

# PrecisionCounter™ 500



## Service Manual

Revision 1.12089

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Column

Ticket Gate & Metal Ticket Gate Edge

**page 34** Adjusting the ticket gate

Metal - Ticket Guide

**page 28** Adjusting the metal ticket guide

Plastic - Main Body

LCD Assembly (display)

**page 38** Replacing the LCD assembly

Keypad

**page 37** Replacing the keypad

Square Pushbutton Switch

**page 36** Replacing the square pushbutton switch

\* For replacements: contact the Arrow Technical Assistance Center, at 800.277.6214 and refer to the part name. A technician will provide you with the current part number or will place an order for that part





Thumb Nut 6-32 - Knurled Brass

page 34

Adjusting the ticket gate

Metal - Film Retainer

page 31

Adjusting the mylar ticket deflector

Mylar - Ticket Deflector

page 32

Replacing the mylar ticket deflector

Ticket Catcher Assembly (hopper)

page 30

Adjusting the ticket catcher assembly

Ticket Catcher Optical Sensor

page 33

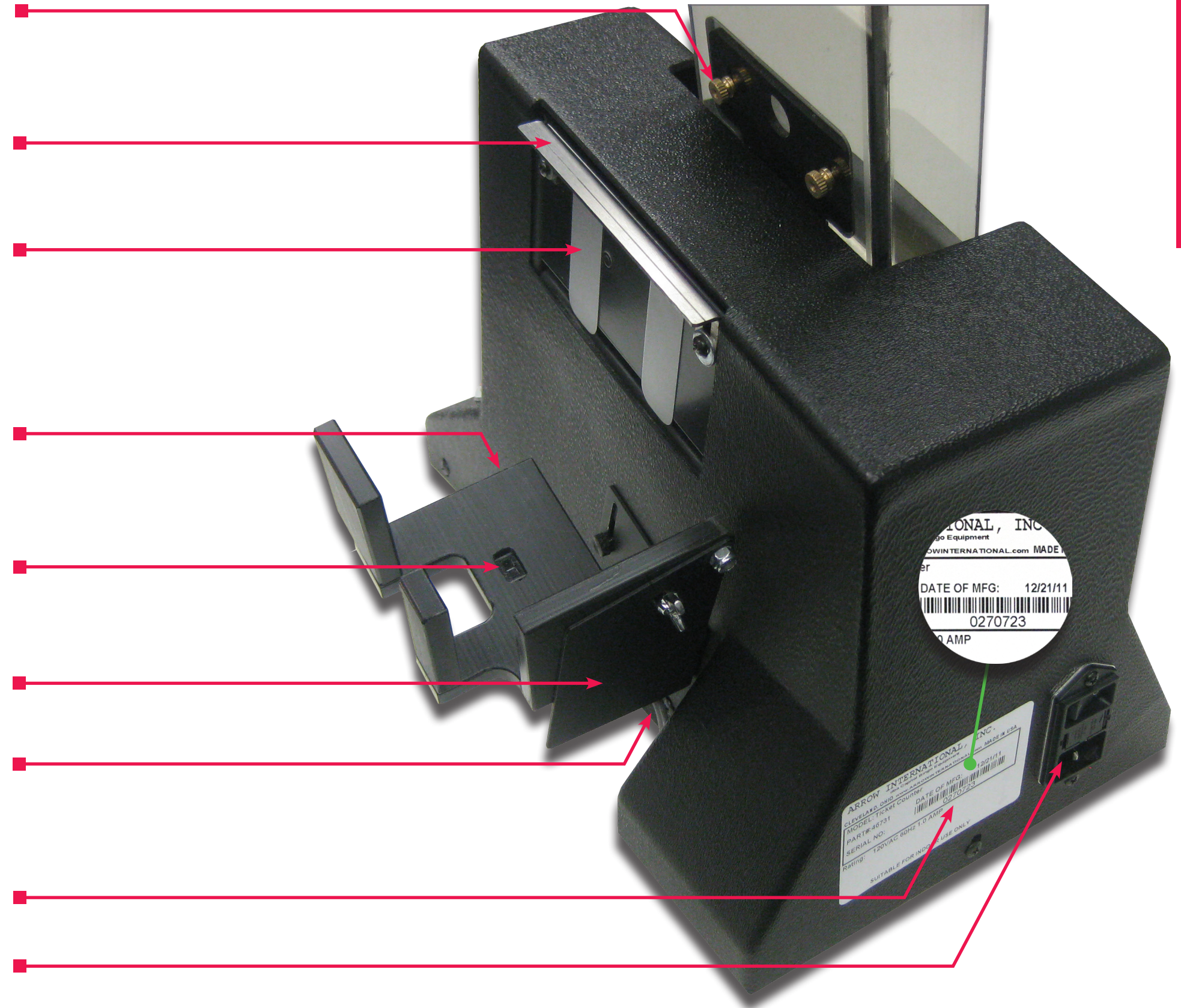
Replacing the ticket catcher sensor

Metal - Mounting Bracket for the Ticket Catcher Assembly

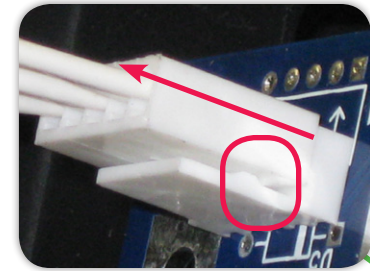
Wire Harness for the Ticket Catcher Optical Sensor

Serial number of the ticket counter:  
Have available when calling the Technical Assistance Center

Power Entry Module (the fuse is located in this component)



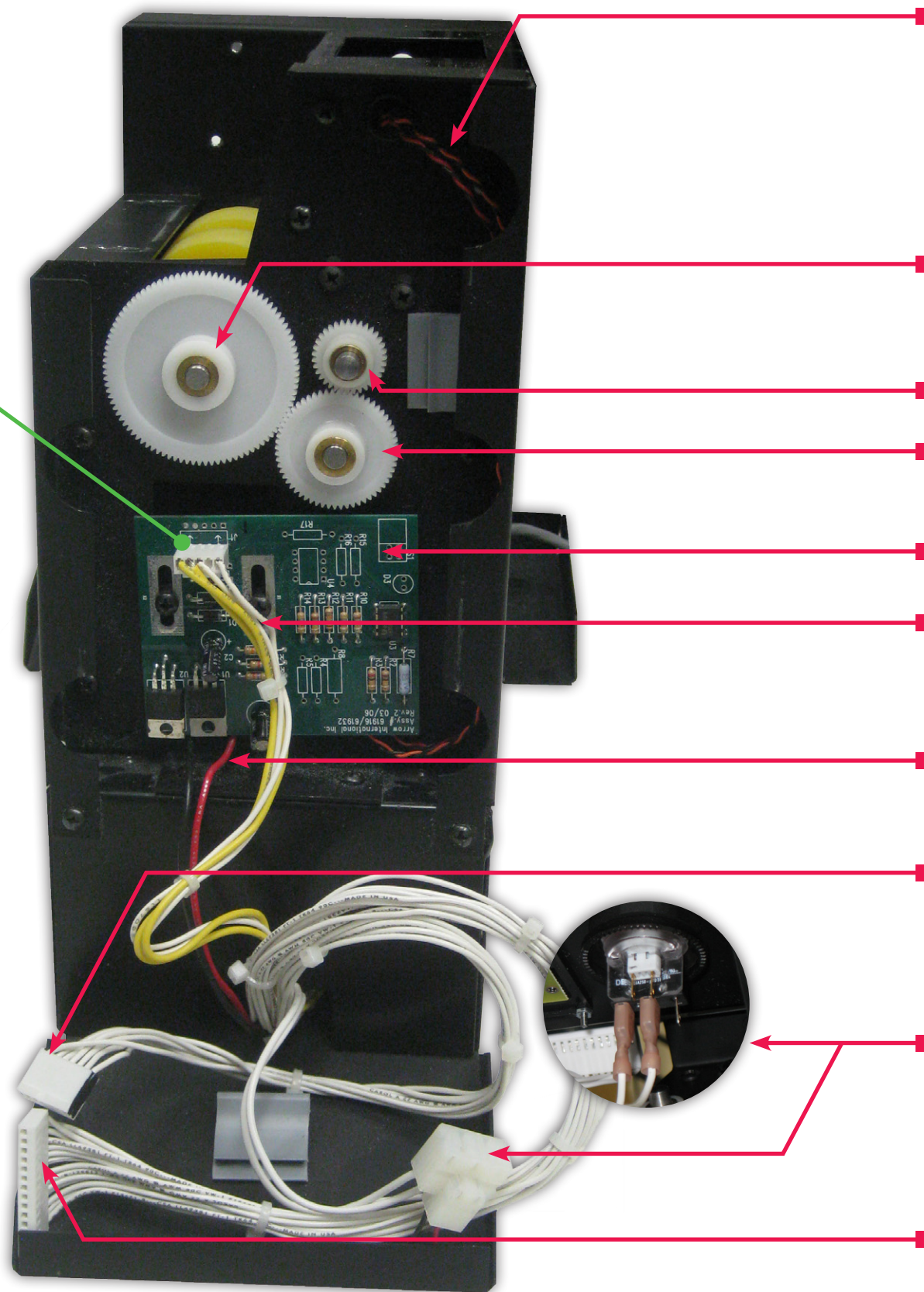




There is an interlocking mechanism between the header on the harness and the header on the PCB. This results in a very solid connection, but, it can also make it seem difficult to disconnect the harness from the PCB

The following notes should be followed when disconnecting the harness from the PCB

- make sure there is enough room to comfortably grip the harness header
- grip the harness header from the left and right plastic sides of the connector (not from the wires) and pull the connector straight backwards (red arrow)



The optical sensor responsible for counting tickets includes these 4 wires pre-attached (consisting of 2 braids [red/black & orange/black]). The other ends of the wires are soldered to the motor board PCB (which is visible on this page)

**page 41** [Cleaning the ticket-count optical sensor](#)

**page 44** [Replacing the ticket-count optical sensor](#)

Plastic Gear - 96 Tooth. It is mounted on the shaft with the two visible rollers

**page 42** [Replacing a plastic gear](#)

Plastic Gear - 35 Tooth. It is mounted on the motor shaft

Plastic Gear - 60 Tooth. It is mounted on the transfer shaft (which does not contain any rollers)

Motor Board PCB

5-pin harness for the motor board PCB - Connects to HDR1 on the main PCB (underneath the ticket counter). This harness has a keyed header on both ends that snaps into place when inserted correctly

Power wires for the motor - they go underneath the ticket counter, across the main PCB, and connect to the motor on the other side of the ticket counter (see p.10-11)

7-pin harness for the keypad - Connects to HDR2 on the main PCB (underneath the ticket counter). The header which connects to the keypad itself is *not* keyed. Prior to removal, it is recommended that both the header and connector on the keypad be marked in some way to ensure correct re-attachment: in the diagram, the header has a black mark indicating the location of PIN 1 ... the keypad connector (not visible) has a similar marking

Harness for the square pushbutton switch: 2 variants may exist in the field. Both variants utilize 2 wires for sending the switch signal, and those 2 wires connect to SW1 and SW2 on the Main PCB (it doesn't matter which wire connects to which connector). The 1st variant consists of just the 2 wires connecting to the pushbutton switch. The 2nd variant, utilizes a 5-prong plug to connect to the pushbutton switch. This 5-prong plug, has 3 extra prongs for possible expanded functionality in future models of the ticket counter

14-pin harness for the LCD assembly - Connects to HDR3 on the main PCB (underneath the ticket counter). This harness has a keyed header on both ends that snaps into place when inserted correctly





O-ring Motor Belt

page 46

Replacing the motor belt

Gear - Plastic Pulley

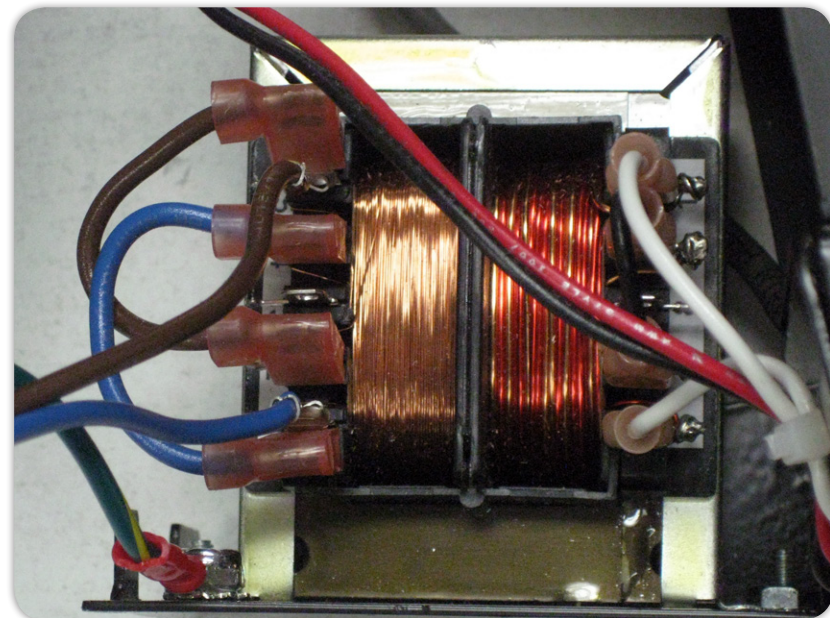
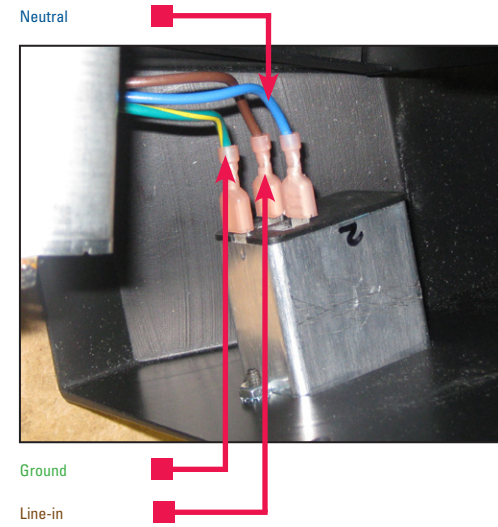
page 47

Replacing the plastic pulley

Motor - Column Drive

page 48

Replacing the motor



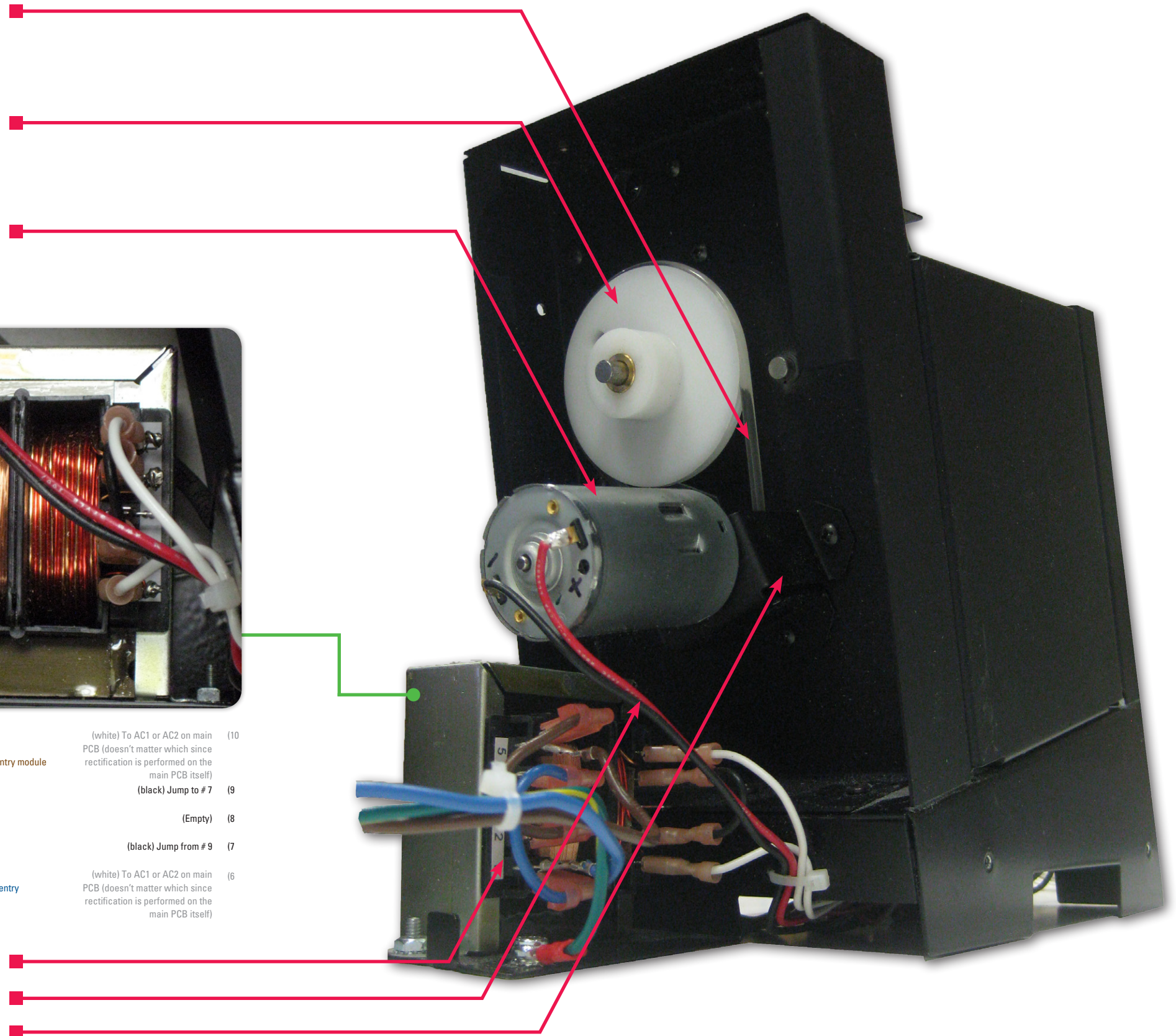
- |                                     |  |      |
|-------------------------------------|--|------|
| 5) Double spade (both brown)        | (white) To AC1 or AC2 on main PCB (doesn't matter which since rectification is performed on the main PCB itself) | (10) |
| • Jump to # 2                       |  |      |
| • 'Line in' from power entry module |  |      |
| 4) Jump from #1 (blue)              | (black) Jump to # 7  | (9)  |
| 3) (Empty)                          | (Empty)  | (8)  |
| 2) Jump from #5 (brown)             | (black) Jump from # 9  | (7)  |
| 1) Double spade (both blue)         | (white) To AC1 or AC2 on main PCB (doesn't matter which since rectification is performed on the main PCB itself) | (6)  |
| • 'Neutral' from power entry module |  |      |
| • Jump to #4                        |  |      |

