OWNER'S MANUAL

MODEL 447UT
25 Gallon Automatic Applicator

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

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HARVEST TEC 447UT TABLE OF CONTENTS

Introduction

Congratulations on purchasing a Harvest Tec Model 447UT applicator. This applicator is designed to apply Harvest Tec buffered propionic acid. The use of other products can cause application problems and damage to system components. The model 447UT base kit includes the following parts: Tank, Frame, Pumps, Hose, Baler Mounted Processor, Touchscreen Display, Moisture Sensors, and Miscellaneous Hardware. Before installing the unit on the baler, make sure you have the proper kit. (See the chart below). If you are unsure about your kit, contact your dealership for specifications. For your convenience we have included a parts break down for the model 447UTapplicator. If something goes wrong bring this manual into the dealership 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.

Tools Needed

Standard wrench set	Crescent wrench
Standard socket set	Hammer
Hose cutter	Metal cutting and drilling tools, saw
Side cutter	Standard screw driver or 5/16" nut driver
Center Punch	

Installation of Applicator

1. Installation of tank, mounting brackets, pump plate and drain / fill line

Locate the tank base bracket (001-4442U). This bracket will mount on the front of the baler is show below. Depending on the year of the baler only two of the required three holes may be premade on the baler. Mark and drill two 1/2" holes (one per side) if necessary. Take care to check behind the area before drilling. The bracket will be secured on each side with three 1/2" x 1 – 1/4" hex bolts, six flat washers, three lock washers, and three hex nuts. Secure the left side of the baler first. Slide the supplied shims (001-4442US), if necessary, between the tank base bracket and the baler side wall if necessary. The shims need to be installed to prevent the balers side wall from moving in once the tank base bracket hardware is tightened. Tighten all hardware.
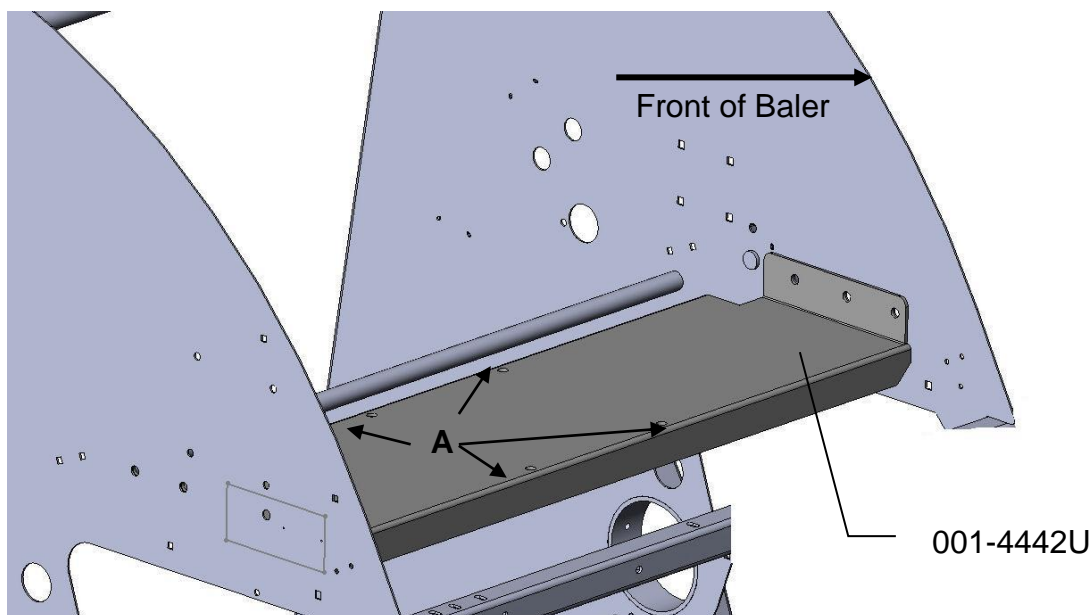
Installation of Tank, Mounting Brackets, Pump Plate & Drain / Fill continued

Mount the tank on the tank base bracket (001-442U) as shown below and on the previous page. The position the tank and saddle so that the additional side hole on the tank will be facing the front of the baler. The tank saddle will have four holes that will line up with point A. Use four 1/2" x 1 – 1/4" hex bolts, four flat washers, and four lock washers to secure the tank to points A.

Locate the pump plate mounts (001-4442UL & 001-4442UR). Attach to the tank saddle as shown below at point B. Attach using four (two per side) 3/8 x 1" hex bolts, lock and flat washers. Connect the pump plate mounting bracket (001-4646C), using two 3/8 x 1 hex bolts, locks, flats and nuts to the pump plate mounts. Attach the pump plate holder (001-4646D) to pump plate mounting bracket (001-4646C) using four 3/8 x 3/4 flange head bolts. The Baler Mounted Processor (BMP) will install in the pump plate holder. The BMP and pump heads must be pointing down. Failure to mount with the heads down will void all warranty.

The drain/fill line will connect to the tank at point C. Thread 3/4" elbow fitting (#003-EL3434) into end of tank. Run 3/4" hose from the elbow down the frame to the bottom of the baler. Drill 1/4" holes to accept the valve holder bracket and use 5/16" x11/4" self-tapping screws. Connect valve assembly to other end of hose. Place hose clamps on both ends. **The drain/fill line needs to be used for all filling or draining of the tank. Fill or drain from ground level only. Failure to do so can lead to injury.**

Locate gauge assembly. On round balers the gauge can be mounted to front of tank saddle or in any other location that is easily viewed from the tractors seat.
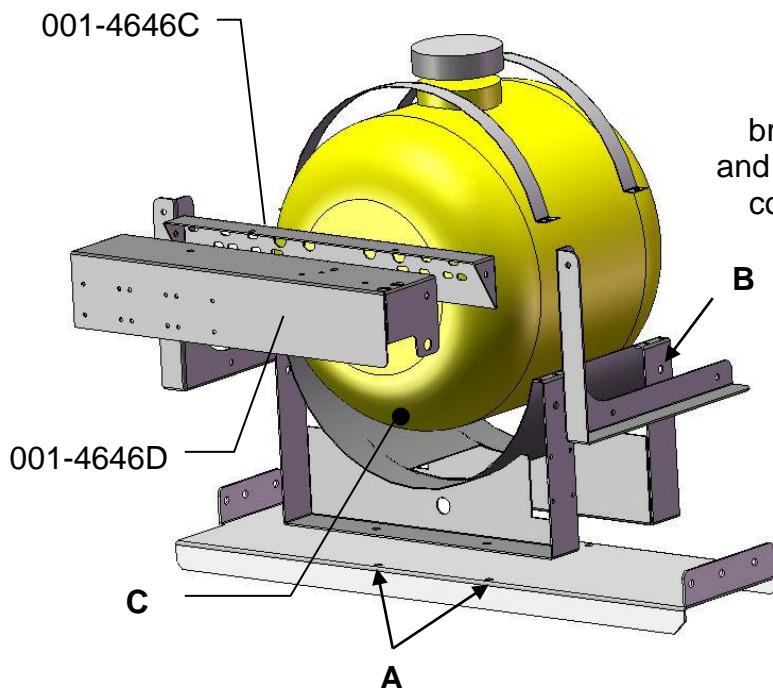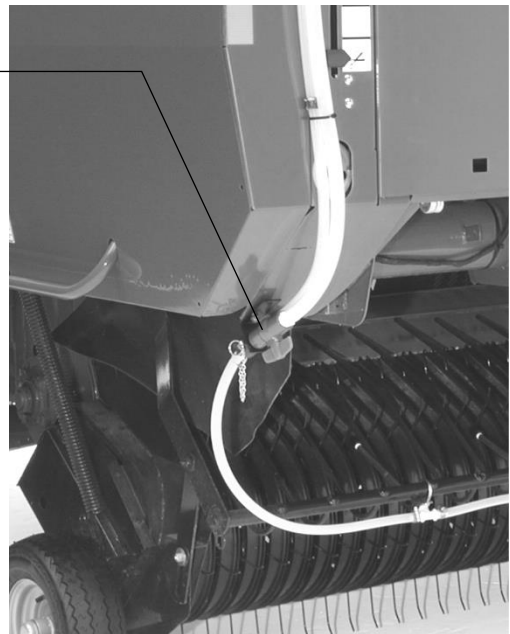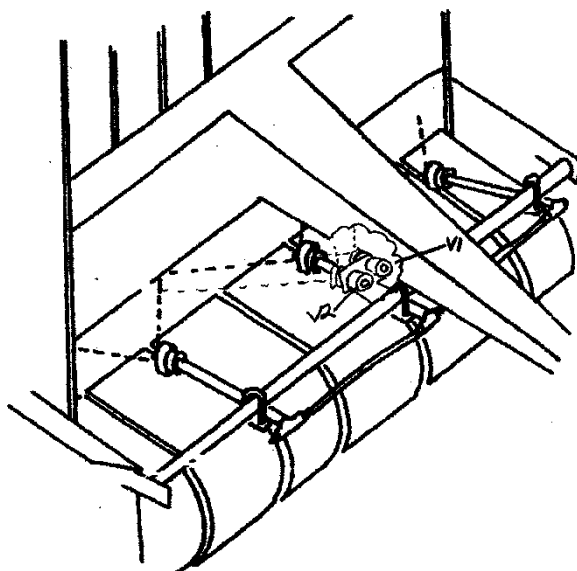
2. Installation of Nozzle Tubes

Locate the nozzle tubes on the cross bar of the wind guard as pictured. Position the nozzle tube with the 3 nozzles in the center.

	LEFT SIDE	CENTER	RIGHT SIDE
4 ft balers	10"from outside	Center	10" from outside

3. Installation of Plumbing

A. Intake
Use the 003-EL3412 on the bottom of the tank to route 1/2" line (002-9001) to the 003-A1212 fitting on the ball valve already attached to the pump plate. Attach hose clamps (003-9003) on both of the fittings.

B. Discharge
The three – 1/4" hose assembly will be used to attach the pumps to the spray nozzles. The pump order is, from closest to the filter bowl, 1,2, and 3. Pump 1 will attach to the three main nozzles. Pump 2 will use the green hose and Pump 3 will use the blue hose to attach to the auxiliary nozzles.

C. High and Low Output Tips
Your baler comes with two sets of tips: a low set and a high set.
-**The low set will cover outputs of 32 to 440 lbs/hr or approximately 8-27 tons/hour.**
   Install the following tips for low output:
        Clear hose to silver tips on all three connected nozzles.
        Green hose to green tip.
        Blue hose to red tip.
-The high set will cover outputs of 84 to 632 lbs/hr or approximately 21-40 tons/hour. Install the following tips for high output:
        Clear hose to white outside tips and orange middle tip.
        Green hose to blue tip.
        Blue hose to gray tip.

**Refer to Tip Output under APPLICATION RATE of the control unit to calibrate system.

5

4. Installation of Moisture Sensor Pads

Figure 1

2" from back of chamber

1" from top of roll

1. If your baler is equipped with bale shaping pads, remove disc and use existing hole (may need to be drilled larger, 3/4") to install new moisture sensing discs.
2. If your baler is not equipped with bale shaping pads you will need to drill a hole in the chamber directly behind and above the starting roll (Figure 1).
3. The mounting hole will be 3/4" in diameter. Use a plastic pad (006-4641F) and place it into the baler to use as a template. The bottom edge of the pad will be placed 1" up from starting roll and 2" from the back of the bale chamber. (Figure 1)

