

Operation Manual

Model 447C ***55 gallon Preservative Applicators***



*Equipment and Products
for Quality Hay.™*

P.O. Box 63 • 2821 Harvey Street • Hudson, WI 54016
800-635-7468 • www.harvesttec.com

(intentionally blank)

Harvest Tec 447C Operations Table of Contents

	Page
Introduction	4
Model reference	4
Safety	4
Safety Decal Definitions	5
Safety Decal Locations	6
Preparing the Applicator for Operation	6-7
Filling the Tank	6
Operation of the Main Ball Valve	7
Connecting the Power Harness	7
Description of Screens and Menus	8
Screen Menus	9-12
Automatic Mode	9
Manual Mode	10
Setup Mode	11
Diagnostics	12
Job Records	12
First Time and Annual Startup Instructions	13
Check and Prime the Pumps	13
Setting Up the System for Initial Use	14
Application Rate	14
Selecting between high and low output tips	14
Baling Rate	15
Operating Instructions	16-19
Automatic Mode	16
Manual Mode	17
Job Records	18
Diagnostics	19
Maintenance	20-22
Maintenance schedule & Diagnostics	20
Filter bowl cleaning	20
Tips & tip screen cleaning	21
Tank lid cleaning	21
Dielectric grease connections	21
Rebuild pumps & Battery Connections	21
Check valves	21
Miscellaneous maintenance	22
Winter Storage	22
Common Questions	23
Troubleshooting	24-25
Backup Fuse	25
Wiring Diagram	26
Pin Outs	27-28
Parts breakdowns	29-33
Tank and Saddle	29
Drain Fill Kit	29
Pump Manifold	30
Moisture Sensor Discs and Hoses	31
Control Box and Wiring Harnesses	32
Baler Specific Installation Kit	33
Selecting Tips-Reference Guide	34
Warranty statement	35

Introduction

Thank you for purchasing a Harvest Tec Model 447C Hay Preservative Applicator System. This 447C applicator is designed to apply a buffered propionic acid on to the forage crop as it is being baled. The 447C applicator will adjust the rate of preservative applied based on the moisture the system detects and the rate at which the crop is being harvested. This manual will take you through the steps of operation of the applicator and also point out safety precautions to take while using the applicator. Please read this manual carefully to learn how to operate the equipment correctly. Failure to do so can result in personal injury or equipment malfunction. If you are unsure about operating the system after consulting this manual, contact your local authorized dealership for additional assistance. If you are in need of parts for the system please see your 447C Installation Manual and contact your local authorized dealer to order the parts. This applicator is designed to apply Harvest Tec buffered propionic acid.

Right and Left sides are determined by facing in the direction of forward travel.

Model Reference Chart

Baler make	Baler Model	Model	Installation kit	Tank size
Roll Belt Round Baler	RBX & RB series 4' and 5' Wide	447C	447C	55 gallon

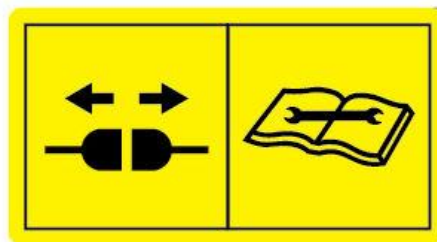
Safety

Carefully read all the safety decal images and descriptions in this manual and on the applicator before use. Keep decals clean and in clear view. Replace missing or damaged safety decals. Replacement decals are available from your local authorized dealer. See your installation manual listed under the replacement parts section for the correct part numbers.

Keep your applicator in proper working condition. Unauthorized modifications to the applicator may impair the function and/or safety of the machine.

Carefully read and understand all of the baler safety decals before installing or servicing the baler. Always use the supplied safety equipment on the baler to service the applicator.

Safety Decal Definitions



Number 1
Spraying hazard. Disconnect power before servicing the applicator
Part no. DCL-8003



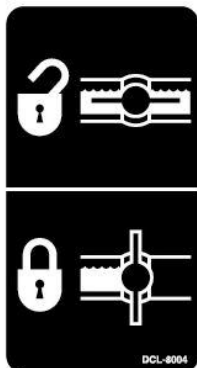
Number 2
Falling hazard. Do not step in this area.
Part no. DCL-8002



Number 3
Use caution when working around chemicals. **Wear all protective equipment according to the label of the product.**
Part no. DCL-8001



Number 4
Read and understand the operator's manual before using or working around the equipment.
Part no. DCL-8000



Number 5
Open (unlocked) and closed (locked) position of the ball valve.
Part no. DCL-8004

Safety Decal Locations

Model 447C

Preparing the Applicator for Operation

After the Applicator has been installed on the baler, follow the below steps to prepare for operating the applicator both safely and correctly.

Filling the Tank

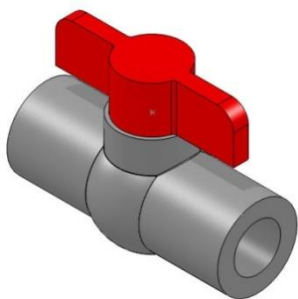
Read the label of the product being filled into the tank to determine what individual protective measures need to be taken. Locate the drain/fill line on the baler. Open the cam-couplers (A) and remove the protective plug (B). Insert the male coupler (found on transfer pump) into the female cam and close the cams (A). To open the ball valve (C) turn the handle so it is vertical. After the ball valve has been turned on switch the pump to the On position. Monitor the level on the tank visually and shut off the pump before over filling. Once the pump is turned off, close the ball valve and remove the male coupler. The handle of the ball valve (C) will be horizontal when closed. Reinstall the protective plug and close the cams. The Harvest Tec model 9212 transfer pump is recommended for this process.

Water is recommended for first time and annual start up procedures.

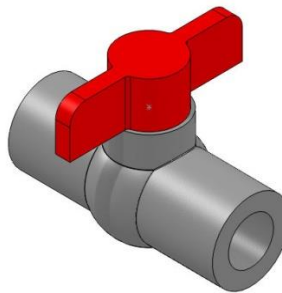


Operation of the Main Ball Valve

The ball valve should be closed at all times when the applicator is not being used. The valve should also be closed when any service work is being done to the baler or applicator.



Valve open



Valve closed

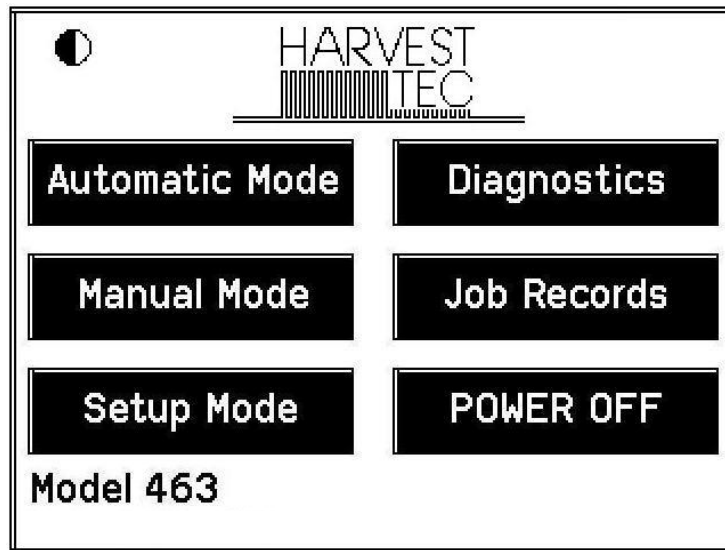
Connecting the Power Harness

The power harness that supplies power from the tractor battery to the applicator pump has a disconnect at the hitch. Connect the two together for operation. Always disconnect before servicing the applicator or baler.

WARNING: Stop tractor engine and shift to park or neutral, set brakes and remove key before leaving the tractor.

Description of Screens & Menus of the Harvest Tec Monitor

This system is calibrated for use with Harvest Tec buffered propionic acid. It is designed to apply rates of 32 to 632 pounds of product per hour and read moisture levels of 10 to 32 percent. The 463 monitor will allow you to set your bale weight, single bale formation time, moisture levels and application rates. The Automatic Mode will automatically adjust the application rates as the moisture levels change. Manual Mode will allow you to control the application rates on the go. To turn the display on touch anywhere on the right side of the screen followed by pushing the "Press to Start" key.



AUTOMATIC MODE: This mode allows you to use all of the applicators 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 and application rate settings and view or change tip selection.

DIAGNOSTICS: Allows operator to automatically check performance and output of pumps as well as set the date and time.

JOB RECORDS: Keeps track of up to 63 jobs with total product used, average moisture content, tons baled, and date of baling.

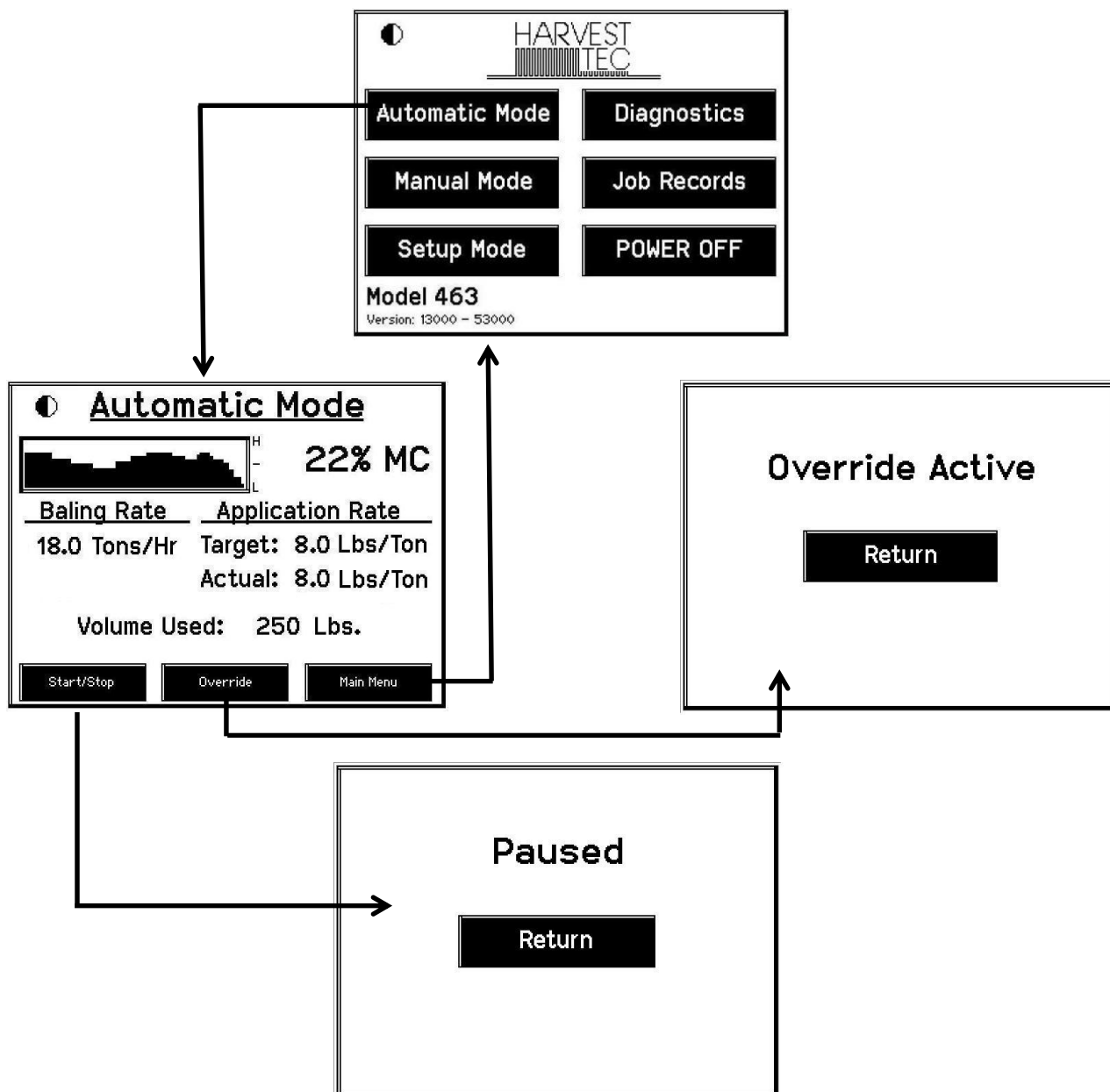
POWER OFF: This key turns the unit off. Press anywhere on the right side of the screen to turn the unit on.

