SERVICE

3/Vista Series Blending and Non-Blending Dispensers

Wayne DRESSER

DANGER

READ THIS MANUAL BEFORE YOU BEGIN

Dispensers have both electricity and a hazardous, flammable and potentially explosive liquid. Failure to follow the below precautions and the Warning and Caution instructions in this manual may result in serious injury. Follow all rules, codes and laws that apply to your area and installation.

SAFETY PRECAUTIONS - INSTALLATION AND MAINTENANCE

Always make sure ALL power to the dispenser is turned OFF before you open the dispenser cabinet for maintenance. Physically lock, restrict access to, or tag the circuit breakers you turn off when servicing the dispenser. Be sure to trip (close) the emergency valve(s) under the dispenser BEFORE beginning maintenance.

Make sure that you know how to turn OFF power to the dispenser and submersible pumps in an emergency. Have all leaks or defects repaired immediately.

EQUIPMENT PRECAUTIONS

Be sure to bleed all air from product lines of remote dispensers and prime suction pumps before dispensing product, otherwise, damage to the equipment may occur. Always use the approved method for lifting the dispenser. Never lift by the nozzle boot, sheet metal, valance, etc., otherwise equipment damage or personal injury may occur.

HOW TO CONTACT WAYNE

Trouble with the installation and operation of the dispenser should be referred to your authorized Wayne service personnel or Wayne Technical Support (1-800-926-3737).

INDICATORS AND NOTATIONS

DANGER	Danger indicates a hazard or unsafe practice which, if not avoided, will result in severe injury or possibly death.
WARNING	Warning indicates a hazard or unsafe practice which, if not avoided, may result in severe injury or possibly death.
CAUTION	Caution indicates a hazard or unsafe practice which, if not avoided, may result in minor injury.
NOTE:	Important information to consider, otherwise, improper installation and/or damage to components may occur.

3/Vista Series
Blending and
Non-Blending
Dispensers

Service

June 2001 Part No. 920525 Rev A

1. INTRODUCTION

This manual describes the service of Wayne Vista series blending and non-blending dispensers that have a "3" in the prefix of the model number. For example, 3/V390D1/GQUY. Again, these dispensers can be identified by their model which begins with “3/V”, hereafter, referred to as 3/Vista models. The basic troubleshooting methods and service theory will remain the same for all models of dispensers which satisfy the above definition. Any information which is specific to a particular model of dispenser will be shown as specific in the text.

Non-blending dispensers included in this manual are the 3/V387, 3/V388, 3/V389, 3/V390, 3/V399 and 3/V490 models. Non-blending dispensers do not combine base products. These dispensers are multi-grade dispensers, except for the 3/V387 single grade model.

Blending dispensers included in this manual are the 3/V580, 3/V585, 3/V590, 3/V591, and 3/V595 models. Blending dispensers combine the base products to provide a blended grade or grades. Blending dispensers have two base products labeled LO and HI. These base products may be dispensed individually and/or combined into one or more blended grades. The 3/V591 and 3/V595 models also have an additional single-product (unblended) grade, however, the 3/V595/U does not.

3/Vista series dispensers have a new computer - and associated boards - and a sales display board mounted on the back of the new bezel.

The new computer in 3/Vista series dispensers controls the hydraulic module that was newly designed and introduced in the 2/Vista series. The hydraulic module consists of the **iMeter Module** and the **Intelligent Pulser.** The iMeter Module is two meters in one assembly and contains the **Intelligent Pulser**.

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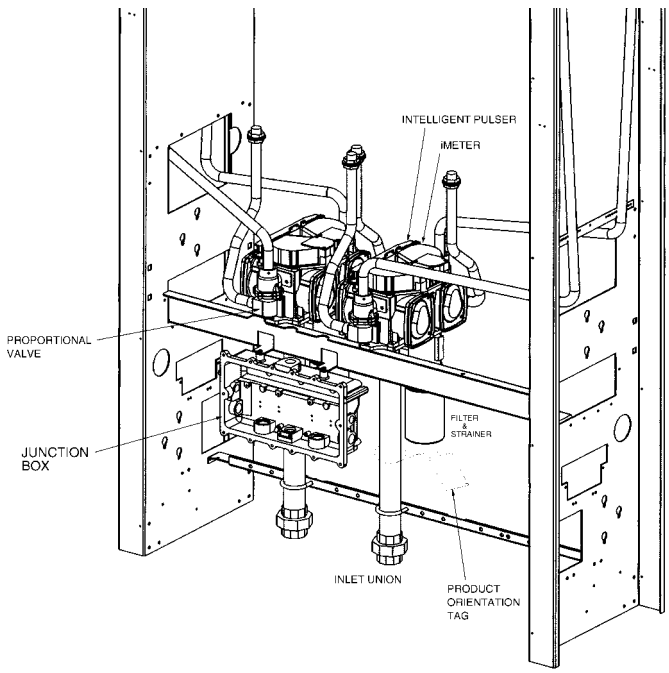

FIGURE 1-1. 3/VISTA DISPENSER. *Porportional valves are mounted at the iMeter outlet on 3/Vista model dispensers.*

1.1. REGIONAL SERVICE OFFICES

Any service problems that cannot be solved should be refered to Wayne Technical Support or to the appropriate regional service office.

Wayne Technical Support Austin, TX	1-800-926-3737 24 hours/7 days
Northeast Regional Service Office Salisbury, MD	410-546-6750 8:30AM-5:00 PM Eastern
Southeast Regional Service Office Atlanta, GA	770-926-6005 8:30AM-5:00PM Eastern
North Central Regional Service Office Chicago, IL	773-693-7404 8:30AM-5:00PM Central
South Central Regional Service Office Houston, TX	281-871-5442 8:30AM-5:00PM Central
Southwest Regional Service Office Cypress, CA	714-952-1137 8:30AM-5:00PM Pacific
Northwest Regional Service Office San Ramon, CA	510-328-0400 8:30AM-5:00PM Pacific
Mid-Atlantic Regional Service Office Baltimore, MD	410-691-2200 8:30AM-5:00PM Eastern

INTERNATIONAL OFFICES

Caribbean and Latin America Service Office Austin, TX USA	(Voice) 512-388-8624 (FAX) 512-388-8643
Mid-East and Africa Service Office United Kingdom	(Voice) 44-1635-874881 (FAX) 44-1635-876633
Far East Service Office Singapore	(Voice) 65-422-2397 (FAX) 65-225-6604

2. OPERATION

The operation for all 3/Vista series dispensers is similar , except where distinguished below between lift-to-start and push-to-start models.

Before the dispenser will reset unit prices must be set and an authorization signal must be received, and if a blender model, blend ratios must be set. The unit prices, authorization, and blend ratios can be manually set at the dispenser for stand-alone operation, or from a control system, after first setting the fueling point ID.

The above requirements are discussed in detail in this section. Once they have been satisfied, the dispenser operates as described in the following sections.

2.1. LIFT-TO-START MODELS

- When the nozzle is removed from the nozzle boot and the lever is lifted, the constant +5 VDC that the computer supplies to the nozzle switch goes to ground. This signals the computer to begin its reset cycle.
- When the dispenser receives an **Authorization** signal either from the control system or, if stand-alone, from the dispenser, the correct submersible pump relay will be energized.
- The computer performs a self test and flashes eights, blanks, then resets to zeros, on the main sale display.
- After the dispenser resets, the proportional flow control valve (or valves if a blender model) is energized with just enough current to barely open the valve and allow a slow flow.
  After a small amount of fuel has been dispensed, the valve is energized with enough current to be in the fully open position and allow fast flow. During the sale, the valve will be continuously controlled with the proper amount of current to limit fuel flow rate to a maximum of 10 GPM*, and if a blender model, provide the correct blend ratio.
- In preset sales, the current received by the proportional flow control valve(s) is reduced to the barely open position just prior to the final shut-off amount. The valve(s) is then de-energized when the final amount is reached.
- When the lever is lowered, the nozzle switch goes back to the constant +5 VDC, the sale is complete, and the nozzle is returned to the nozzle boot.

2.2. PUSH-TO-START MODELS

- When the nozzle is removed from the nozzle boot, the constant +5 VDC that the computer supplies to the nozzle switch goes to ground. At this point, one of the lighted buttons (grade select, cash/credit, or push-to-start, depending model) will flash indicating that one of the buttons must be pressed.
- When one of the lighted buttons is pressed the constant +5 VDC that is supplied to the switch goes to ground. This signals the computer to begin its reset cycle.
- When the dispenser receives an **Authorization** signal either from the control system or from the Authorize switch in the dispenser, the correct submersible pump relay will be energized.

* The maximum allowable flow rate in the United States is 10 gallons per minute.

- The computer performs a self test and flashes eights, blanks, then resets to zeros, on the main sale display.
- After the dispenser resets, the proportional flow control valve (or valves if a blender model) is energized with just enough current to barely open the valve and allow a slow flow.

  After a small amount of fuel has been dispensed, the valve(s) is energized with enough current to be in the fully open position and allow fast flow. During the sale, the valve(s) will be continuously controlled with the proper amount of current to limit fuel flow rate to a maximum of 10 GPM*, and if a blender model, provide the correct blend ratio.
- In preset sales, the current received by the proportional flow control valve(s) is reduced to the barely open position just prior to the final shut-off amount. The valve(s) is then de-energized when the final amount is reached.
- When the nozzle is returned to the nozzle boot, the nozzle switch goes back to the constant +5 VDC and the sale is complete.

2.3. SETTING UNIT PRICES

The procedure below is used to set the dispenser unit prices when operating in stand alone mode or when communication with the POS system is disabled. When enabled, the POS system will not allow price setting at the dispenser.

The pump computer recognizes code stored in memory that defines a dispenser model and assigns logical nozzle numbers to the hose positions as shown in (Table 2-1). To set unit prices on side 1 and side 2, functions **F03** and **F04** are accessed using the remote control interface. Credit prices on side 1 are set using sub-functions **F03.0N** while cash prices are set using sub-functions **F03.1N**, where *N* is the logical nozzle number. Active values of *N* are given in Table 2-1. For side 2, the corresponding sub-functions are **F04.0N** and **F04.1N,** respectively.

To set the unit price, the correct sub-function is accessed, the unit price is changed to its new value and the data is saved. To access the desired sub-function, perform the following steps using the remote control. **Bold** type denotes remote control function; *italicized* type denotes dispenser response.

Accessing the Unit Price Sub-function for Side 1

1. Press **ENTER**
   PASS 1 (enter password)
2. Press **ENTER**
   PASS 2 (enter password)
3. Press **ENTER.** The unit price display will show *F—* (indicating it needs a function number to proceed)
4. Press **03** to access F03
5. Press **ENTER.** The unit price display will show *F03* (indicating the function has been accessed)
6. Press **ENTER** to access the sub-functions of F03. The unit price display will show *3.01*.

* The maximum allowable flow rate in the United States is 10 gallons per minute.

At this point, pressing of **NEXT** will advance the sub-function to the next sub-function, incrementing the value of *N* by (*.01)*. For example, to access F3.02, press **NEXT**. The unit price display will show *3.02, press* **NEXT.** The desired sub-function depends on the dispenser type. Table 2-1 shows the values of *N* that define the desired sub-functions for the dispensers shown. Once the desired sub-function is accessed, the price display will show "– – – – – –" and the volume display will show the current value of the unit price. The following procedure must then be followed to set the unit price.

Changing the Value of the Unit Price

Type in the new unit price with at least three digits for three money display digits to be shown after the decimal point.* For example, to set the new unit price to **$1.50, type in 1500. Type in 1509 for $1.509 unit price.**

1. Press **#**. The volume display will show the unit price with the correct number of digits after the decimal point. Again, for the example above, the volume display will show **1.500**.
2. Press **NEXT** to input the next unit price, and repeat steps 1 and 2. Continue until all the unit prices are input and Save the unit prices as per the following procedure: Note that while inputting the unit prices, the unit price display continues to show the sub-function and not the unit price itself.

Saving the New Unit Prices

1. Press **ENTER.** The price display will show "– – – – – –", the volume display will be blank and the unit price display will show the last sub-function accessed.
2. Press **00** (to access F00)
3. Press **ENTER.** The unit price should now display *F00,* the price display will show "– – – – – –" and the volume display will be blank.
4. Press **ENTER** and the volume display will show a *1*.
5. Press **UP** twice to change the value in the volume display from *1* to *3*
6. Press **ENTER.** The volume display should show a *3*.
7. Press **ENTER.** *CHANGE STORED* should appear on the display momentarily. The display should return to normal in a few seconds. When it does, the unit price displays should show the new prices. If they do not show the desired unit prices, access the appropriate sub-function to make sure that the unit price data is correct.

TABLE 2-1 Hose Positions Defined by Values of *N*.

DISPENSER TYPE	N=7	N=6	N=5	N=4	N=3	N=2	N=1
3/V595 (4+1)		Lo Feedstock	Lo-BL	Hi-BL	HI Feedstock		Single Grade
3/V595 (3+1)		Lo Feedstock	BL	HI Feedstock			Single Grade
3/V595/U	Lo Feedstock	Lo-BL	Mid–BL	Hi-BL	HI Feedstock		
3/V595/U (4)	Lo Feedstock	Lo-BL	Hi-BL	HI Feedstock			

* This is the default mode. The number of digits after the decimal points is set in function F14.02.

3/V580	Lo Feedstock		BL		HI Feedstock		
3/V585	Lo Feedstock	Lo-BL	Mid–BL	Hi-BL	HI Feedstock		
3/V590				HI Feedstock	BL	Lo Feedstock	
3/V590/U	Lo Feedstock		BL		HI Feedstock		
3/V591	Lo Feedstock		BL		HI Feedstock		Single Grade
3/V490/U				AA	Z	Y	X
3/V490				AA	Z	Y	X
3/V390					Z	Y	X
3/V399						Y	X
3/V389						Y	X
3/V387							X

2.4. BLEND RATIO SETTING

Function **F18** is accessed to set the blend ratios, using the remote control interface. The sub-function **F18.1N,** where *N* is the logical nozzle number, is used to set the blend ratios for side 1 and the sub-function **F18.2N** is used to set the blend ratios for side 2. Active values of *N* are given in Table 2-1.

Bold type denote remote control function and *italicized* type represents dispenser response):

Accessing the Blend Ratio Sub-function for Side 1

1. Press **ENTER**
   PASS 1 (enter password)
2. Press **ENTER**
3. *PASS 2* (enter password)
4. Press **ENTER.** The unit price display will show *F—* (indicating that it needs a function number to proceed).
5. Press **18** to access *F18*
6. Press **ENTER.** The unit price display will show *F18* (indicating that the function has been accessed).
7. Press **ENTER** to access the sub-functions of *F18.* The unit price display will show *18.11* (here *N=1*).

The volume display will indicate the value of the blend ratio corresponding to logical nozzle #1(*N=1*). If there is no data for this logical nozzle, the number "**101**" will be displayed. This applies to all logical nozzles. To access the blend ratio for the next logical nozzle, press **NEXT**. The unit price display will show *18.12* and the volume display will show whatever the value of the blend ratio is for logical nozzle #2. Subsequent pressing of **NEXT** will advance the unit price display to *18.17*, the last logical nozzle. Pressing **NEXT** again will advance the unit price display to *18.21*, The "*2*" in "*18.21*" indicates Side 2 and the "*1*", logical nozzle #1. The volume display will show the blend ratio assigned to *logical nozzle #1 of Side 2*.

Changing the Value of the Blend Ratio

8. When the desired logical nozzle is shown on the unit price display, enter the desired value of the blend ratio by using **UP** and **DOWN** keys on the remote control interface or by typing the **#** sign followed by the value of the blend ratio, followed by **ENTER**. For example, to change the value of the blend ratio from **101** to **89**, press the **DOWN** button until **89** shows up on the price display, then press **ENTER**, or type in **#89, ENTER.**
9. Continue until all the blend ratios are entered for Side 1 and Side 2 and save the settings as follows:
10. Press **ENTER.** The price display will show "– – – – – –", the volume display will be blank and the unit price display will show the last sub-function accessed.
11. Press **00** (to access F00)
12. Press **ENTER.** The unit price should now display *F00*, the price display will show "– – – – – –" and the volume display will be blank.
13. Press **ENTER** and the volume display will show a *1*.
14. Press **UP** twice to change the value in the volume display from *1* to *3*.
15. Press **ENTER.** The volume display should show a *3*.
16. Press **ENTER.** *CHANGE STORED* should appear on the display momentarily. The display should return to normal in a few seconds. When it does, the unit price displays should show the new prices. If they do not show the desired unit prices, access the appropriate sub-function to make sure that the unit price data is correct.

