GILBARCO VEEDER-ROOT

Horizon™

Owner's Manual

MDE-4881C

Computer Programs and Documentation

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Federal Communications Commission (FCC) Warning

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

Approvals

Gilbarco is an ISO 9001:2008 registered company.

ATEX/MID

The Horizon dispenser has ATEX and MID certification for installation within the European Union. Contact Gilbarco Inc. for additional information.

National Conference of Weights and Measures (NCWM) - Certificate of Conformance (CoC):

Gilbarco pumps and dispensers are evaluated by NCWM under the National Type Evaluation Program (NTEP). NCWM has issued the following CoC:

CoC#	Product	Model #	CoC#	Product	Model #
02-019	Encore	Nxx	02-036	Legacy	Jxxx
02-020	Eclipse	Exx	02-037	G-SITE Printer (Epson)	PA0307
02-025	Meter - C Series	PA024NC10		G-SITE Distribution Box	PA0306
	Meter - C Series	PA024TC10		G-SITE Keyboard	PA0304
02-029	CRIND	—		G-SITE Mini Tower	PA0301
02-030	TS-1000 Console	—		G-SITE Monitor	PA0303
	TS-1000 Controller	PA0241		G-SITE Printer (Citizen)	PA0308
	Distribution Box	PA0242	02-038	C+ Meter	T19976
	Meter - EC Series	PA024EC10	02-039	Passport	PA0324
	VaporVac Kits	CV	02-040	Ecometer	T20453
			05-001	Titan	KXXY Series

Trademarks

Non-registered trademarks

CIM™	G-SITE® Lite™	Applause™ Media System
C-PAM™	MultiLine™	SMART Meter™
ECR™	Highline™	SmartPad™
EMC™	Optimum™ Series	Surge Management System™
G-CAT™	PAM™ 1000	Tank Monitor™
Gilbert™	PAM™	TCR™
G-SITE® Link™	SMART Connect™	Ultra-Hi™
Horizon™	SMART CRIND™	ValueLine™
FlexPay™	Titan™	

Registered trademarks

CRIND®	InfoScreen®	Transac®
Dimension® Series	Legacy®	Transac® System 1000
e-CRIND®	Making Things Better®	Trimline®
Eclipse®	MPD®	TRIND®
Encore®	Passport®	VaporVac®
G-SITE®	Performer®	
Gilbarco®	The Advantage® Series	

Additional US and foreign trademarks pending.

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Table of Contents

1 – Introduction

Purpose

This manual provides instructions for safely operating and maintaining Horizon™ pumps/dispensers (hereafter referred to as units, unless otherwise specifically stated).

Intended Users

This manual is written for owners and operators of the Horizon units.

Scope

This manual provides the following information:

- Operating the units
- Preliminary steps for servicing the units
- Maintaining the units

Related Documents

Document Number	Title	GOLD Library
MDE-4886	Horizon Site Preparation and Installation Manual	Horizon
MDE-4937	Encore® Horizon Lifting Carriage Kit (M11681K001) Usage Instructions	Horizon

Abbreviations and Acronyms

Term	Description
ASC	Authorized Service Contractor
ATEX	**AT**mosphères **EX**plosibles (European Safety Directive, French)
CE	Conformité Européenne (European Conformity, French)
CIM™	Customer Interface Module
CRIND®	Card Reader IN Dispenser
CSC	Customer Specified Contractor
DEF	Diesel Exhaust Fluid
DLT	Displaying Last Transaction
Ex Standard	Explosion-proof Equipment (ATEX Safety Standard Certificate and Marking)
FF	Flexible Fuels
IFSF	International Forecourt Standards Forum
LCD	Liquid Crystal Display
LON	Local Operating Network
MOC	Major Oil Company
MPD®	Multi Product Dispenser
PIN	Personal Identification Number
PPP	Programmable Pump Preset
PPU	Price Per Unit (Price Per Volume)
STP	Submersible Turbine Pump
USB	Universal Serial Bus
UST	Underground Storage Tanks
VR	Vapor Recovery

2 – Important Safety Information

Notes: 1) Save this Important Safety Information section in a readily accessible location.
2) The owner/operator is responsible for applicable safety regulations compliance.
3) Although DEF is non-flammable, Diesel is flammable. Therefore, for DEF cabinets that are attached to Diesel dispensers, follow all the notes in this section that pertain to flammable fuels.

This section introduces the hazards and safety precautions associated with installing, inspecting, maintaining or servicing this product. Before performing any task on this product, read this safety information and the applicable sections in this manual, where additional hazards and safety precautions for your task will be found. Fire, explosion, electrical shock or pressure release could occur and cause death or serious injury, if these safe service procedures are not followed.

Preliminary Precautions
You are working in a potentially dangerous environment of flammable fuels, vapors, and high voltage or pressures. Only trained or authorized individuals knowledgeable in the related procedures should install, inspect, maintain or service this equipment.

Emergency Total Electrical Shut-Off
The first and most important information you must know is how to stop all fuel flow to the pump/dispenser and island. Locate the switch or circuit breakers that shut off all power to all fueling equipment, dispensing devices, and Submerged Turbine Pumps (STPs).

⚠ WARNING

The EMERGENCY STOP, ALL STOP, and PUMP STOP buttons at the cashier's station MAY NOT shut off electrical power to the pump/dispenser. This means that even if you activate these stops, fuel may continue to flow uncontrolled.

You must use the TOTAL ELECTRICAL SHUT-OFF in the case of an emergency and not the console's ALL STOP and PUMP STOP or similar keys.

Total Electrical Shut-Off Before Access
Any procedure that requires access to electrical components or the electronics of the dispenser requires total electrical shut off of that unit. Understand the function and location of this switch or circuit breaker before inspecting, installing, maintaining, or servicing Gilbarco equipment.

Evacuating, Barricading and Shutting Off
Any procedure that requires access to the pump/dispenser or STPs requires the following actions:

- An evacuation of all unauthorized persons and vehicles from the work area
- Use of safety tape, cones or barricades at the affected unit(s)
- A total electrical shut-off of the affected unit(s)

Read the Manual
Read, understand and follow this manual and any other labels or related materials supplied with this equipment. If you do not understand a procedure, call a Gilbarco Authorized Service Contractor. It is imperative to your safety and the safety of others to understand the procedures before beginning work.

Follow the Regulations
Follow applicable regulations in your country including local requirements.

Replacement Parts
Use only genuine Gilbarco replacement parts and retrofit kits on your pump/dispenser. Using parts other than genuine Gilbarco replacement parts could create a safety hazard and violate local regulations.

Safety Symbols and Warning Words

This section provides important information about warning symbols and boxes.

Alert Symbol

This safety alert symbol is used in this manual and on warning labels to alert you to a precaution which must be followed to prevent potential personal safety hazards. Obey safety directives that follow this symbol to avoid possible injury or death.

Signal Words
These signal words used in this manual and on warning labels tell you the seriousness of particular safety hazards. The precautions below must be followed to prevent death, injury or damage to the equipment:

DANGER: Alerts you to a hazard or unsafe practice which will result in death or serious injury.

WARNING: Alerts you to a hazard or unsafe practice that could result in death or serious injury.

CAUTION with Alert symbol: Designates a hazard or unsafe practice which may result in minor injury.

CAUTION without Alert symbol: Designates a hazard or unsafe practice which may result in property or equipment damage.

Working With Fuels and Electrical Energy

Prevent Explosions and Fires
Fuels and their vapors will explode or burn, if ignited. Spilled or leaking fuels cause vapors. Even filling customer tanks will cause potentially dangerous vapors in the vicinity of the dispenser or island.

DEF is non-flammable. Therefore, explosion and fire safety warnings do not apply to DEF fluid lines.

No Open Fire

Open flames from matches, lighters, welding torches or other sources can ignite fuels and their vapors.

No Sparks - No Smoking

Sparks from starting vehicles, starting or using power tools, burning cigarettes, cigars or pipes can also ignite fuels and their vapors. Static electricity, including an electrostatic charge on your body, can cause a spark sufficient to ignite fuel vapors. Every time you get out of a vehicle, touch the metal of your vehicle, to discharge any electrostatic charge before you approach the dispenser island.

Working Alone

It is highly recommended that someone who is capable of rendering first aid be present during servicing. Familiarize yourself with Cardiopulmonary Resuscitation (CPR) methods, if you work with or around high voltages. Always advise the station personnel about where you will be working, and caution them not to activate power when you are working on the equipment. Follow Lockout/Tagout procedures as per applicable safety regulations in your country.

Working With Electricity Safely

Ensure that you use safe and established practices in working with electrical devices. Poorly wired devices may cause a fire, explosion or electrical shock. Ensure that grounding connections are properly made. Take care that sealing devices and compounds are in place. Ensure that you do not pinch wires when replacing covers. Follow Lockout/Tagout procedures as per applicable safety regulations in your country. Station employees and service contractors need to understand and comply with this program completely to ensure safety when the equipment is down.

Hazardous Materials

Some materials present inside electronic enclosures may present a health hazard if not handled correctly. Ensure that you clean hands after handling equipment. Do not place any equipment in the mouth.

⚠ WARNING

The pump/dispenser contains a chemical known to the State of California to cause cancer.

⚠ WARNING

The pump/dispenser contains a chemical known to the State of California to cause birth defects or other reproductive harm.

In an Emergency

Inform Emergency Personnel

Compile the following information and inform emergency personnel:

- Location of accident (for example, address, front/back of building, and so on)
- Nature of accident (for example, possible heart attack, run over by car, burns, and so on)
- Age of victim (for example, baby, teenager, middle-age, elderly)
- Whether or not victim has received first aid (for example, stopped bleeding by pressure, and so on)
- Whether or not a victim has vomited (for example, if swallowed or inhaled something, and so on)

⚠ WARNING

Gasoline/DEF ingested may cause unconsciousness and burns to internal organs. Do not induce vomiting. Keep airway open. Oxygen may be required at scene. Seek medical advice immediately.

⚠ WARNING

DEF generates ammonia gas at higher temperatures. When opening enclosed panels, allow the unit to air out to avoid breathing vapors.
If respiratory difficulties develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek medical attention.

⚠ WARNING

Gasoline inhaled may cause unconsciousness and burns to lips, mouth and lungs. Keep airway open. Seek medical advice immediately.

⚠ WARNING

Gasoline/DEF spilled in eyes may cause burns to eye tissue. Irrigate eyes with water for approximately 15 minutes. Seek medical advice immediately.

⚠ WARNING

Gasoline/DEF spilled on skin may cause burns. Wash area thoroughly with clear water. Seek medical advice immediately.

⚠ WARNING

DEF is mildly corrosive. Avoid contact with eyes, skin, and clothing. Ensure that eyewash stations and safety showers are close to the work location. Seek medical advice/recommended treatment if DEF spills into eyes.

IMPORTANT: Oxygen may be required at scene if gasoline has been ingested or inhaled. Seek medical advice immediately.

Lockout/Tagout

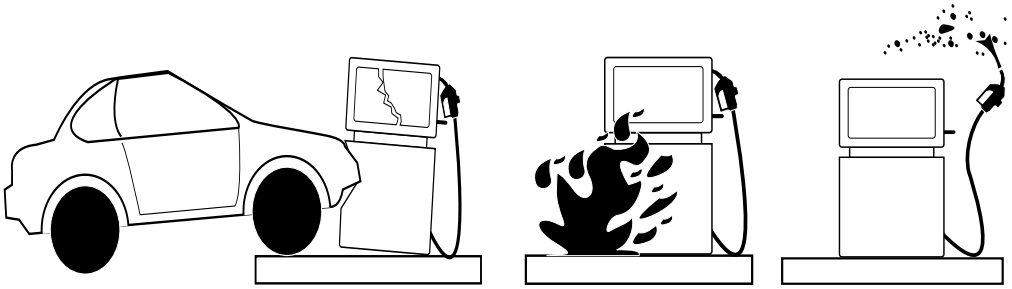
Lockout/Tagout covers servicing and maintenance of machines and equipment in which the unexpected energization or start-up of the machine(s) or equipment or release of stored energy could cause injury to employees or personnel. Lockout/Tagout applies to all mechanical, hydraulic, chemical, or other energy, but does not cover electrical hazards.

Hazards and Actions

WARNING

Spilled fuels, accidents involving pumps/dispensers, or uncontrolled fuel flow create a serious hazard.
Fire or explosion may result, causing serious injury or death.
Follow established emergency procedures.
DEF is non-flammable. However it can create a slip hazard. Clean up spills promptly.

The following actions are recommended regarding these hazards:



Collision of a Vehicle with Unit | Fire at Island | Fuel Spill

- Do not go near a fuel spill or allow anyone else in the area.
- Use station EMERGENCY CUTOFF immediately. Turn off all system circuit breakers to the island(s).
- Do not use console E-STOP, ALL STOP, and PUMP STOP to shut off power. These keys do not remove AC power and do not always stop product flow.
- Take precautions to avoid igniting fuel. Do not allow starting of vehicles in the area. Do not allow open flames, smoking, or power tools in the area.
- Do not expose yourself to hazardous conditions such as fire, spilled fuel or exposed wiring.
- Call emergency numbers.
- In some countries, environmental regulations may require that spills be reported to environmental authorities. The Owner/Operator is responsible for reporting spills in accordance with applicable environmental and local regulations.

Supplementary Information for European Union Countries

The Horizon family of fuel dispensers are manufactured by Gilbarco®, 7300 West Friendly Avenue, Greensboro, NC 27420-22087 USA.

IMPORTANT INFORMATION

CE The 'CE' mark on this product denotes compliance to the EU Directives relating to Machinery, EMC, and Explosive Atmospheres.

CAUTION

Modifications to this equipment, or connection of unauthorized equipment to its electrical circuits, are likely to invalidate any safety or metrological certification and are likely to invalidate conformity with the EMC Directive.

IMPORTANT INFORMATION

Airborne noise emissions from this equipment are no greater than 72 dB.
(A) - (Equivalent continuous A - weighted)

⚠ WARNING

All dispensing areas of the forecourt must be adequately lit for safety purposes at all times of use. The illuminance at ground level and the read-out level of displays must not be less than 100 lux.

⚠ WARNING

At all filling stations Emergency shut-off devices must be provided in accordance with local regulations or codes of practice.

Declaration of Conformity

EC DECLARATION OF CONFORMITY FOR MACHINERY
FOR USE IN POTENTIALLY EXPLOSIVE ATMOSPHERES

CE
0518

Serial Number

Date of Manufacture :

Gilbarco Inc, 7300 West Friendly Avenue, Greensboro, NC 27420-22087 USA declares that the **Horizon model of Fuel Dispenser,** with the serial number stated above, conforms with the provisions of:

The Machinery Directive (Directive 2006/42/EC),
EMC Directive (Directive 2004/108/EC),
and ATEX Directive (Directive 94/9/EC) Group II Category II.

The manufacturer's compliance with Annexes IV and VII of the ATEX Directive is assured by Notified Body No 0518, SIRA Test & Certification, Chester, UK. under Quality Assurance Notification number SIRA 10 ATEX M457.

Gilbarco Inc also declare that this fuel dispenser conforms with the harmonized product standard EN13617-1, giving presumption of conformity with the ATEX Directive, and is in conformance with EC Type Examination Certificate SIRA 10ATEX9052X

The following standards, and others, have also been applied :

Machinery Directive:
EN13617-1, ISO 12100-1, ISO 12100-2, EN 60204-1, EN1050
EMC Directive:
EN 61000-6-1: 2007 EN 61000-6-3: 2007
ATEX Directive:
EN 13463-1 (partially)

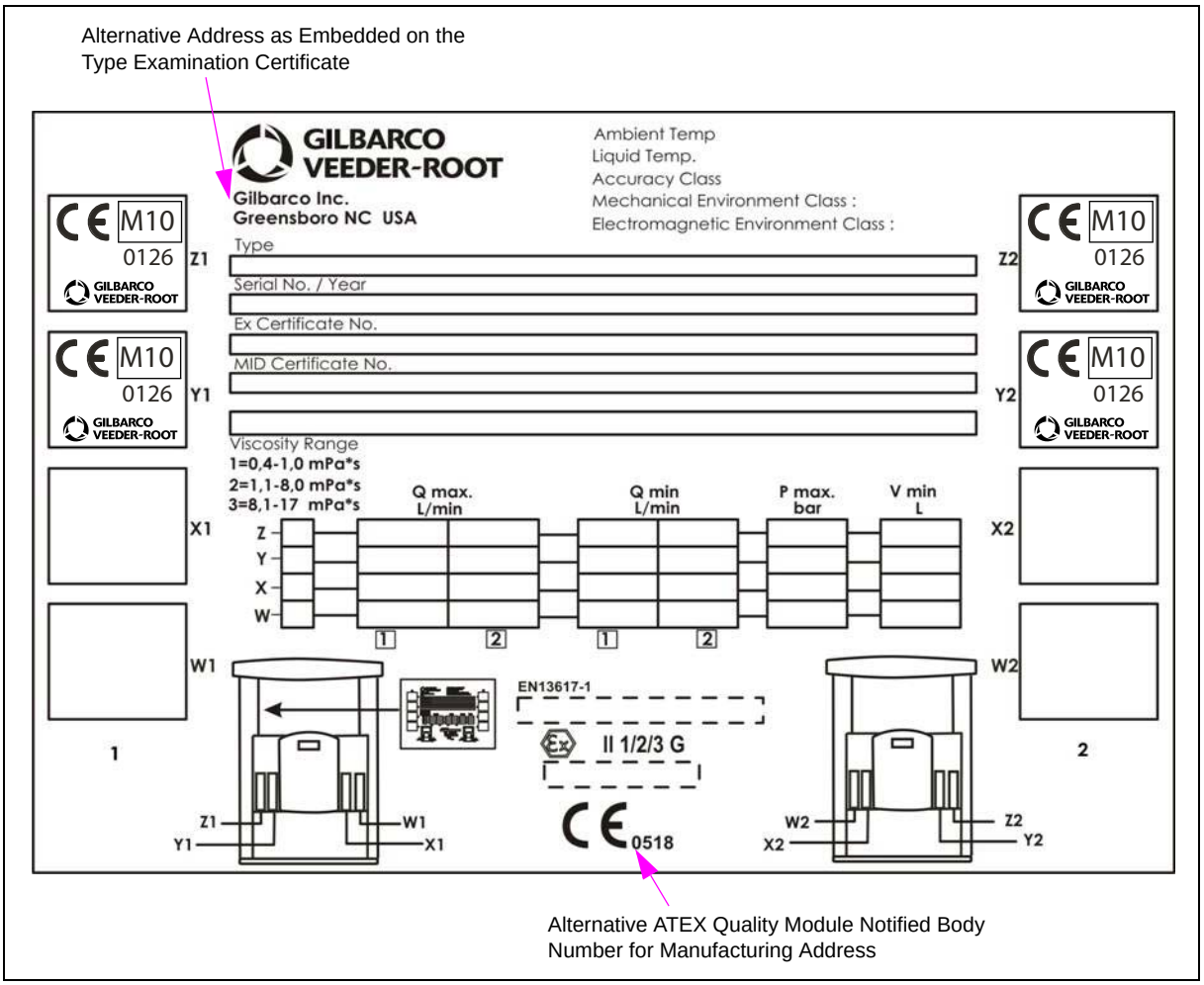
This Declaration has been signed, as empowered by the manufacturer, by

Name: Chris Kastner

Position: Vice President Place: Greensboro, NC

Markings Related to the ATEX Directive

Figure 2-1: Markings Related to the ATEX Directive



Specifications

Parameter	Value
Operating Condition	T3
Maximum Surface Temperature	200 °C (392 °F)
Three-phase Power Supply	400 VAC ±10%
Single-phase Power Supply	230 VAC ±10%
Maximum Pressure	3.5 bar

IMPORTANT INFORMATION

- Horizon fuel dispenser is intended for use in an open location.
- The dispenser's electronics are suitable for use in condensing humidity.
- Ensure that you follow the operating conditions and classes stated on the nameplate of the equipment.

Special Conditions for Safe Use

- When used for ethanol dispensing, the fuel shall not exceed 90% ethanol with minimum water content.
- Where petrol fuel dispensers are shipped without nozzles, the equipment shall be fitted with nozzles complying with EN13012, before being put into use.
- Where petrol fuel dispensers are shipped without hoses, the equipment shall be fitted with hoses complying with EN1360 or EN13483, before being put into use.
- Special models are required for dispensing ethanol above 15%.