 **CONTRAST:** This button is your contrast control. Press this button to lighten the screen. When the screen reaches its lightest point, pressing again will return to the darkest setting. Fine tuning the contrast can be accomplished by turning the knob on the bottom right side of the enclosure.

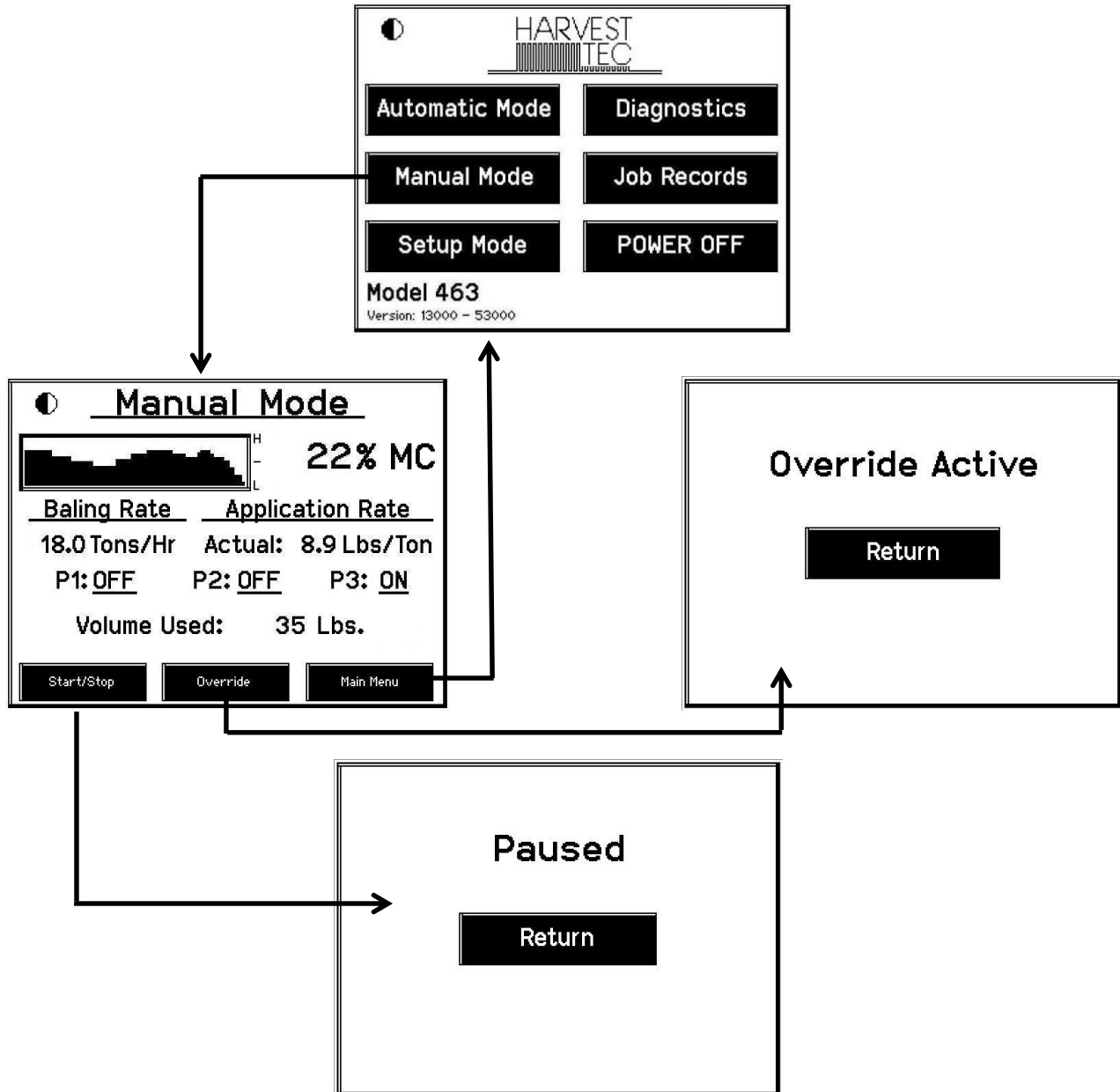
Screen Menus

Use the below listed screen menus to navigate through all of the operation screens.

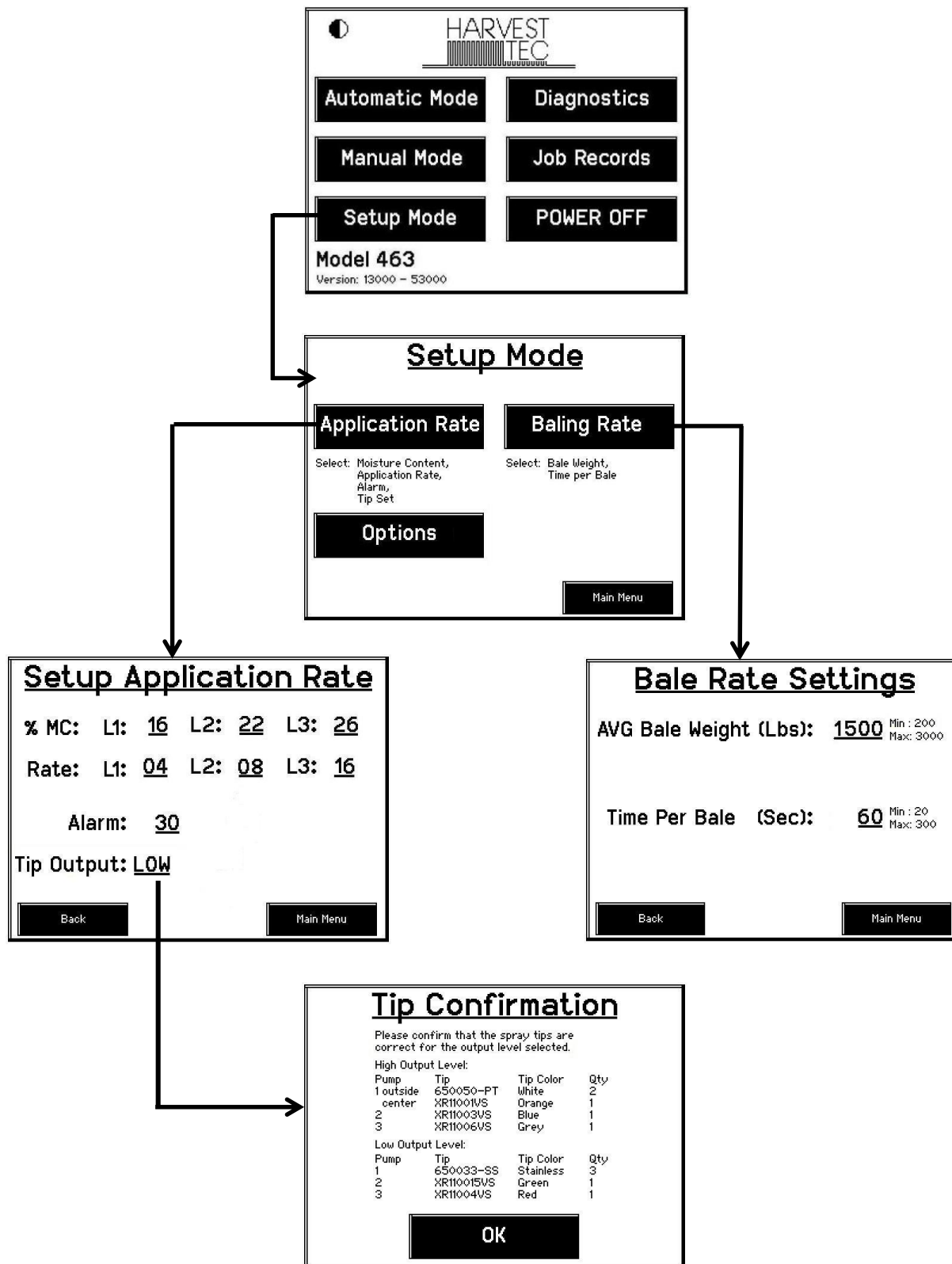
Automatic Mode:



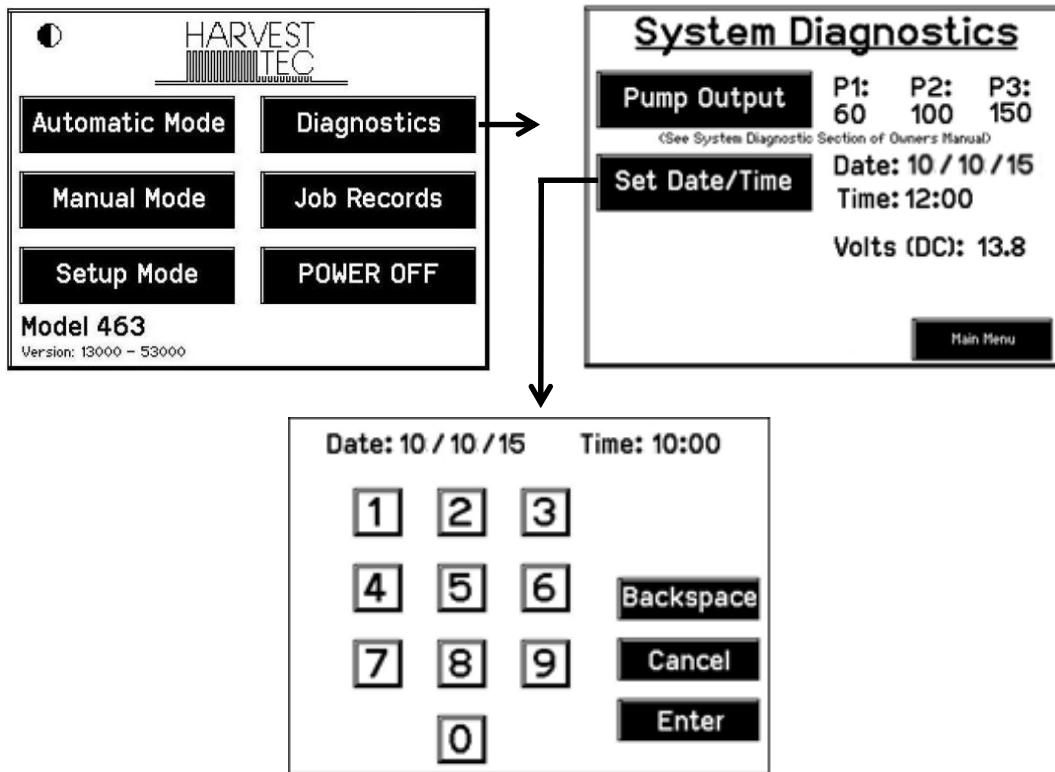
Manual Mode:



