



Installation of the 7th Tray for National 148, 158, 168

*Important Note: Please read all instructions thoroughly before continuing with installation of kit. If you are having problems installing the kit, please call **1-800-321-2311 and select option 3 for Support.***

Tools Required
Phillips Screwdriver or Cordless Screwdriver
Drill
5/32" Drill Bit
1/8" Drill Bit
Pliers
Adjustable/Crescent Wrench
1/4" Nut Drive
Masking Tape
Black Electrical Tape
Flashlight

Rail Replacement Part Numbers	
Item	Part #
Standard Ramp Rail	VE8450B
Wide Ramp Rail	VE8450K
Certs Ramp Rail	VE8450G
Coil Guide	VE8450L
Halls Rail	VE8450J

WARNING: Prior to installation, turn the power off to the vending machine and unplug it from its power source. Also, make sure to level the machine.

The new gum and mint tray will be mounted to the bottom of the "F" tray. It should only be mounted to a 4 select "F" tray. If the "F" tray is a 8 select, you will need to either rearrange the trays to obtain a 4 select "F" tray, otherwise we do not recommend installing this tray.

- 1) Remove the existing gum and mint tray. To do this, remove the two bolts located on the left and right hand side. These bolts allow the gum and mint tray to swing on its hinge. (Figure 1)



Figure 1

- 2) Remove the gum and mint motors from the vend bucket.

Remove the bracket assembly that houses the gum and mint tray motors. Do this by removing the two screws on the left and right hand side, as shown in Figure 2 & 3

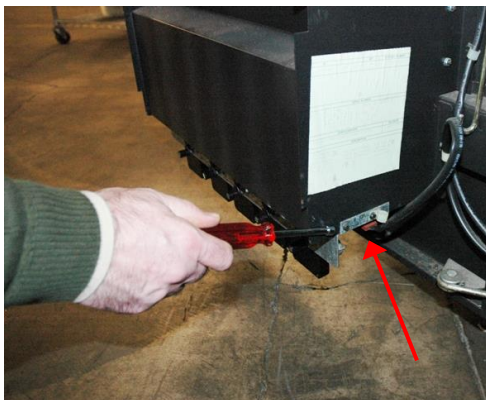


Figure 2

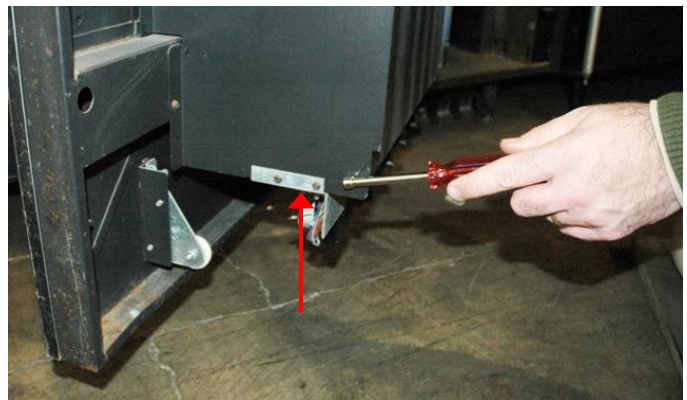


Figure 3

If working on a **National 148**:

3) Remove the board attached to the motor bracket, as shown in Figure 4. Use pliers to pinch the plastic standoffs from the bottom of the bracket.

The **National 158 and 168** do not use this board.



Figure 4

For All Models:

4) Remove the existing wiring harness from the motors (and the board if you are working on a 148) (Figure 5). The wiring harness may be discarded, as it is no longer needed.

5) Remove the motors from the bracket, by using the 1/4" Nut Driver or Flat Head Screwdriver, as shown in Figure 6.

6) Remove the spiral coupler from all motors, using pliers, as shown in Figure 7.

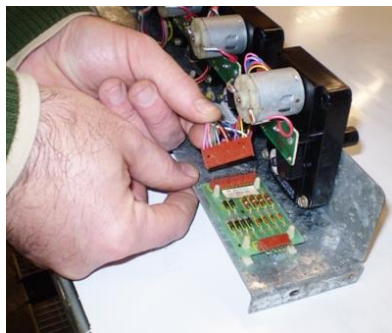


Figure 5



Figure 6



Figure 7

7) Install the motors on the new tray with the supplied hardware.

There are 5 open motor slots for the tray (H0 being the left hand side). Figure 8B shows the bolts that will be used to attach the motors. Figure 8C shows what the back of the motor looks like when being installed.

