# MAG
## BILL ACCEPTOR

## Operation and Service Manual



**coinco**®

## TABLE OF CONTENTS

## INTRODUCTION

This manual contains information on installing, operating and maintaining Coinco's MAG Series bill acceptors. This manual is intended for owners, route operators and shop-level technicians as a primary source of information. Taking time to read this manual and becoming familiar with this information will help you obtain the best performance from your Coinco bill acceptor.

## MODELS

MAG Series bill acceptors are self-contained units designed to work with existing vending machine interfaces, plus MDB vendors. Listed below are some of the models available:

**MAG50B**      MAG bill acceptor, 500 capacity stacker, 110V AC, Bottler interface and mask

**MAG52BX**     MAG bill acceptor, 500 capacity stacker, 24V DC, Bottler mask, MDB interface only

**MAG50SA**     MAG bill acceptor, 500 capacity stacker, 110V AC, Snack interface and mask, Additional length harness

MAG50B bill acceptors are primarily used in cold drink vendors which use either the electromechanical, electronic, or MDB interface. This bill acceptor uses the "bottler" interface, which communicates to the vendor through either HIGH LEVEL or MDB communication.

MAG52BX supports MDB communication only.

MAG50SA and MAG52SA bill acceptors are primarily used in either electronic or MDB snack, coffee or food machines. These bill acceptors use the "snack" interface and communicate to the vendor through either PULSE, SERIAL, PARALLEL or MDB communication.

## FOR YOUR RECORDS

A label indicating the model number and serial number is affixed to the back of the bill acceptor. Refer to the model and serial number whenever you call upon your Coinco Service Center for information or service. The first four digits of the serial number contain the manufacturing date code which indicates the beginning of the warranty period.
*EXAMPLE: Serial number 269900135. First and second digits indicate the week of manufacture. The third and fourth digits indicate the year (the 26th week of 1999).*

## FEATURES

- Modular design
- Bill Hold Feature.
- Center drive belt.
- Scalloped bill path for wet bill acceptance.
- State-of-the-art electronic logic system
- Switch selectable acceptance of the following bills: $1, $2, $5, $10 and $20.
- High capacity bill box.
- Vandal resistant design protects against: saltwater, bill pullback, counterfeit bills.
- Utilizes standard mounting and electrical interfaces.
- 110 and 24 VAC and 24 VDC Multi-Drop Bus interfaces available.
- High impact, non-corrosive plastic construction.
- Easily accessible bill path.
- Self-diagnostics communicated via status light.
- Standard/High Level security switch.
- Switch selectable acceptance of bills face up, in one or both directions.
- Optional hasp for locking bill box.
- Manufactured and supported by Coinco.
- Made in the U.S.A.

## AFTER UNPACKING

After unpacking the unit, inspect it for any possible shipping damage. If the unit is damaged, notify the shipping company immediately. Only the co-signee (the person or company receiving the unit) can file a claim against the carrier for shipping damage. We recommend that you retain the original carton and packing materials to reuse if you need to transport or ship your acceptor in the future.

If the bill acceptor is being stored or used as a spare, always keep it in its shipping carton when not in use. This will keep it clean and offer the best protection for the unit.

## MAIN LOGIC BOARD ASSEMBLY

The main logic board contains the microprocessor which controls all the functions of the bill acceptor based on information from the vending machine, coin mechanism and various bill acceptor sensors.

Also contained on the main logic board is the power supply which receives its primary voltage from the vending machine. For 117VAC units, the primary AC voltage is routed to the transformer in the bill acceptor where it is reduced to 24VAC. This 24VAC is then routed back to the main logic board where it is rectified and filtered for logic board operation. For 24VAC and 24 VDC (MDB) units, no transformer is needed. The primary voltage is rectified and filtered on the main logic board.

## SPECIFICATIONS

**Power Requirements**
**MAG50B, MAG50SA — 117V AC**
95 to 130 VAC, 60 Hz
0.2 Amp max standby
0.75 Amp max operating

**MAG52B, MAG52SA — 24V AC**
20 to 32 VAC, 60 Hz
0.2 Amp average standby
2.5 Amp average operating

**MAG52BX--24V DC**
22 to 45 VDC
0.2 Amp average standby
2.5 Amp average operating

**Operating Temperature**
0°F to 150°F
-18°C to 65°C

**Storage Temperature**
-22°F to 165°F
-30°C to 74°C

**Relative Humidity**
5% to 95% non-condensing

**Physical Weight in Shipping Carton**
5.7 pounds - 117VAC
4 pounds - 24VAC

**Physical Dimensions**

|  | **MAG30B** | **MAG50B** | **MAG70B** |
|---|---|---|---|
| **Height** | 11.16 inches | 11.16 inches | 11.16 inches |

*from top of bill box to bottom of mounting plate*

| **Width** | 5.26 inches | 5.26 inches | 5.26 inches |
|---|---|---|---|

*from logic board cover to mounting plate*

| **Depth** | 4.29 inches | 4.92 inches | 6.17 inches |
|---|---|---|---|

*from mounting plate to back of stacker*

## Dimensions

11.16

6.80

3.25

5.20

4.59

1.33

2.00

3.74

5.26

### MAGxxB

.99    3.25

3.32    2.85

4.23

2.26    2.91

1.80    4.23

Depth

### MAGxxSA

1.74

3.32

2.87

4.24

1.00

.90

.53    4.97

1.21    Depth
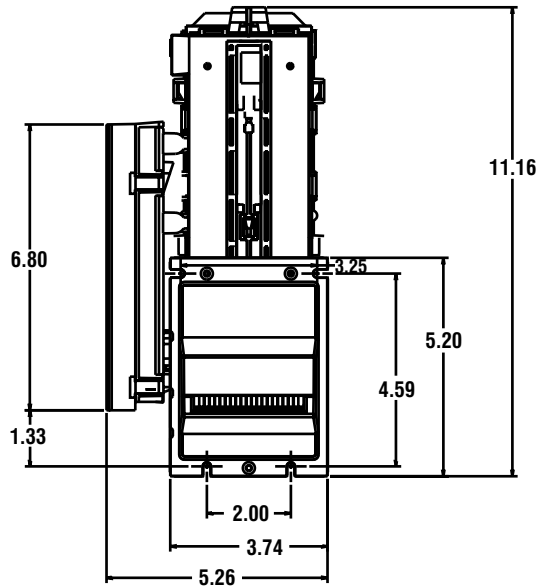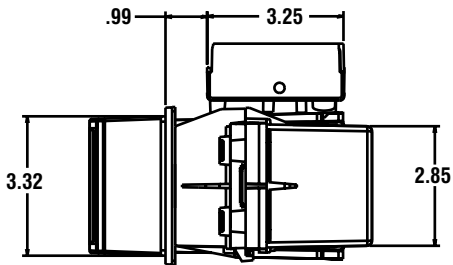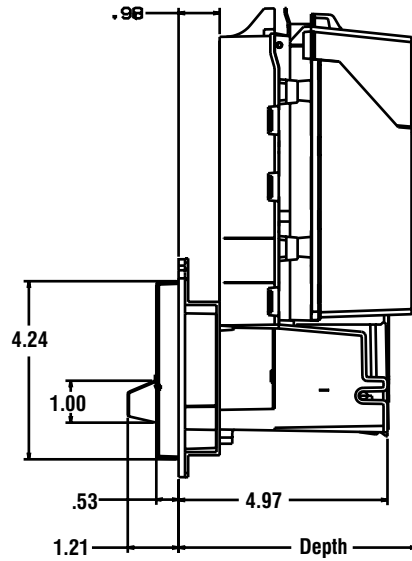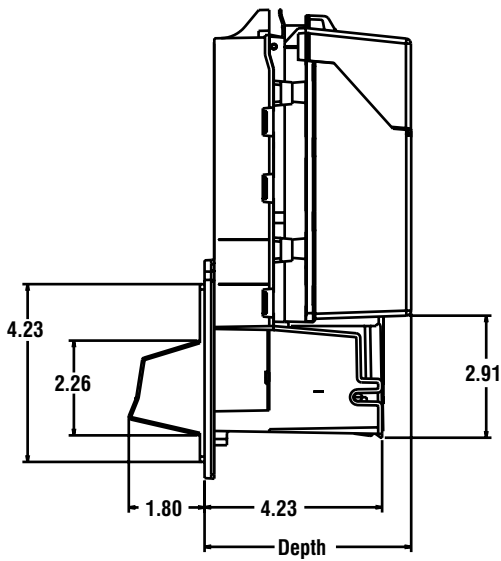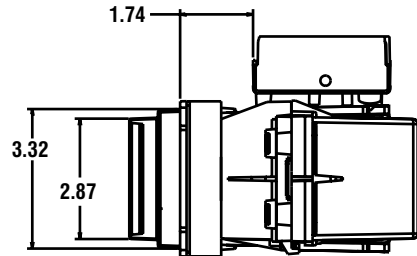
| | Depth | |
|---|---|---|
| | B models | SA models |
| MAG30 | 4.29 | 5.03 |
| MAG50 | 4.92 | 5.66 |
| MAG70 | 6.17 | 6.91 |
| MAG90 | 8.67* | 9.41* |

*Add 0.25 for metal cashbox

# OPTION SWITCH SETTINGS

MAG bill acceptors contain an option switch bank on the main logic board which allows the unit to be customized to the requirements of the individual account. This switch bank is factory set with switch 3 and 8 in the ON position and 1, 2, 4, 5, 6, and 7 in the OFF position.

## Setting Option Switches (see Figure 1)

Remove power from the bill acceptor. Remove the bill box. Located on the side of the logic board cover is the option switch access hole. Insert a small screwdriver through the access hole to set the option switches as desired (see Figure 2). Reinstall the bill box. Apply power and test for proper operation.
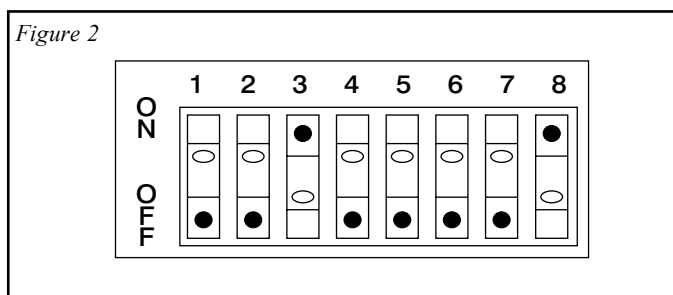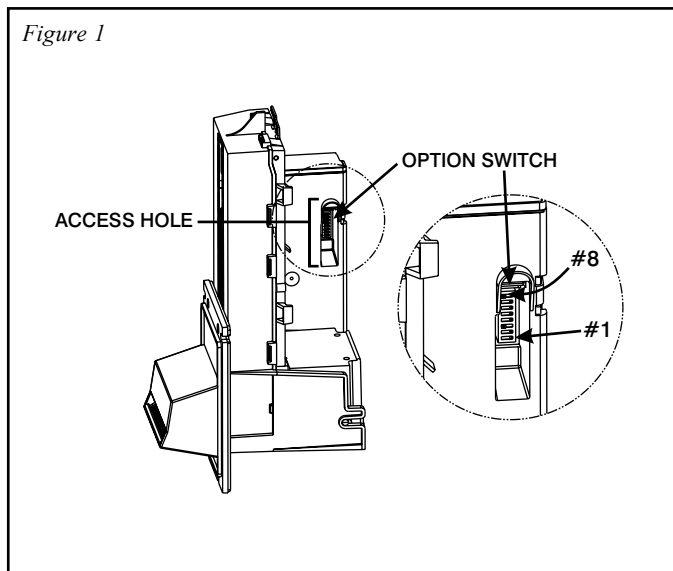


*Figure 1*



*Figure 2*

## MAG**B Option Switch Settings (see Figure 2)

| SWITCH | ON | OFF |
| --- | --- | --- |
| 1 | High Security | Standard Acceptance |
| 2 | Accepts bills in one directions only (face up, green seal first) | Accepts bills in both directions (face up) |
| 3 | Standard credit pulse 150ms on 150ms off | Short credit pulse 50 ms on 50 ms off |
| 4 | $20 Accept | $20 Reject |
| 5 | $10 Accept | $10 Reject |
| 6 | $5 Accept | $5 Reject |
| 7 | $2 Accept | $2 Reject |
| 8 | $1 Accept | $1 Reject (see note) |

**NOTE:** The 407982 logic board with software 67090 will accept $1.00 bills with Switch 8 "OFF", if no other bills are enabled. This is the maximum accept mode.