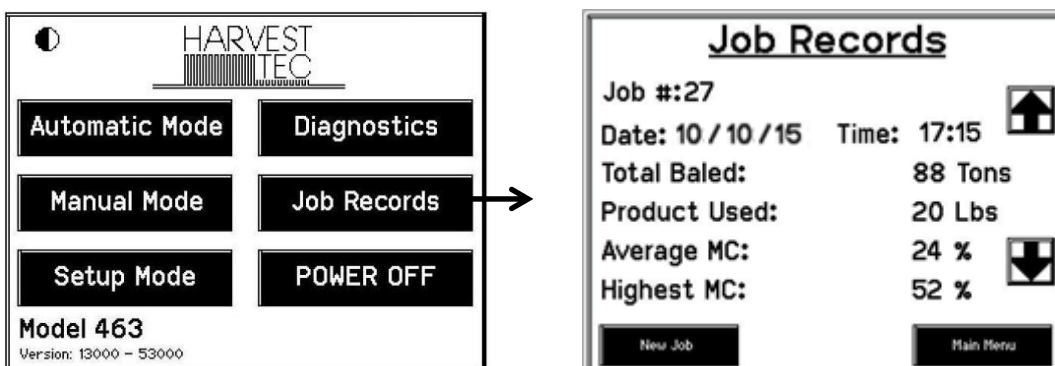
Setup Mode:



Diagnostics:



Job Records:

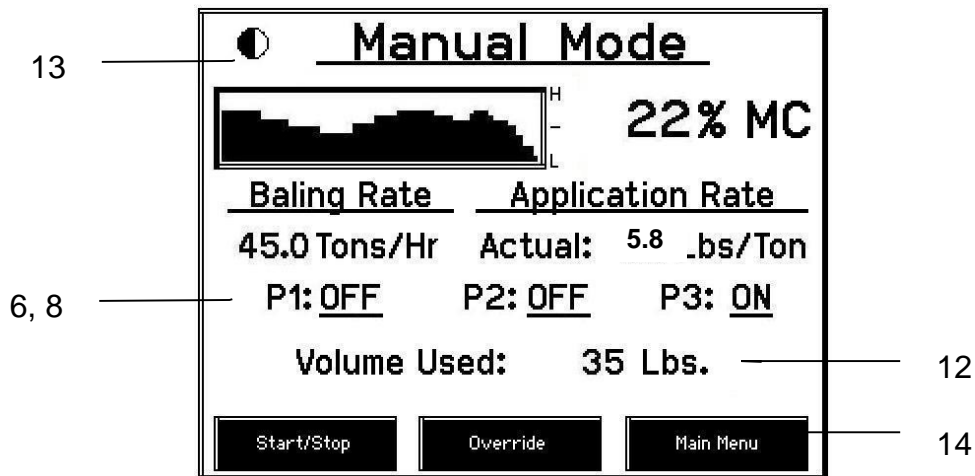


First Time and Annual Startup Instructions

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** (push anywhere on the right side of screen followed by the press to start key).
4. Press the MANUAL MODE key.
5. The screen shown below should appear.



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.

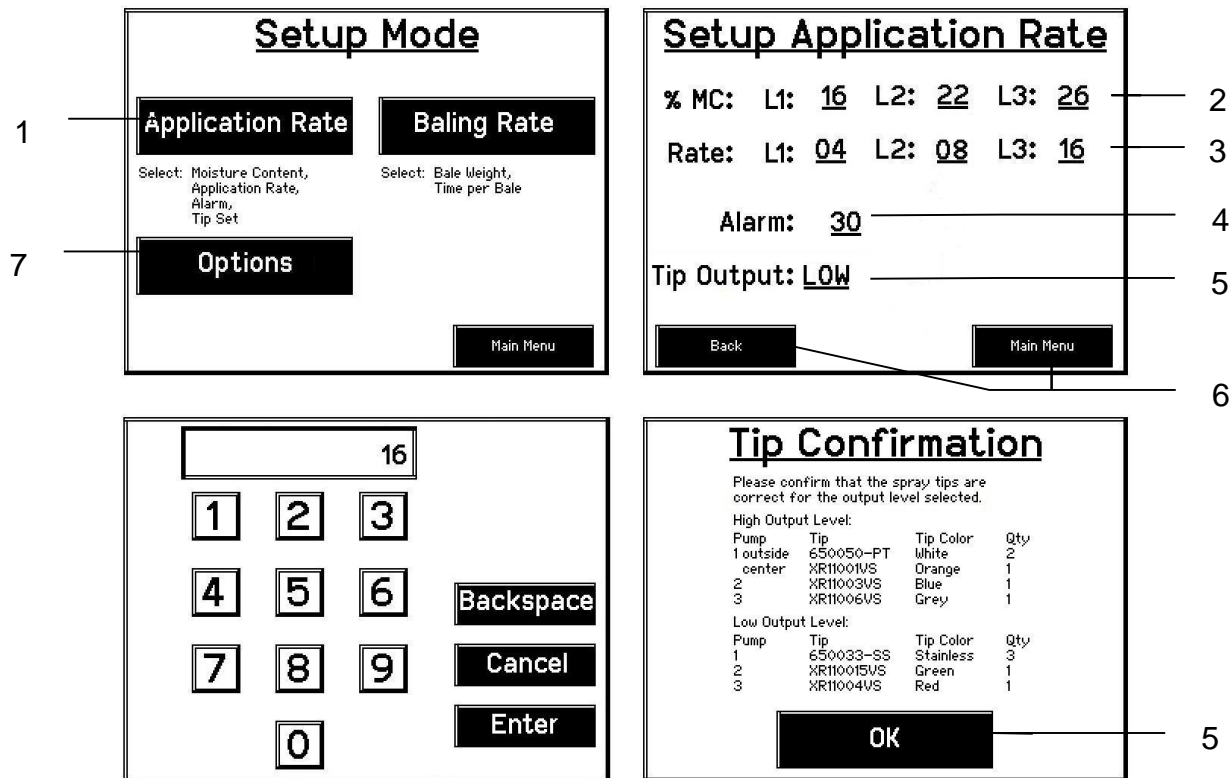
6. **With low tips in:** Turn pump 1 on (P1). To do this press the underlined area on the screen which says OFF. The application rate should then read between 0.7 – 1.2 Lbs/Ton. Ideally, at 13.5 volts, the rate would read 1.0 Lbs/Ton.
7. Repeat the process for pumps 2 and 3 (P2 and P3). The application rate should read between 1.7 – 2.4 Lbs/Ton and 2.5 – 3.5 Lbs/Ton respectively. Ideally, at 13.5 volts, the rate for pump 2 would be 2.0 Lbs/Ton and pump 3 would be 3.0 Lbs/Ton.
8. **With high tips in:** Turn pump 1 on (P1). To do this press the underlined area on the screen which says OFF. The application rate should then read between 1.3 – 1.9 Lbs/Ton. Ideally, at 13.5 volts, the rate would read 1.6 Lbs/Ton.
9. Repeat the process for pumps 2 and 3 (P2 and P3). The application rate should read between 2.6 – 3.6 Lbs/Ton and 4.9 – 6.8 Lbs/Ton respectively. Ideally, at 13.5 volts, the rate for pump 2 would be 3.1 Lbs/Ton and pump 3 would be 5.8 Lbs/Ton.
10. This process will also be used to prime the pumps whenever needed.
11. While running pumps check for a good spray pattern out of the respective tips and verify that no parts of the system are leaking.
12. While doing these tests the Volume Used on the bottom of the screen should be counting up, this verifies that the flow meter is functioning.
13. This button is your contrast control. Press this button to darken the screen. When the screen reaches its darkest point, when the button is next depressed it will return to lightest setting.
14. Press the MAIN MENU key to return to the initial startup screen.

Setting Up the System for Initial Use

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

Application Rate

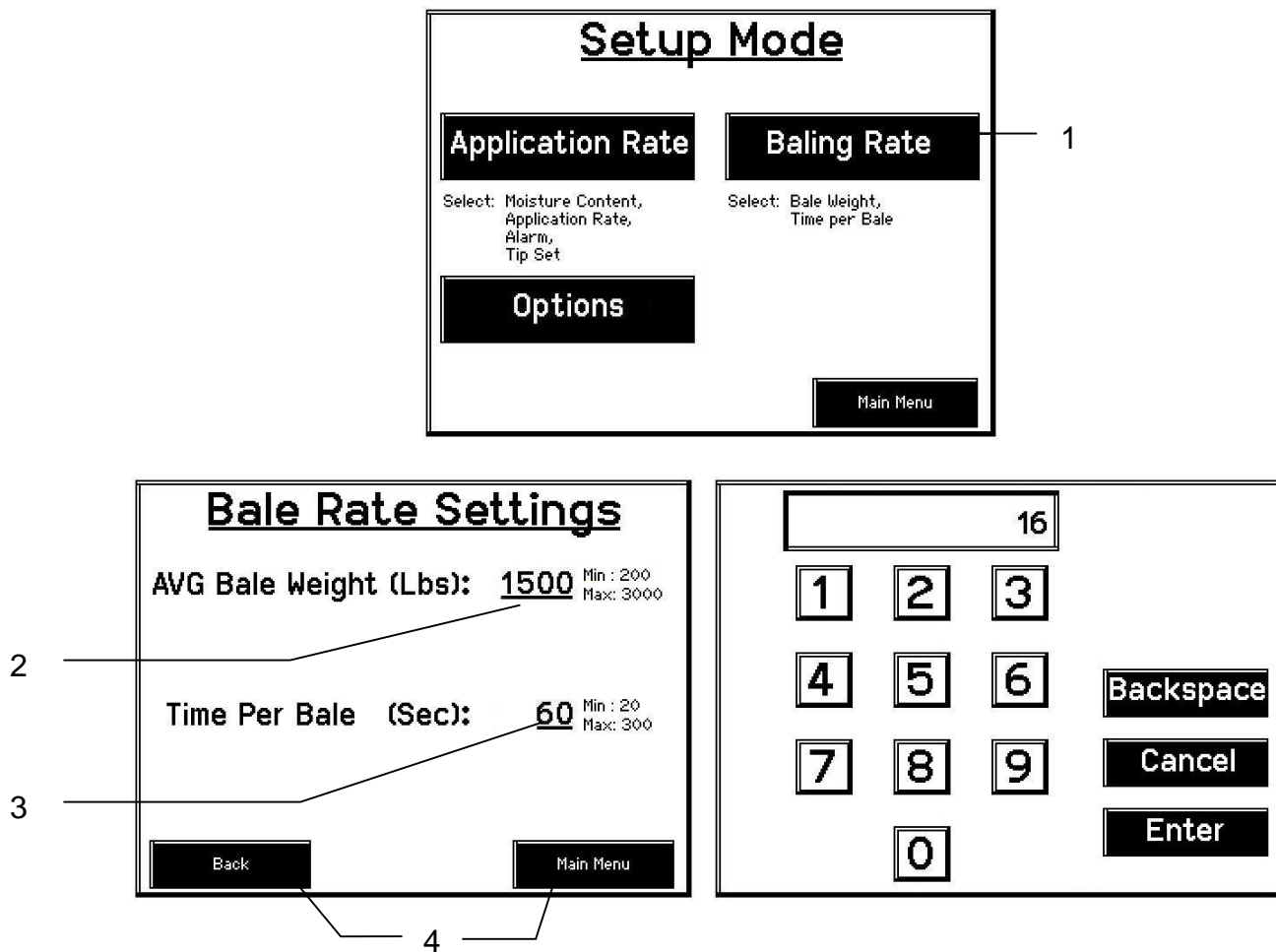
After pushing the SETUP MODE key in the Main Menu screen, the top left screen should appear:



