

OWNER'S MANUAL

Model 495B ***For John Deere 100 BALERS***

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

010-495
Rev.1-05

Table of Contents

INSTALLATION INSTRUCTIONS	
STEP 1: INSTALLATION OF THE HANGERS & PUMP HOLDER	3
STEP 2: LOCATION & INSTALLATION OF THE SPRAY SHIELD ASSEMBLY	4
STEP 3: MOUNTING THE STAR WHEELS ON THE BALER	5
STEP 4: WIRE THE STAR WHEEL TO THE SIGNAL CONDITIONER	6
STEP 5: CONNECTING THE FLOW METER TO THE SIGNAL CONDITIONER	6
STEP 6: BALE RATE SENSORS	6
STEP 7: MAIN WIRING HARNESS INSTALLATION	6
WIRE INSTALLTION	7
STEP 8: PLUMBING	8
STEP 9: INSTALL THE MOUNTING BRACKET INSIDE THE TRACTOR CAB	8
STEP 10: INSTALL CONTROLLER CABLE HARNESS	8
STEP 11: INSTALL THE MAIN POWER LEADS	8
STEP 12: OPERATING INSTRUCTIONS	9
DESCRIPTION OF BUTTONS	9
STEP 13: FIRST TIME & ANNUAL START UP INSTRUCTIONS	10
PRIMING & CHECKING THE PUMPS	11
TO RUN IN AUTOMATIC MODE	11
TO PAUSE THE UNIT	11
TO CHANGE APPLICATION RATES	12
TO CHANGE THE MOISTURE SET POINTS	12
TO RUN IN THE AUTOMATIC BALE RATE MODE	12
TO RUN IN THE MANUAL BALE RATE MODE	12
TO OVERRIDE THE SYSTEM & APPLY FULL APPLICATION	13
TO READ & RESET THE AMOUNT OF PRESERVATIVE USED	13
TO RUN THE APPLICATOR IN MANUAL MODE	13
ADJUSTING THE VOLUME OF THE CONTROL BOX ALARM	13
COMMON QUESTIONS ABOUT THE 464 CONTROL SYSTEM	14
ROUTINE MAINTENANCE	14
WINTER STORAGE	14
TROUBLE SHOOTING CHECKS ON THE 464 CONTROL SYSTEM	15
SYSTEM ERROR GUIDE	16
SYSTEM ERROR 2 TROUBLESHOOTING	17
DISPLAY PROBLEMS TROUBLESHOOTING	17
WIRING DIAGRAM	18
PARTS BREAKDOWN FOR PUMP PLATE	20
PARTS BREAKDOWN FOR STAR WHEEL AND HOSES	21
PARTS BREAKDOWN FOR THE CONTROL BOX AND WIRING HARNESS	22
4489A INSTALLATION KIT PARTS BREAKDOWN	23
STAR WHEEL BLOCK MOUNTING TEMPLATE	24
WARRENTY STATEMENT	25

The **Harvest Tec Model 495B** applicator is designed to automatically apply propionic acid, acid blends, and buffered acid. It is designed to apply 60 pounds of product per hour on the low end and up to 550 pounds per hour on the upper end. The operating moisture range of the applicator is 10% to 32%. The three pumps included in the applicator are needed to apply preservative at the specified application set-points. The applicator can also be run in manual mode, which turns a pump or pumps on at a fixed rate. This applicator includes a flow-meter to measure the rate of product application as well as the accumulated amount of product used. The applicator also has sensors to monitor the baling rate and the applicator will automatically adjust the preservative flow rate based on the updated tons/hr reading from the bale rate sensors.

INSTALLATION INSTRUCTIONS

1. INSTALLATION OF THE HANGERS & PUMP HOLDER

The tank is located behind the wheels and axle on the underside of the baler. The picture below shows where the tank and pump holder fits on the baler. Specific steps for mounting the tank and pump holder are given on subsequent pages.

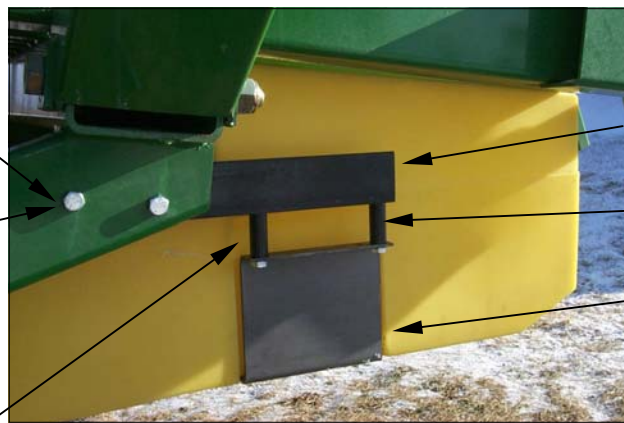


PARTS

Step A: Insert ½” by 4¼” bolts through right side of baler frame and bolt to right rear hanger.

Step B: Follow Step A on the left side but also attach pump hanger with these bolts.

Step C: Lift tank and put spacers between rear hanger and rear bottom strap and bolt together with ½” by 2 ½” bolts.



Rear Hanger
(001-4808)

Spacer between
½” by 2½” bolts

Rear Strap
(001-4807)

A. Mount rear hanger arms on the frame of the baler using the existing holes. The mounting frame is

- B. behind the wheels of baler underneath the bale compression and tying chamber.
- C. Mount the rear hangers on the left side of the baler and install the pump holder on the outside of the baler's frame along with the hangers. The same 1/2" by 4 1/4" bolts will be used, which must be inserted through the hangers first and then through the baler frame and into the pump hanger.
- D. Slide tank under the baler and lift into place so the 1/2" by 2 1/2" bolts can connect the bottom rear strap and the hangers.
NOTE: The spacers must be placed between the bottom rear strap and rear hanger or the tank will warp.
- E. With the rear portion of the tank in place, attach the front plates to the frame of the baler using 1/2" by 6 1/4" bolts. Leave slack in these bolts for easier installation of the front straps.
- F. Lift tank and place top and bottom front straps around tank. Connect the front straps together using 1/2" by 2 1/2" bolts in the back and 3 1/2" bolts in front and nylon locking nuts.
- G. Tighten all bolts.

PARTS

- Front top strap (001-4805)
- 1/2" by 6 1/2" bolts
- 1/2" by 2 1/2" bolts (not visible here)
- Top mounting plate (001-4802)
- Bottom mounting plate(001-4801)
- Front bottom strap (001-4806)

Step D: Mount lower and upper mounting plates

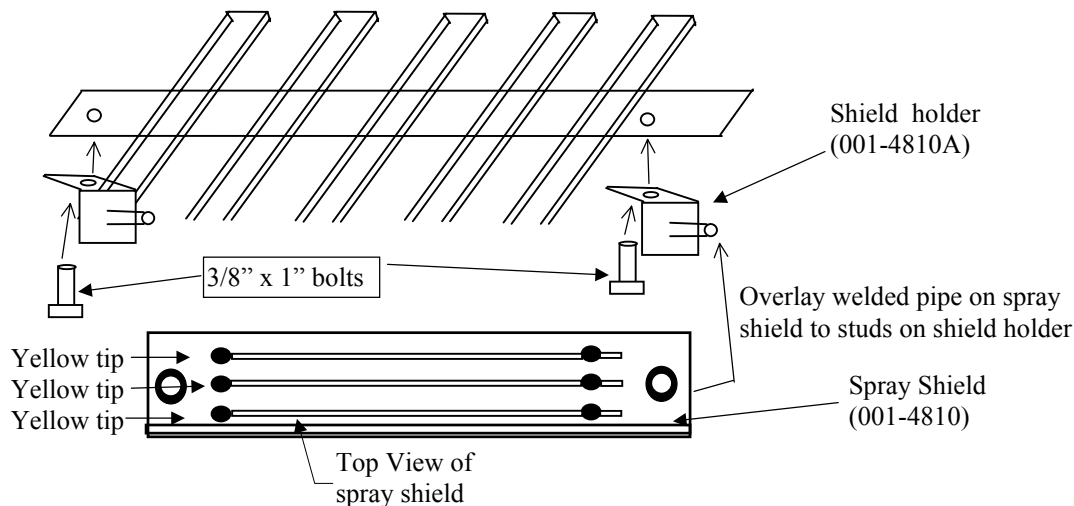
Step E: Lift tank up and put front and top straps in place. Connect using 1/2" by 2 1/2" bolts in the back and 3 1/2" bolts in the front.