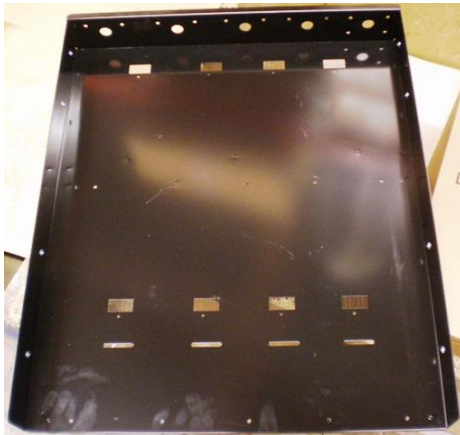


Figure 8A



Figure 8B



Figure 8C

8) Attach the correct harness to the motors. Figure 9 belongs to the National 158/168 and Figure 10 belongs to the National 148. H0 is the first selection of the new gum and mint tray. The small jumper harness may be needed on some later model National 158/168.

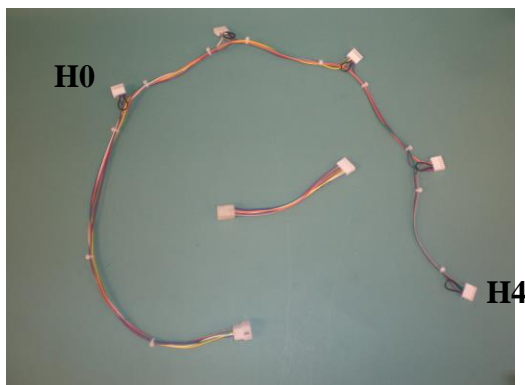


Figure 9

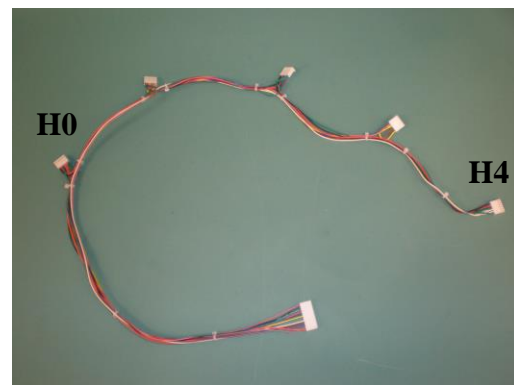


Figure 10

Harness Part Numbers:

National 158/168 Wiring Harness – VE8387

National 158/168 Jumper Harness – VE8387A

National 148 Wiring Harness – VE8384

Please note: Occasionally during the powder coating process, excess material will build up in the screw holes. When this occurs, it may be difficult to screw in the #8 1/4" self tapping screws supplied with your tray. To rectify this situation, simply clean out the screw hole with a 9/64" drill bit.

9) Installing bracket on bottom of gum and mint tray

Place the tray upside down, with the open end facing you. There are a series of holes on the 2nd support brace on the right hand side of the tray, in line with selection H0 (Figure 11). Using 2 of the #8-1/4" pan head screws; attach the bracket as shown in Figure 12.

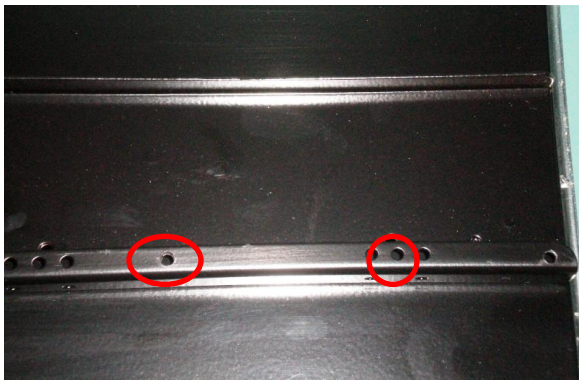


Figure 11



Figure 12

10) Installation of cable clamp

Using #8-1/4" pan head screws, attach a cable clamp using the right most screw hole, to the right of the bracket. Make sure the cable clamp is facing up and is pointing towards the motors (Figure 13).



Motors located in
direction of arrow

Figure 13

If working on a **National 148**:

Attach the small control board removed in Step 3, to the new bracket on the bottom of the tray (Figure 14A/B). Attach motor harness to control board (Figure 14C). Use the supplied wire ties to secure the cable to the mounting plate (Figure 14C, Red Arrow).

If working on a **National 158/168**, attach the motor harness to the bracket (Figure 14D).



