GASBOY

Commercial and Retail Series

Atlas™ Start-up/Service Manual

MDE-4334K

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

Gasboy, Greensboro, is an ISO 9001:2000 registered facility.

Underwriters Laboratories (UL):

UL File#	Products listed with UL
MH4314	All dispensers and self-contained pumping units
MH6418	Power operated Transfer Pump Models 25, 25C, 26, 27, 28, 72, 72S, 72SP, 72X, 73 and 1820
MH7404	Hand operated Transfer Pump Models 1230 Series, 1243 Series, 1520 and 1720 Series
MH10581	Key control unit, Model GKE-B Series
	Card reader terminals, Models 1000, 1000P
	Site controller, Model 2000S CFN Series
	Data entry terminals, Model TPK-900 Series
	Fuel Point Reader System

New York City Fire Department (NYFD):

NYFD C of A #	Product
4823	9100A, 9140A, 9152A, 9153A, 9800A, 9840A, 9850A, 9852A, 9853A, 9140
4997	9822A, 9823A
5046	9100Q, 9140Q, 9152Q, 9153Q, 9800Q, 9840Q, 9852Q, 9853Q
5087	8753K, 8853K, 9153K, 9853K (restricted to diesel and non-retail gasoline sales)
5091	8752K, 9152K
5129	9122K, 9123K, 9822K, 9823K

California Air Resources Board (CARB):

Executive Order #	Product
G-70-52-AM	Balance Vapor Recovery
G-70-150-AE	VaporVac

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

Gasboy 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 #	CoC#	Product	Model #
95-179	Dispenser	9100 Retail Series, 8700 Series, 9700 Series	91-019	Dispenser	9100 Commercial Series	05-002	Atlas	8700K, 8800K, 9100K, 9200K, 9800K
95-136	Dispenser	9800 Series	91-057	Controller	1000 Series FMS, 2000S-CFN Series			

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Non-registered trademarks

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Consola™
Infinity™

Registered trademarks

ASTRA®
Fuel Point®
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Keytrol®
Slimline®

Additional US and foreign trademarks pending.

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1 – Read This First

Introduction

Purpose

This section contains a general introduction, service protocol, safety, and model number information.

Sections of this manual provide start-up and service information for Atlas™ pumps and dispensers. This manual is a general service guide and not a replacement for Gasboy® Atlas certified training. Certified training includes instructions on safety procedures, use of test equipment and common tools, wiring requirements, and electrical service procedures. The sections in this manual cover the following topics:

Important Information About Releases

Sections of this manual may be released or updated independently to supply the most current data. Information about release date and version for independently released sections will be included in the section title and footer of the document. For the latest updates, refer to Gilbarco® Online Documentation (GOLD℠).

This section was last updated in July 2013.

Topics in This Section

Who Must Use This Manual

This manual is intended for Gasboy Atlas Authorized Service Contractors (ASCs) who have been trained and certified by attending Gasboy certified training classes. These ASCs must be aware of the safety requirements and basic troubleshooting techniques, such as reading a volt/ohmmeter, reading pressure, and so on, and understanding the differences between various Gasboy Atlas products, options, and functionalities.

If you have not attended the Gasboy training, contact the Gasboy Training Department. For contact information, refer to "Gasboy Contact Information".

Service Protocol

A Service Technician requesting technical assistance must do the following:

1. Be available at the site.

2. When placing the call, ensure that the following are available:
   - Unit model and serial number
   - Site name and telephone number
   - Your technician number
   - Problem description and history
   - All required recommended spare parts
   - Manuals available for reference

3. Call the Technical Support Department at 1-800-444-5529. Refer to the Customer Service Report (CSR) number, if previously assigned.

Using Replacement Parts

Use only genuine Gasboy Atlas replacement parts. Use of other parts will void warranty and could affect unit conformance to various national, local or state codes.

Gasboy Contact Information

Information Required	Contact Details
Schedule training	Gasboy Training Department TechnicalTraining@gilbarco.com
Technical assistance, customer service, and warranty service	Gasboy Technical Support at 1-800-444-5529 Helpdesk@gasboy.com
Explanation of Gasboy's warranty policy	For assistance, contact your local Gasboy Distributor
Technical literature, parts manuals, and other documents	Gasboy Literature Department at (336) 547-5661

Related Documents

The following documents may be helpful when servicing the Gasboy Atlas equipment:

For a complete list of documents available, refer to *P-7001 Gasboy GOLD and Literature Guide*. For information regarding Gasboy Atlas documentation, contact the Literature Department at 336-547-5661.

Document Number	Description	GOLD Library
C35963	CFN® Islander™ II Installation Manual	Gasboy CFN Series
FE-356	Atlas Pump and Dispenser Field Wiring Diagram Instructions	Gasboy Parts List and Wiring Diagrams
FE-357	Atlas Pump Retail/Commercial Field Wiring Instructions	Gasboy Parts List and Wiring Diagrams
FE-361	Field Wiring Diagram Atlas, Legacy®, Encore® Master and Satellite Units	Gasboy Parts List and Wiring Diagrams
	NIST Handbook 44 (National Institute of Standards and Technology)	N/A
MDE-2188	C, C+, and HD Meter Quad Ring Top Seal Replacement Kits (K35222 and K35222-01)	Advantage® and Legacy Models
MDE-3892	Meter Master Seal Service Kits (K96618 and M08182K001) Installation Instructions	• Encore and Eclipse® • Encore and Eclipse Installers
MDE-4255	Gasboy Warranty Policy Statement for USA and Canada	Gasboy Atlas Pumps/Dispensers
MDE-4298	CFN Series Site Controller III Installation Manual	Gasboy CFN Series
MDE-4319	TopKAT™ Fuel Management System Installation Manual	• Gasboy Fleet PLUS System • Gasboy Series 1000/Fleetkey and TopKAT
MDE-4320	Gasboy UHF Pump Blackmer® XU2A Rebuild Kit Installation Manual	Gasboy Q, A, and E Series Pumps/Dispensers
MDE-4331	Atlas Fuel Systems Installation Manual	Gasboy Atlas Pumps/Dispensers
MDE-4333	Atlas Fuel Systems Site Preparation Manual	Gasboy Atlas Pumps/Dispensers
MDE-4363	Atlas Fuel Systems Owner's Manual	Gasboy Atlas Pumps/Dispensers
MDE-4404	Atlas Technician Programming Quick Reference Card	Gasboy Atlas Pumps/Dispensers
MDE-4447	Gilbarco Global Pumping Unit Operation and Service Manual	Advantage and Legacy Models
MDE-4652	Atlas 9800 Electronics Field Installation Instructions	Gasboy Atlas Pumps/Dispensers
MDE-4811	Islander PLUS and ICR PLUS Installation Manual	Gasboy Fleet PLUS System
MDE-4813	CFN PLUS Installation Manual	Gasboy Fleet PLUS System
MDE-5013	TopKAT PLUS Installation Manual	Gasboy Series 1000/Fleetkey and Topkat
PT-1949	Commercial and Retail Series Atlas Pump and Dispenser Illustrated Parts Manual	• Gasboy Atlas Pumps/Dispensers • Parts Manual
PT-1950	Atlas Recommended Spare Parts List	Gasboy Atlas Pumps/Dispensers
RP-100	PEI Recommended Practices for Underground Liquid Storage Systems	N/A
RP-400	PEI Recommended Procedures for Testing Electrical Continuity of Petroleum Dispensing Systems	N/A
RP-500	PEI Publication	N/A

Note: In addition to these documents, Gasboy Atlas marketing and information sheets are sources of information.

Abbreviations and Acronyms

Term	Description
API	Application Programming Interface
ASC	Authorized Service Contractor
ATC	Automatic Temperature Compensation
CAT5	Category 5
CFN	Cash Flow Network
CFR	Code of Federal Regulations
CFT Meter	Center Flow Through Meter
CoC	Certificate of Conformance
CPU	Central Processing Unit
CSR	Customer Service Report
D-Box	Distribution Box
DEF	Diesel Exhaust Fluid
E-Cal	Electronic Calibration
EC	Error Code
EK	Electric Keytrol
ESD	Electrostatic Discharge
FMS	Fuel Management System
GOLD	Gilbarco Online Documentation
GPM	Gallons Per Minute
GPU	Global Pumping Unit
I.S.	Intrinsic Safety
J-box	Junction Box
LAN	Local Area Network
LC	Liquid Control
LCD	Liquid Crystal Display
LED	Light Emitting Diode
NEC®	National Electrical Code
NFPA	National Fire Protection Association
NIST	NFPANational Fire Protection Association
OSHA	Occupational Safety and Health Administration
PAM	Pump Access Module
PCA	Printed Circuit Assembly
PCB	Printed Circuit Board
PCV	Pressure Control Valve
PEI	Petroleum Equipment Institute
PIN	Personal Identification Number
POS	Point of Sale
PPG	Pulse Per Gallon
PPP	Programmable Pump Preset
PPU	Price Per Unit
PRV	Pressure Relief (Bypass) Valve
PSI	Pounds (of Pressure) per Square Inch

Term	Description
RAM	Random Access Memory
ROM	Read Only Memory
SAE	Society of Automotive Engineers
STP	Submersible Turbine Pump
TCP/IP	Transmission Control Protocol/Internet Protocol
UL®	Underwriters' Laboratories
W&M	Weights and Measures

Common Terms Used

Term	Description
Allocation	Maximum amount of fuel that can be dispensed from a nozzle for a given transaction.
Cold Start	Clears pump and configuration data.
Command Code	Listing under Command Level for setting software parameters.
Command Level	A level of programming accessed by Personal Identification Number [PIN(s)].
Dispenser	A dispensing unit that relies on an Submersible Turbine Pump (STP) in the storage tank to send fuel to the dispenser.
DEF	A clear, colorless, non-toxic, non-flammable, non-combustible liquid. It is made up of 32.5% urea with the balance distilled or de-ionized water. Urea and water are completely miscible and do not separate in storage. Diesel Exhaust Fluid (DEF) is mildly corrosive.
Dual Hose	Same as Twin Hose.
E85	Gasoline ethanol blend with 85% ethanol.
Five Button Preset	This is a keypad that contains five buttons on which the customer can enter a predetermined value and/or increment or decrement in the selected sale or volume value, before fueling.
Function Code	One or more procedures within a Command Code.
Grade	Indicates the fuel grade available at the nozzle. In case of blender dispensers, a grade is created by blending products.
Manager Keypad	Device within the dispenser for setting programming parameters.
Money Display	A display that shows the total value of the product dispensed during normal operation.
Option Code	A choice that is available on entering a Function Code.
Product	Indicates the base fuel grade available in the storage tank. Not to be confused with "Grade"; however, in a non-blending environment, a grade is the same as a product.
Prover Can	A calibrated container used by Weights and Measures (W&M) officials and calibrating technicians to accurately check or calibrate meters in a fuel dispenser.
Pump	Refers to a dispensing unit that has a self-contained suction pump in the unit's cabinet.
Side 1	Indicates the electrical access side of the dispenser. The Manager Keypad is accessed from Side 1 of the dispenser.
Two-wire	Proprietary communication system for Atlas 8800 series units
Variator	The variator section of the computer register(s) is exposed to allow for price changes.
Volume Display	A six-digit display that shows the total volume of product dispensed during normal operation.

DEF Special Considerations

Several important considerations exist for DEF. The service technician must be aware of the following when servicing or supporting DEF units:

- DEF is non-flammable or explosive.
- The fluid is slightly corrosive and can damage tools or equipment that are not stainless steel or plastic. It can also damage the electronic components.
- DEF spills can be cleaned with water and a damp rag. Failure to thoroughly clean spills may result in corrosive damage to components or metals.
- DEF can cause serious eye injury if sprayed in the eyes or may affect those with sensitive skin. Wear protective gloves and eye protection, as required. Flush eyes immediately with water, if sprayed.
- DEF freezes at approximately 11.3 °F (-11.5 °C). If it freezes in hydraulic components, it may permanently damage the meters, valves, breakaways, and possibly other devices. It is extremely important that DEF fluid in the dispenser does not fall below that temperature.
- DEF must not be contaminated with diesel fuel, contaminants or other fluids or materials. Such contamination can cause serious damage to vehicle's catalytic converters.
- A dedicated stainless steel calibration prover (with SS valve, if equipped) must be used with DEF to avoid contamination of the product with diesel fuel or gasoline. No exceptions are allowed.
- DEF can be returned to the storage tank only if it is not contaminated. Contaminated DEF must be disposed of in an environmentally safe manner. Do not dump DEF in storm sewers or any location, where the fluid or its constituents may enter a waterway.
- DEF must never be introduced into diesel fuel tanks or serious damage to the vehicle's engine may occur. Only dispense DEF into vehicle tanks dedicated for DEF.
- DEF when stored at temperatures above 100 °F (37.7 °C) may break down into ammonia gas over a time. Take care when opening the cabinets, tank vaults, or other areas, where DEF may have leaked or been spilt to avoid inhaling any toxic ammonia vapors.
- When exposed to air, the water in DEF will evaporate and result in development of urea crystals. Crystals may be fine and sharp. They will dissolve in water.
- DEF is much heavier than fuels such as gasoline. Be careful to avoid injury when lifting heavier Prover Cans and so on, by the following proper safe lifting techniques.

Troubleshooting DEF Freeze

DEF freezes at approximately 11.3 °F (-11.5 °C). If it freezes in hydraulic components, it may permanently damage the meters, valves, breakaways and possibly other devices. It is extremely important that DEF fluid in the dispenser does not fall below that temperature.

⚠ CAUTION

Applicable during Installation and Operation of the Dispenser: DEF freezes at approximately 11 °F (-11.5 °C). Power to the dispenser and heater must always remain ON in cold weather. If power is lost and the temperature drops below this point, the system must be inspected for freeze damage before restart. For sites that experience occasional power losses or for sites that are located in very cold climates, it is recommended that a back up power generator be used to maintain constant power to the dispenser. Do not use any additives to lower the freezing point of DEF. Additives of any type must not be used in DEF.

Prolonged storage at temperatures above 77 °F (25 °C) can impair the quality of DEF and reduce its shelf life.

If the unit experiences a freeze, it will be required to thaw all components and repair the damage that may have occurred. Units can be thawed using directed exhaust from a vehicle (if no electronic boards are in the area being thawed). Although DEF is non-flammable, diesel fuel is flammable. Therefore, other close proximity heating devices that are non-explosion proof cannot be used. However, before using electrical heating devices with heat extension ducting, ensure that such devices or their power cords are not in hazardous vicinity near diesel, gasoline, other fueling equipment, or hazardous vapors or liquids. To determine any hazard zone involved, consult the installation or service manuals for other equipment. As other damage either missed or not detected may exist, very closely monitor the equipment looking for leaks when the lines are pressurized. Wear eye protection.

⚠ CAUTION

DEF is mildly corrosive. It can corrode components that are made from incompatible material(s) and reduce their integrity. The use of incompatible material(s) may lead to leaks and spills, and can contaminate and degrade the DEF. When dispensing DEF, verify with the manufacturer if the material of all plumbing components are compatible with the DEF being dispensed.

⚠ CAUTION

Do not use Prover Cans meant for engine fuel with DEF or vice versa. Use stainless steel Prover Cans for DEF. DEF and engine fuel must not be mixed with each other or be contaminated by each other. Else, damage to a vehicle's engine or pollution control devices could occur. DEF crystallizes as its water base evaporates. Pouring out liquid will not guarantee that no corrosive DEF remains in the Prover Can. DEF must not be contaminated with diesel fuel, contaminants, or other fluids or materials. Such contamination can cause serious damage to vehicle catalytic converters.

- Conventional fluid handling precautions are also applicable to DEF.
- Avoid contact with eyes, skin, and clothing. Ensure that eyewash stations and safety showers are close to the work location.
- DEF is mildly corrosive and non-flammable.
- Clean the DEF spill with water and dry the area with clean rags, especially areas that contain metallic parts. Spilt DEF can be slippery and will corrode certain types of metallic parts. Wear eye protection and rubber gloves during any cleanup activity.
- DEF is heavier than gasoline. Be aware that Prover Cans, containers filled with DEF, and so on will be considerably heavier than gasoline.

If DEF Freezes

If DEF freezes, proceed as follows:

1. Remove power to the pump and dispenser.

2. Check for any damage to breakaways, nozzles, hoses/hanging hardware, and meter. Perform required repairs. Valve damage can often be detected by looking for seals slightly protruding from the valve body (compared to the new valve). Hose breakaways may only partially separate.

3. Correct the issue that is causing the loss of heat.

4. Thaw components of the dispenser. Dispenser units can be thawed using directed exhaust from a vehicle, as long as electronic boards or connections are not present in the area. They can also be thawed using a non-flame heating device.
   Notes: 1) Electronic boards or connections must not be present in the area where you thaw the components of the dispenser, as any resulting condensation may damage the electronics.
   2) Electrical cords or the heating device must not be used within a designated hazardous area around any fueling pump or dispenser. To identify the designated hazardous area, refer to MDE-4331 Atlas Fuel Systems Installation Manual.

5. Check for leaks. Some leaks can be significant. You may be required to turn off the unit immediately.

6. Check if there is any damage to the above ground tank system or heated above ground plumbing. For assistance, consult the tank manufacturer.

7. For more details on the significance and impact of freezing in DEF, refer to "DEF Heating System (Commercial Cold Weather DEF Units Only)" on page 5-70.

⚠ CAUTION

Certain special alternative fuels such as E85 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 (E85), 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. **As per Underwriters' Laboratories (UL) 87A requirements, nozzles dispensing E85 fuel and DEF must not be used to dispense any other type of fuel such as Gasoline.**

Leaks and potential environmental hazards can result or components may fail prematurely.

To avoid these issues, follow the guidelines for dispensing E85 fuel and DEF in this manual.

Important Requirements for E85 Units

The following equipment and materials are required to properly install E85 units:

UL-listed E85 Hose (Q13486)
- Veyance℠ Flexsteel™ Futura® Ethan-All for E85
- Veyance Flexsteel Futura for E25

Note: Extended reach hoses are not available for E85 applications.

UL-listed E85 Nozzle (M11298)
OPW® 21GE
Note: Approved for use with E85 dispensers, as required under UL 87A.

UL-listed E85 Swivel (N23748-04)
OPW 241 TPS-0492
Note: Approved for use with E85 dispensers, as required under UL 87A.

UL-listed E85 Shear Valve (T19695-23)
OPW 10P-0152E85
Note: Approved for use with E85 dispensers, as required under UL 87A.

UL-listed E85 Breakaway (N23010-10)
OPW 66V-0492
Note: Approved for use with E85 dispensers, as required under UL 87A.

Filter
Use only filters specifically marked for use with E85.

UL-listed Pipe Sealant
Use only UL-listed TPS PTFE Pipe Sealant manufactured by SAF-T-LOC International Corp.

UL-listed Teflon® Tape
Use only UL-listed Taega Technologies Inc. Teflon tape.
*Note: Teflon tape must be used **only** at the inlet pipe connection.*

⚠ CAUTION

Certain special alternative fuels such as E85 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 (E85), 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. **As per UL 87A requirements, units dispensing E85 fuel must not be used to dispense any other type of fuel such as Gasoline**.

Leaks and potential environmental hazards can result or components may fail prematurely.

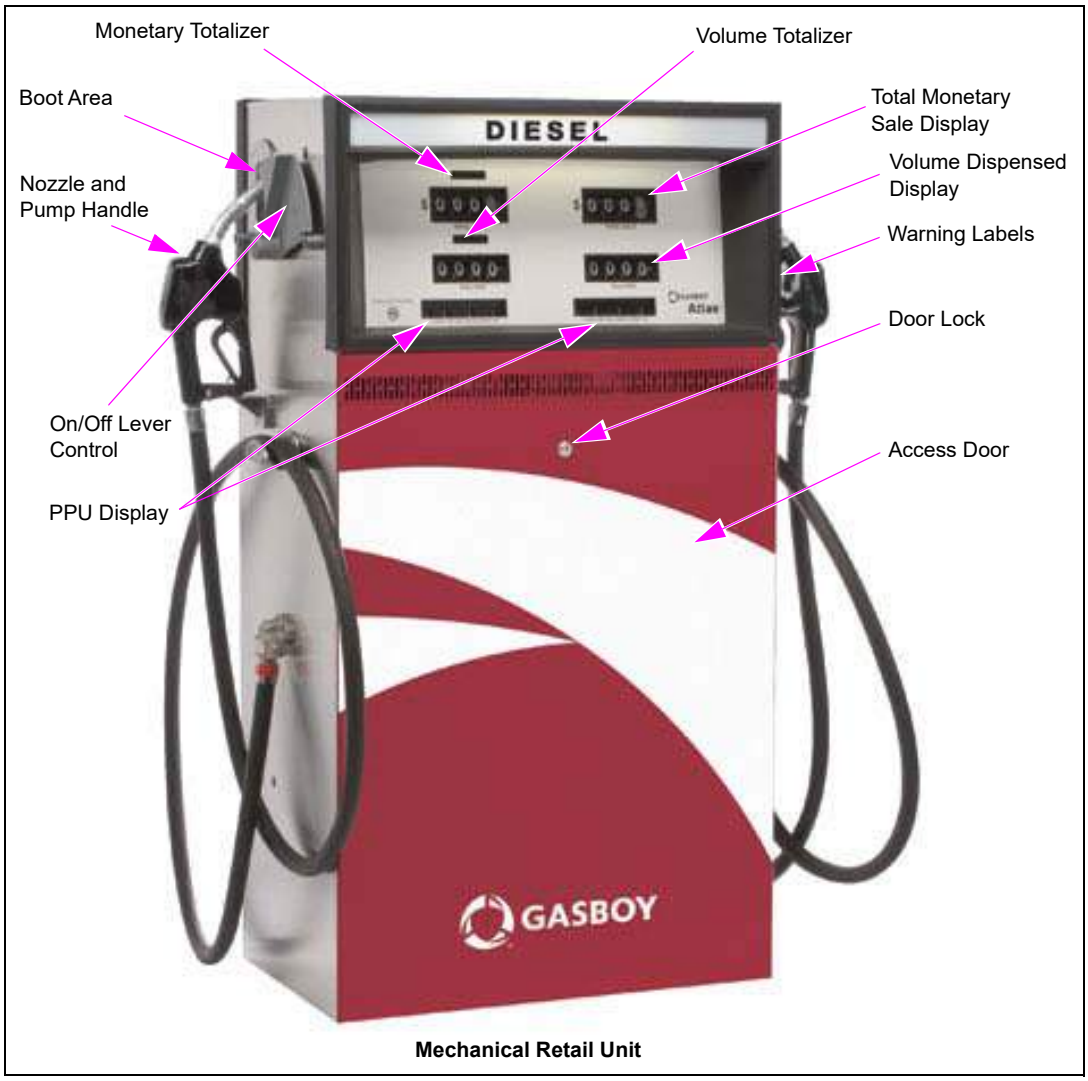
To avoid these issues, follow the guidelines in this section.

Model Information

Mechanical Retail Pump/Dispenser

The external components of a Gasboy pump/dispenser (Mechanical Retail unit) are shown in Figure 1-1. Mechanical units have mechanical type displays as opposed to electronic digital type displays. In units that are Commercial instead of Retail, the external components are the same, except that they do not have a Monetary Sale amount, a Price Per Unit (PPU) display, or Monetary Totalizer display.

Figure 1-1: Atlas Mechanical Retail Unit

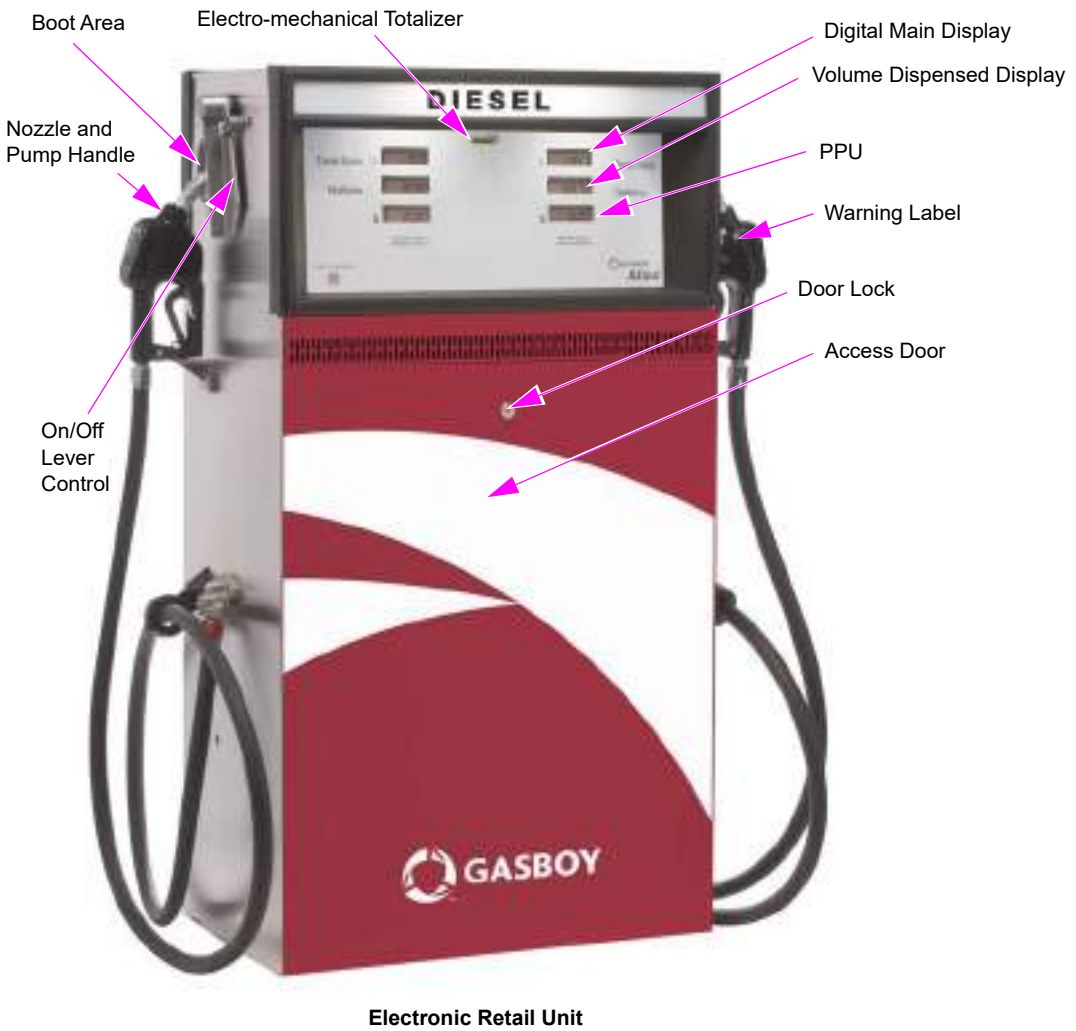


Mechanical Retail Unit

Electronic Retail Pump/Dispenser

The external components of a Gasboy pump/dispenser (Electronic Retail unit) are shown in Figure 1-2. Electronic units have digital displays as opposed to mechanical displays. In units that are Electronic Commercial instead of Retail, the external components are the same, except that they do not have a Monetary Sale amount, a PPU display, or Monetary Totalizer display.

Figure 1-2: Atlas Electronic Retail Unit



Electronic Retail Unit

Serial Number Plate and Date Codes

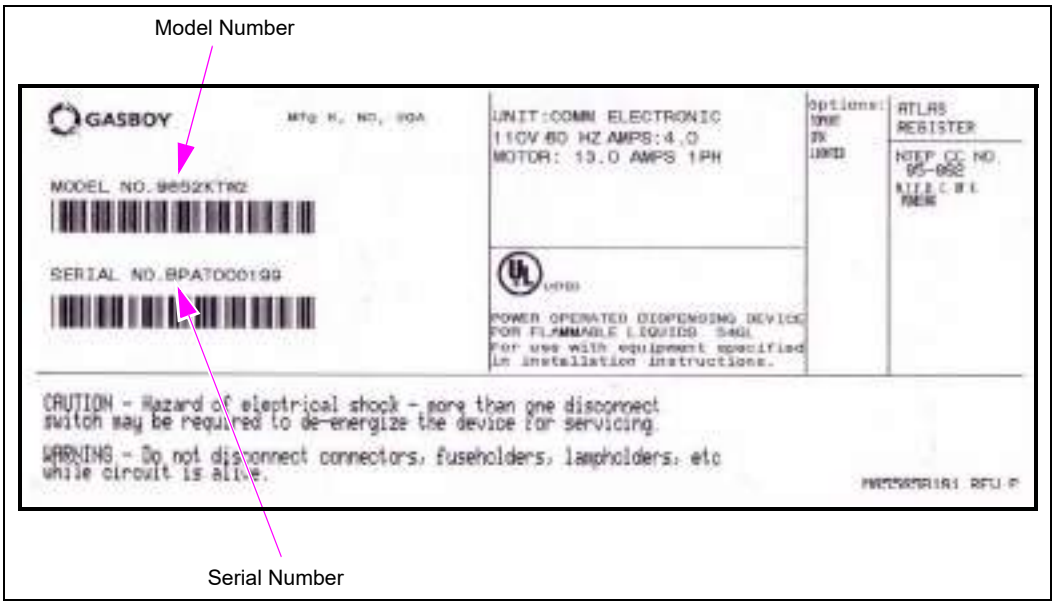
A two-letter date code is stamped on the serial number plate before the serial number. This code shows the month and year of manufacture. For warranty purposes, refer to the date code to determine the age of the equipment. The serial number plate is located on the "A" side at the bottom of the unit attached to the inside of the frame.

To determine the date code on a Gasboy pump or dispenser, refer to the following tables:

Month Codes		
A = January	E = May	J = September
B = February	F = June	K = October
C = March	G = July	L = November
D = April	H = August	M = December

Year Codes		
P = 2005	A = 2012	H = 2019
R = 2006	B = 2013	J = 2020
S = 2007	C = 2014	K = 2021
T = 2008	D = 2015	L = 2022
U = 2009	E = 2016	M = 2023
W = 2010	F = 2017	N = 2024
X = 2011	G = 2018	

Figure 1-3: Serial Number/Model Identification



For example, a serial number plate stamped "BP AT000199" contains the following information:

- Date code [BP] - This unit was manufactured in B = February, P = 2005.
- Serial Number [AT000199]

Model Series

Series	Description
9100K	Mechanical Commercial Pumps and Dispensers
9800K	Electronic Commercial Pumps and Dispensers
8700K	Mechanical Retail Pumps and Dispensers
8800K	Electronic Retail Pumps and Dispensers
9860KX	Electronic DEF Dispensers Only
9870KX	Electronic Commercial Dispensers for Alternative Fuels (E85)

Model Flow Rates

Series Designation (Digits 1 and 2)	Flow Rate Designation (Digits 3, 4, and 5)	Flow Rate Quantity
91/98/87/88	52K	15 Gallons Per Minute (GPM) (57 LPM)
91/98/87/88	53K	22 GPM (83 LPM)
91/98/87/88	40K	40 GPM (151 LPM)
98	50K	50 GPM (190 LPM)
98	60K (DEF Only)	10 GPM (38 LPM)
98	72K	15 GPM (57 LPM)

Note: The flow rates shown are under ideal conditions and will vary depending on the hanging hardware involved, STP sizing, number of units dispensing at the same time, and inlet piping to the unit. These are not guaranteed flow rates.

Atlas Model Number Table

The Atlas model number uses a series of four numbers and five letters stamped into the serial plate to denote the machine type and configuration. To determine the pump/dispenser type that is denoted on the serial plate, refer to the following table:

Gasboy Atlas Model Code																				
Retail Model Code Breakdown										Commercial Model Code Breakdown										
	8	X	X	X	X	X	X	X	X		9	X	X	X	X	X	X	X	X
Product Name:										Product Name:									
ATLAS	8									ATLAS	9								
Product Series:										Product Series:									
- Retail, Mechanical		7								- Commercial, Mechanical Non-computing		1							
- Retail, Electronic		8								- Satellite		2							
Type:										- Commercial Electronic		8							
- Full Size Cabinet			5							Type:									
Flow Rates:										- Narrow			1						
- Ultra-Hi™ Gallonage (40 to 50 gpm)				0						- Compact Cabinet			2						
- Not used				1						- Full Size Cabinet			4						
- Std Gallonage (10 to 15 gpm)				2						- Full Size Cabinet			5 6 7						

Gasboy Atlas Model Code																				
- Hi Gallonage (18 to 22 gpm)				3						Flow Rates:										
Hydraulic Series										- Ultra-Hi Gallonage (40 to 50 gpm)				0						
- Murray					A					- Not used				1						
- Gasboy Hydraulics with Gibarco C meter					Q					- Std Gallonage (10 to 15 gpm)				2						
- Gilbarco Hydraulics with Center Flow Through (CFT) Meter					K					- Hi Gallonage (18 to 22 gpm)				3						
- Tokheim® Hydraulics					E					215 Standard or High Speed Satellite				5						
Pump or Dispenser										- 216 Super or Ultra-Hi Speed Satellite				6						
- Pump						Blank				Hydraulics Series:										
- Dispenser						X				- Murray					A					
Hydraulic Configuration										- Gasboy					Q					
- 1 Grade, 1 Hose							Blank	Blank	Blank	- Improved Gasboy					K					
- 1 Grade, 2 Hose							T	W	1	- Tokheim Hydraulics					E					
- 2 Grades, 2 Hoses							T	W	2	Pump or Dispenser										
- Combo							T	W	3	- Pump						0				
										- Dispenser						X				
										Hydraulic Configuration										
										- 1 Grade, 1 Hose							Blank	Blank	Blank	
										- 1 Grade, 2 Hoses							T	W	1	
										- 2 Grades, 2 Hoses							T	W	2	
										- Combo							T	W	3	

Listing of Atlas Model Suffixes

For information on options that are available for a particular unit, refer to "Atlas Model Number Table" on page 1-13. The following is a list of some of the options that are available on some models:

- B - Display Battery Backup
- CX - 10:1 Pulser, Quantity
- CC - 100:1 Pulser, Quantity
- CM - 100:1 Pulser, Money
- D5 - DC Conduit with Category 5 (CAT5) Cabling
- D - Standard DC Conduit
- EK - Electric Keytrol
- F - Internal Filter Adapter
- I - Internal Hose Retrievers
- J - Manual Reset (Export Only)

- K - Hand Crank
- L - Lighted Display Panel
- P - Atlas PRIME options followed by:

Sides	OrCU	HID
1	1=None	0=None
2	2=OrCU	1=Standard 2=Indala

- PP - Slowdown Valve
- PPS - Satellite Internal Piping - 9850K
- R - Liters Registration
- S - Internal Satellite Piping
- SS - Stainless Steel - All Panels
- SSA - Stainless Steel - Front and Back
- SSTS - Stainless Steel - Top and Sides
- WW - Warm Weather (DEF Units Only)
- X - Remote Dispenser
- Y - Vapor Recovery Ready
- Z - Front Load Nozzle Boot
- 25 - 230 VAC, 50 Hz Motor
- 35 - 380 VAC, 50 Hz Motor
- 36 - 380 VAC, 60 Hz Motor

Options Overview

This section provides an overview of the options available in Atlas dispensers.

Atlas PRIME

The Atlas PRIME is a Fleet Management System that is integrated in to Atlas Commercial units. It can be ordered on any front load 9800 unit. The Atlas PRIME allows several options (contactless tag reader, insert mag card reader, keypad entry, etc.) for fueling access and web-based interface for local reporting. Each PRIME panel is equipped with a 4.3-inch multimedia color display to guide the user through the fuel access sequence. TopKAT PLUS FMS can be ordered factory-mounted on any 9800 unit. This Plug and Play option increases the ease of installation and provides customers with a user-friendly fuel reporting system. The TopKAT PLUS system is also available as a pedestal mounted unit and for use with mechanical pumps.

Electric Keytrol (EK)

The Electric Keytrol can be ordered factory mounted on the 9100 series. The EK provides each customer with a personal key slot and totalizer to record their fueling amounts. Configurations are available for both single and twin units.

Vapor Recovery

Balanced Vapor Recovery kits are available for all the K pump units except Atlas DEF and E85 dispensers. The following two kits are available:

- Vapor Recovery Complete
- Vapor Recovery

The Vapor Recovery Complete kit provides everything required for a balanced system from the high hose retriever to the splitter, all the way to the nozzle.

The Vapor Recovery kit is a retrofit kit used when providing your own vapor recovery system. This kit will provide a new nozzle boot and hook to allow a stage two nozzle to be mounted on the dispenser.

High Hose Retriever
High Hose Retrievers are also available for standard hoses. Hose clamps are available for a variety of hose sizes, up to lengths of 15 inches.

Internal Hose Retriever
Internal Hose Retrievers are also available for some Atlas pump models. The Atlas DEF cold weather unit has a built-in hose reel.

Satellite Piping
Satellite Piping is available on the 9850 pump and all remote dispensers except Atlas DEF and E85 dispensers. This option will provide the internal piping required to connect to a 9216 satellite dispenser.

Hand Crank
Hand Cranks are available for installations in locations, where power availability is a concern. This option is only available for suction pumps.

Solenoid Valve
A two-stage slow down valve is available for units in retail applications. This option is standard on all remote dispensers.

Pulse Output
Pulse output is available for all the 9800 pump models and some 8800 models. The pulse output board for the 8800 model will be different from the 9800 model. Veeder-Root® pulsers will be provided for mechanical units, when specified. An additional pulse output board must be ordered when connecting an Electronic unit to an FMS requiring mechanical type pulses. Factory installation as well as field retrofit kits will be available for all pulse output options.

RS-485 Interface
When connecting a 9800 model to a TopKAT PLUS or Atlas PRIME, an RS-485 Interface Board must be installed in the unit. The interface can be ordered and installed at the factory. Field installation kits are also available.
Note: The RS-485 Interface Board is not available for the 8800 model.

Local Area Network (LAN) Interface
When an Atlas PRIME or TopKAT PLUS is mounted on the 9800 model, a LAN cable is factory installed with a LAN jack at the end in the Junction Box (J-box) for Transmission Control Protocol/Internet Protocol (TCP/IP) communications.

Battery-backed Power Supply
Until summer of 2012, a battery-backed power supply was an option for all the 9800 models. This option was required for units used in a Retail application. If power was lost to the unit, the battery allowed the last transaction amount to remain on the display to meet W&M requirements. The 8800 series and current 9800 series displays are backed up by a super cap that performs this function at the display.

Manual Reset
Manual resets are available for mechanical units and export orders only.

2 – 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).

⚠ WARNING

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 Gasboy 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 Gasboy Authorized Service Contractor or call the Gasboy Support Center at 1-800-444-5529. 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 Gasboy replacement parts and retrofit kits on your pump/dispenser. Using parts other than genuine Gasboy 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. 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.


Gilbarco Veeder-Root encourages the recycling of our products. Some products contain electronics, batteries, or other materials that may require special management practices depending on your location. Please refer to your local, state, or country regulations for these requirements.

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

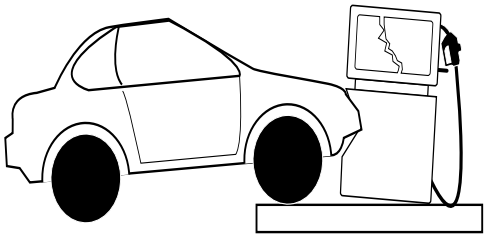
Lockout/Tagout covers servicing and maintenance of machines and equipment in which the unexpected energization or start-up of the machine(s) or equipment or release of stored energy could cause injury to employees or personnel. Lockout/Tagout applies to all mechanical, hydraulic, chemical, or other energy, 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.

Hazards and Actions

WARNING

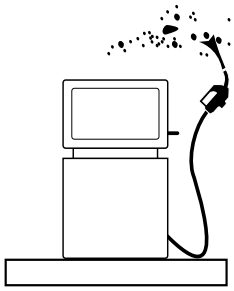
Spilled fuels, accidents involving pumps/dispensers, or uncontrolled fuel flow create a serious hazard.
Fire or explosion may result, causing serious injury or death.
Follow established emergency procedures.
DEF is non-flammable. However it can create a slip hazard. Clean up spills promptly.

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.

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3 – Start-up Procedures

Introduction

Purpose

Gasboy Atlas units require this start-up process for pumps and dispensers that are installed in the United States. This procedure ensures that the equipment is installed and warranty is registered properly. It is also recommended that you follow this procedure outside the United States.

The start-up process and checklists are used to ensure that the unit(s) are installed and function properly.

Important Information About Releases

Sections of this manual may be released or updated independently to supply the most current data. Information about release date and version for independently released sections will be included in the section title and footer of the document. For the latest updates, refer to GOLD.

This section was last updated in July 2013.

Topics in This Section

How to Use This Section

Make copies of the installation checklist found in *MDE-4331 Atlas Fuel Systems Installation Manual* to ensure that all units have been installed correctly and function properly.

Certificate of Conformance (CoC) Numbers

CoC numbers are required during installation and start-up of new sites. You may be asked for these numbers by a W&M official. For information on CoC numbers, refer to the cover page of this document.

Start-up Checklists

Installation Checklists

To ensure proper and safe operation of all equipment and to maintain warranty coverage, it is required that the checklist be completed at this time. Many of the items on the list must have been checked by the electrician already. Forms must be provided with each unit; if not, contact the Gasboy Atlas Distributor. Make copies of the checklists for use in the field, to preserve originals for future use.

Mechanical and Hydraulic Related Items Checklist

Item	Procedure	Refer To	Checked
1	Shear valves must be installed as per the valve manufacturer's recommendations. Shear point is ±0.75-inch of grade and properly mounted.		
2	Flexible pipes must not be used within the dispenser. However, flexible pipes meeting local and state codes can be used below the pump/dispenser, when allowed by regulatory authorities.	*MDE-4333 Atlas Fuel Systems Site Preparation Manual*	
3	Pumps (self-contained units) must have a vacuum actuated pressure regulating valve to prevent positive pressure at the pump base, when used with above ground tanks.	*MDE-4333 Atlas Fuel Systems Site Preparation Manual*	
4	Pumps require a check valve.	*MDE-4333 Atlas Fuel Systems Site Preparation Manual*	
5	Hose breakaways must be used and installed as per the manufacturer's recommendations. For units with retrievers, breakaways, and whip hoses, hose breakaways must be attached to the nozzle end. For units without retrievers, the hose breakaway is attached to the dispenser end.	Manufacturer's specifications	
6	The unit must be anchored to the island properly.		
7	Vapor recovery piping at the pump/dispenser must have no traps or sags.		
8	Verify if there are correct nozzles, piping, and brand panels for each grade.	Unit order specific	
9	All code, regulatory agency, or customer specified safety warning signs, labels, or decals have been installed.	As provided with and for unit	
10	Long hose lengths beyond Gasboy Atlas recommendations must not be used without special retrievers; for VaporVac® hoses, no more than 6 inches of hose length may rest on the ground when nozzle is resting in boot. For balance vapor recovery, no portion of the hose may be on the ground.	NFPA 30A	
11	The unit is mounted using the proper quantity, size, and strength mounting hardware.		
12	The unit must pump fuel, as calibrated. All displays showing the calibrated parameters must be accurate.		
13	The pump must have a vertical lift of no more than 11 feet to deliver the fuel.		
14	The conduit used in the pump to deliver fuel must be of appropriate diameter.		
15	The distance of the pump from the under ground tank must not exceed 50 feet.		

Electrical Related Items Checklist

Item	Procedure	Refer To	Checked
1	Equipment must be installed in conjunction with an emergency power cut-off to shut off all power from the equipment in case of an emergency.	• *MDE-4333 Atlas Fuel Systems Site Preparation Manual* • *FE-356 Atlas Pump and Dispenser Field Wiring Diagram Instructions* • *FE-357 Atlas Pump Retail/Commercial Field Wiring Instructions*	
2	STP isolation relays are required for all dispensers.		
3	Retail 8800 only: Use twisted-pair wires as specified for two-wire communication for new installations or where new wire is pulled. Do not use a shielded wire.		
4	All wiring must be stranded copper of the gauge and insulation casing specified.		
5	All grounds must be properly connected as per the installation manual requirements as well as state, local, and national codes.	*MDE-4331 Atlas Fuel Systems Installation Manual*	
6	Conduit must be approved for hazardous locations and properly sized for the wiring involved.	• NFPA 30A • NFPA 70® • UL 87 • NEC	
7	Properly size all circuit breakers for the units/unit options involved.	NEC and local codes	
8	All pump/dispenser wiring must be properly spaced and isolated from wiring for electrically noisy devices such as variable speed STPs, station equipment motors, and other devices.	*MDE-4333 Atlas Fuel Systems Site Preparation Manual*	
9	All power wiring and circuit breakers to Gasboy Atlas equipment must be dedicated and not be shared with other equipment.		
10	At temperatures below 15 °F (-9.44 °C) for DEF units filled with fluid, power must be supplied to the DEF heater as well as for external plumbing.		
11	All circuit breakers to Gasboy Atlas equipment must be clearly labeled and readily accessible.		
12	All Distribution Boxes (D-Boxes) must be clearly labeled showing the pump/dispenser number connections.		
13	All pumps/dispensers must be wired to the same phase of electrical power.		
14	New site wiring must be Megger® tested. Old site wiring must be continuity and short-tested with a digital meter.		
15	Wiring color must be coded or tagged, sized for distance and application, and resistant to gas and oil.		
16	Remove all tie-wraps securing pulsers and ensure that the pulser is able to float (pumps).		
17	Confirm proper wiring, if used with a Gasboy FMS (using the appropriate FMS installation manual).	• *MDE-4811 Islander PLUS and ICR PLUS Installation Manual* • *MDE-4813 CFN Plus Installation Manual* • For Atlas units with the D5 TopKAT PLUS option, refer to *MDE-5013 TopKAT PLUS Installation Manual*	

Meter Calibration

Calibrate all the units before their use by customers. For instructions on calibrating units, refer to "Hydraulic/Mechanical Components" on page 6-1.

DEF and E85 units are electronically calibrated. For calibrating DEF/E85 units (E-Cal procedure), refer to *MDE-4331 Atlas Fuel Systems Installation Manual*.

Note: DEF units must be purged properly before calibration or calibration verification. Incomplete purging of air can result in inaccurate calibration or errors in calibration verification testing. Improper purging can cause damage to meters and shorten their life. DEF units create special difficulties regarding purging, especially because of the ability of the fluid to hold air and commonly the pumps used with the devices have no air separation capability. Overhead plumbing is especially troublesome.

Gasboy Atlas (Gallon Unit of Measure)

For Gasboy Retail unit, temporary pricing must have already been entered into the unit as outlined in "Purging Air from System" on page 6-9 to allow dispensing and calibration.

Current production Gasboy Atlas pumps/dispensers, excluding units designed for DEF or E85 are tested using U.S. gallons (calibration verification is still required) and programmed to default programming values. Retail units may be operated and purged in normal mode after entering prices. On retail units, purging can be done for units eventually, to be converted to metric mode while the unit is in gallon mode.

4 – Pump Programming

Introduction

Purpose

This section provides instructions for programming and changing settings in Gasboy Atlas 9800, 8800, and 8700 series pumps and dispensers. Programming and settings for each series will be explained separately. Depending on the series, units will have electronic or mechanical means to display the fuel dispensed. Retail units may also show the cost of the fuel dispensed.

Important Information About Releases

Sections of this manual may be released or updated independently to supply the most current data. Information about release date and version for independently released sections will be included in the section title and footer of the document. For the latest updates, refer to GOLD.

This section was last updated in July 2013.

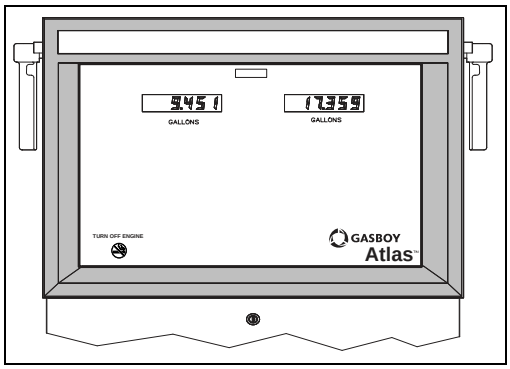
Programming Overview

The purpose of this overview is to show the display characteristics that allow visual reference for identifying each series of pumps and dispensers. This is accompanied by a brief description of the programming methods. For detailed information, refer to “Configuring 9800 Series” on page 4-21, “Programming 8800 Series Units” on page 4-29, and “Programming 8700 Series Units” on page 4-45.

9800 Series Electronic Commercial Units

9800 Gasboy Atlas series Electronic Commercial unit contains a volume display (money display is omitted). The unit can operate in a standalone or online mode, when connected to various Fleet Fueling Systems, such as Atlas PRIME, Gasboy Fleet Plus, Gasboy CFN, or TopKAT Fuel Control System. Configuring 9800 series units is done by selecting switch and jump jack (if applicable) settings on the Central Processing Unit (CPU) Board. These switches control the operation mode, timeout control, addressing, and pulse rates. The type of display associated with the 9800 series units is shown in Figure 4-1.

Figure 4-1: Electronic Commercial Display



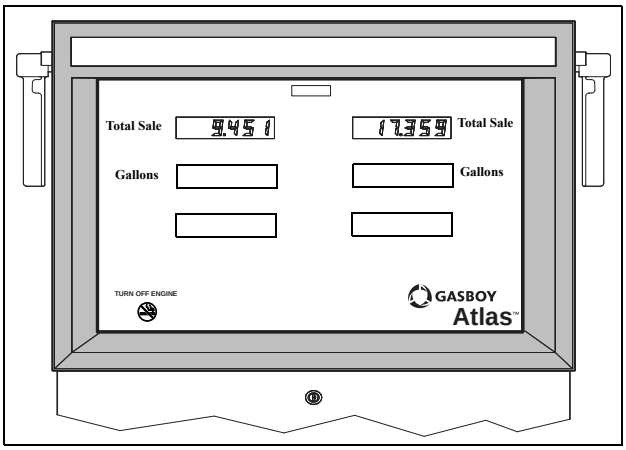
8800 Series Electronic Retail Units

The 8800 series Electronic Retail units perform with options such as sale control, totals maintenance, preset, Automatic Temperature Compensation (ATC) functions, electro-mechanical totalizers, and so on. External communication utilizes a proprietary two-wire communication system, which is used or can be used by a host of Point of Sale (POS)/controllers as manufactured by Gasboy, Gilbarco, Ruby VeriFone®, Allied, and other manufacturers. Interface devices for communication such as a Gilbarco Pump Access Module (PAM) 1000 can also be used to convert the two-wire communication to a usable format for other POS manufacturers who cannot connect directly to the two-wire system.

Programming of the Electronic Retail units is accomplished using three levels of command codes:

- Level 1 codes are potentially used by station personnel but also useful at times, during service.
- Level 2 codes are higher level codes typically intended for the ASC in programming the unit for desired operation.
- Level 3 codes are the highest level reserved for unit configuration and changing PIN. All levels require entry of a PIN code before access. These codes can be changed for station security. However, losing the codes will require a master reset of the unit and reprogramming. Most codes have a default setting.

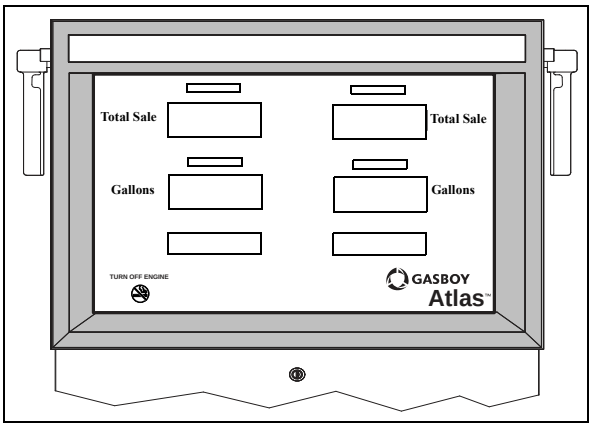
Figure 4-2: Electronic Retail Display



Mechanical Commercial Units

The 9100 and 8700 series units use a mechanical computing device. On 8700 series, prices are set on the mechanical units by adjusting the Variator. Besides the instructions in this manual, there are instructions on the base of the Variator assembly also.

Figure 4-3: Mechanical Commercial Display



Removing or Opening the Bezel Assembly

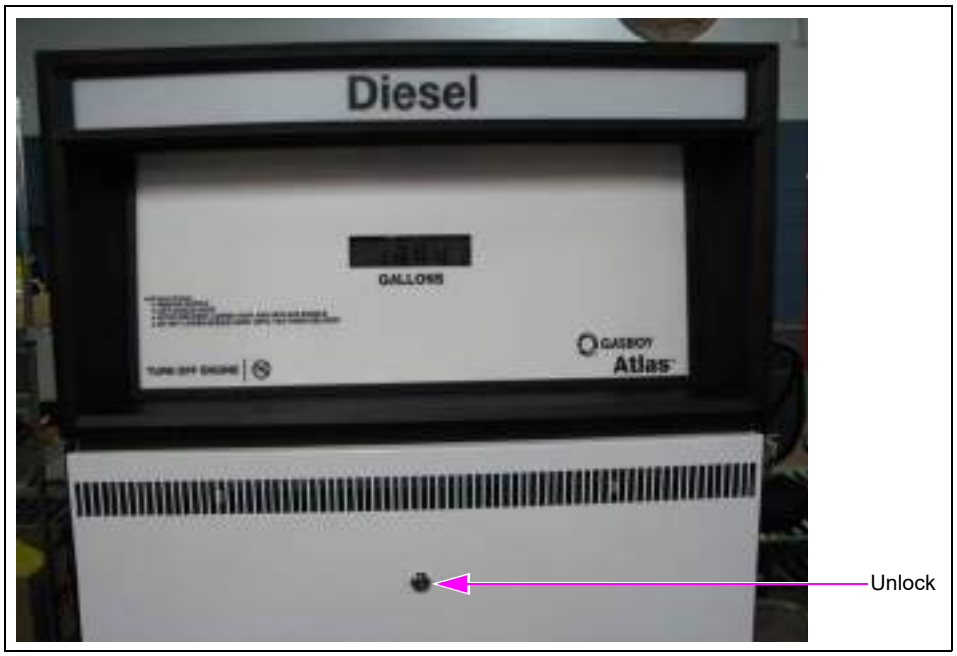
To change the settings and/or programming in Gasboy Atlas 8700, 8800, or 9800 series pumps and dispensers, the bezel assembly must be removed or opened.

Removing the Bezel Assembly

To remove the bezel assembly for Atlas 8700, 8800, or 9800 series (without PRIME) pumps and dispensers, proceed as follows:

1 Unlock and remove the front panel.

Figure 4-4: Removing the Front Panel



2 Loosen and remove the two screws and washers holding the bezel assembly.
Note: Retain the screws for re-installation.

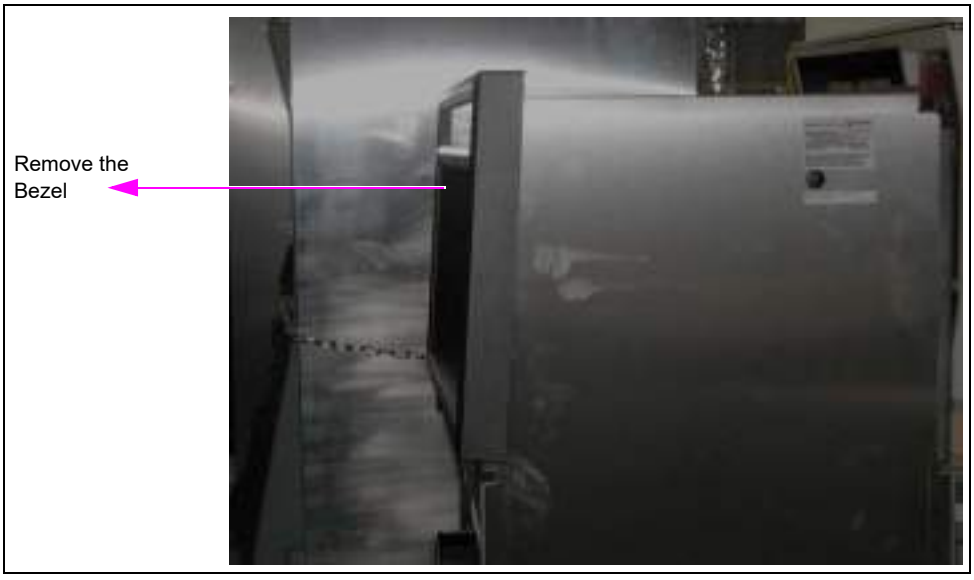
Figure 4-5: Removing the Screws

3 Grip the bezel sides and lift it up.

Figure 4-6: Lifting the Bezel

4 After the bezel has cleared the top channel, pull the bezel forward and remove it.

Figure 4-7: Removing the Bezel



Opening the Bezel Assembly

To open the bezel assembly for Atlas 9800 series pumps and dispensers with PRIME, proceed as follows:

1 Unlock and remove the front panel.

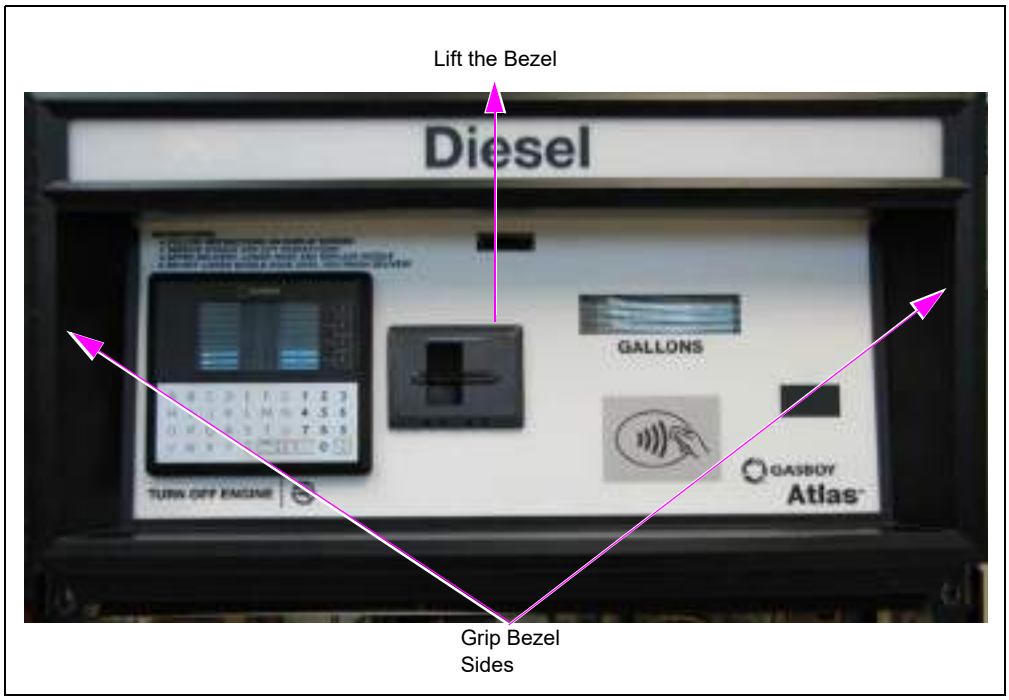
Figure 4-8: Unlocking the Front Panel

2 Loosen and remove the two screws holding the bezel assembly.
Note: Retain the screws for re-installation.

Figure 4-9: Removing the Screws

3 Grip bezel sides and lift it up.

Figure 4-10: Lifting the Bezel

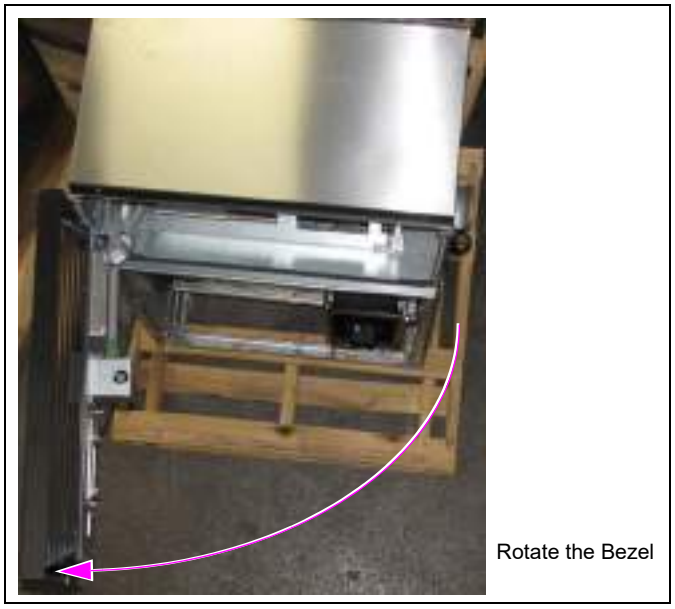


4 Once the bezel has cleared the top channel, pull forward.
Note: The left side is hinged and will only allow the bezel to pull out a few inches.

Figure 4-11: Pulling the Bezel Forward

5 While holding the bezel up, rotate the bezel to the left until it is even with the side.

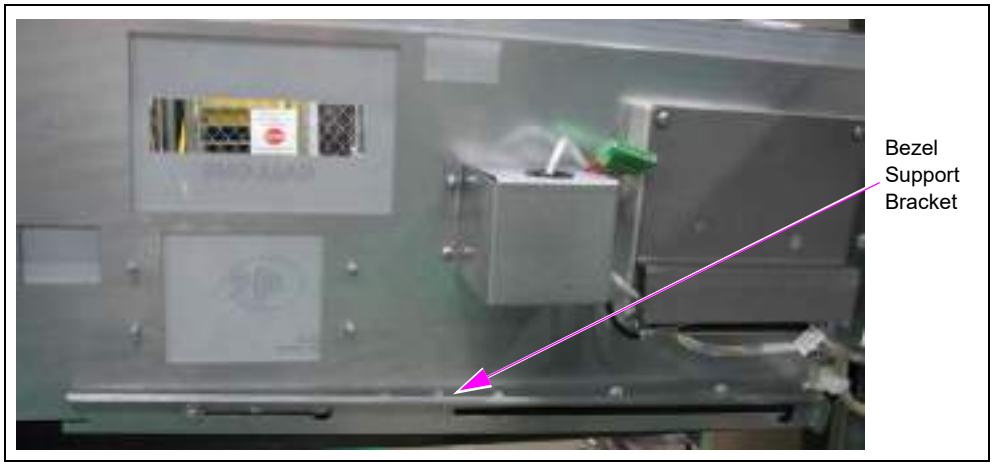
Figure 4-12: Rotating the Bezel



6 Lower the bezel, but continue to support the end farthest away from the pump.

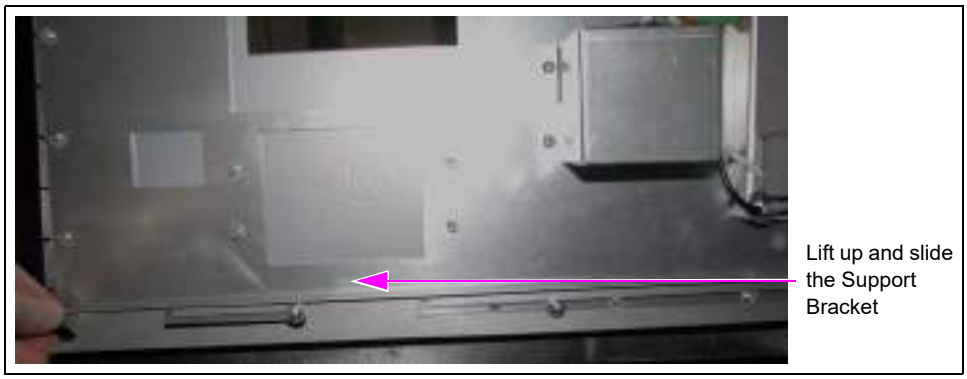
7 Locate the bezel support bracket (see Figure 4-13 for location).

Figure 4-13: Bezel Support Bracket



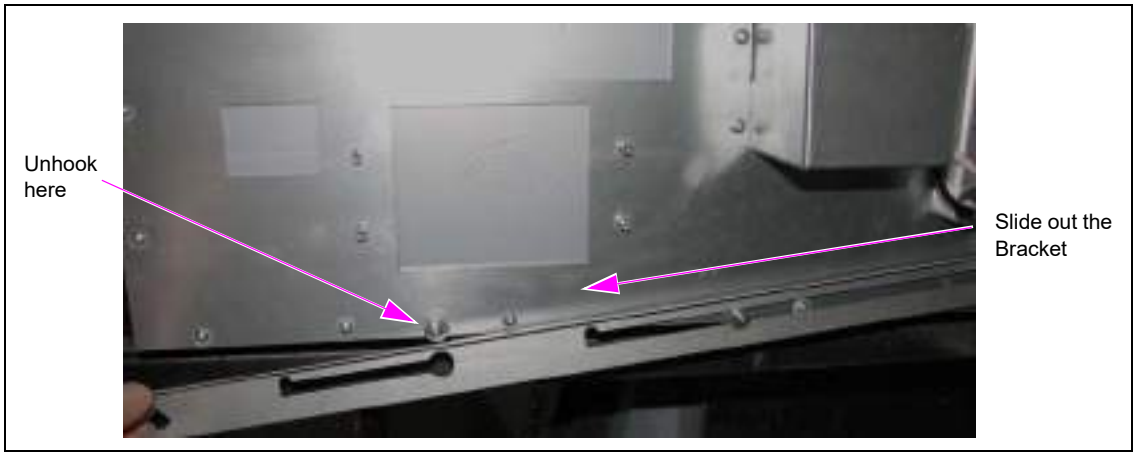
8 Lift up and slide the support bracket out until it stops.

Figure 4-14: Sliding the Support Bracket



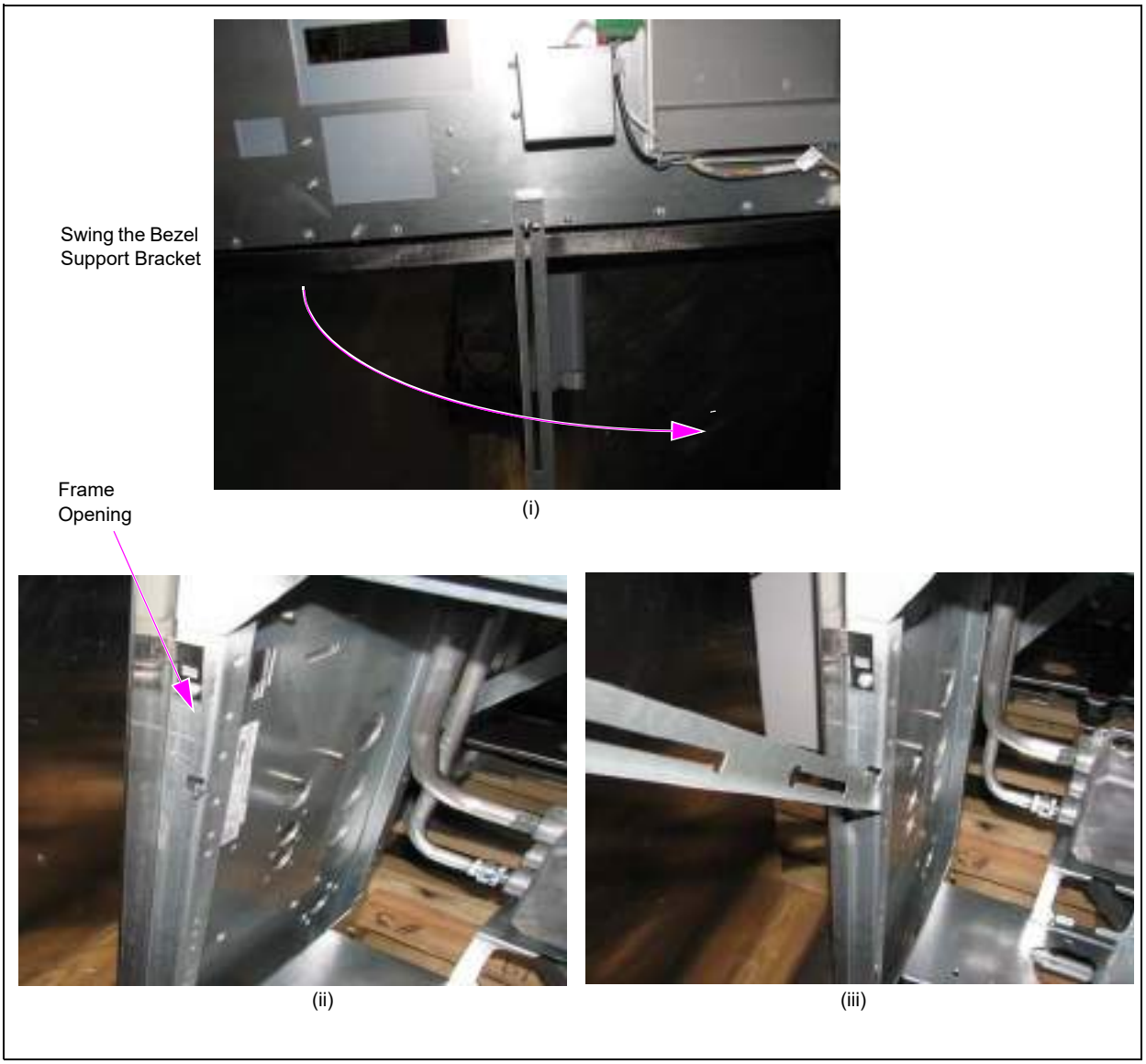
9 Unhook the bracket from the second standoff/washer and continue to slide the bracket out until it stops.

Figure 4-15: Sliding the Bracket



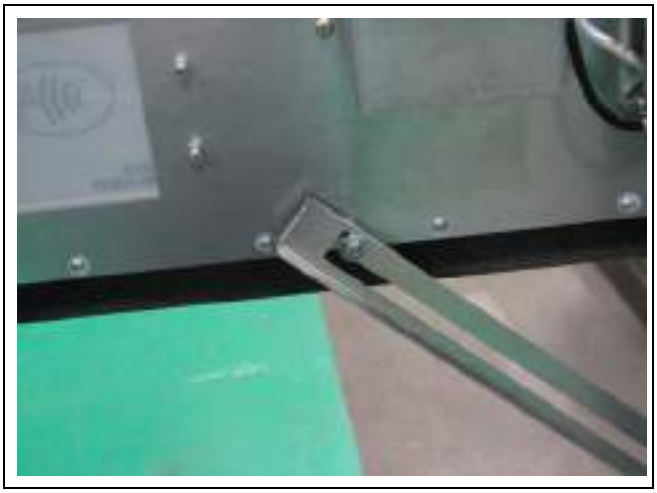
10 Swing the bezel support bracket around and place the end into the frame opening.

