Installation Manual

Model 601A, 700, 701

Microwave Moisture Bale Chute System & Pre-Compression Chamber System



DECLARATION OF INCORPORATION

CE

MANUFACTURER:

Harvest Tec Inc. 2821 Harvey St. P.O. Box 63 Hudson, WI 54016, U.S.A.

REPRESENTATIVE ESTABLISHED IN COMMUNITY: Profitable Farming Company Middle Barlington, Roborough Winkleigh, Devon, EX19 8AG ENGLAND

The person above certifies and declares that:

VIRTUAL MACHINE: Equipment mounted on a farm press and for the application of innoculants onto forage crops. MODEL: 601A, 700, 701-17-INST – Imp&Metric BRAND: Harvest Tec PATENT NUMBER: US 9,854,743 B2:

This application preservatives for hay Harvest Tec system meets the Directive 2006/42/EC of the European Parliment and the Council of 17 May 2006 and other applicable European Directives including Directive 2004/108/EC on the Electromagnetic compatability.

The application of preservatives for hay Harvest Tec system will be turned on after being installed on a farm press has been declard in conformity with the Machinery Directive.

Person in the community authorized to provide information on the partly completed machinery and making this statement:

Richard Snell, President, Profitable Farming Company

Signed on May 21, 2011: Middle Barlington, Roborough Winkleigh, Devon, EX19 8AG ENGLAND

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Introduction

Congratulations and thank you for purchasing a Harvest Tec Model 601A, 700, 701 Microwave Moisture kit. Please read this manual carefully to ensure correct steps are taken to attach the system to the baler. This is designed to read moisture through the baler's monitor or Apple iPad. A parts break of the system is located in the back of the manual.

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

System Requirements

The Baler Processor must have Version 3.3 or higher. C1000 monitor must have Version 3.0.1 or higher If equipped with the SBM, the SBM must have Version 4.0 or higher.

*Requirement to run iPad option are 3rd Generation iPad (2012) or newer with iOS8 or greater operating system, plus the Hay App.

Tools Needed:

Standard wrench set Electric drill and bits Side cutter Standard nut driver set Standard socket set Hammer Center punch Plasma cutter Grinding wheel

Microwave Sensor Installation - 601A, 700MWM

Begin by opening the side shields on the baler and go to the right side of the baler so you can see the right side of the pre-compression chamber (PCC). Locate the mounting template in the kit. Removed the bolt (red arrow in figure 1) that attached the linkage that is in the way, and position the linkage out of the way.



Figure 1

Locate the right side sheet of the PCC and locate the two slotted holes along the front edge that attach the stripper band to the PCC side sheet. Align the slots on the template with the slots on the side sheet (figure 2). Clamp the template in place and use a marker or paint pen to mark the location for the eight holes that will need to be drilled, and also mark the rectangular area that will be cut out (figure 3).

Figure 2



Microwave Sensor Installation – Massey Ferguson 2190 & 2290 Baler (left side view)

Align the curved edge of the template with the curved edge of the pre-compression chamber. Align the template so the straight top edge is parallel and 5-1/2" below the edge of the angle bracket. Clamp the template in place to the side of the pre-compression chamber and mark 8 holes and cutout locations. Mirror on opposite side (figure 4).



Microwave Sensor Installation 601A, 700MWM (continued)

In the eight locations indicated by the marks, drill 3/8" (10mm) diameter holes for the mounting bolts. Cut the rectangular area out using a grinder with cutoff wheel, reciprocating saw, or plasma cutter. Final results should look similar to the picture (figure 5). Test the fitment by placing the plastic filler plate (001-2600FP) in the rectangular hole. If the filler plate extrusion does not fully fit in the cutout, modify the cutout until the flanges of the filler plate fit flush against the outside of the PCC (figure 6).

Figure 5



Install eight bolts 5/16"x 1" BHCS from the inside of the pre-compression chamber through the side of the PCC and the plastic filler plate (001-2600FP). Secure the top two bolts and bottom two bolts with 5/16" flanged nuts. Place a mounting bracket over each of the two bolts on the sides of the filler plate and secure with 5/16" flanged nuts (figure 7).

The right hand side mounting brackets (001-2600) should be aligned parallel with the long edges of the filler plate. Locate the sensor that says RX on the gray connector and mount it to the brackets using four 5/16-3/4" bolts and flanged nuts (figure 8). The grey connector should be pointing down toward the ground.

Figure 7



Figure 8

Repeat the procedure on the left side of the PCC for marking the locations, drilling and cutting, and mounting. The sensor labeled TX on the gray connector needs to be mounted on the left hand side with the connector towards the ground.

