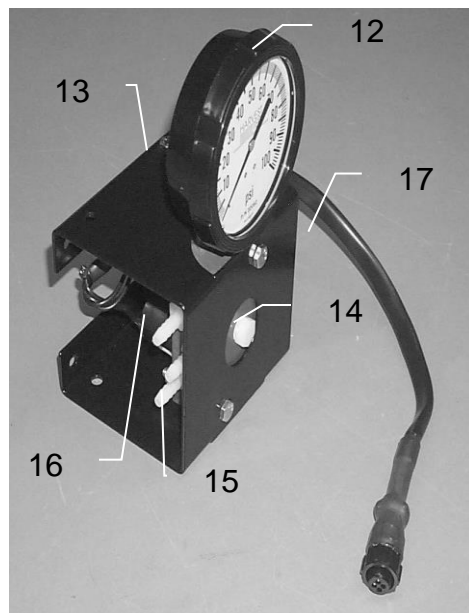
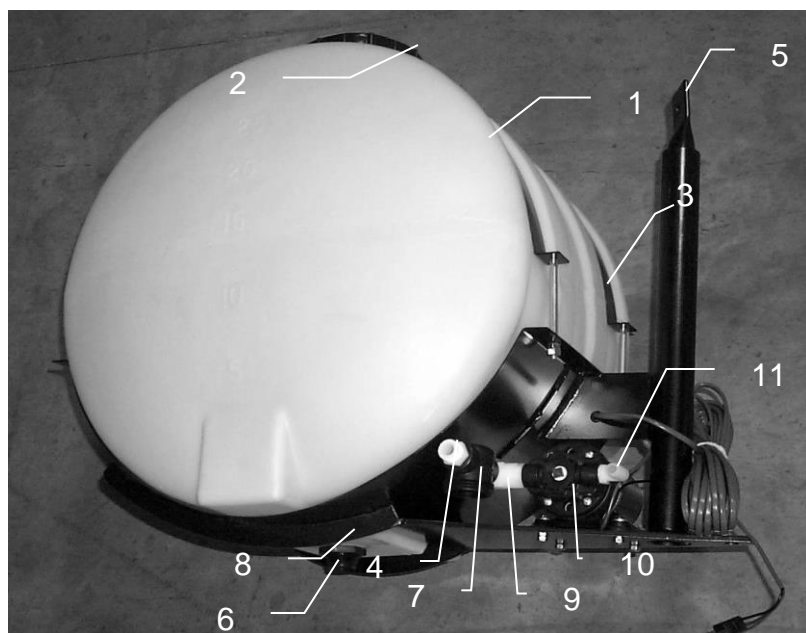
MAINTENANCE

1. Clean the tip strainers and main strainer every 10 hours of operation or more frequently if required.
2. Flush system between cuttings of hay with clean water.
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 automatic control box if the implement is left outside in the field.
5. Pump performance may start to decline after 400 hours (1500 acres on conventional balers) of use. Rebuilding the pump is a simple procedure if the motor is not damaged. Order pump rebuilding kit #007-4585 for the automatic unit.
6. If you are using bacterial inoculants, flush your system daily after every use.

STORAGE

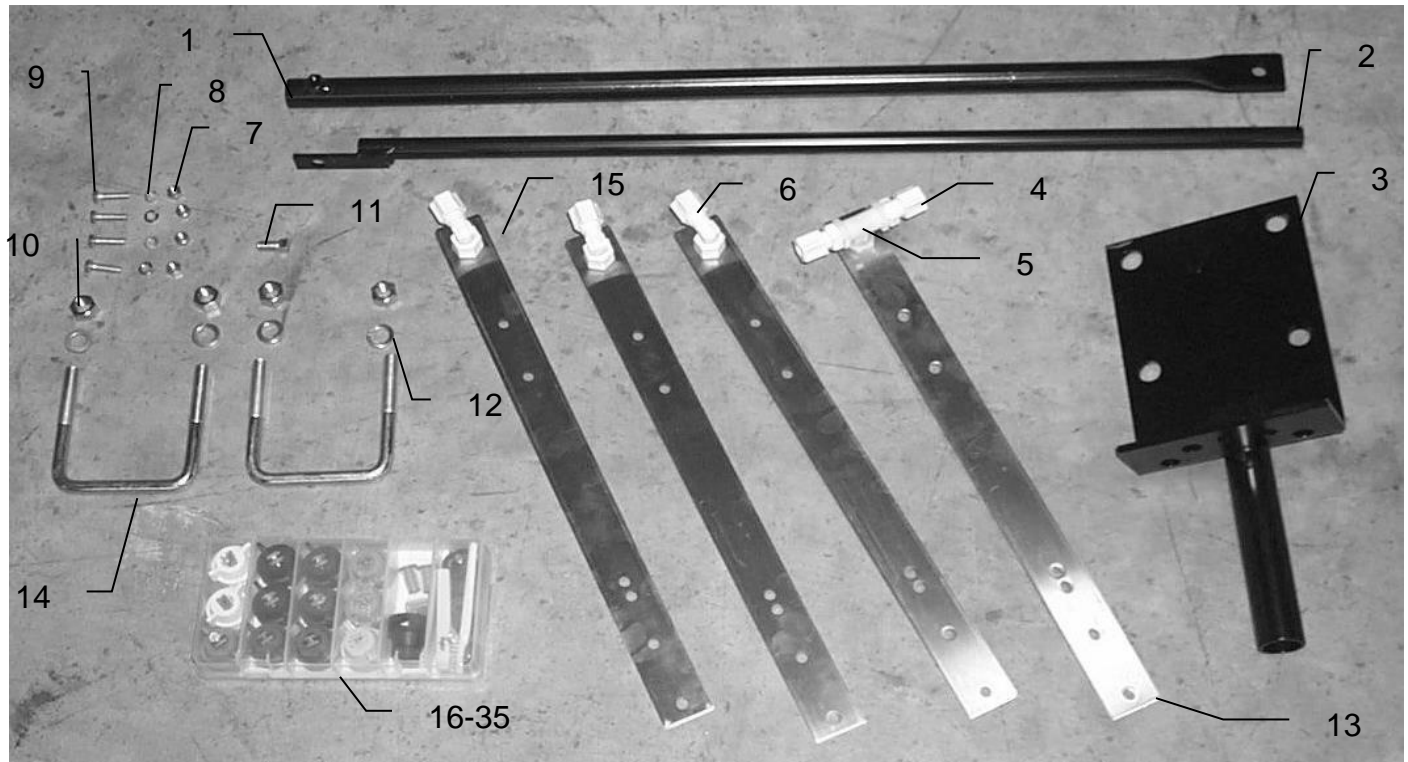
1. Thoroughly flush the system with water.
2. Pull the intake line and run dry until the water has cleared out of the intake side.
3. Remove the red pug from the end of the pump, drain and replace the plug.
4. Drain all lines on the outlet side.
5. Never use oils or alcohol-based anti-freeze in the system.
6. For spring start up, or anytime the pump fails to run, turn off the power immediately to avoid burning the motor out. The pump head can be disassembled and freed or rebuilt in most cases.
7. Remove the control box and store indoors.