2.5. SETTING THE FUELING POINT ID

The procedure below is used to set the dispenser fueling point address. The dispenser FPID should be input and saved before control is transferred to the POS system.

Functions **F05** and **F06** are accessed to set the FPID on Side 1 and Side 2, respectively. To set the FPID, the desired FPID must be input and saved.

Accessing the FPID Function for Side 1

1. Press **ENTER**

   PASS 1 (enter password)

2. Press **ENTER**

   PASS 2 (enter password)

3. Press **ENTER.** The unit price display will show *F—* (indicating that it needs a function number to proceed)
4. Press **05** to access *F05*
5. Press **ENTER.** The unit price display will show *F05* indicating the function has been accessed and the volume display will show the current FPID or a "**0**" when no FPID has been assigned to that dispenser side.
6. Input the desired FPID by using the **UP** and **DOWN** keys on the remote control interface followed by **ENTER**, or by typing the # sign followed by the valve of the FPID followed by **ENTER**.
7. Repeat the procedure for Side 2.

Saving the New FPID

1. Press **ENTER.** The price display will show "– – – – – –", the volume display will be blank and the unit price display will show the last sub-function accessed.
2. Press **00** (to access F00)
3. Press **ENTER.** The unit price should now display *F00*, the price display will show "– – – – – –"and the volume display will be blank.
4. Press **ENTER** and the volume display will show a *1*.
5. Press **UP** twice to change the value in the volume display from *1* to *3*.
6. Press **ENTER**
7. The volume display should show a *3*.
8. Press **ENTER.** *CHANGE STORED* should appear on the display momentarily. The display should return to normal in a few seconds. When it does, the unit price displays should show the new prices. If they do not show the desired unit prices, access the appropriate sub-function to make sure that the unit price data is correct.
8. Repeat the procedure for Side 2.

2.6 AUTHORIZING THE DISPENSER

The dispenser must be authorized before it will dispense product.

In stand-alone operation, not connected to a control system, the dispenser is always authorized, unless the dispenser is equipped with the (optional) Authorize keyswitch on the bezel. This momentary contact keyswitch can be used for one time authorizations.

When connected to a control system, the system programming determines authorization.

3. BOARD LAYOUTS, INDICATORS AND PINOUTS

3.1 COMPUTER BOARD LED INDICATORS)

Processor Activity Indicator

DS1: Red (Heartbeat) LED indicates processor activity. It will be blinking on and off at a steady rate as long as the processor is running properly.

Power Indicators

These LEDs only indicate the presence of a voltage. They do not assure that the levels are correct.

DS6: Green LED indicates that the board is connected to power source on its 24VDC input line.
DS7: Green LED indicates that the board is generating 5VDC to power the logic.
DS8: Green LED indicates that the board is generating 8VDC for use on board and to power associated assemblies.
DS13: Green LED indicates that the board is generating 15VDC which is used to power the attached WIPs.
DS14: Green LED indicates that the board is generating 5VDC for use onboard.

Communication Activity Indicators

POS Communications:
DS5: Red LED indicates activity on the Host Receive Line. The LED is on when the line is low.
DS12: Green LED indicates activity on the Transmit Line. The LED is on when the line is low.

Display Bit Bus Side 1 and 2 Communications:
DS3: Red LED indicates activity on Receive Line. The LED is on when the line is high.
DS9: Green LED indicates activity on the Transmit Line. The LED is on when the line is high.

WIP (Pulsers) Communications:
DS4: Red LED indicates activity on Receive Line. The LED is on when the line is low.
DS11: Green LED indicates activity on the Transmit Line. The LED is on when the line is low.

CAN Bus Communications (Future Use for Harmony, eVista, Ovation):
DS2: Red LED indicates activity on Receive Line. The LED is on when the line is low.
DS10: Green LED indicates activity on the Transmit Line. The LED is on when the line is low.

3.2 COMPUTER BOARD CONNECTOR PINOUTS

Connector and Pin #	Description	Connects To	Note
J1	24 VDC In	24V DC Distribution Bd J4	Typical Reading 24V
1	24V		
2	24V		
3	GND		
4	GND		
J2	Sub Pump Relays	Relay Board J1	Typical Readings 24V
1	24 VDC		
2	Pump Motor 2		
3	24 VDC		
4	Pump Motor 1		
5	24 VDC		
6	Pump Motor 4		
7	24 VDC		
8	Pump Motor 3		
J3	Valve Outputs	Proportional Valves	
Pin			
1	GND		Typical Voltage Readings for checking the operation of the proportional valves. All valves MGDs: slow flow 8Vdc fast flow 19 Vdc Blender: slow flow or fast flow 8-19 Vdc
2	Valve #9 24V		
3	GND		
4	Valve #4 24V		
5	GND		
6	Valve #3 24V		
7	GND		
8	Valve #2 24V		
9	GND		
10	Valve #1 24V		
11	GND		
12	Valve #10 24V		
13	GND		
14	Valve #8 24V		
15	GND		
16	Valve #7 24V		
17	GND		
18	Valve #6 24V		
19	GND		
20	Valve #5 24V		

Connector and Pin #	Description	Connects To	Note
J4	Nozzle Switch Inputs	ISB J7	Typical Reading 5V
1	GND		
2	NOZZ 4		
3	GND		
4	NOZZ 3		
5	GND		
6	NOZZ 2		
7	GND		
8	NOZZ 1		
9	GND		
10	NOZZ 8		
11	GND		
12	NOZZ 7		
13	GND		
14	NOZZ 6		
15	GND		
16	NOZZ 5		
J5	WIP IN/OUT	ISB J1	Typical Reading 14.8-15.2V
1	15 VDC		
2	GND		
3	WIP1 REC		
4	WIP1 TX		
5	GND		
6	WIP2 REC		
7	WIP2TX		
8	GND		
9	GND		
10	WIP3 REC		
11	WIP3 TX		
12	GND		
13	WIP4 REC		
14	WIP4 TX		
15	GND		
16	15 VDC		

3.2 COMPUTER BOARD CONNECTOR PINOUTS, CONTINUED

Connector and Pin #	Description	Connects To	Note
J6	Totalizers from Side1	Outputs from Tots 1-4	
1	24V		
2	TOT 1		
3	24V		
4	TOT 2		
5	24V		
6	TOT 3		
7	24V		
8	TOT 4		
9	N/C		
10	N/C		
J7	Totalizers from Side2	Outputs from Tots 5-8	
1	24V		
2	TOT5		
3	24V		
4	TOT6		
5	24V		
6	TOT7		
7	24V		
8	TOT8		
9	N/C		
10	N/C		
J8	BackLight Output		
1	SIDE A 24V		
2	GND		
3	SIDE B 24V		
4	GND		
J9	Red/Green Light Outputs		
1	SIDE A 24V		
2	GND		
3	SIDE B 24V		
4	GND		
J10, J11, J12	SPARE IN/OUT		

J13	CAN BUS I/O		Future use for Harmony, eVista, Ovation
1	TX/RC +		
2	TX/RC -		
3	24V		
4	GND		
J14	Euro DataLink		Not used in US
J15	Display Data Cable Bit Bus Side A (1)	Side 1 Display J1	
1	DATA IN A		
2	DATA OUT A		
3	ADDRESS BIT A		
4	CLOCK A		
5	BUZZER A		
6	STOP A		
7	8 VDC		Typ reads 8.1 V
8	GND		
9	REMOTE		
10	GND		
J16	Display Data Cable Bit Bus Side B (2)	Side 2 Display J1	
1	DAT IN B		
2	DATA OUT B		
3	ADDRESS BIT B		
4	CLOCK B		
5	BUZZER B		
6	STOP B		
7	8VDC		Typ reads 8.1 V
8	GND		
9	REMOTE		
10	GND		
J21	BUZZER POWER SIDE 2		
1	8V		
2	BUZZER 2		

Connector and Pin #	Description	Connects To	Note
J22	BUZZER POWER SIDE 1		
1	8V		
2	BUZZER 1		
J23	CAT BUZZER		
1	GND		
2	BUZZ CAT		
J24	WAYNE VAC	WAYNE VAC BD J2	
1	VAC CONNECTED (YES/NO)		
2	FREEZING TEMP	Thermostat	
3	WAYNE VAC ID 0		
4	WAYNE VAC ID 1		
5	ORVR B		
6	MOTOR SPEED B		
7	MOTOR STATUS B1		
8	MOTOR STATUS B0		
9	ORVR A		
10	MOTOR SPEED A		
11	MOTOR STATUS A1		
12	MOTOR STATUS A0		
13	RUN MOTOR A		
14	DIR MOTOR A		
15	RUN MOTOR B		
16	DIR MOTOR B		
17	RESET		
18	GND		
19	CLOCK		
20	GND		
J25	DATALINK	DATALINK PAIR 1	
1	DATA +		
2	DATD -		

3.3 ISB BOARD CONNECTOR PINOUTS

Connector and Pin #	Description	Connects To	Note
J1	WIP Pulsers 1-4	Computer J5	
1	POWER 1 15V		
2	GND		
3	RC 1		
4	TX 1		
5	GND		
6	RC 2		
7	TX 2		
8	GND		
9	GND		
10	RC 3		
11	TX 3		
12	GND		
13	RC 4		
14	TX 4		
15	GND		
16	POWER 2 15V		
J2	TO PULSER 1		
1	TX		
2	RC		
3	GND		
4	15V		
5	N/C		
6	N/C		
7	N/C		
8	N/C		
J3	TO PULSER 2		
1	TX		
2	RC		
3	GND		
4	15V		
5	N/C		
6	N/C		
7	N/C		
8	N/C		

Connector and Pin #	Description	Connects To	Note
J4	TO PULSER 3		
1	TX		
2	RC		
3	GND		
4	15V		
5	N/C		
6	N/C		
7	N/C		
8	N/C		
J5	TO PULSER 4		
1	TX		
2	RC		
3	GND		
4	15V		
5	N/C		
6	N/C		
7	N/C		
8	N/C		
J7	Nozz Switch Outputs	Computer J4	Typ 5V
1	NOZ 1		
2	NOZ 2		
3	NOZ 3		
4	NOZ 4		
5	NOZ 5		
6	NOZ 6		
7	NOZ 7		
8	NOZ 8		
9	GND		
10	GND		

J6	NOZZ Switch INPUTS	Nozzles	
1	NOZ 1		
2	NOZ 2		
3	NOZ 3		
4	NOZ 4		
5	GND		
6	NOZ 5		
7	NOZ 6		
8	NOZ 7		
9	NOZ 8		
10	GND		

3.4 24V DC DISTRIBUTION BOARD CONNECTOR PINOUTS

Connector and Pin #	Description	Connects To	Note
J1		24V P/S J2	
1	24V IN		
2	24V IN		
3	GDN		
4	GDN		
J2		BATTERY EXTERNAL	
1	24V		
2	24V		
3	GDN		
4	GDN		
J3	24V OUT	Wayne Vac Board J6	
1	24V OUT		
2	24V OUT		
3	GDN		
4	GDN		
J4	24V	COMPUTER J1	
1	24V		
2	GDN		
J5	24V SPARE OUT		
J6	24V	DUAL CAT BD	
1	24V		
2	GDN		
J7	24V SPARE OUT		
J8	24V	PRINTER 1	
1	24V		
2			
3	24V		
4	GDN		
5	GDN		
6	GDN		
J9	24V	PRINTER 2	
1	24V		
2			
3	24V		
4	GDN		
5	GDN		
6	GDN		

3.5 WAYNE VAC CONTROL BOARD PINOUTS

Connector and Pin #	Description	Connects To	Note
J1	IS	ISB Connection	
1	5V		
2	GND		
3	5V		
4			
5	5V		
6	N/C		
7	N/C		
8	N/C		
9	5V		
10	GND		
J7	VAC MOTOR A	VAC MOTOR A	
1	5V		
2	5V		
3	5V		
4	5V		
5	GND		
6	V MOTOR		
7	SW 24V		
8	PHASE A		
9	PHASE B		
10	PHASE C		
J8	TO VAC MOTOR B	VAC MOTOR B	
PIN			
1	5V		
2	5V		
3	5V		
4	5V		
5	GND		
6	V MOTOR		
7	SW 24V		
8	PHASE A		
9	PHASE B		
10	PHASE C		

Connector and Pin #	Description	Connects To	Note
J2	TO COMPUTER J24	COMPUTER J24	
PIN			
1	GND		
2	CLOCK		
3	GND		
4	RESET		
5	DIR B		
6	RUN B		
7	DIR A		
8	RUN A		
9	STAT A0		
10	STAT A1		
11	SPEED A		
12	ORVR A		
13	STAT B0		
14	STAT B1		
15	SPEED B		
16	ORVR B		
17	TEMP		
18	GND		
19	GND		
20	GND		
J6	POWER 24V	DIST BD J3	
1	24V		
2	24V		
3	GND		
4	GND		

3.6 DISPLAY BOARD CONNECTOR PINOUTS, CONTINUED

Connector and Pin #	Description	Connects To	Note
J1		COMPUTER J15/J16	J15 Side1 J16 Side 2
J2		PRESET CONTROL BD J2 (OPTIONAL)	
J3		PTS BUTTONS	
J4		STOP SWITCH	
J5		AUTHORIZE SWITCH (OPTIONAL)	

3.7 RELAY BOARD CONNECTOR PINOUTS

J1		COMPUTER J2	
1			
2			
J2		Relay Selects XYZ in J-Box	
1			
2			
J3		Control Power in J-Box	
1			
2			
J4		24V P/S BD J1	
1			
2			

3.8 24V POWER SUPPLY BOARD CONNECTOR PINOUTS

J1		RELAY BD J4	
J2		24V DIST BD J1	

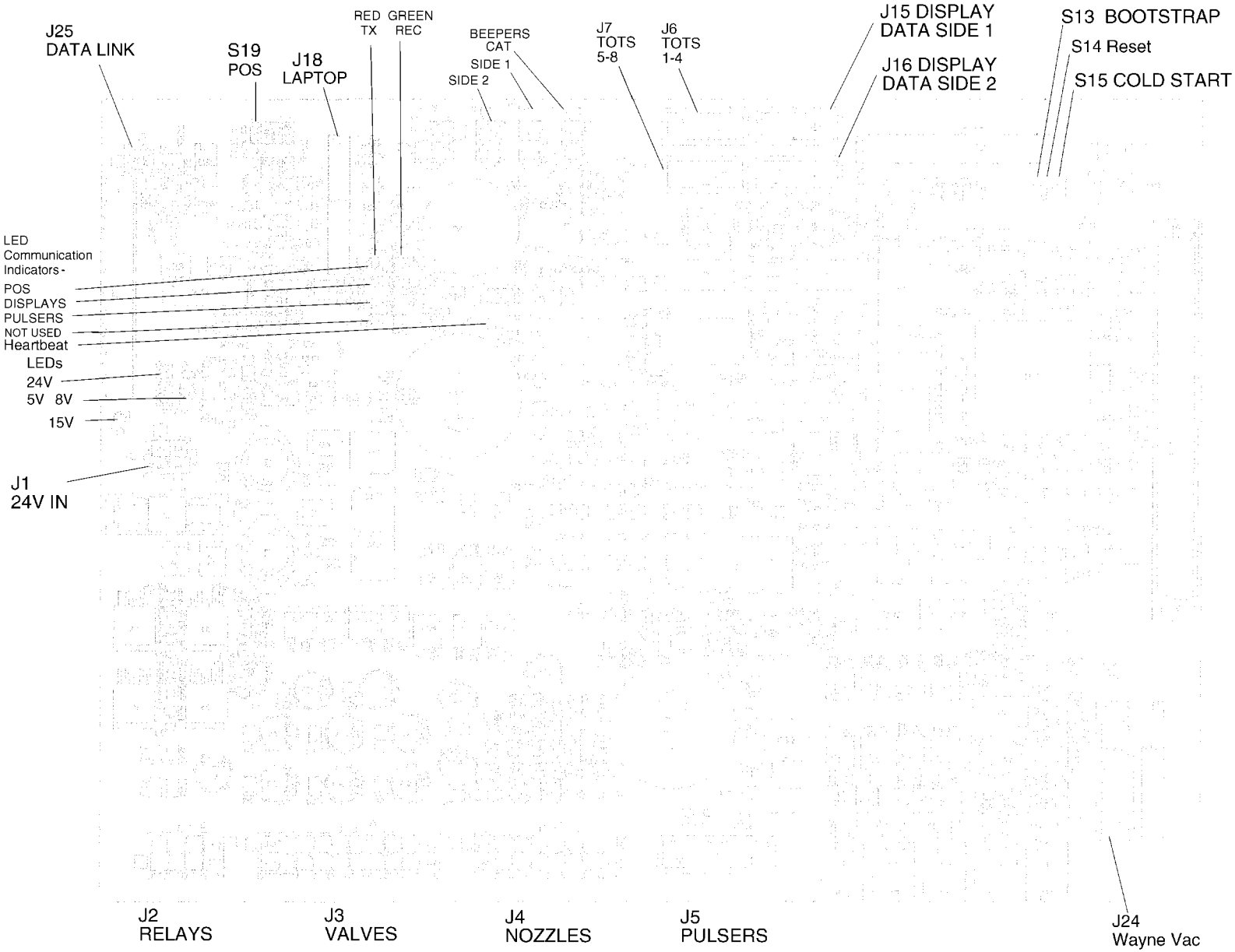

FIGURE 3-1. COMPUTER BOARD.

