

## Introduction

### Purpose

This manual provides instructions for replacing the Piston Diaphragm Assembly in the Digital Valve unit. Digital Valves are used in several models, including Encore®, Eclipse®, and The Advantage® Series units.

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### Required Tools and Materials

Following tools and materials are required to replace the Piston Diaphragm Assembly in the Digital Valve unit.

- Approved Absorbent Material
- Approved Containers for Catching Fuel
- Channel Lock Pliers
- Needle Nose Pliers
- Screwdrivers, Flat-blade, assorted sizes
- Socket Set 3/8-inch Drive, US
- Wrench Set, US

### Parts List

Following table lists the parts included in the Digital Valve Piston Replacement Kit.

*Note: Order one kit per Digital Valve.*

Item	Description	Supplier's Kit Number VP2-1148	Quantity
1	Diaphragm Piston Assembly	VP2-1075-2	1
2	Diaphragm Retainer	VR2-1010	1
3	Label	Supplier Label	-
4	O-ring	V12-0292-2	1

## Related Documents

Document Number	Title	GOLD Library
MDE-2530	Pump and Dispenser Installation Manual	Advantage & Legacy® Models
MDE-2531	Start-up and Service Manual For The Advantage Series	Pump & Dispenser Start-up & Service Manual
MDE-3804	Encore & Eclipse Start-up and Service Manual	Encore and Eclipse
MDE-3985	Encore Installation Manual	Encore and Eclipse
PT-1728	The Advantage Illustrated Parts Manual	Parts Manual

## Abbreviations and Acronyms

Term	Description
ASC	Authorized Service Contractor
D-Box	Distribution Box
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Administration
STP	Submersible Turbine Pump

## Required Reading



Before installing this equipment, the installer must read, understand, and follow:

- This manual.
- NFPA 30A, The U.S. Automotive and Marine Service Station Code.
- NFPA 70, The U.S. National Electric Code.
- Applicable federal, state, and local codes and regulations.

Failure to do so may adversely affect the safe use and operation of the equipment.

*Note: To ensure warranty, this kit must be installed by a Gilbarco® Authorized Service Contractor (ASC).*

# Important Safety Information

**Notes:** 1) Save this Important Safety Information section in a readily accessible location.

2) 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).

 <b>WARNING</b>	
	The EMERGENCY STOP, ALL STOP, and PUMP STOP buttons at the cashier's station WILL 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 or call the Gilbarco Support Center at 1-800-800-7498. It is imperative to your safety and the safety of others to understand the procedures before beginning work.

## Follow the Regulations

Applicable information is available in National Fire Protection Association (NFPA) 30A; *Code for Motor Fuel Dispensing Facilities and Repair Garages*, NFPA 70; *National Electrical Code (NEC)*, Occupational Safety and Health Administration (OSHA) regulations and federal, state, and local codes. All these regulations must be followed. Failure to install, inspect, maintain, or service this equipment in accordance with these codes, regulations, and standards may lead to legal citations with penalties or affect the safe use and operation of the equipment.

## 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 lines.

## Important Safety Information

### 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. This information is available from the American Red Cross. Always advise the station personnel about where you will be working, and caution them not to activate power while you are working on the equipment. Use the OSHA Lockout/Tagout procedures. If you are not familiar with this requirement, refer to this information in the service manual and OSHA documentation.

### 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 OSHA Lockout/Tagout requirements. Station employees and service contractors need to understand and comply with this program completely to ensure safety while 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 needed 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 needed 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. Subpart S of 29 CFR Part 1910 - Electrical Hazards, 29 CFR Part 1910.333 contains specific Lockout/Tagout provision for electrical hazards.

## Important Safety Notice

 **WARNING**

 Working on hydraulic systems while power is applied **will create danger of fire and explosion**, and can result in **serious injury or death**.

 **All circuit breakers** for unit being worked on, all **dispensers** using same grades, and **all associated Submersible Turbine Pumps (STPs) MUST be turned OFF**.