HARVEST TEC MODEL 443 PARTS LIST



Ref	Description	Part#	Ref	Description	Part#
1	Tank-25 gallon	005-9022	20	454 Automatic control box	006-4540
2	Tank lid- 1999 or older	005-9022A	21	Wiring harness-tractor to pump	006-4540B
	Gasket-1999 or older	005-9022AG	22	Control box knobs	
	Tank lid-2000 or new	005-9022C	23	Moisture testing pad	008-1986P
	Gasket-2000 or newer	005-9022CG	24	Double female connector	008-1986E
3	Tank strap	001-4402	25	Wiring harness	006-4540A
4	Nipple	003-M1212	26	Filter bowl only	002-4315F
5	Stub pipe	001-4403	27	Filter bowl gasket	002-4315D
6	Tank fitting	005-9100	28	Filter bowl screen-80 mesh	002-4315B
7	Complete filter assembly	002-4315	29	Ball valve	002-2212
8	Tank frame	001-4401	30	Elbow fitting	003-EL1212
9	Elbow fitting	003-SE12	31	#6 Hose clamp	003-9003
10	Pump	007-4120KLP	32	Jiffy clip	008-9010
11	Elbow fitting-3/8"x1/2"	003-EL3812	33	Nuts-5/16"	
12	4" Gauge	002-2208Z	34	Lock washers 5/16"	
13	Valve body holder bracket	001-4719	35	Bolts 5/16"	
14	Plug	003-F14	36	#4 Hose clamp	003-9002
15	Straight fitting	003-A1414	37	Cable ties	
16	Valve body with harness	002-2203D	38	Elbow	003-EL3412
17	Valve body assembly	030-2454			
18	Moisture testing cable	008-1986C			
19	Control box mounting bracket				

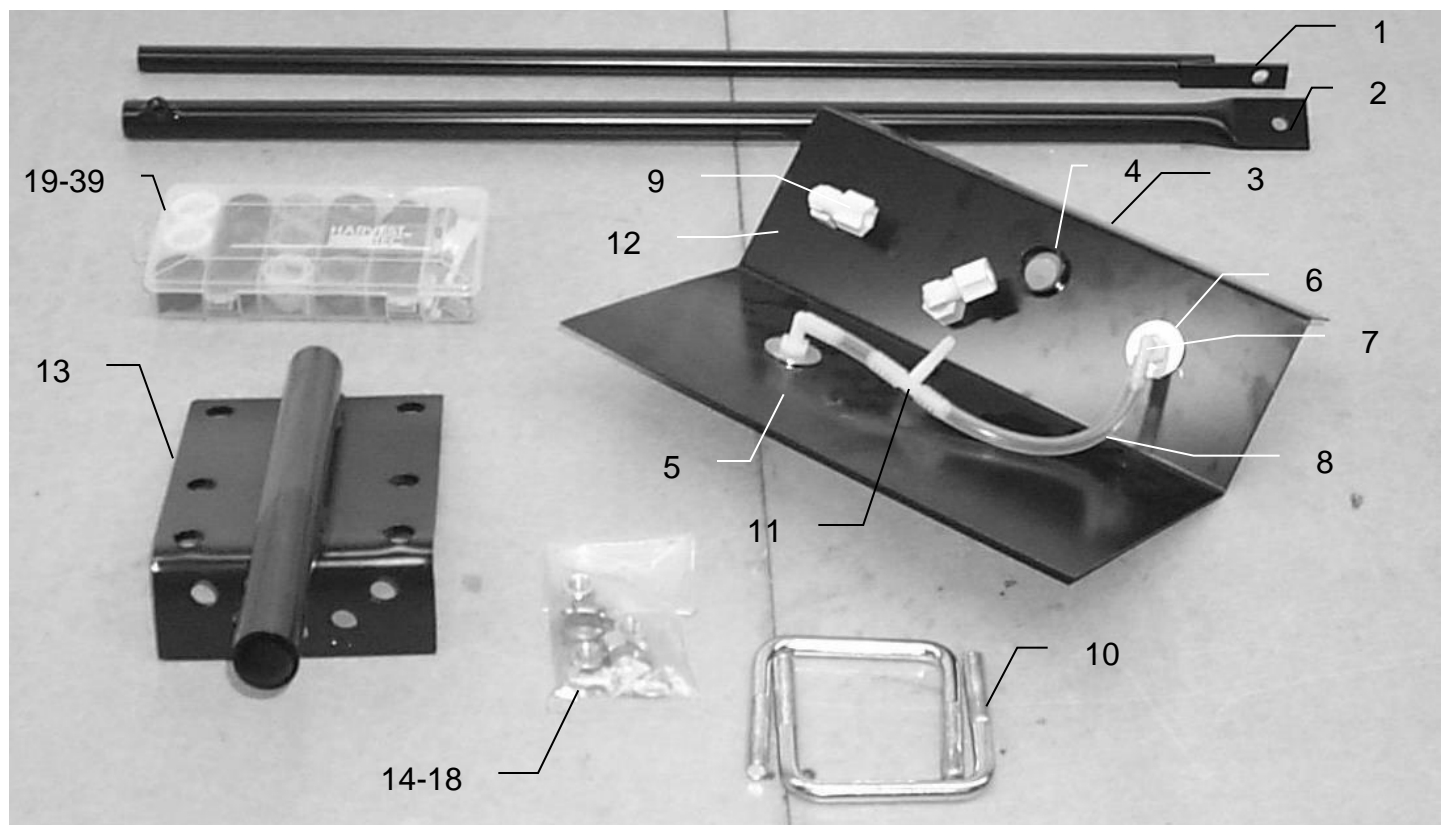
HARVEST TEC MODEL 4409A INSTALLATION KIT FOR UNIVERSAL CONVENTIONAL SQUARE BALERS WITH AUTOMATIC CONTROL



