

# **Hamilton Manufacturing Corp.**

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## **Retrofit Brick Mount External Display Installation Instructions**

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# I. INTRODUCTION

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The Hamilton Manufacturing External Display is a bright, highly visible message center designed not only to help customers through their transaction, but also to attract new customers. The External Display provides a 3" x 18" scrolling display visible from hundreds of feet away that is sure to attract attention.

While waiting for a customer to start a transaction, the External Display can display the same messages as the ACW Controller, or custom messages that have been programmed by the operator. These custom messages can be anything from additional information on using the car wash to special promotional messages. Such messages could include advertisements for weekly specials or discounted beverage prices in the attached convenience store. As soon as the customer takes some action, such as inserting money or choosing a wash selection, the External Display will automatically duplicate the messages shown on the ACW Controller Display. This helps the customer understand and use the wash more efficiently by seeing the instructions in such a bold fashion.

To insure visibility and durability in a variety of situations, the External Display PCB Assembly is protected by a stainless steel enclosure incorporating a 1/8" thick lexan shield. This shield not only helps protect against vandalism, but also helps filter out bright sunlight, making the display extremely visible in nearly all situations.

# **II. INSTALLATION**

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ACW 4/5 or AUTOTEC 4/5

## ***INSTALLATION OF DISPLAY BOX***

When locating the Display Box, do not recess the Display Box past the hinge. If recessed to far, the door will not open.

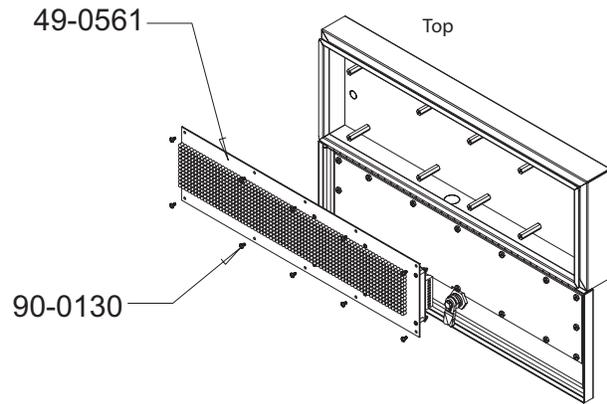
This Display Box is designed for attachment to a solid surface. Holes are provided for appropriate fasteners. Fasteners to be used should be recommended by your engineer as to strength and suitability for surface composition. Hamilton will not be responsible for injury or damage due to improper installation.

Two larger knockouts are provided for conduit connection. One knockout is located on the rear of the box so the wiring may enter unseen, while another knockout is provided on the bottom of the box so that the wiring may enter from that area, if necessary. The conduit must be run from the Display Box to the Autocashier.