Figure 14A



Figure 14B

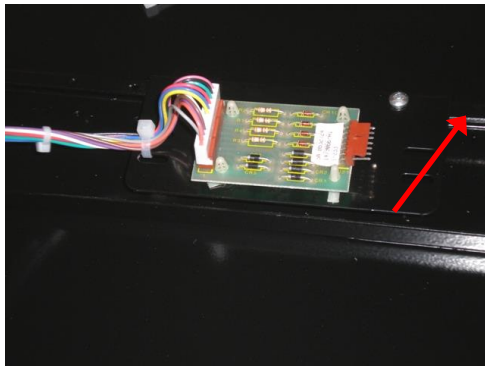


Figure 14C

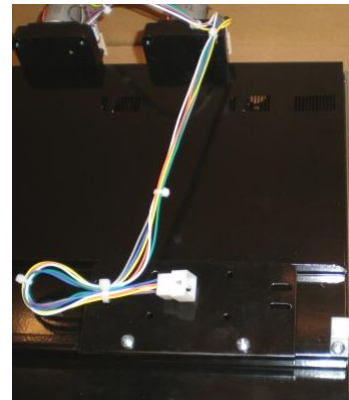


Figure 14D

11) Home the motors.

The factory gum and mint tray motors spin counter-clockwise, while they will need to spin clockwise for the new tray. This must be done before installing the coils to ensure proper alignment of the coils.

Set the tray in the bottom of the machine. Attach the new gum and mint tray to the gum and mint tray cabinet harness, so it can receive power. Plug it in and then power up the machine.

If working on a **National 148**:

The easiest way to home the motors is to run a test vend (Figure 15). Push the “Test Vend” button and then press “H0” through “H4”. Run each several times to ensure that the motors are homed properly.

If the display says “Locked”:

- Push the Up arrow until it displays “Code”
- Push the Right arrow key and it will say “Enter Code”
- Enter “0000” and hit “Enter”.

The machine will be unlocked. At this point, repeat the test vend portion of this section.

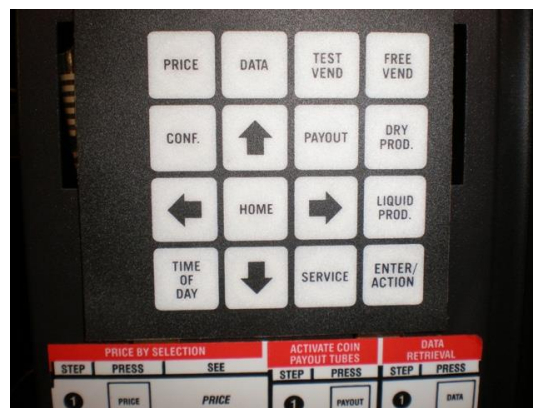


Figure 15

If working on a **National 158/168**:

Press “Test” and then “H0” through “H4”. Run each several times to ensure that the motors are homed (Figure 16).

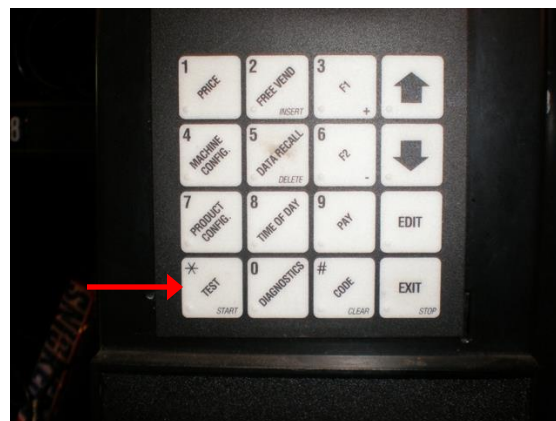


Figure 16

TURN OFF THE MACHINE, UNPLUG FROM POWER SOURCE, AND UNPLUG THE GUM AND MINT TRAY

12) Installing the dividers

Align the leg (Figure 17) of the dividers for the default setting. To do this, find the slot (front and back of tray) that is in line with the holes (Figure 18). The spring faces the back of the tray. Lock the divider into the slots by pulling forward so that the hole is still partly visible. The extra slots can be used to vend larger or smaller items in the future.

Repeat for all dividers



Figure 17

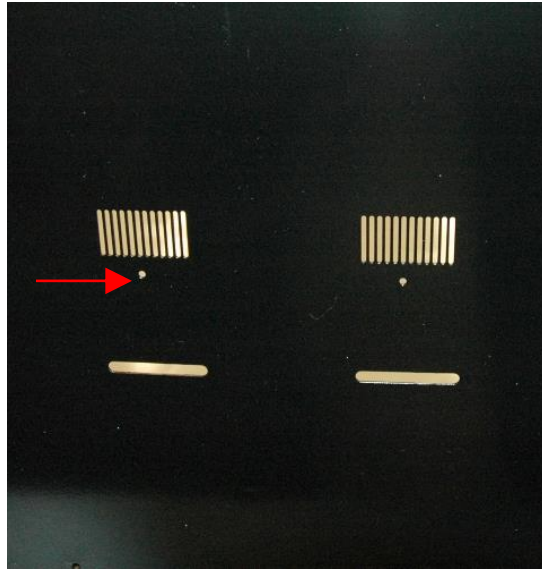


Figure 18

13) Installing the coils

Use the supplied spiral couplers. Follow Figure 19 and align the couplers to the following settings:

H0 & H2: 9 to 9:30 o'clock
H1, 3, & 4: 10 to 10:30 o'clock

Install the coils as you normally would on the snack shelves using the supplied spiral retainers (Figure 20). H0 and H2 receive 15 count spirals. H1, H3, and H4 receive 22 count spirals.



Figure 19



Figure 20

Please note: Occasionally during the powder coating process, excess material will build up in the screw holes. When this occurs, it may be difficult to screw in the #8 1/4" self tapping screws supplied with your tray. To rectify this situation, simply clean out the screw hole with a 9/64" drill bit. The #8 1/4" self-tapping screws will be used to secure the ramp rail to the tray.

14) Installing the Rails (Rails H0 - H4, Figure 21)

H0 receives the wide Halls rail with the alignment pin (Figure 21). Slide it underneath the coil and secure it with the alignment pin in the center of all of the holes in the front of the tray (Figure 24).



Figure 21



Figure 22A



Figure 22B

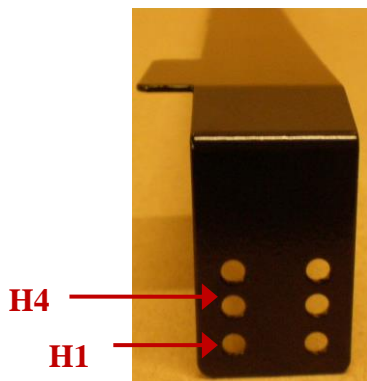


Figure 23A

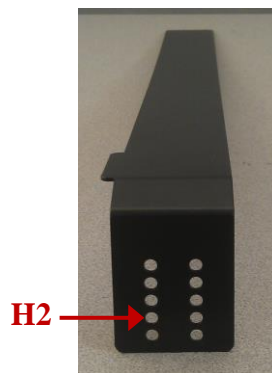


Figure 23B

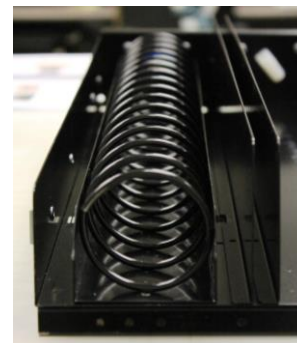


Figure 24

Selections H1 and H4 receive the standard ramp rails (Figure 21). Slide the rail through the coil. The rail for H4 gets fastened to the tray using the middle 2 holes. The rail for H1 gets fastened using the bottom set of holes (Figure 23A).

H2 receives the wide ramp rail (Figure 23B). Slide this rail through the center of the coil and secure it in the 2nd set of holes from the bottom. Note: This column uses a larger ramp and coil than necessary for the product vended in it. This was done so different product may be vended in the future with minimal changes.

H3 is a 2 part kit. It receives the coil guide (Figure 22A) and Certs ramp rail. Feed the coil guide underneath the coil and secure it with the alignment pin. The Certs ramp rail has a rectangle shape at the back end. Slide the Certs ramp rail through the center of the coil and secure to the front of the tray using the bottom holes (Figure 22B)

Completed Tray



Figure 25

15) Installing the tray

Pull tray “F” completely out of the machine. Inspect the back corners of the “F” tray for cracking or damage (Figure 26). If any damage is found, the shelf must be replaced before installing the new gum and mint tray. After inspecting the tray, place masking tape across the top of the tray (Figure 27). After applying the masking tape, flip the tray over on a flat surface with the open end of the tray facing you.

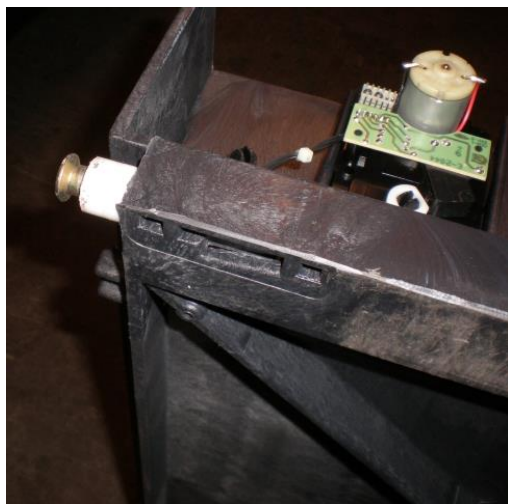


Figure 26



Figure 27

Install the new gum and mint tray mounting rails. Attach the brackets to the 4 holes that are a part of the factory tray “F”, if the holes are already drilled (Figure 28).