2. LOCATION AND INSTALLATION OF THE SPRAY SHIELD ASSEMBLY

The spray shield is designed to accurately distribute product evenly across the hay at the baler's pick-up head. The spray shield is designed so that the spray nozzles can be easily removed for cleaning.

- A. Lower the wind guard of the baler to maximize the installation working space.
- B. Locate the guards between the hay intake fingers.
- C. Hold the spray shield up so it straddles the top of the guards.
- D. Locate the holes on the baler that line up with the spray shield holders.
- E. Connect the spray shield to the baler using 3/8" x 1" bolts.
- F. Adjust the spray shield so it can be removed and reinstalled freely once the lynch pins are removed.



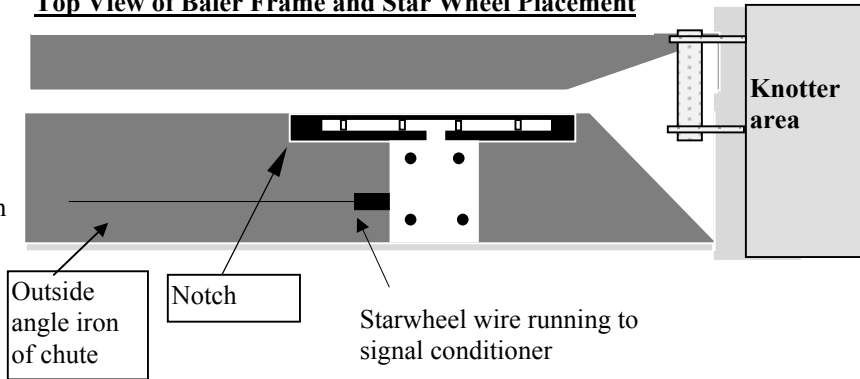
3. MOUNTING THE STAR WHEELS ON THE BALER

Use the template located at the end of the manual as a guide for cutting a notch and locating the mounting holes for the star wheels. Carefully mark the location of the star wheel holes using the template and a center punch so the star wheels will run true to the direction of the bales, otherwise, the star wheels may work themselves out of the block. The star wheels must be mounted so that they are no closer than 1/4" from any metal parts of the baler and come in contact only with the bale. Four 5/16" allen headed bolts will be used to mount the star wheel block and twine guard. The bolts must be inserted from the inside of the baler chamber. Use nuts to hold the bolts in place before putting on the star wheel block, the block is counter-bored on one side so the block will fit over the nuts. The star wheel block has a plug on one side and a wire grommet on the other side so if there are interference problems with the star wheel wires on one side of the block exchange the wire grommet with the plug so the wire can exit the block on the other side. Mount the twine guards using the two inner holes on the star wheel block—the **twine guard containing the bale rate sensors should be placed on the baler's right side**. Follow these instructions below for location of the star wheels on the respective baler.

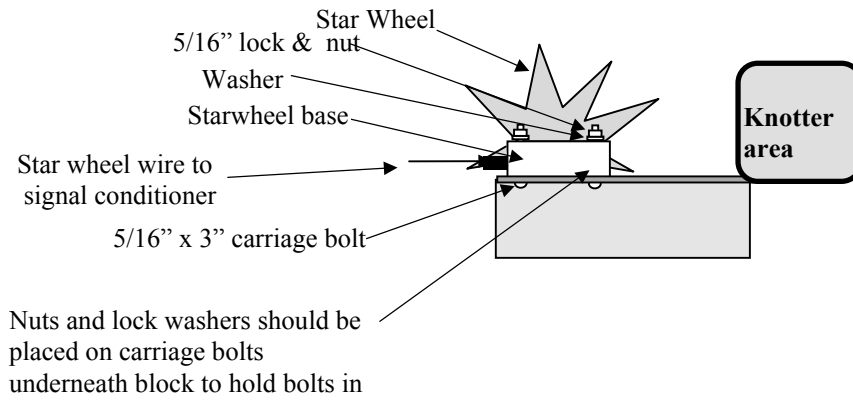
Top View of Baler Frame and Star Wheel Placement

Step A: Mark and notch out a 5/8" wide by 9" long section at forward most point of baler's angle iron.

Step B: Drill 5/16" holes in the four locations of the starwheel's base and mount the starwheel.



Side View of Baler Frame and Star Wheel Placement



STEP 4: WIRE THE STAR WHEEL TO THE SIGNAL CONDITIONER

The signal conditioner is located underneath the pump holder. First, remove the cover from the star wheel block and use a ¼” nut driver to remove the nut from the electronic swivel. Next, run the star wheel sensor wire through the black strain relief and place the eye terminal on the star wheel sensor. Tighten the eye loop on the sensor and put the star wheel cover back on the base. Next, tighten the dome nut around the strain relief to form a tight seal around the wire. Once the star wheel connection is complete, run the wires along the baler frame to the signal conditioner. (See wiring installation on the following page.)

STEP 5: CONNECTING FLOW METER TO SIGNAL CONDITIONER

The flow meter is located on the pump intake line underneath the pump plate. Connect the flow meter to the signal conditioner’s connector. On some models the flow meter is already connected. (See wiring installation on the following page.)

STEP 6: BALE RATE SENSORS

The bale rate sensors will be factory installed on the right side twine guard in the correct position. The sensor with the longer sensor wire should say “FRONT”, which indicates it should be placed in the front sensor hole. The sensor wire with the shorter wire should say “BACK.” The tip of the sensor should be placed no more than ¼” away from the star wheel teeth and no less than 1/8” from the star wheel teeth. Connect the bale rate sensor wires to the signal conditioner located on the underside of the pump plate. Each sensor will have a LED light located by the wire connection. Once the unit is powered up spin the wheel and make sure that both sensor turn on and off the LED lights. If they don’t turn on and off, adjustments may need to be made. (See wiring installation on the following page.)

STEP 7: MAIN WIRING HARNESS INSTALLATION

Start by unrolling the long communication cable (006-4640C3) along the side of the baler. The end that has the two wires connected by a mesh loom should be facing the tractor. Leave enough cord that will allow you to connect this end of cable, to the 464 monitor in the cab of the tractor. Run the wire, with the 7 pin plug through the right side of the baler as pictured below. Connect this plug to the right side of pump plate. Run the other wire, with the 16 pin plug, on the other side of the baler in the same location. Connect this plug to the conditioner, located under the left side of the pump plate. Secure with cable ties. (Note do not connect wires to hydraulic lines. The temperature may melt them.) The short gray wire, with a 4 pin plug coming out of the main harness by the mesh loom is for the optional crop sensor eye kit (not included.)



Wire Installation

Step 7



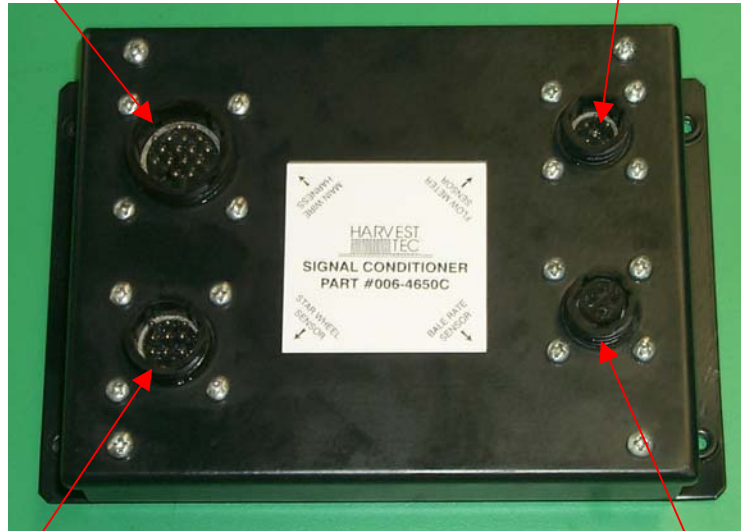
U.S. Patent # 6,377,058B1

Connection for main wiring harness going to tractor

Step 5



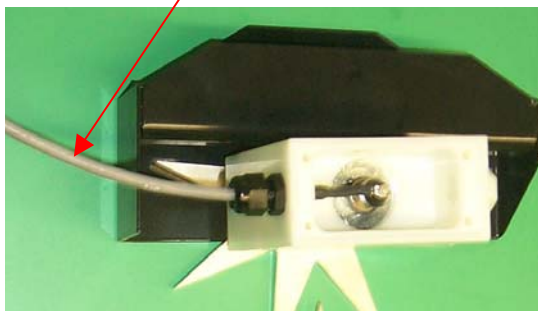
Connection for flow meter



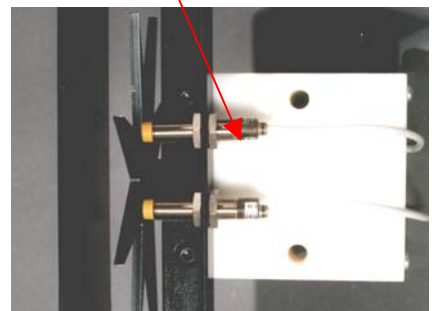
Location for star wheel wire connection to electronic swivel