Arrow International cannot guarantee that the original transformer is present in a machine at the time of repair, or that the wiring has not been tampered with. When working with power, *always* verify the connections on both the transformer and the power entry module. Also verify that the outlet used by the ticket counter does not have its hot/neutral/ground pins reversed or disconnected

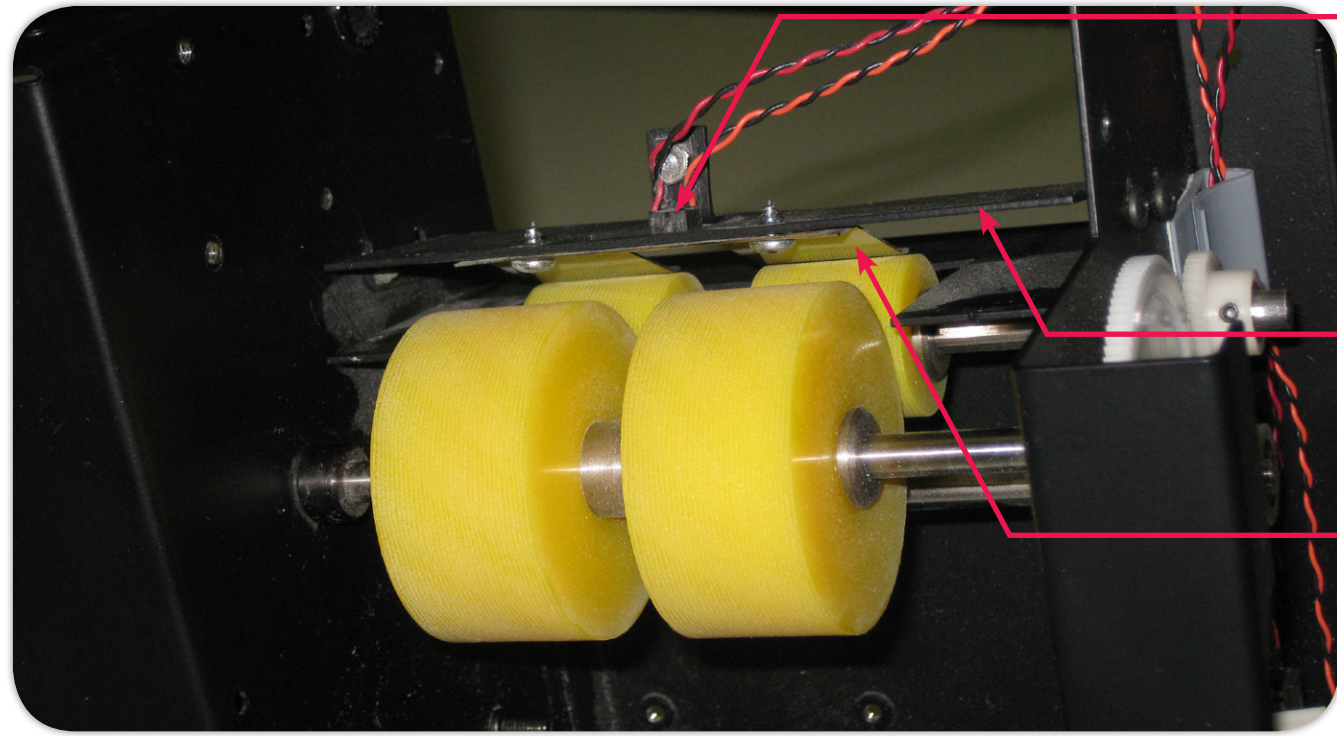
Transformer: current model # 4-49-5016 (see label on top of transformer)

Power wires for the motor - connect to other side of machine (see p.7)

Motor Bracket







The optical sensor responsible for counting tickets includes 4 wires pre-attached (consisting of 2 braids [red/black & orange/black]). The other ends of the wires are soldered to the motor board PCB (see p. 8-9)

**page 41** Cleaning the ticket-count optical sensor

**page 44** Replacing the ticket-count optical sensor

Foot Mounting Bracket

**page 40** Adjusting the metal spring foot

Metal Spring Foot

Roller Core (for 1" rollers)

1" Roller

**page 43** Replacing a roller

Clip Bearing

Shaft Drive (Motor): 7" long

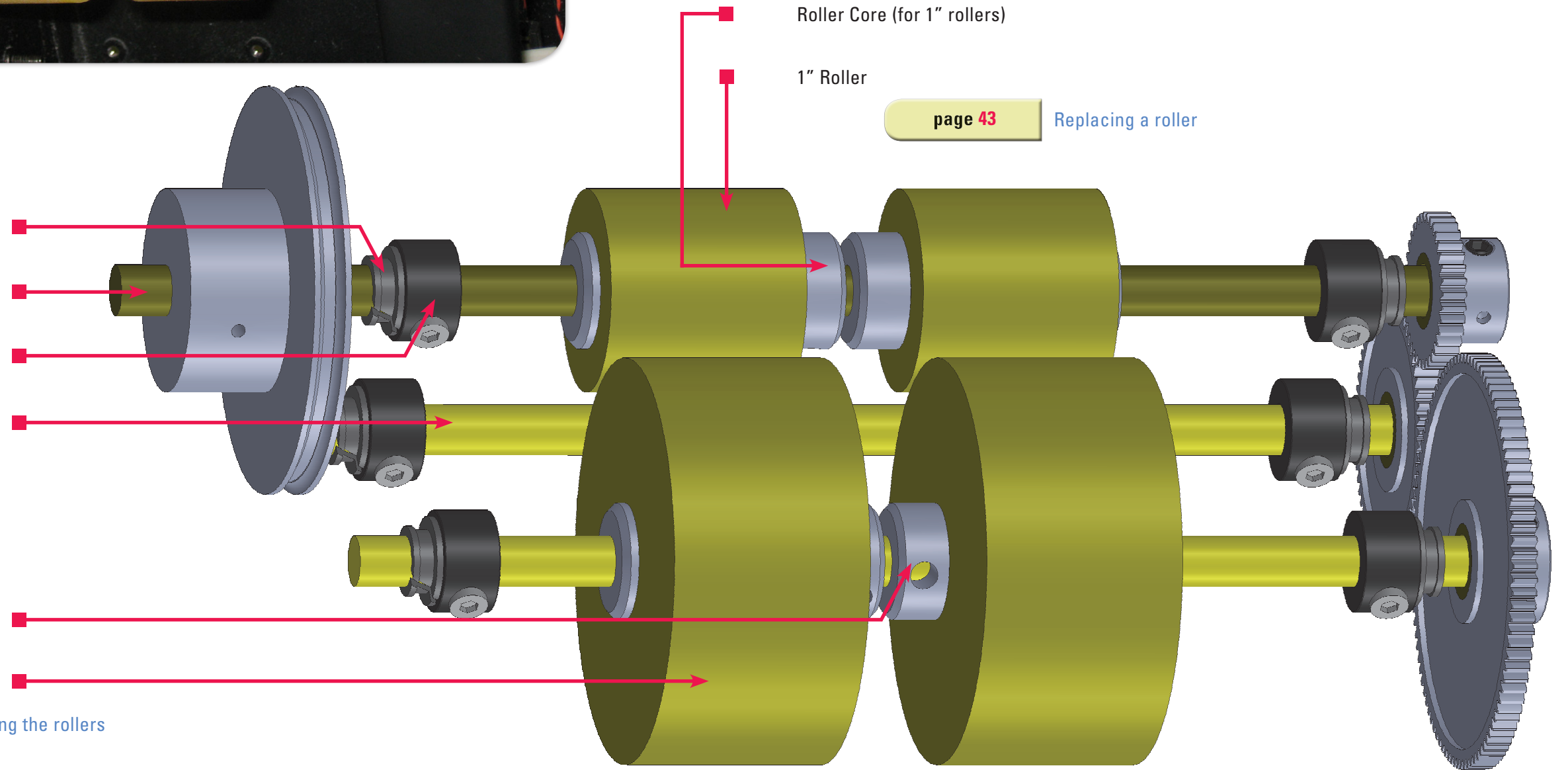
Shaft Collar

Shaft Drive (Transfer): 6" long

Roller Core (for 2" rollers)

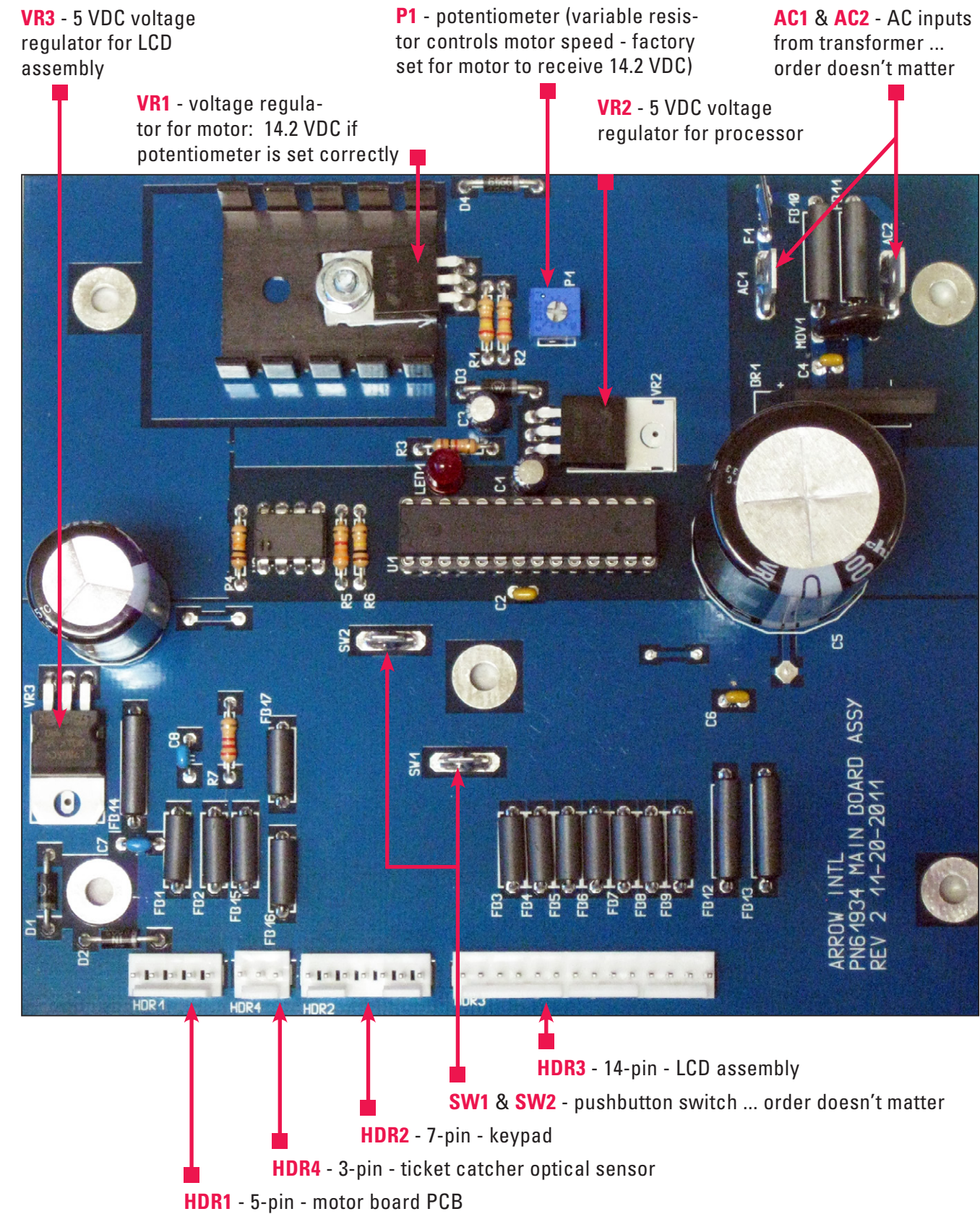
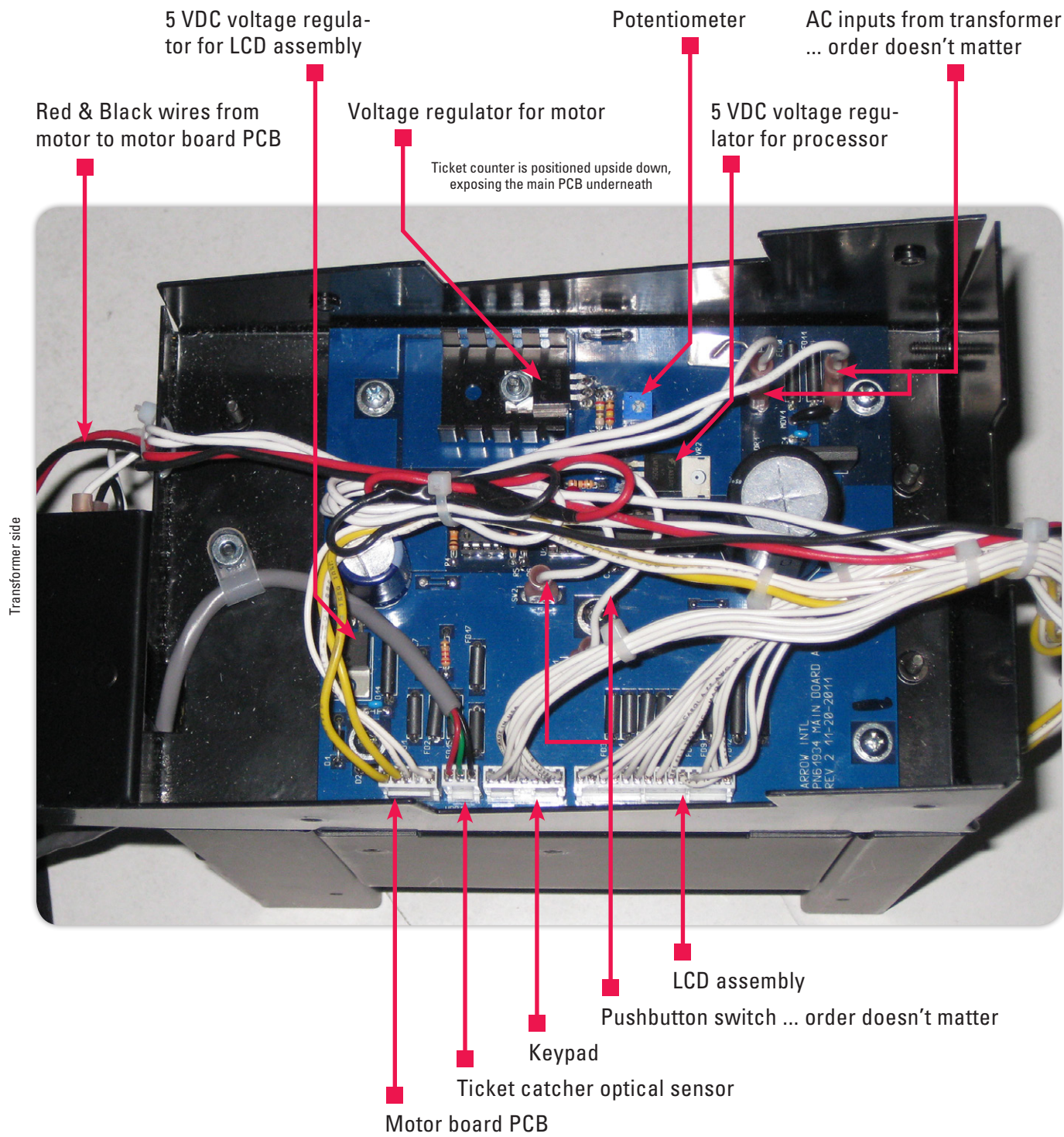
2" Roller

**page 50** Cleaning the rollers





**CAUTION:** When performing repairs & maintenance on the PrecisionCounter 500, various jagged metal edges may be exposed. These can cause personal injury or damage to property if not properly accounted for





This chapter documents the common steps needed to begin all internal repairs of the PrecisionCounter 500. Most procedures outlined in Chapter 3 will refer to this disassembly process and will state which steps should have been completed before the procedure can begin

All procedure estimates assume a technician of average skill who has only performed this process 1 or 2 times, and is moving at a relatively cautious speed

Estimated Time	15 minutes
Difficulty	3 of 5
Possibility of damage	3 of 5

- Tools Required:**
- #1 Phillips screwdriver (capable of comfortably handling size 6 screws)

**CAUTION:** To prevent the risk of electrocution, unplug the unit prior to performing maintenance. Failure to disconnect power could result in injury and/or death, and possible damage to the PrecisionCounter 500

## A Remove the column

The ticket counter will then be easier to handle and can even be positioned upside down

1) (Optional, but recommended) - use a cloth or paper towel to cover the gaps through which a screw might fall into the inner chamber of the machine



Use a cloth or paper towel to cover the gaps

Figure 2.1

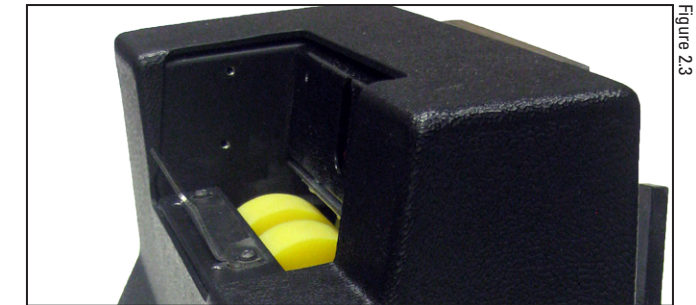
2) Remove the 4 screws which hold the column to the main body of the ticket counter. The screws may not be magnetic: do not rely on a magnetic-tip driver to prevent a screw from falling. The order does not matter but the last screw will have a lot of torque on it from the weight of the column. Make sure to support the column with your hand as you remove the last screw



Remove these 4 screws

Figure 2.2

3) Remove the cloth/paper towel and set aside the column with its 4 screws

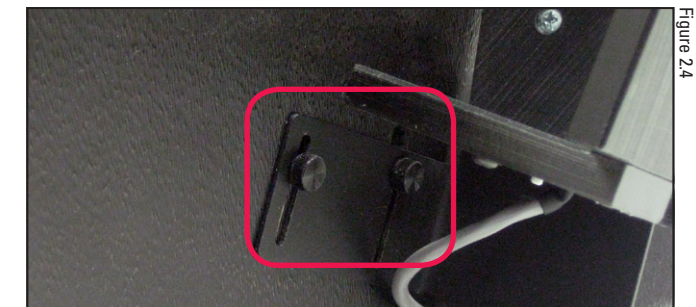


With the column removed

Figure 2.3

## B Remove the ticket catcher assembly

4) If possible, take note of the angle at which the assembly is currently attached to the main body (each owner will customize this for his/her needs and the results may vary)



Notice the angle of the thumb nuts

Figure 2.4

5) Remove the two thumb nuts which hold the assembly to the main body. Gently lift the assembly to alleviate any torque on the thumb nuts: it can help a great deal



Remove the two thumb nuts

Figure 2.5



6) Let the assembly rest on the table, but ...