If the holes are closed (Figure 29), then use the 5/32” drill bit and drill through the center and push all the way through the tray (Figure 30). Drilling through the tray will not affect the performance of the “F” tray.

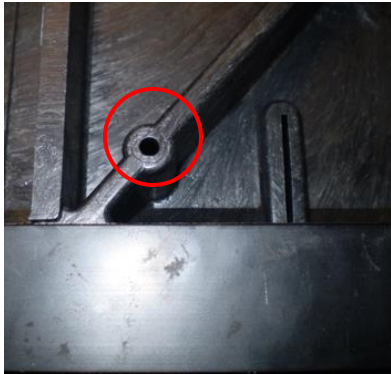


Figure 28



Figure 29



Figure 30

Attach the brackets with the supplied #10 self tapping screws and external lock washer as shown in Figure 31. Make sure the silver slides are facing towards the inside (Figure 32). The Right bracket (red R) contains the locking mechanism, which is covered by tape (Figure 33). **DO NOT REMOVE THIS TAPE UNTIL AFTER THE TRAY IS INSTALLED.** The left bracket (red L) has 2 wire clamps attached (Figure 34).



Figure 31



Figure 32



Figure 33

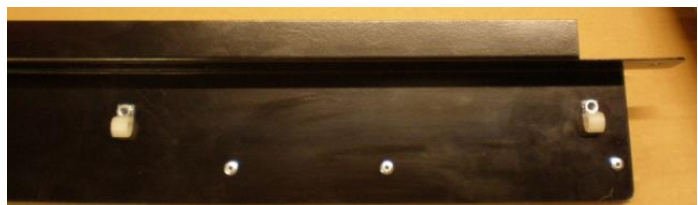


Figure 34

16) Installation of anti-tilt device for tray “F”

There is a left and right piece to the anti-tilt device (Figure 35). This device will allow the “F” tray to slide in and out easily and be removed, but it will no longer be able to tilt down. Figure 36 are the required screws for installing the anti-tilt device.

Since the position of the brackets is crucial, attached to the back of the instructions is a template to install the device. Two sets are included in case of a mistake when cutting one out.



Figure 35



Figure 36

Cut the left hand template out (Figure 37).

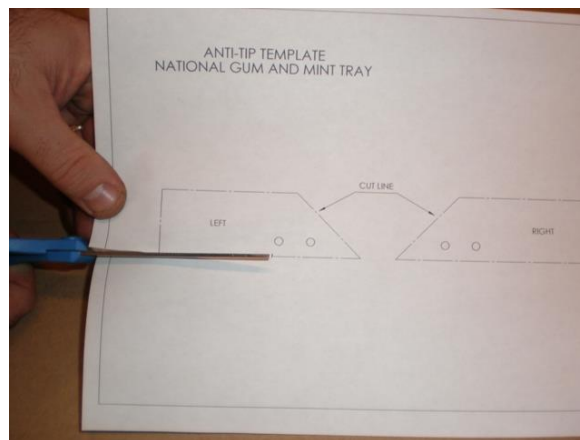


Figure 37

Next, tape it into place on the left rail for the “F” tray flush against the top and angle as shown by Red Arrows in Figure 38. Start to drill a little bit into the side rail using a 9/64” drill bit (Figure 38). After partially drilling both holes, remove the template and finish drilling (Figure 39).

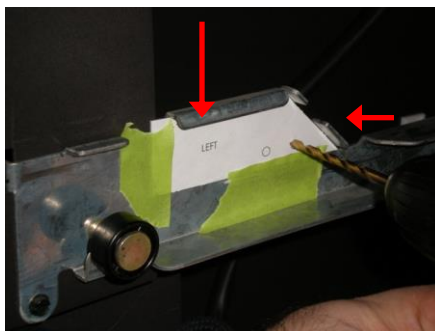


Figure 38



Figure 39

Using a ¼” nut driver, screw the left hand bracket into place using supplied screws (Figure 36). Finished product should look like Figure 40. **If the bracket is not parallel (red arrow), then you will need to swap rails with another row and re-drill your holes.** Repeat for the right side.