Connection for bale rate (proximity) sensors

Step 4



Step 6



STEP 8: PLUMBING

- A) Split the triple welded hose 20" back using a sharp knife. **Note:** Be careful when pulling apart the hose apart it can cause damage to the hose at the seams.
- B) Use warm soapy water when connecting the triple welded hose to the pumps located inside the pump plate. Because all nozzles on the spray shield are the same, it does not matter which line goes to a particular pump or nozzle.
- C) Run the hose from the pumps to the spray shield. Do not cut the triple weld hose to length in case more hose length is needed later, rather, wrap the hose in an isolated location. **KEEP HOSE AWAY FROM: MOVING PARTS, SHARP METAL, AND HYDRAULIC LINES. WORKING TEMPERATURE FOR THE HOSE IS 140 °F AND UNDER.**
- D) Tie the hose down at secure locations on the baler using the enclosed tie straps and cable clamps.

STEP 9 : INSTALL THE MOUNTING BRACKET INSIDE THE TRACTOR CAB

Mount the bracket in a secure area that is easy to reach in the cab and away from any obstructions. Adjust the bracket position as required to provide easy display viewing before tightening the screws.

STEP 10: INSTALL CONTROLLER CABLE HARNESS

Locate each end of the cable harness. Note which end matches up to the plug in the control box. Route this end of the harness in close proximity to the mounting bracket. Allow enough service loop to facilitate installation and removal of the 464 control. Make sure the controller is located away from two way radios and cell phones.



U.S. Patent # 6,377,058B1

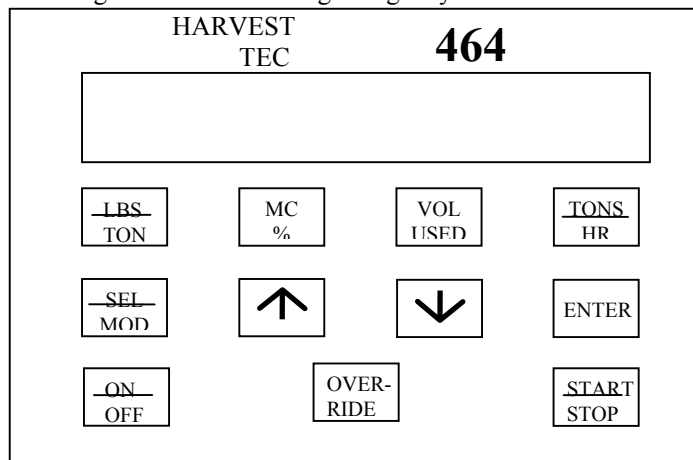
STEP 11: INSTALL THE MAIN POWER LEADS

Locate the power leads of the harness. Connect the eye loops to a 12 volt battery power supply on the tractor (separate connections from 2-way radios and cell phones). When all 3 pumps are running, the unit draws up to 25 AMPS, which is more than the rating of the in-cab convenience outlets. **It is strongly recommended to connect the power leads directly to the battery!** The RED wire is the POSITIVE power feed (check the fuse holder to verify the fuse type and installation). Note: this unit will not function correctly on positive ground tractors. Make sure to connect to a 12 volt source. NOTE: If the unit loses power while operating, the accumulated pounds of product used will be lost from its memory. Therefore, connect the power wire terminals to a non-keyed power supply so that if the tractor is shut off while operating the accumulated pounds of product will not be lost from memory.

First connect up the main communication wires from the signal conditioner to 464 controller. Next, connect the power cord to a 12V battery and **hook it up to the 464 controller last.** After connecting the power cord, the control box should light up for a second or two and then go back to its off state. If the communication cord is not connected to the controller prior to connecting the power cord, you will not be able to run the controller.

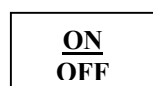
STEP 12: OPERATING INSTRUCTIONS

This system is calibrated to be used with Harvest Tec buffered propionic acid. It is designed to apply rates of 60 to 550 lbs and at 10-32% moisture levels. The 464 monitor will allow you to preset your bale size, weight, single bale formation time, moisture levels, and application rates. The automatic mode option will automatically adjust the application level as the moisture levels vary and bale speed changes. The option of manual mode will allow you to manually control your application rates on the go. The following control box drawing will give you an overview of each button's function.



U.S. Patent # 6,377,058B1

DESCRIPTION OF BUTTONS



This is the main power button. Note that power cannot be turned off in any screen other than the opening selection screen-“AUTO MODE” “MANUAL MODE.” Press “ENTER” from any other screen to get back to the opening screen.



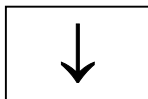
Used to kick the system into full application rate.



Used to temporarily pause the unit.



Used to change selections on any screen.



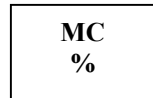
Adjustment keys for changing values.



Used to select values and to return to the opening selection screen.



Used to set application rates.



Used to set percent moisture content at which each level is activated.



Used to read the amount of product used.



Used to switch between auto and manual bale rate, control and enter bale weight.

STEP 13: FIRST TIME AND ANNUAL START UP INSTRUCTIONS

After installation, check this unit out!

Prior to powering up the pumps, be sure to tighten up the filter bowl, flow meter fittings, and check any other plumbing fittings that could have vibrated loose.

1.Check the pumps: Put 10 gallons of water in the tank. Press the **ON/OFF** button to turn the controller on. Push the **tons/hr** key. Select “manual” with the ↓ key. Push **enter** . Select “Manual Mode” with the **sel** key. Press **enter** . Run each pump by turning the pump that is flashing on with the ↑ key. Turn the pump off with the ↓ key. Move between pumps using the **sel** key. After the air is out of the lines, the rate in the lbs/ton reading should be: **pump 1=4-6 lbs/ton; 2=5-7 lbs/ton; 3=6-9 lbs/ton.**(This assumes that the settings are the factory default values for bale weight at 800 lbs and time at 1 minute.)

After completing this test, re-set the baling rate to automatic by pushing the **tons/hr** key. Push the ↑ key to select “automatic. Push the **enter** key and the control is now set back to adjust tons per hour.

2.Check the moisture reading: Use the **sel** key to go back to automatic mode, and press **enter** . The screen will display a % moisture of “LO”, without a bale in the chamber . Have an assistant climb up on top of the baler and grab both wheels at the same time. Most people test between 17% and 20% moisture.

3.Checking the speed of baling: With the unit in “automatic mode” have an assistant turn the right hand star wheel forward at a slow speed. The tons per hour reading should respond in 15 seconds.

4.Checking the flowmeter: Push the **enter** key to get back to the main screen, Push the **vol used** key to read “field” This value should correspond to water removed from the tank during test (1 gallon is 8 pounds). Rest field and total to “0” by pushing the ↑ key.

Your 464 is now ready for initial set up for lb/ton,% moisture, and tons/hr. Do not use the unit until checking these setting(see operating instructions.)

*****Note

The monitor will then switch to the main selection screen as shown here. If the voltage supplied is lower than 11.5 volts, a warning “Low Voltage” will appear. If the voltage supplied is higher than 14.5 volts, a warning “High Voltage” will appear. This warning is to alert operators that the output from the pumps may be off the target rates. There is internal protection in the box to prevent damage from extremely low voltage (below 9.5 volts) or from extremely high voltage (above 18 volts.) If the voltage is outside this range, the box will not operate.