If however, another bill switch is "ON", then $1.00 bills will be rejected if Switch 8 is "OFF".

## MAG**SA Option Switch Settings (see Figure 2)

| SWITCH | ON | OFF |
| --- | --- | --- |
| 1 | High Security | Standard Acceptance |
| 2 | Accepts bills in one directions only (face up, green seal first) | Accepts bills in both directions (face up) |
| 3 | Serial or Parallel Interface | Pulse Interface |
| 4 | $20 Accept | $20 Reject |
| 5 | $10 Accept | $10 Reject |
| 6 | $5 Accept | $5 Reject |
| 7 | $2 Accept | $2 Reject |
| 8 | $1 Accept | $1 Reject |

# INSTALLING THE BILL ACCEPTOR

1. Remove power from the vending machine.
2. Set the bill acceptor option switches as desired.
3. Connect the bill acceptor harness to the mating harness in the vending machine.
4. Mount the bill acceptor according to the instructions found in the vending machine manual or appropriate kit literature.

*NOTE: Ensure bill acceptor is free of all obstructions*

5. Load the vending machine with product and fill the coin changer with change.
6. Apply power to the vending machine.
7. Test for proper operation.

# BILL RECOGNITION

When a bill is inserted into the bill acceptor and it blocks the left and right alignment sensors as well as the center optic sensor, the transport motor beings to run.

# BILL VALIDATION

From the time the transport motor begins to run until the trailing edge of the bill leaves the alignment sensors, optical and magnetic sensors send information to the microprocessor to determine the validity of the bill.

# BILL STACKING AND CREDIT

If the bill is determined to be authentic, it is transported to the stack position. Once the sensors of the lower housing's anti-pullback lever signals the microprocessor that the bill is in the stacking position, the stacker motor runs and credit is given.

# BILL REJECTION

If the bill is determined to be invalid, the wrong denomi-nation or the anti-pullback levers are active when the bill is determined to be in the stack position, the transport motor will reverse returning the bill to the customer.

# COMPONENT EXPLANATION (see Figure 3)

## Bill Transport and Stacking

The bill transport system is composed of a motor and gearcase assembly and two sets of pulleys and belts. When the transport motor is energized, it pulls the bill in by sandwiching it between the lower housing rollers and the chassis belts. During the validation process, the bill is transferred from the lower housing rollers and chassis belts to the intermediate frame and chassis belts.

The bill stacker is composed of a motor and gearcase assembly and a pusher plate assembly. When the bill is transported past the anti-pullback levers into the stacking position, the stacker motor energizes driving the pusher plate, which in turn, pushes the bill into the bill box.

## Left and Right Alignment Sensors

The left and right alignment sensors send information to the microprocessor to insure that the bill is the right width and that it is being fed in correctly.

## Center Optic Sensor

The center optic sensor informs the microprocessor that the bill is ready to be transported if the information from the alignment sensors is correct.

## Left and Right Optic Sensors

The left and right optic sensors and associated circuitry perform various optical checks on the bill and send that information to the microprocessor for bill validation.

## Magnetic Sensor

The magnetic sensor and its associated circuitry performs checks on the magnetic properties of the bill and sends that information to the microprocessor for bill validation.

## Anti-Pullback Lever

The lower anti-pullback lever is optically monitored to tell the microprocessor when the bill has entered the stack position or if an attempt to defraud the unit is taking place.

## Stacker Home Sensor

The stacker home sensor is an optical sensor that informs the microprocessor of the position of the stacker pusher plate.

## Encoder Sensor

Connected to the transport motor is an encoder wheel which is optically monitored to determine the speed of the transport motor and to determine the position of the bill in the bill path.

*Figure 3*
*Component Explanation*

BILL BOX LID

INTERMEDIATE FRAME

BILL BOX

PUSHER PLATE

ENCODER SENSOR

STACKER
HOME
SENSOR

LOWER HOUSING

ANTI-
PULLBACK
LEVERS

CENTER
DRIVE
BELT

INTERMEDIATE
FRAME BELTS

LEFT & RIGHT
OPTIC SENSORS

CHASSIS BELT

LEFT & RIGHT
ALIGNMENT SENSORS

CENTER OPTIC SENSOR

## INTERCONNECTIONS
## MAG50B/MAG52B

ENCODER WHEEL

P11B
1
2
3

UPPER BOARD AND HARNESS ASSEMBLY (407244)

P11A
1
2
3

STACKER BOARD AND HARNESS ASSEMBLY (407246)

STACKER HOME SENSOR

TRANSPORT MOTOR (920195-2) BLUE DOT

STACKER MOTOR (920195)

(RED DOT)

(RED DOT)

P3
1 BRN +12V 1
2 RED SENSOR SINK 2
3 ORG TRANS L 3
4 YEL TRANS R 4
5 DK GRN (W/GRN) SENSOR COM 5
6 BLU LEVER UPPER 6

P9
1 PUR POSITION SENSOR 7
2 GRY RIGHT SKEW 8
3 WHT LEFT SKEW 9
4 BLK VE3 10
5 PNK (W/BRN/PNK) REFL C 11
6 LT BLUE (W/RD/PNK) ANALOG MAG 12
7 LT GRN (W/OR/PNK) GND 13

P5
1 BRN +12V 1
2 RED E.W. 2
3 ORG STACKER HOME 3
4 YEL VE2 4
5 GRN CASHBOX 5

P7
1 BLU 1
2 WHT 2

P8
1 WHT 1
2 RED 2

VALIDATOR MAIN LOGIC BOARD 407982 OR 408049

P6
1 +12V 1
2 SENSOR COM 2
3 LEVER LOWER 3
4 VE3 4
5 VE2 5
6 TRANS. C 6
7 REFL L 7
8 REFL R 8
9 GND 9

P11
1 1
2 2
3 P.P. 3
4 4
5 5
6 6

P1
1 CR- 1
2 CR+ 2
3 P.P- 3
4 P.P- 4
5 P.P- 5
6 110 VAC NEU 6
7 NEU INHIBIT 7
8 P.P HOT ENABLE 8
9 110 VAC HOT 9

P2
1 24 VAC HOT 1
2 24 VAC NEU 2
3 P.P- 3
6 110 VAC HOT 6
5 P.P- 5
4 110 VAC NEU 4

24 AWG
24 AWG
24 AWG
24 AWG
24 AWG

24 AWG
24 AWG
24 AWG
24 AWG

TO CHANGER CONNECTOR (920274) TERMINAL PIN (920275)

4 BLACK
2 BROWN
3 N.C.
1 WHITE
RED
6 GREEN

ANTI CHEAT
P14B
G B R
WHT/GRN WHT/BLK WHT/RED
P14A

LOWER BOARD AND HARNESS ASSEMBLY (407125)

P6
1 BLACK
2 BROWN
3 RED
4 ORANGE
5 YELLOW
6 GREEN
7 BLUE
8 PURPLE
9 GRAY

MULTI-DROP BUS CONNECTOR (920273) TERMINAL SOCKET (920276)

4 BLACK
2 BROWN
3 N.C.
1 WHITE
RED
6 GREEN

JONES PLUG POWER HARNESS (407052-1)

2 WHITE
1 W/RED

2 BROWN
5
6 BLUE
1 BLACK

4 PIN POWER HARNESS (407419-1)

2
2
4
3

TRANSFORMER AND HARNESS ASSEMBLY (920949-2)

RED
GREEN
BLACK
WHITE

ANTI CHEAT

G B R

WHT/GRN WHT/BLK WHT/RED
P14B

G B R
P14A

TO CHANGER CONNECTOR (920274) TERMINAL PIN (920275)

| 4 | BLACK |
| 3 | BROWN |
| 2 | N.C. |
| 1 | WHITE |
| | RED |
| 6 | GREEN |

P6

LOWER BOARD AND HARNESS ASSEMBLY (407125)

| 1 | BLACK | +12V | 1 | 1 |
| 2 | BROWN | SENSOR COM | 2 | 2 |
| 3 | RED | LEVER LOWER | 3 | 3 |
| 4 | ORANGE | VE3 | 4 | 4 |
| 5 | YELLOW | VE2 | 5 | 5 |
| 6 | GREEN | TRANS. C | 6 | 6 |
| 7 | BLUE | REFL. L | 7 | 7 |
| 8 | PURPLE | REFL. R | 8 | 8 |
| 9 | GRAY | GND | 9 | 9 |

P6

MULTI-DROP BUS CONNECTOR (920273) TERMINAL SOCKET (920276)

| 4 | BLACK | | 1 | 1 |
| 2 | BROWN | | 2 | 2 |
| 3 | N.C. | P.P. | 3 | 3 |
| 1 | WHITE | | 4 | 4 |
| 5 | RED | | 5 | 5 |
| 6 | GREEN | | 6 | 6 |

P11

110V POWER HARNESS (407473) CONNECTOR (908834) TERMINAL PIN (908835-1)

1 2 3 4 5 6 7 8 9

| BLACK | 110 VAC NEU | 1 | 1 |
| WHITE | P.P.- 110 VAC NEU | 2 | 2 |
| BLUE | | 3 | 3 |
| BROWN | | |

P13

24V POWER HARNESS (407474) CONNECTOR (908834) TERMINAL PIN (908835-1)

1 2 3 4 5 6 7 8 9

| BLACK | CREDIT+ | 1 | 1 |
| WHITE | ENABLE | 2 | 2 |
| BLUE | +12V DC | 3 | 3 |
| BROWN | GROUND | 4 | 4 |
| | CREDIT- | 5 | 5 |

P14

TRANSFORMER AND HARNESS ASSEMBLY (920949-3, -2)

| RED | 24 AWG | 24 VAC HOT | 1 | 1 |
| GREEN | 24 AWG | 24 VAC NEU | 2 | 2 |
| | | | 3 | 3 |
| BLACK | 24 AWG | 110 VAC HOT | 6 | 6 |
| | | P.P.- | 5 | 5 |
| WHITE | 24 AWG | 110 VAC NEU | 4 | 4 |

P2

P1

| S1 CREDIT | 1 | 10 | OUT OF SERVICE |
| INTERRUPT | 2 | 11 | ACCEPT ENABLE |
| $5 CREDIT | 3 | 12 | $2 CREDIT (OUT OF SERVICE) |
| GROUND | 4 | 13 | |
| DATA | 5 | 14 | SEND |
| ESCROW RETURN HIGH | 6 | 15 | $1 ENABLE LOW |
| $5 ENABLE HIGH | 7 | 16 | $2 ENABLE LOW |
| $2 ENABLE HIGH | 8 | 17 | $5 ENABLE LOW |
| $1 ENABLE HIGH | 9 | 18 | ESCROW RETURN, LOW |

SNACK VALIDATOR MAIN LOGIC BOARD 408064

P3

UPPER BOARD AND HARNESS ASSEMBLY (407244)

| 1 | 1 | BRN | +12V | | |
| 2 | 2 | RED | SENSOR SINK | | |
| 3 | 3 | ORG | TRANS L | | |
| 4 | 4 | YEL | TRANS R | | |
| 5 | 5 | DK GRN (W/GRN) | SENSOR COM | | |
| 6 | 6 | BLU | LEVER UPPER | | |

P9

| 1 | 1 | PUR | POSITION SENSOR | 8 | |
| 2 | 2 | GRY | RIGHT SKEW | 9 | |
| 3 | 3 | WHT | LEFT SKEW | 10 | |
| 4 | 4 | BLK | VE3 | 11 | |
| 5 | 5 | PNK (W/BRN/PNK) | REFL. C | 12 | |
| 6 | 6 | LT BLUE (W/RD/PNK) | ANALOG MAG | 13 | |
| 7 | 7 | LT GRN (W/OR/PNK) | GND | | |

P5

STACKER BOARD AND HARNESS ASSEMBLY (407246)

STACKER HOME SENSOR

| 1 | 1 | BRN | +12V | | |
| 2 | 2 | RED | E.W. | | |
| 3 | 3 | ORG | STACKER HOME | | |
| 4 | 4 | YEL | VE2 | | |
| 5 | 5 | GRN | CASHBOX | | |

P11A   P11B

ENCODER WHEEL

1 2 3 | 1 2 3

P7

| 1 | 1 | BLU | (RED DOT) |
| 2 | 2 | WHT | |

TRANSPORT MOTOR (920195-2) BLUE DOT

P8

| 1 | 1 | WHT | |
| 2 | 2 | RED | (RED DOT) |

STACKER MOTOR (920195)

11

## DISASSEMBLING THE MAG

### Removing the Bill Box (see Figure 4)
Push the bill box tab forward while sliding the bill box up.

### Removing the Main Logic Board (see Figure 5)
Using a small screwdriver, release the three tabs that secure the logic box to the main frame. Separate the logic box from the lid by releasing the four tabs with a small screwdriver. (Some units also have a tab that snaps between the two harness headers.)

