



# OPT<sup>®</sup>

## Outdoor Payment Terminal

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### Service Guide

# **OPW Fuel Management Systems - System and Replacement Parts Warranty Statement**

*Effective September 1, 2002*

## **System and Replacement Parts Warranty**

OPW Fuel Management Systems warrants that all OPW Tank Gauge and Petro Vend Fuel Control systems supplied by OPW Fuel Management Systems to the Original Purchaser will be free from defects in material and/or workmanship under normal use and service for a period of 12 months from the date of installation or 15 months from the date of shipment. Additionally, OPW Fuel Management Systems warrants that all upgrades and replacement parts (new and remanufactured) supplied by OPW Fuel Management Systems will be free from defects in material and workmanship under normal use and service for a period of 90 days from the date of installation or for the remainder of the system's original warranty, whichever is greater, as set forth in the first sentence of this statement. The foregoing warranties will not extend to goods subjected to misuse, neglect, accident, or improper installation or maintenance or which have been altered or repaired by anyone other than OPW Fuel Management Systems or its authorized representative.

The buyer's acceptance of delivery of the goods constitutes acceptance of the foregoing warranties and remedies, and all conditions and limitations thereof.

If a claim is made within the warranted time period that any equipment and/or remanufactured part is defective in material or workmanship under normal use and service, such equipment and/or remanufactured part shall be returned to OPW Fuel Management Systems, freight prepaid. If such equipment or remanufactured part is found by OPW Fuel Management Systems in its sole judgment, to be defective in material or workmanship under normal use and service, OPW Fuel Management Systems, shall, at its sole option, repair or replace such equipment and/or remanufactured part (excluding, in all instances, fuses, ink cartridges, batteries, other consumable items, etc.)

The warranties, as set forth above, are made expressly in lieu of all other warranties, either expressed or implied, including, without limitation, warranties of merchantability and fitness for any particular purpose and of all other obligations or liabilities on OPW Fuel Management Systems part. Further, OPW Fuel Management Systems neither assumes, nor authorizes any other person to assume for it, any other liability in connection with the sale of the systems, or any new/replacement part that has been subject to any damage from any act of nature or any *force majeure*.

The term "Original Purchaser" as used in these warranties shall be deemed to mean the authorized OPW Fuel Management Systems distributor to which the system or any new/replacement part was originally sold. These warranties may be assigned by the original purchaser to any of its customers who purchase any OPW Fuel Management Systems systems or new/replacement parts.

The sole liability of OPW Fuel Management Systems, for any breach of warranty, shall be as set forth above. OPW Fuel Management Systems does not warrant against damage caused by accident, abuse, faulty or improper installation or operation. In no event shall manufacturer's liability on any claim for damages arising out of the manufacture, sale, delivery or use of the goods exceed the original purchase price of the goods. In no event shall OPW Fuel Management Systems be liable for any direct, indirect, incidental or consequential damage or loss of product.

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# Overview

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## **WARNING**

**Remove power from the OPT at the circuit breaker panel before servicing.**

This document explains the following service procedures. Petro Vend part numbers for the assemblies are in a table on the following page.

- ☐ PV290 Controller Board Removal and Replacement
- ☐ PV291 Power Board Removal and Replacement
- ☐ Power Supply Assembly Removal and Replacement
- ☐ Keypad Removal and Replacement
- ☐ Light Assembly Removal and Replacement
- ☐ Display Removal and Replacement
- ☐ Sensor Assembly Removal and Replacement
- ☐ Magnetic Card Reader Removal and Replacement
- ☐ Head Replacement for Mag Reader
- ☐ Printer/Cutter Assembly Removal and Replacement
- ☐ Motorized Reader Removal and Replacement
- ☐ “Function Key” Removal and Replacement





## Parts/Procedures List

Grouped alphabetically, the following are field-replaceable assemblies in the OPT. DO NOT attempt to repair the assemblies. They must be returned to Petro Vend for replacement.