A	U	T	O	M	A	N	U	A	L
M	O	D	E	M	O	D	E		

AUTO MODE should be flashing, which indicates that it will be the selected mode when **ENTER** is pressed. Press the **SEL/MODE** key to go from the modes listed above, and press **ENTER** to choose the specified mode. AUTO MODE will automatically apply product to the hay based on the moisture content sensed by the star wheels in the hay. MANUAL MODE will apply product to the hay at a fixed rate regardless of the moisture content. Follow the instructions to change the product application rate (LBS/TON), the moisture set-points at which to apply the application rates (MC%).

PRIMING AND CHECKING THE PUMPS:

After checking the plumbing and opening the intake valve, turn the control box on press **SEL/MODE** until MANUAL MODE is flashing. Press **ENTER** to activate manual mode and the following screen should appear.

M	C					L	B	S	/	T	O	N					
P	1	:	O	F	F	P	2	:	O	F	F	P	3	:	O	F	F

Use the **SEL/MODE** button to move to pump three (P3) and use the up arrow (↑) key to turn the pump on. Next, use the **SEL/MODE** button to move to pump two (P2) and use the up arrow (↑) key to turn the pump on. Finally, turn pump one on and all three pumps should be running. After all three pumps are turned on there should be a LBS/TON reading on the upper right of the screen, which is a flow rate based on the flow meter reading. After letting all three pumps run for a minute or so, go back and turn all the pumps off using the down arrow (↓) key. Next, go back and turn each pump on individually and let it run without any of the other pumps turned on to see if each one is properly primed. First go into T/HR and make sure you are using manual T/HR. Push up arrow to move between Auto and Manual modes. Before priming the pumps individually, proceed to the main menu and select T/HR(upper right hand corner button.) Then select manual T/HR using the ↑ and then **Enter** (the time should be 1 minute and a 800lb per bale.) At this time you are back at the main menu. Select Manual mode. When pump one (P1) is running by itself the average flow meter reading should be 4-6 lbs per/ton at a baling rate 20 ton per hour, which is an average flow rate of $4 \times 24 = 96$ lbs per hour. (To get a baling rate of 24 tons per hour the bale weight should be set at 800 pounds and the bale time at one minute in the TONS/HR menu). When pump two (P2) is running by itself the average flow meter reading should be 5-7 lbs per ton at a baling rate of 24 tons per hour, which is an average flow rate of $6 \times 24 = 144$ lbs per hour. When pump three (P3) is running by itself the average flow meter reading should be 5-7 lbs per ton at a baling rate of 24 tons per hour, which is an average flow rate of $8 \times 24 = 192$ lbs per hour.

Note:If the flow rate is not close to the average readings listed above, check for air leaks in the plumbing and make sure the filter bowl and filters in the nozzles are clean. Also check over all hoses to make sure there are no kinks in any of the lines. If the one of the pumps still does not prime, remove the red plug from the bottom of the pump that is not running and turn the pump on from the control box in the cab. With the red plug removed, the liquid should start rapidly flowing out the bottom of the pump. Replace the red plug and the pump should be primed.

TO RUN IN AUTOMATIC MODE:

After selecting **AUTOMATIC MODE** the main menu screen will come up. **MC%** is the percent moisture content of the hay. Below 10%, the monitor will read LO. Above 32% MC, the monitor will read HI. This reading is an average of multiple readings and is taken every 3 seconds. **TONS/HR** is the baling rate based on the calculations done from the bale rate sensors and user inputted bale length and bale weight. **LEVEL** will display 0,1, 2, or 3. The unit will apply preservative at three pre-set application rates per ton of hay being baled and this level displays which level the unit is working at. **LBS/TON** is a reading from the electronic flow meter. It should match the preset application rates that correspond to the level the unit is working at. If it does not match, consult the trouble shooting section of this manual. **NO CHANGES TO APPLICATION RATE CAN BE MADE ON THIS SCREEN.** In the automatic mode, the following screen should be displayed:

M	C	%	:	-	-	L	E	V	E	L	:	-	-					
T	O	N	/	H	R	:	-	-	L	B	S	/	T	O	N	:	-	-

TO PAUSE THE UNIT:

Push the **START/STOP** bottom, which will pause the system on until the button is pressed again. All values will be saved during pause. The following screen will be displayed as follows when paused:

(U	N	I	T	S	T	O	P	P	E	D)				
P	U	S	H	S	T	A	R	T	T	O	R	E	S	U	M	E

Push the **START/STOP** button again to resume application. If the crop sensor eye option pause is installed on the baler, the crop sensor eyes will automatically start and stop the unit in either automatic or manual mode. The start stop button can be used to stop the unit at any time but the unit will not start when the unit is stopped by the crop sensing eyes. However, **ENTER** can be pressed while in pause. If you wish to run the applicator with the crop sensors not sensing any hay, then they will need to be disconnected back on the baler communication cable.

TO CHANGE APPLICATION RATES:

To change the application rates, the monitor must be in the main menu screen (the screen that says **AUTO MODE** and **MANUAL MODE**.) Push the **LBS/TON** button and the following screen will appear, which indicates the application rates at the three levels:

L E V E L 1	L E V E L 2	L E V E L 3
L B / T	L B / T	L B / T

Move between the levels using the **SEL/MODE** button. When the level requiring adjustment is highlighted use the up (↑) and down (↓) arrow keys to change the application rate. When the desired rates are set, push **ENTER**. You will see the **SYSTEM UPDATING SCREEN**, indicating the new levels are being saved. The main screen will then appear.

TO CHANGE THE MOISTURE SET POINTS:

To change the moisture set points, the monitor must be in the main menu screen (the screen that says **AUTO MODE** and **MANUAL MODE**.) Push the **MC%** button and the following screen will appear, which indicates the application rates at the three levels:

M C %	L 1 : _ _	M C %	L 2 : _ _
M C %	L 3 : _ _	A L A R M :	

Move between the levels using the **SEL/MODE** button. When the level requiring adjustment is highlighted use the up (↑) and down (↓) arrow keys to change the application rates. When the desired rates are set, push **ENTER**. You will see the **SYSTEM UPDATING SCREEN** indicating the new levels are being saved. The main screen will then appear.

TO RUN IN THE AUTOMATIC BALE RATE MODE:

Auto bale rate mode will automatically calculate bale rate off of the preset length, weight, and real time baling speed. Push the **TON/HR** button and if the bale rate is currently in manual mode, the following screen will appear.

M A N U A L	T / H R	T I M E	_ _ _ _
L E N G T H	N A	W T :	_ _ _ _ #

To change bale rate sensing into auto mode, press the up (↑) arrow key when manual is flashing on this screen, and the following screen will appear:

A U T O	T / H R	T I M E	N A
L E N G T H	9 6 I N	W T :	_ _ _ _ #

The length is the bale length measured in inches and the bale weight (WT:) is in pounds. Use the **SEL/MODE** button to move between **BALE LENGTH** and **BALE WEIGHT**. Use the up (↑) and down (↓) arrow keys to change the values. When the desired values are set, push **ENTER**. You will see the **SYSTEM UPDATING SCREEN** indicating the new levels are being saved. The main screen will then appear. The displayed baling rate value, while running in automatic mode, will display the baling rate that is updated every 15 seconds.

TO RUN IN THE MANUAL BALE RATE MODE:

Manual bale rate will manually calculate the bale rate off of the preset time of baling and weight. Push the **TON/HR** button and if the bale rate is currently in auto mode, the following screen will appear.

A U T O	T / H R	T I M E	N A
L E N G T H	9 6 I N	W T :	_ _ _ _ #

To change bale rate sensing into manual mode, press the down (↓) arrow key, when Auto mode is flashing and the following screen will appear:

M A N U A L	T / H R	T I M E	_ _ _ _
L E N G T H	N A	W T :	_ _ _ _ #

The time to make a bale and the bale weight need to be inputted on this screen. The bale time is in seconds. Use **Sel/Mode** mode to move between Time and Weight. Use the up (↑) and down (↓) arrow keys to change the values. When the desired values are set, push **ENTER**. You will see the **SYSTEM UPDATING SCREEN** indicating the new levels are being saved. The main screen will then appear.

TO OVERRIDE THE SYSTEM AND APPLY FULL APPLICATION:

Push the **OVERRIDE** button. Use this when an extremely wet spot of hay is about to enter the baler. All three pumps will be pumping at full rate and the following screen will be displayed.

```
P U S H   O V E R R I D E   A G A I N
F O R   N O R M A L   O P E R A T I O N
```

Push the **OVERRIDE** button again to resume normal operation.