## Before You Begin



- 1 Read all the instructions before beginning.
- 2 Follow all safety precautions.
- 3 Isolate unit at Distribution Box (D-Box).
- 4 Close and test all shear valves on dispensers only.
- 5 Turn off all power to unit including unit lights. Turn off all associated STP power. Use system circuit breakers. Multiple disconnects may be required.
- 6 Follow OSHA lockout/tagout requirements. For procedures, refer to *MDE-2531 Start-up and Service Manual for The Advantage Series* or *MDE-3804 Encore & Eclipse Start-up and Service Manual*.
- 7 Place nozzle(s) into an approved container to drain and bleed pressure. Some residual pressure may remain.
- 8 Position the approved container for catching fuel under the Digital Valve Assembly being serviced.

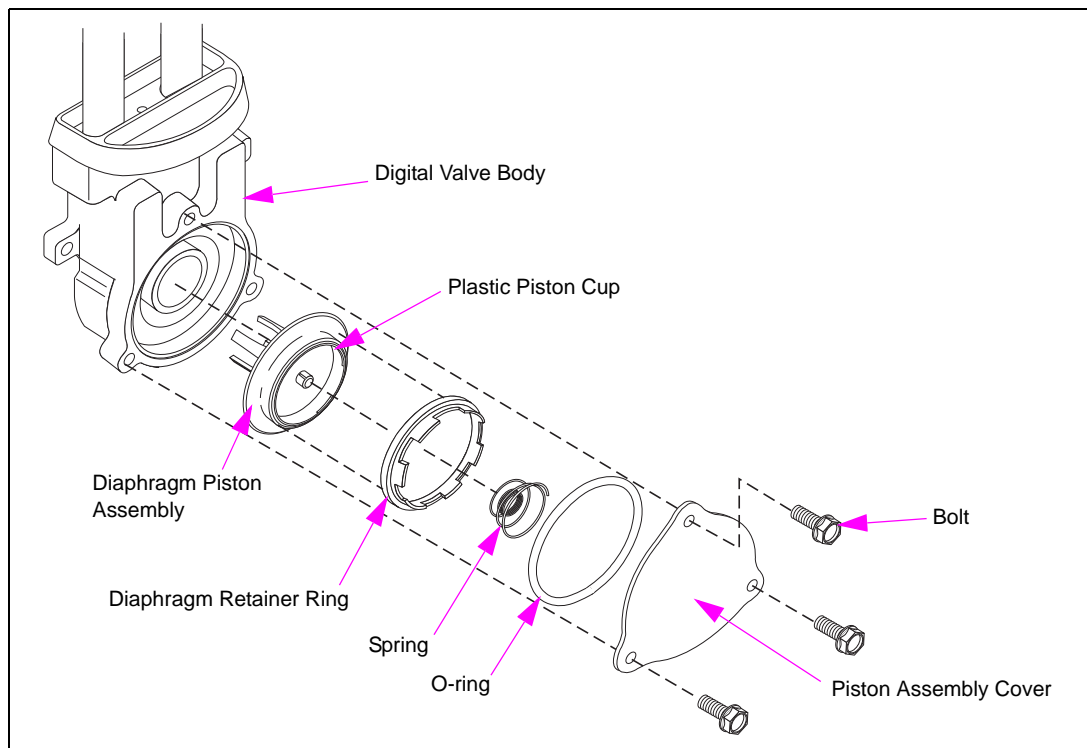
## Replacing Piston Diaphragm Assembly

To replace the Piston Diaphragm Assembly, proceed as follows:


### Removing Existing Piston Diaphragm Assembly


To remove the existing Piston Diaphragm Assembly, proceed as follows:

**Figure 1: Removing Existing Piston Diaphragm Assembly**



**⚠ WARNING**

 Residual pressure and entrapped fuel may still be present and may spray when removing parts.

 Fire and explosion could result in severe injury or death.

- Wear eye protection.
- Remove parts slowly. Catch fuel in approved containers.
- Clean up all spills promptly.