Description	PV Part No.
Card Reader, Manual Magnetic	75-3020
Card Reader, Magnetic Head Replacement	75-1018
Card Reader, Motorized Magnetic	75-3017
Display, 2 x 16	04-1037
Display, Graphics	04-1035
Function Key Assembly	20-5044
Keypad, DES Numeric	20-4206-01
Keypad, DES Alphanumeric	20-4207-01
Keypad, Standard Numeric	20-4206
Keypad, Alphanumeric	20-4207
Light Assembly	20-5042
PC Board, PV290 Controller	R20-0290
PC Board, PV291 Power	R20-0291
Printer, Receipt, Cutter and Mechanism	20-4219
Sensor Assembly	20-1507
Transformer, Power Supply	20-5045

# Preliminaries

Before attempting to remove any of the OPT sub-systems (listed on the previous page), note the following.

- The door must be removed for all service work. Remove the door as follows:
  -  Remove J1 from the PV290 board
  -  Remove the ground lead that connects the door to the enclosure
  -  Hold the door from the bottom
  -  Unlatch the hinges, and remove the door.
- Do NOT unplug the battery on the Controller Board (the PV290 board).
- When putting things back together, DO NOT FORGET to reconnect ALL the green ground (GND) wires. These wires separate via in-line “disconnects.” There is one extra green wire on OPTs not equipped with a receipt printer.

# Tools Required

- Phillips-head screwdriver, #1
- Phillips-head screwdriver, #2
- Magnetic Phillips-head screwdriver (for Single-Side OPTs ONLY), #2
- Slotted-head screwdriver, 1/4"
- Nut driver or open-face wrench, 1/4"

Notes:



# Controller Board (PV290) Replacement

The Controller Board(s) reside inside the doors. Each controls one side of the OPT. Depending on whether your unit has receipt printers installed, there are up to 20 ribbon cables and wiring harnesses leading from the board to other OPT components.

All these cables must all be disconnected before you remove the board from inside the door. For ease of reassembly, it is *strongly* suggested that you label the connectors with their destinations (for example, write "J16" on a sticky label and place it on that cable connector before disconnecting it). The "destinations" are printed on the PC board near the connectors.

1. Remove all visible connectors from the PV290 board. Connectors **J8** and **J9** are on the bottom of the board, and cannot be removed until the board is removed from the door.
2. Disconnect the green GND wires by separating the in-line plastic connectors.
3. Remove the four Phillips-head screws from the corners of the board. Do not lose the four nylon flatwashers.
4. Lift the board far enough from the door to disengage **J8** and **J9**. Pack the defective board for return to Petro Vend.
5. Hold the new PV290 board in position to attach the J8 and J9 connectors to the bottom of the board.
6. Place the new board on its supports inside the door, and replace the four Phillips-head screws. Don't forget the nylon flatwashers.
7. Replace all the wiring connectors on the board, and reconnect all GND wires.

Package up the defective board(s) for return to Petro Vend.

## Power Board (PV291) Replacement

The Power Board contains the AC-to-DC rectification components and filtering capacitors. The single board supplies DC power to both sides of the OPT.

**WARNING!** *HIGH VOLTAGES! Make sure power has been removed from the OPT BEFORE opening the door that exposes the Power Board.*

1. Unlatch and open the OPT door that exposes the Power Board.
2. Disconnect **J1**, **J2**, **J3** and **J4** from the board. J1 and J2 supply power and communications to the two Controller Boards (single-sided units use only J3 is AC power from the OPT transformer, while J4 is data communication from the outside world).
3. Remove the four Phillips-head screws from the corners of the board. The lower-left screw has a flatwasher underneath - be careful not to lose it.
4. Install the new board with the original four screws. Don't forget the flatwasher under the lower-left screw. It's there to enhance the ground connection.
5. Replace all connectors on the board.
6. Re-apply power to the OPT. Turn the POWER toggle switch ON.

Package up the defective Power Board for return to Petro Vend.

# Power Supply Assembly Replacement

The Power Supply Assembly consists of a transformer, a voltage selection switch, a power switch, and other related components. This assembly reduces the line voltage (120 or 240 VAC) and sends it to the Power Board (described on the previous page).