Unplug the harnessing from the logic board and place the logic board in a static-free area.

*Figure 4*



BILL BOX TAB

BILL BOX

*Figure 5*



LOGIC BOARD BOX

MAIN LOGIC BOARD

LOCKING TABS

LOGIC BOX LID
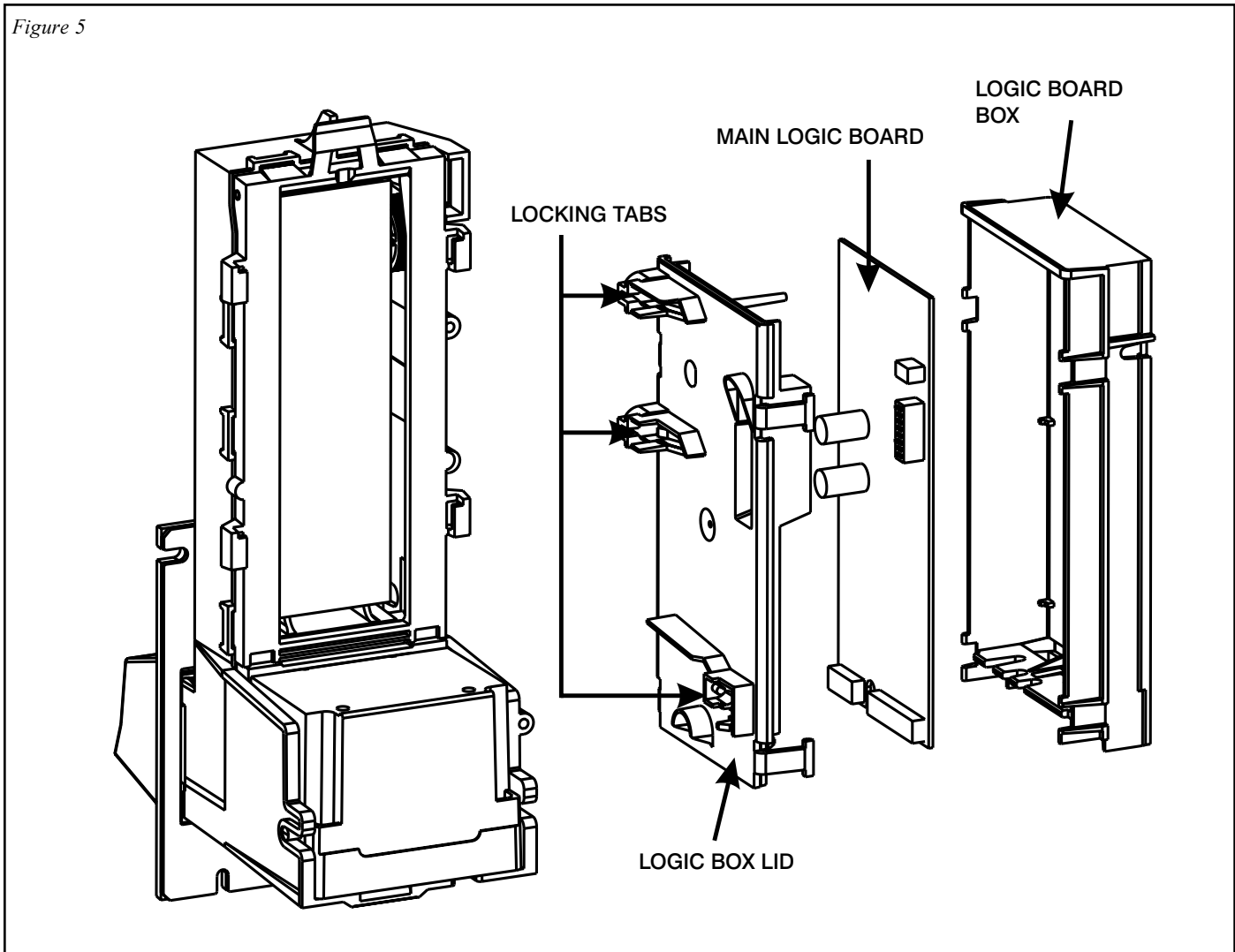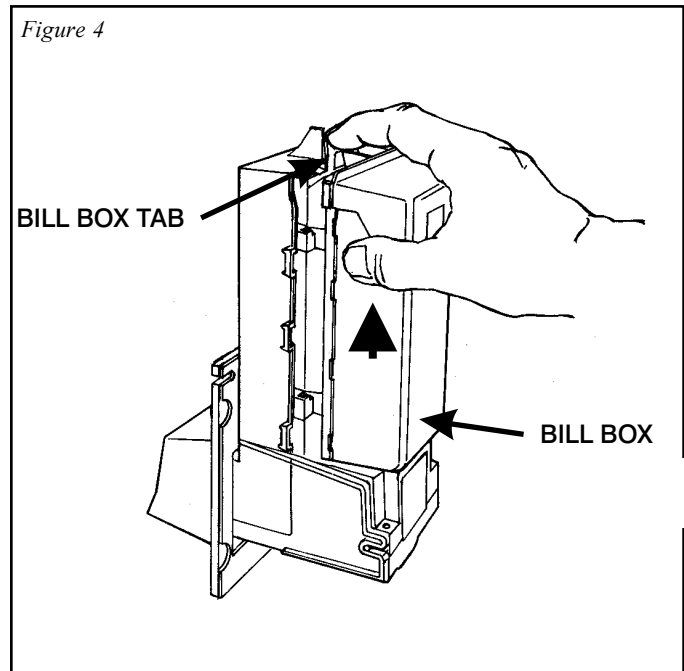
## Removing the Lower Housing
## (see Figure 6)

To remove the lower housing, push the locking tab on the bottom of the bill acceptor and pull the lower housing to the rear.

*Figure 6*



MAINFRAME    LOWER HOUSING    LOCKING TAB
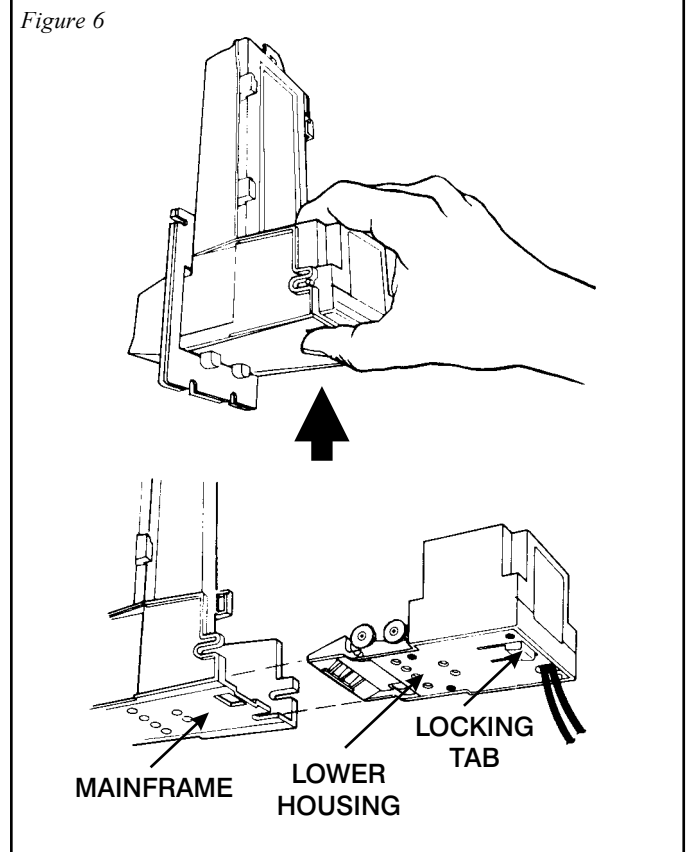
## Removing the Intermediate Frame
## (see Figure 7)

Using a small straight tip screwdriver, free the ten locking tabs which secure the intermediate frame to the main frame and remove the intermediate frame.
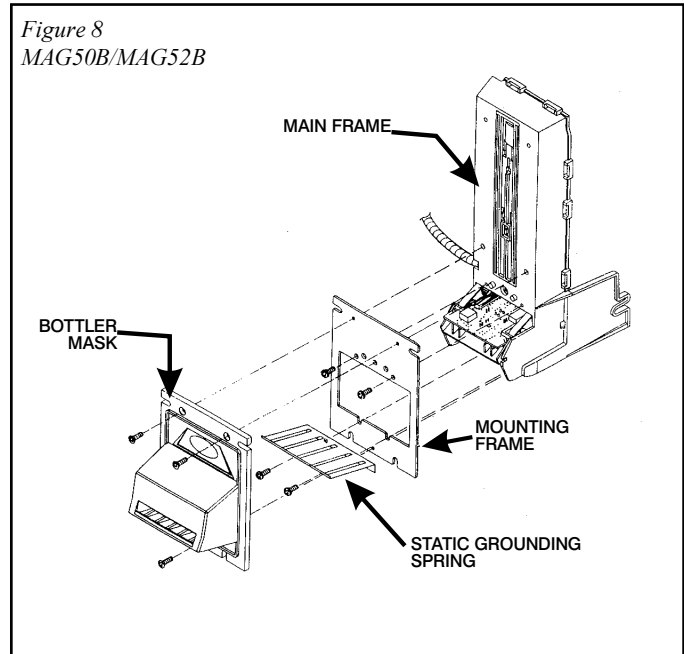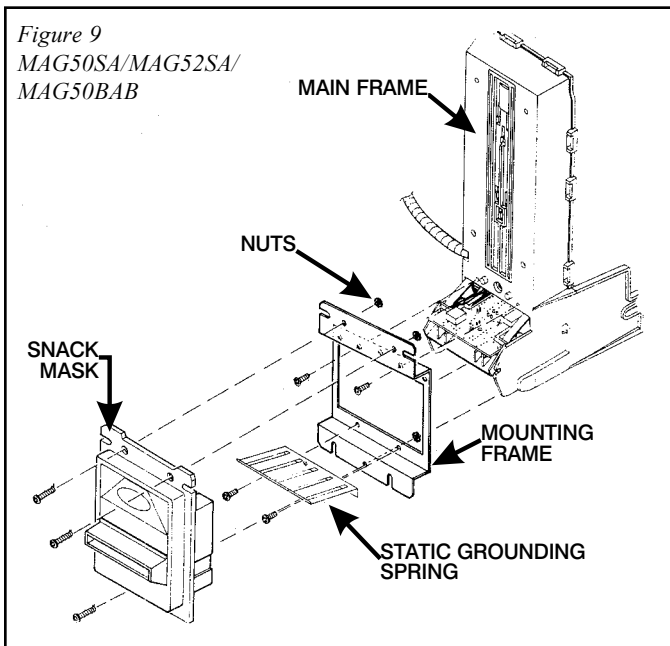
*Figure 7*



INTERMEDIATE FRAME

TAB

LOWER TAB

UPPER LOCKING TAB DETAIL

LOWER LOCKING TAB DETAIL
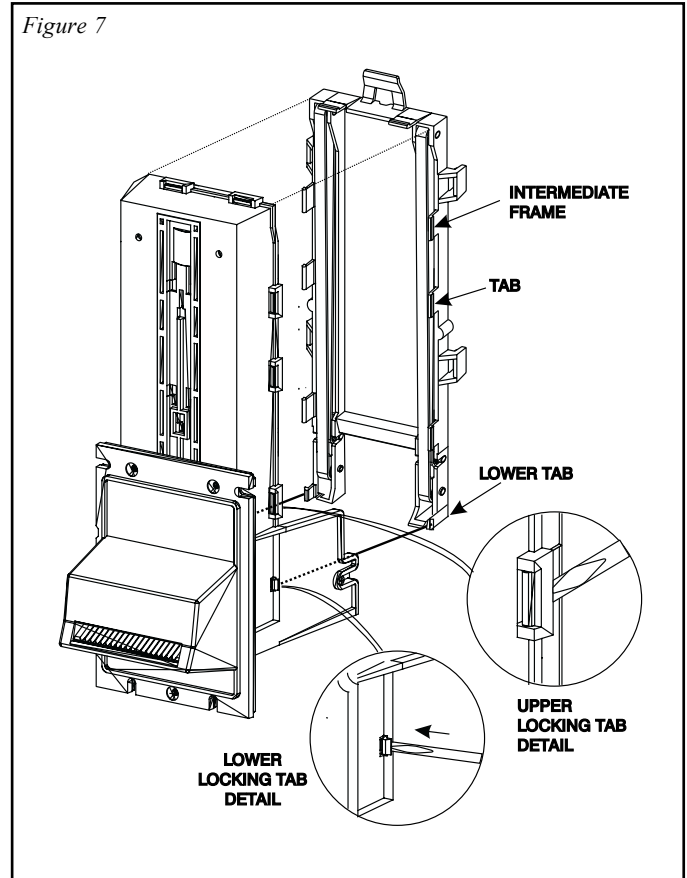
## Removing the Inlet Mask
## (see Figure 8 or 9)

Using a Phillips screwdriver, remove the three screws that secure the mask to the mounting frame.