Ref	Description	Part #
1	Outside reach rod	001-4404
2	Inside reach rod	001-4405
3	Mounting bracket	001-4406
4	Jaco fitting	001-JA1414
5	Tee	003-TT14
6	Jaco fitting	003-JEL1414 F
7	Nuts- 1/4"	
8	Lock washers- 1/4"	
9	Bolts- 1/4"x1"	
10	Nuts-1/2"	
11	Square head screws- 3/8"x3/4"	
12	Lock washers- 1/2"	
13	Nozzle straps 001-4215	
14	U-bolts-1/2"x 4"	001-4406A
15NP	Quick fitting	004-4710
NP	Not pictured	

Ref	Description	Part #
16-35	Tip set	
	Plastic box	008-9000
	Rate decal	HS454-02
	Washers	004-1207W
	Strainers	004-4213-200
	White set- Cap	004-1207D
		Tip 004-650033-SS
	Black set- Cap	004-1207I
		Tip 004-650050-SS
	Brown set- Cap	004-1207K
		Tip 004-650067-SS
	Orange set- Cap	004-1207J
		Tip 004-XR11001VS
	Green set- Cap	004-1207A
		Tip 004-XR110015VS
	Yellow set- Cap	004-1207E
		Tip 004-XR11002VS
	Blue set- Cap	004-1207C
		Tip 004-XR11003VS
	Red set- Cap	004-1207B
		Tip 004-XR11004VS
	Complete HS454-02 tip kit	030-9004

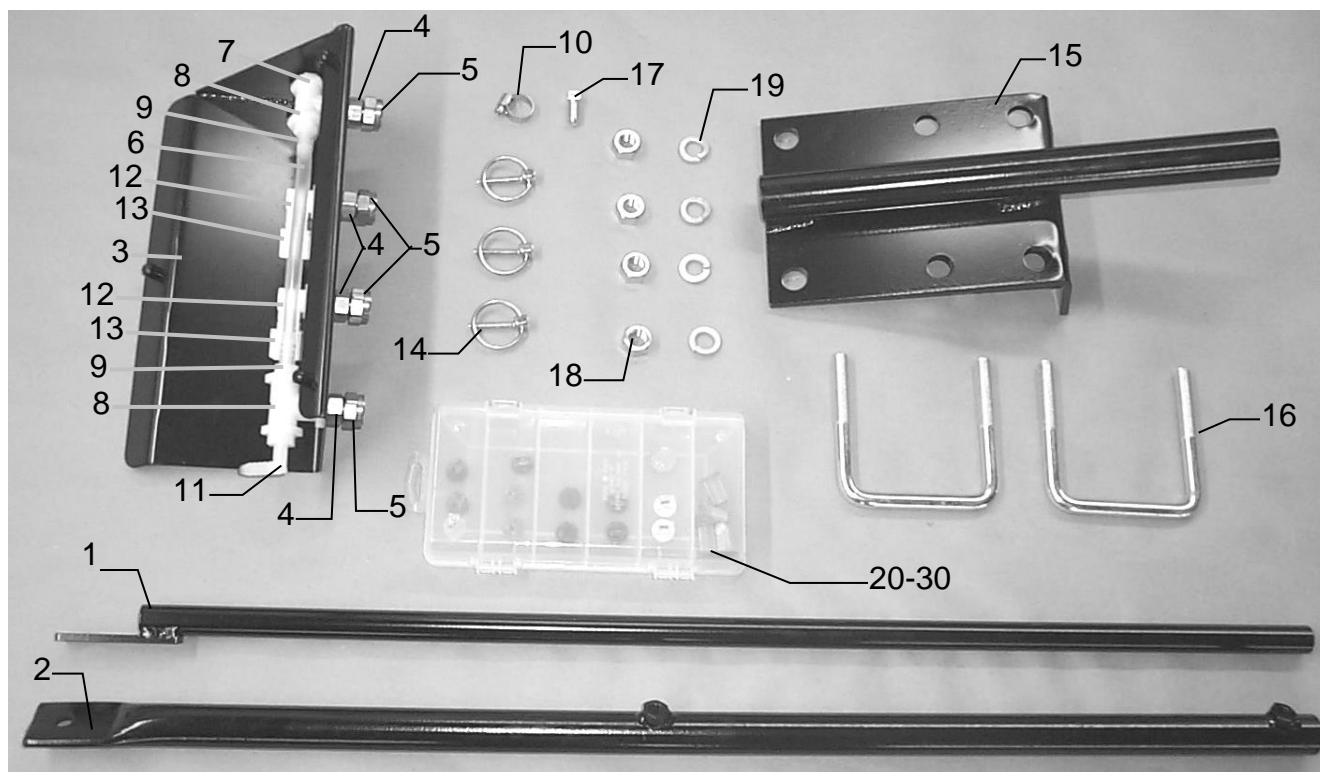
HARVEST TEC MODEL 4410A INSTALLATION KIT FOR JOHN DEERE CONVENTIONAL SQUARE BALERS WITH AUTOMATIC CONTROL