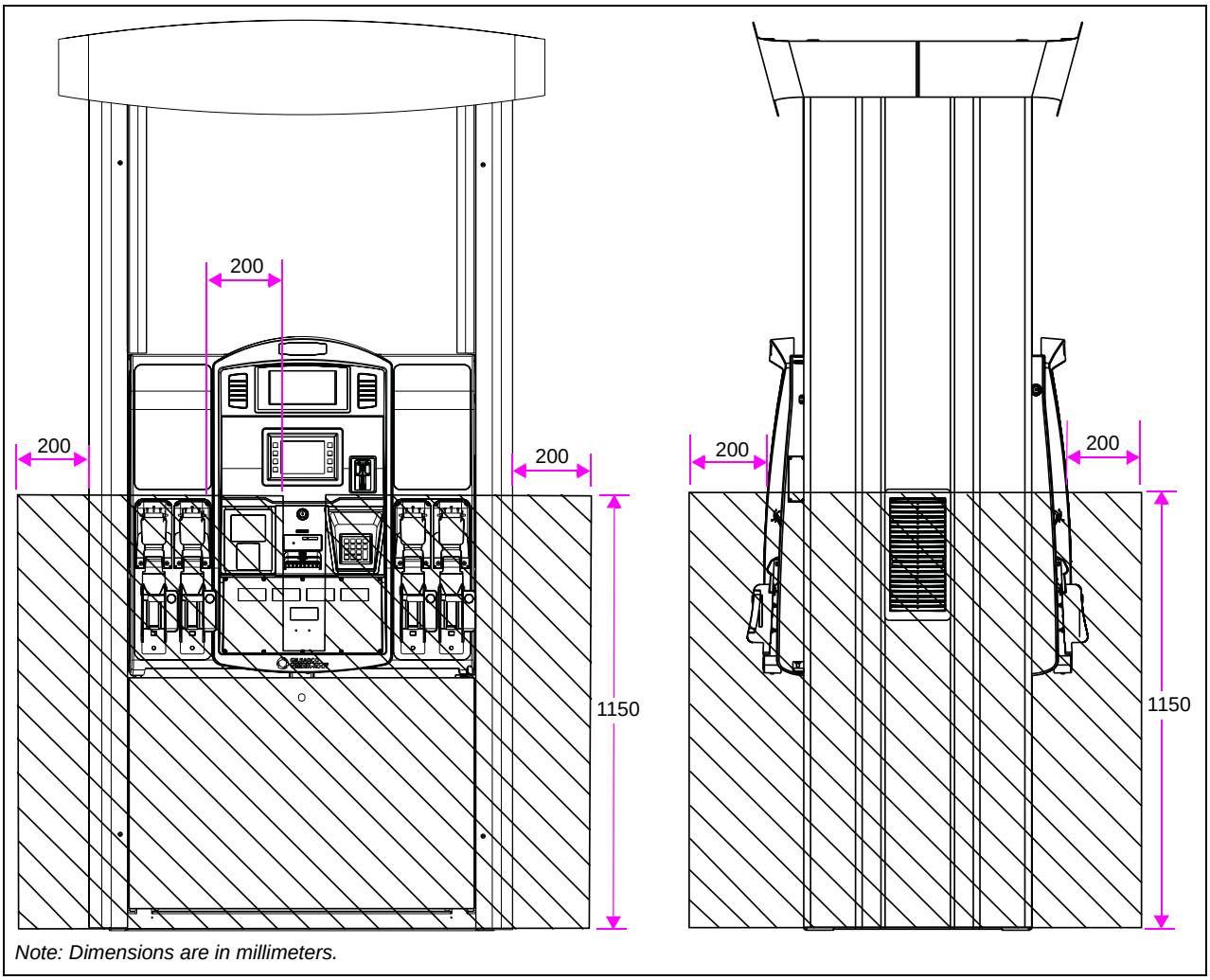
Zoning Diagrams

⚠ WARNING

The dispenser must be installed such that the zones illustrated in the Figure 2-2 are not compromised. The external influences must be such that the areas of the pump/dispenser are not positioned in a more hazardous zone than those associated with the pump/dispenser itself.

The Zoning Diagram for the dispenser is shown in Figure 2-2.

Figure 2-2: Zoning Diagram for the Dispenser

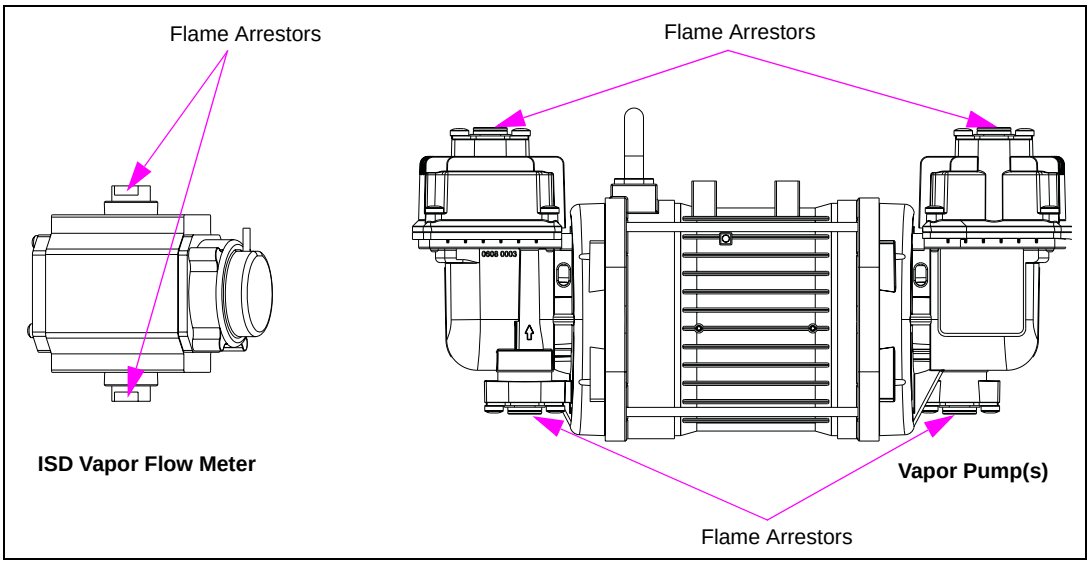


Note: Dimensions are in millimeters.

⚠ WARNING

Some components (in particular the vapor pumps and electrical motors) in this equipment can reach very high temperatures under certain circumstances. Extreme care must be taken when handling these components.

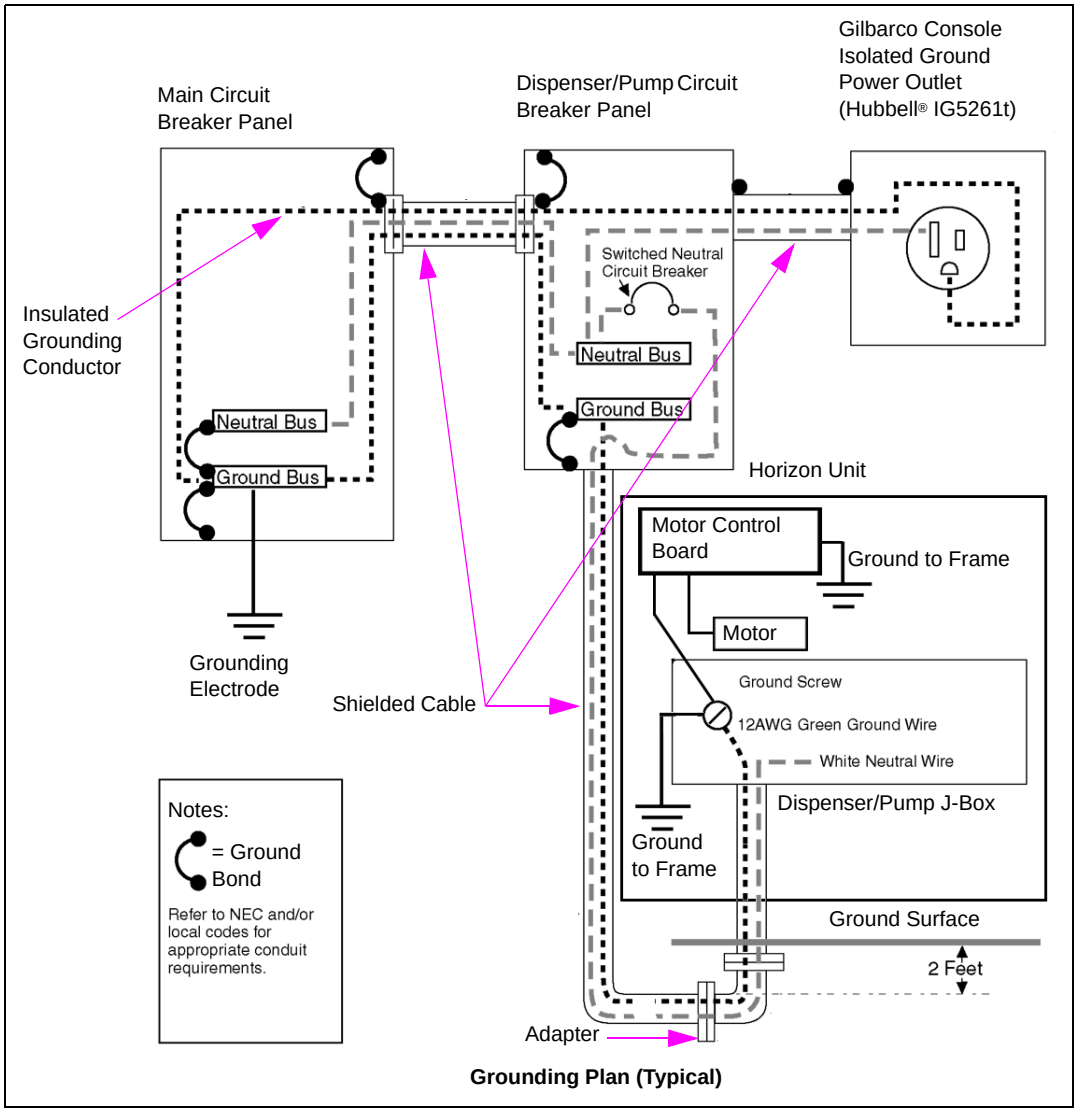
Figure 2-3: Vapor Pump with Flame Arrestors



Horizon Grounding Plan

This section provides the grounding plan of the Horizon unit.

Figure 2-4: Horizon Grounding Plan (Typical)



Grounding Plan (Typical)

Figure 2-5: Outer Sheathing Grounding

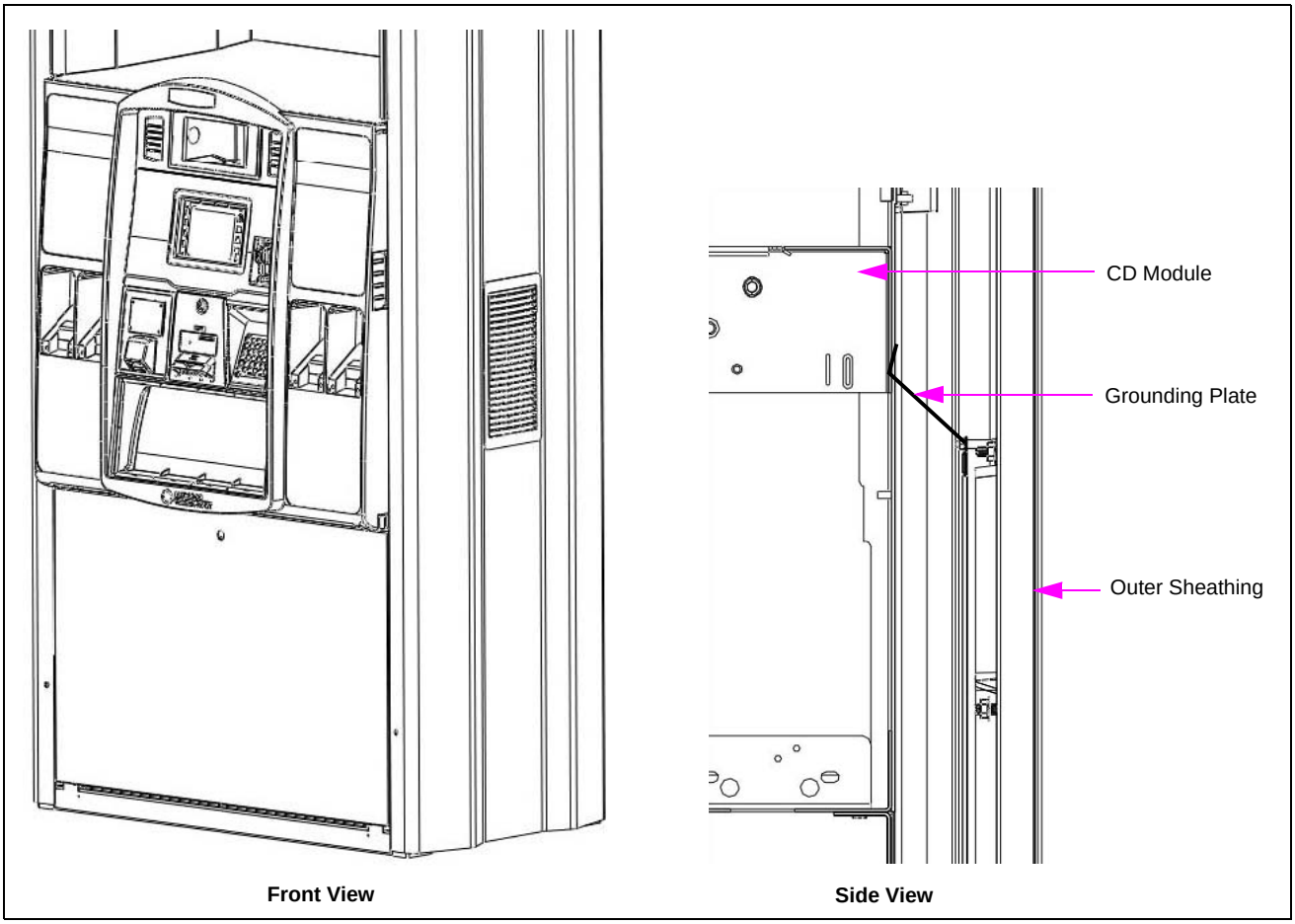
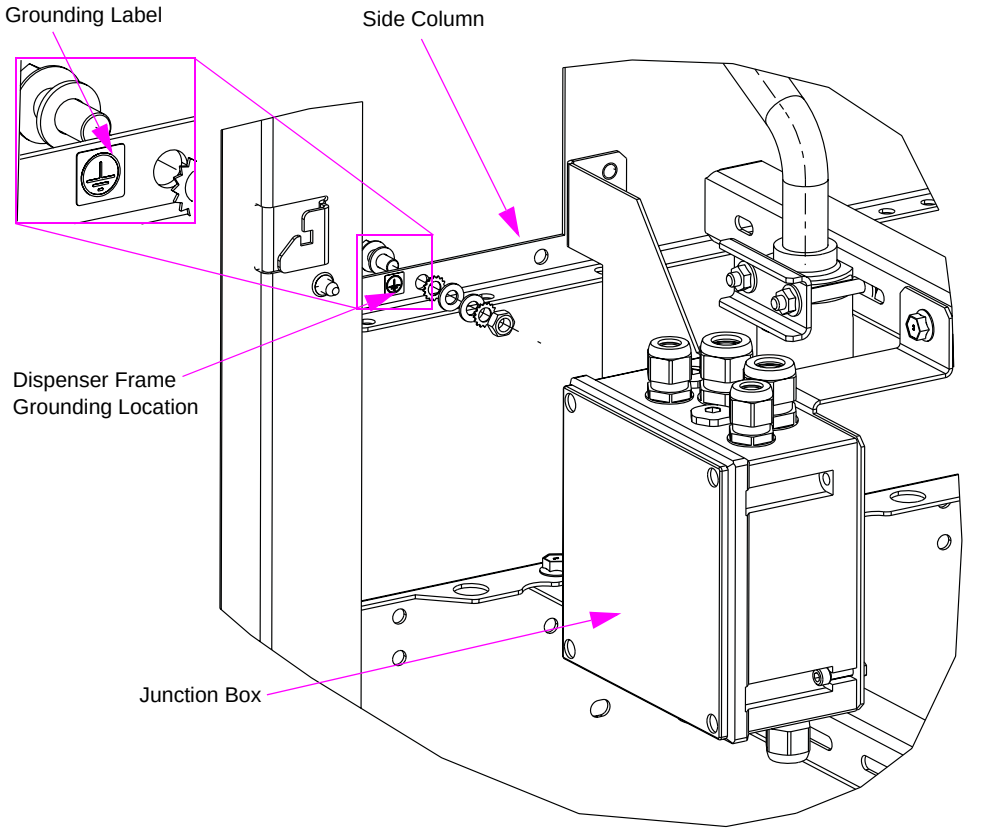


Figure 2-6: Frame Grounding - Horizon Dispensers and Pumps



Note: Figure shows the Frame Grounding location for Horizon dispensers, when grounding hardware is included. The Ground on Horizon pumps is in the same location shown in this figure.

Figure 2-7: Main Door Grounding

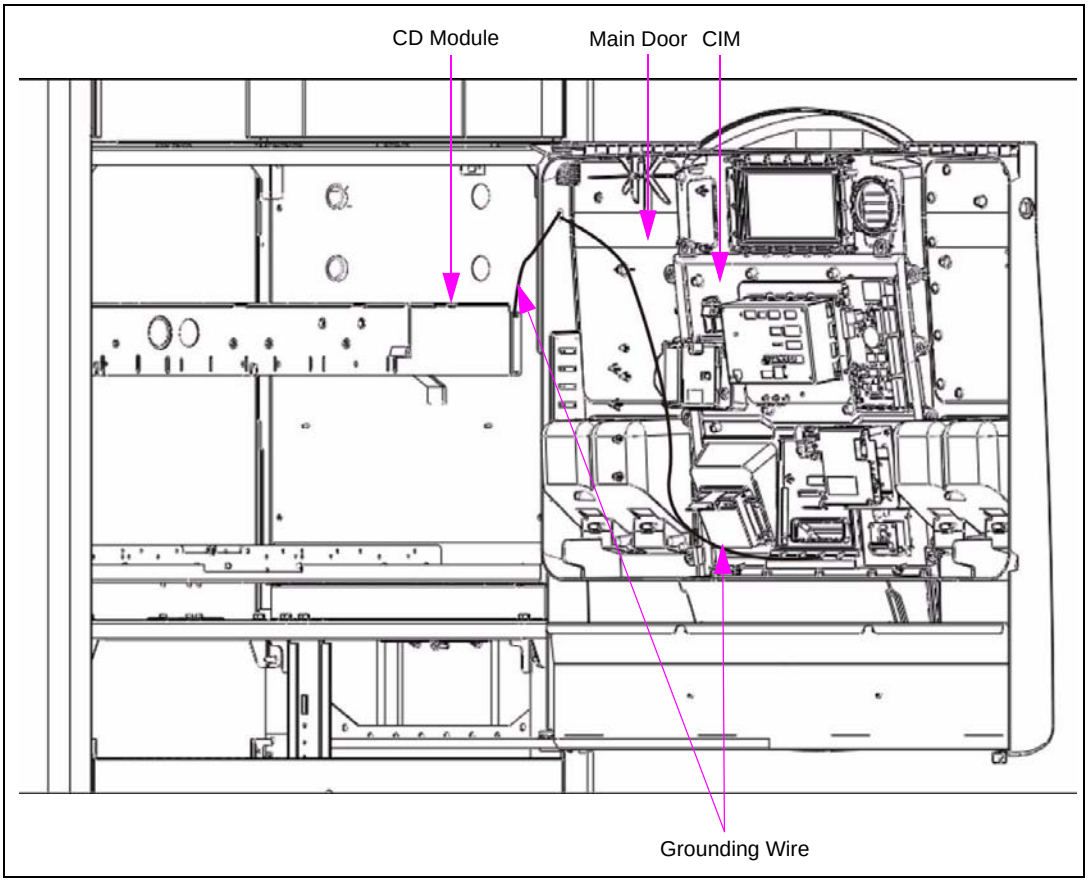
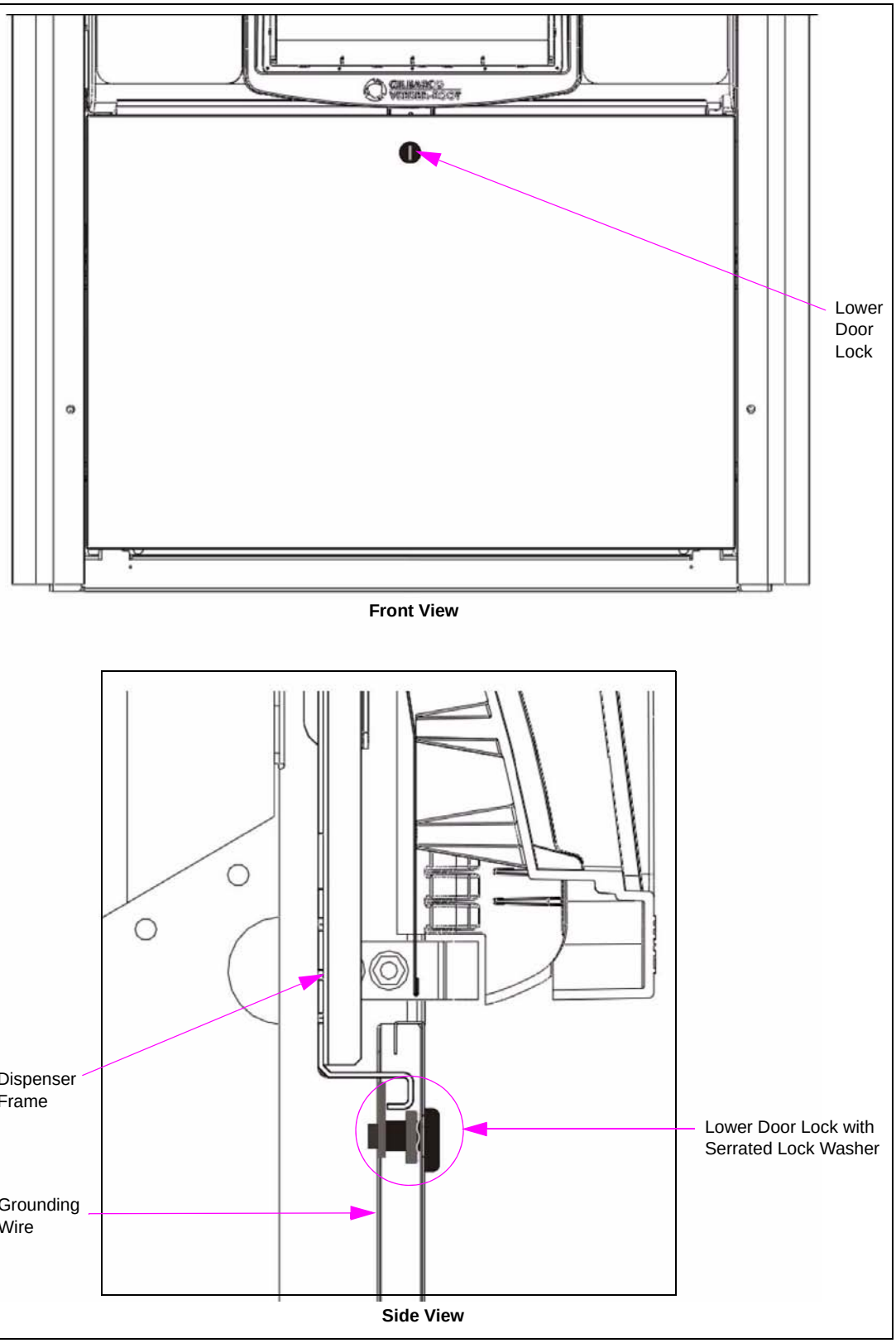


Figure 2-8: Lower Door Grounding



Vapor Barrier Sealing in Horizon Dispensers

This section provides illustrations of the Vapor Barrier sealing in the Horizon dispenser.