TO READ AND RESET THE AMOUNT OF PRESERVATIVE USED:

Push the **VOL USED** button and the following screen will appear.

```
F I E L D - #   T O T A L   #
( P U S H - ↑ - T O   R E S E T - L B )
```

If you want to reset the total amount used in the indicated FIELD to zero, push the up arrow (↑) key once. To reset all field TOTALS to zero, push the up arrow (↑) key twice. Push the ENTER button to return to the main screen. If the recorded amounts are not reset with the arrow key, they will be saved. *(Note: Always check the accuracy of the flow meter by comparing actual pounds used against the reading. If the amounts are not close, consult the trouble shooting section of this manual).* Also values will roll over to “0” when they reach their maximum number.

TO RUN THE APPLICATOR IN MANUAL MODE:

Push the **SEL/MODE** button to bring up the selection screen.

```
A U T O   M A N U A L
M O D E   M O D E
```

Use the **SEL/MODE** button to move to manual mode and press **ENTER**, and the following screen will appear.

```
M C           L B S / T O N
P 1 : O F F   P 2 : O F F   P 3 O F F
```

The MC% values displayed will be the readings off the moisture reading circuit. The LBS/TON will be the actual flow rate divided by the current baling speed. Use the **SEL/MODE** button to move from one pump to the next. Use the up arrow (↑) key to turn the selected pump on. Use the down arrow (↓) key to move the selected pump off. *Manual application rates are fixed at:*

Pump 1	100lbs/Hr
Pump 2	150lbs/Hr
Pump 3	200lbs/Hr

You must use any combination of pumps to get close to the desired application rate.

ADJUSTING THE VOLUME OF THE CONTROL BOX ALARM:

The alarm opening is located on the bottom side of the control box (where all the wiring harnesses hook up to.) A small strap is located near the alarm opening and can be adjusted to vary the volume of the alarm.

COMMON QUESTIONS ABOUT THE 464

1) How to turn the control box OFF?

The unit must be in the main menu screen to turn off, the main selection screen looks like the following:

A	U	T	O	M	A	N	U	A	L
M	O	D	E	M	O	D	E		

Press **Enter** to get to the main menu screen from any of the other operating screens.

2) How to get in the LBS/TON, MC%, VOL USED, and TONS/HR menus?

The unit must be in the opening main menu screen (shown directly above) to get into the LBS/TON, MC%, VOL USED, and TONS/HR menus. Press **Enter** from auto or manual mode to get into the main selection screen.

3) The unit is stuck in the MC% screen.

In the MC% screen, level 1 must be less than level 2, and level 2 must be less than level 3. For example, if level 1 is set at 16, level 2 must be set at 17 or higher, and level 3 must be set higher than level 2.

4) How does OVERRIDE work?

Override turns on all three pumps at full output.

5) The flow meter reading is more or less than the programmed level set in the box.

Some variation in flow meter readings compared to the programmed set-point is normal due to factory tolerances on the pump motors as well as varying tractor voltages inputted to the control box. The flow meter reading is an accurate measure of how much is actually being applied so adjust the set-points in the box to try and attain the desired flow meter reading.

6) Why don't all the pumps turn on even at higher application rates?

The selection of what pumps turn on when are automatically controlled by the control box's flow rate look up chart. Thus, not all the pumps turn on at once and the combination of what pumps turn on when is automatically controlled by the software. If you want to make sure all three pumps are working, run the unit in auto mode and hit override. This will turn all three pumps on at once at their maximum output.

7) The moisture content displays "LO" or "HI" all the time.

When the moisture content display does not change frequently while baling, there is likely a faulty star wheel connection. One of the first places to check is inside the white star wheel block. Check to see if the electronic swivel is in the star wheel shaft and check to see that the star wheel shaft is not working out of the block. Also, check all star wheel wires and connectors to see if there is a continuity problem.

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 (10,000 bales on large square balers) of use. Rebuilding the pump is a simple procedure if the motor is not damaged. Order pump rebuilding kit #007-4581 for the automatic unit.

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.
- 7) ****When using other products other than Harvest Tec product, make sure to flush the system thoroughly!

TROUBLE SHOOTING CHECKS ON THE 464 CONTROL SYSTEM:

CONDITION	CAUSE AND SOLUTION
-----------	--------------------

MOISTURE READING ERRORS:

Moisture readings seem low or high.

1. Wire disconnected or bad connection between star wheels and signal conditioner box. Reconnect.
2. Low power supply to signal conditioner. Check voltage at box (min 11 volts required.)
3. Wet hay over 32% moisture.
4. Ground contact with either or both star wheels and signal conditioner box. Reconnect.
5. Short in wire between star wheels and signal conditioner. Replace.
6. Short in signal conditioner box. Replace.
7. Short in main box. Replace.
8. Check hay with hand tester to verify.
Contact Harvest Tec if condition persists.

Moisture readings erratic.

1. Test bales with hand tester to verify that cab monitor has more variation than hand tester.
2. Check all wiring connections for poor contact.
3. Check power supply in tractor.
Tractor power should deliver a constant voltage between 12 and 14 volts. Alternators should be equipped with voltage surge protectors.

FLOW METER READINGS DO NOT MATCH UP WITH PRODUCT USAGE

Product shown on VOL used is less than actual product used
(see PRIMING AND CHECKING THE PUMPS in the operating instructions)

1. Voltage supply to meter is low. Unplug wire at meter and check for minimum 6 volts supplied
2. Wiring short in signal from meter. Inspect wire especially at plugs. Run unit having assistance watch the screen display of “pounds per ton” while moving all wires and connections to see if the value jumps when any section is moved.
3. Clog in meter. Do not use air to clean meter. Back flush with water.

Product shown on meter is more than actual product used.

1. High voltage supplied to meter. Unplug wire at meter and check for high voltage on power supply (maximum 18 volts)
2. Light interference with meter. Reflection into the meter can cause high readings.
3. Air leak in intake. Look for air bubbles in line.

PUMP PROBLEMS

Pump does not run.

1. Wiring short to pump. Trace back from pump to main box through the disconnect at the pump, at the signal conditioner at the draw bar and at the cab connection with volt meter (see wiring diagram for the position of the wire on the pump involved.)
2. Test all three pumps individually in manual mode (see First time and annual start up instructions.) To do this, first change tons/hr to manual setting, then press enter, and finally run unit in manual mode
3. Bad pump motor. Replace.

Pump runs full speed all the time.

1. Outside grounding to the pumps.
2. The pump speed is cut back by the controller by interrupting the ground.
3. Check for outside grounding at pump and through wiring harness.

Pump will not prime.
(see PRIMING AND CHECKING THE PUMPS in Operating instructions)

1. Dirt in intake filter. Check and clean filter.
2. Check valve in pump. Replace with pump rebuild kit.
3. Air leak in intake line.
4. Fault check valve in intake line.

Warning-Supplied voltage is “High”

1. This is just a message to let you know that incoming voltage to the monitor is higher than normal.
2. Pump outputs may then be higher.
3. Check your batteries and/or alternator.

Warning-Supplied voltage is “Low”

1. This is just a message to let you know that incoming voltage to the monitor is lower than normal.
2. Pump outputs may be lower.
3. Check your batteries and/or alternator.

OTHER

System leaks product out of tips after shut down.

1. Dirty or defective check valves in tips. Clean or replace.

SYSTEM ERROR CODE GUIDE

If a message comes up on the display, **SYSTEM ERROR:** (NUMBERS 1 THRU 255), push the ENTER key to reset. If the problem has been corrected, the system will function again. If the problem persists, the unit will display the error code again and will not let the operation continue or let the unit shut down (unless power is pulled.) The following guide will help locate and correct the problem.

System error	Cause	Solution
1	Communication failure in either the in-cab box or the baler’s signal conditioner box.	Send in both boxes for inspection and repair.
2-3	Communication problem between the in-cab box and the baler’s signal conditioner box.	Check connections in large cable between cab and baler. Faulty signal conditioner. Low voltage supplied to the signal conditioner.
4-6	Communication failure in the in-cab box.	Send box in for repair.
127	Communication failure between the in-cab box and the baler’s signal conditioner box.	Send in both boxes for inspection and repair.
129-134	In-cab box memory failure.	Send box in for repair.
152	In-cab box micro-processor failure.	Send box in for repair.
153	Bale rate calculation came in too high or too low.	Run the unit in the manual baling rate mode on the TONS/HR key until baling resumes at a rate between 10 and 100 tons per hour.
154	In-cab box voltage detection failure.	Send box in for repair.
255	Internal failure in either the in-cab box or the baler’s signal conditioner box.	Send in both boxes for inspection and repair.