Ref	Description	Part #
1	Inside reach rod	001-4405
2	Outside reach rod	001-4404
3	Spray shield	001-4426
4	Rubber grommet	
5NP	Quick jet fitting	004-1207G
6	Fender washer- 1/2"	
7	Elbow	003-EL1414
8	EVA hose-1/4"	002-9006
9	Jaco fitting	003-JEL1414F
10	U-bolts- 1/2"x4"	001-4406A
11	Tee	003-T1414
12NP	Quick jet fitting	004-4710
13	Mounting bracket	001-4406
14-18	Parts bag	
	Square head set screw- 3/8"x3/4"	
	Nuts- 1/2"	
	Locks- 1/2"	
	#4 Hose clamp	003-9002
NP	Not pictured	
	Complete HS454-02	
	tip kit	030-9004

Ref	Description	Part#
19-39	Plastic box	008-9000
	Washers	004-1207W
	Shut-off cap	004-1207F
	Rate decal	HS454-02
	Tip strainers	004-4213-200
	White set- Cap	004-1207D
	Tip	004-650033-SS
	Black set- Cap	004-1207I
	Tip	004-650050-SS
	Brown set- Cap	004-1207K
	Tip	004-650067-SS
	Orange set- Cap	004-1207J
	Tip	004-XR11001VS
	Green set- Cap	004-1207A
	Tip	004-XR110015VS
	Yellow set- Cap	004-1207E
	Tip	004-XR11002VS
	Blue set- Cap	004-1207C
	Tip	004-XR11003VS
	Red set- Cap	004-1207B
	Tip	004-XR11004VS

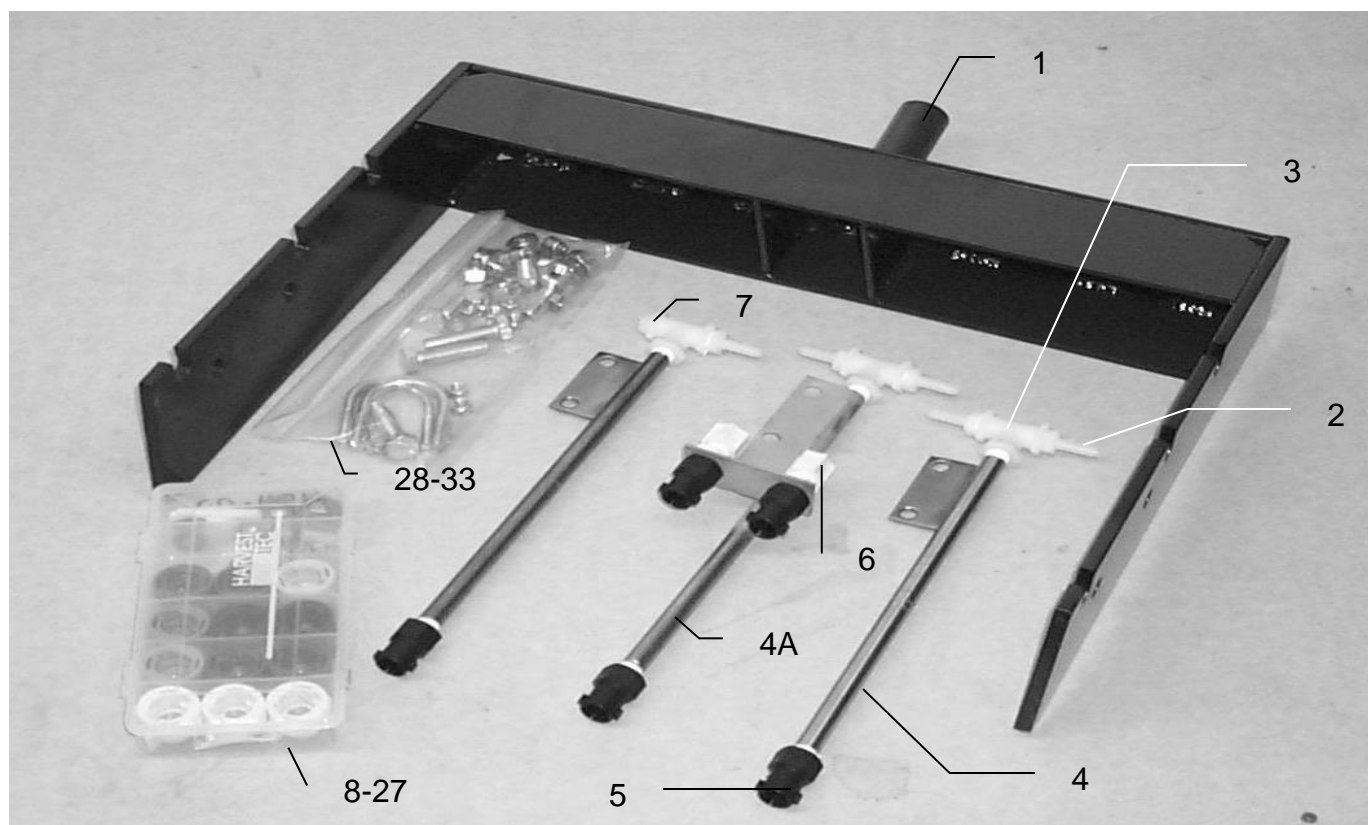
HARVEST TEC MODEL 4411A INSTALLATION KIT FOR NEW HOLLAND & CASE IH SBX CONVENTIONAL SQUARE BALERS WITH AUTOMATIC CONTROL



Ref	Description	Part#
1	Inside reach rod	001-4405
2	Outside reach rod	001-4404
3	Spray shield	001-4425A
4	Nozzle Body	004-4744
5	Nozzle Cap	004-4745
6	Eva hose-1/2"	002-9006
7	1/4" Plug	003-F14
8	1/4" Tee	003-TT14
9	Straight fitting	003-A1414
10	#4 Hose clamp	003-9002
11	Elbow	003-EL1414
12	Jaco Elbow fitting	003-JEL1414
13	Jaco nut	003-JN14
14	3/16" Lynch Pin	008-4576
15	Mounting bracket	001-4406