1. On this screen the operator will press the APPLICATION RATE key. Once pressed the SETUP APPLICATION RATE screen will be shown. (Top right picture)
2. Press any of the underlined numbers to the right of %MC to adjust their figures. The key 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. Harvest Tec products recommend set points of 16,22, and 26 % MC levels. These are preset from the factory. Press ENTER to return to previous screen.
3. To change rate of chemical application, press any of the underlined numbers to the right of RATE: The key 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. Harvest Tec products recommend rates of 4,8, and 16 lbs/ton. These rates are preset from the factory. Press ENTER 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 on the underlined area and set the level at which you want the alarm to activate. To turn the alarm off, set level above 35.
5. Press the underlined area next to Tip Output to **cycle between the high and low sets of tips**. The high tips will cover outputs of 84 to 632 lbs/hr or approximately 21-40 tons/hour. The low tips will cover outputs of 32 to 440 lbs/hr or approximately 8-27 tons/hour. Use the correct tip set for the field conditions. Please refer to the Selecting Tips-Reference Guide in the back of this manual.
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.

Baling Rate Settings

After pushing the SETUP MODE key in the Main Menu screen, the top screen will appear:



1. On this screen the operator will press the BALING RATE key. This screen is shown on the bottom left side picture shown above.
2. Press the underlined number to the right of AVG Bale Weight (Lbs): to adjust the weight of your bales. The key pad shown on the right side will display. Press any number combination in this screen within the min/max limits. Press the ENTER key to save this information. The information will remain until it is changed again.
3. Press the underlined number to the right of Time Per Bale (Sec): to adjust the time it takes to make a bale. The key pad shown on the right side will display. Press any number combination in this screen within the min/max limits. Press the ENTER key to save this information. The information will remain until it is changed again.
4. Next 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 on the bottom right hand of the screen to return to the opening screen.

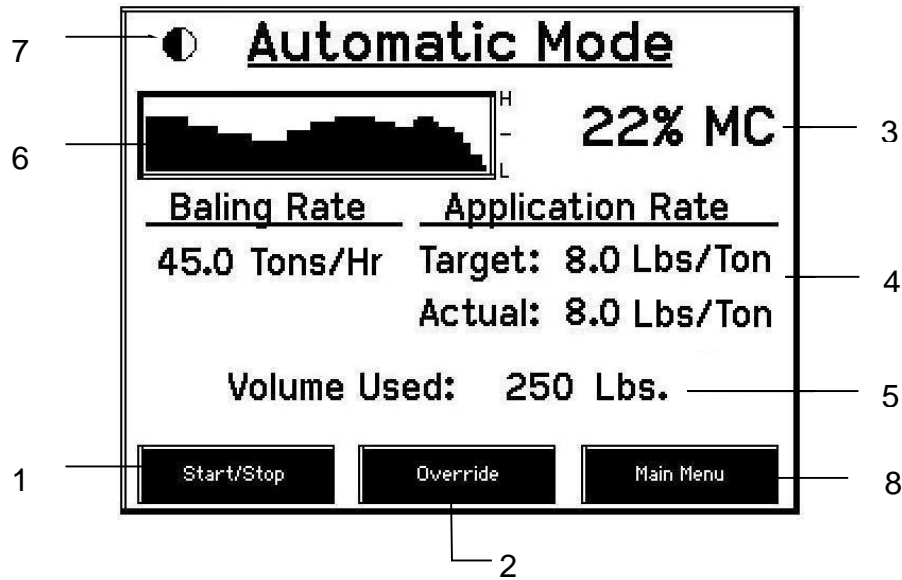
Operation Instructions

Auto mode will automatically apply product based on hay moisture content sensed by the moisture discs 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 content.

Automatic Mode

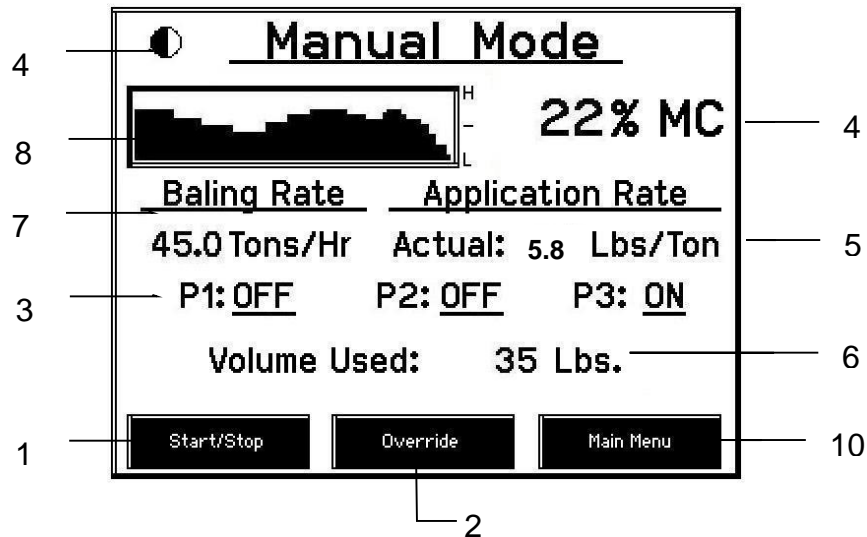
After pushing the AUTOMATIC MODE key in the Main Menu screen, the following screen should appear:



1. Push the START/STOP key to pause the unit while in operation.
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. The operator sets the target application rate in the setup mode; the actual rate should be within +/- one pound when running. The baling rate is also set in Setup Mode.
5. Volume used shown at the bottom of the screen will show accumulated pounds (liters) 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. This button is your contrast control. Press this button to darken the screen. When the screen reaches its darkest point, when the button is next depressed it will return to lightest setting.
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:



1. Push the START/STOP key to pause the system while in operation.
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. In Manual Mode you can turn the pumps on or off by pressing the underlined area next to the pump numbers. In Manual Mode (regardless of moisture, baling rate or bale weight) the outputs of the pumps are fixed rates as follows:

Low output tips:

Pump 1 = 45 LBS/HR
Pump 2 = 90 LBS/HR
Pump 3 = 135 LBS/HR

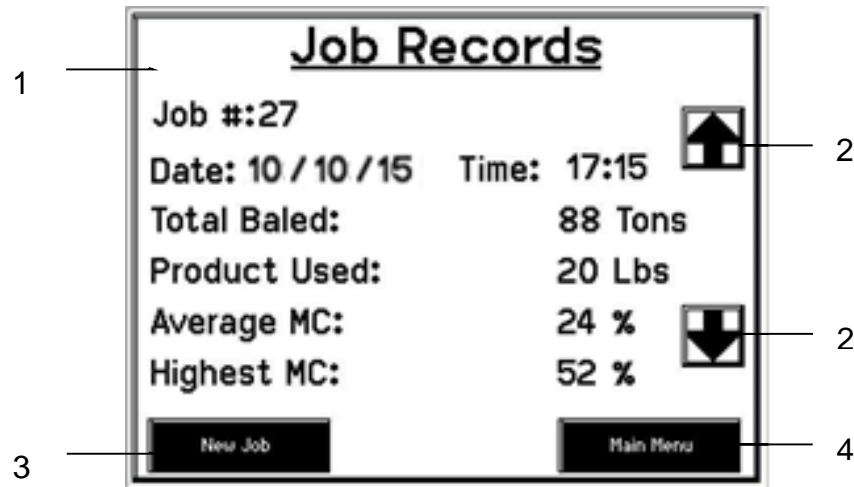
High output tips:

Pump 1 = 75 LBS/HR
Pump 2 = 140 LBS/HR
Pump 3 = 265 LBS/HR

4. The moisture content is shown in the upper right hand corner.
5. Baling rate and Application rate are shown in the middle. 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 high output tips in and are running pump three, by itself, your output is 265 lbs/hr. Given the baling rate shown on the above screen of 45.0 tons/hr, the application rate should be about 5.8 lbs/ton (265 lbs/hr divided by 45.0 tons/hr).
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 for operation.** (See JOB RECORDS screen)
7. The baling rate is set in the SETUP MODE menu.
8. This graph shows the moisture trend from the last 90 seconds of baling (one reading every 3 seconds).
9. This button is your contrast control. Press this button to darken the screen. When the screen reaches its darkest point, when the button is next depressed it will return to lightest setting.
10. Press the MAIN MENU key to return to the opening screen.

Job Records

After pushing the JOB RECORDS key in the Main Menu screen, the following screen will appear:

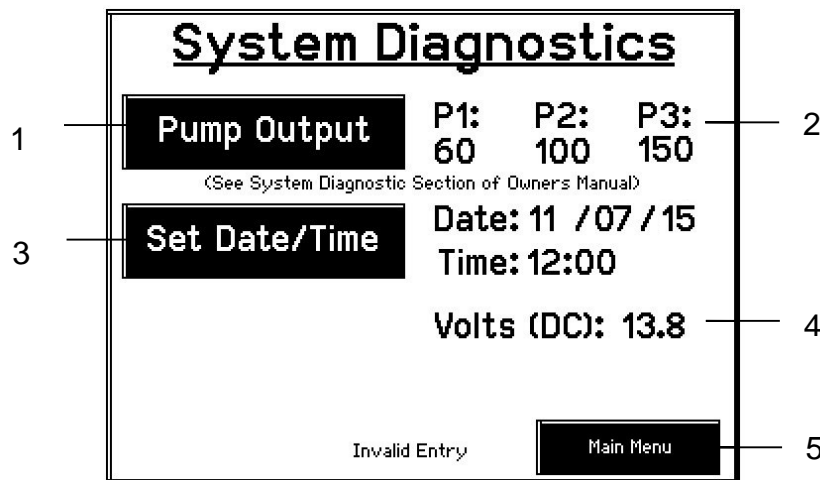


1. The job number will be displayed in the top left corner and will move to the next job when the NEW JOB key is pressed. The current job being viewed will always read "Job #: 0". Product used and average moisture content will be reset when the NEW JOB key is pressed. The job records screen will store up to 63 jobs and will allow you to access previous jobs by using the up and down arrows found on the right side of the screen.
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.