006-4641G

006-4641G

006-4641I

006-4640G
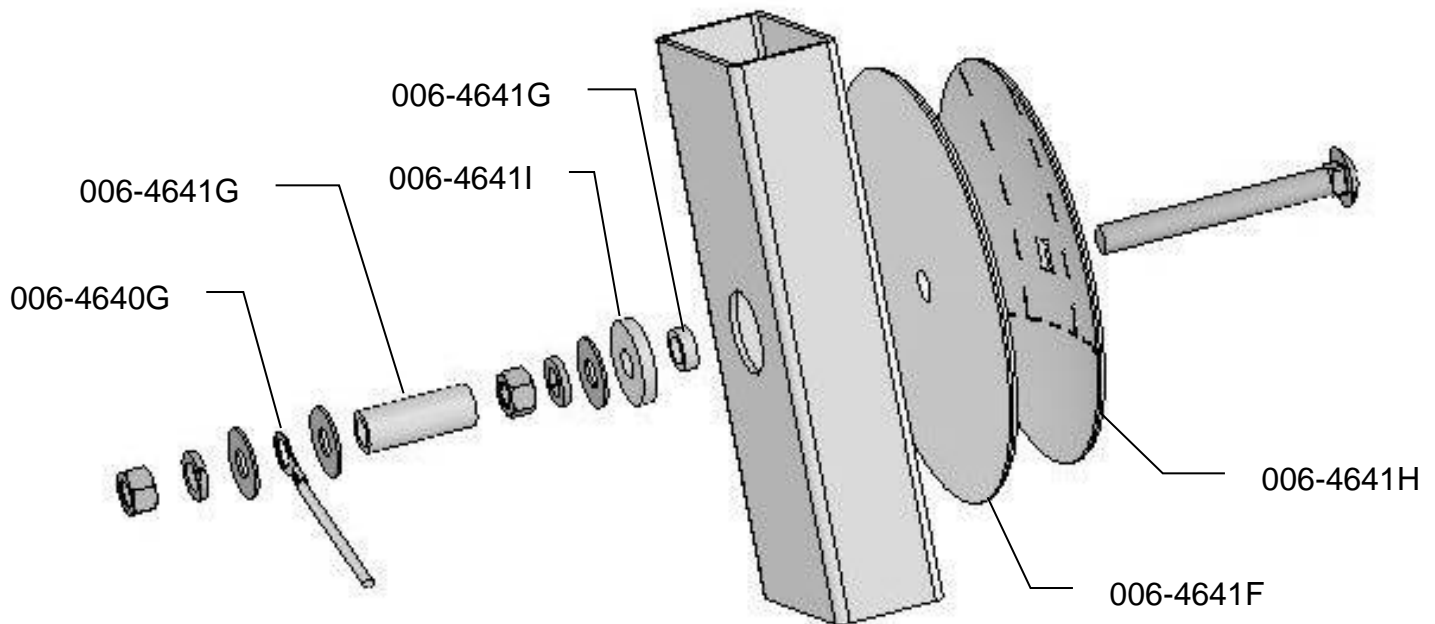
006-4641H

006-4641F

4. Locate the 006-4641G. The piece will need to be cut down to size. Use the already machined line in the bushing to cut off the small piece shown above.
5. Depending on the baler the bolt may need to be trimmed for proper fit.
6. Tighten all of the hardware to 50 ft/lbs.
7. Make sure that the plastic pad is protecting all metal surfaces of the disc from touching baler.
8. Run the moisture wire harness (006-4640G) from pump plate to each disc securing with cable ties.
9. Apply silicone over nuts and washers.

6

5. Power Cable and Main Wiring Harness Installation

1. Connect the power harness (006-4640A) to the battery (12 volt) using the red wire with fuse to the positive side and the black wire to the negative
   a. **The power harness must be connected to the battery!** The unit will draw more amps than convenience outlets can handle. Any modifications of the power harness will void systems warranty. **CONTACT HARVEST TEC BEFORE MODIFICATIONS.**
   b. **This unit will not function on positive ground tractors.**
   c. **If the unit loses power while operating it will not keep track of accumulated pounds of product used.**
2. The power harness (006-4640A) will run from the tractor battery to the hitch. The power harness (006-4660R) will connect to the tractor power harness (006-4640A) at the hitch. Run the Communication harness (006-4660N) from the cab to the hitch. This wire will connect to the Communication harness (006-4660S). These wires will run together to the Baler Mounted Processor (006-4671RB).
3. Connect Communication harness (006-4660N) to Bluetooth Receiver (030-4672A) mounted in cab.
   a. Mount Bluetooth Receiver (030-4672A) in safe location as close to iPad as possible in cab.
4. Connect Flow Meter (006-4725A) to the Baler Mounted Processor.
5. Connect Pump Harness (006-4660Z) to the Baler Mounted Processor.
6. If you have the optional Hay Indicator, connect it to the Baler Mounted Processor.
7. Attach moisture cable (006-4640GX) to Baler Mounted Processor.
8. Install Baler Mounted Processor in pump plate using 5/16" lock, nut and flat washers.

NOTE: The plugs on the Baler Mounted Processor must face down. Failure to mount correctly will void systems warranty.

SYSTEM WIRING DIAGRAM

Pump Harness
006-4660Z

Tractor to Hitch
Power Cable
006-4640A

463 Terminal
006-4670

Flow Meter
006-4725A

Comm Terminal
to Hitch
006-4660N

Baler
Mounted
Processor
006-4671RB

Moisture Cable
006-4640G

Hitch to Baler Power Cable
006-4660R

Comm Hitch to Baler
006-4660S

Optional Hay
Indicator

Bale Rate Sensors:
Not Used
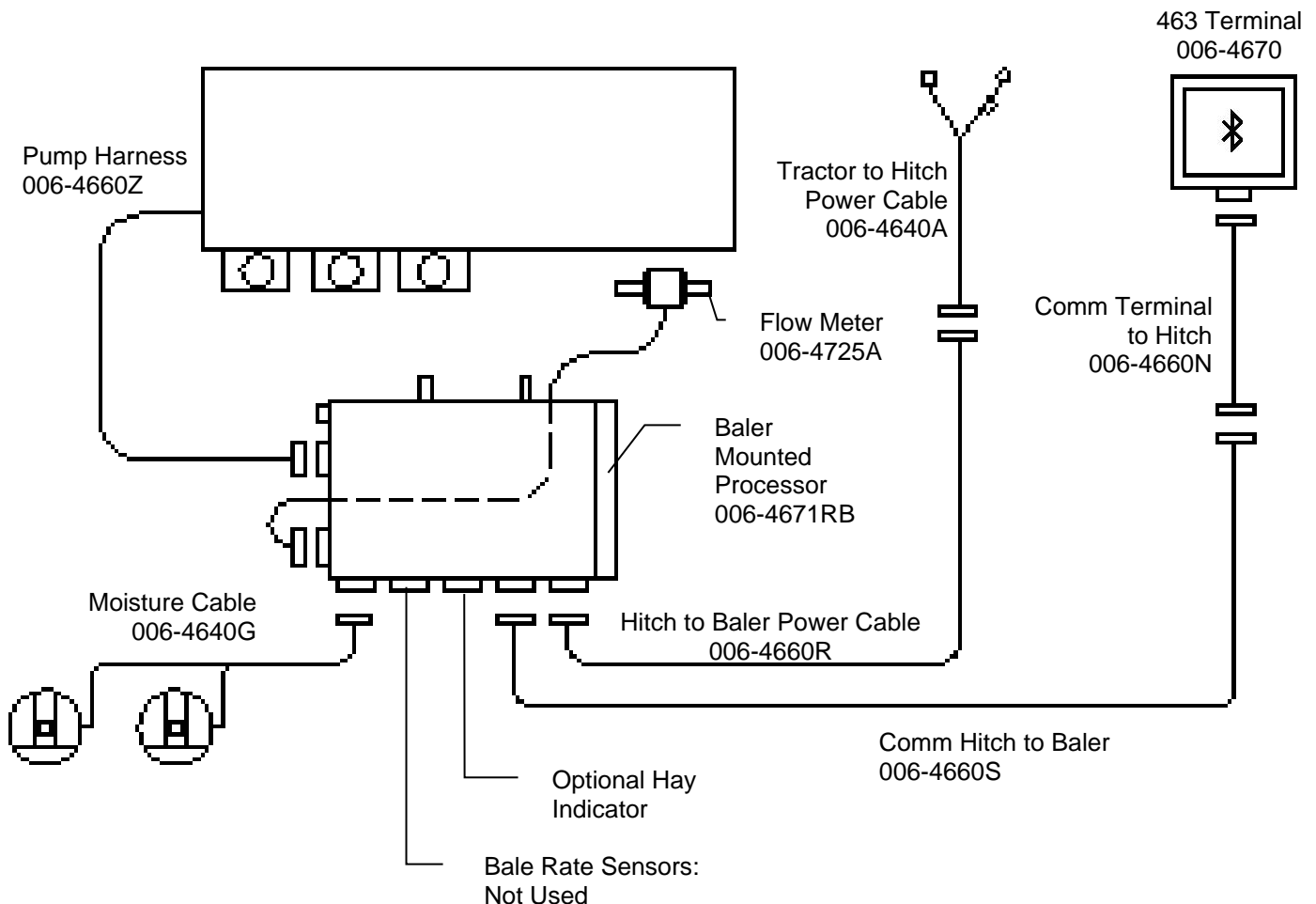
Installation of Controls

Installation of Bluetooth Receiver

Locate a safe location in the cab of the tractor to place the Bluetooth Receiver (030-4672A). Recommended location is as close to the iPad being used as possible.

Connect communication wire (006-4660N) to the bottom of the receiver.

Optional Touch Screen Display

Use suction cup mount (001-2012SCM) to position the monitor in the cab. Make sure the glass is clean before installing the suction cup mount. If an open cabbed tractor is used, use the supplied #10 screws for installation on the fender. If unit is mounted on fender it will need to be removed at night and stored in a clean, dry area. Use the Ram mount (001-2012H) swivel-positioning nut to tighten the entire assembly. Adjust it so that you can view the entire screen and be able to use the touch screen without interfering with other tractor functions.

Connect communication wire (006-4660N) to the bottom of the terminal.

<u>Backup Fuse</u>

The Model 463 is equipped with a backup system if your display is not functioning. This function is intended for use only as a temporary means for application and not as a way to apply preservative over multiple fields or for a lengthy amount of time. The baler mounted processor has a location for a backup fuse on the same side as the pump and flow meter harness that bypasses all other system inputs and applies preservative using one pump (Pump Three) at a constant lbs/hour shown below. These values are based upon on input voltage of 13.5 DC. Insert at least a 10 amp up to 20 amp fuse (3 AG style) into the backup fuse port to activate the bypass. The system will not turn off or pause until the fuse is removed. The main fuse must also be functional for the backup fuse to work.

	Tip Set	Output (lbs/hour)
463	High	230
	Low	180

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 automatic cab terminal on open station tractors if left outside.
5. Pump performance may start to decline after 400 hours (5000 bales on large round 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.
6. If you are using bacterial inoculants, flush your system daily after every use.
7. Clean tank cap every 10 hours of operation.
8. **WARNING: Do not climb on baler for maintenance.**

Maintenance Schedule

	Daily	10 hrs	400 hrs	Weekly	Monthly	Season
Diagnostics	X					X
Filter bowl cleaning		X				X
Tip screen cleaning		X				X
Tank cap cleaning		X				X
Dielectric grease connections					X	X
Rebuild pump			X			
Battery connections				X		X
Check valves			X			
Visually inspect hoses				X		X

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 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, if 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. Disconnect power from the system.
8. Remove display from the tractor and store in a warm, dry place.
9. The drain/fill line needs to be used for all filling and draining of the tank. Fill or drain from ground level only. Failure to do so can lead to injury.

400T Bluetooth Operation

Turn On / Off iPad using the Sleep/Wake button

*(Info from Apple User's Guide)

Turn iPad on. Hold down the Sleep/Wake button until Apple logo appears. iPad will take a moment to load.

You can lock iPad and put it to sleep when you're not using it. Locking iPad puts the display to sleep, saves the battery, and prevents anything from happening if you touch the screen.

Sleep/Wake Button

When you are not going to use the iPad for an extended period of time put the unit into sleep mode by pressing the Sleep/Wake button. Press Sleep/Wake button to wake iPad and then unlock iPad by entering passcode.

Turn iPad off. Hold down the Sleep/Wake button for a few seconds until the slider appears onscreen, then drag the slider to the right.

Downloading Harvest Tec App

1. If iPad does not have Wi-Fi turned on, select the Settings tab [icon] then select the Wi-Fi tab (below).
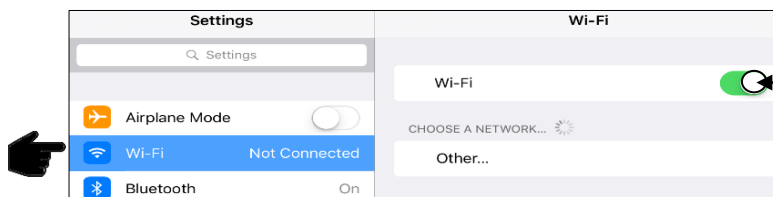
2. Turn Wi-Fi on by sliding button to the right.
*Green bar indicates ON

3. Use same process to turn on Bluetooth function

4. Select an available network when detected by the iPad, shown in area above that currently says 'Other.'
5. Select App Store icon (below) and open. *You will need a Wi-Fi connection available to view App Store.

Download the Hay App in the App Store by searching for 'Hay App' in the search bar in the top right corner of screen (right):
  *The advertisements displayed on the App Store screen will change.