Figure 4-16: Swinging the Bezel Support Bracket



11 Ensure that the top of the bracket is in place and supports the bezel.

Figure 4-17: Mounting the Bracket



12 Release the end of the bezel such that the bracket now supports the bezel assembly.

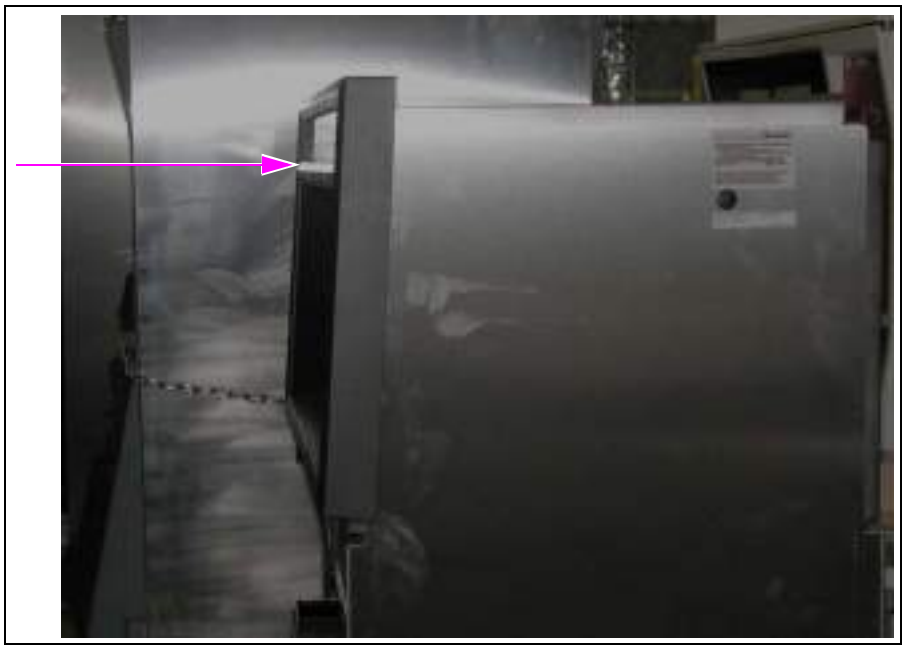
Figure 4-18: Supporting the Bezel Assembly

Reinstalling the Bezel Assembly

To reinstall the Bezel Assembly on Atlas 8700, 8800, or 9800 series (without PRIME) pumps and dispensers, proceed as follows if the Bezel Assembly has been opened or removed:

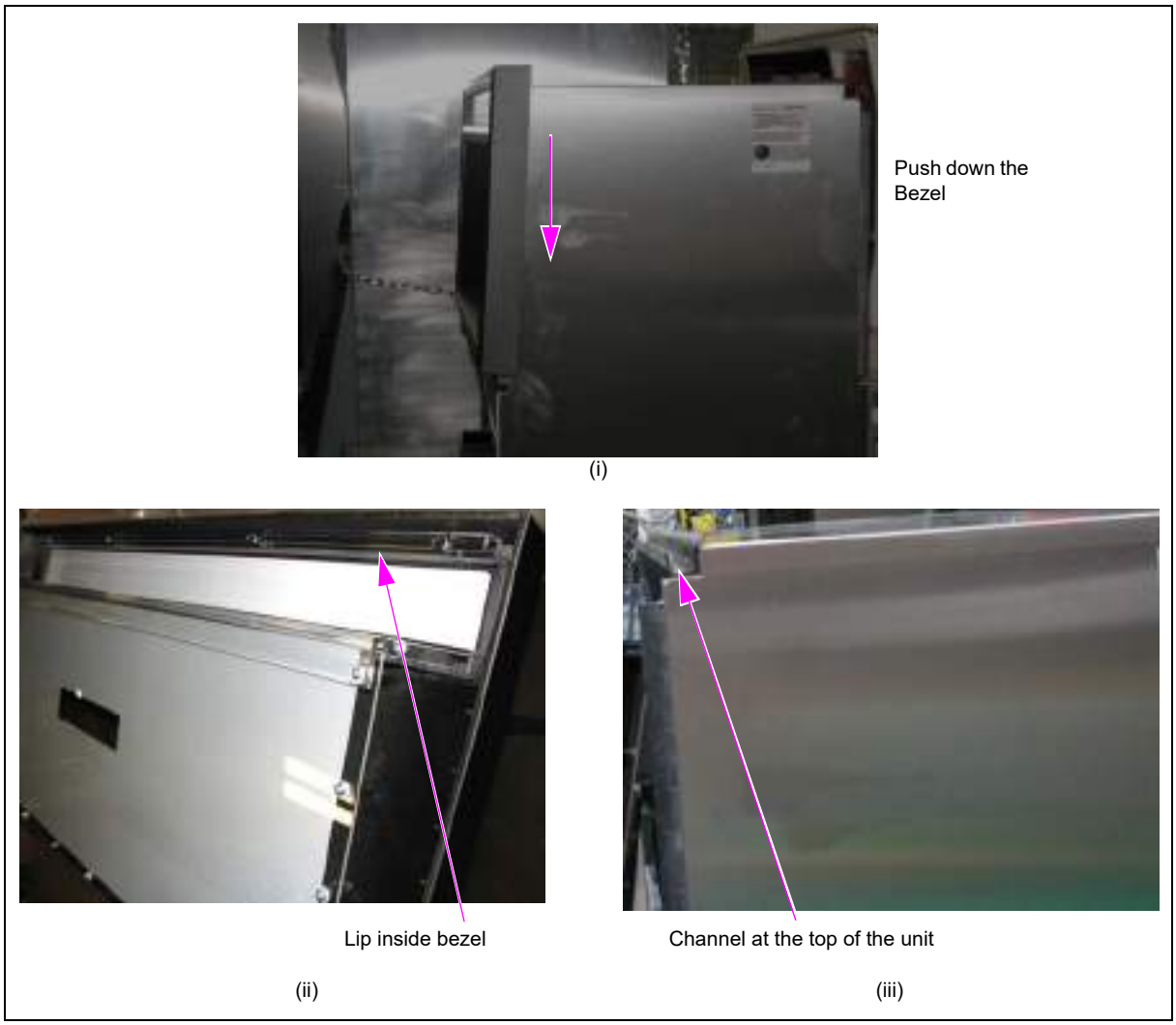
1 Hold the bezel two inches above the top of the unit, overlapping the sides of the bezel outside the sides of the unit and push towards the unit.

Figure 4-19: Overlapping the Bezel Sides



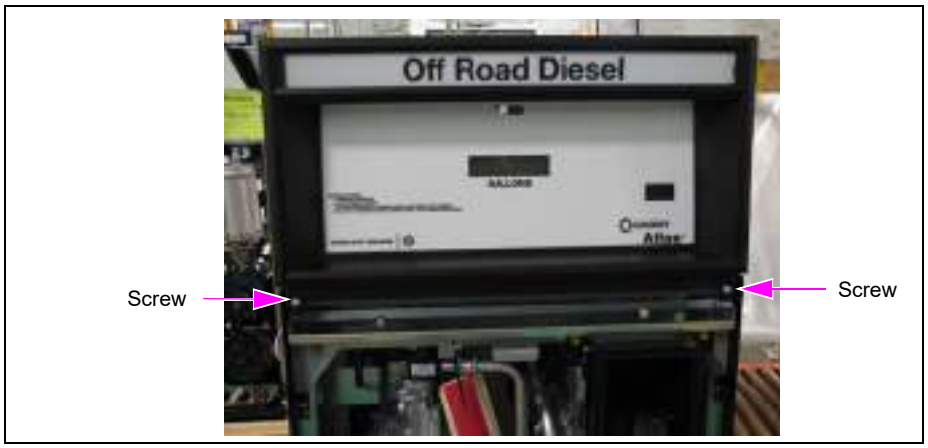
2 While pushing toward the unit, push the bezel down into place. Ensure that the lip inside the bezel fits into the channel at the top of the unit. The bezel must be fully hooked along the top of the unit.

Figure 4-20: Mounting the Lip



3 Install the two screws and washers that secure the bezel to the unit (see Figure 4-21 on page 4-14).

Figure 4-21: Securing the Bezel



4 Install and lock the front panel.

Figure 4-22: Locking the Front Panel

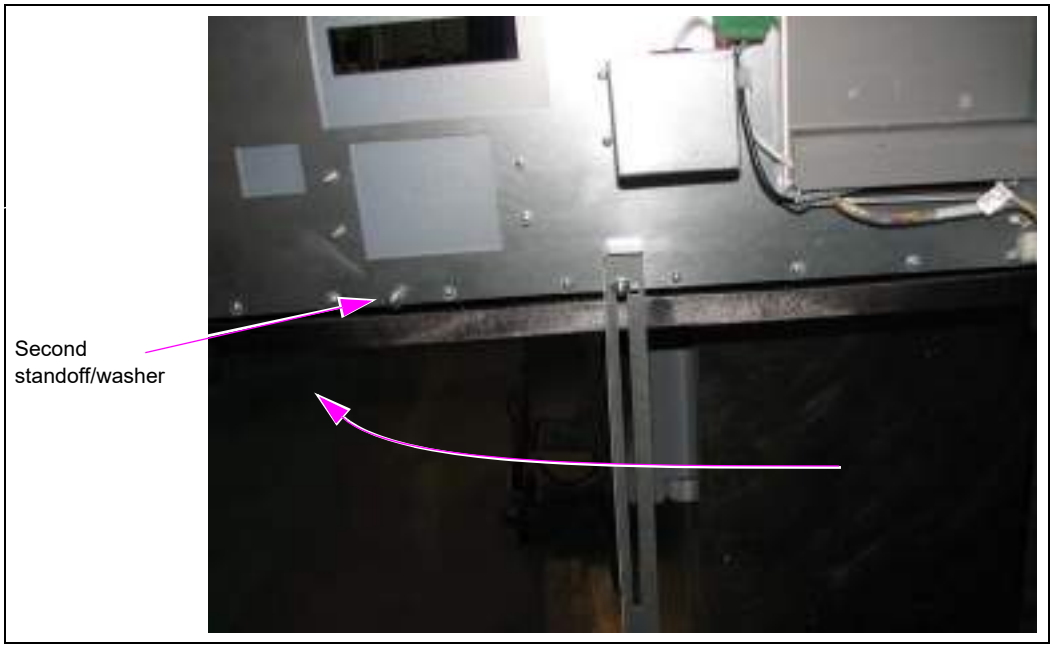
For Atlas 9800 series pumps and dispensers with PRIME, proceed as follows to close the bezel assembly:

1 While supporting the end of the bezel away from the unit, remove the bezel support bracket from the frame opening.

Figure 4-23: Removing the Bezel Support Bracket

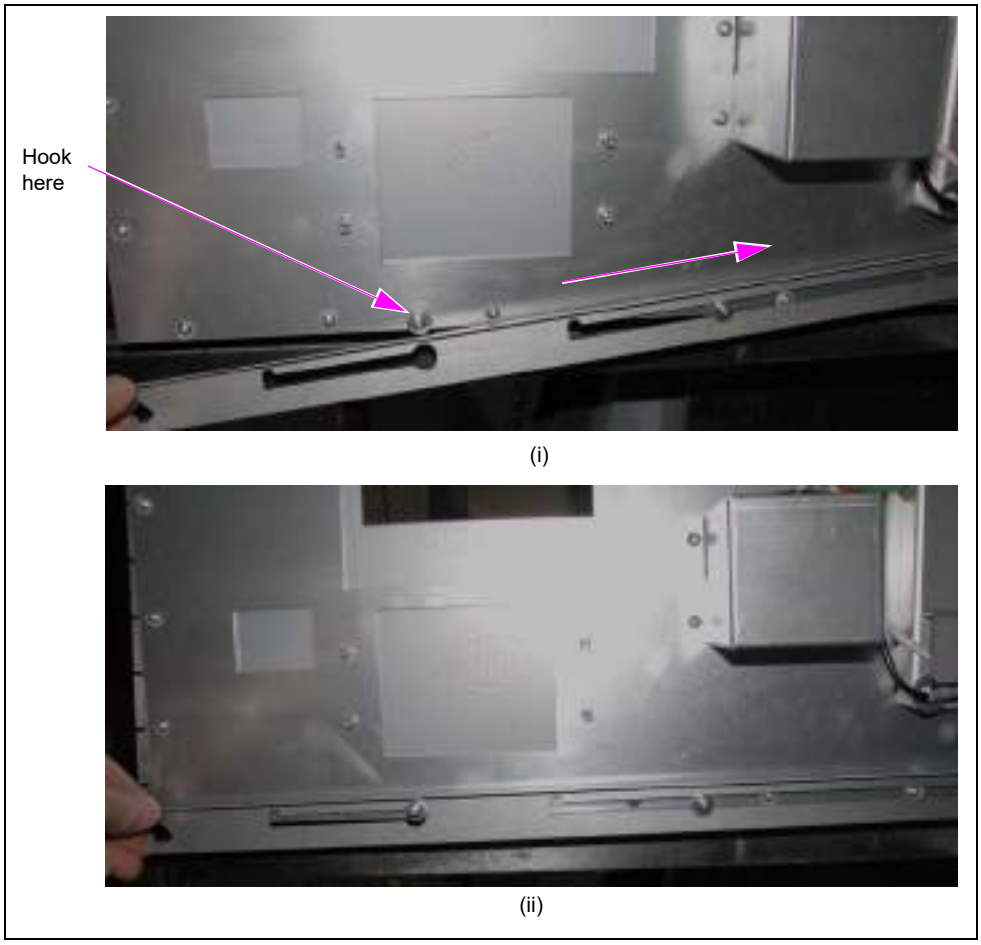
2 Swing the Bezel Support Bracket away from the unit until it is just below the second standoff/washer.

Figure 4-24: Swinging the Support Bracket



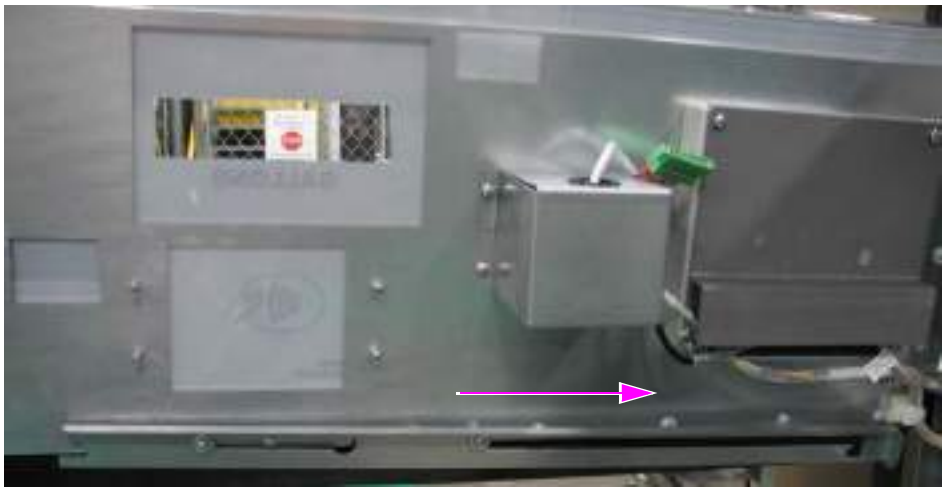
3 Slide the Bracket towards the unit until the opening in the Bracket lines up with the second standoff/washer. Hook the Bracket opening over the standoff/washer.

Figure 4-25: Sliding the Bracket



4 Slide the Support Bracket in until it stops.

Figure 4-26: Sliding the Support Bracket

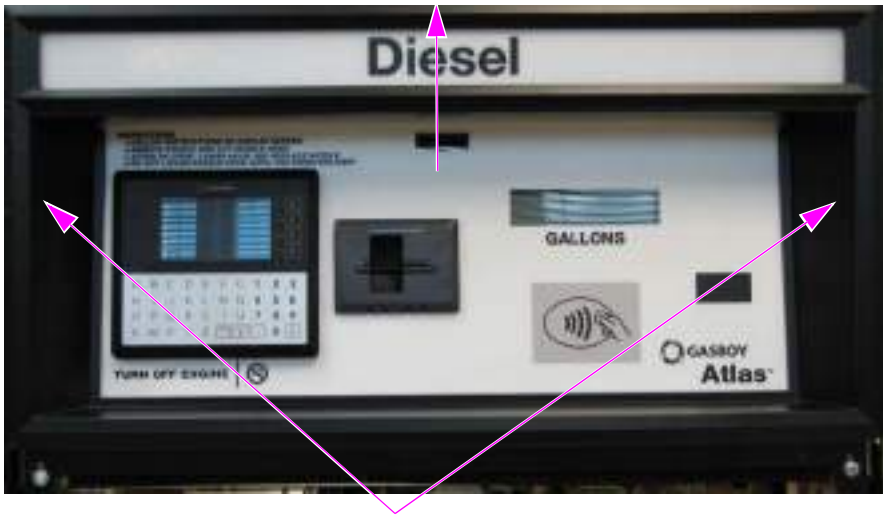


Slide the Support Bracket

5 Grip Bezel sides and lift it up.

Figure 4-27: Gripping the Bezel

Lift the Bezel up



Grip Bezel sides

6 While holding the bezel up, rotate the Bezel towards the unit.

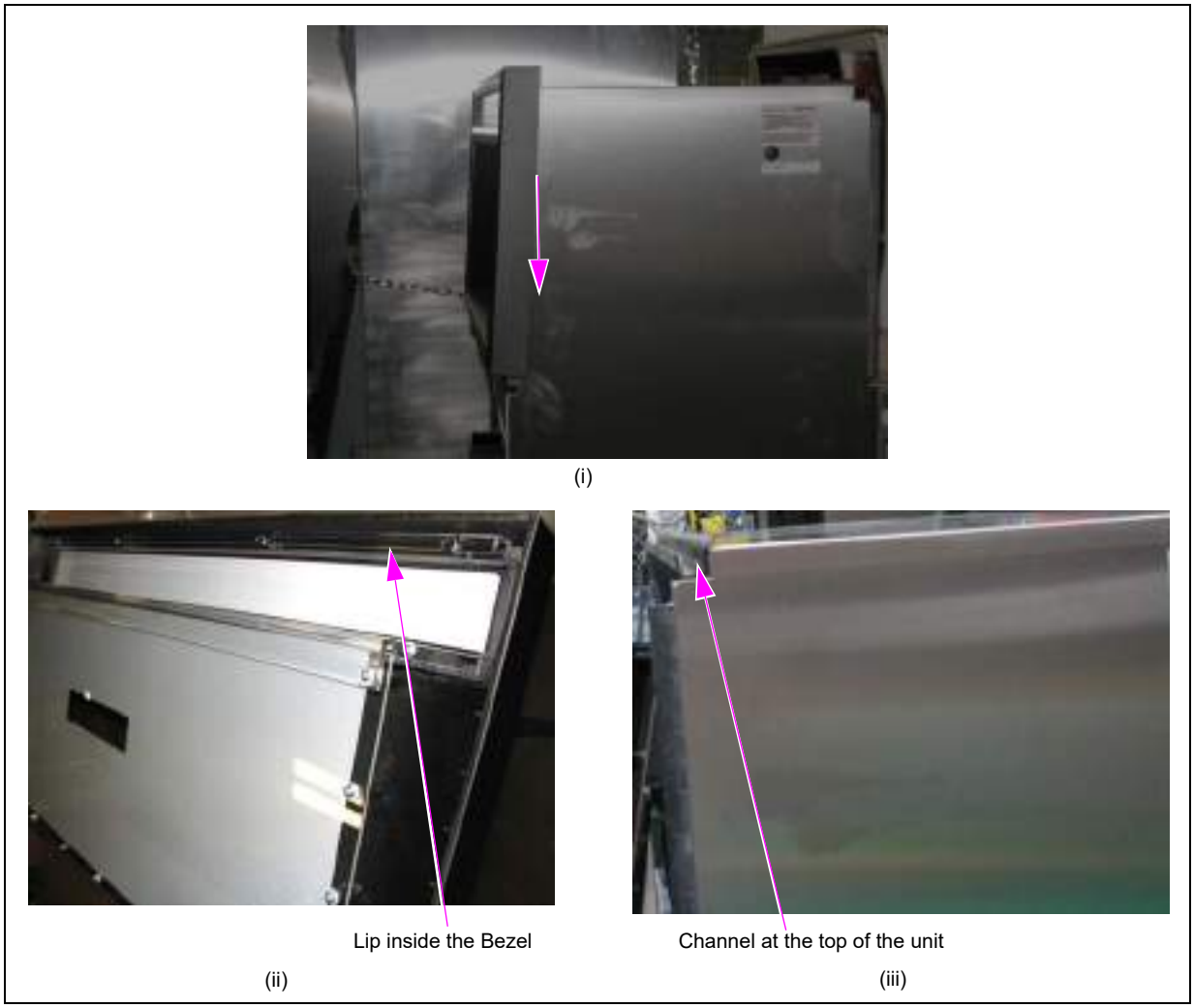
Figure 4-28: Rotating the Bezel

7 Once the Bezel is parallel to the front of the unit, push it straight back towards the unit so that the sides of the Bezel overlap the sides of the unit.

Figure 4-29: Aligning the Bezel

8 While pushing towards the unit, push the Bezel down in place.
Note: Ensure the lip inside the bezel fits into the channel at the top of the unit. The Bezel must be fully hooked along the top of the unit.

Figure 4-30: Installing the Lip on the Bezel



9 Install the two screws and washers that secure the Bezel to the unit.

Figure 4-31: Installing the Bezel Unit

10 Install and lock the front panel.

Figure 4-32: Locking the Front Panel

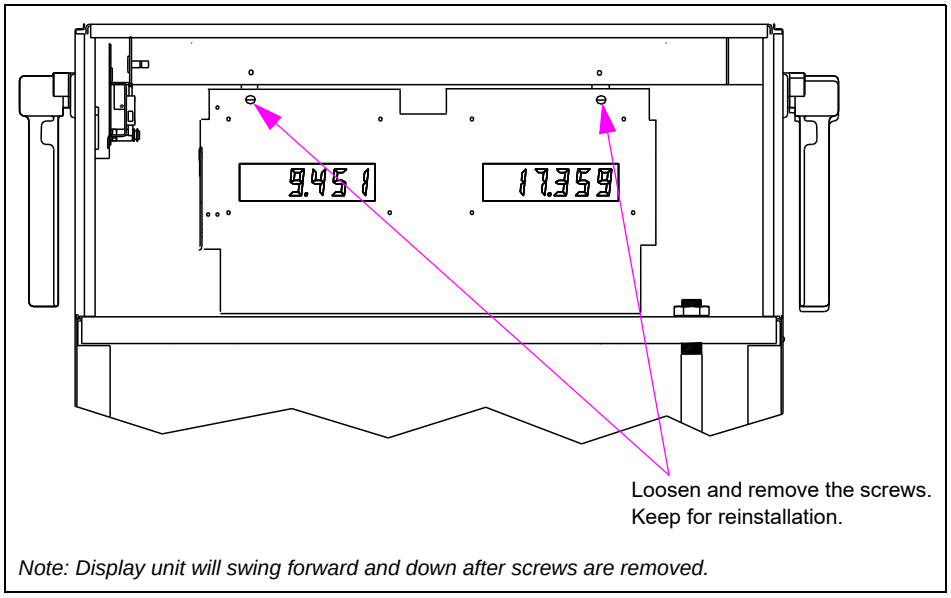
Configuring 9800 Series

General Configuration Details

The 9800 series units can be configured for various operating conditions using the switch(es) and jump jacks (if applicable) located on the CPU Printed Circuit Assembly (PCA). Check these switch(es) and jump jacks (if applicable) and change their settings, if required. Switch and jump jack (if applicable) settings must be changed only when power is shut off. The new settings are read by the CPU PCA when power is restored.

To change the switch and jump jack (if applicable) settings, access the CPU Board by removing the front panel and then remove the screws shown in Figure 4-33.

Figure 4-33: Access to CPU Board



Note: Display unit will swing forward and down after screws are removed.

Figure 4-34: Previous Atlas 9800K CPU (M05346A00X, C06391-C06394, and C06500-C06503)

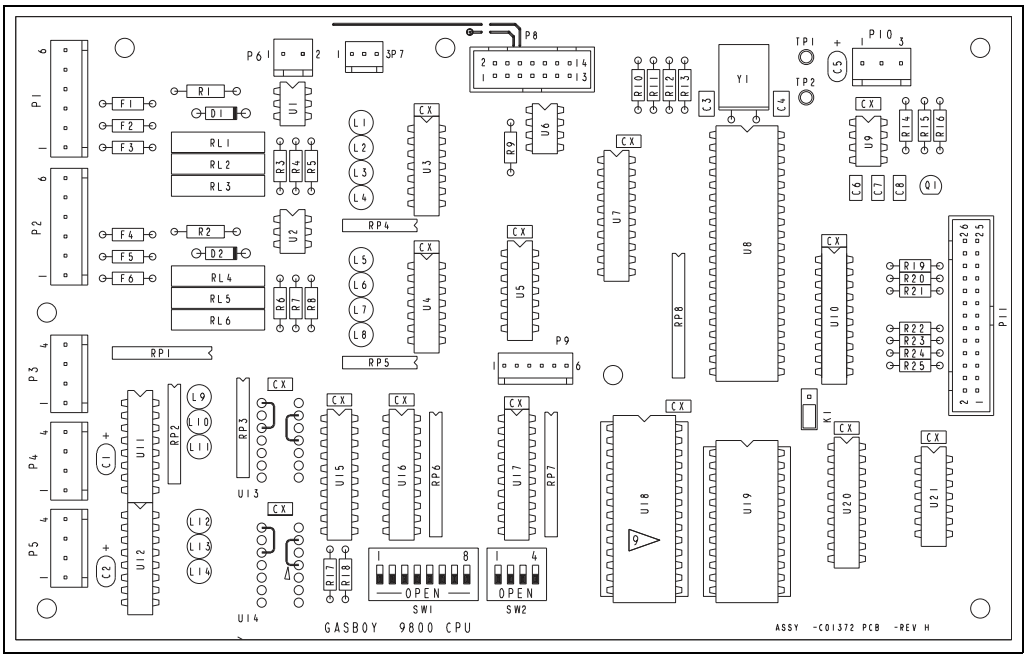
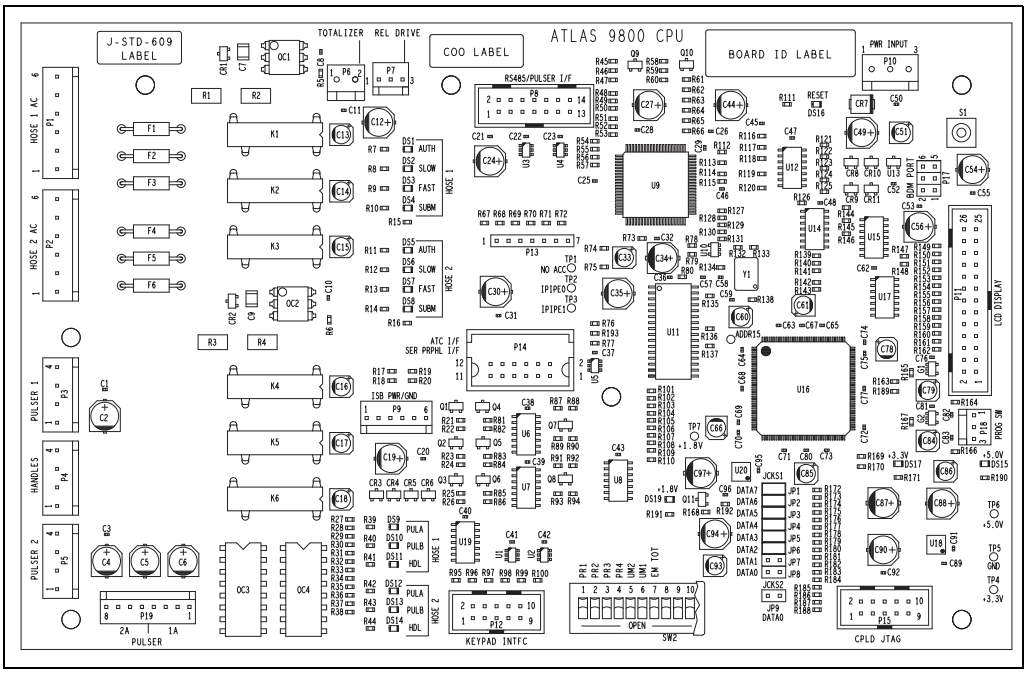


Figure 4-35: Current Atlas 9800 CPU (M06333KXXXX)



Configuration Steps

This section provides steps for configuring the 9800 series (Electronic Commercial) for various operating conditions.

Baud Rate
(JP1 on M06333KXXXX CPU and SW1-1 on Previous CPU)

This jumper/switch selects the baud rate for RS-485 communications. The Atlas PRIME, Gasboy CFN PLUS System, and TopKAT PLUS Electronic System communicate at 9600 baud.

Baud Rate	JP1/SW1-1
1200	Jumpered/Closed
9600	Open

Mode
(JP2 on M06333KXXXX CPU and SW1-2 on Previous CPU)

This jumper/switch selects the mode in which the pump/dispenser operates. Set the mode to "Online" if the pump/dispenser communicates through a RS-485 I/F (for example, to a controlling Gasboy CFN, TopKAT Electronic System). Set the mode to "Standalone" for all others including Pulse-out I/F configurations (for example, Pulse-out to a Gasboy Series 1000 FMS or TopKAT Mechanical System or non-Gasboy systems) or no controlling system.

Mode	JP2/SW1-2
Standalone	Jumpered/Closed
Online	Open

Leak Detect Delay
(JP3, JP4 on M06333KXXXX CPU and SW1-3, SW1-4 on Previous CPU)

These jumpers/switches select the delay time used by leak detectors in submersible pump applications. The delay time is the period between the activation of the submersible pump and activation of the slow flow valve. The delay time must be set according to the type of leak detector installed on the submersible pump to allow a normal leak test for each transaction. The delay time must be set to 0 seconds for suction pumps.

Delay Time	JP3/SW1-3	JP4/SW1-4
0 seconds	Jumpered/Closed	Jumpered/Closed
4 seconds	Jumpered/Closed	Open
5 seconds	Open	Jumpered/Closed
6 seconds	Open	Open

Hose Pressurization
(JP5 on M06333KXXXX CPU and SW1-5 on Previous CPU)

For US Gallons (always in Hose Pressurization mode), this jumper/switch is ignored. This jumper/switch is used to determine if hose pressurization is used. If enabled, the slow flow valve is opened before reset is complete, to allow the hose to be pressurized before fuel dispensing begins.

Pressurization	JP5/SW1-5
Enabled	Jumpered/Closed
Disabled	Open

Authorization
(JP6 on M06333KXXXX CPU and SW1-6 on Previous CPU)

This jumper/switch allows activation or non-activation of the pump/dispenser from an external source (for example, Pulse-out I/F configurations). When jumpered (closed), a 115/230 VAC signal must be present on the Control Feed/AUTH line (for your model pump/dispenser, refer to the wiring diagram) for pump activation to occur (required setting for Gasboy Series 1000, TopKAT Mechanical and all non-Gasboy systems). When open, the Control Feed line signal is ignored [normal setting for online mode communicating through an RS-485 I/F (TopKAT Electronic System, CFN System) or standalone mode].

Authorization	JP6/SW1-6
Enabled	Jumpered/Closed
Disabled	Open

Note: For JP6 authorization, in standalone mode, the Auth Signal must be present to activate the pump.

Electronic Totalizers
(JP7 on M06333KXXXX CPU and SW1-7 on Previous CPU)

This jumper/switch must be open for normal operation (electronic totals protected). When jumpered (closed), this allows the electronic totals to be reset.

Totalizers	JP7/SW1-7
Reset	Jumpered/Closed
Normal	Open

Pump Disable Detection
(JP8 on M06333KXXXX CPU SW1-8 on Previous CPU)

This jumper/switch allows the pump/dispenser to detect or ignore a pump disable (RS-485 protocol break character). When detection is enabled, the pump/dispenser will monitor the RS-485 communications for a protocol break character. When received, any transaction in progress will be halted and then completed. This setting must only be used when the pump/dispenser is communicating to a Gasboy CFN system. When communicating to an Atlas PRIME, Gasboy TopKAT PLUS or Fleet Plus system, or when in standalone mode including Pulse-out I/F configurations, the setting must be disabled as shown in the following table:

Detection	JP8/SW1-8
Disabled	Jumpered/Closed
Enabled	Open

JP9
(Only on M06333KXXXX CPU)

JP9 is a spare jump jack and is not used.

The M06333KXXXX CPU Board can also be configured for various operating conditions using the switch positions SW2-1 through SW2-10. The previous CPU only uses SW2-1 through SW2-4. Check these switches and change, if required. Switch settings must be changed with the power to the pump/dispenser “Off”. The CPU Board only reads new switch settings during power-up.

Note: A switch in the Closed position indicates that the switch is “On” (towards the center of the CPU Board).

SW2-1 Through SW2-4 (Identical for M06333KXXXX CPU and Previous CPU)

These four switches serve a dual purpose: as an address setting when communicating through RS-485 I/F (for example, Online mode with CFN systems, TopKAT Electronic system, Fleet Plus system, or Atlas PRIME system), or as a pulser output rate selector when in Pulse-out I/F configuration (for example, Gasboy Series 1000 FMS).

Address Switches (If JP2 on M06333KXXXX CPU or SW1-2 on Previous CPU is Open)

A unique address identifier must be set when the pump/dispenser is communicating through the RS-485 interface. The unique address must correspond to the address of a unique PCU of a Gasboy CFN, Atlas PRIME, Fleet Plus, or TopKAT Electronic system. There are 16 possible address combinations; up to 16 pumps (single or twin) can be connected through RS-485 interface. Addressing must start at 1 and continue sequentially through 16. The physical wiring order does not have to correspond with the address order, that is, the first pump/dispenser on the RS-485 does not have to be address 1.

Address	SW2-1	SW2-2	SW2-3	SW2-4
1	Closed	Closed	Closed	Closed
2	Open	Closed	Closed	Closed
3	Closed	Open	Closed	Closed
4	Open	Open	Closed	Closed
5	Closed	Closed	Open	Closed
6	Open	Closed	Open	Closed
7	Closed	Open	Open	Closed
8	Open	Open	Open	Closed
9	Closed	Closed	Closed	Open
10	Open	Closed	Closed	Open
11	Closed	Open	Closed	Open
12	Open	Open	Closed	Open
13	Closed	Closed	Open	Open
14	Open	Closed	Open	Open
15	Closed	Open	Open	Open
16	Open	Open	Open	Open

Note: All pumps/dispensers with an Atlas PRIME panel should be set to address 1.

Pulse Output Rate Switches (If JP2 on M06333KXXXX CPU is Jumpered or SW1-2 on Previous CPU is Closed)

When the pump/dispenser is connected to an external controlling equipment other than CFN System, Fleet Plus System, or TopKAT Electronic System, that requires pulse output signals (for example, Pulse-out I/F configuration interfacing with Gasboy Series 1000 and non-Gasboy systems), the pulse signals are sent through the Pulse-out Interface Board. Setting switches SW2-1 through SW2-3 configures the Pulse-out rate required by the monitoring equipment. The Pulse-out rate represents the pulses per unit (gallon, liter, or imperial gallon). SW2 may require to be sealed by a Weights and Measures paper seal if the unit is used for resale of the product

Pulse Rate	SW2-1	SW2-2	SW2-3
1:1	Closed	Closed	Closed
10:1	Open	Closed	Closed
100:1	Closed	Open	Closed
250:1	Open	Open	Closed
500:1	Closed	Closed	Open
None	Open	Closed	Open
None	Closed	Open	Open
None	Open	Open	Open

The maximum pulse output rate that can be achieved depends on the model of the pump/dispenser and the unit of measure. Pulse output rate of 1000:1 is not supported. *Note: 9800 refers to models 9852, 9853, 9822, and 9823.*

Unit of Measure	9800 Models	9840A/Q Models	9840K Models	9850 Models
US Gallons	500:1	500:1	500:1	100:1
Liters	100:1	100:1	10:1	10:1
Imperial Gallons	500:1	500:1	500:1	100:1

Note: If a valid Pulse-out rate is not selected, the M06333KXXXX CPU will not output pulses.

Leading zeros are always suppressed in the tens and hundreds place to the left of the decimal point. In the Standalone mode, positions to the right of the decimal point are displayed based on the pulse output rate and unit of measure selected as shown in the following table:

Pulse Rate	Gallons - US or Imperial	Liters and/or 9850
1:1	XXX.	XXXX.
10:1	XXX.X	XXXX.X
100:1	XXX.XX	XXXX.XX
250:1	XXX.XXX	XXXX.XX
500:1	XXX.XXX	XXXX.XX

Timeout Switch (If JP2 on M06333KXXXX CPU is Jumpered or SW1-2 on Previous CPU is Closed)

When the pump/dispenser is in the standalone mode including Pulse-out I/F configurations, it will turn off an active hose outlet if it does not detect input pulses for 4 minutes and 15 seconds.

Timeout	SW2-4
Enabled	Closed
Disabled	Open

SW2-5 and SW2-6 - Unit of Measure Selection (Only on M06333KXXXX CPU)

These two switches set the unit of measure (US gallons, liters, or Imperial gallons) that the pump/dispenser will be using to meter fuel.

.

Unit of Measure	SW2-5	SW2-6
US Gallons	Closed	Closed
Liters	Open	Closed
Imperial Gallons	Closed	Open
NOT USED (default US Gallons)	Open	Open

SW2-7 - Electro-mechanical Totalizer Enable (Only on M06333KXXXX CPU)

This switch is only used on K model pumps/dispensers (excluding the 9850K model). When closed ("On"), it enables the pump/dispenser to drive electro-mechanical totalizers used on some K model pump. On A and Q models, this switch must be open.

EM Totalizer	SW2-7
Enabled	Closed
Disabled	Open

SW2-8 - Background Debug Module (BDM) Enable (Only on M06333KXXXX CPU)

This switch must be OPEN for normal operation.

SW2-9 - Software Load Enable (Only on M06333KXXXX CPU)

This switch must be OPEN for normal operation. When this switch is closed, it enables loading the new M06333KXXXX CPU software.

SW2-10 (Only on M06333KXXXX CPU)

This switch is not used. Set to the Open position.

ATC Setup

On commercial units with the ATC module installed, when you activate the magnet located at the opposite side of the totalizer, the following items are visible on the display:

Display Name	Example	Display Description
Volume	0023043	Uncompensated volume
Probe Temperature	023.2	Probe temperature in Celsius only
Flow Rate	189.2	Flow rate (in LPM only)
Software Version	1.30	Software version number
ATC Status	842.2	Automatic Temperature Compensation

On the status display, the rightmost digit (2) indicates whether the temperature compensation is enabled or not, and if so, the product that is being dispensed. The following digits indicate the settings that have been enabled:

- 0 = Temperature compensation enabled
- 1 = Product is gasoline and compensation is enabled
- 2 = Product is diesel and compensation is enabled

On the status display, the leftmost digits (842) are error indicators, which are blank when the corresponding error condition is not active. When any of these digits are displayed, it indicates the following:

- 8 = Temperature probe fault is detected
- 4 = Pulser error occurred
- 2 = Exceptional reset was detected

Setting DIP Switches

DIP Switch Settings			
Switch Number	**Switch Function**	**Settings for Existing and Model 9850K**	**Settings for Models 9840K, 9852K, 9853K**
1	Product 1	ON for Diesel, OFF for Gasoline	ON for Diesel, OFF for Gasoline
2	Product 2	ON for Diesel, OFF for Gasoline	ON for Diesel, OFF for Gasoline
3	Not Used	N/A	N/A
4	Unit of Measure	N/A	ON for Liters, OFF for Gallons
5	Pulser Multiplier	ON for 9850 and 9850K, OFF for 9852/9853	N/A
6	Number of Probes	ON for two (2) probes, OFF for one (1) probe	ON for two (2) probes, OFF for one (1) probe
7	Pulser Adder	ON for 9840	ON for 9840K
8	ATC	ON for ATC ON, OFF for ATC OFF	ON for ATC ON, OFF for ATC OFF

Error Codes (EC)

When operating the pump/dispenser, the 9800 series unit shows a two or three digit error transaction code on the Liquid Crystal Display (LCD) display when transactions are terminated abnormally (that is, other than turning the pump handle off).

The error codes are displayed for two seconds at the left of the LCD window, alternating with a five-second display of the last sale amount. The display alternates between the two until a new transaction begins. When an error occurs, note the error code and relay the information to the system administrator.

Code	Condition
01	RAM failure
02	ROM failure
55	Power failure
56	Pulser error
57	Timed out
58	Limit cutoff
59	Flow error meter 1 (9840 only)
60	Flow error meter 2 (9840 only)
99	Frozen error (9860 only)
993	Calibration error (9860 or 9870 only)

In case of 993 error, a new transaction will NOT start until the error is cleared. When the 9800 series unit is in the Online mode, connected to a CFN or TopKAT, transaction error codes are transmitted back to the system with the completed transaction data.

Note: Error Codes for the Atlas DEF units can be found in MDE-4331 Atlas Fuel Systems Installation Manual.

Programming 8800 Series Units

For 8800 series units, the programming mode can only be entered when both sides of the dispenser are in an idle mode, using the Manager Keypad. The nozzles must be in the nozzle boots. Dispenser programming results in the unit being placed offline with regard to external communications. Dispenser programming is started by pressing **F1** on the Manager Keypad. The following sub-sections describe general dispenser operation while in programming mode.

At each level, the PIN code must be entered. After you are in the third level, you can access any programming process.

General Programming Details

Action	Cash Display	LSD in Volume Display
F1		1
2222	0000	1
ENTER Repeats for Level 2	88888 Flashing	
10	10	
ENTER		2
1503	0000	2
ENTER Repeats for Level 3	88888 Flashing	
17	17	
ENTER		3
1309	0000	3
ENTER	88888 Flashing	

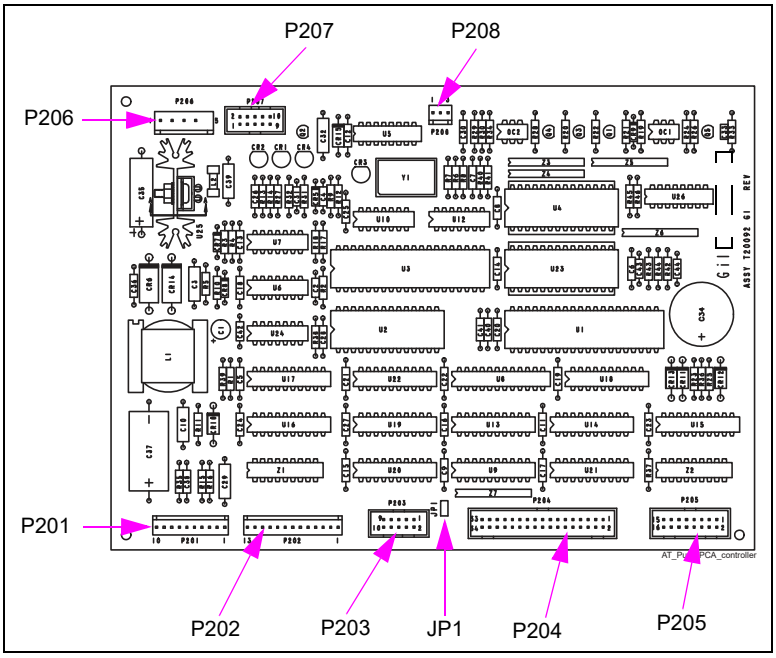
Notes: 1) It is important to note that each programming level utilizes a unique set of programming codes. The reason for this is to allow room for future expansion of programming features. Function codes within a command code begin at 1.

2) After the highest level security code has been entered, you can access all levels.

Entry into a command code will present data in either the DEFAULT format or last programmed values for that command code. Only one command code and function code/parameter may be programmed/changed at a time.

Figure 4-36 shows a PCA of the Gasboy 8800 Electronic System. For proper service, the technician must be knowledgeable of the functions of components and how they relate to the system.

Figure 4-36: Pump Controller (T20092)



Manager Keypad Details

Figure 4-37 shows the Manager keypad details.

Figure 4-37: Manager Keypad Layout

Manager Keypad Key Definitions and Use

Key(s)	Definition/Use
0-9	Numeric Values
F1	Function 1 – Used to start dispenser programming and sequence among programming and function codes. In general, each depression of **F1** will take you back to a previous programming function selection. Pressing **F1** from the normal dispenser state will always initiate the Programming mode. Note that displays are always activated during the Programming mode.
F2	Function 2 – Used to exit the programming mode and return to normal mode.
$Totals	Money Totals – Used to display money totals by side and grade. This key does not require a security code. **Clear** is used to exit the Money Totals mode.

Key(s)	Definition/Use
Vol. Total	Volume Totals – Used to display volume totals by side and grade. This key does not require a security code. **Clear** key is used to exit the Volume Totals mode.
ENTER	Value entry keys – Sends the entered value to the pump.
CLEAR	Clear key – Used to clear the last keypad entry, and exit the Money and Volume Totals mode.

Programming Errors

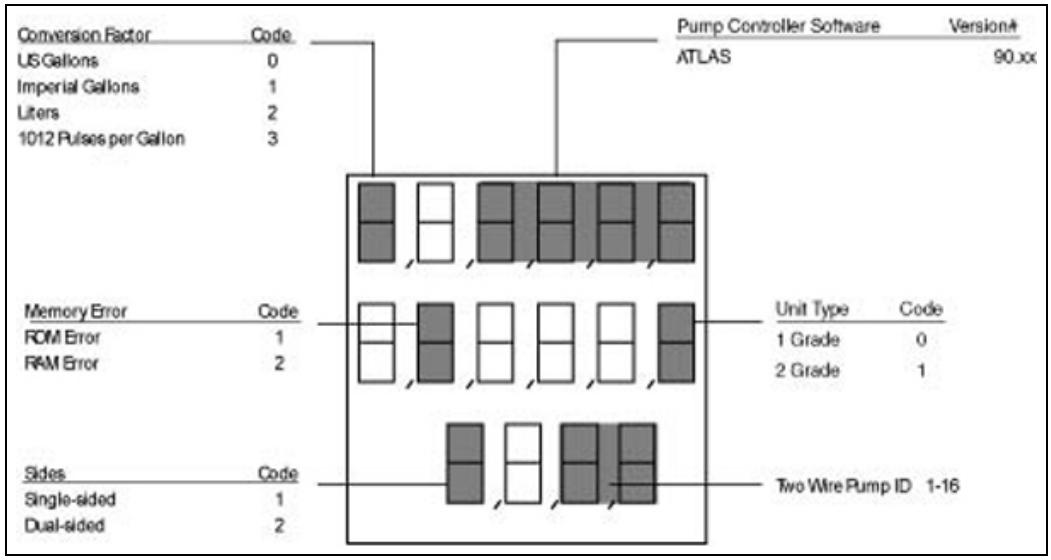
The following table shows the currently allocated security and command codes that have been assigned for Atlas. These codes can be modified by the user by the use of command codes:

Programming Level	Default Security Code	Level Primarily Used by
Level 1	2222	-
Level 2	1503	-
Level 3	1309	-

Display Conventions

The programming digit positions for the main money and volume displays are shown in Figure 4-38. This applies even in cases where more than six display digits are available for display purposes. Information will be displayed on all grade PPUs when required and will be restricted to digits 4 through 1, unless otherwise noted.

Figure 4-38: Location of Data on Displays at Power Up



During programming, the command code is always shown left justified in the main money display, starting at digit position 6. Other display information will be dependent on specific programming command codes and function codes within the command code.

Flashing fields indicate a selected parameter where data may be entered or simply inspected.

Programming parameters are shown in LCD displays as soon as the parameter selection key is pressed. Parameters are entered into the pump control system only after **Enter** is pressed.

Totals Examples

To toggle between the grade and side selection for both **$ Total** and **Vol Total** key, press **Enter** as found on the Manager Keypad.

Non-resettable Money and Volume Totals

The dispenser maintains a set of non-resettable totals for each dispensed fuel grade. These totals reflect the total value of money and volume of fuel, since the dispenser was installed.

Money and Volume Totals

$ Total is used to retrieve money totals for each fuel grade. This key does not require a security code. **Clear** is used to exit Money Totals mode. **1** displayed in the leftmost $ Total display indicates that this total is a non-resettable money total. The **Vol Total** key displays the volume for the grade selected. Volume for both sides of the unit can be viewed. **Clear** is used to exit the Volume Total mode. This convention comes from The Advantage Series product line and is maintained here for ASC and Site Manager familiarity.

Programming Steps for 8800 Series Units

This section provides the programming steps for 8800 Series units.

Master Reset/Warmstart

A Master Reset removes all programming, unit configuration, and dispenser memory in addition to resetting the internal processor to an initial state. It is frequently referred to as a Cold Start. A Warmstart (power-down and up of the unit) only resets the processor to an initial state.

Master Resets are generally required:

- When changing the software
- To temporarily or permanently fix a locked dispenser or unusual dispenser response

A Master Reset is a powerful service tool. However, when troubleshooting a non-responsive pump, avoid performing a Master Reset as the first step in troubleshooting. First observe the symptoms, observe the diagnostic Light Emitting Diode (LED)s, and check the voltage, as appropriate. In many cases, a Master Reset will hide problems that are being alerted by these troubleshooting aids by resetting the pump/dispenser processor. If multiple or repetitive resets are required, investigate a hardware or software issue.

To perform a Master Reset, proceed as follows:

1. Record all totals and programming. Isolate the unit at the D-Box.
2. Turn off power to the unit.
3. Install a jump jack on JP-1B on the A side main display (J-box opening side).
4. Restore power to the unit and wait for Error Code 40.
5. Remove the jump jack.
6. Reprogram the unit.
7. Bring the unit back on line at the D-Box.

Level 1 Programming

The following information gives specific programming steps for Level 1 commands. All this information is entered on the Manager Keypad. Ensure that you follow the following steps. The side with the J-box opening is Side 1 while the other side is Side 2. Power-up and Command Code 8 will display the current software version.

For Level 1 programming, proceed as follows:

1 Press **Fl**.

2 Enter the 4-digit ID (default 2222) and then press **Enter**.

3 Press **F1** to exit any command code.

4 Press **F2** to return to normal operation.

You may enter any command code directly from Level 1 after entering the PIN code.

Command Code 1: Program PPU

Manual programming of PPU, unit pricing. Pricing can also be downloaded through the two-wire communication using the POS device.

To program the PPU, proceed as follows:

1 Press **1** and then press **Enter**.

2 Select the Side (1 or 2) and then press **Enter**.

3 Select the Grade and then press **Enter**.

4 Select the Price Level and then press **Enter**.

5 Enter the new PPU and then press **Enter**.

Note: Repeat steps 1 to 5 for the other Side, Grade, and Price Level.

Command Code 2: Program Two-wire/Standalone

To set the operation to Standalone mode (isolates sale control from the POS) or two-wire (unit control through the POS), proceed as follows:

1 Press **2** and then press **Enter**.

2 Press the configuration number and then press **Enter**, where:
- 0 = Standalone mode
- 1 = Two-wire mode
- 2 = Pulse-out mode

Command Code 3: Program Allocation

Programming Volume Allocation basically sets the maximum sale size in units of measure (for example, gallons).

To program the Volume Allocation, proceed as follows:

1 Press **3** and then press **Enter**.

2 Select the Side (1 or 2) and then press **Enter**.

3 Select the Hose/Grade and then press **Enter**.

4 Select the Allocation amount and then press **Enter**.

Note: Repeat steps 1 to 4 for the other Side, Hose, and Grade.

Command Code 4: Program Manual Blank Display Cash/Volume Preset Select

The Manual Blank and Five-button Preset is a dual use code that allows turning off displays manually or is used to activate different preset modes depending on the options included with the unit.

To program Manual Blank Display Cash/Volume Preset Select, proceed as follows:

1 Press **4** and then press **Enter**.

2 Select the Function Code (1 or 2) and then press **Enter**, where:

Function Code 1: Manual Blank Displays
Press the option code and then press **Enter**, where:
0 = Display Off
1 = Display On

Function Code 2: Cash/Volume Preset Select
Press the option code and then press **Enter**, where:
0 = No Five-button Preset or Programmable Pump Preset (PPP) installed
1 = Money Preset
2 = Volume Preset
3 = Incremental Preset

Command Code 5: Test Customer Programmable Preset

Test Programmable Customer Preset is a code that is used to initiate testing for the Five-button Preset option if used.

To program the Test Programmable Customer Preset, proceed as follows:

1 Press **5** and then press **Enter**.

2 Select the Configuration and then press **Enter**, where:
0 = STOP Test/Program
1 = START Test/Program

Depending on the preset option, the type testing will convey the following when you press the preset buttons:
Five-button Preset (Non-customer Programmable Preset)
Press **Enter** after making selections, where:
1 = Program Button 1 (Default 1)
2 = Program Button 2 (Default 5)
3 = Program Button 3 (Default 10)
4 = Program Button 4 (Default 15)
Incremental Preset (Non-customer Programmable Preset)
Press **Enter** after making selections, where:
1 = Program Button 1 (Default 1) Money
2 = Program Button 2 (Default 5) Money
3 = Program Button 3 (Default 10) Money
4 = Program Button 1 (Default 1) Volume
5 = Program Button 2 (Default 5) Volume
6 = Program Button 3 (Default 10) Volume

After the test is complete, follow programming steps to setup.

Command Code 6: Memory Clear for Error Code 31 or 35

The Memory Clear code is only useful to clear a unit displaying an EC 31 Totals Data Error) or EC 35 Configuration Data Error.

To program the Memory Clear code, proceed as follows:

1 Press **6** and then press **Enter**.

2 Press **1** and then press **Enter**.

Command Code 7: Program Totals Input

The Setting Totals Input code allows setting of non zero totals. It is useful for new installations or service when the station does not want to restart totals for its dispensers at zero, when old dispensers are replaced, or receive certain types of service. It can only be performed after performing a Master Reset, CC6, or for new units.

To program Totals Input, proceed as follows:

1 Press **7** and then press **Enter**.

2 Select the Side (1 or 2) and then press **Enter**.

3 Select the Grade # and then press **Enter**.

4 Press **$ Total**.

5 Enter the money total and then press **Enter**.
Note: Repeat steps 1 to 5 for the other side and grade.

6 Press **Volume Total** and repeat the above procedure for volume totals.

Command Code 8: Display Version Number

To display the Pump Controller Firmware Version, proceed as follows:

1 Press **8** and then press **Enter**.

2 Select the Software Option and then press **Enter**, where:
1 = Pump Controller
3 = Customer Programmable Preset

Level 2 Programming

The following information gives specific programming steps for Level 2 commands. All this information is entered on the Manager Keypad. Ensure that you follow the following steps. The side with the J-box opening is Side 1 while the other side is Side 2.

*Note: *Indicates the default value.*

PIN Code Entry

You must enter Level 1 before accessing Level 2 commands.

- **Level 1**- Press **Fl**, enter the 4-digit ID (default 2222) and then press **Enter**.
- **Level 2**- From Level 1, enter any Level 2 Command Code (10-12), enter the 4-digit ID (default 1503), and then press **Enter**. Press **F1** to exit any command code. Press **F2** to return to normal operation.

Command Code 10: System Configuration

This multi-purpose code contains several sub codes called Function Codes (FC). Not all codes are used for Atlas. If accessible, do not change other codes from their default values or the unit may not work properly.

1 Press **Enter** after making selections.

2 Press **10**.

3 Press **Function #**.

4 Press **Configuration #**.

Function Code 1: Unit Type
Defines the unit. It must be always set to **1** for Atlas.
1 = 1 product
2 = 2 product

Function Code 2: Money Decimal Point
Defines the money display format.
1 = xxxxx
2 = xxxx.x
3 = xxx.xx
4 = xxx.xxx

Function Code 3: Calculation PPU Decimal Point
Defines the PPU decimal point. Must use number **4** for US (required in U.S. as per WandM).
1 = xxxx
2 = xxx.x
3 = xx.xx
4 = x.xxx

Function Code 4: Displayed PPU Decimal Point
Configures the default value. Normally select **4** for US. If the displayed decimal point and calculated decimal point are different, program FC 3 first.
1 = xxxx
2 = xxx.x
3 = xx.xx
4 = x.xxx

Function Code 5: STP Pre-start
Set to **On** for mechanical leak detectors or set to **Off** for most electronic line leak detectors. Also, for self-contained pumping units, set to **Off**.
0 = Off
1 = On

Function Code 6: Beeper Option
Activates the beeper.
0 = Off
1 = On

Function Code 8: Two-wire Display Blank Option
Activation of this code allows entering of a specific preset amount to be turned off on the display at the dispenser using a remote POS device.
0 = Off
1 = On

Function Code 9: 5- or 6-digit Cash Display
Programs 5 or 6 digits of cash. POS must be set to the same.
0 = 5 Digit Money
1 = 6 Digit Money

Function Code 10: Decimal/Comma Mode
Programs display format.
0 = Decimal point
1 = Decimal point, comma

Function Code 11: Pre-select Timeout
The customer must make a decision (other than the default) within the programmed time or the unit will be de-authorized.

Function Coda 12: Pump Timeout
After you begin dispensing of fuel, if the idle time exceeds the programmed time, the unit will terminate the sale.
0 = None
1 = 5 seconds
2 = 15 seconds
3 = 30 seconds
4 = 45 seconds
5 = 60 seconds
6 = 75 seconds
7 = 90 seconds
8 = 120 seconds

Function Code 13: Slowdown
This determines the time for which the unit will be in a slowdown mode during a preset sale. Setting it for too short time will result in you missing the target sale. Setting it for too long will increase the time of completion the sale. This code is useful for preset problems.
0 = .070 gallons (.264 liters)
1 = .120 gallons (.454 liters)
2 = .170 gallons (.643 liters)
3 = .220 gallons (.833 liters)
4 = .270 gallons (1.02 liters)
5 = .320 gallons (1.21 liters)
6 = .370 gallons (1.40 liters)
7 = .420 gallons (1.59 liters)
8 = .470 gallons (1.78 liters)
9 = .520 gallons (1.97 liters)

Function Code 15: Zero PPU Pricing Option Enable
Allows dispensing of fuel with a “zero” PPU.
0 = Disabled
1 = Enabled

Function Code 16: Beeper Timeout
Used in conjunction with FC 12 to turn beeper off after a programmed period of time.
0 = None
1 = 5 seconds
2 = 15 seconds
3 = 30 seconds
4 = 45 seconds
5 = 60 seconds
6 = 75 seconds
7 = 90 seconds
8 = 120 seconds

Function Code 17: Stop Control
Turns off one or both sides of the unit if the **Stop** option is pressed.
0 = Stop controls one side
1 = Stop controls two sides

Function Code 18: Zero Previous Transaction After Pump Handle Operation
Resets the last transaction after the pump handle is raised and the unit is authorized (required for New Jersey, US).
0 = Zero after lamp test
1 = Zero before lamp test (Required for New Jersey)

Function Code 19: Lamp Test (Leak Detector Test)
It is not actually a lamp test; but it programs the amount of time the dispenser valves take to open, after the handle is raised. Primarily used for dispensers with mechanical STP leak detectors to allow the leak detector enough time to run its test.
1 = 1 second
2 = 2 seconds
3 = 3 seconds
4 = 4 seconds
5 = 5 seconds
6 = 6 seconds
7 = 7 seconds
8 = 8 seconds
9 = 9 seconds

Function Code 20: Programmable Pump Preset Value
Set to **1** for use with six-digit cash programming.
0 = Value X 1
1 = Value X 10

Function Code 21: PPU Blinking Option
0 = No PPU Blinking
1 = PPU Blinking

Function Code 22: Volume Decimal Point
0 = xxx.xxx
1 = xxxx. xx (export only)

Function Code 23: Program STP Control
0 = Off
1 = On

Command Code 11: Grade Assignment (Perform this at Console)

Assigning Grades. Normally not used as grades must be programmed using the POS.

Command Code 12: Pump Program

This is also a multi-purpose code with sub-codes. Not all codes are used for Atlas. If accessible, do not change other codes from their default value or the pump/dispenser may not work properly.

To program the pump, proceed as follows:

1. Press **12**.
2. Enter the Side #, where 1 = Side A, 2 = Side B.
3. Enter the Function Code (1-4).
4. Enter the Configuration Code.

Function Code 1: Two-wire Pump ID
Sets the two-wire ID that the POS uses for the pump/dispenser involved. Press **Enter** after making selections.
1-16 = Choose a number between 1-16

Function Code 2: Cash/Credit at Pump
0 = No
2 = Yes

Function Code 3: Side Exists
0 = Does not exist
1 = Exists

Function Code 4: PPU Options
0 = Level 1 price bar displays the level sent by console
1 = Normal

Level 3 Programming

You must enter Level 1 and 2 before accessing Level 3 commands.

- **Level 1 -** Press **Fl**, enter the 4-digit ID (default 2222), and then press **Enter**.
- **Level 2** - From Level 1, enter any Level 2 Command Code (10-12), enter the 4-digit ID (default 1503), and then press **Enter**.
- **Level 3** - From Level 2, enter any Level 3 Command Code (13-17), enter the 4-digit ID (default 1309), and then press **Enter**. Press **F1** to exit any command code. Press **F2** to return to normal operation.

Command Code 13: PIN Code Change

Change PIN code. To change the PIN code, proceed as follows:

1. Enter **13**.

2. Enter Level #1, 2, or 3.

3. Enter the new PIN code.
Note: The unit returns to Command Input Mode.

Command Code 17 - Conversion Factor and Master Reset Select Function

The Conversion Factors/Performing Master Resets function is normally used during the setup of a unit, to program the unit of measure and provide a means to do a firmware initiated Master Reset.

Function Code 1: Conversion Factor
0 = No conversion factor*
1 = US. Gallons
2 = Imperial Gallons
3 = Liters
4 = 1012 Pulses per gallon

Function Code 2: Master Reset
0 = No Master Reset
1 = Master Reset

Command Code 18 - To Program Various Options Under Pulse Output

Function Code 1 = Volume Pulses per Unit
1 = 1
2 = 10 (Default)
3 = 50
4 = 100
5 = 1000

Function Code 2 = Volume Output Pulse Width
1 = 0.5 ms
2 = 1.0 ms
3 = 2.0 ms
4 = 4.0 (Default)
5 = 17.0 ms
6 = 19.0 ms
7 = 26.0 ms
8 = 150.0 ms

Function Code 3 = Money Output Pulse Width
1 = 0.5 ms
2 = 1.0 ms
3 = 2.0 ms
4 = 4.0 (Default)
5 = 17.0 ms
6 = 19.0 ms
7 = 26.0 ms

Function Code 4 = Volume Suppression
1 = 0.030 (Default)
2 = 0.009
3 = 0.000

Function Code 5 = Quadrature Pulse Output
0 = Disabled (Default)
1 = Enabled

Function Code 6 = Authorize After Stop
0 = Disabled (Default)
1 = Enabled

Function Code 7 = PRC Restore Option Programming
0 = Disabled (Default)
1 = Enabled

Command Code 2 - To Program the Unit to the Pulse Output Mode

Function Code 0 = Standard Mode
Function Code 1 = Two-wire Mode
Function Code 2 = Pulse Output Mode

Option and Miscellaneous Programming/Data Acquisition

Special programming is involved in ATC and displaying Totals.

ATC Programming

At power-up, the units programmed with the ATC option will flash 104 before displaying normal information. Units with the option, but not programmed for ATC will flash 100. To program the ATC option, proceed as follows:

1 Turn On the programming switch on the ATC Controller Board.
Note: The dispenser must not be used during this programming and all pump handles must be down or inactive.

2 Press **100** on the keypad and then press **Enter**.
- The money position showing fueling position selected will display 1.
- The volume position showing the fuel type selected will display 1, where:
  1 = Gasoline
  2 = Diesel
- The PPU position showing fuel density selected will display 730, where:
  740 = Gasoline
  840 = Diesel
  730 = Default

3 Select the fuel type and press **Enter**.

4 The firmware sequence will sequence through each fueling position. Select the fuel type for each position (diesel or gasoline).

5 Turn the programming switch on the ATC controller board to **Off**.

6 Press **F2** to exit the ATC Programming mode.

ATC Inspection Mode

Inspection of the ATC states and data collection can be obtained following a similar procedure as outlined for ATC Programming above. Instead of pressing **100**, other codes can be used as described in the following table:

ATC Inspection Modes

On the Manager Keypad, press the ATC following function code, when the unit is idle. Note that all pump handles must be down or inactive. Press **Enter**, meter number if appropriate, and then press **Enter**. Exit by pressing **F1**.

Function Code	Description	Main Display	Volume Display	PPU Display
300	Audit Last Transaction	Gross Volume	Net Volume	Average Temperature
301	Display Volume Correction Factor	Meter Number		Volume Correction Factor.
302	Display Fuel Density	Meter Number		730 Gas 840 Diesel
303	Display Temperature	Meter Number		Current Temperature
304	Display Gross Totals		Gross Volume (most significant)	
500	Display Software Version Number	ATC Version		
200	Real-Time Transaction Mode	Gross Volume	Net Volume	Current Temperature

Displaying Pump Totals

During service, it is often required to access pump totals. This can be done at the POS or at the pump/dispenser. Access is simple and is through the Manager Keypad.

To view Side 1 totals, proceed as follows:

1. Press **$ Total**. The combined cash and credit total will display for grade 1, side 1.
2. Select the grade. Read $ Total for each grade selected.
3. Press **Vol Total**. The volume total will display for the grade selected.
4. Select the grade. Read volume totals for grade selected.
5. To view Side 2 totals, press **Enter**.
6. Press **Clear** to exit.

Error Codes and Descriptions

The following list describes error codes/states that you may observe. These codes are useful when troubleshooting a problem. Side A is the J-box opening side and Side B is the opposite side.

Error Code	Description
20	Pulser Fail
21	Non existent Memory
22	Not used
23	Grade Assignment Changed
24	Conversion Factor Changed/ Not Programmed
25	Two-wire/Standalone Mode Changed
26	No Conversion Factor, Tape
27	Side A Two-wire ID Changed
28	Side B Two-wire ID Changed
29	Pump Time-out Error
30	Not Used
31	Totals Data Error
32	Pulser Count Error
33	Push-to-stop Button Activated
34	Not Used
35	Configuration Data Error
36	Unit Type Configuration Code Changed
37	PIN Code 1 Changed
38	PIN Code 2 Changed
39	Cast/Credit Option Changed
40	Master Reset Jumper in Place
41	Side Exists Option Changed
42	PPU Options Changed
43	Not Used
44	Pump Handle Up at Power-up

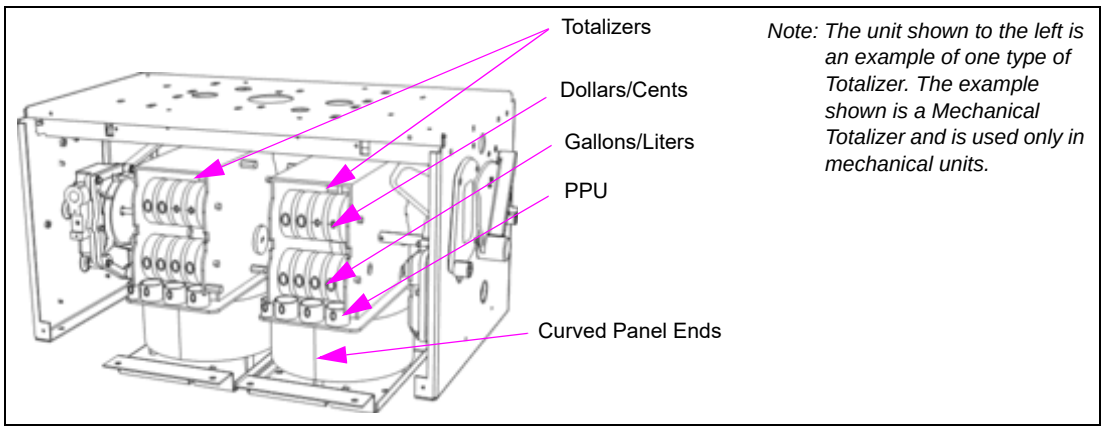
Programming 8700 Series Units

General Programming Details

The mechanical computer can be set for the price range and PPU (gallon/liter) dispensed. Adjustments for volume of the product dispensed is accomplished at the meter calibration adjustment wheel.

Note: 9100 series units do not require programming.

Figure 4-39: Variator Assembly for Mechanical Units



Programming Steps

This section provides the programming steps for the 8700 Series unit.

Setting Calibration

Gasboy Atlas pumps and dispensers are tested for accurate measure at the factory. It is the responsibility of the installer to check the unit for accuracy and make the required adjustments. It is the owner's responsibility to report this device to the local Weights and Measures authority for inspection before putting the unit in service. For setting the calibration, refer to "Meter Calibration" on page 6-22.

Setting Prices

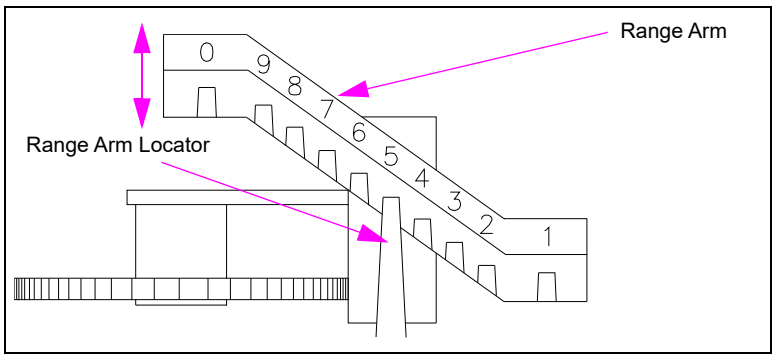
To set the prices, proceed as follows:

1. Unlock and remove the front panel. Repeat this procedure for the other side.

2. The variator section of the computer register(s) is exposed to allow for price changes. Slide the variator cover of the computer register apart to expose the price range arms.

3 There are three range arms located in the variator section. One sets the tenths of a cent position, one sets the one cent position, and the last one sets the ten cents position. To change the setting, grasp a range arm and raise it to clear the range arm locator, and relocate the range arm to the desired setting. Ensure that the range arm is totally bottomed on its setting. Repeat this for all range arm settings, if required.