Diagnostics

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



The diagnostic mode will automatically check the pump output and performance of the three pumps. It is recommended to use this mode daily to ensure proper system performance.

Acceptable ranges for output:

Low output tips:

Pump 1 = 38 - 53 LBS/HR
Pump 2 = 76 - 105 LBS/HR
Pump 3 = 115 - 160 LBS/HR

High output tips:

Pump 1 = 64 - 88 LBS/HR
Pump 2 = 119 - 165 LBS/HR
Pump 3 = 225 - 312 LBS/HR

1. Once the screen is displayed, press the PUMP OUTPUTS key.
The machine will cycle all three of the pumps for 15 seconds. After the cycles are complete, the system will display a number next to each pump number.
2. **If the system displays within the listed range.**
 - A. The system is operating correctly.**If the system displays higher than the listed range, some common problems could be:**
 - A. Leak in line. Inspect lines thoroughly.
 - B. Tip missing. Check for lost or broken tip on spray shield.
 - C. Tip worn. Replace tip.
 - D. High tractor voltage.**If the system displays lower than the listed range, some common problems could be:**
 - A. Make sure there is preservative in the tank and ball valve is in the open position.
 - B. Air in lines. Pump will not prime. Check for leak in lines, or defective check valve.
 - C. Pump is working, but not producing desired output. Pump needs to be rebuilt.
 - D. Main filter plugged. Check filter by tank and clean if necessary.
 - E. Tip or tip screen plugged. Check both tip and tip screen and clean if necessary.
 - F. Kink in hose. Straighten or replace hose.
 - G. Voltage from tractor is low. Check power cord with multimeter for 12 volts at baler mounted processor. Clean connections on battery. Dielectric grease connections at baler mounted processor and at hitch connection.
 - H. Pump is defective. Rebuild pump if motor runs smoothly. Replace pump if motor is bad.
 - I. Defective flow meter. Only if all pumps run, product is applied, and all numbers read 0.
3. To set date and time, press the SET DATE/TIME key. In the next screen enter the date (month, day, year format) followed by the time. When done press the ENTER key. NOTE: The clock uses military (or 24 hour) time.
4. The voltage should be between 12.0 to 14.5 volts for the system to work properly. If voltage is not in this range check all power cord connections and the tractors charging system.
5. When done in this mode, press the MAIN MENU key.

Maintenance

- If you are unsure how to perform any of the maintenance steps have your local authorized dealer perform the tasks.

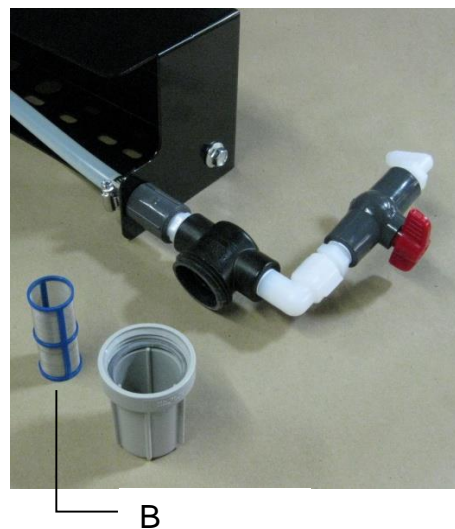
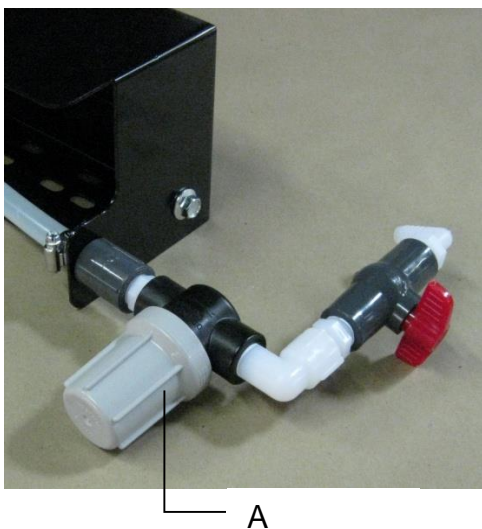
Maintenance Schedule

	Daily	10 hrs	400 hrs	Weekly	Monthly	Season
Diagnostics	X					X
Filter bowl cleaning		X				X
Tips & tip screen cleaning		X				X
Tank lid cleaning		X				X
Dielectric grease connections					X	X
Rebuild pumps			X			
Battery connections				X		X
Check valves			X			
Visually inspect hoses				X		X

Diagnostics: Follow the instructions in this manual to run the Diagnostics mode.

Filter bowl cleaning: The filter bowl is located in front of the applicators tank and is connected to the ball valve. Before cleaning the filter bowl all personal protective equipment must be worn (Face shield or goggles, chemically resistant apron, boots, and gloves).

Verify that the ball valve located next to the pump is turned off. Locate the filter bowl on the side of the pump manifold (A). Unscrew the bottom section of the filter bowl and remove the strainer. (B) Clean off any debris and soak in warm water with a mild soap if necessary. Once the screen is clean reinstall by following the directions in reverse.

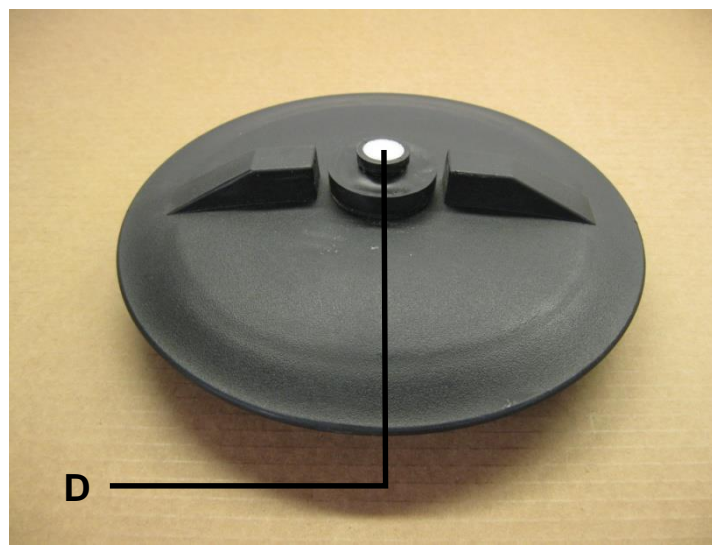


Tips and Tip Screen Cleaning: Before cleaning the tips and screens all personal protective equipment must be worn (Face shield or goggles, chemically resistant apron, boots, and gloves).

Verify that the ball valve located next to the pump is turned off. Disconnect spray shield from hangers if possible or remove tips in place. Remove the tip, and screen. Some models may require a wrench to remove. Clean off any debris and soak tip and screen in warm water with a mild soap if necessary. Once the tips and screens are cleaned reinstall by following the directions in reverse.

Tank Lid Cleaning: Before cleaning the tank lid all personal protective equipment must be worn (Face shield or goggles, chemically resistant apron, boots, and gloves).

The tank lid is located on the top of the tank. Use the supplied handle on the tank to secure your person and use the other hand to remove any debris from the top of the tank. Unscrew the tank lid and bring down ground level. Use compressed air clean out the tank screen (D). If the screen cannot be thoroughly cleaned with compressed air, replace fitting (005-9022B3). Once the screen is cleaned reinstall the cover.



Dielectric Grease Connections: Disconnect all harnesses on the applicator, clean the connections, and repack with dielectric grease.

Rebuild Pumps: If Diagnostic or Manual Mode show that the pumps are running lower than normal, a pump rebuild may be necessary. To rebuild the pump, it must be removed from the pump manifold. The Pump Rebuild Kit is part no. 007-4581. A service pack that includes pump rebuild components and check valves is available through your local dealer.

Verify that the ball valve is turned off. Before working around the pumps all personal protective equipment must be worn. Face shield or goggles, chemically resistant apron, boots, and gloves. Remove pump from manifold. Follow rebuild instructions supplied with pump rebuild kit. Reinstall after rebuild is complete.

Battery Connections: Follow the batteries safety warnings and clean the battery connections. If the connections cannot be cleaned, replace harness.

Check Valves: Before servicing the check valves all personal protective equipment must be worn. Face shield or goggles, chemically resistant apron, boots, and gloves.

Verify the ball valve is turned off before service the check valves. Replace the intake check valves by the pumps (002-4566F) and the discharge check valves by the tip (004-1207VB).

Miscellaneous Maintenance

1. 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 preservative product is being used, flushing is not necessary.
2. Although the pump can run dry, extended operation of a dry pump will increase wear. Watch the preservative level in the tank.
3. If you are using bacterial inoculants, flush your system daily after every use.

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 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, if the pump is frozen, turn off the power immediately to avoid burning the motor out or blowing a fuse. The pump head can be disassembled and freed or rebuilt in most cases. Check the fuses after the pump has been freed.
7. Disconnect power from the Baler Mounted Processor.
8. Remove display from tractor and store in a warm, dry place.

Common Questions

1. How do I turn the system on/off?

To turn the system ON simply press anywhere on the right side of the screen followed by pressing the “Press to Start” key. To turn the system OFF, return to the Main Menu screen and press the POWER OFF key.

2. How to get in the LBS/TON, MC%, and TONS/HR screens?

In the Main Menu press the SETUP MODE key. From this screen you can change your application rates and how much product is applied. See SETTING UP FOR INITIAL USE for a detailed explanation of this process.

3. The unit is stuck in the Application Rate screen.

In the Application Rate 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. The pumps will remain at full output until the operator turns these pumps off by pressing the OVERRIDE key again.

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 product is actually being applied. The set points then will need to be adjusted if you want to attain a different flow meter reading.

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

The selections 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, go to the Diagnostics screen and run pump outputs.

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 moisture disc connection. One of the first places to check is build up around the moisture discs and for grounding between the disc and the bale chamber. Also, check all moisture disc wires and connectors to see if there is a continuity or grounding problem.

8. Should the battery connections be removed before jump starting or charging a battery?

Yes. Anytime the tractor will have voltage going up rapidly the connections should be removed.