**WARNING!** *HIGH VOLTAGES! Make sure power has been removed from the OPT BEFORE opening the door that exposes the Power Supply Assembly.*

1. Remove both doors from the OPT. To *remove* each door:
  - a. Disconnect the grounding strap from the door.
  - b. Loosen upper door lock release cable.
  - c. On the door, disconnect the cable from the back of the key lock by removing the cotter pin and sliding the cable off the pin.
  - d. Disconnect the wiring edge connectors from the PC board.
  - e. Pull the two clips off the door-mounted half of each hinge (four clips total).
  - f. Lift the door free of the enclosure and set it aside.
2. SINGLE-SIDED UNITS ONLY: Remove the PV291 Power Board. See the previous page. You do not have to remove the Power Board from Dual-Sided units.
3. Disconnect power and communication wires from the PV291 Power Board.
4. Remove the four Phillips-head screws that secure the Power Supply to the chassis, and remove the supply from inside the chassis. SINGLE-SIDE UNITS: A magnetic screwdriver is needed to remove two of the screws.
5. Place the new Power Supply inside the chassis, and secure it with the four screws removed from the old supply. SINGLE-SIDE UNITS: A magnetic screwdriver is needed to replace two of the screws.
6. Reconnect all the cable harnesses to their respective connectors.
7. Make sure the Voltage Selector is set to the line voltage in your area, 120 VAC or 240 VAC.

8. Re-install the PV-291 Power Board (if removed).
9. Replace the doors as follows:
  - a. Slide the hinges out on their tracks from inside the enclosure. Hold the door along the hinges, and replace the four clips in the hinges.
  - b. Replace the edge connectors on the PC board, the grounding strap, and the door lock cable.
  - c. Swing the door back until it is parallel with the enclosure, then push it straight back into the enclosure.
10. Re-apply power to the OPT, then turn the unit ON with the red toggle switch on the power supply. Close the door completely.
11. Lock the door with the key by turning the key a half-turn clockwise (it may be necessary to press in on the door while locking it).

Pack the defective Power Supply for return to Petro Vend.

# Keypad Replacement

There are four types of keypad available for the OPT: (1) A standard numeric (non-DES), (2) a standard alphanumeric keypad, (3) a DES numeric keypad, and (4) a DES alphanumeric keypad.

The only difference between standard and DES keypads is in their connectors. The standard keypad disconnects at a single connector (J19) on the Controller Board. The DES keypad has two connectors on the keypad itself.

1. Open the door containing the keypad to be replaced. The back of the keypad (Figure 1) is on an angled portion of the door, behind the receipt printer (if so equipped).
2. **STANDARD:** Disconnect the cable from pin header J19 on the PV290 Controller Board. **DES:** Disconnect the two cables from the keypad.
3. Remove **ONLY** the four screws shown in Figure 1, then push on the two studs to free the keypad from the door.