Microwave Sensor Installation 601A, 700MWM (continued)

Locate the 006-7400 harness (stuffer sensor) and the L-shaped bracket (001-4648SS) from the parts bag. Attach the stuffer sensor to the bracket loosely and locate the shielding on the right hand side of the baler ahead of the stuffer.

Position the stuffer sensor and L-bracket against the outside of the shield so the sensor is positioned within 3/8" (10mm) of the stuffer (figure 9). Mark mounting hole location and attach bracket to the shielding using at least one of the 5/16-1" hex bolts and a flange nut. Secure the sensor to the bracket by tightening the jam nuts.

Route the wire from the sensor along the existing wiring along the frame towards the rear of the PCC (figure 10). Secure with cable ties.

Locate the MWM wiring harness (006-6650MW) in the kit. Start by locating the connector with the white heat shrink label marked RX. Connect this connector to the sensor mounted on the right side of the PCC (006-4641MRX). Locate the longer lead that is labeled TX. Route this wire behind the PCC in an area where it will not be pinched or snagged.

Locate the bearing on each side of the PCC (figure 11). It works well to route the wire across to the other side by routing the wire below that pivoting assembly and securing with cable ties. Connect the connector labeled TX to the MWM sensor on the left hand side (006-4641MTX). Secure excess harness slack with cable ties.

Route the rest of the harness along the existing wiring toward the top of the chamber. The wire from the stuffer sensor will be connected to the 4 pin connector coming off the main harness about 2' (.6M) from the right hand sensor.

Route the MWM harness (006-6650MW) to the DCP on the baler and remove the green capped terminating resistor (006-5650Z) on the pump modular port, connecting the MWM sensors. Secure harness with cable ties.

If there is already an additional module connect to the DCP (PAC, Tagger, ect.) route the MWM harness to the module that contains the green capped terminator (006-5650Z). Remove the terminator and attach the MWM harness. Store the green capped connector in a location where it will not be lost (for example toolbox on baler).







Figure 11

Figure 10

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Moisture Installation – 701MWM

Locate the mounting holes on the back of both the left and right side of the bale chute (figure 1).

Mount the rear microwave moisture mounting brackets 001-2601 (figure 2) on the holes using two 3/8" x 3 1/2" hex bolts, nuts and lock washers located in parts bag D.







Attach the microwave moisture sensors to each mounting bracket. Sensor 006-4641MTX will be mounted or the left side of the bale chute (figure 3). Sensor 006-4641MRX will be mounted on the right side (figure 4). Mount the sensors with the wire connection port toward the baler.



Figure 3

Figure 4

Locate the MWM wiring harness (006-6650MWL) in the kit. Start by locating the connector with the white heat shrink label marked RX. Connect this connector to the sensor mounted on the right side chute (006-4641MRX).

If connecting to a *moisture only system* route the MWM harness (006-6650MWL) to the DCP on the baler and remove the green capped terminating resistor (006-5650Z) on the pump modular port, connecting the MWM sensors. Secure the harness.

If connecting to a *complete applicator system* route the MWM harness (006-6650MWL) to the Pump Controller (006-5672) on the pump plate next to the tank and remove the green capped terminating resistor (006-5650Z) on the pump modular port. Connect the MWM harness to the pump controller in the modular port. Secure the harness. The green resistor is no longer needed.

601A - Wiring Diagram – Connecting to Moisture Only System

- 1. Locate the tractor power/communication harness (006-6650TM(E)).
- 2. At the back of the tractor run the power leads to the battery.
- 3. Connect the red power wire with the 50 amp fuse to the positive side (12 volt) of the battery.



- 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. IF MODIFICATIONS ARE REQUIRED CONTACT HARVEST TEC FIRST!
- 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 and bale records.
- 4. Connect the black ground wire to frame of tractor or negative side of (12 volt) battery.
- 5. Connect the Bluetooth Receiver (030-6672B) to the Communication Harness (006-6650TM). Place in a safe location in the cab. Behind the seat for example.
- 6. Connect the orange Keyed Power wire (006-5650K) to a keyed power source.
- 7. Connect the end to the Communication Harness (006-6650TM(E)) to the Bluetooth Receiver.
- 8. Connect the orange keyed power wire (006-5650K) to a keyed power source on the tractor.
- 9. Connect the Pre-Compression Harness (006-6650MW) into the Pump Controller port on the DCP.
- 10. Connect Microwave Sensors (006-4641MTX & 006-4641MRX) to the Pre-Compression Harness.
- 11. Connect the Stuffer Sensor (006-7400) to the Pre-Compression Harness.