System Error 2 Troubleshooting

What is System Error 2? It is a communication error between the signal conditioner and the control box. It can be caused by one or more of the following: insufficient voltage, poor connections (such as loose connections, corroded pins, broken pins, and faulty signal conditioner or control box) or a break in the harness.

A)What to check:

- *Check connection to battery (this is the best place for it to be.)
- *Check for corrosion or a bad connection.
- *Inspect inline fuse.
- *Check the voltage on the main harness back by the signal conditioner between pins 11 & 12. The voltage needs to be at least 11.5 volts.
- * Inspect all harnesses.
- *Check for broken, stretched, and worn harnesses.
- *Run a continuity test though all wires on the harness and check to see if any wires are grounding out through shield or other wires(pins 11& 12 are the power supply, pins 13& 14 are the data signals, and pin 10 is the shield.)
- *Unplug all harnesses except the main wire harness from the signal conditioner plug in one at a time.

B)How to fix the problem:

- *Put die electric grease on all connections.
- *Inspect the pins for any that are pushed back (Pull the pins to the same height as the others.)
- *Clean any corrosion form connections.
- *Inspect for any broken pins. If they are damaged they need to be replaced.

Display Problems Troubleshooting

A)Symptoms:

- *Control is not starting or lighting up.
- * The display is going out.

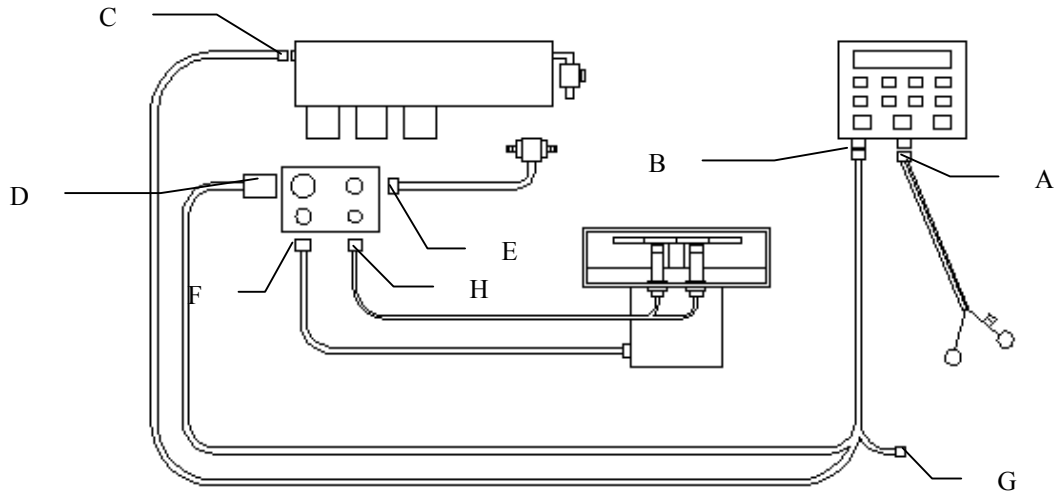
B)What to check:

- *Inspect the main inline fuse on power cord.
- *Check power with multi meter on the main power connection.

C)How to fix the problem:

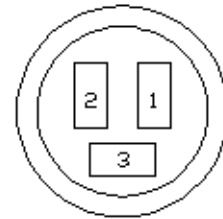
- * If none of these work the display may be blown and needs to be sent in for inspection and possible replacement.

Wiring Plug Diagram



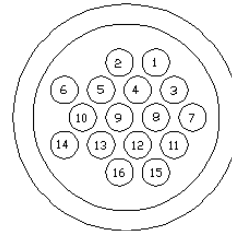
A. Main power connector mounted on cab enclosure

Pin 1	Red	+12V input from tractor supply
Pin 2	Black	Ground from tractor supply
Pin 3	Not used	



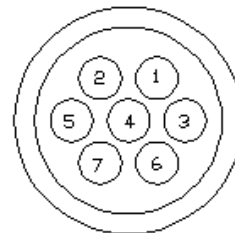
B. Connector mounted in the cab for data communication

Pin 1	Black with orange markings	Pump 1 Ground
Pin 2	Black with green markings	Pump 2 Ground
Pin 3	Black with yellow markings	Pump 3 Ground
Pin 4	White	End of row/crop sensor input
Pin 5	Orange with black markings	Pump 1 Positive (+)
Pin 6	Green with black markings	Pump 2 Positive (+)
Pin 7	Yellow with black markings	Pump 3 Positive (+)
Pin 8		Not used
Pin 9		Not used
Pin 10	Silver	Shield for 18 ga. wires
Pin 11	Red(Large)	+12 V supply (signal conditioner)
Pin 12	Black(Large)	Ground (signal conditioner)
Pin 13	Orange	Data (+) from cab enclosure
Pin 14	Blue	Data (-) from cab enclosure
Pin 15	Red (Small)	+12 V supply for crop sensors
Pin 16	Black (Small)	Ground for crop sensors



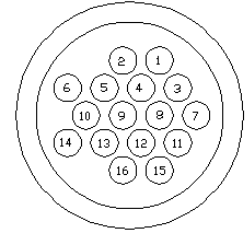
C. Pump wire harness colors

Pin 1	Black with orange markings	Pump 1 Ground
Pin 2	Black with green markings	Pump 2
Ground		
Pin 3	Black with yellow markings	Pump 3 Ground
Pin 4	Not used	
Pin 5	Orange with black markings	Pump 1 Positive
Pin 6	Green with black markings	Pump 2
Positive		
Pin 7	Yellow with black markings	Pump 3 Positive



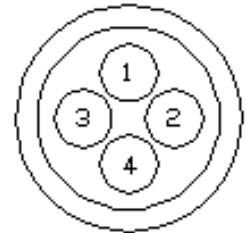
D. Connector mounted on signal conditioner

Pin 1		Not used
Pin 2		Not used
Pin 3		Not used
Pin 4		Not used
Pin 5		Not used
Pin 6		Not used
Pin 7		Not used
Pin 8		Not used
Pin 9		Not used
Pin 10	Silver	Shield for 18 ga. wires
Pin 11	Red	+12V supply (signal conditioner)
Pin 12	Black	Ground (signal conditioner)
Pin 13	Orange	Data (+) from cab enclosure
Pin 14	Blue	Data (-) from cab enclosure
Pin 15		Not used
Pin 16		Not used



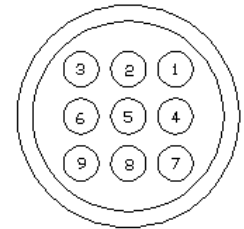
E. Flow meter connection mounted on signal conditioner

Pin 1	White	5 - 12 V (+) supply
Pin 2	Green	Ground
Pin 3	Brown	Signal
Pin 4	Black	Shield



F. Star wheel connector mounted on signal conditioner

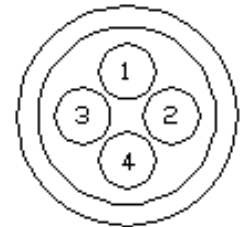
Pin 1	Brown	Star wheel input 1
Pin 2	Blue	Star wheel input 2
Pin 3	Brown	Diagnostic 1
Pin 4	Blue	Diagnostic 2
Pin 5	Silver	Shield
Pin 6	Silver	Shield
Pin 7		Not used
Pin 8		Not used
Pin 9		Not used



G. Connector for crop sensor option (4 pin plug on 006-4640C3)

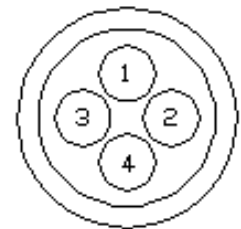
Note: Crop sensors are an add-on option for the 464 that will automatically turn the applicator on when entering a windrow and turn the applicator off when exiting the windrow. The connector for the crop sensors are located on the main baler communication cord near the tractor to baler junction.