The app will have the icon as shown:

Hay App
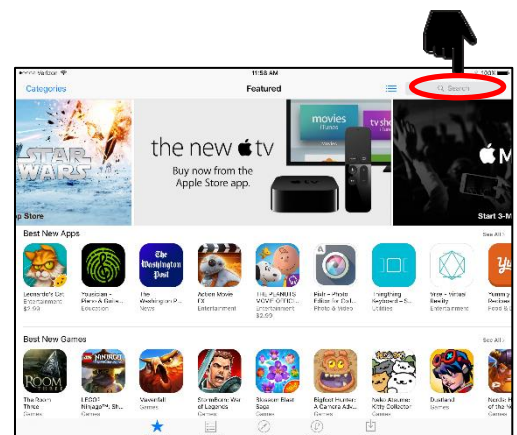
Note: Operation requires 3rd generation (2012) iPad, iPad Mini, or newer with iOS8 or greater operating system.

Turn Off Auto-Lock Function

To ensure that your iPad does not periodically auto-lock or 'sleep' during periods of inactivity, the auto-lock timer must be changed.

Under the Setting tab (illustrated previously), select the General settings tab (below left), and change the timer setting to Never (below right).
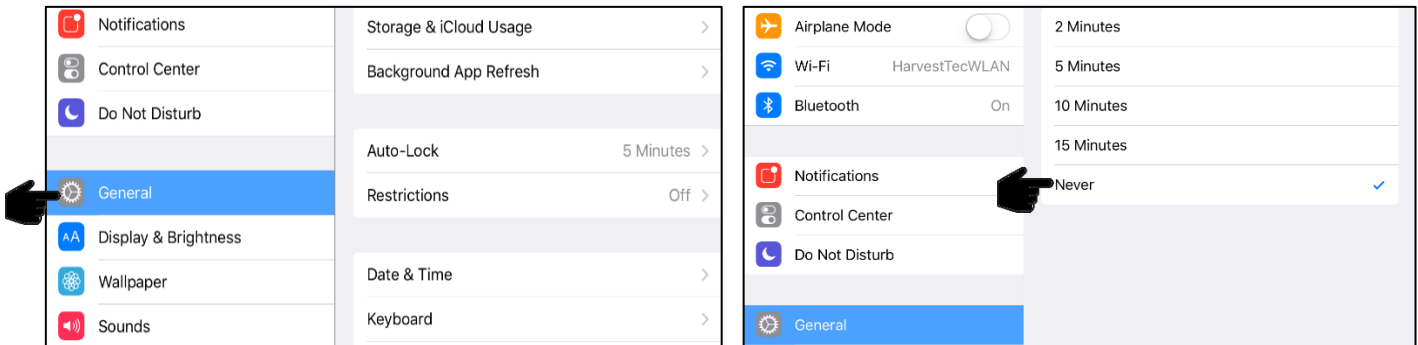
Shutting Down the Hay App

1. To shut down the Hay App double click the home button (Figure A). This will show the open apps that are running on your iPad (Figure B).
   *Note: By pressing the home button one time to return to the home screen, the Hay App **does not** shut down. The system will however, stop applying preservative after 10 seconds.

Figure A

2. Slide the app you want to shut down by sliding the app toward the top of the iPad, until the app is no longer visible (Figure C).
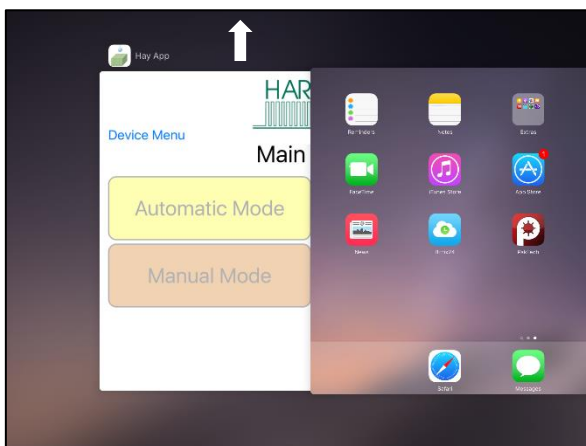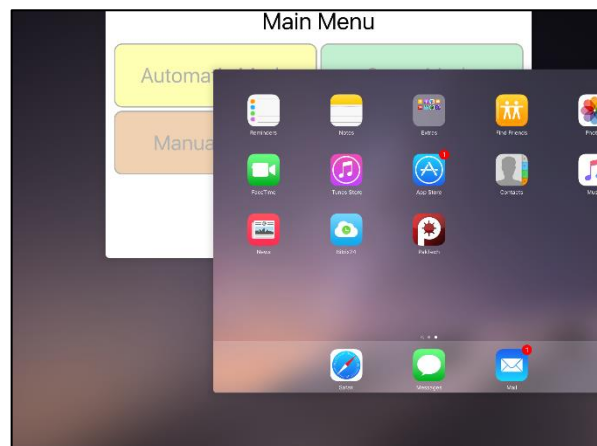

Figure B

Figure C

11

Operating the Harvest Tec iPad App

After installation of the Bluetooth Receiver (030-4672A) on to the applicator system, attach the power cord 006-4640A to supply power.

*Refer to the applicator installation manual for details on connecting the Bluetooth Receiver.

When ready to operate your applicator system, open the Hay App on the iPad by selecting the Hay App icon.
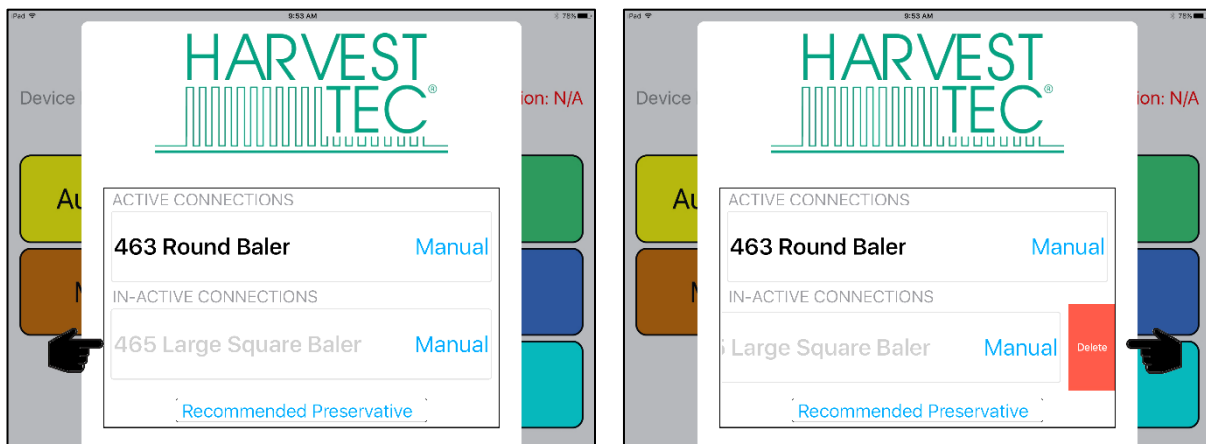
Device Selection

The app will open to the Device Menu screen as shown below. Applicators which are equipped with the Bluetooth receiver that are within range (20') of the iPad and have power going to them, will be shown under the Active Connections section.

After the iPad connects to the Bluetooth receiver, select the applicator you want to connect with.
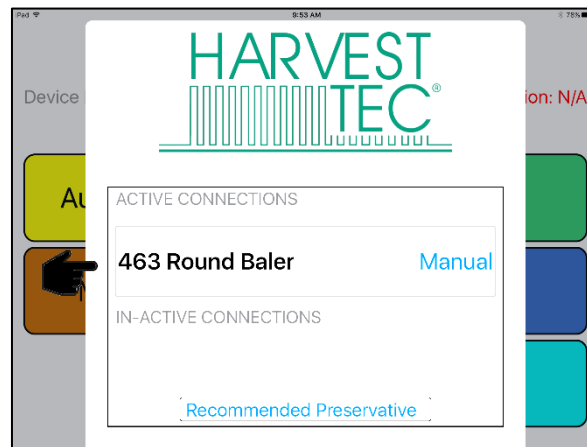
The In-Active Connections section will show the applicator systems that once were connected, that are not within range of the iPad or do not currently have power going to them (bottom left).

To remove a baler from the In-Active list, slide the bar displaying the baler name to the left, and select the Delete button that will appear (bottom right).
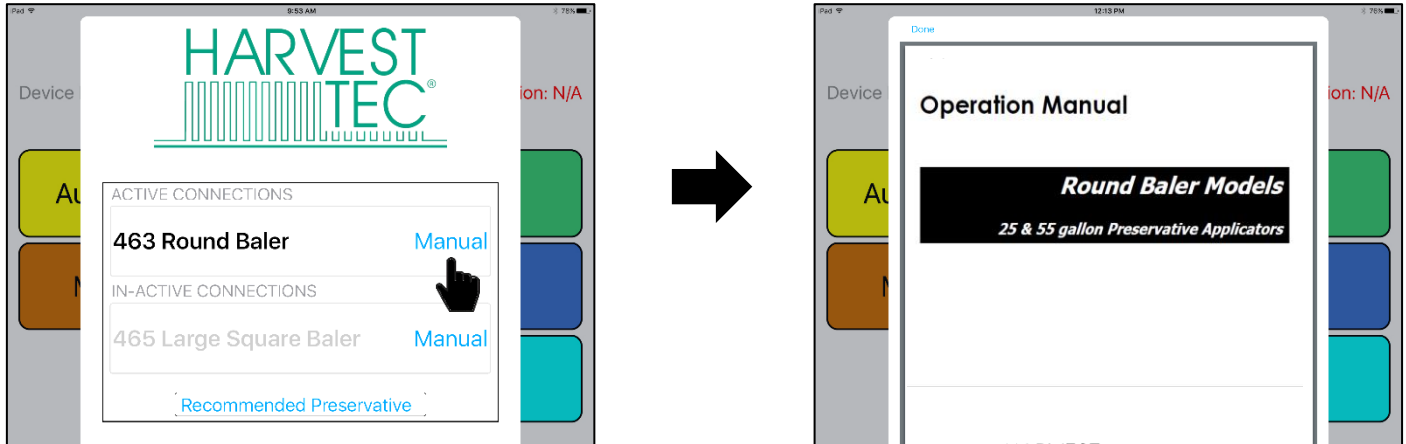
Manual Selection

Selecting the Manual button (below) displayed to the right of the baler name will open the operation manual for your baler.

*You do not need to be connected to a baler to open the manual after a baler has been connected.


When finished reviewing the manual, press the Done button in the top left corner to return to the Device Menu.

Recommended Preservative

To view recommended preservative information, application rates, and frequently asked preservative questions, select Recommended Preservative (below).

*You do not need to be connected to a baler to open the recommended preservative page.
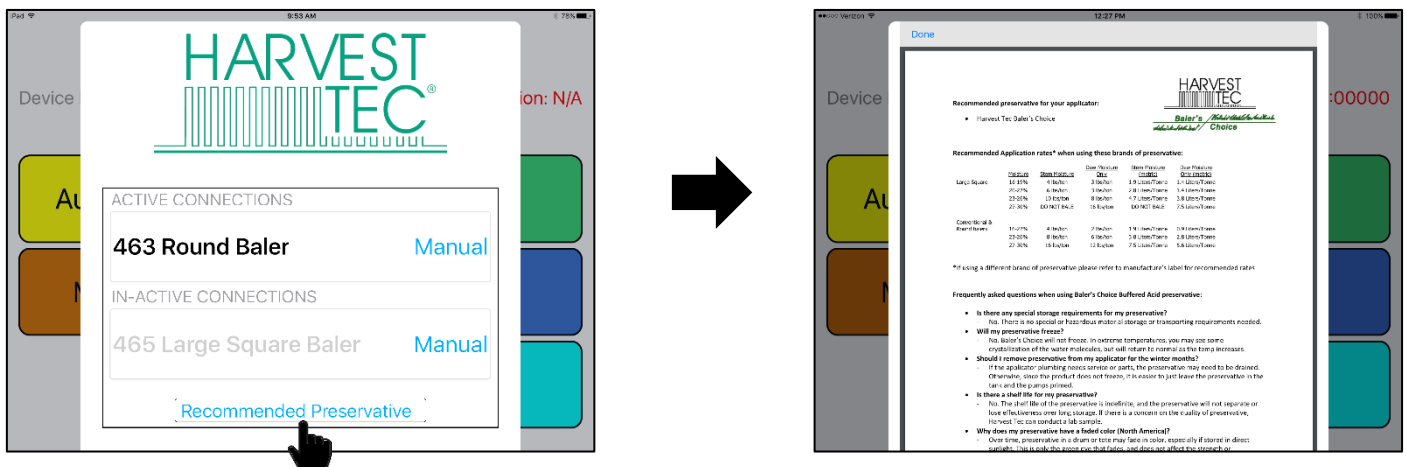
Operating the Harvest Tec iPad App (continued)

Once you have selected the baler you want to connect with from the Device Menu, the applicator main menu will display (below).
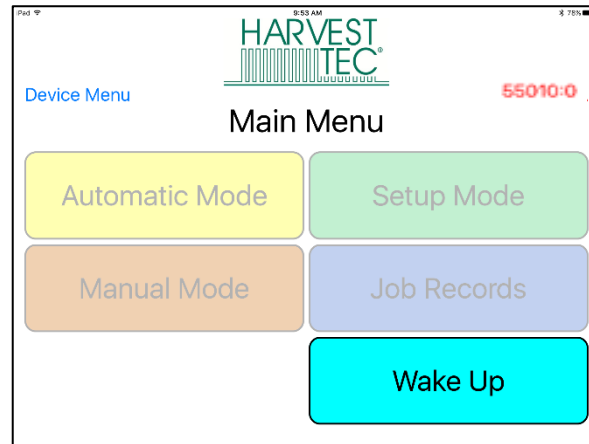
Tab Descriptions

Wakeup: Press this button to take the system out of the Standby mode and perform operation (above).