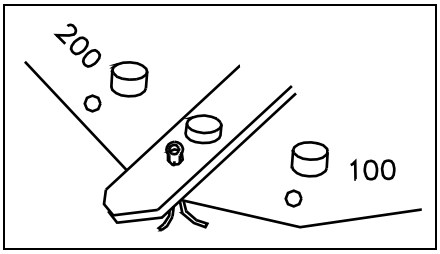
Figure 4-40: Range Arm Setting



4 To change the money unit setting, locate the lever control that is located above the variator section on the same level as the price display. There are three available positions: 0.00, 1.00, and 2.00. Remove the cotter pin, grasp the lever, and raise it slightly to clear the position locators. Position the lever to the desired setting and release. Reinsert the cotter pin through the lever and plate.

Note: If the lever does not move to the required position, rotate the right hand money wheel until the lever is free to move.

Figure 4-41: Insert Cotter Pin



5 If you have difficulty reaching the money shift lever when changing prices, remove the two cap screws located over the tabs of the bezel assembly. Lift the bezel assembly upward and remove it from the unit. When reattaching the bezel to the dispensing unit, ensure that the top inner edge of the bezel assembly slides into the “U” shaped channel located on the upper edge of the dispensing unit.

5 – Electronic and Electrical Components

Introduction

Purpose

This section provides information regarding the electronics and electrical components within pumps and dispensers. This information consists of applicable data on connections, settings, test points, and functional descriptions. PCAs control the hydraulics, monitors fuel delivery, computes, displays, and stores transactional information. These electronic components interface with the POS devices and support payment options. The term PCA and Printed Circuit Boards (PCBs) are used interchangeably in this document.

Important Information About Releases

Sections of this manual may be released or updated independently to supply the most current data. Information about release date and version for independently released sections will be included in the section title and footer of the document. For the latest updates, refer to GOLD.

This section was last updated in July 2013.

Topics in This Section

How to Use This Section

For location and listings of topics contained in this section, refer to "Topics in This Section". To find information on specific components, use the above table.

Electronics Highlights

Atlas 8800 Electronic Retail units communicates with various POS devices using the Gilbarco two-wire current loop proprietary communication protocol. Atlas 9800 series Commercial units will communicate with various POS devices using the Gasboy PAC Data Protocol.

Retail Parts by Name

Retail Parts
Retail Parts for Gasboy Atlas 8800 Series
ATC # T19405-G3 T-Meter Module Automatic Temperature Controller (Optional)
ATC, Optimum™ # T20569-G1 Optimum Automatic Temperature Controller Control PCA (Optional)
Backlight # T17622-G9 0.6-inch Main Display PCA
Ballast # M03154B001 Instant Start
Barrier, Intrinsically Safe # T19428-G1 Assembly ATC (Optional)
Buzzer # Q11763-01
Cable # M02739A001 from T20092-G1 (Pump Controller PCA) P205 (16) and 207 (10) to T20569-G1 OP ATC Control PCA P405 (34) and P301 (20) and 305 (34)
Cable # M04658A001 from T18994-G1 P405 (20) to Q11763-01 Buzzer to Q12514-10 switch A1 PH (B1) (4) and B1 PH (A1) (4) to J921B and J921A to J1 (3) to P1 Relays
Cable # M04658A001 from T18994-G1 P406 (5) to J922A (4) > M00455A003 Grade 1 Electronic Totalizer Side A and J922B (4) > M00455A003 Grade 2 side Electronic Totalizer B
Cable # M04659A001_2_3 to relay
Cable # M04850A006
Cable # M04889A001 from T18994-G1 P405 (20) to Q11763-01 Buzzer to Q12514-10 switch A1 PH (B1) (4) and B1 PH (A1) (4) to J921B and J921A to J1 (3) to P1 Relays
Cable # M04890A001 from Main J-box
Cable # R196677-G1 from T20092-G1 (Pump Controller PCA) P204 (34) to T20569-G1 (OP ATC Control PCA) P304 (34)
Cable # R18944-G1 from T17331-G1 (Pump Preset PCA) P412 (34) to T17328-G1 Pump Preset Display PCA P612 (34)
Cable # R18944-G1from T17331-G1 (Pump Preset PCA) P413 (34) to T17328-G1 Pump Preset Display PCA P612 (34)
Cable # R19072-G1 from J921A to T18350-G3 Pulser
Cable # R19527-G1 from T20569-G1 {OP ATC Control PCA (Optional)} P204A (34) to P204A (34) J204 LCD Main Display
Cable # R19936-G1 from T20092-G1 (Pump Controller PCA) P201 (10) to T17331-G1 (Pump Preset PCA) P411 (34)
Cable # R19939-G1 from T20092-G1 (Pump Controller PCA) P206 (5) to T18994-G1 (Pump Interface PCA) P306 (5)
Cable # R19951-G1 Cable from T20092-G1 (Pump Controller PCA) P203 (10) to T17549-G1 (Manager Keypad) P901A (10)
Cable # R19951-G1 Cable from T20092-G1 (Pump Controller PCA) P207 (10) toT18994-G1 P307 (10)
Cable # R19951-G1 Cable from T20569-G1 {Optimum ATC Controller PCA (Optional)} P303A (10) to T17549-G1 (Manager Keypad) P901A (10)
Cable # R19952-G1 Cable from T20092-G1 (Pump Controller PCA) P205 (16) to T18994-G1 (Pump Interface PCA) P305 (16)
Cable # R20128-G1 Cable from T20569-G1 {OP ATC Control PCA (Optional)} P307 (4) to Main J-box
Cable # R20146-G1 Cable from T20092-G1 (Pump Controller PCA) P203 (10) to T20569-G1 (OP ATC Control PCA) P303 (10)
Cable # R20148-G3 Cable from T19405-G3 (T-Meter Module) P200 (16) to Probe 2 PTP2 (16)
Cable # R20148-G3 Cable from T19405-G3 (T-Meter Module) P202 (16) to Probe 1 PTP1 (16)
Cable # R20412-G3 Cable from T20092-G1 (Pump Controller PCA) P208 (two-wire) to P402A (2) to J402 FE Wiring
Cable # R20412-G3 Cable from T20092-G1 (Pump Controller PCA) P208 [3 (two-wire)] to FE wiring sheet 1> P402A (2)
Cable # R20412-G3 from T19428-G1 Intrinsic Safety (I.S.) Barrier > JIS (10) to P201 (10) T19405-G3

Retail Parts
Filter # Q10895-07
Fuse # Q10131-03
Key Pad # T17549-G1 Manager
LCD # M15224A001 or T18981-G1 Main Display PCA 0.6-inch
Power Supply # T19868-G1 Main
Pulser # T18350-G3 Assembly
Pump Controller # T20092-G1 PCA
Switch # Q12514-10 Pump Handle SW
Totalizer # M00455A003 Electronic
Varistor PCA # T17448-G1 (115 VAC) in Main J-box
Varistor PCA # T17448-G3 (220/230/240 VAC) in Main J-box

Note: ATC is available as an option in units for the Canadian market.

Retail Parts by Number

Part Number	Description
M00455A003	Electro-mechanical Totalizer
M02739A001	Cable from T20092-G1 (Pump Controller PCA) P205 (16) and 207 (10) to T20569-G1 OP ATC Control PCA P405 (34) and P301 (20) and 305 (34)
M03154B001	Instant Start Ballast
M04011B001	Cable Pulser Assembly
M04658A001	Cable from T18994-G1 P405 (20) to Q11763-01 Buzzer to Q12514-10 switch A1 PH (B1) (4) and B1 PH (A1) (4) to J921B and J921A to J1 (3) to P1 Relays
M04658A001	Cable from T18994-G1 P406 (5) to J922A (4) > M00455A003 Grade 1 Electronic Totalizer Side A and J922B (4) > M00455A003 Grade 2 Side Electronic Totalizer B
M04659A001 M04659A002 M04659A003	Cable to relay
M04850A006	Main Conduit
M04889A001	Cable from T18994-G1 P405 (20) to Q11763-01 Buzzer to Q12514 10 switch A1 PH (B1) (4) and B1 PH(A1)(4) to J921B and J921A to J1 (3) to P1 Relays
M04890A001	Ballast and 2-lamp assembly
M04956A006 M04956A007	Relay Single, A007 Dual
M13924A001	LED Light Strip PCA
M13929B001	LED Driver Assembly
Q10131-03	Fuse, 3 A, 250 V SLO-BLO
Q10895-07	Filter
Q11763-01	Buzzer
Q12514-10	Pump Handle Switch
R12667-G1	Cable from T20092-G1 (Pump Controller PCA) P204 (34) to T20569-G1 (OP ATC Control PCA) P304 (34)
R18944-G1	Cable from T17331-G1 (Pump Preset PCA) P412 (34) to T17328-G1 Pump Preset Display PCA P612 (34)
R19072-G1	Cable from J921A to T18350-G3 Pulser
R19527-G1	Cable from T20569-G1 (OP ATC Control PCA) P204A (34) to P204A (34) J204 LCD Main Display

Part Number	Description
R19936-G1	Cable from T20092-G1 (Pump Controller PCA) P201 (10) to T17331-G1 (Pump Preset PCA) P411 (34)
R19939-G1	Cable from T20092-G1 (Pump Controller PCA) P206 (5) to T18994-G1 (Pump Interface PCA) P306 (5)
R19951-G1	Cable from T20092-G1 (Pump Controller PCA) P203 (10) to T17549-G1 (Manager Keypad) P901A (10)
R19951-G1	Cable from T20092-G1 (Pump Controller PCA) P207 (10) toT18994-G1 P307 (10)
R19951-G1	Cable from T20569-G1 (Optimum ATC Controller PCA) P303A (10) to T17549-G1 (Manager Keypad) P901A (10)
R19952-G1	Cable from T20092-G1 (Pump Controller PCA) P205 (16) to T18994-G1 (Pump Interface PCA) P305 (16)
R20128-G1	Cable from T20569-G1 (OP ATC Control PCA) P307 (4) to Main J-box
R20146-G1	Cable from T20092-G1 (Pump Controller PCA) P203 (10) to T20569-G1 (OP ATC Control PCA) P303 (10)
R20148-G3	Cable from T19405-G3 (T-Meter Module) P200 (16) to Probe 2 PTP2 (16)
R20148-G3	Cable from T19405-G3 (T-Meter Module) P202 (16) to Probe 1 PTP1 (16)
R20412-G3	Cable from T20092-G1 (Pump Controller PCA) P208 (2 wire) to P402A (2)to J402 FE Wiring
R20412-G3	Cable from T19428-G1 I.S Barrier > JIS (10) to P201 (10) T19405 G3
R20412-G3	Cable from T20092-G1 (Pump Controller PCA) P208 (3) (2 wire) to FE wiring sheet 1> P402A (2)
T17448-G1	Varistor PCA (115 VAC) in Main J-box
T17448-G3	Varistor PCA (220/230/240 VAC) in Main J-box
T17549-G1	Manager Keypad
M15224A001 ~ OR ~ T18981-G1	Main Display PCA LCD
T17897-01	Membrane Switch, Pump Reset Display
T18350-G3	Assembly Pulser
T18679-G1	Main Display Backlight PCA
T18994-G1	Pump, Hydraulic Interface PCA
T19405-G3	T-Meter Module Automatic Temperature Controller
T19428-G1	Intrinsically Safe Barrier Assembly
T19868-G1	Main Power Supply
T20092-G1	Pump Controller PCA
T20569-G1	Optimum Automatic Temperature Controller Control PCA
W199	Probe Assembly

Commercial Parts by Number

Part Number	Description
140941824	Cable Pump Handle Switch, Cold Weather DEF Only
C02824	Fuse, Pico 3 A, 125 V, QB
C04044 or Q10131-29	1 A, 250 VAC Slow-blow Fuse
C04243	Sensor, Front Load Nozzle Boot
C06372	Display Backlight Board (Used only with C06387, M12158A002, or M12158A004)
C06387	LCD Display PCA (Replaced by M12158A002 or M12158A004)
C06455	Cable, Display Ribbon, Single

Part Number	Description
C06518	Cable/Bracket Assembly, Solenoid to CPU, Ultra-Hi Only, Dual
C06519	Cable Backlight PWR, Single Front Load, Ultra-Hi Only
C06574	Cable, Display Ribbon, Front load, Single, Ultra-Hi Only
C06766	Barrier, I.S, Front Load
C09071	Fuse, Pico 1A, 125 V, QB
C09546	Fuse Holder
M00150A003	Cable Assembly, E-Cal Switch DEF Only
M00150A004	Cable Assembly, E-Cal Switches E85 Only
M00455A002	Electro-mechanical Totalizer
M02367A004	Cable, AC to Filter, DEF Only
M02958A002	Valve Coil Assembly, E85 Only
M03154B001	Instant Start Ballast
M04011B001	Cable Pulser Assembly
M04114A007	Conduit/Cable Assembly, Cold Weather DEF Only
M04114A008	Cable, Meter Interface, Warm Weather DEF Only
M04161B005	Power Supply, +24 VDC, DEF and E85 Only
M04193A001	Cable/Bracket Assembly, Solenoid to CPU, Ultra-Hi Only, Single
M04659A004 M04659A005	Cable to Relay
M04659A007 M04659A008	Cable to Relay, E85 Only
M04850A008	Conduit, Main AC
M04850A010	Conduit, Main AC, E85 Only
M04890A001	Ballast and 2-lamp Assembly
M04956A008 M04956A009	Relay Single, A009 Dual
M04956A010 M04956A011	Relay Single, A011 Dual, E85 Only
M05105A001	Cable Pump Handle Switch, Dual
M05105A002	Cable Pump Handle Switch, Single
M05105A003	Cable Pump Handle Switch, Front Load Warm Weather DEF Only
M05107A001	Cable, Power Supply to CPU, DC
M05107A002	Cable, Power Supply to CPU, DC, E85 Only
M05108A001	Cable Backlight PWR
M05109A001	Cable, Display Ribbon, Dual
M05110A001	AC Bracket Assembly
M05110A002	AC Bracket Assembly, DEF Only
M05110A003	AC Cable, Atlas Commercial Assembly
M05119A001	Cable, Sensor, K-pump
M05120A001	Cable 115 VAC Heater
M05120A002	Cable 230 VAC Heater
M05158A00X	K-pump Pulse-out I/F Board with Totalizer Drive (Replaced by M06587A001)

Part Number	Description
M05189A002	Conduit Pulse-out to Main J-box, Standard
M05189A006	Conduit DC, Dispenser-mount TopKAT
M05189A008	Conduit DC, Dispenser-mount TopKAT PLUS
M05201A001	Cable Pulser to CPU
M05248A001	RS-485 I/F Board with Electro-mechanical Totalizer Drive (Replaced by M06725A001)
M05683A002	Conduit, DC Dispenser-mount TopKAT, Ultra-Hi Only
M05683A004	Conduit, DC Standard, Ultra-Hi Only
M05683A006	Conduit DC, Dispenser-mount TopKAT PLUS
M05684A002	Conduit, Main AC, Ultra-Hi Single Dispenser
M05685A002	Conduit, Main AC, Ultra-Hi Single Pump
M05686A002	Conduit, AC, Valve and Micro, Ultra-Hi TW2 Only
M05686A003	Conduit, AC, Valve and Micro, Ultra-Hi TW1 Only
M05692A002	Conduit, AC, Valve and Lights, Ultra-Hi TW2 Only
M05692A002	Conduit, AC, Valve and Lights, Ultra-Hi TW1 Only
M05819K001	Kit, ATC Single Non-Ultra-Hi
M05819K002	Kit, ATC Dual Non-Ultra-Hi
M05819K003	Kit, ATC Single Ultra-Hi
M05819K004	Kit, ATC Dual Ultra-Hi
M05839B002	Cable Pulser Assembly, E85 Only
M06031A001	Valve Controller Board, E85 Only
M06333KXXXX	Atlas 9800 CPU Board 115/230 VAC *Note: M06333KXXXX requires M07588A00X Power Supply.*
M06725A001	RS-485 I/F Board with Electro-mechanical Totalizer Drive (Replaces M05248A001)
M06587A001	Atlas 9800 Pulse-out I/F Board with EM Totalizer Drive (Replaces M05158A00X)
M06656K00X	Atlas 9800 Serial EEPROM Board
M06783A001	E2 Temperature Control Board, DEF Only (Replaced by M14100A001)
M07141A003	Cable, DC to Coriolis Interface, DEF and E85 Only
M07141A004	Cable, DC to DEF (new power supply)
M07141A005	Cable, 24 volt power (new power supply)
M07233A003	Cable, Heater Adapter, Cold Weather DEF Only
M07233A009	Cable, Heater Adapter, Cold Weather DEF Only
M07275A002	Conduit, Satellite AC, Ultra-Hi Pump Combo Only
M07275A004	Conduit, Satellite AC, Ultra-Hi Dispenser Combo Only
M07366A001	Satellite Control Board, 115 VAC, Ultra-Hi Combo Only
M07366A002	Satellite Control Board, 230 VAC, Ultra-Hi Combo Only
M07588A001	Atlas 9800 Power Supply AC-DC with Battery 115 VAC (Replaced by M12421K00X Kit)
M07588A002	Atlas 9800 Power Supply AC-DC Without Battery 115 VAC (Replaced by M15579A001)
M07588A003	Atlas 9800 Power Supply AC-DC with Battery 230 VAC (Replaced by M12422K00X Kit)
M07588A004	Atlas 9800 Power Supply AC-DC Without Battery 230 VAC (Replaced by M15579A001)
M08121A002	Cable, AC from Filter to PS, DEF Only
M09958A001	Cable, Heater AC to J-box, DEF Only

Part Number	Description
M16502B001	DEF Magmeter
M10006A001	Coriolis Meter, DEF Only
M10030A001	Coriolis Interface Board, DEF Only
M10059A002	Cable, DC PWR to Meter Interface Board, DEF Only
M10060A001	Cable, Pulser to Meter Interface Board, DEF Only
M10092A001	Cable, Coriolis Meter, DEF Only
M10131A006	Cable, Heater Sensor, Cold Weather DEF Only
M10131A008	Cable, Frozen Sensor, Cold Weather DEF Only
M11277A001	Cable, Main AC to J-box, DEF Only
M11277A002	Cable, DC to J-box, DEF Only
M11480A001	Valve Interface Board, E85 Only
M11714A002	Display, LCD PCA, Super Cap
M11715A001	Cable, AC to Filter, E85 Only
M11716A001	Cable, AC from Filter to PS, E85 Only
M11716A002	Cable, AC to PS, E85 Only (new power supply)
M11717A001	Cable, Valve Adapter, E85 Only
M12019A001	Backlight PCA, Use with M11714A001 or M11714A002 Only
M12201A001	Cable, Pump Handle, Cold Weather DEF Only
M12202A001	Cable, AC Splitter Heater, Cold Weather DEF Only
M12260A001	Heater/Fan Assembly 230 W, Cold Weather DEF Only
M12261A001	Cable, AC Heater Relay Extension, Cold Weather DEF Only
M12262A001	Cable, DC to Heater, Cold Weather DEF Only
M12263A001	Cable, AC PWR Extension, Cold Weather DEF Only
M12264A001	Cable, DC Heater Relay Extension, Ribbon, Cold Weather DEF Only
M13924A001	LED Light Strip PCA
M13929B001	LED Driver Assembly
M15579A001	Atlas Power Supply Assembly (Replaces M07588A00X)
Q10362-02	AC filter, DEF and E85 Only
Q10557-01	Fluorescent Bulb
Q11008-01	Relay, Solid State, 40 A
Q11008-02	Relay, Solid State, 25 A, Cold Weather DEF Only
Q11781-01	Fuse Holder, E85 Only
Q12514-10	Sensor, Pump Handle, Side Load
Q13070-07	Fuse, Pico 1 A, 250 V, QB
Q13254-03	Heater/Fan Assembly 750 W, Cold Weather DEF Only
Q13254-05	Heater/Fan Assembly 750W, Cold Weather DEF Only
T17448-G1	Varistor PCA (115 VAC) in Main J-box
T17448-G3	Varistor PCA (220/230/240 VAC) in Main J-box
M16761A001	DEF Magmeter Adapter Cable
N22887-G4	Ground Cable

8800 Series Electronic Retail Units

Atlas 8800 series Electronic Retail unit is discussed in this section. The electronic parts are listed in the "Retail Parts by Name" on page 5-2. The electronics manages all the common functions for a low hose compact dispenser such as sales control, maintenance, preset ATC functions, electro-mechanical totalizers, and other options. External communications utilize a proprietary two-wire communication system used by a number of POS controller manufacturers. Interface devices for communications such as a PAM 1000 can be used to convert two-wire communications to a usable format for other POS manufacturers who cannot connect directly to the two-wire system.

Note: To interface to the Gasboy CFN Site Controller Systems, a Current Loop (ISL2, SC2) or PC Interface Package (SC3) is used in place of the PAM.

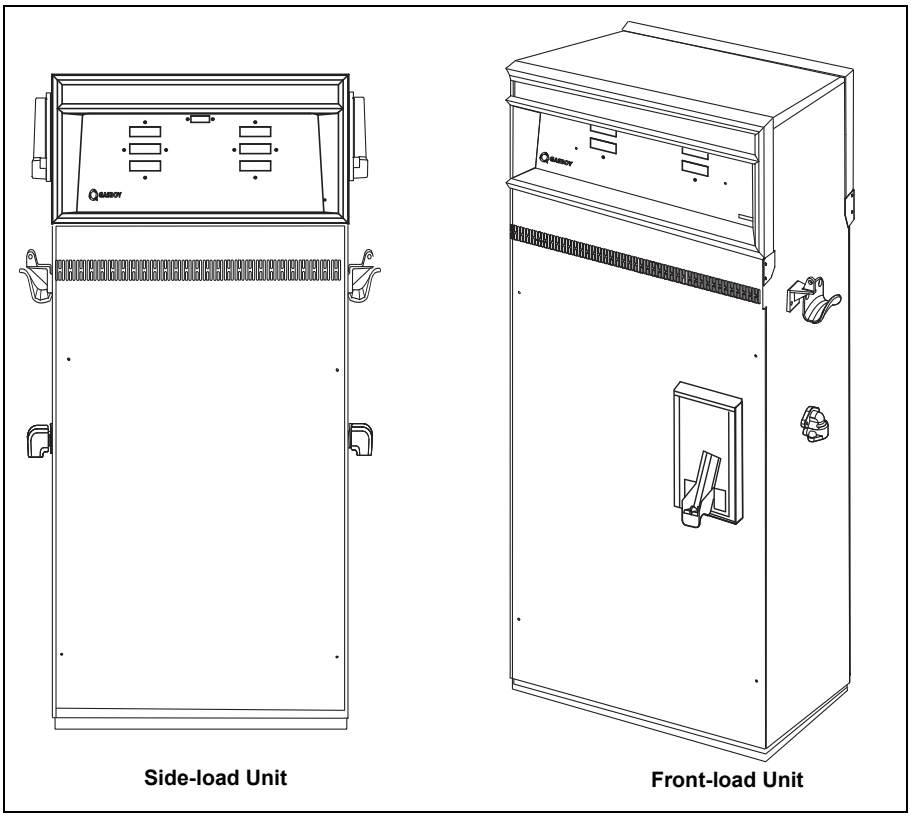
System and Component Overview

In this section, cautions and warnings for electronic components will be addressed. Extreme care must be taken while using explosive vapors or liquids, which may be present around the dispensing equipment. These vapors can be ignited by flames, electrical arcs, or static electricity discharges. An electrical shock hazard exists when working with this equipment. An electrical discharge can cause injury, ignite vapors, or damage sensitive electronic components. All safety precautions and requirements must be strictly followed.

About Service Procedures

Figure 5-1 shows an example of a Front-load and Side-load Atlas 8800 Retail unit. The nozzle boot is located either on the front or side of the unit.

Figure 5-1: Atlas 8800 Retail Units - Side-load and Front-load



Working on Electronic and Electrical Components

Explosive vapors or liquids are present in and around the fuel dispensing equipment, which can be ignited by open flames, electrical arcs, or static electricity discharges.

A potential shock hazard exists when working with this equipment. Electricity discharges can cause injury and damage sensitive electronic components. Follow all precautions and requirements.

⚠ WARNING

Read and follow all precautions and requirements before performing any inspection and/or maintenance in a potentially dangerous environment of flammable fuels, vapors, and high voltage.

Fire, explosion or electrical shock could result in severe injury or death if safety procedures are not strictly followed.

Do not smoke and prevent open flames in the pump area.

Promptly clean up spills or debris in the pump area.

Preparing for Service

To prepare for service, perform the following:

- Barricade the working area.
- Shut off all power from units with electronic components to be serviced. Shut off power from the associated connected devices, for example, STP. Multiple disconnects may be required.
- Use extreme caution during any observation or testing procedure that requires power to be applied to the unit.
- To prevent damage from Electrostatic Discharge (ESD) to electronic components or ignition of flammable fuels or vapors, follow all precautions and requirements.

Preventing ESD

⚠ WARNING

Ground wrist strap is required

Use IC extractor

PCAs and ICs are sensitive to ESD. ESD can damage electronic parts.

While removing PCAs or handling ESD sensitive parts:

- Touch an unpainted metal surface to discharge any static electricity build-up.
- Use a wrist strap connected to a grounded metal frame or chassis.
- Place the removed PCAs or ICs on a grounded anti-static mat.
- Use an IC extractor tool to remove the undergirded circuits.
- Place all PCAs you plan to return for credit or repair in anti-static bags.

Hazardous Materials

Some components inside electronic enclosures may present a health hazard if not handled correctly. Always clean your hands after handling the equipment. Do not hold or place any equipment in your mouth.

⚠ WARNING

The area contains a chemical known to the State of California to cause cancer.

⚠ WARNING

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

Replaceable Batteries

Some PCBs contain replaceable batteries. Insert all the batteries correctly.

⚠ WARNING

There is danger of explosion if batteries are incorrectly replaced. Only replace batteries with the same or equivalent type of batteries recommended. Dispose of the used batteries as per battery manufacturer's instructions. Ensure that you replace the batteries in the correct polarity position to avoid damage to the equipment.

Replacing Fuses

⚠ CAUTION

To ensure equipment protection and maintenance of safe operation, always use the correct replacement fuse. Using an incorrectly sized or type fuse may cause equipment damage. The type of fuse is also very important. Some fuses even with the same amperage rating are designed to respond differently to over current and so on.

Helpful Service Information

Some boards include information that helps in correct or faster servicing. Be aware of the following found on many boards:

- Cable connectors are labeled with the destination of the cable.
- Test points are clearly labeled and recessed to facilitate the use of meter probes.
- Test point labels indicate an acceptable electrical range. For example, 4.8-5.2 VDC.
- LED Status Code: Refer to the LED Status description included with PCA information.

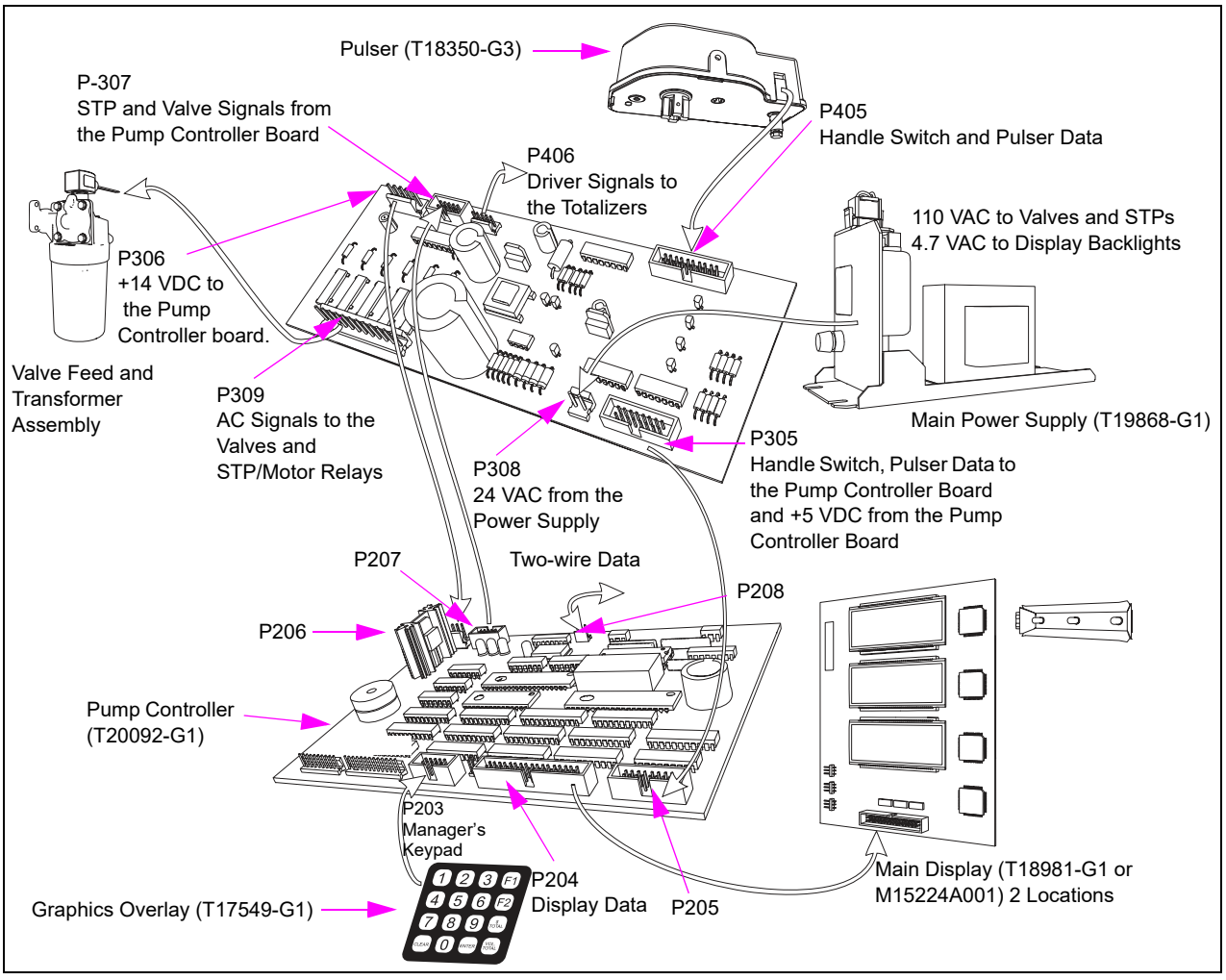
Component Overview

Figure 5-2 shows the electronic components found in Atlas 8800 Retail unit. It is a typical Atlas 8800 electronic system. For proper service, the technician must possess knowledge of the functions of components and how they relate to the system.

Part Number	Description
T18350-G3	Pulser Assembly
T18994-G1	Hydraulic Interface PCA
T19868-G1	Main Power Supply
T20092-G1	Pump Controller PCA
M15224A001 ~ OR ~ T18981-G1	LCD Main Display PCA

While learning to operate the system, use a copy of this illustration for reference until you are completely familiar with the system. This information is supplied with the Service Launch Package. The prime functions of boards, devices, and service details are covered in "Hydraulic/Mechanical Components" on page 5-1.

Figure 5-2: Atlas 8800 Electronics Retail Unit



PCAs

This section provides information specific to PCAs.

Atlas 9800 PCAs

PCAs control the hydraulics and monitor the fuel delivery, compute, and display store transaction information, interface with FMS. The term PCA and PCB may be interchanged suitably.

Note: For proper service of PCAs, the technician must possess knowledge of the functions of components and how they relate to the system.

Figure 5-3 shows the interface that relates assemblies and components for the main display PCA [see Figure 5-2 (on page 5-11) and Figure 5-36 (on page 5-46)].

Figure 5-3: Atlas 9800 Series Block Diagram

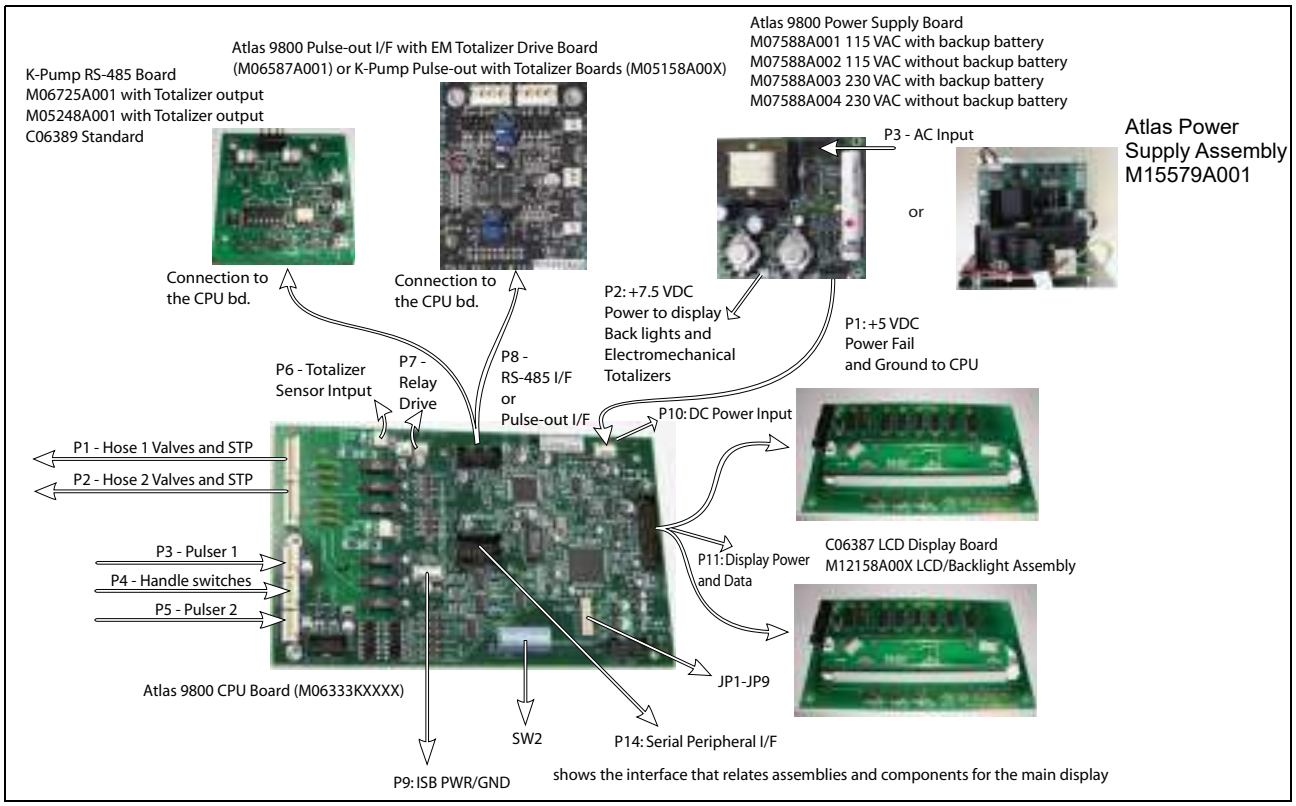


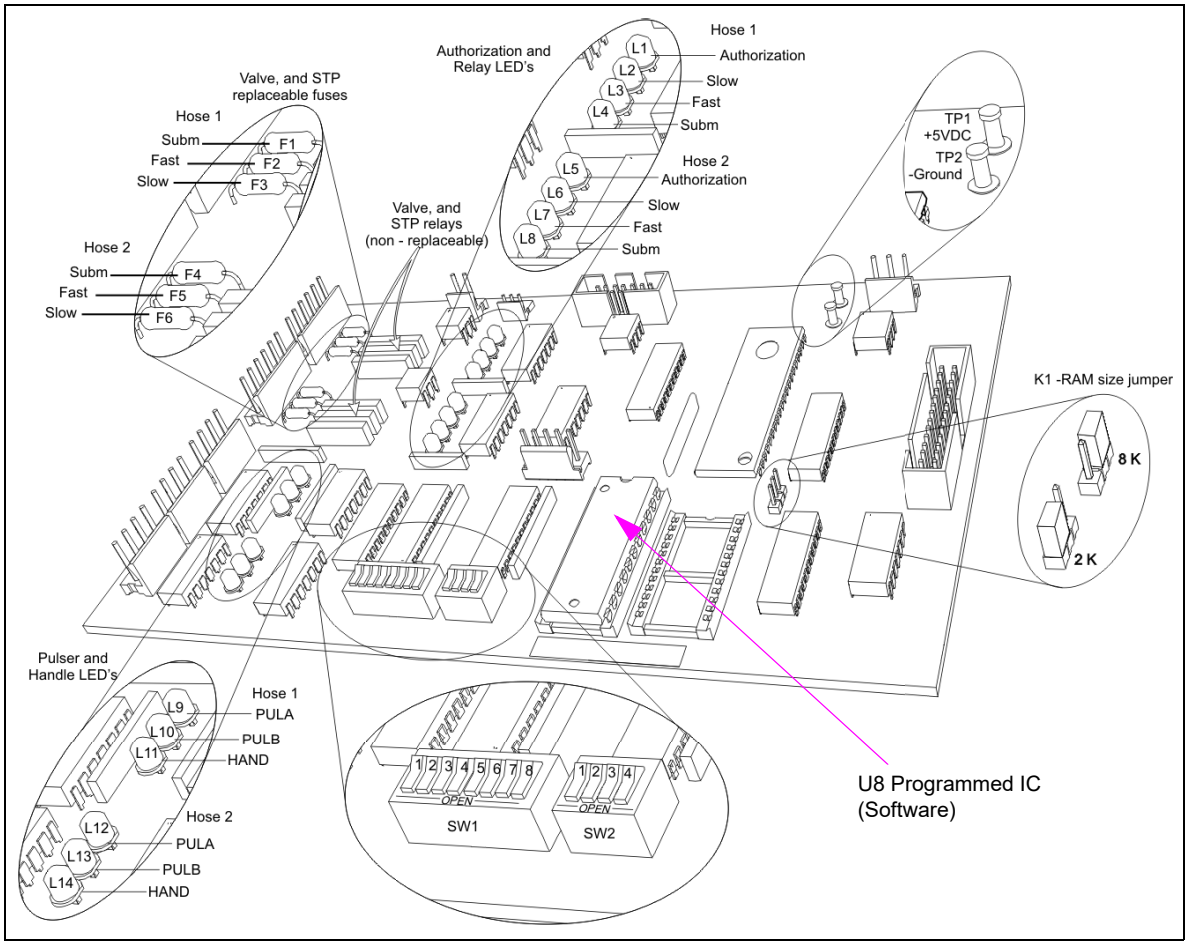
Figure 5-4 contains information regarding LEDs, hose information, switch locations, and Random Access Memory (RAM) connections for previous Atlas 9800K CPUs.

M05346A002 (Dual, 115 VAC) and M05346A004 (Dual, 230 VAC):
Used on Models 9852K, 9853K, 9840K.

C06394 (Dual, 115 VAC) and C06503 (Dual, 230 VAC):
Used on Models 9850K, 9850A/Q, 9852A/Q, 9853A/Q, 9840A/Q, 9822A/Q, 9823A/Q/K.

Note: This PCA is only used for 9800 series Commercial pumps.

Figure 5-4: Previous Atlas 9800K CPU (M05346A00X, C06391-C06394, C06500-C06503)



Previous Atlas 9800K CPU Software Kits

Dispenser or Pump	Type	Conversion Factor	PCB Used On	Software
Electronic Commercial Units	Standard 9800K	Gallons	M05346A001 - M05346A004 CPUs	M03946K001
	Standard 9800K	Liters		M03946K002
	Standard 9800K	Imperial Gallons		M03946K003
	Super-Hi 9840K	Gallons		M03946K004
	Super-Hi 9840K	Liters		M03946K005
	Super-Hi 9840K	Imperial Gallons		M03946K006
	Ultra-Hi 9850K	Gallons	C06391 - C06394, C06500 - C06503	C06426K9850G
	Ultra-Hi 9850K	Liters		C06426K9850L
	Ultra-Hi 9850K	Imperial Gallons		C06426K9850M

Figure 5-5 and Figure 5-6 on page 5-15 contains information regarding LEDs, hose information, switch locations, and jump jack locations on the current Atlas 9800 CPU.

Notes: 1) M06333KXXXX requires an Atlas 9800 Power Supply (M07588A00X or M15579A001).

2) M06333KXXXX requires ATC Kit (M08218K001) for Models 9850A/Q, 9850K, 9852A/Q, 9853A/Q, 9840A/Q, where ATC is present.

M06333KXXXX (Dual, 115/230 VAC)
Used on Models 9852K, 9853K, 9850K, 9840K, 9852A/Q, 9853A/Q, 9850 A/Q, 9840A/Q, 9822A/Q, 9823A/Q/K.

Figure 5-5: Atlas 9800 CPU (M06333KXXXX, used before March 2021)

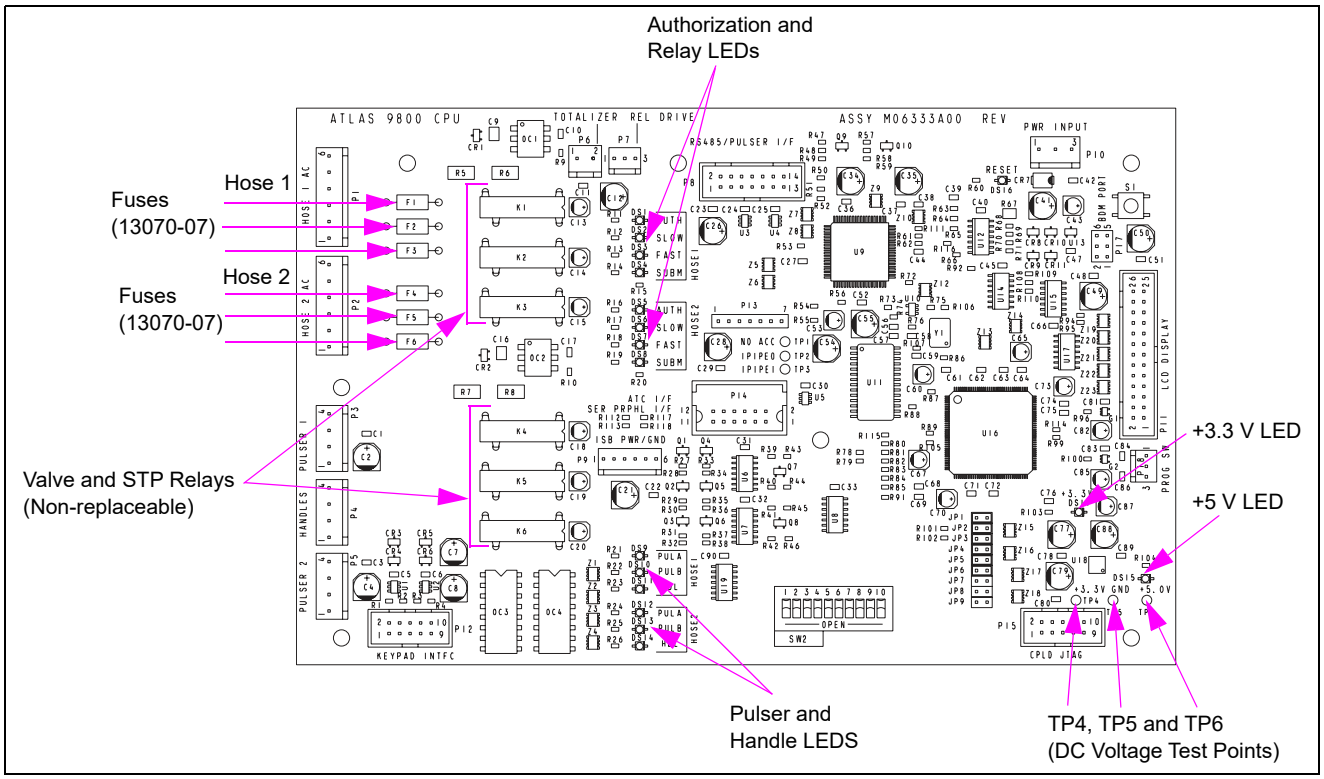
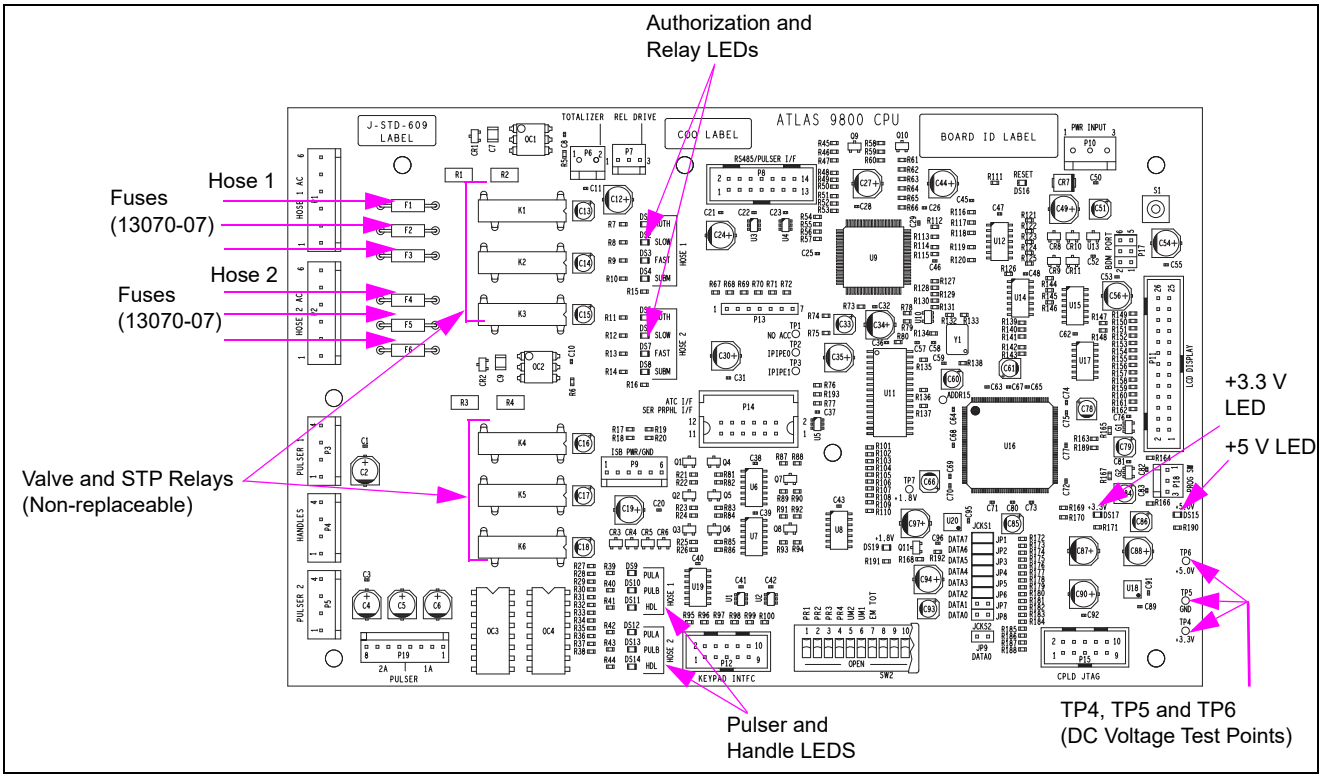


Figure 5-6: Current Atlas 9800 CPU (M06333KXXXX, used after March 2021)



Current Atlas 9800 CPU Software Kits

Dispenser or Pump	Type	Conversion Factor	PCB Used On	Software
Electronic Commercial Units	Standard 9800K (Models: 9852K, 9853K)	Selectable at M06333KXXXX CPU	M06333K9800K CPU	M06656K001*
	Ultra-Hi 9850 (Models: 9850A/Q, 9850K)		M06333K9850 CPU	M06656K002*
	Super-Hi 9840K (Model: 9840K)		M06333K9840K CPU	M06656K003*
	Standard 9800Q (Models: 9852A/Q, 9853A/Q, 9822A/Q, 9823A/Q/K)		M06333K9800AQ CPU	M06656K004*
	Super-Hi 9840Q (Model: 9840A/Q)		M06333K9840AQ CPU	M06656K005*
	Standard 9860 and 9870 (Models: 9862KX, 9872KX)		M06333KECAL	M06656K006*

**Atlas 9800 Serial EEPROM Boards (M06656K00X) are used for reprogramming CPU Boards (M06333KXXXX). Software Kit (M06656K100) contains parts M06656K001 - M06656K006 (one of each).*

Figure 5-7 shows the previous Atlas 9800K CPU.

Figure 5-7: M05346A002 (115 VAC) and M05346A004 [230 VAC (Previous Atlas 9800K CPUs)]

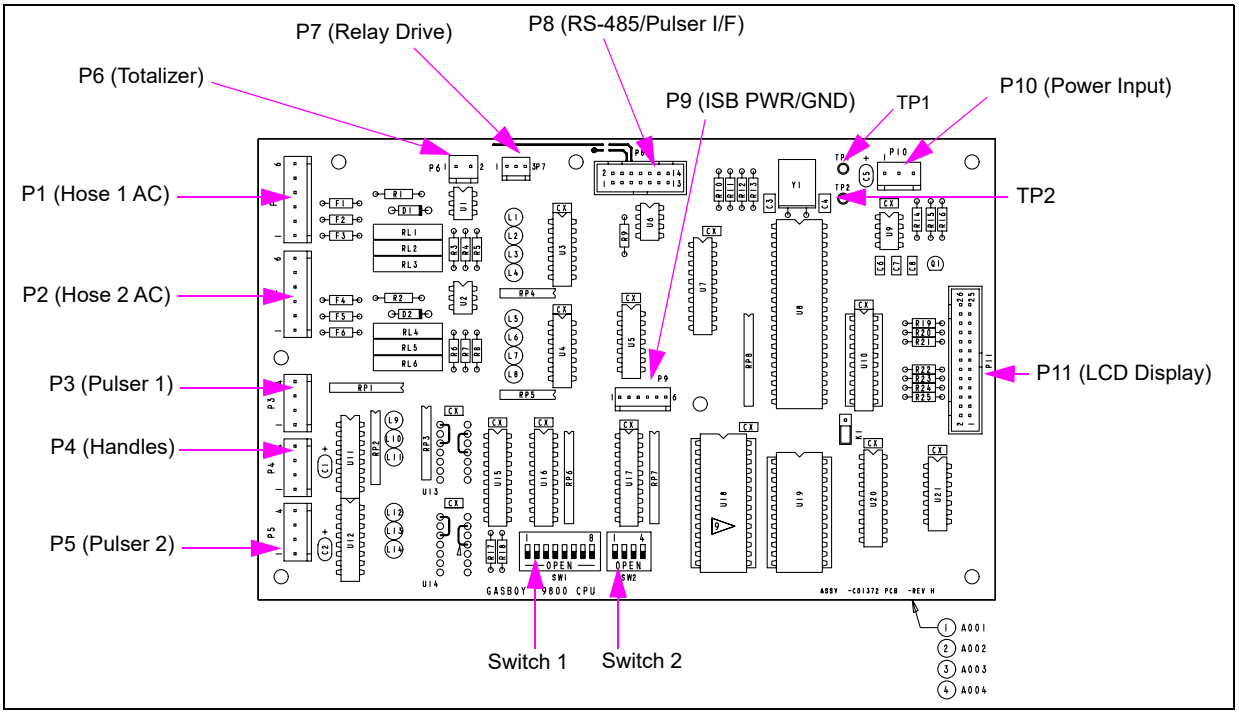


Figure 5-8: Atlas 9800 CPU (M06333KXXXX, used before March 2021)

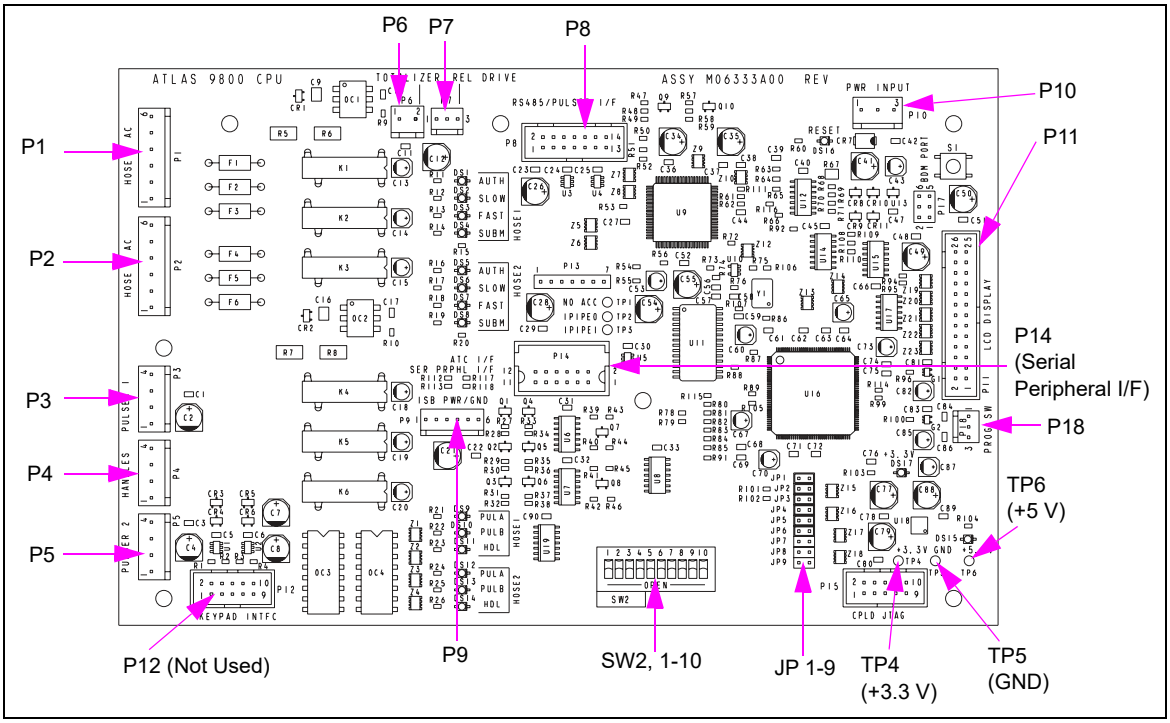
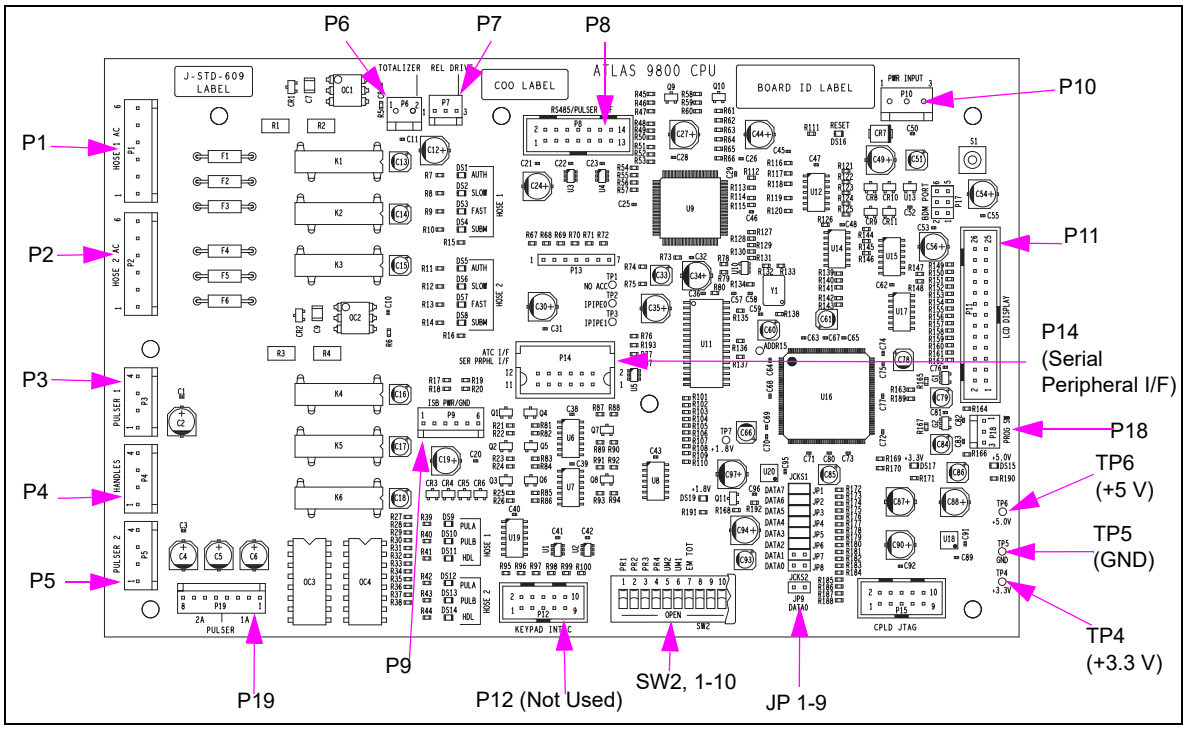


Figure 5-9: Current Atlas 9800 CPU (M06333KXXXX, used after March 2021)



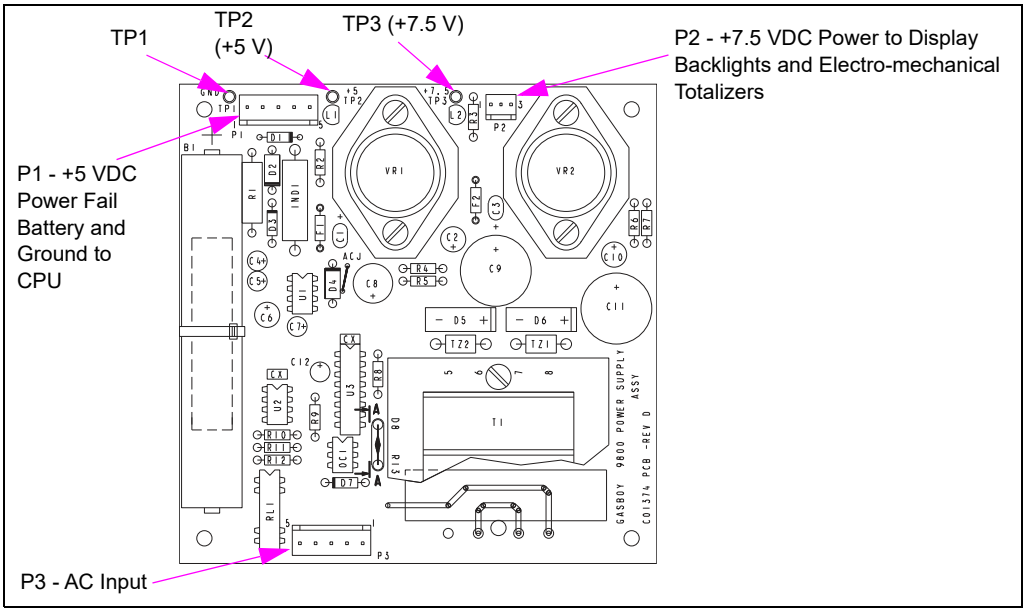
Note: For cable block diagram, refer to M05193.

PCA Connections and Cables

Connector #	Through Cable	To Assembly	At Connector #
P1 (6)	P/O M04850A008		
P2 (6)	P/O M04850A008		
P3 (4) Pulser 1	M05201A001(Cable) Pulser (8)	M04011B001 (cable)	Pulser Side A
P5 (4) Pulser 2			Pulser Side B
P4 (4)	M05105A001	Q12514-10 Pump Handle Switch A1	PH (B1) (4)
		Q12514-10 Pump Handle Switch B1	PH (A1) (4)
P6 (2)	M05119A001	Q12514-13 Sensor	
P7 (3)		Relay K1 (3) and (4)/Relay K2 (3) and (4)	
P8 (14)		M06725A001	P2 (14) CPU
P9 (6) Not Used			
P10 (3)	M05107A001	M07588A00X or M15579A001 Atlas 9800 Power Supply AC-DC	P1 (5)
P11 (26)	M05109A001	C06387 or M12158A00X P1 Side A and P1 Side B	P1 (26)
P18 (3)	M00150A003 or M00150A004	E-Cal Security Switches (DEF or E85 Only)	
P19 (8)		M04011B001 (cable)	

Figure 5-10 shows the Atlas 9800 Power Supply Board (M07588A00X) that connects to the CPU.

Figure 5-10: Atlas 9800 Power Supply (M07588A00X)

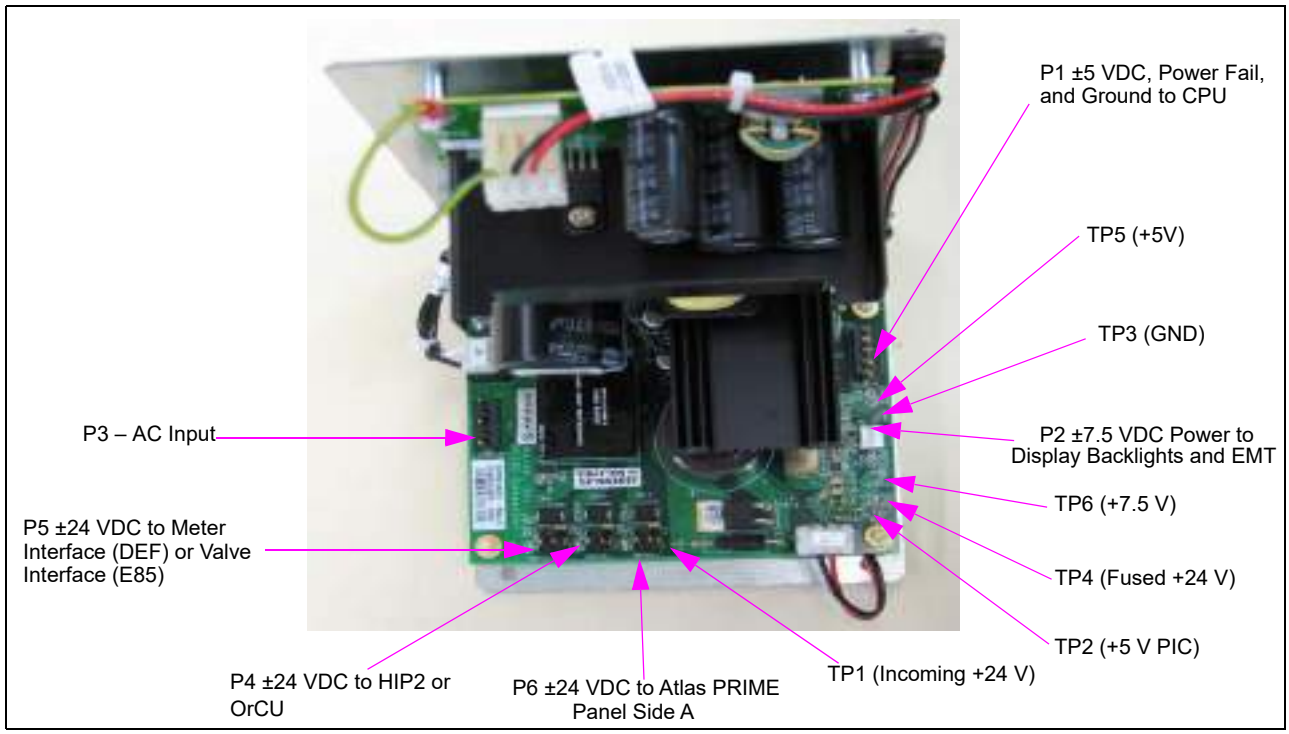


PCA Connections and Cables

Connector #	Through Cable	To Assembly	At Connector #
P1 (5)	M05107A001 or M05107A002	M05346A002 (115 VAC) or M05346A004 (230 VAC) or M06333KXXXX (115/230 VAC)	P10 (3)
P2 (3)	M05108A001	M12019A001, C06372	P1 (3)
		M06587A001, M06725A001, M05158A00X, or M05248A001	P804 (3)
P3 (5)	M05110A001, M05110A002, or M05110A003	P/O M04850A008 (Cable)	

Atlas 9800 Power Supply Assembly (M15579A001)

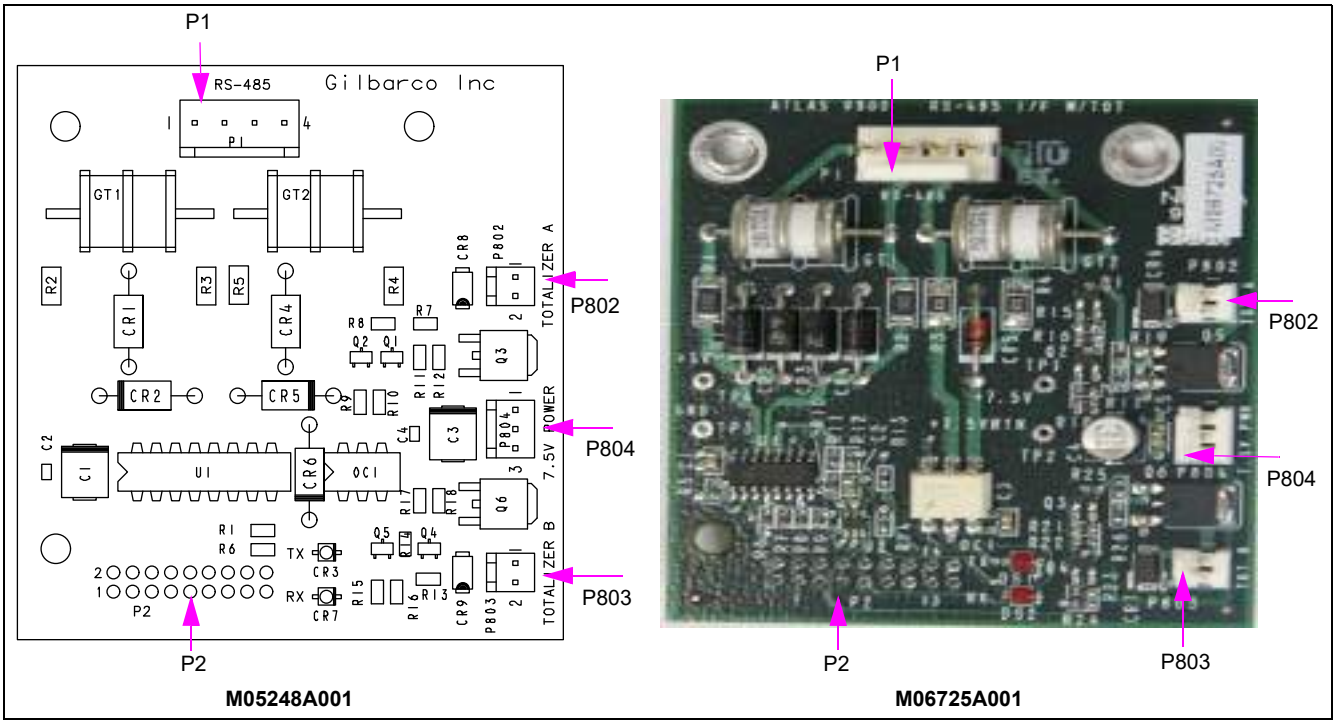
Figure 5-11: Atlas 9800 Power Supply Assembly (M15579A001)



PCA Connections and Cables

Connector No	Through Cable	To Assembly	At Connector No
P1 (5)	M05107A001 or M05107A002	M05346A002 (115 VAC) or M05346A004 (230 VAC) or M06333KXXXX (115/230 VAC)	P10 (3)
P2 (3)	M05108A001	M12019A001, C06372	P1 (3)
		M06587A001, M06725A001, M05158A00X, or M05248A001	P804 (3)
P3 (5)	M05110A001, M05110A002, or M05110A003	M04850A008 or M04850A010 (Cable)	
P4 (2)	M15502A001 or M15502A002	M12760A001 HUB Interface (HIP2)	P401 (3)
	M15505A001 or M15505A002	M15778B206 OrCU	DCJACK (4)
P5 (2)	M07141A004	M10030A001 (DEF) Meter Interface	P1402 (2)
	M07141A005	M11480A001 (E85) Valve Interface	P2402 (2)
P6 (2)	M15499A001 or M15499A003	M15778B208 (Cable)	

Figure 5-12: K-pump RS-485 with Totalizer



Note: For cable block diagram, refer to M05193.

PCA Connections and Cables

Connector #	Through Cable	To Assembly	At Connector #
P1 (4)	M05189A002	Field Wiring Main J-box	
P2 (14)	Direct Connect	M05346A002 (115 VAC) or M05346A004 (230 VAC) or M06333KXXXX (115/230 VAC)	P8 (14)
P802 (2)		M00455A002 Side A	
P803 (2)		M00455A002 Side B	
P804 (3)	M05108A001	C06372 or M12019A001 2 Connections Side A 2 Connections Side B	P1 (3)
		M07588A00X or M15579A001	P2 (3)

Figure 5-13: C06425, C06746 - 9800 Pump I/F

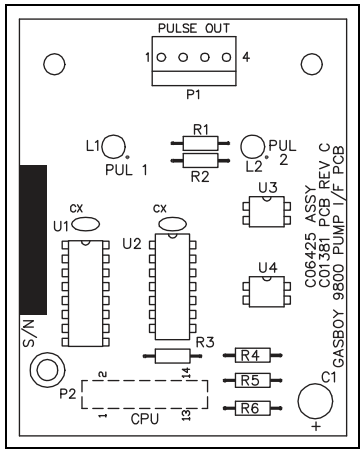
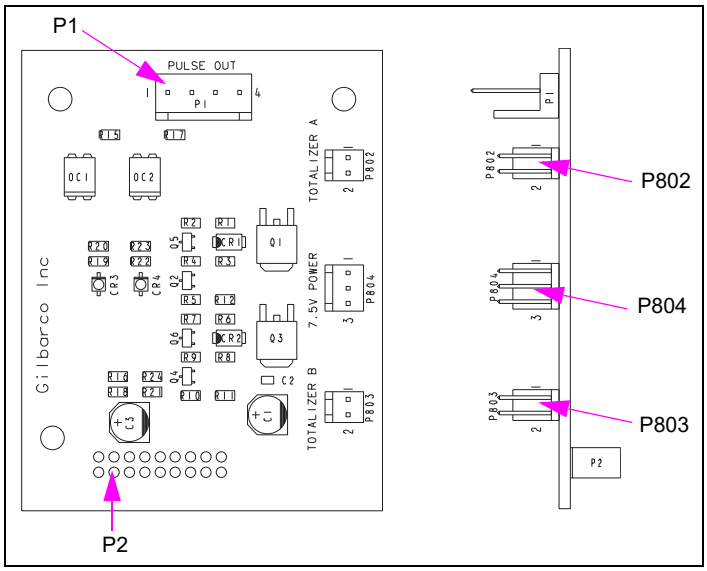


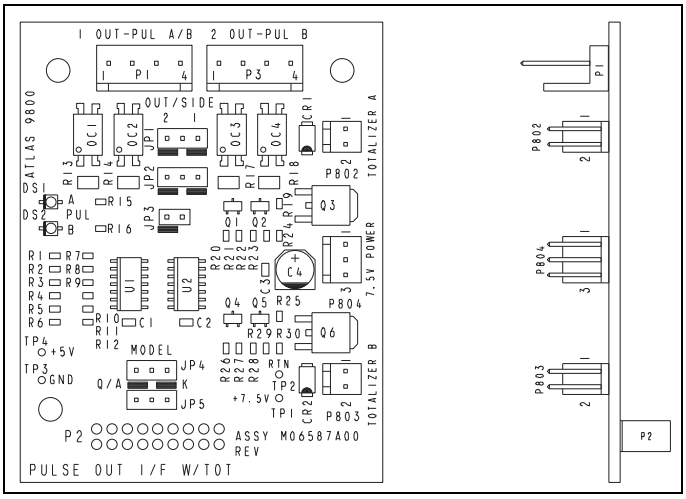
Figure 5-14: M05158A001/2/3 - K-pump Pulse-out with Totalizer



Part Number	Where Used
M05158A001	To be used with all models (except 9850A/Q/K) calling out for Single Channel, Dual/Single Hose Pulse-out I/F (see Figure 5-31 on page 5-42).
M05158A002	To be used with all models (except 9850A/Q/K) calling out for Dual Channel, Single Hose Pulse-out I/F (see Figure 5-30 on page 5-42).
M05158A003	To be used with all models (except 9850A/Q/K) requiring only EM Totalizer, no Pulse-out I/F.