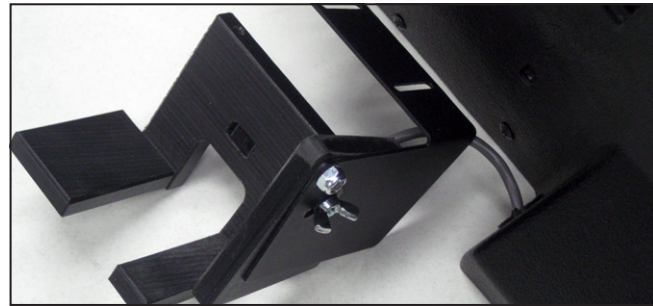


Figure 2.6

Let the assembly rest on the table, but ...

7) ... do not forget that the harness for the ticket catcher sensor is still attached

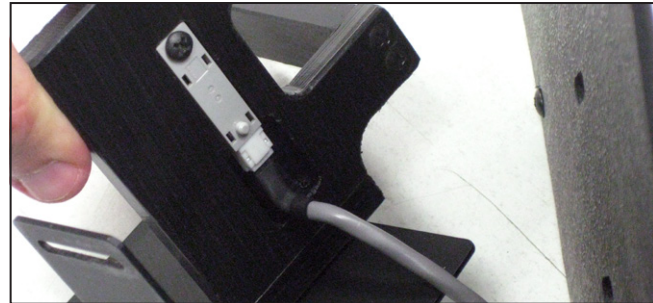


Figure 2.7

... do not forget that the harness for the ticket catcher sensor is still attached

8) The harness can be pulled out (there is no catch that holds it in place). When it is later re-inserted, however, it must be inserted as oriented in the picture (with the notch being visible)

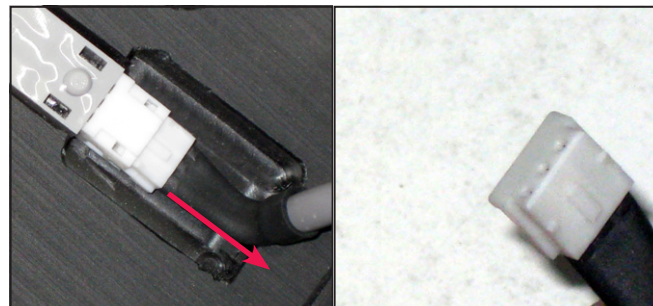


Figure 2.8

Slide the connector out of the sensor

9) Leave the harness positioned as in the picture. In later steps it will be necessary to pull it further inside the plastic body, in order to lift the plastic body off the metal body of the ticket counter



Figure 2.9

With the ticket catcher assembly removed

## C Remove the metal film retainer and metal ticket guide

10) Before removing the metal film retainer take note of how much of the ticket exit chute is covered by the mylar film. In most cases, the mylar film should just reach the metal of the ticket exit chute

Unscrew the two screws and remove the retainer and the film that is attached to the retainer

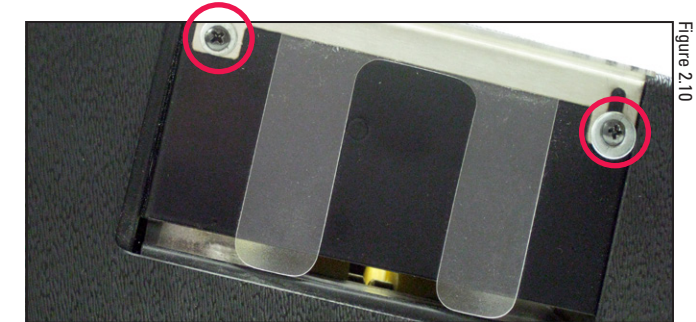


Figure 2.10

Remove the metal film retainer

11) Before removing the metal ticket guide, take note of which position it is screwed into: the metal ticket guide can be adjusted for various ticket widths by being screwed further in, or away, from the column

Unscrew the two screws and remove the ticket guide

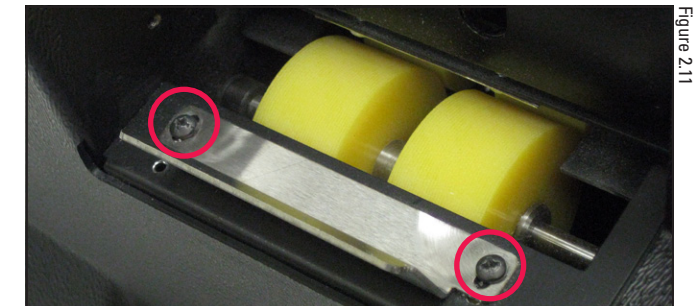


Figure 2.11

Remove the metal ticket guide

## D Remove the plastic body

12) The plastic body is attached to the rest of the machine with 4 screws on each side ...

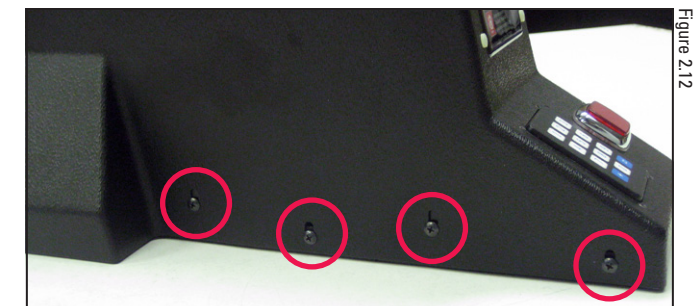


Figure 2.12

Remove these 4 screws on each side



13) ... and 1 screw in the back: remove all 9 screws



Figure 2.13

Remove this screw in the back as well

14) *Note: the studs to which the ticket catcher assembly thumb nuts mount will also prevent the plastic body from being lifted off the metal body of the ticket counter. Before step #15 can be performed, it will be necessary to 'tuck the studs into' the plastic body' by gently pulling the plastic body over the studs*



Figure 2.14

Gently pull the plastic body over these 2 studs

15) Only lift the plastic body a few inches ... it will not go any further because it is restricted by cable lengths in the following locations:

- **back** - power cables and wire harness for the ticket catcher optical sensor
- **front** - harnesses for pushbutton, LCD assembly, and keypad

1 set of cables will need to be removed to lift the plastic body: in this manual, the front cables are removed

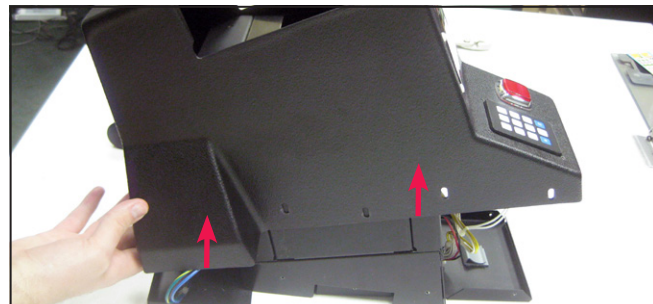


Figure 2.15

Partially lift the plastic body

16) Pull back on the wire harness for the ticket catcher optical sensor to get some slack. You shouldn't need to pull it out all the way: the rest of this manual proceeds under the assumption that both the sensor harness and the power cables are long enough that they do not need to be removed (individual machines may vary)

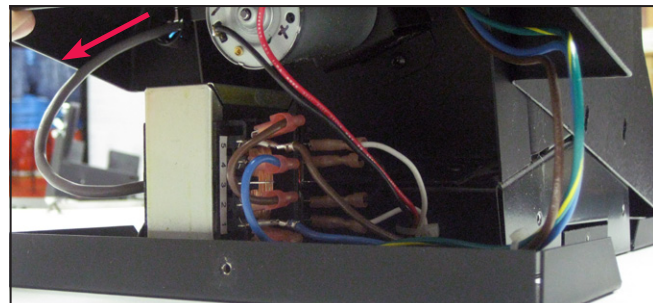


Figure 2.16

Get some slack on the wire harness

17) *Note: steps 17-20 can be performed in any order ... disconnect the shortest cables first, in order to allow greater range of motion when pulling out the remaining cables*

Reach through *the top* of the plastic body and pull out the connector for the LCD assembly. This keyed connector will be tough to pull out if the plastic body is not lifted enough: pull from the sides, not on the wires

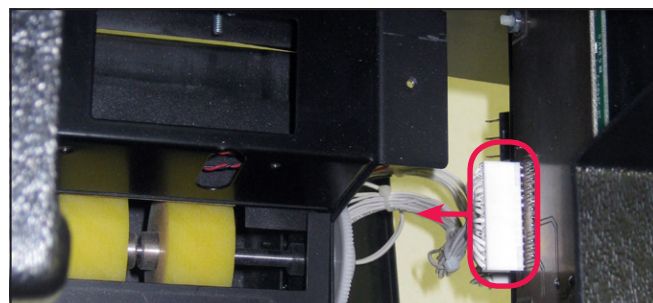


Figure 2.17

Pull out the connector for the LCD Assembly

18) There are two options for disconnecting the keypad connector. It *can* also be removed by reaching through the top of the plastic body (be careful not to snag the LCD assembly connector), but ...

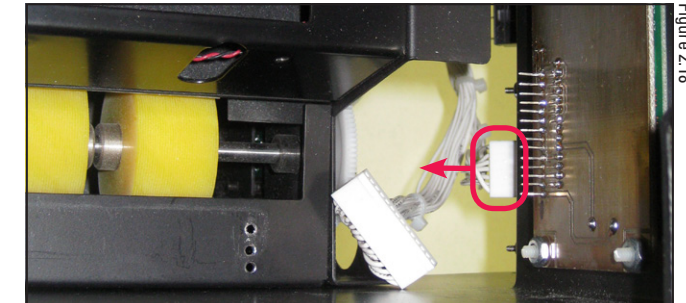


Figure 2.18

Option #1 for disconnecting the keypad connector

19) ... some might find it easier to disconnect the keypad connector by reaching underneath the plastic body (in the bottom right of Figure 2.15)

Whichever option you use, be aware that the keypad connector is *not* keyed (see p. 9) and take precautionary steps to make sure you can reinsert it correctly

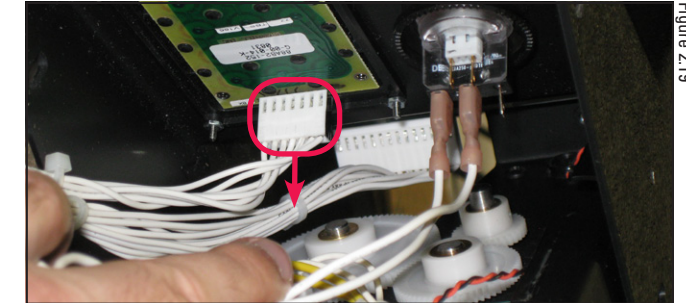


Figure 2.19

Option #2 for disconnecting the keypad connector

20) The final component that needs to be disconnected before the plastic body can be lifted is the square pushbutton switch. The switch has 5 prongs, but is connected to the machine with only 2 wires. The 2 wires are interchangeable, but they must be connected to the 2 prongs shown in Figure 2.20. The switch be accessed by reaching underneath the plastic body (in the bottom right of Figure 2.15)

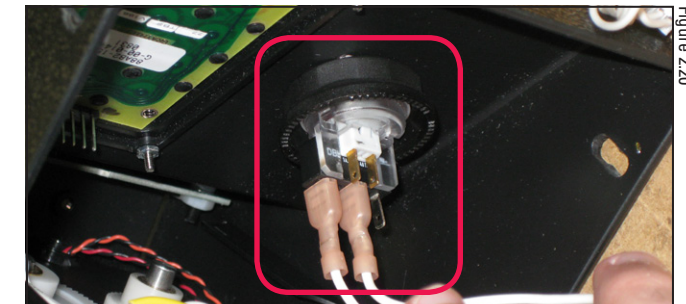


Figure 2.20

A close-up of the connector for the square pushbutton switch

21) Since the cables in the back of the ticket counter are still connected, keep the back of the plastic body at a steady height of 5 inches, and use it as a hinge on which to swing the plastic body upwards *in the front*



Figure 2.21

Use this motion to lift the plastic body

22) View #1 of the metal body of the ticket counter (on the left) set beside the plastic body (notice the two sets of cables which are still attached)

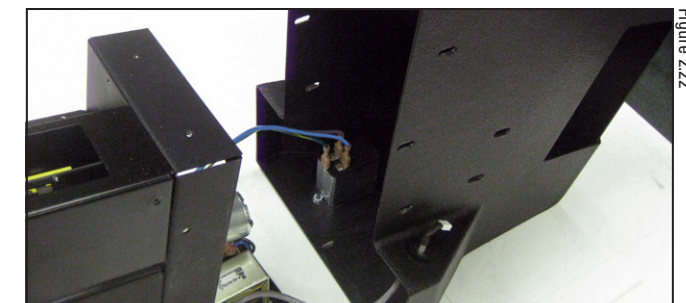


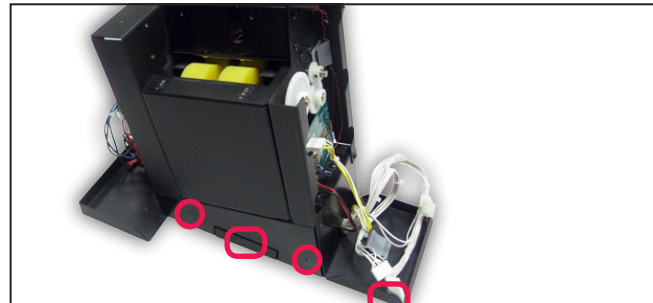
Figure 2.22

View #1 of the metal body of the ticket counter



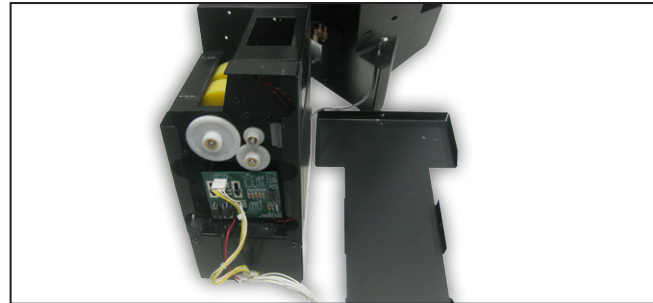
23) View #2 of the metal body of the ticket counter

The metal body of the ticket counter is resting on a metal pan. Of the screws you removed in step # 12, 2 - on each side of the ticket counter - drilled into the metal body, and the other 2 drilled into the metal pan. By completing step #12 you simultaneously detached not only the plastic body, but also the metal pan, from the metal body of the ticket counter ... so ...



View #2 of the metal body of the ticket counter

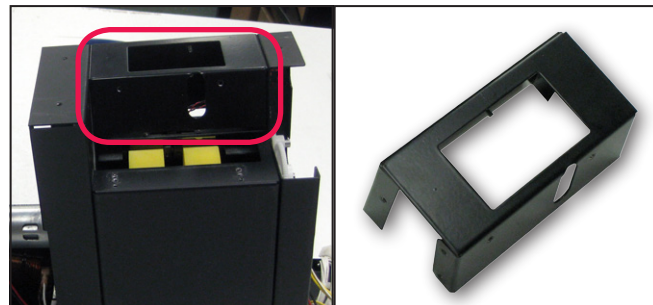
24) ... you can now lift the metal body of the ticket counter out of the bottom metal pan



Lift the metal body from the bottom metal pan

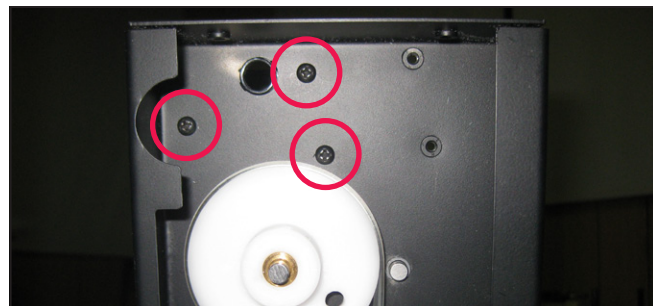
## **E** Remove the metal top wrap

25) The metal top wrap protects the ticket-count optical sensor and provides 2 of the 4 mounting points for the column



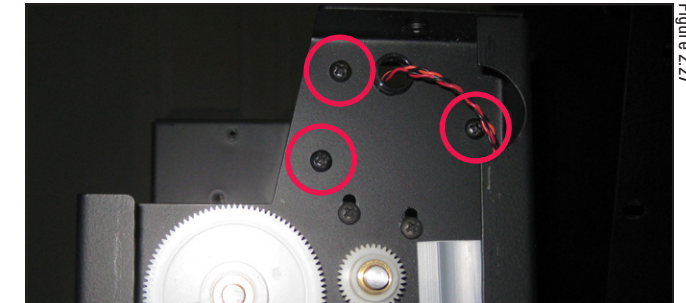
The metal top wrap

26) Remove these 3 screws on the side of the ticket counter which has the motor



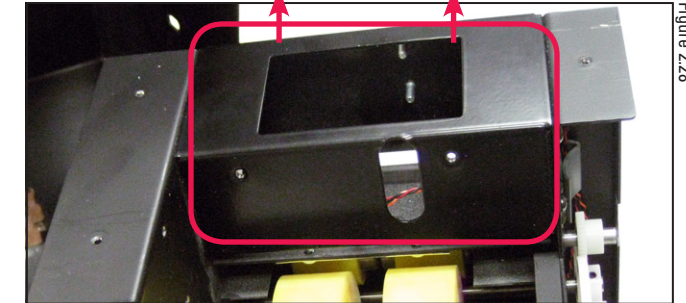
Remove these 3 screws

27) Remove these 3 screws on the side of the ticket counter which has the motor board PCB