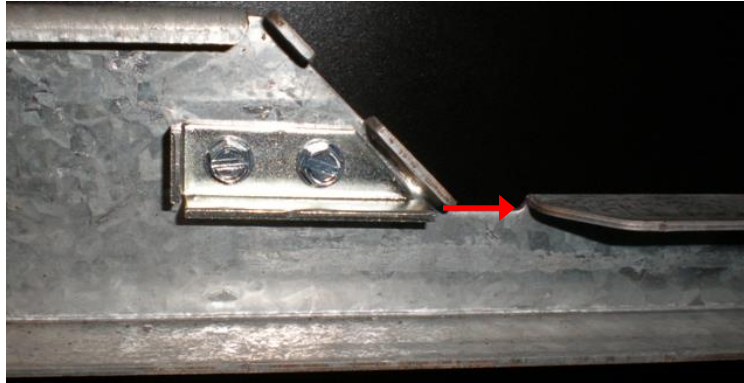


Figure 40

17) Re-install tray “F” (Figure 41)

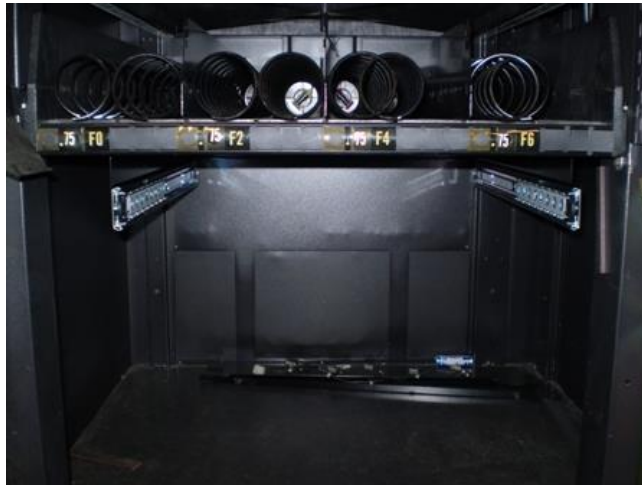


Figure 41

18) Installing the new gum and mint tray.

If installing on a **National 148**:

Free the factory wiring harness from the factory harness retainers (Figure 42). Feed the wire up the left hand side channel and into the hole at the top of the side channel (Figure 43/44). Drop the wire down to the machine floor.

If installing on a **National 158 & 168**:

Free the factory wiring harness from the factory harness retainers (Figure 42). The wiring already runs along the bottom of the machine.



Figure 42

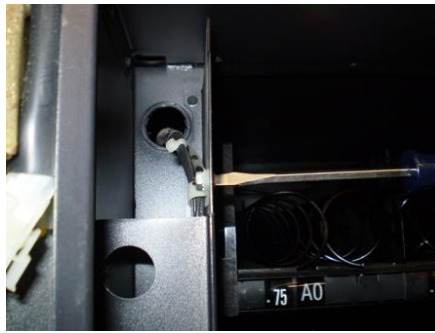


Figure 43



Figure 44

19) Insertion of the gum and mint tray

Pull the tray slides out and make sure the grey slider is all the way to the front of the slide as well (Figure 45)

Properly align the slides so the gum and mint tray fits onto the rails carefully. Push back on the tray until you hear 2 clicks, meaning the tray is locked, and then push the tray completely in. About 2/3rds of the way pushed in, there will be resistance and it will require a little more force to push the tray completely in the first time only.

Once the tray is completely pushed in, pull it out and push it back in several times to ensure it is fully engaged in the slides.



Figure 45

Pull the “F” tray out part way and remove the packing tape from the right hand slide, covering the locking mechanism (Figure 46), allowing the mechanism to lock into place (Figure 47).

To pull out the tray, the locking mechanism will need to be pushed up while pulling it out. At about the half-way point of sliding the tray out, the tray will stop unless the mechanism is held up.

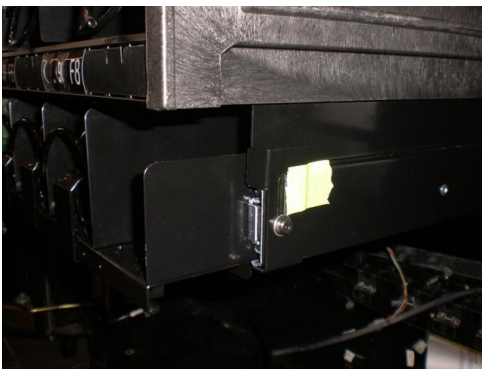


Figure 46

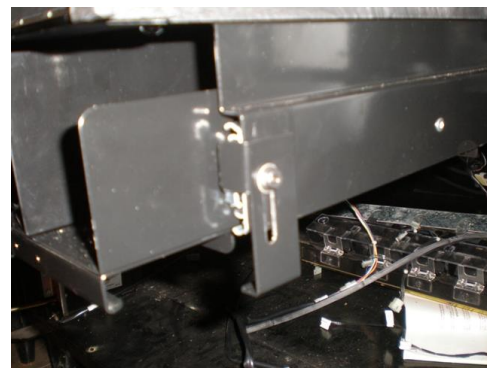


Figure 47

20) Securing Cabinet Harness

Figure 51: **National 148**

Figure 52: **National 158/168**

Zip-tie the cabinet harness to the bracket on the bottom of the tray (red arrow). Run the cabinet harness through the cable clamp. Make sure the thickest part of the harness is through the clamp (blue arrow, Figure 48/49).