Note: Models 9850A/Q/K can only use M06587A001, C06425, or C06746.

Figure 5-15: Atlas 9800 Pulse-out I/F with EM Totalizer Board (M06587A001)



Notes: 1) To be used with models calling out for Dual Channel, Dual Hose Pulse-out I/F (9850 Dual Hose requires M05683A004 Revision B or later).

2) M06587A001 Pulse-out I/F replaces the following 9800 Pump I/F Boards:

- *Single Channel, Dual/Single Hose Pulse-out I/F Board, C06425.*
- *Dual Channel, Single Hose Pulse-out I/F Board, C06746.*

3) For cable block diagram, refer to M05193.

PCA Connections and Cables

Connector #	Through Cable	To Assembly	At Connector #
P1 (4)	M05189A002	Field Wiring Main J-box	
P2 (14)	Direct Connect	M05346A002 (115 VAC) or M05346A004 (230 VAC) or M06333KXXXX	P8 (14)
P3 (4)	M05189A002	Field Wiring Main J-box	
P802 (2)		M00455A002 Side A	
P803 (2)		M00455A002 Side B	
P804 (3)	M05108A001	C06372 or M12019A001 2 Connections Side A 2 Connections Side B	P1 (3)
		M07588A00X or M15579A001	P2 (3)

Figure 5-16 shows the C06372 Backlight for the main LCD Display Board.

Figure 5-16: C06372 Main Display Backlight (Atlas 9800 Only)

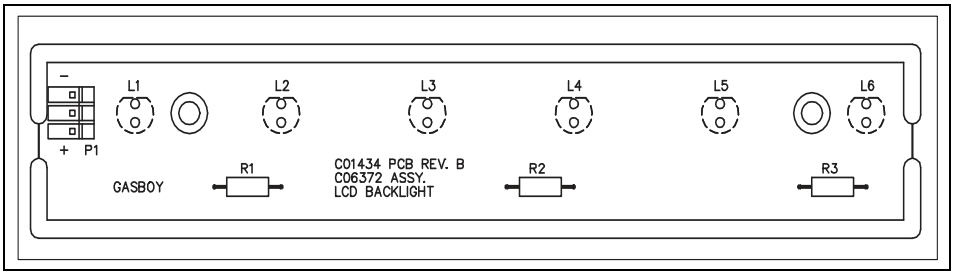


Figure 5-17 shows the new Main Display Backlight Board (M12019A001).

Figure 5-17: New Main Display Backlight (Atlas 9800 Only)

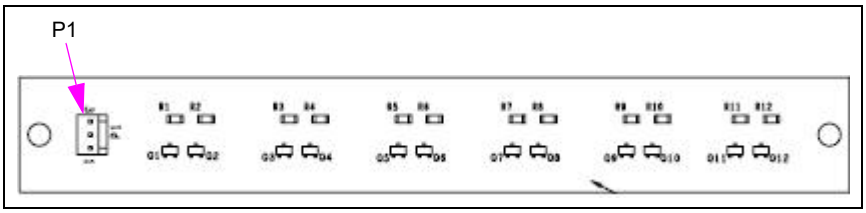


Figure 5-18 shows C06387 LCD Display Board. In Figure 5-3 on page 5-12, the C06387 LCD Display Board has been shown to connect to the CPU.

Figure 5-18: C06387 Atlas 9800 LCD Display Board

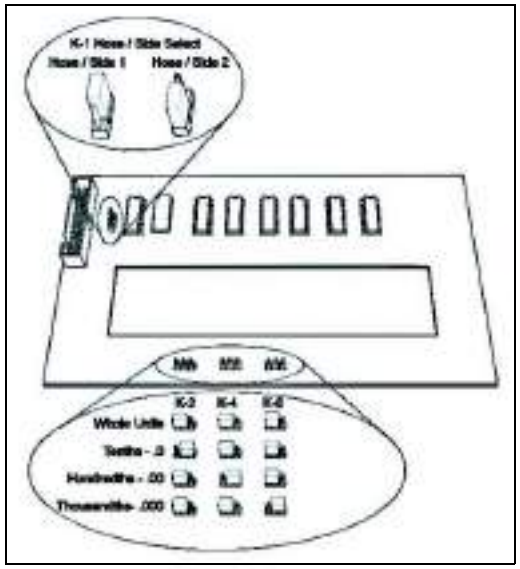
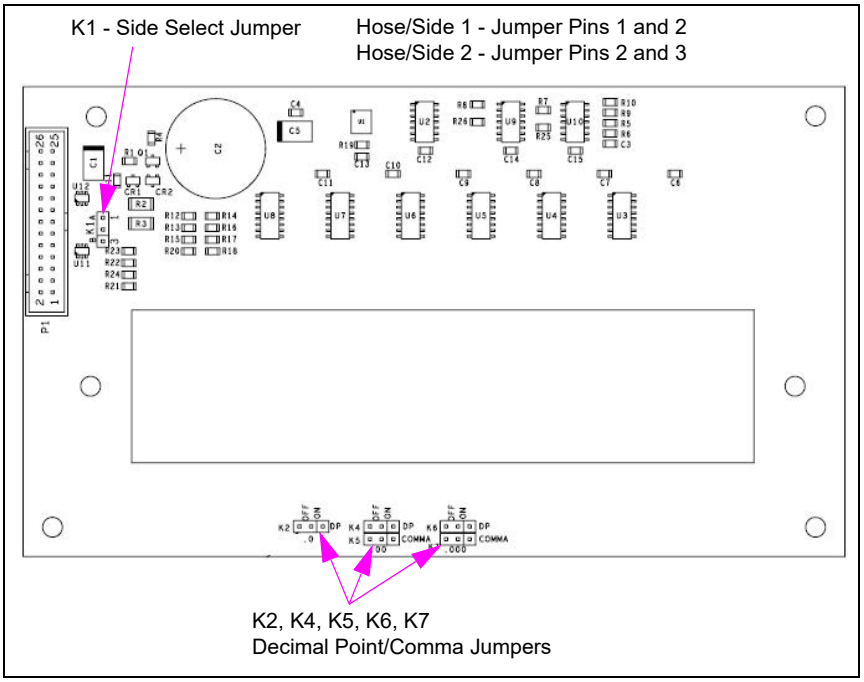


Figure 5-19 shows the new Super Cap Main Display Board (M11714A00X).

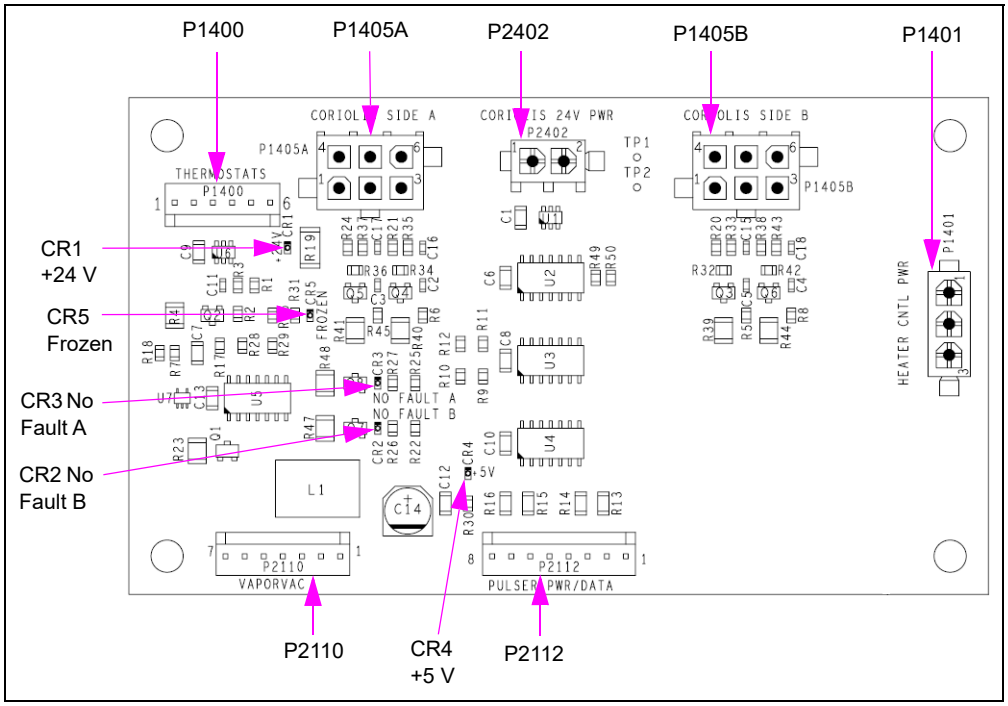
Figure 5-19: New Super Cap Main Display (Atlas 9800 Only)



Display	K2	K4	K5	K6	K7
000000	OFF	OFF	OFF	OFF	OFF
00000.0	ON	OFF	OFF	OFF	OFF
0000.00	OFF	ON	OFF	OFF	OFF
0000,00	OFF	ON	ON	OFF	OFF
000.000	OFF	OFF	OFF	ON	OFF
000,000	OFF	OFF	OFF	ON	ON

Figure 5-20 shows Coriolis Interface Board (M10030A001).

Figure 5-20: Coriolis Interface Board [M10030A001 (Atlas DEF Only)]



PCA Connections and Cables (Cold Weather DEF)

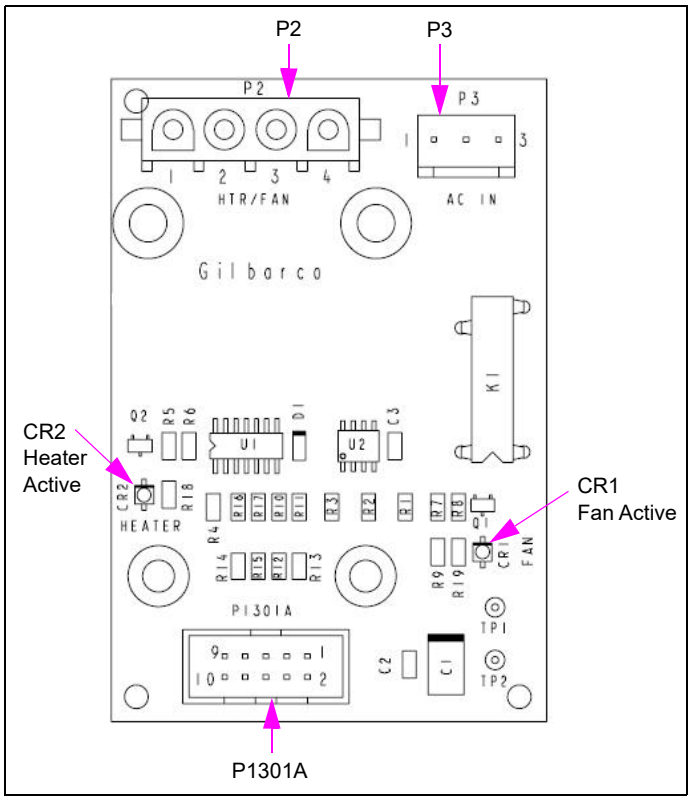
Connector #	Through Cable	To Assembly	At Connector #
P1400 (6)	M04114A007	Temperature Sensor (Frozen) (M10131A008)	PTRMF (3)
P1401 (3)	M04114A007 to M12264A001	E2 Temperature Control Board (M14100A001)	P1301A (10)
P1405A (6)	M04114A007	Coriolis Meter (M10006A003) DEF Magmeter (M16502B001)	J1501A/B (6)
P1405B (6) Not used			
P2110 (7)	M10059A002	Atlas CPU (M06333A002)	P9 (6)
P2112 (8)	M10060A001 to M05201A001	Atlas CPU (M06333A002)	P3 and P5 (4)
P2402 (2)	M07141A003	+24 V Power Supply (M04161B005)	Red - (+) Black - (-)
	M07141A004	Power Supply Assembly (M15579A001)	P5 (2)

PCA Connections and Cables (Warm Weather DEF)

Connector #	Through Cable	To Assembly	At Connector #
P1400 (6)	Jumper	Pins 5 and 6	
P1401 (3) Not used			
P1405A (6)	M04114A008	Coriolis Meter (M10006A003) DEF Magmeter (M16502B001)	J1501A/B (6)
P1405B (6) Not used			
P2110 (7)	M10059A002	Atlas CPU (M06333A002)	P9 (6)
P2112 (8)	M10060A001 to M05201A001	Atlas CPU (M06333A002)	P3 and P5 (4)
P2402 (2)	M07141A003	+24 V Power Supply (M04161B005)	Red - (+) Black - (-)
	M07141A004	Power Supply Assembly (M15579A001)	P5 (2)

Figure 5-21 shows E2 Temperature Control Board (M06783A001 or M14100A001).

Figure 5-21: E2 Temperature Control Board [M06783A001 or M14100A001 (Atlas Cold Weather DEF Only)]



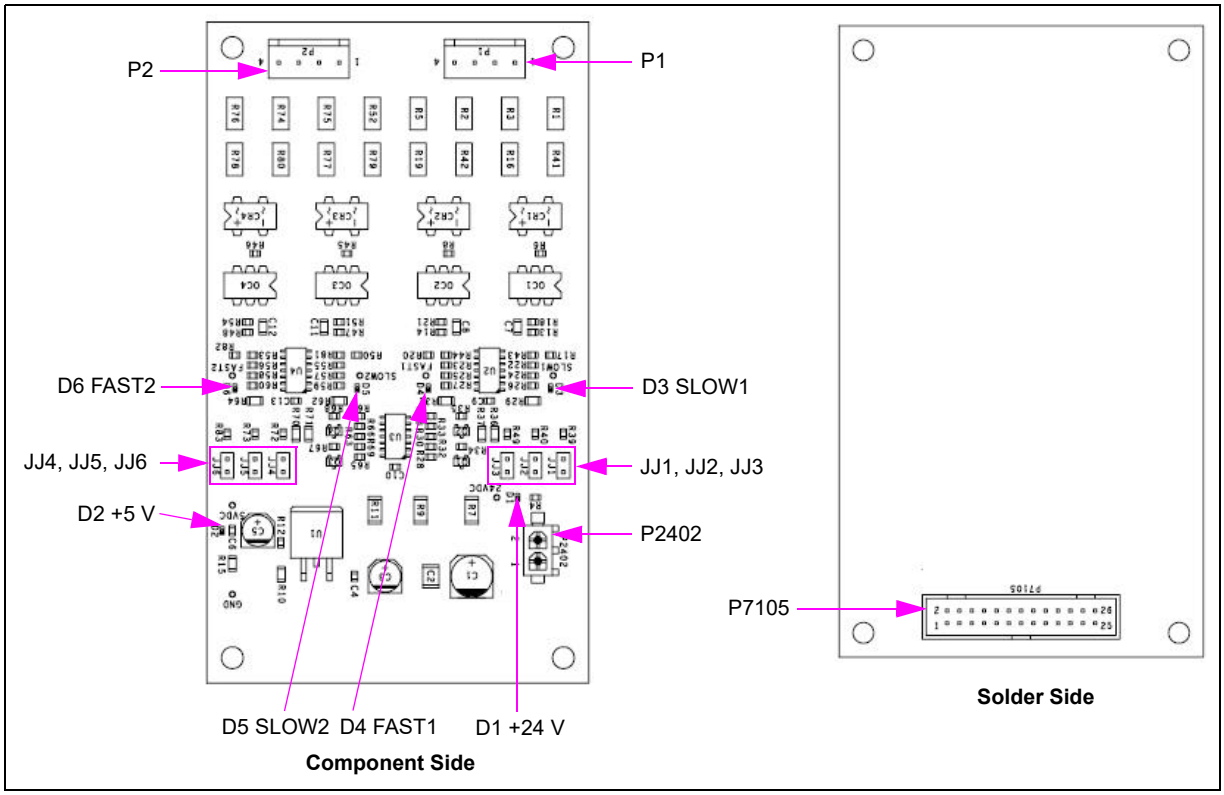
PCA Connections and Cables (Cold Weather DEF)

Connector #	Through Cable	To Assembly	At Connector #
P2 (4)	M12261A001 to M07233A009	Heater/Fan Assembly (Q13254-05)	J2 (4)
P3 (3)	M09958A004	AC Power Input	AC J-box (3)
P1301A (6)	M12264A001 to M04114A007	Coriolis Interface (M10030A001)	J1401 (3)
		Temperature Sensor (M10131A006)	PTRMH (3)

This assembly mounts directly to a Solid-state Relay (Q11008-02).

Figure 5-22 shows Valve Interface Board (M11480A001).

Figure 5-22: Valve Interface Board [M11480A001 (Atlas E85 Only)]



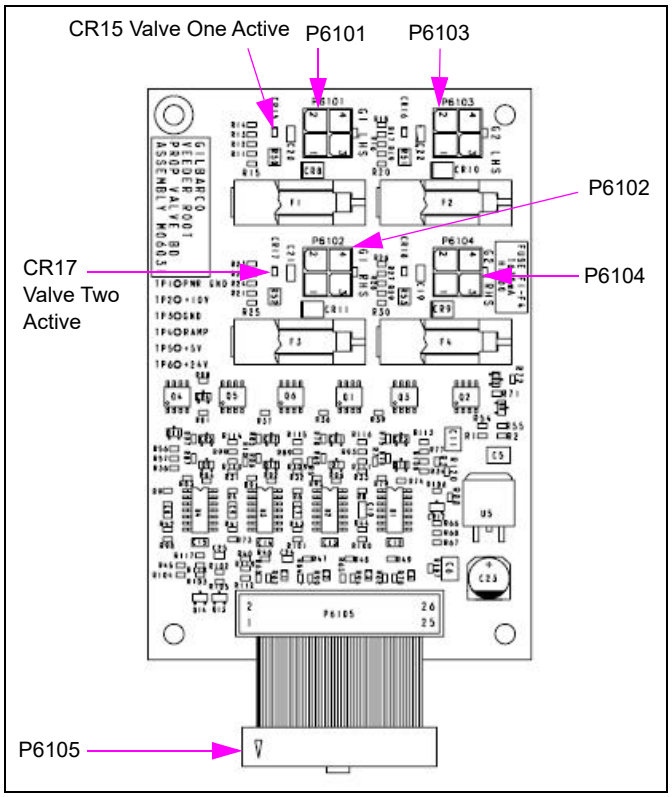
PCA Connections and Cables (Atlas E85 Only)

Connector #	Through Cable	To Assembly	At Connector #
P1 (4)	M04850A010	Atlas CPU (M06333A002)	P1 (6)
P2 (4)	M04850A010	Atlas CPU (M06333A002)	P2 (6)
P2402 (2)	M07141A005	Power Supply Assembly (M15579A001)	P5 (2)
P7105 (26)	Cable on M06031A001	Valve Controller (M06031A001)	P6105 (26)

Due to different tolerances in components and proportional valve coils, jump jacks JJ1 through JJ6 (JJ1 through JJ3 affect side 1, JJ4 through JJ6 affect side 2) were added to allow adjusting the SLOW flow rate. If the SLOW flow rate is too slow, adding a jumper on one of these jump jacks will increase the valve drive output in SLOW flow mode. Each jumper added increases the drive output (maximum 3 per hose outlet). They do not affect FAST (or full) flow. If jumpers have been added and the SLOW flow is too fast (for example, over run of presets), removing a jumper will decrease the drive output in SLOW flow mode.

Figure 5-23 shows Valve Controller Board (M06031A001).

Figure 5-23: Valve Controller Board [M06031A001 (Atlas E85 Only)]



PCA Connections and Cables (Atlas E85 Only)

Connector #	Through Cable	To Assembly	At Connector #
P6101 (4)	M11717A001	M02958A002 Valve Coil (Side 1)	
P6102 (4)	M11717A001	M02958A002 Valve Coil (Side 2)	
P6103 (4) Not used			
P6104 (4) Not used			
P6105 (4)	Cable on M06031A001	M11480A001 Valve Interface	P7105 (26)

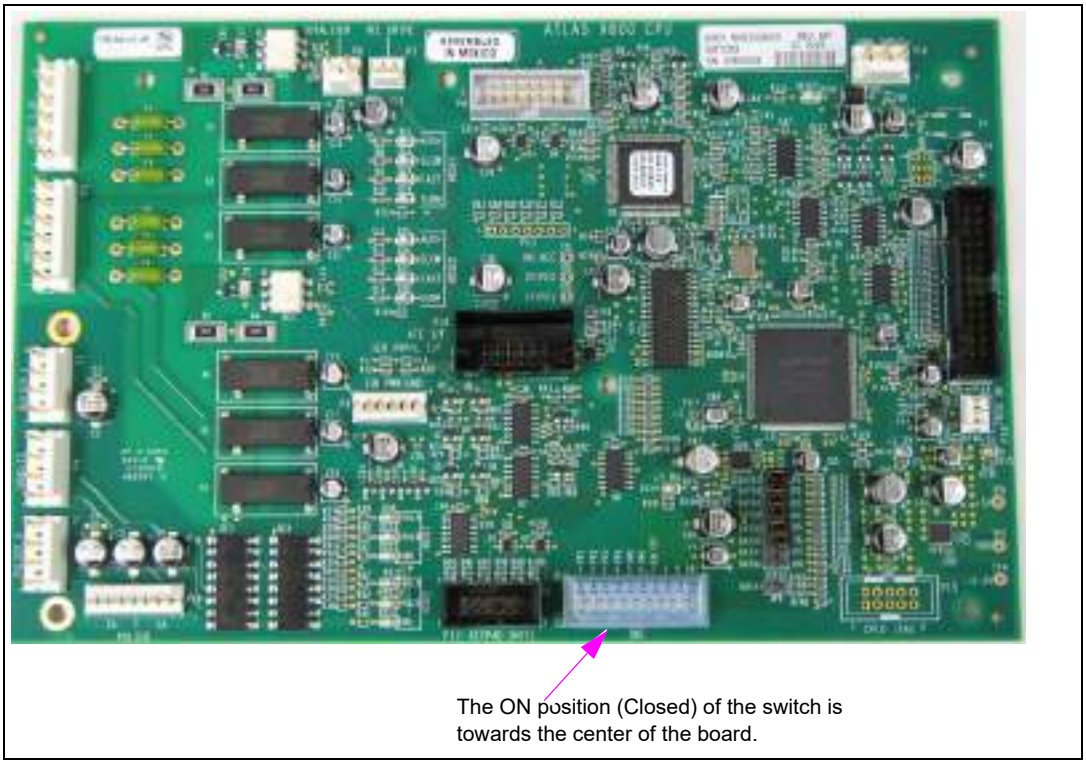
Atlas 9800 Parts

Atlas 9800 CPU Board (M06333KXXXX)

The features of the Atlas 9800 CPU Board are as follows:

- Accepts either 115 or 230 VAC on AUTH line inputs.
- Compatible with models 9852K, 9853K, 9850K, 9840K, 9852A/Q, 9853A/Q, 9850A/Q, 9840A/Q, 9822A/Q, 9823A/Q/K, 9862KX, 9872KX.
- Compatible with all RS-485 I/F Boards (C06389, M05248A001, M06725A001).
- Compatible with all Pulse-out I/F Boards (C06425, C06746, M05158A001, M05158A002, M05158A003, M06587A001).
- Replaces 9800 CPU Boards: C06391, C06392, C06393, C06394, C06500, C06501, C06502, C06503, M05346A001, M05346A002, M05346A003, M05346A004.
- Requires power supply M07588A00X or new power supply assembly M15579A001 (refer to "Atlas 9800 Power Supply Assembly (M15579A001)" on page 5-32).
- Requires ATC Kit (M08218K001), for models 9850A/Q, 9850K, 9852A/Q, 9853A/Q, and 9840A/Q, where ATC is present.

Figure 5-24: Atlas 9800 CPU Board (M06333KXXXX)



CPU Boards	Software Type	Pump Type
M06333K9800K	9800K	9852K, 9853K
M06333K9850	9850	9850A, 9850Q, 9850K
M06333K9840K	9840K	9840K
M06333K9800AQ	9800Q	9852A/Q, 9853A/Q, 9822A/Q, 9823A/Q/K
M06333K9840AQ	9840Q	9840A, 9840Q
M06333KECAL	9800K ECAL	9862KX, 9872KX

Note: The above software types can be loaded on any one of the M06333KXXXX CPU Boards by using the appropriate M06656K00X Serial EEPROM Board.

Loading New CPU Software (M06333KXXXX)

The CPU Board is configured and programmed before shipping from the factory. In the event the software requires to be changed, proceed as follows:

⚠ WARNING

Always remove AC power from the pump/dispenser before servicing the unit. Failure to turn off the unit before servicing may result in serious injury or death.

1. Disconnect AC power to the pump/dispenser. Remove the DC cable from the P1 connector on the power supply.
2. Set Switch SW2-9 to the closed ("On") position.
3. Select the appropriate Atlas 9800 Serial EEPROM Board (M06656K00X) for the software type you want to load (refer to "Atlas 9800 Serial EEPROM Board (M06656K00X)" on page 5-34).
4. Ensure that JP1 is not jumpered on the Serial EEPROM Board Assembly (M06656K00X). Carefully insert into the P14 connector located in the middle of the CPU Board.
5. Connect the DC cable to the P1 connector on the power supply. Connect AC power to the pump/dispenser.
6. At this point, on the Serial EEPROM Board Assembly, the green "PWR" and yellow "BUSY" LEDs will illuminate. A few seconds later, the yellow "BUSY" LED will go off and green "OK" LED must illuminate, indicating download is OK. Ensure that the "OK" LED is lit before proceeding. If the red "NOT OK" LED illuminates, repeat steps 1 (on page 5-31) to 6. If the "NOT OK" LED illuminates after a second attempt, call your service representative or contact Gasboy Technical Service.
7. Disconnect AC power to the pump/dispenser. Remove the DC cable from the P1 connector on the power supply.
8. Set Switch SW2-9 to the Open position.
   Note: If SW2-9 is left in the Closed position, the unit will not display software version, software type, and firmware version during power-up.
9. Carefully remove the Serial EEPROM Board assembly from the P14 connector.
10. Connect the DC cable to the P1 connector on the power supply.
11. Connect AC power to the pump/dispenser.

12 Ensure that the displayed software type is correct for the pump/dispenser model that the CPU is installed in (refer to the following table):

Displayed Software Type	Corresponding Pump Type
“9800 1”	Corresponds to the 9800Q Software: 9852A/Q, 9853A/Q, 9822A/Q, 9823A/Q/K
“9800 2”	Corresponds to the 9800K Software: 9852K, 9853K, 9862KX, 9872KX
“9800 3”*	Corresponds to the 9800K Software: 9862K*, 9872KX*
“9840 1”	Corresponds to the 9840Q Software: 9840A, 9840Q
“9840 2”	Corresponds to the 9840K Software: 9840K
“9850”	Corresponds to all 9850 Software: 9850A, 9850Q, 9850K

Note: Version 06.0.20 or later.

Atlas 9800 Power Supply Assembly (M15579A001)

The features of the Atlas 9800 Power Supply Assembly (M15579A001) are as follows:

- Required for M06333KXXXX CPU Board (see Figure 5-24 on page 5-30).
- Compatible with models 9852K, 9853K, 9850K, 9840K, 9852A/Q, 9853A/Q, 9850A/Q, 9840A/Q, 9822A/Q, 9823A/Q/K, 9862KX, 9872KX.
- Compatible with the following 9800 CPU Boards: C06391, C06392, C06393, C06394, C06500, C06501, C06502, C06503, M05346A001, M05346A002, M05346A003, M05346A004, and M06333KXXXX.
- Replaces previous 9800 power supplies as shown in the following table:

Description	Old Power Supply Part Number	Replacement Power Supply Part Number
Kit to replace115 VAC with Battery	C06397, M07588A001	M12421K00X (see Note 1 below)
115 VAC Without Battery	C06396, M07588A002	M15579A001
Kit to replace 230 VAC with Battery	C06489, M07588A003	M12422K00X (see Note 2 below)
230 VAC Without Battery	C06488, M07588A004	M15579A001

Figure 5-25: Atlas 9800 Power Supply Assembly (M15579A001)

(i)

(ii)

Notes: 1) The M07588A001 supply can no longer be manufactured. Replacement kits are available. For 115 VAC units, the kits are as follows:

Number of Displays per Unit	Kit Number
1	M12421K001
2	M12421K002
4	M12421K003

2) The M07588A003 supply can no longer be manufactured. Replacement kits are available. For 230 VAC units, the kits are as follows

Number of Displays per Unit	Kit Number
1	M12422K001
2	M12422K002
4	M12422K003

Atlas 9800 Serial EEPROM Board (M06656K00X)

The features of the Atlas 9800 Serial EEPROM Board are as follows:

- Used to reprogram software on Atlas 9800 CPU Board [M06333KXXXX, (see Figure 5-24 on page 5-30)].

Serial EEPROM Board	Software Type	Pump Type
M06656K001*	9800K	9852K, 9853K
M06656K002*	9850	9850A, 9850Q, 9850K
M06656K003*	9840K	9840K
M06656K004*	9800Q	9852A/Q, 9853A/Q, 9822A/Q, 9823A/Q/K
M06656K005*	9840Q	9840A, 9840Q
M06656K006*	9800K ECAL	9862KX, 9872KX

**A kit of the latest versions of all of these boards is also available as part number M06656K100.*

- Provides LED indicators to monitor software transfer (Download OK and Download Not OK).

Figure 5-26: LED Indicators

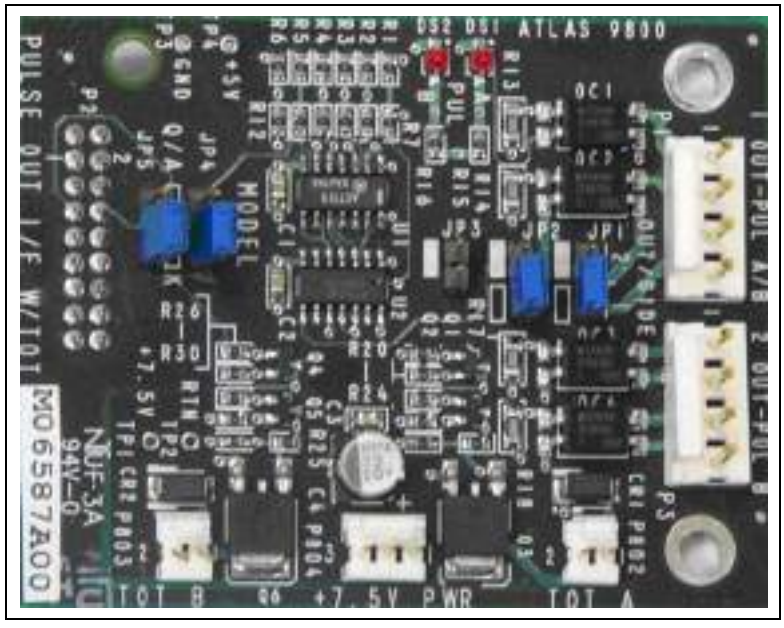
Atlas 9800 Pulse-out I/F Board with EM Totalizer Drive (M06587A001)

The features of the Atlas 9800 Pulse-out I/F Board with EM Totalizer Drive are as follows:

- To be used with models calling out for Dual Channel, Dual Hose Pulse-out I/F (9850 Dual Hose requires M05683A004 Revision B or later).
- This board assembly can be configured for use in one of the following pump/dispenser configurations:
  - Dual Channel, Single Hose Pulse-out I/F (see Figure 5-30 on page 5-42).
  - Single Channel, Dual/Single Hose Pulse-out I/F (see Figure 5-31 on page 5-42).
  - Dual Channel, Dual Hose Pulse-out I/F (see Figure 5-32 on page 5-43).
  - Dual Channel, Dual Hose Pulse-out I/F for 9850KXTW1 or 9850KXTW2 Ultra-Hi (see Figure 5-33 on page 5-43).
- Compatible with models 9852K, 9853K, 9850K, 9840K, 9852A/Q, 9853A/Q, 9850A/Q, 9840A/Q, 9822A/Q, 9823A/Q/K, 9862KX, 9872KX.
- Compatible with 9800 CPU Boards (C06391, C06392, C06393, C06394, C06500, C06501, C06502, C06503, M05346A001, M05346A002, M05346A003, M05346A004, M06333KXXXX).
- Can be used in place of previous 9800 Pump I/F Board with Dual Channel, Single Hose Pulse-out I/F (C06746).
- Can be used in place of previous 9800 Pump I/F Board with Single Channel, Dual/Single Hose Pulse-out I/F (C06425).

Note: 9850A/Q/K models cannot use M05158A00X Boards. They can use M06587A001, C06425, and C06746 Boards only.

Figure 5-27: Atlas 9800 Pulse-out I/F Board with EM Totalizer Drive (M06587A001)



K-pump RS-485 with Totalizer (M06725A001)

The features of K-pump RS-485 with Totalizer Board are as follows:

- Allows RS-485 communications between 9800 and a CFN PLUS system, or TopKAT PLUS Islander PRIME, Atlas PRIME Electronic system.
- Compatible with 9852K, 9853K, 9850K, 9840K, 9852A/Q, 9853A/Q, 9840A/Q, 9822A/Q, 9823A/Q/K, 9862KX, 9872KX.
- Compatible with 9800 CPU Boards (C06391, C06392, C06393, C06394, C06500, C06501, C06502, C06503, M05346A001, M05346A002, M05346A003, M05346A004, M06333KXXXX).
- Can be used in place of previous 9800 RS-485 I/F Board C06389 and M05248A001.

Figure 5-28: K-pump RS-485 with Totalizer (M06725A001)

Accessing Electronic Components

⚠ WARNING

Always remove AC power from the pump/dispenser before servicing the unit. Failure to turn off the unit before servicing may result in serious injury or death.

To access the electronic components, refer to Removing or Opening the Bezel Assembly on page 4-3.

Loosen the two screws that secure the display panel and remove them, if required, and pivot the display panel down.

Installing Atlas 9800 Power Supply Assembly (M15579A001)

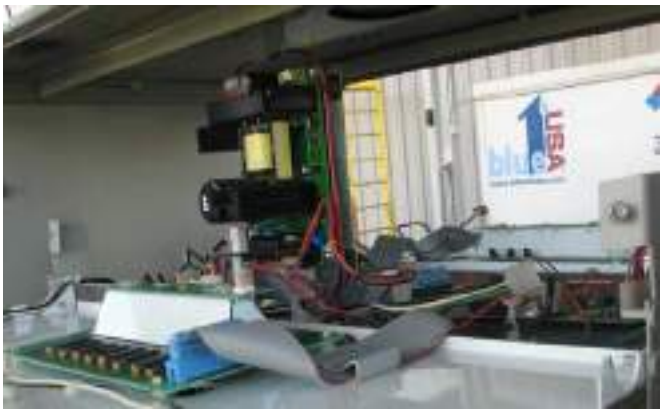
To install the Atlas 9800 Power Supply Assembly (M15579A001), proceed as follows:

⚠ WARNING

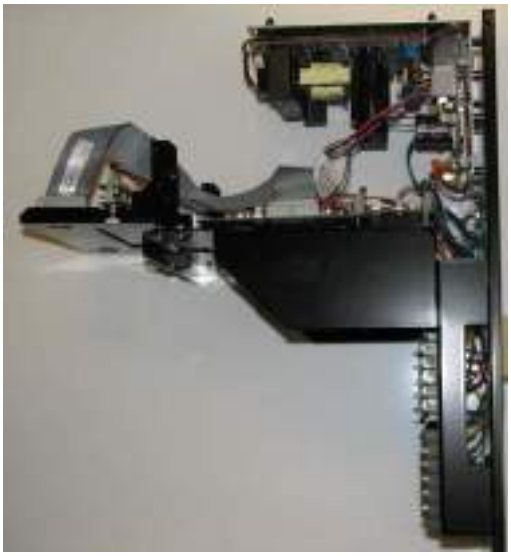
Always remove AC power from the pump/dispenser before servicing the unit. Failure to turn off the unit before servicing may result in serious injury or death.

1. Check the existing power supply. For the correct replacement part number, refer to "Atlas 9800 Power Supply Assembly (M15579A001)" on page 5-32.
2. Ensure that the AC power to the pump/dispenser has been disconnected.
3. Disconnect the AC power cable from the P3 connector. Disconnect the DC cables from the P2 and P1 connectors.
4. Unscrew and remove all screws that hold the power supply. Retain the screws for installing the new power supply.
5. Remove the power supply. For models with plastic standoffs, after the screws have been removed, carefully unsnap the power supply from the standoffs and remove it. Remove any standoffs that may have remained on the power supply and place them back into the plate where the power supply was mounted.
6. Install the new power supply on the standoffs. Ensure that the P1 connector is closest to the CPU Board and P3 connector is away from the CPU. If the pump model is 9822 or 9823, the P1 connector is closest to the pump handle assembly.

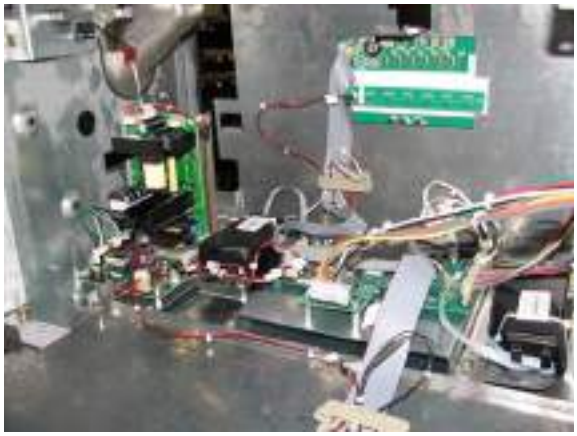
Figure 5-29: Installing the New Power Suppy



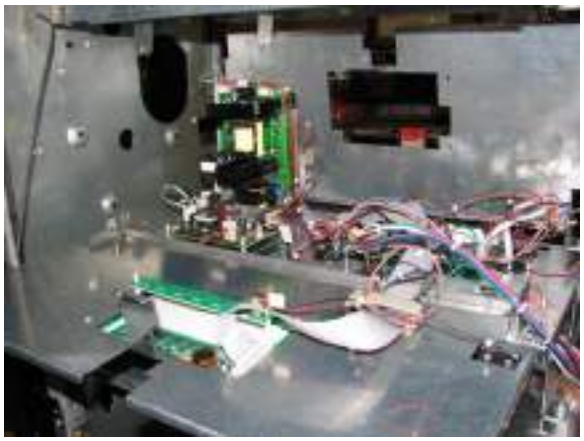
(i)
9800 Pre-A, A or Q Models



(ii)
ASTRA (9820) Model (Chassis without Cabinet)

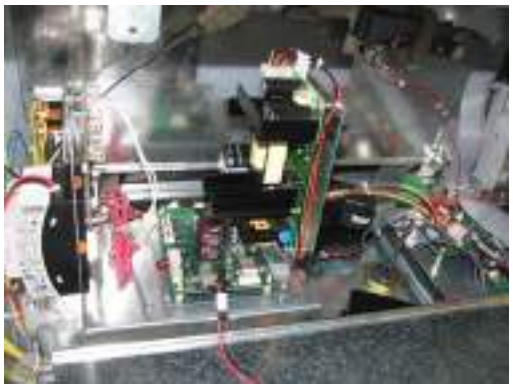


(iii)
Standard Atlas 9800K Models



(iv)
Atlas Ultra-High 9850K Models

(v)
Atlas DEF 9862KX Models



(vi)
Atlas E85 9872KX Models

7 Reinstall the screws removed in step 4. For models with plastic standoffs, carefully push the power supply onto the plastic standoffs before installing the screws.

8 Reconnect the following:
- Cables and AC power to the P3 connector.
- Display Backlight to the P2 connector.
- CPU DC to the P1 connector.

Installing Atlas 9800 CPU Board (M06333KXXXX)

To install the Atlas 9800 CPU Board, proceed as follows:

⚠ WARNING

Always remove AC power from the pump/dispenser before servicing the unit. Failure to turn off the unit before servicing may result in serious injury or death.

1 Check the existing power supply. If the existing supply is not a M07588A00X or M15579A001 Assembly, it must be replaced. For additional information, refer to "Installing Atlas 9800 Power Supply Assembly (M15579A001)" on page 5-37.

2 Ensure that the AC power to the pump/dispenser has been disconnected. Remove the DC cable from the P1 connector on the power supply.

3 If the pump/dispenser does not have ATC installed, proceed to step 4. If the model of the pump/dispenser is one of the following - 9850A/Q, 9850K, 9852A/Q, 9853A/Q, 9840A/Q, the ATC support bracket (that holds the ATC black box) must be replaced. Use the kit M08218K001 to install the new bracket.

4 If the pump/dispenser has an RS-485 or Pulse-out Interface Board, remove the screws that secure the interface board and disconnect it from the existing CPU Board.

5 Disconnect all cables going to the connectors on the CPU Board. Ensure that you take note of connectors and cables so that they can be reconnected to the correct connector.

6 Unscrew and remove all the screws holding the CPU Board. Retain the screws for installing the M06333KXXXX CPU Board.

7 Remove the CPU Board. For models with plastic standoffs, carefully unsnap the CPU Board from the standoffs and remove it. Remove any standoffs that may have remained on the CPU Board and place them back into the plate where the board was mounted.

8 The M06333KXXXX CPU Board can be configured for various operating conditions using the jumpers JP1 to JP9 and Switch SW2. Check these jumpers and switch settings and change, if required. Jumper settings must be changed with the power to the pump/dispenser "Off". The M06333KXXXX CPU Board only reads new jumper settings during power-up. For detailed information on Jumper and Switch Settings for the M06333KXXXX CPU, refer to "Configuration Steps" on page 4-23.

9 Set the new CPU Board on the standoffs. Reinstall screws removed in step 6. For models with plastic standoffs, ensure that the metal standoffs are under the mounting holes located between P2 and P3, and the outside corner next to P5. Carefully push the new CPU Board onto the standoffs before installing the screws.

10 Reconnect all the cables, P1 to P9, and P11, if applicable. Reconnect the DC cable to P10 of the power supply.

11 Apply power to the pump/dispenser and take note of the display(s). The first set of numbers displayed will be the software version (for example, 06013), second set is the software type (for example, 9800 1), and third set is the firmware version (for example, 01008).

Ensure that the displayed software type is correct for the pump/dispenser model that the CPU is installed in (refer to the following table). If it is, proceed to step 12. If not, proceed to "Loading New CPU Software (M06333KXXXX)" on page 5-31.

Displayed Software Type	Corresponding Pump/Dispenser Model
"9800 1"	Corresponds to the 9800Q Software: 9852A/Q, 9853A/Q, 9822A/Q, 9823A/Q/K
"9800 2"	Corresponds to the 9800K Software: 9852K, 9853K, 9862KX, 9872KX
"9800 3"*	Corresponds to the 9800K Software: 9862K*, 9872KX*
"9840 1"	Corresponds to the 9840Q Software: 9840A, 9840Q
"9840 2"	Corresponds to the 9840K Software: 9840K
"9850"	Corresponds to all 9850 Software: 9850A, 9850Q, 9850K

Note: Version 06.0.20 or later.

12 Reassemble the pump/dispenser by proceeding to "Accessing Electronic Components" on page 5-36 and follow the steps in the reverse order.

Installing Atlas 9800 Pulse-out I/F with EM Totalizer Drive Board (M06587A001)

Jumpers JP1, JP2, and JP3

This board assembly can be configured for use in one of the following pump/dispenser configurations:

- Dual Channel, Single Hose Pulse-out I/F (see Figure 5-30 on page 5-42).
- Single Channel, Dual/Single Hose Pulse-out I/F (see Figure 5-31 on page 5-42).
- Dual Channel, Dual Hose Pulse-out I/F (see Figure 5-32 on page 5-43).
- Dual Channel, Dual Hose Pulse-out I/F for 9850KXTW1 or 9850KXTW2 Ultra-Hi (see Figure 5-33 on page 5-43).

The following chart shows the jumper settings and wires to connect to in the J-box, based on the configuration. The numbers identify the hose (1 or 2), the letters identify the channel (A or B).

Check JP1 - JP3 jumpers and change them, if required. The jumper settings must be changed only when the power to the pump/dispenser is removed, to protect the circuit that they are connected to.

The default configuration is Single Channel, Dual/Single Hose Pulse-out I/F. When configured for Dual Channel, Single Hose Pulse-out I/F, or Single Channel, Dual/Single Hose Pulse-out I/F, the P3 connector is not connected.

When configured for Dual Channel, Dual Hose Pulse-out I/F, the P3 connector is used.

	Jumper Settings			
	Single Channel, Dual/Single Hose Pulse-out I/F (Default Setting)	**Dual Channel, Single Hose Pulse-out I/F**	**Dual Channel, Dual Hose Pulse-out I/F (accept 9850KXTW1 & 9850KXTW2**	**Dual Channel, Dual Hose Pulse-out I/F (9850KXTW1 or 9850KXTW2**
Wire Color	**JP1 Position 1 JP2 Position 1 JP3 Open**	**JP1 Position 2 JP2 Position 2 JP3 Open**	**JP1 Position 2 JP2 Position 2 JP3 Jumpered**	**JP1 Position 2 JP2 Position 2 JP3 Jumpered**
Red	Pulse out Side 1	Pulse out Side 1A	Pulse out Side 1A	Pulse out Side 1A
Green	Pulse out Side 2	Pulse out Side 1B	Pulse out Side 1B	Pulse out Side 1B
White	Common Return	Side 1A Return	Side 1A Return	Channel A Return
Black	No Connection	Side 1B Return	Side 1B Return	Channel B Return
Brown	No Connection	No Connection	Pulse out Side 2A	N/A
Orange	No Connection	No Connection	Pulse out Side 2B	N/A
Yellow	No Connection	No Connection	Side 2A Return	N/A
Gray	No Connection	No Connection	Side 2B Return	N/A
Blue**	No Connection	No Connection	N/A	Pulse out Side 2A*
Violet**	No Connection	No Connection	N/A	Pulse out Side 2B*

**Requires DC conduit M05683A004 Revision B or later.*
***9850K models only.*

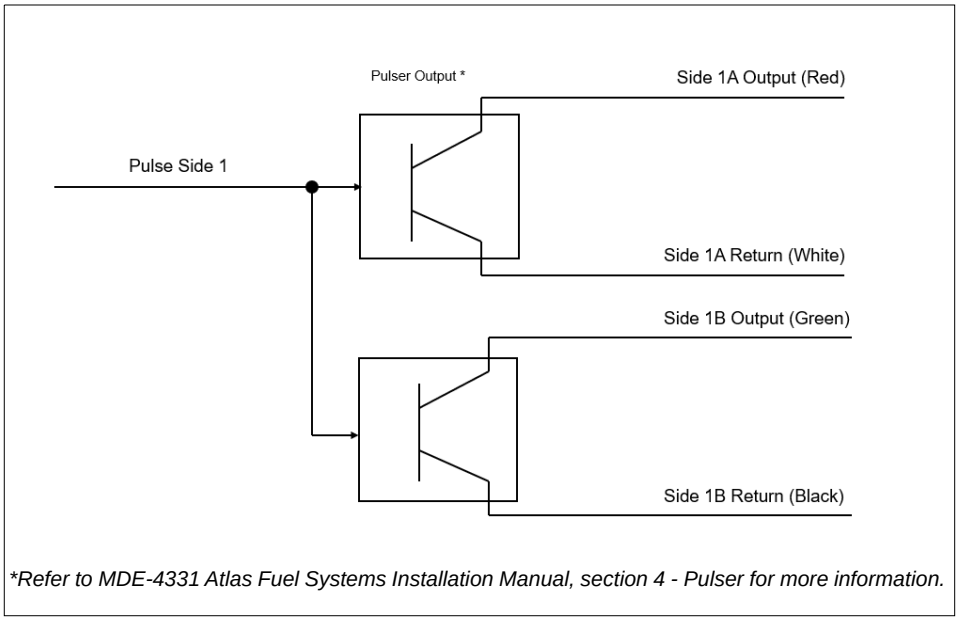
Jumpers JP4 and JP5

When this board is used in a model A or Q pump/dispenser or 9850K, jumpers JP4 and JP5 are set to the Q/A position. When this board is used for all other K models except 9850K, these jumpers must be in the K position.

Configurations

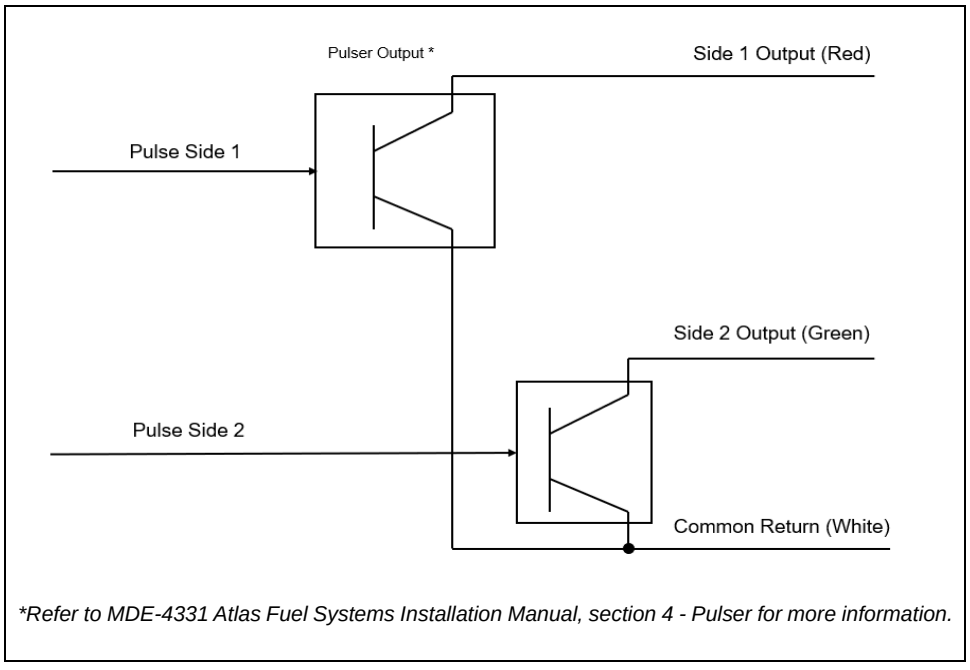
Refer to Figure 5-30 through Figure 5-33 on page 5-43 for different configurations.

Figure 5-30: Dual Channel, Single Hose Pulse-out I/F



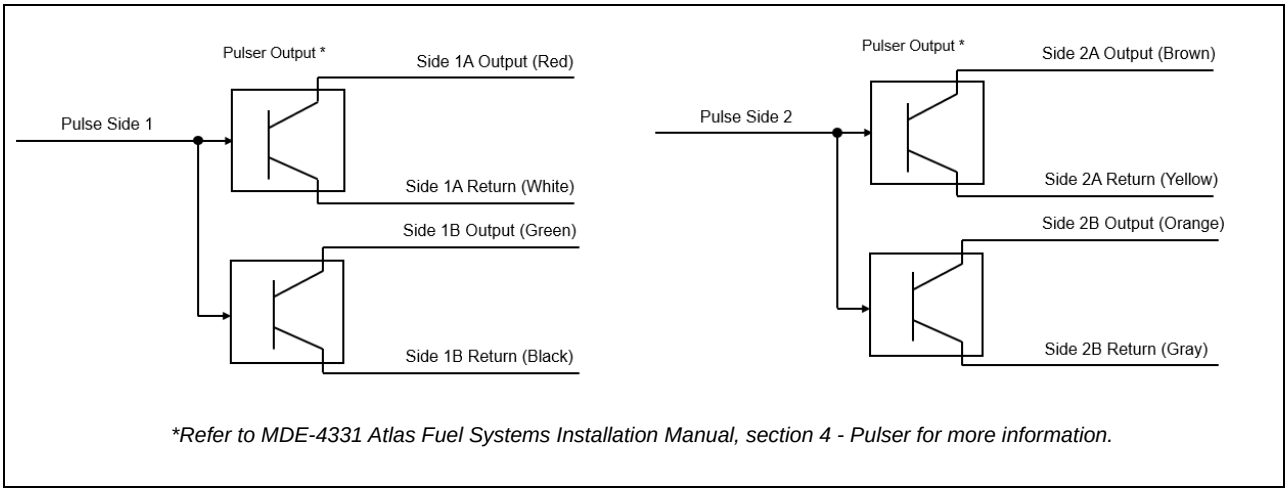
**Refer to MDE-4331 Atlas Fuel Systems Installation Manual, section 4 - Pulser for more information.*

Figure 5-31: Single Channel, Dual/Single Hose Pulse-out I/F (Default Setting)



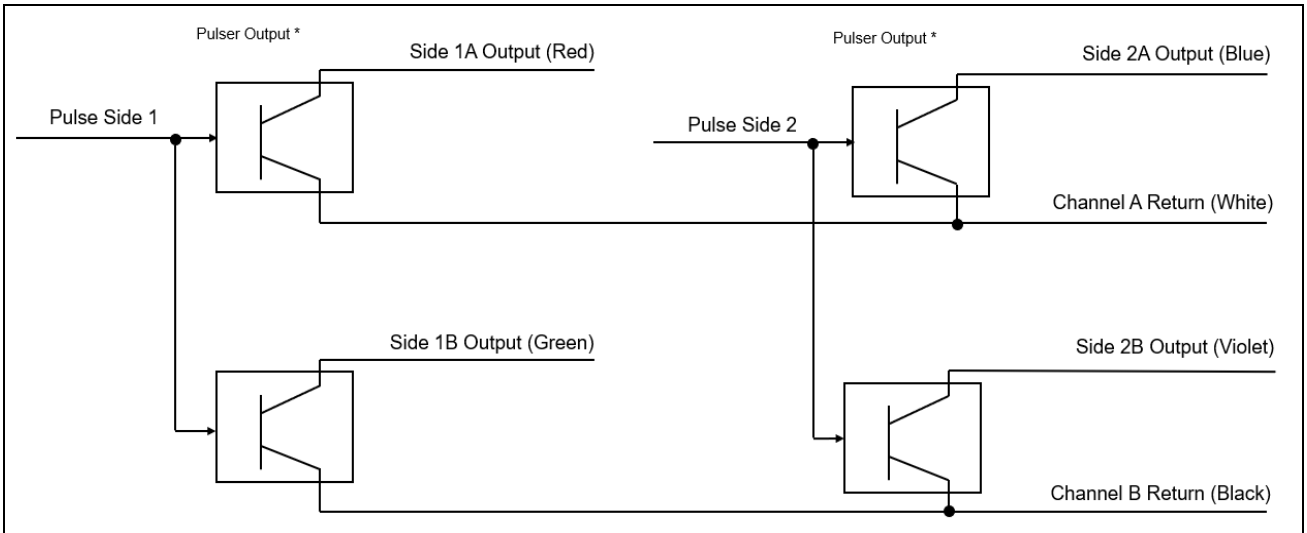
**Refer to MDE-4331 Atlas Fuel Systems Installation Manual, section 4 - Pulser for more information.*

Figure 5-32: Dual Channel, Dual Hose Pulse-out I/F



**Refer to MDE-4331 Atlas Fuel Systems Installation Manual, section 4 - Pulser for more information.*

Figure 5-33: Dual Channel, Dual Hose Pulse-out I/F on 9850KXTW1 or 9850KXTW2 Ultra-Hi



**Refer to MDE-4331 Atlas Fuel Systems Installation Manual, section 4 - Pulser for more information.*

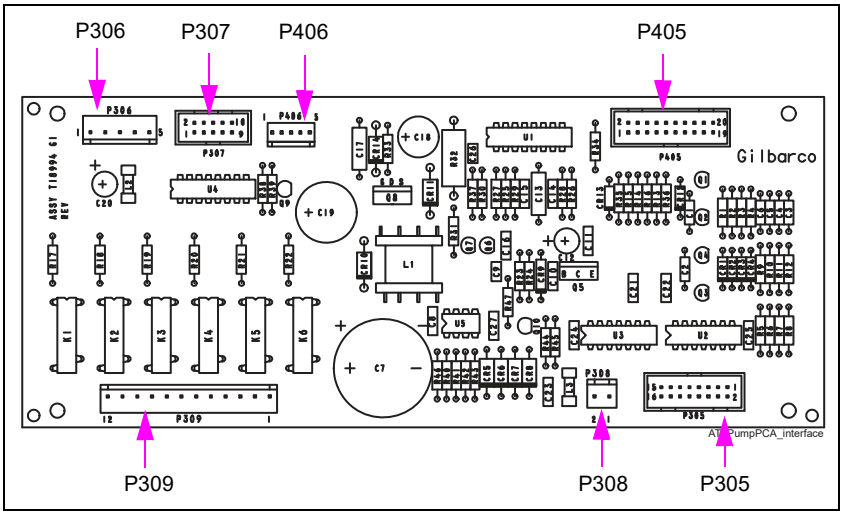
Atlas 8800 Parts

Pump Interface PCA [T18994 (Atlas 8800 Only)]

Pump Interface PCA (T18994) connects with the pump controller and pulsers, pump handle switches, valves, STP signal relays, and electro-mechanical totalizers. Normally, this interface is with the Pump Controller PCA. However, when an ATC Controller Board is used, the Pump Controller Interface sends pulser information to the ATC Controller PCA. The Hydraulic Interface (T18994) also converts the 24 VAC it receives from the power supply to 14 VDC for the pump handle feed and 150 VDC for pulsers. The interface receives +5 VDC from the Pump Controller PCA and supplies 120 VAC for the valve and STP signals.

Figure 5-34 shows the STP PCA layout that contains components related to the Hydraulic Interface, Pump Interface PCA (T18994-G1).

Figure 5-34: Pump Interface PCA [T18994 (Atlas 8800 Only)]



PCA Connections and Cables

Connector #	Through Cable	To Assembly	At Connector #
P305 (20)	R19952-G1	T20092-G1	P205 (16)
P306 (5)	R19939-G1	T20092-G1	P206 (5)
P307 (10)	R19951-G1	T20092-G1	P207 (10)
P308 (2)	24 VAC	R20333-G2	
P309 (12)	T19983	T19983-G1	P604 (4) P601 (3) P401 (9)
P405 (20)	M04658A001	Q12514-10 (A1)/Q12514-10 (B1)	PH (A1) (4), PH (B1) (4)
	R19072-G1	T18350-G3 (A) T18350-G3 (B)	J921B (4), J921A (4)
	M04658A001	Q11763-01	(+) (C) (-)
P406 (5)	M04889A001	M00455A003 Grade 1	J922A (4)
		M00455A003 Grade 1	J922B (4)

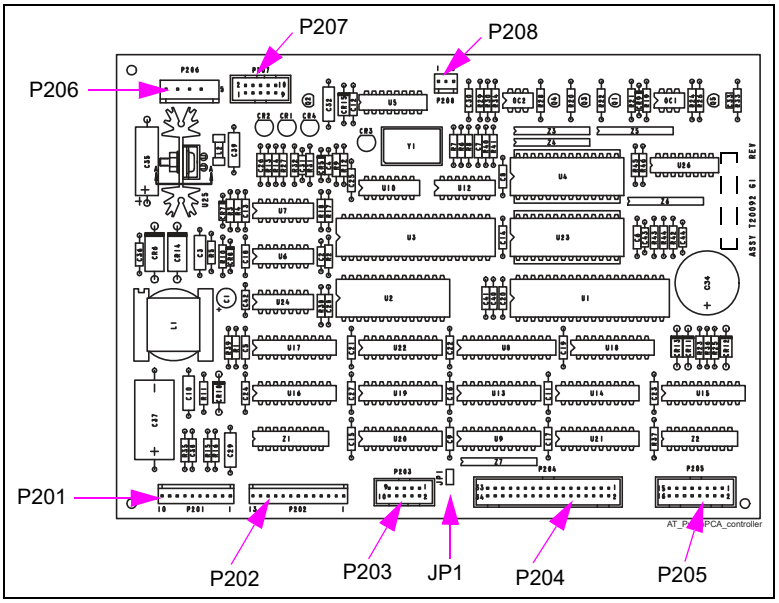
Pump Controller PCA [T20092 (Atlas 8800 Only)]

This PCA provides computation for the operation of the unit. It provides instructions to the other boards for:

- Control of valves
- Displayed information
- Sale progression
- Sale calculations
- Totals memory
- Programming storage

Figure 5-35 shows the PCA of the Atlas Retail Electronic system. For proper service, the technician must possess knowledge of the functions of components and how they relate to the system.

Figure 5-35: Pump Controller [T20092 (Atlas 8800 Only)]

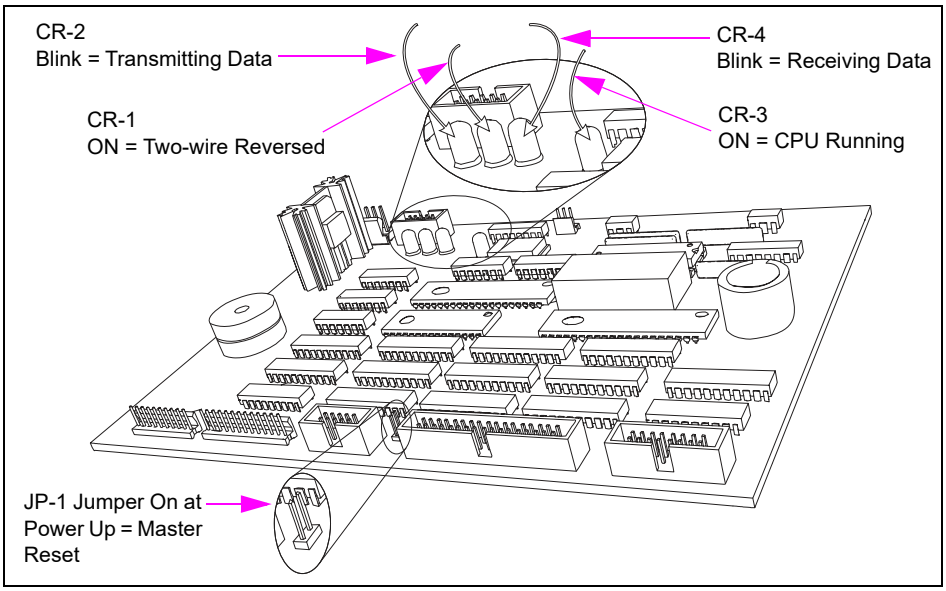


T20092 Connections and Cables (with ATC)

Connector #	Through Cable	To Assembly	At Connector #
P201 (10) (Not used)			
P202 (13) (Not used)			
P203 (10)	R201461-G1	T20569-G1	P303 (10)
P204 (34)	R19667-G1	T20569-G1	P304 (34)
P205 (16) P207 (10)	M02739A001	T20569	P405 (34) P301 (20) P305 (34)
P206	R19939-G1	T18994-G1	P306 (5)

Figure 5-36 shows the Hydraulic Interface that contains assemblies and components related to customer information on the Pump Controller PCA (T20092-G1).

Figure 5-36: Atlas 8800 Pump Controller (T20092)



PCA Connections and Cables

Connector #	Through Cable	To Assembly	At Connector #
P201 (10-pin)	N/A	N/A	N/A
P202 (13-pin)	N/A	N/A	N/A
P203 (10-pin)	R19951-G1	T17549-G1	P901A (10)
P204 (34-pin)	T17768-G1	M15224A001 or T18981-G1, Standard LCD Display	P801 (34) (Side A) (2 places) and (Side B) (2 places)
P205 (16-pin)	R19952-G1	T18994-G1	P305 (16)
P206 (5-pin)	R19939-G1	T18994-G1	P306 (5)
P207 (10-pin)	R19951-G1	T18994-G1	P307 (10)
P208 (3-pin)	R20412-G3	J402 Field Wiring	P402A (2) P402 (3)

This PCA contains a firmware chip that holds base instructions for the operation of the unit. LEDs are provided to alert the technician during diagnostics, regarding POS problems, processor function, or reversed polarity of the two-wire system feed wires.

The board receives +14 VDC from the Hydraulic Interface PCA. Customer programmable and 5-button preset as well as the Manager Keypad (except for ATC) are connected directly to this PCA. It supplies +5 VDC to the Hydraulic Interface PCA.

ATC Component Overview (Atlas 8800 Only)

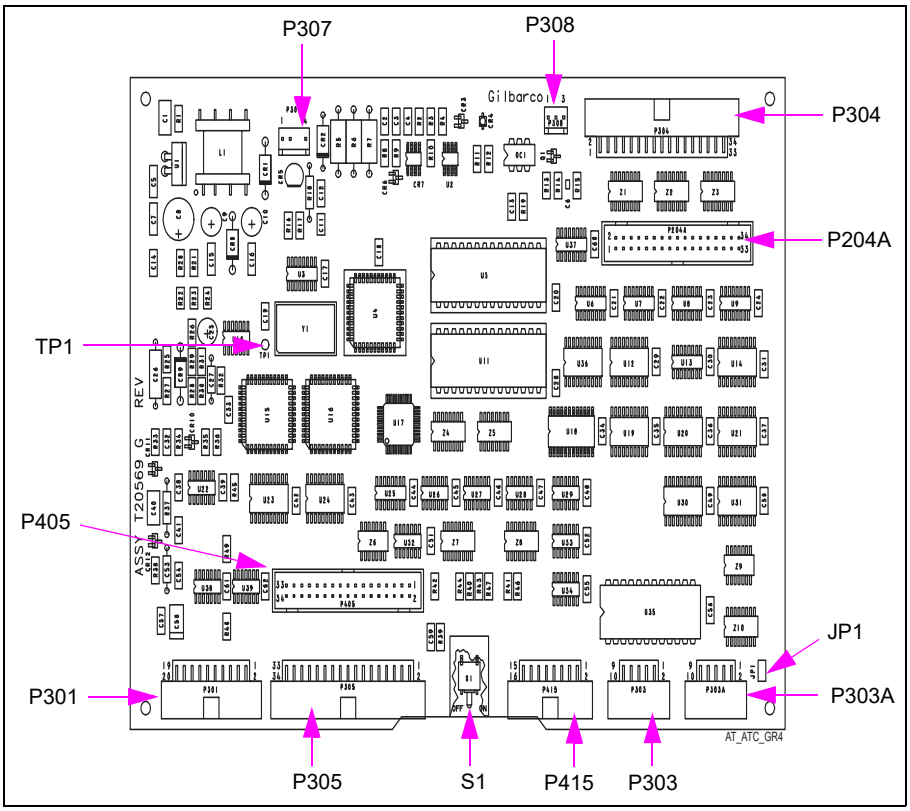
The ATC PCA (T20569) and T-Meter Module ATC (T19405) are optional electronic components. Examples of probes and meters used for temperature control are primarily for the Canadian market. The ATC option measures the temperature of the dispensed products and compensates for changes in the product volume due to changes in the ambient temperature.

The T-Meter Module PCA links the thermal probe in the meter cover with the ATC PCA. An I.S. barrier is used at the J-box between the T-Meter Module PCA and ATC PCA.

115/230/380 VAC Single/Dual Unit with ATC PCA (T20569) and PPP (Option)

The ATC PCA (T20569) records the temperature-related input from the T-Meter Module Hydraulic Interface PCA, which then modifies the pulser-count to regulate the temperature change. The adjusted pulser-count is supplied to the Pump Controller PCA. Components for the firmware are located near the center of the board at U5 and U11, which also contains the battery-backed RAM. The PCA receives +5 VDC from the Pump Controller PCA and 14.5 VDC from the Pump Interface PCA. The ATC PCA also receives data from the Manager Keypad before the Pump Controller PCA, which allows information to be entered through the keypad for programming and testing purposes, when the ATC is used.

Figure 5-37: ATC PCA [T20569 (Atlas 8800 Only)]



ATC PCA (T20569) Connections and Cables

Connector #	Through Cable	To Assembly	At Connector #
P204A	T17768-G1	M15224A001 ~ OR ~ T18981-G1	P801 (34) (Side A) (2 places) and (Side B) (2 places)
P301	M02739A001	T20092-G1	P205 (16) P207 (10)
		T18994-G1	P307 (10) P305 (16)
P303	R20146-G1	T20092-G1	P203 (10)
P303A	R19951-G1	T17549-G1	P901A (10)
P304	R19667-G1	T20092-G1	P204 (34)
P305	M02739A001	T20092-G1	P205 (16) P207 (10)
		T18994-G1	P307 (10) P305 (16)
P307	R20128-G1	Main J-box (24 AWG WHT)	WT-4 and WT-3
P405	M02739A001	T20092-G1	P205 (16) P207 (10)
		T18994-G1	P307 (10) P305 (16)
P415	N/A	N/A	N/A

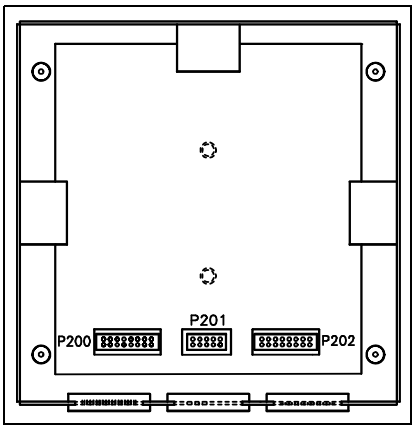
Switch

P308	Position
S1	On
	Off

ATC T-Meter Module PCA

Figure 5-38 shows the Hydraulic Interface that contains assemblies and components related to customer information on T20092-G1 PCA. The ATC T-Meter Module PCA Interface PCA modifies the pulser-count to account for the ambient temperature change. The adjusted pulser-count is supplied to the Pump Controller PCA.