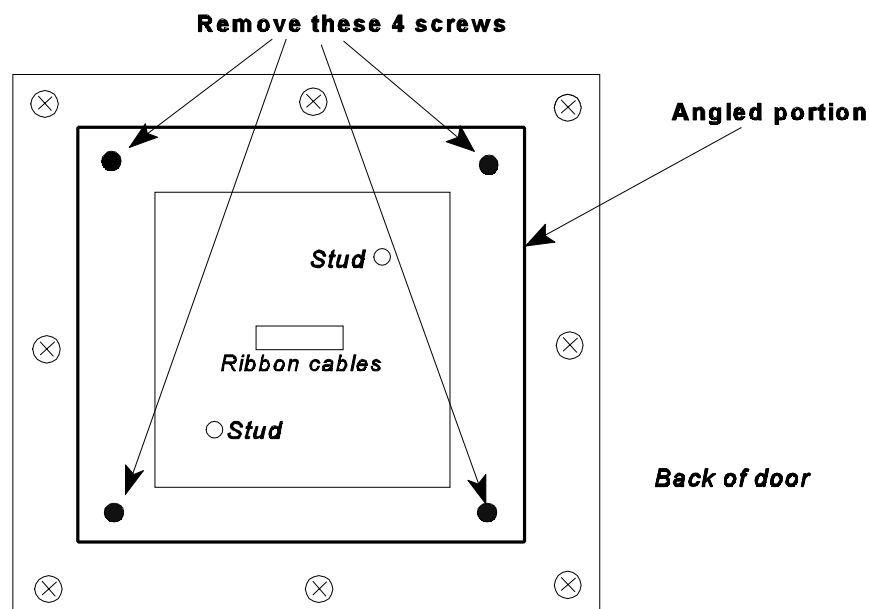


Figure 1 - Keypad Replacement

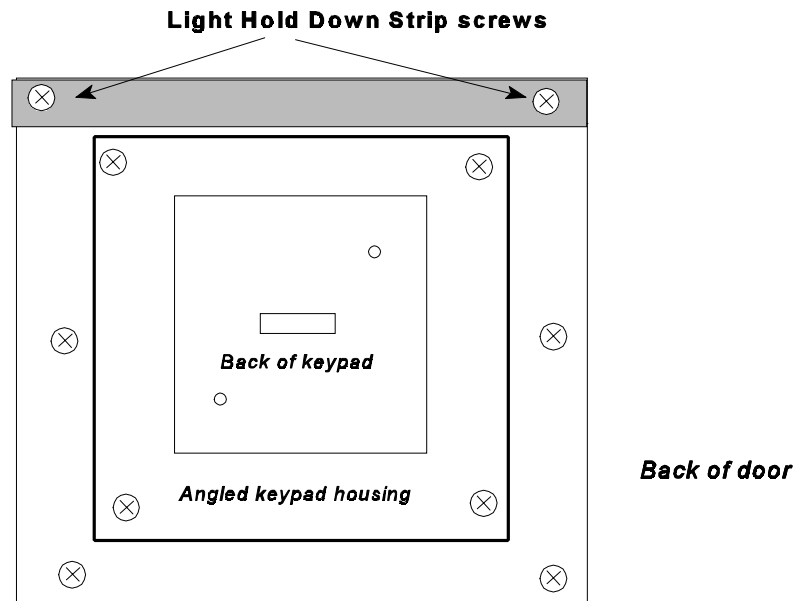
4. Install the new keypad into the recess in the front of the door by lining up the two studs with the holes in the door. Secure the new keypad with the four screws removed from the previous keypad.
5. STANDARD: Reconnect the ribbon cables to J19 on the Controller Board. DES: Reconnect the two ribbon cables to the keypad.
6. Run the diagnostic program to test the keypad. See your *OPT User's Guide* for details on running the diagnostics.

Package the defective keypad for return to Petro Vend.

# Light Assembly Replacement

The light bar that illuminates the keyboard is a plug-in element similar to a fuse. You must remove the Controller Board before you can get at the light.

1. Open the door containing the defective light assembly. Use the instructions on Page 5 to remove the Controller Board from the door. **NOTE WHERE ALL WIRES GO.**
2. To get to the back of the display, remove the Controller Board Mounting Plate from the door by using a #1 Phillips screwdriver to remove the four screws from the plate. Separate the in-line ground connectors.



**Figure 2 - Light Bar Removal**

3. Locate the Light Hold-Down Strip (Figure 2) above the angled keypad housing. Remove the two Phillips screws with your #2 Phillips screwdriver. Remove the Light Hold-Down Strip to expose the light.

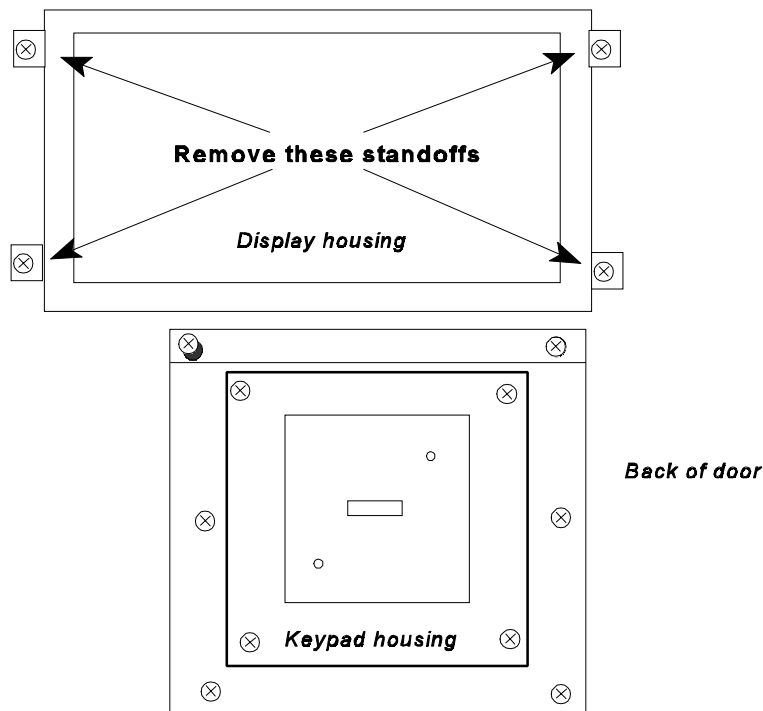
4. Use your #2 Phillips screwdriver to remove the cable clamp that secures the pair of wires leading to the light. Separate the in-line connector.
5. Tug gently on the wire on each side of the light - as close to the light as possible! - to free the light from the panel enclosure. Package the defect up for return to Petro Vend.
6. Insert the new light into the panel enclosure. With the wires from the light coming out on TOP, replace the Light Hold-Down Strip and secure with the two Phillips screws.
7. Replace the cable clamp over the new light wiring harness. Snap together the in-line wire connector.
8. Replace the Controller Board Mounting Plate.
9. Replace the Controller Board, making sure all cables and wires are connected properly. See Page 5.