## Removing the Mounting Frame and Static Grounding Spring (see Figure 8 or 9)

Using a Phillips screwdriver, remove the screws that attach the mounting plate and grounding spring to the main frame.

*Figure 8*
*MAG50B/MAG52B*

MAIN FRAME

BOTTLER MASK

MOUNTING FRAME

STATIC GROUNDING SPRING

*Figure 9*
*MAG50SA/MAG52SA/*
*MAG50BAB*

MAIN FRAME

NUTS

SNACK MASK

MOUNTING FRAME

STATIC GROUNDING SPRING

## Removing the Chassis from the Main-frame (see Figure 10)

Remove the phillips screw securing the chassis to the main frame. Remove the web wrap from the chassis harness. Spread the main frame apart to release the two locating pins of the chassis from the main frame then pull down on the chassis. Carefully feed the chassis harness through the opening in the main frame. Pull the chassis out through the lower main frame opening.
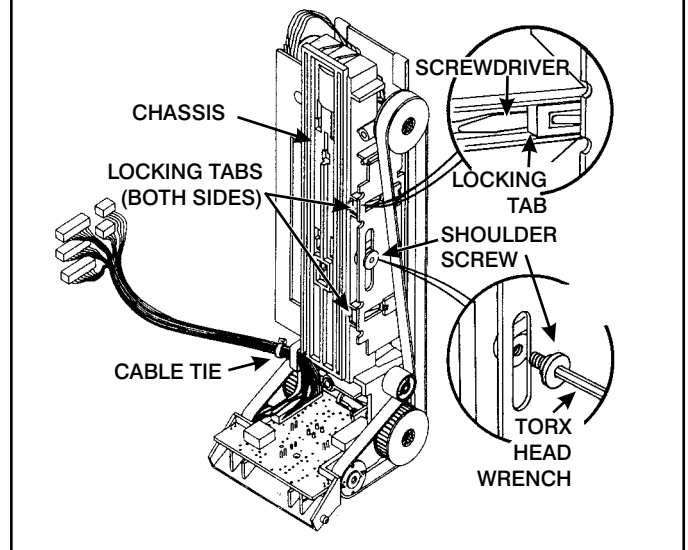
*Figure 10*

CHASSIS

MAIN FRAME
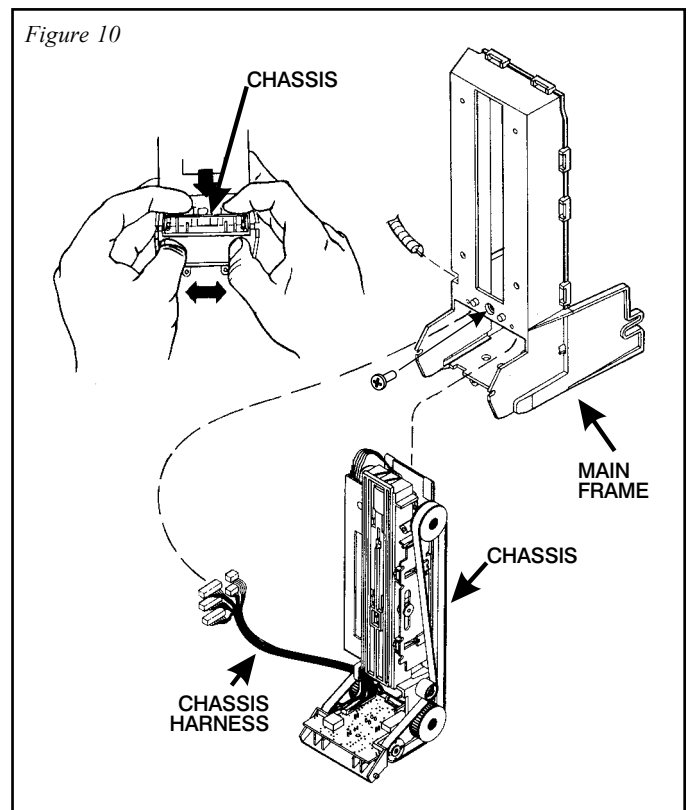
CHASSIS

CHASSIS HARNESS

## DISASSEMBLING THE CHASSIS

### Removing the Pusher Plate from the Chassis (see Figure 11)

Cut the cable tie that secures the chassis harnessing. Remove the two T15 Torx head shoulder screws that secure the pusher plate to the stacker gear box assembly. Pull the pusher plate straight out until the locking tabs of the stacker slides catch the chassis. Using a small screwdriver, release the four tabs and remove the pusher plate.
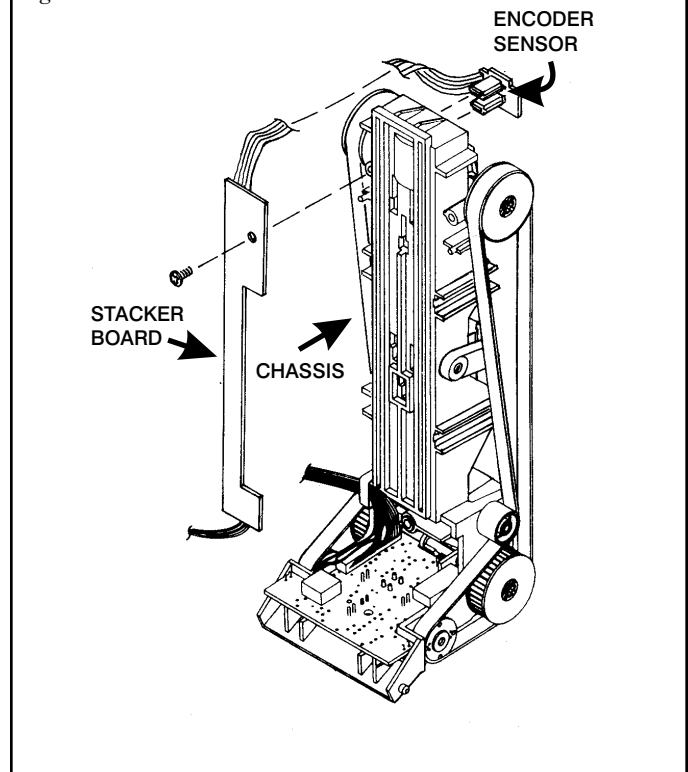
*Figure 11*



### Removing the Encoder Sensor and Stacker Board (see Figure 12)

Remove the encoder wheel dust cover from the transport gearcase and motor assembly.
Free the encoder sensor from the top of the transport motor gear case assembly. Remove the Phillips screw that secures the stacker board to the chassis and remove the stacker board.
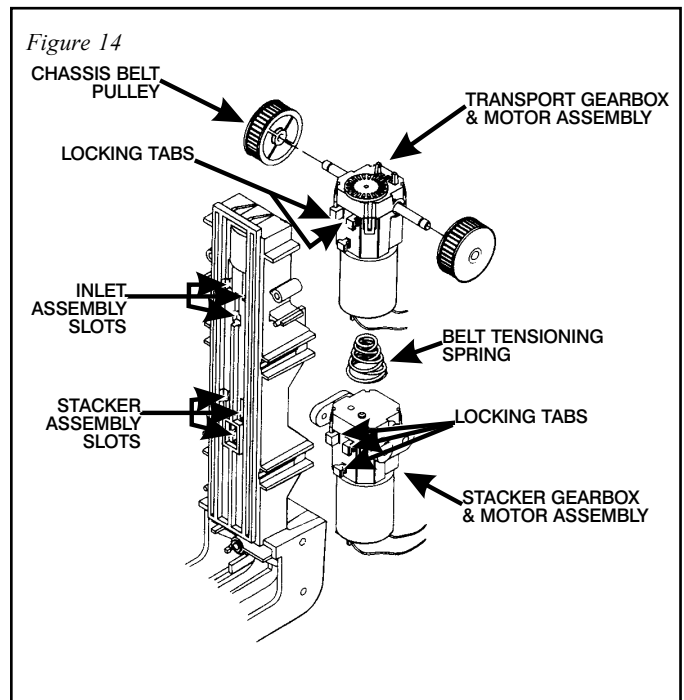
*Figure 12*



15

## Removing the Chassis Belts and Pulleys (see Figure 13)

Compress the belt tensioning spring by pressing down on the transport motor and gear case assembly and remove the belts. Slide the pulleys off the lower shafts to prevent them from falling off.

Figure 13

TRANSPORT MOTOR ASSEMBLY

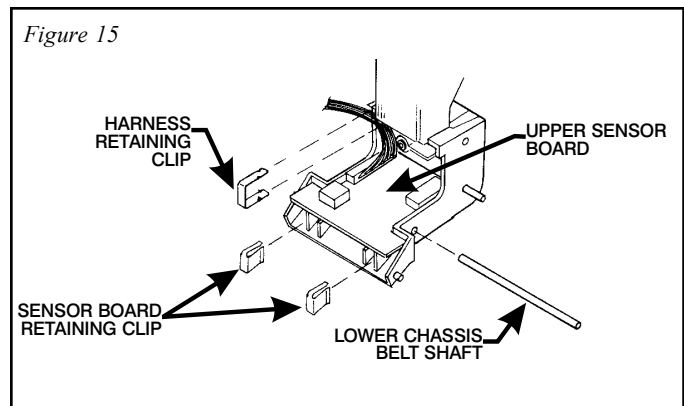CHASSIS BELT

CHASSIS BELT
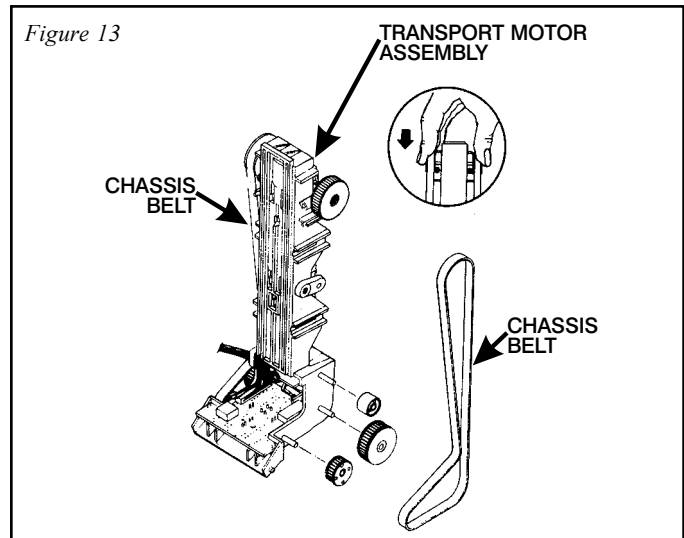
## Removing the Transport and Stacker Motor Assemblies (see Figure 14)

Compress the belt tensioning spring by pushing up on the stacker motor and gear case assembly until the three locking tabs of the gear case can be freed from their mating slots in the chassis. Remove the stacker motor and gear case assembly along with the tensioning spring. Slide the transport motor and gear case assembly down until its three locking tabs are freed from their mating slots on the chassis.

Figure 14

CHASSIS BELT PULLEY

LOCKING TABS

TRANSPORT GEARBOX & MOTOR ASSEMBLY

INLET ASSEMBLY SLOTS

BELT TENSIONING SPRING

STACKER ASSEMBLY SLOTS

LOCKING TABS

STACKER GEARBOX & MOTOR ASSEMBLY

## Removing the Upper Sensor Board from the Chassis (see Figure 15)

Remove the lower chassis belt shaft. Using a small screwdriver, remove the two metal sensor board retaining clips and the harness retaining clip. Lift the front of the sensor board and pull forward.