Figure 2-9: C-Sip Pulser Air Gap Sealing

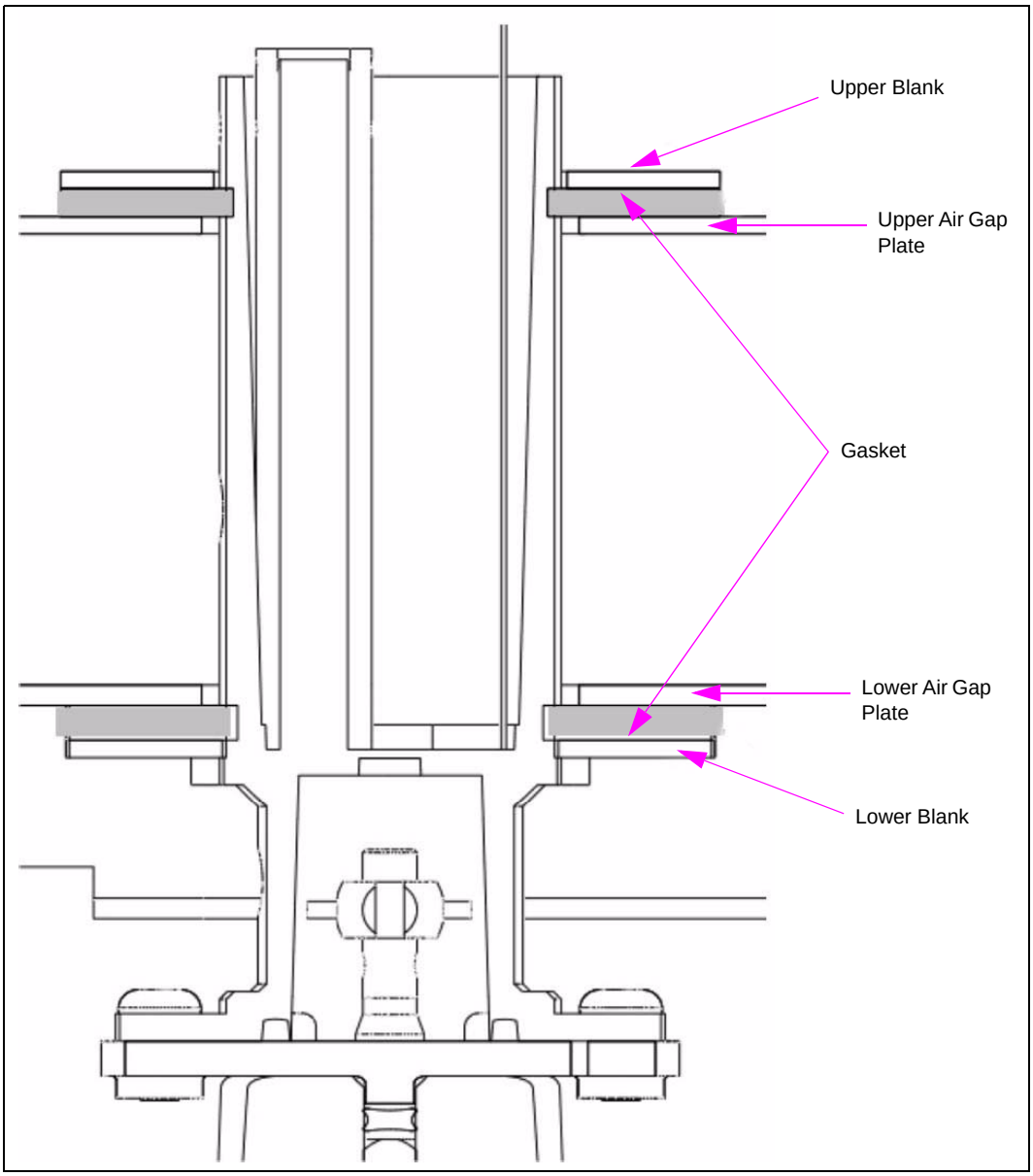


Figure 2-10: ILV Pulser Air Gap Sealing

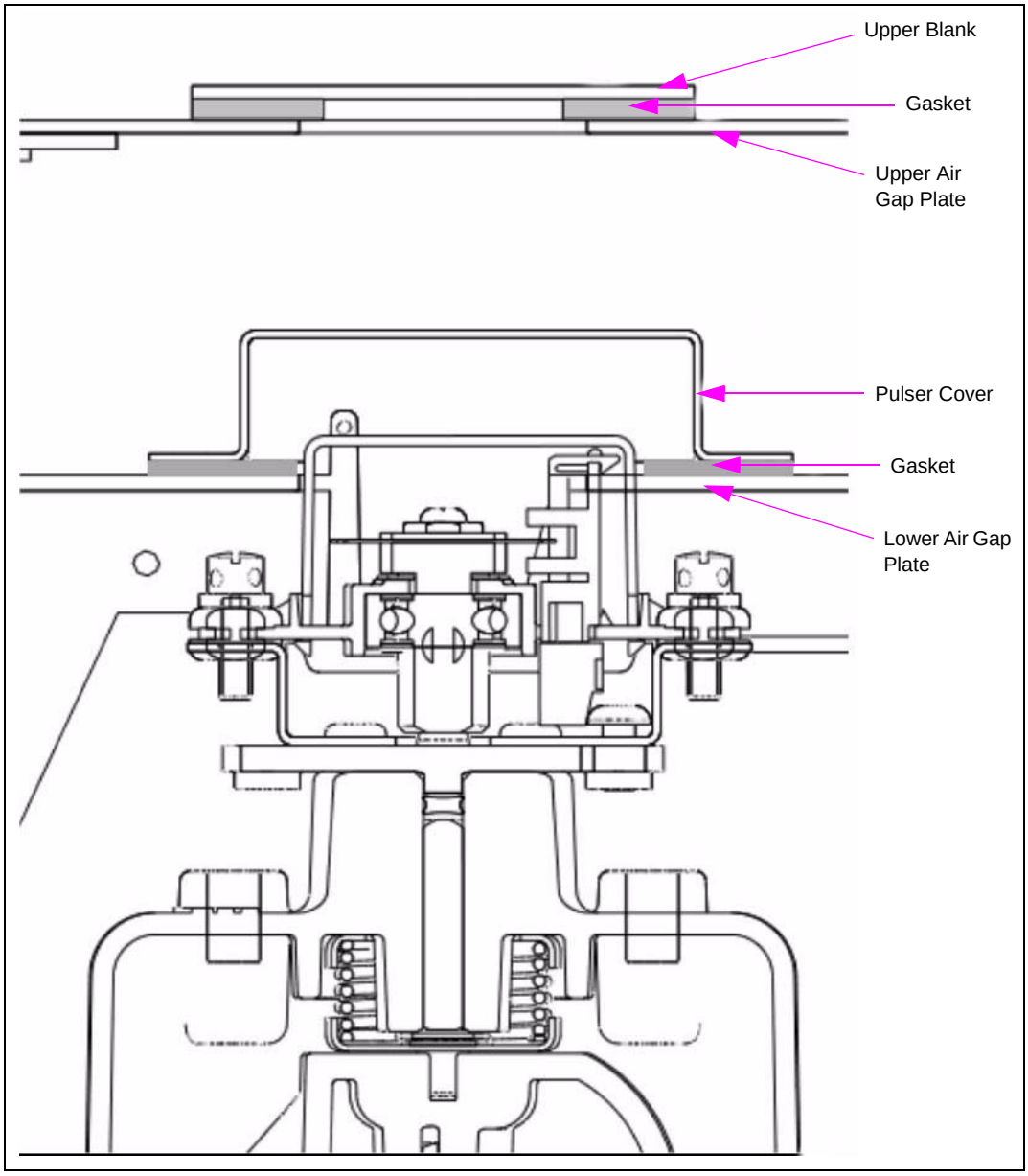
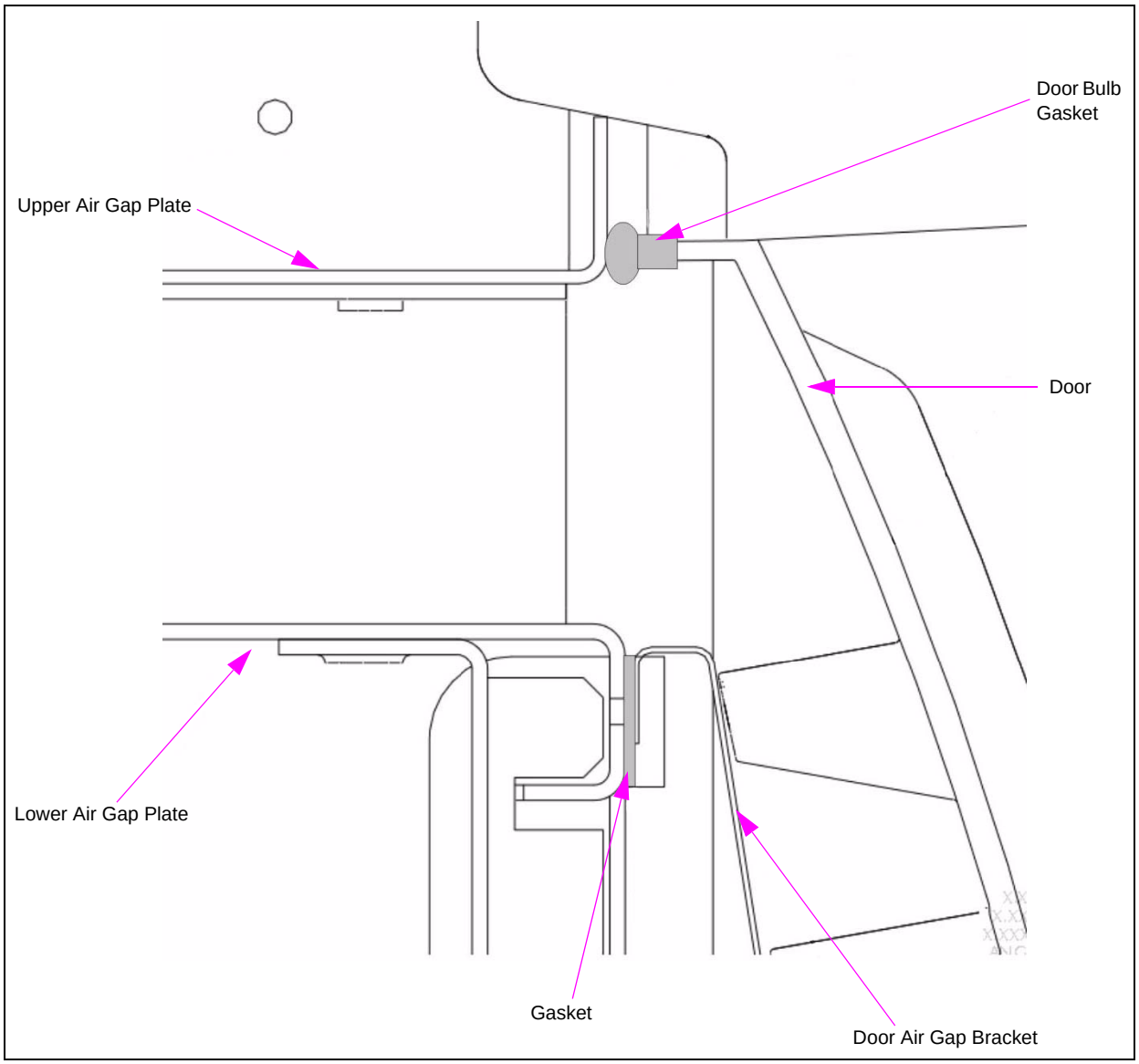


Figure 2-11: Door Air Gap Sealing



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3 – Horizon - The “ART” of Dispensing

This chapter provides an illustration of the Horizon unit and its components.

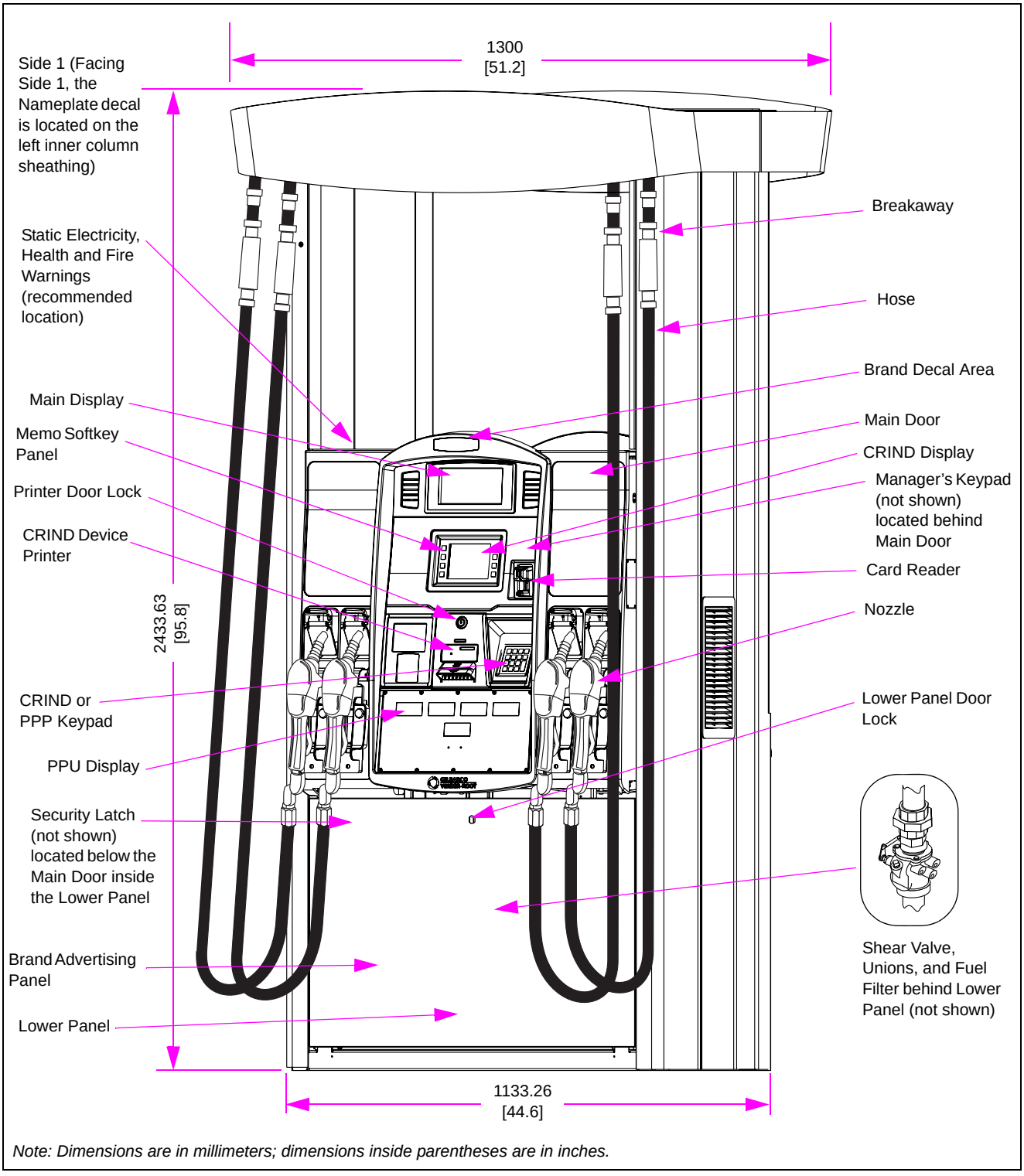
Horizon

The Horizon unit offers a refined style that delivers a simplified customer layout, resulting in effective fuel time. With the Horizon unit, the retailer also receives the benefit of increased security against fuel fraud, including:

- A separate printer door with a barrier, restricting access to the inside of the unit
- A security latch below the main door, placed behind the lower panel door
- A secure pulser

For additional information on the additional security features of the Horizon unit, refer to "Additional Security in the Horizon Unit" on page 31.

Figure 3-1: Horizon Unit



Note: Dimensions are in millimeters; dimensions inside parentheses are in inches.

Understanding the Model Codes

For Horizon units a two-letter and one-number model code is stamped on the nameplate. To determine the model code on a Gilbarco Horizon unit, refer to the following table.

Horizon Series

H	X	X
Horizon	**A** = Multi-hose Dispenser	**1** = 1 Grade **2** = 2 Grade **3** = 3 Grade **4** = 4 Grade
	C = Multi-hose Pump	**1** = 1 Grade **2** = 2 Grade **3** = 3 Grade **4** = 4 Grade
	P = Ultra-High Flow	**1** = Super-Hi™ Dispenser **2** = Super-Hi Pump

Common Functions

This section provides information on the common functions of the Horizon unit.

Displaying the Last Transaction

If power supply is interrupted, information about the previous sale (last transaction) remains on the main display for at least 15 minutes.

Displaying Pump Totals for the Horizon Unit

You can view pump totals for the Horizon unit on the main display and Price Per Unit (PPU) display by using the Manager’s Keypad located behind the Electronic Cabinet Book on Side 1 of the dispenser. The keypad’s magnetic backing enables easier handling and input.

Notes: 1) Side 1 is the junction box side of the unit. Facing Side 1, the Nameplate decal is located on the left inner column sheathing.

2) For Horizon units, to identify Side 1 of the unit, see Figure 3-1 on page 22.

The Manager’s Keypad is shown in the Figure 3-2.

Figure 3-2: Manager’s Keypad

Manager’s Keypad

Note: To enter the required Command Codes to place the pump/dispenser in Standalone mode or to program prices directly at the unit location, refer to "Standalone Mode" on page 25.

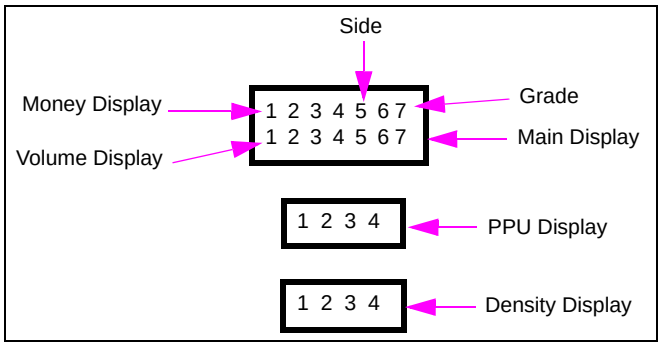
⚠ WARNING

To avoid potential electric shock, do not touch any wiring or electronic component(s) behind the Main Door.

The Manager's Keypad for the Horizon Series is attached (by magnet) behind the door.

Figure 3-3 shows the location of data in the display.
Note: For location of the display, see Figure 3-1 on page 22.

Figure 3-3: Location of Data on the Manager's Keypad



To display pump totals for the Horizon unit, use the Manager's Keypad and the instructions in the following table.

To	Press	Result
Display totals	• $ Total for Money • Vol Total for Volume	Side digit flashes
Select side	• 1—Side 1 (A) • 2—Side 2 (B)	Side digit flashes
Select grade	**ENTER** and **1-8** for grades 1-8	Grade digit flashes
Toggle between side and grade	**ENTER**	Toggles flashing digit between the side and the grade digits
Exit	**CLEAR**	Exits the operation

Horizon Grade Number Reference Chart

Type	Grade
1 Grade MPD	1
2 Grade MPD	1, 2
3 Grade MPD	1, 2, 3
4 Grade MPD	1, 2, 3, 4

Operating the Units

The Horizon unit can dispense fuel in any one of the following two modes:
- Console mode - Authorization and payment occur at the console
- Standalone mode - Authorization and payment occur at the pump

This section provides instructions for operating the units in either mode.

