

# **Hamilton Manufacturing Corporation**

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## **HSH Hopper Operational Manual**

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## ABOUT THIS MANUAL

This manual was designed to introduce the HSH Hopper and provide general information about operation and maintenance. This manual will enable the operator to identify errors and perform basic troubleshooting procedures. If further assistance is needed, please call (800) 837-5561 or (419) 867-4858.

When calling for assistance, it is important to have serial numbers readily available. Please record the serial number in the space provided.

**HOPPER MODEL #** \_\_\_\_\_

**SERIAL #** \_\_\_\_\_

# I. INTRODUCTION

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The Hamilton model HSH Hopper was not only designed for large quantities of coins, it was also designed to withstand the most rugged of environments. It contains very few moving parts for reduced wear, virtually zero adjustments, and an all Lexan and stainless steel construction to weather the harshest of environments.

The model HSH Hopper comes in many different configurations for dispensing a variety of coins and metal tokens. Among the possibilities are coins that range in size from the small U.S. dime to the large  $1\frac{1}{8}$ " token. Many foreign coins will also work in this Hopper. It is important to specify what type of coin is to be dispensed when ordering so the correct configuration will be shipped to you.

## II. CAPACITY

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Hamilton Mfg. Corp. produces three different styles of Hoppers to meet the varying demands of its customers. These Hoppers differ in holding capacity. The three Hoppers are shown in the table below, where it is assumed that quarters are being dispensed.

<b>MODEL</b>	<b># QUARTERS</b>	<b>\$ QUARTERS</b>	<b>CHANGER APPLICATION</b>
<b>HSH</b>	<b>4800</b>	<b>\$1,200</b>	<b>Most Changers</b>
<b>HSH-A</b>	<b>3200</b>	<b>\$800</b>	<b>Auto Cashiers</b>
<b>HSH-60Q</b>	<b>2400</b>	<b>\$600</b>	<b>ER-60 Changers</b>

For all of these models, the Hopper reports that it is empty when the coins no longer cover the two sensing plates in the bottom of the Hopper Bowl. This usually occurs when there are approximately 70-125 quarter-sized coins remaining. These numbers will vary depending on the actual coin being dispensed.

# III. OPERATION

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To dispense the coins, the Hopper uses a Coin Wheel mounted to the Hopper Motor. This Coin Wheel is a round disc with semi-circular cutouts placed around its outer edge (refer to the parts layout on page 12, Index # 8). As this wheel turns with the motor, coins fall into the cutouts and are lifted past the dual count switch and through the exit chute. If coins are picked up in every cutout, a dispensing rate of 5 coins per second is achieved.

The Coin Counting Mechanism utilizes a pair of switches that are actuated by coins as they exit the Hopper. One switch directly triggers the 120VAC counter mounted on the Hopper. The other switch manipulates the controller's "Coin Drop" input. The normally closed contacts are opened as a coin passes under the switch. This opening of the "Coin Drop" circuit is observed as a coin vends.

The Coin Level Mechanism takes advantage of the conductivity of metallic coins. Since the Coin Wheel is connected to earth, and logic grounds through the case of the motor, a connection can be made from the Coin Wheel through the coins and to the stainless sensing strips that are connected to the Controller. When the coins no longer touch the sensing strips, the circuit is open and the Hopper is observed as empty.

When the Hopper does go empty, there will still be approximately 70-125 quarter sized coins left in the Hopper Bowl (this number varies depending on coin size). Diagram A on page 8 shows where the "Manual Run" Toggle Switch is located. Although not pictured in Diagram A, there is a bracket that encases the Toggle Switch. There is also a thumbscrew that fits into this bracket and prevents the switch from being activated. The thumbscrew must be removed and the Toggle Switch flipped to its ON position. To stop the motor, turn the "Manual Run" Toggle Switch back to its OFF position and re-insert the thumbscrew.