Figure 15

HARNESS RETAINING CLIP

UPPER SENSOR BOARD

SENSOR BOARD RETAINING CLIP

LOWER CHASSIS BELT SHAFT

## Removing the Chassis Anti-Pullback Lever and Spring (see Figure 16)

Remove the center chassis belt shaft and remove the anti-pullback lever and spring.

*Figure 16*

ANTI-PULLBACK LEVER

CENTER CHASSIS BELT SHAFT

SPRING
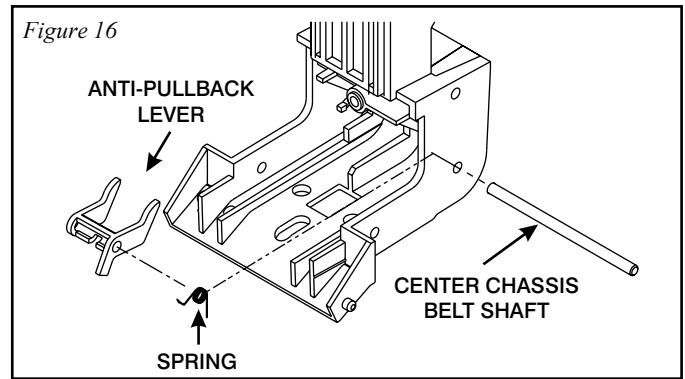
# DISASSEMBLING THE LOWER HOUSING

## Removing the Transformer (see Figure 17)

Remove the two Phillips screws from the bottom of the lower housing that secure the bottom cover. Remove the bottom cover. Cut the cable tie and separate the harness. Remove the hose that holds the transformer in place. Remove the transformer.

*Figure 17*

BOTTOM COVER

TRANSFORMER HOLDING HOSE

TRANSFORMER
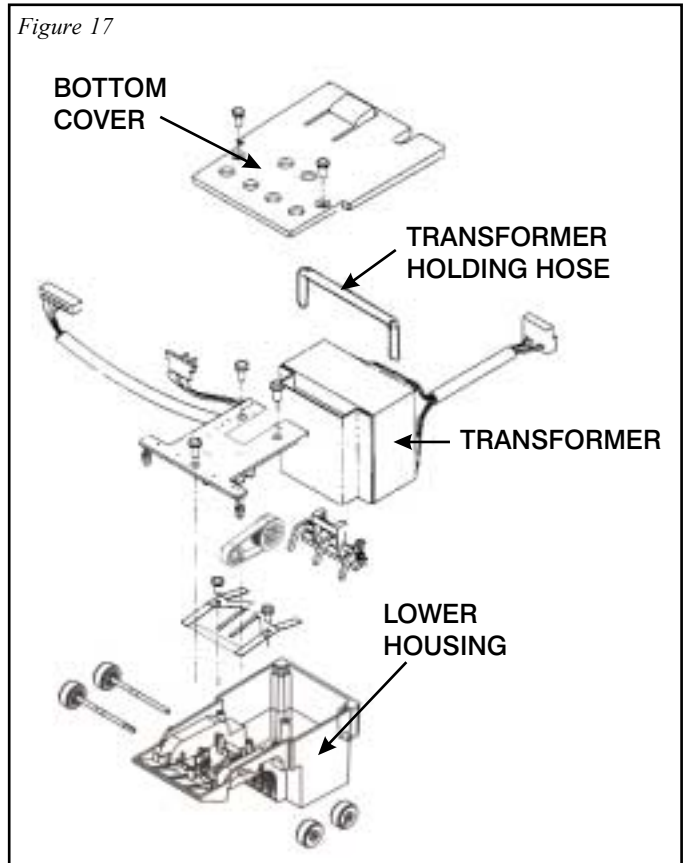
LOWER HOUSING

## Removing the Lower Sensor Board
## (see Figure 18)

Remove the Phillips screw that secures the sensor board to the lower housing, unsnap the lower housing anti-pullback sensor board and remove the lower sensor board.

## Removing the Mag Roller and Spring
## (see Figure 18)

Remove the two Phillips screws that secure the roller spring and remove the spring.

*Figure 18*

LOWER HOUSING
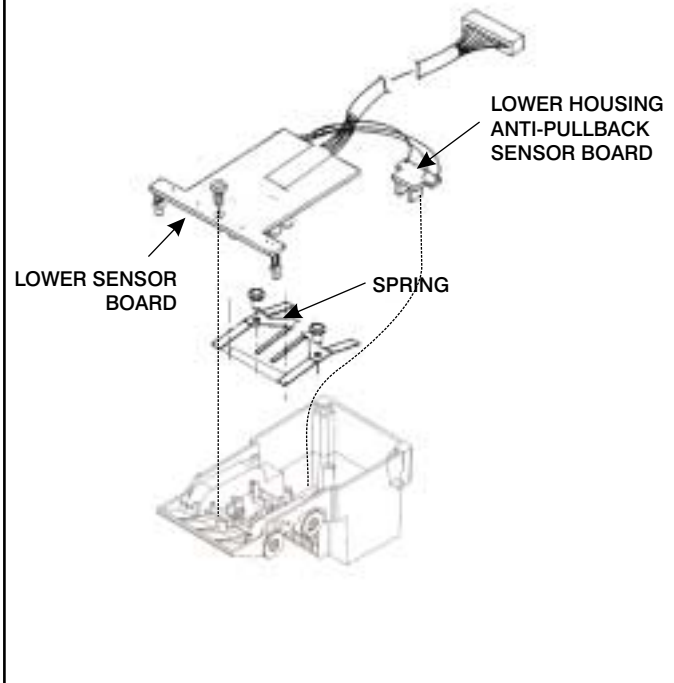ANTI-PULLBACK
SENSOR BOARD

LOWER SENSOR
BOARD

SPRING

## Removing the Lower Housing
## Anti-Pullback Lever and Spring
## (see Figure 19)

Using a small drift or Phillips screwdriver, depress the locking tab in the small hole in top of the lower housing. At the same time, insert a small standard blade screwdriver into the center slot and push the anti-pullback assembly back out of the retaining tabs. Remove the anti-pullback lever from its mount by releasing the locking tabs. Pay close attention to the placement of the spring to assure its correct position on reassembly.

*Figure 19*

ANTI-PULLBACK
MOUNT

ANTI-PULLBACK
LEVER

SPRING
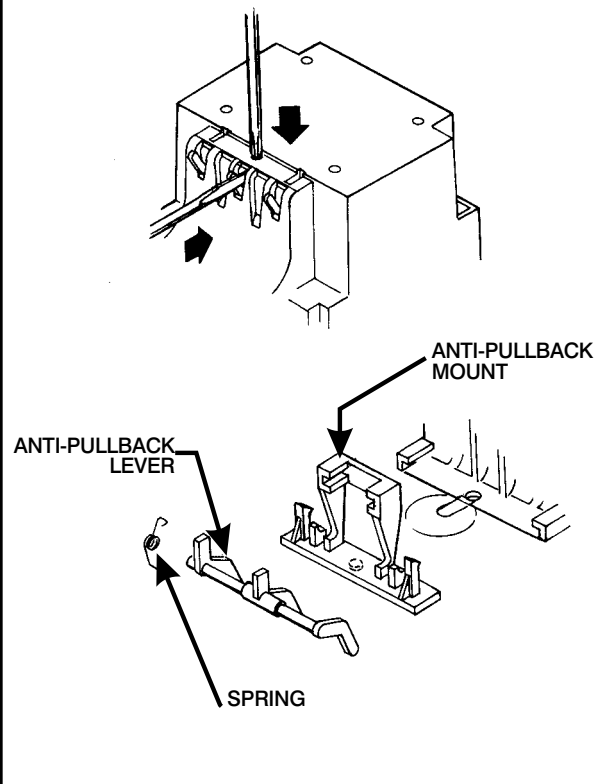
## Removing the Lower Housing Rollers and Pulleys (see Figure 20)

Slide the front pulleys off the shaft.

To remove the center belt, slide the back pulleys off the shaft. Gently tap the back shaft with a small hammer until the shaft splines are free from the center pulley.



*Figure 20*

SHAFT

BACK PULLEY

FRONT PULLEY

# MAG50 CLEANING MAINTENANCE PROCEDURE

*NOTE: Petroleum-based cleaners and freon-based propellants can damage plastic and some electronic components. Scouring pads and stiff brushes may harm the protective coating on the circuit boards and can mar the plastic. These items should never be used when cleaning the MAG bill acceptor.*
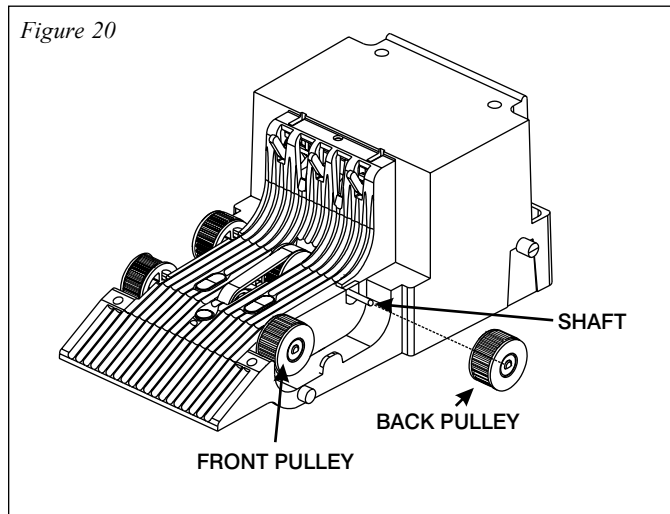
The MAG50 should be cleaned every 20,000 bills or every two years (or as needed, depending on the environmental conditions of the location). Dust can be removed with a soft brush or cloth or it can be blown out using compressed air.

## Procedure

1. Disconnect power from the bill acceptor.
2. Remove the bill box and use a soft cloth to wipe any dust from around the intermediate frame and stacker plate.
3. Remove the lower housing.
4. Using compressed air or a soft brush, blow or brush the dust off of the optic sensors.
5. Remove dust from around the rollers on the lower housing and the sensors on the upper sensor board. The upper sensors are located directly above the lower housing sensors when the lower housing is installed.
6. The bill path can be further cleaned of any dirt or oil by using a soft cloth moistened with a mild soap and water solution.
7. Clean the magnetic head with a cotton swab and isopropyl alcohol.
8. Remove dust from the transport belt areas and any other places of build up.
9. Once the lower housing is dry, place it back into the mainframe making sure the tab on the bottom locks into place.
10. Remount the bill box.
11. Apply power and insert bills to verify the unit is functioning properly.

# MAG50 CLEANING PROCEDURE FOR SALT WATER POLLUTED UNITS

*NOTE: Petroleum-based cleaners and freon-based propellants can damage plastic and some electronic components. Scouring pads and stiff brushes may harm the protective coating on the circuit boards and can mar the plastic. These items should never be used when cleaning the MAG bill acceptor.*

## Procedure

1. Remove power from the bill acceptor.
2. Remove the bill acceptor from the vending machine.
3. Open the bill box lid and verify that the stacker plate is in the standby/home position. If it is not in the home position, apply power and observe that the stacker plate returns home.
4. Remove the bill box.

*WARNING: If moisture is present, allow the unit to dry thoroughly before applying power to avoid possible shock hazard. If the stacker plate does not return to the home position, remove power and carefully remove the bill box to avoid damaging the bill box and/or stacker plate.*

5. Remove the lower housing.
6. Remove the bottom cover from the lower housing.
7. Run hot water (110°-140°F) over the lower housing from the top and bottom. Using a soft brush, gently clean any salt residue. Use a soft, absorbent cloth to clean residue off the lower housing. If the transformer gets wet, allow the unit to dry for 24 hours before applying power.
8. Remove the front mask. Using hot water and a soft brush, clean the front mask, upper sensor board and main frame anti-pullback levers.

*CAUTION: The motors are not protected from water, therefore the unit must be held in a manner that prevents water from running over them.*

9. Verify the anti-pullback levers move freely and that the spring returns them to their extended position.
10. Allow the unit to dry thoroughly.
11. Clean the magnetic head using a swab and isopropyl alcohol.
12. Replace the front mask.
13. Replace the lower housing cover.
14. Place the lower housing into the main frame.
15. Remount the bill box.
16. Apply power and insert bills to verify the unit is functioning properly.