Figure 5-38: ATC T-Meter Module PCA

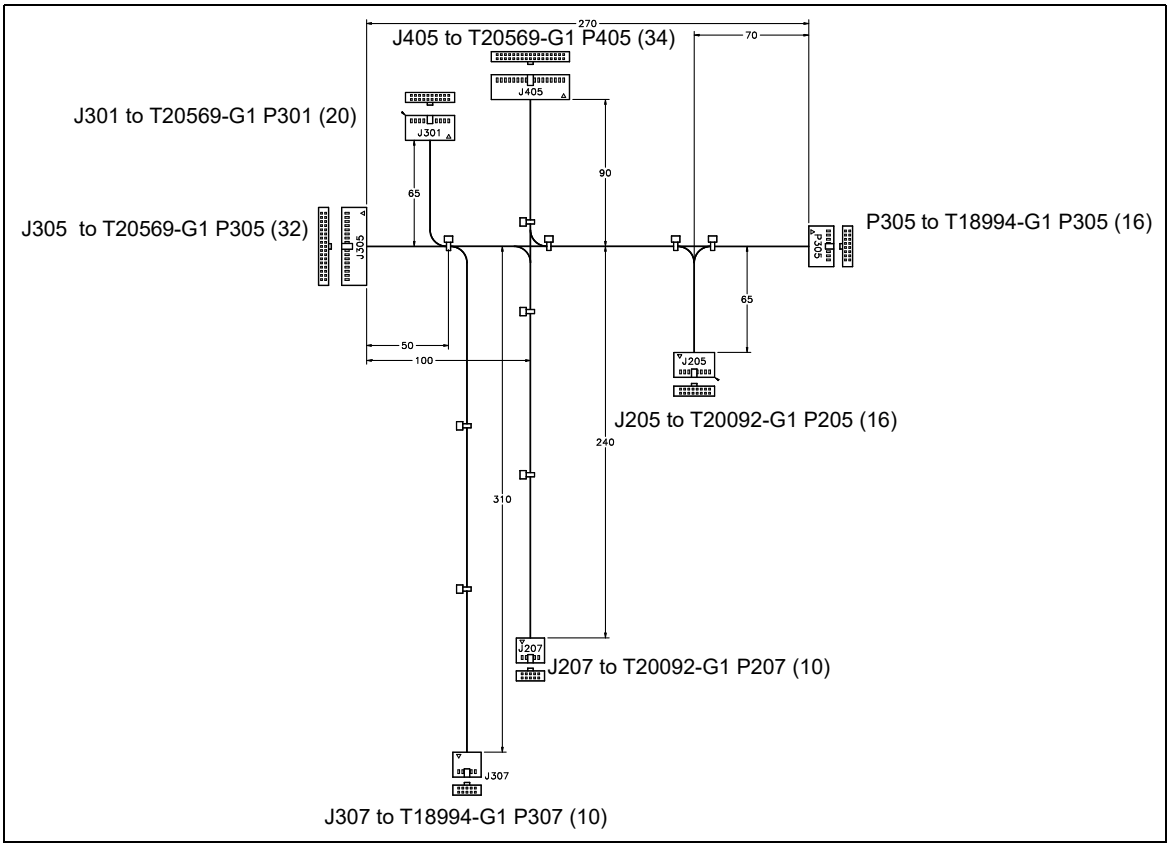


PCA Connections and Cables

Connector #	Through Cable	To Assembly	At Connector #
P200 (16)	R20148-G3	Probe 2	PTP5 (16)
P201 (10)	R20147-G1	T19428-G1	JIS (10)
P203 (16)	R20148-G3	Probe 1	PTP5 (16)

Figure 5-39 shows the ATC retail Atlas Cable # M02739A001 from T20092-G1 Pump Controller PCA P205 (16) and 207 (10) to T20569-G1 OP ATC PCA P405 (34) and P301 (20) and 305 (34).

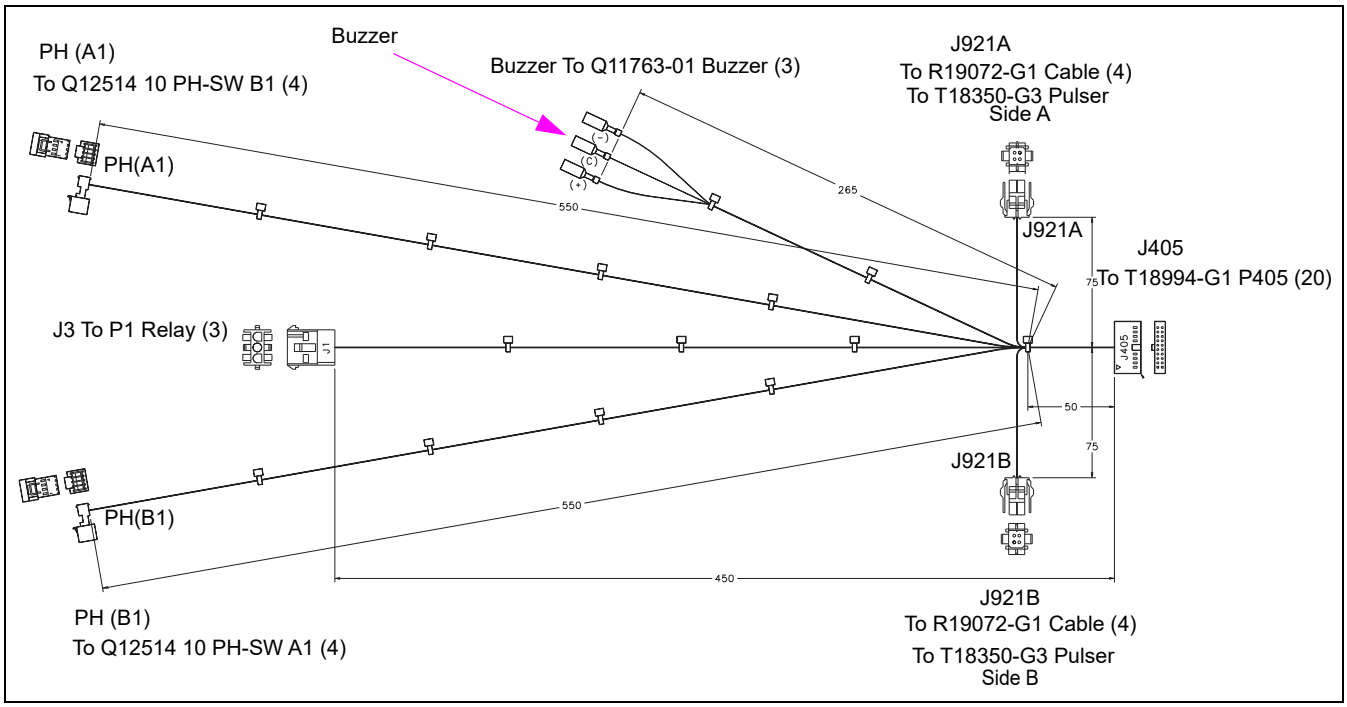
Figure 5-39: M02739A001 Cable



M04659A001 Cable

Connector #	Through Cable	To Assembly	At Connector #
J405 (34)	M02739A001	T20569-G1	P405 (34)
P305 (16)	M02739A001	T18994-G1	P305 (16)
J205 (16)	M02739A001	T20092-G1	P305 (34)
J207 (10)	M02739A001	T20092-G1	P207 (10)
J307 (10)	M02739A001	T18994-G1	P307 (10)
J305 (32)	M02739A001	T20569-G1	P305 (32)
J301 (20)	M02739A001	T20569-G1	P301 (20)

Figure 5-40: M04658A001 Cable



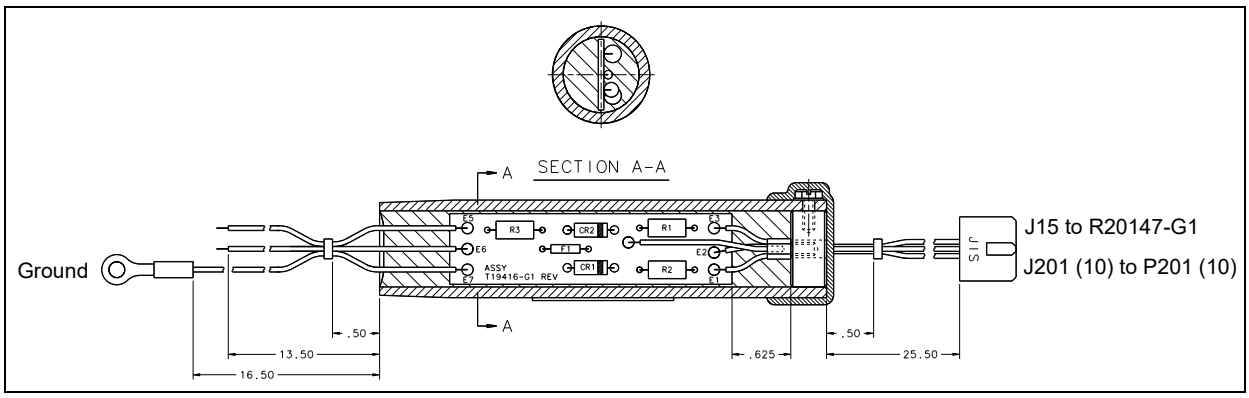
M04658A001 Cable

Connector #	Through Cable	To Assembly	At Connector #
T18994-G1 J405 (20)	M04658A001	R19072-G1 to T18350-G3 A-side	
	M04658A001	R19072-G1 to T18350-G3 B-side	
	M04658A001	Q11763-01 Buzzer (3)	
	M04658A001	Q12514-10	PH-SW B1 (4)
	M04658A001	Q12514-10	PH-SW A1 (4)
	M04658A001	P1 Relay (3)	

I.S. Barrier Assembly ATC (T19428-G1)

Figure 5-41 shows the I.S. Barrier Assembly ATC.

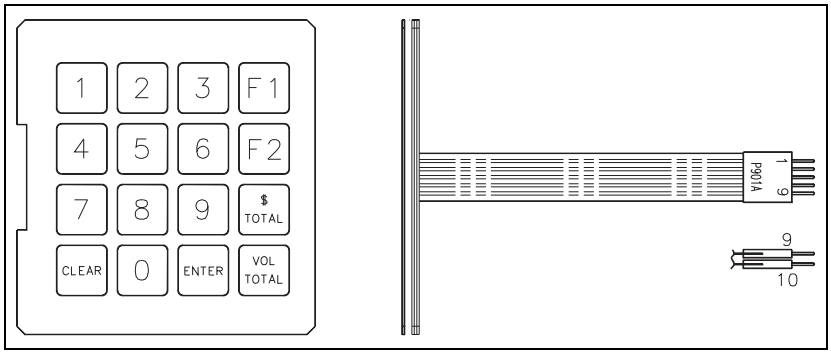
Figure 5-41: I.S. Barrier Assembly ATC



Manager Keypad [T17549-G1 (Atlas 8800 Only)]

Figure 5-42 shows the Manager Keypad used in Atlas 8800 units to display pump transaction information in two locations. The Manager Keypad relates to T20092-G1 PCA, shown in Figure 5-35 on page 5-45.

Figure 5-42: Manager Keypad [T17549-G1 (Atlas 8800 Only)]



PCA Connections and Cables

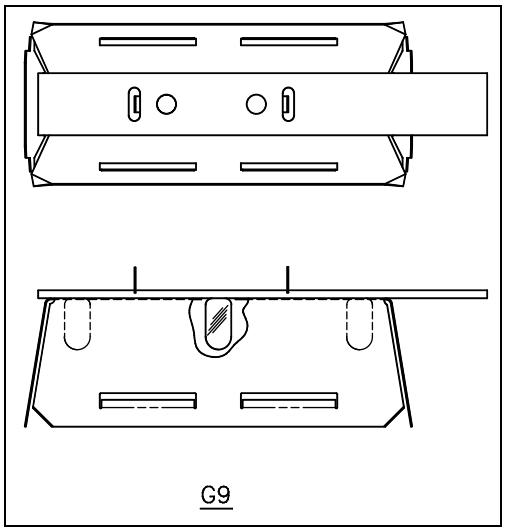
Connector #	Through Cable	To Assembly	At Connector #
P901A (10)	R19951-G1	T20092-G1	P203 (10)

Display Backlight PCA (0.6-inch) [T17622-G9 (Atlas 8800 Only)]

Note: The M15224A001 LCD does not use bulbs for backlight. The T17622-G9 is required only on the T17701-G1 and T18981-G1 Display Boards.

Figure 5-43 shows the Display Backlight PCA [0.6-inch (T17622-G9)]. It provides the backlight for the display of pump transaction information to the customer, inside or at the pump.

Figure 5-43: Display Backlight PCA (0.6-inch) [T17622-G9 (Atlas 8800 Only)]



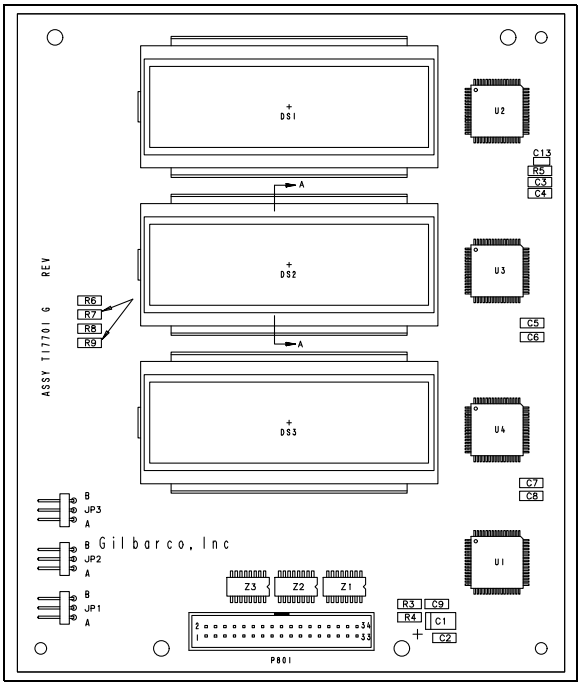
Service Tip for Backlight Bulbs

If one of the backlight bulbs burns out and the unit has been in service for some time, it is recommended that all backlight bulbs be replaced. Other bulbs may be nearing the end of their service.

LCD Display (0.6-inch) [M15224A001 (Atlas 8800 Only)]

Figure 5-44 shows the LCD Display [0.6-inch (M15224A001)]. It is used in Gasboy Atlas Retail units to help display pump transaction information. The LCD is at the pump and displays information to the customer.

Figure 5-44: Display (0.6-inch) [M15224A001 (Atlas 8800 Only)]

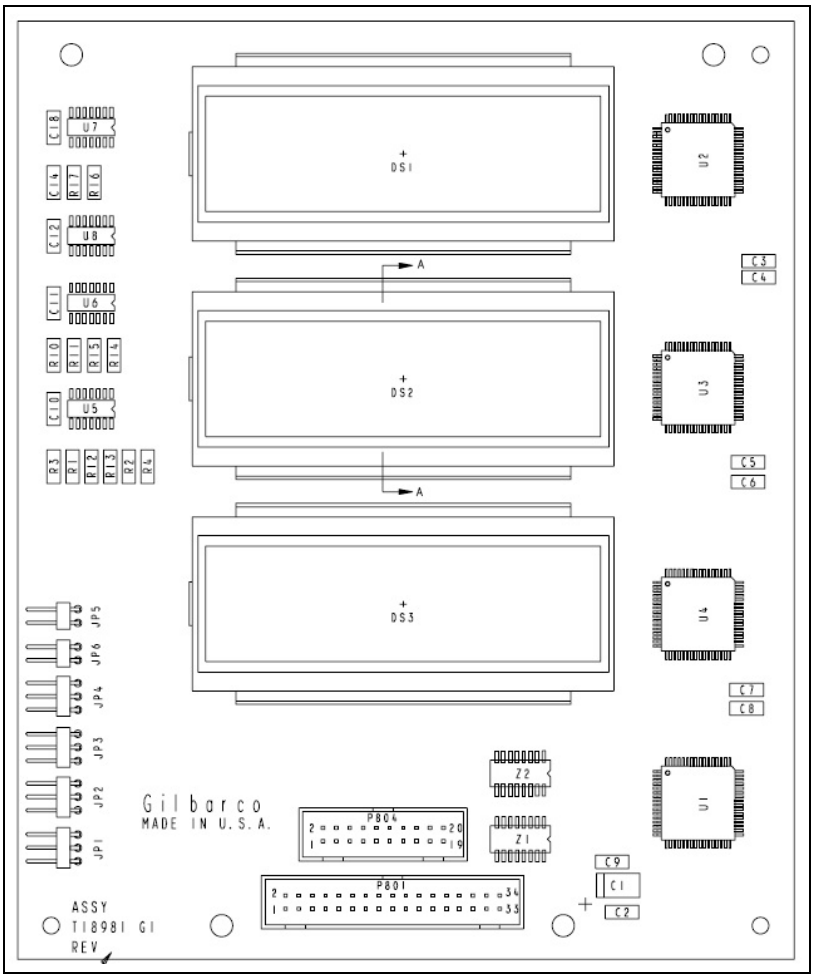


LCD Display (0.6-inch) [T18981-G1 (Atlas 8800 Only)]

Note: The T18981-G1 Display Board is no longer active and has been replaced by M15224A001 LCD.

Figure 5-45 shows the LCD Display [0.6-inch (T18981-G1)]. It is used in Gasboy Atlas Retail units to help display pump transaction information. The LCD is at the pump and displays information to the customer.

Figure 5-45: LCD Display [T18981-G1 (0.6-inch)]



Service Tip for Backlight Bulbs

If one of the backlight bulbs burns out and the unit has been in service for some time, it is recommended that all backlight bulbs be replaced. Other bulbs may be nearing the end of their service life.

Power Supplies

The function of the power supply is to provide clean voltage at correct values required by the electronics.

Replacing Fuses

⚠CAUTION

Using an incorrectly rated fuse may cause equipment damage. To ensure equipment protection and maintenance of safe operation, always use the correct replacement fuse.

Q10131-03 Fuse (Retail Unit only)

The rating for this fuse is 3A SLO-BLO. The size of the fuse used is 1.25 inches ×0.25 inches.

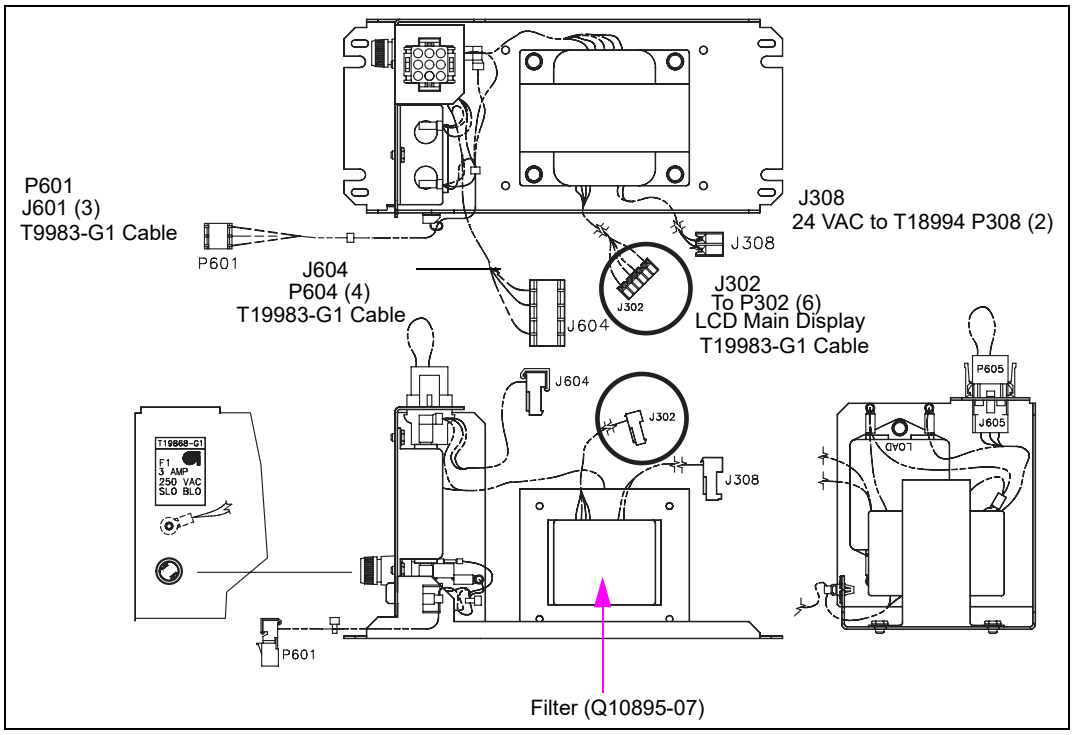
Incoming AC Fuse (Commercial Units only)

The rating for this fuse is 1A SLO-BLO (Q10131-29 or C04044). The size of the fuse used is 1.25 inches × 0.25 inches.

Main Power Supply (T19868-G1), Retail Units only

The Main Power Supply (T19868-G1) assembly contains the transformer, fuses, line filter, and other components to provide unregulated 4.7 VAC backlights, 110 VAC valves and STP signal relays, and 24 VAC to the Hydraulic Interface PCA. The Main Power Supply (T19868-G1) uses a special voltage selector plug for establishing connections either to 115 VAC or 230 VAC systems.

Figure 5-46: Main Power Supply (T19868-G1)



Main Power Supply (T19868-G1)

Connector #	Through Cable	To Assembly	At Connector #
P601	Main Power Supply (T19868-G1)	Main Display (M15224A001 or T18981)	J601 (3)
J604	Main Power Supply (T19868-G1)	T19983 Cable	P604 (4)
J302	Main Power Supply (T19868-G1)	T19868 Cable	P302 (6)
J308	Main Power Supply (T19868-G1)	Pump Interface (T18994-G1)	P308 (2)

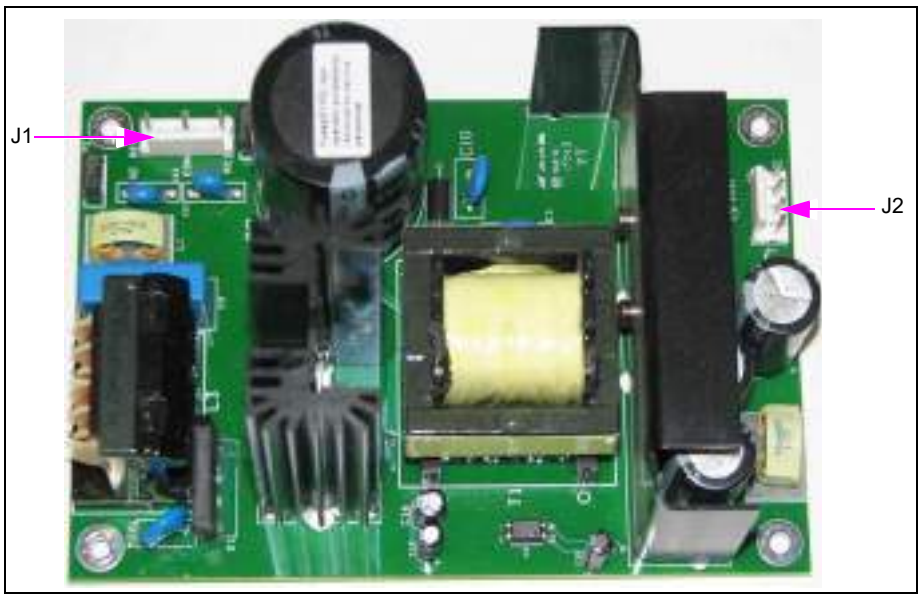
Atlas 9800 Power Supply Assembly (M15579A001, Commercial Units Only)

The Atlas 9800 Power Supply assembly (M15579A001) contains a +24 VDC power supply (M10996A001) and a DC-to-DC converter board (M15321A001) to provide regulated +7.5 VDC for backlights and electro-mechanical totalizers, +5 VDC for CPU power, and +24 VDC to the Coriolis Interface PCA (DEF) or E85 Valve Interface PCA (E85). It also supplies a power fail signal to the CPU to warn the CPU of impending loss of power once the +24 volts drops below +22 VDC.

+24 VDC Power Supply Board (M10996A001)

The function of the +24 VDC Power Supply is to convert AC power to +24 VDC.

Figure 5-47: +24 VDC Power Supply Board



PCA Connections and Cables

Connector #	Through Cable	To Assembly	At Connector #
J1 (3)	M15512A001	M15321A001	P8 (3)
J2 (4)	M15512A002	M15321A001	P7 (4)

Service Tips

The +24 VDC Power Supply has current overload protection. If the load is too high when the supply is first powered up, it will turn off the output. If it appears that the supply is not supplying DC voltage, try disconnecting the cable at the J2 connector and measure the voltage on pins 2 and 3. If +24 volts is measured with the cable disconnected, it is possible that there is a problem with the DC-to-DC Converter Board or something connected to it.

DC-to-DC Converter Board (M15321A001)

The functions of the DC-to-DC Converter Board are as follows:

- Provide AC connection to adapt the existing AC cable to the +24 VDC Power Supply
- Provide fuses, control, and distribution for the +24 Volts
- Provide regulated +5 VDC fused output to the CPU
- Provide regulated +7.5 VDC fused output to display backlight and EM Totalizers
- Provide power fail signal to CPU board

Figure 5-48: DC-to-DC Converter Board

PCA Connections and Cables

Connector #	Through Cable	To Assembly	At Connector #
P1 (5)	M05107A001 or M05107A002	M05346A002 (115 VAC) or M05346A004 (230 VAC) or M06333KXXXX (115/230 VAC)	P10 (3)
P2 (3)	M05108A001 or C06519	M12019A001, C06372	P1 (3)
		M06587A001, M06725A001, M05158A00X, or M05248A001	P804 (3)
P3 (5)	M05110A001, M05110A002, or M05110A003	M04850A008 or M04850A010 (Cable)	
P4 (2)	M15502A001 or M15502A002	M12760A001 Hub Interface (HIP2)	P401 (3)
	M15505A001 or M15505A002	M15778B206 OrCU	DCJACK (4)
P5 (2)	M07141A004	M10030A001 (DEF) Meter Interface	P1402 (2)
	M07141A005	M11480A001 (E85) Valve Interface	P2402 (2)
P6 (2)	M15499A001 or M15499A003	M15778B208 (Cable)	
P7 (4)	M15512A002	M10996A001	J2 (4)
P8 (3)	M15512A001	M10996A001	J1 (5)

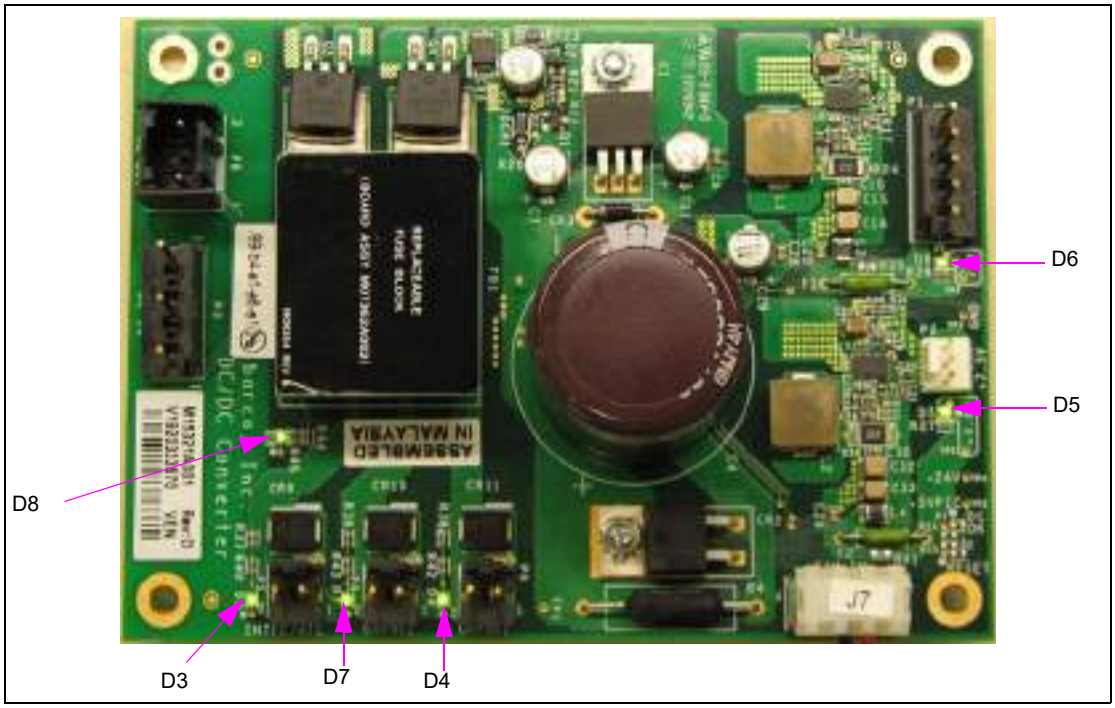
Service Tips

The following is the list of service tips for DC-to-DC Converter Board (M15321A001):

- TP1 and TP3 on the board can be used to verify if the +24 VDC is supplied at the P7 connector.
- TP2 and TP3 on the board can be used to verify if the +5 VDC that is used by the +24 Volt control and power fail signal generating circuit.
- TP4 and TP3 on the board can be used to verify if the +24 VDC is supplied at the input of the +5 and +7.5 volt regulating circuits.
- TP5 and TP3 on the board can be used to verify if the +5 VDC is available at P1, power to CPU.
- TP6 and TP3 on the board can be used to verify the +7.5 VDC is available at P2, power to display backlights and electro-mechanical totalizers.
- When +24 VDC is applied to the board, all +24 VDC outputs are held off for a brief period and then turned on by the +24 volt control circuit on the board. If the voltage supplied does not go above +22 VDC, all +24 VDC outputs will remain off. When the board turns on the +24 VDC outputs, it also sets the power fail signal to +5 volts (pin 5 of P1).
- If the incoming +24 VDC drops to +22 VDC or below, the board sets a power fail signal to a low level. Once the power fail signal is set low, the board will turn off all +24 VDC outputs after 150 milliseconds, including the +24 VDC that is used to generate the +5 VDC & +7.5 VDC outputs.

Diagnostic LEDs on the M15321A001 DC-to-DC Converter Board

Figure 5-49: Diagnostic LEDs on M15321A001 DC-to-DC Converter Board

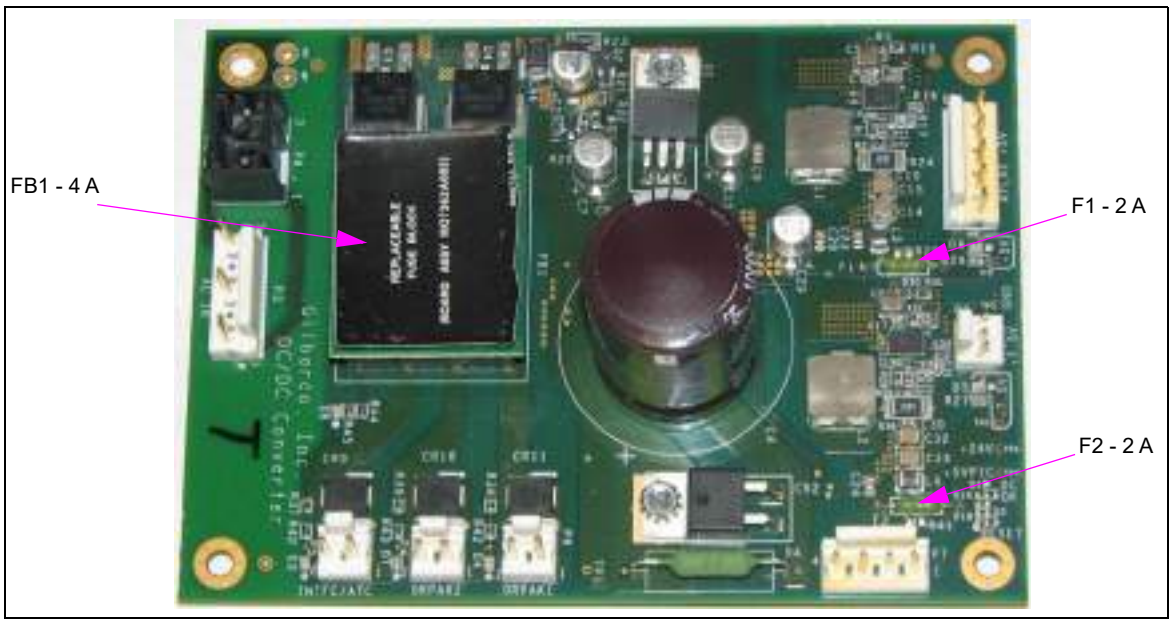


- If D3 LED is on, it indicates +24 VDC is available at the P5 connector [Power to Meter Interface (DEF) or Valve Interface (E85)].
- If D4 LED is on, it indicates +24 VDC is available at the P6 connector (Power to Atlas PRIME Panel Side A).
- If D5 LED is on, it indicates +7.5 VDC is available at the P2 connector (Power to Display Backlights and Electro-Mechanical Totalizers).
- If D6 LED is on, it indicates +5 VDC is available at the P1 connector (Power to the Atlas CPU).
- If D7 LED is on, it indicates +24 VDC is available at the P4 connector (Power to HIP2 or OrCU).
- If D8 LED is on, it indicates +24 VDC is available at the input of the +5 & +7.5 regulator circuit (used to develop +5 & +7.5 volt outputs).

Fuses on M15321A001 DC-to-DC Converter Board

This DC-to-DC Converter Board has fuse protected outputs. The +24 VDC outputs are protected by the fuses (4 amp) on the Fuse Block Assembly (FB1). The +5 VDC output is protected by fuse F1 (2 amps). The +7.5 VDC output is protected by fuse F2 (2 amp). The fuses are located on the DC-to-DC Converter Board (M15321A001) as shown in the following diagram.

Figure 5-50: Fuses on M15321A001 DC-to-DC Converter Board



To replace the fuse on the fuse block, proceed as follows:

1 Shut off all breakers that supply power to the unit.

2 Remove FB1.

3 Install new FB1 (M07362A002).

4 Re-apply power to the unit.

If F1 and/or F2 require replacement, proceed as follows:

1 Shut off all breakers that supply power to the unit.

2 Remove the DC-to-DC Converter Board.

3 Install new DC-to-DC Converter Board (M15321A001).

4 Re-apply power to the unit.

Service Tips

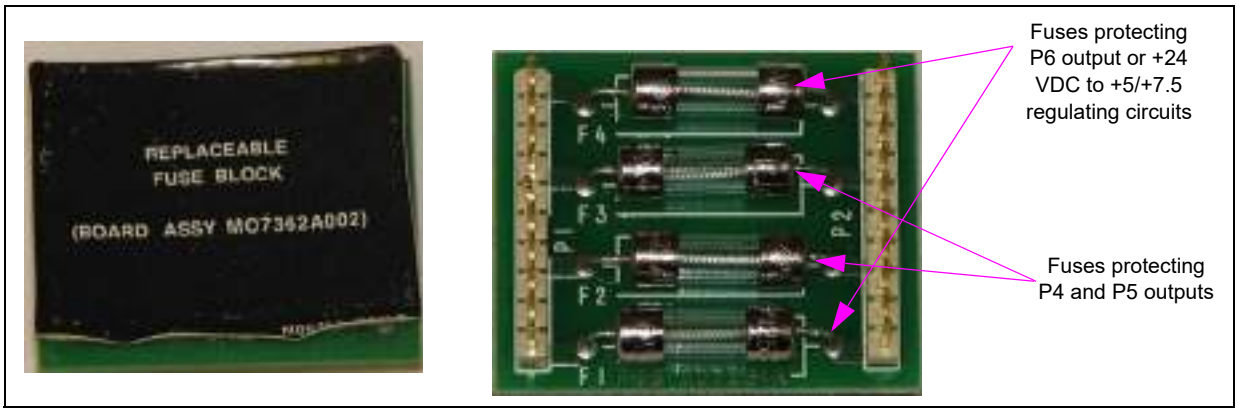
The following is the list of service tips for Fuses on M15321A001 DC-to-DC Converter Board:

- If power has been applied and all LEDs remain off, disconnect cables at P1, P2, P4, P5, and P6. Verify +24 VDC (TP1 & TP3). If +24 VDC is present, verify the control voltage (PIC) is +5 volts (TP2 & TP3). This voltage is used to turn on or off the outputs and generate the power fail signal.
- The +24 volt must be present to generate the +5 & +7.5 VDC outputs. If power has been applied and LEDs D5 & D6 are not on, verify that D8 is on. If D8 is not on, check the fuses on the fuse block FB1.
- If power has been applied and LED D5 (+7.5 VDC) is not on, disconnect the cable going to P2. If D5 comes on, verify there are no pinched wires going to or shorts on the display backlights or electro-mechanical totalizers. If D5 remains off when the cable is disconnected, check fuse F2.
- If power has been applied and LED D6 (+5 VDC) is not on, disconnect the cable going to P1. If D6 comes on, verify there are no pinched wires going to or shorts on the CPU board or something connected to the CPU board. If D6 remains off when the cable is disconnected, check fuse F1.
- If power has been applied and LED D3 (+24 VDC output) is not on, check the cabling going to P5. Verify there are no pinched wires going to or shorts on the Coriolis Meter Interface Board (M10030A001 - DEF) or Valve Interface Board (M11480A001 – E85) or something connected to them. If D3 remains off, check the fuses on fuse block FB1.
- If power has been applied and LED D4 (+24 VDC output) is not on, check the cabling going to P6. Verify there are no pinched wires going to or shorts on the Atlas PRIME panel on side A or something connected to it. If D4 remains off, check the fuses on fuse block FB1.
- If power has been applied and LED D7 (+24 VDC output) is not on, check the cabling going to P4. Verify there are no pinched wires going to or shorts on the HIP2 board, or something connected to the HIP2 board, or OrCU board or something connected to the OrCU. If D7 remains off, check the fuses on fuse block FB1.

Replaceable Fuse Block Board Assembly (M07362A002)

The function of the Replaceable Fuse Block Board is to protect +24 VDC from damage in the event of a circuit short or overload condition.

Figure 5-51: Replaceable Fuse Block Board Assembly (M07362A002)



PCA Connections and Cables

Connector #	To Assembly	At Connector #
P1 (10)	M15321A001	FB1
P2 (10)	M15321A001	FB1

Service Tips

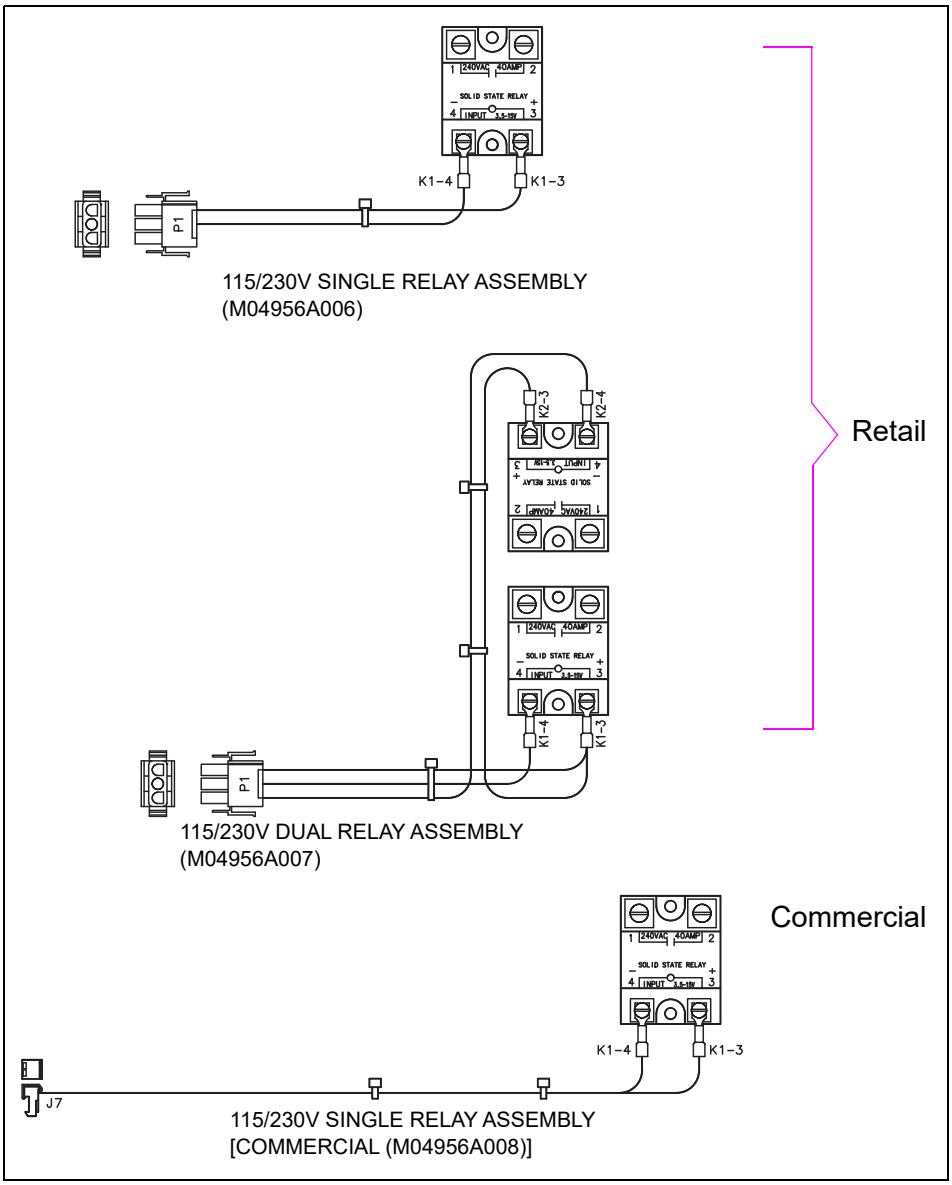
The following is the list of service tips for Replaceable Fuse Block Board Assembly (M07362A002):

- The Fuse Block Assembly is symmetrical. It does not matter which connector (P1 or P2) plugs into the connectors on the DC-to-DC Converter Board, as long as the pins on the Fuse Block Board are aligned with the connectors on the Converter board. If the pins become offset, there will be no voltage outputs.
- Since the Fuse Block Board is symmetrical if one of the fuses is open, it is possible to pull out the Fuse Block, turn it around 180 degrees, and plug it back into the DC-to-DC Converter Board, provided not all +24 VDC outputs are being used. Before this is done, determine the cause for fuse to open and rectify the issue.

Atlas Relay Assemblies

Figure 5-52 shows Atlas relays related to single and dual pumps.

Figure 5-52: M04956A001 and Two Relays



Relay Assemblies

For this Voltage	Use this Plug
115/230 VAC	P1 M04956A006 Single Retail Relay Assembly P1 (3)
115/230 VAC	P1 M04956A007 Dual Retail Relay Assembly P1 (3)
115/230 VAC	J7 M04956A008 Single Commercial Relay Assembly P7 (3)
115/230 VAC	J7 M04956A009 Dual Commercial Relay Assembly P7(3)
115/230 VAC	J7 M04956A010 Single Commercial Relay Assembly E85 Only P7 (3)
115/230 VAC	J7 M04956A011 Dual Commercial Relay Assembly E85 Only P7 (3)

For this Voltage	Use this Plug
115/230 VAC	J7 C06433 and C06681 Relay Assemblies for Atlas Commercial Ultra-Hi P7 (3)

Electro-mechanical Registers and Totalizers

About Displays

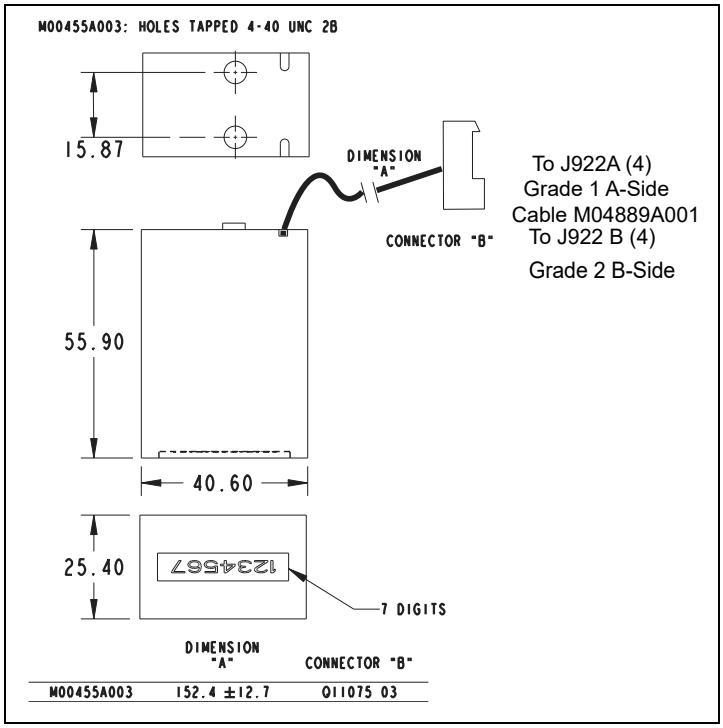
Depending on the configuration, Atlas units may have electronic or mechanical registers or totalizers. Totalizers provide a cumulative total similar to the odometer reading on a vehicle. The display provides the customer with information about the total cost and total volume of the fuel dispensed. PPU displays the PPU information to the customer.

Electro-mechanical Totalizer

An electro-mechanical totalizer is used for Electronic units. This replaces the cable-driven accumulative totalizer for Electronic units. This totalizer is driven off the RS-485 and Pulse Output Boards on the 9800 series and Hydraulic Interface Board on the 8800 series.

Figure 5-53 on page 5-65 shows details of the Electro-mechanical Totalizer [M00455A003 (Retail units)]. In the electronic layout of Atlas pumps, there are two electronic totalizers, one each on Side A and Side B. The sides are connected by the M04889A001 Cable through 4-pin connectors J922A and J922B. The Electro-mechanical Totalizer for 9800 series is M00455A002.

Figure 5-53: Electro-mechanical Totalizer [M00455A003 (Retail Only)]

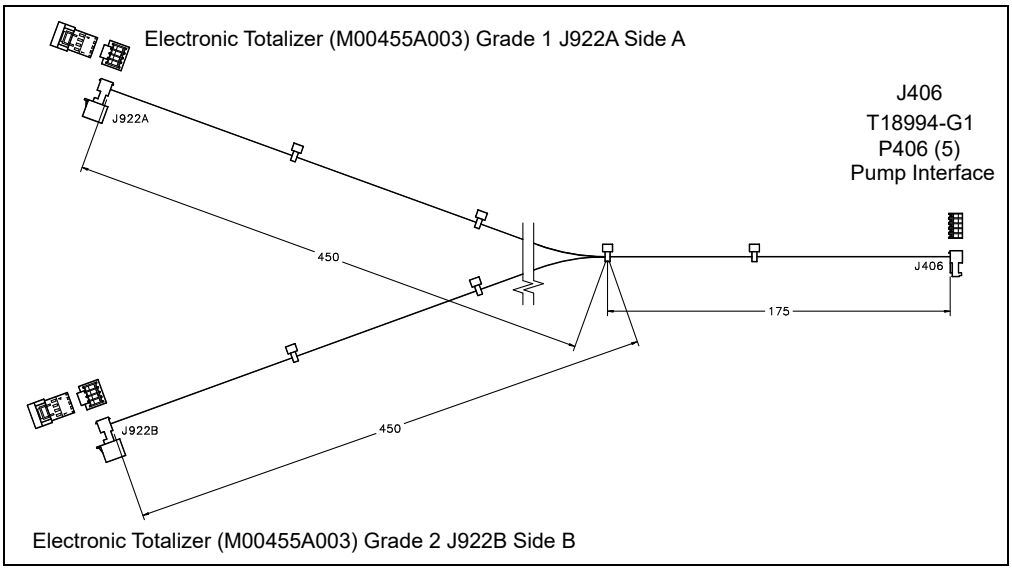


Electro-mechanical Totalizer (M00455A003)

Connector #	Through Cable
Electronic Totalizer (M00455A003) Grade 1 J922A Side A	M04889A001
Electronic Totalizer (M00455A003) Grade 2 J922B Side B	M04889A001

Figure 5-54 shows the totalizer three-plug cable for Atlas Retail units.

Figure 5-54: Three-plug Cable (M04889A001)



Three-plug Cable (M04889A001)

Connector #	Through Cable	To Assembly	At Connector #
Electronic Totalizer (M00455A003) Grade 1 J922A Side A J922A	M04889A001		
Electronic Totalizer (M00455A003) Grade 2 J922B Side B J922B	M04889A001		
J406	M04889A001	T18994-G1	P406 (5)

Service Tips (Retail only)

- Totalizers can be set to operate per product inlet, per unit, or per side.
- Programming of jump jacks is required to set the functionality.
- Certain problems can be indicated by error codes.

Figure 5-55: Main V-R Computer Register (Atlas 8700)

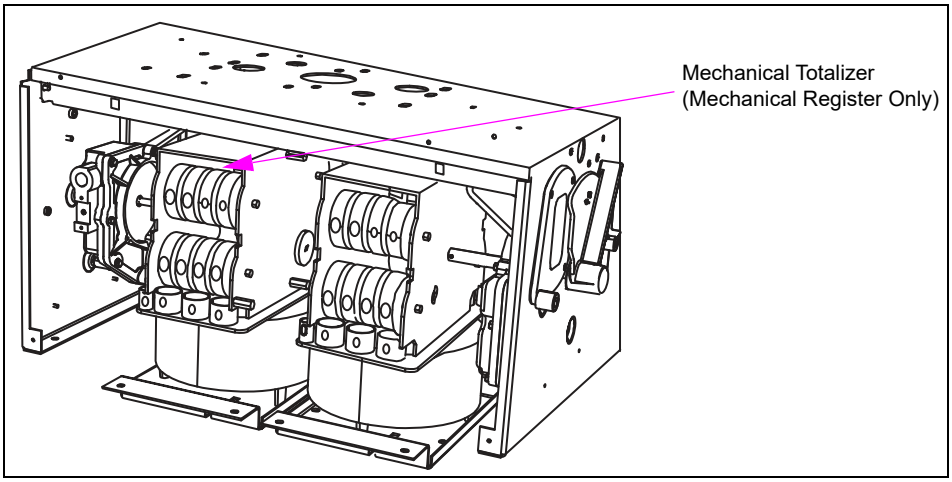
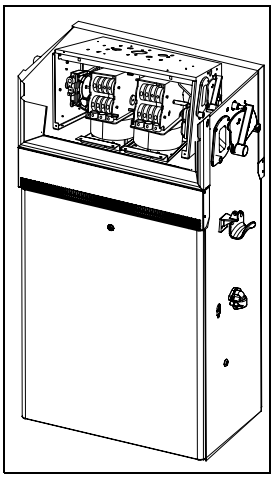


Figure 5-56 shows the main V-R Computer of the Mechanical PPU mechanism located in the side-mounted Atlas unit.

Figure 5-56: Main V-R Computer (Atlas 8700)



Pulsers

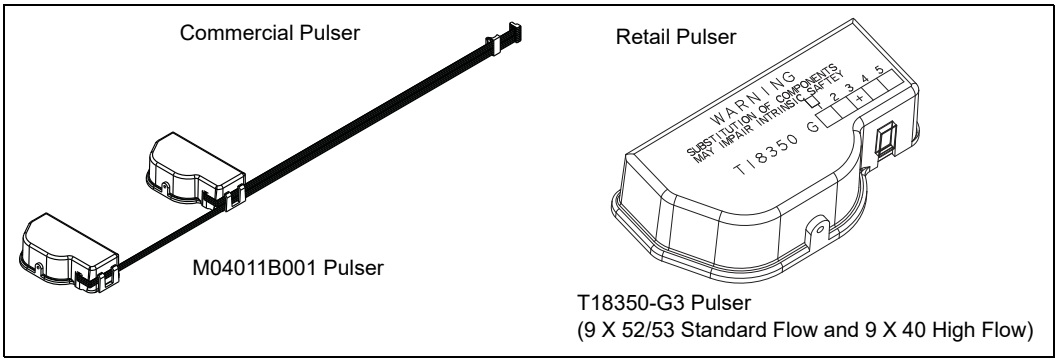
Read and follow all safety precautions in "Read This First" on page 1-1. Warnings and cautions appear throughout this section and must be regarded with utmost vigilance. Follow OSHA lockout/tagout procedures.

For DEF units, the pulser is part of the Coriolis Meter or DEF Magmeter. Refer to "Coriolis Meter" on page 6-35 or "DEF Magmeter" on page 6-37.

About Standard Pulsers

A pulser converts meter rotations to Pulse Per Gallon (PPG) (or liter) for use in some units by way of the controller board or mechanical gear/reed switch system. Program the unit to scale pulses for specific applications. For example, standard gallonage units use 1000 pulses per gallon. For other conversion factors, refer to "Pump Programming" on page 4-1.

Figure 5-57: Pulser Assemblies



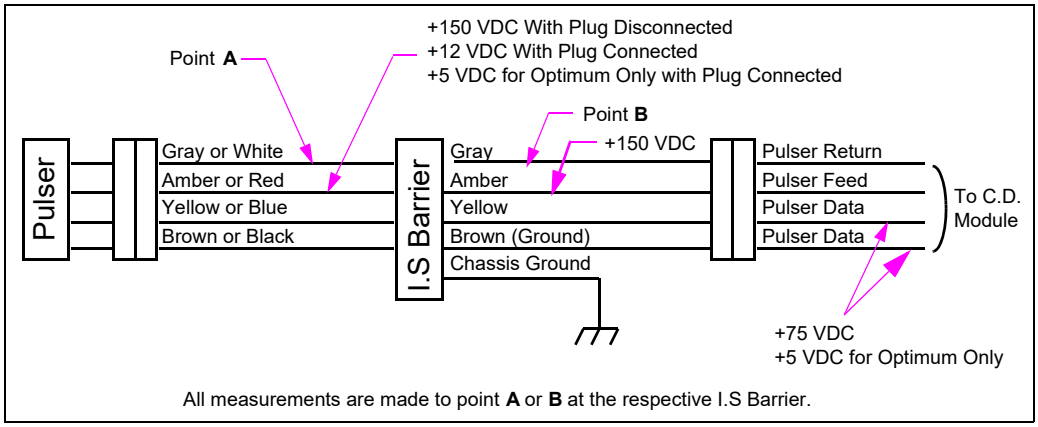
Testing Pulsers and I.S. Barriers (Retail Units only)

Voltage is limited to 12 VDC in the pulser. An I.S. Barrier is used to limit the current. Test the pulser by substitution and proceed as follows:

1. Unplug the pulser and plug in a known, good pulser.
2. Rotate the pulser and watch displays for the count.
3. Test the I.S. barrier by substitution, or disconnect it and check the I.S Barrier with an Ohmmeter.
4. Measure 10,000 Ohms + or - 20% from gray to gray, yellow to yellow, brown to brown, and amber to amber.
5. Always read a low resistance from the green wire to the case.

6 Measure between each wire. Meter must indicate an open.

Figure 5-58: Pulser and I.S Barrier Test Points



Pulser Drive Assembly

This section explains about the pulser drive assembly.

Special Note for Canadian Installations

An O-ring is used on the shaft in Canadian installations. If squealing is noted, lubricate the O-ring with silicone grease. When replacing a meter, align the lower drive collar to the meter shaft to reduce the potential for binding.

Service Tips (Retail only)

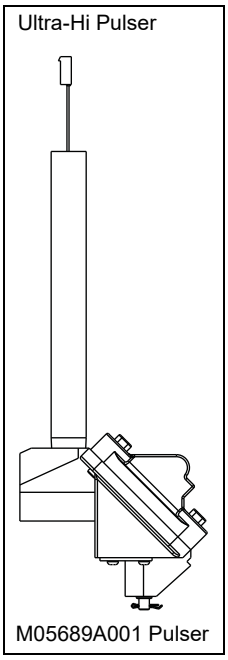
- During shipment, T18350-G3 Pulsers are restrained by a tie-wrap and must be removed during installation. If the tie-wrap is discovered on the pulser during service, it must be removed. A tie-wrap left in place can result in binding of the pulser shaft.
- Event Logs can be used to identify a specific pulser during troubleshooting pulser errors such as 20, 5047, 5049, and 5050. Pulser locations are designated by ePulserX. To determine the location of the pulser, refer to the following table:
  Note: Event Logs are available only for Atlas 8800 units.

Pulser Name	Side of Unit	Product Pulser
ePulser1	1	1
ePulser2	1	2
ePulser3	1	3
ePulser4	1	4
ePulser5	2	1
ePulser6	2	2
ePulser7	2	3
ePulser8	2	4

About Ultra-Hi Pulsers

Figure 5-59 shows the Ultra-Hi Pulser.

Figure 5-59: Ultra-Hi Pulser (Commercial Only)



Service Tip

The Ultra-High Pulser assemblies contain an optical encoder. If the Pulser requires replacement, open the assembly and replace the encoder (G013078).

Heater (DEF Only)

DEF Heating System (Commercial Cold Weather DEF Units Only)

The Heater Control Board (M14100A001) receives logic voltage from the Coriolis Meter Board and 120 VAC power supply for the heater and fan from line voltage. A Heater Sensor is located within the DEF cabinet. It monitors the temperature of the cabinet and is connected to the Heater Control Board. There is also a second sensor in the Heater Control and both the sensors must be cold. Within the approximate range of 40 °F (4 °C) to 45 °F (7 °C) or lower, the Heater Control Board activates the fan and heater to maintain the temperature within the cabinet. The heater circuit will activate and deactivate depending on the temperature within the cabinet. The sensor, heater, and fan are located within the DEF cabinet. The Heater Interface Board is located within the electronic cabinet.

When the DEF freezes, it can cause extensive damage to hydraulic components, hence the DEF hydraulics cabinet is heated. The Service Technicians must be aware of the following important information regarding DEF freezing:

- The heater is turned on when the sensor detects a temperature of approximately 43 °F (6 °C) in the cabinet. It will commonly cycle on and off and may not run at all times during cold weather. To test the system, electronic spray circuit coolant can be used on the cabinet Heater Sensor (not the Freeze Sensor which is attached to the piping). At the same time, coolant must also be sprayed on U2 on the Heater Control PCA to test the system.

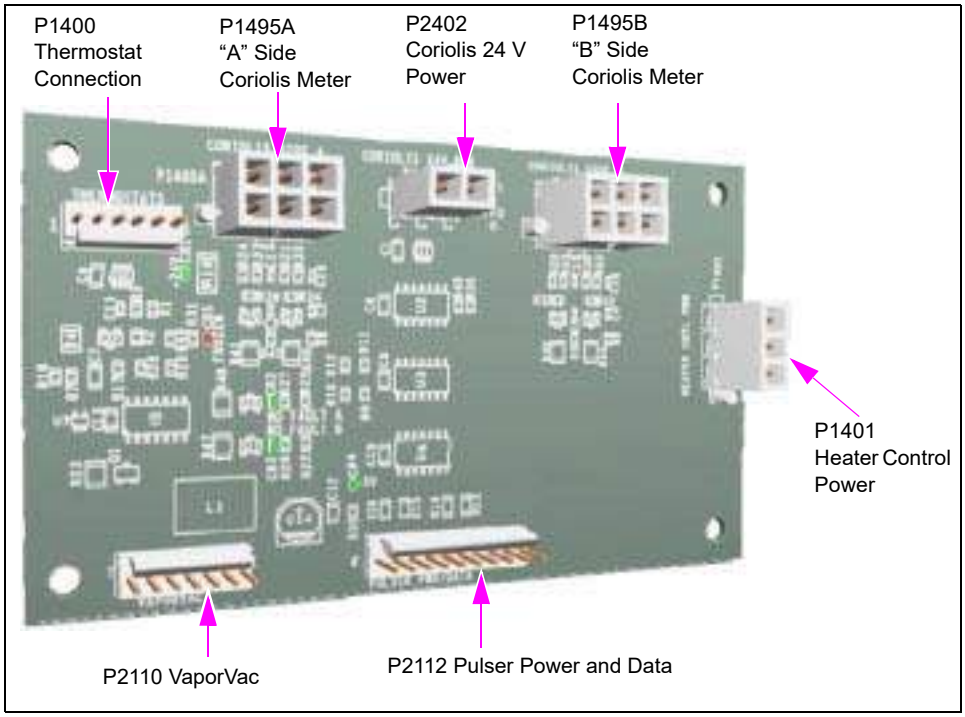
- Damage incurred due to freezing of components when there is power loss in cold weather is not covered under warranty. If power to the dispenser is lost during cold weather and temperature is below 20 °F (-6 °C) or if there are possibilities to drop below 20 °F (-6 °C), then the customer must call an ASC immediately to the site to drain fluid from the following components to avoid serious damage to the components:
  - Meter
  - Breakaway and Hose
  - Nozzle
  - Check Valve
  - Dispenser Filter

  Similar service may be required for any tank vault and intermediate plumbing components, as required by the tank system manufacturer. ASCs must respond very quickly to such customer requests.
- If the unit freezes, it will be required to thaw all components and repair the damage that may have occurred. Units can be thawed using a non-flame heating device or directed exhaust from vehicle, for areas where no boards or electronic connections are present. DEF is non-flammable or explosive. However, before using electrical heating devices, ensure that such devices or their power cords are not in the hazardous vicinity near diesel, gasoline, or other fueling equipment containing hazardous vapors or liquids. To determine any hazardous zone involved, monitor the equipment closely for leaks when the lines are pressurized, refer to *MDE-4331 Atlas Fuel Systems Installation Manual*.
- Meter damage during a freeze may occur and can only be detected by performing calibration checks. For additional information, refer to "Coriolis Meter" on page 6-35 or "DEF Magmeter" on page 6-37.
- The insulated cabinet is critical for the proper performance of the heating system. Never remove the insulation from any area or damage it during service. Such removal can cause the system to freeze. If insulation drops or is disturbed from its original area, reglue using a quick curing outdoor compatible adhesive.

Coriolis Meter Interface Board (M10030A001)

The Coriolis Meter Interface Board interfaces the Coriolis Meter and Pump CPU, as well as to the Freeze Sensor. The meter receives a 24 V input from the 24 V power supply and supplies 5 VDC logic power to the Temperature Control Board. The meter can handle up to two Coriolis Meter inputs. However, only Side A is used on a commercial dispenser.

Figure 5-60: Coriolis Meter Interface Board

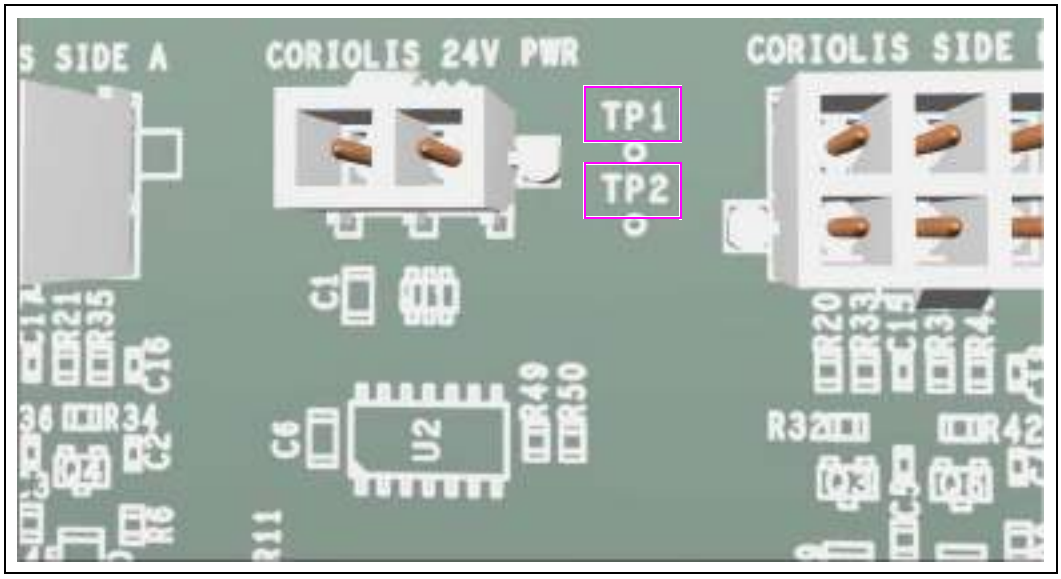


The Coriolis Meter contains electronics within the meter that monitor the function of the meter and create pulses in proportion to the volume of flow through the meter. A Coriolis Meter Interface Board provides power to the meter as well as accepts pulses and diagnostic data from the meter that are processed and directed to the standard CPU. Additional functions of the Meter Board are to provide power to the Heater Control Board and to accept input from the Pump Freeze Sensor.

Service Tips

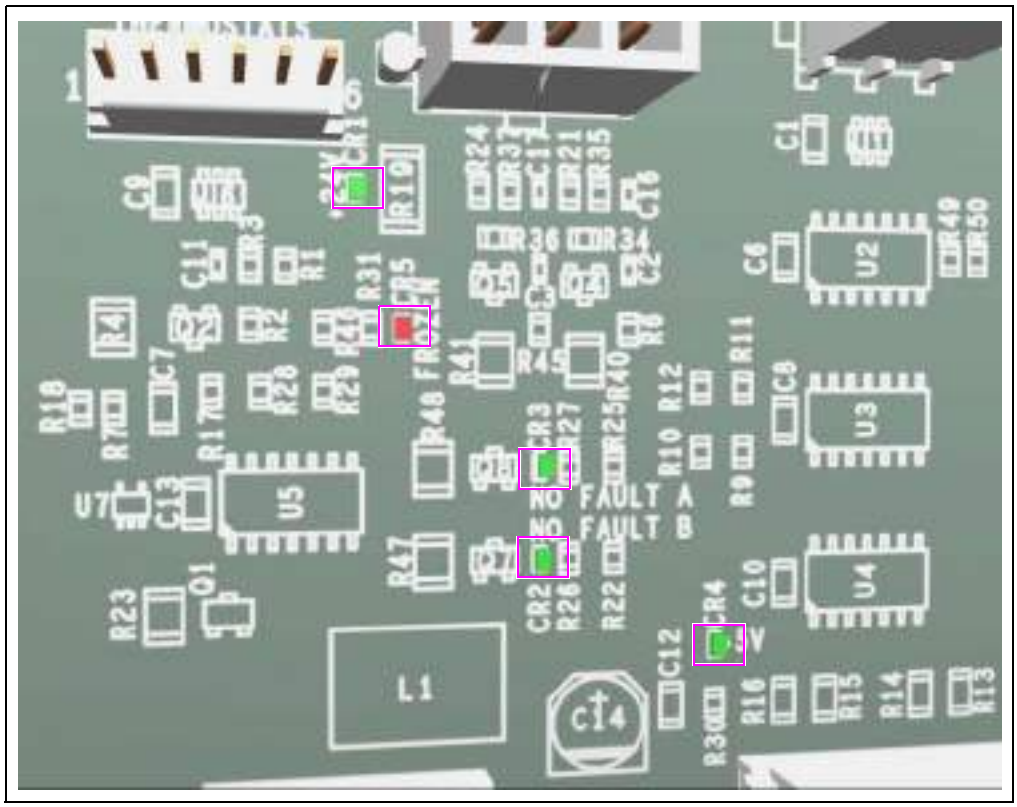
- TP1 and TP2 on the board can be used to verify if the 24 VDC power input is correct (see Figure 5-61).

Figure 5-61: TP1 and TP2 on Coriolis Meter Interface Board



- Although the board supplies logic power to the Temperature Control Board, it does not monitor board's performance or state. If the Temperature Control Board is inoperative, check the Coriolis Meter Interface Board and cables between the boards for transference of 5 VDC.
- Pulser-related error codes could be caused by this board in addition to the cables to and from the board, as well as the Coriolis Meter or occasionally the CPU.
- Side A and Side B Coriolis Meter inputs have the same jack, so ensure that you connect the correct meter to the jack on the board. Commercial dispensers use Side A only.
- Several diagnostic LEDs exist on the board. They provide valuable troubleshooting information. Check the LEDs first before replacing a board as the fault may not be with the board.

Figure 5-62: Diagnostic LEDs on Coriolis Meter Interface Board



The functions of Coriolis Interface PCA are as follows:

- Provides +24 VDC power to the Coriolis Meter.
- Provides +5 VDC power to the Temperature Control PCA (M06783A001 or M14100A001).
- Provides an interface to the Pump Freeze Sensor and sends signals to the CPU, if the unit is frozen.
- Provides Coriolis Pulser data to the CPU.
- Provides the following diagnostic data:
  - If CR1 LED is On, it indicates that +24 VDC power supply is enabled.
  - If CR2 LED is On, it indicates that the Coriolis Meter for Side B is enabled (not used on Commercial units).
  - If CR3 LED is On, it indicates that the Coriolis Meter for Side A is enabled.
  - If CR4 LED is On, it indicates that +5 VDC power supply is enabled.
  - If CR5 LED is On, it indicates that the pump is frozen.

6 – Hydraulic/Mechanical Components

Introduction

Purpose

This section provides information regarding hydraulic systems and fuel handling mechanical components contained within Gasboy Atlas units. It includes specific safety information, typical testing procedures, information on related components and common service procedures.

Important Information About Releases

Sections of this manual may be released or updated independently to supply the most current data. Information about release date and version for independently released sections will be included in the section title and footer of the document. For the latest updates, refer to GOLD.

This section was last updated in July 2013.