- 1 Use approved materials and practices in preparation of any residual fuel and pressure that may be in the valve.

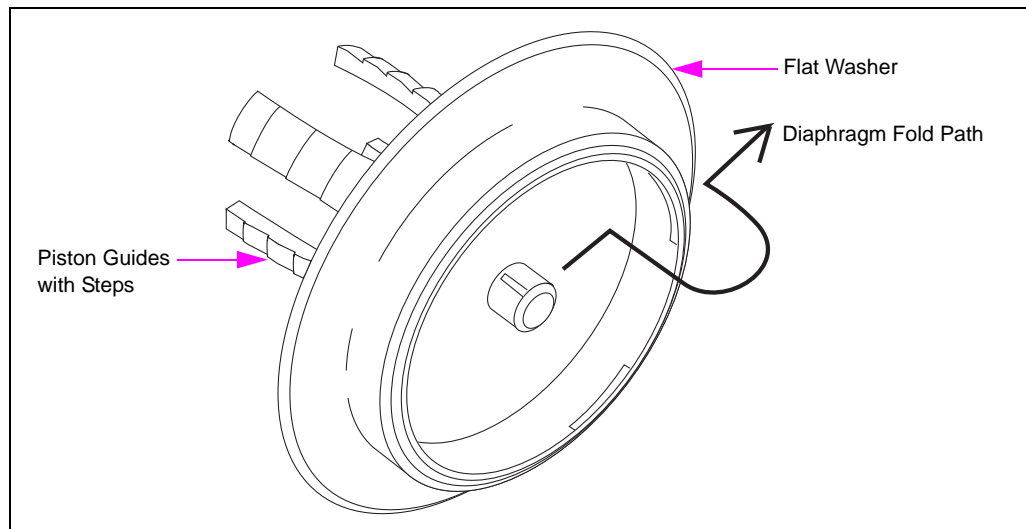
- 2 Slowly remove the three bolts from Piston Assembly Cover and remove the cover (see [Figure 1](#) on [page 6](#)). Retain the cover and bolts.  
*Note: Observe the fold of Diaphragm in the Digital Valve Body. Use this observation and the installation steps to correctly position the replacement Diaphragm Piston Assembly.*
- 3 Remove and discard the existing O-ring.
- 4 Remove and discard the spring from the center of the Diaphragm Piston Assembly. Spring is snapped onto the center stem of the Diaphragm Piston Assembly.
- 5 Remove and discard the Diaphragm Retainer Ring.  
*Note: Retainer ring is not threaded, it is pressed in place. Removal may require use of channel lock pliers and a screwdriver to pry the retainer ring loose. Use tools carefully to avoid damage to Digital Valve Body.*
- 6 Grasp outer edge of Plastic Piston Cup with needle nose pliers and pull to remove Diaphragm Piston Assembly (see [Figure 1](#) on [page 6](#)). Discard Diaphragm Piston Assembly.  
*Note: Suction within Digital Valve Body may cause resistance during removal.*

## Preparing Diaphragm

Occasionally, Diaphragm may arrive in an extended position. Use the following steps to ensure that Diaphragm is positioned correctly on the Piston Assembly before installation.

- 1 Use observation made in step 2 of “[Replacing Piston Diaphragm Assembly](#)” and [Figure 2](#) to determine the position of Diaphragm.
- 2 Gently roll Diaphragm over to follow path demonstrated in [Figure 2](#).