## INTRODUCTION

The Troubleshooting Guide on the following pages is intended to help locate problems within the bill acceptor. If a bill acceptor cannot be repaired by following this guide, return the unit to the nearest Coinco Service Center for repair along with a complete description of the problem you are having with the bill acceptor.

Logic troubleshooting minimizes the time spent in removing and replacing parts that are not defective. Some failures are caused by minor problems such as dirt or loose/faulty connections. Please check the following before replacing any parts:

• Clean any dirt or dust from the bill path.
• Coin changer inventory tubes are filled to their correct levels.
• Connectors are inserted correctly.
• Connector pins are not bent or broken.
• All wires are properly secured.

## MAG50 DIAGNOSTIC CODES

Troubleshooting can be done by reading the number of flashes or blinks of light from the LED located inside the logic board cover. These flashes can be seen through the gray cover.

Diagnostic codes 2, 8, 14, and 18 are not used. Codes 1, 3, 4, 5, 15, 16 may appear during normal servicing of the MAG50. If the MAG is flashing a #5 code, turn off power to the MAG for 10 seconds. Reapply power to the MAG50 and diagnostic codes 6, 7, 9, 10, 11, 12, 13, and 17 will appear for approximately 30 seconds. After 30 seconds these codes will revert back to the #5 code. If more than one error exists, the lower number code will appear until its condition is corrected. The left and right sensors referenced in the next column are given viewing the MAG50 from the front.

NOTE: With software 67090 and 67126, diagnostic code #4 (4 flashes) will not appear if all bill accept switches are off.

| # Of Flashes | Description of Diagnostic Codes |
|---|---|
| 1 | Bill Box Full |
| 2 | (Not Used) |
| 3 | Check Bill Path |
| 4 | All Bill Accept Switches Are Off |
| 5 | Check Optical Sensors |
| 6 | Stacker Motor/Home Sensor |
| 7 | Transport Motor/Encoder Sensor |
| 8 | (Reserved for Future Use) |
| 9 | EEPROM Check Sum Error |
| 10 | RAM or ROM Check Sum Error |
| 11 | Center Optic Sensor |
| 12 | Right Optic Sensor |
| 13 | Left Optic Sensor |
| 14 | (Not Used) |
| 15 | Right position Sensor |
| 16 | Left Position Sensor |
| 17 | Lower Board Anti-Pullback Lever Sensor |
| 18 | (Not Used) |



*Figure 21*

DIAGNOSTIC CODE FLASHES HERE

Three Blinks → Switch power off, then on → Does stacker cycle?
- YES → Check for pull back lever obstruction or unit salting
- NO → Check stacker motor

*Two Blinks → NOT USED

One Blink → Remove bills from cash box and close cash box → Does LED blink once?
- YES → Check for obstruction or defective stacker motor or stacker home sensor
- NO → If less than 200 typical bills, check stacker mechanism

No LED or No Blinks → Switch power off, then on → Does LED blink?
- YES → Check machine interface or L6 opto circuit on main logic
- NO → Check for power to logic board or check harness

## Seven Blinks

Seven Blinks → Remove power, wait 10 seconds and reapply power → **Does transport motor cycle?**

- YES → Check encoder wheel circuit or transport motor and circuit
- NO → Check for power to logic board or check harness

## Six Blinks

Six Blinks → Open cash box lid and inspect push plate → **Is push plate home?**

- YES → Check stacker motor and circuit or stacker home sensor
- NO → Check stacker home sensor

## Five Blinks

Five Blinks → Open cash box lid and remove power for 10 seconds and reapply power → **Does LED blink five times?**

- YES → Switch power off, then on again. Wait 20 sec.
- NO → Check all connectors in logic box & look for assembly problems or look at other flash codes

## Four Blinks*

Four Blinks* → Enable at least one bill type → **Does LED blink?**

- YES → Check dip switch for open or associated circuits
- NO → Correct operation

*Does not apply to sofware 67090 and 67126

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## Eleven Blinks

```
Eleven Blinks → Is bill path blocked?
    YES → Remove blockage & reassemble unit → Does LED blink?
        YES → Clean sensors or check diagnostics of all sensors
        NO → Clean sensors and test unit with several bills
    NO → (to Remove blockage & reassemble unit path)
```

## Ten Blinks

```
Ten Blinks → Remove and reapply power → Does LED blink?
    YES → Replace microprocessor
    NO → Check power supplies and possible replace micro-processor
```

## Nine Blinks

```
Nine Blinks → Recalibrate unit optics → Does LED blink?
    YES → Check calibration again or replace
    NO → Check sensor calibration for proper values
```

## Eight Blinks

```
Eight Blinks → Not Used
```

## Fifteen Blinks

Fifteen Blinks → Is bill path blocked?

- YES → Remove blockage & reassemble unit → Does LED blink?
  - YES → Clean sensors or check for bent sensors or check diagnostics of all sensors
  - NO → Clean sensors or check for bent sensors and test unit with several bills
- NO → (to Does LED blink?)

## *Fourteen Blinks

*Fourteen Blinks → NOT USED

## Thirteen Blinks

Thirteen Blinks → Is bill path blocked?

- YES → Remove blockage & reassemble unit → Does LED blink?
  - YES → Clean sensors or check diagnostics of all sensors
  - NO → Clean sensors and test unit with several bills
- NO → (to Does LED blink?)

## Twelve Blinks

Twelve Blinks → Is bill path blocked?

- YES → Remove blockage & reassemble unit → Does LED blink?
  - YES → Clean sensors or check diagnostics of all sensors
  - NO → Clean sensors and test unit with several bills
- NO → (to Does LED blink?)

**Eighteen Blinks** → Not Used

**Seventeen Blinks** → Is bill path blocked?
- YES → Remove blockage & reassemble unit → Does LED blink?
  - YES → Clean and check smooth actuation of chassis lever, check to see if board is seated into mount properly or check all sensors with diagnostics
  - NO → Clean and check smooth actuation of chassis lever, check to see if board is seated into mount properly and test unit with several bills
- NO → Remove blockage & reassemble unit

**Sixteen Blinks** → Is bill path blocked?
- YES → Remove blockage & reassemble unit → Does LED blink?
  - YES → Clean sensors or check for bent sensors or check diagnostics of all sensors
  - NO → Clean sensors or check for bent sensors and test unit with several bills
- NO → Remove blockage & reassemble unit

### MAIN FRAME
MAG50B/MAG52B/MAG52BX

| ITEM NO. | PART NO. | DESCRIPTION | QTY. | NOTES |
|---|---|---|---|---|
| 1 | 921401 | Screw | 3 | |
| 2 | 922013 | Bottler Mask | 1 | Pad Printed, no decal required |
| 3 | 345-6R6 | Screw | 5 | |
| 4 | 920807-2 | Main Frame | 1 | |
| 5 | 920065-2 | Mounting Frame | 1 | |
| 6 | 921357 | Grounding Spring | 1 | |

## MAIN FRAME
MAG50SA/MAG52SA
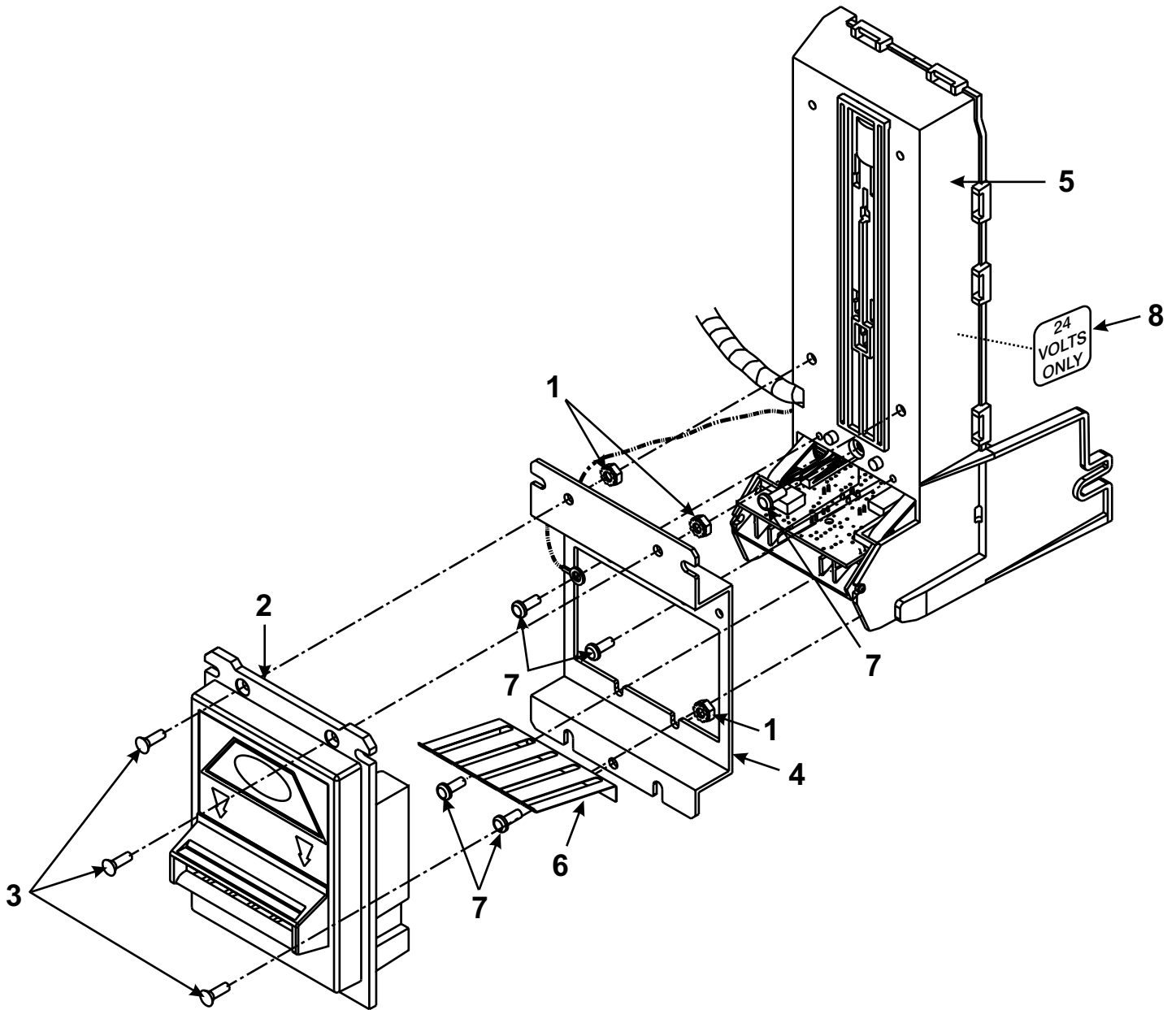
| ITEM NO. | PART NO. | DESCRIPTION | QUANTITY | NOTES |
|---|---|---|---|---|
| 1 | 438-6 | Nut & Lockwasher | 3 | #6-32 |
| 2 | 922015 | Snack Mask | 1 | Pad printed, no decal required |
| 3 | 921401 | Screw | 3 | |
| 4 | 921492 | Mounting Frame | 1 | |
| 5 | 920807-2 | Main Frame | 1 | |
| 6 | 921357 | Grounding Spring | 1 | |
| 7 | 345-6R6 | Screw | 5 | |
| 8 | 902224 | 24 VOLTS Decal | 1 | Used on MAG52SA, MAG52BAB, MAG52BX units |