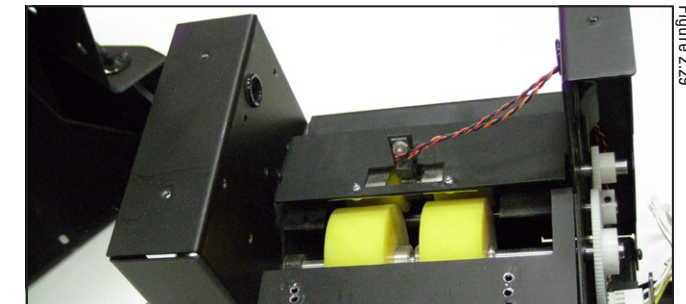
Remove these 3 screws

28) Lift the metal top wrap from the metal body of the ticket counter



Lift the metal top wrap

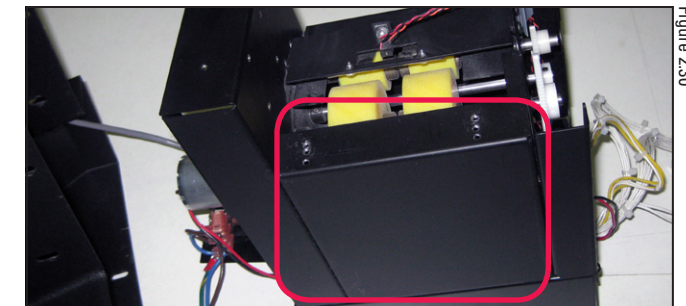
29) With the metal top wrap removed, the ticket-count optical sensor is now accessible for service



With the metal top wrap removed

## **F** Remove the metal side wall

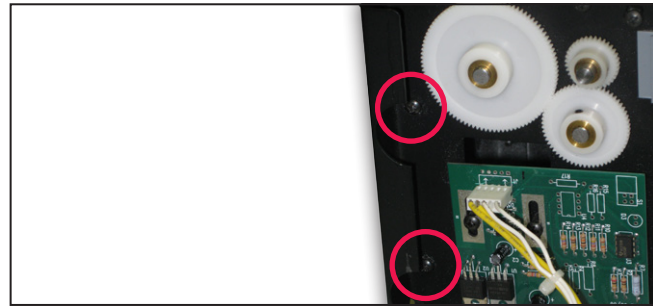
30) The metal side wall is a large component of the metal body of the ticket counter. It provides the mounting point for the metal ticket guide and restricts access to the inner components



The metal side wall



31) Remove these 2 screws on the side of the ticket counter which has the motor board PCB



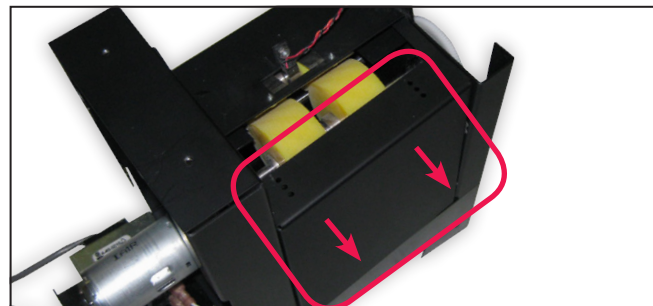
Remove these 2 screws

32) Remove these 2 screws on the side of the ticket counter which has the motor



Remove these 2 screws

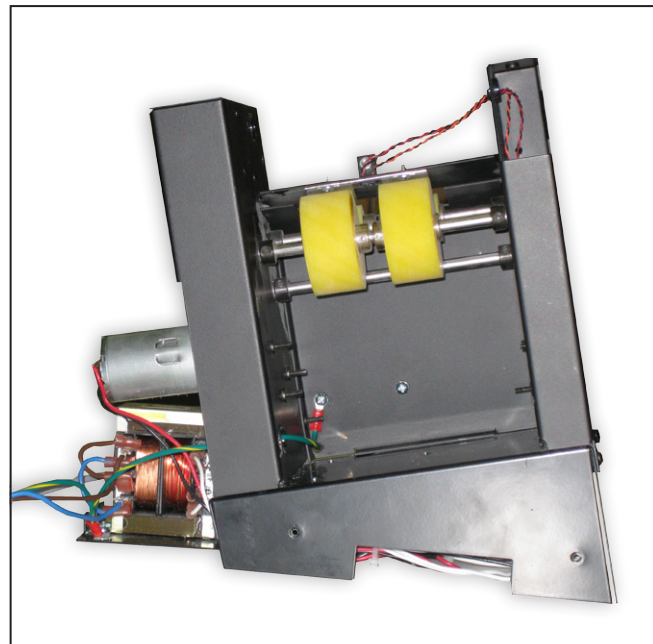
33) Pull the metal side wall from the rest of the body of the ticket counter. Because of the precise fitting design, there will still be some pressure exerted on the metal side wall from the surrounding metal enclosure



Pull out the metal side wall

34) The inside chamber of the ticket counter is revealed once the metal side wall is removed

Common disassembly for most procedures stops at - or before - this point



The inside chamber of the ticket counter

Figure 2.31

Figure 2.32

Figure 2.33

Figure 2.34

Re-assembly can be performed by following the previous procedure in reverse

- Attach the metal side wall
- Attach the metal top wrap
- Attach the plastic body
- Attach the metal film retainer and metal ticket guide
- Attach the ticket catcher assembly
- Attach the column
- Plug in the power cord and turn on the power
- *Test the operation of the machine*



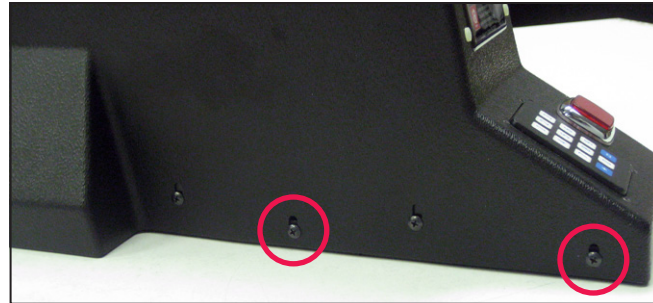
Because of the precise-fitting metal construction of the ticket counter, attempting to re-assemble the machine with a power tool can result in stripping of the screws/sockets if the alignment is improper (metal is not as accommodating as wood to overpowering force). We recommend that all the long screws for a particular step, first be inserted 1/3 of the way, and then - only once the first step is complete - be fully screwed in: if necessary, use a screwdriver to correct improper alignment. Power tool torque settings should not exceed level 4 for metal and level 3 for the plastic column.



## G Partial disassembly

By removing the bottom metal pan, it is possible to access the bottom inner chamber of the ticket counter without removing the plastic body or any of the external components (column, ticket catcher assembly, metal ticket guide, and metal film retainer). Partial disassembly is useful for replacing the keypad, pushbutton switch, main PCB, or for diagnosing power issues. For all other procedures that involve internal repairs, you will still need to perform the complete disassembly process as described up to this point

35) Remove these 2 screws on each side ...



Remove these 2 screws on each side

36) ... and the screw in the back

These 5 screws hold the bottom metal pan to the plastic body



Remove this screw in the back as well

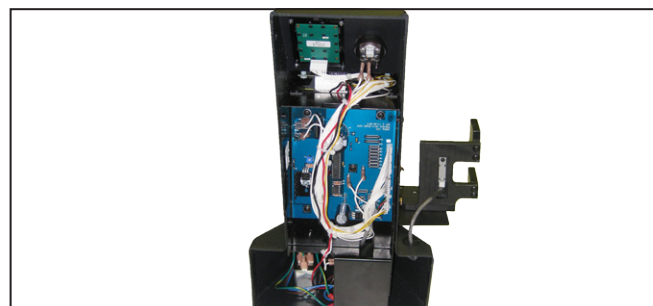
37) The metal pan can then be removed by resting the machine on its rear side and pulling out the bottom metal pan

*Note: resting the machine as in Figure 2.37, is the ideal end position for partial disassembly: though it seems as if the column is touching the desk, it is actually a few millimeters above it, and the entire weight of the ticket counter is supported on the plastic body*



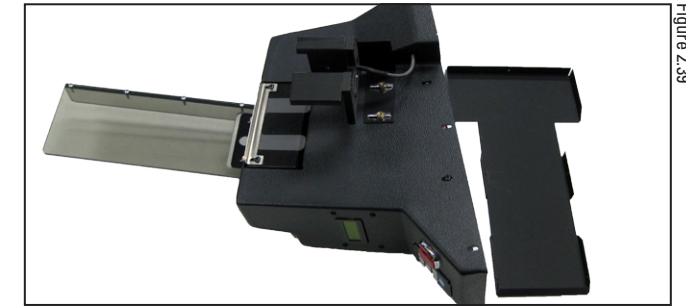
The ideal end position for partial disassembly

38) Resting the machine on its rear side provides access to the following components



2.37's position allows access to the following components

39) The ticket counter can also rest on the side that does *not* have the ticket catcher assembly ...



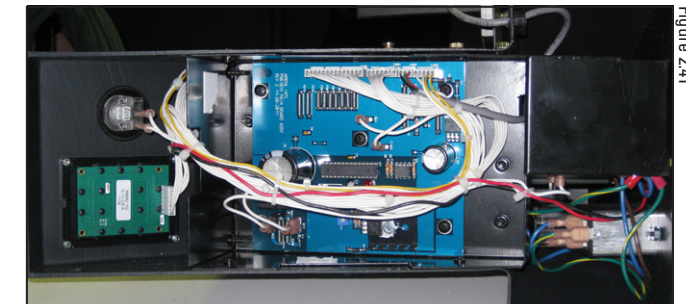
The ticket counter resting on the side that does not have the ticket catcher assembly

40) ... however, extra caution must be taken to not leave the machine too long in this position, or to provide a cushion underneath the metal ticket guide (because it is one of the two support points for this position)



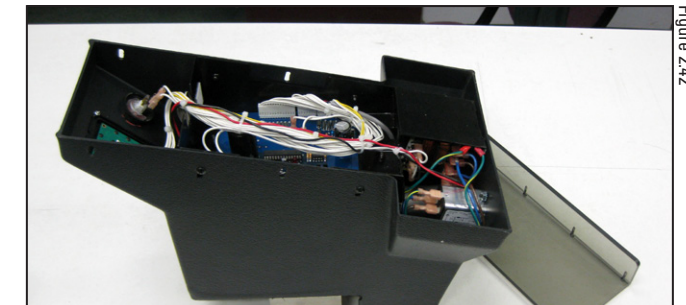
The 2 support points when the ticket counter is laying on its side

41) Having the ticket counter rest on its side, may provide easier access to some components



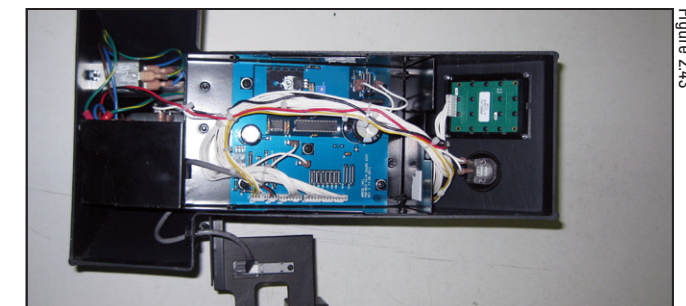
A view of the inner components when the ticket counter is resting on its side

42) For the small added effort of removing the column (disassembly steps 1-3), the ticket counter can also be set to rest on its top ...



Remove the column to allow the ticket counter to be laid upside down

43) ... providing, possibly, the best access to components of all the partial disassembly positions



A view of the inner components when the ticket counter is resting upside down



All procedure estimates assume a technician of average skill who has only performed a certain procedure 1 or 2 times, and is moving at a relatively cautious speed

**CAUTION:** To prevent the risk of electrocution, unplug the unit prior to performing maintenance. Failure to disconnect power could result in injury and/or death, and possible damage to the PrecisionCounter 500

**Legend:**

Estimated Time	20 minutes
Difficulty	3 of 5
Possibility of damage	3 of 5
Disassembly?	1-22

**Disassembly** - the steps in chapter 2 that need to be completed before a procedure can begin. *N/A* means that disassembly is not applicable/not needed. *Only Partial* means that only partial disassembly - section G of chapter 2 - needs to be completed

**Estimated Time** - how long the procedure will take on average. This does *not* include the time needed to perform the pre-requisite disassembly steps: all estimates for a procedure (time, difficulty, possibility of damage) refer to just the procedure, and do not take the pre-requisite disassembly into consideration

**Difficulty** - an estimate of the amount of concentration - and mechanical aptitude - generally required to successfully perform the procedure

**Possibility of damage** - an estimate of the possibility that damage will occur, based on the sensitivity of the components involved and on the difficulty of configuring those components

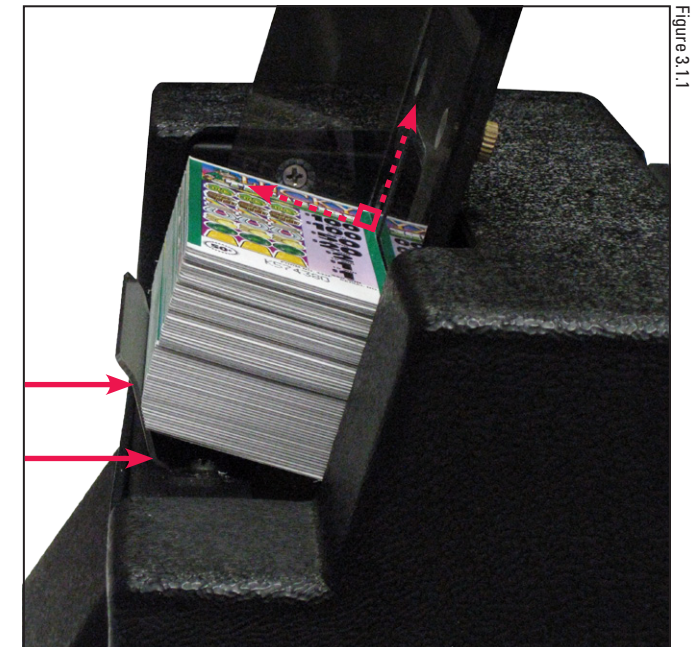
**Disassembly 1-22**, for example, means that steps 1-22 of disassembly should be completed before beginning the procedure (up to the point in the attached image)

1) Adjusting the metal ticket guide can rely, in large part, on trial and error, but the time involved can be lessened considerably if the following principle is adhered to:

*When a stack of about 50 tickets is loaded into the column, the top ticket should form an angle of about 90° with the column*

As an extra indicator, the bottom ticket should touch the metal guide somewhere close to the middle of the range specified by the two arrows ...

... this is, however, only a helpful approximation: after every configuration, dispense at least an entire column to ensure proper functionality



The ideal ticket alignment

2) The tickets in Figure 3.1.2 are less likely to dispense properly

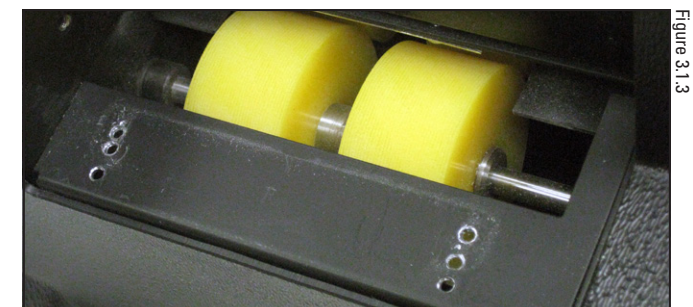


The metal ticket guide is too close to the column

3) The 'large' adjustment to the metal ticket guide can be made by switching its location between 1 of 3 pre-drilled positions

Most tickets will dispense properly when the metal ticket guide is in the middle position

*Pay particular attention to not drop a screw into the internal compartment of the ticket counter*

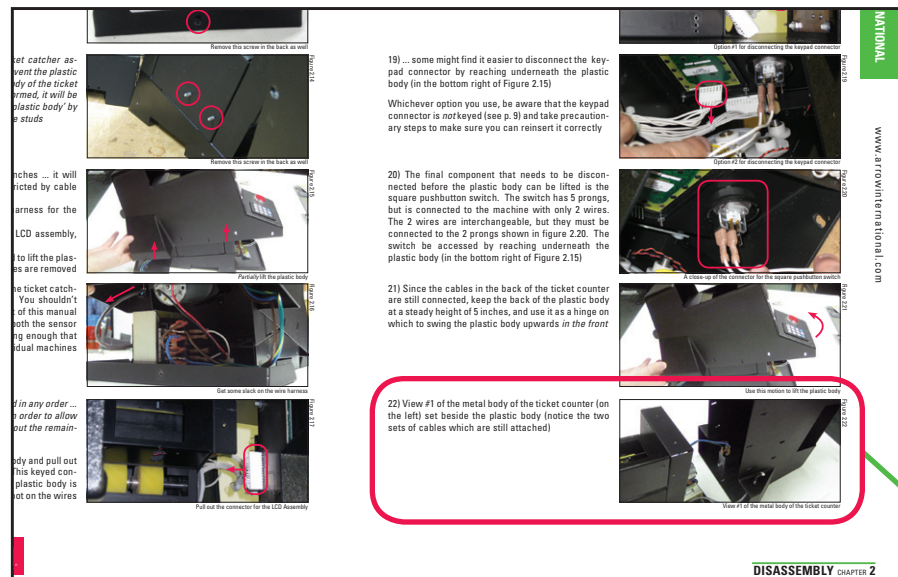


Select one of the 3 available positions

4) Once step #3 is complete, a more precise adjustment can be performed by partially unscrewing each screw (to avoid dropping a screw inside the ticket counter) and moving the metal ticket guide back and forth within the range that the screw will allow



Move the metal ticket guide back and forth for a more precise adjustment



## 1 Adjusting the metal ticket guide

The PrecisionCounter 500 does not need to be adjusted for tickets of different lengths, but it may need to be adjusted for tickets of different widths. Tickets are supported against the rollers, on one side by the column, and on the other side by the metal ticket guide: since the column is immobile, the metal ticket guide is adjusted for tickets of varying widths to ensure that the tickets are properly fed to the rollers

Estimated Time	< 5 minutes
Difficulty	1 of 5
Possibility of damage	1 of 5
Disassembly?	N/A

**Tools Required:**

- #1 Phillips screwdriver (capable of comfortably handling size 6 screws)