AGCO 2100 Series Balers Pre 2012 need the AGCO Integration Harness (006-6650VAX)

700MWM - Wiring Diagram – Connecting to 696A Preservative Applicator System

- 1. The Baler Power/Communication Harness (006-6650LS2(E)) will attach to the open port of the Tractor Harness (006-6650TM(E)) and run back to the Dual Channel Processor (006-6671LS). Connect the large plug of the Baler Power/Communication Harness (006-6650LS(E)) to the bottom (shorter side) of the DCP.
- 2. Attach the Baler Interface Harness (006-6650VA) in between the short whip cable hardwired to the DCP and the main Power/Communication Harness (006-6650LS2(E)). Make sure Active Terminator removed from the top of the baler processor is attached to Baler Interface Harness (006-6650VA).
- 3. Attach moisture and bale rate harness (006-7303H(E)) and the end of bale harness (006-7400) to the DCP.
- 4. Attach the Pump Control Harness (006-5650F3M(E)) between Pump Controller (006-5672) and the DCP.
- 5. Connect Keyed Power Extension harness (006-5650K) to a keyed power source on tractor.
- 6. Connect the Bluetooth Receiver (030-6672B) to the Communication Harness (006-6650TM).
- 7. Connect the Pre-Compression Harness (006-6650MW) into the Pump Controller port on the DCP.
- 8. Connect Microwave Sensors (006-4641MTX & 006-4641MRX) to the Pre-Compression Harness.
- 9. Connect the Stuffer Sensor (006-7400) to the Pre-Compression Harness.



AGCO 2100 Series Balers Pre 2012 need the AGCO Integration Harness (006-6650VAX)

701MWM - Wiring Diagram – Connecting to 696A Preservative Applicator System

- 1. The Baler Power/Communication Harness (006-6650LS2(E)) will attach to the open port of the Tractor Harness (006-6650TM) and run back to the Dual Channel Processor (006-6671LS). Connect the large plug of the Baler Power/Communication Harness (006-6650LS(E)) to the bottom (shorter side) of the DCP.
- 2. Attach the Baler Interface Harness (006-6650VA) in between the short whip cable hardwired to the DCP and the main Power/Communication Harness (006-6650LS2(E)). Make sure Active Terminator removed from the top of the baler processor is attached to Baler Interface Harness (006-6650VA).
- 3. Attach moisture and bale rate harness (006-7303H(E)) and the end of bale harness (006-7400) to the DCP.
- 4. Attach the Pump Control Harness (006-5650F3M(E)) between Pump Controller (006-5672) and the DCP.
- 5. Connect Keyed Power Extension harness (006-5650K) to a keyed power source on tractor.
- 6. Connect the Bluetooth Receiver (030-6672B) to the Communication Harness (006-6650TM(E)).
- 7. Connect the Chute Wire Harness (006-6650MWL) into the Pump Controller port on the DCP.
- 8. Connect Microwave Sensors (006-4641MTX & 006-4641MRX) to the Chute Wire Harness.
- 9. Connect Stuffer Sensor (006-7400) and 20' sensor extension harness (006-7400MXT) to the Chute Harness.



AGCO 2100 Series Balers Pre 2012 need the AGCO Integration Harness (006-6650VAX)

Pin Outs

Power/	<u>Comm Harnes</u>	<u>s 006-6650TM(E) at Hitch</u>		
Pin 1	Red	+12V Power to BLE		
Pin 2	Red	+12V Power to DCP		
Pin 3	Orange	Keyed Power		
Pin 4	Gray	Shield		
Pin 5	Green	HT Can Low		
Pin 6	Yellow	HT Can Hi		
Pin 7	Orange	Can1 Hi		
Pin 8	Black	Ground from BLE		
Pin 9	Black	Ground from DCP		
Pin 10	Blue	Can1 Low		
Power	Comm Harnes	s 006-6650I S2(E) at Hitch		
Pin 1	Red	+12V Power to BLE		
Pin 2	Red	+12V Power to DCP		
Pin 3	Orange	Keved Power		
Pin 4	Grav	Shield		
Pin 5	Green	HT Can Low		
Pin 6	Yellow	HT Can Hi		
Pin 7	Orange	Can1 Hi		
Pin 8	Black	Ground from BLE		
Pin 9	Black	Ground from DCP		
Pin 10	Blue	Can1 Low		
Dhuata				
Biueto	Ded	1 Hamess 006-6650 TM(E)		
PIII I Din 2	Reu Block	+12V Power Holli DCP		
	BIACK			
PIN 3 Din 4	reliow	FI Can Low		
PIN 4	Gray			
	Green			
Pin 6	Orange			
Pin <i>(</i>	BIUE	Can'i LOW		
006-66	006-6650VA to DCP Whip			
Pin 1	Red	Can Power		