Pin 1	Red	+12V
Pin 2	Black	Ground
Pin 3	White	Signal wire
Pin 4		Not used

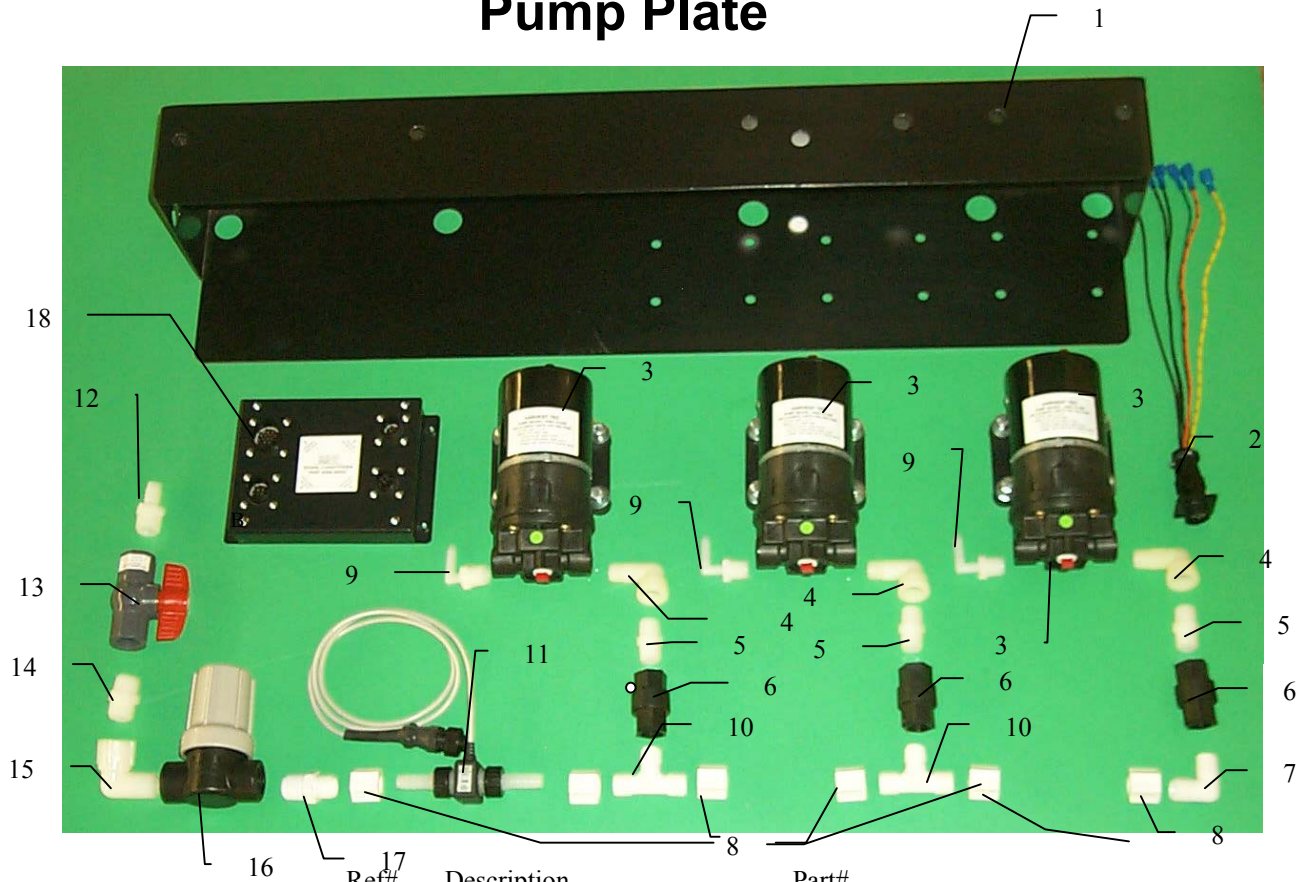


H. Proximity sensors

Pin1	Brown	Sensor power
Pin2	Black	Signal for front prox. sensor
Pin3	Blue	Sensor ground
Pin4	Black	Signal for back prox. sensor

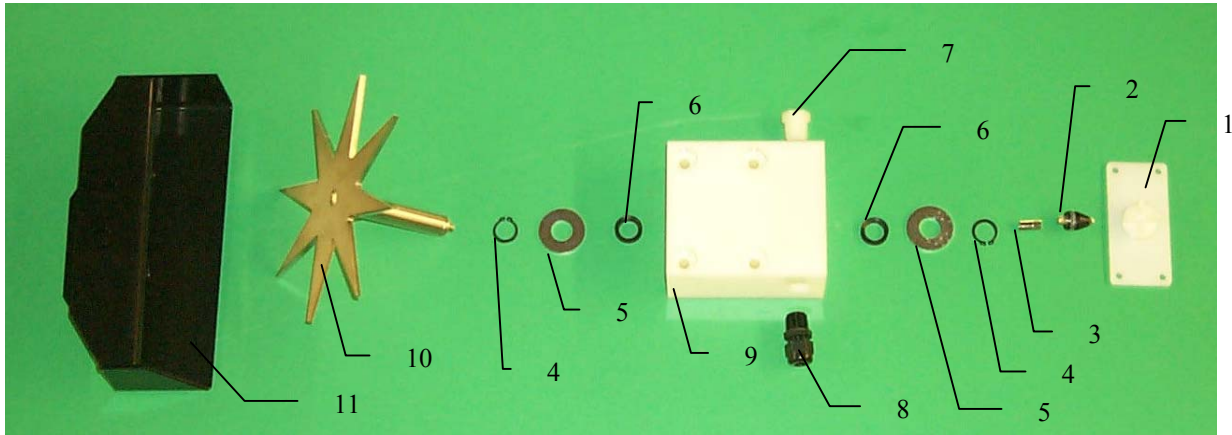


Parts Breakdown for Pump Plate



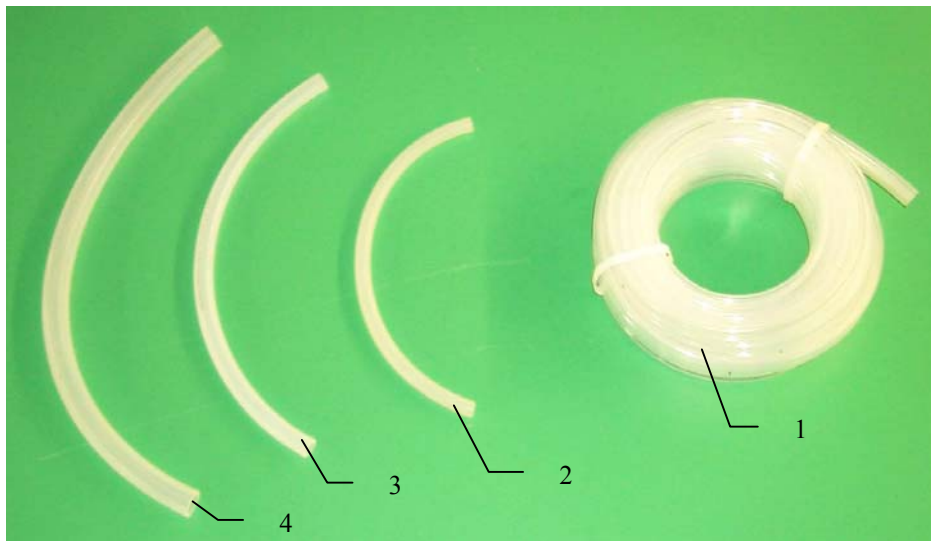
Ref#	Description	Part#
1.	Pump plate	001-4642
2.	Plug lead	006-4640F
3.	Pump	007-4120S
4.	Street elbow fitting	003-SE38
5.	Nipple fitting	003-M3838
6.	Check valve	002-4566F
7.	Jaco elbow fitting	003-JEL1238
8.	Jaco nut fitting	003-JN12
9.	Elbow fitting	003-EL3814
10.	Jaco tee fitting	003-JT3838T
11.	Flowmeter assembly	006-4725A
12.	Straight fitting	003-A1212
13.	Ball valve	002-2212
14.	Nipple fitting	003-M1212
15.	Street elbow fitting	003-SE12
16.	Filter bowl (100 mesh filter)	002-4315
17.	Straight jaco fitting	003-JA1212
18.	Signal conditioner	003-4650C