Note: For location of the components, see Figure 3-1 on page 22.

Console Mode

Consoles can be set up in a pre-authorized mode where a sale is automatically allowed, or in an authorization mode where a sale requires initiation by a cashier.

To operate a unit in the authorization mode, proceed as follows:
Note: Step 1 can occur before or after steps 2 and 3.

1. Authorize the unit at the console.
2. Remove the nozzle and lift the pump handle, if required.
3. Select the grade and the payment form, if required.
4. Dispense the fuel.
5. Return the nozzle to the nozzle boot.
6. Pay out the fuel transaction at the console.

Standalone Mode

Standalone mode does not involve the console with the sale. To operate a unit in a pre-authorized mode, proceed as follows:

1. Remove the nozzle and lift the pump handle, if required.
2. Select the grade and the payment form, if required.
3. Dispense the fuel.
4. Return the nozzle to the nozzle boot.

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4 – Preliminary Steps for Service

This chapter provides instructions for collecting information on any unit-related problems that a Gilbarco-trained Authorized Service Contractor (ASC) or Customer Specified Contractor (CSC) requires for servicing. Providing complete information can shorten the time that the ASCs/CSCs spend in troubleshooting and enable them to have the correct parts required for service.

⚠ WARNING

Do not attempt to service a Horizon pump/dispenser on your own, without special, qualified training. Servicing a Horizon pump/dispenser incorrectly could result in severe injury or death. Only Gilbarco-trained ASCs/CSCs must service a Horizon pump/dispenser.

⚠ WARNING

Do not make unapproved modifications to Gilbarco equipment. Doing so could result in improper equipment operation and violation of state and local codes, and could also create a safety hazard. For approved modifications and kits, consult your ASC/CSC, distributor, or Gilbarco.

Avoid contact with eyes, skin, and clothing. Ensure that the eyewash stations and safety showers are close to the work location. Use only meters and registration devices that have all the required Regulatory approvals.

Important Considerations for the Units with Ecometers

Units must always use the M008007B010 (gasoline) or the M08007B030 (diesel) filter manufactured by PetroClear® filter.

To maintain warranty, the unit requires use of a special filter type as mentioned. It potentially allows lesser contaminants to pass through it during normal unit operation, as compared to other filters and prevents nozzles from snapping shut. The filter has a standard mounting and is similar in cost to current filters. The filter contains a slightly higher load spring. In addition, it has improved internal sealing. The filter will also improve the reliability of other hydraulic devices in the dispenser potentially, such as valves.

Important Considerations When Changing Fuel Types

⚠ WARNING

Certain special alternative fuels and additives can degrade pump/dispenser performance or integrity if the dispensers are not designed for use with such fuels. Additionally, converting to certain standard fuels (gasoline, diesel, kerosene, and so on) from alternative fuels such as those with ethanol, methanol, or Biodiesel or from alternative fuels to standard fuels can degrade dispenser performance or integrity. Similar effects can also occur when converting units to different standard fuel types.

Leaks and potential environmental hazards can result or components may fail prematurely. To avoid these issues, follow the guidelines as described in this section.

Follow the guidelines given below when changing the fuel types for a pump/dispenser or while using alternative fuels:

1 Check with your Gilbarco ASC or Distributor if the fuel that you use is compatible with the pumps/dispensers that dispense the fuel.

2 For Flexible Fuels (FF) dispensers, do not use standard hydraulic parts used in other Gilbarco pumps/dispensers in these units. Standard dispenser parts may not be compatible with the fluids.

3 Biodiesel fuels must comply to ASTM standards for Biodiesel fuels, or equivalent. In Europe, Biodiesel blends must be a blend of biocontent (FAME) to EN14214, and diesel to EN590. Mixes of diesel with cooking oils, other plant or animal derived oils, and so on are not considered Biodiesel fuel. Use of such mixes may void the warranty on the hydraulic components of the unit.

4 Review the latest copy of the unit's warranty statement regarding use of the fuel.

5 Certain fuels (especially fuels enhanced with alcohol) when used in tanks that previously contained a different fuel, may clean out the tanks and force a large amount of contaminant into the dispenser. Apart from abnormally clogging filters, this large quantity of contaminant may damage certain dispenser components. Do not run units without filters at such times. Normally tanks and lines are cleaned of all water, sediments and contaminants before such conversions, to minimize potential unit downtime or damage. Damage to hydraulic components from contamination when not using filters, is not covered by Warranty. For recommendations, consult your ASC or Gilbarco Distributor.

6 Do not use any equipment that was formerly used to store or dispense any other fuel or liquid with DEF/Urea. Dispensers designed for use with DEF must only be used with DEF/Urea.

7 Although conversions from one fuel to an equivalent fuel (say from another supplier) generally do not create issues, it is recommended that after making any fuel type conversions (including those to alternative fuels or back), all units must be visually checked for leaks for two days, one week, and one month after fuel conversion. The ASC repairs any possible leaks. This must also be performed for standard fuels when significant new additives are incorporated.

Notes: 1) This does not apply to the FF model dispensers.

2) Before changing from one fuel type to another including gasoline to diesel, or diesel to gasoline, consult your ASC.

8 It is recommended that whenever making non-equivalent fuel conversions, all units are checked for calibration within one month after the fuel conversion.

9 Some non-equivalent fuel conversions will necessitate the requirement to change the pump/dispenser filter type previously used. Consult your ASC or Gilbarco Distributor for any changes required, before making any fuel conversions.

Call ASC

Call your ASC/CSC. The ASC/CSC may be able to resolve the issue for you.

Service Preparation

Appoint an ASC/CSC to efficiently service and maintain your Horizon unit. Gilbarco trains and certifies ASCs/CSCs to service and maintain the Horizon unit in a safe manner. Warranty service must be performed by an ASC/CSC only.

Before Making a Service Call

Perform the following tasks, before you make a service call:

- Obtain complete information from station personnel about the problem. Provide any history that may help (whether the unit has a recurring problem, or the problem has been observed for the first time, and so on).
- Mention the associated hose number(s) along with the problem.
- Ensure that the tank contains fuel.
- Ensure that the power, pump lights, and circuit breakers are on.
- For electronic units, write down and report any error codes displayed.

Note: For information on recording and clearing error codes, refer to "Error Codes" on page 33.

Description of the Problem

Provide the ASC/CSC with a complete and accurate description of the problem, including all symptoms and error codes. Ensure that you give the service personnel complete and accurate information. It will ensure faster and potentially inexpensive repairs and keep downtime costs to a minimum.

Warranty Service

IMPORTANT INFORMATION
All warranty services must be performed by an ASC/CSC. Failure to use an ASC/CSC to perform warranty service could result in loss of warranty coverage.

Station Security

In any manufacturer's unit, it may be impossible (even with detailed security arrangement), to stop a knowledgeable, unobserved, and experienced thief. It is possible to reduce the probability of a theft attempt if security measures are designed for the station layout and security-minded actions are planned for the site's operation. The following recommendations are intended to decrease the probability of theft by observance and incorporating obstacles to deter criminal activity.

Enhancing Security

To enhance security, proceed as follows:

1 Design stations where employees have full, unobstructed view of all fueling locations. Do not block the view with merchandise displays or other obstacles. If full view is impossible, use video surveillance equipment. Equipment monitoring must be made obvious and signs stating their use must be posted.

2 Enter new programming access codes, as default codes are commonly known. Only trusted station employees and associated ASCs/CSCs must know these codes. Store the codes in a safe and secure location known to all station management personnel. Unit service can be costlier, if these codes are lost.

3 Use unit security kits when available. For areas subject to high risk of theft, consider the additional security of special keys/locks to replace the standard locks. Such keys and locks can be obtained from local locksmiths. This enhancement is extremely effective in preventing theft modes using the keypad with the additional benefits of preventing potential tampering with other dispenser devices.

4 Remove the keypads from the units and store them in the station or other safe locations. The keypads must be accessible to Station Management or service people when required. A sign out system can be used to track who used the keypad last.

5 The station must monitor “pump total” and “station total” reports comparatively. Theft can be noted as fuel dispensed will still be recorded in “pump totals” (although not in “station totals”), if a thief uses the Manager’s Keypad. When this will not prevent the theft that has already occurred, it will alert the station as to whether security measures are working or must be applied.

6 Plan to use modular programming “time-out” functions that shut down the unit if no pulser activity occurs for a preselected time. Consult your ASC and determine if there is any optional software that can be used on your units to enhance security.

7 Ensure that the station personnel is alert to any unit offline message at the Point Of Sale (POS) system, accompanied by suspicious activity at the pump/dispenser.

8 Plan to provide periodic/frequent check of equipment security provisions to verify their integrity.

9 During installation and thereafter, ensure that lower door levers are adjusted correctly and do not allow the panels to be removed easily without a key or tool. If you suspect that keys are available to thieves in your area, consider using special locks and keys available from locksmiths.

10 Be alert to dispensers being “offline” or equivalent at the POS system. Fuel theft may occur, especially if the customer is pumping fuel.

11 For units left powered on during power-off hours, ensure that power to the STPs or self-contained pump motors is turned off.

Additional Security in the Horizon Unit

The Horizon unit has been designed with adequate security to prevent/minimize the probability of fuel theft.

In addition to security features that have been built into the Horizon unit so far, such as the CIM, lower panel locks and keys, and the Personal Identification Number (PIN) code-secured Manager Keypad, the Horizon unit comes with the following additional security features:

- A separate printer door (with a lock) that restricts access to the inside of the unit.
- A security latch that may be used to secure the lower part of the main door (bezel). See Figure 4-1 on page 32.
- An improved design that does not enable a person to open the main door without first removing the lower panel door.
- An option to install hinge sensors that will send an alert to the POS system whenever the main/lower panel doors are opened.

To optimally use the additional security features installed in the Horizon unit, proceed as follows:

1 Close and lock the main door, use the main door lock located to the left of the main door.

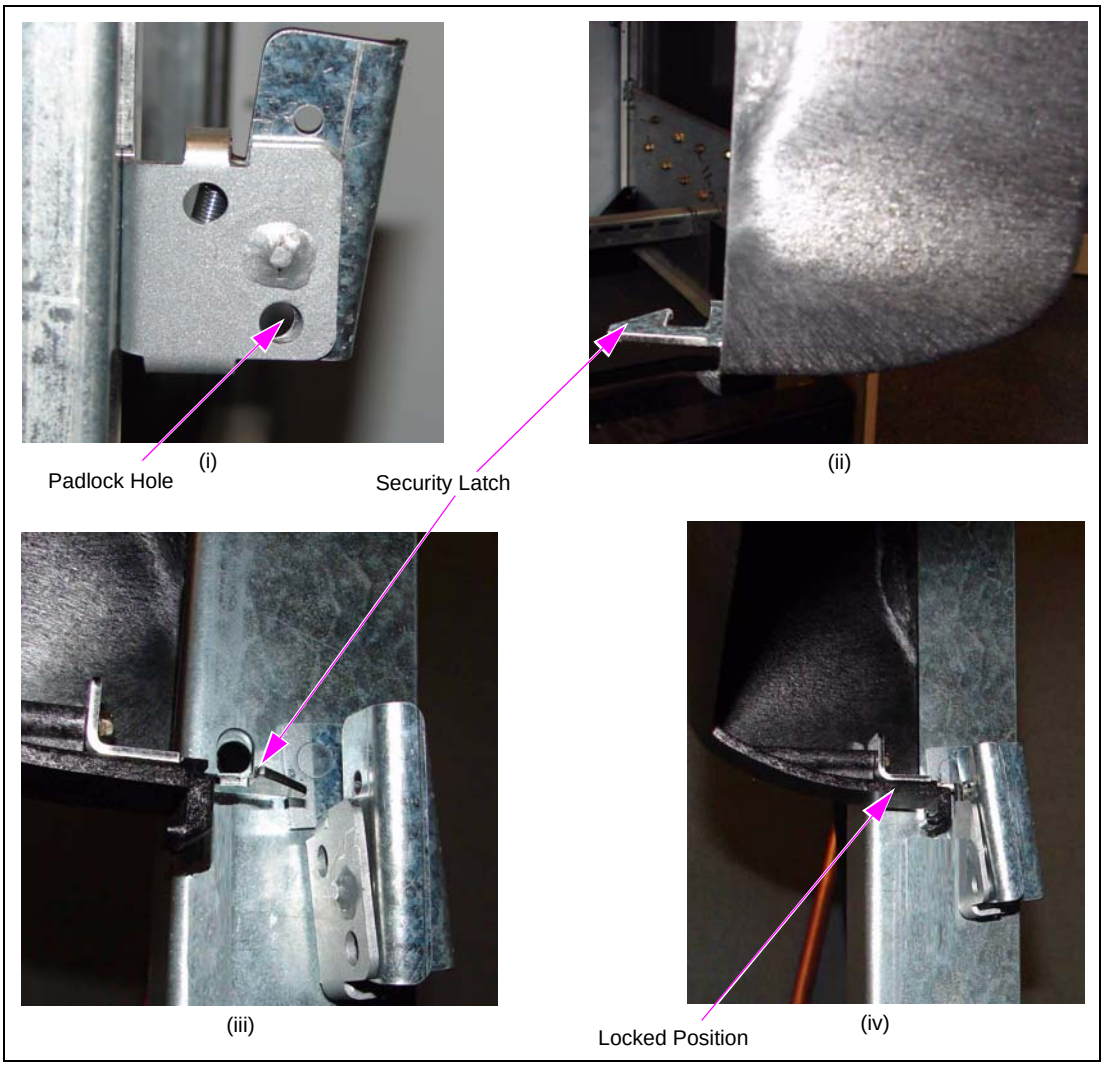
Notes: 1) When closing the main door, remember to push inward and then lock the door to ensure that the inner lining is sealed to prevent rain water from seeping into the main door.

2) If you do not close the main door properly, you will have problems when removing or reinstalling the lower panel door.

2 Place the security latch in the locked position.
Note: To secure the latch you may optionally use a padlock.

3 Place the lower panel door and lock it using the lower panel lock.

Figure 4-1: Security Latch - Open and Locked Positions



Notes: 1) If you suspect that the main/printer/lower panel door key's security has been compromised, consider purchasing replacement locks for your units from Hudson Lock Inc. (www.hudsonlock.com). Ordering directly from the lock supplier will ensure a strict control over the distribution of locks and keys, eliminating the possibility of keys being taken or copied through the traditional distribution channels. Hudson Lock can provide specific pricing and lead-time information based on your requirements.

2) ASCs must be aware of any lock changes or added locks in order to service the unit. The keys must be available to ASCs.

Important Installation Information

To ensure that your equipment provides safe and reliable operation, verify the following:

- Breakaways for drive-off protection must be installed. For breakaways to function properly, the pumps must be anchored to the island with bolts.
- Dispensers and some self-contained pumps must use Shear Valves. Refer to local regulations.
- Proper operating and safety warning signs must be used at the station. Refer to local regulations and the oil company.
- Station emergency stop buttons must be used. Refer to local regulations.
- Isolation relays must be used with dispensers. Refer to local regulations.
- Shear Valve linkage must be free of obstructions so that the valve can close properly during a fire or accident.
- Ensure that the installers follow all other requirements and recommendations as in MDE-4886 Horizon Site Preparation and Installation Manual.

Unit Commissioning

You must ensure that your units are commissioned shortly after installation, if applicable. Improper installation can void warranty or result in poor unit performance.

Error Codes

Note: For complete list of Horizon Error Codes, refer to "Appendix C: Anti-static Link Drive Belt Adjustment" on page C-1.

If an error or malfunction occurs, the LCD on the main display must flash and alternately display the error code and the normal readout. Some error codes can appear at the PPU. These must not be confused with numbers that may flash when power is first applied to the unit. These numbers represent software versions and other similar information, and are not error codes.

Recording Error Codes

Error codes provide an excellent service and troubleshooting tool for ASCs/CSCs and will ensure that the ASC/CSC brings the correct part to your site for a quick repair. Record all error codes and provide the list to your ASC/CSC. The ASC/CSC uses these codes to diagnose and repair unit problems, which results in less down time.

Clearing Error Codes

In some cases, you can permanently clear error codes from your unit. To clear an error code, proceed as follows:

1. For EC 44 - pump handle on at power up, replace handle, power down, and then power up. One instance of this error code does not normally require a service call.
2. If the error code still appears, power down the unit, wait for one minute, and then restore power using the station circuit breaker.
3. If the error code still appears or reappears at a later time, record the error code and call your ASC/CSC for assistance.

Replacement Parts

Use only genuine Gilbarco replacement parts and retrofit kits on your unit.

⚠ WARNING

Use only Gilbarco replacement parts and retrofit kits. Non-Gilbarco replacement parts may create safety hazards and violate local regulations.

Gilbarco replacement parts are required to maintain warranty.

Specialized Training

For safety reasons, do not attempt to service a Horizon unit on your own, unless you have been trained and certified to do so.

⚠ WARNING

Do not attempt to service a Horizon pump/dispenser yourself. Only a Gilbarco-trained ASC/CSC must service an Horizon pump/dispenser. Servicing a Horizon pump/dispenser incorrectly could result in severe injury or death.

To receive specialized training for servicing the Horizon unit, contact an ASC/CSC or distributor. Training may be available at local or various regional centers.

ASCs/CSCs and distributors may charge a nominal training fee. For additional information, contact your nearest distributor.

5 – Maintaining Units

This chapter provides information on the following aspects of pump/dispenser maintenance:

- Periodic Inspections
- Periodic Maintenance Requirements
- Special Maintenance Instructions

CAUTION

Do not open the electronics cabinet to change paper, to remove Cash Acceptor cassettes, or to perform any other tasks when it is raining. The moisture from the rain can damage the pump/dispenser.

General Safety Considerations

Safe operation of the equipment is very important to your customer and you. The following recommendations are in addition to those found in the sections that follow and "Important Safety Information" on page 3.

1. Do not allow the customer to use damaged units or broken components with sharp edges.
2. Do not allow the customer to use units with missing doors or panels or with doors open.
3. Ensure that adequate and readable instructions are clearly given on the units or nearby areas for potential safety hazards such as static electricity fueling hazards, use of unapproved containers, and so on. Place signs where fueling customers will notice and can read them.
4. Do not use long hoses beyond recommendations that may present a trip hazard. Use hose retrievers in good operating condition, when long hoses are used.
5. Do not allow the customer to use units which do not have breakaways installed on them.
6. Do not allow the customer to use units with hoses and/or nozzles removed from either side.
7. Do not allow the customer to use units that are leaking fuel.

Periodic Inspections

Performing General and Component Maintenance Inspections

This section provides instructions for scheduling two types of maintenance inspections:

- General inspections
- Component inspections

Note: This section does not include special inspections such as those required when changing fuel types. For those requirements, refer to "Important Considerations When Changing Fuel Types" on page 28.

Safety Warnings

You are performing inspections and maintenance in a potentially dangerous environment of flammable fuels/vapors and high voltage. To prevent injury when inspecting a unit at the islands, follow all safety precautions provided in "Important Safety Information" on page 3.

⚠ WARNING

You are performing inspections and maintenance in a potentially dangerous environment of flammable fuels/vapors and high voltage. Failure to adhere to the safety precautions in this manual may cause fire or explosion, resulting in severe injury or death. Read and adhere to all safety precautions before performing any maintenance activity.

General Inspections

Perform a general inspection of each unit as follows:

- Every week to ensure that all units are operating properly
- Whenever you receive a complaint about potential unit problems

As part of your general inspection, check the entire pump or dispenser for the following indications:

- External damage
- Leaks
- Exposed sharp or similar edges that may cause cuts
- Missing parts, doors, and so on
- Safety hazards when fueling, such as slippery surfaces, trip hazards, missing warning signs, and so on

Replace any missing or damaged warning labels. Gilbarco also strongly recommends that ASCs/CSCs periodically check the equipment, as outlined in the next subsection.

⚠ WARNING

If you find any leaks or damage, stop using the pump/dispenser, and contact your local ASC/CSC. Fire, explosion, or electrical shock could result, if you continue to use leaking or damaged pumps/dispensers.

⚠ WARNING

To prevent injury to customers or yourself, block customer access to the pump/dispenser with cones or similar equipment, when inspecting.

Component Inspections

To schedule component inspections, refer to the following table. Generally, the station owner must only *inspect* for damage or problems with the units. For safety reasons, several tasks in the following table, including *all* repairs, must be performed only by an ASC/CSC.
To determine if an ASC/CSC must perform a task, refer to the "Who Performs the Inspection/Repair" column in the following table.

⚠ WARNING

Do not attempt to perform any task that is noted "ASC/CSC only" in the "Who Performs the Inspection/Repair" column. Performing those tasks incorrectly could result in severe injury or death.

⚠ WARNING

If you find a leak during an inspection, stop using the pump/dispenser, and contact your local ASC/CSC. Fire, explosion, or electrical shock could result, if you continue to use a leaking or damaged pump/dispenser.