Pin 1	Red	Can Power
Pin 2	Black	Can Ground
Pin 3	Yellow	HT Can Hi
Pin 4	Gray	Shield
Pin 5	Green	HT Can Low
Pin 6	Orange	Can1 Hi
Pin 7	Blue	Can1 Low

006-6650VA Harness to Baler Plug Pin A N/A

PINA	IN/A	
Pin B	Red	TBC Power
Pin C	N/A	
Pin D	Gray	TBC Ground
Pin E	Orange	Can1 Hi
Pin F	Blue	Can1 Low





Pin Outs (continued)

006-6650VA to 006-6650LS2(E)

- Pin 1 Red Can Power Pin 2 Black Can Ground HT Can Hi Pin 3 Yellow Pin 4 Grav Shield Pin 5 Green HT Can Low Pin 6 N/A
- Pin 7 N/A

Main Power Connector on Dual Channel Processor (DCP)

- Pin 1 Red +12V Power from tractor
- Pin 2 Black Ground from tractor
- Pin 3 Orange

Keyed power

Star Wheel and Bale Rate Sensor Connector on DCP

Pin 1 Blue +12V Power Pin 2 Orange Ground Black Signal for sensor 1 Pin 3 Signal for sensor 2 Pin 4 White Pin 5 N/A Pin 6 N/A Pin 7 N/A Pin 8 Violet Star wheel input 1 Pin 9 Brown Star wheel input 2

End of Bale Sensor on DCP

Pin 1 Brown Sensor Power Pin 2 Blue Sensor Ground Pin 3 N/A Pin 4 Black Signal from Sensor









Pin Outs (continued)

Microwave Moisture Harness 006-6650MW & 006-6650MWL

Pin 1	Red	Power
Pin 2	N/A	Not Used
Pin 3	N/A	Not Used
Pin 4	Yellow	Can H In
Pin 5	Green	Can L In
Pin 6	Orange	Can H Out
Pin 7	Blue	Can L Out
Pin 8	Black	Ground
Pin 9	N/A	Not Used
Pin 10	N/A	Not Used

Microwave Moisture Harness 006-6650MW & 006-6650MWL

Pin 1	Red	Power
Pin 2	Black	Ground
Pin 3	N/A	Not Used
Pin 4	Brown	Signal

Microwave Moisture Harness 006-6650MW & 006-6650MWL (RX)

- Pin 1 Black Ground Pin 2 Red Power Pin 3 Yellow Can H Pin 4 Green Can L Pin 5 Plugged
- Pin 6 Plugged
- Pin 7 Brown Signal
- Pin 8 Black Ground

Microwave Moisture Chamber Harness 006-6650MW & 006-6650MWL (TX)

- Pin 1 Black Ground Pin 2 Red Power
- Can H Pin 3 Yellow Pin 4 Green Can L
- Pin 5 Plugged
- Pin 6 Plugged
- Pin 7 Plugged
- Pin 8 Plugged









Common Questions

1. Can microwave sensors function with 500 series PIP?

No, microwave sensors are only compatible w/600 Series units running software version dcp46227 or later.

- 2. Can microwave sensors function through a Harvest Tec Touch Screen Display? No, microwave sensors require an ISOBUS Interface (VT) or iPad system to set the microwave settings.
- 3. What terminal is required to operate microwave sensor?

Microwave sensors are compatible with VT & iPads.

4. What moisture range will sensors detect?

Pre-Compression Chamber microwave sensors have a moisture range of 6-60% moisture. The Bale Chute chamber sensors have a range of 6-40%.

5. How do I know if I'm displaying microwave or star wheel moisture?

The sensor type selected is indicated in the upper right corner of the run screen (right). MC-0 indicates starwheels, MC-1 indicates MWM Pre-Compression Chamber, MC-2 indicates MWM Bale Chamber System, MWM-3 indicates other.

6. What crops are the microwave sensors designed for?

The Microwave sensors are designed and calibrated for Alfalfa.

- **7.** Is there a calibration to the microwave sensors for different crops? No, there is no adjustments needed.
- 8. Do the sensors emit harmful waves?

No

9. How often should a Zero Adjust (ZA) be performed?

A zero adjust should be performed on initial installation. It is also recommended during a zero adjust calibration at the beginning of each season.