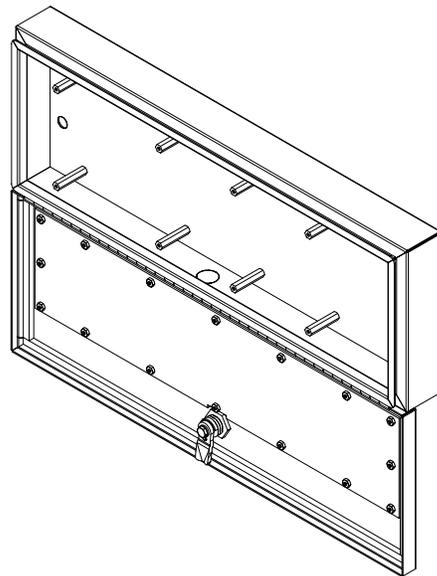


**BRICK MOUNT DISPLAY**  
**PART #61-0594A**  
**INSTALLATION INSTRUCTIONS**

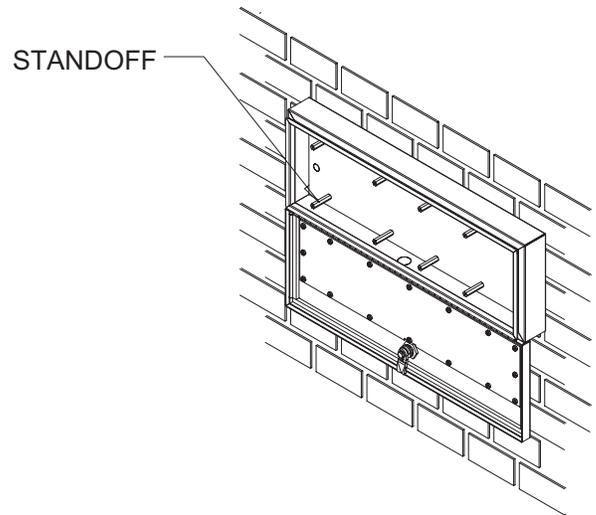
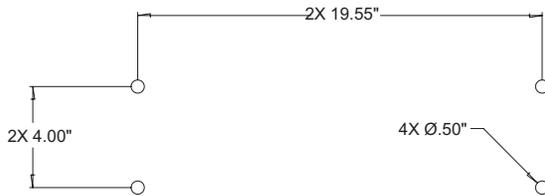
1. Remove board by unscrewing 10, #6-32 x 1/4 lg. screws (part #90-0130). Disconnect harness from display board (part #49-0561).



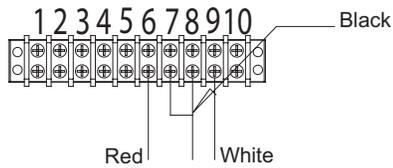
2. Punch out one of the two larger knockouts for wiring.



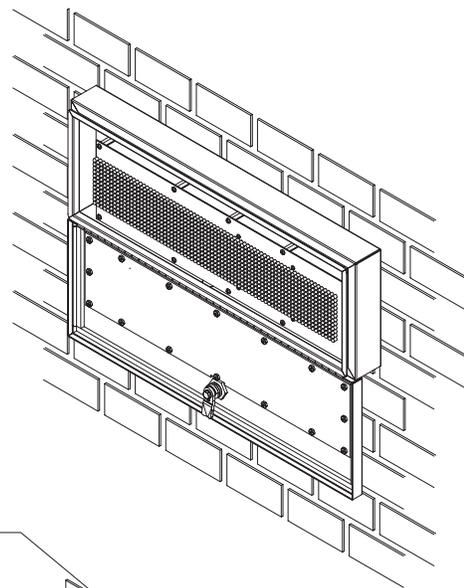
3. Mount the enclosure to the wall securely with desired hardware using the following hole pattern if needed. At the same time feed the communication harness through the larger hole previously knocked out.



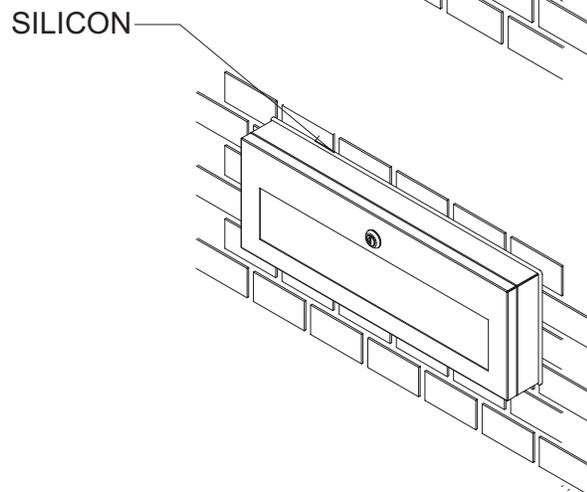
4. Connect the communication harness from the ACW to the connection terminal as shown below.



5. Reconnect harness to the display board (part #49-0561) and mount the board to the standoffs with 10 #6-32 x 1/4 lg. screws (part #90-0130).



6. Lay a bead of silicon around the back edge where the display meets the wall so that moisture will not be able to protrude behind the display as shown all the way around.