Recommended Frequency	Components	Recommended Maintenance	Who Performs the Inspection/Repair
Upon receiving a customer complaint	Replacing printer paper	Refer to the instructions in "Changing the Receipt Paper in the USB Sliding Printer for Horizon Series Enhanced Bezel (M07885A001)" on page 46.	Owner
Upon receiving a customer complaint	Correcting printer jams	Refer to the instructions in "Clearing Paper Jams in M07885A001 (USB Sliding Printer)" on page 50.	Owner
Once a week	Displays	1. Check displays for proper reading of all digits. 2. Verify if the displays are properly backlit.	• Owner—Inspect • ASC/CSC only—Repair and test

Recommended Frequency	Components	Recommended Maintenance	Who Performs the Inspection/Repair
At least once a week or if a customer complaint arises	Hoses	1. Check each hose for leaks and damage. **⚠ WARNING** If you find a leak, stop using the pump/dispenser, and contact your local ASC/CSC. Fire, explosion, or electrical shock could result, if you continue to use a damaged pump/dispenser. 2. Check each hose for the following wear or damage: • Bulges • Cracks • Cuts • Flattened spots • Reinforcement showing • Soft spots • Splits • Weaknesses • Tears 3. For any additional required inspections, consult the hose manufacturer. *Note: If repair is required, call an ASC/CSC.* **⚠ WARNING** Do not attempt to make these repairs yourself. Doing so could result in severe injury or death.	• Owner—Inspect • ASC/CSC only—Repair and test
Once a week or if a customer complaint arises	Hose retrievers	1. Check hose retrievers for frayed or broken cables. 2. Check hose retrievers for cables wrapped around hoses. *Notes:* *1. If repair is required, call an ASC/CSC.* *2. When hose retrievers are used, the breakaway whip hose must be attached to the nozzle, and the breakaway coupling attached to the whip hose, with the retriever clamp positioned between the breakaway coupling and the dispenser outlet casting. When retrievers are not used, the breakaway whip hose is attached to the dispenser outlet casting and the breakaway coupling is attached to the other end of the breakaway whip hose.* **⚠ WARNING** Do not attempt to make these repairs yourself. Doing so could result in severe injury or death.	• Owner—Inspect • ASC/CSC only—Repair and test

Recommended Frequency	Components	Recommended Maintenance	Who Performs the Inspection/Repair
Once a week or as notified about a potential problem	Nozzles and boot area	1. Check nozzles for the following: • Damage • Leaks • Loose nozzle spouts • Missing parts, such as retainer springs and splash guards **⚠ WARNING** If you find a leak, stop using the pump/dispenser, and contact your local ASC/CSC. Fire, explosion, or electrical shock could result, if you continue to use a damaged pump/dispenser. 2. Check vapor recovery boots (bellows) for proper seal and signs of damage. 3. For any additional required inspections, consult the nozzle manufacturer. *Note: If repair is required, call an ASC/CSC.* **⚠ WARNING** Do not attempt to make these repairs yourself. Doing so could result in severe injury or death.	• Owner—Inspect • ASC/CSC only—Repair and test
Once a week, or as notified about a potential leak	Leaks, outside the unit	1. Check the following for leaks or signs of leakage: • Breakaways • Couplings • Hose outlet castings • Hoses • Nozzles • Swivels 2. Look for any signs of fuel or fuel staining around the base of the dispenser, especially at the side columns and at the upper housing. 3. Review all documentation provided by each component's manufacturer for additional inspection information. 4. If a leak is found, stop using the unit, and make arrangements to repair the leak. **⚠ WARNING** If you find a leak, stop using the pump/dispenser, and contact your local ASC/CSC. Fire, explosion, or electrical shock could result, if you continue to use a damaged pump/dispenser. **⚠ WARNING** Do not attempt to make these repairs yourself. Doing so could result in severe injury or death.	• Owner—Inspect • ASC/CSC only—Repair and test

Recommended Frequency	Components	Recommended Maintenance	Who Performs the Inspection/Repair
Once a week or after drive-offs	Breakaways	1. Check breakaways for secure connection to hose and for any leaks. **⚠ WARNING** If you find a leak, stop using the pump/dispenser, and contact your local ASC/CSC. Fire, explosion, or electrical shock could result, if you continue to use a damaged pump/dispenser. 2. For any additional required inspections, consult the breakaway manufacturer. *Notes:* *1. If repair is required, call an ASC/CSC.* *2. Some breakaways are not repairable. Check with the ASC/CSC whether the breakaway is repairable before the ASC/CSC attempts to reassemble the breakaway.* *3. A leak inspection within the hydraulics cabinet is also required. See the relevant section, later in this chapter.* **⚠ WARNING** Do not attempt to make these repairs yourself. Doing so could result in severe injury or death.	• Owner—Inspect • ASC/CSC only—Repair and test
Once a week or as required	Wash unit	Clean with Simple Green® all purpose cleaner (or equivalent). **CAUTION** Do not wash with a high pressure hose. Refer to "Performing General and Component Maintenance Inspections" on page 36.	Owner
Once a week or upon complaint of improper reading of cards	Card Reader	Clean the Card Reader with a cleaning card (Q11482) weekly or if the Card Reader is not reading Credit Cards properly. Cleaning of Card Readers periodically may prevent future service calls. Card Readers that do not work because of lack of periodic cleaning are not covered by warranty. **⚠ CAUTION** Do not use a pressure washer to clean the pump/dispenser.	Owner

Recommended Frequency	Components	Recommended Maintenance	Who Performs the Inspection/Repair
Once a month, after drive-offs, or as notified about a potential leak	Leaks, within the lower hydraulics cabinet	1. Whenever possible, Gilbarco recommends removing power to the unit before performing these inspections. 2. Block the unit area to prevent customers from operating the unit during inspection. 3. Remove the lower panels slowly and carefully to avoid any fuel being sprayed in the cabinet (especially if a drive-off has occurred). Wear eye protection. 4. Check all hydraulic connections and seals, including the following: • Meters • Valves 5. If wetness or dripping fuel is found, stop using the unit, and make arrangements to repair the leak. *Note: Some staining of parts around seals is normal and does not indicate a problem. Look for dripping or wet surfaces.* 6. Monitor repaired places closely.	• Owner—Inspect • ASC/CSC only—Repair and test

⚠ WARNING

To prevent injury when checking self-contained units (equipped with pumps and electric motors), do not place your hands near the belts, pulleys, or motors. Do not allow anyone to use either side of the pump when inspecting. Block the pump/dispenser off or lock the nozzle to the nozzle hook.

⚠ WARNING

If you find a leak, stop using the pump/dispenser, and contact your local ASC/CSC. Fire, explosion, or electrical shock could result, if you continue to use a damaged pump/dispenser.

⚠ WARNING

Do not attempt to make these repairs yourself. Doing so could result in severe injury or death.

⚠ CAUTION

To prevent potential injury, wear eye protection when performing these inspections.

New installations—After 200,000 liters (50,000 gallons), or after one month	Filter change and strainer cleaning	Replace filters, and clean strainers regularly. *Note: Water alert filters may fail prematurely if water passes through them.*	Only an ASC/CSC must perform these tasks.

Recommended Frequency	Components	Recommended Maintenance	Who Performs the Inspection/Repair
After first filter change—Every 1.1 million liters (300,000 gallons), every six months, or when fuel delivery rate significantly slows.		**⚠ WARNING** Do not attempt to perform any of these tasks yourself. Performing these tasks incorrectly could result in severe injury or death. *Note: Most complaints regarding continual slow flow rate from the dispenser are caused by clogged filters.*	
Every three months	Clean CRIND device printer	• Clean the CRIND device M07885A001 printer using the printer cleaning card Q13400. Follow instructions in "Cleaning the CRIND Device in the M07885A001 Printer" on page 50 (use Moore Wallace M05194B001). • Clean the CRIND device M04119A001 (USB) printer using the M05194B001 cleaning kit. Follow instructions included in the kit.	Owner
Every three months	Clean CRIND device display	Clean the CRIND device display regularly with a mild detergent and soft cloth using Moore Wallace M05194B001 cleaning kit. Be careful not to scratch the display. Do not use an abrasive cleaner, or glass cleaner or detergent that contains ammonia. Ammonia will damage plastic display windows and door materials.	Owner
Every six months	Inspect and lubricate Shear Valves	To check valve operation, perform these tasks: 1. Trip the valve. 2. Authorize the hose at the console, if required. 3. Lift the operating handle. 4. Place the discharge nozzle in an approved container. 5. Squeeze the nozzle operating lever. If flow continues after several seconds, the valve is defective and must be serviced or replaced. 6. Place a few drops of SAE10 oil on Shear Valve body shaft. 7. Open and close valve with a wrench several times. 8. Place valve back in service. *Note: If repair is required, call an ASC/CSC.* **⚠ CAUTION** If you are not sure which device is the Shear Valve or have not been trained regarding its use or service, have the ASC/CSC check and lubricate this device for you. **⚠ WARNING** Do not attempt to make these repairs yourself. Doing so could result in severe injury or death.	• Owner—Inspect and lubricate • ASC/CSC only—Repair

Recommended Frequency	Components	Recommended Maintenance	Who Performs the Inspection/Repair
Every six months	Pump pulleys, belts, and belt tension	1. Remove power to the unit. **⚠ WARNING** To prevent an injury, remove power to the pump/dispenser before you start the maintenance activity. **⚠ CAUTION** To avoid injury, avoid getting your fingers in a pinch point between the pulley and belt during an inspection. 2. Check belts for fraying/cracks. 3. Check pulleys for excessive wear in grooves and excessive bearing play. 4. Ensure, by pressing the belt midway between the two pulleys, that there is no more than 1-inch of play on either side of the belt. *Note: If repair is required, call an ASC/CSC.* **⚠ WARNING** Do not attempt to make these repairs yourself. Doing so could result in severe injury or death.	• Owner—Inspect • ASC/CSC only—Repair and test
Every six months	Nozzle hooks and shafts	1. Lubricate with silicone grease, if required. 2. Check for damage. 3. Ensure that the locking tab locator is not broken. The locking tab locator helps hold the nozzle in the nozzle boot and enables the station owner to lock the nozzle boot with a clasp padlock. *Note: If repair is required, call an ASC/CSC.* **⚠ WARNING** Do not attempt to make these repairs yourself. Doing so could result in severe injury or death.	• Owner—Inspect • ASC/CSC only—Repair and test
Every six months	Door locks	Lubricate with a graphite lubricant or lock oil. Follow manufacturer's instructions. Do not over-lubricate.	Owner
Every 12 months or as required in harsh climate	Polish unit	Polish metal parts with high quality car polish. Do not use automobile wax. Refer to "Performing General and Component Maintenance Inspections" on page 36.	Owner
Every six months or if fuel inventory discrepancies exist.	Meter Calibration	Have the unit meters checked for proper calibration and corrected as required. High volume stations may require more frequent calibration inspections when compared to the low volume stations.	• Owner - arranges for service • ASC/CSC - tests and re-calibrates, if required

Recommended Frequency	Components	Recommended Maintenance	Who Performs the Inspection/Repair
For Units with Ecometer			
Yearly	Ecometer Calibration	Have the unit meters checked for proper calibration and corrected as required. Ecometers with proper air purging during installation will not generally vary from initial calibration settings.	• Owner - arranges for service • ASC/CSC - tests and re-calibrates, if required

Periodic Maintenance Requirements

Changing CRIND Device Printer Paper

This section provides instructions for cleaning and changing paper for the CRIND device printer (M07885A001).

⚠ CAUTION

Avoid contacting the gears on the side of the printer, with fingers or hair, as it could result in an injury.

CAUTION

If the units are wet or if there is rain, avoid changing paper for units without overhead canopies. If this cannot be prevented, use a dry rag to wipe off the water from the door area, especially around the edges. Avoid dripping water on the printer or other electronic components when opening the door. This will cause them to fail prematurely, as a result of corrosion.

Cleaning the Printer

Cleaning the printer regularly may help print quality and increase the life-span of the printer. When cleaning the printer, use Moore Wallace M05194B001 Cleaning Kit. For additional information, refer to “Special Maintenance Instructions” on page 51.

Printer Paper Ordering Information

The printer paper is sold as a blank roll or with low paper marks. Paper rolls with low paper marks alert the station about the paper level being low. Paper for the printer can be ordered as follows.

Vender	Type	Part No	Printer Type
Moore Wallace Customer Service 1-800-416-8151	Blank Roll (4”)	M04809B012	• M04119A001 (USB) • M00317A00X Printer
	Low Paper Marks (4”)	M04809B014	• M04119A001 (USB) • M00317A00X Printer
Nakagawa Mfg (USA) 1-800-609-0608	Blank Roll (4”)	N60125BN	M04119A001 (USB)
	Low Paper Marks (4”)	N60125DN	M04119A001 (USB)
Moore Wallace Customer Service 1-800-416-8151	Blank Roll (6”)	M04809B017	M06972A001 (Sliding)
	Low Paper Marks (6”)	M04809B018	M06972A001 (Sliding)

Notes: 1) Use of improper paper can result in poor quality print, reduced printer life or frequent printer jams, which may not be covered by warranty.

2) It is important that all operators are trained in proper paper changing technique for problem-free operation.

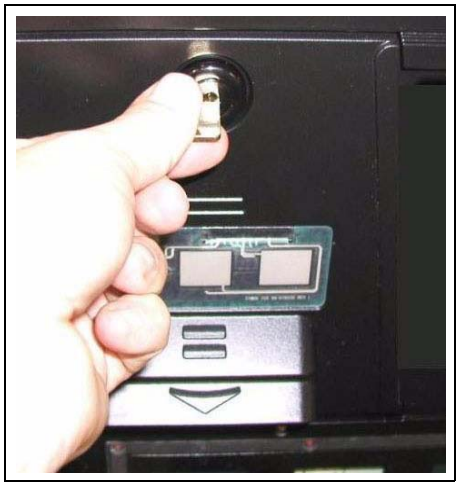
Changing the Receipt Paper in the USB Sliding Printer for Horizon Series Enhanced Bezel (M07885A001)

To change the receipt paper in the printer, proceed as follows:

Note: The USB Sliding Printer for Horizon Series E-CIM (M07885A001) is capable of holding a receipt paper roll of 6 inches.

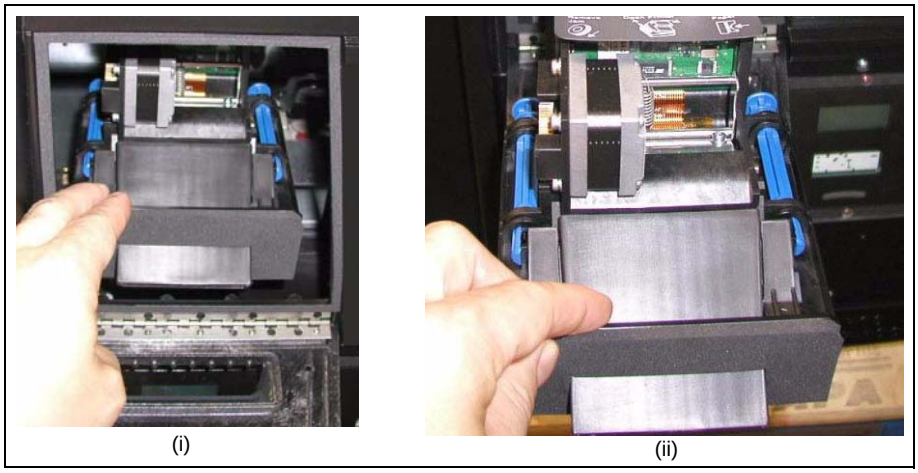
1 Insert the printer key and turn it to the left to open the printer door (see Figure 5-1).

Figure 5-1: Inserting the Printer Key



2 Open the printer door and pull out the slide completely (see Figure 5-2).

Figure 5-2: Opening the Door and Pulling Out the Slide



(i) (ii)

3 Pull the empty paper spindle from the cable clamp (see Figure 5-3).
Note: The unit is shipped with the spindle held by the cable clamp.

Figure 5-3: Pulling the Paper Spindle

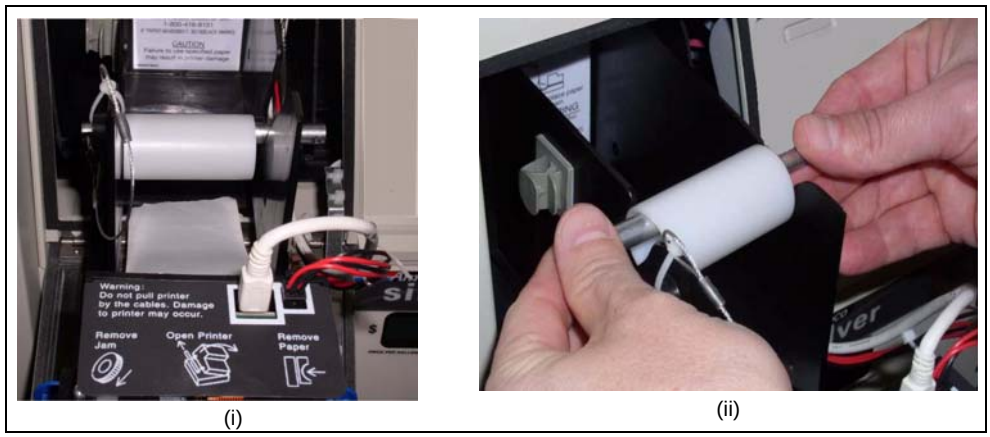
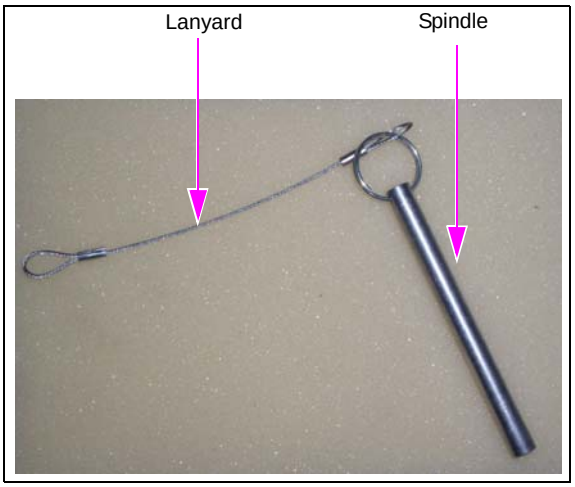
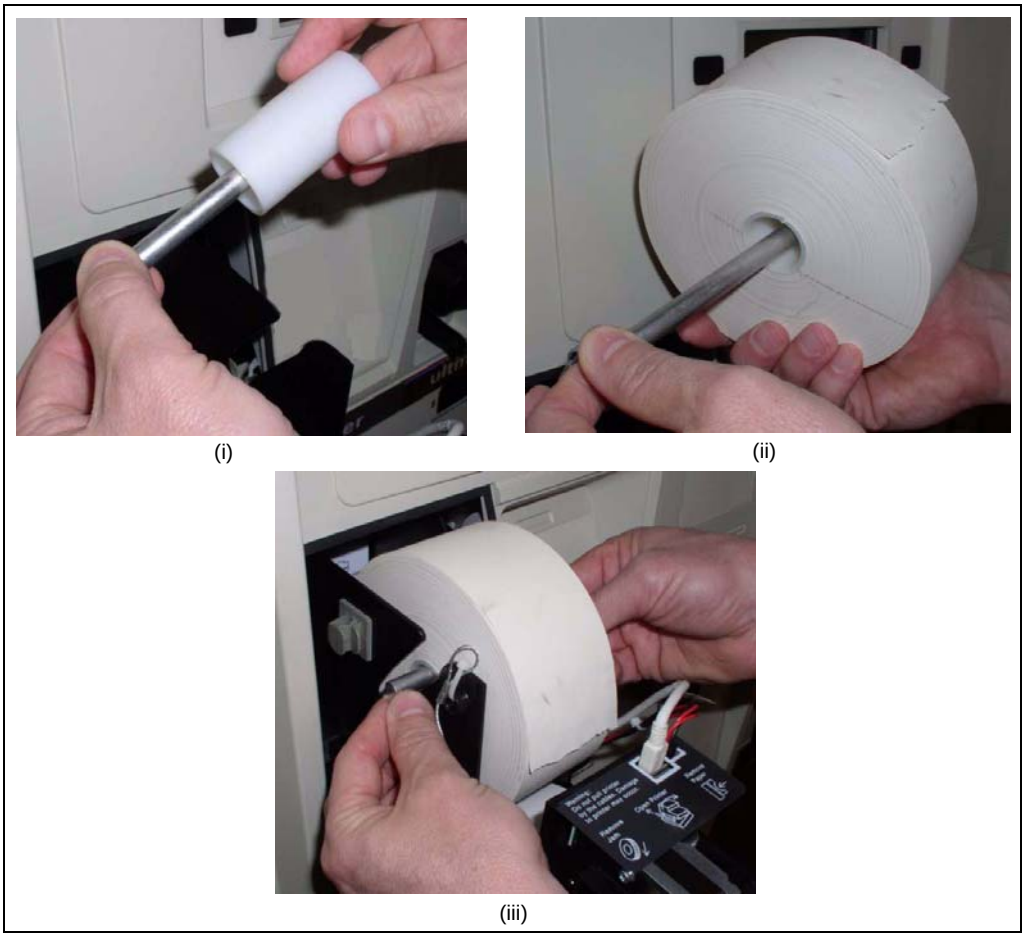


Figure 5-4: Spindle



4 Insert the spindle in a new paper roll and slide it into the spindle slot with the paper feeding from over the top (see Figure 5-5).