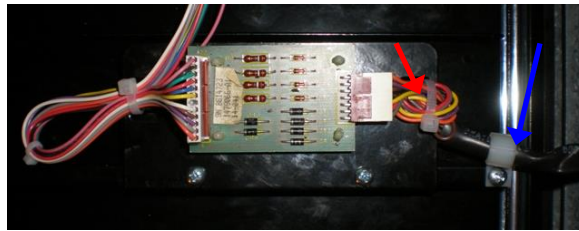


Figure 48

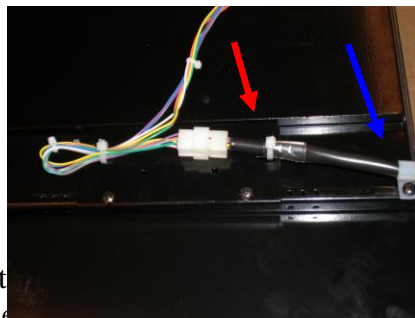


Figure 49

Clean an area, approximately 2 inches by 2 inches, on the inside tray support pillar (red arrow, Figure 50), with the supplied alcohol swab. Make sure this spot is about even with the bottom of the “F” tray (Figure 50).



Figure 50

Using the supplied zip-tie and tie down, loosely secure the cabinet harness to the cabinet wall, as shown in Figure 51.



Figure 51

Extend the gum and mint tray all the way out. Take the cable harness and put it in the first (front) cable clamp on the left gum and mint tray hanging bracket (red circle, Figure 52). Leave a little slack in the cable as shown in Figure 52. Attach the cable harness to the back cable clamp (blue circle, Figure 52).

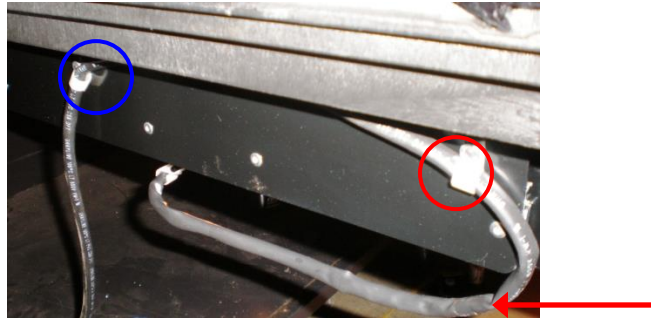


Figure 52

Push your gum and mint tray back in and latch into place. Fully extend the “F” tray. Adjust the remaining cabinet harness so that there is enough slack to allow the “F” tray to completely extend and latch back into place (Figure 53). Tighten the zip-tie, from Figure 51. If need, use additional zip-ties and tie downs to clean up remaining cabinet harness so that it is out of the way.

The harness on the left hand side of the gum and mint tray may need to have the plastic bent so it folds properly when being pulled out and pushed in (red arrow, Figure 52).



Figure 53

21) Working around SureVend system.

If your machine has the SureVend system you must place a piece of black electrical tape over the SureVend gum and mint sensor, shown in Figure 54A/B. Doing so will disable SureVend for the gum and mint tray. However, by doing this, the error “SV.TST H.” will appear on the display each time the door is opened (Figure 54C). To clear the error, hit “Exit” on the service panel keypad. This error does not cause any other issues with your SureVend system.

Figure 54A



Figure 54B



Figure 54C



22) Removing the spacer. If your machine is equipped with a gum and mint spacer bracket, it must be removed, as shown in Figure 55.