Topics in This Section

How to Use This Section

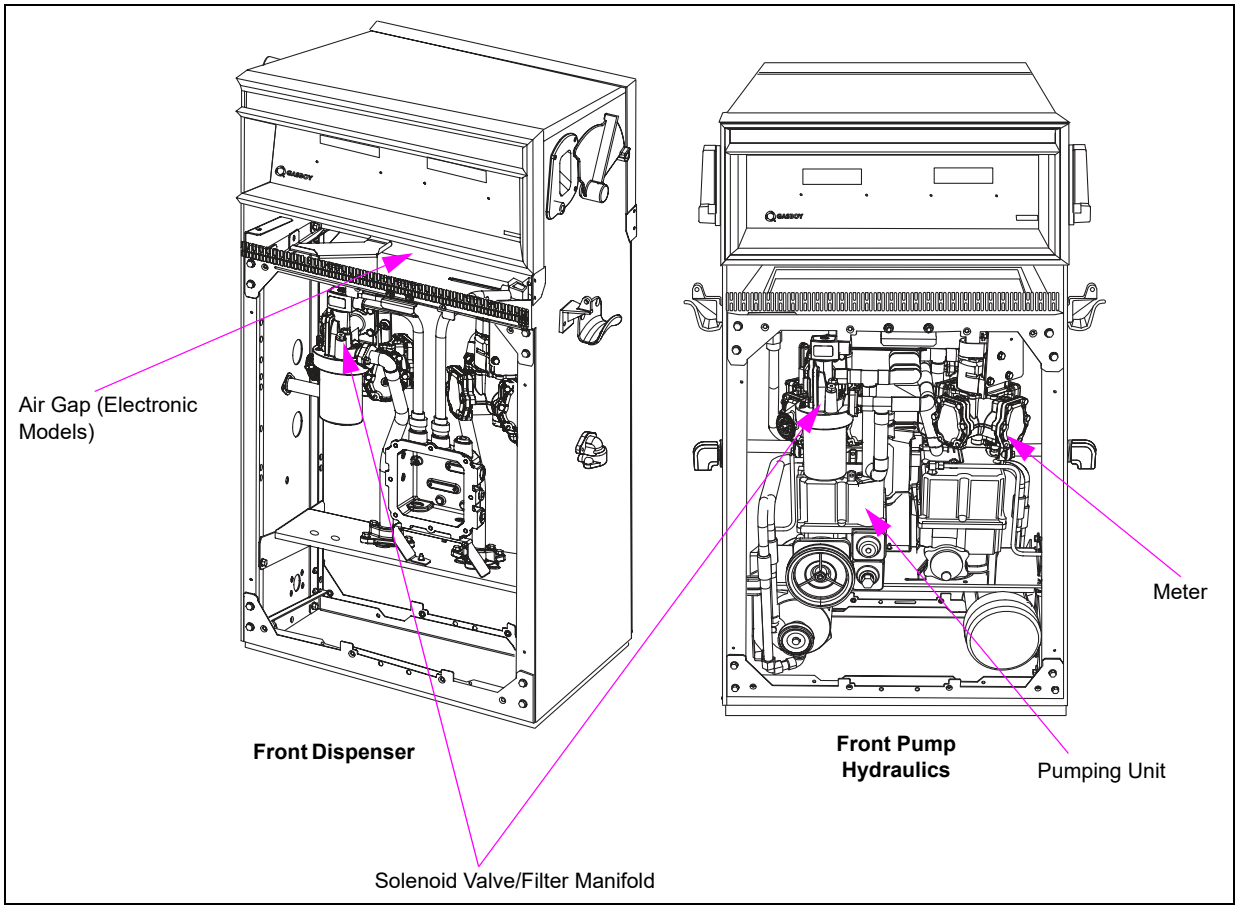
For the list of topics contained in this section and their respective locations, refer to "Topics in This Section". Use this list to obtain information regarding specific components.

Hydraulic and Mechanical Highlights

Gasboy Atlas parts with major changes in structure and appearance have the following new hydraulic features. These features will be shared, where required, by Mechanical or Electronic and Commercial or Retail units:

- CFT meter
- A new manifold and valve assembly
- A new pumping unit

Figure 6-1: Pump and Dispenser Hydraulics-Standard Models



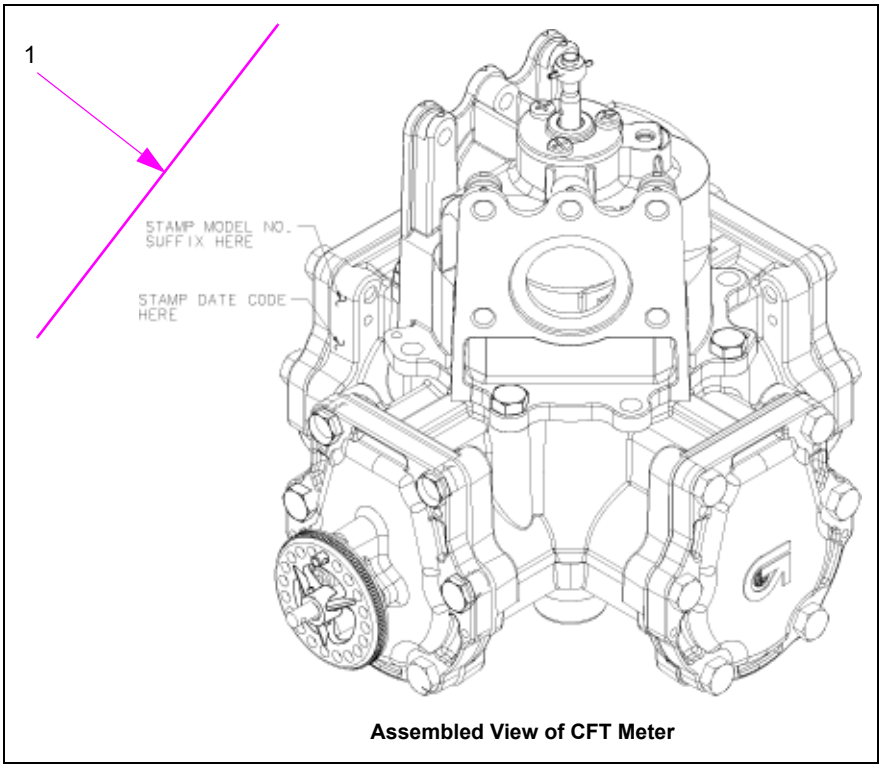
2-Stage Solenoid Valve

The new Gasboy Atlas Pump has a standardized 1-inch 2-stage solenoid valve. If the valve hydraulics require service, the service technician can remove the diaphragm without removing the coil or conduit connections. The valve and filter adapter are built into the manifold.

Meter

The four-piston positive displacement flow through the CFT Meter increases resistance to fuel contamination with a top inlet, bottom outlet, and self-cleaning central chamber. For information on Coriolis Meter, refer to "Coriolis Meter" on page 6-35 or "DEF Magmeter" on page 6-37.

Figure 6-2: CFT Meter



Assembled View of CFT Meter

Item #	Description	Current Part	Previous Part	Quantity
1	CFT Meter Assembly - Electronic Models (*Spare Parts item*)	T20150-G5	-	(See Note 1)
	CFT Meter Assembly - Mechanical Computer Models, Gallons (*Spare Parts item*)	T20150-G6	-	(See Note 1)
	CFT Meter Assembly - Mechanical Computer Models, Liters (*Spare Parts item*)	T20150-G7	-	(See Note 1)
	C+ Meter Plated Assembly, E85 Only	T19976-G5		(See Note 1)
	• Meter Master Seal Service Kit Installation (*Reference Only*)	K96618	-	(See Note 2)
	• Meter Quad Ring Top Seal Replacement Kit *(Reference Only)*	K35222	-	(See Note 3)

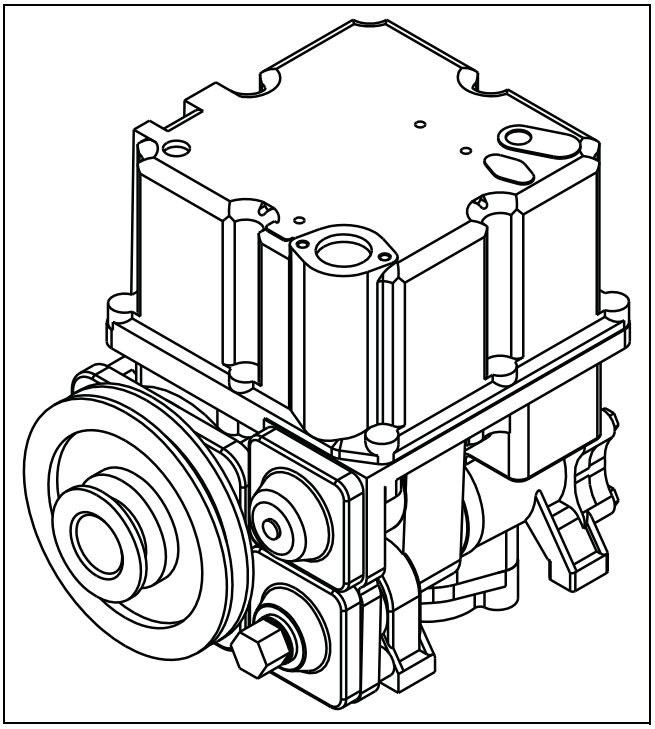
Notes:

1. *CFT Meter is ordered only as an assembly.*
2. *MDE-3892 C+ Meter Master Seal Service Kit Installation provides information on how to install the Meter Master Seal Service Kit (K96618). The kit provides materials and instructions for the complete change-out of all seals as a major rebuild.*
3. *MDE-2188 Kits K35222 and K35222-01 Meter Quad Ring Top Seal Kit provides information on how to install the K35222 Kit. The kit contains enough top seals to service ten (10) meters.*

Pumping Unit

The Gasboy Atlas unit includes the field-proven Bennett suction pump. The Bennett pump is a rotary vein-style suction pump with built-in air elimination, pressure relief valve, strainer, sump system, and control valve (to prevent air metering). For more information, refer to *MDE-4447 Gilbarco Global Pumping Unit Operation and Service Manual*.

Figure 6-3: Bennett Suction Pump



Item #	Description	Current Part	Previous Part	Quantity
1	Global Pumping Unit (GPU)	M04920B003	-	1 per Grade

Air Gap (Electronic Units Only)

The air gap is a new concept for Gasboy Atlas units. The air gap is located between the hydraulics and electronics of the unit. This air gap removes fumes before getting into the electronics and lowers the classification of the electronic platform area (see Figure 6-1 on page 6-2).

General Service Procedures

Read and follow all safety precautions in "Read This First" on page 1-1. Warnings and cautions appear throughout this section and must be regarded with utmost vigilance. Follow OSHA lockout/tagout procedures.

Working on Hydraulic Components

Gasboy Atlas dispensers receive pressurized fuel from an STP while pumps generate pressure using a self-contained pumping unit. The potential hazard of fluid spray or leak exists when working on the hydraulic system. Ensure that proper service procedures and safety precautions are followed. For additional information, refer to "Servicing Hydraulic Components" on page 6-6.

⚠ WARNING

Read all safety information and wear all the required safety equipment.

This is a potentially dangerous environment of high voltage and flammable fuel-vapors. Fuel-vapors may ignite. Fire, explosion, or electrical shock can result in severe injury or death, if safety procedures are not strictly followed.

No cigarettes or open flames must be allowed near pumps or dispensers.

Ground the nozzle and Prover Can to prevent static discharge. Do not place Prover Cans on ungrounded surfaces such as plastic truck liners.

Static electricity may be present before or while dispensing the fuel. A spark between the container and nozzle may occur. Fire or explosion may result, causing serious injury or death.

Always wear proper eye protection while servicing the hydraulic system. Take appropriate steps to contain any spraying or draining fuel. The residual pressure present may result in fuel spray in the unit. Release pressure through the nozzle.

Do not attempt to use the Manager Keypad with the electronics cabinet open in any situation where power has been applied and fuel vapors are present or potentially present.

When you calibrate Atlas series units, run the keypad cable over the door and close the door. This allows the keypad to be suspended on the unit and can be accessed from outside for all procedures done with power applied or possibility of fuel or fuel vapor presence.

Always clear area of debris or spills.

Servicing Hydraulic Components

To service the hydraulic components, proceed as follows:

Before Beginning

Before beginning the service, proceed as follows:

1 Ensure that the unit is not pressurized with fuel. For dispensers, close and test shear valves. Refer to "Shear Valves" on page 6-72.

2 Isolate the unit at the interface box (8800 Retail units only).

3 Shut off power to the unit. If the unit is a dispenser, shut off power from the involved STPs. Use the OSHA lockout/tagout procedures at the station's STP and dispenser breakers.

4 Open the nozzle into an approved container to bleed of the pressure. Some residual pressure may remain.

⚠ CAUTION

Wear eye protection for hydraulic service, where fluid lines or containing parts are serviced.

5 Record the totals before you continue with the service procedures.

6 Continue with the required service procedures.

After Repairing

After repair, proceed as follows:

1 In the interface box, place the unit in normal operation. Power-up the unit.

2 Purge air and check for leaks after replacements or rebuilds. Refer to "Purging Air from System" on page 6-9.

3 Verify if the unit is operating properly.

4 Record the totals after the service and provide the totals (before and after) to the station, if fuel was dispensed.

Servicing Seals, O-rings, and Gaskets

When opening or disassembling hydraulic components that have been in service for more than two years, replace all of the disturbed seals. Failure to replace the degenerated or old seals could result in leaks.

Note: Universal Seal Kit (M05559K001) contains proportional quantities of material types commonly replaced during service. Use of this kit is recommended.

To service seals, O-rings, and gaskets, proceed as follows:

1. Inspect the seals for excessive swelling, hardening, softening, and other degradation.
2. Clean and inspect sealing surfaces before replacing or installing seals, O-rings, or gaskets. *Note: Always use Atlas-approved O-rings and gaskets.*
3. Replace the parts, as required.
4. Use a small amount of silicone grease to retain O-ring seals in position during assembly and to improve durability of dynamic seals. Ensure that the seal remains in position and does not drop out of its location in case of a blind assembly (seal cannot be seen easily).

Pipes and Hydraulic Plumbing

Follow these procedures when you work on piping:

- Use UL-approved pipe sealants suitable for the fuel involved for pipe threads. Follow the sealant manufacturer's recommendations for use. Avoid any sealants that may become hard over time.
- Always clean and inspect pipe threads before applying the sealant. Do not apply sealant to dirty, oily, or wet threads. Do not apply sealant to the first two threads.
- Do not tighten or disturb joints during or after the sealant has set.
- Do not use Teflon tape. Teflon tape fragments may cause unit failure.
- Do not excessively tighten any component during installation or assembly. Excessive tightening may cause damage to the part.
- Torque fittings to the correct pounds. Refer to "Torque Specifications" on page 6-8.
- Always check for leaks after service.

Service Hints

Follow these hints for servicing the pump and hydraulic plumbing:

- Slow or no flow can be due to several causes. A less common issue that can happen at times is that the flow path through the plumbing can be completely or partially plugged. If more common issues such as valves, filters, strainers, meters have been found to be OK, check for plumbing obstructions.
- Always use sealants suitable for the fuel involved. Some fuels, especially diesel, may wash away general purpose sealants.

Torque Specifications

Ensure that you follow these recommendations when working with fasteners on pumps and dispensers:

- Never use a metric fastener in place of an Society of Automotive Engineers (SAE) or non-metric fastener and never use an SAE fastener in place of a metric fastener. The device may suffer damage.
- To prevent failure, always use the same or higher grade of materials for load bearing devices. For example, structural and hydraulic device bolts.

The following tables provide general torque guidelines for plated steel screws and bolts, pipe plugs, and tube fittings:

Screws and Bolts (Plated)

	Recommended Torque	
Thread	**in-lbs**	**Newton Meters (Nm)**
M4	10-12	1.1-1.3
M5	25-35	2.8-4.0
M6	36-40	4.1-4.5
M8	120-140	13.6-15.8
M10	150-170	16.9-19.2

Pipe and Tube Fittings

	Recommended Torque	
Thread	**in-lbs**	**Nm**
1/8-inch National Pipe Thread (NPT)	10-12	13.6-16.3
1/4-inch NPT	22-25	29.8-33.9
3/8-inch NPT	30-35	40.7-47.5
1/2-inch NPT	35-40	47.5-54.2
3/4-inch NPT	45-55	61.0-74.5
1-inch NPT	70-80	94.9-108.4
1-1/2-inch NPT	150-180	203-244

Flanged and Compression Tube Fittings

	Recommended Torque	
Pipe	**in-lbs**	**ft-lbs**
1/8-inch	40 - 45	
1/16-inch	49 - 55	
1/4-inch	58 - 65	
5/16-inch	72 - 80	
3/8-inch		9 - 10
1/2-inch		19 - 21
5/8-inch		26 - 29
3/4-inch		38 - 42
7/8-inch		49 - 54

Self-contained Pumping Units

Unit	Recommended Torque in-lbs	Nm
Pump head (tightened in star pattern)	200	23
Strainer cover	150	17
Rear cover	200	23

Meter Bolts

Bolt (In Order)		Recommended Torque in-lbs	Kg-meters
1	Cylinder cover gasket	130 ± 10	1.50 ± 0.12
2	Piston and connecting bar	35 ± 5	0.40 ± 0.06
3	Shaft seal cap	25 ± 5	0.30 ± 0.06
4	Lower bearing housing	75 ± 10	0.90 ± 0.12
5	Packing retainer	20 ± 5	0.25 ± 0.06
6	Body cover	130 ± 10	1.50 ± 0.12

Purging Air from System

WARNING

- Wear eye protection. Residual pressure and entrapped fuel may still be present and may drain or spray while removing the parts.
- Fire and explosion could result in severe injury or death.
- Test and close the involved shear valves. Shut off power to the unit.
- Remove the parts slowly. Collect fuel in approved containers.
- Clean up all spills promptly.

About Purging System

Purge air from the hydraulic system properly. Failure to properly purge air from the system can damage components and result in inaccurate calibration and fuel delivery. Purge air from the system for new installations or when fluid containing parts of the hydraulic system are serviced.

Purging Product Lines (New Installations)

To purge the product lines, proceed as follows:

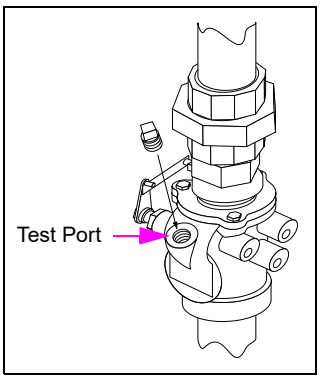
Amount to Purge at Nozzle

Use the following table to determine the amount of fuel that is to be dispensed when purging the unit through the nozzle. Use an appropriately-sized Prover Can:

For	Pump This Amount
Start-ups (installing new systems)	35* gallons (132.5 liters) per hose

**Applies to the amount purged through the dispenser hydraulics after purging the underground plumbing of air.*

Figure 6-4: Typical Shear Valve and Test Port



To purge all air from lines and pumps/dispensers for new installations, proceed as follows (see Figure 6-4):

1. Shut off all power to the STP involved.
2. Start with the unit farthest from the tank and then move to units that are closer to the tank.
3. Use a UL-approved sealant and connect a fuel-resistant hose and petcock valve to the shear valve test port for dispensers. Leave the valve closed.
4. Place the end of the hose into an approved container.
5. Restore power to the STP. Activate the STP for the line being purged.
6. Open the mechanical valve and purge the product lines slowly, until a steady stream of fuel is observed.
7. After purging, shut off power to the STPs and remove the line and petcock valve from the shear valve.

8 Remove the hose from the test port.

⚠ CAUTION

Wear eye protection and exercise caution by removing the hose slowly with a cloth or by other means, to prevent fuel spray. Fuel under pressure may remain in the product lines.

9 Reinstall the plug using a UL-approved pipe sealant suitable for the fuel involved.

10 Open the shear valve and restore power.

11 Check for leaks during purging.
Note: See Figure 6-5 on page 6-12.

Purging Pumps and Dispensers (with Fuel in Product Lines)

To purge the pumps and dispensers, proceed as follows:

Using Nozzle to Purge Unit

Use the following procedure for units that have their product lines purged of air or have not been drained. Begin purging by partially opening the nozzle until fuel is observed at the nozzle, after which you can open the nozzle further to finish purging.

⚠ CAUTION

Purging through a fully open nozzle on a unit with air in product lines can damage the meter due to overspeed.
Damage resulting from overspeed is not covered by warranty.

Amount to Purge at Nozzle

Use the following table to determine the amount of fuel that is to be dispensed when purging the unit through the nozzle. Use the appropriately-sized Prover Can:

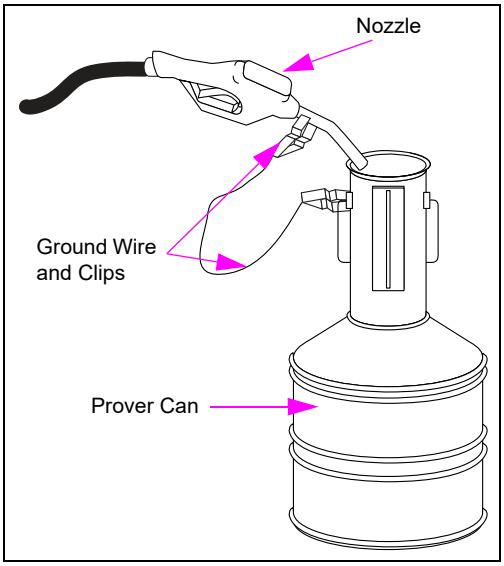
For	Amount to Pump
Major services (changing meters, pumping units, and others)	25 gallons (94.6 liters) per hose
Minor services (changing filters, strainers, and others)	10 gallons (37.9 liters) per hose
Start-ups (installing new systems)	35 gallons (132.5 liters) per hose

1 Lift the nozzle handle of the hose being purged.

2 Place the nozzle in the approved container (see Figure 6-5 on page 6-12).

3 Open the nozzle slowly until a constant stream of fuel is observed. Dispense the amount of fuel depending on the service being done, as shown in the table.

Figure 6-5: Dispensing into Prover Can (Purge)



4 Return the nozzle to the nozzle boot.

5 Empty the approved container into the appropriate product tank.
Note: The purged amount will not be reflected in the electronic totals.

Purging Air in DEF Systems

Because of the meter's sensitivity to aeration of the fluid, it is suggested when first purging the unit of air to temporarily install a standard Atlas pulser to the 9800 CPU Board for the first purged (farthest from tank) Coriolis Meter or DEF Magmeter. The standard Atlas pulser is shown in Figure 5-57 on page 5-68.

To install a standard Atlas pulser, proceed as follows:

1 Remove power to the unit.

2 Disconnect the pulser data connection at the Pulser Adapter Cable and connect a standard Atlas pulser.

3 Restore power and activate the dispensing position.

4 Slowly hand spin the pulser to allow air to be purged through the system with the nozzle activated.

5 Purge the air, following the normal procedures, until DEF with minimal air is being dispensed.

6 Remove power to the unit.

7 Remove the temporary pulser and replace with the data connector from the Coriolis Meter or DEF Magmeter.

8 Restore power.

9 Complete the purging operation as per standard practice.
Note: The Strainer must be cleaned after performing the purging operation.

⚠ WARNING

Do not substitute the pulser while power is being supplied to the unit. Lethal voltages exist within the dispenser and damage to the unit could occur if certain critical steps are not followed. It is recommended that only Gasboy-certified ASCs, who are trained in the service and operation of Atlas dispensers perform this procedure.

All the error codes in the DEF unit are identical to the standard Atlas 9800 with additional error codes on the Display and their definitions as follows:

- 7 = When the Calibration switch is initially turned to on.
- 574 = Time out and Calibration mode error if no DEF is dispensed within 4 min. or if the nozzle is not removed within 10 min.
- 993 = Product not available, not calibrated.
- 994 = If an additional transaction is attempted during a calibration procedure.

Measuring Flow Rate

⚠ WARNING

Static electricity may be present before or during dispensing of fuel. A spark between container and nozzle may occur.

Fire or explosion may result causing serious injury or death.

Ground the nozzle to the Prover Can to prevent static discharge. Place the Prover Can directly on the ground and not on any insulated surface.

While dispensing fuel into a container, ensure that proper equipment and procedures are being used to eliminate the hazard of fuel vapors that can be ignited from static discharge or other sources. Maintain contact between the nozzle tip and Prover Can during all fueling procedures, or use a grounding clip while dispensing the fuel. Return the dispensed fuel to the proper storage tank.
Use the appropriately-sized Prover Can.

- For standard flow units, use at least a 5-gallon Prover Can.
- For high gallonage units, use at least a 25-gallon Prover Can.
- Start with all displays reading zero (0).

To measure the flow rate, proceed as follows:

1 Dispense fuel at full flow for 15 seconds (1/4 of a minute) into an approved container. Stop the fuel flow. Clean up any spills promptly.

2 To calculate gallons or liters per minute, multiply the volume dispensed by four. For example: 5 gallons x 4 = 20 gallons per minute.

Measuring Pressure and Vacuum

WARNING

- Wear eye protection. Residual pressure and entrapped fuel may still be present and may drain or spray while removing the parts.
- Fire and explosion could result in severe injury or death.
- Test and close the involved shear valves. Shut off power to the unit.
- Remove the parts slowly. Collect fuel in approved containers.
- Clean up all spills promptly.

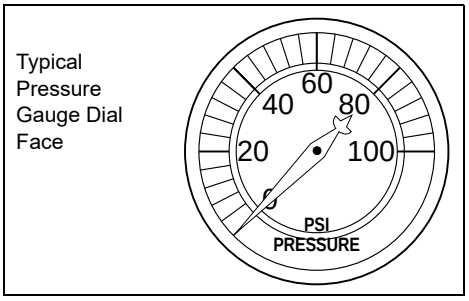
Using Pressure Gauge

Use pressure gauges and vacuum gauges to test pumps and dispensers when:

- Flow rate is too low
- Motors fail prematurely or stall (pump only)
- Units take a long time to prime (pump only)
- Units are noisy (pump only)

The use of a combined vacuum and pressure gauge eliminates the requirement to carry more than one gauge.

Figure 6-6: Typical Pressure Gauge Dial



If gauge readings are erratic, it indicates that the gauge needle pulsations must be snubbed. The following is recommended:

- Always use accurate, calibrated gauges. Using a gauge snubber or a dampened gauge helps prevent gauge damage and to obtain a more accurate reading. Liquid filled gauges that dampen readings can also be used.
- Use gauges that have appropriate scales for reading in Pounds per Square Inch [PSI (scale 0-100 psi)] for pressure and 0-30 Hg (inches of mercury) for vacuum.

Pressure Measuring Locations on Unit

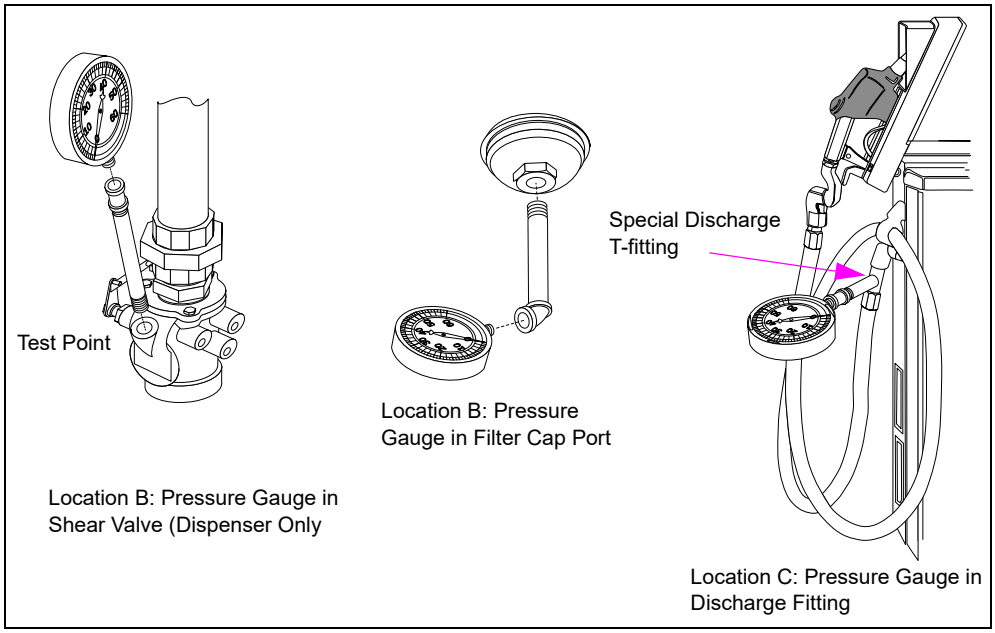
This section provides information about the pressure measuring locations on unit.

For Dispensers

Install the pressure gauge at any one of the following locations (see Figure 6-7):

To Check	Insert the Pressure Gauge in the
Inlet pressure (pressure available to dispenser)	Shear valve test port (location A)
Filter cap port pressure (pressure available at filter)	Special filter cap port fitting (location B)
Discharge pressure (pressure available to hanging hardware)	Special discharge fitting (location C)

Figure 6-7: Typical Pressure Gauge Installations



Measuring STP Pressure for Dispensers

To measure STP pressure for dispensers, proceed as follows:

1. Shut off power to the STP.
2. Verify if the dispenser and STP have been deactivated.
3. Always use eye protection. Install the gauge at the shear valve test port (see Figure 6-7), Location A.
4. Turn on power to the STP.
5. Activate the handle. Do not pump fuel.

6 Read the psi reading on the gauge. The operating pressure depends on the STP horsepower. For exact performance values, consult the manufacturer.

Note: The pressure at the dispenser inlet will reduce when the dispenser is dispensing fuel. Pressure drop of more than a few psi may indicate an inadequately sized STP, underground restrictions, inadequately sized plumbing, or a defective STP.

7 For a representation of model STP performance, refer to the following table. STPs with more or fewer stages vary from the information in the following table:

Note: More stages usually mean higher pressure capability. Variable speed STPs can be set to different pressures. Do not rely on this chart for the exact values.

	Operating Pressure			
STP Horsepower	**Gasoline**		**Diesel**	
1/3 HP	26 psi	76 kg-cm^2	30 psi	88 kg-cm^2
3/4 HP	30 psi	88 kg-cm^2	34 psi	99 kg-cm^2
1-1/2 HP	30 psi	91 kg-cm^2	35 psi	102 kg-cm^2
2 HP	41 psi	120 kg-cm^2	46 psi	134 kg-cm^2
3 HP	31 psi	91 kg-cm^2	35 psi	102 kg-cm^2
5 HP	38 psi	111 kg-cm^2	43 psi	126 kg-cm^2

For Self-contained Pumps

See Figure 6-7 on page 6-15 (Locations B and C).

To measure pressure for pumps, proceed as follows:

- Install the pressure gauge to the discharge side at a test port on the special filter cap (location B).
- Install the pressure gauge downstream at the nozzle or other locations, as required (location C).

Measuring Pressure Drop for Pumps and Dispensers

Use the Pressure Drop test to check the specific groups of parts (meters, shear valves, filters, and others). An exceptionally high pressure drop for a specific flow rate indicates that a part is clogged or defective.

To measure the pressure drop for pumps and dispensers, proceed as follows:

1 Shut off power to the unit. Multiple disconnects may be required.

2 Ensure that the pump/dispenser handle is in the Off position. For pumps, shut off power to the motor and pump using lockout/tagout procedures. While measuring a dispenser, close and test the shear valve. Place the nozzle in an approved container. Lift the pump handle and squeeze the nozzle slowly to bleed of the pressure.

3 Wear eye protection and then install pressure gauges. For locations, see Figure 6-7 on page 6-15.

- For pumps, install pressure gauges at the pumping unit discharge test port and the discharge special T-fitting (location C).
- For dispensers, install the pressure gauge at the shear valve test port (location A) or filter cap port (location B) and at the discharge special T-fitting (location C).

4 Restore power to the unit. Open the shear valve on dispensers. Lift the pump handle to the On position. Activate the nozzle and pump fuel at full flow into an approved container.

5 Measure the flow rate and read and record the psi reading on both gauges. Return the pump handle to the Off position.

6 Calculate the pressure drop (difference between the psi readings). For an example of desirable range, see Figure 6-8.

7 Ensure that the pump handle is in the Off position. If the unit is a dispenser, close the shear valve. Place the nozzle in an approved container. Lift the pump handle to the On position. Squeeze the nozzle to bleed the pressure. Return the pump handle to the Off position.

8 Shut off power to the unit.

9 Remove pressure gauges, restore the unit to original condition, purge air, check for leaks, and return the unit to operation.

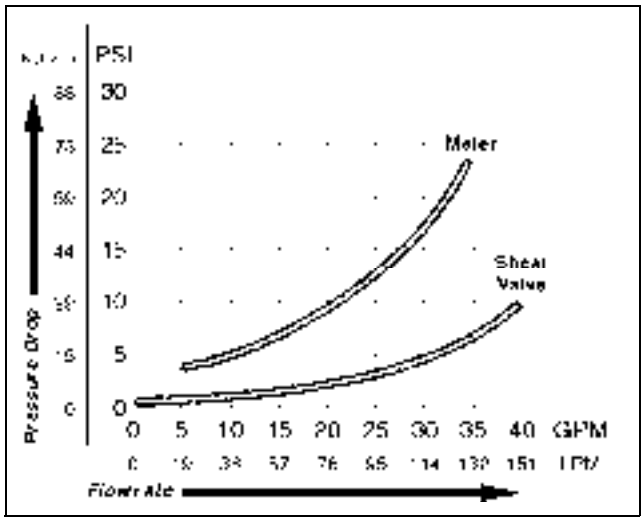
Analyzing Pressure Drop for Pumps and Dispensers

Pressure drop across components increases as the total flow rate increases.

- For dispensers, Total System Pressure Drop = Product Lift from bottom of STP to the dispenser base + Pressure Drop through external piping + Pressure Drop through dispenser including hose and nozzle.
- Pressure Drop through external piping segments varies depending on the sizes and types of piping used. It is also affected by the number, sizes, and types of fittings used.

If the total System Pressure Drop at the total flow rate is less than the STP pressure at that flow rate, the system will develop the required flow rate.

Figure 6-8: Graph for CFT Meter and 1-1/2-inch Shear Valve



Determining if Components Are Faulty

To determine if the components are faulty, proceed as follows:

1 Always check and replace the filter and strainer before performing this test.

2 Determine the dispenser pressure at the inlet and flow rate with the nozzle wide open.
Note: If the pressure at the base of the dispenser is substantially lower, it indicates that the dispenser is functioning correctly.

3 Compare the observed flow rate to the chart and actual inlet pressure for the dispenser model being checked. If the flow rate is low relative to the pressure, it is likely that a dispenser or hanging hardware problem exists. If the readings are similar to the specification, it is likely that the dispenser is working properly and it is a **system** problem.

Measuring Pressure and Vacuum Test Chart	
Pressure at shear valve or filter cap with no flow	Maximum pressure capability of the STP
Pressure at shear valve with full flow	Actual capability of STP and in-ground piping to supply pressure at maximum flow rate
Pressure at shear valve or filter cap minus pressure at hose at full flow	Pressure drop across dispenser meter and valve at maximum flow rate
Pressure at shear valve or filter cap minus pressure at hose at no flow	Maximum pressure available to force fuel through meter and valve
Pressure at hose at full flow	Pressure drop across nozzle and hose at full flow

Use this table to evaluate the probable cause of dispenser low flow rate.

Low Flow Rate Symptom	**Probable Causes**
Observed pressure drop across the meter and valve is more than a few psi higher than indicated in the charts	Flow restriction or defective pump/dispenser component, assuming that the filter is new
Observed and expected pressure drop across the pump/dispenser components is close to specification	Hanging hardware or dispenser pressure supply (STP) problem upstream or issue with pumping unit/installation for pumps
Observed pressure at the hose and nozzle during full flow is too high	Undersized or defective hanging hardware
Pressure at the dispenser inlet or pumping unit is too low at full flow	Undersized or defective STP/piping to dispenser or pumping unit hardware or installation problem

Reaching Required Flow Rate

Suggested methods for achieving the required flow rate are:

- Correct and replace the faulty components
- Use a larger STP or manifolded STP
- Use larger inlet piping to the pump or dispenser
- Use less restrictive hoses and nozzles
- Reduce the maximum lift of product from the tank
- For a pump, reduce the maximum lift of product from the tank and minimize feed line lengths

Measuring Vacuum for Pump

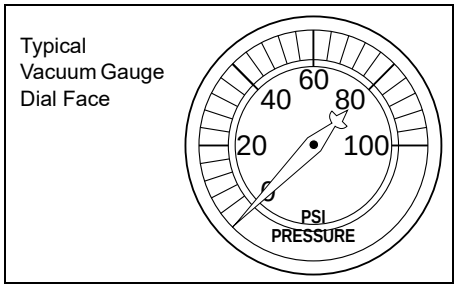
WARNING

- Wear eye protection. Residual pressure and entrapped fuel may still be present and may drain or spray while removing the parts.
- Fire and explosion could result in severe injury or death.
- Remove the parts slowly. Collect fuel in approved containers.
- Clean up all spills promptly.

About Vacuum Readings

Use vacuum readings to determine if the pumping unit has the ability to move the product from the storage tank to the pump. Inability to pull a vacuum may indicate that air is entering the system. Use vacuum gauges that read in inches of mercury (scale 0-30 Hg.).

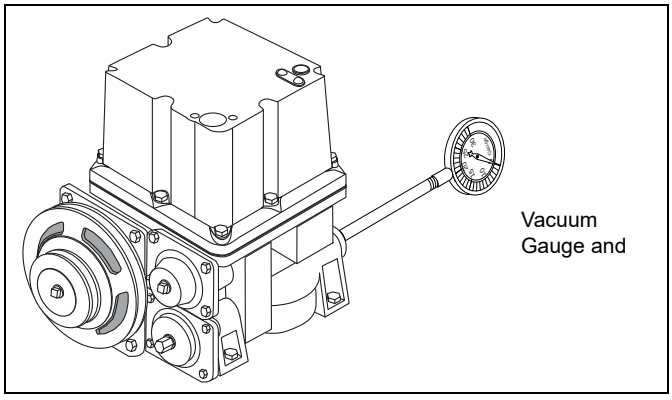
Figure 6-9: Vacuum Gauge



Measuring Dry Vacuum for Pump

Use this test to determine the priming ability of a self-contained pumping unit (only run the test if priming problems exist). Always follow all safety warnings and cautions.

Figure 6-10: Vacuum Gauge Port on GPU



To measure dry vacuum for pumps, proceed as follows:

1 Shut off power to the unit. Multiple disconnects may be required. Use OSHA lockout/tagout procedures.

2 Drain the Bennett GPU of all fuel. Use an approved container. Refer to "Draining GPU" on page 6-52. Clean up any spills promptly.

3 Plug the pumping unit inlet. Use a flat rubber disc between the union halves or use a pipe plug in the lower half of the inlet union.

4 Check the belt tension between the pump and motor. Refer to "Setting Belt Tension" on page 6-65.

5 Restore power to the unit.

6 Read the vacuum gauge. Newly installed units must read 8 inches Hg (mercury) or above. Older units (about 1,000 hours of service) must read approximately 4 inches Hg.

7 After the testing is complete, shut off power at the circuit breaker.

8 Remove the gauge and install the plugs that may have been removed earlier using UL-approved pipe sealant suitable for the fuel involved.

9 Remove the inlet plugs and reconnect the inlet plumbing securely.

10 Restore power and check for leaks.

Measuring Wet Vacuum and Pressure for Pump

This test is useful when the flow output is low. Always follow all safety warnings and cautions.

To measure wet vacuum and pressure for pumps, proceed as follows:

1 Shut off power to the unit.

2 Check the belt tension between the pump and motor. Refer to "Setting Belt Tension" on page 6-65.

3 Install pressure and vacuum gauges.

4 Restore power and operate the unit with both pressure and vacuum gauges attached. Use an approved container to collect fuel. Clean up any spills promptly.

5 Record the discharge pressure with the nozzle opened fully and then with the nozzle closed.

6 Record the vacuum pressure with the nozzle opened fully and then the nozzle closed.

7 Record the flow rate with the nozzle opened fully.

8 Compare readings with "Acceptable Range Tables" on page 6-21.

Acceptable Range Tables

The values listed in the following tables are approximate and may vary depending on site conditions, the hanging hardware used, age of units, and other factors. Flow rate for a standard gallonage is based on 5/8-inch hoses, 3/4-inch swivels, and unleaded gas. Flow rate for high gallonage is based on 1-inch hoses and OPW7H Nozzle.

Acceptable Ranges (Pumps) - Standard and High Flow Rate Units

	Full Flow - All Nozzles Open			By-pass - Nozzles Closed	
Pump Configuration	**Inlet Vacuum (in hg)**	**Discharge Pressure (in psi)**	**Flow Rate (gpm)**	**Inlet Vacuum (in hg)**	**Discharge Pressure. (in psi)**
One Pumping Unit per Hose:					
Standard Flow	4 - 10	15 - 30	10 - 13	4 - 7	20 - 35
High Flow	6 - 12	25 - 40	18 - 24	5 - 8	28 - 45
One Pump Unit per Two Hoses:					
Standard Flow	4 - 10	20 - 35	17 - 20	4 - 7	22 - 38

Acceptable Ranges - Metric Measure

Note: This range is for both hoses running.

	Full Flow - All Nozzles Open			By-Pass - Nozzles Closed	
Pump Configuration	**Inlet Vacuum (cmhg)**	**Discharge Pressure bar**	**Flow Rate ipm**	**Inlet Vacuum cmhg**	**Discharge Pressure bar**
One Pumping Unit per Hose:					
Standard Flow	10.2 - 25.4	1.0 - 2.1	37 - 50	10.2 - 17.8	1.3 - 2.4
High Flow	15.2 - 30.5	1.7 - 2.8	68 - 90	12.7 - 20.3	1.9 - 3.1
One Pump Unit per Two Hoses:					
Standard Flow	10.2 - 25.4	1.3 - 2.4	64 - 76	10.2 - 17.8	1.5 - 2.6

Probable Causes of Low Flow Rate for Pumps

Use the following table to determine the causes of low flow rate:

Low Flow Rate Symptom	Probable Causes
The open nozzle vacuum reads high, pressure reads low, and closed nozzle pressure is normal.	• Check valve sticking, closed, or partially closed • Pumping unit strainer dirty • Supply line obstructed or restricted • Spring loaded check valve in supply line • Storage tank air vent plugged • Undersized supply line for unit • Tank too far or too deep (no further than 50’ away and 10’ deep) • Vapor lock (very low to no flow)
The open nozzle vacuum reads low or normal, pressure reads high, and closed nozzle pressure is normal.	• Hose crushed • Nozzle defective • Meter binding • Discharge piping obstructed • Filter dirty • Bypass valve defective or sticking • Regulator or check relief valve defective or sticking • Solenoid valve defective • Meter check valve defective or sticking

Low Flow Rate Symptom	Probable Causes
The open nozzle vacuum reads low and pressure reads low; closed nozzle vacuum reads low and closed nozzle pressure reads normal.	• Belt slipping • Pump operating below specified RPM rate • Pumping unit parts worn out • Sump float valve malfunctioning • Leak in supply line between tank and pump or at union • Relief valve stuck open
Surging or hesitation occurs.	• Supply line check valve defective • Leak in supply line that traps air • High spots in supply line • Bad solenoid valve (uncommon symptom)
Motor stalls or burns out.	• Relief valve sticking • Motor defective • Low voltage or defective wiring • Debris in pump • Broken pump elements

Meter Calibration

WARNING


• Wear eye protection.


• Fire and explosion could result in severe injury or death.


• Remove the parts slowly. Collect fuel in approved containers.

About Calibrating Meters

All meters, even factory calibrated meters, must be checked for accuracy.

Your WandM Agency requires accurate meter calibration. Calibrate every meter under actual service and installation conditions, as per the *Application Programming Interface (API) Manual of Petroleum Measurement Standards*. Check Prover Cans periodically for accuracy.

- Before calibration, properly purge air from the system if the unit is new or has just undergone hydraulic service. Air in the system affects calibration accuracy. Refer to "Purging Air from System" on page 6-9. After completing calibration, obtain the local WandM seal. All replacement meters must be calibrated after installation and testing.
- Use a 5-gallon prover for flow rates under 20 gpm (75 lpm). If you use larger than 5-gallon Prover Cans, the calibrating adjustment changes.
- For delivery rates over 20 gpm (75 lpm), use a Prover Can equal to or larger than the system flow (flow produced in one minute with the nozzle wide open).

Notes: 1) Calibrating with a small Prover Can causes inaccurate test results. Never use an under-sized Prover Can for calibration purposes.

2) When calibrating Atlas DEF dispenser, a special Prover Can must be used when dispensing the Urea product.

- *National Institute of Standard and Technology (NIST) Handbook 44* permits these operating tolerances:
  - Plus or minus 3-cubic inches 'acceptance tolerance' (typically at the time of installation).
  - Plus or minus 6-cubic inches 'maintenance tolerance' (typically 30 days after installation).

  Note: WandM requires meters to be calibrated as close to zero as possible.
- Local WandM authorities requirements may differ from *Handbook 44*.
- Calibrate the meter within its rated flow range. Meter calibration must remain at the same setting and within the acceptable tolerance for both high and low flow rates.

IMPORTANT INFORMATION
In new systems, **all meters** must be checked for accuracy after purging air from the system. Air in the system affects calibration accuracy.

CFT Meter Calibration Adjustment for Standard, Hi-Flow, and Super-Hi™ Models (All Models Excluding 9850K and 9850KX)

Note: The procedure for calibrating the Liquid Control (LC) Meter is different.

If calibration is required, remove the restraint (seal wire from locking pin) on the calibration wheel located on each meter. Each adjacent pin hole represents 2/3-cubic-inch (0.011 liter) variance for a 5-gallon (18.9 liter) measure. Moving the calibration wheel counterclockwise by one pin hole adds 2/3-cubic-inch of fuel (0.011 liter) in the Prover Can, while turning the calibration wheel clockwise by one pin hole creates a negative 2/3-cubic-inch of fuel in the Prover Can.

Note: It is the owner's responsibility to notify the local WandM officials if their inspection is required before the unit is put into service.

IMPORTANT INFORMATION
Local or state regulations frequently require testing and calibrating units at both fast and slow-flow nozzle settings. If required in your area, adjust settings such that both fast and slow-flow readings are in compliance. For guidance, consult your local regulatory agency.

Note: For units with two meters supplying one (Super-Hi) hose, a variation of this process is required. When adjusting meters, split the adjustment between the two meters instead of adjusting only one meter. Life of the meters can be negatively affected if this is not done.

For electronic units, pricing (temporary or permanent) must be entered into the unit as outlined in the purging section to allow dispensing and calibration.

Setting Calibration

Located on the side of each meter is a calibration wheel for setting the calibration.

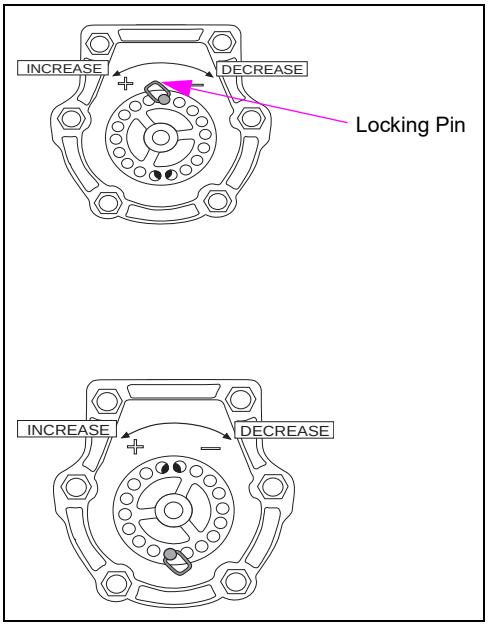
To adjust the meter, proceed as follows:

1 Check the meter by delivering the product into an appropriately-sized Prover Can. If the amount in the Prover Can does not match with the display (within a tolerance), proceed with the remaining steps to calibrate the meter.

2 Remove the seal wire from the locking pin.

3 Remove the locking pin and turn the wheel to adjust the measurement. Moving the pin to one adjacent hole position changes the calibration by 2/3-cubic-inch per 5 gallons dispensed. To change by half this amount, use the alternate locking pin hole on the opposing side of the calibration wheel.

Figure 6-11: Setting Calibration



4 Turn clockwise to decrease the amount of fuel being delivered to the Prover Can (previously over-dispensed).

5 Turn counter-clockwise to increase the amount of fuel delivered to the Prover Can (previously under-dispensed).

6 Check the calibration. If the calibration is not correct, repeat steps 4 through 5. If the calibration is correct, proceed to step 7.

7 After the calibration is complete, reinstall the locking pin and secure with a seal wire.

Atlas (Gallon Unit of Measure)

All Atlas meters must be checked for calibration before placing them in service or on service replacement. Air-purging of new units or serviced meters is required before calibration.

Causes of Known Calibration Problems

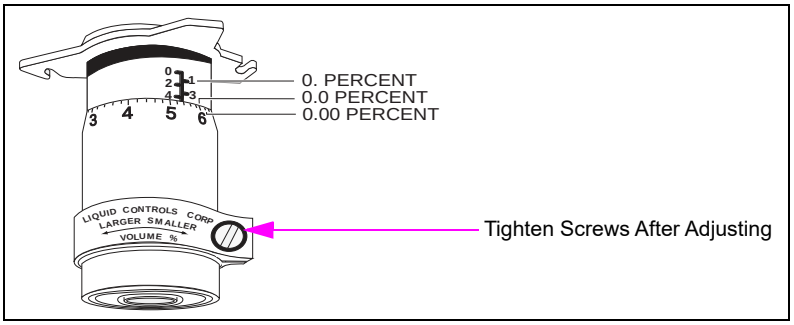
- Bad meter (worn piston cup, internal valve not seating, or calibrating wheel in wrong location).
- Bad pulser.
- O-rings leaking on inner VaporVac vapor return hose.
- Leaking meter check valve (product is leaking back through another meter, causing other meters to turn backwards).
- Internal leaks or thermal contractions, causing a void in the hose. WandM may take readings that come up short in the morning when it is cooler, but will pass in the afternoon after warming up. Use the Hose Pressurization option.

LC Meter Calibration Adjustment for Ultra-Hi Models 9850K and 9850KX

To adjust the calibration for Ultra-Hi Models 9850K and 9850KX, proceed as follows:

1 Check the meter accuracy by delivering the product to a reliable and accurate 50- or 100-gallon (or metric equivalent) Prover Can.

Figure 6-12: 9850K and 9850KX Models



2 Convert the amount of error to gallons per hundred (which gives a whole percent figure) or gallons per thousand (which gives one-tenths of a percent figure).

3 Read and note the setting indicated on the adjuster. The amount of error is added to or subtracted from this setting. The adjuster is shown in graduated divisions of 1%, 0.1%, 0.02%.

4 Reset the adjuster after first loosening the clamp.
- To decrease the amount delivered, turn the thimble In on the barrel.
- To increase the amount delivered, turn the thimble Out (unscrew it). After resetting the adjuster, tighten the clamp.

5 Verify proper meter calibration by performing a retest.

Note: Always make the final adjustment by turning In the thimble. If the new setting is a higher number than the original, turn it back beyond the required figure and then come back to the setting.

Example: Assume that the adjuster setting at the start of the test reads 2.05. The product is run through the meter into a Prover Can until the counter registers 100 gallons. Assume that the prover shows a volume of 98.7 gallons (1.3 gallons short). Since the adjuster graduations are in percent readings, this 1.3 could be added directly to the adjuster reading (2.05 plus 1.3 equals 3.35 on the adjuster). A rerun through the meter must then show 100 gallons both on the meter counter and on the prover.

If you are measuring in increments of less than 100 gallons, use this simple formula to determine the percentage by which the adjuster must be adjusted:

(P - M) / M = A%

where **P** is the actual prover measurement, **M** is the dispenser volume reading, and **A%** is the percent adjustment for the adjuster.

Calibration Adjustment for E85/DEF Units [Electronic Calibration (E-Cal)]

For the E-Cal procedure of E85/DEF units, refer to *MDE-4331 Atlas Fuel Systems Installation Manual*.

Meters

WARNING

• Wear eye protection. Residual pressure and entrapped fuel may still be present and may drain or spray while removing the parts.

• Fire and explosion could result in severe injury or death.

• Test and close the shear valves involved. Shut off power to the unit.

• Remove the parts slowly. Collect fuel in approved containers.

• Clean up all spills promptly.

About Meters

The Gasboy Atlas CFT Meter is used on standard units (refer to "CFT/E85 Meters" on page 6-27). For Gasboy Atlas Ultra-Hi units, refer to "Replacing Cylinder Cover and Gasket (Cylinder Cover Leaks)" on page 6-29. Gasboy does not recommend a major field overhaul of these meters. Suggested repairs are related to fixing external leaks. The only serviceable parts on the meter are gaskets and seals. Most repairs require removing the meter from the unit.

Note: The version of the meter used for E85 units (T19976-G5) is specially plated and contains special seals to handle E85 fluids. Do not use a standard meter to dispense E85.

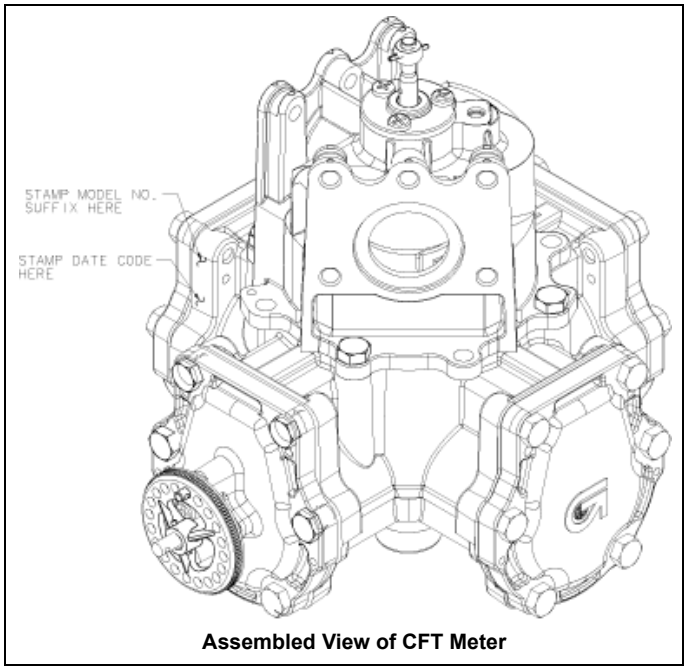
Model and Date Codes

The model number is stamped on each meter. Refer to "CFT Meter Date and Model Code Location" on page 6-27.

CFT/E85 Meters

The CFT/E85 Meter is a four-piston, mechanically-calibrated positive displacement piston meter, where the fluid is pushed into a cylinder which causes the opposing piston to push a similar cylinder of fluid out. Two sets of two pistons are used and timed using cam and piston connecting bars to convert the piston movement into a rotation of the meter output shaft. The meter has a flow path that discharges the product from the center chamber on the bottom of the meter. This configuration reduces water and contaminates from building up in the meter and prevents meter freeze-ups from water accumulation in the meter during very cold weather, resulting in longer meter life.

Figure 6-13: CFT Meter Date and Model Code Location



Assembled View of CFT Meter

Service Tips

- Purge air from the system before performing a calibration. Air in the system affects the accuracy of the calibration. Refer to "Purging Air from System" on page 6-9.
- Place an approved pan under the meter during repairs to collect the residual fuel.
- Replacing the top quad ring requires the use of a special tool that is included in the replacement seal kit. The tool protects the new seal during installation over the drive pin across the hole in the shaft.
- It is not cost effective to rebuild a meter. If a meter exhibits problems, install a new meter. *Note: Meter tops must be returned for warranty coverage.*
- Remove and replace the meter using metric tools.
- Inspect all gaskets when the unit is Off during repairs. Replace the meters, as required.
- Some meter bolts are difficult to access. A 13-mm universal socket makes installation and removal easier.
- For calibration procedures, refer to "Meter Calibration" on page 6-22.
- After calibrating a meter, always ensure that it is properly sealed at the calibrating wheel to avoid tampering.

- After a drive-off, inspect the meter for leaks.
- Non-use of filters and strainers can significantly reduce meter life.
- Abnormally low pressure and flow rate can cause the meter to stall.
- Meter failure may be indicated by a significant change in calibration from high to low flow rate, excessive calibration spread, or meter stall at low-flow.
  Note: Other problems may also cause the same symptoms.
- After replacing the meter, always purge the system of air (refer to "Purging Air from System" on page 6-9) and recalibrate the unit.
- Calibration problems are not always caused by a bad meter. Meter check valves, leaking nozzles, binding pulsers, defective pistons, or internally leaking vapor recovery hose can also result in calibration problems.
- A top shaft seal kit to prevent leakage at extremely cold temperatures is available.

Repairing CFT/E85 Meters

This section provides information for repairing CFT/E85 meters.

Before You Begin

Before beginning the repair, proceed as follows:

1. Read and follow the procedure in "Servicing Hydraulic Components" on page 6-6.
2. After following power-down procedures, open the nozzle into an approved container to bleed pressure. Some residual pressure may remain.
3. Continue with the required meter service procedures.

Removing/Replacing Gasboy CFT/E85 Meters

To remove/replace the Gasboy CFT/E85 meter, proceed as follows:

1. Disconnect the pulser drive on electronic models or the computer drive on mechanical models, from the meter output shaft.
2. Support the meter when removing the bolts.
3. Remove the discharge line flange and inlet line flange bolts.
4. Remove the meter bracket bolts.
5. Remove the meter.
6. Perform required service on the meter.
7. Inspect and clean the manifold or inlet, and discharge line mounting surfaces.
8. Install the new inlet and discharge flange O-rings.
9. Bolt the meter to the inlet and discharge flanges.
10. Bolt the meter to mounting brackets.
11. Replace the pulser drive or computer drive.

After Repairing Meters

After the repair is complete, proceed as follows:

1 Open shear valves (dispensers only).

2 Restore power to the unit and STP. In D-Box, place the unit in normal operation.

3 Purge air and check for leaks. Refer to "Purging Air from System" on page 6-9.

4 Calibrate the meter.

Replacing Cylinder Cover and Gasket (Cylinder Cover Leaks)

Note: Cork gaskets may show some staining. Replace the gaskets only when you note dampness or pooling of fuel.

To replace the cylinder cover and gasket, proceed as follows:

1 Follow steps 1 to 3 in "Before You Begin" on page 6-28.

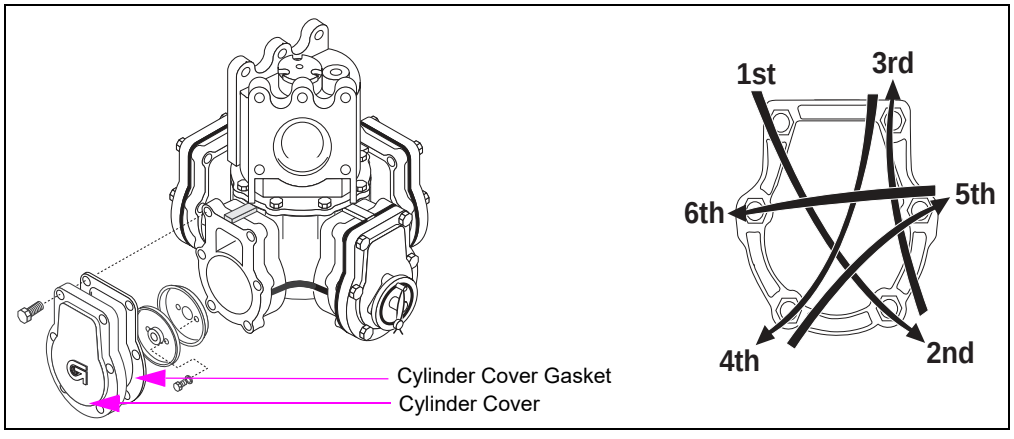
2 Remove the cylinder cover.

3 Scrape the old gasket and clean the surface.

4 Install the new gasket. Replace the cylinder cover.

5 Torque all bolts in sequence as shown in Figure 6-14.

Figure 6-14: Replacing Cylinder Cover and Gasket



6 Follow the steps in "After Repairing Meters".

Replacing O-rings (Body and Cover Leaks)

Note: Always use Gasboy-approved O-rings and gaskets.

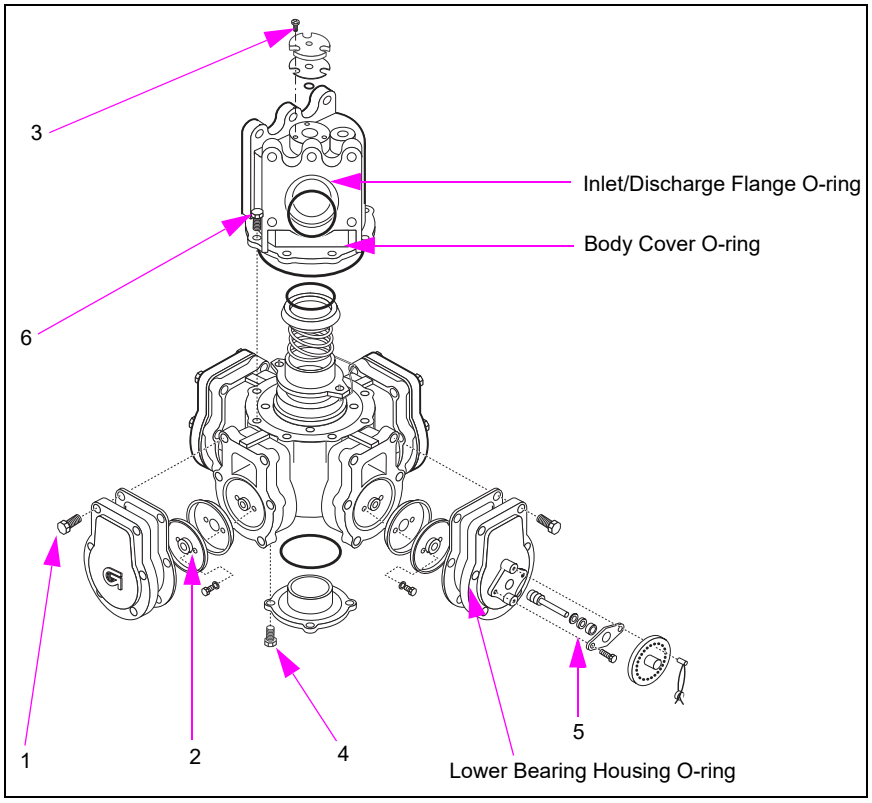
Replace the following O-rings for obvious leaks or during “off unit” repair:

- Inlet/Discharge Flange O-ring
- Body/Cover O-ring
- Valve Seal O-ring
- Lower Bearing Housing O-ring

To replace the O-rings, proceed as follows:

1. Follow steps 1 to 3 in “Before You Begin” on page 6-28.
2. Remove the body cover and lower bearing housing.
3. Remove the O-ring(s) and install a new one(s). Lubricate the O-ring(s) with silicone grease. Ensure that the O-ring is in the groove before tightening the cover(s).
4. Install the cover(s). Torque all meter bolts.
5. Follow the steps in “After Repairing Meters” on page 6-29.

Figure 6-15: Replacing O-rings

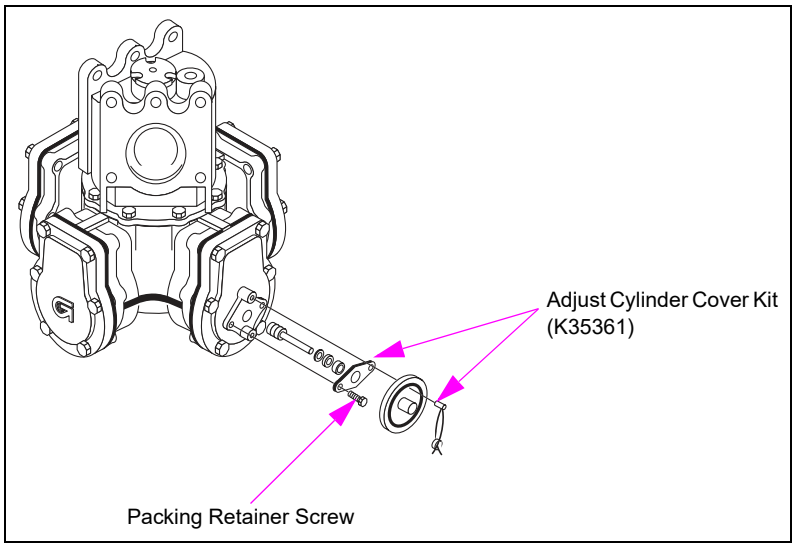


Bolt Number	Bolt	Meter Bolt Torque in -lbs	Meter Bolt Torque Kg -meters
1	Cylinder Cover Gasket	130 ± 10	1.5 ± 0.12
2	Piston and Connecting Bar	35 ± 5	0.4 ± 0.06
3	Shaft Seal Cap	25 ± 5	0.3 ± 0.06
4	Lower Bearing Housing	75 ± 10	0.9 ± 0.12
5	Packing Retainer	20 ± 5	0.25 ± 0.06
6	Body Cover	130 ± 10	1.5 ± 0.12

Calibrating Wheel Parts Repair

- Replace the damaged parts or when you note an obvious leak.
- Use new seals on reassembly.
- Use steel screws for packing the retainer and do not overtighten.

Figure 6-16: Calibrating Wheel Parts Repair



Replacing Piston Cups

To replace the piston cups, proceed as follows:

1. Follow steps 1 to 3 in "Before You Begin" on page 6-28.
2. Remove the cylinder cover. Remove the old gasket and clean the surface. Refer to "Replacing Cylinder Cover and Gasket (Cylinder Cover Leaks)" on page 6-29.
3. Examine the cylinder liner for scoring. If it is scored, replace the meter.
4. Remove the piston head screws, and then remove the piston head and cup.

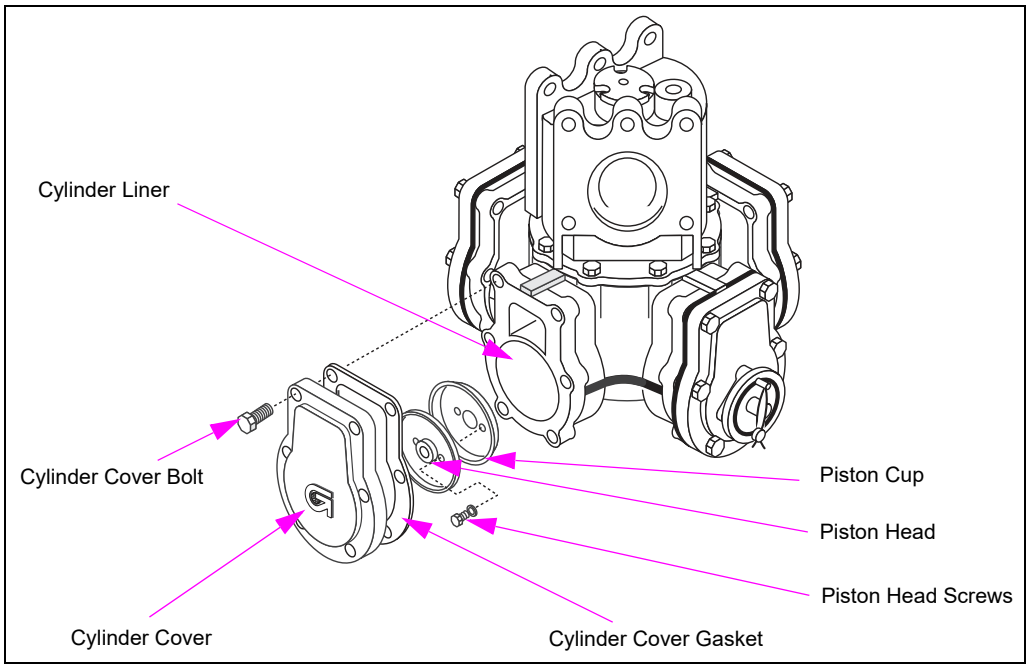
5 Install the new piston cup with the cup opening facing outward. Spray oil on the piston cup before closing.

6 Reinstall the piston head. Torque screws and apply Loctite™ 510.

7 Install the cylinder cover with the new gasket. Torque all meter bolts.

8 Follow the steps in "After Repairing Meters" on page 6-29.

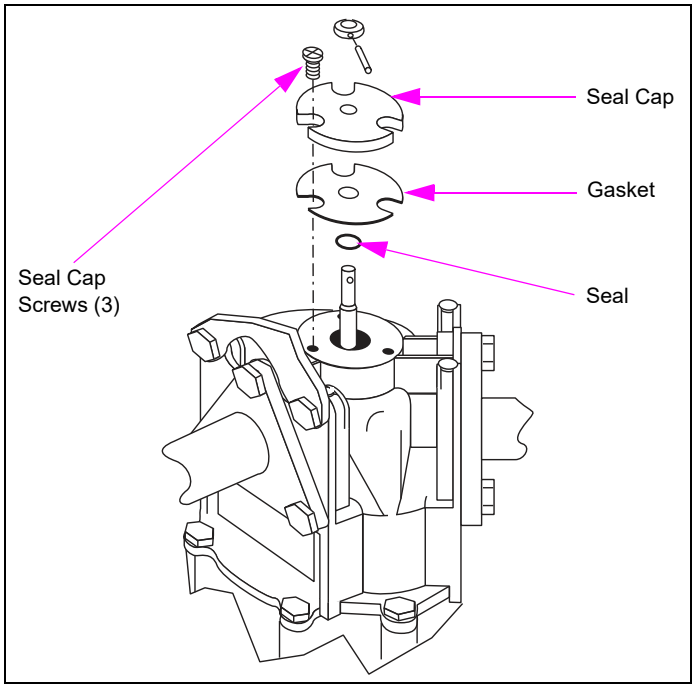
Figure 6-17: Replacing Piston Cups



Removing/Replacing Shaft Seal and Gasket (Upper Seal Leaks)

Replace the shaft seal and gaskets when leaks are obvious. Use the Gilbarco Seal Installation Tool Kit (K35222). Before disassembly, inspect the seal cap and output shaft for wobble. Replace the meter, if the shaft wobbles.