# Graphics Display Replacement

Like the light assembly, the Graphics Display is underneath the Controller Board and the Controller Board Mounting Plate.

1. Open the door containing the defective Graphics Display. Use the instructions on Page 5 to remove the Controller Board from the door. **NOTE WHERE ALL WIRES GO.**
2. Remove the Controller Board Mounting Plate from the door by using a #1 Phillips screwdriver to remove the four small screws from the plate. Separate the in-line ground connectors.



**Figure 3 - Graphics Display Removal**

3. Remove the four male/female standoffs (Figure 3) with a 1/4-inch nutdriver or other suitable tool. Note the orientation of the display - the manufacturer's label is right-side up - and remove it from the door.

4. Install the new display, making sure the manufacturer's label is right side up. Secure the display with the four original standoffs.
5. Replace the Controller Board Mounting Plate atop the standoffs, and secure with the four small Phillips screws.
6. Replace the Controller Board atop the Controller Board Mounting Plate, and reconnect all wiring.

Package the defective Graphics Display for return to Petro Vend.

## 2 x 16 Display Replacement

Like the Graphics Display, the 2 x 16 Display is underneath the Controller Board and the Controller Board Mounting Plate.

1. Open the door containing the defective 2 x 16 Display. Use the instructions on Page 5 to remove the Controller Board from the door. **NOTE WHERE ALL WIRES GO.**
2. Remove the Controller Board Mounting Plate from the door by using a #1 Phillips screwdriver to remove the four small screws from the plate. Separate the in-line ground connectors.
3. Note the way that the cable on the bottom of the display is attached, and then disconnect it from the display.
4. Remove the four Phillips screws from the back of the display, then pry it off the back of the door.
5. Install the new display using the original four Phillips screws. Reattach the cable to the display (be sure it is positioned correctly).
6. Re-install the Controller Board Mounting Plate to the door. Re-attach the in-line ground connectors.
7. Re-install the Controller Board to its mounting plate.

Package the defective display for return to Petro Vend.

Notes:

# Receipt Printer Service

This section explains how to replace the Low Paper Sensor assembly, and the Print Bar/Cutter assembly.

## Sensor Replacement (p/n 20-1507)

There are two sensors attached to the optional receipt printer (Figure 4). The first - the Paper Roll Sensor - is a square device mounted on the printer bracket. It detects when a roll of paper is nearly gone. The other - the Chute Sensor - is a cylindrical object plugged into the top of the printer's discharge chute. It tells the system when there is a receipt in the chute.

Wiring harnesses from both sensors come together at J15 on the Controller Board.