# LOWER HOUSING ASSEMBLY

MAG50B
407973

MAG52BX
408040

MAG50SA
407973-1

MAG52SA
408156
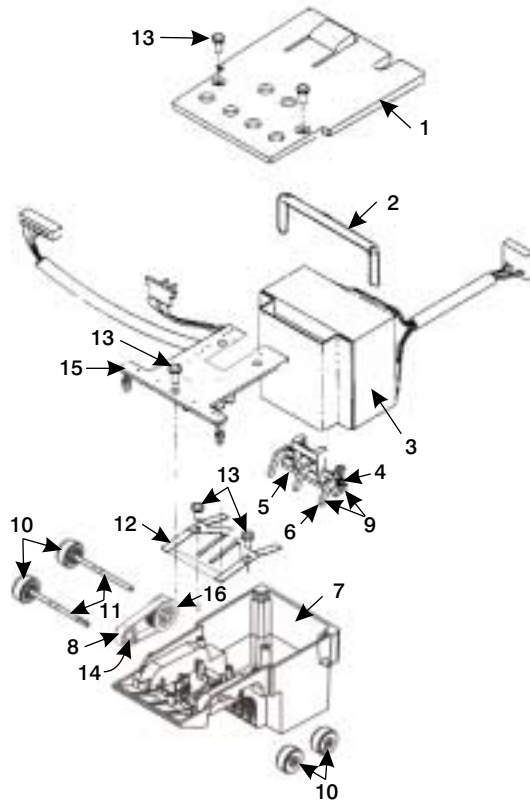
| ITEM NO. | PART NO. | DESCRIPTION | QTY. | NOTES |
|---|---|---|---|---|
| 1 | 921704 | Bottom Cover | 1 | |
| 2 | 921613 | Transformer Holding Hose | 1 | For 110VAC units only |
| 3 | 921798-1 | MAG50B Transformer & Shield | 1 | For 110VAC units only |
| | 921798-2 | MAG50SA Transformer & Shield | 1 | For 110VAC units only |
| 4 | 920889 | Anti-Pullback Lever Spring | 1 | |
| 5 | 920819-1 | Anti-Pullback Lever Mount | 1 | |
| 6 | 920818 | Anti-Pullback Lever | 1 | |
| 7 | 407977 | Lower Housing & Lens Assy. | 1 | Includes 920806-4 with Lenses |
| | 920806-4 | Lower Housing Frame | 1 | |
| 8 | 923403 | Center Belt | 1 | |
| 9 | 407936 | Anti-Pullback Lever & Mount Assy. | 1 | Includes #5 & #6 |
| 10 | 408165-1 | Pulley and Tire Assy. | 4 | Used in place of lower housing belts (#9) |
| 11 | 923080 | Drive Shaft | 2 | |
| 12 | 923102 | Mag Spring | 1 | |
| 13 | 345-4R4 | Screw, #4 x ¼ PH Plastite | 5 | |
| 14 | 923101 | Idler Roller | 1 | |
| 15 | 407245-18 | Lower Sensor Board | 1 | |
| | 407245-19 | MAG50SA/MAG52SA Lower Sensor Bd. | 1 | |
| 16 | 408056 | Pulley and Hub Assy. | 1 | |
| 17 | 906303 | Cable Tie | 1 | 6" Not shown |

# CHASSIS ASSEMBLY

MAG50B/MAG52BX
407975

MAG50SA/MAG52SA/MAG50BAB
407975-2
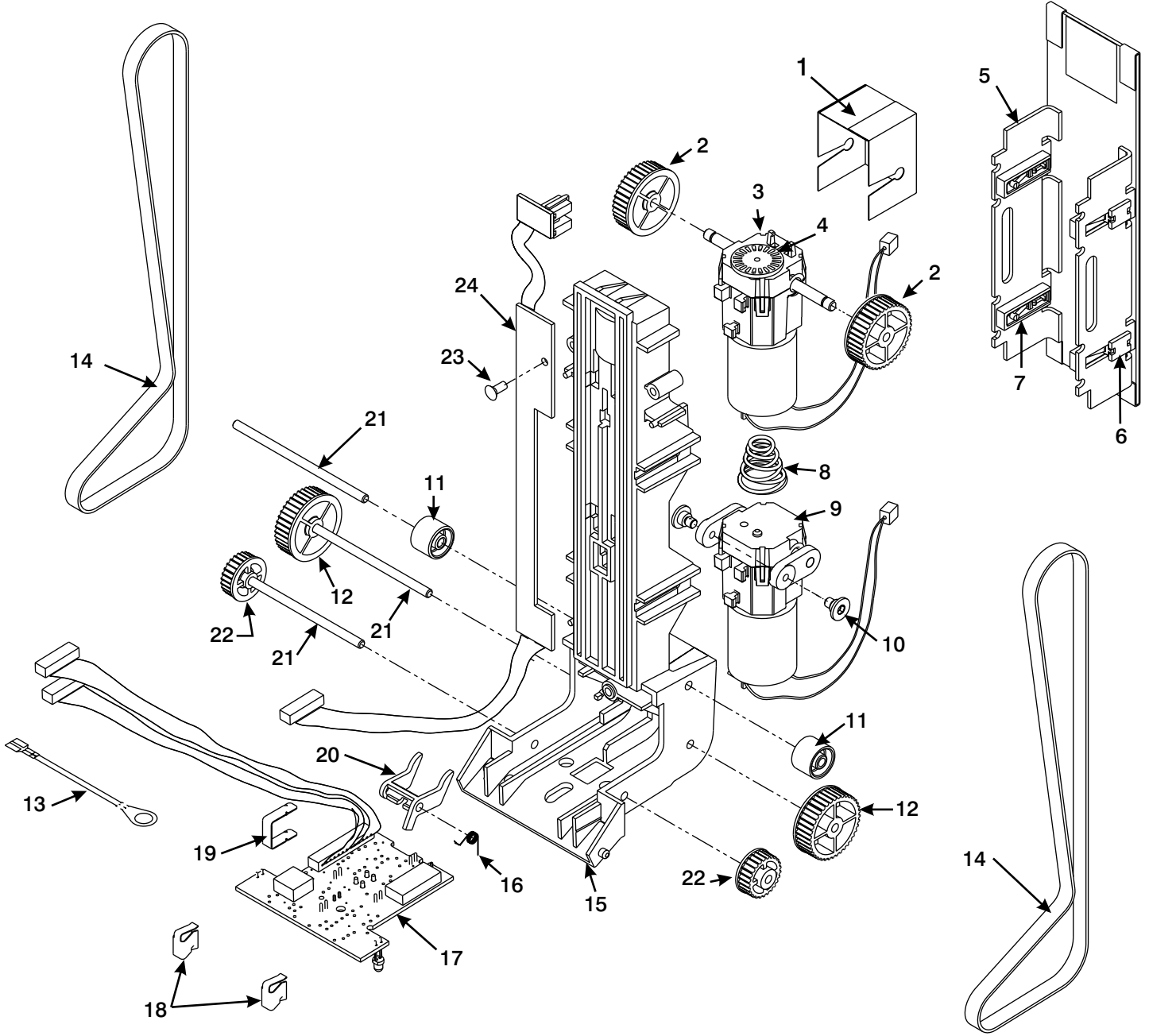
# SECTION 6:  PARTS LIST

| ITEM NO. | PART NO. | DESCRIPTION | QTY. | NOTES |
|---|---|---|---|---|
| 1 | 923770 | Dust Cover | 1 | |
| 2 | 408054 | Upper Transport Pulley & Hub Assy. | 2 | |
| 3 | 407254-1 | Transport Motor Gearbox Assy | 1 | For MAG50B, MAG52B, MAG52BX, includes #4 |
| | 407254-2 | Transport Motor Gearbox Assy. | 1 | For MAG50SA, MAG52SA, includes #4 |
| 4 | 920000-3 | Encoder Wheel | 1 | |
| 5 | 407952 | Plastic Stacker Pushplate Assy. | 1 | Includes #6 & #7 |
| 6 | 920836 | Stacker Cap | 4 | |
| 7 | 920833-1 | Stacker Slide | 4 | |
| 8 | 921387 | Belt Tension Spring | 1 | |
| 9 | 407253-1 | Stacker Motor Gearbox Assy. | 1 | For MAG50B, MAG52B, MAG52BX |
| | 407253-2 | Stacker Motor Gearbox Assy. | 1 | For MAG50SA, MAG52SA |
| 10 | 920834-1 | Pushplate Bearing Screw | 2 | |
| 11 | 920829-1 | Idler Pulley | 2 | |
| 12 | 408055 | Lower Transport Pulley & Hub Assy. | 2 | |
| 13 | 407454 | Ground Wire | 1 | For MAG50B/MAG52B, MAG52BX |
| | 407454-1 | Ground Wire | 1 | For MAG50SA, MAG52SA |
| 14 | 921403 | Chassis Belt | 2 | Black |
| 15 | 407974 | Chassis & Lens Assy. | 1 | Includes 920821-4 with lenses |
| | 920821-4 | Upper Housing Chassis | 1 | Without lenses |
| 16 | 920889 | Anti-Pullback Spring | 1 | |
| 17 | 407244-10 | Upper Sensor Board | 1 | For MAG50B, MAG52B, MAG52BX |
| | 407244-15 | Upper Sensor Board | 1 | For MAG50SA, MAG52SA |
| 18 | 920827 | Upper Board Clip | 2 | |
| 19 | 921128 | Wire Clip | 1 | |
| 20 | 920828-1 | Anti-Pullback Lever | 1 | |
| 21 | 920040 | Pulley Shaft | 3 | |
| 22 | 408057 | Inlet Pulley & Hub Assy. | 2 | |
| 23 | 345-4R4 | Screw | 1 | #4 x 1/4 PH Plastite |
| 24 | 408031 | Stacker Board | 1 | For MAG50B, MAG52B, MAG52BX |
| | 408031-4 | Stacker Board | 1 | For MAG50SA/MAG52SA |
| 25 | 901358 | 4" Cable Tie | 2 | Not shown |
| 26 | 407796 | Lens Kit | 1 | Contains 100 sets of lenses--not shown |

## LOGIC BOARD AND CASE ASSEMBLY
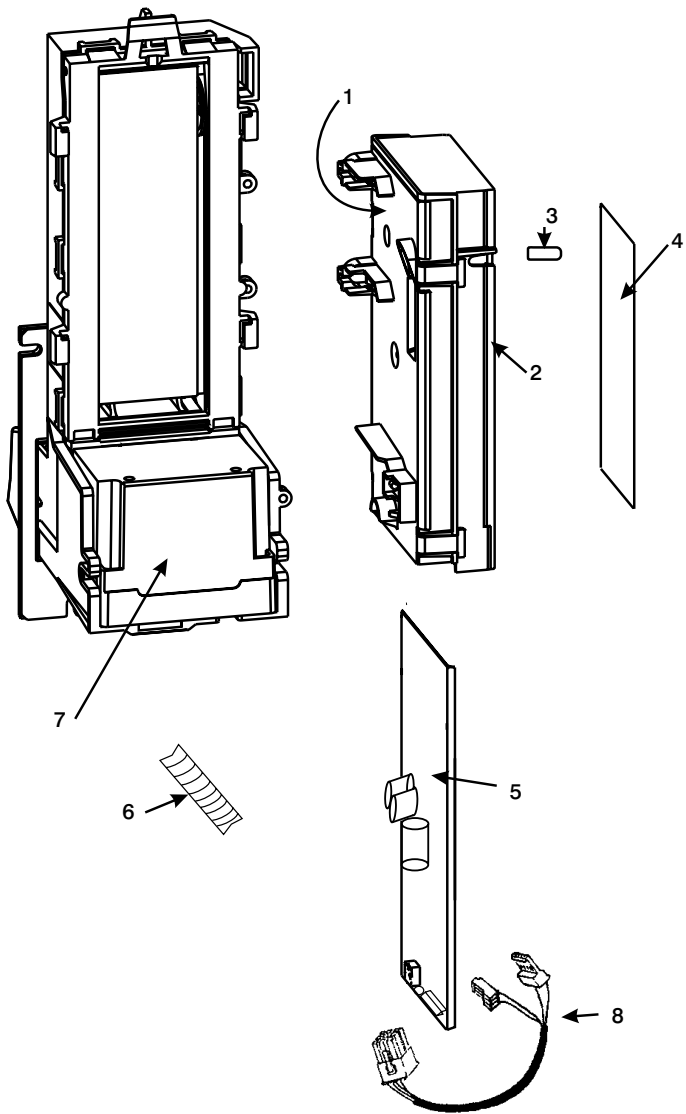


| ITEM NO. | PART NO. | DESCRIPTION | QTY. | NOTES |
|----------|----------|-------------|------|-------|
| 1 | 922804 | Logic Box Lid | 1 | |
| 2 | 408066 | Logic Box Assembly | 1 | Includes #3 and #4, For MAG50B, MAG52BX |
| | 408066-1 | Logic Box Assembly | 1 | Includes #3 and #4, For MAG50SA, MAG52SA |
| | 922694 | Logic Box | 1 | |
| 3 | 922563 | Clear Decal | 1 | |
| 4 | 923388 | MAG Decal | 1 | MAG50B, MAG52BX |
| | 923389 | MAG Snack Decal | 1 | MAG52SA, MAG52SA |
| 5 | 407982 | MAG50B Logic Board | 1 | Replace with 408049 |
| | 407982-1 | MAG52BX Logic Board | 1 | Replace with 408049-1 |
| | 408064 | MAG50SA/52SA Logic Board | 1 | 67126 Software |
| | 408064-1 | MAG50SA/52SA Logic Board | 1 | 67155 Software |
| | 408049 | MAG50B Logic Board | 1 | |
| | 408049-1 | MAG52BX Logic Board | 1 | |
| | 408049-2 | MAG52B Logic Board | 1 | |
| 6 | 921707 | 1/2" Expandable Sleeving | ~ | Order quantity in feet |
| 7 | 909729-2 | Identification Label | 1 | |
| 8 | 407473 | MAG50SA Power Harness | 1 | |
| | 407474 | MAG52SA Power Harness | 1 | |
| 9 | 906303 | 6" Cable Tie | 3 | |