Figure 6-18: Shaft Seal and Gasket

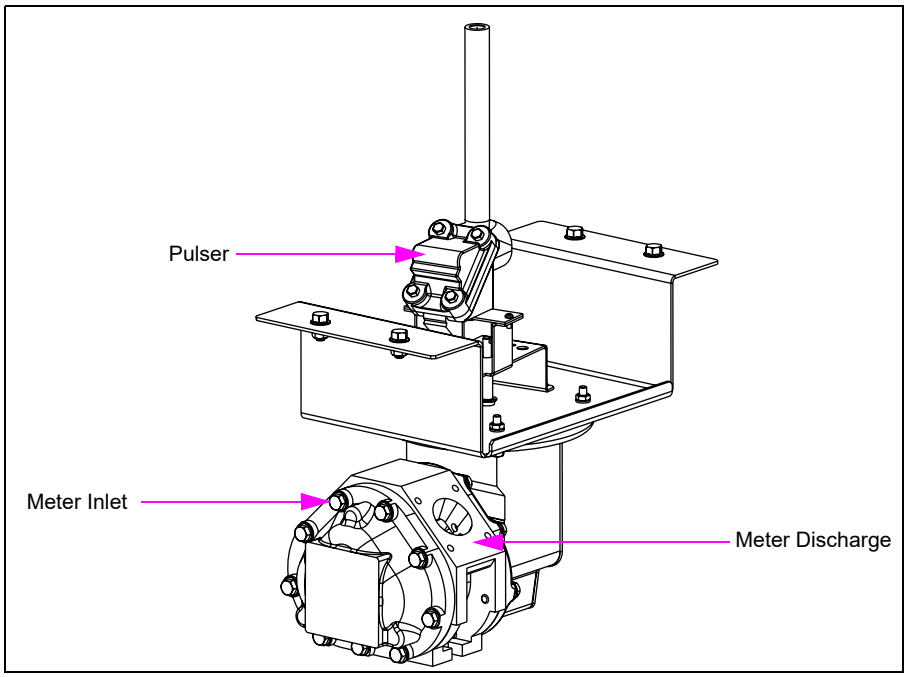


1. Follow steps 1 to 3 in "Before You Begin" on page 6-28.
2. Remove the pulser, gears, and connecting shafts (if you cannot access the seal cap, remove the meter).
3. Lightly sand burr on the shaft (near holes).
4. Disassemble the seal cap. Do not scratch the shaft.
5. Remove all old seals and gaskets, and clean the surface.
6. Install the new seal (use installation tool) lubricating lightly with silicone grease. Do not twist or roll the shaft seal.
7. Install the new gasket with the seal cap.
8. Torque all screws (locking screws is recommended).
9. Follow the steps in "After Repairing Meters" on page 6-29.

LC Meters

LC meters are used in Atlas Ultra-Hi Master or Ultra-Hi Combo series units 9850 and 9850KTW3 or 9850KXTW3.

Figure 6-19: LC Meter and Pulser Assembly



Service Tips

- Remove and replace the meters using metric tools.
- Place an approved pan under the meter during repairs to collect the residual fuel.
- Inspect all gaskets during off-unit repairs. Replace the meters, as required.
- Some meter bolts are difficult to access. A 13-mm universal socket makes installation and removal easier.
- For calibration procedures, refer to "LC Meter Calibration Adjustment for Ultra-Hi Models 9850K and 9850KX" on page 6-25.
- Non-use of strainers can significantly reduce the meter life.
- Meter failure may be indicated by a significant change in calibration from high to low flow rate, excessive calibration spread, or meter stall at low flow.
  Note: Other problems may also cause the same symptoms.
- After replacing a meter, always purge the system of air (refer to "Purging Air from System" on page 6-9) and recalibrate the unit.
- Calibration problems are not always caused by meters. Dispenser check valves and leaking nozzles may also cause calibration problems.

Removing/Replacing LC Meters

Note: This meter is used on Ultra-Hi models only.

To remove/replace the LC meter, proceed as follows:

1. Follow steps 1 to 3 in "Before You Begin" on page 6-28.
2. Disconnect the pulser.
3. Remove the four bolts from the discharge casting.
4. Remove the four bolts on the inlet.
   Note: Support the meter while removing the bolts.
5. Remove the meter.
6. Perform the required service on the meter.
7. Inspect and clean the inlet and discharge line mounting surfaces.
8. Install the new inlet and discharge gaskets.
9. Replace the meter.
10. Bolt the meter to the inlet.
11. Bolt the meter to the discharge casting.
12. Reconnect the pulser.
13. Follow the steps in "After Repairing Meters" on page 6-29.

Coriolis Meter

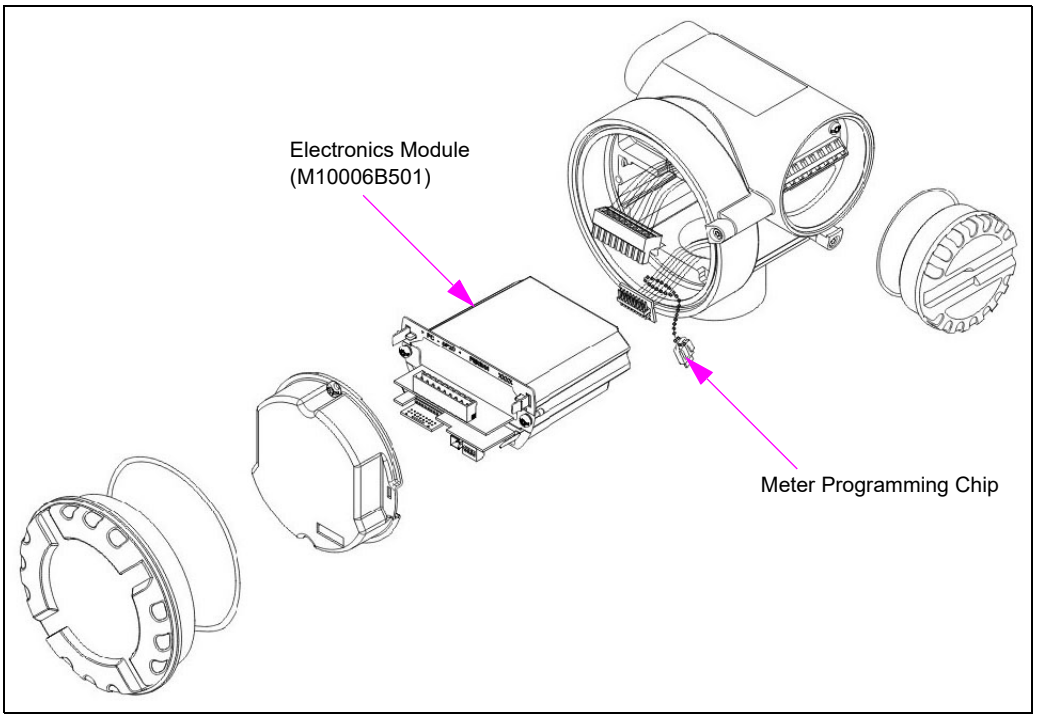
The Coriolis Meter is a very precise mass flow meter that can be used to measure volume for fluids of consistent density. It is extremely durable and has no sensitive components directly exposed to fluids.

The stainless steel mass flow meter is used for DEF only. It contains no mechanical moving parts and is extremely accurate (M10006A003).

Some important considerations for servicing the Coriolis Meter include the following:

- The meter electronic parts are serviceable by replacement. Typical error codes associated with pulsers indicate symptoms of failure in the electronic parts. In case of such symptoms, replace the electronic parts.
- The expensive meter electronics and hydraulics assembly can also be replaced.
- The meter hydraulics including the transducers are not serviceable. Replace the meter, if these components are damaged.
- When servicing the electronics, you must reuse the purple chip from the previous meter or the meter will not be properly adjusted. Use ESD protection when servicing the electronics.

Figure 6-20: Components of Coriolis Meter



- As meters are very sensitive to air in the fluid, the air can cause a pulser error code or erratic calibration results at fast and slow flow. If the calibration for the meter is erratic, then check the above ground pumping units. Ensure that the pump is not producing excessive air due to inlet leaks in the pump. If the meter freezes, then check the calibration of the meter. If there is a large difference between the fast and slow flow values, then the meter is permanently damaged.
  Note: Presence of air changes the fluid density and mass flow rate.
- The meters can be permanently damaged by freezing. Usually the symptom is repeatable tests at high flow rate, with a large change in calibration resulting at slow flow rate. That is, meter linearity error is high.
- When purging the air from the meter during installation, temporarily connect a standard Atlas pulser to the CPU, as the meter is sensitive to air. When dispensing DEF, spin the pulser manually until all the air is purged from the system. If this is not done, an error code may be generated by the dispenser. Ensure that you turn off the dispenser before disconnecting the output between the Coriolis Meter Interface Board and CPU when connecting or disconnecting the temporary pulser and Coriolis Meter Interface Board.

⚠ WARNING

Do not substitute the pulser while power is being supplied to the unit. Lethal voltages exist within the dispenser and damage to the unit could occur if certain critical steps are not followed. It is recommended that only Gilbarco-certified ASCs, who are trained in the service and operation of Atlas dispensers perform this procedure.

The meter is electronically calibrated similar to standard meters. There is no change to this procedure. For additional information, refer to "Coriolis Meter Interface Board (M10030A001)" on page 5-72.

DEF Magmeter

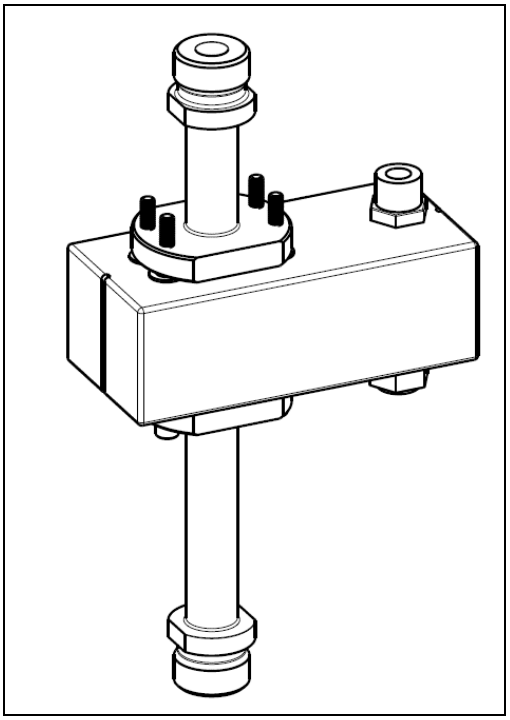
The Magnetic Flow meter (Magmeter) for Atlas DEF units serves the same function as the Coriolis meter but has some different characteristics.

The Magmeter is Certified MI-005 (liquids other than water) and has a high strength ceramic flow tube available with Explosion safety certificate.

Note: There are no programming differences between the Magmeter and the Coriolis meter.

When purging the air from the meter during installation, temporarily connect a standard Atlas pulser to the CPU, as the dispenser will generate an Error Code 56 until the fluid is present inside the meter. This is done by disconnecting the cable plugged into the 8-pin PULSER connector on the pulser adapter cable (M05201A001). Then, connect the standard Atlas pulser (M04011B001) to pins 1-4 on the PULSER connector. When dispensing DEF, spin the pulser manually to initiate full flow. Dispense fluid until all the air is purged from the system and CR3 is lit on the Coriolis Meter Interface board. If this is not done, an Error Code 56 will be generated by the dispenser. Ensure that you turn off power to the dispenser before disconnecting the output between the Coriolis Meter Interface Board and CPU when connecting or disconnecting the temporary pulser and Coriolis Meter Interface Board.

Figure 6-21: Atlas DEF Magmeter



Filters and Strainers

⚠ CAUTION

To prevent fueling problems and to minimize the dispenser down-time due to damage to valves and motor, never operate a unit without the use of a filter or strainer.

⚠ WARNING

• Wear eye protection. Residual pressure and entrapped fuel may still be present and may drain or spray while removing the parts.

• Fire and explosion could result in severe injury or death.

• Test and close the shear valves involved. Shut off power to the unit.

• Remove the parts slowly. Collect fuel in approved containers.

• Clean up all spills promptly.

About Filters

A noticeably slower flow rate usually indicates a dirty filter or clogged strainer. Slow flow or no flow rate can also result, when water has passed through water alert type filters. Alert the owner or operator, if water is in the tank.

For efficient operation and long life of pumps and dispensers, replace the fuel filters and clean the strainers regularly.

- After 50,000 gallons (189,000 liters) or one month for new installations.
- Every 300,000 gallons (1,134,000 liters) or six months thereafter.

Notes: 1) Harsh environments, including old corroded steel fuel storage tanks, may require change of filters and strainers to be cleaned more frequently.

2) Conversions from non-alcohol to alcohol-enhanced fuels typically results in frequent filter changes due to the cleansing effect of alcohol in tanks and piping.

Always use the Gasboy-recommended filters (standard, water alert, and high capacity).

Filter Description	Gasboy Part Number	Cim-Tek Part Number
400-10 High Flow Particulate - 10 Micron	R18189-10	70015
400-30 High Flow Particulate - 30 Micron	R18189-30	70016
400HS-10 High Flow Water Alert - 10 Micron	R20039	70060
400HS-30 High Flow Water Alert - 30 Micron	026019	70065
400MB-10 High Flow Alcohol Monitor - 10 Micron	R19736-10	70120
Manifold Strainer	R19457	N/A
Filter Cap - NO FILTER	R18896-G1	N/A

Notes: 1) Water alert filters are for use with gasoline, ether-blended fuels, and diesel fuel. They are not for use with alcohol-blended fuels.

2) Alcohol monitor filters are for use with ethanol-blended fuels containing up to 20% ethanol. They are not for use with any other fuels.

3) Manifold strainers also require the use of a filter or filter cap.

4) The Fuel Filter option listed here are for protection of the dispenser components. The fuel filter options listed here are not sufficient for filtering the aviation fuel.

Servicing Filters

This section explains about servicing the filters.

Before Removing Filters

Before removing the filters, proceed as follows:

1. Use OSHA lockout/tagout procedures.
2. Close the shear valve (dispensers only). Refer to "Shear Valves" on page 6-72. Check the operation of the valve. Multiple shear valve closures may be required. Shut off all power to pumps.
3. Bleed pressure (dispensers only):
   a. Lift the operating handle and authorize the unit.
   b. Place the nozzle in the approved container.
   c. Close the nozzle.
   d. Shut off the operating handle.
4. Shut off the associated STP circuit breakers (dispensers only). Multiple STP disconnects may be required.
5. Shut off the dispenser circuit breaker.
6. Shut off all power to the unit.

Removing Filters

⚠ WARNING

Servicing filters without shutting off power properly and ensuring that the appropriate valves are closed may result in fuel discharge or spray. Any involved STPs with power still applied can be energized from another unit resulting in fuel pressure in the product lines for the unit you are working on. Pumping units with power applied could also be accidently energized. Commonly, retightening of the filter under pressure will not stop fuel flow as the seal can be blown out of the sealing position during tightening.
Fire and explosion could result in severe injury or death.
Ensure the following:
- Wear eye protection
- Test and close the involved shear valves
- Shut off power to the pump, dispensers, and any involved STPs
- Remove the parts slowly. Collect fuel in approved containers.
- Clean up all spills promptly

Use an approved container to collect the residual fuel. Use gasoline/fuel-approved absorbent materials to mop up the spilled fuel. Use Gasboy-approved fuel collectors, if applicable. Be careful of any residual fuel. Always follow all safety warnings and cautions.

To remove the filters, proceed as follows:

1 Slowly turn the filter counterclockwise. Use a filter wrench to loosen the filter, if required.

2 Drain the removed filter into an approved container and dispose of properly. Do not dispose of filters and fuel soaked absorbent materials in trash cans. Follow local, state, and national code requirements for disposal. Use of a fuel catch-cup or pan is recommended.

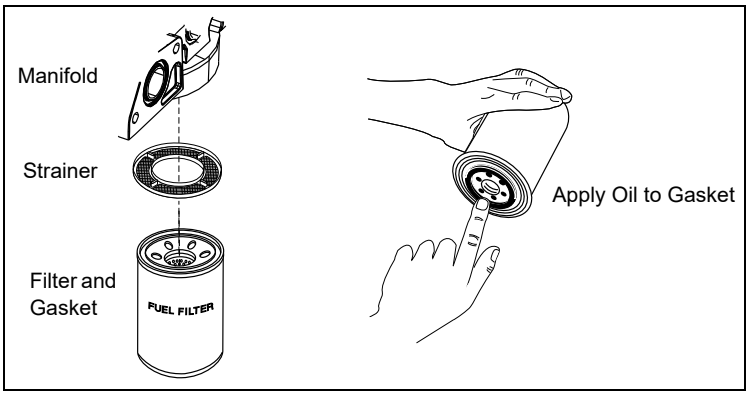
3 Remove and clean the strainer. Refer to "Servicing Strainers" on page 6-41.

Installing New Filters

To install the new filters, proceed as follows:

1 Read and follow the instructions printed on the new filter.

Figure 6-22: Coating Filter Gasket



2 Install a cleaned or new strainer, inserting the cupped side into the filter manifold. Ensure that it is fully inserted.

3 Coat the new filter gasket with a thin film of clean oil as shown in Figure 6-22 on page 6-40.

4 Attach the filter to the hydraulic manifold and turn the filter clockwise until the gasket contacts the base. Then, hand-tighten an additional half turn.

5 Restore power to the unit.

6 Open the shear valve on dispensers.

7 Lift the nozzle hook and authorize the pump.

8 Check for leaks.

9 Bleed air by dispensing 10 gallons (40 liters) into an approved container for each hose involved.

10 Check for leaks again.

Service Tips

- Only hand-tighten the filter. Do not use a filter wrench to tighten.
- A light coating of oil on the gasket helps the seal to seat properly and allows for easier release at the time of removal.
- Use of a filter and strainer is required to ensure warranty. Units that do not use filters will commonly experience reduced life of hydraulic components. Use of only strainers for very cold weather and diesel fuels is acceptable. However, filters must be used when warm weather returns. The use of only a strainer will not ensure long life of hydraulic components.

About Strainers

Strainers are installed between the manifold and filter to trap larger particles leaving the fine filtering to be done by the filter element. The strainer helps to prolong filter life by preventing premature filter clogging. Strainers can also help reduce the frequency of filter change, resulting from fungus and slime conditions. Always reinstall or replace the strainer.

DEF Strainer

Filtration is required to protect the nozzles and valves. The earlier versions of the dispenser relied completely on a filter tank system. The later versions of the dispenser have a strainer. The 100-micron strainer and assembly is compatible with DEF. The strainer must be cleaned after the first air purging and calibration to ensure good flow rates. Refer to "Purging Air from System" on page 6-9.

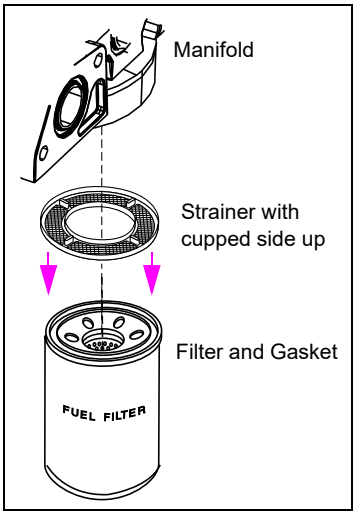
Servicing Strainers

This section explains about servicing the strainers.

Cleaning/Replacing Standard and Hi-flow Filter Strainer

Figure 6-23 shows the standard and Hi-flow filter and stainer assembly.

Figure 6-23: Filter and Strainer Assembly



Service Tips

- Strainers commonly help reduce the frequency of filter change.
- Strainers can be cleaned with denatured alcohol. Replace the strainer if it is damaged or partially clogged and not cleanable.
- Always check/clean the strainer, when replacing a filter.
- Ensure that you note the orientation of the tabs when reinstalling the strainer (see Figure 6-23).

Hanging Hardware

WARNING

• Wear eye protection. Residual pressure and entrapped fuel may still be present and may drain or spray while removing the parts.

• Fire and explosion could result in severe injury or death.

• Test and close the shear valves involved. Shut off power to the unit.

• Remove the parts slowly. Collect fuel in approved containers.

• Clean up all spills promptly.

About Hanging Hardware

Hanging hardware is the component that is attached to the outlet casting. This includes hoses, nozzles, swivels, spacer hose, and breakaways. The hanging hardware is tested for leaks and electrical continuity. The hanging hardware may be manufactured by companies other than Gasboy. Ensure that you follow all manufacturer's recommendations.

DEF units require special hanging hardware that is compatible with DEF fluid. Do not use standard gasoline or diesel hardware for DEF units.

Hoses and Flow Restrictors

This section explains about the hoses and flow restrictors.

Inspecting Hoses

Check hoses regularly (at least once a week or on complaint) for leaks and damage. Inspect and replace the hose assembly, as required. The following conditions may contribute to damage or problems:

- Twisting and curling puts unusual stress on hose parts.
- Repeated flexing of the hose in the same spot can cut, tear, or split the hose cover.
- Flattened hoses from vehicle drive-over can cause restricted flow and hose reinforcement damage.
- A soft spot is a sign of internal damage to the hose reinforcement. Reinforcement may appear through the cover.
- Loose or cracked hose couplings can cause fuel spills.
- Hose bulges are a sign of pressurized gasoline pushing against the cover. A full rupture could occur at any time.
- Use of Teflon tape for NPT hose ends may result in damage to the dispenser outlet casting during assembly.
- Reuseable hose end couples are generally not recommended as improper repair/assembly can cause leaks, lack of continuity, or hose separation.
- Use of excessively long hoses may create a trip hazard for customers. Use hose retrievers, hose reels and so on, to eliminate trip hazards.

⚠ WARNING

- Breakaways for low hose units must be attached close to the nozzle end, where the hose clamp of the retriever is attached between the breakaway and the pump/dispenser hose outlet casting.
- An improper location of the hose clamp may prevent the hose breakaway from working properly.
- Severe injury, death, or equipment damage may result from a vehicle drive-off where the hose breakaway fails to operate properly.

Hose Retrieval Mechanisms

Hose retrieval mechanisms must be operational or a trip hazard may occur.

Replacing Hoses

Do not use soft-wall hoses. They can cause the unit to register with the nozzle closed when the nozzle hook is first raised. Always use UL-approved hoses designed for the fuel being dispensed. Read and follow all safety precautions. Follow OSHA lockout/tagout procedures.

⚠ WARNING

- Wear eye protection. Residual pressure and entrapped fuel may still be present and may drain or spray while removing the parts.

- Fire and explosion could result in severe injury or death.
- Test and close the shear valves involved. Shut off power to the unit.

- Remove the parts slowly. Collect fuel in approved containers.

- Clean up all spills promptly.

To replace a hose, proceed as follows:

1. On dispensers, close the shear valve (refer to "Shear Valves" on page 6-72). Check for proper shear valve operation. Units may require multiple shear valve closures.
2. Shut off power to the unit and associated STPs. Multiple STP disconnects may be required. Use OSHA lockout/tagout procedures.
3. Drain the nozzle and hose into an approved container.
4. Remove the nozzle, swivel, whip hose, and breakaway first and then, the hose clamp.
5. Remove the hose.

⚠ WARNING

Wear eye protection as residual pressure may exist in the hose during disassembly and may cause fuel spray.

6 Use a UL-approved pipe sealant on hose coupling with NPT threads. Follow all these recommendations:
- Ensure that you follow the manufacturer's instructions for installation and proper torque.
- Do not use Teflon tape. Teflon tape on these components can cause damage during assembly or installation and defeat the conductive property of the hanging hardware and cause nozzles to malfunction.
- Do not apply sealant to the first two threads of any hose coupling.
- Do not use sealant on hose end couplings using O-ring seals, such as those found with coaxial vapor recovery hoses (a light coating of silicone grease is advised to allow the O-rings to seat and seal properly).
- Assemble the clamp to the hose to ensure proper retrieval and minimum trip hazard, then the hose to the breakaway, then to the whip hose and swivel, and finally to the nozzle. Always attach the hose assembly by rotating the hose and coupling. Screw the coupling in securely. Do not overtighten.

Note: Install padded or contoured plastic hose clamps and retractor cables properly. In all instances, do not install hose retractor clamps downstream of the breakaway.

7 Check the hose hanging hardware for continuity. Refer to "Testing Hose and Hanging Hardware Continuity" on page 6-47. Replace any components, if required.

8 Restore power to the unit. Open the shear valve for dispensers.

9 Check for leaks.

10 Bleed system of air. For more information, refer to "Purging Air from System" on page 6-9.

11 Check for leaks again.

Flow Restrictors

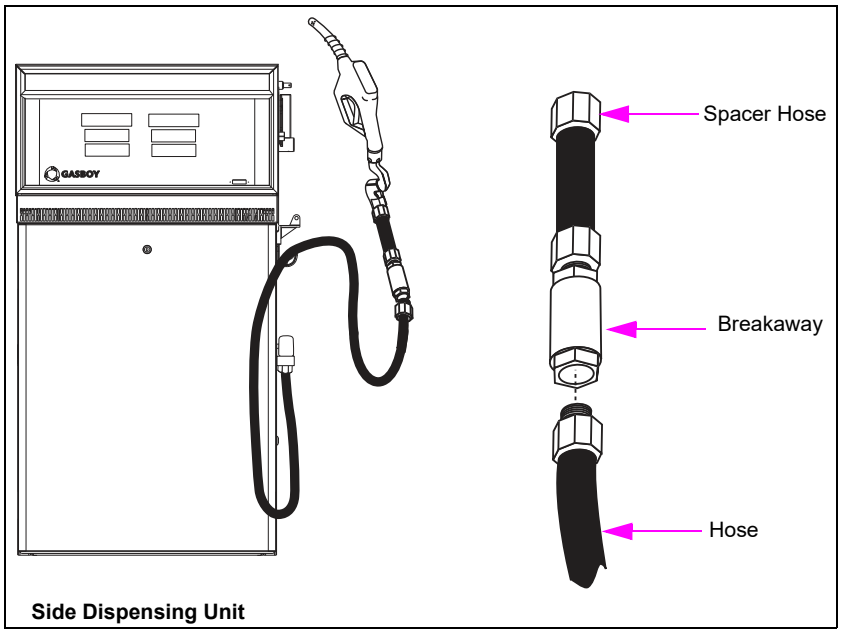
Flow restrictors are the devices used for pumps and dispensers to reduce flow rates. Commonly, they are used for vapor recovery applications and to limit the maximum flow to 10 gpm, as per certain US national regulations. They are commonly used as a separate device attached between the hose outlet casting and hose. For more details, refer to the manufacturer's installation and service information.

Breakaway Valves

Emergency breakaway couplings help protect against fuel spill, fire hazard, and equipment damage. The breakaway valve stops significant fuel drainage from the dispenser during drive-offs, if the nozzle or hose loop catches on the vehicle. Always use UL-listed breakaways.

- For proper operation of the breakaway, always bolt the pump or dispenser securely to the island. For pumps and dispensers, refer to Gasboy Atlas installation instructions.
- Some breakaway manufacturers require testing of pumps or dispensers for pull strength before installing the device. Follow the manufacturer's instructions.
- A hose retriever clamp must never be installed between the breakaway and nozzle.
- When installing a breakaway, always use a wrench on breakaway hex or wrench flats only.
- Always use a UL-approved pipe sealant suitable for the fuel involved for connections, except on the O-ring fittings. Never use Teflon tape.
- Some breakaways are reusable. For inspection and reuse, follow the breakaway manufacturer's instructions.
  Note: Do no reuse resettable breakaways beyond the number of allowed resets listed by the manufacturer.
- Periodically and after all drive-off occurrences, check the breakaway hoses and couplings for hose continuity. Refer to "Testing Hose and Hanging Hardware Continuity" on page 6-47.

Figure 6-24: Typical Breakaway



Replacing Breakaways

To replace a breakaway, proceed as follows:

1. Close and test the shear valve. The unit may require multiple shear valve closures. Also, refer to the manufacturer's instructions.

2. Shut off power to the unit and associated STPs. Use OSHA lockout/tagout procedures.

3. Drain the nozzle and hose into an approved container. Clean up any spills promptly. Wear eye protection. Be prepared for any residual pressure that may still exist in the hanging hardware.

4 Check for damage to the nozzle, especially the spout and threads.

5 If the repair or replacement is the result of a drive-off, inspect the unit for structural, meter, and piping damage. Repair or replace the damaged components, as required.
Note: Meters, piping, and connections may leak after a drive-off.

6 Replace the breakaway if it is not of the reusable type.

7 Restore power to the unit and open the shear valves.

8 Authorize the nozzle and check for leaks in the hose and plumbing, especially the meter and filter.

9 Purge the system of air. For more information, refer to "Purging Air from System" on page 6-9.

10 Perform a hose continuity test. Refer to "Testing Hose and Hanging Hardware Continuity" on page 6-47.

Resetting Breakaways

Note: Not all breakaways can be reset. Consult the supplier or manufacturer of the breakaway used.
To reset a breakaway, proceed as follows:

1 Close and test the shear valve. The unit may require multiple shear valve closures. Also, refer to the manufacturer's instructions.

2 Shut off power to the unit and associated STPs. Use OSHA lockout/tagout procedures.

3 Check for damage to the nozzle, especially the spout and threads.

4 If the repair or replacement is the result of a drive-off, inspect the unit for structural, meter, and piping damage. Repair or replace the damaged components, as required.
Note: Meters, piping, and connections may leak after a drive-off.

5 Check for damage to the breakaway valve and seals before reassembly. Follow the manufacturer's instructions.

6 Follow the manufacturer's instructions for cleaning and lubricating seals and valve ends.

7 Follow the manufacturer's instructions for recoupling.

8 Restore power to the unit and open shear valves.

9 Authorize the nozzle and check for leaks in the hose and plumbing, especially the meter and filter.

10 Purge the system of air. For more information, refer to "Purging Air from System" on page 6-9.

11 Perform a hose continuity test. Refer to "Testing Hose and Hanging Hardware Continuity" on page 6-47.

Service Tips

- Do not reuse a separated breakaway if any part appears damaged.
- Some brands of breakaways require lubrication every six months. Others require only periodic visual inspections. Follow the manufacturer's recommendations.
- Inspect the breakaway for leaks at least once a week or on complaint of a leak.
- If the breakaway separates without a drive-off occurring, do not reuse. The breakaway may be defective, having been reset excessive number of times, or have an inadequate rating for the application. If multiple breakaways have this issue, first suspect inadequate rating for the application.
- Consult the manufacturer for the maximum number of times you can reset a breakaway. Some breakaways cannot be reset.
- A protective sleeve supplied by the manufacturer is recommended to avoid damage to the dispenser and to improve appearance.

Testing Hose and Hanging Hardware Continuity

Perform an electrical continuity check when installing hoses after a drive-off and for periodic preventive maintenance. The STP check valve or pump regulating valve must maintain the operating pressure to perform this test. The following procedure tests the continuity of the hanging hardware (that is, hose, nozzle, swivel, breakaway, and hose casting). Hose and hardware continuity tests are not required for DEF units.

Note: Testing of an unpressurized hose may lead to false conclusions in determining if a defect exists or not.

⚠ WARNING

Read and follow all hazardous zones requirements.

You are working in a potentially dangerous environment of flammable fuels/vapors. Fuel and its vapors may ignite, leading to serious injury or death.

Fire, explosion, or electrical shock could result in severe injury or death if you do not follow safety procedures.

Ensure that you correct any safety hazards and barricade the area. Follow the manufacturer's instructions for the safe use, operation, and maintenance of the testing equipment.

Use only a low voltage digital Ohmmeter. Do not turn the tester On until the connections are made. Turn the tester Off before disconnecting test clips. Do not test continuity if there is spilled fuel, leaking components, or fuel vapors present in the area.

Hanging hardware without the proper electrical continuity rating presents a risk of igniting fuel vapors.

Injuries or death may result if hose continuity is not maintained.

Use approved procedures to test for hanging hardware continuity. For additional information, refer to PEI/RP400-02 in addition to the equipment and component manufacturer's instructions.

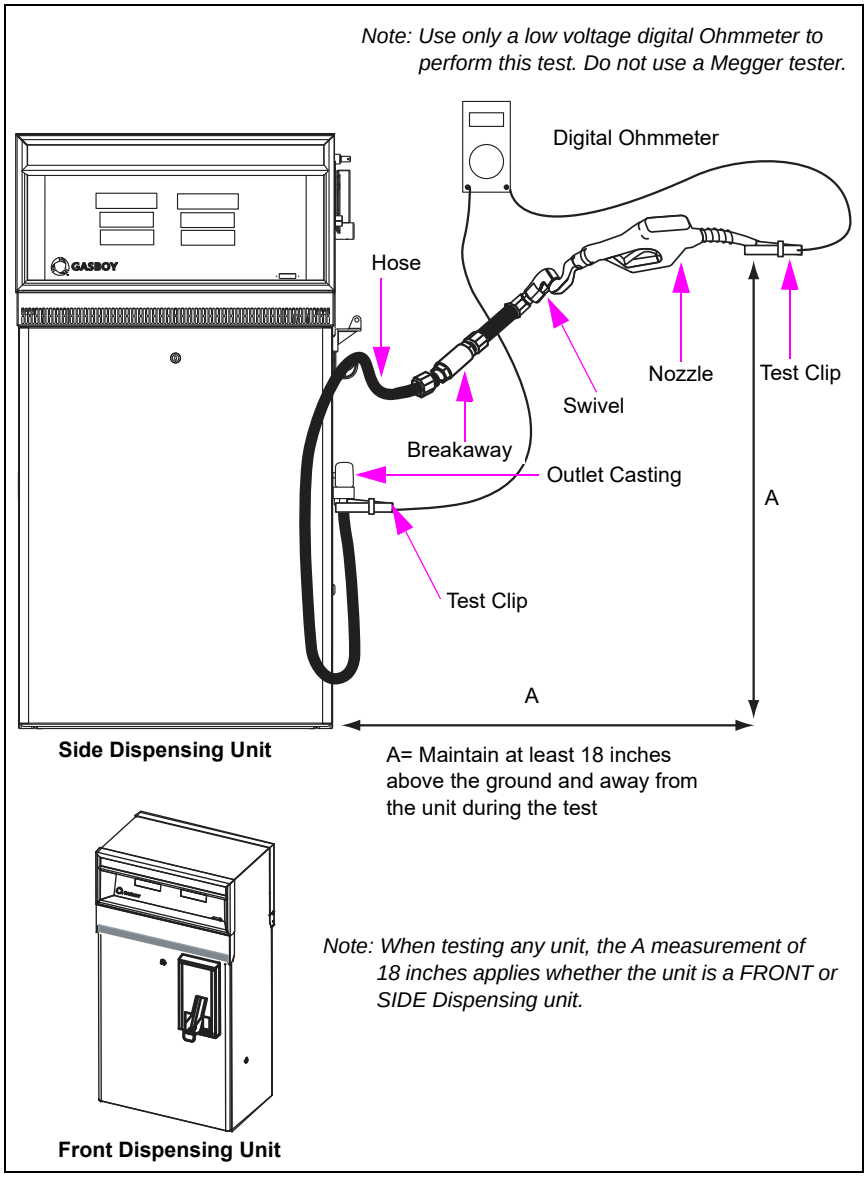
To test the hose and hanging hardware continuity, proceed as follows:

1 Ensure that there is no liquid fuel or flammable vapor present. Clean up, as required.

2 Lift the nozzle hook and authorize the unit to pressurize the hose.

3 Lower the nozzle hook, shutting the unit off.

Figure 6-25: Testing Hanging Hardware Continuity



4 Connect one probe to the nozzle spout and the other probe to the fuel outlet fitting at the outlet casting, or other component grounded with the unit frame (see Figure 6-25 on page 6-48). For the probe to read properly, the contact surface must be clean and free from fuel or other contamination.
- Use test leads that are at least 3 feet long (1 meter) and equipped with insulated clips.
- Typical meter test clips are not suited for direct attachment to the hanging hardware. Use an appropriate clamping device to ensure good contact.
- Keep the nozzle at least 18 inches above the ground and 18 inches away from the dispenser during this test.
- Wear insulating gloves if the hanging hardware component is handheld during test, or use an insulated device to support the nozzle. For additional information, refer to PEI/RP400-02.

5 To test the continuity, turn on the meter to conduct the test.
- Measure the resistance while flexing and moving the hose and nozzle into various positions that could be reasonably expected during fueling.
- Keep good electrical contact between probes and contact locations.

6 UL330 states that resistance must not exceed 70,000 Ohms per foot (233,000 Ohms per meter). If the test reading complies, this indicates that the hanging hardware has passed the continuity test.

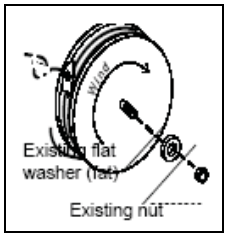
If test readings exceed 70,000 Ohms per foot:
- If you are testing on sheet metal or other locations in the pump or dispenser, perform the continuity test instead, between the J-box and the end of the nozzle.
- Check the contact surface for corrosion, dirt, or film. If required, polish the test probe location with emery cloth to ensure that there is good contact. Do not polish appearance parts such as sheet metal and so on.
- If no problem exists, isolate the defective part by performing continuity tests between and across the hose, nozzle, swivel, breakaway, and hose casting. Replace any part if the resistance exceeds the manufacturer's recommended maximum limit.
- Do not use components if the test reading shows an open circuit or any other defect.

Internal Hose Retrievers and Clamps

Read and follow all safety precautions as outlined in "Read This First" on page 1-1. Use OSHA lockout/tagout procedures.

Check hose retrievers regularly for frayed or broken cables and cables wrapped around hoses. Check retriever reels for free movement and lubricate, if required.

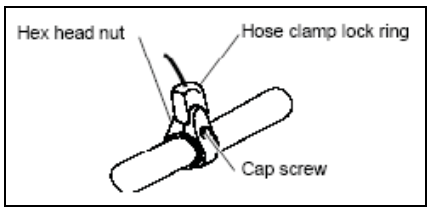
Replacing Retriever Reels, Cables, and Hose Clamps



To replace the retriever reels, cables, and hose clamps, proceed as follows:

1. Install hose onto the pump/dispenser.
2. Allow hose to assume a natural coiled shape while holding the hose upright on the island.
3. If retriever reel does not have the cable, connect the cable to the reel.
4. Load the retriever reel to the required spring force.
5. Assemble the reel to the reel hanger.
6. Thread the cable from the reel through the cable grommet, and then through the hose clamp lock ring.
7. Tie a knot and insert into the cable end.
8. Slide the cable end into the hose clamp lock ring. 1-inch hoses use metal clamps instead of plastic hose clamps.
9. Install a retriever clamp at the top of the loop. Attach a hose clamp lock ring (cable end) to the hose clamp. Use a cap screw and hex head nut to secure. Do not overtighten. Always use appropriately-sized, padded, or contoured plastic clamps for hoses. Under-sized clamps will damage the hose cover.

Figure 6-26: Replacing Retriever Reels, Cables, and Hose Clamps



10. With the retriever cable fully extended, ensure that there is some slack on the hose. Do not allow coaxial hoses to touch the ground when retracted and hanging.

Pumping Unit

GPU Pumping Unit

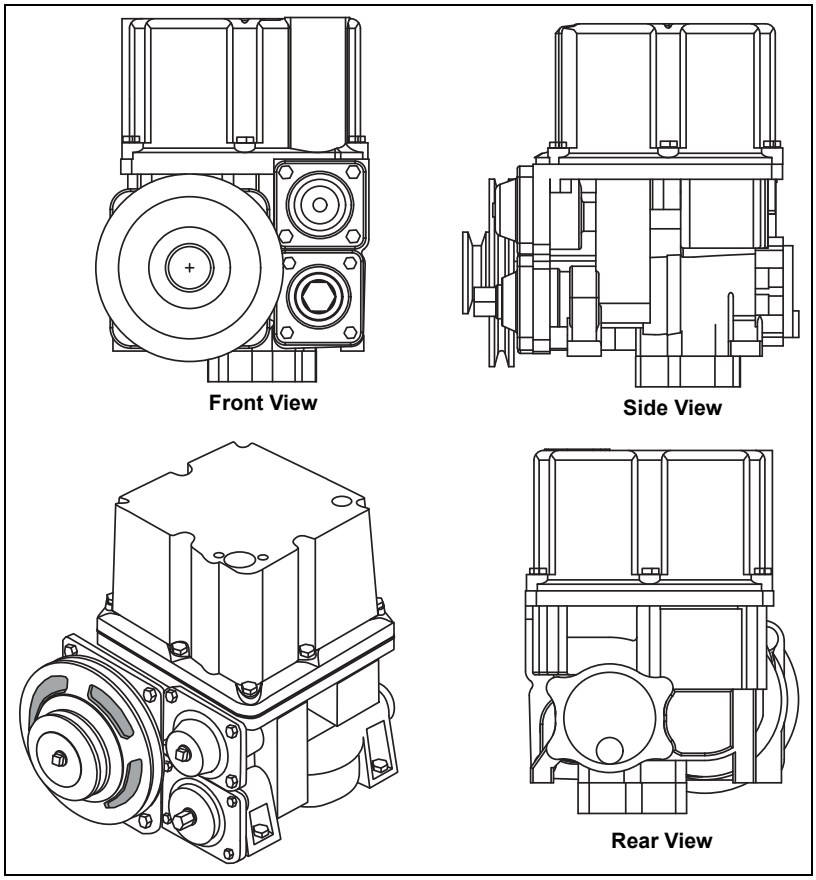
WARNING

- Wear eye protection. Residual pressure and entrapped fuel may still be present and may drain or spray while removing the parts.
- Fire and explosion could result in severe injury or death.
- Shut off power to the unit.
- Remove the parts slowly. Collect fuel in approved containers.
- Clean up all spills promptly.

About GPU

Self-contained Gasboy Atlas pumping units use the Bennett GPU. The case is made of aluminum and sealing surfaces may be damaged while working on an inappropriate surface.

Figure 6-27: GPU (Four Views)



General GPU Service Procedures

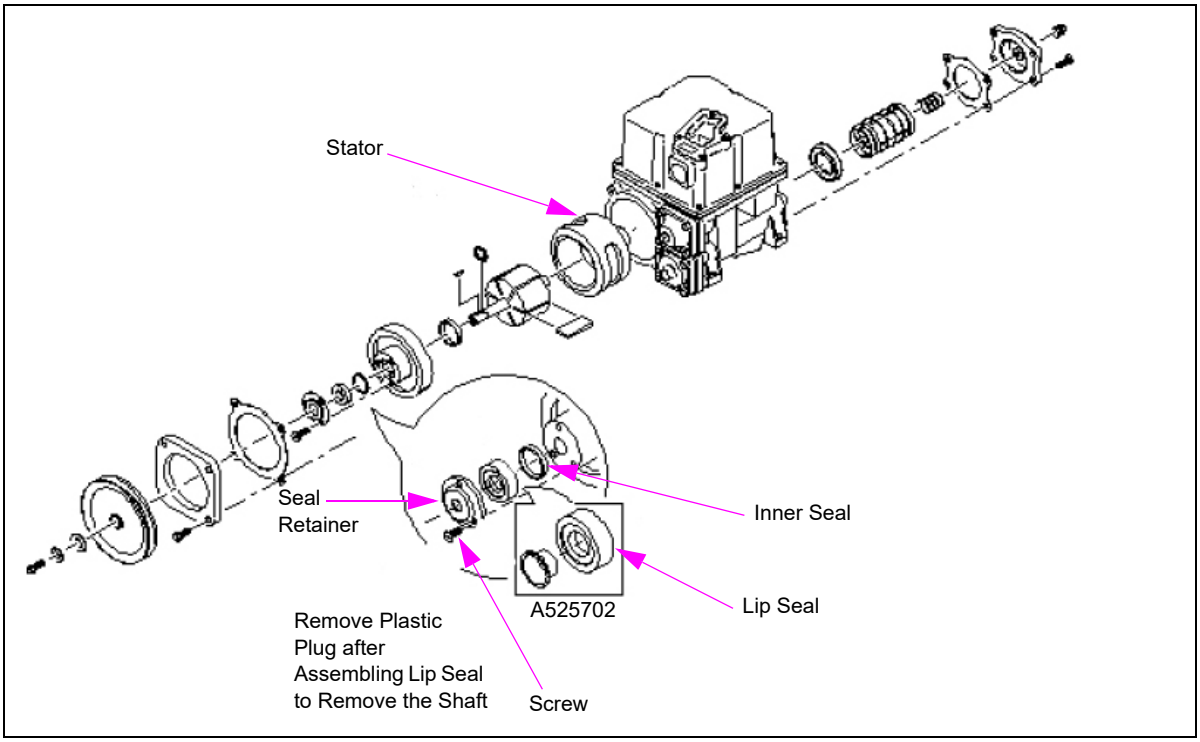
This service manual contains basic service procedures for the GPU.

Note: For additional GPU service information, refer to MDE-4447 Gilbarco Global Pumping Unit Operation and Service Manual.

Draining GPU

Draining the GPU unit to some extent is required while opening the unit for servicing the strainer, or removing the bypass or control valves.

Figure 6-28: Pumping Unit Servicing



To drain the bulk of the fluid from the pumping unit, proceed as follows. Residual fluid may remain in the pumping unit.

To drain the GPU, proceed as follows:

1. Put an approved tray in place to collect the fuel.
2. The pumping unit contains up to 0.5 liters (1.1 pints or 0.53 quarts) of fluid.
3. If sump drainage is required, the plug on top, right, and rear of the pumping unit casing may be removed.
4. Manually turn the pumping unit pulley counterclockwise to aid fluid removal.
5. Properly dispose of all fluid drained from the pumping unit.
6. After the pumping unit is drained, replace all plugs using a non-hardening UL-approved pipe sealant suitable for the type of fluids being used.
   Note: Do not use Teflon tape.

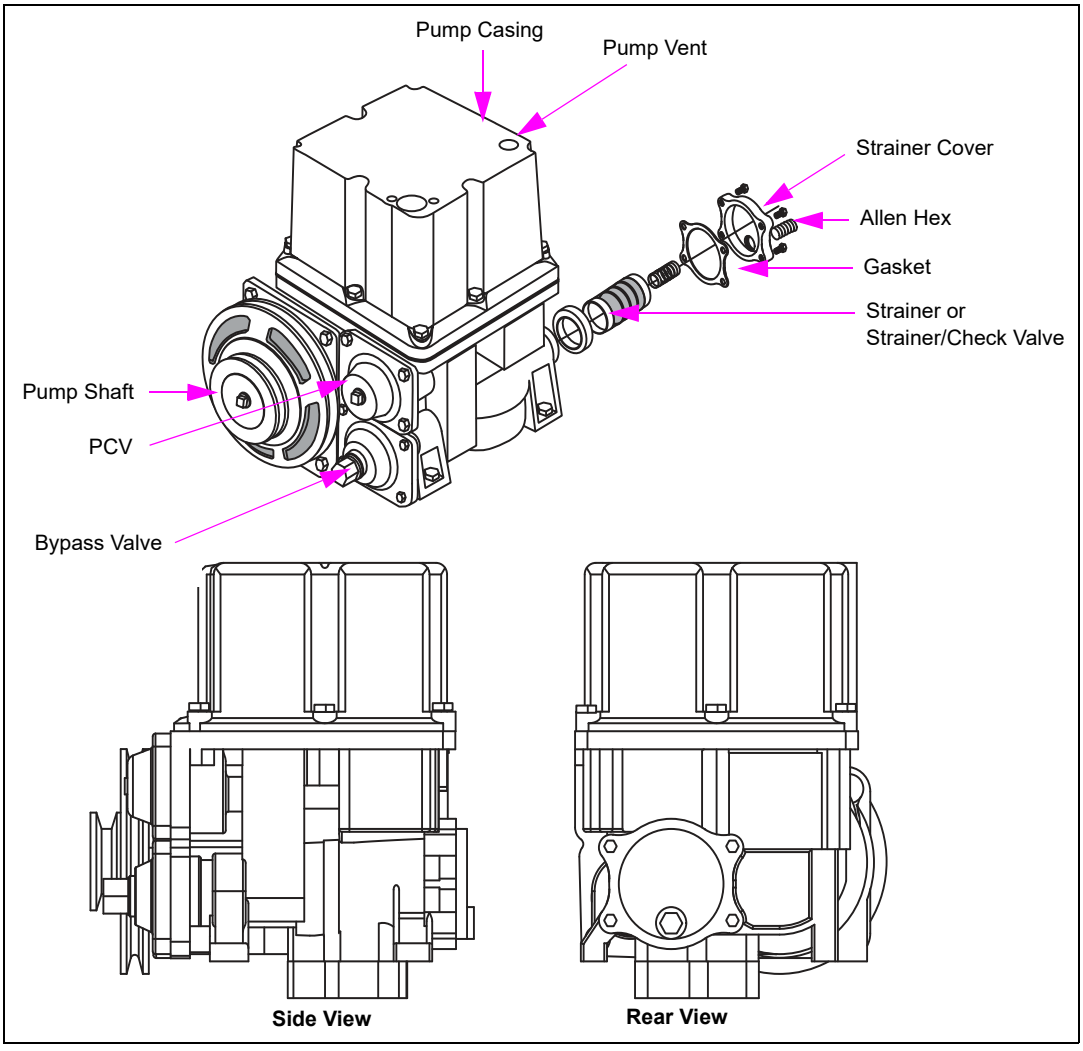
Servicing Strainer Check Valve

This section explains about servicing the strainer check valve.

Removing Strainer (or Strainer/Check Valve)

Check valves (if equipped) are to be replaced only if the pumping unit is experiencing frequent loss of prime, indicating that the check valve is not functioning. A check valve must be installed when a tank check valve is not available. Always use a strainer with the pump. Failure to use a strainer may cause premature pumping unit failure and may void warranty. The strainer must be kept clean to ensure proper operation and to extend the life of the pumping unit.

Figure 6-29: Strainer Check Valve



CAUTION

The Inlet Strainer Check Valve is required on all TW1M pumps and model 9840K and 9140K pumps for proper operation. If the pumping unit is replaced on these models, you must also install an Inlet Check Valve Kit (M04920K109). Failure to include an Inlet Strainer Check Valve on these models will result in reduced flow rate and fuel discharge from the adjacent pump sump vent.

To remove the strainer/strainer check valve, proceed as follows:

1 Lower the pumping unit fluid level by removing the plug located in the lower part of the strainer cover. Remove the four hex nuts holding the cover in place.
Note: Removing the plug allows air to enter (see Figure 6-29 on page 6-53).

2 Remove the strainer cover. Inspect the gasket for damage. If the gasket is damaged, discard the gasket and replace it with a new gasket.

3 Carefully pull out the strainer. Keep the strainer in a horizontal position to avoid contaminating the pumping unit with strainer debris. It may be required to use a small tool to gently hook the inside of the metal strainer end cap.

4 If the pumping unit contains an inlet check valve assembly, remove the inlet check valve. Inspect the area for cracked or otherwise damaged gaskets. Replace any worn or damaged gaskets.

5 Remove the strainer from the bore located behind the check valve assembly. Inspect the strainer for damage. Clean and/or replace the strainer, if required.

Installing Strainer Check Valve

To install the strainer check valve, proceed as follows:

1 If the unit is equipped with the check valve option, insert the dome strainer into the bore.

2 Clean any debris from the check valve and carefully inspect the gaskets.

3 Insert the check valve assembly or strainer support into the corresponding pumping unit bore (see Figure 6-29 on page 6-53). Press the assembly squarely over the receiving cylindrical surface until the gasket seats over the surface and holds the assembly in position.

4 Insert a new or cleaned strainer into the bore, over the check valve assembly.

5 Clean any debris from the strainer cover and install a new gasket.

6 Install the strainer cover. Hand-tighten and keep the cover parallel to the casing face. Torque the screws to 150 lbs-in (17 Nm). Do not overtighten as it may cause damage.

7 Replace the plug in the hole of the strainer cover.
Note: Use a UL-approved sealant suitable for the fuel involved.

Service Tips

- Clogged strainers must be frequently cleaned using denatured alcohol. If damaged or permanently clogged, replace the strainer.
- If check valves are sticking, it may cause reduced flow rate. If stuck open, check valves cause the loss of unit prime.
- It is a good service practice to replace the strainer cover gasket when servicing the strainer or check valve. This will help avoid subsequent leaks.

Servicing Pressure Control Valve (PCV)

This section explains about servicing the PCV.

Removing PCV

The purpose of the PCV is to apply a slight back pressure to the pumping unit, to prevent it from pumping air through the meter (for example, during a dry tank situation). Meters will meter air as well as fluid.

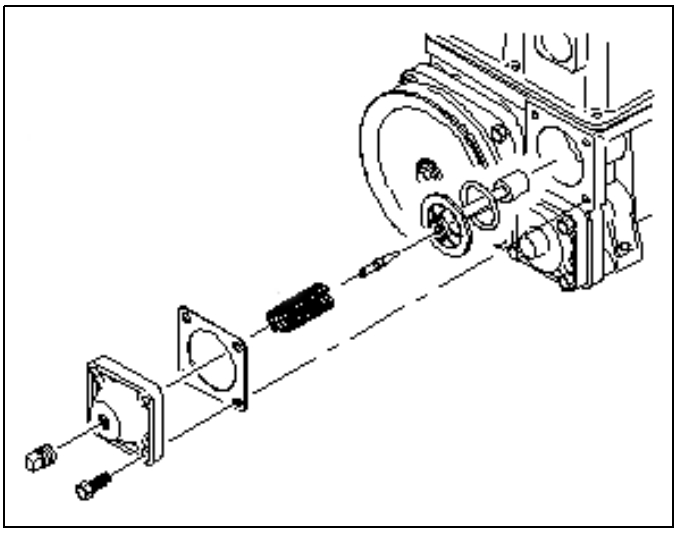
Excessive wear or a sticking PCV can cause improper pump performance, including flow loss, excessive or low discharge pressure, or metering of air under a dry tank condition.

To remove a PCV, proceed as follows:

1 Drain the pumping unit. Refer to "Draining GPU" on page 6-52.

2 Remove the snap ring (see Figure 6-30).

Figure 6-30: PCV



3 Turn the valve cover outward or counterclockwise using a 16 mm socket wrench until it is completely removed.
Note: The cover is held on by bolts and not screwed in.

4 Remove the spring and valve.

5 Remove the valve from the bore using needle nose pliers.

Installing PCV

To install a PCV, proceed as follows:

IMPORTANT INFORMATION

Modification of the PCV or failure to correctly install all components of the PCV will **void** any regulating agency recognition applicable to this pump.

1 Inspect the valve for damage or excessive wear. Replace the valve, if required.
Note: The valve must move in and out of the valve bore freely, with only minor resistance. If it does not, check for burrs or contamination in the bore or on the valve.

2 Install the PCV in the reverse order of removal (see Figure 6-30 on page 6-55).

3 Apply a thin coat of grease on the cover of the gasket to prevent the gasket from being damaged during installation.
Note: Replacement of the gasket is recommended if the gasket has not been replaced during previous service, and is older than six months or shows signs of deterioration.

Service Tips

- PCVs normally fail from excessive wear or sticking.
- Symptoms of failure may be reduced flow rate, reduced pressure, or metering of air with a dry tank.
- The plug in the cap can be removed and a discharge pressure measurement can be taken, using a gauge at that point. The gauge will measure the pressure downstream from the control valve. A stuck valve will result in lower pressure.

Servicing Bypass/Pressure Relief Valve (PRV)

The PRV functions to prevent excessive pressure from being built up internally within a pumping unit. Excessive pressure can cause overheating during idling, motor stalling, or premature motor failure. Low factory pressure settings can cause low flow rate. Relief settings are set for normally anticipated operation with the unit style, and must not be changed from factory settings.

WARNING

• Wear eye protection. Residual pressure and entrapped fuel may still be present and may drain or spray while removing the parts.

• Fire and explosion could result in severe injury or death.

• Test and close the shear valves involved. Shut off power to the unit.

• Remove the parts slowly. Collect fuel in approved containers.

• Clean up all spills promptly.

Service Tips

- Adjustment of pressure in the PRV is not recommended normally. A lower adjustment can result in low flow rates. A higher adjustment can result in premature motor failure.
- While inspecting or installing PRVs, avoid introducing contamination into the unit.
- PRVs normally fail only from excessive wear, especially at the seat or in the valve bore area, or sticking from defective parts or contamination. Low flow, high pressure (motor failures and so on), overheating, or noise can result in PRV failure.
- Replace the external seals while inspecting or servicing the valve, if the seals are more than six months old or appear degraded.
- Units that are idle for excessive time with the motor running and no fuel being dispensed may overheat resulting in vapor lock and so on. Use pump time-outs (Electronic units) or lower pressures to reduce this possibility.
- When the pumping unit is operating at full speed, the discharge pressure must not exceed 50 psi (3.5 bar) with any discharge restriction (fully open to fully close discharge). If the pressure exceeds 50 psi (3.5 bar), refer to the following table:

Cause	Solution
Bypass/PRV is stuck operating at full open position.	Replace the valve.
Excessive voltage to the motor.	Measure proper input voltage to the motor.

Optimizing Adjustment on Pump Bypass Preload

It is not recommended to alter the bypass adjustment from the factory setting. However, if the flow rate is low, and other means of increasing flow rate, such as cleaning filters have been performed, adjustments can be made if the motor amperage is low.

1 Connect an amp probe to a power leg of the motor.

2 Operate the unit at full flow and in bypass, and record the amperage.

3 If the amperage is found to be substantially below the rated amperage, bypass adjustment can be made using the following procedure.

Note: Before making adjustments, ensure that the motor has been switched off.

To optimize the bypass preload, proceed as follows:

1 Remove the adjustment cap on the pumping unit.

2 If the amperage from the initial test is low, turn the adjustment screw clockwise and increase the preload (and the flow rate and motor load).
Note: If the initial bypass voltage is below 205 V for a 220 V system, or below 100 V for a 110 V system, then the wiring is insufficient to handle full motor loads. In such a case, the maximum amperage must be set to a maximum of 4.9 A on a 220 V system and 9.5 A on a 110 V system.

3 Run the unit and check the amperage at full flow and at bypass (both must be checked to verify proper loading on the motor).

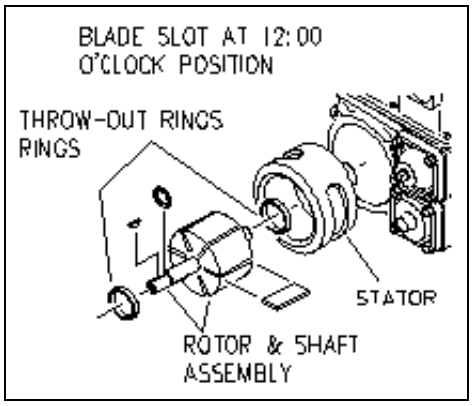
4 Adjust the screw to obtain amperage just below the maximum setting noted on the motor faceplate.

5 Replace the adjustment cap. Disconnect the amp probe and replace the J-box cover.

Servicing Rotor and Shaft Assembly

The rotor and shaft assembly is the heart of the pumping unit. It creates the flow and pressure supplied by the pump.

Figure 6-31: Rotor and Shaft Assembly



WARNING

- Wear eye protection. Residual pressure and entrapped fuel may still be present and may drain or spray while removing the parts.
- Fire and explosion could result in severe injury or death.
- Test and close the shear valves involved. Shut off power to the unit.
- Remove the parts slowly. Collect fuel in approved containers.
- Clean up all spills promptly.

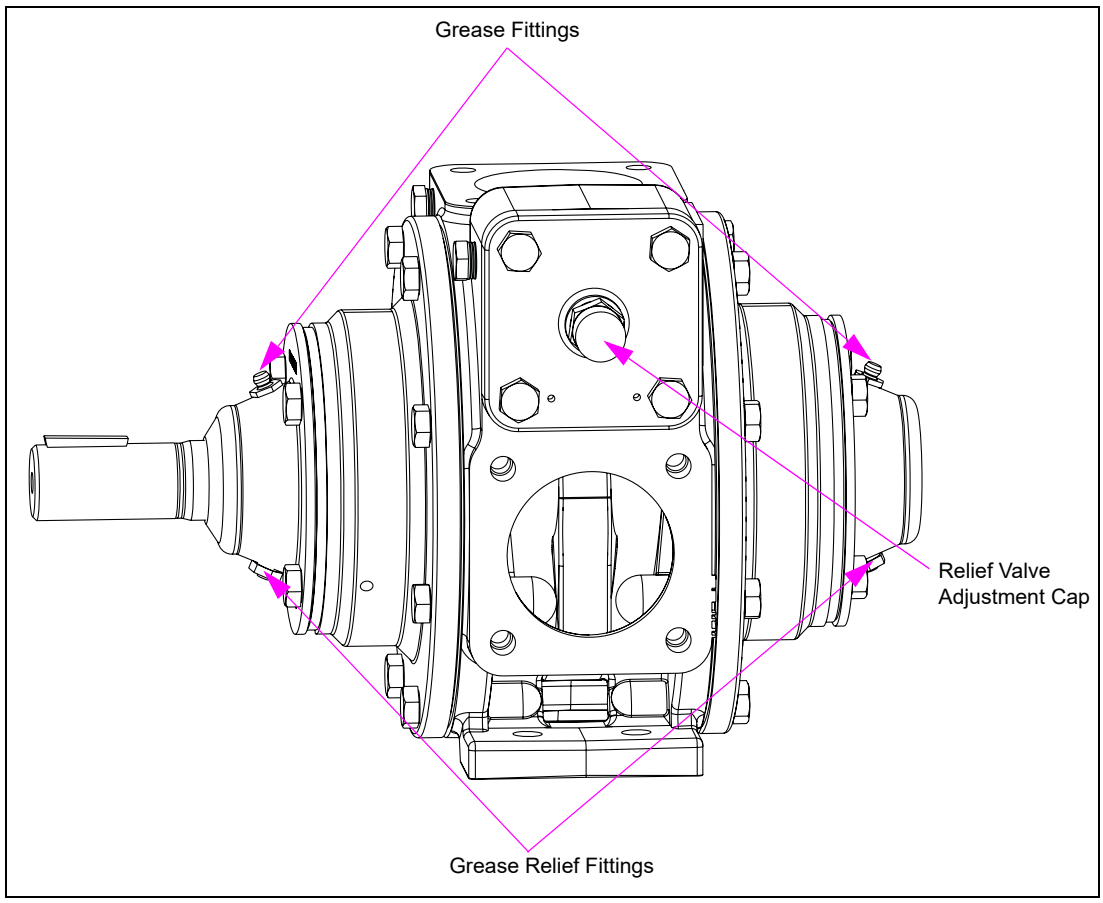
Service Tips

- The normal failure mode for pumping elements is excessive wear. Occasionally, a seizure in the bore can result. Wear/seizure can result in either lower or very low flow, or less commonly motor stalling, and very occasionally noise.
- If the pumping elements appear with minimal wear and the symptom is noise or low flow, usually there is an installation issue starving the pump or an issue with the Bypass/PRV, Control Valve, or a component downstream.
- Avoid introducing contamination into the unit while inspecting or replacing the pumping elements, including the rotor and shaft. Always use the strainer provided and ensure that it is not clogged.
- Some pumping elements have grooves in the blades manufactured, on purpose. While replacing the blades, always install new blades in the same orientation.
- A shot of clean oil in the bore after replacing the pumping elements will aid in priming and initial start-up.
- Excessive belt tension may cause failure of the pumping elements or bearings.

XU2A Pumping Unit for 9850K

Figure 6-32 shows the XU2A pumping unit for 9850K.

Figure 6-32: XU2A Pumping Unit



About XU2A

Self-contained Gasboy Atlas 9850K models use the Blackmer XU2A pumping unit.

Note: For additional maintenance, servicing and troubleshooting information of the XU2A, refer to MDE-4320 Gasboy UHF Pump Blackmer XU2A Rebuild Kit Installation Manual.

General XU2A Service Procedures

To perform general XU2A service, proceed as follows:

Start-up Procedure

Note: If problems occur during start-up, refer to "Troubleshooting Tables" on page 7-1.

1 Start the motor. Priming must occur within one minute.

2 Check the vacuum and pressure gauges to ensure that the system is operating within the expected parameters. Record gauge readings for future reference.

3 Inspect the piping, fittings, and associated system equipment for leaks, noise, vibration and overheating.

4 If possible, check the flow rate to ensure that the pump is operating within the expected parameters. Record the flow rate.

WARNING

Incorrect settings of the PRV can cause system component failure, personal injury and property damage.

5 Check the pressure setting of the PRV by momentarily closing a valve in the discharge line and reading the pressure gauge. This pressure must be 10-20 psi (69-138 kPa) higher than the maximum system operating pressure, or the external bypass valve setting (if equipped). Do not operate the pump against a closed discharge valve for more than a minute.

Draining Pump

To drain the pump, run the pump with the discharge valve open and intake valve closed. Bleed air into the pump through the intake gauge plug hole or through a larger auxiliary fitting in the intake piping. Pump air in 30 second intervals to clean out most of the pumpage.

Note: Some residual fluid will remain in the pump and piping.

Pump Relief Valve

Note: The pump internal relief valve is designed to protect the pump from excessive pressure and must not be used as a system PCV.

Pumping volatile liquids under suction lift may cause cavitation. Partial closing of the discharge valve will result in internal relief valve chatter and is not recommended. For these applications, install an external system PCV and required bypass piping back to the storage tank.

A system PCV is also recommended while operating for extended periods (more than a minute) against a closed discharge valve.

Setting Relief Valve

The factory relief valve pressure setting is marked on a metal tag attached to the valve cover. It is recommended that the relief valve be set at least 10-20 psi (69-138 kPa) higher than the operating pressure or the system PCV setting.

⚠ WARNING

Relief valve cap is exposed to pumpage and will contain some fluid.

⚠ CAUTION

Incorrect settings of the PRV can cause system component failure, personal injury, and property damage.

Adjusting Relief Valve

To adjust the PRV, proceed as follows:

Note: Numerical references are included to indicate part identification.

1 To increase the pressure setting, remove the relief valve cap (1) and gasket (88), if equipped. Turn the adjusting screw (2) inward or clockwise. Inspect the PRV cap gasket (88) and replace, as required. Reattach the PRV cap gasket and replace, if required. Reattach the PRV cap, if equipped.

2 To decrease the pressure setting, remove the relief valve cap and gasket. Turn the adjusting screw outward or counterclockwise. Inspect the PRV cap gasket and replace, as required. Reattach the PRV cap gasket and replace, if required. Reattach the PRV cap, if equipped.

Pump Lubrication

The pump's ball bearings must be lubricated every three months (at minimum). More frequent lubrication may be required, depending on the application and operating conditions.

Recommended Grease

Exxon® - Ronnex MP Grease
Mobil® - Mobilith AW-2 (64353-6) Grease, or equivalent

Sump for 9850K

Sumps do not require a periodic inspection, unless leaks or problems occur. Careful troubleshooting will help determine whether to replace the entire sump or individual parts.

Service Tips

Read and follow all safety precautions as outlined in "Read This First" on page 6-1.

Sump overflows can be caused by:

- Defective sumps
- Air in pumping unit inlet lines
- Wrong sump type installed
- Internal sump float stuck

To determine possible causes, refer to "Sump Overflows".

Above ground tanks must have a pressure regulator valve installed at the base of the pump. Installation at other locations can cause flow or sump overflow problems. Ask Gasboy for the valve type and follow the manufacturer's instructions completely for installation.

Sump Overflows

Use the following table to help troubleshoot sump overflows:

If Sump Is Overflowing		Check These Items/Probable Cause
Only in bypass	With above ground tank	Anti-siphon valve
	With tank less than 3-feet of product	Replace pump
Sporadically in bypass		• Small air leak (check all connections). • Missing or defective check valves • Leaky piping
Only at start-up		• Missing or defective check valves • Leaky piping
Only at full flow or both full flow and bypass		• Air leak (check all connections) • Shared suction lines with missing or defective check valve • Leaky piping

If after checking the above probable causes, the sump continues to constantly overflow in full flow or shortly after being placed in bypass, then replace the sump.

Pump Motor

About Electric Motor for Self-contained Pump Units

This section explains about the electric motor for self-contained pump units.

Motor Loads

The following chart shows the maximum running amperage that can be expected for the pump motor, unless noted otherwise:

Model	Motor Rating			
	115 V 50/60 Hz 1PH	230V 50/60 Hz 1PH	230V 50/60 Hz 3PH	380V 50/60 Hz 3PH
8X5XK, 9X52K, 9X53K	13 A	6.5 A	3.4 A	2.3 A
9X40K	13.0 A per motor	6.5 A per motor	3/4 A per motor	2.3 A per motor
9850K		9.75 A		

Thermal Overload

Most motors have a thermal overload switch to open the circuit automatically if the motor is overheated or drawing excessive current. When the switch cools, it activates and turns the motor back on. Motors do not require a manual reset. The 220/380 VAC motors do not have a thermal overload switch.

If overload shut-off occurs frequently:

- Check the voltage switch for proper voltage selection (110/230/240) (see Voltage Selection Switch on page 6-64). For three phase motors, check for proper wiring.
- Check for free pump and motor shaft rotation.
- Check the Pump Bypass Valve and relief pressure setting.
- Check the belt tension.
- Check the line voltage during operation with the nozzle closed and then with the nozzle open. Low or high voltages (greater than +/- 10%) can cause overheating or premature failure.
- NFPA requires explosion-proof motors. Only use an Atlas-specified explosion-proof motor for replacement.

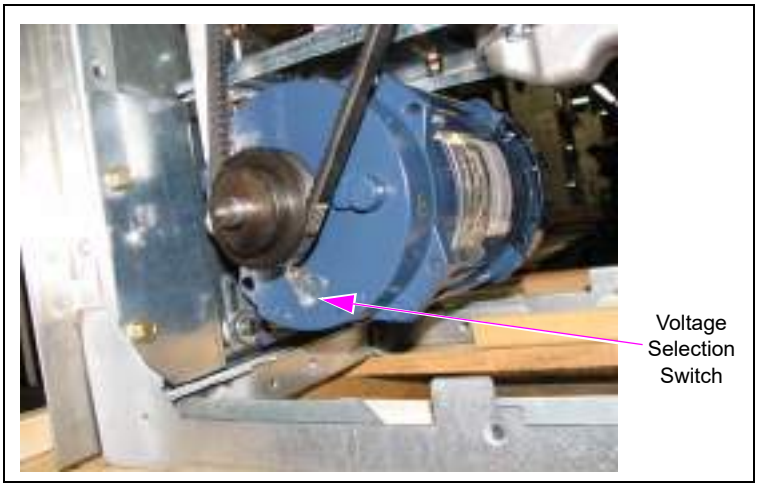
Service Tips

- Frequently, low voltages during operation can result when the PRV is set to too high a pressure, or wiring to the motor is inadequately sized for the motor load.
- Premature motor failures are usually caused by continuous operation at too low a voltage or high pressure setting at the PRV.