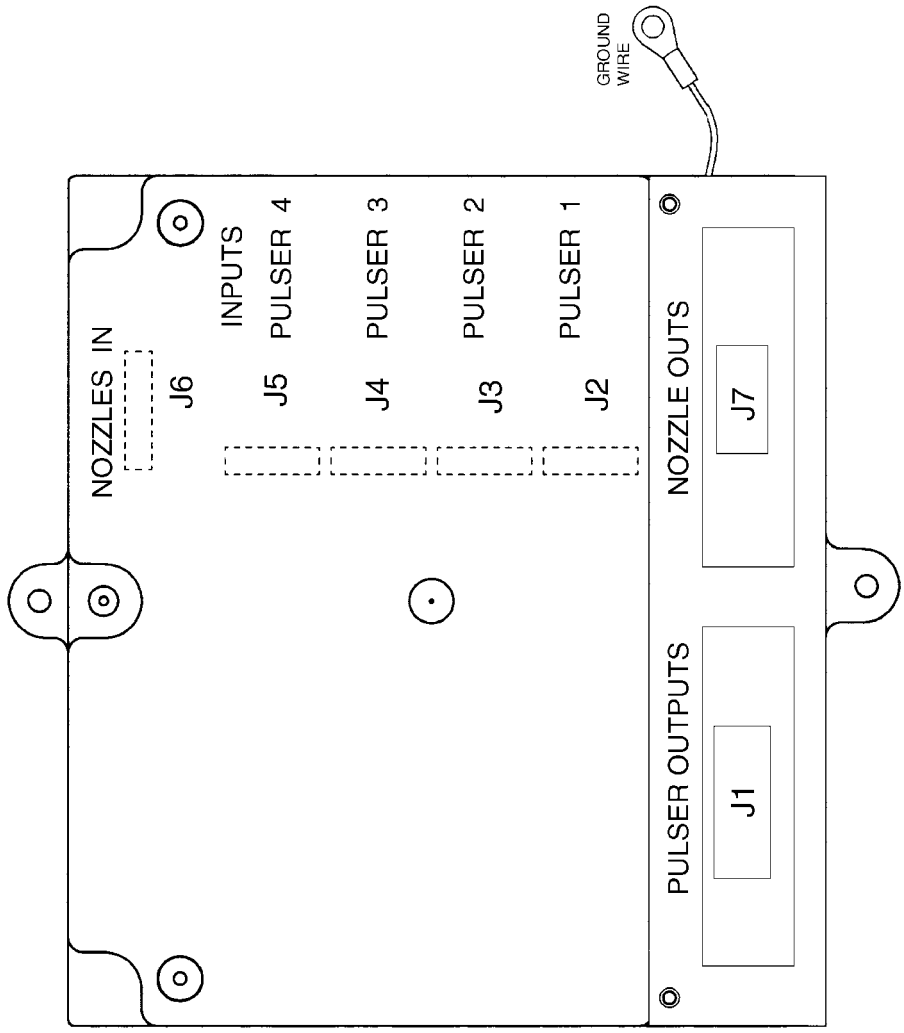

FIGURE 3-2. ISB BOARD ASSY.

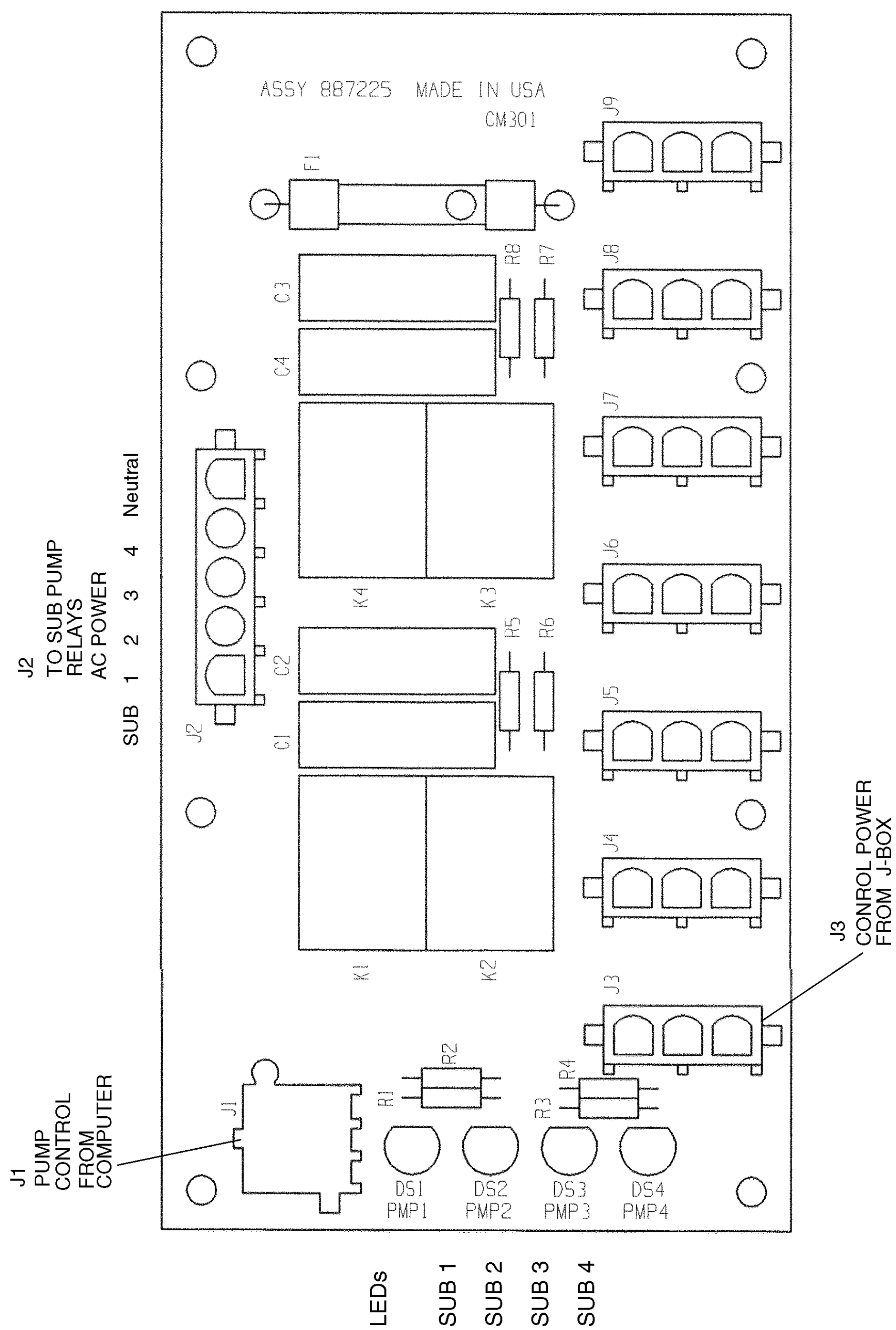

FIGURE 3-3. RELAY BOARD.

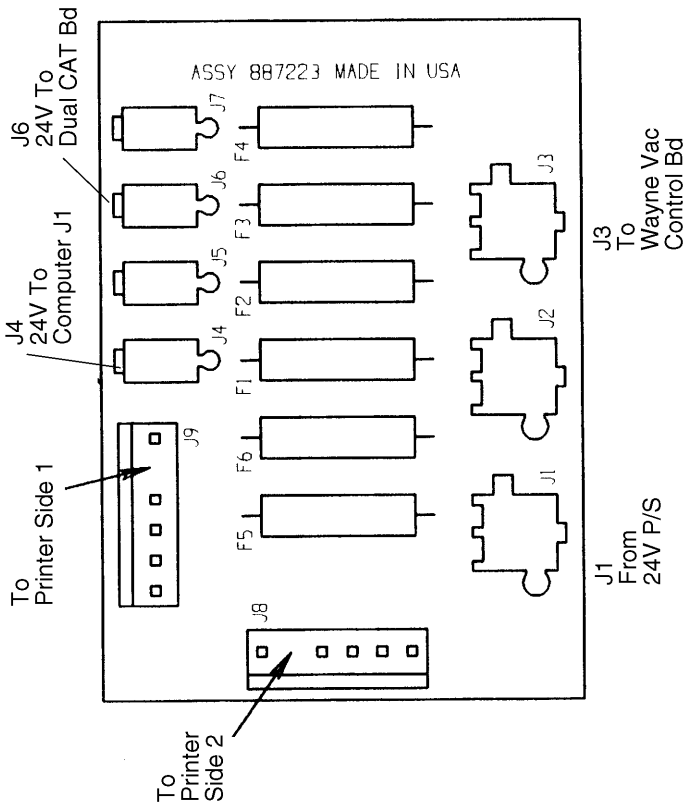

FIGURE 3-4. 24VOLT DIST BOARD.

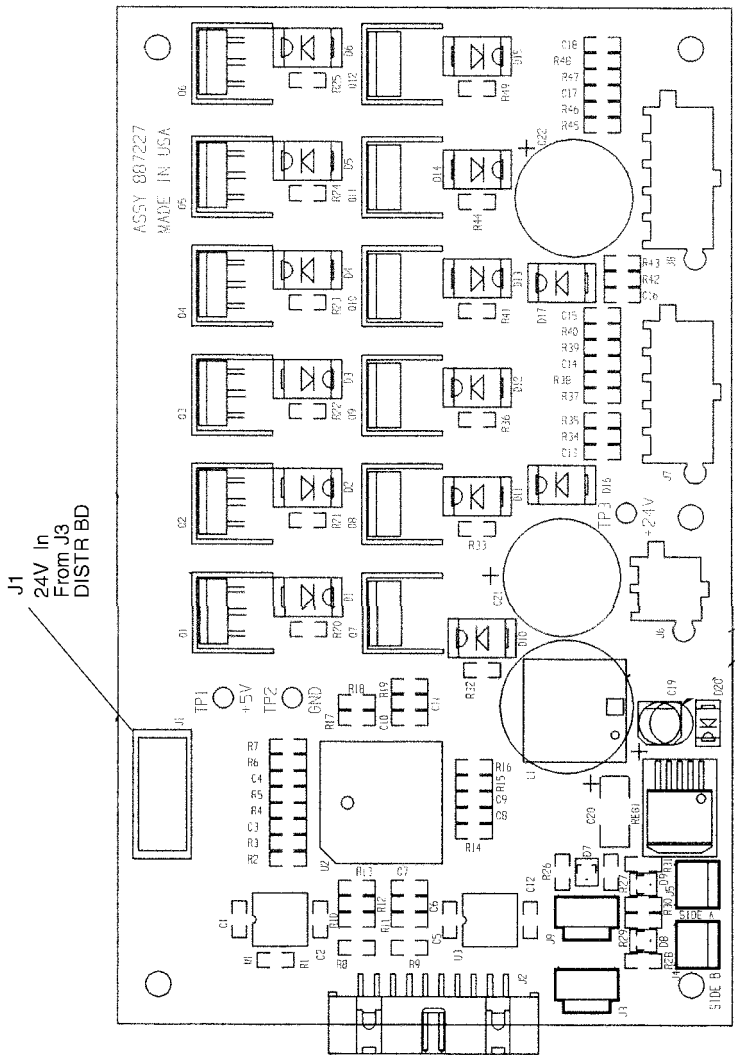

FIGURE 3-5. WAYNE VAC CONTROL BOARD.

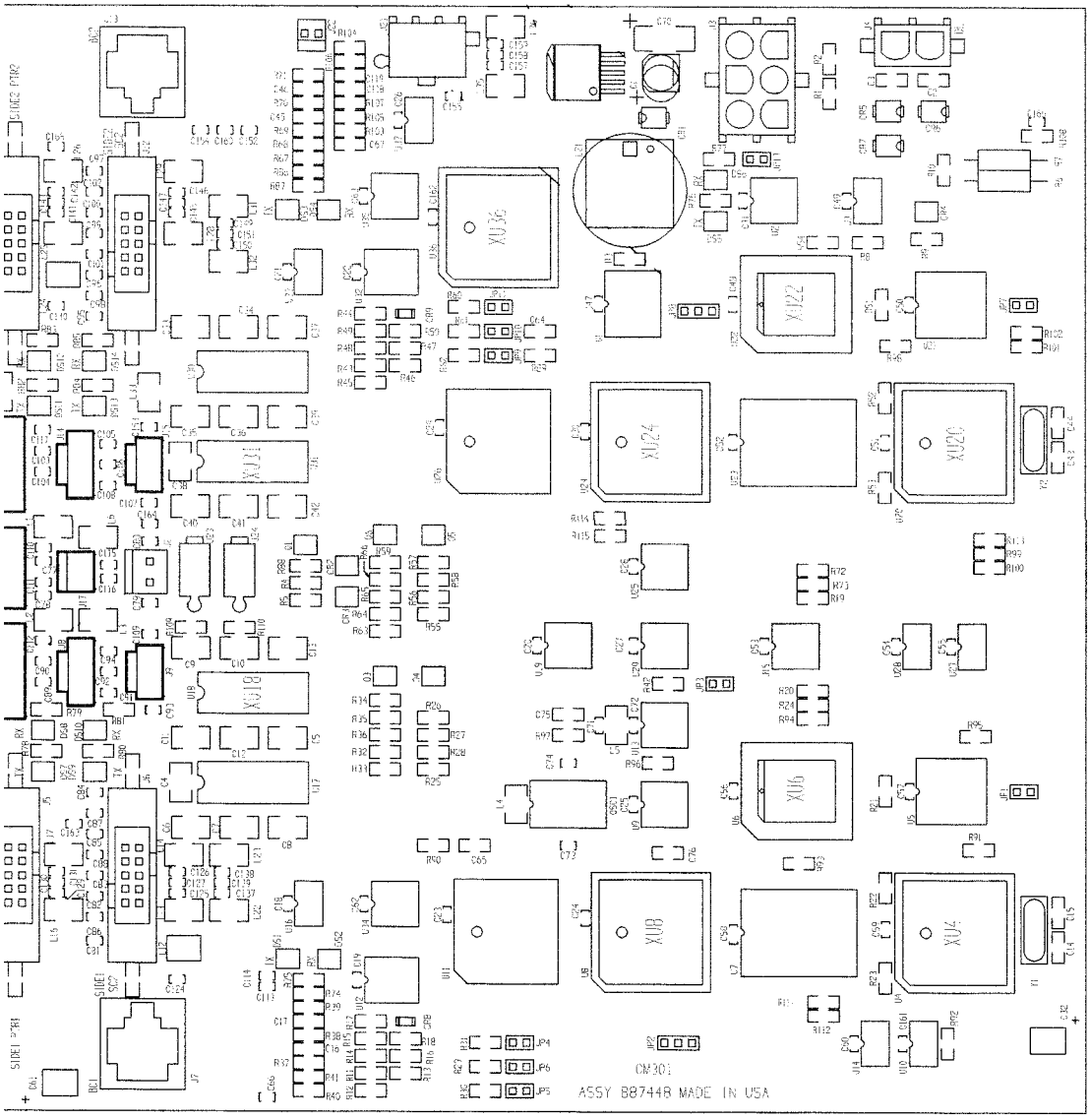

FIGURE 3-6. DUAL CAT BOARD.