Ref	Description	Part#
16	U-bolts-1/2"x4"	001-4406A
17	3/8"x3/4" square head set screw	
18	Nuts-1/2"	
19	Lock washers-1/2"	
20-30	Tip set	
	Plastic box	008-9000
	White set- Tips	004-650033-SS
	Black set- Tips	004-650050-SS
	Brown set- Tips	004-650067-SS
	Orange set- Tips	004-XR11001VS
	Green set- Tip	004-XR110015VS
	Yellow set- Tip	004-XR11002VS
	Blue set- Tip	004-XR11003VS
	Red set- Tip	004-XR11004VS
	Strainers-200 mesh	004-4213-100
	Shut off cap	004-1207FP

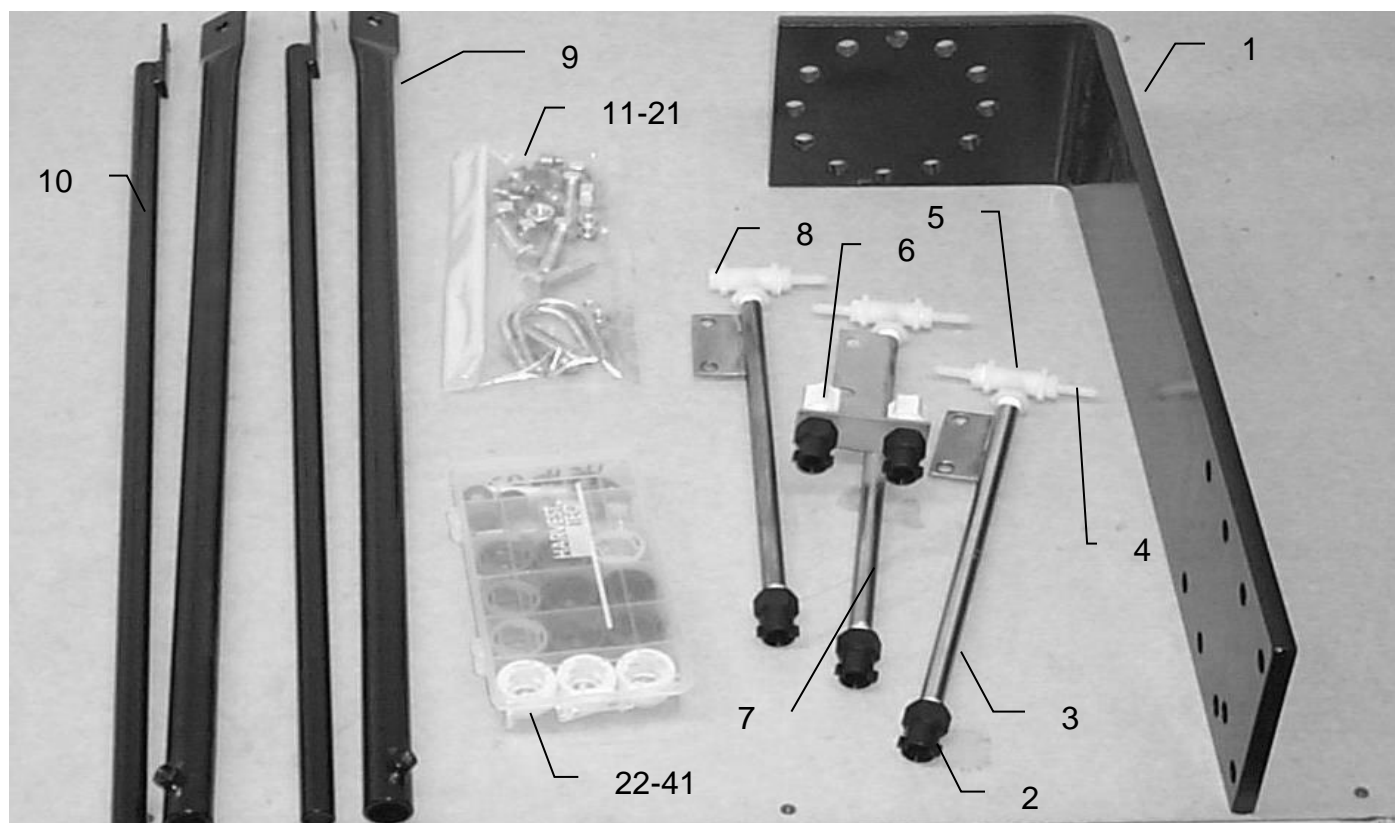
HARVEST TEC MODEL 4483A INSTALLATION KIT FOR JOHN DEERE ROUND BALERS WITH AUTOMATIC CONTROL



Ref	Description	Part #
1	Mounting bracket	001-4411
2	Straight fitting	003-A1414
3	Tee	003-TT14
4A	Auto nozzle tubes	001-4714A
4	Nozzle tube	001-4714
5	Quick jet fitting	004-1207G
6	Jaco fitting	003-JA1414
	Jaco nut	003-JN14
7	Plug	003-F14
8-27	Tip set	
	Plastic box	008-9000
	Decal	HS454-03
	Washer	004-1207W
	Tip strainers	004-4213-200
	White set- Cap	004-1207D
		Tip 004-650033-SS
	Black set- Cap	004-1207I
		Tip 004-650050-SS
	Brown set- Cap	004-1207K
		Tip 004-650067-SS

Ref	Description	Part#
8-27	(continued)	
	Orange set- Cap	004-120J
		Tip 004-XR11001VS
	Green set- Cap	004-1207A
		Tip 004-XR110015VS
	Yellow set- Cap	004-1207E
		Tip 004-XR11002VS
	Blue set- Cap	004-1207C
		Tip 004-XR11003VS
	Red set- Cap	004-1207B
		Tip 004-XR11004VS
	Complete HS454-03 tip kit	030-9005
28-33	Parts bag	
	U-bolts- 5/16"x11/2"	
	Nuts- 5/16"	
	Locks- 5/16"	
	Nuts- 12mm	
	Bolts- 12mmx45mm	
	#4 Hose clamps	003-9000