# **RETROFIT INSTALLATION OF HARDWARE AND WIRING ACW 4/5 or Autotec 4/5**

The Brick Mount External Display (Part No. 61-0594A) is powered by a transformer and controlled by the ACWv4.23E Auto Cashier Controller (Part No. 49-1212A), Autotec Controller (Part No. 49-1201A) or a later model. The following accessories are used:

Part Number	Part Description
ACW 49-1212A	ACW v4.23E
Autotec 49-1201A	ACW v4.198TE Specify Model and Options of Machine
60-0331A	External Display Transformer Assembly
48-2129A	External Display Transformer Harness
48-2130A	External Display Communication Harness

**Step 1.** Mount the External Display Transformer Assembly (60-0331A) by first removing the Coin Hopper from the Auto Cashier. Unplug both ends of the cable that connects to the Coin Hopper. Next, remove the two nuts and lock washers at the back of the Hopper Mounting Plate. Set the Transformer Assembly onto the Hopper Mounting Plate studs with the Transformer facing downwards. Re-install the nuts and lock washers.

**Step 2.** Remove the 12-pin Hopper Connector that is snapped into a bracket on the rear wall of the Auto Cashier. Plug the 12-pin female connector of the Display Transformer Harness onto the end of the connector just removed from the bracket. Snap the 12-pin male connector of the Display Transformer Harness into the bracket. Re-install the cable that originally connected to the Coin Hopper.

**Step 3.** Connect the square 4-pin male connector of the External Display Transformer Harness (48-2129A) to the Transformer.

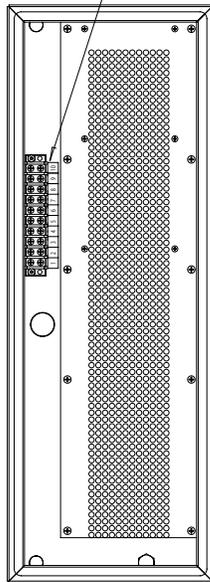
**Step 4.** The singular white wire of the Display Transformer Harness must be connected to the 22-pin edge connector at the top of the Controller. Route the white wire with the existing harness along the rear bottom of the Auto Cashier and follow the harness as it proceeds onto the door and into the Controller Housing. With the Snap Cover off the Controller Housing, gently remove the long, black connector from the top of the Controller. Carefully insert the terminal of the white wire into the small slot 7 positions from the end with the White (Neutral) wire. Starting with the White wire count the 7 positions. Be sure the terminal is inserted far enough so there is no exposed metal (there will be a faint click heard when the terminal reaches its required depth).

**Step 5.** Secure the long 4-pin connector to the rear wall of the Auto Cashier with the supplied stick-on cable clamp in a convenient position.

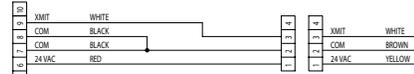
**Step 6.** The External Display Communication Harness (48-2130A) supplied with the kit is connected from the long 4-pin connector to the terminal strip located inside the Display Box, splicing in extra wire if necessary. The connections inside the External Display Enclosure should be made as shown below.

Wire Color	Terminal #
RED	6
BLK	7
BLK	8
WHT	9

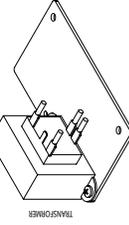
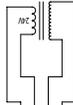
EXTERNAL DISPLAY ASSEMBLY  
(61-0594A)



EXTERNAL DISPLAY COMMUNICATIONS HARNESS  
(48-2130A)

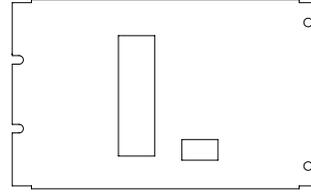


EXTERNAL DISPLAY TRANSFORMER HARNESS  
(48-2129A)

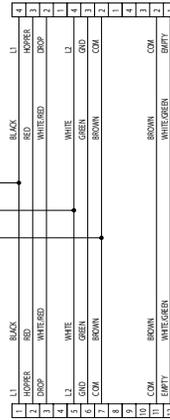


EXTERNAL DISPLAY TRANSFORMER ASSEMBLY  
(60-0331A)