Troubleshooting

Problem	Possible cause(s)	Solution(s)
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 is determined to be 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 not develop enough output.	1. Air leaks or clogs on inlet side of pump.	1. Tighten or clean filter bowl assembly.
	2. Pump worn or dirty.	2. Rebuild pump.
Moisture reading errors (high or low)	1. Wire disconnected or bad connection between moisture discs and baler mounted processor.	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	3. Wait to bale when hay has dried to a lower moisture level.
	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 12V - 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 COMPRESSED AIR.
	4. Using product other than Harvest Tec.	4. Catch and weigh product to check outputs.

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 volts.	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. Short in cable.	1. Replace cable.
Display will not power up.	1. Display connector plug and bale rate sensors plug are switched on the Baler Mounted Processor. 2. Short in display cable.	1. Switch plugs. 2. Replace cable.
Display is too dark or light	1. Change in temperature or light conditions.	1. Use the monitors contrast control.
	2. Display and BMP not communicating.	2. Disconnect 12 volt power cable at hitch. DO NOT DISCONNECT DISPLAY CABLE. Wait 5 minutes and reconnect.
Display says waiting for BMP	1. Display and BMP not communicating.	1. Disconnect 12 volt power cable at hitch. DO NOT DISCONNECT DISPLAY CABLE. Wait 5 minutes and reconnect.

Backup Fuse

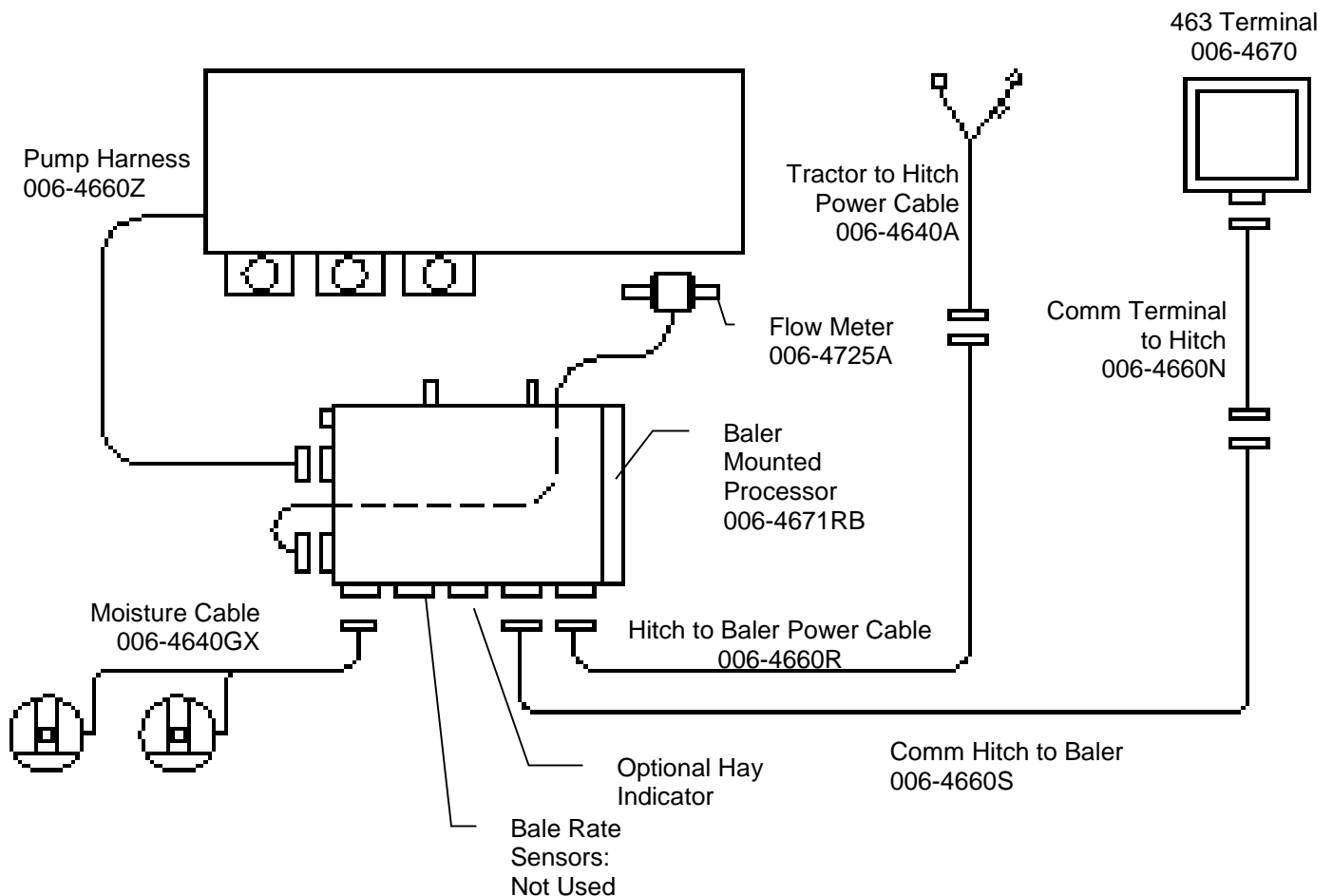
The Model 463 is equipped with a backup system if your display is not functioning. This function is intended for use only as a temporary means for application and not as a way to apply preservative over multiple fields or for a lengthy amount of time. The baler mounted processor has a location for a 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 an 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

Wiring Diagram

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 Flow Meter (006-4725A) to the Baler Mounted Processor.
4. Connect Pump Harness (006-4660Z) to the Baler Mounted Processor.
5. If you have the optional Hay Indicator, connect it to the Baler Mounted Processor.
6. Attach moisture cable (006-4640GX) to Baler Mounted Processor.
7. Install Baler Mounted Processor in pump plate using 5/16" lock, nut and flat washers.

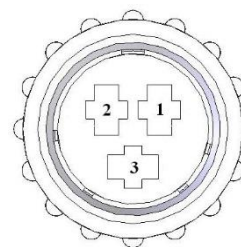
NOTE: The plugs on the Baler Mounted Processor must face down. Failure to mount correctly will void systems warranty.



Pin Outs

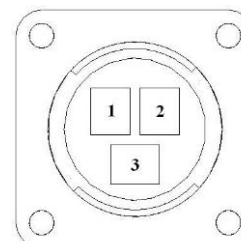
A. Main power connector mounted on battery

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



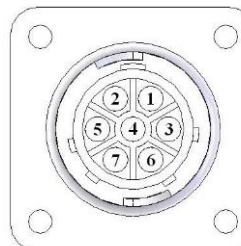
B. Main power connector mounted on BMP

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



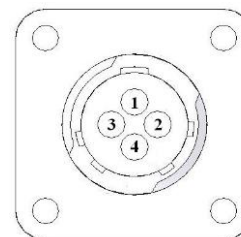
C. Pump connection colors

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

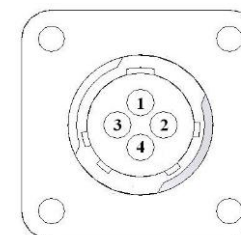
Pin 1	White	5 - 12 V (+) supply
Pin 2	Green	Ground
Pin 3	Brown	Signal
Pin 4	Black	Shield



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	



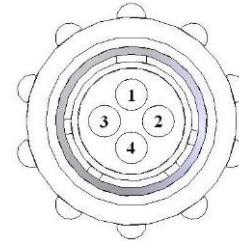
G. Star wheel connector mounted on BMP

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	



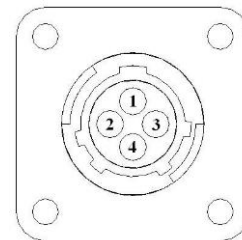
H. Communication harness display to hitch

Pin 1	Red	Power to display
Pin 2	Black	Ground to display
Pin 3	Blue	Comm channel OH
Pin 4	Orange	Comm channel OL

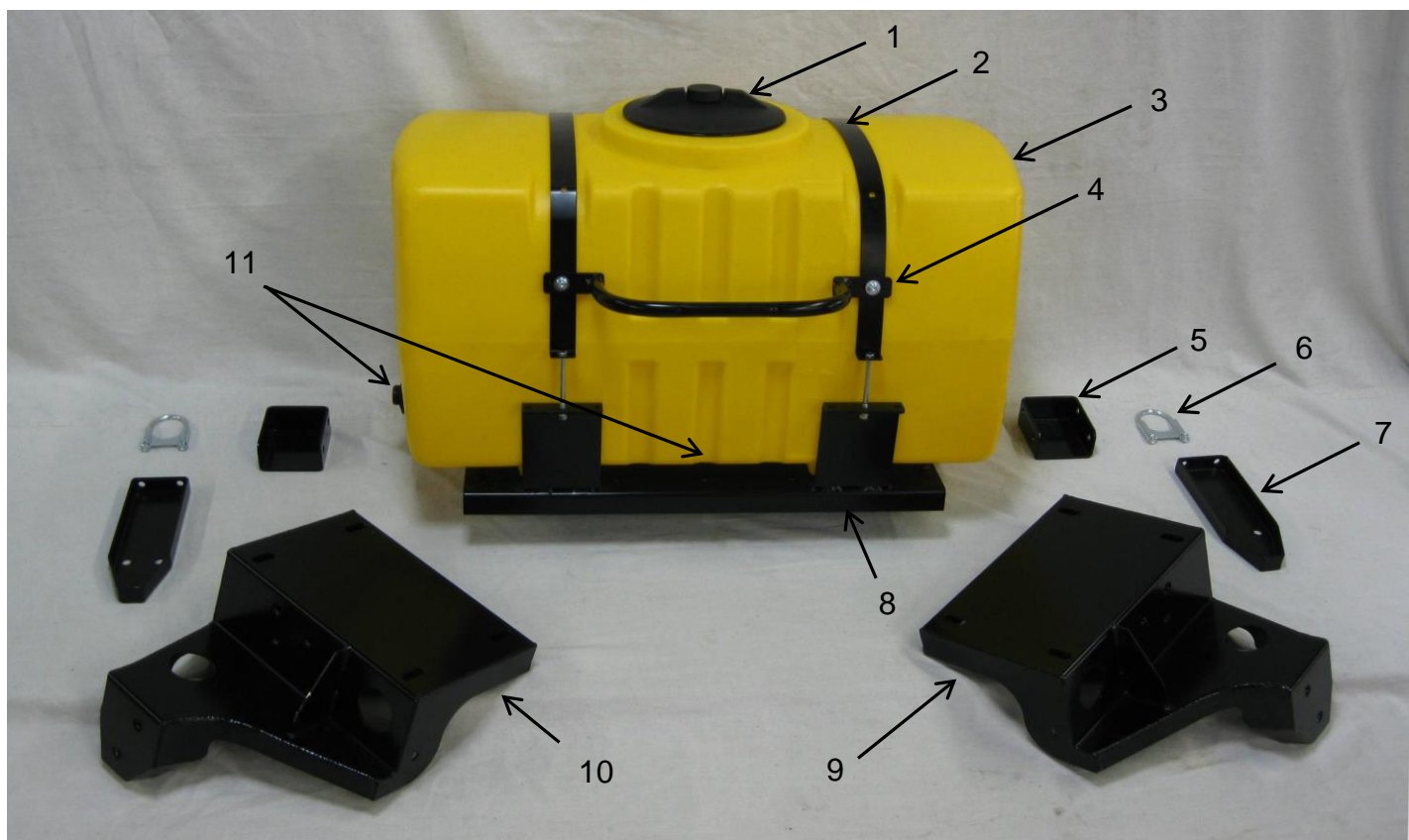


I. Communication harness hitch to baler mounted processor

Pin 1	Red	Power to display
Pin 2	Black	Ground to display
Pin 3	Blue	Comm channel OH
Pin 4	Orange	Comm channel OL