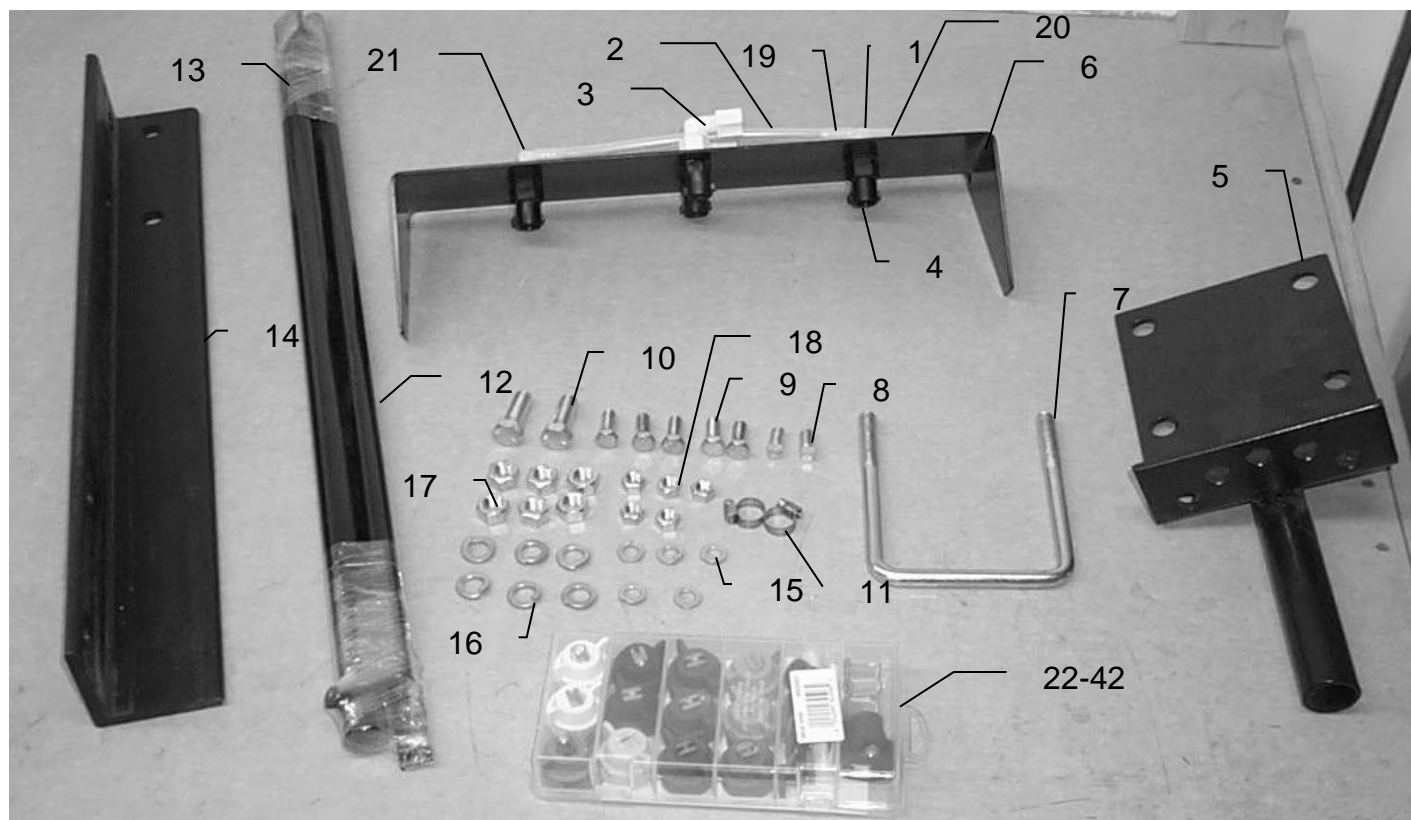
HARVEST TEC MODEL 4484A INSTALLATION KIT FOR UNIVERSAL ROUND BALERS WITH AUTOMATIC CONTROL



Ref	Description	Part #
1	Mounting bracket	001-4418
2	Quick jet fitting	004-1207G
3	Nozzle pipes	001-4714
4	Straight fitting	003-A1414
5	Tee	003-TT14
6	Jaco fitting	003-JA1414
	Jaco nut	003-JN14
7	Auto nozzle tube	001-4714A
8	Plug	003-F14
9	Outside reach rod	001-4404
10	Inside reach rod	001-4405
11-21	Parts bag	
	U-bolts- 5/16"x11/2"	
	Nuts- 5/16"	
	Locks- 5/16"	
	Square head screw- 3/8"x3/4"	
	Bolts- 3/8"x 1"	
	Nuts- 3/8"	
	Lock washers- 3/8"	
	#4 Hose clamp	003-9002
	Bolts- 1/2"x11/2"	
	Nuts-1/2"	
	Locks-1/2"	

Ref	Description	Part#
22-41	Tip set	
	Plastic box	008-9000
	Rate decal	HS454-03
	Washers	004-1207W
	Tip strainers	004-4213-200
	White set-	
	Cap	004-1207D
	Tip	004-650033-SS
	Black set-	
	Cap	004-1207I
	Tip	004-650050-SS
	Brown set-	
	Cap	004-1207K
	Tip	004-650067-SS
	Orange set-	
	Cap	004-1207J
	Tip	004-XR11001VS
	Green set-	
	Cap	004-1207A
	Tip	004-XR110015VS
	Yellow set-	
	Cap	004-1207E
	Tip	004-XR11002VS
	Blue set-	
	Cap	004-1207C
	Tip	004-XR11003VS
	Red set-	
	Cap	004-1207B
	Tip	004-XR11004VS
	Complete HS454-03	
	tip kit	030-9005