22 POSITION CARD  
EDGE ADD IN PIN 16



ACW CONTROLLER (49-1212A)  
OR  
AUTOTEC CONTROLLER (49-1201A)



TO SYSTEM HARNESS  
HOPPER PLUG

TO HOPPER  
EXTENSION PLUG

# **RETROFIT INSTALLATION OF HARDWARE AND WIRING**

## **Autotec-CRC**

The Brick Mount External Display (Part No. 61-0594A) is powered by a transformer and controlled by the ACWv4.196TCE Auto Cashier Controller (Part No. 49-1212B), ACWv4.198TC9E Retro CRC controller (Part No 49-1212B). or a later model. The following accessories are used:

Part Number	Part Description
49-1212B	ACW v4.196TCE ACW v4.196TC9E (Retro) Specify Model and Options of Machine
60-0331A	External Display Transformer Assembly
48-2139A	External Display Transformer Harness
48-2130A	External Display Communication Harness

**Step 1.** Mount the External Display Transformer Assembly (60-0331A) by first removing the Coin Hopper from the Auto Cashier. Unplug both ends of the cable that connects to the Coin Hopper. Next, remove the two nuts and lock washers at the back of the Hopper Mounting Plate. Set the Transformer Assembly onto the Hopper Mounting Plate studs with the Transformer facing downwards. Re-install the nuts and lock washers.

**Step 2.** Remove the 12-pin Hopper Connector that is snapped into a bracket on the rear wall of the Auto Cashier. Plug the 12-pin female connector of the Display Transformer Harness onto the end of the connector just removed from the bracket. Snap the 12-pin male connector of the Display Transformer Harness into the bracket. Re-install the cable that originally connected to the Coin Hopper.

**Step 3.** Connect the square 4-pin male connector of the External Display Transformer Harness (48-2139A) to the Transformer.

**Step 4.** Secure the long 4-pin connector to the rear wall of the Auto Cashier with the supplied stick-on cable clamp in a convenient position.

**Step 5.** Connect the grey cable with the DB-9 connector coming from the long 4 pin connector to the CRC computer. The connection on the CRC computer is the DB-9 connector beneath the power connection for the CRC computer.

**Step 6.** The External Display Communication Harness (48-2130A) supplied with the kit is connected from the long 4-pin connector to the terminal strip located inside the Display Box, splicing in extra wire if necessary. The connections inside the External Display Enclosure should be made as shown below.

Wire Color	Terminal #
RED	6
BLK	7
BLK	8
WHT	9

# **III. OPERATION**

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## ***ACW 4/5 or AUTOTEC 4/5***

The External Display receives serial data from the ACW Controller. The data received is then displayed in a scrolling fashion. The message being displayed depends on whether the ACW system is processing a transaction, and if Custom External Display Messages have been programmed.

First, in the case of processing a customer transaction, the External Display will exactly duplicate the messages shown on the ACW Controller. For example, messages such as “Deposit \$4.00 WASH & WAX”, “Credit \$1.00”, and “Thank You! Please Drive Ahead” will be displayed. These messages help the customer to follow the transaction and understand what is to be done.

When there are no transactions being processed the messages displayed on the External Display will depend on whether any Custom External Display Messages have been programmed (instructions on how to program Custom External Display Messages are shown on page 8 of this manual). If *all* Custom External Display Messages have been programmed to “NOT USED”, the External Display will show the same messages as the ACW Controller’s Welcome Messages.

If there are any Custom External Display Messages programmed and set to be displayed (any message not set to “NOT USED” will be displayed), these messages will be shown during this idle period. Up to 4 different messages of 40 characters each can be programmed. If more than one External Display Message is programmed and displayed, the External Display will show each 40-character message for approximately 12 seconds then display the next message. Twelve seconds allows each 40-character message to be scrolled across the display approximately two times. This continues until all programmed messages have been displayed and the cycle repeats.