# **IV. LOADING AND UNLOADING**

## ***To Fill the Hopper***

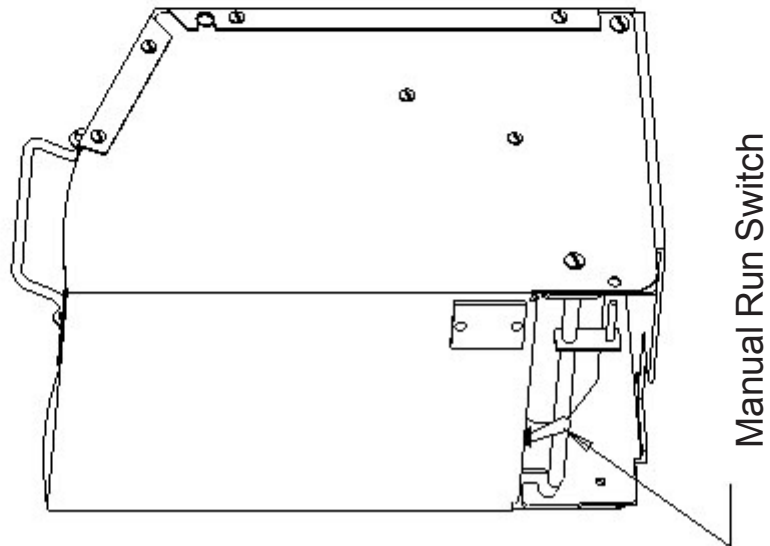
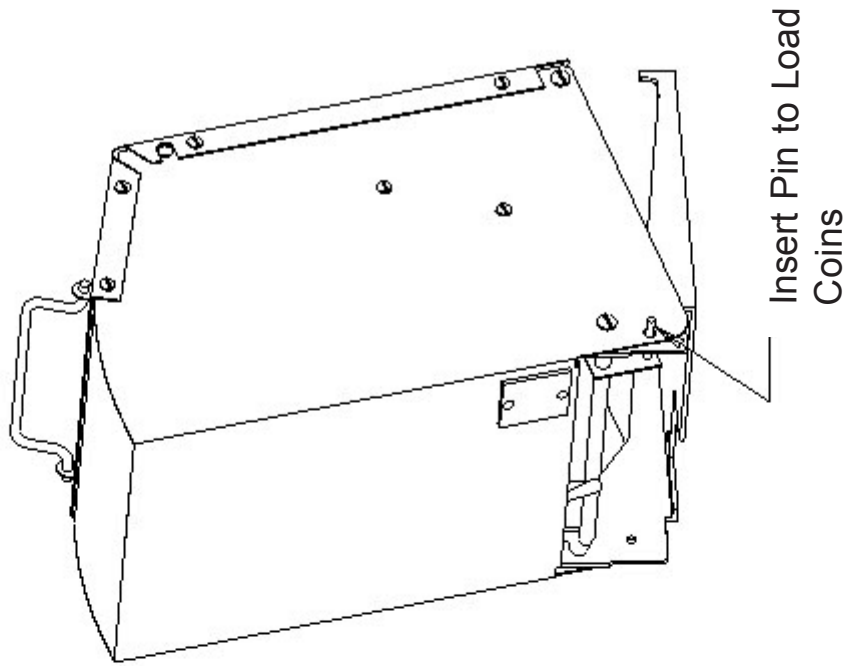
To fill the Hopper with coins, tilt it partially towards you and insert the Load Rivet (as shown in Diagram A on page 8). Pour the coins into the top of the Hopper.

**CAUTION! Use only clean, dry coins. Remove all debris from coins before loading into Hopper.**

To Empty the Hopper

To empty, tilt the Hopper all the way towards you and dump the coins into a container.

# DIAGRAM A





# V. MAINTENANCE

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The plastic parts in the Hopper are formed of LEXAN®. GE's recommendation for cleaning the plastic parts is to use normal household cleaners. **DO NOT USE gasoline, high alkaline solutions, benzene acetone, carbon tetrachloride, methyl ethyl ketone, muriatic acid, or electrical contact cleaner as THEY WILL DAMAGE THE PLASTIC.**

**CAUTION! This Hopper DOES NOT NEED TO BE OILED. Oil caused dirt to accumulate and certain oils may damage the plastic components. Any lubrication in the Hopper can result in a faulty payout.**

It is recommended that the Hopper is cleaned on a monthly basis, but this may vary depending on circumstances and usage. Disassembly of the Hopper is required for proper cleaning.



**Disconnect all power to the machine and remove the Hopper before attempting any service.**

To remove the Hopper from the machine and clean it, follow the steps below:

1. Empty all the coins from the Hopper.
2. Disconnect all power from the machine.
3. Unplug the Main Harness from the bottom of the Hopper.
4. Tilt the top of the Hopper backwards slightly, then lift up and forward to remove the Hopper Assembly from the cabinet.
5. Use a Phillips screwdriver to remove the eight #8 x 1/4" self-tapping screws that hold the cover on the Outer Housing.
6. Swing the Coin Baffle up and out of the Outer Housing.
7. Remove the Coin Baffle from the Outer Housing.
8. Sweep all debris out of the Hopper with a CLEAN paintbrush.
9. Dampen a cloth and apply a household cleaner to all surfaces inside the Coin Bowl. Scrub if needed.
10. Dampen a clean cloth and soak up any remaining residue.
11. Reassemble the Coin Hopper and re-install it into the machine.