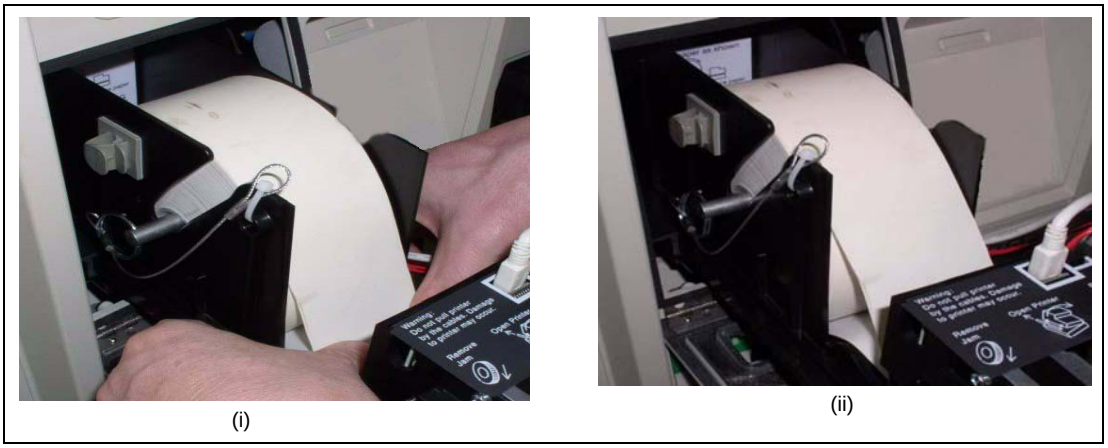
Figure 5-5: Inserting a New Paper Roll



5 Remove any small pieces of paper behind the printer head.

6 Feed paper into the printer using the built-in ramp as a guide (see Figure 5-6).
Note: Ensure that the paper is fully fed before you proceed. If the paper is not fed, check if the paper is jammed.

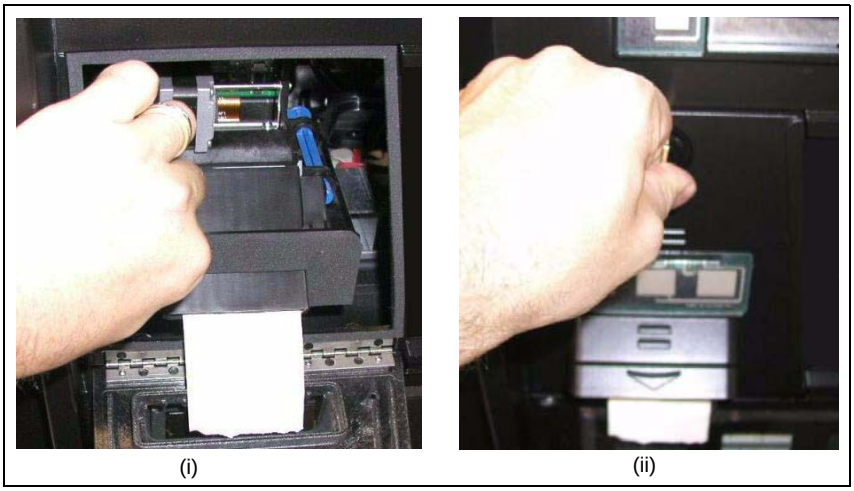
Figure 5-6: Feeding Paper into the Printer



(i) (ii)

7 Push the printer slide back in and feed the paper through the slot. Close the printer door and turn the key to the right to lock it (see Figure 5-7).

Figure 5-7: Pushing the Printer Slide



(i) (ii)

8 Pull to tear paper.

Cleaning the CRIND Device in the M07885A001 Printer

Clean the CRIND device in the M07885A001 printer using printer cleaning cards (Q13400) every three months. Cleaning the printer will eliminate most print quality problems.

To clean the CRIND device's printer, proceed as follows:

1. Remove the paper and paper roll from the printer. Follow steps 1 to 4 in "Changing the Receipt Paper in the USB Sliding Printer for Horizon Series Enhanced Bezel (M07885A001)" on page 46.
2. Insert a printer cleaning card into the inlet.
3. Manually advance the cleaning card through the roller bars using the round feed knob near the paper release lever.
4. Replace paper roll and re-install the receipt paper. Refer to "Changing the Receipt Paper in the USB Sliding Printer for Horizon Series Enhanced Bezel (M07885A001)" on page 46.

Clearing Paper Jams in M07885A001 (USB Sliding Printer)

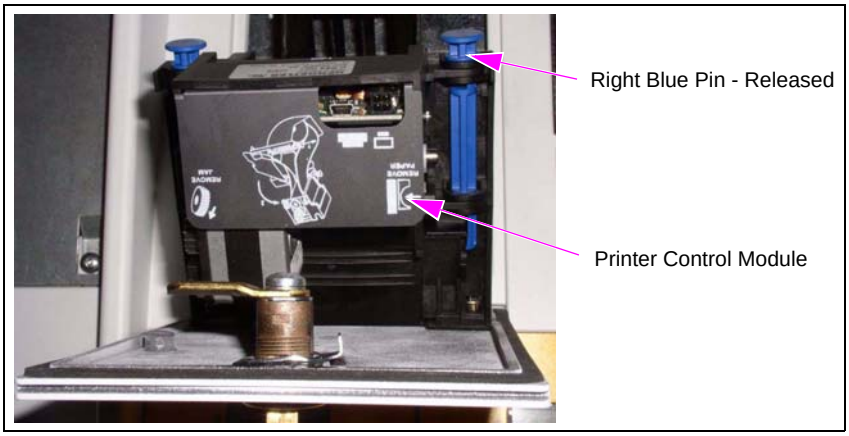
CAUTION

Avoid using tools for prying printer parts or using excessive force to clear jams. This could result in permanent damage to the printer.

To clear a paper jam, proceed as follows:

1. Release the right blue pin by pulling it upward and tip the Printer Control Module forward to expose the jam (see Figure 5-8).

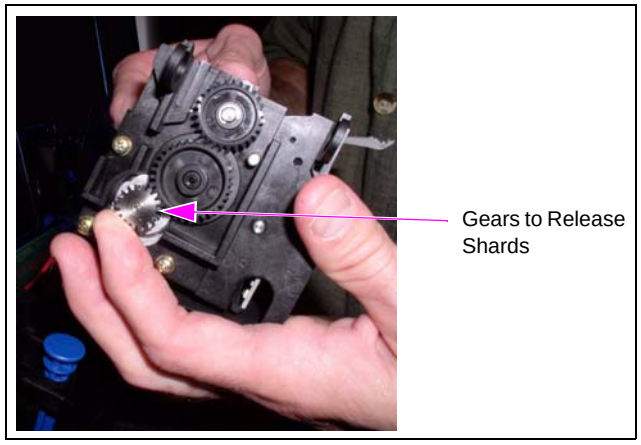
Figure 5-8: Printer Control Module



2 Press the printer head release trigger on the right side of the printer during the paper removal process.

3 Gently pull the paper through the module until it is completely removed. Leave no shards of paper in the unit. Check the paper chute and ensure that it is clear. Lower the module back on the paper bucket and push the right blue pin in place (see Figure 5-9).
Note: You can rotate the gears to release shards.

Figure 5-9: Use Gears to Remove Shards



4 Place the Printer Control Module back and push the right blue pin back in place.

Special Maintenance Instructions

Cleaning and Detailing the Unit

Materials Required

- Safety glasses
- Flexible rubber gloves
- Concentrated Simple Green all purpose cleaner
- Soft bristle nylon brush
- Spray bottle filled with water
- Empty spray bottle (to use with prepared cleaning mixture)
- White cotton cloths
- High quality car polish
- Safety cones or barricades

Important Items to Remember

- Do not use waxes, harsh abrasives, or ammonia-containing cleaners on the textured door surfaces.
- Always use a soft bristle nylon brush and rinse after cleaning.
- Simple Green cleaner is recommended for all surfaces.
- Do not spray the cleaner or rinse water onto or into the card reader, receipt printer, cash acceptor, or electronic display areas of the unit.
- High quality car polish is recommended. Do not use wax-based polishes.
- Do not apply the high quality car polish to electronic displays or nozzle boots.
- Do not use pressure washers or high pressure hoses. Rinse water must be applied as a gentle spray.
- Do not use high pressure hoses.

Routine Cleaning

Perform the following routine cleaning activity every week or as required:

1 Place safety cones or other devices to barricade the units being cleaned.

2 Wear safety glasses and flexible rubber gloves.

3 In the empty spray bottle, prepare a mixture of one (1) part Concentrated Simple Green cleaner to 10 parts water.

CAUTION

Do not spray the cleaning mixture and water in or onto the Card Reader, receipt printer, cash acceptor, or electronic display area, as it may damage the equipment and will not be covered by warranty.

4 Spray the prepared cleaning mixture on the unit from bottom to the top. Streaking may occur if sprayed from the top down.

5 Scrub the unit with a soft bristle nylon brush in a circular motion from bottom to top. Scrub long enough to cause the cleaning solution to foam. For best results, two scrubbing cycles are recommended.

6 Rinse the unit thoroughly from the top to the bottom, ensuring that all the cleaner is removed. For best results, brush the unit when rinsing. Cleaner that dries on the unit will attract dirt.

7 Dry the unit with a clean white cloth.

8 Remove barricade(s) and cleaning supplies from the unit area.

Deep Cleaning and Detailing

Perform the following deep cleaning and detailing as required, at least once a year. This helps to restore the original color to the painted surfaces.

1 Perform steps 1 to 8 in "Routine Cleaning" on page 52. However, in step 3 on page 52 prepare a mixture of one part concentrated Simple Green cleaner to one part water.

2 Using a new clean white cloth, apply the high quality car polish to the cloth and apply the polish to the painted or metal surfaces of the unit.
Note: For difficult-to-remove ground-in dirt, apply high quality car polish to the soft bristle nylon brush and rub the surface.

IMPORTANT INFORMATION

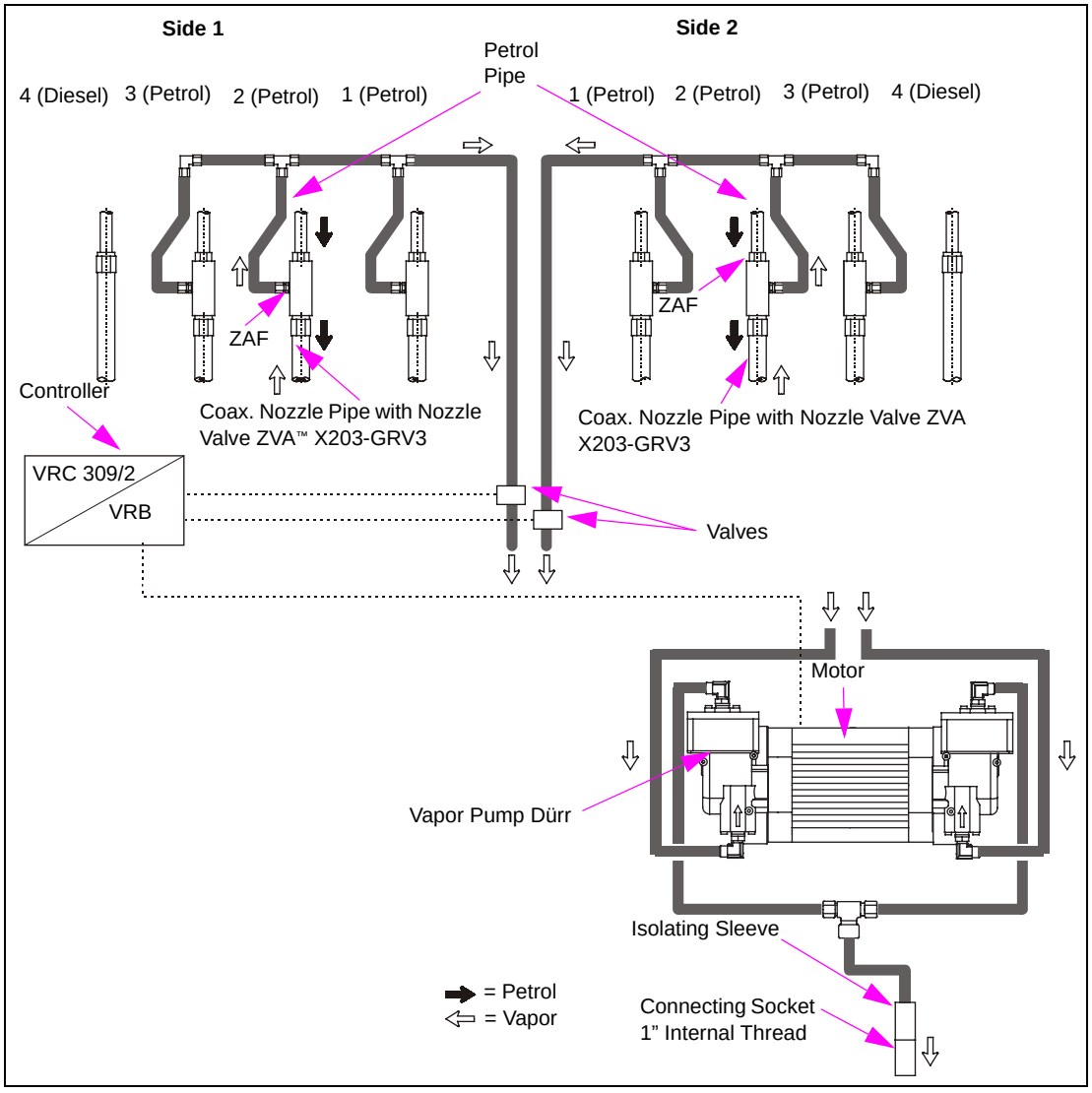
- Do not apply the high quality car polish to textured surfaces.
- Do not apply the high quality car polish to electronic displays or nozzle boots.

3 Wipe the surface of the unit with a clean white cloth.

4 Remove barricade(s) and cleaning supplies from the unit area.

Vapor Recovery Adjustment

Figure 5-10: Vapor Recovery Adjustment

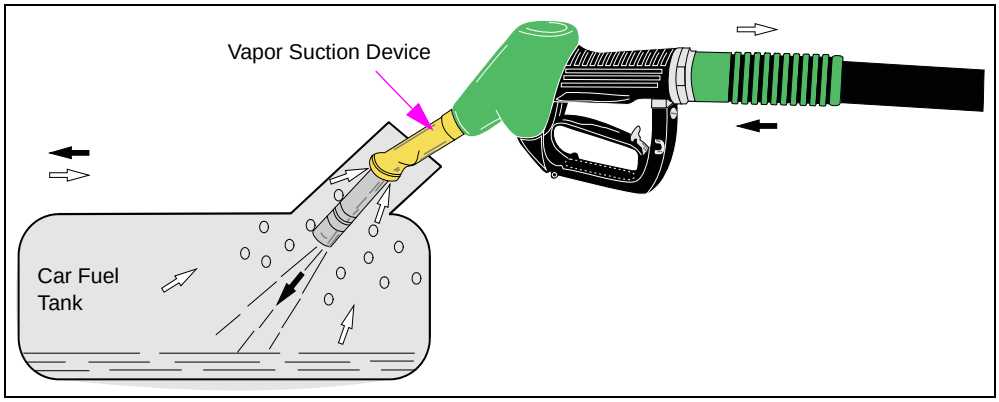


Basic Facts/Information Concerning the Adjustment of the Vapor Recovery System (VRS)

The initial calibration of the MPD Vapor Recovery System (VRS) is performed by the manufacturer. The calibration of the VRS onsite, must be performed in accordance with national regulations, or as a default, either using the wet or dry test methods defined in VDI4205. Initial calibration is required to adjust the amount of vapor returning to the amount of fuel filled in, accounting for the loss of vapor flow in the return pipeline and other local features. As a result of this calibration, no vapor escapes into the environment while refuelling the vehicle.

This calibration (with automatic compensation) is carried out with the service terminal FB1. The simulation procedure is performed as a dry test, without using any fuel.

Figure 5-11: Vapor Recovery



Installing the Vapor Measuring Circuit

The following is a summary of the automatic adjustment process:

1. The automatic adjustment process, for one side of the dispenser and its fueling points is performed on a single nozzle valve.
2. Start with Side 1 with nozzle valve or hydraulic module 1 (see Figure 5-10 on page 54).
3. Attach the vapor measuring section to the nozzle valve. Refer to “Installing the Vapor Measuring Section” on page 56.
4. Perform the automatic adjustment process. Refer to “Automatic Compensation - Automatic Adjustment of Vapor Recovery” on page 58.
5. After the automatic adjustment procedure, perform a test simulation. Refer to “Simulation” on page 59.

   This simulation is performed with all nozzle valves. Start with the nozzle valve on which the auto-adjustment (Module 1) was carried out and then perform the simulation with the remaining nozzle valves on Side 1.

6 Repeat steps 1 to 5 (on page 55) for Side 2.

Equipment for the vapor measuring section:
- One dry gas meter with pulse generator
- One vapor flow meter with adapter and air hose DN 10
- One hand-held service terminal FB1

Installing the Vapor Measuring Section

To install the vapor measuring section, proceed as follows:

1 Connect the hand-held service terminal FB1 to the service plug of the VRC 390/2 (see Figure 5-12 on page 57).

2 Connect the air tube to the suction side of the dry gas meter and the vapor flow meter and place the gas meter firmly on the ground.

3 Connect the impulse cable to the hand-held service terminal FB1.

4 Take the nozzle valve off the dispenser.

5 Place the flow meter adapter over the outlet pipe and vapor suction device of the nozzle (see Figure 5-12 on page 57). Ensure that it is properly sealed. The rubber sleeve must be greased for better handling and sealing.

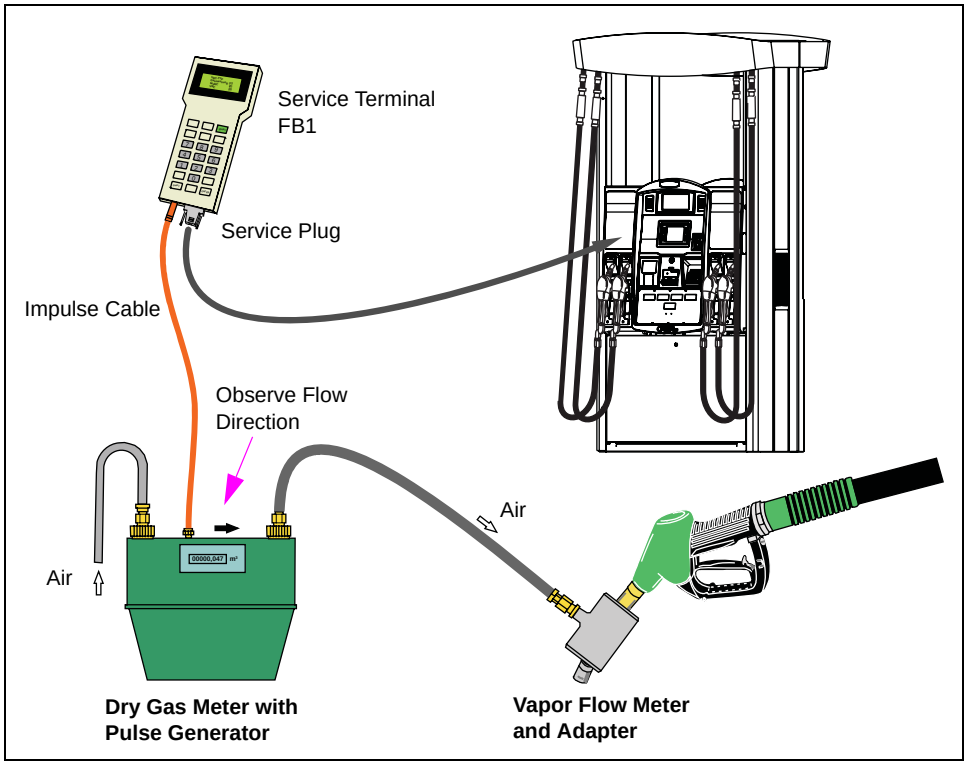
IMPORTANT INFORMATION

In order to activate the open/close valve type ZVA X200–GRV3 for auto adjustment, the nozzle must face downwards. With the vapor suction pump switched off, the open/close valve opens automatically. If the vapor pump is switched on and a high volume of vacuum has been built up, it may be required to give it a slight shake in order to activate the open/close valve. A key which was required for the previous nozzle type GRV, is not required with this type ZVA X200-GRV3.

The vapor pump starts only in combination with the pump engine. Therefore the pump must be set to standalone fuelling mode, before the Vapor Recovery adjustment starts. The vapor pump is controlled by the VRC 390/2. The rotational speed of the pump is constant. As soon as the start menu is shown in the display of the FB1, the automatic compensation is completed for this MPD lane side.

The hand terminal FB1 is directly connected to the VRC 390/2. The power supply of the pump does not have to be interrupted. The fuel pump is put into operation, after the nozzle has been taken off. The gas pump is driven by the link belt.