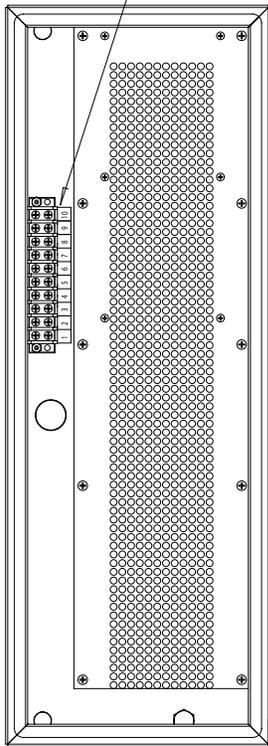
## ***AUTOTEC-CRC***

The ACW controller sends a signal to the CRC computer which in turns sends a serial signal to the External Display. The data received is then displayed in a scrolling fashion. The message being displayed depends on whether the ACW system is processing a transaction, and if Custom External Display Messages have been programmed.

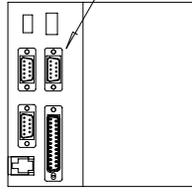
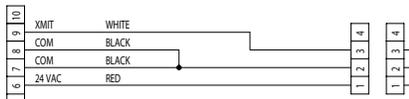
First, in the case of processing a customer transaction, the External Display will exactly duplicate the messages shown on the ACW Controller. For example, messages such as “Deposit \$4.00 WASH & WAX”, “Credit \$1.00”, and “Thank You! Please Drive Ahead” will be displayed. These messages help the customer to follow the transaction and understand what is to be done.

When there are no transactions being processed the messages displayed on the External Display will depend on whether any Custom External Display Messages have been programmed (instructions on how to program Custom External Display Messages are shown on page 14 of this manual). If *all* Custom External Display Messages have been programmed to “NOT USED”, the External Display will show the same messages as the

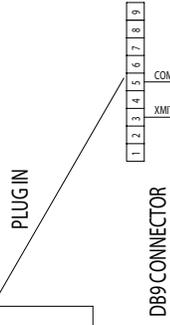
EXTERNAL DISPLAY ASSEMBLY  
(61-0594A)



EXTERNAL DISPLAY COMMUNICATIONS HARNESS  
(48-2130A)

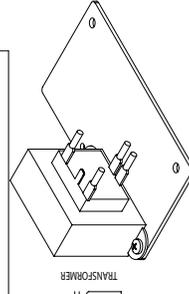
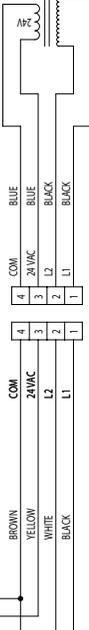


CRC BOX  
(49-0560E)



DB9 CONNECTOR

EXTERNAL DISPLAY TRANSFORMER HARNESS  
(48-2139A)



EXTERNAL DISPLAY TRANSFORMER ASSEMBLY  
(60-0331A)

1	L1	BLACK	L1
2	HOPPER	RED	HOPPER
3	DROP	WHITERED	DROP
4	L2	WHITE	L2
5	GRD	GREEN	GRD
6	COM	BROWN	COM
7			
8			
9			
10	COM	BROWN	COM
11	EMPTY	WHITEGREEN	EMPTY
12			

TO SYSTEM HARNESS  
HOPPER PLUG

TO HOPPER  
EXTENSION PLUG

## ACW Controller's Welcome Messages.

If there are any Custom External Display Messages programmed and set to be displayed (any message not set to "NOT USED" will be displayed), these messages will be shown during this idle period. Up to 4 different messages of 40 characters each can be programmed. If more than one External Display Message is programmed and displayed, the External Display will show each 40-character message for approximately 12 seconds then display the next message. Twelve seconds allows each 40-character message to be scrolled across the display approximately two times. This continues until all programmed messages have been displayed and the cycle repeats