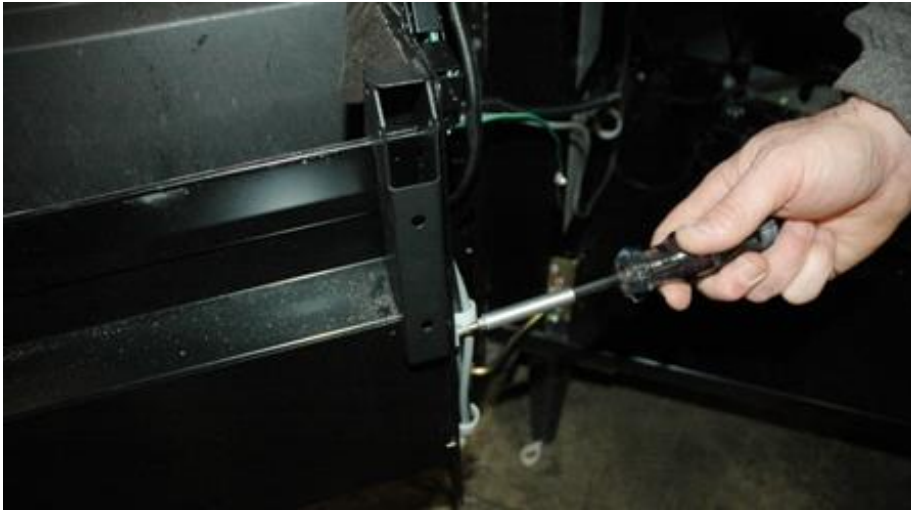


Figure 55

23) Creating clearance for the vend bucket.

With Vending Machine Door Open:

If the top right inside of the vend bucket has a “C” notch (Figure 56), the top portion needs to be bent to a 90 degree angle (Figure 57).

If the top right inside of the vend bucket does not have a “C” notch (Figure 58), it needs to be bent back enough to ensure the clearance of the new gum and mint tray.

Open and close the vend door to ensure proper clearance of the vend bucket wire on the new gum and mint tray.



Figure 56

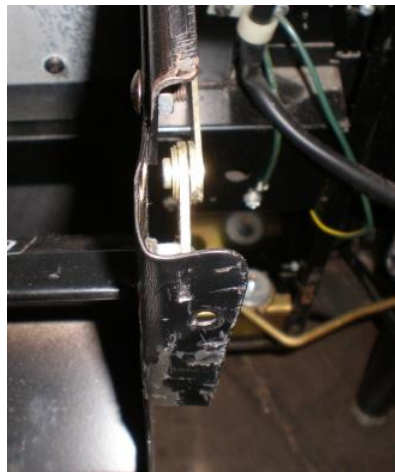


Figure 57



Figure 58

24) “Wing” removal (Figure 59)

If there is a wing on the left hand side of the machine, with the door open, it needs to be removed to ensure the product in H4 has a clear path for vending.

There are two screws that hold this unit into place.



Figure 59

25) Applying the gum and mint tray labels.

First, remove all of the old labels from the front of the vend bucket. Then, clean the area thoroughly where the labels will be applied to (Figure 60A). Align the label with the left side (when facing the machine) of the bucket and firmly press the label into place (Figure 60B). **Note: The National 158/168 kit includes two labels. The narrow label is for the 168, and the wider label is for the 158 machine.**



Figure 60A



Figure 60B

27) Loading the tray with product, Figure 61



Figure 61

Product loaded as follows:

- H0 – Halls
- H1 – Trident Tropical Twist
- H2 – Trident Original
- H3 – Certs
- H4 – Stride

If your product is tight between the dividers, please follow the instructions below.

Issue: The product fits too tight.

Solution: If the product is too tight between the dividers:

- 1) Check the dividers to make sure they are located in the correct slot.
- 2) Remove the dividers that are affecting the product, and look down the edge. If they are not straight, gently try to bend them back into shape.
- 3) Check to ensure that the backwards “L” (Diagram on Right) is approximately a 90 degree angle. If it is not, you can switch the divider to the first divider (left of H0) or last divider (right of H4).

TEST VEND ALL PRODUCTS

Note:

If the Stride (H4) is having issues vending in the National 168, adjust the rail to the top screws (Figure 62), and adjust the coil coupler to the 12 o'clock position (Figure 63).

This step may be necessary due to the inconsistency of the vend bucket height as a result of machine age, wear and tear.

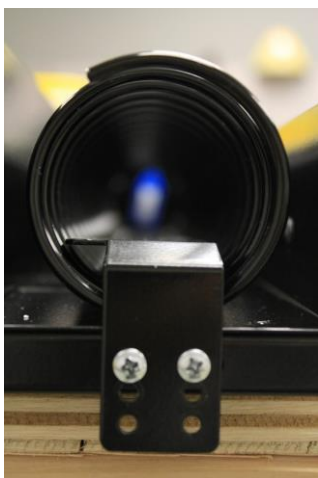


Figure 62



Figure 63

Retest Vend All Products

If you are having problems installing the kit, please call 1-800-321-2311 and select option 3 for Support.

Revised 12-6-11