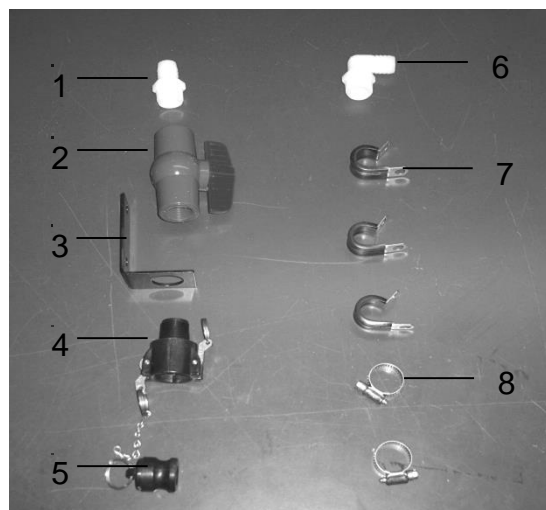
Parts Breakdown for the Tank and Saddle Harvest Tec Model 447C Base Kit



<u>Ref</u>	<u>Description</u>	<u>Part #</u>	<u>Qty</u>	<u>Ref</u>	<u>Description</u>	<u>Part #</u>	<u>Qty</u>
1	55 Gallon tank lid	005-9022H	1	7	Anchor Bracket	001-4703XA	2
2	Strap	001-4402	2	8	Saddle	001-4703X	1
3	Tank	005-9203SQ	1	9	Left Leg	001-4703XL	1
4	Handle	001-6707HRS	1	10	Right Leg	001-4703XR	1
5	Anchor Bracket Ext	001-4703XAX	2	11	Tank fitting	005-9100	2
6	U Clamp	001-4703XAB	2				

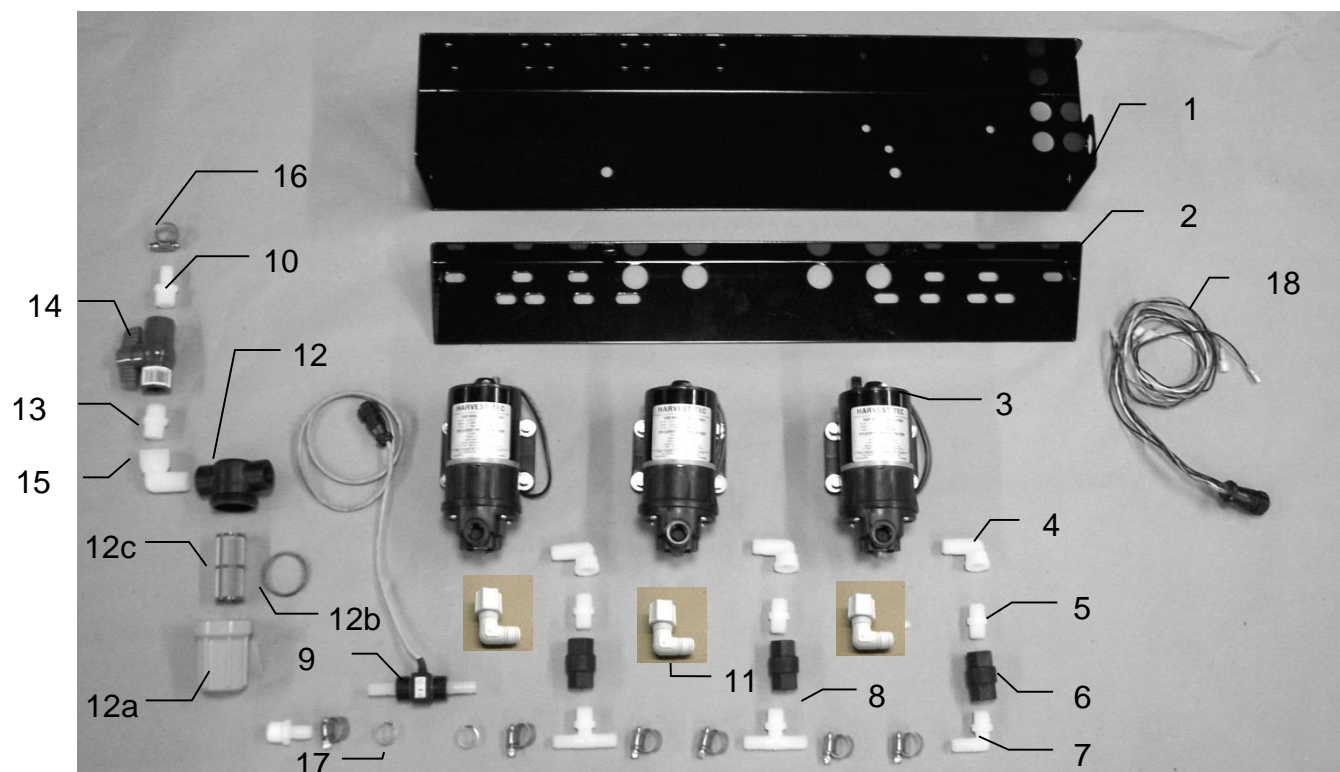
Tank Kit Assembly 030-0447C-TK
(Includes Ref# 1-11)

Parts Breakdown for Drain / Fill Kit



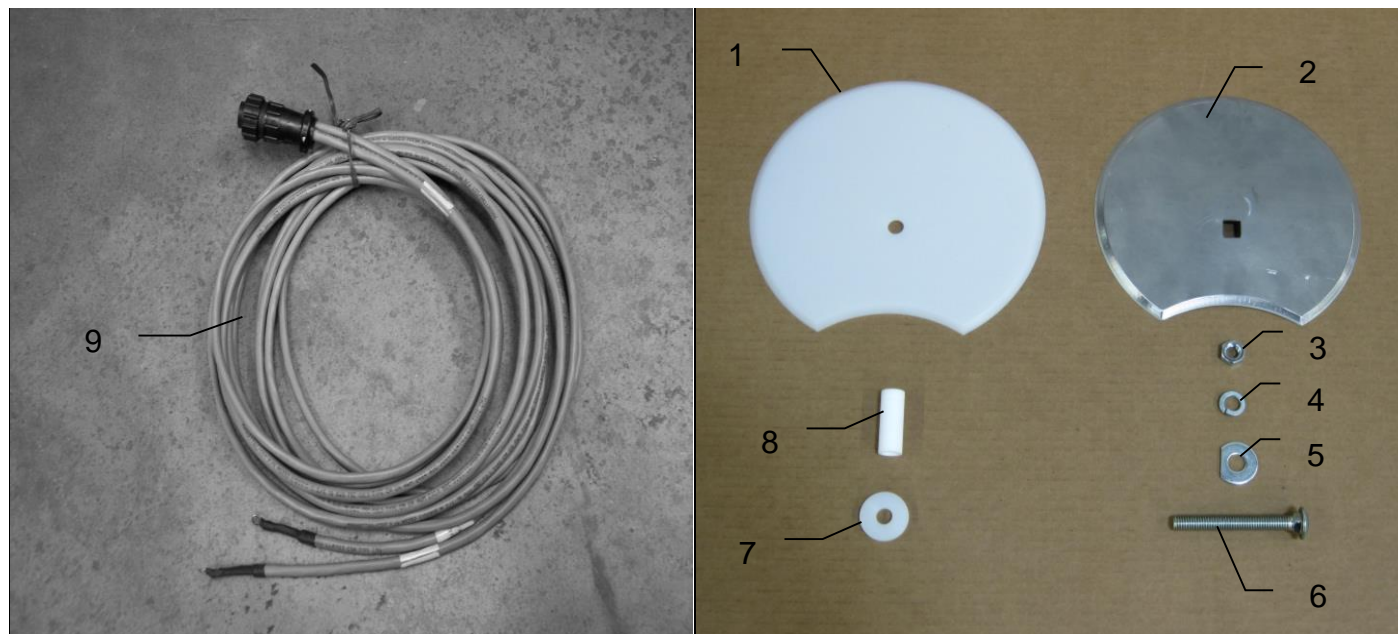
<u>Ref</u>	<u>Description</u>	<u>Part #</u>	<u>Qty</u>
1	Straight Fitting	003-A3434	1
2	Ball valve	002-2200	1
3	Valve Holder	001-6702H	1
4	Female Coupler	002-2204A	1
5	Male Coupler	002-2205G	1
6	Elbow	003-EL3434	1
7	Jiffy Clip	008-9010	3
8	Hose Clamps	003-9004	2
NP	3/4" Hose	002-9002	8ft

Parts Breakdown for Pump Manifold



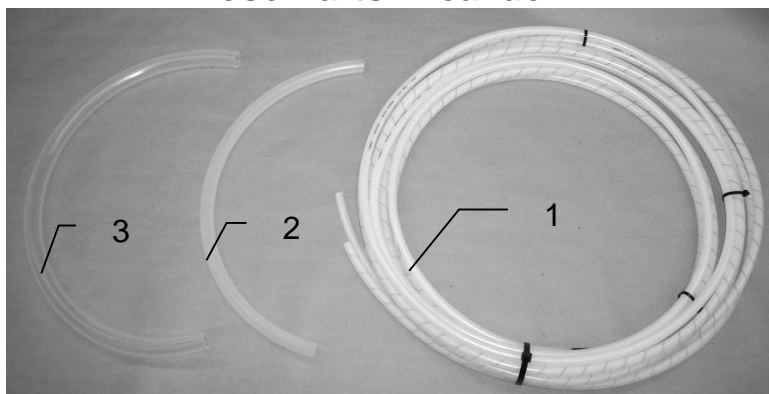
<u>Ref</u>	<u>Description</u>	<u>Part#</u>	<u>Qty</u>
1	Pump plate	001-4646D	1
2	Mounting Bracket	001-4646C	1
3	Pump	007-4120H	3
4	Street elbow fitting	003-SE38	3
5	Nipple fitting	003-M3838	3
6	Check valve	002-4566F	3
7	Elbow fitting	003-EL3812	1
8	Tee fitting	003-T3812HB	2
9	Flow meter assembly	006-4725A	1
10	Straight fitting	003-A1212	2
11	Elbow fitting	003-EL3814	3
12	Filter bowl assembly	002-4315	1
12a	Filter bowl only	002-4315F	1
12b	Filter bowl gasket	002-4315D	1
12c	Filter bowl screen	002-4315B	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	Pump rebuild kit	007-4581	1
	(1 per pump)		
NP	Not Pictured		