4. MECHANICAL PARTS

4.1. NOZZLE BOOT (PROXIMITY "REED" SWITCH STYLE BOOT)

The nozzle boot assembly, used on the dispenser models covered in this manual, uses a proximity "Reed" switch and magnet for ON/OFF dispenser activation. The nozzle boot can be assembled in either the Lift-to-Start or the Push-to-Start configuration.

4.1.1. Lift-to-Start Version

The nozzle boot switch assembly (see section 10) consists of a proximity reed switch attached to the rear of the nozzle boot casting. A magnet is contained in the Lift-to-Start lever and when the lever is lifted to the ON position the magnet is brought into alignment with the proximity switch, turning the switch ON. There is no adjustment for the switch.

Check the operation of the nozzle switch as follows:

1. Authorize the dispenser and remove the nozzle from the nozzle boot. Lift the nozzle hook lever fully upward to make sure the switch turns ON. An ON switch will be indicated by the unit price displays of the unselected products going OFF or displaying dashes.
2. Lower the Lift-to-Start lever to the down position and check that the switch turns OFF. An OFF switch is indicated by the unit price displays of the unselected products coming back ON.

4.1.2. Push-to-Start Version

The nozzle boot switch assembly (see section 10)) consists of a proximity reed switch attached to the side of the nozzle boot casting and a magnetic actuator shaft inserted into a spring-loaded flipper within the nozzle boot. When the nozzle is removed, the flipper rotates and aligns the magnetic shaft with the proximity switch, turning the switch ON. There is no adjustment for the switch.

Check the operation of the nozzle switch as follows:

1. Authorize the dispenser and remove the nozzle from the nozzle boot to make sure the switch turns ON. An ON switch will be indicated by the lighted Push-to-Start buttons and the unit price displays blinking.
2. Insert nozzle slowly into the nozzle boot and check that the switch turns OFF. An OFF switch is indicated by the lighted Push-to-Start buttons turning OFF and the unit price displays stop blinking.

5. HYDRAULIC PARTS

The following section describes the operation of those hydraulic parts in Wayne dispensers which perform some “act”. Simple flow tubes will not be discussed.

There are four basic hydraulic parts in the dispenser:

- Strainer and Filter
- Proportional Flow Control Valve iMeter
- Check & Pressure Relief Valve

5.1. STRAINER AND FILTER

The strainer and filter (see Figure 5-1) are mentioned in this document because they may cause the dispenser to deliver slowly. In some cases this may appear to be a service problem. In reality the filter should be changed and the strainer cleaned on a regular basis.

Before removing the strainer or filter assembly, trip the impact valve and turn OFF the circuit breaker for the associated submersible pump.

5.1.1. Strainer

If the underground installation is new, it may be necessary to clean the strainer screen two or three times the first few days of operation to remove debris and pipe dope. After this, occasional cleaning of the strainer is all that should be required. The fuel filter should be changed whenever the strainer is cleaned.

The strainer is located above, and held in place by, the filter. After removing the filter, again place suitable container below filter/strainer casting to catch product and sediment, gently pull the strainer downward to remove it from the filter/ strainer casting. Replace or clean strainer screen of any debris and reinstall.

5.1.2. Filter

Like the strainer, in new installations it may be necessary to change the filter frequently in the first few days of operation in order to ensure proper operation.

The fuel filter is removed the same way an oil filter is removed from a car engine. Place a container under the filter to catch the fuel. To install the new filter, first apply a film of oil to the gasket and hand turn until the gasket contacts the base. Then tighten one half turn. Open the emergency shear valve, turn the submersible circuit breaker ON and check for leaks.

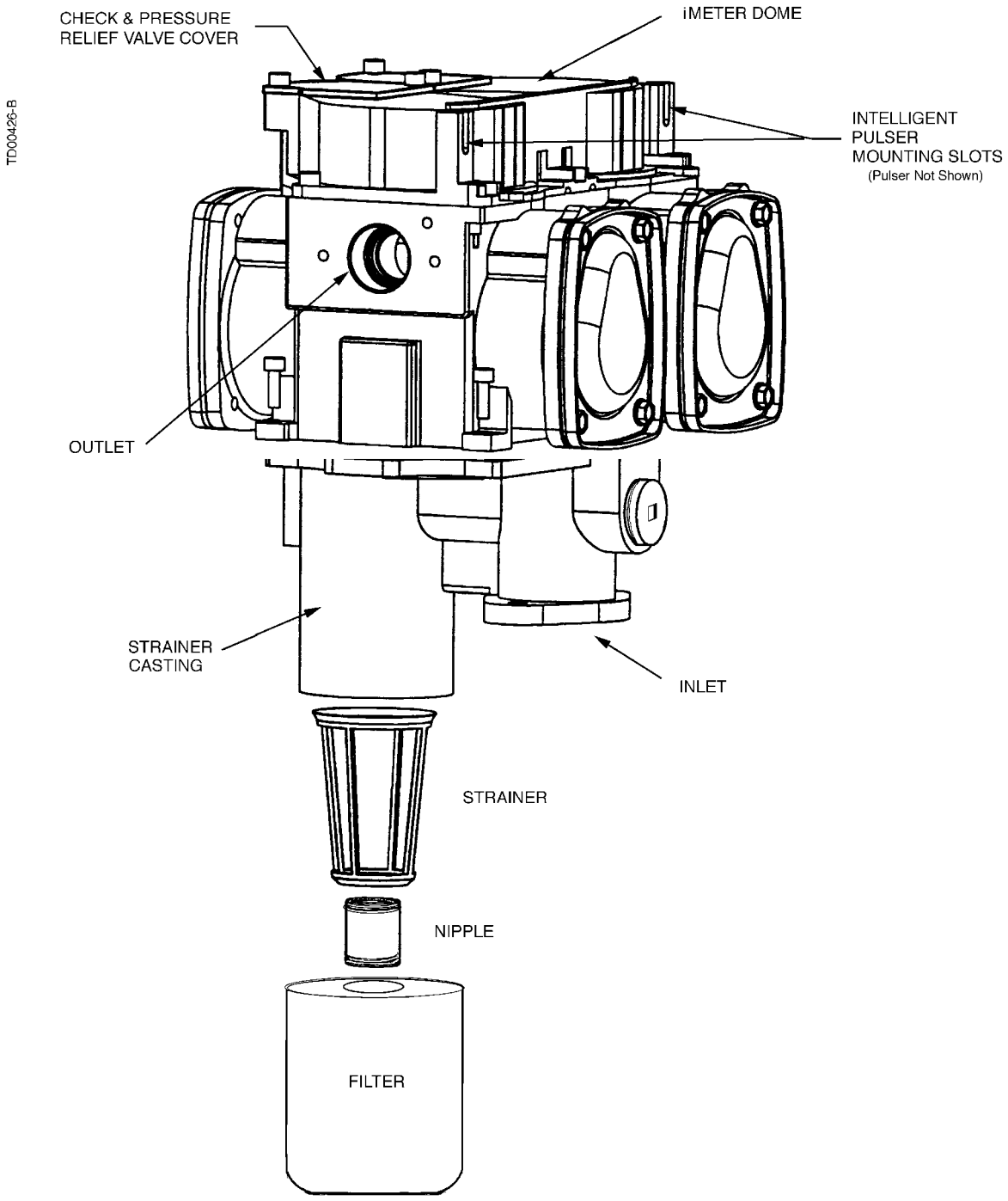

FIGURE 5-1. STRAINER AND FILTER. *The strainer should be cleaned as needed to remove any debris it has captured. The filter should be UL recognized.*

5.2. PROPORTIONAL FLOW CONTROL VALVE

The proportional flow control valve (see Figure 5-2) is a pilot-operated, diaphragm solenoid valve. It has three main functions in the dispenser:

- Positive shutoff
- Blend ratio control
- Flow rate regulation

Located between the meter and the hose outlet, the valve is controlled by a 24 VDC pulse width modulated signal. Normally closed, the pilot opens by an amount proportional to the amount of current sent to the valve coil. As the pilot raises off its seat, it reduces the pressure to the back side of the diaphragm causing it to lift off of its seat as well. The same applies to the valve closing; the diaphragm follows the pilot back to the closed position as the current to the coil is reduced for blender models. The computer continually adjusts the current to the valves during a sale based on the desired blend ratio of the two feedstocks and maximum allowable flow rate. The high and low products remain separate until they are mixed at the hose outlet in proportional blenders or at the outlet valve in fixed ratio blenders.

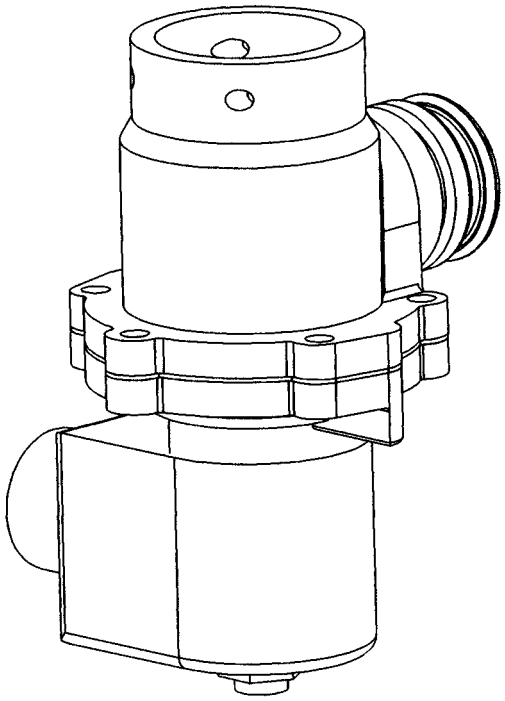

FIGURE 5-2. PROPORTIONAL FLOW CONTROL VALVE. *In 3/Vista models the valve is located at the meter outlet.*

The pilot operated proportional solenoid valve performs three basic functions in the dispenser. It provides positive shutoff, regulates the ratio of blended feedstocks, and controls the flow rate through the hydraulic path by limiting the maximum flow rate through a given hose.

The pilot operated proportional flow control valve consists of two main parts:

- The proportional valve
- The valve coil

The proportional valve is an electrically operated solenoid made up of a body and an operator. It controls all flow through the dispenser.

The valve coil controls the operator of the valve. The coil is energized with a pulse width modulated (PWM) signal that sends discrete "bursts" of current at a set frequency level. When the coil receives this signal, the pilot inside the operator reacts to the changing magnetic field and moves up and down depending on the amount of current through the coil. The position of the pilot relative to the pilot orifice in the diaphragm controls the amount of flow.

In all Wayne dispensers using this valve, the general order of operation is the same. At the beginning of a sale, the coil is energized with a minimum current level, allowing slow product flow to start. After a small amount of product is delivered, the coil is energized with more current to initiate full regulated flow. For preset sales, the dispenser will switch back to slow flow at a pre-determined point.

5.2.1. Flow Control Valve "Off" No Flow

Flow control valve "Off" or no flow occurs when the inlet to the valve is charged. But there is no flow required from the particular valve as in the instance where a submersible pump motor is running because another fueling point is being used. The pilot stays closed allowing pump pressure to build on the back side of the diaphragm, closing the outlet port.

5.2.2. Flow Control Valve "On" Slow Flow

Flow control valve "On" slow flow occurs at the beginning of all sales, and again at the end of preset sales. In this case the coil is energized with current bursts of shorter duration. This allows the pilot to slightly move off its seat, allowing slow flow through the pilot orifice leading to the valve outlet, but not relieving enough pressure to cause the diaphragm to open.

5.2.3. Flow Control Valve “On” Full Regulated Flow

Flow control valve “On” full regulated flow occurs during the main portion of all sales. At this time, the coil is energized with bursts of current of longer duration, pulling the pilot further off it’s seat, relieving the pressure balance, and allowing the diaphragm to open by an amount relative to the distance between pilot and the pilot orifice. The position of the pilot is constantly moving in very small increments based on the signals sent from the computer relative to controlling a specific blend ratio and/or maintaining a maximum flow rate of 10 GPM through a hose. As the computer senses the need to increase or decrease the amount of a particular feedstock, it will send signals to the coil of longer (to open) or shorter (to close) duration. As a result, the pilot moves up or down causing the diaphragm to follow its movement and achieve the proper amount of flow.

When the delivery is complete, the coil is de-energized, allowing the pilot to return to its closed position. This allows pressure to build on the back side of the diaphragm, forcing it to close and seal the outlet port thereby stopping flow.

5.3. iMETER

The iMeter is designed and assembled around a modular type concept using fewer parts and allowing easier access for service. The iMeter module Figure 5-3. contains two meters in one assembly and the Intelligent Pulser. Each of the two meters in the iMeter module is a positive displacement meter. The pistons in the meter are in-line with respect to one another - one piston is 180° out of phase with the other. In remote dispensers, the bottom of the iMeter body is attached to the filter/strainer casting as shown in Figure 5-1. In suction pumps, the bottom of the iMeter body is attached to the top cover of the compact pumping unit. There are no external moving parts on the iMeter. Calibration is accomplished electronically. A procedure for iMeter calibration and Intelligent Pulser operation is found in Section 3.

5.3.1. Check and Pressure Relief Valve

There are two Check & Pressure Relief (C&PR) valves located atop the iMeter module under removable covers, as shown in Figure 5-3. The top mounted location allows for check valve replacement without draining the meter body. Once a delivery is complete and the diaphragm valve is closed, the product pressure between the check valve and the nozzle will be held at the pressure of the last delivery. If the pressure should build up due to temperature rise in the hose or a car runs over the hose, the relief function of the C&PR valve would relieve the pressure buildup. The relief valve is set to relieve pressure between 30-50 psi.

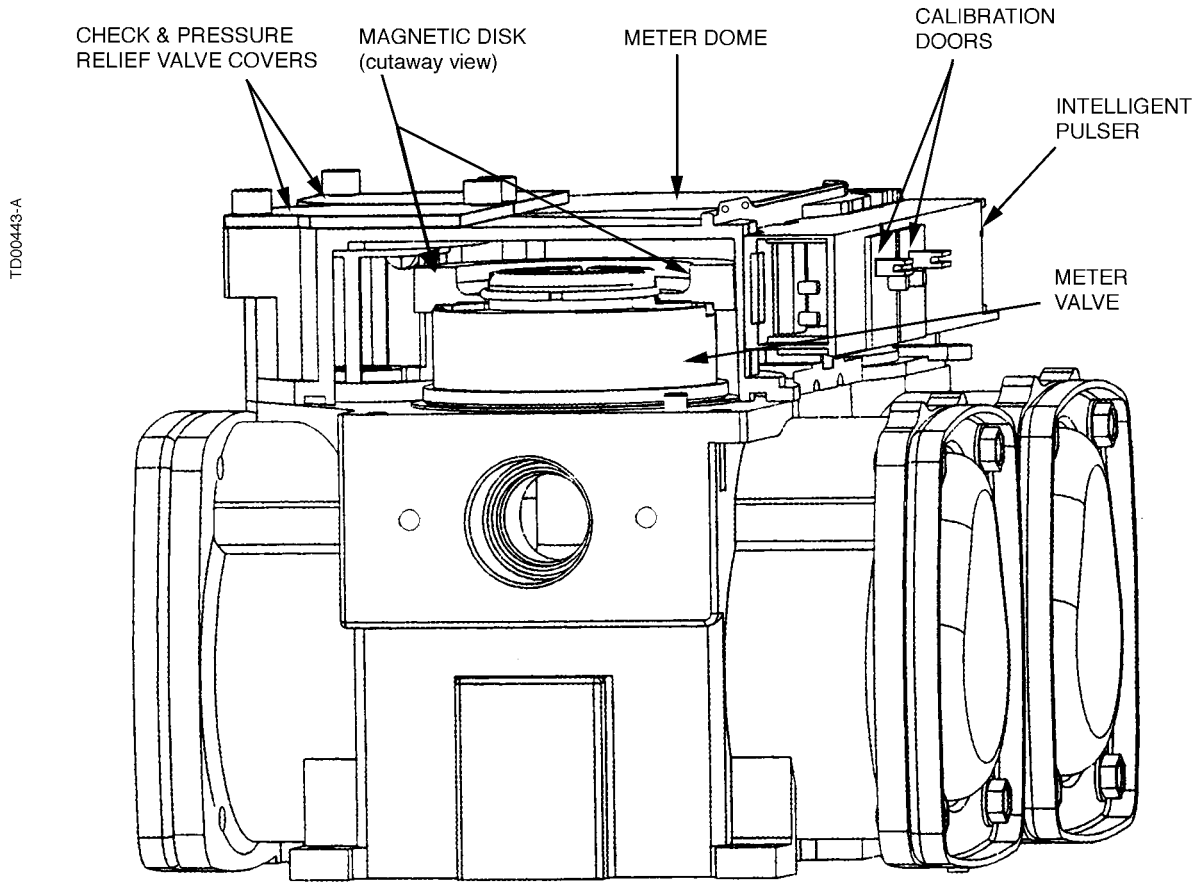

FIGURE 5-3. iMETER CUTAWAY. *The magnetic disk affixed to the top of the meter valve is rotated by the meter crank shaft. As the disk rotates, the pulser converts the changing magnetic field into digital pulses.*

5.4. DOUBLE BUMP TUBING

On 3/Vista dispensers, Double Bump product tubing is used between the iMeter outlet, proportional valve, and hose outlet casting. The double bump connection eliminates the need to torque the compression fittings that were used on the flare tubing.