Figure 5-12: Setup for Vapor Measuring Section and Automatic Adjustment



Service Terminal FB1 - Operation

The service terminal FB1 is equipped with an operator control. The functions are displayed one after the other on the display, corresponding to the respective programme selected. For summary of functions, see Figure 5-13 on page 61.

When using the FB1, you must follow the display indicators and select the appropriate key for each function as required.

Key allocation: START = switching the FB1 on and off

SHIFT = call back the last display (press once) and return to starting menu (press several times)

ENTER = confirmation of an entry

Automatic Compensation - Automatic Adjustment of Vapor Recovery

1 Press **Start** to start the FB1. The following menu appears:

**** * * Service * * ****

Gas measuring ***(1)*** = Volume measurement

SYS Identification ***(2)*** = Recognition of the system connected (MC-VRC, VRC)

EC 2000 ***(3)*** = Service of the price calculation system EC 2000

2 Press **2** for recognition of the system that is connected. If the system connected is not recognized by FB1, the following menu appears:

* **** * Please select * * ****

MVRC ***(1)*** = Vapor return with control MC-VRC125 and piston pump GR125

VRC ***(2)*** = Vapor return with control VRC, piston pump ASF or Dürr and proportional magnetic valves

3 Press **1** to select the type of vapor return.

Service ***(1)*** = Malfunction indicator

Parameters ***(2)*** = Gain/offset

Auto calib. ***(3)*** = Auto calibration (adjustment)

Simulation ***(4)*** = Simulation for the purpose of testing and recording the measurement results of all filling points individually.

4 Press **3** to select Auto Calib. option in the above menu. The following menu appears:

**** * * Select side * * ****

Side 1 ***(1)*** = MPD lane side 1

Side 2 ***(2)*** = MPD lane side 2

As soon as the start menu is shown in the display of the service terminal FB1, the automatic compensation is completed for all filling points on this MPD lane side.

5 Press **1** or **2** to select the corresponding MPD lane side.

6 Press **Shift** thrice to reset the FB1 to the start menu.

Simulation

The simulation is carried out individually for each fueling point for the purpose of checking and recording the measurement results. To avoid unnecessary overheating of the pump that could lead to a power loss, complete the auto calibration quickly.

1 Start with the nozzle used in the previously carried out auto calibration.

2 Start the service terminal FB1, perform steps 1 to 5 of "Automatic Compensation - Automatic Adjustment of Vapor Recovery" on page 58.

Service ***(1)*** = Malfunction indicator

Parameter ***(2)*** = Gain/offset

Auto calib. ***(3)*** = Automatic compensation (adjustment)

Simulation ***(4)*** = Simulation for the purpose of checking and recording the measurement results of all filling points, individually

3 Press **4** to select Simulation.

4 Press **1** or **2** to select the corresponding MPD lane side.

**** * * Select side * * ****

Side 1 ***(1)*** = MPD lane side 1

Side 2 ***(2)*** = MPD lane side 2

5 Select the output for the fuel pump block.

Note: If the output of the fuel pump block is not known, it can be determined during a normal fueling up process using the service terminal FB1 connected to the VRC 390/2.

**** * * Simulation * * ****

Max. 45 L/min ***(1)*** = Largest output of the fuel pump block

Min. 40 L/min ***(2)*** = With reduced output of the fuel pump block

Free input ***(3)*** = Measured output (max.55 L/min); confirm with ENTER

The following information appears (for example with 40 L/min output of the fuel pump block):

**** * * Input Volume * * ****

Rate ***110%*** = Vapor return rate (refer to the following explanation)

Set ***40 L/min*** = Simulated fuel output

cur ***44 L/min*** = Vapor return (refer to the following explanation)

With the above mentioned result, that in the simulation procedure with air, the flow ratio (rate) HC/air = 1/1, 10 = is 110%, indicates that the simulated fuel output of 40 L/min produces an cur air flow of about 40 L/min. With the permitted tolerance of +/- 5%, the result for air may lie between 42 L/min and 46 L/min or 95% and 105% approximately.

6 Enter the current result in the acceptance protocol.

7 Press **Shift** twice to reset FB1, or thrice in the case of Free input, back to the start menu.

8 Change to the nozzle at the next filling point.

Troubleshooting

Current result is too high: Auto calibration and/or simulation is defective or control VRC 390/2 is faulty. Repeat auto calibration and simulation. With repeated result, change the VRC 390/2 control.

Current result is too low: Suction pipeline leak. Check the pipeline system. Perform visual and auditory inspection of the pipe screw joints. If the inspection does not result in anything, carry out a pressure check with 1-bar. Check the nozzle, delivery hose, ZAF and appropriate pipes for passage.

Output of the vapor pump is too small: Check the output directly on the vapor pump with FB1, without suction and pressure lines. Select Free input 55 L/min. The output must be around 52 L/min in this test, but must not be substantially less than 50 L/min.

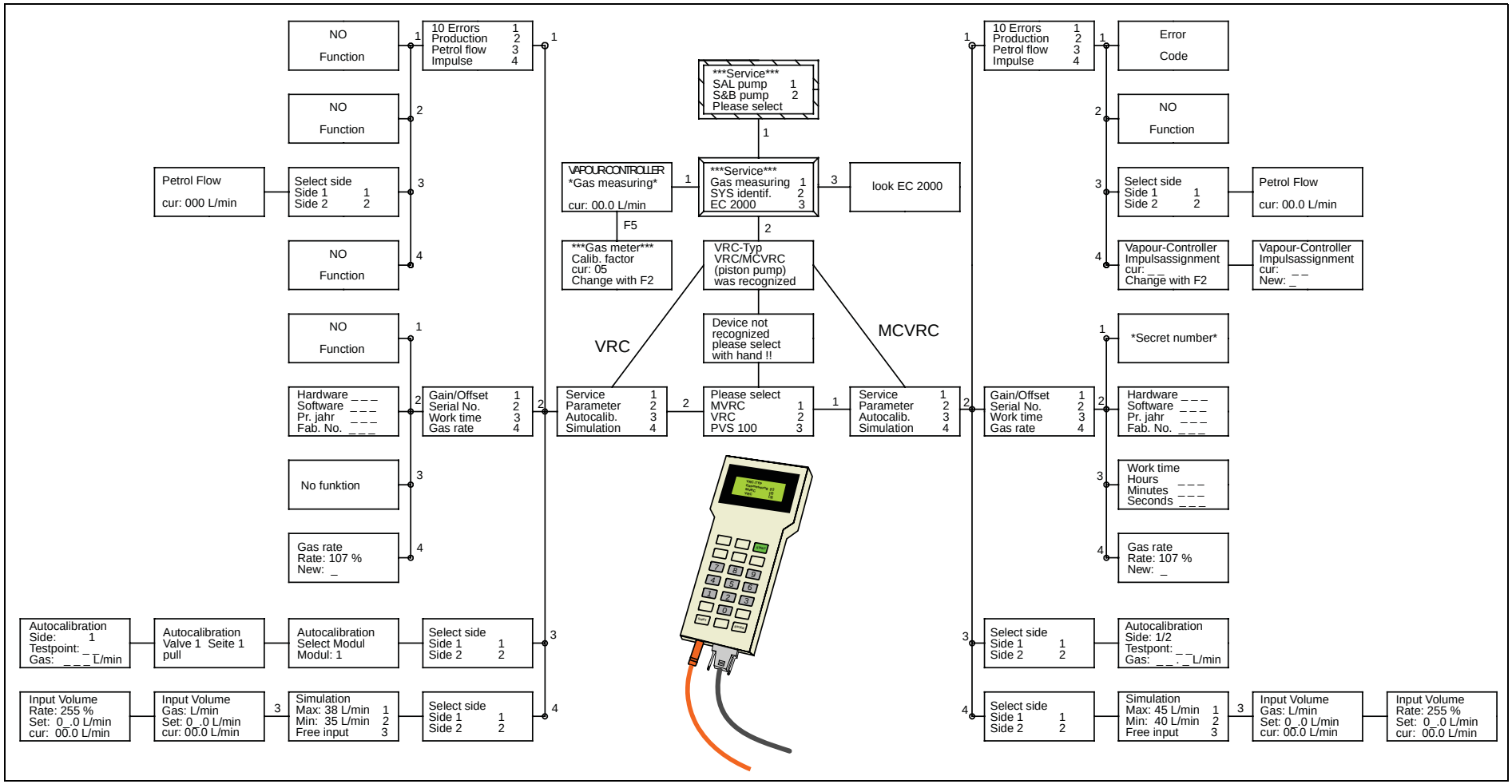
Otherwise, the flame filters are to be checked for soiling by dirt and moisture and, if required, to be cleaned with white spirit/benzene. After cleaning, check the output again directly on the vapor pump. If the maximum pump output is still insufficient, replace the pump.

There is no recognized guarantee for exchanging vapor pumps if the defect is the soiling of the flame filter.

The flow rate of the fuel pump must be set to 38 L/min.

Service Terminal FB1 - General Overview of Vapor Recovery

Figure 5-13: Overview of Vapor Recovery



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Appendix A: Horizon Error Codes

Following are the severity descriptions for the Horizon with Split Software (with E101) Error Codes for 26.04.1.27 or later and 27.04.1.32 or later.

Minor: A minor error does not affect the operation of the dispenser. The occurrence is logged in the relevant log file and operation continues as normal.

Medium: A medium error only affects the use of one grade or nozzle for one fueling position. This type of error clears itself at the start of a new transaction. All other grades or nozzles on a fuelling position can continue to be used the same fuelling position.

Major: A major error only affects one fuelling position. All grades or nozzles will be unavailable on the fuelling position after a major error has occurred. All other fuelling positions will be unaffected. To clear a major error, the entire pump or dispenser must be restarted.

Supermajor: A supermajor error affects an entire pump or dispenser. To clear a supermajor error, the entire pump or dispenser must be restarted.

Error Code	Description	Severity	Solution
E1	W and M RAM database corrupted	Supermajor	Contact technical support
E2	Application RAM database corrupted	Supermajor	Restart with F1/F2 on Manager Keypad
E4	One or more tasks not started	Supermajor	Contact technical support
E5	Coldstart with Manager Keypad (CC59, FC1)	Supermajor	Information only, restart with F1/F2 on Manager Keypad
E6	NV data mismatch	Supermajor	Contact technical support
E7	NV data download error	Supermajor	Contact technical support
E8	Database not compatible with previous version	Supermajor	Contact technical support
E9	Hardware Coldstart	Supermajor	Contact technical support
16	Preset Underrun	Medium	Information only
20	Pulser disconnected/SIP magnet dropout	Medium	Contact technical support
26	Invalid calibration factor	Medium	Contact technical support
29	“Valve Stuck”/Initial dispenser or maximum no flow time-out	Medium	Dispenser time-out has occurred
32	Maximum authorize time expired/maximum fill time expired	Medium	Information only
33	Stop button activated	Medium	Information only
34	RAM battery status bad	Major	Contact technical support
44	Pump handle ON at power up	Medium	Information only, lower pump handle or return nozzle
46	Minimum preset limit	Medium	Information only, preset from POS or from keypad is too small
50	POS communications lost (disconnected)	Medium	Contact technical support

Error Code	Description	Severity	Solution
51	POS communications established (reconnected)	Medium	Information only
58	Communication battery backup status low	Medium	Contact technical support
99	BOSS: W and M database CRC incorrect	Supermajor	Contact technical support
100	BOSS: Application Flash Hash invalid	Supermajor	Contact technical support
101	BOSS: W and M Application Flash Hash invalid	Supermajor	Contact technical support
4322	Valve board not connected	Medium	Contact technical support
5047	SIP/IS Pulser: Reverse flow detected	Medium	Contact technical support
5049	Unauthorized flow detected	Medium	Contact technical support
5050	SIP/IS Pulser: Invalid pulser/pulser pattern invalid	Medium	Contact technical support
5054	SIP pulser calibration switch open	Medium	Close SIP calibration switch
5055	W and M/ECAL board switch open	Medium	Close switch on the ECAL
5056	Main W and M security switch open	Medium	Close switch on the E101 CPU board
5065	STP board 1 disconnected	Medium	Contact technical support
5074	Vapor Recovery motor not responding	Medium	Contact technical support
5080	Air sensor connected but option disabled	Medium	Contact technical support
5081	Air sensor not connected but option enabled	Medium	Contact technical support
5088	IFSF board not connected but option enabled	Supermajor	Contact technical support
5089	IFSF board errors	Medium	Contact technical support
5091	ATC configured but no communication to ATC hub(s)	Supermajor	Contact technical support
5092	ATC hub detected but ATC is not enabled	Major	Contact technical support
5099	Number of probes exceeds the number of ATC grades	Minor	Contact technical support
5100	Number of ATC grades exceeds the number of active ATC probes	Medium	Contact technical support
5104	Abnormal system end during transaction	Minor	Contact technical support
5111	Display board communication failure	Major	Contact technical support
5118	PPU board communication failure	Medium	Contact technical support
5120	Fiscal printer release lost	Medium	Check fiscal printer
5122	PPU board grade select button stuck	Major	Contact technical support
5124	Density, transaction or preset display communications failure	Medium	Contact technical support
5130	Display board errors	Major	Contact technical support
5131	PPP keypad option set but not present	Medium	Contact technical support
5134	Density display communication failure	Medium	Contact technical support
5135	Preset display communication failure	Medium	Contact technical support
5136	Transaction display communication failure	Medium	Contact technical support
5137	Stop button not detected but option enabled	Major	Contact technical support
5139	Stop button stuck	Major	Contact technical support
5140	Push to start not detected but option enabled	Supermajor	Contact technical support
5142	Push to start button stuck	Major	Contact technical support
5183	Totalizer present but no return pulse detected	Medium	Contact technical support
5211	Satellite display communications failure	Major	Contact technical support
5230	Totalizer CRC per nozzle corrupted	Medium	Contact technical support
5411	Vapor Recovery maximum recovery volume exceeded	Medium	Contact technical support

Error Code	Description	Severity	Solution
5413	Zero price on PPU	Medium	Set prices from POS or use Command Code 20
5600	Fuel density not set with VRC or ATC enabled	Supermajor	Contact technical support
5601	ATC temperature reading out of range	Medium	Contact technical support
5603	Display board software version error/version changed	Major	Contact technical support
5604	ATC probe short circuit	Medium	Contact technical support
5700	Multiwire interface communications failure	Major	Contact technical support
5701	Multiwire interface unconfigured	Major	Contact technical support
5702	Multiwire interface device error	Major	Contact technical support
5703	Multiwire interface cash pulses overrun	Medium	Contact technical support
5704	Multiwire interface volume pulses overrun	Medium	Contact technical support
6036	AAB/PIB not detected but tank low level sensor enabled	Major	Contact technical support
6037	Pump handle ON at power up and hose leak test not possible	Supermajor	Information only, lower pump handle or return nozzle
6039	Kiosk switch not connected but option enabled	Major	Contact technical support
6040	Vapor Recovery Board not connected but option enabled	Medium	Contact technical support
6041	Vapor Recovery motors not responding	Medium	Contact technical support
6042	Vapor Recovery monitoring system stop (Vaporix stop)	Medium	Contact technical support
6047	Vapor Recovery Board detected but option disabled	Supermajor	Contact technical support
6048	Vapor Recovery service terminal connected	Medium	Contact technical support
6058	Satellite hardware not detected but option enabled	Medium	Contact technical support
6081	Maximum flow rate exceeded	Medium	Contact technical support
6082	High speed pulser out of range	Medium	Contact technical support
6084	Nozzle leak test failed	Medium	Contact technical support
6086	New software version detected	Supermajor	Contact technical support
6087	APP: Incompatible W and M software version	Major	Contact technical support
6088	SIP/IS Pulser: Communications lost with pulser device	Medium	Contact technical support
6089	SIP/IS Pulser: Pulser enable state error	Medium	Contact technical support
6090	SIP/IS Pulser: Too many pulsers enabled	Medium	Contact technical support
7108	BOSS: APP not polling ECAL board	Major	Contact technical support
8022	SIP Pulser: Encryption Failure ON enable	Medium	Contact technical support
8023	SIP Pulser: Encryption Failure ON disable	Medium	Contact technical support
8024	SIP/IS command mismatch	Medium	Contact technical support
8025	SIP Serial Number mismatch	Medium	Contact technical support
8026	SIP configured for by not detected	Medium	Contact technical support
8027	SIP device busy	Medium	Contact technical support
8122	Display proxy RAM allocation error	Major	Contact technical support
8123	Display proxy unknown board detected	Major	Contact technical support
9050	BOSS RAM runtime allocation error	Major	Contact technical support
9051	BOSS: Failure to create timer	Major	Contact technical support
9052	BOSS: Invalid callback used in constructor	Major	Contact technical support
9062	BOSS: Legal transaction response data in ATCL, PumaLan or Two-wire packet contains incorrect information.	Major	Contact technical support

Error Code	Description	Severity	Solution
9063	BOSS: Legal data in Two-wire special function response contains invalid information.	Major	Contact technical support
9064	BOSS: Legal data in ATCL, PumaLan or Two-wire pump totals response contains incorrect information.	Major	Contact technical support
9065	BOSS: IFSF data mismatch	Major	Contact technical support
9101	BOSS: Display update failed	Medium	Contact technical support
9102	BOSS: Display lamp test failed	Medium	Contact technical support
9103	BOSS: W and M ECAL board poll failure	Major	Contact technical support
9104	BOSS: Multiwire board poll failure	Major	Contact technical support
9120	BOSS: Display update failed	Medium	Contact technical support
9121	BOSS: Hydraulics access failed	Medium	Contact technical support
9122	BOSS: Transaction data sequence failed	Medium	Contact technical support
9123	BOSS: LPG nozzle time-out	Medium	Contact technical support
9124	BOSS: UHF/Satellite nozzle time-out	Medium	Contact technical support
9126	BOSS: Transaction sequence number mismatch	Medium	Contact technical support
9127	BOSS: Application not polling hydraulics interface board	Medium	Contact technical support

Appendix B: Horizon Ex Components and Certificates

Component	Manufacturer	Part Number	Certificate Number	Marking Label
Motor Three-phase	Sida	YBB 1311E /YBB 1511E	Nemko 05ATEX1125	II 2 G Ex d IIB T3
Motor Single-phase	Sida	YBB 3241E/3341E/3441E	Nemko 05ATEX1375	II 2 G Ex d IIB T4
Motor	Rael	AD-PE V80 / AD-PE V90	CESI 03ATEX023X	II 2 G EEx d IIB T3
Junction Box	Stahl	Type 8146	PTB01ATEX1016	II 2 G EEx edm ia/ib IIC/IIB/IIA/T6/T5/T4
Junction Box	Stahl	Type 8118	PTB 99ATEX3103	II 2 G EExeIIT6/T5
Junction Box	Stahl	Type 8102	PTB 01ATEX1136	II 2 G EEx e ia/ib II/IA/IIB/IIC/T6/T5
Terminal	Wago	Topjob 2001	PTB 05ATEX1094U	II 2 G Ex e II
Terminal	Wago	Topjob 2002	PTB 03ATEX1162U	II 2 G Ex e II
Solenoid	Chunhui	DV1060P	SIRA 07ATEX5107X	II 2 G Ex mb IICT3
Solenoid	Parker	HZ	LCIE 02ATEX6022X	II 2 G EEx m II T4
Pulser Ecometer	Eltomatic	ME 01-04	TUeV 05ATEX2905X	II 2 G EEx ia IIB T6
Pulser IS	Gilbarco	M03127	SIRA 05ATEX2313X	II 2 G Ex ib IIB T4 Gb
IS Interface	Gilbarco	M06202	SIRA 05ATEX2311X	II 2 G Ex ib GB IIB
IS Hub	Gilbarco	M06205	SIRA 05ATEX2312X	II 2 G Ex ib IIB T4 Gb
ATC Hub	Gilbarco	M07876	SIRA 08ATEX2009X	II 2 G Ex ia IIB T4
Vapor Pump + Motor Assembly	Dürr	MEX 0544	PTB 04ATEX4002	II 1/2G IIA T3 - II G IIA
Vapor Recovery:				
Motor (VR)	Rael	AD90	INERIS 08ATEX0019X	II 2 G Ex d IIBT3
Motor (VR)	Sida	YBB 702/703/704/712/ 713/714	LCIE 07ATEX6052	II 2 G EEx d IIB T3
Solenoid (VR)	Burkert	641/2832/6022/6013	PTB 03ATEX5014X	II 1/2 G EEx m II T3
Pulser VFM	Eltomatic	ME 01-03	DEMKO 04ATEX137008X	II 2 G EEx mb IIB T6
Non-electrical Items:				
Vapor Flowmeter	Gilbarco	GE1	PTB 05ATEX4009	II 1/2G IIA dm T4

Horizon Ex Fuses

Component	Manufacturer	Part Number	Current	Voltage	Break Capacity
Motor Three-phase	Sida	YBB 1311E /YBB 1511E	T2 A	250 V	1500 A
Motor Single-phase	Sida	YBB 3241E/3341E/3441E	T10 A	250 V	1500 A
Motor	Rael	AD-PE V80 / AD-PE V90	T2 A	250 V	1500 A
Solenoid	Chunhui	DV1060P	T630 mA	250 V	1500 A
Solenoid	Parker	HZ	T630 mA	250 V	1500 A
Pulser Ecometer	Eltomatic	ME 01-04	T100 mA	250 V	35 A
Pulser IS	Gilbarco	M03127	T100 mA	250 V	35 A
IS Interface	Gilbarco	M06202	T100 mA	250 V	35 A
IS Hub	Gilbarco	M06205	T100 mA	250 V	35 A
ATC hub	Gilbarco	M07876	T100 mA	250 V	35 A
Vapor Recovery:					
Motor (VR)	Rael	AD90	T1 A	250 V	1500 A
Motor (VR)	Sida	YBB 702/703/704/712/713/714	T1 A	250 V	1500 A
Solenoid (VR)	Burkert	641/2832/6022/6013	T315 mA	250 V	1500 A
Pulser VFM	Eltomatic	ME 01-03	63 mA	250 V	1500 A

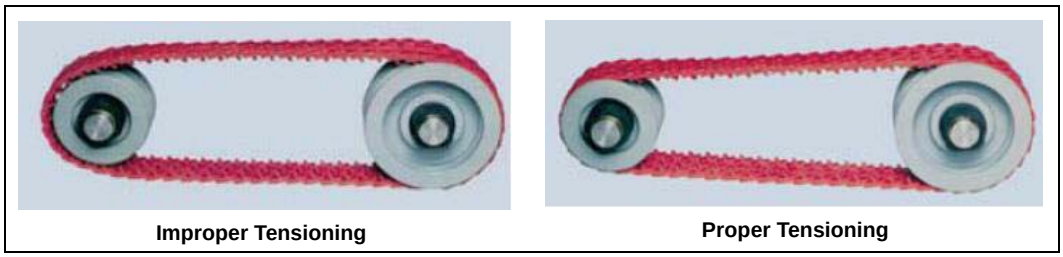
Appendix C: Anti-static Link Drive Belt Adjustment

Standard force deflection tensioning methods do not apply to the Link Drive belts on Horizon. Link belt tensioning is predetermined by the manufacturer.