Automatic Mode: This mode allows you to use all of the applicator features such as adjusting preservative application on the go and counting total pounds of product used.

Manual Mode: Allows operator to manually turn pumps on and off. This mode also has moisture content displayed. Use this mode to prime pumps.

Setup Mode: This mode allows the operator to adjust bale rate, application rate settings and select tip output.

Job Records: Keep track of up to 63 jobs with total product used, average moisture content, tons baled, and baling date.

Standby: The feature puts the system into a non-operating mode when operation is not needed.
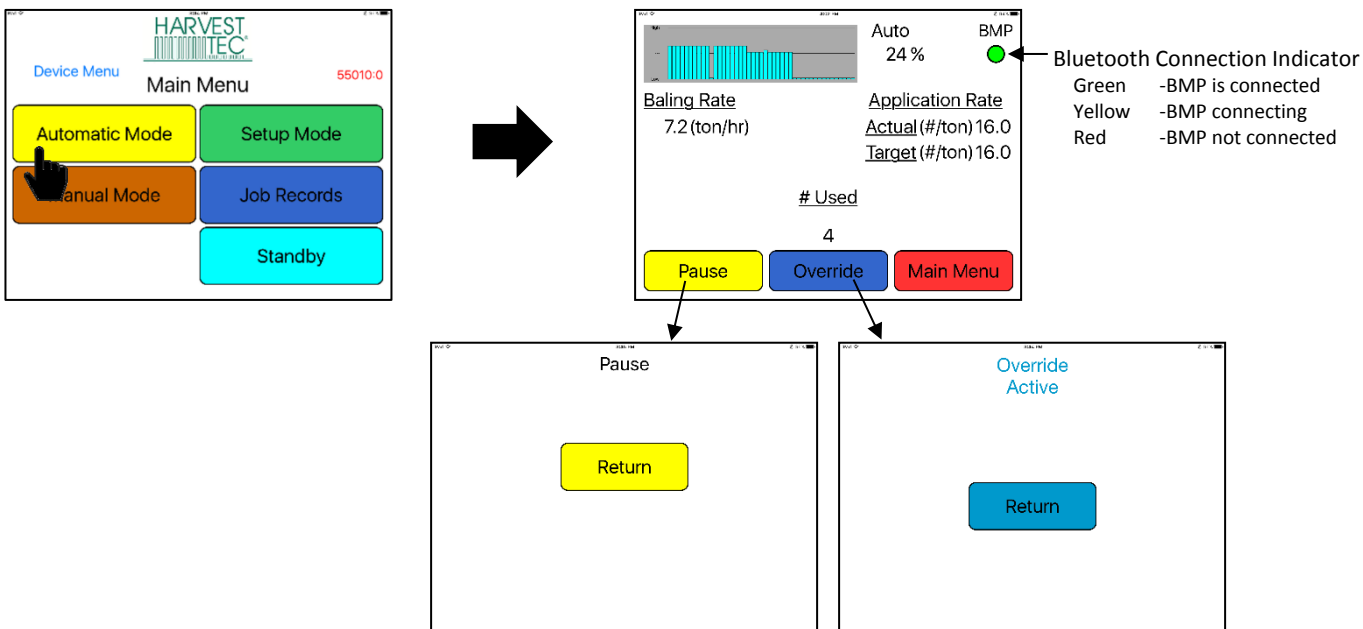
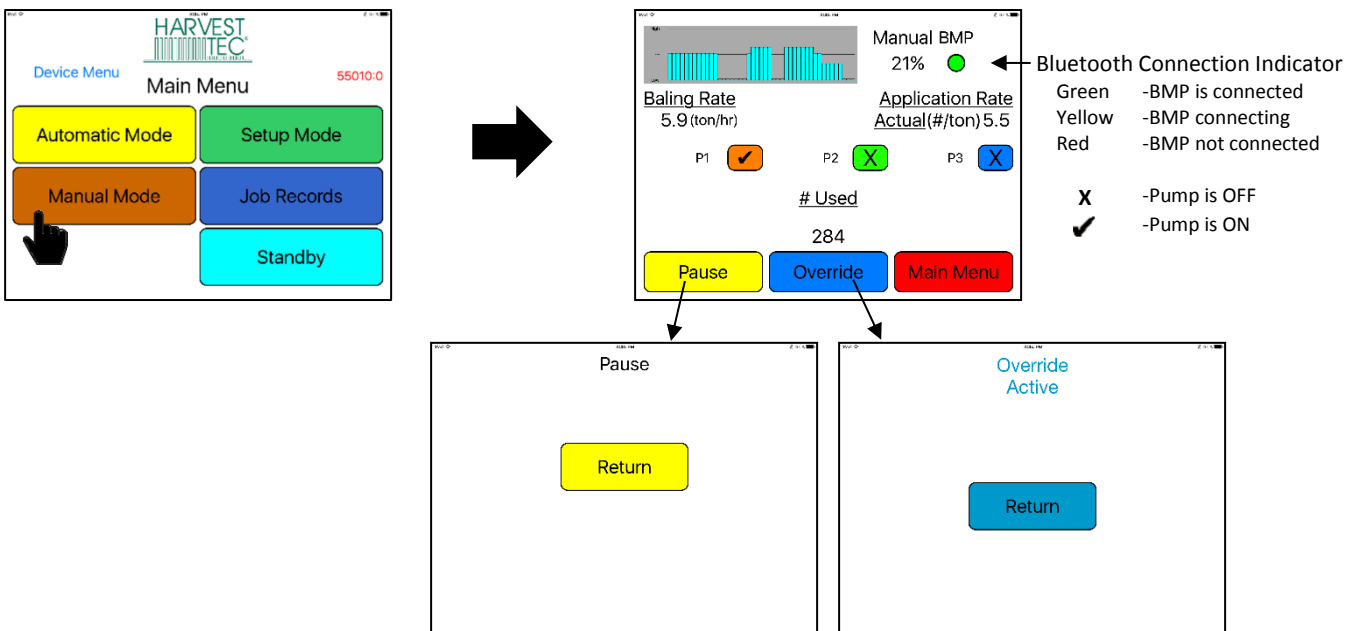**Device Menu:** This button will take you back to the Device Menu to select an applicator to connect with.

14
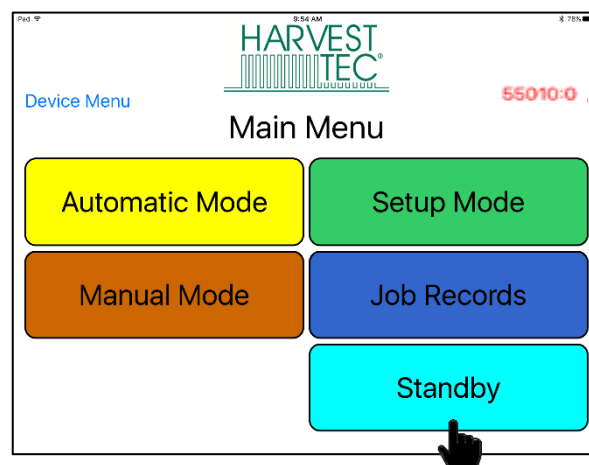
Screen Menus

Use the screen shots below to navigate through the operation screens.

Automatic Mode.

Bluetooth Connection Indicator
Green   -BMP is connected
Yellow   -BMP connecting
Red   -BMP not connected

Manual Mode

Bluetooth Connection Indicator
Green   -BMP is connected
Yellow   -BMP connecting
Red   -BMP not connected

X   -Pump is OFF
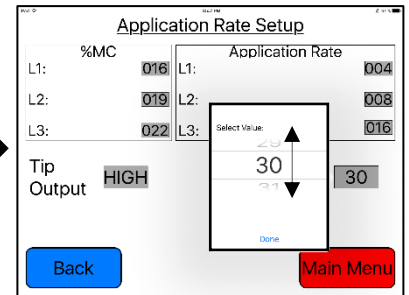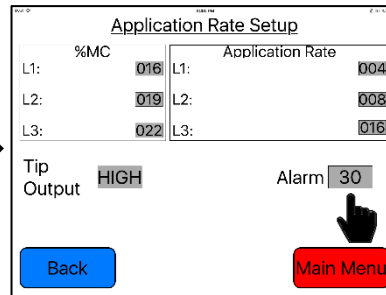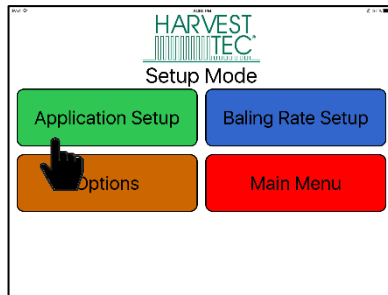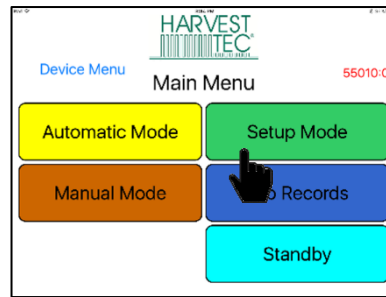**✔**   -Pump is ON

Operation Note:

Pressing the Home Button on the iPad **WILL NOT** immediately stop application of preservative. (see below):
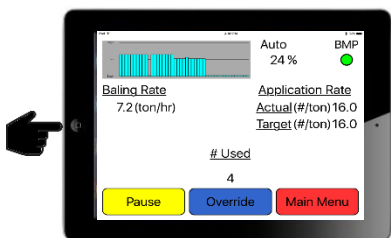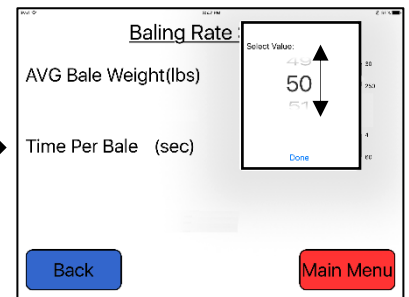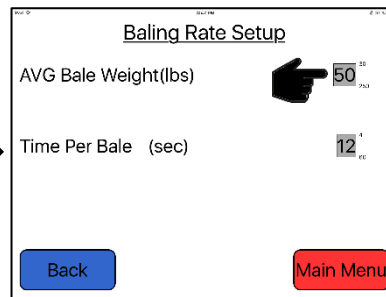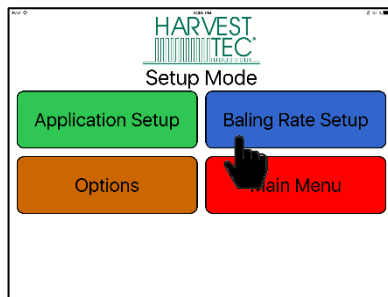

Select [Pause] or [Main Menu] to stop application.

*Pressing the home button will cause the system to stop application after 10 seconds.
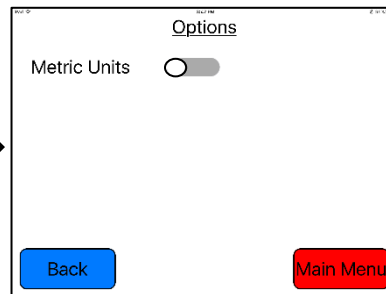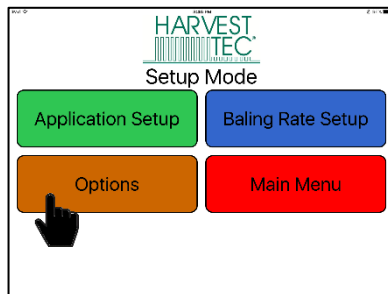
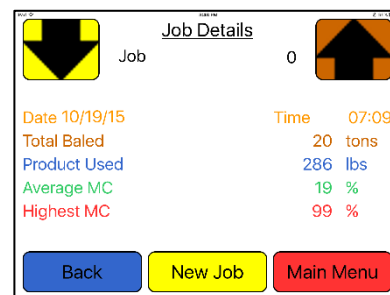15

Setup Mode

*All values can be changed

*All values can be changed

Job Records
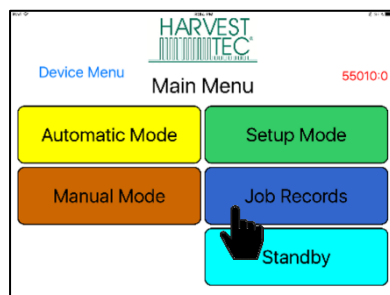
First Time and Annual Startup Instructions

THE UNIT MUST BE CHECKED OUT BEFORE FIELD OPERATION!