Parts Breakdown for Moisture Sensor Discs



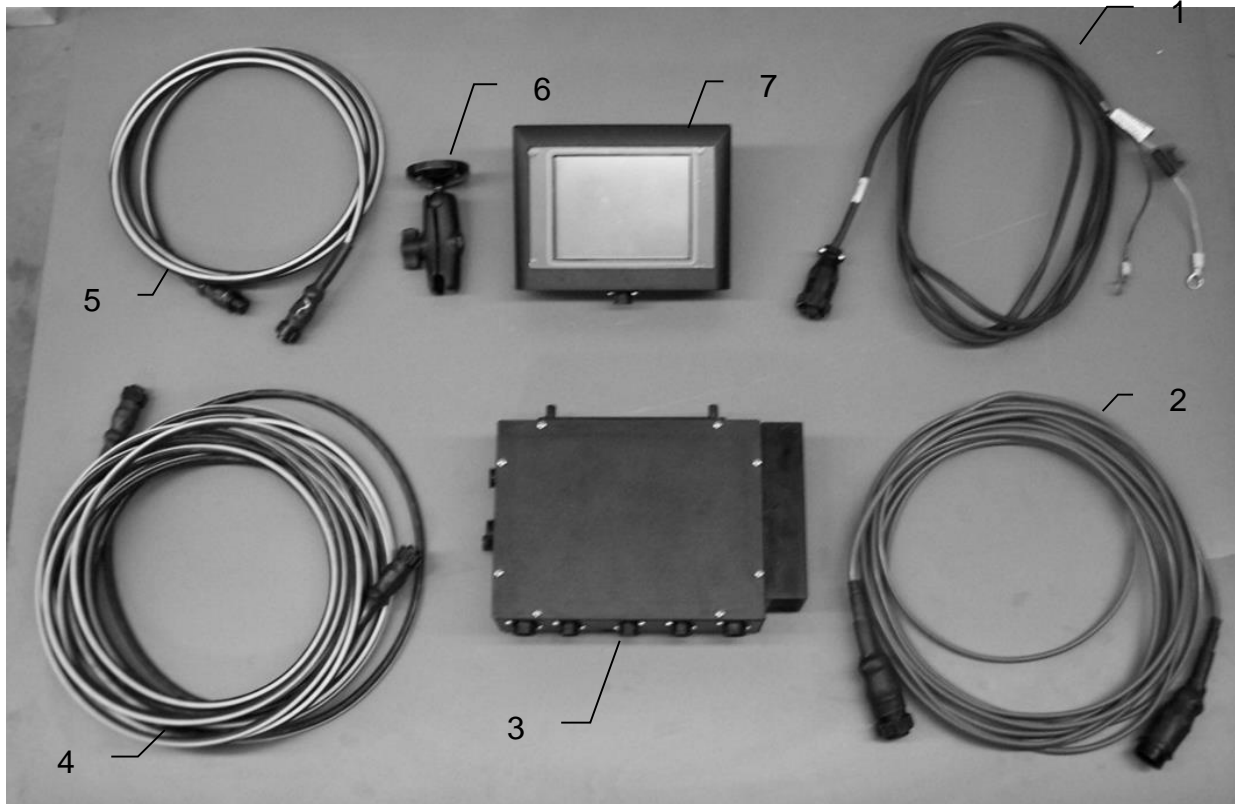
<u>Ref</u>	<u>Description</u>	<u>Part #</u>	<u>Qty</u>
1	CNH RB Moisture Isolator	006-4641FX	2
2	CNH RB Moisture Disk	006-4641HX	2
3	1/2" JAM Nut	Misc Hardware	4
4	1/2" Lock	Misc Hardware	4
5	1/2" D Washer	Misc Hardware	6
6	1/2"x 4" Bolt	Misc Hardware	2
7	Sensor Bushing	006-4641G	2
8	Sensor Isolator	006-4641I	2
9	Moisture Cable	006-4640GX	1
	Moisture Disc Assembly	030-4643C	
	(Includes Ref # 1/8)		

Hose Parts Breakdown



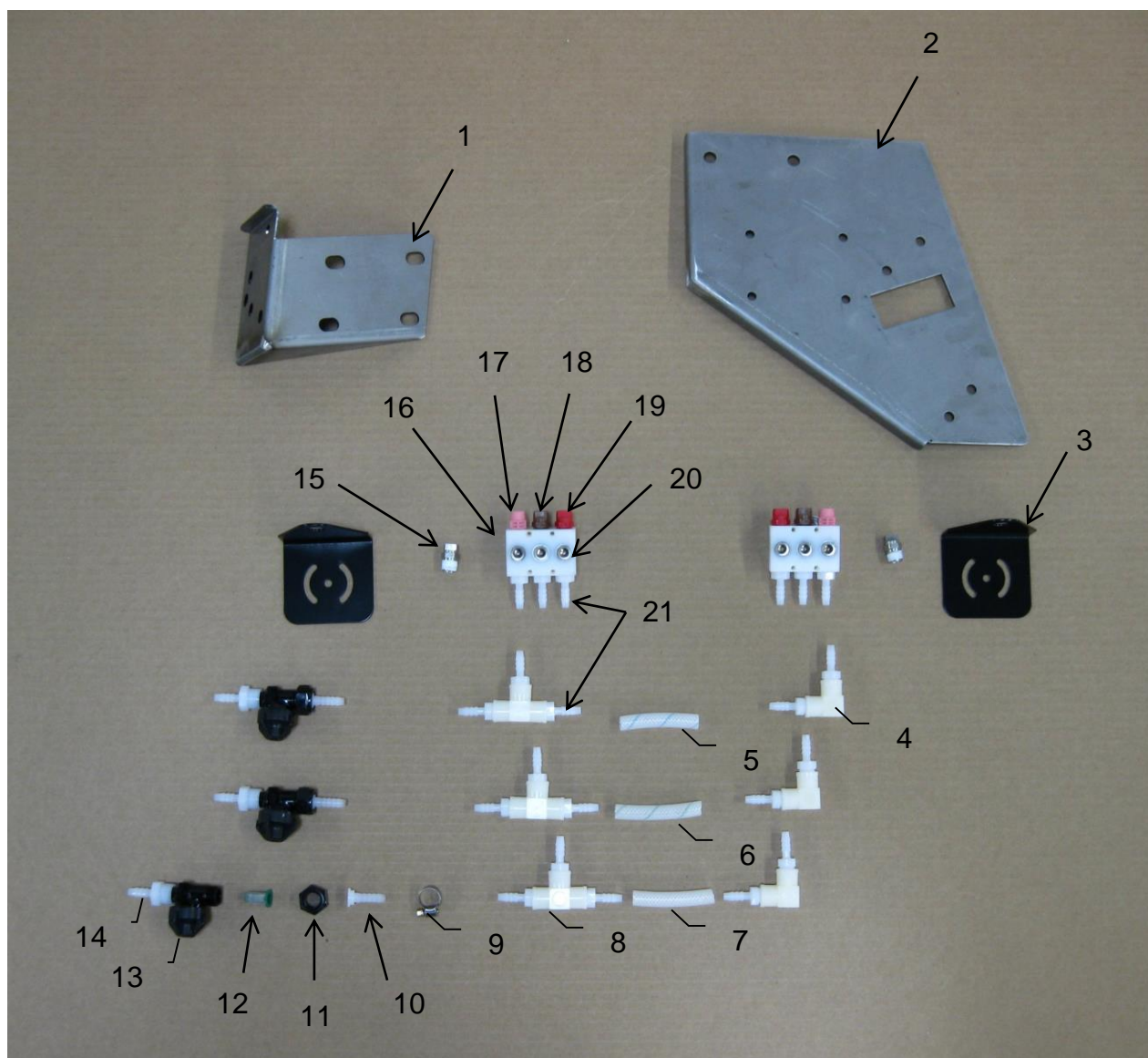
<u>Ref</u>	<u>Description</u>	<u>Part #</u>	<u>Qty</u>
1	Triple Weld (pumps to tips)	002-9016	15ft
		002-9016B	15ft
		002-9016G	15ft
	Hose assembly	030-9016RB	1
2	1/2" Hose (tank to filter)	002-9001	6ft
3	3/4" Hose Drain Fill Line	002-9002	10ft

Parts Breakdown for Control Box and Wiring Harnesses



<u>Ref</u>	<u>Description</u>	<u>Part #</u>	<u>Qty</u>
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	Ram mount	001-2012H	1
7	463 Terminal	006-4670	1

Parts Breakdown for Harvest Tec Model 447C Installation Kit



<u>Ref</u>	<u>Description</u>	<u>Part #</u>	<u>Qty</u>	<u>Ref</u>	<u>Description</u>	<u>Part#</u>	<u>Qty</u>
1	Pump Plate Bracket	001-4703XF	1	15	Tip –Stainless	004-T800067-SS	2
2	Pump/Valve Mount	001-4703XE	1	16	Spray Shield Manifold	001-4435NSB	2
3	Spray Block Holder	001-4703XD	2	17	Tip –pink	004-T8001-PT	2
4	Elbow	003-SE14F	3	18	Tip –brown	004-T80015-PT	2
5	Hose-clear	002-9016	15 ft	19	Tip –red	004-T8003-PT	2
6	Hose-green striped	002-9016G	15 ft	20	Plug Allen SS	003-F14A	6
7	Hose-blue striped	002-9016B	15 ft	21	Fitting	003-A1414	21
8	Tee	003-TT14SQ	3				
9	Hose Clamp	003-9002	27		Shield Only Assembly	030-0447C-SO	
10	Fitting	003-A1414VB	3			(Includes Ref # 3-21)	
11	Nozzle cap	004-4723	3				
12	Tip Strainer	004-1203-100	3				
13	Check Valve	004-1207VB	3				
14	Fitting	003-A1414F	3				

Selecting Tips-Reference Guide

The applicator is sent from the factory with High output tips installed. The tips used are determined by how many ton per hour you are baling. You can see this on either the automatic or manual screen.

1 – 7 Tons of hay per hour

- Too low a level for the system to apply at. Increase baling speed or rake more hay together. System will show over application when at these tonnages.

8 – 27 Tons of hay per hour (32 – 440 lbs of hay preservative per hour)

- Use low output tips
 - For most 4 ft balers
 - Pump 1 = Qty 2 004-T800067-SS 80 degrees Silver
 - Pump 2 = Qty 2 004-T8001-PT 80 Pink
 - Pump 3 = Qty 2 004-T80015-PT 80 Brown

21 – 40 Tons of hay per hour (84 – 632 lbs or hay preservative per hour)

- Use high output tips
 - For most 5 ft balers
 - Pump 1 = Qty 2 004-T8001-PT 80 degrees Pink
 - Pump 2 = Qty 2 004-T80015-PT 80 Brown
 - Pump 3 = Qty 2 004-T8003-PT 80 Red

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 manufacture. 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 purchaser 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.

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.

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 02/01/2012

HARVEST TEC, INC.
P.O. BOX 63
2821 HARVEY STREET
HUDSON, WI 54016 USA
PHONE: 715-386-9100
FAX: 715-381-1792
Email: info@harvesttec.com