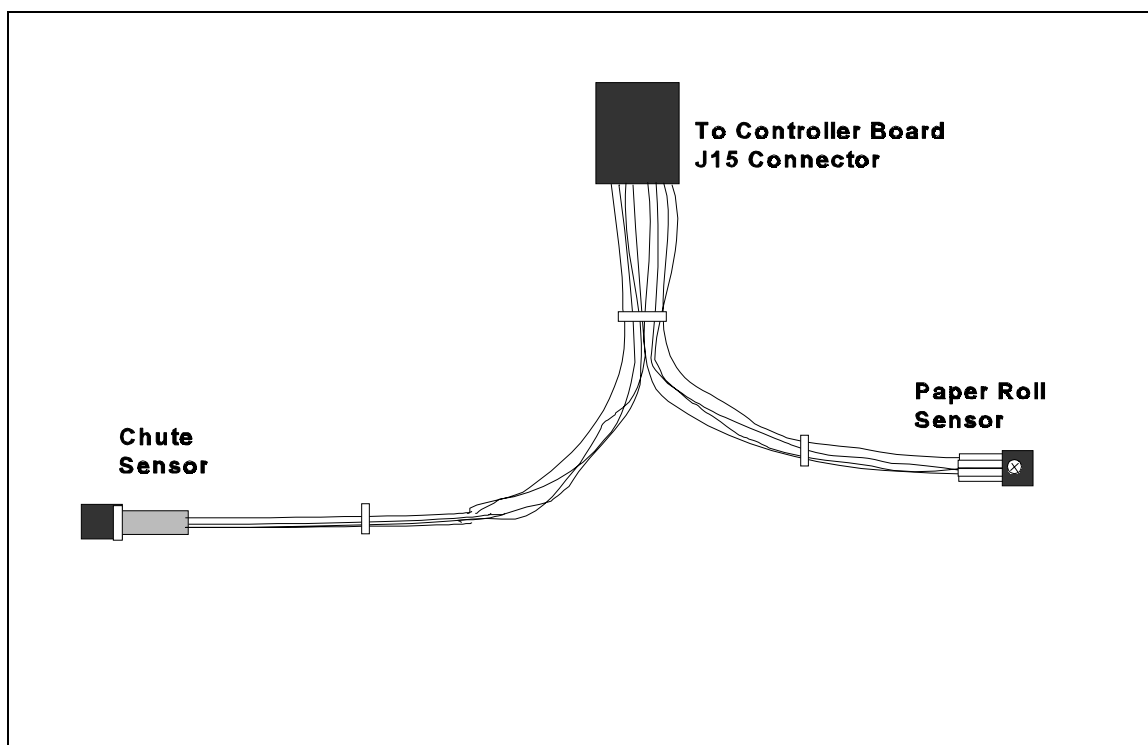


Figure 4 - Sensor Assembly

To replace the Sensor Assembly, do the following:

1. *Noting orientation*, remove the sensor connector from the PV290 Controller Board at J15. The two-forked eight-wire harness goes to both the Paper Roll Sensor and the Chute Sensor.
2. Trace one bundle of wires back to the Paper Roll Sensor. Using a #1 Phillips, remove the screw from the sensor (it is on the printer-cutter bracket.)
3. Follow the other bunch of wires to the cylinder-shaped Chute Sensor, behind the printer/cutter assembly. Grasp the four wires as close to the sensor as possible, and pull the sensor out of the chute.
4. Install the new Paper Roll Sensor onto the printer bracket.
5. Plug the new Chute Sensor into its hole in the top of the chute. Route the wire bundles away from obstacles and potentially pinching parts.
6. Attach the sensor connector to the J15 pin header on the Controller Board.

Test the operation of the sensors with the Diagnostics routine built into your OPT. See the *OPT User's Guide* for complete details.

## Printer/Cutter Assembly Replacement

The print head and paper cutter are serviced as a single unit.

1. Remove the paper roll and spindle from the printer.
2. Remove the ribbon cable from the Printer/Cutter Assembly.
3. Unplug connectors J11, J12, J13 and J14 from the PV290 Controller Board.
4. Remove the two screws from the bottom of the Printer/Cutter Assembly using a #2 Phillips screwdriver. Remove the assembly from the printer.
5. Install the new Printer/Cutter with the original two screws.
6. Re-attach wiring connectors J11, J12, J13 and J14 from the new Printer/Cutter Assembly to the Controller Board.
7. Re-attach the ribbon cable to the printer.
8. Replace the paper spool on the printer.

# Card Reader Replacement

Explained here: Procedure for replacing the MANUAL (the “push-pull”) card reader, the replacement procedure for the MOTORIZED reader, and head replacement in the manuals reader.

## Manual Reader Replacement

1. Remove the four screws from the back of the rainguard.
2. CAREFULLY lift the rainguard, separating the drain tube from the door. Be careful not to damage (or lose) the gasket.
3. Remove the ribbon cable from the back of the manual reader. There is a mounting plate attached to the reader. Separate the halves of the in-line ground connector.
4. Use the #1 Phillips screwdriver to remove the four screws from the mounting plate, to separate the plate from the reader.
5. Attach the mounting plate to the new reader.
6. Install the plate/reader assembly into the door, securing the assembly with the original hardware.
7. Re-install the rainguard, with its gasket.