As shown in the Figure 5-4, the oring fills the space between the "two bumps" , hence the name double bump, and when the tube is inserted into the mating connection, the oring compresses or spreads across this space, making a tight seal around the cylinder. The Safety Clip, while securing the connections, also improves the seal by allowing some flexibility as to exactly where the seal is made.

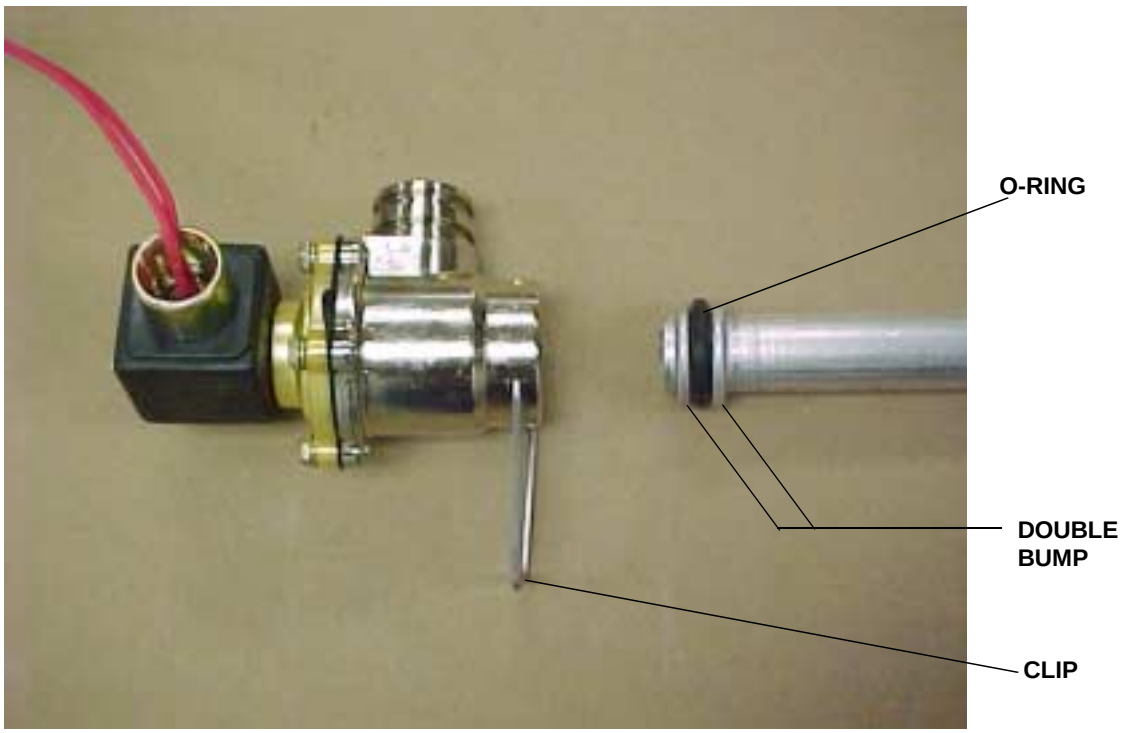

FIGURE 5-4. DOUBLE BUMP TUBE BETWEEN VALVE AND HOSE OUTLET.

6. PROGRAMMING FUNCTIONS AND STATISTICS

The Maintenance Mode is used to access the functions and statistics in the 3/Vista computer. Service technicians can access the Maintenance Mode by using the Infrared Remote (IR) remote control or by running the Service Terminal Program (STP) from a laptop computer. Both of these methods and the descriptions of the functions and statistics are discussed in detail in this section.

6.1 IR REMOTE CONTROL

The Infrared Remote (IR) Control communicates with the pump computer by an infrared link to the sensor mounted on the dispenser's sales display board behind the bezel.

The IR remote control has 16 buttons. When the remote control is held close to the infrared eye (Figure 6-2.) on the display board, it can be used to access dispenser functions and statistics (diagnostics). The remote is used to set unit prices, fueling point numbers, serial or stand-alone communications, blend ratios, read electronic totalizers and error codes, and perform many other diagnostic and service related tasks via the Maintenance Mode.

Four levels of entry to the Maintenance Mode are listed below. To access the mode, hold the remote control within 12" of the display and press the appropriate key as follows:

for Field Service entry using field engineer password press	ENTER
for Station Manager entry using station manager password press	1
for Operator entry using operator password press	2
for Weights and Measures entry using W&M password press	CLEAR

The maintenance mode asks for a password twice before allowing access to the maintenance mode functions and statistics. A 10 second time-out is built into the password entry code. When the word *PASS 1* appears on the sales display, **enter password** and press **ENTER**. You have 10 seconds to start entering the password. The timer restarts after you press a key. *PASS 2* appears on the sales display, prompting you to **enter the same password again** and press **ENTER**. The unit price display will show "F - - ", the money display shows the software version number, and the volume display shows the date of the software version. At this point, you can go to either Functions or to Statistics. To edit or view functions, **enter the function number** and press **ENTER**. The function number will appear in the unit price display. To enter the statistics viewing mode press either the **UP** or **DOWN** arrow when the unit price is displaying "F - - ". When you enter the statistics viewing mode, the unit price display window shows "S - - ", the money display window shows the current transaction count for side A, and

the volume display window shows the current transaction count for side B. To view specific statistics, **enter the statistic number** and press **ENTER**. The statistic number appears in the unit price display. Figure 7-2 lists a quick step procedure on accessing the Maintenance Mode.

press ENTER
enter Password _ _ _ _
press ENTER
enter Password again _ _ _ _
press ENTER
enter Function number

FIGURE 6-1. PROCEDURE FOR ENTERING THE MAINTENANCE MODE . *Use the IR Remote to access Functions for setting unit prices, fueling point numbers, blend ratios and to access Statistics for viewing error codes and performming other diagnostics.*

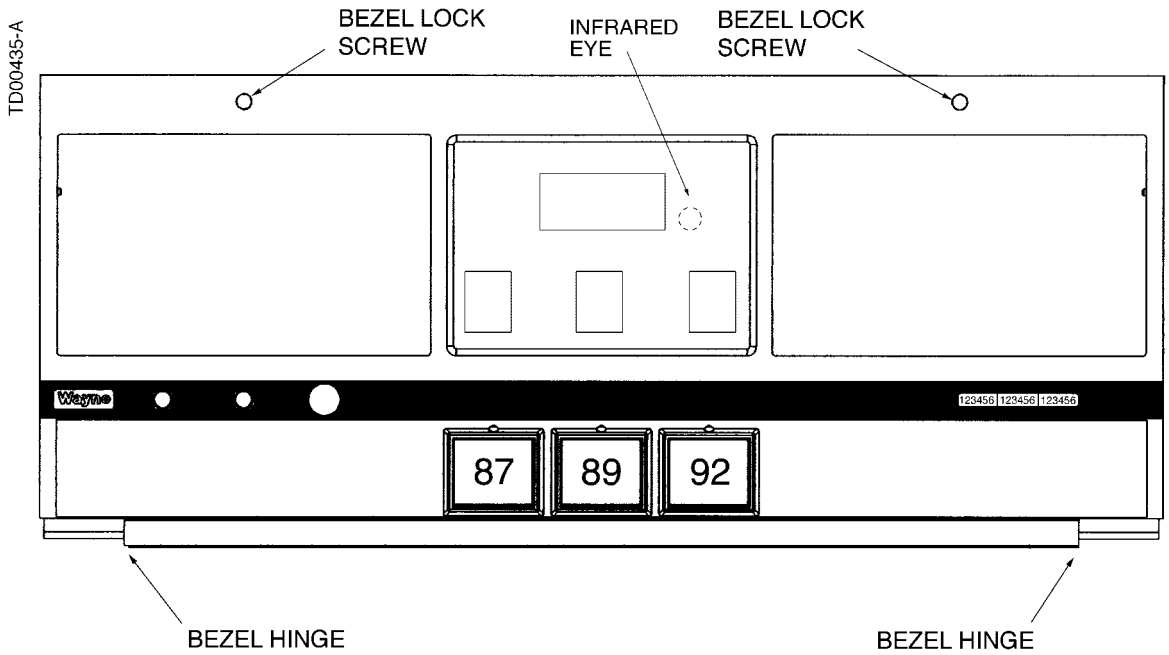

FIGURE 6-2. INFRARED INTERFACE LOCATION. *The dispenser infrared eye is located behind the sales display on each side of the dispenser.*

6.2 SUB ENTRY LEVEL

When you enter the sub entry level, the unit price display shows the function/statistic number in the two left-most digits and the sub level number in the two right-most digits separated with a decimal point. The **F** or **S** no longer appear. The following list shows functionality provided at this level. Not all functionality is available depending on user access.

NEXT Advances to the next sub function or sub-statistic within the current function or statistic.

If you enter numeric data without first pressing the **#** key, the system goes to the sub function or sub-statistic of the corresponding number that you entered. If the number is beyond the range of available subfunctions or substatistics, the maximum sub function or sub-statistic is used.

When you begin to enter numbers (preceded by the **#** key or not), the non-numeric keys have the following functionality.

CLEAR Backspace key if there is numeric input, otherwise returns control to initial screen.

ENTER Accepts any numeric input already entered.

UP Ignored when numeric input has been entered, otherwise returns control to the sub entry level.

DOWN Ignored when numeric input has been entered, otherwise returns control to the sub entry level.

Ignored when numeric input has been entered, otherwise returns control to sub entry level.

NEXT Ignored when numeric input has been entered, otherwise returns control to the sub entry level.

6.3 FUNCTION LIST

The template controls access to functions and subfunctions. The template contains an access level table that determines what functions each user has access to. Access levels are as follows:

- Read and Write
- Read only
- No access

F00 - Exit Function

Use this function to select one of three maintenance mode exits.

Sub-function numbers are in the format .0X where X = the selected configuration parameters defined as follows:

.00 Exit Option, 1 through 3

1 = Do not exit and do not save changes

2 = Exit, but do not save changes

3 = Exit and save changes

F01 - Filling Modes

Sub-function numbers are in the format .0X where X = the selected configuration parameters defined as follows:

.00 Filling Mode, 1 through 4

1 = Serial Mode, dispenser controlled by site controller via serial link

2 = Stand Alone Mode, dispenser not supervised by a site controller

3 = Serial W&M Mode, same as #1 but volume decimal point format forced to .xxx volume units

4 = Stand Alone W&M Mode, same as #2 but volume decimal point format forced to .xxx units

F02 - Clock Configuration

Sub-function numbers are in the format .0X where X = the selected configuration parameters defined as follows:

.00 Time in the format HH.MM

.01 Date in the format MM.DD

.02 Year in the format YY.YY

Note: System does not update automatically for Daylight Savings Time.

F03 - Set Side A Unit Prices

Note: These functions are not part of the template data.

Sub-function numbers are in the format:

.0N Set credit prices

.1N Set cash prices

N Logical nozzle number 1-8

F04 - Set Side B Unit Prices

Note: These functions are not part of the template data.

Sub-function numbers are in the format:

.0N Set credit prices

.1N Set cash prices

N Logical nozzle number 1-8

F05 - Set Side A Fueling Point Address

.00 Fueling Point Address, 0 through 98, where 0 = None Assigned

F06- Set Side B Fueling Point Address

.00 Fueling Point Address, 0 through 98, where 0 = None Assigned

F07 - Dispenser Configuration

Sub-function numbers are in the format .0X where X = the selected configuration parameters defined as follows:

.00 Maximum logical nozzle number for each side, 1-8

.01 Dispenser geometry, 1 = single sided, 2 = double sided

.02 Maximum blend error allowed, 1-5 (units of %)

.03 First check set for blending if liters, 2-200 (units of 1/10 Liters)

.04 First check set for blending if gallons, 5-50 (units of 1/10 Gallons)

.05 Not Used

.06 Manufacturing default for Intelligent Pulser

.07 Stop button configuration

1 = Stop Both Sides
2 = Stop Side

F08- Side A Dispenser Type Configuration Part #1

Sub-function numbers are in the format: .XN where X = the selected configuration parameters and N = the logical nozzle number 1-8 as follows:

.0N Physical nozzle number assignment, 0-8, 0 = None assigned

.1N Product type assignment, 1 = Non-blend, 2 = blend

.2N Unit Price display assignment, 0-8, 0 = None assigned

.3N Primary meter number assignment, 0-8, 0 = None assigned

.4N Secondary meter number assignment, 0-8, 0 = None assigned

.5N Primary valve number assignment 0-8, 0 = None assigned

.6N Primary valve type, 1-3

1 = On/Off
2 = Fast/Slow
3 = Proportional

.7N Secondary valve number assignment, 0-8, 0 = None assigned

.8N Secondary valve type, 1-3

F09 - Side B Dispenser Type Configuration Part #1

Sub-function numbers are in the format: .XN where X = the selected configuration parameters and N = the logical nozzle number 1-8 as follows:

.0N Physical nozzle number assignment, 0-8, 0 = None assigned

.1N Product type assignment, 1 = Non-blend, 2 = blend

.2N Unit Price display assignment, 0-8, 0 = None assigned

.3N Primary meter number assignment, 0-8, 0 = None assigned

.4N Secondary meter number assignment, 0-8, 0 = None assigned

.5N Primary valve number assignment 0-8, 0 = None assigned

.6N Primary valve type, 1-3

1 = On/Off
2 = Proportional

.7N Secondary valve number assignment, 0-8, 0 = None assigned

.8N Secondary valve type, 1-3

F10 - Side A Dispenser type Configuration Part #2

Sub-function numbers are in the format: .XN where X = the selected configuration parameters and N = the logical nozzle number 1-8.

.0N Octane number assignment, 00-99, 00 = None assigned

.1N Product select button input number assignment, 0-8, 0 = None assigned

.2N Push-to-Start button input number assignment, 0-8, 0 = None assigned

.3N Vapor recovery system enabled, 1 = Yes, 2 = No

.4N Beep annunciator in a series of six beeps on physical nozzle lift, 1 = Yes, 2 = No

F11 - Side B Dispenser Type Configuration Part #2

Sub-function numbers are in the format: .XN where X = the selected configuration parameters and N = the logical nozzle number 1-8.

.0N Octane number assignment, 00-99, 00 = None assigned

.1N Product select button input number assignment, 0-8, 0 = None assigned

.2N Push-to-Start button input number assignment, 0-8, 0 = None assigned

.3N Vapor recovery system enabled, 1 = Yes, 2 = No

.4N Beep annunciator in a series of six beeps on physical nozzle lift, 1 = Yes, 2 = No

F12 - Side A Pump Assignments

Sub-function numbers are in the format: .XN where X = the selected configuration parameters and N = the logical nozzle number 1-8.

.0N Primary pump assignment, 0-8, 0 = None assigned

.**1N** Secondary pump assignment, 0-8, 0 = None assigned

F13 - Side B Pump Assignments

Sub-function numbers are in the format: .XN where X = the selected configuration parameters and N = the logical nozzle number 1-8.