Parts Breakdown for Star Wheel Sensor and Hoses



<u>Ref</u>	<u>Description</u>	<u>Part#</u>
1.	Block cover	006-4641B
2.	Electronic swivel	006-4642A
3.	Swivel insert	006-4642B
4.	Snap ring	
5.	Washer	
6.	Dust seal	
7.	Plug fitting	003-F38
8.	Wiring grommet	008-0821A
9.	Star wheel block	006-4641A
10.	Star wheel sensor	006-4641C
11.	Twine guard-left	001-4645
	Twine guard-right(prox)	001-4644
	Star wheel assembly	030-4641

*****Note: Star wheel assembly includes Ref#'s 1-10.



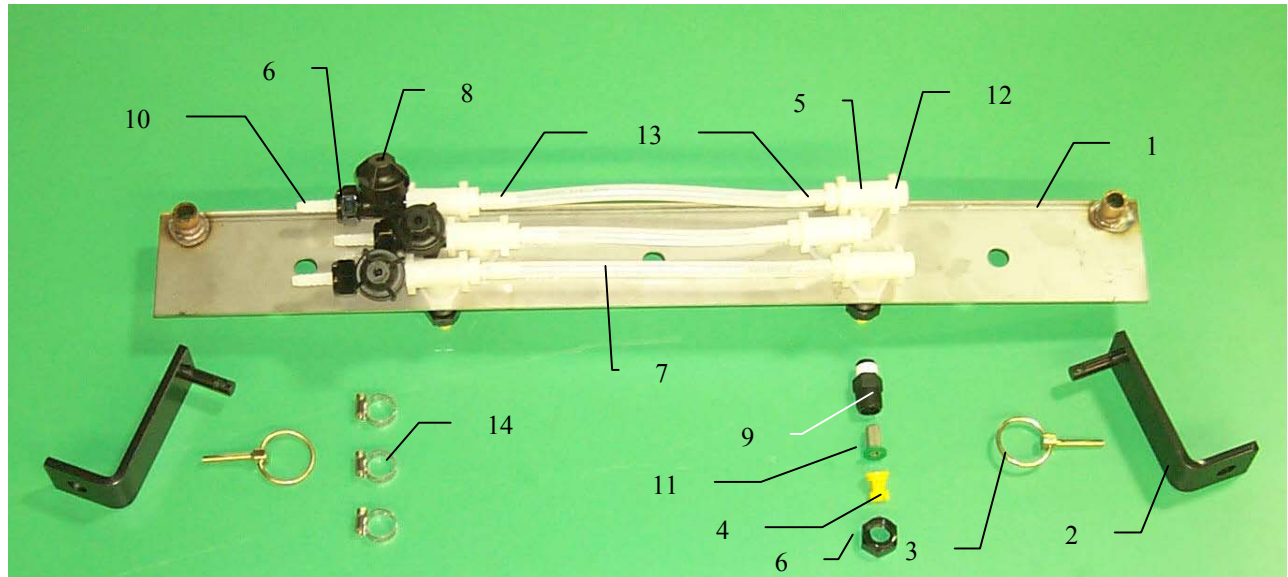
<u>Ref</u>	<u>Description</u>	<u>Part#</u>
1.	Triple weld hose (from pumps to tips)	002-9005
2.	3/8" Hose (filter to pumps)	002-9003
3.	1/2" Hose (tip to filter)	002-9001
4.	1/4" Hose (tank to drain/fill valve)	002-9002

Parts Breakdown for Control Box and Wiring Harnesses

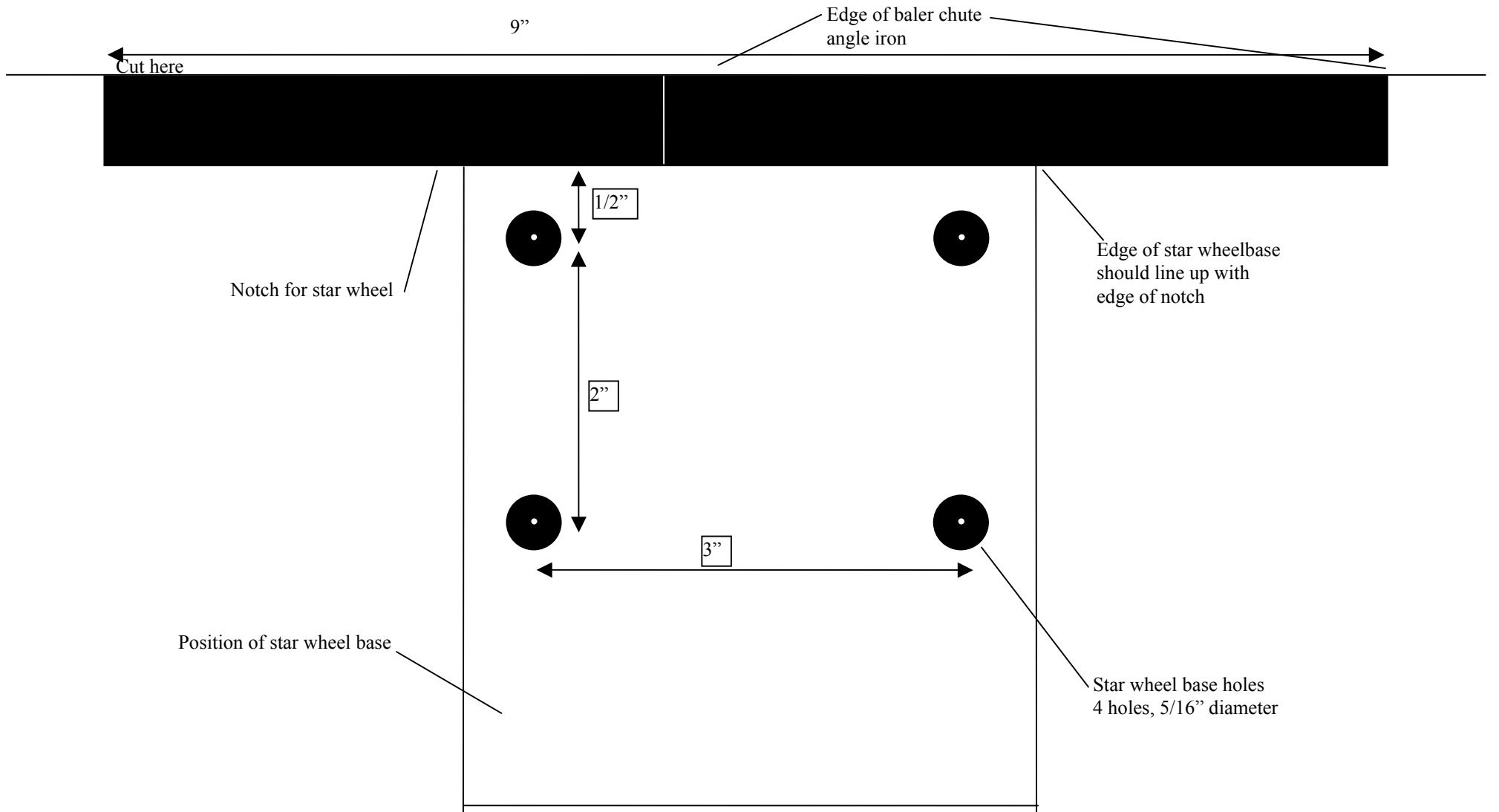


<u>Ref.</u>	<u>Description</u>	<u>Part#</u>
1.	Star wheel harness	006-4640D
2.	Power supply harness	006-4640A
3.	Proximity sensor and harness	006-7202
4.	Main control harness	006-4640C3
5.	Control box bracket	001-2012G
6.	Control box knobs	008-0923
7.	464 control box	006-4650A

4498A INSTALLATION KIT



<u>Ref</u>	<u>Description</u>	<u>Part#</u>
1	Spray shield	001-4810
2	Shield holder	001-4810A
3	Lynch pin	008-4576
4	Yellow tip	004-TT11002VP
5	Tee fitting	003-TT14
6	Nozzle cap	004-4723
7	Eva hose-1/4"	002-9006
8	Check valve	004-1207VB
9	Nozzle body	004-4722
10	W/Straight fitting	004-1414VB
11	Tip screen	004-1203-100
12	Plug	003-F14
13	Straight fitting	003-A1414
14	Hose clamp-#4	003-9002



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 purchase. 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 purchase 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. It will be the purchaser's responsibility to provide proof of such purchase.

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.