## Head Replacement

1. Remove the reader from the door (follow procedure in *Manual Reader Replacement*, above).
2. Note the color coding on the wire harness that connects the head to the reader: *The white wire in the harness is the wire that is closest to the head.* Unplug the harness from the reader.
3. CAREFULLY remove the screw and spring that attaches the head to the reader. Remove the old head.



4. Install the new head with the original hardware. Route the wires like the old head wires.
5. Attach the wire connector from the new head to the reader.
6. Re-attach the reader assembly to the door, using the last part of the Manual Reader Replacement instructions on the previous page.

## **Motorized Reader Replacement**

The head on the motorized reader is not field-replaceable. The entire reader must be returned to Petro Vend for service.

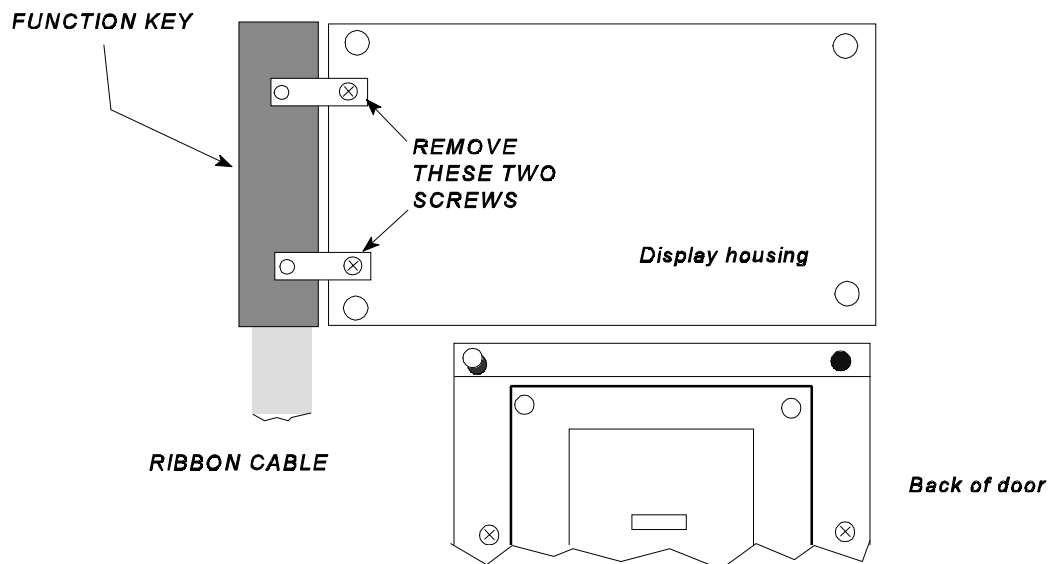
1. Remove the PV290 Controller Board assembly from the door (no need to separate the board from the plate). See Page 5 For details.
2. Remove the ribbon connector from the back of the motorized reader.
3. Remove the two Phillips screws from the top of the card receptacle. This releases the reader from the door.
4. Install the new reader, and secure with the original hardware.
5. Attach the ribbon connector to the new reader.
6. Re-install the PV290 Controller Board.

Notes:

# Function Key Replacement

The Function Key assembly is a four-pad membrane switch mounted to the door on the right side of the graphics display. It is only used in OPTs with a graphics display.

1. Remove the PV290 Controller Board using the procedure beginning on Page 5.
2. Remove the Controller Board Mounting Plate, underneath the Controller Board. The Graphics Display and Function Key assemblies are now visible (Figure 5).



**Figure 5 - Function Key Removal**

3. Remove the two mounting “S” brackets from the Function Key by removing the Phillips screw from each bracket (Figure 5). Save the brackets.
4. Remove the Function Key from the door by inserting a small screwdriver between the Function Key and the door. CAREFULLY pry the assembly away from the door. DO NOT damage the gasket on the Function Key!
5. Fold the ribbon cables on the new Function Key to look like the cables on the old

Function Key.

6. Carefully peel the gasket from the old Function Key assembly. Place the gasket on the front of the new Function Key, then place the new assembly in its door opening.
7. Replace the clips on the new key.

Notes:



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