.0N Primary pump assignment, 0-8, 0 = None assigned

.**1N** Secondary pump assignment, 0-8, 0 = None assigned

F14 - Dispenser Display Configuration (both sides)

Sub-function numbers are in the format .0X where X = the selected configuration parameters defined as follows:

.00 Number of unit price displays per side, 0-8, 0 = None supported

.01 Display mode after sale paid

1 = Money is actual, volume is actual, unit price is actual
2 = Money is zeros, volume is zeros, unit price is actual
3 = Money is zeros, volume is zeros, unit price is blanks
4 = Money and Volume actual, Unit Price blank

.02 Money display digits right of decimal point, 0-4

.03 Volume display digits right of decimal point, 0-4

.04 Unit Price display digits right of decimal point, 0-4

.05 Flash unit price display when selected after 8 - blanks - 0

1 = No Flash,
2 = Flash until flow
3 = flash always

.06 Suppress display of leading zeros in normal mode

1 = Yes
2 = No

.07 Totals and Totalizers Amount display digits right of the decimal point, 0-4

.08 Totals and Totalizers Volume display digits right of the decimal point, 0-4

F15 - Dispenser Annunciator Configuration

Sub-function numbers are in the format .0X where X = the selected configuration parameters defined as follows:

.00 Beep annunciator on any button push

1 = Yes
2 = No

.01 Beep annunciator on physical nozzle lift

1 = Yes
2 = No

.02 Repeat annunciator beep if physical nozzle out and Push-to-start (or grade select) NOT satisfied

1 = Yes
2 = No

.03 Beep annunciator once for each eights, blanks, and zeros

1 = Yes
2 = No

F16 - WIP Configuration

Sub-function numbers are in the format .0X where X = the selected configuration parameters defined as follows:

.00 Measurement mode

1 = Liters
2 = Gallons
3 = Imperial Gallons

.01 WIP reverse pulse hysteresis, 1-64

.02 Reverse pulse Limit (after hysteresis) on an “in use” WIP, 1-99

.03 Reverse pulse Limit (after hysteresis) on an idle/unused WIP 1-255

F17 - Dispenser Limits Configuration

Sub-function numbers are in the format .0X where X = the selected configuration parameters defined as follows:

.00 Maximum number of pulse errors on an “in use” WIP (in a transaction), 1-99

.01 Maximum number of pulse errors on an idle/unused WIP, 1-99

.02 Maximum number of display errors/filling, 0-99, where 0 = disabled

.03 Stop for “no flow” or “flow lost” time limit (0 - 1000 seconds)

.04 Maximum number of consecutive no flow events w/out error, 0-10, 0 = disabled

.05 Maximum number of flow lost events w/out error, 0-10, 0 = disabled

.06 Maximum number of unfinished fillings, 0-10, 0 = Feature disabled

.07 Maximum filling amount/filling, 1-6 digits

.08 Maximum volume amount/filling, 1-6 digits

F18 - Blend Ratio Configuration

Sub-function numbers are in the format: SN where S = the Side number (1=A, 2=B) and N = the logical nozzle number 1-8.

SN. Blend ratio (the allowed range for data is 0-101, where 101 = Disabled for a non-blend 000 is

F19 - Volume Unit Specific Configuration

Sub-function numbers in the format .VX where V= volume unit selection (1= liters, 2=gallons) and X = the selected configuration parameters defined a follows.

.10 Suppressed volume @ start of filling, 1-9 cl.

.11 Maximum volume for selection of new product, 1-9 cl.

.12 Suppress overflow of preset limit, 0-99 cl.

.13 Preset/Prepay slow down volume delta. 5-399 cl.

.14 Forward pulse limit on idle/unused WIP. 1-99 cl.

.20 Suppressed volume @ start of filling, 1-99 (units of 1/1000 Gallons)

.21 Maximum volume for selection of new product, 1-99 (units of 1/1000 Gallons)

.22 Suppress overflow of preset limit, 0-99 (units of 1/1000 Gallons)

.23 Preset/Prepay slow down volume delta. 2-999 (units of 1/1000 Gallons)

.24 Forward pulse limit on idle/unused WIP. 1-999 (units of 1/1000 Gallons)

F20 - Dispenser Serial Link Configuration

Sub-function numbers are in the format .0X where X = the selected configuration parameters defined as follows:

.00 Protocol

0 = Off link
1 = RS485 Standard DART
2 = RS485 Full DART
3 = LON
4 = U.S. Current Loop
5 = Ljungman Current Loop
6 = Ferranti

Note: "4 = US current loop" is the only protocol currently supported.

.01 Baud rate

1 = 4800
2 = 9600
3 = 19200
4 = 38400

.02 CRC Calculation. 1 = Enable, 2 = Disable

.03 Send "Filling Complete" after zero sale. 1 = Yes, 2 = No

.04 Serial Link Control of the Dispenser Light Enable. 1 = Yes, 2 = No

F21 - Miscellaneous Configuration

Sub-function numbers are in the format .0X where X = the selected configuration parameters defined as follows:

.00 Pump Motor ON configuration

1 = ON at end of display test
2 = ON at start of display test
3 = ON at product selection

.01 Lock on filling mode configuration

1 = Access to filling mode configuration restricted
2 = Access allowed.

.02 Standalone indication enabled (show four digits right of decimal point)

1 = Yes
2 = No

.03 Blank or dash unselected unit price displays on product selection

1 = Blank
2 = Dash

.04 Product change allowed after fuelling started

1 = product change allowed after fuelling started
2 = product change not allowed after fuelling started

.05 Electro-mechanical totalizer configuration

1 = Each side has it's own electro-mechanical totalizers per meter
2 = One electro-mechanical totalizer per meter shared by both sides

.06 Dianostic Flow Rate Display, 1 = Display Sale Amount, 2 = Display Flow Rate

F22 - Sales Amount Calculation

Sub-function numbers are in the format .0X where X = the selected configuration parameters defined as follows:

.00 Denomination ratio between Money display and Unit Price display

1 = 1/1
2 = 10/1
3 = 100/1
4 = 1/10
5 = 1/100

.01 Count by ones or fives in least significant digit of Money display

1 = Ones
2 = Fives

.02 Volume digits to the right of the decimal point used in amount calculation 0-5, where 5 = use volume decimal point as defined in function 18.5

.03 Money preset configuration. As the unit price increases, the system reaches a point when certain preset money amounts cannot be set due to the resolution of the metering system and/or the configured resolution of the volume used for the money calculation. Program this sub-function to give the desired result when this occurs.

0 = Calculate the closest volume from the money and the unit price and show the actual money amount at the end of the sale.

1 = Calculate the closest volume from the money and the unit price but show the preset money amount at the end of sale as long as the sale hasn't reached the maximum overrun volume.

2 = Calculate a volume amount that will ensure a money amount that is greater than or equal to the preset amount and show the preset money amount at the end of the sale as long as the sale hasn't reach the maximum overrun volume.

F23 - Miscellaneous Timers

Sub-function numbers are in the format .0X where X = the selected configuration parameters defined as follows:

.00 Display test time (total test time - also known as valve on delay), 2-24 (units of 1/2 Sec)

.01 Minimum time between fillings, 0-20 (units of 1/2 Sec), where 0 = disabled

.02 Stop for offline error, 0-30 (seconds), where 0 = disabled

.03 Maximum time allowed for filling, 0-60 (minutes), where 0 = disabled

.04 Time from unit price change until next start of sale, 0-15 (seconds)

F24 - Local Preset Configuration

Sub-function numbers are in the format .0X where X = the selected configuration parameters defined as follows:

.00 Operation Mode

1 = Money amount only entry
2 = Volume amount only entry
3 = Default to money, toggle by button
4 = Default to volume, toggle by button

.01 Preset entry required before filling start

1 = Yes
2 = No

.02 FILL mode display

1 = Show dashes during filling
2 = Show "FILL" during filling

.03 Preset entry time-out, 0-60 (units of seconds)

.04 Soft key #1 function configuration, 0-9

0 = Disabled
1 = Select Money Pre-set
2 = Select Volume Pre-set
3 = Toggle between Money or Volume Pre-set
4 = Select FILL Mode
5 = Select Pre-set Value #1
6 = Select Pre-set Value #2
7 = Select Pre-set Value #3
8 = Clear Key
9 = Enter Key

.05 Soft key #2 function configuration, 0-9 (See .04 for definitions of configuration items.)

.06 Soft key #3 function configuration, 0-9 (See .04 for definitions of configuration items.)

.07 Soft key #4 function configuration,.0-9 (See .04 for definitions of configuration items.)

.08 First digit entry point for money preset, 1-6

.09 First digit entry point for volume preset, 1-6

F25 - Local Preset By Button Configuration

Sub-function numbers are in the format .0X where X = the selected configuration parameters defined as follows:

.00 Preset button #1 operation mode

1 = Money
2 = Volume

.01 Preset button #2 operation mode

1 = Money
2 = Volume

.02 Preset button #3 operation mode

1 = Money
2 = Volume

.03 Preset button #1 money/volume limit, 0-999999

.04 Preset button #2 money/volume limit, 0-999999

.05 Preset button #3 money/volume limit, 0-999999

F26 - VAP Configuration

Sub-function numbers are in the format .0X where X = the selected configuration parameters defined as follows:

.00 ORVR control

1 = Enabled
2 = Disabled

F27 - Side A Dispenser Configuration

.00 Button input for Local Authorize function, 0-8, where 0 = not supported

F28 - Side B Dispenser Configuration

.00 Button input for Local Authorize function, 0-8, where 0 = not supported

F29 - Side A Liter Flow Rate Configuration

.0N Maximum slow flow rate, 3-50 (units of 1/10 Liters/min.)

.1N Minimum slow flow rate, 0-50 (units of 1/10 Liters/min.), 0 = no minimum

.2N Maximum fast flow rate, 10-180 (units of Liters/min.)

.3N Minimum fast flow rate, 0-180 (units of Liters/min.), 0 = no minimum

N Logical nozzle

F30 - Side B Liter Flow Rate Configuration

.0N Maximum slow flow rate, 3-50 (units of 1/10 Liters/min.)

.1N Minimum slow flow rate, 0-50 (units of 1/10 Liters/min.), 0 = no minimum

.2N Maximum fast flow rate, 10-180 (units of Liters/min.)

.3N Minimum fast flow rate, 0-180 (units of Liters/min.), 0 = no minimum

N Logical nozzle

F31 - Side A Gallon Flow Rate Configuration

.0N Maximum slow flow rate, 1-10 (units of 1/10 Gallons/min.)

.1N Minimum slow flow rate, 0-10 (units of 1/10 Gallons/min.), 0 = no minimum

.2N Maximum fast flow rate, 3-48 (units of Gallons/min.)

.3N Minimum fast flow rate, 03-48 (units of Gallons/min.), 0 = no minimum

N Logical nozzle

F32 - Side B Gallon Flow Rate Configuration

.0N Maximum slow flow rate, 1-10 (units of 1/10 Gallons/min.)

.1N Minimum slow flow rate, 0-10 (units of 1/10 Gallons/min.), 0 = no minimum

.2N Maximum fast flow rate, 3-48 (units of Gallons/min.)

.3N Minimum fast flow rate, 03-48 (units of Gallons/min.), 0 = no minimum

N Logical nozzle

F33 - Password Change

Dashes appear in the money display window, and the word PASS appears on the volume display. When you begin editing, the money display goes blank and dashes appear instead of the regular entries. Enter the new password twice. The sub-function numbers are defined as follows:

.00 Service Engineer Password, maximum of 6 characters (Use numbers only)

.01 Station Manager Password, maximum of 6 characters (Use numbers only)

.02 Station Operator Password, maximum of 6 characters (Use numbers only)

.03 Weights and Measures Password, maximum of 6 characters (Use numbers only)

F34 - Diagnostics

These functions provide a way to test various parts of the hardware, including all switches, displays, beeper and Vapor recovery. Other motors and valves are not available for security and safely reasons. When a test is invoked, press **CLEAR** or **ENTER** to end the test.

.01 **Switch test.** The money display shows 4 dashes until a switch is activated. A description of the activated switch and side (1 or 2) is displayed on the money display. For example, nozzle switch 3 on side 2 is displayed as 2n3 as long as the switch is depressed (n=nozzle, S=Stop switch, b = bitbus, P = preset). When the nozzle is deactivated the display reverts to dashes.

.02 **Display test**. A “walking segment” test is performed in which each segment of the display is turned on and off. Each digit of the display is tested at the same time.

.03 **Vapor Recovery** subsystem test, Side A

.04 **Vapor Recovery** subsystem test, Side B

These subfunctions simulate a flow rate to the vapor recovery system, which turns on the recovery motor accordingly. At least one nozzle on the specified side must have WayneVac enabled for the motor to turn on. The volume display shows the simulated flowrate. The money display shows actual RPM as measured by the computer. The **UP** key increases the simulated flowrate. The **DOWN** key decreases the flowrate.

Simulated flow rates:

Off
Low (7.0 GPM)
Medium (8.5 GPM)
High (10.0 GPM)

F35 - Side A Wayne Vac A/L Calibration Data

This function provides a way to calibrate the Wayne Vac A/L ratio.

There is an adder and a multiplier that can be used to change the ratio. The adder has more effect at the low flow rates (lower RPMs) and the multiplier has more effect at the higher flows (higher RPMs).

.00 Default setting is 100, which is a 0 adder. To increase RPMs increase the number above 100. To decrease RPMs make the number lower than 100.

.01 Default setting is 100, which is a 1 multiplier. To increase RPMs increase the number above 100. To decrease RPMs make the number lower than 100.

The example below shows how the adder and multiplier affect the motor speed.

Assume the speed is set at 1000 RPM, then:

F35.00	F35.01	Calculation	Result (RPM)
100	100	(1000+(F35.00-100))*(F35.01/100)	1000
110	100	(1000+(F35.00-100))*(F35.01/100)	1010
100	120	(1000+(F35.00-100))*(F35.01/100)	1200
105	103	(1000+(F35.00-100))*(F35.01/100)	1035
95	95	(1000+(F35.00-100))*(F35.01/100)	945

F36 - Side B Wayne Vac A/L Calibration Data

This function provides a way to calibrate the Wayne Vac A/L ratio.

There is an adder and a multiplier that can be used to change the ratio. The adder has more effect at the low flow rates (lower RPMs) and the multiplier has more effect at the higher flows (higher RPMs).

.00 Default setting is 100, which is a 0 adder. To increase RPMs increase the number above 100. To decrease RPMs make the number lower than 100.

.01 Default setting is 100, which is a 1 multiplier. To increase RPMs increase the number above 100. To decrease RPMs make the number lower than 100.

The example below shows how the adder and multiplier affect the motor speed.

Assume the speed is set at 1000 RPM, then:

F36.00	F36.01	Calculation	Result (RPM)
100	100	(1000+(F36.00-100))*(F36.01/100)	1000
110	100	(1000+(F36.00-100))*(F36.01/100)	1010
100	120	(1000+(F36.00-100))*(F36.01/100)	1200
105	103	(1000+(F36.00-100))*(F36.01/100)	1035
95	95	(1000+(F36.00-100))*(F36.01/100)	945

F96 - Upload Flash Memory Programming

This function requires the service terminal, *NOT* the remote control.

This function has no subfunctions. Press **ENTER** to transmit the FLASH program data. The service terminal program requests a filename to upload the data to. Select the file to begin the program upload.

When the FLASH program upload finishes, the computer goes back to function entry mode where you may access other functions.

F97 - Upload Dispenser Configuration Templates

This function requires the service terminal, *NOT* the remote control.

This function has no subfunctions. Press **ENTER** to transmit the FLASH template data. The service terminal program requests a filename to upload the data to. Select the file to begin the template upload.

When the FLASH template upload is complete, the computer will go back to function entry mode where you can access other functions.

F98 - Download Flash Memory Programming

This function requires the service terminal, *NOT* the remote control.

This function has no subfunctions. Complete the following steps to use the service terminal:

1. Enter PASS 1.
2. Enter PASS 2.
3. Enter Function.
4. Enter Verification Code.
5. Select the file.

The service terminal program requests a filename to download. You can browse various directories for the desired file. Select the correct file to start the program download. If you cannot find the file or if the there is a bad CRC, the download aborts.