# VI. TROUBLESHOOTING

SITUATION	PROBABLE CAUSE	CORRECTION
Overpayment of change	<ul style="list-style-type: none"> <li>• Wash prices set incorrectly</li> <li>• HOPPER not counting coins</li> </ul>	<ul style="list-style-type: none"> <li>• Check wash prices</li> <li>• Perform HOPPER RUN TEST (See page 11)</li> <li>• Contact the manufacturer for assistance</li> </ul>
HOPPER does not run at all to pay back change	<ul style="list-style-type: none"> <li>• Coin or foreign material lodged in HOPPER</li> <li>• Broken connection in wire between CONTROLLER and HOPPER motor</li> <li>• Output missing from CONTROLLER</li> </ul>	<ul style="list-style-type: none"> <li>• Clear obstruction in HOPPER</li> <li>• Locate and repair connection</li> <li>• Contact the manufacturer for assistance</li> </ul>
HOPPER runs slowly	<ul style="list-style-type: none"> <li>• Foreign material in HOPPER</li> <li>• Output weak from CONTROLLER</li> </ul>	<ul style="list-style-type: none"> <li>• Remove foreign material</li> <li>• Contact the manufacturer for assistance</li> </ul>
Underpayment of change, CONTROLLER does not go into "OUT OF SERVICE"	<ul style="list-style-type: none"> <li>• Wash prices set incorrectly</li> <li>• Coins fall back into HOPPER after counting</li> <li>• CPU misreads coin count</li> </ul>	<ul style="list-style-type: none"> <li>• Check wash prices</li> <li>• Perform HOPPER RUN TEST (See page 11)</li> <li>• Contact the manufacturer for assistance</li> </ul>
Underpayment of change, CONTROLLER does go into "OUT OF SERVICE"	<ul style="list-style-type: none"> <li>• Error detected by CONTROLLER</li> </ul>	<ul style="list-style-type: none"> <li>• Check error message on CONTROLLER and refer to CONTROLLER Manual.</li> </ul>