Check and Prime the Pumps

1. Put 10 gal of water in tank and turn main ball valve on.
2. Inspect for any leaks or drips at this time. If any are found tighten or replace area or fitting.
3. Turn controller on.
4. Press the SETUP MODE ket. Make sure the AVG Bale weight is 1500 lbs, and Time Per Bale is 60 seconds. Press the MAIN MENU key to return to the opening screen.
5. Press the MANUAL MODE key and the screen shown below will appear.

iPad
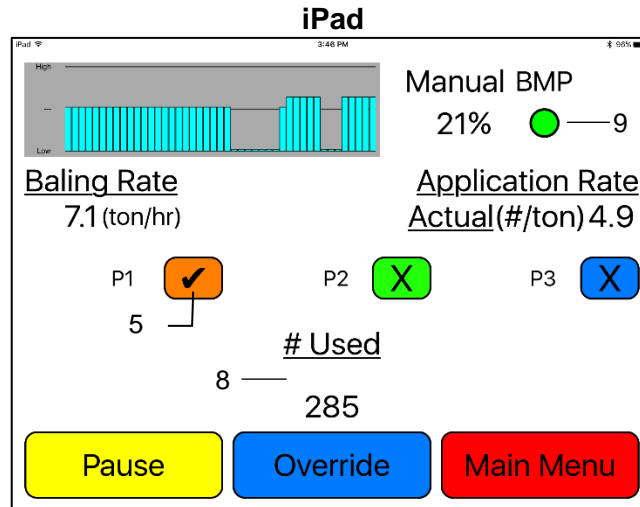
Note: The system comes with the high tips already installed on the spray shield or nozzle tubes. Test the system with the tips you will use most often.

Pump	Low Tips Output (Lbs / Ton)	High Tips Output (Lbs / Ton)
1	0.7 – 1.2	1.3 – 1.9
2	1.7 – 2.4	2.6 – 3.6
3	2.5 – 3.5	4.9 – 6.8

6. Turn pump 1 on (P1). To turn the pump on, select the colored box next to P1 and change the 'X' to a check mark Repeat the process for pumps 2 and 3 (P2 and P3).
7. This process will also be used to prime the pumps whenever needed.
8. While running pumps check for a good spray pattern out of the respective tips and verify that no parts of the system are leaking.
9. While doing these tests the Volume Used on the bottom of the screen will be increasing, this verifies that the flow meter is functioning.
10. The BMP button displays your connection signal with the Bluetooth receiver. Green – BMP is connected, Yellow – BMP is connecting, Red – BMP not connected. Pressing MAIN MENU key to return to the initial startup screen.

Setting Up the System for initial use with the iPad

In this mode you will setup your initial application rate and baling rate.

Application Rate

After pushing the SETUP MODE key in the Main Menu screen, the top left screen will appear:
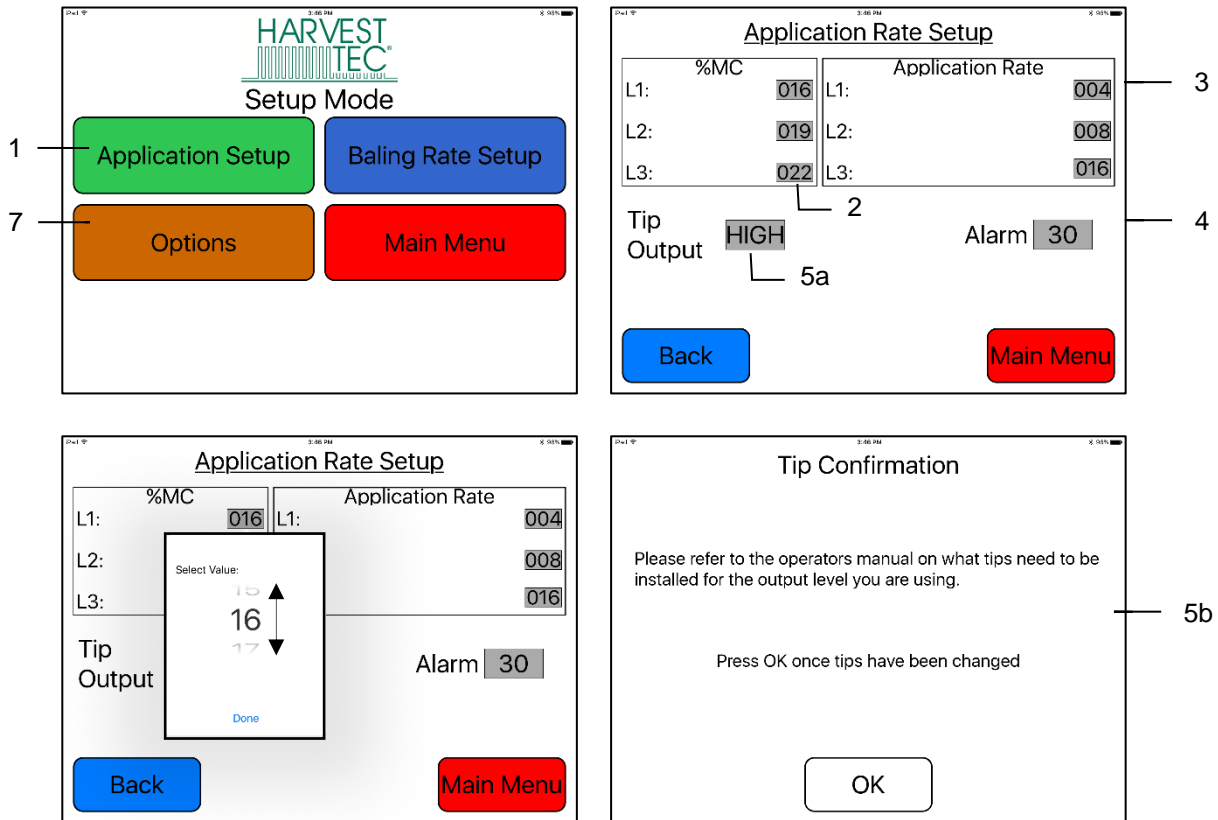
1. On the Setup Mode screen press the APPLICATION RATE key. Once selected the SETUP APPLICATION RATE screen will be shown. (Top right picture)
2. Press any of the grey number values to the right of %MC to adjust their figures. The scroll pad shown on the bottom left will display. Remember level 1 must be lower than level 2 and level 2 must be lower than level 3. Press Done, when value has been selected. Harvest Tec products recommend set points of 16, 22, and 26 % MC levels. These are preset from the factory. Press Back to return.
3. To change rate of chemical application, press any of the grey number values to the right of RATE. Remember level 1 must be lower than level 2 and level 2 must be lower than level 3. Press Done, when value has been selected. Harvest Tec products recommend rates of 4, 8, and 16 lbs/ton. These rates are preset from the factory. Press Back to return to previous screen. **IT IS THE OPERATORS RESPONSIBILITY TO FOLLOW THE RECOMMENDATIONS OF THE PRESERVATIVE. ONLY THE OPERATOR CAN APPLY THE PROPER RATE.**
4. To set the alarm, press the grey number value and set the level at which you want the alarm to activate. To turn the alarm off, set level above 50.
5. Press the grey area next to Tip Output to **cycle between the high and low sets of tips** (5a). Use the correct tip set for the field conditions. The tip confirmation screen will appear (5b). Press OK once tips are changed.
6. Next press the BACK key found on the bottom left hand figure of the screen to return to SETUP MODE screen or press MAIN MENU key on bottom right hand figure of the screen to return to opening screen.
7. Press OPTIONS to adjust the unit between metric and standard units.

18

Baling Rate Settings – Round Balers

iPad Operation
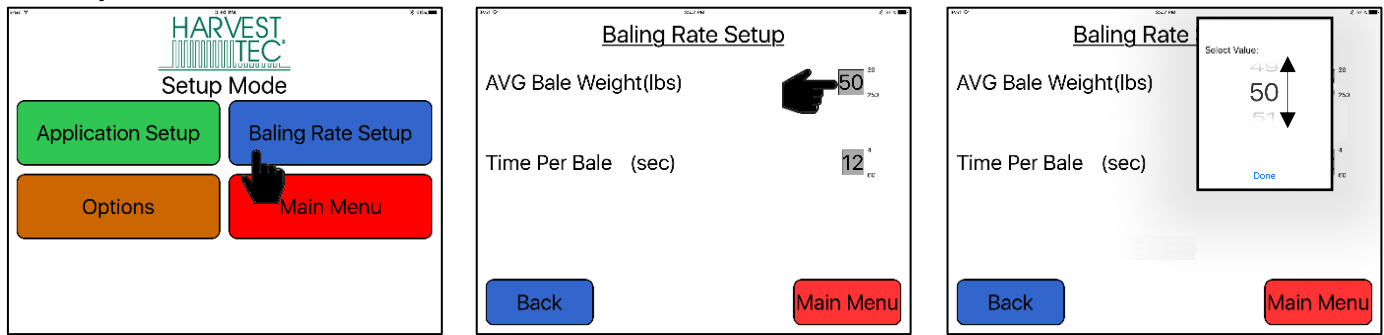
1. On the setup mode screen press the BALING RATE key.

2. Press the grey number value to the right of AVG Bale Weight (Lbs). To adjust the weight of your bales, the scroll tool shown on the right will display. Scroll through the values to select correct information, press DONE when value has been selected. The information will be saved until updated. Use the same procedure for adjusting time per bale.
   Note: Only count time that hay is coming into the baler, do not count tie time or drive time.

3. Press the BACK key found on the bottom left hand figure of the screen to return to SETUP MODE screen or press the MAIN MENU key to return to the opening screen.

Operation Instructions

Automatic mode will automatically apply product based on hay moisture content sensed by the moisture sensors and the operator's presets. See SETTING UP SYSTEM FOR INITIAL USE to change any of these settings. **Manual mode will apply preservative to the hay at a fixed rate regardless of the moisture.**

Automatic Mode

After pushing the AUTOMATIC MODE key in the Main Menu screen, the following screen will appear:
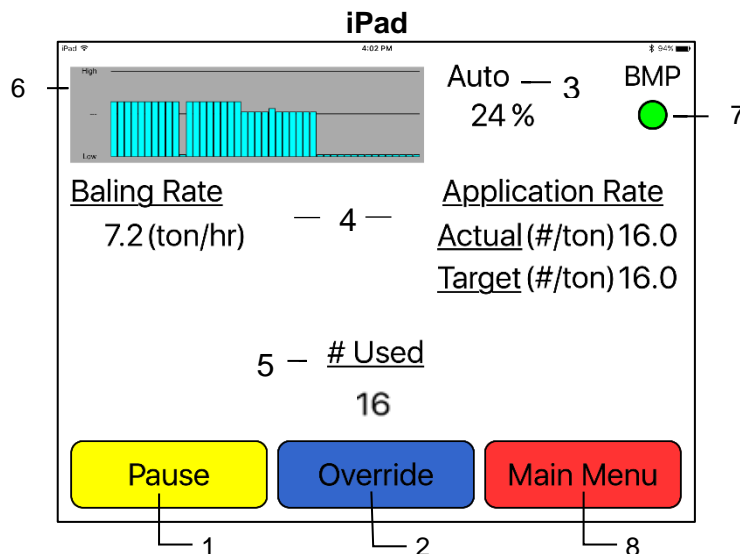
1. To pause the unit while in operation select the Pause key.
2. Push the OVERRIDE key to turn on all three pumps at the same time for full output of the system. Use this mode when going through a short area of wet crop.
3. The moisture content is shown in the upper right hand corner.
4. Baling Rate and Application Rate are shown in the middle of the screen. The operator sets the target application rate and baling rate in the setup mode; the actual rate should be within +/- one pound.
5. Volume used shown at the bottom of the screen will show accumulated pounds of preservative used on the go. This number will reset at power down, but remains in the job record screen. **NOTE: Initial start-up requires pressing the New Job key in the Job Records screen in order for Volume Used accumulation to be recorded**. **This only needs to be done once on initial start-up of system and not every time the system is started for operation.** (See JOB RECORDS screen)
6. The graph shows the moisture trend from the past 90 seconds in 3 second intervals.
7. The BMP button shown when using an iPad displays your connection signal with Bluetooth receiver. Green – BMP is connected, Yellow – BMP is connecting, Red – BMP not connected.
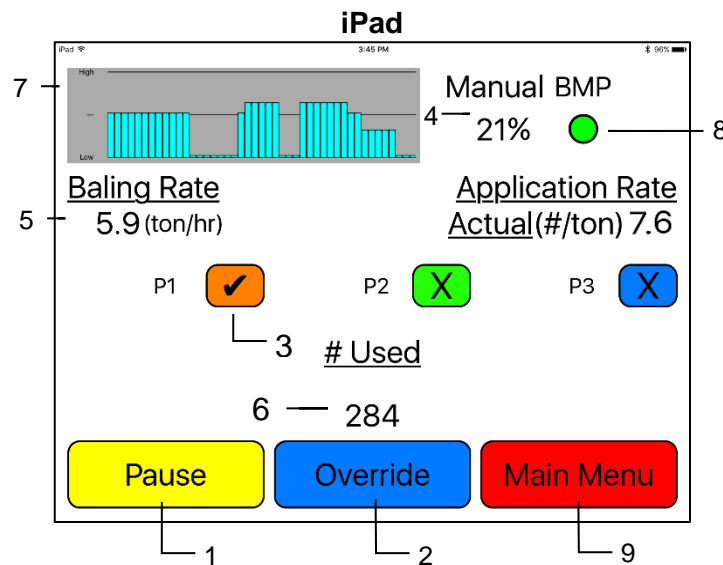8. Press the MAIN MENU key to return to the opening screen.