It is important that you do not interrupt the download for any reason. If this happens, you will have to load the FLASH via bootstrap mode. See the procedure on the following page for a description of the **bootstrap** mode.

When the download is complete, the software executes a warm start which is just like a power cycle. If the laptop is still connected and the laptop program is still running, the computer will re-enter maintenance mode prompting for the passwords to be entered. At this point you can terminate the laptop program and disconnect the laptop.

The FLASH memory programming that is being downloaded contains a default template. If the template that is currently in the FLASH is compatible with the new version of program code, the template data is preserved. If the template data that is currently in the flash is not compatible with the new version of program code, the template data will be overwritten with the default template.

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F99 - Download dispenser Configuration Template

This function has no subfunctions. Press **ENTER** to download a verification code and display the word PASS. Enter 42 for the verification code. The program on the laptop requests a filename to download. You can browse various directories for the desired file. Select the correct file to start the program download. If you cannot find the file or if the there is a bad CRC, the download aborts.

If the template download is interrupted, restart the service terminal and reload the template.

When the download is complete, the software executes a warm start which is just like a power cycle. If the laptop is still connected and the laptop program is still running, the computer will re-enter maintenance mode prompting for the passwords to be entered. At this point you can terminate the laptop program and disconnect the laptop.

After downloading a new template into the FLASH, a cold start must be done to transfer the new template from the FLASH to the RAM.

6.4 STATISTICS LIST

The template controls access to statistics and sub-statistics. The template contains an access level table that determines what functions each user has access to. Access levels are as follows:

- Read and Write
- Read only
- No access

The following is a comprehensive list of defined statistics:

S01 - Side A Totals by Logical Nozzle

Sub-statistic numbers in the format '.TN'

T = totals type:

1 = Volume
2 = Total Money
3 = Credit
4 = Cash
5 = Serial Filling Mode Filling Count
6 = Stand Alone Mode Filling Count

N = logical nozzle number 0-8 (0 = None Assigned)

The least significant six (6) digits of the data value appear on the volume display. Higher order non-zero digits of the data value, if present, appear on the money display. Leading zeros appear as blanks.

S02 - Side B Totals by Logical Nozzle

Sub-statistic numbers in the format '.TN'

T = totals type:

1 = Volume
2 = Total Money
3 = Credit
4 = Cash
5 = Serial Filling Mode Filling Count
6 = Stand Alone Mode Filling Count

N = logical nozzle number 0-8 (0 = None Assigned)

The least significant six (6) digits of the data value appear in the volume display with higher order non-zero digits of the data value, if present, shown on the money display. Leading zeros appear as blanks.

S03 - Side A Error/Event Counter Totals

The money display is in the form of dashes and sub-statistic displays on the unit price display in the range 1-99 representing the set of error/events detectable by the program. The allowed range for the counter value is 0-255.

Note: See Section 7 for a list of error codes.

S04 - Side B Error/Event Counter Totals

The money display is in the form of dashes and sub-statistic displays on the unit price display in the range 1-99 representing the set of error/events detectable by the program. The allowed range for the counter value is 0-255.

S05 - Side A Meter Volume Totals

Sub-statistic numbers in the format '.M0' where 'M' = meter number 1-8. The least significant six (6) digits of the data value appear on the volume display. Higher order non-zero digits of the data value, if present, appear on the Money display. Leading zeros appear as blanks.

S06 - Side B Meter Volume Totals

Sub-statistic numbers in the format '.M0' where 'M' = meter number 1-8. The least significant six (6) digits of the data value appear on the volume display. Higher order non-zero digits of the data value, if present, appear on the Money display. Leading zeros appear as blanks.

S07- S10: RESERVED

S11 - Side A Totalizers by Logical Nozzle

Sub-statistic numbers in the format '.TN':

T = Totals type

1 = Volume
2 = Total Money
3 = Credit
4 = Cash
5 = Serial Filling Mode Filling Count
6 = Stand Alone Mode Filling Count

N = logical nozzle number 0-8 where 0 = None Assigned

The least significant six (6) digits of the data value appear on the volume display. Higher order non-zero digits of the data value, if present, appear on the Money display. Leading zeros appear as blanks.

S12 - Side B Totalizers by Logical Nozzle

Sub-statistic numbers in the format '.TN':

T = Totals type

1 = Volume
2 = Total Money
3 = Credit
4 = Cash
5 = Serial Filling Mode Filling Count
6 = Stand Alone Mode Filling Count

N = logical nozzle number 0-8 where 0 = None Assigned

The least significant six (6) digits of the data value appear on the volume display. The higher order non-zero digits of the data value, if present, appear on the money display. Leading zeros appear as blanks.

S13 - Side A Error/Event Counter Totalizers

The money display shows dashes and the volume display shows the statistic data. The unit price display shows the statistic and sub-statistic numbers in the format 13.XX where .XX is in the range 0-99 representing the set of error/ events detectable by the program. The allowed range for the counter value is 0-999.

See Appendix A, “Error Codes” for a list of error codes.

S14 - Side B Error/Event Counter Totalizers

The money display shows dashes and the volume display shows the statistic data. The unit price display shows the statistic and sub-statistic numbers in the format 14.XX where .XX is in the range 0-99 representing the set of error/ events detectable by the program. The allowed range for the counter value is 0-999.

See Appendix A, “Error Codes” for a list of error codes.

S15 - Side A Meter Volume Totalizers

Sub-statistic numbers in the format '.M0' where 'M' = meter number 1-8. The least significant six (6) digits of the data value appear on the volume display. The higher order non-zero digits of the data value, if present, appear on the Money display. Leading zeros appear as blanks.

S16 - Side B Meter Volume Totalizers

Sub-statistic numbers in the format '.M0' where 'M' = meter number 1-8. The least significant six (6) digits of the data value appear on the volume display. The higher order non-zero digits of the data value, if present, appear on the Money display. Leading zeros appear as blanks.

S17 - S20: RESERVED

S21 - Side A Error/Event Log

Sub-statistic numbers in the format '.XX' with the range 01-50 representing the set of error/events records maintained by the program, with the record in sub-statistic 01 being the most recent. Display error log data by using the two (2) data pages shown in an alternating sequence at a 1 second per page.

Note: See Appendix A, "Error Codes" for a list of error codes.

Page 1 has the following format:

Page 1 has the following format:		Page 2 has the following format:

```
  .HH.MM
CC.DD.NN
```

where:

HH = hour

MM = minute

CC = error code

DD = device number

NN = logical nozzle number

Page 1 has the event time on the Money display in the format HH.MM. The volume display has data in the format CC.DD.NN where CC = the error/event code in the range 1-99, DD = the device number associated with the error/event and NN = the logical nozzle 0-8 selected at detection of the event (0 = none selected).

Page 2 has the following format:

```
MM.DD.YY
       C
```

where:

MM = month

DD = day

YY = year

C = filling count

Page 2 shows the event date on the Money display in the format MM.DD.YY and the filling count for the side on the volume display.

S22 - Side B Error/Event Log

Sub-statistic numbers in the format '.XX' with the range 01-50 representing the set of error/events records maintained by the program, with the record in sub-statistic 01 being the most recent View statistic data on the two (2) data 'pages' shown in an alternating sequence at a frequency of 1 second per page.

Note: See Appendix A, "Error Codes" for a list of error codes.

Page 1 has the following format:

```
  .HH.MM
CC.DD.NN
```

where:

HH = hour

MM = minute

CC = error code

DD = device number

NN = logical nozzle number

Page 1 has the event time on the Money display in the format HH.MM. The volume display data is in the format CC.DD.NN where CC = the error/event code in the range 1-99, DD = the device number associated with the error/event and NN = the logical nozzle 0-8 selected at detection of the event (0 = none selected).

Page 2 has the following format:

```
MM.DD.YY
       C
```

where:

MM = month

DD = day

YY = year

C = filling count

Page 2 shows the event date on the Money display in the format MM.DD.YY and the filling count for the side on the volume display.

S23 - Side A Transaction History Log

Sub-statistic numbers in the format '.XX' with the range 01-10 representing the set of transaction records maintained by the program. The record displayed in sub-statistic 01 is the most recent and 10 is the oldest. View statistic data on the two (2) data 'pages' shown in an alternating sequence at a frequency of 1 second per page. Page 1 has the transaction amount on the money display. The volume display has the transaction volume. Page 2 shows the unit price on the money display and volume display has the transaction volume.

S24 - Side B Transaction History Log

Sub-statistic numbers in the format '.XX' with the range 01-10 representing the set of transaction records maintained by the program. The record displayed in sub-statistic 01 is the most recent and 10 is the oldest. Display of statistic data is accomplished by the use of two (2) data 'pages' shown in an alternating sequence at a frequency of 1 second per page. Page 1 has the transaction amount on the money display. The volume display has the transaction volume. Page 2 shows the unit price on the money display and volume display has the transaction volume.

S25 - Total Number of Power Cycles

The money display is blank and the power cycle counter value appears on the volume display. Sub-statistic numbers are displayed in the format '0X' where X = the selected configuration parameter defined as follows:

0. Number of Power Cycles

1. Number of Software Resets

2. Number of Cold Start Power Cycles

S26 - Reset History

This statistic provides information for a software engineer to aid in troubleshooting.

Shows the date, time, reason, and return location for the last 50 resets. Sub-statistic numbers in the format '.XX' with the range 01-50 representing the set of reset event records maintained by the program. The record displayed in sub-statistic 01 is the most recent and 50 is the oldest.

View statistic data on the two (2) data 'pages' shown in an alternating sequence at a frequency of 1 second per page. Page 1 shows the event time on the Money display in the format HH.MM. The volume display has data in the format TT.FFFF where TT = the trap id, FFFF = the value of the trap flag register, (TFR) at detection of the reset.

Page 2 shows the event date on the Money display in the format MM.DD.YY and the return address as SS.OOOO where SS is the hex code segment, and OOOO is the hex offset into the code segment. The return address can be used to determine the PC contents when the trap occurred. This can be especially helpful for unexpected traps such as illegal instructions, odd word fetches, etc.

0.1 Weights and Measures Mode

If you enter the maintenance mode through a weights and measures entry, a special weights and measures mode version of the maintenance mode automatically starts. This special mode is designed to make it as easy as possible to display the blend ratio change event logs and volume metering change event logs required by Weights and Measures.

If the dispenser is configured as a blender, you enter the View Blend Ratios mode first. After you finish viewing the blend ratio or if the dispenser is not configured as a blender, the View Volume Metering Unit Change Counters mode begins.

Note: The weights and measures mode is side specific. It shows the blend ratio logs and volume metering unit logs for the side that you are facing when using the infrared device.

0.1.1 View Blend Ratios Mode

When you enter this mode, the sale display contains the words **bLEnd rAtioS** and the current blend ratios for all the blended products are displayed in the current price display for a maximum of 20 seconds. If you dont press any other buttons within 20 seconds, or if you press the **CLEAR** button, the system enters the View Volume Metering Unit Change Counters mode.

If you press **ENTER** or **NEXT**, the system enters the View blend Ratio Change Counters mode.

0.1.2 View Blend Ratio Change Counters Mode

In this mode, the following sequence repeats every 20 seconds for every blended product. When all products finish displaying, the system enters the View Volume Metering Unit Change Counters mode.

l The corresponding unit price display contains **Pr n** where **n** is the product number, also known as the logical nozzle number.

- The money display contains the current counter value showing how many times this products blend ratio has changed.
- The volume display contains the current blend ratio

If you press one of the following keys while you are in this mode, the corresponding action occurs:

CLEAR	The system enters the View Volume Metering Unit Change Counters mode.
ENTER	The system enters the View Blend Ratio Change Event Logs mode.
NEXT	The next products change counter data in the sequence is displayed, unless you are viewing the last products change counter. Otherwise the system enters the View Volume Metering Unit Change Counters mode.

0.1.3 View Blend Ratio Change Event Logs Mode

In this mode, the following sequence repeats every 20 seconds for the last ten event logs for the selected product. When all ten event logs are finished displaying, control returns to the previous mode.

The corresponding unit price display contains **bC n** where **n** is the blend change event number (1-10) where 1 is the last blend change event and 10 is the oldest stored change event.

The sale display alternates every two seconds between the following pages:

The money display displays either **LOCAL** or **SErIAL** depending on whether the blend ratio change came from local programming or from the serial link to the site controller and the volume display contains the blend ratio that it was changed to with this event.

The money display contains the date of the event in the form of mm.dd.yy where “mm” is the month, “dd” is the day, “yy” is the year. The volume display contains the time of the event in the form of hh.mm where hh is the hour (0-23) and mm is the minute (0-59).

If you press one of the following keys while in this mode, the corresponding action is taken:

CLEAR	The system exits the View Blend Ratio Change Event Logs mode and returns control to the View Blend Ratio Change Counters log.
ENTER	The system exits the View Blend Ratio Change Event Logs mode and returns control to the View Blend Ratio Change Counters log.
NEXT	The next blend change event displays. If you are viewing event 10, it will wrap around and show event 1.
UP	The next blend change event displays. If you are viewing event 10, it will wrap around and show event 1.
DOWN	The previous blend change event displays. If you are viewing event 10, it will wrap around and show event 1.

0.1.4 View Volume Metering Unit Change Counters Mode

In this mode, the following items display for 20 seconds

1. Unit price displays contain **Unit** (for volume metering unit)
2. Money price display contains the current counter value showing how many times the volume metering unit was displayed
3. Volume display contains the current volume metering unit described as follows:

- **LItErs** Liters volume unit
- **US GAL** U.S. Gallons volume unit
- **IP GAL** Imperial Gallons volume unit

If you press one of the following keys while in this mode, the corresponding action happens:

CLEAR	The system exits the weights and measures mode.
ENTER	The system enters the View Volume Metering Unit Change Event Logs mode.
NEXT	The system exits the weights and measures mode.

0.1.5 View Volume Metering Unit Change Event Logs Mode

In this mode, the following sequence repeats every 20 seconds for the last ten event logs for the volume metering unit changes. When all ten event logs have finished displaying, control returns to the previous mode.

1. The corresponding unit price display contains **UC n** where **n** is the unit change event number 1-10; 1 is the last unit change event and 10 is the oldest stored change event.
2. The sale display alternates every two seconds between the following two pages:
   a. The money display is blank and the volume display contains the metering unit that was changed to with this event described as follows:
      - **LItErs**Liters volume unit
      - **US GAL**U.S. Gallons volume unit
      - **IP GAL**Imperial Gallons volume unit
   b. The money display contains the date of the event - mm.dd.yy where mm is the month, dd is the day, yy is the year. The volume display contains the time of the event in the form of hh.mm where hh is the hour (0-23) and mm is the minute (0-59).

If you press one of the following keys while in this mode, the corresponding action happens:

CLEAR	The system enters the weights and measurements mode.
ENTER	The system enters the weights and measurements mode.
NEXT	The next volume metering unit change event displays. If you are viewing event 10, it wraps around to show event 10
UP	The next volume metering unit change event displays. If you are viewing event 10, it wraps around to show event 10
DOWN	The next volume metering unit change event displays. If you are viewing event 10, it will wrap around to show event 10.

⚠ **WARNING**

Electric Shock Hazard!
Some of the following corrective actions in this Section may require the electrical power to the equipment be ON. Use wiring diagrams, connector drawings and other information in this manual to identify the electrical connections and AVOID contact with the electrical power. Failure to do so may result in severe injury or death.

See board layouts in Section 9 for for identification and location of connector assignments and LED indicators.

Enter the Maintenance Mode statistics S21 and S22 to check error codes.

7.1. USE IR REMOTE

Use the IR Remote to access Functions for setting unit prices, fueling point numbers, blend ratios and to access Statistics for viewing error codes and performming other diagnostics as follows.

press ENTER
enter Password _ _ _ _
press ENTER
enter Password again _ _ _ _
press ENTER
enter Function number

7.2 USING THE SERVICE TERMINAL PROGRAM (STP)

A service kit, Service Terminal Kit, part number 887722-001, includes all items necessary to perform the following tasks.

The Service Terminal Program allows a laptop computer to communicate with the pump computer through an RS232 link to access dispenser functions and diagnostic data. Although you perform the programming through the pump display, a description of the various functions and statistics appear on the laptop display.