- 10. When reading moisture with microwave sensors why can I <u>not</u> select Automatic mode? MWM Pre-Compression sensors can be used in both Auto and Manual mode. MWM Bale Chute sensors can only be used in Manual Mode due to the lag time between the application tops and the sensors.
- 11. Where does the green terminating resistor plug in to microwave sensors?

The green resistor (006-5650Z) is not used. Store the resistor for potential updates and changes you may make to the system in the future.

12. Where do I position 840 moisture dye marker spray tip when operating microwave sensors in precompression chamber?

Dye marking tips should be located behind (toward rear end of chute) MWM Chute sensors, with the tips angled toward the rear at a 45 degree angle. Alternative mounting would locate the dye marking tips above the bale w/ the brackets mounted off the top cross beam.

When using a Pre-Compression system mount the tips as close to the front of the bale chamber as possible, either on the side if there is clearance or on the top of the bale.

13. What do the lights on the 030-6672B indicate?

Red Light – The Bluetooth receiver has power. *Green Light* – When the proper active connection is selected in the Hay App menu, the green light will indicate connection with the iPad.



Troubleshooting

PROBLEM	POSSIBLE CAUSE	SOLUTION
Moisture reading errors (high or low)	1. Wire disconnected or bad connection between star wheels and DCP	1. Reconnect wire.
	2. Low power supply to DCP	2. Check voltage at box. (Min of 12 volts required.) See Diagnostics section of manual.
	3. Dry hay lower than 8% moisture or wet hay over 75%.	3. Pre-Compression System reads 6-60% moisture. The Bale Chute system read 6-40% moisture.
	4. Ground contact with one or both star wheels and baler mounted processor.	4. Reconnect.
	5. Short in wire between star wheels and DCP.	5. Replace wire.
	 Check hay with hand tester to verify. 	6. Contact Harvest Tec if conditions persist.
Moisture readings erratic.	 Test bales with hand tester to verify that DCP has more variation than hand tester. 	
	2. Check all wiring connections for corrosion or poor contact.	2. Apply dielectric grease to all connections.
	 Check power supply at tractor. Voltage should be constant between 12 and 14 volts. 	3. Install voltage surge protection on tractors alternator.
Terminal reads under or over power.	 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.
Bale rate displays zero.	 Bale rate sensors are reversed. Short in cable. Damaged sensor. Sensor too far from starwheel. 	 Switch the sensors next to the star wheel. Replace cable. Replace sensor. Adjust gap between prox sensor and star wheel so it is 1/8-1/4" away.
MWM moisture reads low all the time	1.Stuffer sensor out of adjustment	 Verify stuffer sensor is not damage and is sensing the stuffer moving each time
Bluetooth Receiver lights will not illuminate	 Bluetooth receiver not connected Harness disconnected Low power 	 Check connections and voltage. Minimum 12.5V needed.
	Red Light – The Bluetooth receiver has power Green Light – When the proper active connection is selected in the Hay App menu, the green light will indicate connection with the iPad.	

Microwave Moisture Pre-Compression System – 601A & 700MWM



Ref	Description	Part #	Qty
1	MWM Mounting Bracket	001-2600	4
2	Microwave TX Sensor	006-4641MTX	1
3	MWM Filter Plate	006-2600FP	2
4	MWM Pre-Compression Harness	006-6650MW	1
5	Microwave RX Sensor	006-4641MRX	1
6	End of Bale Bracket (Stuffer Bracket)	001-4648SS	1
7	End of Bale Sensor (Stuffer Sensor)	006-7400	1
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Complete Assembly 030-0700MWM

Microwave Moisture Bale Chute System – 701MWM



<u>Ref</u>	<u>Description</u>	Part #	<u>Qty</u>
1	MWM Rear Mounting Bracket	001-2601	2
2	Microwave TX Sensor	006-4641MTX	1
3	End of Bale Extension Harness (20')	006-7400MXT	1
4	MWM Pre-Compression Harness	006-6650MWL	1
5	Microwave RX Sensor	006-4641MRX	1
6	End of Bale Bracket (Stuffer Bracket)	001-4648SS	1
7	End of Bale Sensor (Stuffer Sensor)	006-7400	1
NP	Power / Comm Extension Harness (25')	006-6650FMX	1
	Complete Assembly	030-0701MWM (Ref 1-7)	

Harvest Tec Inc. 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. If it is determined that a non-Harvest Tec branded hay preservative has been used inside the Harvest Tec applicator system where the failure occurred, then Harvest Tec reserves the right to deny the warranty request at their discretion. 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.

Revised 4/17

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