Manual Mode

After pushing the MANUAL MODE key in the Main Menu screen, the following screen will appear:

iPad

1. To pause the unit during operation select the Pause key.
2. Push the OVERRIDE key to turn on all three pumps at the same time for full output of the system. Use this mode when going through a short area of wet crop.
3. To turn the pump on, select the colored box next to P1 and change the 'X' to a check mark. In Manual Mode (regardless of moisture, baling rate or bale weight) the outputs are fixed rates as follows:

Pump	Low Tips Output (Lbs / HR)	High Tips Output (Lbs / HR)
1	45	75
2	90	140
3	135	265

4. The moisture content is shown in the upper right hand corner.
5. Baling rate and Application rate are shown in the middle of the screen. The output of a pump can be checked by dividing the preset output (shown in step 3) by the displayed baling rate. For example, if you have the low output tips in and are running pump one, by itself, your output is 45 lbs/hr. Given the baling rate shown on the above screen of 5.9 tons/hr, the application rate should be about 7.6 lbs/ton (45 lbs/hr divided by 5.9 tons/hr). The baling rate is set in the SETUP MODE menu.
6. Volume used shown at the bottom of the screen will show accumulated pounds of preservative used on the go. This number will reset at power down, but remains in the job record screen. **NOTE: Initial start-up requires pressing the New Job key in the Job Records screen in order for Volume Used accumulation to be recorded**. **This only needs to be done once on initial start-up of system and not every time the system is started.**
7. This graph shows the moisture trend from the last 90 seconds of baling (one every 3 seconds).
8. The BMP button shown when using an iPad displays your connection signal with Bluetooth receiver.
   Green – BMP is connected, Yellow – BMP is connecting, Red – BMP not connected.
9. Pressing MAIN MENU will return you to the opening screen.

Job Records

After pushing the JOB RECORDS key in the Main Menu screen, the following screen will appear:
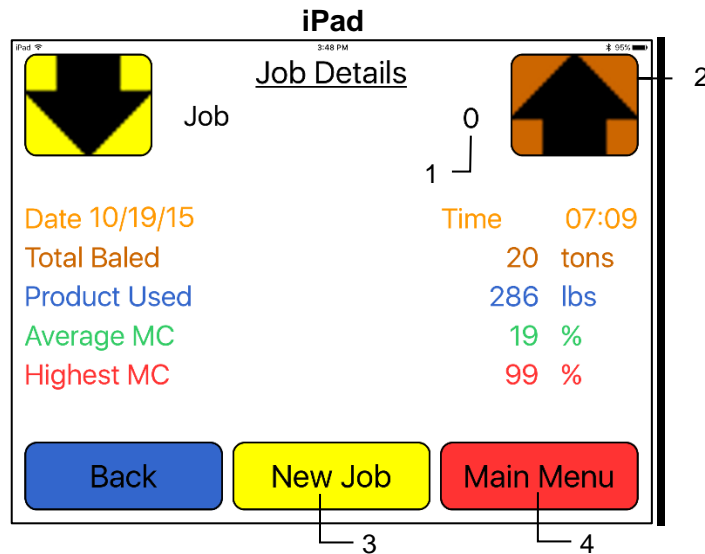
1. The job number will be displayed at the top center. The current job being viewed will always read "Job #: 0". Product used and average moisture content will be reset when the NEW JOB key is pressed. The job records screen will store up to 63 jobs and will allow you to access previous jobs by using the up and down arrows.
2. Scrolling through previous jobs is done by pressing the UP or Down keys.
3. **Every time the NEW JOB key is pressed the accumulated pounds on auto and manual modes will be reset to zero.** After 63 jobs have been stored, the next time the NEW JOB key is pressed the system will start over with job one and the old job will be replaced.
4. To return the opening screen, press the MAIN MENU key.
   NOTE: Initial start-up requires pressing the New Job key in the Job Records screen in order for Volume Used accumulation to be recorded. This only needs to be done once on initial start-up of system and not every time the system is started for operation.

Troubleshooting

PROBLEM	POSSIBLE CAUSE	SOLUTION
Pump will not run.	1. No voltage to Baler Mounted Processor.	1. Check for short, low voltage, and replace fuse if necessary.
	2. Pump locked up.	2. Clean or rebuild pump if motor ok.
	3. Damaged wire.	3. 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 give enough output.	1. Air leaks or clogs on inlet.	1. Tighten or clean filter bowl.
	2. Pump worn or dirty.	2. Rebuild pump.
Moisture reading errors (high or low)	1. Wire disconnected or bad connection between moisture discs and BMP	1. Reconnect wire.
	2. Low power supply to baler mounted processor.	2. Check voltage at box. (Min of 12 volts required.) See Diagnostics section of manual.
	3. Wet hay over 32% moisture	
	4. Ground contact with one or both moisture discs and baler mounted processor.	4. Reconnect.
	5. Short in wire between moisture discs and baler mounted processor.	5. Replace wire.
	6. Check hay with hand tester to verify.	6. Contact Harvest Tec if conditions persist.
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 corrosion or poor contact.	2. Apply dielectric grease to all connections.
	3. Check power supply at tractor. Voltage should be constant between 12 & 14V.	3. Install voltage surge protection on tractors alternator.
Flow meter readings do not match up with product usage.		
Product is less than actual product used.	1. Voltage supplied to meter is less than 6 volts.	1. Check for a min of 6 volts supplied at baler mounted processor.
	2. Wiring short in signal to baler mounted processor.	2. Inspect wire and replace if necessary.
	3. Clog in meter.	3. Back flush with water. DO NOT USE AIR.
	4. Using product other than Harvest Tec	4. Catch and weigh product to check outputs.

Troubleshooting (continued)

| PROBLEM	POSSIBLE CAUSE	SOLUTION
Product shown is more than actual product used.	1. High voltage supplied to the meter.	1. Check voltage at baler mounted processor. Max of 18 volts.
	2. Light interference with meter.	2. Reflection into meter can cause a high reading. Move meter or protect from sunlight.
	3. Air leak in intake.	3. Look for air bubbles in line. Replace line or other defective area that is allowing air into the system.
	4. Using product other than Harvest Tec	4. Catch and weigh product to check outputs.
System leaks product out of tips after shut down.	1. Dirty or defective check valves.	1. Clean or Replace.
Terminal reads under or over power.	1. Verify with multi-meter actual voltage. Voltage range should be between 12-14.	1. Clean connections and make sure applicator is hooked to battery. See Diagnostics section of manual.
System always displays "End of Row Pause".	1. Flow meter connector plug is plugged into Hay Indicator port on Baler Mounted Processor.	1. Switch ports.
System does not pause at the end of a row.	1. Cable is damaged or has short. 2. Crop eyes are damaged.	1. Replace cable. 2. Replace crop eye

iPad Troubleshooting

iPad Symptom	Troubleshooting
iPad won't turn on	-Turn your iPad off and on. Press and hold the Sleep/Wake button for a few seconds until a red slider appears; then slide it. Press and hold the Sleep/Wake button to turn on again.
	-Reset your iPad. Press the "Sleep/Wake" button and the "Home" button simultaneously for at least 10 seconds until the Apple logo appears on the screen. This reset will not damage your files.
	-Battery may be drained. Plug iPad into your computer or AC adapter and see if anything happens. The iPad will recognize it has been connected to a power source and charge its battery. If it will no longer charge, the battery must be swapped with a replacement battery. Battery level displays in top right corner of iPad.
Cannot get an active baler connection	-Make sure that your Bluetooth accessory and iOS device are close to each other when connecting.
	-Make sure that your Bluetooth accessory is on and fully charged or connected to power. If it uses batteries, test them to see if they need to be replaced.
	-Restart your Bluetooth receiver, by removing power and reconnecting after 30 seconds.
	-Make sure that you have at least a 3rd generation iPad with iOS8 or greater operating system on your iPad
	-On your iPad, go to Settings > Bluetooth and make sure that Bluetooth is on. If you can't turn Bluetooth on or you see a spinning gear, restart your iPad
	-Unpair the Bluetooth accessory, put the accessory back in discovery mode, then pair and connect it again. By tapping on its name in the Bluetooth accessories tab and then Forget this Device. In settings, tap on a device's name, then Unpair.
	-Display connector plug and bale rate sensors plug are switched on BMP. Switch connections.
	-Short in display cable. Replace the cable.
iPad touchscreen is slow or does not respond	-Screen may be dirty. Clean screen. Unplug everything, turn off iPad and with soft, lint-free, slightly damp cloth gently wipe screen. Do NOT use window cleaners and paper towels.
	-If you have a screen protector sheet, try removing it.
iPad is not charging or is slow to charge	-In order to charge your iPad you can try either connecting your iPad to a power outlet or connecting to a USB 2.0 port on a computer. However, note that computers generally don't supply enough power to their USB ports to be able to charge an iPad. When this happens, a "Not Charging" message will appear.
How can I unlock my iPad if I forgot the passcode	-If you cannot remember the passcode, you will need to *restore your device using the computer with which you last synced.* This allows you to reset your passcode and resync the data from the device (or restore from a backup). If you restore on a different computer that was never synced with the device, you will be able to unlock the device for use and remove the passcode, but your *data will not be present.*
How do I send in my iPad for service?	-Refer to your iPad owner's manual or contact Apple. DO NOT SEND iPad TO HARVEST TEC.
For other issues refer to your iPad Owner's Manual or contact Apple Directly	

Harvest Tec Does Not Service iPads
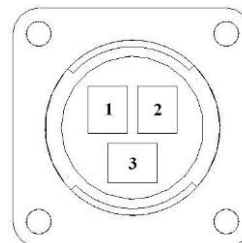
Pin Outs

A. Main power connector mounted on battery
Pin 1   Red   + 12 V input from tractor supply
Pin 2   Black   Ground from tractor supply
Pin 3   Not used
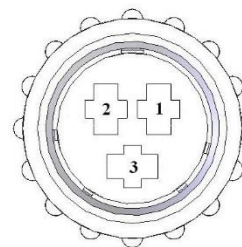
B. Main power connector mounted on BMP
Pin 1   Red   + 12 V input from tractor supply
Pin 2   Black   Ground from tractor supply
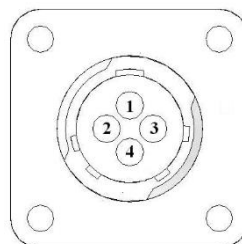Pin 3   Not used

C. Pump connection 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
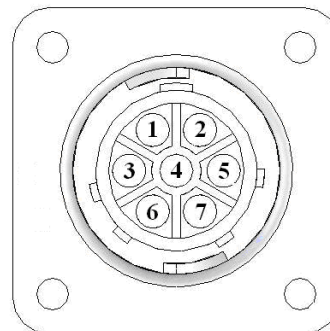
D. Flow meter connection on BMP
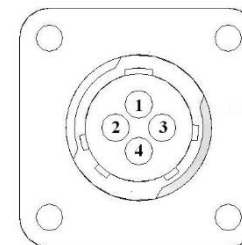Pin 1   White   5 - 12 V (+) supply
Pin 2   Green   Ground
Pin 3   Brown   Signal
Pin 4   Black   Shield