The Service Terminal Program is also used to upload and download dispenser model configuration templates and program code revisions.

1. Disconnect the J1 power connector on the computer board.
2. Connect the RS232 cable to the RS232 adapter (part # 887526-001). Connect the adapter to J18 on the computer board. Connect the other end of the RS232 cable to the laptop PC.
3. With the Service Terminal Program (STP) on the laptop closed, re-connect J1 power on the computer board.
4. Start the Service Terminal Program to put the dispenser into maintenance mode.
5. The STP should start communicating with the pump computer.

TABLE 6-1. ERROR CODES AND SOLUTIONS

Error Code	Description	Probable Cause	Corrective Action
1	Flash Program CRC Error	Corrupt Flash Program Area	Bootstrap & Re-Flash Program or Replace computer base
2	Flash Template CRC Error	Corrupt Or Incompatible Flash Template Area	Download correct template Replace computer base
3	Reserved		
4	Reserved		
5	RAM Error Log CRC Error	Corrupt RAM Error Log Data	Re-Flash Program or Replace computer base
6	RAM Function Programming CRC Error	Corrupt RAM Function Data	Re-Flash Program or Replace computer base
7	RAM Unit Prices CRC Error	Corrupt RAM Unit Price Data	Re-Flash Program or Replace computer base
8	RAM Statistics CRC Error	Corrupt RAM Statistics Data	Re-Flash Program or Replace computer base
9	RAM Event Logs CRC Error	Corrupt RAM Event Log Data	Re-Flash Program or Replace computer base
10	RAM Totals CRC Error	Corrupt RAM Totals Data	Re-Flash Program or Replace computer base
11	RAM Totalizers CRC Error	Corrupt RAM Totalizer Data	Re-Flash Program or Replace computer base
12	RAM Electro-mech Totalizers CRC Error	Corrupt RAM EMT Data	Re-Flash Program or Replace computer base
13	Reserved		
14	Reserved		
15	Reserved		
16	Suppress Overflow Limit Reached - Function 19.12-.22	Slow down limit too low Defective flow control valve	Adjust slow down volume - (Dispenser or POS) Replace valve
17	Reserved		
18	Reserved		
19	Reserved		
20	n Consecutive Display Read Back Error - Device #s: 0 = Sales, 1 = Unit Price, 2 = Preset	Defective display board or cable Defective preset board or cable Defective computer base	Replace display board or cable Replace preset board of cable Re-Flash Program & Template or Replace computer base

21	Reserved		
22	Reserved		
23	Reserved		
24	Reserved		
25	Sale Cannot Start - Zero Unit Price	Unit price not set	Set unit price
26	Sale Cannot Start - No Unit Price Downloaded	POS has not set a unit price	Set unit price on POS
27	Sale Cannot Start - Unit Price Changed – Function 23.04	Unit price has changed prior to start of sale	Check setting of function 23.04
28	Sale Cannot Start - Need Preset Entry – Function 24.01	Sale requires an entry from preset keypad	Check function 24.01
29	Reserved		
30	No Communications with POS Timeout – Function 23.02	Communication lost with POS	Verify data-link connection & polarity to POS.
31	Reserved		
32	Reserved		
33	Sale Aborted Because Stop Button Pushed	Stop button pushed or stop button defective	Verify stop button functionality
34	Reserved		
35	Blend Ratio Out of Tolerance - Function 7.02	Inlet pressures too low, too high Product flow restriction	Check inlet pressures Check product flow paths (filters strainer, valves…)
36	Reserved		
37	Reserved		
38	Reserved		
39	Reserved		
40	Reserved		
41	Reserved		
42	Vapor Recovery Motor On When It Should Be Off	Defective Wayne Vac control board or cables Defective computer Defective Wayne Vac Motor	Replace Wayne Vac control board or cables Re-Flash Program & Template or Replace computer base Replace Wayne Vac Motor
43	Vapor Recovery Motor Off When It Should Be On	Defective Wayne Vac Motor Defective Wayne Vac control board or cables Defective computer	Replace Wayne Vac Motor Replace Wayne Vac control board or cables Re-Flash Program & Template or Replace computer base
44	Reserved		

45	Reserved		
46	Vapor Recovery Motor Turning Wrong Direction	Defective Wayne Vac Motor or cables Defective Wayne Vac control board	Replace Replace
47	Illegal Sensor States from Vapor Recovery Sys	Defective Wayne Vac Motor or cables Defective Wayne Vac control board	Replace Replace
48	Vapor Recovery Motor Load High	Defective Wayne Vac Motor Blocked vapor path	Replace Wayne Vac Motor Check vapor return path (nozzle, hose, breakaway)
49	Vapor Recovery Motor Load Low	Defective Wayne Vac Motor	Check for vein adjustments and debris. Replace Motor
50	Jitter Limit Reached on an In Transaction Pulser	Defective Pulser	Replace
51	Jitter Limit Reached on an Idle Pulser	Defective Pulser	Replace
52	Jitter Limit Reached on an Illegal Pulser	Defective Pulser	Replace
53	Reserved		
54	Reserved		
55	Reverse Flow Limit Reached on an Illegal Pulser	Defective check valve	Replace
56	Forward Flow Limit Reached on an Idle Pulser	Defective flow control valve	Replace
57	Forward Flow Limit Reached on an Illegal Pulser	Defective computer	Re-Flash Program & Template or Replace computer base
58	Communications Lost to an In Transaction Pulser	Defective Pulser Defective ISB or cables	Replace Replace
59	Communications Lost to an Idle Pulser	Defective Pulser Defective ISB or cables	Replace Replace
60	Reserved		
61	Reserved		
62	Pulser is Outputting Jitter	Volume of fuel dispensed during a meter calibration exceeded limits. Defective Pulser	---- Replace Pulser
63	Reserved		
64	Reserved		
65	Reserved		
66	Reserved		

67	Pulser Calibration OK Bit Status Changed	Pulser has been calibrated	
68	Pulser Calibration Door Status Changed	Pulser cal door was opened or closed	
69	Pulser Last Calibration Status Changed	Pulser last calibration successful.	
70	Timeout Limit Reached for No Flow – Function 17.02 (flow never started)	Defective flow control valve or cables Defective pump motor/control, relay Defective nozzle Defective computer	Replace Replace Replace Replace
71	n Consecutive No Flow Timeouts – Function 17.03	Defective flow control valve or cables Defective pump motor/control, relay Defective nozzle Defective computer	Replace Replace Replace Re-Flash Program & Template or Replace computer base
72	Timeout Limit Reached for Flow Lost – Function 17.02 (flow lost during sale)	Defective flow control valve or cables Defective pump motor/control, relay Defective nozzle Defective computer	Replace Replace Replace Re-Flash Program & Template or Replace computer base
73	n Consecutive Flow Lost Timeouts – Function 17.04	Defective flow control valve or cables Defective pump motor/control, relay Defective nozzle Defective computer	Replace Replace Replace Re-Flash Program & Template or Replace computer base
74	Sale Terminated before Preset Limit Reached - Unfinished Filling	Defective flow control valve or cables Defective pump motor/control, relay Defective nozzle Defective computer	Replace Replace Replace Re-Flash Program & Template or Replace computer base
75	n Consecutive Unfinished Fillings	Defective flow control valve or cables Defective pump motor/control, relay Defective nozzle Defective computer	Replace Replace Replace Re-Flash Program & Template or Replace computer base
76-79	Reserved		
80	Mail Buffer Memory Pool Exhausted – (Internal Error)	Defective computer	Replace computer base
81-98	Reserved		

99	Hardware/Software Mismatch - Device #s:
	0 = No Proportional Hardware,
	1 = No Vapor Rec Hardware
		Defective Wayne Vac control board or cable
		Defective computer
			Replace
			
			Re-Flash Program & Template or Replace computer base

See board layouts in Section 9 for for identification and location of connector assignments and LED indicators.

Table 6-2 SYMPTOMS AND SOLUTIONS

Symptom		Probable Cause	Corrective Action
Sale and Unit Price Displays are out	1	No AC power to dispenser	Check control power circuit breaker. Check check for AC input voltage at J3 on Relay Board. If not present check in J-box. If not present in J-box, problem is in site wiring. If present in J-box, problem is in internal dispenser wiring. Check LED indicators on computer for DC power and "Heartbeat" (see board layout for LEDs). If all are On, see Probable Cause 6 and 7. If all not On, see Probable Cause 5.
	2	No DC power to computer	All LEDs should be On. DS6 is 24v input LED. Check for 24 VDC input at Computer J1. If present, see Probable Cause 7. If not present, check at DC Distr Board J4 output, fuse F1, and J1 input. If present at J1, see Probable Cause 3. If not present at J1, check at Power Supply Boad J2 output, J1 input. If present at J1, see Probably Cause 4. If not present at J1, see Probable Cause 5.
	3	Defective 24V DC Distribution board	Replace fuse F1 or board as necessary.
	4	Defectice Power Supply board	Replace board
	5	Defective Relay board	Check fuse F1 on Relay board. Replace board if fuse is bad.
	6	Defective display	Replace board
	7	Defective computer	Replace board

Table 6-2 SYMPTOMS AND SOLUTIONS, continued

Symptom		Probable Cause	Corrective Action
Unit Price Displays read 0.000	1	Control system unit price set at 0.000.	Set correct unit price in control system.
	2	Unit price not set at dispenser. If a control system is connected see Cause 3.	Set correct price function F03 and F04.
	3	Fueling point # not set. If a control system is not connected go to Step 5.	Set fueling point function F01.01.
	4	Defective computer.	Replace computer board
Display Segments Fail to Operate During Reset Cycle	1	Defective display	Replace board
	2	Defective data cable	Replace data cable
	3	Defective computer	Replace board
Dispenser will not Reset	1	Unit prices 0.000	See above symptom.
	2	No authorize to dispenser computer.	Check control system and filling mode function F01.01 =1 If stand-alone, check F01.01 =2
	3	Defective Nozzle switch	Repair/Replace switch
	4	Defective PTS switch	Repair/Replace switch
	5	Defective Computer	Replace computer board

8. PROCEDURES FOR UPLOADING AND DOWNLOADING FILES

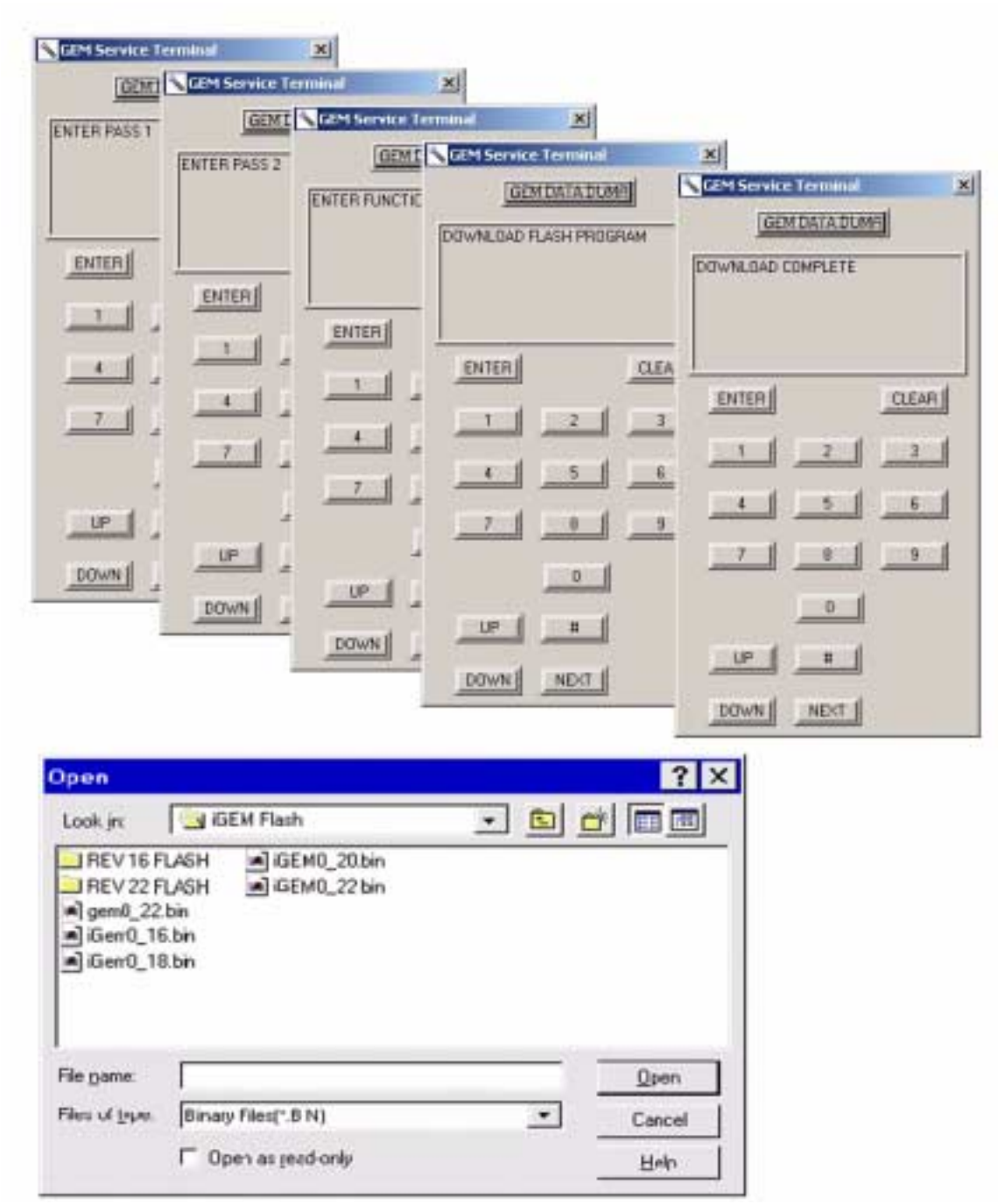

FIGURE 8-1. SERVICE TERMINAL SCREENS THAT APPEAR ON THE LAPTOP.

TABLE 8.1 Procedures for UpLoading and Downloading Computer Code Revisions and Templates.

Power down the pump. Connect laptop via cable and RS-232 adapter to J18 on computer board. Power up pump and then open the Service Terminal Program (STP) on the laptop, then

press ENTER
enter Pass 1 _ _ _ _
press ENTER
enter Pass 2 _ _ _ _
press ENTER
enter Function number

96 To upload code to pc	97 To upload template to pc	98 To download code to dispenser	99 To download template to dispenser
press ENTER	press ENTER	press ENTER	press ENTER
upload flash program	upload template	download flash program	download template
press ENTER	press ENTER	press ENTER	press ENTER
select the filename	select the filename	enter password (type 42)	enter password (type 42)
press ENTER	press ENTER	press ENTER	press ENTER
uploading blocks begins	uploading blocks begins	browse/select filename gem_ _.bin	browse/select the proper template
upload complete	upload complete	waiting for flash to erase [1]	waiting for flash to erase [1]
Close STP	Close STP	downloading blocks begins	downloading blocks begins
		download complete	download complete
		Close STP [2]	Close STP [2]
		power down pump	power down pump
		remove RS232 & laptop	remove RS232 & laptop
		power up pump	jumper S15 Cold Start
			power up pump
			display reads *COLD*
			remove S15 jumper
			program prices, fueling point, etc., with IR remote

1. If this process is now interrupted for any reason, the Bootstrap procedure then must be used to download to dispenser.
2. After briefly displaying “Download Complete”, the laptop will display “Enter Password” assuming you may want to proceed to other functions, however, you should Close STP at this time and finish the above procedure and then access other functions using the IR remote.

The Bootstrap procedure listed below must be performed if: *1)* after selecting filename or template in Function 98 or 99, the process of downloading to the pump computer is interrupted, or *2)* a pump computer is installed that does not have pump software code already onboard.

TABLE 8-2 Bootstrap Procedure for 3/Vista Computer

Power down pump
Follow procedure in Table 8-1 for connecting laptop
Jumper S13 Bootstrap on computer base
Power up pump
Remove S13 jumper
Run the Service Terminal Program
Complete the remaining procedure for Function 98 or 99 in Table 8-1.

Service Manual
3/Vista Series

Written by S. G. Martin

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Wayne Division, Dresser Industries Inc., P.O. Box 1859, Salisbury, MD 21802-1859, (410) 546-6600
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