# **VII. HOPPER RUN TEST**

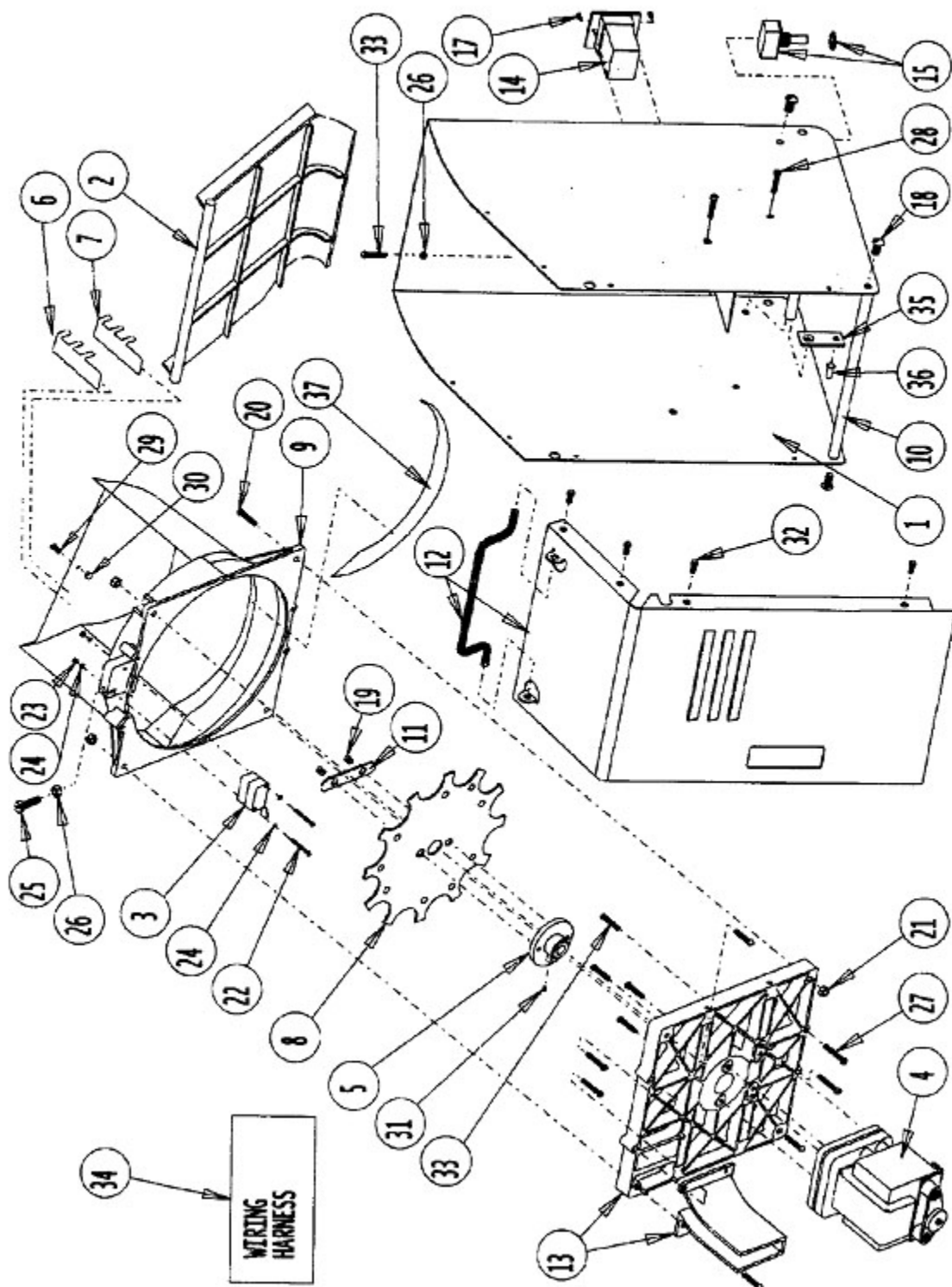
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The Hopper Run Test is a test that can be used to determine if a Hopper is counting coins correctly.

1. Obtain a large number of coins (500 if possible) that the Hopper is configured to dispense, and count them carefully to determine the exact number of coins.
2. Empty Hopper completely and make note of the count on the Hopper's mechanical counter.
3. Dump in all of the counted coins and turn the Manual Run Switch to the ON position. Run the Hopper until every coin has been dispensed.
4. Check to see if the Hopper's mechanical counter matches the previous count plus the number of coins that were just dispensed.
5. Repeat the test as necessary.