### E. Connector for Hay Indicator option on BMP
Note: Hay indicators are an option that will turn the system on and off automatically as hay enters the pickup of the baler.
Pin 1   Red   +12V
Pin 2   Black   Ground
Pin 3   White   Signal wire
Pin 4   Not used

F. Star wheel connector mounted on BMP

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
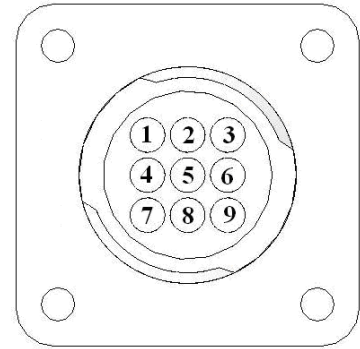
G. Communication harness Bluetooth receiver or display to hitch

Pin 1   Red   Power to display
Pin 2   Black   Ground to display
Pin 3   Blue   Comm channel OH
Pin 4   Orange   Comm channel OL
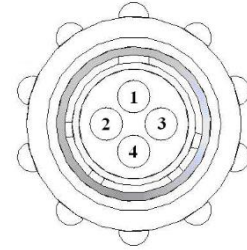
H. Communication harness hitch to baler mounted processor

Pin 1   Red   Power to display
Pin 2   Black   Ground to display
Pin 3   Blue   Comm channel OH
Pin 4   Orange   Comm channel OL
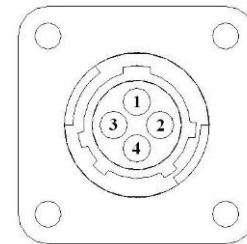
Parts Breakdown for the Tank

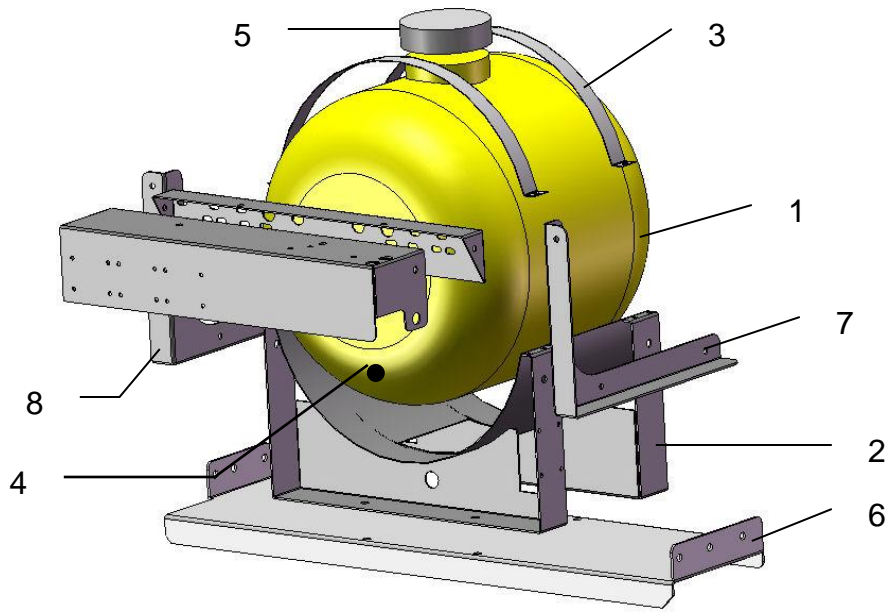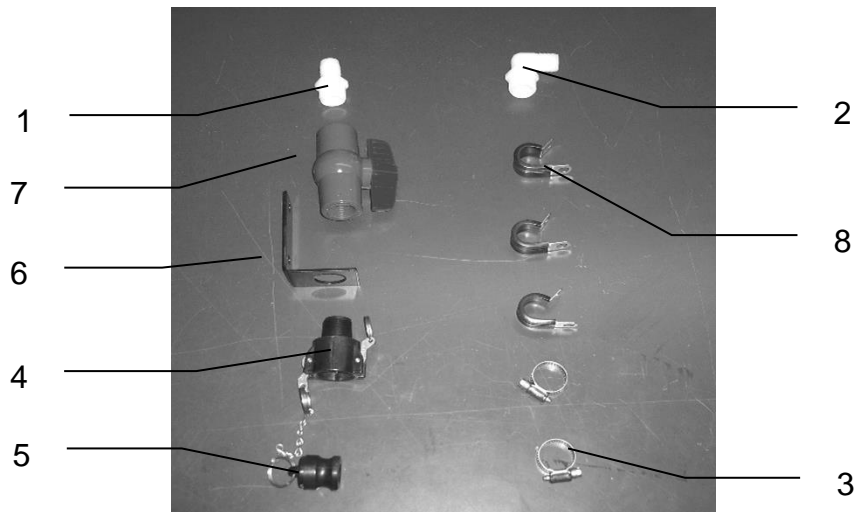| Ref #	Description	Part #	Qty	Ref #	Description	Part #	Qty
1	25 Gallon tank	005-9022	1	5	Tank lid	005-9022C	1
2	25 Gallon saddle	001-4442	1		Tank lid gasket	005-9022CG	1
3	Strap	001-4402	2	6	Tank mounting bracket	001-4442U	1
4	Tank fitting	005-9100	2	7	Pump plate bracket	001-4442UL	1
				8	Pump plate bracket	001-4442UR	1

Drain / Fill Kit

Ref #	Description	Part #	Qty	Ref #	Description	Part #	Qty
1	Straight Fitting	003-A3434	1	5	Male Coupler	002-2205G	1
2	Elbow	003-EL3434	1	6	Valve Holder	001-6702H	1
3	Hose Clamps	003-9004	2	7	Ball valve	002-2200	1
4	Female Coupler	002-2204A	1	8	Jiffy Clip	008-9010	3

Parts Breakdown for Pump Manifold
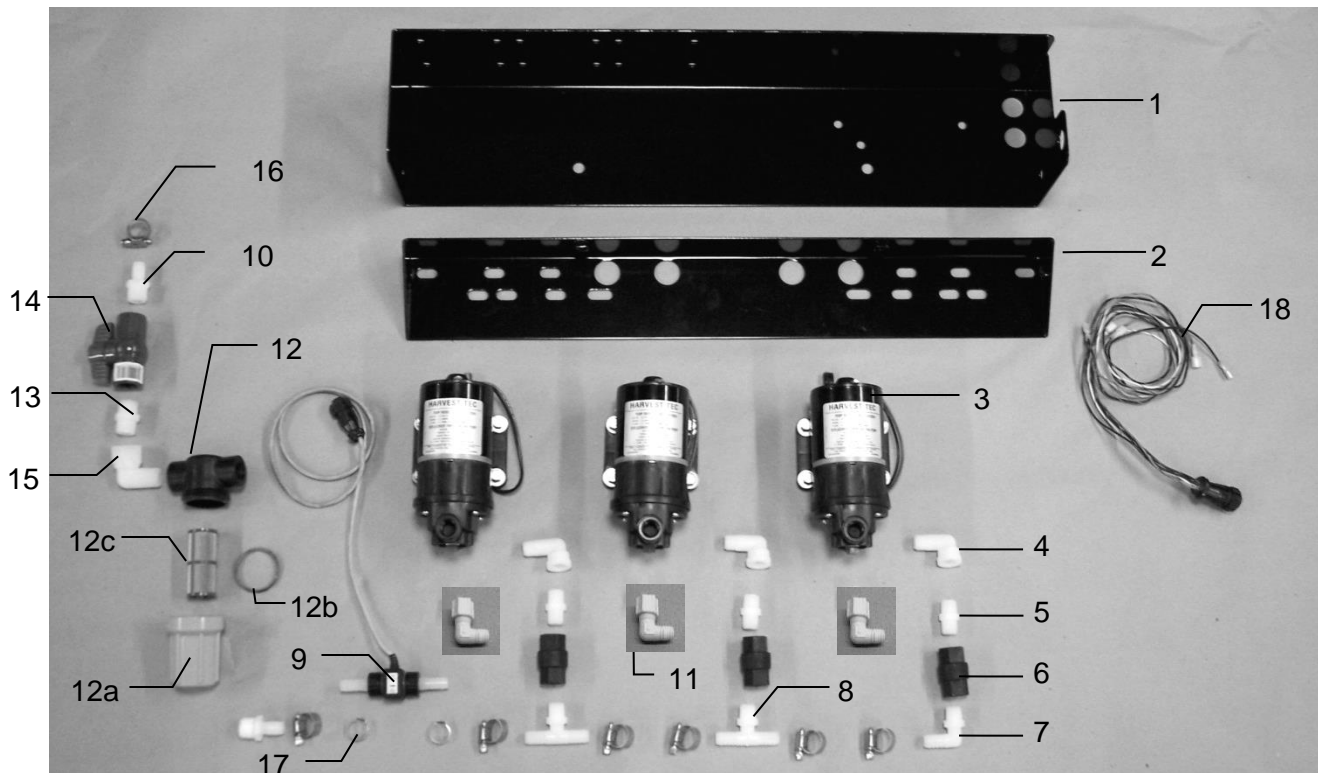
Ref#	Description	Part#	Qty
1	Pump plate	001-4646D	1
2	Mounting Bracket	001-4646C	1
3	Pump	007-4120H	3
4	Street elbow fitting	003-SE38	3
5	Nipple fitting	003-M3838	3
6	Check valve	002-4566F	3
7	Elbow fitting	003-EL3812	1
8	Tee fitting	003-T3812HB	2
9	Flow meter assembly	006-4725A	1
10	Straight fitting	003-A1212	2
11	Elbow fitting	003-JEL1238	3
12	Filter bowl assembly	002-4315-100	1
12a	Filter bowl only	002-4315F	1
12b	Filter bowl gasket	002-4315D	1
12c	Filter bowl screen	002-4315A	1
13	Nipple fitting	003-M1212	2
14	Ball valve	002-2212	1
15	Street elbow fitting	003-SE12	1
16	Hose clamp	003-9003	7
17	Hose clamp (Flow Meter)	003-9005	2
18	Pump Cable	006-4660Z	1
NP	Elbow	003-EL1212	1
NP	Pump rebuild kit (1 per pump)	007-4581	1

Moisture Pad and Hoses
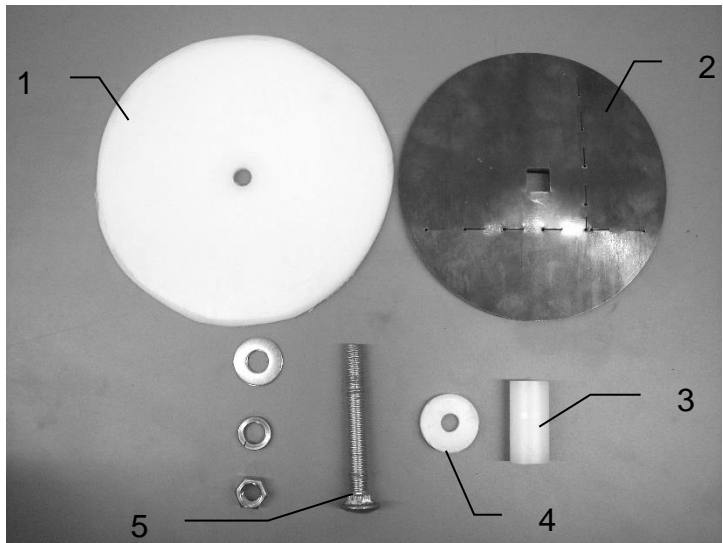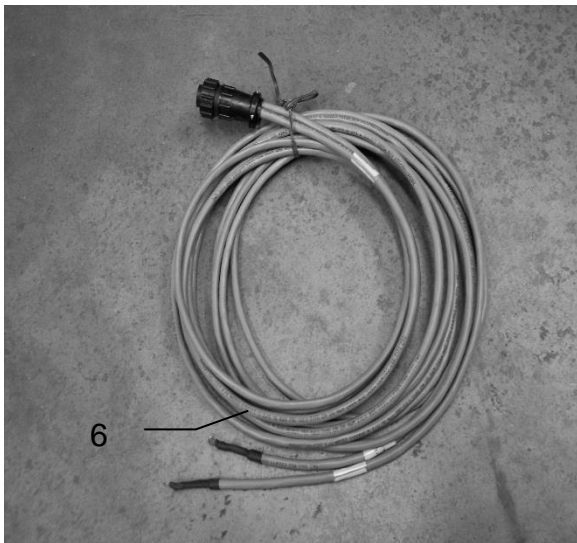
Ref #	Description	Part #	Qty
1	Plastic Pad	006-4641F	2
2	Moisture Disc	006-4641H	2
3	Plastic Bushing	006-4641G	2
4	Plastic Isolator	006-4641I	2
5	1/2X4 1/2" Carriage Bolt	Hardware	2
6	Moisture Cable	006-4640G	1
1-5	Moisture Pad Assembly	030-4643	2