A properly fitted link belt is properly tensioned.

IMPORTANT INFORMATION
Anti-static V-belt is blue in color. The red colored V-belts shown in this document are samples only.

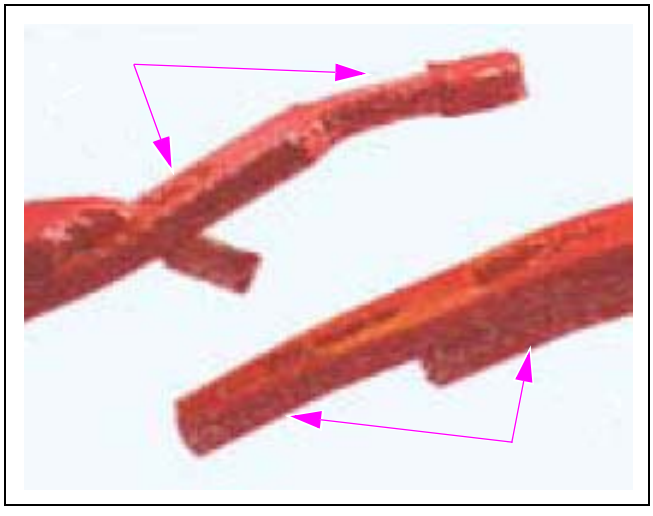
Figure C-1: Proper and Improper Tensioning



Measuring the V-belt

Pull the V-belt tight around pulleys to check the hand tight length overlapping the last two tabs with two holes in matching links as shown in Figure C-2. Count the number of links and remove one link for every 24 sections. This gives the correct installed V-belt length and ensure the optimum belt tension when running.

Figure C-2: Measuring the V-belt

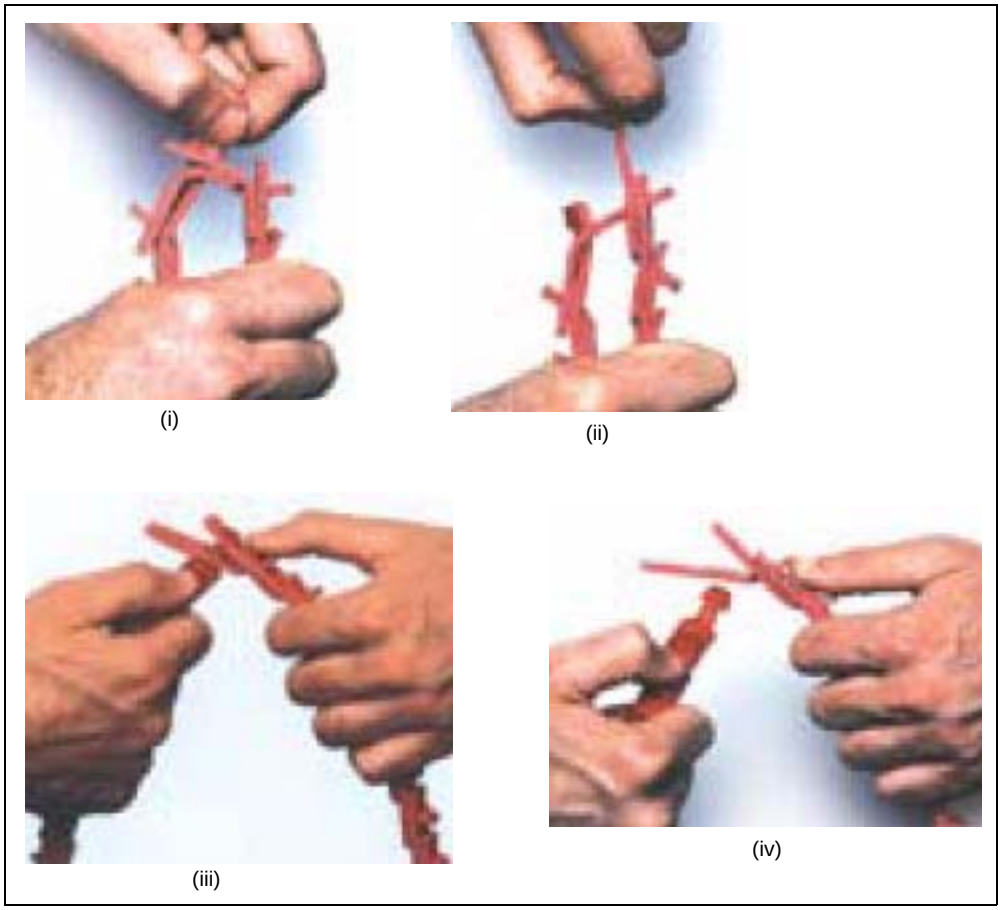


Disassembling the V-belt

To disassemble the V-belt, proceed as follows:

1 Hold the V-belt upside down. Bend back as far as possible by holding with one hand. Twist one tab, 90° parallel to the slot.

Figure C-3: Disassembling the V-belt



2 Pull the end of a link over the tab.

3 Rotate the belt end with the tab at 90°.

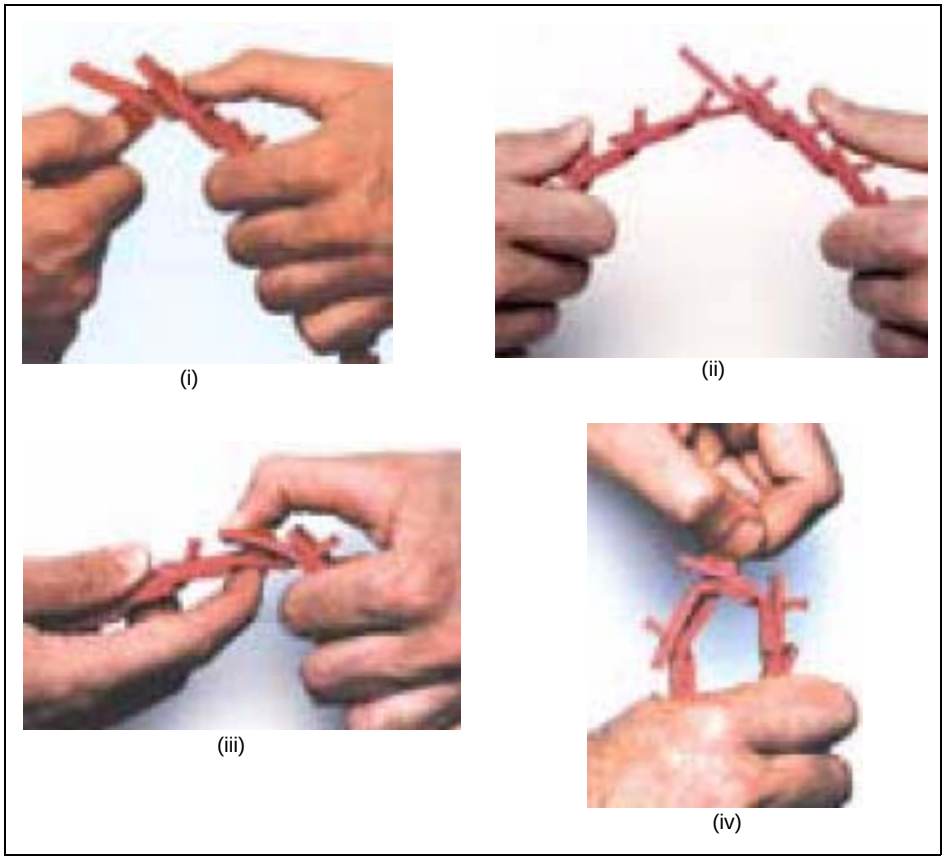
4 Pull the belt end through two links.

Assembling the V-belt

To assemble the V-belt, proceed as follows:

1 Hold the belt with tabs pointing outward.

Figure C-4: Assembling the V-belt



2 Place end tab through two links at once.

3 Flex the belt further and insert the second tab through the end link by twisting the tab with thumb.

4 Ensure that the tab returns to position across belt. Reverse the belt so tabs run inside.

Note: To ensure easy assembly and disassembly, turn the belt inside out as shown in Figure C-3 on page C-2 and Figure C-4.

Installing the V-belt

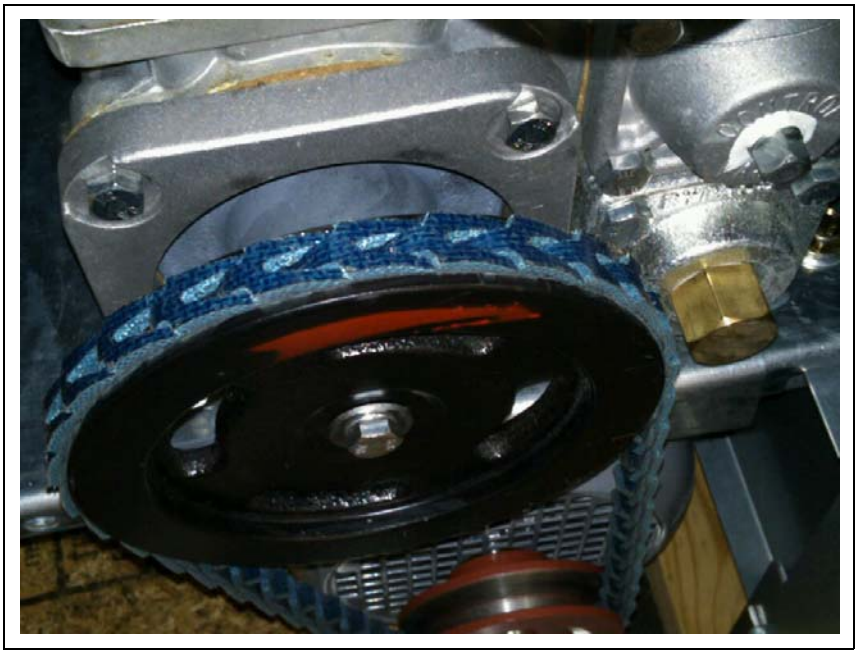
To install the V-belt, proceed as follows:

1 Before installing the V-belt, turn the belt with tabs facing inside.

2 Determine the direction of the drive rotation.

3 Align the belt with the drive rotation as shown in Figure C-5.

Figure C-5: Aligning the V-belt

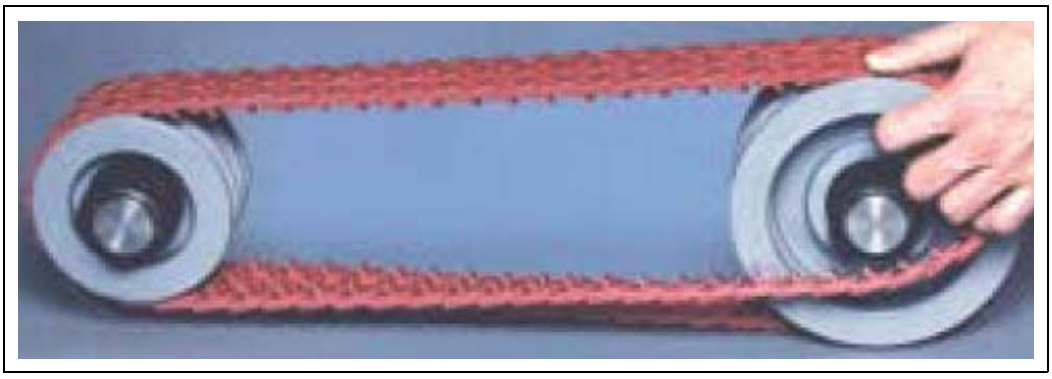


4 Install the belt in the nearest groove of the smaller pulley.

5 Turn the drive slowly, and roll the belt onto the larger pulley (see Figure C-6). The belt may seem very tight. Do not jog motor.

6 Verify if all the tabs are in their correct position and are not twisted out of alignment.

Figure C-6: Installing the V-belt



Retensioning the V-belt

Like all high performance V-belts, PowerTwist Plus® V-belts require the maintenance of correct drive tension to operate efficiently. Drive tension must be checked after operating the unit for 24 hours at full load. A retension may be required depending on the severity of the drive. Any initial belt stretch is then taken up. Subsequently, belt tension must be checked periodically and adjusted when required.

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Glossary

A

Allocation Volume
The maximum amount of product the unit will dispense, if programmed.

Alternative Fuels
Any fuel other than straight gasoline, diesel fuel, or kerosene. Alternative fuels containing ethanol, methanol, MTBE, Biodiesel, and other potential significant additives.

ATEX (ATmosphères **EX**plosibles**) (European Safety Directive, French)**
EU directive describing what equipment and work environment is allowed in an environment with an explosive atmosphere.

Authorized Service Contractor (ASC)
A Gilbarco-trained and authorized service contractor.

B

Bellows
Refer to “Vapor Recovery Boots” on Glossary-6.

Boot Area
The part of the unit where the nozzle is stored.

Breakaway
Device attached to the hoses on pump/dispensers that detaches if a customer drives off with the nozzle still attached to the cars; the device protects against gasoline being spilled and a resulting fire, and it minimizes damage to the pump/dispensers in the event of a drive off and stops fuel flow through the separated hose.

C

CIM
Customer Interface Module; the portion of the electronics through which the dispenser interfaces with the customer (for example, displays, and card readers).

CIM Door
CIM Door is the unit that provides access to the Manager’s Keypad and some electrical components of the unit.

Command Code
Two-digit number used in programming the unit; this code indicates which setting to configure.

Component Inspections
Periodic inspections of various unit components performed by the Station Manager; the Station Manager must look for signs of damage and wear for each component.

Note: For a list of components and the recommended frequency of inspection, refer to "Component Inspections" on page 37.

Console
A system (such as the G-SITE system) that is located inside the store and controls unit operation.

Console Mode
Refer to "Two-wire Mode" on Glossary-6.

Couplings
Plumbing used to join pipes or hoses together. Refer to "Breakaway" on Glossary-1.

Cradle
Refer to "Boot Area" on Glossary-1.

CRIND (Card Reader IN Dispenser) Device
A device that reads the magnetic code on a debit or credit card; located inside the unit.

Customer Specified Contractor (CSC)
Contractor selected by customer.

D

Date Code
Two-letter code that is stamped on the Horizon unit before the serial number; shows the month and year of manufacture.

Diesel Exhaust Fluid (DEF)
It is a clear, colorless, non-toxic, non-flammable, non-combustible liquid. It is made up of 32.5% urea with the balance distilled or deionized water. Urea and water are completely miscible and do not separate in storage. DEF is mildly corrosive.

Dispenser
A device that uses an STP in the storage tank to move fuel from the storage tank.

Display, Main
Refer to "Main Display" on Glossary-4.

Displaying Last Transaction (DLT)
After a power failure, procedure for displaying the last transaction at a unit that occurred before the unit lost power; automatic with the LCD main display.

Drive Offs
Situations where customers forget to remove the nozzles from the tanks in their cars and drive away from the unit; the hose detaches from the unit at the breakaway.

E

Ethernet
A local area network technology that provides communication between the unit and the pump controller.

Error Codes
Codes that appear on the main display when an error occurs; these codes are useful to ASCs in diagnosing any problems with the unit. For a list of Horizon Error Codes, refer to "Appendix C: Anti-static Link Drive Belt Adjustment" on page C-1.

F

Function Codes
When programming a unit, two-digit numbers used to indicate which setting to configure.

G

General Inspections
Weekly inspections of all of units on the site performed by the Station Manager; the Station Manager must ensure that all units are operating properly, that no warning labels are missing, and that there is no evidence of damage or sharp edges.

Grade
Level of fuel, such as unleaded or premium.

Graphite Lubricant
Type of lubricant used on the door locks of units.

H

Hose Outlet Castings
Fuel discharge port on the unit where the hose is attached to the unit.

Hose Retriever
Device (option) at the unit that retracts and pulls the hose close to the unit after the customer has completed fueling.

Hydraulic Connections
Any fuel-handling hardware where castings, hoses, and pipes are joined through threads, O-rings, or other seals.

I

IFSF
International Forecourt Standards Forum; forum of international oil companies with the common objective of harmonizing equipment inter connectivity and communication standards for use in the petroleum retail business.

Inspections
Refer to "Component Inspections" on Glossary-2 and "General Inspections".

J

Junction Box
The explosion-proof box on the unit that contains the main electrical connections between the unit and the main power and data source.

L

Liquid Crystal Display (LCD)
The alphanumeric display on the Main Display.

Lock Oil
Type of lubricant used on the door locks of units.

LON
Local Operating Network.

M

Main Display
LED display on the front of the unit that shows various information about the unit, such as the following:

- Programming options
- Selected grade and price for the current transaction

Manager's Keypad
An input device consisting of a separate grid of numerical and function keys arranged for efficient data entry; located behind the locked CIM door on the unit.

Meter
Device in the unit that measures fuel flow.

MOC CRIND Device
System that uses a single data loop to communication through the Gilbarco POS system to both CRIND devices and the unit.

Mode of Operation
Refer to "Operation Mode" on Glossary-5.

N

Nameplate
Mounted on Side 1 of the Horizon Unit.

National Fire Protection Association (NFPA)
An international nonprofit organization dedicated to protecting lives and property from the hazards of fire; publishes 280 recognized codes and standards, including the *National Electrical Code.*

Nozzle
On the unit, the projecting part at the end of the hose that regulates and directs the flow of fuel.

Nozzle Hook
In the boot area on the unit; place upon which the nozzle rests when the unit is not in use.

O

Operation Mode
Configuration of the unit that determines whether authorization and payout occurs at the console (Two-wire mode) or at the unit (standalone mode).

Oven Door
Oven door on the unit that provides access to the Manager's Keypad and some electrical components of the unit.

P

Personal Identification Number (PIN)
Password used by the Station Manager to program the unit; different PINS are used for different levels of programming.

Price Per Unit (PPU)
The price of each unit of gasoline dispensed.

Programmable Pump Preset (PPP)
Feature that allows customers or attendants to preset the dollar or volume amount of a transaction before fueling.

Programming Commands
Programming commands used to configure settings on the unit; most commonly configured on site by the station owner or operator.

Pump
A device that uses a self-contained pumping unit and motor to move fuel from the storage tank.

Pump Controller
Refer to "Console" on Glossary-2.

Pump Pulleys
Ordinary pulley wheels used on self-contained suction pumps and motors.

S

Seals
Substances used to prevent seepage of gasoline or vapor from the unit.

Shear Valves
Device at the base of all dispensers and some pumps that shuts off the fuel flow in case of a vehicle impact or fire at the base of the unit.

Silicone Grease
Type of lubricant used on the nozzle hooks and shafts of units.

Standalone Mode
Authorization and payout occur at the pump.

Submersible Turbine Pump (STP)
Submersible turbine pump in Underground Storage Tank (UST).

Swivels
A fastening that permits the free turning of attached parts to the unit.

T

Two-wire Mode
A communication mode with the unit where authorization and payout occur at the console.

V

Vapor Hoses
Multi-wall hoses that reduces the amount of fuel vapor that escapes into the atmosphere when a customer is dispensing fuel.

Vapor Recovery
Process of capturing emissions and returning them to an underground storage tank, reducing the amount of volatile organic compounds emitted into the atmosphere.

Vapor Recovery Boots
Device inside the nozzle that reduces the amount of fuel vapor that escapes into the atmosphere when a customer is dispensing fuel.

Index

7300 West Friendly Avenue · Post Office Box 22087
Greensboro, North Carolina 27420
Phone (336) 547-5000 · http://www.gilbarco.com
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