## 2 Adjusting the ticket catcher assembly

To account for the various conditions that can affect the stacking of dispensed tickets, the PrecisionCounter 500 has 4 customizable settings which allow the machine to be configured for the needs of any particular customer

3 of these configurations are performed on the ticket catcher assembly and the 4th is performed on the mylar ticket deflector (the latter configuration is described in the next procedure)

We recommend the following approach to adjusting the ticket catcher assembly: set each of the 3 configurable options to the middle of the possible ranges, and then, while dispensing several columns of tickets, make minor adjustments to the original setup. *Once an acceptable configuration is reached, it will rarely need to be modified*

Dispense several columns of tickets to complete this procedure and to verify that the results are acceptable

Estimated Time	15 minutes
Difficulty	3 of 5
Possibility of damage	1 of 5
Disassembly?	N/A

**Tools Required:**

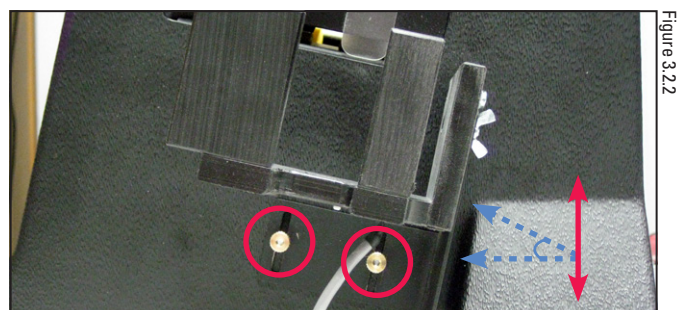
- None: the relevant components can be adjusted by hand

1) This wingnut allows the ticket catcher assembly to swing into, or away from, the main body of the PrecisionCounter 500: it adjusts the angle at which the tickets land



Select how far into, or away from, the body of the machine, the assembly should be

2) The height of the ticket catcher assembly - and its angle to the ticket exit chute - can both be modified from these two thumb nuts: they adjust how the tickets stack



Change the height of the ticket catcher assembly, or its angle to the ticket exit chute

## 3 Adjusting the mylar ticket deflector

In most cases, the mylar film should just reach the metal of the ticket chute so that every ticket is lightly grazed as it exits the dispensing mechanism. The mylar ticket deflector guides the tickets to ensure that they consistently follow the same path upon exiting the ticket chute: more specifically that they do not flip upwards as they exit the chute. If, after adjusting the mylar ticket deflector, you notice that the tickets have a tendency to flip upwards, this deflector will need to be lowered a bit further

This is the 4th easily accessible adjustment which can be configured to affect the stacking of dispensed tickets. The recommended setting, however, is the one described above and any alteration will usually result in a greater change than expected. *If, some configuration is necessary to affect the stacking of dispensed tickets, it will - in most cases - need to be performed on the ticket catcher assembly and not on the mylar ticket deflector*

Just as for procedure 2, any changes to this component should be thoroughly tested to ensure the tickets stack properly

Estimated Time	< 5 minutes
Difficulty	1 of 5
Possibility of damage	1 of 5
Disassembly?	N/A

**Tools Required:**

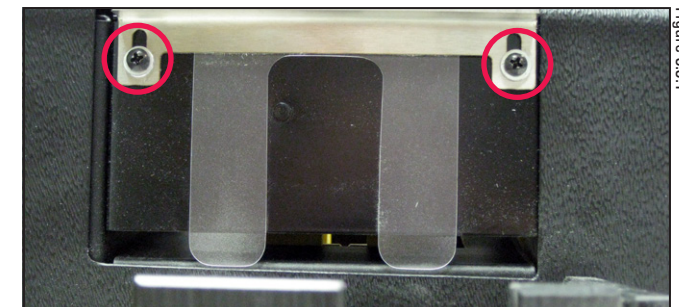
- #1 Phillips screwdriver (capable of comfortably handling size 6 screws)

1) Loosen the two screws

Move the metal film retainer upward or downward until the mylar ticket deflector is at the desired height

Re-tighten the two screws and verify that the torque from tightening the screws did not alter the height

*Note: having washers present helps alleviate the torque from tightening the screws*



Set the mylar ticket deflector at the desired height by adjusting the metal film retainer





## 4 Replacing the mylar ticket deflector

The mylar ticket deflector is a wear & tear part because hundreds of thousands of tickets will be hitting the strip in exactly the same spot. The strip should also be replaced if it is ever accidentally bent or torn: the mylar ticket deflector is a simple, but critical, component to the successful operation of the machine, and any defect should be cause for immediate replacement

It is, however, easy to replace: the only unique consideration to pay attention to is that the mylar ticket deflector has a smooth side and a semi-rough side: *the smooth side must be the side that the tickets hit*

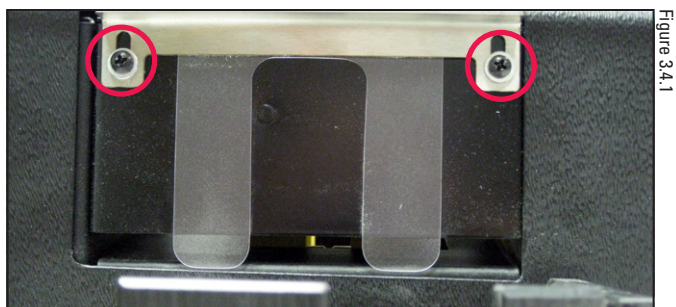
Once the mylar ticket deflector is replaced, be sure to complete procedure 3 in order to verify proper operation

Estimated Time	5 minutes
Difficulty	1 of 5
Possibility of damage	1 of 5
Disassembly?	N/A

**Tools Required:**

- #1 Phillips screwdriver (capable of comfortably handling size 6 screws)
- A small strip of double-sided tape

1) The mylar ticket deflector is attached to the metal film retainer with double-sided tape: unscrew the 2 screws in Figure 3.4.1 and remove the metal film retainer



Remove the metal film retainer

2) In Figure 3.4.2, the double-sided tape is visible underneath the mylar ticket deflector. In most circumstances the tape already present can be reused

*Note: the tape should be glued to the rough side of the replacement mylar ticket deflector. This way, when the metal film retainer is re-attached to the ticket counter, the smooth side of the mylar ticket deflector will be the one that is hit by tickets*



Change the mylar ticket deflector and re-attach the metal film retainer

## 5 Replacing the ticket catcher sensor

The most likely reason to need to replace the ticket catcher sensor is physical damage due to its external location: even that, however, is not very likely, since access is limited by the ticket catcher assembly

Estimated Time	< 5 minutes
Difficulty	1 of 5
Possibility of damage	1 of 5
Disassembly?	N/A

**Tools Required:**

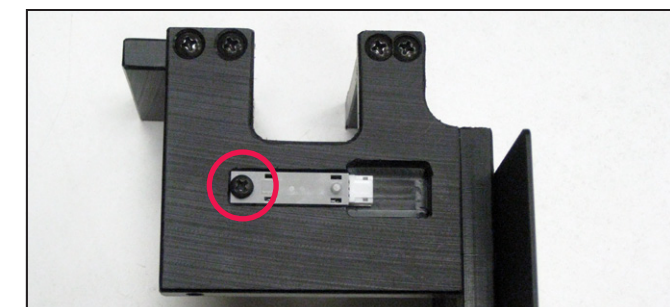
- #1 Phillips screwdriver (capable of comfortably handling size 6 screws)

1) Set the ticket counter in this position: this will allow easy access to the underside of the ticket catcher assembly



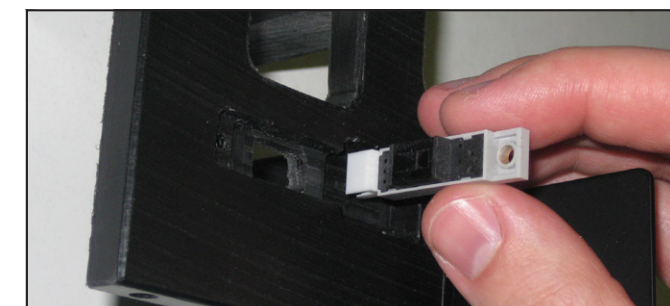
Set the ticket counter in this position

2) The ticket catcher sensor can be removed by disconnecting the harness for the sensor and unscrewing 1 screw



Unscrew 1 screw on the underside of the ticket catcher assembly

3) Do not attempt to slide out the ticket catcher sensor: it is recessed in a groove; instead, lift the sensor from the side. Screw in a new ticket catcher sensor, and dispense at least a column of tickets to ensure proper operation of the machine (specifically, try batch dispensing, since that functionality relies on the ticket catcher sensor)



Replace the ticket catcher sensor



## 6 Adjusting the ticket gate

The ticket gate only permits one ticket at a time to pass through the dispensing mechanism. This is accomplished by positioning the ticket gate such that the distance between the metal ticket gate edge and the rollers is greater than the thickness of 1 ticket *but less than the thickness of 2*

There are 2 main techniques for setting this up. The 1st consists of placing 1 ticket underneath the metal ticket gate edge and loosely pressing down on the ticket gate (just to make sure it doesn't move) as the ticket gate is tightened into position. This results in a precise fit, but it can be configured to be *too* restricting (if there is too much pressure on the ticket as the ticket gate is tightened into position)

The 2nd method consists of placing 2 tickets underneath the gate edge and pressing with moderate force (not *too* hard) on the tickets with the ticket gate as the ticket gate is tightened into position. This will definitely leave enough room for 1 ticket to pass underneath the gate, and it should be *too* tight for 2 tickets (because the kind of pressure exerted on the 2 tickets does not occur naturally). With this method, the possible issues that can arise consist of, possibly being too forceful with the machine, or, of having trouble tightening the tickets gate into position while simultaneously pressing down on it

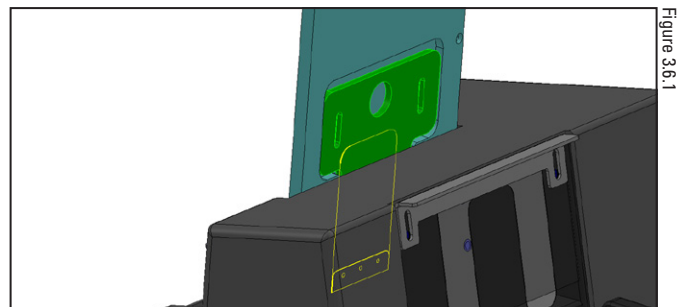
This procedure will demonstrate the 1st method, but both should be experimented with to see which gives the best results for an individual technician

Estimated Time	10 minutes
Difficulty	2 of 5
Possibility of damage	1 of 5
Disassembly?	N/A

**Tools Required:**

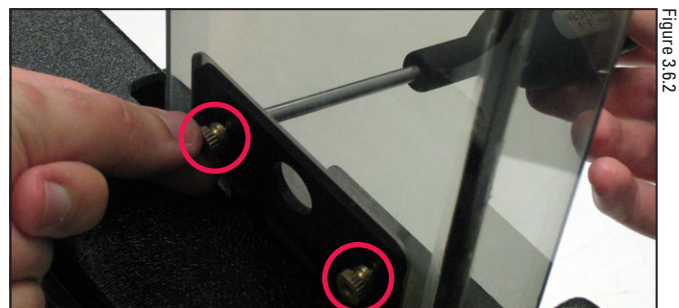
- #1 Phillips screwdriver (capable of comfortably handling size 6 screws)

1) The ticket gate is housed in a recessed groove on the back side of the column ... its range of motion is restricted to that groove



Conceptual drawing of the ticket gate

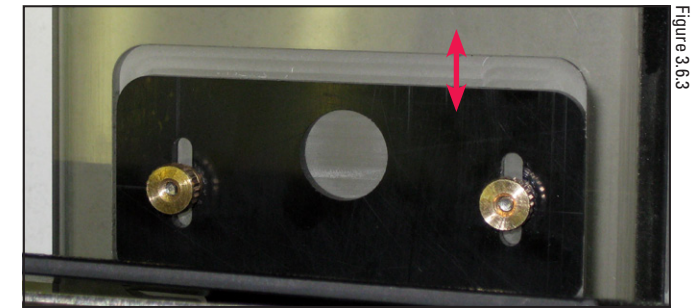
2) Loosen (but do not remove) the 2 thumb nuts which hold the ticket gate in place



Loosen these 2 thumb nuts

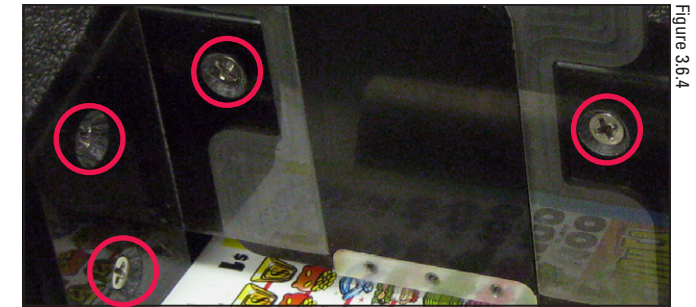
3) Verify that the ticket gate can move within the full range of the groove within which it is enclosed

If it cannot, loosen the 2 thumb nuts a little more and try again ... if it will still not move within the full range of the groove ...



Verify that the ticket gate can move freely

4) ... on rare occasions, it may be necessary to slightly loosen the 4 screws which mount the column to the body of the ticket counter



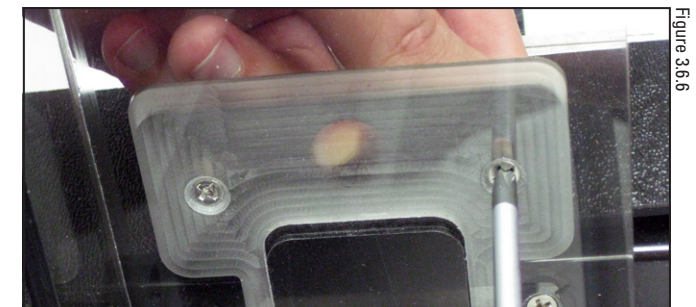
On rare occasions, it may be necessary to loosen these screws

5) Place a ticket underneath the ticket gate



Place a ticket underneath the ticket gate

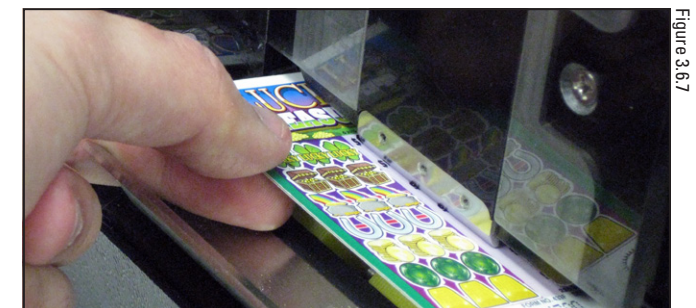
6) Tighten the thumb nuts for the ticket gate to about 80% of final torque. Keep a finger in the adjusting hole of the ticket gate to make sure that the ticket gate does not move up as you're tightening it in place



Tighten the ticket gate in place

7) Verify that a ticket can move easily underneath the ticket gate

Firmly tighten the ticket gate thumb nuts, but do not use *too* much force



Verify that the adjustment is working correctly





## 7 Replacing the square pushbutton switch

The square pushbutton switch is a possible wear & tear part: it is designed to withstand a certain amount of rough handling, but because of its prominent location and functionality it may need to be replaced

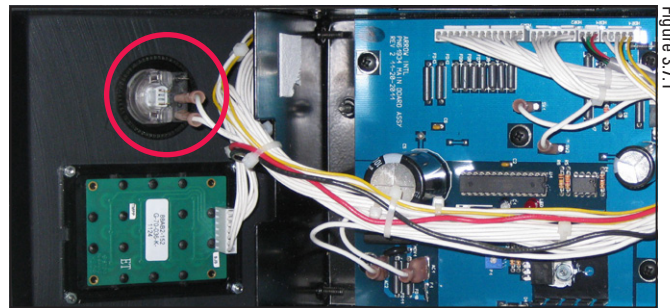
Estimated Time	5 minutes
Difficulty	1 of 5
Possibility of damage	2 of 5
Disassembly?	Only partial

**Tools Required:**

- None: the relevant components can be modified by hand

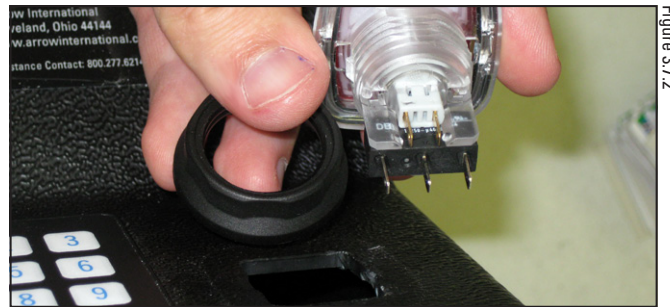
1) Partial disassembly (see p. 26) will remove the bottom metal pan in order to provide express access to several components, among which, the square pushbutton switch

The switch has 5 prongs but only uses two wires. The two wires *can* be reversed, but, as a pair, they must be placed on the correct prongs of the switch



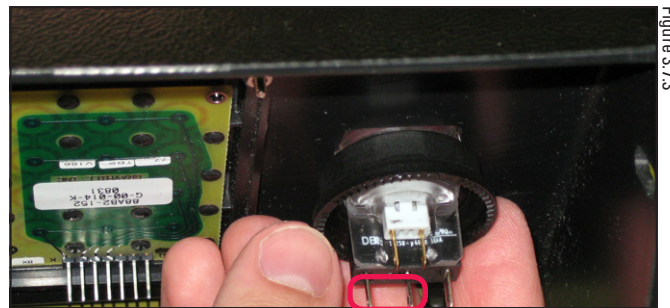
After partial disassembly

2) The pushbutton switch consists of the switch itself - mounted from the outside through a cutout in the plastic body of the ticket counter - and a plastic nut which secures the pushbutton switch to the plastic body



The switch, plastic nut, and cutout in the plastic body of the ticket counter ...