# IV. PROGRAMMING

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To program Custom External Display Messages, starting from the RUN MODE, press the ACTION button to enter the MENU MODE. Using the RED and BLUE buttons, scroll through the categories until “EXT DISPLAY MSGS?” is displayed. Enter the PROGRAMMING MODE by pressing the ACTION BUTTON. The display will read:



The second message displayed is the first 20 characters of the current external display message #1. To change this message, use the RED and BLUE buttons to toggle between “NOT USED” and the current custom message. When the desired message is displayed you may either program the next 20 characters of the message or exit the PROGRAMMING MODE. Repeatedly pressing the ACTION button scrolls through each of the 8 message halves (4 messages programmed 20 characters at a time). Pressing the RETURN button exits you from the PROGRAMMING MODE and into the MENU or RUN MODE.

If the current custom message is blank or needs to be changed, it is possible to program the custom message using the following procedure. Starting from the RUN MODE, enter the PROGRAMMING MODE by pressing the ACTION button to enter the MENU MODE. Then scroll through the categories until “EXT DISPLAY MSGS” is displayed and again press the ACTION button. This will bring up the external display message #1 first 20 characters. If the current message is shown as “NOT USED”, press the RED or BLUE buttons to display the current message. Press and hold the ACTION button until a flashing cursor is displayed, then release the ACTION button. Use the RED and BLUE buttons to move through the displayable letters and characters. Once the desired character or letter is displayed, move to the next space by pressing the ACTION button. When the message is complete, press the RETURN button to return to the MENU or RUN MODE.

# V. TROUBLESHOOTING

PROBLEM / TEST	POSITIVE / YES	NEGATIVE / NO
<p><b><i>Display does not show version information just after power-up.</i></b></p> <ul style="list-style-type: none"> <li>Verify the proper connection of Display Communication Harness.</li> <li>Verify proper connection of Display Transformer Harness.</li> <li>Verify power is connected to machine and circuit is energized.</li> <li>Perform the following electrical test:</li> <li>Test the voltage between terminals 6 &amp; 7 of Display Terminal Block for 24VAC.</li> </ul>	<p>If electrical test is positive, replace/reconnect Display and retest.</p> <p>If this does not correct the problem, then reconnect all the wires between the green 10-pin connector and the Terminal Block and retest.</p>	<p>If electrical test is negative, proceed to the text test.</p>
<p>Test the voltage between terminals 3 &amp; 4 of square 4-pin connector and terminal block of Display Transformer Harness for 24VAC.</p>	<p>If electrical test is positive, replace/reconnect Display Transformer Harness and retest.</p>	<p>If electrical test is negative, proceed to the text test.</p>
<p>Test the voltage between terminals 1 &amp; 2 of square 4-pin connector of Display Transformer Harness for 120VAC.</p>	<p>If electrical test is positive, replace/reconnect Display Transformer Assembly and retest.</p>	<p>If electrical test is negative, proceed to the text test.</p>
<p>Test the voltage between terminals 1 &amp; 5 of 12-pin connector of display Transformer Harness plugged into Main System Harness for 120VAC.</p>	<p>If electrical test is positive, replace/reconnect Display Transformer Harness and retest.</p>	<p>If electrical test is negative, Refer to the troubleshooting section of the ACW or Auto-Tec Manual.</p>