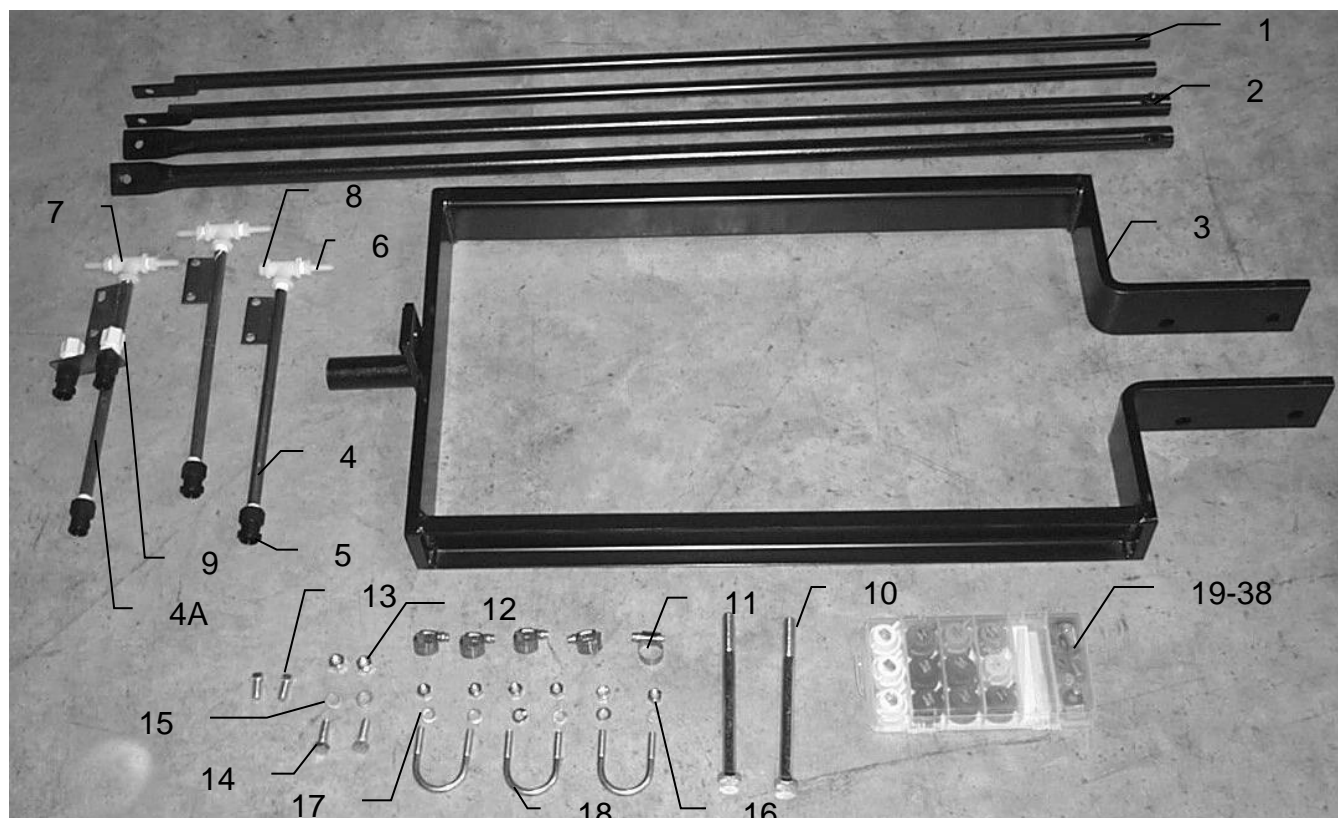
HARVEST TEC MODEL 4485A INSTALLATION KIT FOR CASE IH & CHALLENGER CONVENTIONAL SQUARE BALERS



Ref	Description	Part#
1	Tee	003-TT14
2	Eva hose- 1/4"	002-9006
3	Jaco fitting	003-JEL1414F
4	Quick jet fitting	004-4710
5	Mounting bracket	001-4406
6	Spray shield	001-4424
7	U-bolt- 1/2"x43/4"x6"	001-4417C
8	Square head screw- 3/8"x3/4"	
9	Bolt- 3/8"x1"	
10	Bolt- 1/2"x1 1/2"	
11	#4 Hose clamp	003-9003
12	Inside reach rod	001-4405
13	Outside reach rod	001-4404
14	Axle bracket	001-4417
15	Lock washers- 3/8"	
16	Lock washers- 1/2"	
17	Nuts- 3/8"	
18	Nuts- 1/2"	
19	Straight fitting	003-A1414
20	Elbow fitting	003-EL1414
21	Plug	003-F14
Complete HS454-02 tip kit 003-9004		

Ref	Description	Part #
22-42	Tip set- Plastic box	008-9000
	Shut off cap	004-1207F
	Washers	004-1207W
	Rate decal	HS454-02
	Tip screen	004-4213-200
	White set- Cap	004-1207D
		Tip 004-650033-SS
	Black set- Cap	004-1207I
		Tip 004-650050-SS
	Brown set- Cap	004-1207K
		Tip 004-650067-SS
	Orange set- Cap	004-1207J
		Tip 004-XR11001VS
	Red set- Cap	004-1207B
		Tip 004-XR11004VS
	Green set- Cap	004-1207A
		Tip 004-XR110015VS
	Yellow set- Cap	004-1207E
		Tip 004-XR11002VS
	Blue set- Cap	004-1207C
		Tip 004-XR11003VS