Hose Breakdown
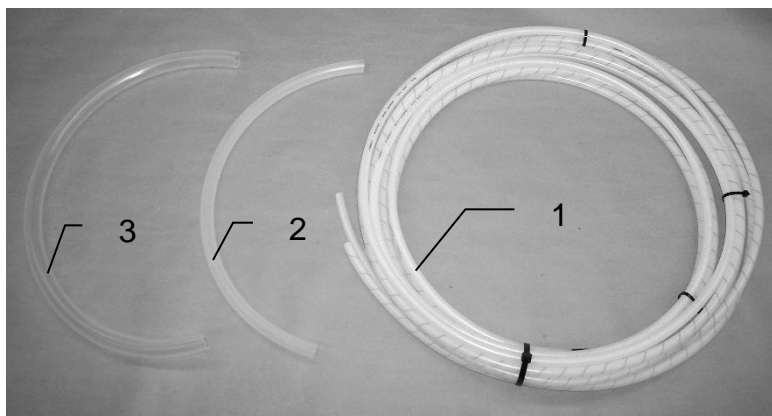
Ref #	Description	Part #	Qty
1	Triple Weld (pumps to tips)	002-9016	15ft
		002-9016B	15ft
		002-9016G	15ft
	Hose assembly	030-9016RB	1
2	1/2 Hose (tank to filter)	002-9001	6ft
3	3/4 Hose Drain Fill Line	002-9002	10ft

30

Parts Breakdown for Control Box and Wiring Harnesses
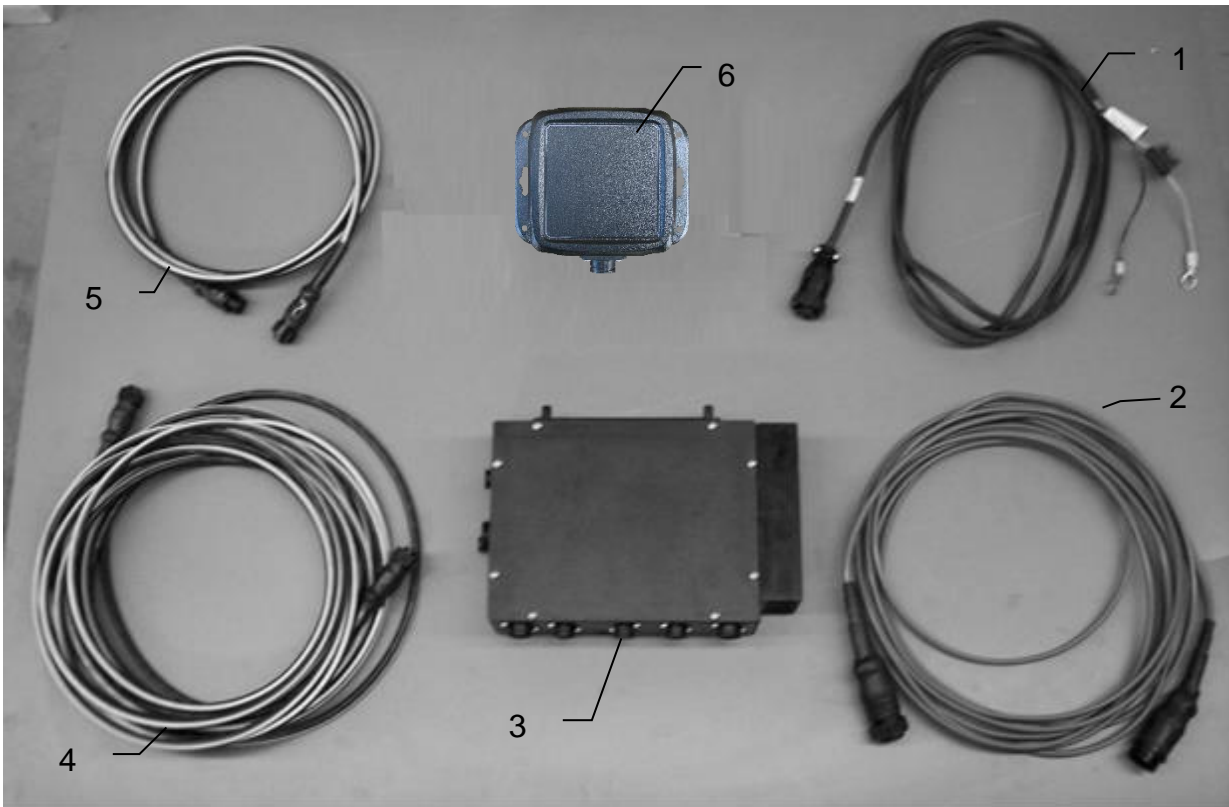
Ref #	Description	Part #	Qty
1	Power lead tractor	006-4640A	1
2	Power lead baler	006-4660R	1
3	Baler mounted processor	006-4671RB	1
4	Communication harness (baler)	006-4660S	1
5	Communication harness (tractor)	006-4660N	1
6	400 Series Bluetooth Receiver	030-4672A	1
NP	Optional Touch Screen Display	006-4670	

Optional iPad Mini Mounting Kit
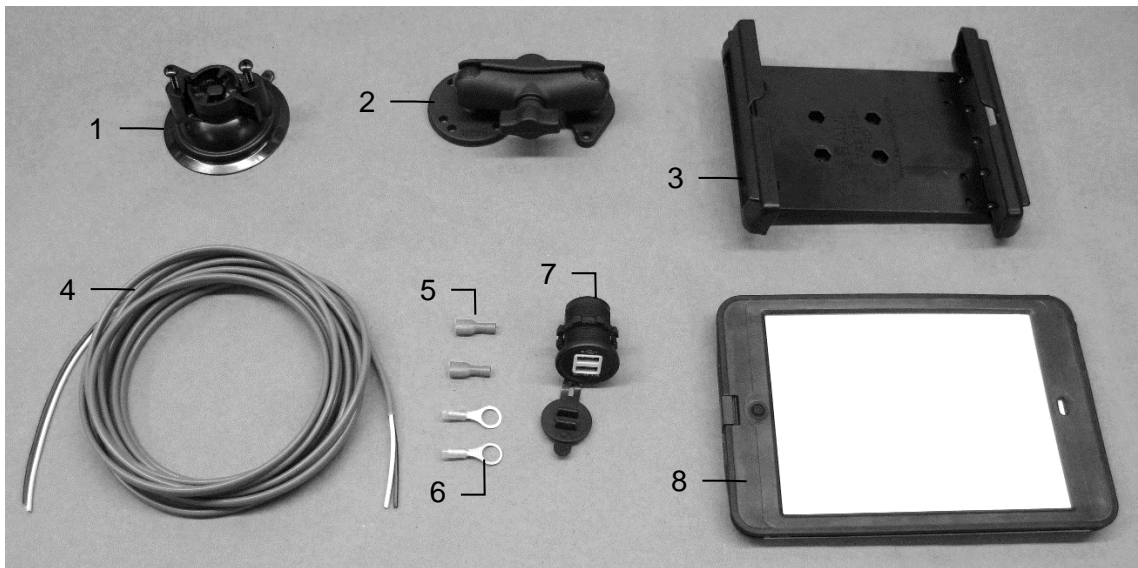
Ref	Description	Part #	Qty
1	Suction cup mount	001-2012SCM	1
2	Ram mount	001-2012H	1
3	iPad Mini spring load cradle (Mini 1,2,3)	001-2012SLC	1
4	16 gauge power wire	Hardware	1
5	Female spade connector	Hardware	2
6	Eye loop connector	Hardware	2
7	iPad Mini Charger 12V	001-2012P	1
8	iPad Mini 2 case	001-2012C2	1
NP	4 amp fuse	Hardware	1
	Mounting Kit Assembly	030-2012MK (Includes All Parts)	

Installation Instructions

1. Identify 12V power source for wires to connect.
   a. Eye loops included if wiring directly to the battery is desired.
   b. Test for key power source if preferred to have power to the USB shut off with the key.
2. Once power source is identified, cut wires to desired length.
3. Crimp the two supplied quick connectors onto each the white and black wire.
4. Remove the round locking plastic nut from USB plug before connecting the wires. Black (+) White (-).
5. The wires will then be hooked to the designated terminals on the bottom of the USB plug
6. Drill a 1 1/8" hole in the preferred mounting location. Be sure to clean any sharp edges after drilling.
7. Feed the wires through the mounting hole.
8. If using the round plastic nut to secure plug in place, slide the nut back over the wiring before connecting the wires to powered source.
9. Connect the wires to the identified power source if easier to do so before tightening the plug into place.
10. Tighten plug using either the round plastic nut or mounting plate and two screws, both options supplied.
11. Once connected, hook a USB charging cord into the plug and connect a mobile device/tablet to ensure the plug is operating as you wish (key power working properly if necessary).

NOTE: This plug is not designed to charge two iPads. System damage could occur if this is attempted. System will charge a mobile phone and iPad simultaneously without problem.

Model 447U Installation Kit
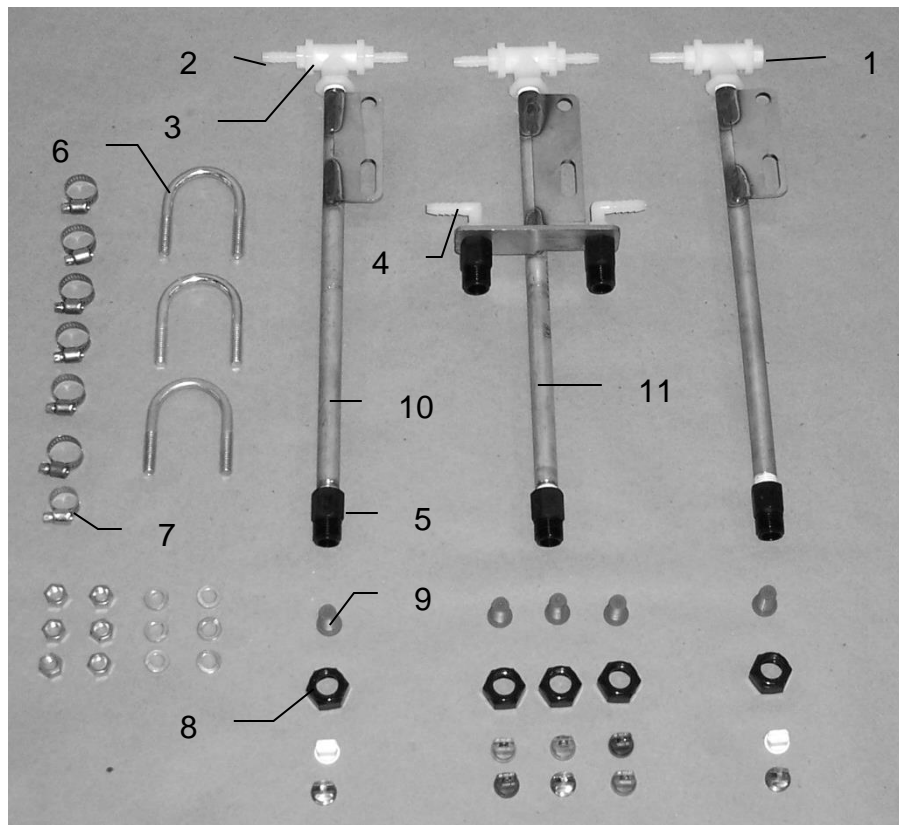
Ref #	Description	Part#	Qty	Description	Part #	Qty
1	Plug	003-F14	1	Tip–Low – Silver	004-650033-SS	3
2	Straight fitting	003-A1414	5	Tip–Low – Green	004-XR110015VS	1
3	Tee	003-TT14	3	Tip–Low – Red	004-XR11004VS	1
4	Elbow	003-EL1414	2	Tip–High – White	004-650050-PT	2
5	Nozzle body	004-4721	5	Tip–High – Orange	004-XR11001VS	1
6	U bolt	001-4714UBS	3	Tip–High – Blue	004-XR11003VS	1
7	Hose clamp	003-9002	7	Tip–High – Grey	004-XR11006VS	1
8	Nozzle cap	004-4723	5			
9	Tip strainer w/check	004-4213-200	5			
10	Nozzle tube	001-4714	2			
11	Nozzle tube auto	001-4714A	1			

Notes:

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.

Note: The warranty registration card supplied with the installation manual must be filled out and returned to the manufacturer within fifteen days of purchase. Without record of receipt of warranty registration at the manufacturer, the warranty is not valid.

Revised 6/22

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Email: info@harvesttec.com