3) It is mounted as in Figure 3.7.3



The switch in its mounted position

## 8 Replacing the keypad

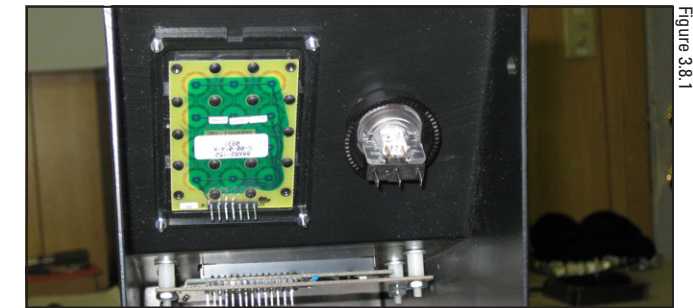
The keypad is a possible wear & tear part because it is one of the main interfaces through which the operator interacts with the ticket counter; however, the probability that it will need to be changed is low

Estimated Time	15 minutes
Difficulty	2 of 5
Possibility of damage	1 of 5
Disassembly?	Only partial

**Tools Required:**

- mini Phillips screwdriver
- 3/16 nut driver

1) Because full disassembly would leave the keypad in the following position ...



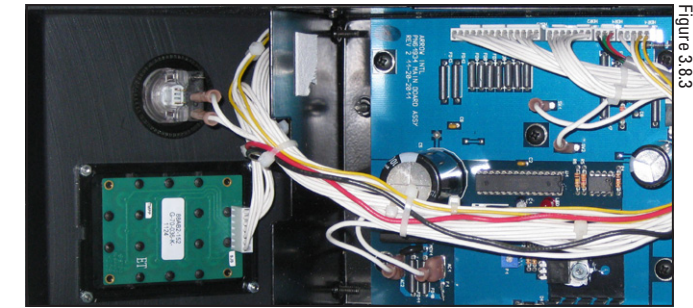
The keypad after disassembly step 22

2) ... and the keypad mounts from the inside out, it can be hard to screw the keypad into the ticket counter (because gravity is pulling it down - away from its mounting position)



Mounting like this can be tricky

3) Perform partial disassembly (see p. 26) which only removes the bottom metal pan of the ticket counter and allows the ticket counter to be positioned sideways, or upside down. It is much easier to mount the keypad in that position



After partial disassembly





4) The keypad and the tools needed to mount it

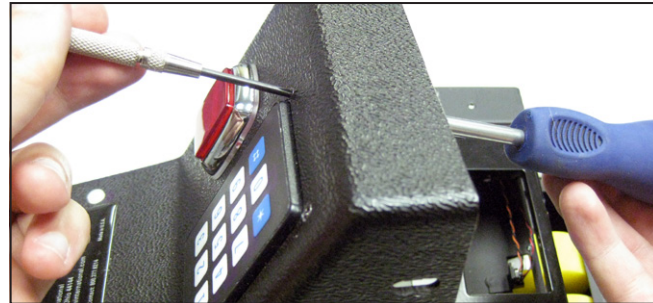
The keypad will not have a keyed connector (see p. 9). If replacing a keypad, make sure to copy over the marking from the old keypad which indicates the proper orientation for re-attaching the keypad harness



The keypad and the tools needed to mount it

5) Mount the keypad: the screws come from the outside and the nuts from the inside

When performing re-assembly, be sure to mount the keypad harness with the correct orientation



Mount the keypad

## 9 Replacing the LCD assembly

There is little likelihood that the LCD assembly will need to be replaced: more likely scenarios for the LCD assembly not functioning properly have to do with the harness or with power. Check the harness cable to make sure it is not damaged and that it is connected properly. If the cable is ok, follow the diagnostic procedure for checking power

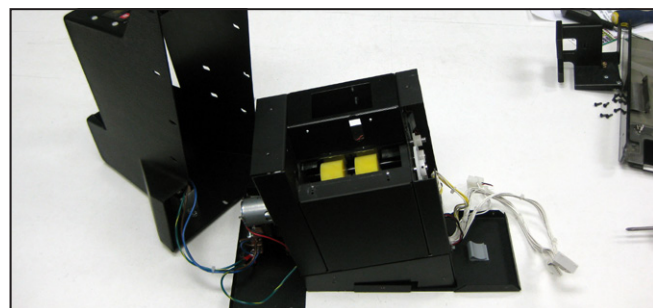
If everything is checking out ok, however, and the LCD assembly is still not functioning properly, follow the procedure below to replace it

Estimated Time	20 minutes
Difficulty	3 of 5
Possibility of damage	3 of 5
Disassembly?	1-22

### Tools Required:

- #1 Phillips screwdriver (capable of comfortably handling size 6 screws)
- 5/16 nut driver

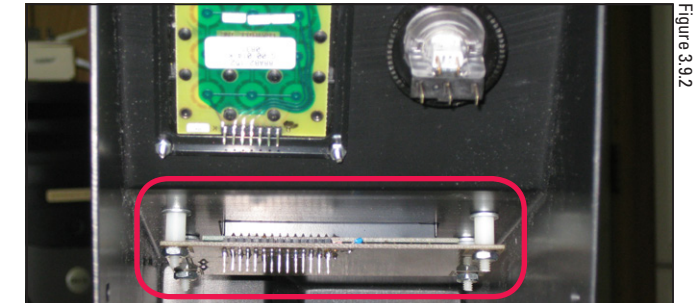
1) The disassembly process will leave the ticket counter in the following state



After disassembly step 22

2) The LCD assembly mounts from the inside. After the initial disassembly is complete, the LCD assembly would fall down if dismounted

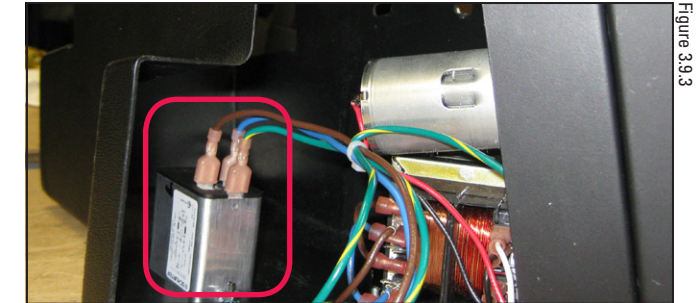
The plastic body needs to be turned upside down ...



It is hard to replace the LCD assembly in this position

3) ... in order to do that, however, the power cables need to be unplugged from the power entry module, and the wire harness for the ticket catcher optical sensor needs to be pulled out of the plastic body

*Note: take careful note of which power wire connects to which plug (see p. 10): an incorrectly plugged power wire can result in injury and/or death, and possible damage to the PrecisionCounter 500*



Disconnect these cables - and the ticket catcher harness - from the plastic body

4) Oriented in this manner, it is easier to perform maintenance on the LCD assembly

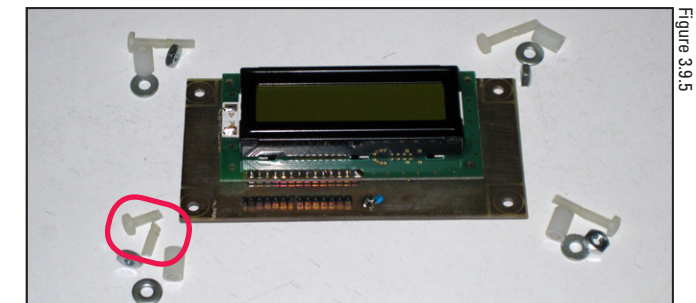
*Note: to make sure that the replacement LCD assembly will not be mounted upside down, take note of the location of the header on the original LCD assembly PCB*



Oriented in this manner, it is easier to perform maintenance on the LCD assembly

5) The components of the LCD assembly

*Note: the plastic screws and spacers are used to protect against static shocks - it can be easy, however, to break one of the plastic screws if the nuts are tightened too tightly*

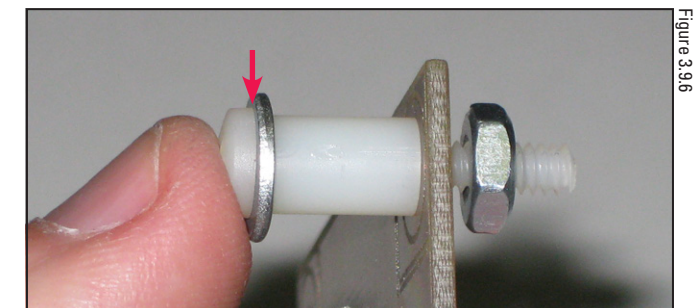


The components of the LCD assembly

6) The mounting order is the following (left to right)

Plastic screw; plastic body (not pictured, but would be present where the red arrow is); washer; spacer; PCB; nut

A final tip for mounting the assembly: the Precision Counter 500 label has a see-through pane that covers the LCD screen: take care not to puncture it



The mounting order for the components of the LCD assembly

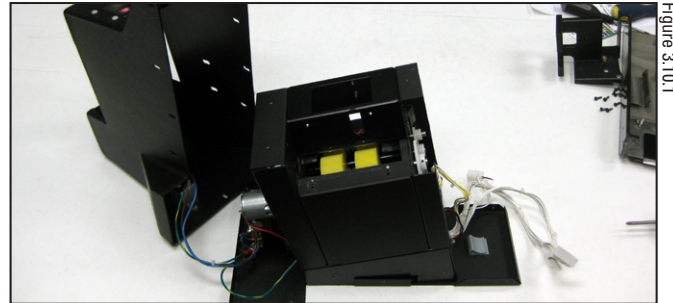


# 10 Adjusting the metal spring foot

Estimated Time	10 minutes
Difficulty	2 of 5
Possibility of damage	2 of 5
Disassembly?	1-22

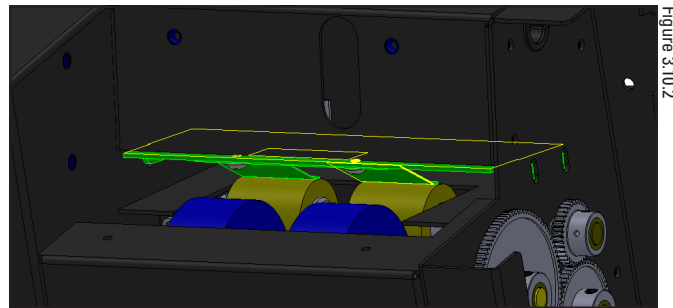
- Tools Required:**
- #1 Phillips screwdriver (capable of comfortably handling size 6 screws)

1) The disassembly process will leave the ticket counter in the following state



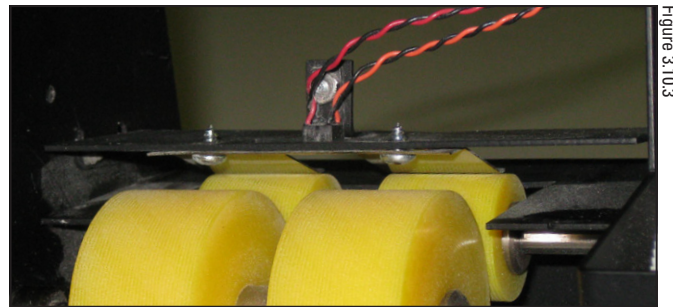
After disassembly step 22

2) The foot mounting bracket and metal spring foot can be adjusted even if the metal top wrap is not removed



Conceptual drawing of the foot mounting bracket and metal spring foot

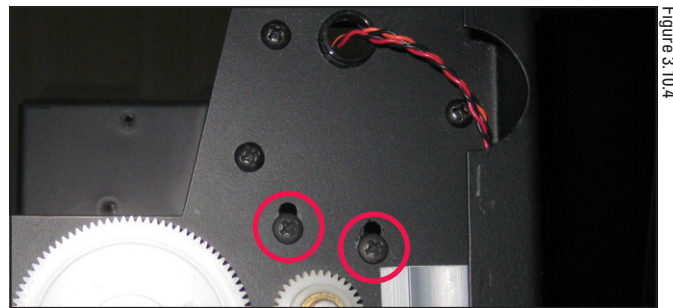
3) If the metal spring foot does not exert enough pressure against tickets as they leave the rollers, the ticket counter will not operate properly



The same area as Figure 3.10.2 with the metal top wrap removed for clarity

4) The height of the metal spring bracket is adjusted by these 2 screws on the side of the ticket counter which has the motor board PCB ...

[the 2 screws only need to be loosened, not removed]



2 of the adjusting screws for the metal spring bracket

5) ... and by 2 more screws on the side of the ticket counter which has the motor

[the 2 screws only need to be loosened, not removed]

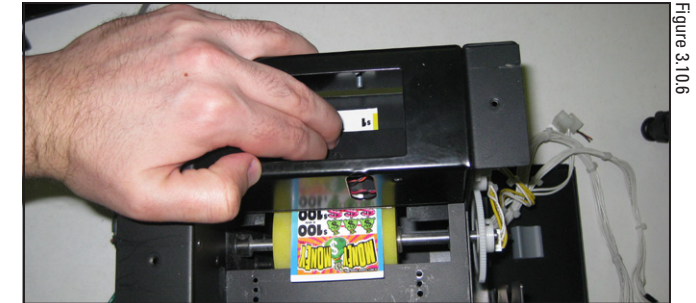
These last 2 screws are accessed through the hole in the plastic pulley gear (when the hole in the gear is at roughly 11 and 1 o'clock)



The other 2 adjusting screws for the metal spring bracket

6) a) place a ticket between the metal spring foot and the rollers

b) while pressing on the metal spring foot with mild-moderate force, tighten all 4 screws



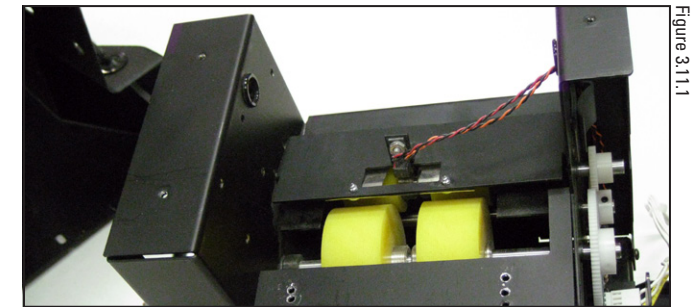
Adjusting the height of the metal spring foot

# 11 Cleaning the ticket-count optical sensor

Estimated Time	< 5 minutes
Difficulty	1 of 5
Possibility of damage	1 of 5
Disassembly?	1-29

- Tools Required:**
- Q-tips
  - A can of compressed air
  - A small vacuum

1) The disassembly process will leave the ticket counter in the following state

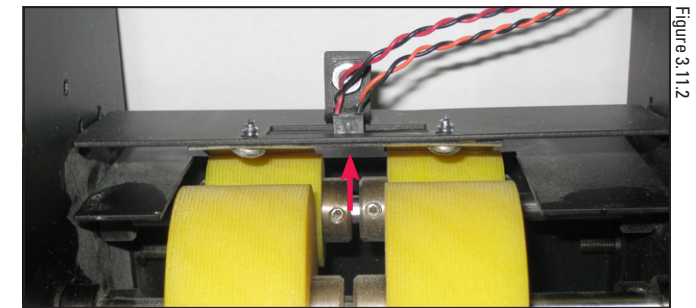


After disassembly step 29

2) Gently use a q-tip to wipe the bottom of the optical sensor. This is the only step that really needs to be performed, but it would also help to ...

Blow out any dust close to the sensor

Vacuum any dust that has accumulated in the inner chamber (the metal side wall needs to be removed to access it)



Gently use a q-tip to wipe the bottom of the optical sensor



## 12 Replacing a plastic gear

If a plastic gear has chipped teeth - or is missing teeth - it will need to be replaced: this situation usually results in an abnormal whirring sound that is quite readily identifiable

Some technicians change gears in the field, but everyone who attempts to do so should be aware of the following notes. Gears are tightened down via Allen screws. The body of the Allen screw is located in a fixed position in the gear: it goes further toward the center of the gear when screwed in, and further away from the center of the gear when screwed out. The inner tip of the Allen screw does not go into some kind of socket (like a regular screw). Instead, it exerts pressure anywhere against the flat surface of the shaft on which the gear is mounted. The friction of the Allen screw pressing against the flat surface prevents the gear from moving around: this allows the gear to be mounted anywhere along the shaft without the need of a socket

For this to work properly, a flat surface is needed on the shafts on which the gears are mounted. The flat surface on most of the shafts in the PrecisionCounter 500 are only about 2-3 millimeters wide! If the Allen screw misses the flat surface when being screwed in, it will likely hold against the curved surface of the shaft for a short period of time, but when it begins to slip, and the gear begins to move around, it will cause the gears to be out of sync, and one or more gears will get damaged

Even when the Allen screw of a gear is correctly positioned, with time, it will begin to loosen its pressure against the flat surface of the shaft. That is why virtually every Allen screw in the PrecisionCounter 500 is doused in a healthy serving of locktite - a compound which hardens and prevents backward regression of the Allen screw during normal operation. In order to replace a gear you will need to do what the Allen screw is prevented from doing by the locktite: break through the locktite and unscrew the Allen screw so that it no longer exerts pressure against the shaft: this requires a good deal of force (for that reason it is recommended that you have 90° Allen wrenches because they can exert more torque than straight wrenches)

Sometimes, however, you will find that the Allen screw gets stripped within the gear before it can move backwards against the locktite: in such cases the only option is to break the gear off the shaft - a dangerous process which can result in damage to the PrecisionCounter 500. These are some of the dangers associated with performing this procedure and - though the procedure is described below - we recommend that, should a gear need to be changed, the entire unit be shipped to Arrow International for service

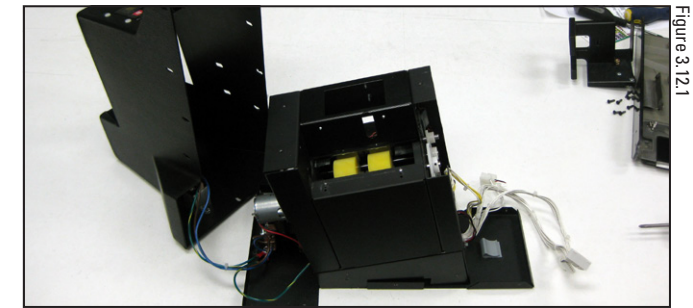
Estimated Time	15 minutes
Difficulty	5 of 5
Possibility of damage	5 of 5
Disassembly?	1-22

**Tools Required:**

- 1/16" 90° hex Allen wrench
- locktite

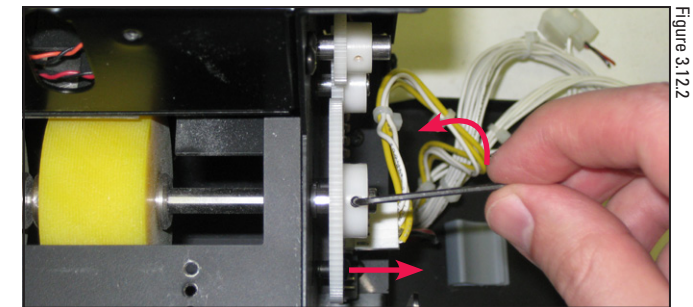
After completing the replacement of a part that utilizes an Allen screw, be sure to re-apply locktite to the Allen screw prior to re-assembling the rest of the ticket counter