# VIII. PARTS

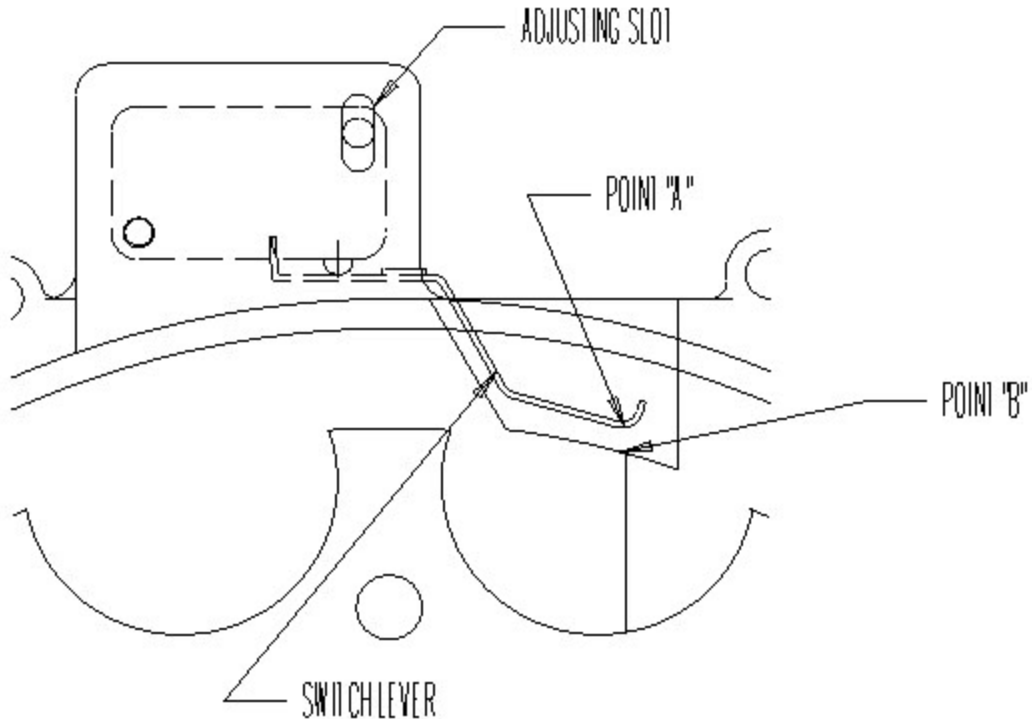
## Parts Layout



<b>HOPPER PARTS INDEX</b>		
<b>INDEX #</b>	<b>PART #</b>	<b>PART DESCRIPTION</b>
1	11-0001	HOUSING - OUTER (TALL)
2	11-0005	BAFFLE - COIN
3	11-0008	SWITCH - DUAL COIN COUNTER
4	11-0096B	MOTOR
5	11-0010	HUB - WHEEL DRIVE
6	11-0011	SENSOR - COIN (RIGHT HAND)
7	11-0012	SENSOR - COIN (LEFT HAND)
8	11-0013	WHEEL - NICKLE
	11-0014	WHEEL - DIME
	11-0015	WHEEL - QUARTER
	11-0016	WHEEL - DOLLAR (S.B.A)
9	11-0017A	HOPPER - COIN BOWL
10	11-0018	ROD PIVOT
11	11-0020	PLATE - STIR
12	11-0021	COVER & HANDLE ASSEMBLY
13	11-0025	MOTOR MOUNTING, HOUSING & CHUTE ASSEMBLY
14	11-0026B	COUNTER - VEEDER ROOT
15	47-0051	SWITCH - ON/OFF ARROW HART
17	90-0650	4 x 3/8" FLAT HEAD, SELF-TAP SCREW
18	90-0333	1/4"-20 x 1/2" PAN HEAD SCREW
19	90-0155	10-32 x 5/16" FLAT HEAD SCREW
20	90-0156	10-32 x 1 1/4" ROUND HEAD SCREW
21	90-0160	10-32 HEX NUT
22	90-0126	4-40 x 1 3/8" ROUND HEAD SCREW
23	90-0307	4-40 LOCK NUT
24	90-0430	1/8" INNER DIAMETER PLAIN WASHER
25	90-0147	8-32 x 5/16" HEX SLOT HEAD SCREW
26	90-0319	8-32 HEX NUT
27	90-0510	10-16 x 1 3/8" PAN HEAD HI-LO
28	90-0511	10-16 x 3/4" PAN HEAD HI-LO
29	90-0153	10-32 x 3/8" PAN HEAD SCREW
30	90-0340	10-32 ACORN NUT
31	90-0660	10-32 x 5/16" SOCKET SET SCREW
32	90-0131	6-32 x 3/16" PAN HEAD SCREW
33	90-0249	8-32 x 3/8" PAN HEAD SCREW
34	11-0031A	WIRING HARNESS
35	11-0046	RIVET HOLDER
36	11-0045	1/4" DIAMETER x 1 1/4" LOAD RIVET
37	11-0040	INSERT - COIN BOWL SERV. WITH COIN BOWL ASSEMBLY

# APPENDIX A

## Payout Switch Adjustment



1. Remove the Hopper Cover and Handle.
2. Remove the plastic Baffle.
3. Loosen the Switch Mounting Screws.
4. Push the Payout Switch upward into the adjusting slot.
5. Push the Switch Lever up and down slowly. Notice that the switch clicks twice in each direction (usually very close together).
6. Lift the Switch Lever up and let it down slowly. When the switch clicks a second time (as the switch moves downward), STOP!
7. Between Point "A" and Point "B" there should be  $\frac{1}{16}$ " space for Dime Hoppers and  $\frac{1}{8}$ " space for all other Hoppers. When the actuator is let go and comes to a rest, Point "A" must contact Point "B". No other part of the switch actuator may contact the plastic.
8. Tighten the switch and recheck the adjustment.
9. Reassemble the Hopper.