PROBLEM / TEST	POSITIVE / YES	NEGATIVE / NO
<p><b><i>Display shows version at power up, but then remains blank.</i></b></p> <ul style="list-style-type: none"> <li>• Verify the proper connection of Display Transformer Harness.</li> <li>• Verify proper connection of Display Communication Harness.</li> <li>• Verify serial communications by pressing a wash selection button to see if any information is displayed on the External Display.</li> </ul>	<p>If any information is displayed on the External Display, then verify that one of the following is true:</p> <ul style="list-style-type: none"> <li>• At least one custom message half, set to a message other than "NOT USED", contains characters other than blank spaces.</li> <li>• If all External Display messages are set to "NOT USED", at least one of the ACW Controller Welcome Messages must contain characters other than blank spaces.</li> </ul>	<p>If no information is displayed on the External Display, proceed to the next test.</p>
<p>Test the voltage between terminals 8 &amp; 9 of Display Terminal Block for +12VDC or -12VDC.</p>	<p>If either +12VDC or -12VDC is obtained, then proceed to Test A.</p>	<p>If not, proceed to Test B.</p>
<p>A) Test the voltage between terminals 8 &amp; 9 of the green 10-pin connector for +12VDC or -12VDC.</p>	<p>If either +12VDC or -12VDC is obtained, replace/reconnect the Display Assembly and retest.</p>	<p>If not, reconnect all the wires between the Terminal Block and the green 10-pin connector and retest.</p>
<p>B) Test the voltage between terminals 2 &amp; 3 of the Display Communications Harness 4-pin connector for +12VDC or -12VDC.</p>	<p>If either +12VDC or -12VDC is obtained, replace/reconnect the Display Communications Harness and retest.</p>	<p>If not, proceed to the next test.</p>
<p>Test the voltage between terminals 19 &amp; 16 of the 22-pin edge connector at the top of the ACW controller (with the harness plugged in) for +12VDC or -12VDC.</p>	<p>If either +12VDC or -12VDC is obtained, replace/reconnect the Display Communications Harness and retest.</p>	<p>If not, replace/reconnect the ACW Controller and retest.</p>

PROBLEM / TEST	POSITIVE / YES	NEGATIVE / NO
<p><b>Display Shows Messages While In Standby.</b></p> <ul style="list-style-type: none"> <li>Are the desired messages different than the ACW Controllers Welcome Messages?</li> </ul>	<p>If yes, verify that at least one custom message half, set to a message other than "NOT USED", contains characters other than blank spaces. If the messages displayed are different than the ACW Welcome messages but still not correct, refer to the programming section of this manual.</p>	<p>If no, verify that all External Display Messages are set to "NOT USED" and at least one of the ACW Controller Welcome Messages contains characters other than blank spaces. For information on programming ACW Welcome Messages, refer to the programming section of the ACW Manual.</p>
<p><b>Hopper Malfunctions When Display Transformer Harness Is Installed.</b></p> <ul style="list-style-type: none"> <li>Verify proper connection of Display Transformer Harness.</li> <li>Verify proper connection of Display Communications Harness.</li> <li>Verify correct ACW system operation by removing the Display Transformer Harness, reconnecting the system as before, and testing for proper Hopper operation.</li> </ul>	<p>If ACW is operating correctly, replace/reconnect the Display Transformer Harness.</p>	<p>If the ACW is not operating correctly, refer to the troubleshooting section of the ACW Manual.</p>

**LIMITED WARRANTY AGREEMENT  
OF HAMILTON MANUFACTURING CORP.**

Hamilton Manufacturing Corp., an Ohio Corporation, (“Seller”) warrants to Purchaser that all new equipment shall be free from defects in material and factory workmanship for a period of one (1) year from the original shipping date. Hamilton Manufacturing Corp. further warrants if any part of said new equipment in Seller’s sole opinion, requires replacement or repair due to a defect in material or factory workmanship during said period, Seller will repair or replace said new equipment. Purchaser’s remedies and the liabilities and obligations of Seller herein shall be limited to repair or replacement of the equipment as Seller may choose, and Seller’s obligation to remedy such defects shall not exceed the Purchaser’s original cost for the equipment. Purchaser EXPRESSLY AGREES this is the EXCLUSIVE REMEDY under this warranty. There are no other express or implied warranties which extend beyond the face hereof. All warranty repair service must be performed by either a Factory Trained Service Representative or **HAMILTON MANUFACTURING CORP., 1026 Hamilton Drive, Holland, Ohio 43528 PHONE (419) 867-4858 or (800) 837-5561, FAX (419) 867-4867.**

The limited warranty for new equipment is conditioned upon the following:

1. The subject equipment has not, in the Seller’s sole opinion, been subjected to: accident, abuse, misuse, vandalism, civil disobedience, riots, acts of God, natural disaster, acts of war or terrorism.
2. The Seller shall not be liable for any expense incurred by Purchaser incidental to the repair or replacement of equipment and Purchaser shall assume full responsibility for any freight or shipping charges.
3. The coverage of this warranty shall not extend to expendable parts.
4. Purchaser shall have a warranty registration card on file with Seller prior to any claim in order for warranty protection to apply.
5. No warranty coverage is applicable to any equipment used for currency other than that specified at the time of the purchase.
6. Seller expressly disclaims any warranty that counterfeit currency will not activate said equipment.
7. Seller expressly disclaims any warranty for any losses due to bill manipulation or theft or loss of cash under any circumstances.
8. Use of the equipment for anything other than its intended and designed use will void the Limited Warranty Agreement. Use of equipment for anything other than its intended and designed use includes, but is not limited to, downloading software/applications not certified by Seller such as e-mail, spyware, screen savers, viruses, worms, third party software, web search engines, cookies, spam, desktop applications, games, web surfing, etc.

Seller further warrants all repair or service work performed by a factory trained representative or Hamilton Manufacturing Corp. for a period of ninety (90) days from the date the repair or service work was performed. Purchaser’s remedies and the liabilities and obligations of Seller herein shall be limited to repair or replacement of equipment as Seller may choose, and Seller’s obligation to remedy such defects shall not exceed the Purchaser’s depreciated value of the equipment. Purchaser EXPRESSLY AGREES this is an EXCLUSIVE REMEDY under this warranty. There are no other express or implied warranties on repair or service work performed by a factory trained representative or Hamilton Manufacturing Corp. which extend beyond the face hereof.

The limited warranty for repair and service work is conditioned upon the following:

1. The subject equipment has not, in the Seller's sole opinion, been subjected to: accident, abuse, misuse, vandalism, civil disobedience, riots, acts of God, natural disaster, acts of war or terrorism.
2. The Seller shall not be liable for any expense incurred by Purchaser incidental to the repair or replacement of equipment and Purchaser shall assume full responsibility for any freight or shipping charges.
3. The coverage of this warranty shall not extend to expendable parts.
4. Purchaser shall have a warranty registration card on file with Seller prior to any claim in order for warranty protection to apply.
5. No warranty coverage is applicable to any equipment used for currency other than that specified at the time of the purchase.
6. Seller expressly disclaims any warranty that counterfeit currency will not activate said equipment.
7. Seller expressly disclaims any warranty for any losses due to bill manipulation or theft or loss of cash under any circumstances.
8. No person or entity other than a factory trained representative or Hamilton Manufacturing Corp. has performed or attempted to perform the subject repair or service.
9. Using equipment which has been serviced or repaired for anything other than its intended or designed use such as downloading software applications not certified by Seller will void the Limited Warranty Agreement. This includes software/applications such as e-mail, spyware, screen savers, viruses, worms, third party software, web search engines, cookies, spam, desktop applications, games, web surfing, etc.

THIS AGREEMENT IS MADE WITH THE EXPRESS UNDERSTANDING THAT THERE ARE NO IMPLIED WARRANTIES THAT THE EQUIPMENT SHALL BE MERCHANTABLE, OR THAT THE GOODS SHALL BE FIT FOR ANY PARTICULAR PURPOSE. PURCHASER HEREBY ACKNOWLEDGES THAT IT IS NOT RELYING ON THE SELLER'S SKILL OR JUDGMENT TO SELECT OR FURNISH EQUIPMENT SUITABLE FOR ANY PARTICULAR PURPOSE AND THAT THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THAT WHICH IS DESCRIBED HEREIN.

The Purchaser agrees that in no event will the Seller be liable for direct, indirect, or consequential damages or for injury resulting from any defective or non-conforming new, repaired or serviced equipment, or for any loss, damage or expense of any kind, including loss of profits, business interruption, loss of business information or other pecuniary loss arising in connection with this Limited Warranty Agreement, or with the use of, or inability to use the subject equipment regardless of Sellers knowledge of the possibility of the same.



# **Hamilton Manufacturing Corp.**

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