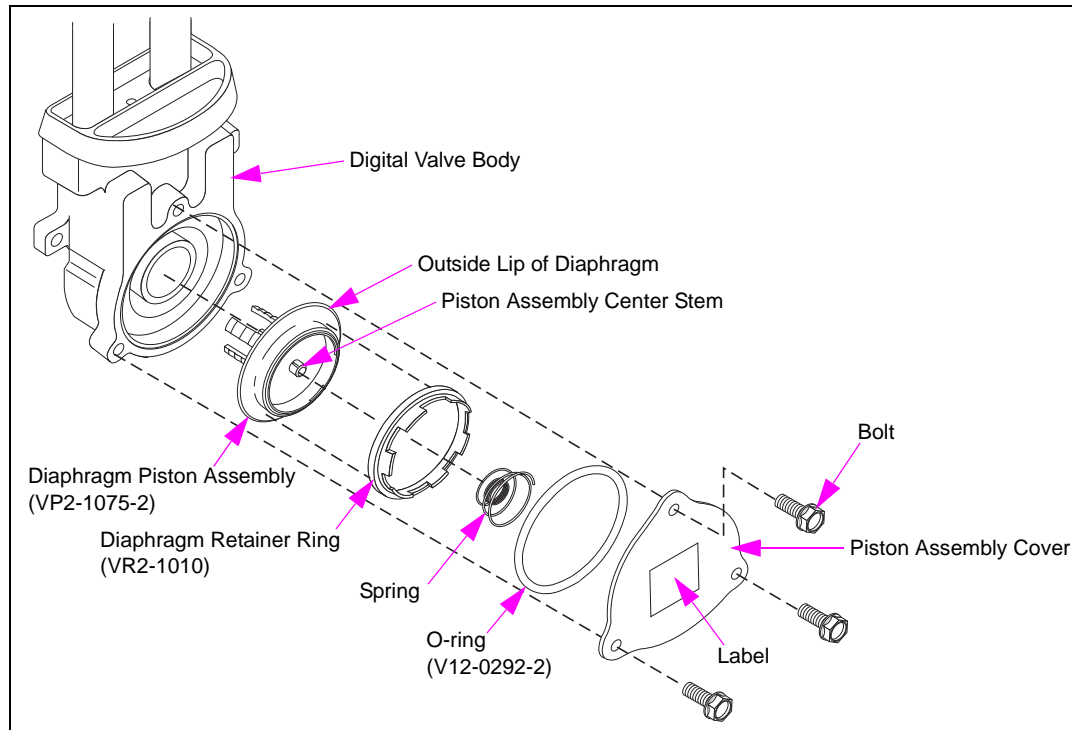
**Figure 2: Position of Diaphragm on Diaphragm Piston Assembly**



## Installing New Piston Diaphragm Assembly (VP2-1075-2)

To install the new Piston Diaphragm Assembly, proceed as follows:

**Figure 3: Installing New Piston Diaphragm Assembly**



- 1 Use approved materials to ensure that replacement parts and visible surfaces in Digital Valve Body are free of contaminants.
- 2 Carefully insert Diaphragm Piston Assembly into valve until the Piston Assembly seats.  
*Note: Ensure the Piston Assembly moves freely in the bore.*
- 3 Gently press in the Diaphragm Retainer Ring (VR2-1010) over outside lip of Diaphragm (see [Figure 3](#)).
- 4 Snap small end of spring onto Diaphragm Piston Assembly Center Stem.
- 5 Insert O-ring (V12-0292-2) into the valve body.
- 6 Position Piston Assembly Cover removed in Step 2 on [page 7](#) over the spring. Use hand pressure to compress spring and position cover onto Digital Valve Body.
- 7 Loosely install the three screws removed earlier.
- 8 Tighten screws evenly to avoid warping the cover.
- 9 Clean the cover and use one of the following methods to signify installation of kit:
  - If the kit includes a label, affix label as shown in [Figure 3](#).
  - If no label is present, use a permanent marker to mark the cover with “Piston Assembly Installed”.



## Completing Installation

To complete the installation, proceed as follows:

- 1 Open the shear valve on dispensers only.
- 2 Restore all the power to the unit. Turn on the STP power, if applicable. In the D-Box, place the unit in normal operation.
- 3 Purge air, check for leaks, and proper operation. For instructions and test procedures, refer to *MDE-2531 Start-up and Service Manual for The Advantage Series*.

The installation of the Digital Valve Piston Replacement Kit is now complete.

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