## **APPENDIX B**

### **Hopper Wheel Sizes**

<b>PART #</b>	<b>WHEEL SIZE</b>	<b>MINIMUM SIZE</b>	<b>MAXIMUM SIZE</b>
11-0014	* DIME	0.706	0.770
11-0050	** 0.800	0.771	0.825
11-0013	NICKEL	0.826	0.900
11-0015	QUARTER	0.901	0.984
11-0016	SBA	0.985	1.073
11-0051	TOKEN	1.074	1.125
11-0019	*** THIN NICKEL	0.826	0.900

\* Need to use Mexican Coin Diverter in chute, Part #11-0048

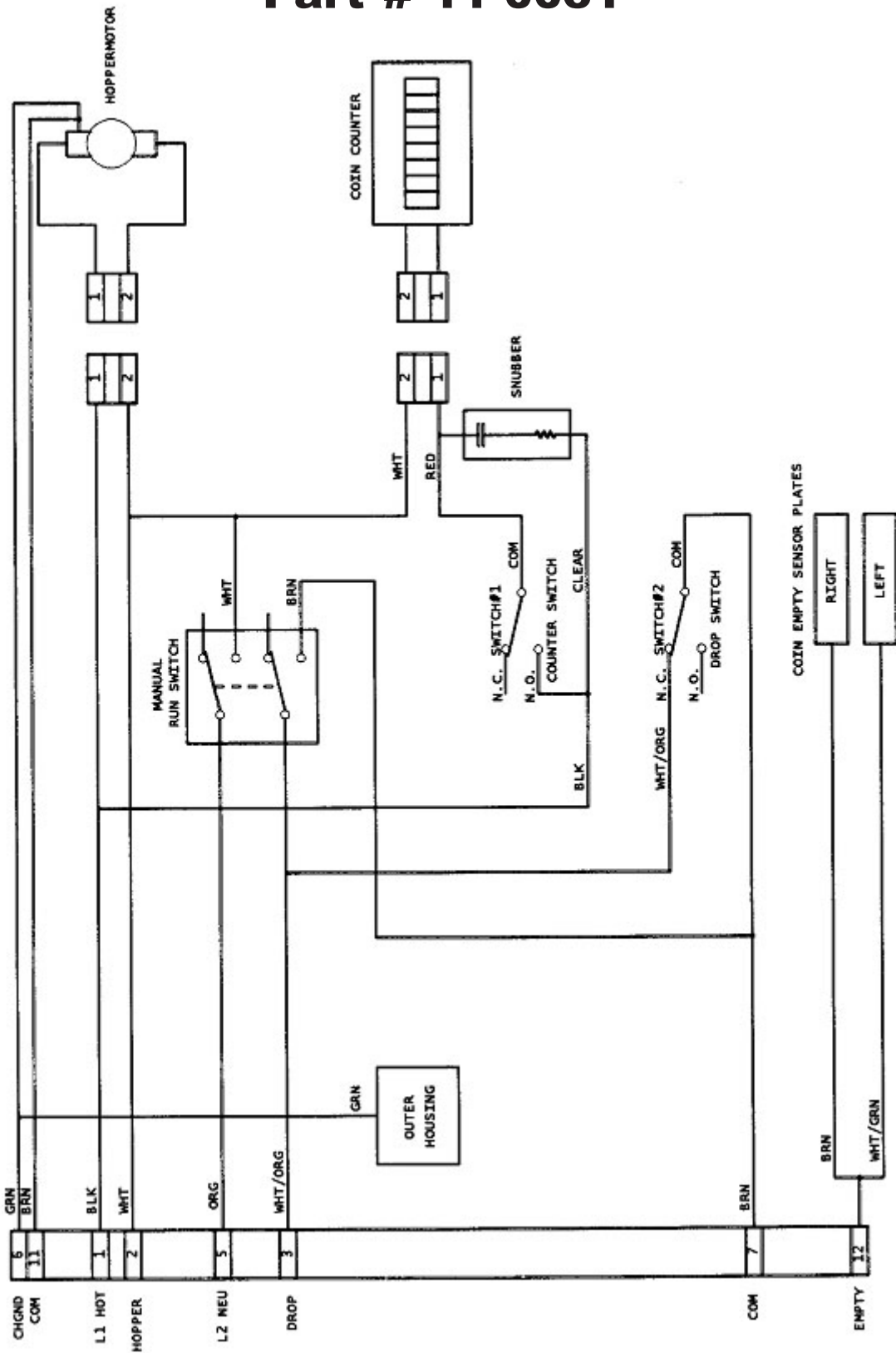
\*\* Need to use special Coin Baffle for PTV, Part #25-0007

\*\*\* Thickness' under .060

# APPENDIX C

## Hopper Wiring Harness

### Part # 11-0031





## **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.



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