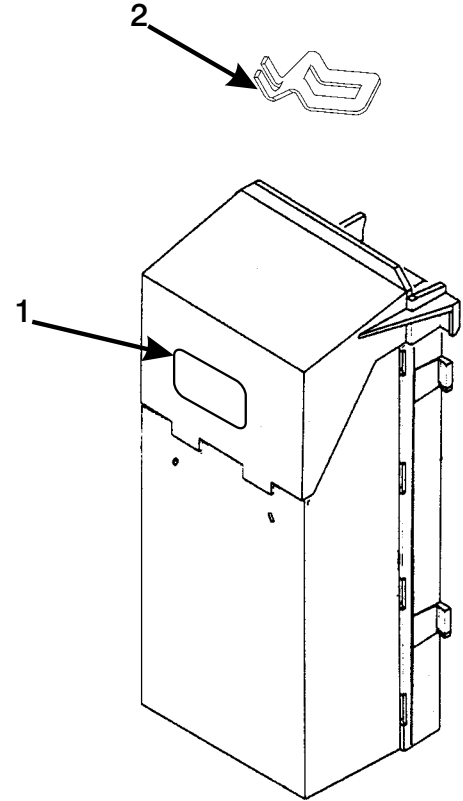## INTERMEDIATE FRAME ASSEMBLY
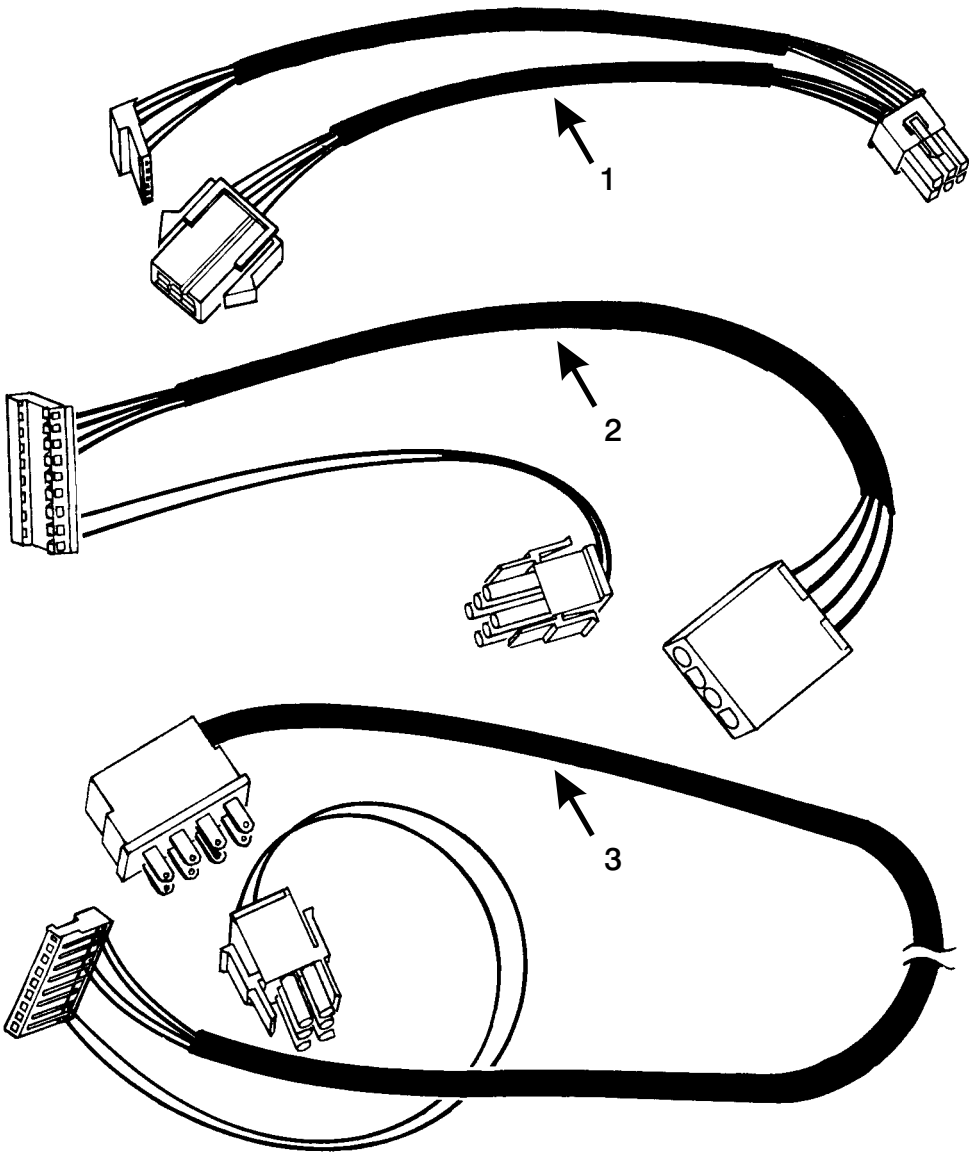(407247-3)
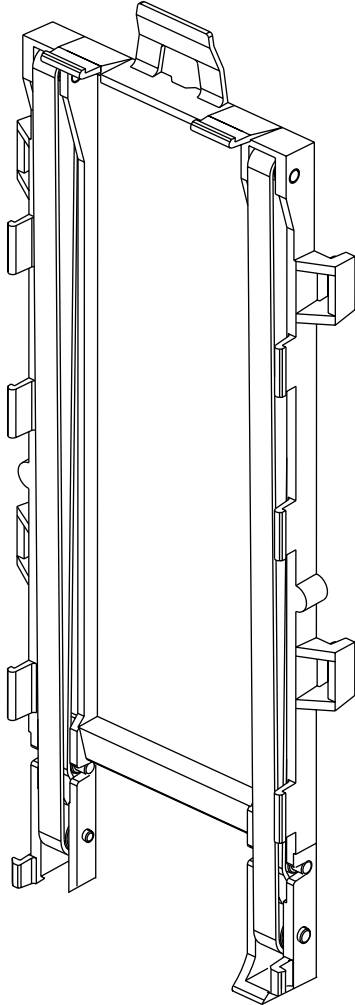
## CASHBOX ASSEMBLY
(407251 - 300 Capacity)
(407763 - 450 Capacity)
(407763-1 - 650 Capacity)

| ITEM NO. | PART NO. | DESCRIPTION | QUANTITY | NOTES |
|---|---|---|---|---|
| 1 | 909213 | U.S. Flag Decal | 1 | |
| 2 | 922405 | Lock Bracket | 1 | Option |

# HARNESSES



| ITEM NO. | PART NO. | DESCRIPTION | QUANTITY | NOTES |
|----------|----------|-------------|----------|-------|
| 1 | 407420 | MDB Harness | 1 | |
| 2 | 407419-1 | Electronic Harness | 1 | For MAG50B Only |
| 3 | 407052-1 | Single Price Harness | 1 | For MAG50B Only |

# SECTION 6: PARTS LIST

## Interface Harnesses

### Bill Acceptor-to-Vendor Harnesses

| | |
|---|---|
| 406958 | Connects a MAG30B to a Royal Merlin II Version 2, mates to 407419-1 |
| 407179-1 | Connects a MAG30B to a Royal Merlin II, Version 5 and non-MDB GII, replaced by 407604, mates to 407419-1 |
| 407379 | Connects a MAG30B to a Dixie Narco MPC (4 ft. long), mates to 407419-1 |
| 407380 | Connects a MAG30B to a Vendo Electronic vendor, replaced by 407603, mates to 407419-1 |
| 407420-1 | Connects a MAG30B to MDB (Multi-Drop Bus) vending machines (15" long) |
| 407518 | Connects a MAG30B to a Dixie Narco SII vendor |
| 407518-1 | Connects a MAG30B to a Dixie Narco SII-D vendor |
| 407518-2 | Connects a MAG30SA to a Dixie Narco SII-D vendor, replaced by 407518-3 |
| 407518-3 | Connects a MAG30SA to a Dixie Narco S2-D vendor, allows $5.00 acceptance |
| 407529 | Interface harness--Connects a MAG30SA to a Rowe 548 and 550 vendor, used with 407530 |
| 407529-1 | Conntects a MAG32R to a Rowe 650 vendor, used with 407903 |
| 407530 | Power harness--Connects a MAG30SA to a Rowe 548 & 550 vendor, used with 407529 or 407535 |
| 407535 | Interface harness--Connects a MAG30SA to a Rowe 5900 vendor, used with 407530 |
| 407561 | Connects a MAG30SA to an A.P. 110 Series vendor |
| 407562 | Connects a MAG32SA to an A.P. LCM Series vendor, replaced by 407993 |
| 407563 | Connects a MAG32SA to an A.P. 110 Series vendor and 203 and 213 Hot Drink vendors |
| 407569 | Connects a MAG30SA or BA32SA to an A.P./RMI 211 Hot Drink vendor |
| 407573 | Connects a MAG30SA to an A.P. 6000 and 7000 vendor |
| 407581-1 | Connects a MAG30SA to a National Vendors Hot Drink Center (3 ft. long) |
| 407581-2 | Connects a MAG30SA to a National Vendors Snack/Refreshment Center (5 ft. long) |
| 407597 | Connects a MAG32SA to a Polyvend 700 Series snack vendor |
| 407597-1 | Connects a MAG32SA to a Polyvend 705 snack vendor |
| 407598 | Connects a MAG30SA to a Polyvend can drink vendor (14" long) |
| 407598-1 | Connects a MAG30SA to a R-O International can drink vendor (40" long) |
| 407603 | Connects a MAG30B to a Vendo Univendor and Sales Manager drink vendor (26" long) |
| 407603-1 | Connects a MAG30B to a R-O International can drink vendor (40" long) |
| 407604 | Connects a MAG30B to a Royal Merlin II, Version 5 vendor |
| 407633 | Interface harness--Connects a MAG30SA to a Snackmart 3 vendor, used with 407634 |
| 407634 | Power harness--Connects a MAG30SA to a Snackmart 3 vendor, used with 407633 |
| 407700 | Connects a MAG30SA to a Royal Merlin II, Version 5 and a Merlin III vendor |
| 407827 | Connects a MAG32B to the 4-pin and 6-pin connectors (24V) used in Lance vendors |
| 407903 | Power harness--Connects a MAG32R to a Rowe 650 vendor, used with 407529-1 |
| 407919 | Connects a MAG32R to a Ticket vendor |
| 407945 | Connects a MAG30 to a Wurlitzer jukebox (12" long) |
| 407993 | Conncect a MAG32SA to an AP LCM vendor, allows $5.00, $10.00, $20.00 acceptance |

### Bill Acceptor-to Coin Changer Harnesses

| | |
|---|---|
| 406818-1 | Connects a 9340-L to a MAG30B (15' long) |
| 406878 | Connects a 9342-L to a MAG30BE (4 1/2' long) |
| 406890 | Connects a 9360-S or 9370-S or 3341-S to a MAG30SA |

### Bill Acceptor Miscellaneous Harnesses

| | |
|---|---|
| 406865 | 13' extension harness for MAG30BE |
| 407566 | Enable Plug for MAG30SA, MAG32SA, and MAG32R (18-pin plug, ties pins 4 and 12 together) |
| 407567 | Inverts the polarity of the credit lines for a MAG30SA and MAG32SA |
| 407648 | BAFP to bill acceptor harness |
| 407948 | RS232 interface board to MAG30 MDB (flat 6 pin) connector (3 ft. long) |
| 407948-1 | RS232 interface board to MAG30 MDB (flat 6 pin) connector (5 ft. long) |