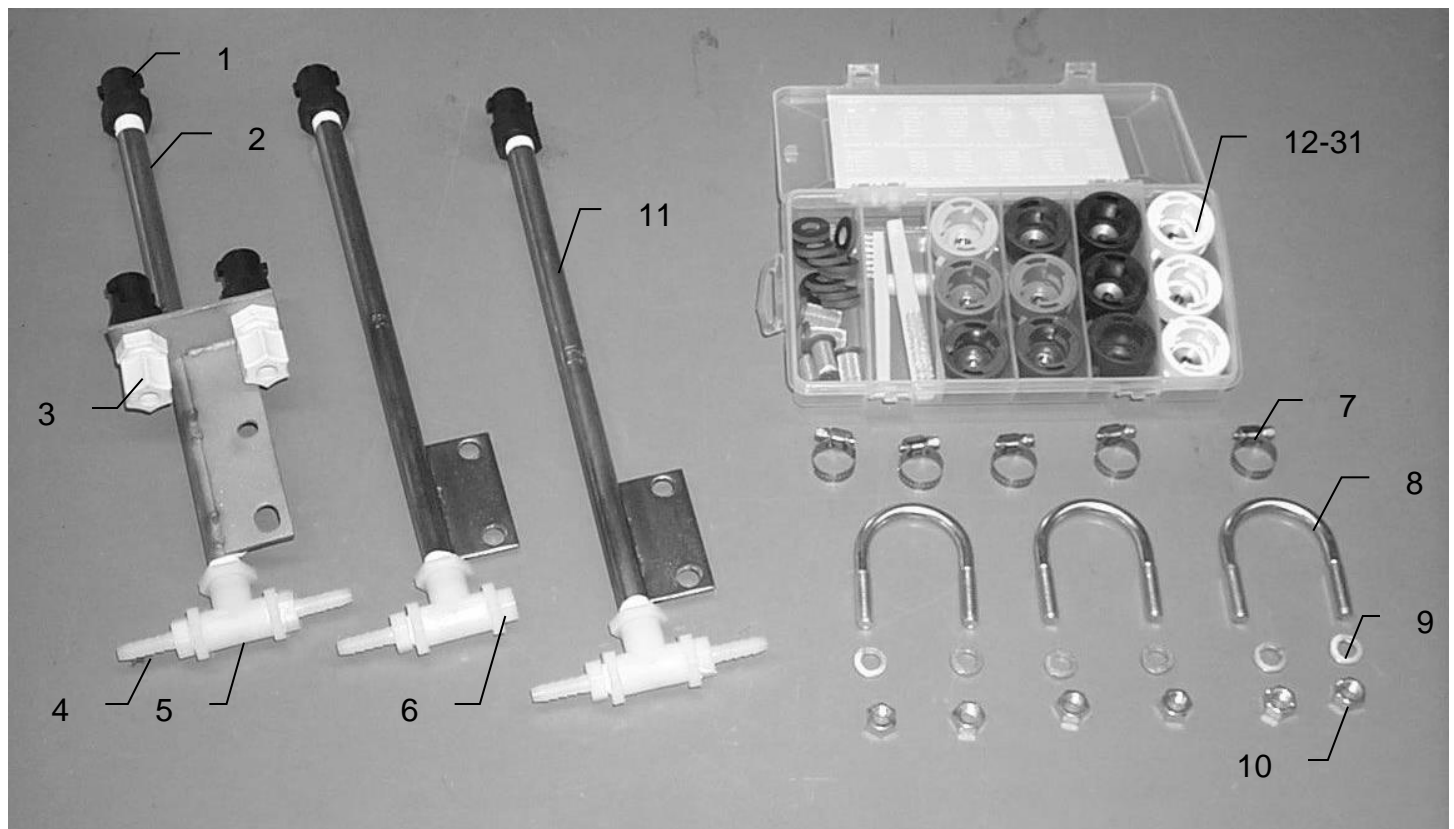
HARVEST TEC MODEL 4486A INSTALLATION KIT FOR NEW HOLLAND ROUND BALERS WITH AUTOMATIC CONTROL



Ref	Description	Part#
1	Inside reach rod	001-4405A
2	Outside reach rod	001-4404A
3	Mounting Bracket	001-4420
4	Nozzle pipe	001-4714
4A	Auto nozzle pipe	001-4714A
5	Quick jet fitting	004-1207G
6	Straight fitting	004-A1414
7	Tee	003-TT14
8	Plug	003-F14
9	Jaco fitting	003-JA1414
	Jaco nut	003-JN14
10	Bolts- 1/2"x6"	
11	#4 Hose clamps	002-9002
12	Nuts- 3/8"	
13	Square head screw-3/8"x3/4"	
14	Bolts- 3/8"x1"	
15	Lock washers- 3/8"	
16	Nuts- 5/16"	
17	Lock washers- 5/16"	
18	U-bolts- 5/16"	
19-38	Tip set	
	Plastic box	008-9000
	Washers	004-1207W

Ref	Description	Part#
19-38	(continued)	
	Tip strainers	004-4213-200
	Rate decal	HS454-03
	White set- Cap	004-1207D
	Tip	004-650033-SS
	Black set- Cap	004-1207I
	Tip	004-6500650-SS
	Brown set- Cap	00-1207K
	Tip	004-650067-SS
	Orange set- Cap	004-1207J
	Tip	004-XR11001VS
	Green set- Cap	004-1207A
	Tip	004-XR110015VS
	Yellow set- Cap	004-1207E
	Tip	004-XR11002VS
	Blue set- Cap	004-1207C
	Tip	004-XR11003VS
	Red set- Cap	004-1207B
	Tip	004-XR11004VS
	Complete HS454-03 tip kit	030-9005

HARVEST TEC MODEL 4400CA INSTALLATION KIT FOR ROUND BALERS WITH AUTOMATIC CONTROL



Ref	Description	Part #
1	Quick jet fitting	004-1207G
2	Nozzle tube	001-4714A
3	Jaco fitting	003-JA1414
4	Straight fitting	003-A1414
5	Tee	003-TT14
6	Plug	003-F14
7	Hose clamp	003-9002
8	U-bolt- 5/16" x 1 1/2"	
9	Lock washers- 5/16"	
10	Nuts- 5/16"	
11	Nozzle tube	001-4714
12-31	Tip kit	
	Plastic box	008-9000
	Rate decal	HS454-03
	Washers	004-1207W
	Strainers	004-4213-200

Ref	Description	Part#
12-31	(continued)	
	White set- Cap	004-1207D
	Tips	004-650033-SS
	Black set- Cap	004-1207I
	Tips	004-650050-SS
	Brown set- Cap	004-1207K
	Tips	004-650067-SS
	Orange set- Cap	004-1207J
	Tip	004-XR11001VS
	Green set- Cap	004-1207A
	Tip	004-XR110015VS
	Yellow set- Cap	004-1207E
	Tip	004-XR11002VS
	Blue set- Cap	004-1207G
	Tip	004-XR11003VS
	Red set- Cap	004-1207B
	Tip	004-XR11004VS
	Complete HS454-03 tip kit	030-9005

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.

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