1) The disassembly process will leave the ticket counter in the following state



After disassembly step 22

2) Unscrew the Allen screw and pull the gear off the shaft



Removing a gear

- When mounting the new gear make sure to
- align it with the other gears (you will notice that the smaller gear in the Figure is a little misaligned)
  - align the screw with the flat surface of the shaft (the tiny sliver of reflective light in Figure 3.12.2)
  - re-apply locktite once the screw is tightened

## 13 Replacing a roller

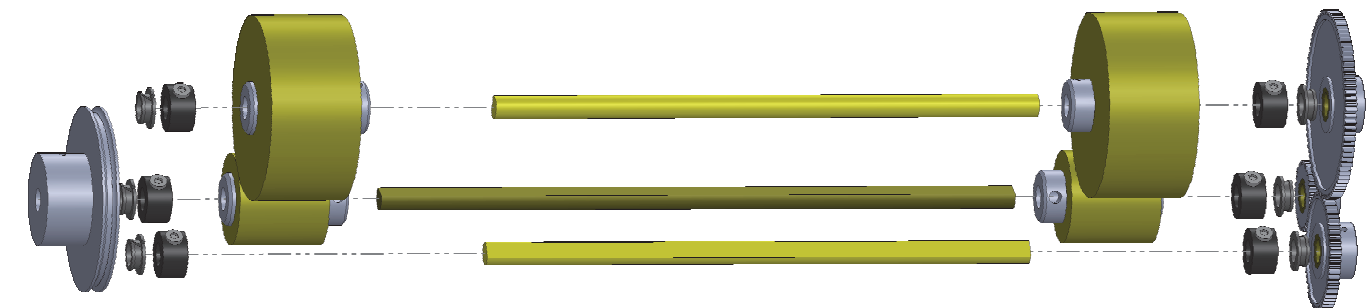
Please read over procedure 12 for an introduction to the Allen screws which are used in this procedure: roller replacement is another procedure for which we recommend that the entire unit be shipped to Arrow International for service

The main difference between replacing a roller and replacing a gear is that to replace a roller, 4 Allen screws must be loosened and re-attached instead of 1 (2 for the roller cores and 2 for the shaft collars): the rollers cannot be pulled out until every piece is off the shaft

Estimated Time	30+ minutes
Difficulty	5+ of 5
Possibility of damage	5 of 5
Disassembly?	1-34

**Tools Required:**

- 1/16" hex Allen wrench (for the 2 roller cores)
- 3/32" hex Allen wrench (for the 2 shaft collars)
- locktite





1) The disassembly process will leave the ticket counter in the following state

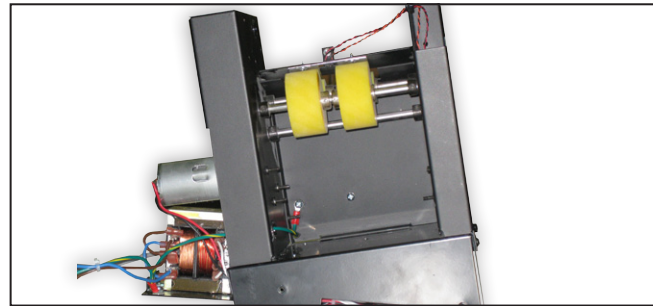


Figure 3.13.1

- Before disassembling the roller shaft, wiggle it back and forth (red arrow) ... notice that it has a *little* play (because the shaft collars are not screwed in *all* the way into the sides)
- Notice the perfect alignment between the two rollers and metal spring (blue arrows)
- Notice the gap between rollers (green arrow)
- Unscrew the 4 Allen screws - with the shaft properly turned they'll be in the circled areas

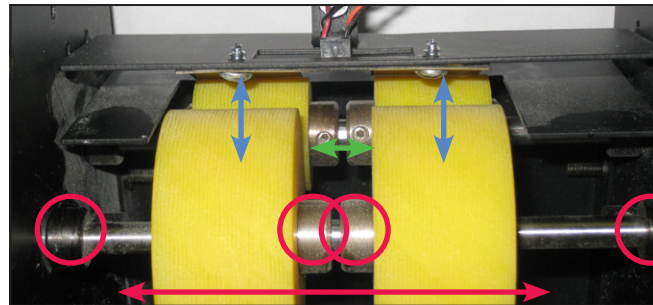


Figure 3-13-2

Pay attention to the arrows before unscrewing the Allen screws

## 14 Replacing the ticket-count optical sensor

Estimated Time	20 minutes
Difficulty	4 of 5
Possibility of damage	3 of 5
Disassembly?	1-29

### Tools Required:

- #1 Phillips screwdriver (capable of comfortably handling size 6 screws)
- 1/4" nut driver
- soldering kit

1) The disassembly process will leave the ticket counter in the following state

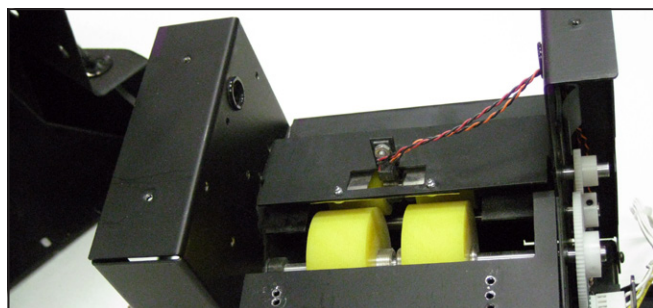


Figure 3.14.1

After disassembly step 29

2) The optical sensor is mounted on an immovable stand: the stand is soldered to the foot mounting bracket

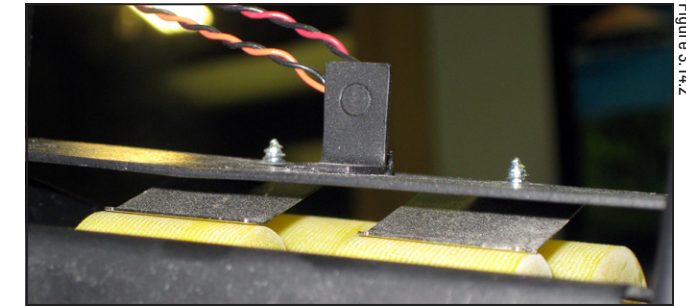


Figure 3.14.2

The sensor is mounted to this stand

3) The stand has a stud to which the optical sensor is fastened with a 1/4" nut. The only possible movement for the optical sensor is to rotate around the stud, or to slide up or down

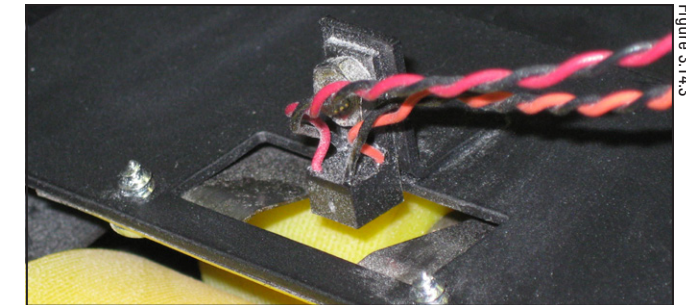


Figure 3.14.3

The position of the optical sensor in Figure 3.14.3 is correct: the optical sensor is pointing straight down between the rollers, and protrudes *at most* 1mm below the foot mounting bracket

Remember the original sensor's position, and unscrew the 1/4" nut which fastens it

4) The optical sensor's 4 wires are soldered to the underside of the motor board PCB. The motor board must be removed in order to be able to un-solder the old wires and to solder the replacement optical sensor wires

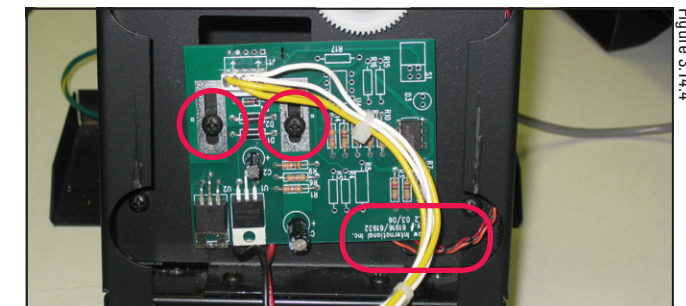


Figure 3.14.4

The motor board PCB is screwed to the main body of the ticket counter with 2 screws

To un-solder the optical sensor's wires, the underside of the PCB must be exposed

5) Un-solder the old optical sensor's wires and solder in the replacement optical sensor's wires: if possible - in order to avoid mixing up the wires - un-solder and solder one wire at a time

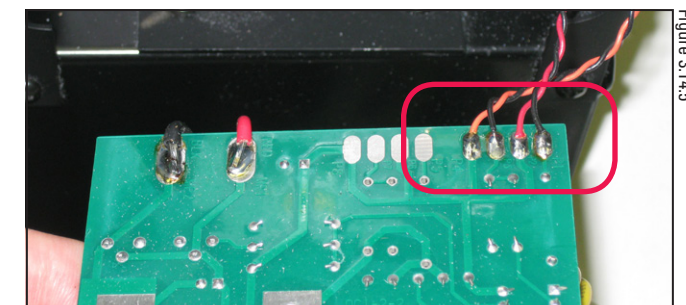


Figure 3.14.5

Mount the replacement optical sensor as in Figure 3.14.3. The new optical sensor is now ready for operation

Un-solder the old wires and solder in the replacement optical sensor's wires

6) Be sure to run the wires through the provided panduit: this will prevent them from getting snagged by a gear when the ticket counter is dispensing tickets

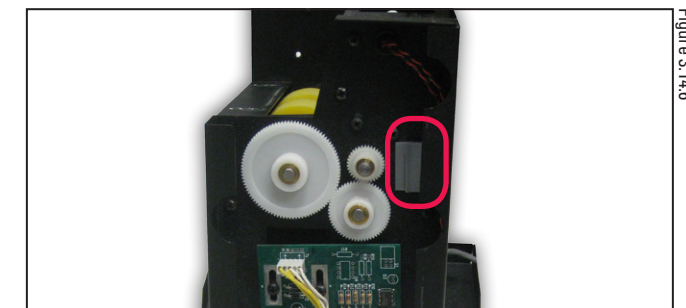


Figure 3.14.6

Keep the wires away from the gears by running them through the provided panduit



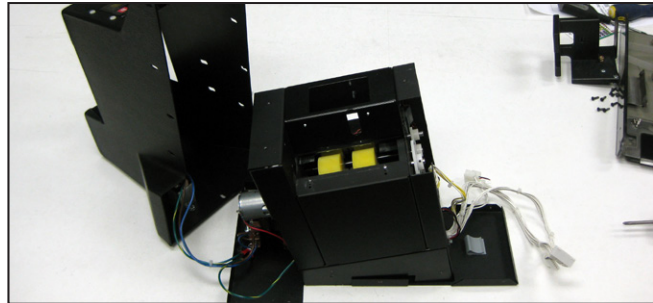
## 15 Replacing the motor belt

Estimated Time	5 minutes
Difficulty	1 of 5
Possibility of damage	1 of 5
Disassembly?	1-22

**Tools Required:**

- None: the relevant components can be modified by hand

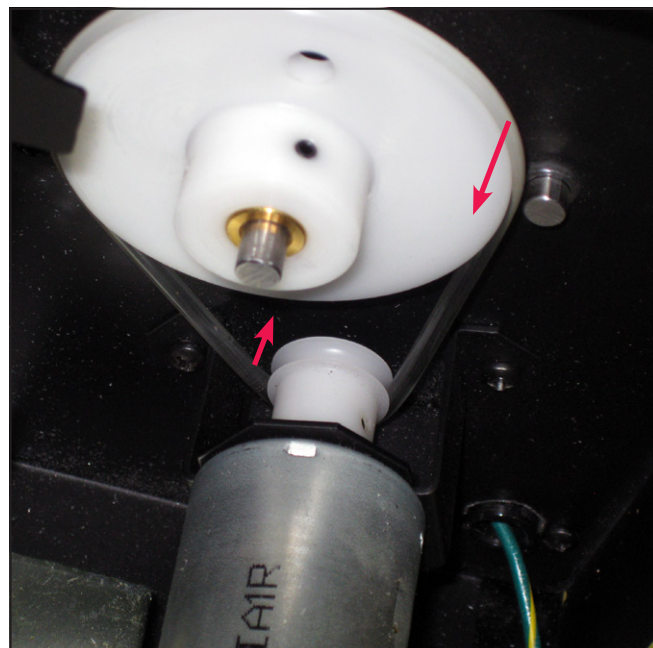
1) The disassembly process will leave the ticket counter in the following state



After disassembly step 22

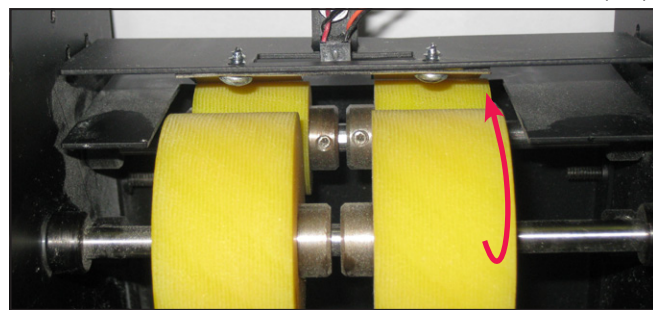
2) The motor belt is a wear & tear part that can be removed from the machine by de-railing it off the plastic pulley and the motor

When the replacement is mounted, take care to ensure that no twists are present in the motor belt: they can significantly reduce the life of the motor belt



Pull the motor belt off the 2 pulleys

3) Turn the 2" rollers by hand and verify that the motor belt is operating properly for several cycles of rotation



Manually turn the 2" rollers to verify correct operation of the motor belt

Figure 3.15.1

Figure 3.15.2

Figure 3.15.3

## 16 Replacing the plastic pulley

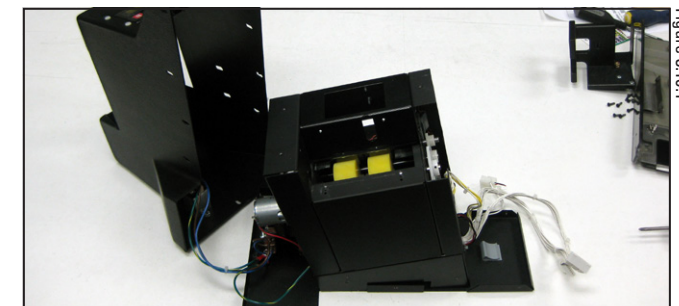
Please read over procedure 12 for an introduction to the Allen screws which are used in this procedure

Estimated Time	15 minutes
Difficulty	4 of 5
Possibility of damage	4 of 5
Disassembly?	1-22

**Tools Required:**

- 1/16" hex Allen wrench
- locktite

1) The disassembly process will leave the ticket counter in the following state



After disassembly step 22

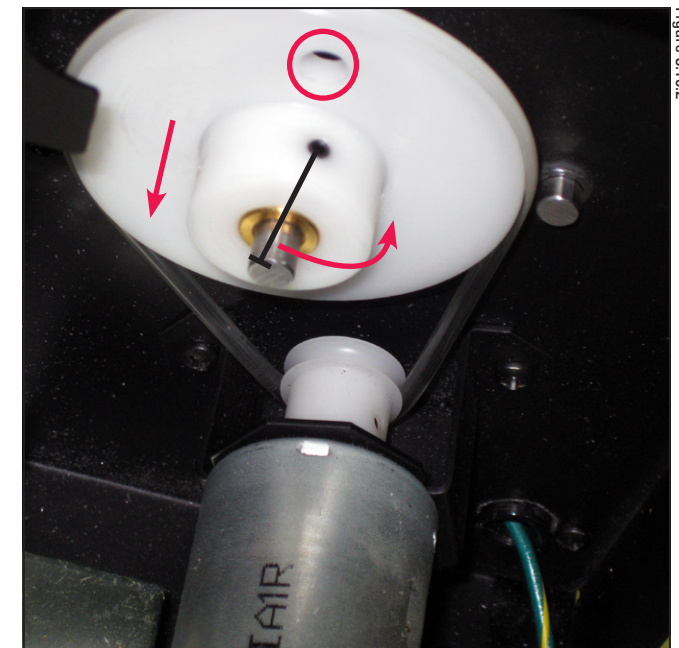
2) Verify that the replacement plastic pulley has the hole needed to adjust the metal spring foot

Unscrew the Allen screw on the original plastic pulley and pull the pulley off the shaft. The motor belt will need to be derailed in order to be able to pull the pulley off the shaft

When the replacement plastic pulley is inserted, it must be aligned with the motor pulley to make sure they are one the same vertical plane - so that the motor belt will not be spinning at an angle: an improperly aligned motor belt will wear out pre-maturely or will derail when tickets are being dispensed

Turn the 2" rollers by hand and verify that the belt is operating properly for several cycles of rotation

Apply locktite to the Allen screw prior to assembling the rest of the ticket counter



Replace the original pulley and verify that the replacement is aligned with the motor

Figure 3.16.1

Figure 3.16.2



# 17 Replacing the motor

The following considerations are applicable to this procedure

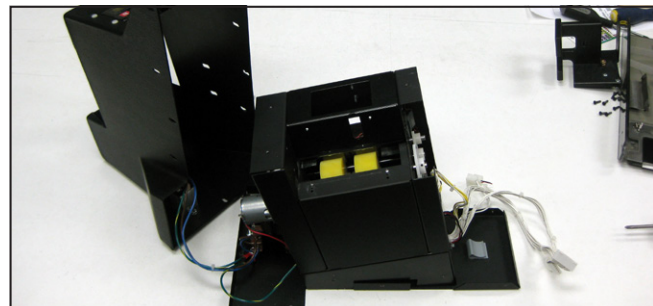
- physical mounting of the motor: please read over procedure 12 for an introduction to the Allen screws which are used in this procedure
- alignment with the plastic pulley: to prevent damage to the motor belt
- soldering: the correct polarity must be maintained in order for the motor to operate correctly

Estimated Time	20 minutes
Difficulty	5 of 5
Possibility of damage	4 of 5
Disassembly?	1-22

**Tools Required:**

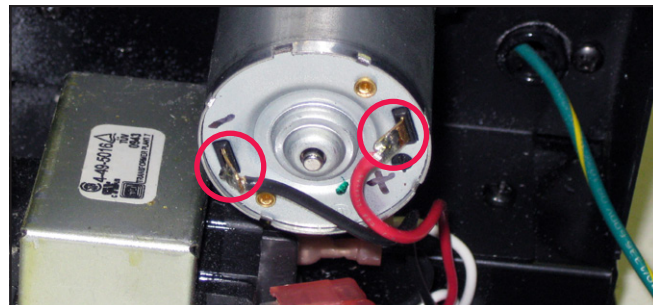
- #1 Phillips screwdriver (capable of comfortably handling size 6 screws)
- .05" hex Allen wrench
- locktite
- soldering kit

1) The disassembly process will leave the ticket counter in the following state



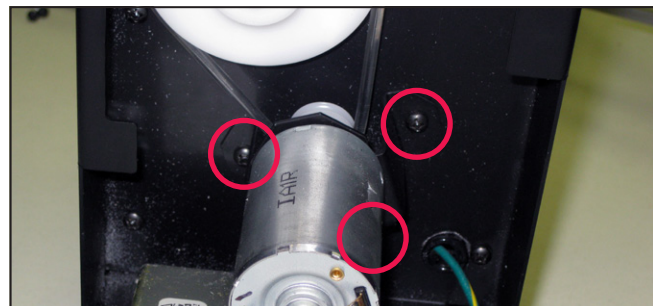
After disassembly step 22

2) Un-solder the two power leads to the original motor: be sure to note the correct polarity



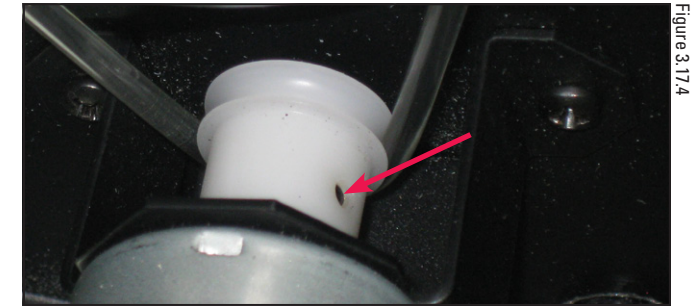
Un-solder the two power leads to the original motor

3) Remove the 3 screws which fasten the motor mounting bracket to the main body of the ticket counter (2 on the side and 1 below)



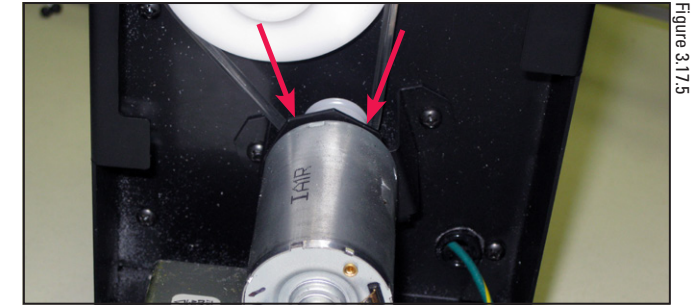
Remove these 3 screws

4) Remove the small pulley off the motor shaft: first mark how deep on the shaft the pulley is located: the pulley will need to be inserted at the same position on the replacement motor's shaft to preserve vertical alignment with the plastic pulley above the motor. If the two pulleys are not properly aligned, the motor belt will spin at an angle: an improperly aligned motor belt will wear out pre-maturely or will derail when tickets are being dispensed



Remove the small pulley off the motor shaft

5) Remove the 2 screws which fasten the motor mounting bracket to the motor itself



Detach the motor mounting bracket from the motor

The original motor is now detached from the ticket counter

5) To connect the replacement motor, perform the previous steps in reverse

- attach the motor mounting bracket to the motor itself (2 screws)
- attach the small motor pulley to the motor (do not use locktite yet in case the pulley needs to be adjusted further up, or down, the shaft)
- attach the motor mounting bracket to the main body of the ticket counter (3 screws)
- install the motor belt and observe if the pulleys are properly aligned. If the alignment is correct, apply locktite to the small motor pulley
- solder the two power leads to the replacement motor: be sure to observe polarity

- re-assemble the ticket counter
- test the machine





## 18 Cleaning the rollers

The rollers maneuver the ticket from the bottom of the column to the dispensing chute. They need friction - the ability to 'grab' the ticket - in order to be able to reliably perform their job. This friction is achieved by the rough coating applied to the rollers

This coating is very resilient: it hardly ever gets damaged. What does happen, however, is that waxy glazing from the tickets, over time, deposits *on top* of the coating. Cleaning the rollers of this waxy residue is one of the more important maintenance routines to be performed: it is recommended that this procedure be performed every few months on busy machines

Estimated Time	10 minutes
Difficulty	1 of 5
Possibility of damage	2 of 5
Disassembly?	1-34

**Tools Required:**

- Rubbing alcohol, or white vinegar ... or - as a last resort - Windex
- Lint-free cloth

1) The disassembly process will leave the ticket counter in the following state

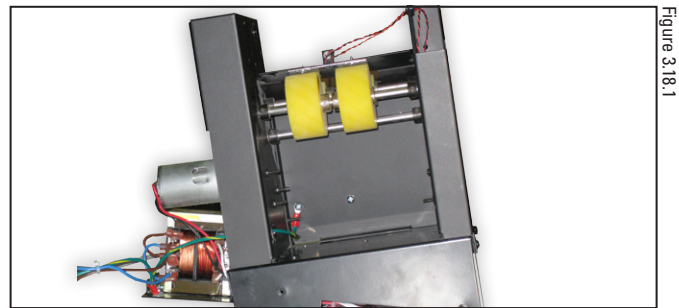


Figure 3.181

2) Turn 1 of the 2" rollers by hand. This will turn all the rollers in the assembly and allow their various extremities to be accessible for cleaning

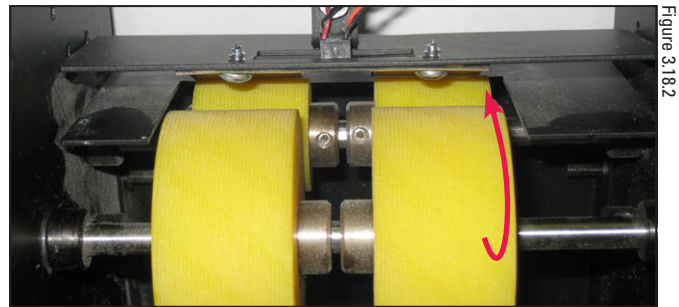


Figure 3.182

Scrub the undersides of the rollers as necessary: use a lint-free cloth and rubbing alcohol: rubbing alcohol is recommended because it does a good job of cleaning the waxy residue and because it evaporates very quickly

Manually turn 1 of the 2" rollers and clean the accessible parts of the rollers

- also clean the side walls and the inner chamber of accumulated ticket dust: once the machine is operational, some of that dust may settle on the rollers
- do NOT turn on the ticket counter until certain that all liquids used in cleaning the machine have evaporated

## 19 Diagnosing power issues

This procedure requires that electrical readings be taken with a multimeter while the power to the ticket counter is connected and turned on. This procedure can result in injury and/or death, and possible damage to the PrecisionCounter 500

Estimated Time	15 minutes
Difficulty	4 of 5
Possibility of damage	5+ of 5
Disassembly?	Only Partial

**Tools Required:**

- Multimeter

Electrical current flows into the ticket counter along the path described below: a failure anywhere along this path will cause improper operation of the ticket counter. It is possible to start by taking readings further up the path (which can be used to validate that everything before that point on the path is correct) but, because it shouldn't be assumed that the electrical components of the machine have not been tampered with, the recommended procedure is that the electrical testing follow the order described below

1) The electrical outlet is the source of AC power for the ticket counter: do not assume it is working correctly. Either plug another appliance into the same outlet used by the ticket counter or take an AC reading: this reading should give 110-120 VAC

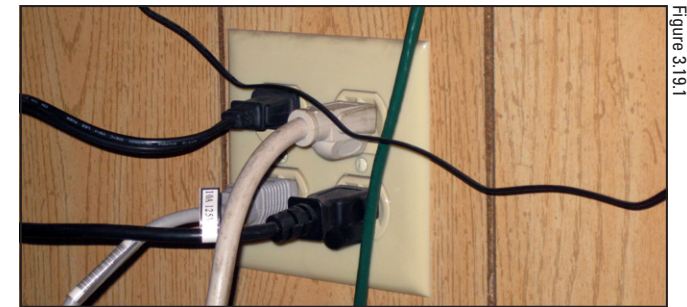


Figure 3.191

Test the AC outlet

2) The AC lines feed into the power entry module of the ticket counter. This module houses the fuse and on-off switch

To test the fuse, leave the machine unplugged and remove the fuse. A bad fuse may appear cloudy, but to be certain, set your multimeter to test for Ohms across the 2 ends of the fuse. A bad fuse will give the same reading as when the 2 leads are not touching anything (different meters display this state in different ways). A good fuse will show a value close to 0

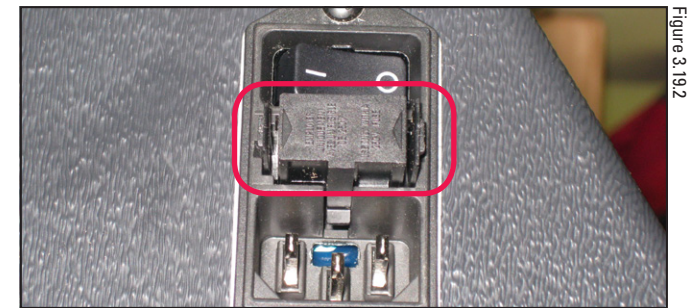


Figure 3.192

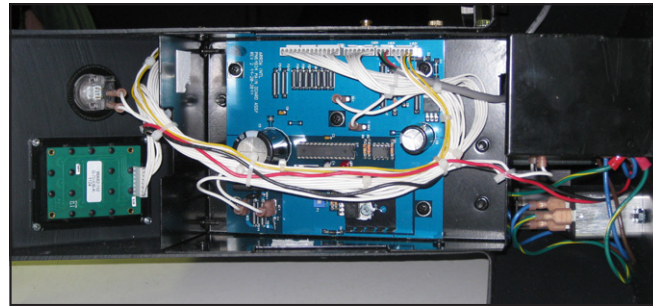
Test the fuse





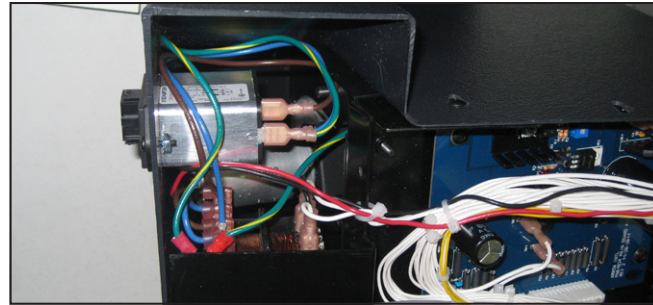
3) To test the on/off switch, you will need to perform partial disassembly (see p. 26)

This will leave the electrical components accessible for testing



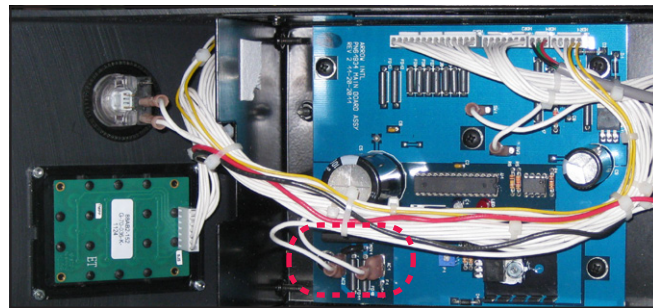
After partial disassembly

4) With the machine still unplugged, verify that all the power connections are connected properly - see page 10 of this manual for a close-up of the transformer and power entry module. If you wish to verify that the transformer is still the original transformer, you will need to perform full disassembly, up to step #22



Verify that the power connections are properly connected

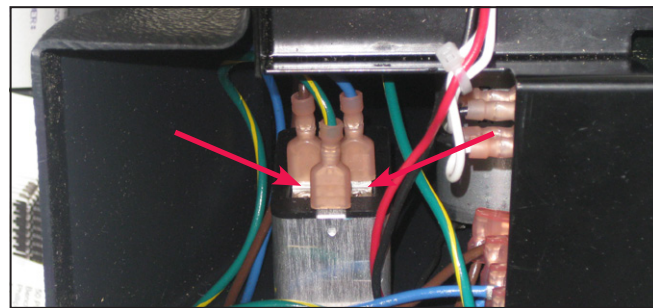
5) While in this position - with the machine still unplugged - verify that the rest of the cables and harnesses are connected as well ... particularly the AC inputs to the main PCB from the transformer (see p. 14-15 for a close-up of the main PCB connections)



Verify that every other cable or harness is properly connected

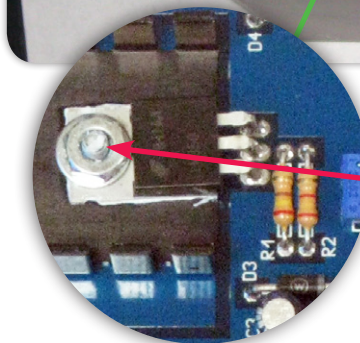
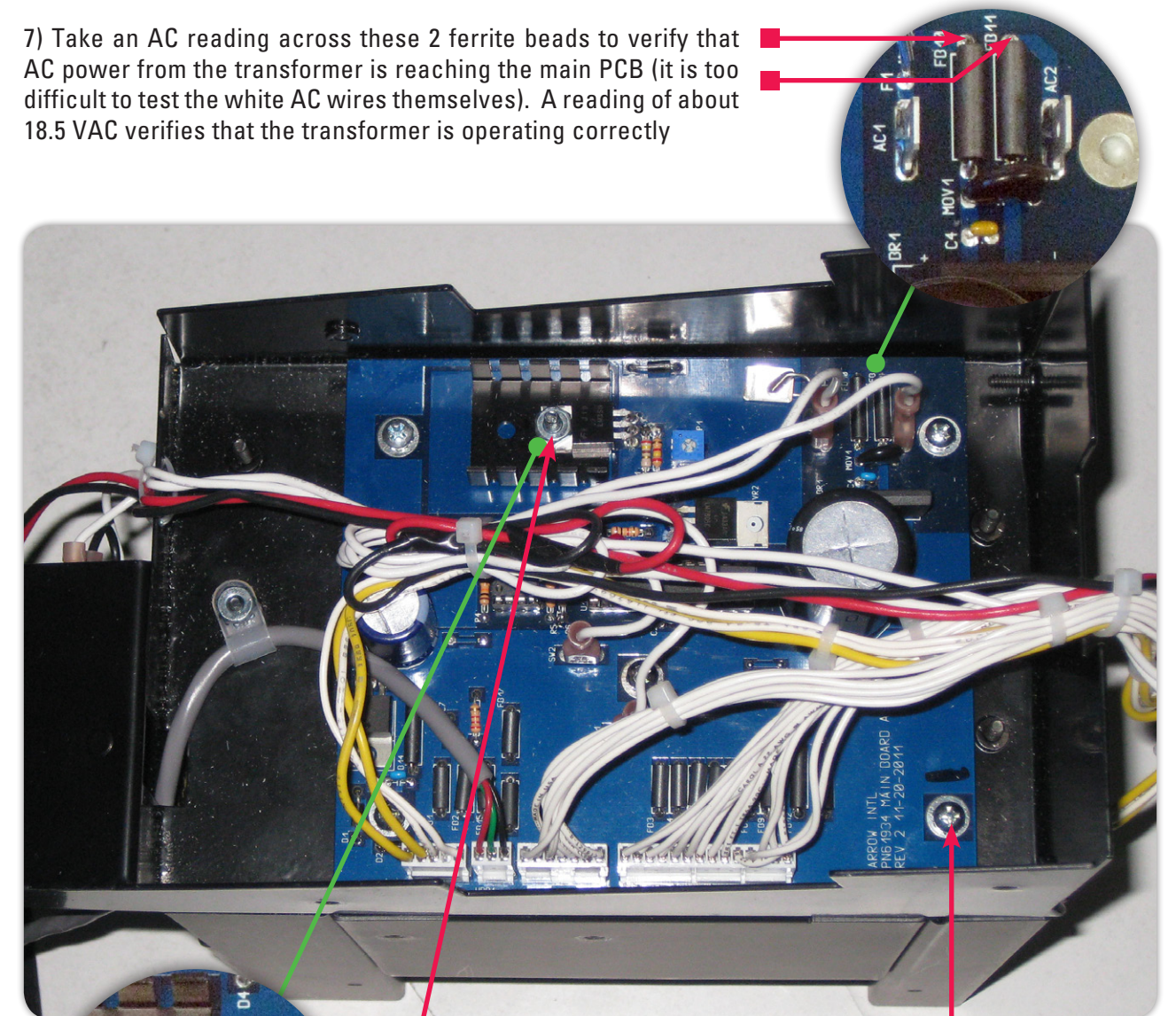
### Plug in the power cord and turn on the on/off switch

6) ... take an AC reading across the Line-in and Neutral leads that connect to the power entry module: this reading should give the same result as that in step #1: about 110-120 VAC



Test the operation of the on/off switch

7) Take an AC reading across these 2 ferrite beads to verify that AC power from the transformer is reaching the main PCB (it is too difficult to test the white AC wires themselves). A reading of about 18.5 VAC verifies that the transformer is operating correctly



8) Take a DC reading across these 2 screws to verify the operation of the bridge rectifier, the voltage regulator for the motor, and the potentiometer

(The tabs of voltage regulators generally connect to the middle pins of the regulators (which are usually ground); however, for this particular adjustable regulator, the middle pin is the output, and the tab, which connects to it, can be used to read the DC voltage going to the motor)

The DC reading should be 14.2 VDC (or a value very close to it, like 14.1, or 14.3). If it is close, but more than .3 VDC away from 14.2 VDC, the bridge rectifier is ok, but the potentiometer needs to be adjusted to the correct value: do not operate the machine if the reading from step #8 is not 14.2 VDC



Please contact the Technical Assistance Center for any further technical questions about the PrecisionCounter 500

[800.277.6214](tel:800.277.6214)

If you have any comments, or suggestions, specifically related to this manual - or its future revisions - please contact the Technical Writing Team directly

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