Voltage Selection Switch

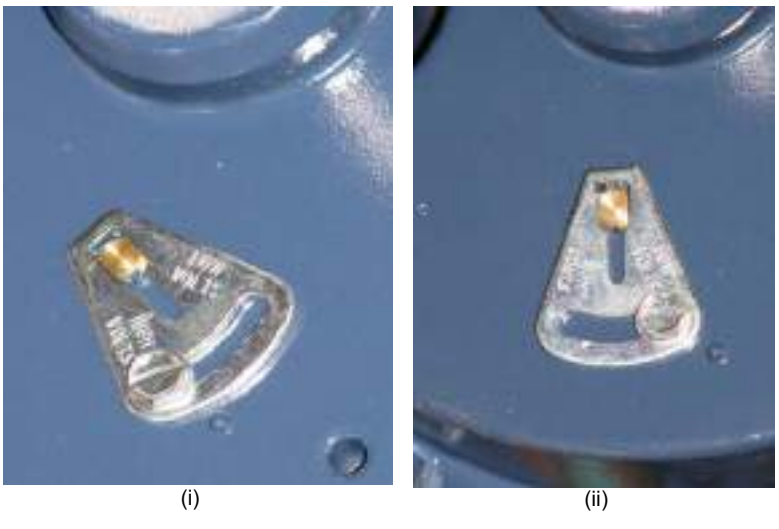
Most of the single-phase motors have a Voltage Selection Switch. This switch provides the ability to set the motor to match the supplied AC voltage. There are two possible switch positions, LOW VOLTS or HIGH VOLTS. Set the switch to LOW VOLTS when the supplied voltage is 110-120 VAC. Set the switch to HIGH VOLTS when the supplied voltage is 208-240 VAC.

Figure 6-33: Voltage Selection Switch



To change the switch setting, disconnect power to the motor. Never change switch setting while motor is running, or power is being supplied. Loosen the screw (DO NOT REMOVE) at the end of the level, slide level to the desired setting, and re-tighten the screw.

Figure 6-34: Changing the Switch Setting



Belts and Pulleys

The following information is required to inspect and service the belts and pulleys:

Inspecting Belts and Pulleys

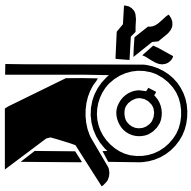
Check belts and pulleys every time you inspect or change belts. Replace them if any of these conditions exist:

- Excessive wear in the pulley grooves, on the pulleys, belts, excessive pulley-to-shaft clearance, or excessive bearing play
- Cracks or linear separations in the belt
- Frayed belts or excessively worn belts

Service Tips

- Excessive belt tension can cause motors or the pumping unit to fail prematurely.
- Excessively low belt tension can cause premature belt failure, noise or pulley failure as well as reduced flow rate.

⚠ WARNING



Belts and pulleys can pinch fingers and hands.

Injuries may result. Avoid placing fingers or hands between belts and pulley.

Never apply power while fitting the belt to the pulley.

Setting Belt Tension

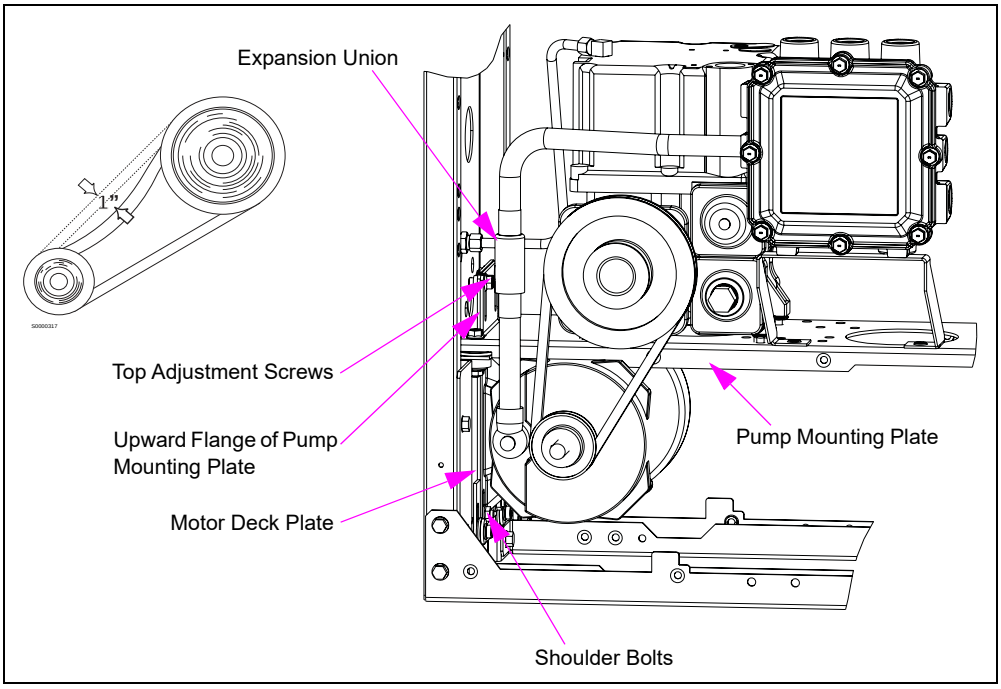
Overtightened belt tension can cause both pump and motor bearing to excessively wear out and lead to premature failures. Loose belts result in low flow, pulley and belt failures, or noise. Use the following rating of belt tension: 45-55 lbs (200-244 Newtons).

Do not run the motor to install the belt. The belt is tight during assembly. Some belts have arrows marked on them to show the direction of rotation. While replacing the belts, ensure that the arrows point in the direction of rotation.

Belt Adjustment

If no tension gauge is available, push the belt in as shown in Figure 6-35. If there is more than 1-inch of play on one side of belt, tighten it.

Figure 6-35: Adjusting Belt



Inspecting Pulleys

Check every time you inspect or change the belts. Replace if these conditions exist:

- Excessive wear in grooves, excessive pulley-to-shaft clearance, or excessive bearing play, cracks, and so on.

Adjusting Belt

To adjust the belt, proceed as follows:

1. Loosen the two shoulder bolts at the bottom of the motor deck plate.
2. Loosen the two screws that attach the top of the deck plate with the upward flange on the pump mounting plate.
3. Lift the motor to loosen the belt.
4. To tighten the belt, insert a large screwdriver or crawbar between the motor and pump mounting plate, and push down in front, forcing the motor downward.
5. The Expansion Union will permit upward or downward adjustment with the conduit attached.
6. After you have achieved the proper belt tension, tighten the two upper screws, and then the bottom shoulder bolts.

Valves

WARNING

- Wear eye protection. Residual pressure and entrapped fuel may still be present and may drain or spray while removing the parts.

- Fire and explosion could result in severe injury or death.
- Test and close the shear valves involved. Shut off power to the unit.

- Remove the parts slowly. Collect fuel in approved containers.

- Clean up all spills promptly.

Flow Control Valves regulate the flow rate. Check valves at the manifold and meter help keep the meter full of fuel. Manifold and Meter PRVs also help relieve excessive pressure due to thermal expansion, which could damage parts or make nozzles difficult to open.

Solenoid Valves

Solenoid valves use a solenoid coil to open or close a valve. Valves of this type are either fully open or fully closed. Servicing consists of replacing the coil, valve body, or board supplying voltage to the valve. For most Gasboy Commercial units, the voltage of the solenoid must match whatever voltage is being supplied to the AUTH line input. Gasboy retail and DEF units use the 115 VAC solenoid. Gasboy Commercial E85 uses a 24 VDC solenoid. If the solenoid requires replacement, ensure that you replace with the correct voltage solenoid.

Gasboy Atlas units have solenoid valves either built into the manifold, or as components in the discharge piping line.

Atlas models 8700, 8880, 9152, 9153, 9852, and 9853 have a 1-inch 2-stage solenoid valve built into the manifold. For service, refer to “Meters” on page 6-26.

All Atlas models that can have internal piping for feeding a satellite use a solenoid valve in the discharge piping line. These models are 9140, 9840, 9850, and 9152/53 or 9852/53 with a “S” suffix. For repair or replacement of these valves, read this section.

Rebuilding or Replacing

Labor cost for your area may determine your service philosophy. High labor costs favor parts replacement. The difficult removal of a part from a unit favors a partial rebuild in the unit. Gasboy recommends the following services for average or lower than average labor costs:

For Valves	Recommended Service
Less than two years old	Use a repair kit (replace spring, diaphragm, and O-rings)
More than two years old or high usage	Replace the valve

To rebuild or replace a solenoid valve, proceed as follows:

1. Close and test the shear valves for dispensers.
2. Shut off power to the unit and for any involved STPs in the dispensers. Use OSHA lockout/tagout procedures.
3. Open the nozzle into an approved container to bleed of any pressure. Some residual pressure may remain.
4. Check the disconnected valve coils for continuity. If the coil is bad, replace the coil.
5. Replace any valves, if they are defective.
6. Use a UL-approved sealant required for fuels while replacing valves. Do not use Teflon tape. Teflon tape debris may cause the valve to malfunction.
7. Clean the valve area. Do not introduce contamination into the valve or piping.
8. Install valves with the flow arrow in the proper direction.

Service Tips

If no magnetic field or power exists, the following are likely problems:

- Power from the valve driver board
- Cable problem

If power exists, the following may be likely problems:

- Coil
- Valve body

Solenoid Valve and Filter Manifold

WARNING

- Wear eye protection. Residual pressure and entrapped fuel may still be present and may drain or spray while removing the parts.
- Fire and explosion could result in severe injury or death.
- Test and close the shear valves involved. Shut off power to the unit.
- Remove the parts slowly. Collect fuel in approved containers.
- Clean up all spills promptly.

About Valve and Filter Manifolds

The Valve and Filter manifold connects to the meter inlet and provides filtration upstream of a built-in 1-inch 2-stage solenoid valve. Filters must be selected and changed as per "DEF Magmeter" on page 6-37. The valve diaphragm and coil are the serviceable parts. Use Gasboy recommended kits for valve repair. Follow the instructions provided in the kit.

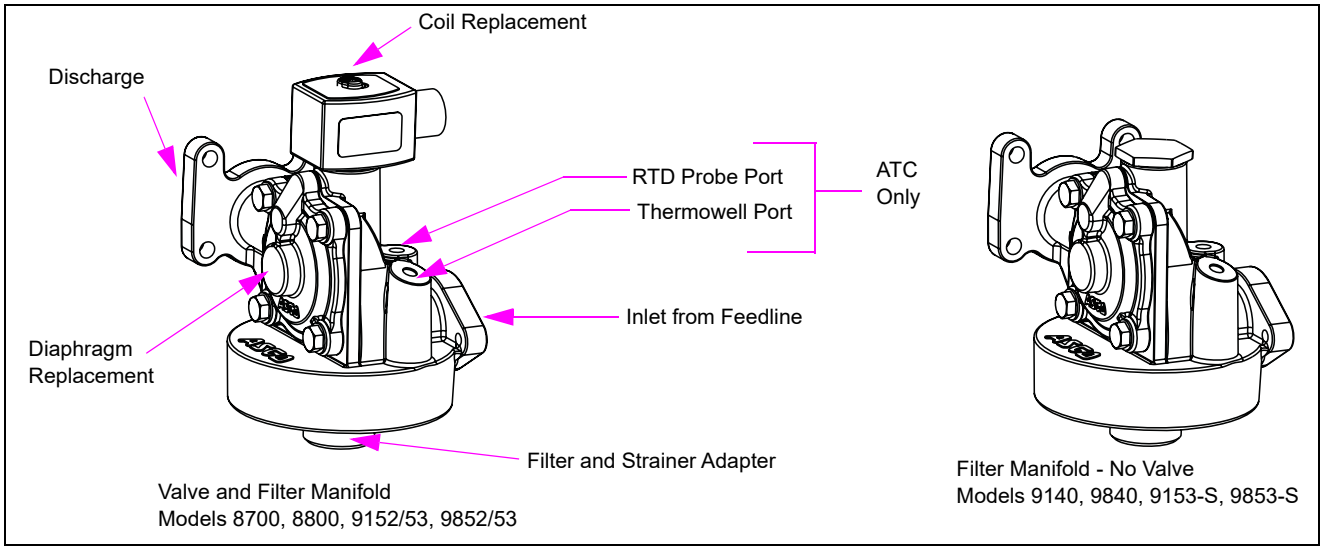
Recommended Solenoid Valve Repair Kits

Kit Description	Kit No
ASCO Diaphragm Repair Kit	M04607K010
ASCO Coil Replacement Kit - 110/120V	M04607K012
ASCO Coil Replacement Kit - 220/240V	M04607K013

The manifold also provides probe and thermowell ports for the ATC option.

There is also a no-valve manifold used on models that have a piping to satellite provision. This provides filtration, but there is a separate valve downstream of the meter.

Figure 6-36: Valve and Filter Manifold



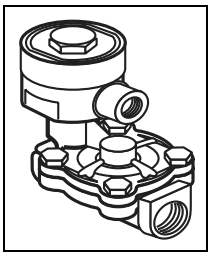
Service Tips

While reinstalling the strainer, always install it with tabs pointing downwards. Hand-tighten the filter and do not use a wrench.

Solenoid Valves for 9X40, 9850 and 9X53 with Satellite Outlet Piping

Figure 6-37 shows the solenoid valve with satellite outlet piping for 9X40, 9850, and 9X53 models.

Figure 6-37: Solenoid Valves with Satellite Outlet Piping



Troubleshooting

Problem	Recommended Solution
No flow or slow or fast flow	Check the valve power and then hydraulic parts (diaphragm, spring, core, and so on)
Pulsing flow	Check the hydraulic part of the valve
Missed Preset	Check the hydraulic part of the valve and unit firmware
Delivery is indicated but nozzle is closed	Check the valve diaphragm, STP check valve, or use of softwall hose

Rebuilding or Replacing

Labor cost for your area may determine your service philosophy. High labor costs favor replacement. Difficult removal from unit favors partial rebuild in the unit. Gasboy recommends the following services for average or lower than average labor costs:

For Valves	Recommended Service
Less than two years old	Use a repair kit (replace spring, diaphragm, and O-rings)
More than two years old or high usage	Replace the valve

Service Steps

Read and follow all safety precautions as outlined in "Read This First" on page 1-1 and at the start of this section.

To service solenoid valves, proceed as follows:

1. Power up and check power to the valve.
2. Shut off power to the unit. Check the disconnected valve coils for continuity.
   - Resistance across coils is 200-500 Ohms (approximately) for most single-stage valves.
   - Two-stage valves have two coils with two different resistances, 200 and 500 Ohms (approximately).
   - Resistance across the coils on an E85 unit is 39-47 Ohms (approximately).
3. Replace the valves and/or coils if readings are out of tolerance.

4 Use UL-approved sealant (as required) while replacing the valves.
Note: Do not use Teflon tape.

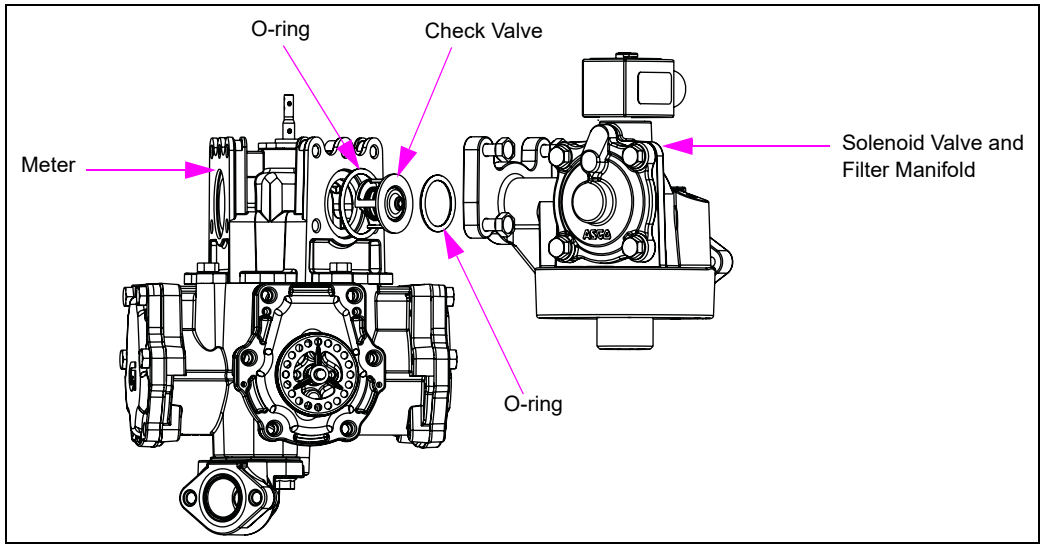
5 Clean the valve area. Do not introduce contamination.

6 Install valves with the flow arrow in proper direction.
Note: Two-stage valve torque specifications on Hexagonal Head bolts is 130+/- 10-inches lbs.

Meter Check Valve

This section explains about servicing the meter check valve.

Figure 6-38: Check to Meter Orientation



Potential Problems

The following are the potential meter check valve problems:

- Damage to hydraulic parts can occur from thermal expansion or driving over a hose, if the valve is inoperative.
- If a valve sticks open, a sale may register when you first turn the nozzle hook On with the nozzle closed. Check STP check valves for problems.
- Stuck valve can cause reduced flow rates
- Leaks
- Calibration problems

Service Steps

The following are the steps for servicing the meter check valve:

- Check valves are not rebuildable. Replace any defective check valves.
- Wear eye protection while replacing any check valve.

To service valves, proceed as follows:

1 Close and test the shear valves for dispensers.

2 Shut off power to the unit and any involved STPs. Use OSHA lockout/tagout procedures.

3 Open the nozzle into an approved container to bleed pressure. Some residual pressure may remain.

4 Use a Gasboy Atlas repair kit to replace the check valve.

5 Inspect the metallic seat of the valve body for damage or uneven seating surfaces.

6 Clean any contamination from the valve body interior.

7 Torque bolts properly. Refer to "Torque Specifications" on page 6-8.

Shear Valves

Shear valves have a section of the valve that is designed to break from an impact to the unit. Shear valves cut off the flow of fuel from the product piping if the impact or fire causes the shear valve linkage to trip. Single poppet shear valves only stop fuel at the product piping. Double poppet shear valves also stop fuel from draining out of the dispenser.

⚠ CAUTION

Improper wrench technique may damage the shear valve and lead to leaks. Excessive force applied to the shear valve during fitting and tightening may damage or weaken the shear section of the valve. Always use two wrenches; one wrench to hold the valve above the shear line and another wrench to apply force to the fitting.

UL requires all dispensers to use shear valves. Follow these recommendations while installing or servicing shear valves:

- Read and follow the shear valve manufacturer's service instructions.
- Ensure that there is free movement of the linkage.
- Lubricate the valve linkage as per the manufacturer's instructions.
- Follow the manufacturer's recommendations while installing the valves first.
- Shear section of valves must be flush with top of islands.
- Do not mount the valve upside down.
- Rigid cross member and mountings are important devices for proper operation of the system. Anchor shear valves rigidly.
- Inspect the valves every six months. Ensure that the valve linkage is free and clear from any debris, conduit, piping, or any other obstruction. Lubricate the linkage with SAE 10W motor oil.
- Gasboy highly recommends that you always use the double-poppet shear valve instead of single-poppet when replacing valves. Use of double-poppet shear valves may require some internal plumbing changes in older units. Double-poppet shear valves prevent fuel from draining from the unit, which has been knocked off the island.
- Do not use pliers to open or close shear valves. Reduce the pressure if the valve does not open easily. For proper tools and procedures, refer to the shear valve manufacturer's instructions.

Model 9850KXTW1 Shear Valve Configuration

The Atlas Ultra-Hi with Twin Inlet Manifold requires a special inlet configuration because of the limited base to manifold distance. Gasboy recommends the Marrison Bros. 2-inch 636F Shear Valve with a union attached at the bottom of the valve, to connect to the service system piping.

Note: This configuration is for the Atlas Model 9850KXTW1 only. All other Atlas models must use a standard inlet configuration.

All shear valve anchoring requirements noted in this section apply.

Figure 6-39: Atlas 9850KXTW1 Model Recommended Inlet Configuration

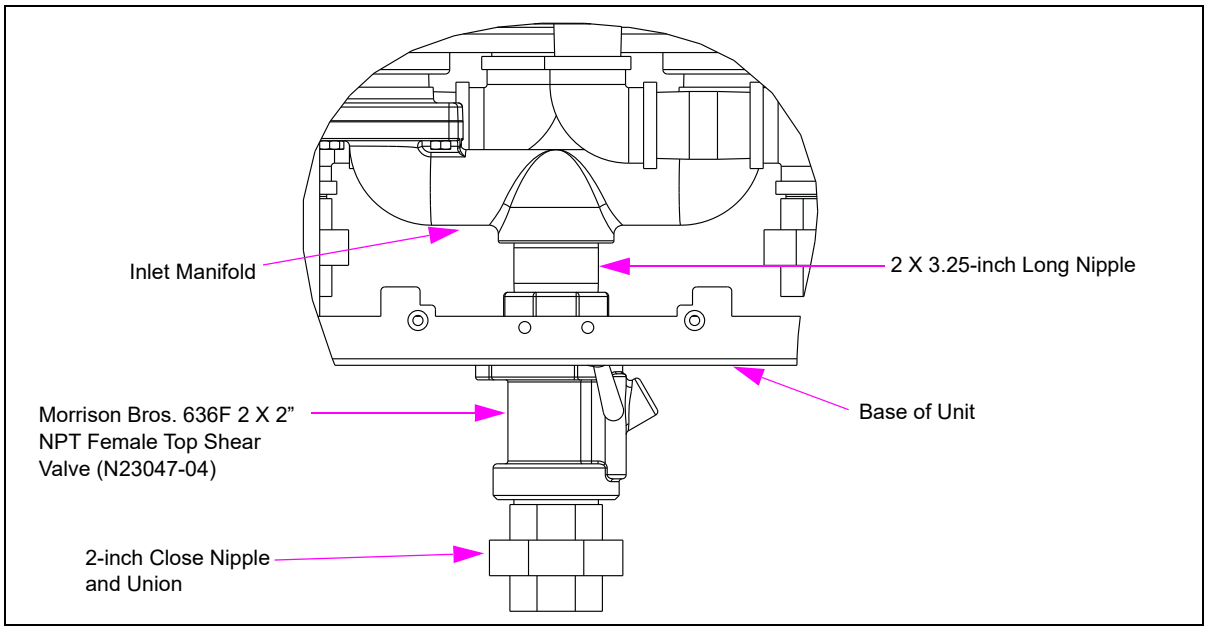


Figure 6-40: Typical Shear Valve Linkage

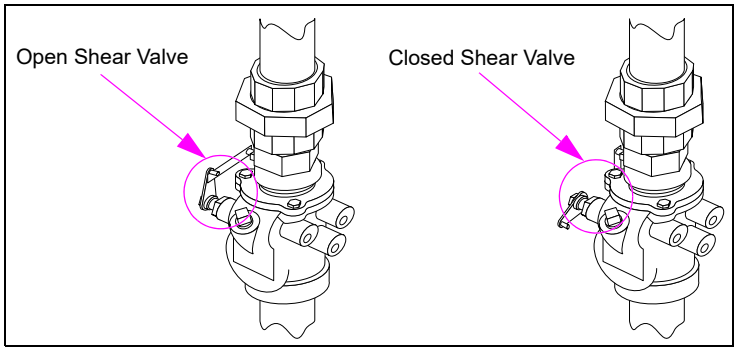
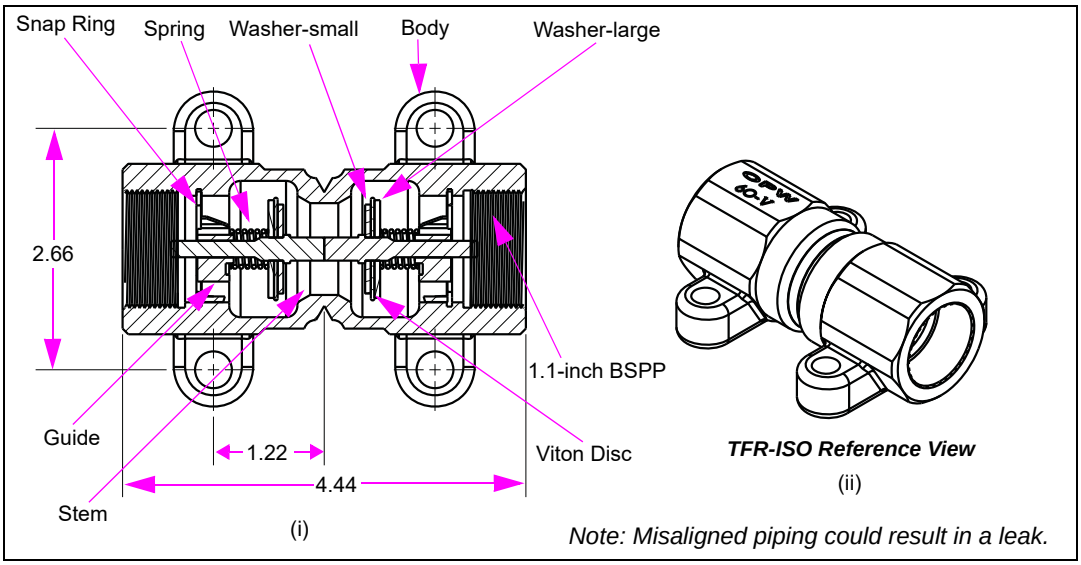


Figure 6-41: OPW Shear Valve for 9862KXTW1 DEF Unit



Inspecting Shear Valves

⚠ WARNING

Always confirm proper operation of the shear valve before performing the hydraulic service that requires the shear valve to be closed. In some instances, a shear valve may outwardly appear closed but could actually be open.

To inspect a shear valve, proceed as follows:

1. Close the shear valve. Authorize the hose at the console, as required.
2. Lift the operating handle.
3. Place the discharge nozzle in an approved container.
4. Squeeze the nozzle operating lever. If the flow continues after several seconds, it indicates that the valve is defective.
5. Repair or replace the valve.
6. Place a few drops of SAE 10 W motor oil or equivalent on the valve body shaft after testing. Open and close the valve by hand several times. Place the valve back in service.

T-52A Pressure Regulator Valve Option

The Model T-52A PRV is a unique control valve developed for use with suction-type island dispensers. It can be used for above ground storage tank installations or in booster systems, with a submersible pump in an underground storage tank.

The standard Model T-52A PRV is designed for temperatures up to -13°F (-25°C). A T-52A cold option is available for applications, where the valve must operate in temperatures between -13 °F to 40 °F (-25 °C to -40 °C). The T-52A-Cold Valve is not for use with methanol/ethanol applications.

Vapor Recovery Stage 2 Balance Type

Stage 2 Balance Type Vapor Recovery uses a coaxial hose and nozzle with bellows to remove vapors. A liquid evacuation device (Venturi or Co-Vent®) installed in the coaxial hose, removes liquid splashback from the vapor hose passage.

- Vapor Recovery hoses must never touch the ground when nozzle is at rest in the dispenser.
- Promptly replace the damaged hoses, nozzle bellows or face seals.
- Inspect parts daily.

Troubleshooting

Read and follow all safety precautions as outlined in "Read This First" on page 1-1.

The following table lists possible problems and their causes:

Problem	Possible Causes
Meter runs on without leaking.	• A leaking inner hose O-ring. • Inner hose leak. • Leaking hose Venturi or Co-Vent check valve.
Venturi or Co-Vent does not drain hose.	• Leaking hose or O-ring. • Leaking Venturi or Co-Vent check valve. • Improperly positioned Venturi or Co-Vent pick-up (must be near the normal low drape of the hose). • Hose installed upside-down.
Nozzle clicks-off prematurely.	• Trap in underground plumbing. • Trap at dispenser plumbing (do not use rubber hose). • Restricted vent at tank. • Bad nozzle. • Topping off of tanks by customer. • Defective Venturi or Co-Vent.

Mechanical Computers

Although the mechanical computers used in Gasboy pumps are carefully adjusted and lubricated at the factory before shipment, they require (as do all mechanical parts) occasional cleaning and lubrication when in service. The intervals at which this must be done vary with conditions of operation. Under normal conditions, service of computers is required only twice a year, or after each 100,000 gallons (378,000 liters) delivered.

Shut off and lockout the AC power to the pump. It is easier to clean and oil the mechanical computer if you remove it from the pump. Clean the mechanical computer with compressed air and wipe all accessible parts (such as figure wheel drums) with a clean cloth.
Note: Always wear protective safety goggles or glasses while using compressed air.

Never use solvents, such as gasoline or kerosene, as this will be trapped in many of the inaccessible bearings and dissolve the new lubricant when it is applied.

A light, non-acid type oil (SAE 10) is recommended as it gives maximum protection in varying temperatures. The oil must also be acid-free so that it will not cause corrosion of the cast metal parts. A long handled, fine lettering brush is very convenient for applying the oil to all bearings and shafts and for applying light, non-fluid oil (grease with body similar to that of chassis lubricant) to bevel-type gears.

DEF Nozzle

The DEF nozzle is designed to dispense DEF. No other nozzle type is currently approved. The DEF nozzle is manufactured by Elaflex/OPW (Elaflex Slimline ZVA).

- The nozzle is a non-vapor recovery nozzle. Conventional performance and troubleshooting procedures for non-vapor recovery nozzles are also applicable to the DEF nozzle.
- In addition to fluid compatibility, some nozzles require a ring magnet to be slipped over the spout to dispense DEF. Normally this ring magnet is part of the construction of the vehicle DEF tanks. It helps to prevent DEF from being dispensed into the diesel tank that will result in severe damage to the engine. The technician must have a ring magnet or its equivalent to dispense DEF through the nozzle during tests. The test ring magnet (M10656B001) is available from Gilbarco.
- The nozzle handle also contains the activation magnet that is part of the pump handle system.
- The nozzle can freeze if the cabinet heater fails, power is lost, or the nozzle door does not drop down completely during cold weather. The nozzle must be checked for leaks and operation after thawing.

Nozzle Door Mechanism (Cold Weather Units Only)

The Nozzle Door Mechanism protects the nozzle, hose and breakaway from freezing by retrieving the components into the heated cabinet and covering them with a drop down door.

- The door mechanism must drop down completely without assistance to cover the nozzle, and so on when holstered. For cold environments if this does not happen, the nozzle, hose and breakaway may freeze. If the door does not close on its own, repair is required.
- When using the nozzle always maintain control manually of the nozzle as the hose retriever could pull the nozzle out of the tank, prover or other receptacle.
- Missing or damaged curtains must be replaced.
- Curtains must close completely to ensure heat is retained in the nozzle vicinity or nozzle freezing may occur during very cold weather.

7 – Troubleshooting Tables

Introduction

Purpose

This section provides information regarding troubleshooting Atlas pumps/dispensers.

Important Information About Releases

Sections of this manual may be released or updated independently to supply the most current data. Information about release date and version for independently released sections will be included in the section title and footer of the document. For the latest updates, refer to GOLD.

This section was last updated in July 2013.

Topics in This Section

How to Use This Section

Example

A customer calls and says, “I don’t have any displays on one side of the pump.”.

1 Write down the following information while talking to the customer:

Request this Information	Example
Store number and location	Store number 1234; 211 Any Street
Pump or Dispenser type	Gasboy/Atlas
Model number	
Serial number	
Options on the unit	
Hose number(s) involved	
Symptoms found	No displays on one side of unit
Any history information	No history of other problems on this unit

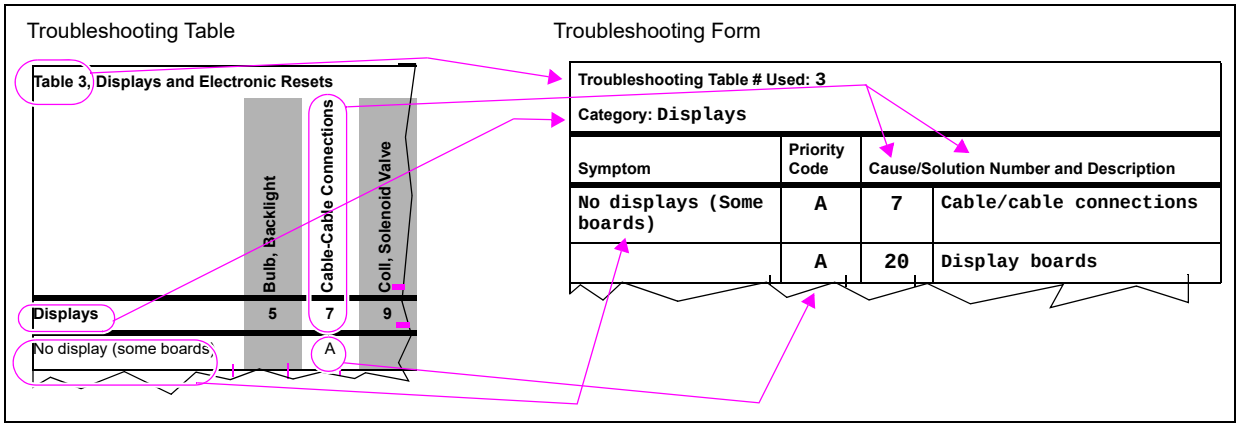
2 At the site, verify the above information.

3 Identify the symptoms: Is there no display on one side of the pump/can the valves be heard opening and is the fuel being delivered? Investigate for other symptoms and conditions.

4 Refer to "Troubleshooting Tables (Commercial Electronic and Retail Electronic Units)". The list will help you categorize your problem/symptom. For this example, refer to "Table 3: Electronic Displays, Electric Reset, and Calibration" on page 7-6 since the display is not working.

5 List your symptoms on a Troubleshooting Form (refer to "Sample Troubleshooting Form" on page 7-3). List the symptoms in the order of priority. Refer to "Priority Codes" on page 7-4. A troubleshooting sample is shown in Figure 7-1.

Figure 7-1: Troubleshooting Example



6 If you require further assistance, contact Technical Support at 1-800-444-5529. You must have the following information:

- Your technician number
- Equipment model and serial numbers
- Site area code and phone number
- Site name
- All symptoms and related conditions
- History of problem including the attempts that have been made to solve the problem

Troubleshooting Tables (Commercial Electronic and Retail Electronic Units)

Gasboy recommends that you make a copy of this page for your reference and use it for all service calls.

For Problems	Troubleshooting Table to be Used
Communication (two-wire communication)	"Table 1: Communications to Console" on page 7-4
Delivery (improper product flow)	"Table 2: Fuel Delivery (All Units)" on page 7-5
Displays (improper display operation)	"Table 3: Electronic Displays, Electric Reset, and Calibration" on page 7-6
Electric reset components	
Electronics error codes	"Table 4: Error Codes 10-44" on page 7-7

For Problems	Troubleshooting Table to be Used
Handle responses (pump handle circuit)	"Table 5: Handle Responses, Leaks, Noise, and Presets (All Units)" on page 7-9
Leaks (hydraulic system components)	
Noises (STP relay, meters, and pumping units)	
Presets (missed presets, overruns, and underruns)	
Recurring chronic symptoms	"Table 6: Repeated Problems and STPs" on page 7-10
STP operation	
Unit resets (mechanical resets)	

Sample Troubleshooting Form

Troubleshooting Table # Used:		
Category:		
Symptom	**Priority Code**	**Cause/Solution Number and Description**

Priority Codes

For all letters shown in the following table, the issue has been reported to be involved in at least some of the cases. Always investigate earlier letters (A and so on) first. Letters toward the other end of the scale have been reported less frequently, but can still be an issue. Avoid repeating the same repair if the symptoms remain ***unchanged*** after attempting the fix.

Priority Code	Likeliness
A	Highly likely or easy to check
B	Likely
C	Possible, some locations only
D	Not likely
E	Remote
No entry	Not previously reported

Table 1: Communications to Console

	Cable Connection Wet	Cable-Cable Connections, Disconnected	Controller/Console	Pump Controller Board	Customer/Cashier Error	Data Wire Length/D-Box Type	Data Wires	D-Box	D-Box Switch Settings	D-Box Wrong for Application	Firmware	Pump Interface Board	Master Reset Required	Power Supply, Main	Power to Unit, Missing	Programming, Console	Programming, Unit (Retail Units)	Pump Interface Board	Switch/Power, Pump Handle	CPU Switch Settings	CPU Board	Pulser (Commercial Units)	Retail Pulser Output PCB
Communications	**3**	**4**	**5**	**201**	**7**	**502**	**8**	**501**	**503**	**504**	**9**	**204**	**904**										
False calls at console	A	B	C	C								B						B	A		C		D
No communication with controller: multiple units		C	A		E	C	D	D	B	C		E				D	D			B			A
One unit		C	A	B	E	C	D	D	B		E	A	E	D	C	D	D	A		B	B	B	C
Pulser Output Incorrect (missing)																				A	B	C	A

Table 2: Fuel Delivery (All Units)

Delivery, Product	Alcohol MTBE % Too High (Affecting Components) 2	Cable-Cable Connection 7	Coil, Solenoid Valve 9	Contactor/Reset Relay/Relay Board 10	Pump Controller Board 14	Filter (Water Alert) Tripped 26	Filter/Strainer/Check Valve Clogged 27	Firmware 28	Firmware, Check Version 29	Fuel contaminated (Affecting Components) 31	Hose (V.R) O-ring 34	Hose (V.R), Fuel In Vapor Section 35	Pump Interface Board 39	Leak Detector Tripped 44	Leak in Unit (Hydraulic) 45	Linkage or Mechanical Computer 46	Master Reset Required 50	Meter Locked/Frozen/Bad 51	Misalignment/Binding 52	Motors/Belts/Pulleys 55	Nozzle (Contaminated, Damaged, Bad) 58	Piping (Inlet) Conditions 61	Power (External) Grounding 62	Power Supply, Main 66	Programming, Unit (Retail Electronic) 77	Pulser 78	Pumping Unit 79	Relay or STP 84	Service Procedure (Poor) 90	Switch/Power, Pump Handle 97	Tank Out of Product 98	Temperature Low (Diesel) 100	Valve (Solenoid) Hydraulics 106	Valve/Meter Check 107	Valve, Shear 110	Valve, STP/Dispenser/Line Check 111	Vapor Line Back Pressure 112	Vibration/Bad Mounting 113	CPU Board	CPU Switch Settings
Flow registered with nozzle closed (at turn-on)	C										A				B						A											B	B		B		D		
Flow registered with nozzle closed (continuous)	C				E						A		E		D																							D		
Improper nozzle shut-off										A		A									A				C											C				
Meter calibration	C									B	B				B			A	B						D	C	D		C											
No flow with display reset (all hoses, one unit)		A		C	B	B							B				E			D		C					C										B	D	
No flow with display reset (one hose, one unit)		A	A		C	B							B				E	C	D	D	B	E			E		D					B		B			B		
No flow, no display reset (one hose, one unit)		C			B			D	D				B										D	D	C					A						B		
No flow, no display reset (multiple Hoses, one Unit)		A			C			D	D				B										D	D	C					A						B		
Product delivered, but not registered		D			B								C			B		C	C						D	A										B		
Product delivered with handle off	C	C		B	C								B																	B			A				B		
Pulsating flow (surging or pulsing)	B															D		B	C			C					D						A						
Slow-flow (one hose)	B	A	D		C		A			C			B					D	E	D		E					E						C	B		E			C	
No flow with reset (all hoses same grade at station)				A		A																						A	B		A							
Slow-flow with reset (all hoses, same Device)							B							A														B	A			C				B			
Flow stall at slow speed															D	B		A	A								C	B	B										

Table 3: Electronic Displays, Electric Reset, and Calibration

	Service Procedure (Poor)	Meter	Meter Check Valve	Pulser	Cable-Cable Connection	Coil, Solenoid Valve	Contactor/Reset Relay/Relay Board	Controller/Console	Controller Board	Display board	Jump Jack Settings	Master Reset Required	Misalignment/Binding	Motors/Belts/Pulleys	Power Supply, Main	Power to Unit Missing	Programming, Unit	Pump Interface Board	Reset Levers/Springs	Reset Motor/Gear Box	Switch/Power, Pump Handle	Temperature Low (unit not warmed up)	Valve Solenoid (Hydraulics)	CPU Board	Linkage or Mechanical Computer	CPU Switch Settings	Totalizer Bad	Totalizer PCB	RAM	Mechanical Computer Bad
Displays (Electronic)					**7**	**9**	**10**	**13**	**14**	**20**	**41**	**50**	**52**	**55**	**66**	**68**	**77**	**83**	**85**	**86**	**96**	**98**			**46**					
Displays Don't Come On Immediately					C					D												A								
Error Codes. Refer to Table 4: Error Codes 10-44 on page 7-7.																														
Flickering Displays (all boards)					A		D			B					C			C				C		D					
Flickering displays (one board)					A					A																				
Incorrect digit(s), garbled display					A				B	A		B										C		B					
Incorrect prices on display boards					B			D	C	C	A						A							C					
No backlight, both boards					B										B														
No backlight, one board					A																								
No display (all boards)					B				D	E		D			C	B		C				C								
No display (some boards)					A				D	A		C										B								
Electronic Totalizers																														
Not Incrementing					A																			C		B	B	B	C	
Electric Reset					**7**	**9**	**10**	**13**	**14**	**20**	**41**	**50**	**52**	**55**	**66**	**68**	**77**	**83**	**85**	**86**	**96**	**98**			**46**					
Handle won't stay on/off																			A											
No reset													C			A			B	B	B				C					B
Reset motor runs, no return to zero													B						B	B	B				C					
Reset OK, valves/motor not on						C	B	B						C					C		A		C							
Resets continually													B						A		C									
Calibration																														
Calibration does not hold (repeat tests)	B	A	A	D									B																	B
Calibration does not hold (few months)	B	C	A	D																										D

Table 4: Error Codes 10-44

		Cable/Cable Connection	Pump Controller Board	Customer/Cashier Error	Display Board	Firmware	Pump Interface Board	Master Reset Required	Normal Operation as Programmed	Programming Unit	Power Cycle Required	Programming, Unit	Pulser	Temperature Low	CPU Board	Power to Unit	Power Supply	CPU Switches	Card Limit Exceeded
No Description		**7**	**14**	**16**	**20**	**28**	**39**	**50**	**61**	**69**	**77**	**78**	**80**	**99**					
Retail Electronic Units																			
10	Read Only Memory (ROM) or RAM error	A																	
11	Communication loss error	A	C					D											
12	No communication with dispenser	A																	
20	Pulser fail, single	B	C				B						A						
21	Pulser fail, all	B	A				B						C						
23	Grade assignment changed		B								A								
24	Conversion factor changed		C					B			A								
25	Two-wire/Standalone mode changed		B								A								
26	No conversion factor table		B								A								
27	Side A, two-wire ID changed		B								A								
28	Side B, two-wire ID changed		B								A								
29	Pump timeout error			B					A		B	B							
31	Totals data error		C					A			B								
32	Pulser count error	B	C				B					A							
33	Heaters on at power-up	B	C		B									A					
35	Configuration data error							A			A								
36	Unit type code changed		B							A	B								
37	PIN code 1 changed		C							A	B								
38	PIN code 2 changed		C							A	B								
39	Cash/credit option changed		C							A	B								
41	Side exists option changed		B							A	A								
42	PPU options changed		C					B		A	A								
44	Pump handle on at power-up		C				B												

		Cable/Cable Connections	Hydraulics/Valve/Flow Meter	Customer/Cashier Error	Display Board	Firmware	Pump Interface Board	Master reset Required	Normal Operation as Programmed	Programming Unit	Pulser	Temperature Low	CPU Board	Power to Unit	Power Supply	CPU Switches/Jumpers	Preset/Card Limit Obtained
Commercial Electronic Units																	
01	RAM Failure	C						A					A				
02	ROM Failure	C				B		A					C				
55	Power Failure	B											D	C	A		
56	Pulser Error	B				C					A		C				
57	Timed Out								B		C					A	
58	Limit Cutoff			B					A								A
59	Flow Error Meter 1*		C			A					B						
60	Flow Error Meter 2*		C			A					B						
99	Product Unavailable							A				A	B				
554	Power Failure (Calibration mode)**	B											D	C	A		
564	Pulser error (Calibration mode)**	B				C					A		C				
574	Timed Out (Calibration mode)**								B		C					A	
584	Limit Cutoff (Calibration mode)**			B					A								A
993	Invalid Calibration Factor**								A				D				
994	Invalid Calibration Transaction**			A					B				D				

**9840 Models only*
***Electronic Calibration Models only (DEF and E85)*

Table 5: Handle Responses, Leaks, Noise, and Presets (All Units)

	Alcohol MTBE % too High	Cable/Cable Connection	Contactor/Reset Relay/Relay Board	Controller Board	Customer/Cashier Error	Dispensers (number of) On STP Relay	Firmware	Firmware, Check Version	Pump Interface Board	Master Reset Required	Meter Locked/Frozen/Bad	Misalignment/Binding	Motors/Belts/Pulleys	Nozzle	Piping (Inlet) Conditions	Power (External)/Grounding	Power Supply, Main	Power to Pump Missing	Programmable Preset Board	Programming, Unit	Pumping Unit	Relay, STP	Sealing Compounds/Seals	Service Procedure (Poor)	Switch/Power, Pump Handle	Torque (proper tightness)	Valve Solenoid Hydraulics	VAlve, Inlet Pressure Regulating	Vibration/Bad Mounting	CPU Board	Reset, Electronic/Mechanical
Handle Responses	**2**	**7**	**10**	**14**	**16**	**19**	**28**	**29**	**39**	**50**	**51**	**52**	**55**	**58**	**61**	**62**	**66**	**68**	**75**	**77**	**79**	**84**	**89**	**90**	**97**	**101**	**106**	**108**	**113**		
No response/Reset, displays OK (all hoses)		C		B			D	D	B	A						D	D			C										B	
No response/Reset, displays OK (one hose)		A		C					B											B					A					C	A
No response/Reset, garbled displays		C		B			D	D		A						D	D													B	
No response/Reset, no displays		B		B			D	E		B						E	C	A												B	
Leaks	**2**	**7**	**10**	**14**	**16**	**19**	**28**	**29**	**39**	**50**	**51**	**52**	**55**	**58**	**61**	**62**	**66**	**68**	**75**	**77**	**79**	**84**	**89**	**90**	**97**	**101**	**106**	**108**	**113**		
Meter	B										A												A	C		A					
Piping (general)	B																						A	B		A					
Sump overflow															B						A							B			
Noise (Audible)	**2**	**7**	**10**	**14**	**16**	**19**	**28**	**29**	**39**	**50**	**51**	**52**	**55**	**58**	**61**	**62**	**66**	**68**	**75**	**77**	**79**	**84**	**89**	**90**	**97**	**101**	**106**	**108**	**113**		
Chattering STP relay			B			A			D													B									
Noisy meter											A	D																	C		
Noisy pumping unit													C		A						B							C	A		
Buzzer on continuously		C		B					B																						
Noisy valve																											A				
Presets	**2**	**7**	**10**	**14**	**16**	**19**	**28**	**29**	**39**	**50**	**51**	**52**	**55**	**58**	**61**	**62**	**66**	**68**	**75**	**77**	**79**	**84**	**89**	**90**	**97**	**101**	**106**	**108**	**113**		
Missed presets (complete miss)	C		B	C	B			C	B										C	B							A			C	
Small over-run	B		D	C				C	C		B	C		C						A							A			C	
Small under-run	C		D	C				C	C		B	C		C						A							A			C	

Table 6: Repeated Problems and STPs

	Air Trapped in Underground Piping	Alcohol/MTBE (First use)	Cable/Cable Connection	Connector/Reset Relay/Relay Board	Controller/Logic Board	Crossphasing/Isolation Circuit	Fuel Contaminated	Gasboy Atlas Supplied Parts required	Pump Interface Board	Leak (Underground)	Lubrication	Misalignment/Binding	Power (External)/Grounding	Programming, Console	Programming, Unit	Relay, STP	Reset, Electrical/Mechanical	Service Procedure (Poor)	STP	Switch/power, Pump Handle	Temperature Low (Diesel)	Valve, STP/Dispenser/Line Check	Vibration/Bad Mounting	Water Intrusion Possible	Wiring Error	CPU Board	CPU Switches
Repeated Problems	**1**	**3**	**7**	**10**	**14**	**15**	**31**	**32**	**39**	**43**	**49**	**52**	**62**	**76**	**77**	**84**	**87**	**90**	**93**	**97**	**100**	**111**	**113**	**114**			
Displays								A																C			
Filter replacement/clogged		B					A														C			A			
Filter replacement/cracked																						A	B				
Hydraulic interface board replacement			B			A		D										B									
Indicator lamps								A																C			
Leak detector tripping	B									A					B							A			B	
Locks											A	B												C			
Same board replacement			B					B					C					A							C			
STPs	**1**	**3**	**7**	**10**	**14**	**15**	**31**	**32**	**39**	**43**	**49**	**52**	**62**	**76**	**77**	**84**	**87**	**90**	**93**	**97**	**100**	**111**	**113**	**114**			
STP not activated (multiple units)			C			B									D	A			A						C		
STP not activated (one hose)			B	B	C				A						B					B						C	C
STP not activated (one unit)			B	B	A	B			B																	A	
STP stays on (multiple)				B	B	B			B							A										B	
STP stays on (one)			B	B					A																		
Wrong STP turns on			A											A	A										B		

8 – Wiring and Configuration

Introduction

Purpose

This section provides information regarding the wiring and configuration associated with Atlas pumps/dispensers.

Important Information About Releases

Sections of this manual may be released or updated independently to supply the most current data. Information about release date and version for independently released sections will be included in the section title and footer of the document. For the latest updates, refer to GOLD.

This section was last updated in July 2013.

Topics in This Section

Cable Block Diagrams

Block Diagram Atlas Commercial (Including DEF and E85 Models) M05193

Note: For block diagram of Atlas DEF units, refer to M05193 and for Atlas PRIME, refer to M16645.

Atlas Hydraulics, Bezel, and Door Configurations

Figure 8-1: Mechanical Single Units

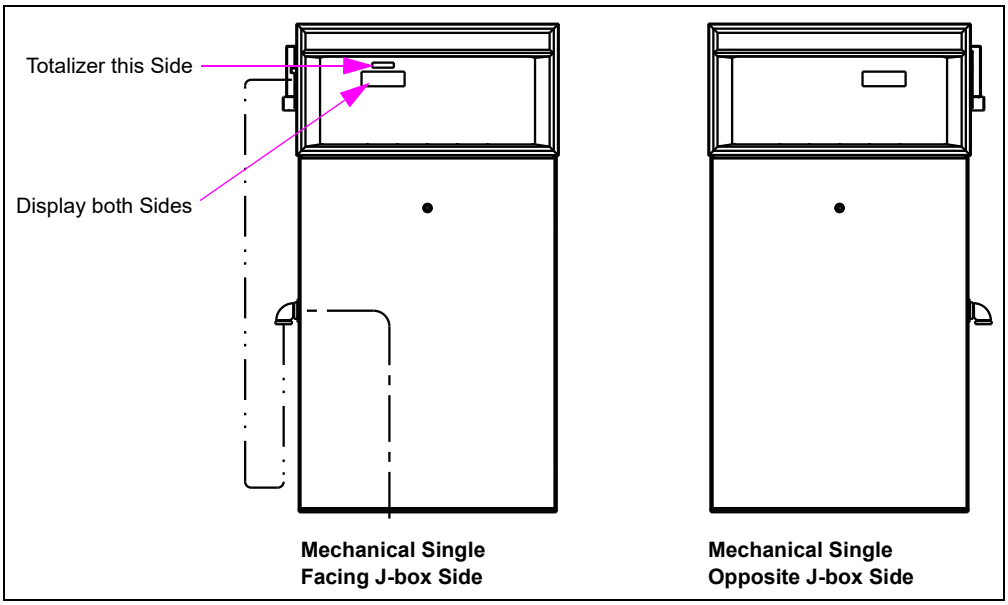


Figure 8-2: Electronic Single Side-load Units

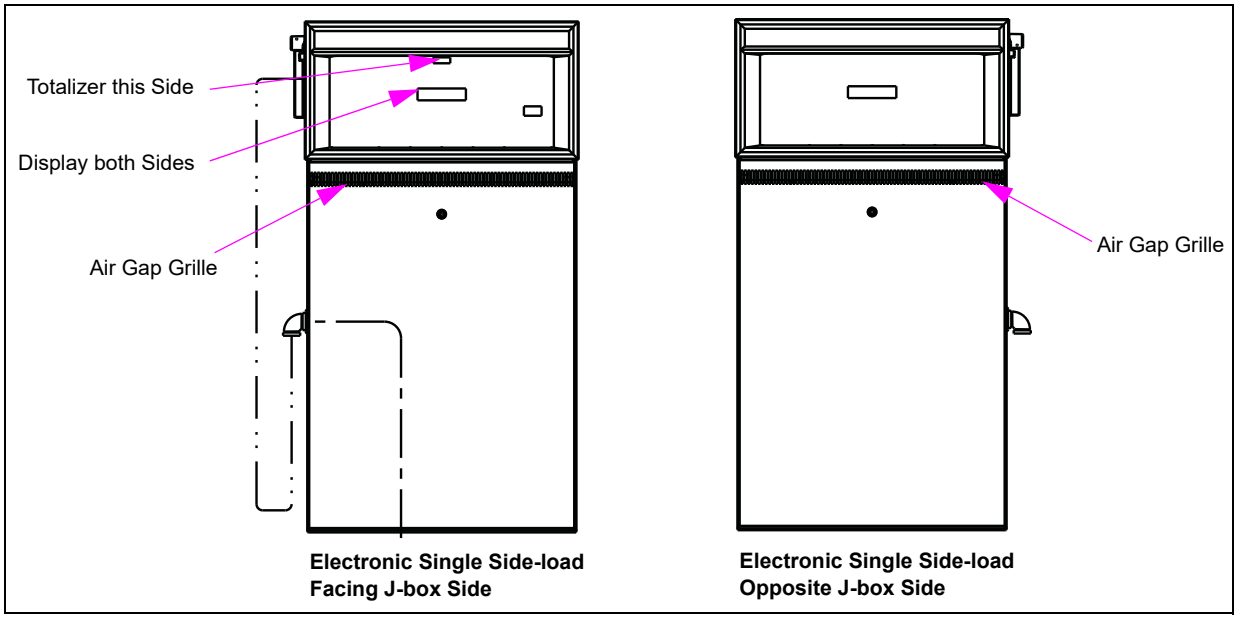


Figure 8-3: Electronic Single Front-load Units

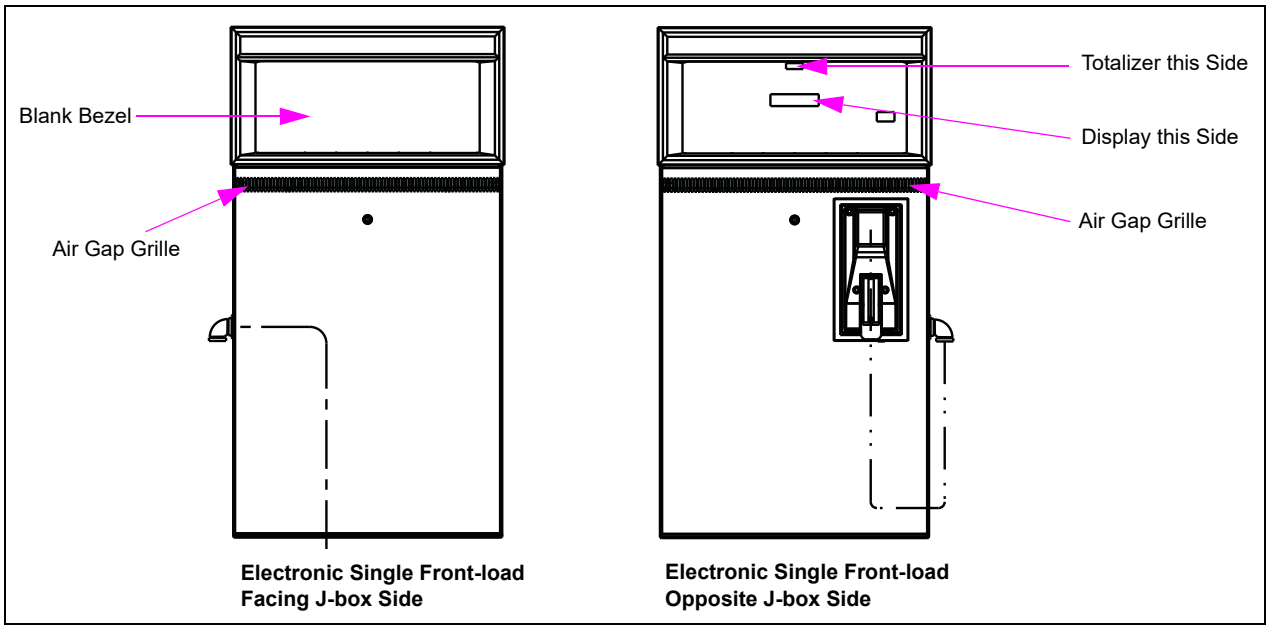


Figure 8-4: Mechanical 1-Grade 2-Hose Facing J-box

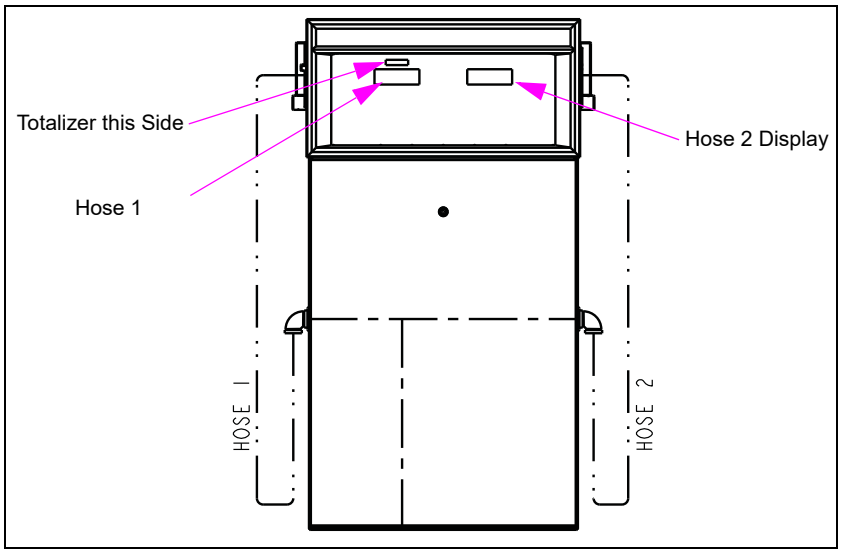


Figure 8-5: Electronic 1-Grade 2-Hose Side-load Facing J-box

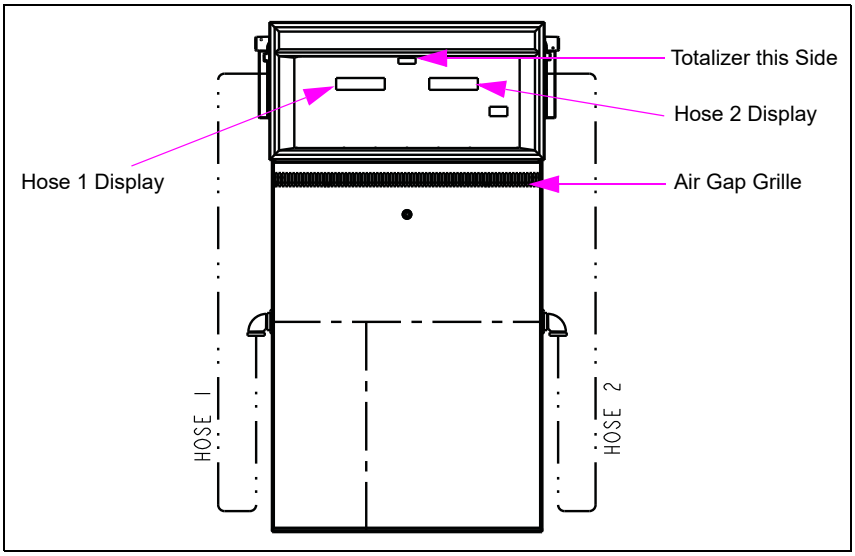


Figure 8-6: Electronic 1-Grade 2-Hose Front-load Facing J-box

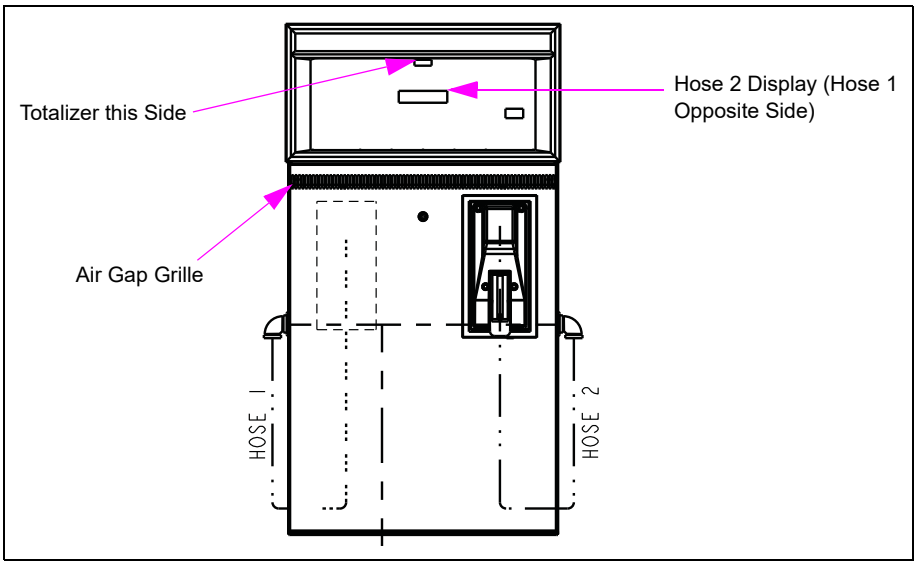


Figure 8-7: Mechanical 2-Grade 2-Hose Facing J-box

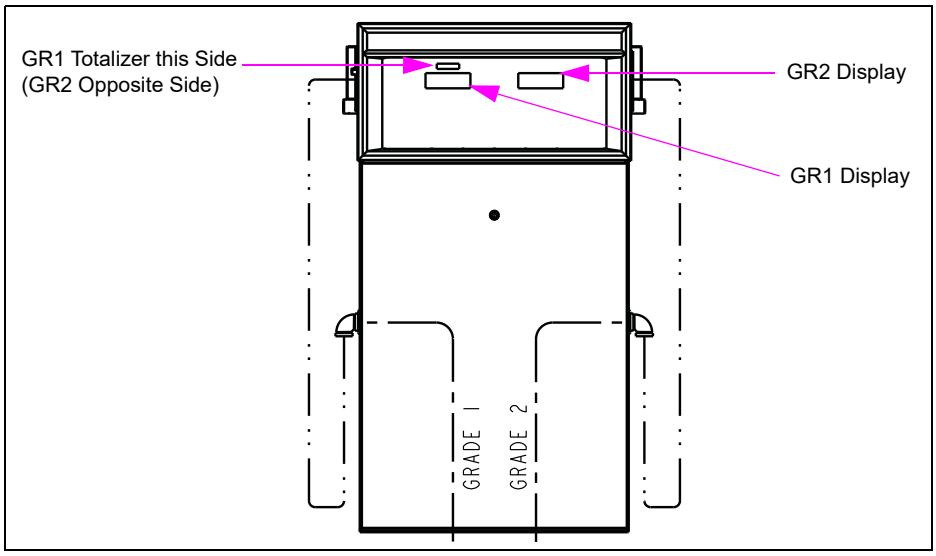


Figure 8-8: Electronic 2-Grade 2-Hose Side-load Facing J-box

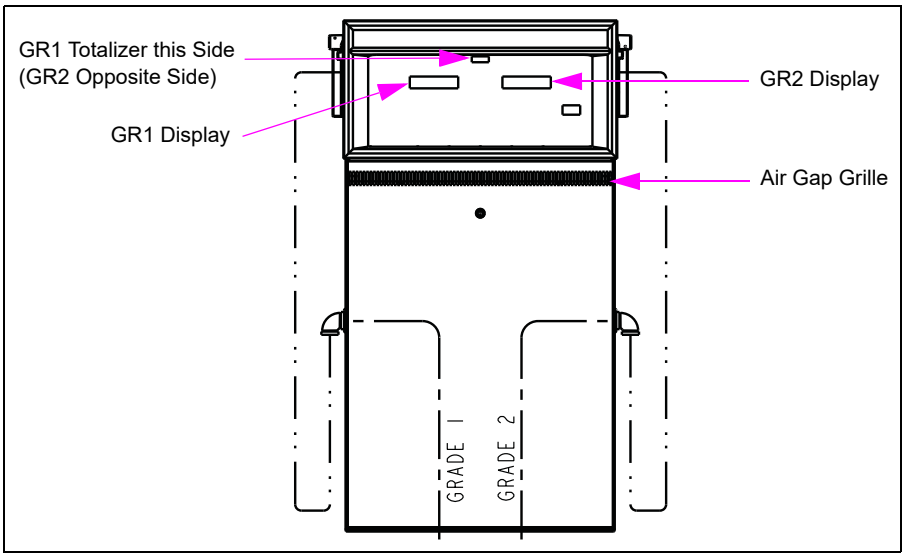


Figure 8-9: Electronic 2-Grade 2-Hose Front-load Facing J-box

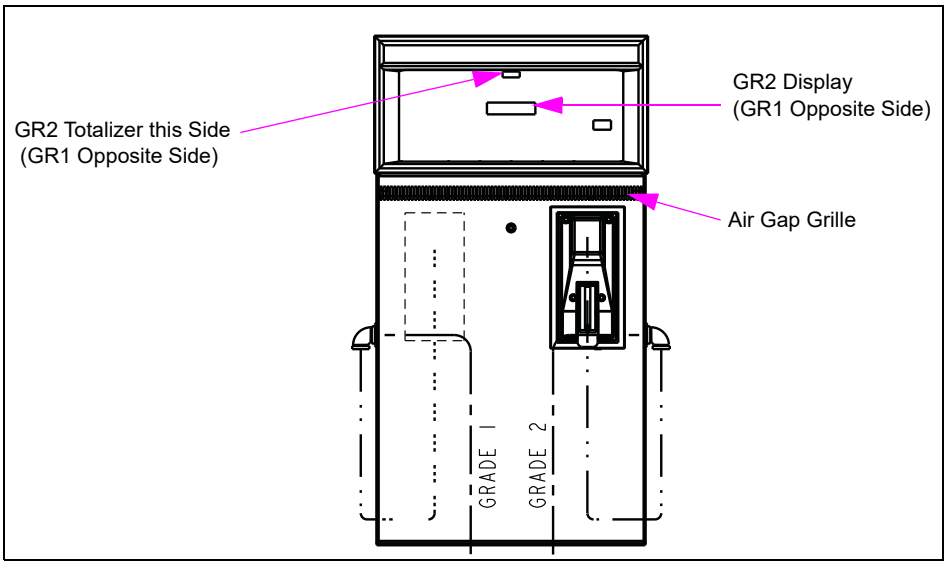


Figure 8-10: Mechanical Super-Hi Facing J-box

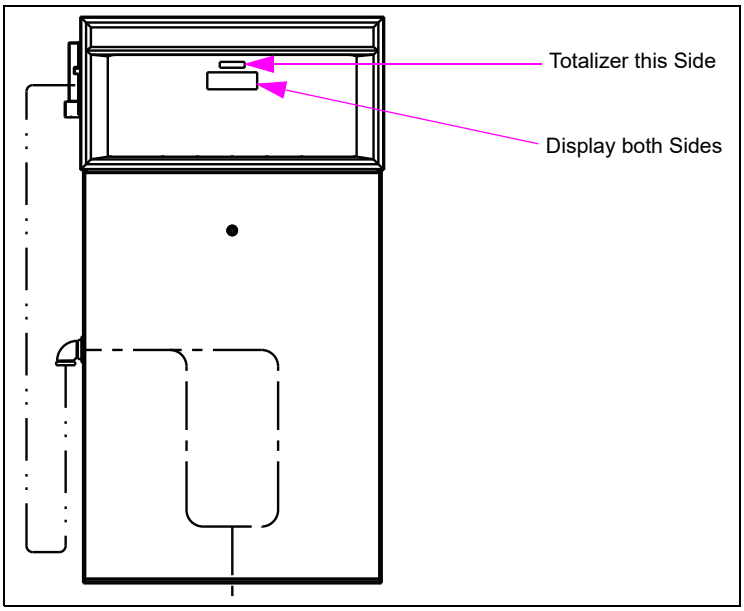


Figure 8-11: Electronic Super-Hi Side-load Facing J-box

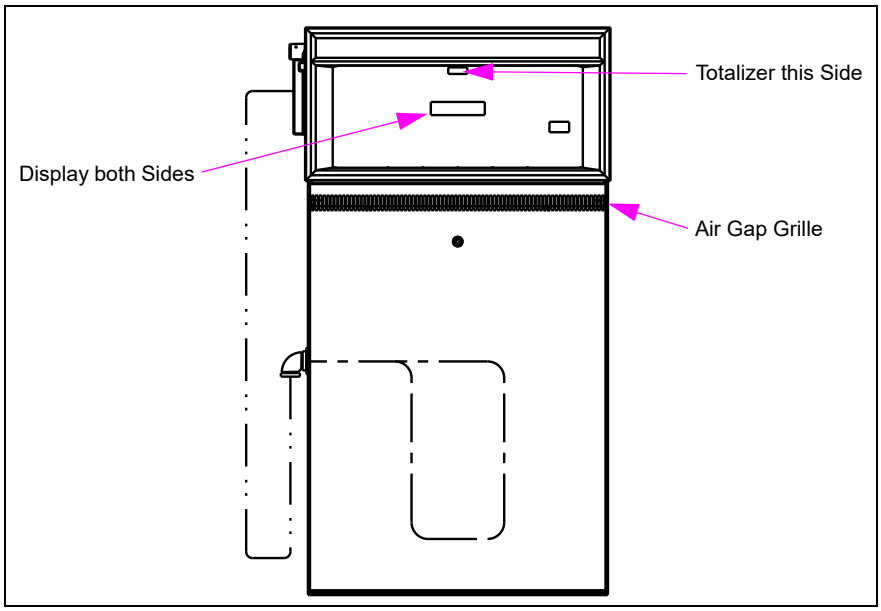


Figure 8-12: Electronic Super-Hi Front-load Units

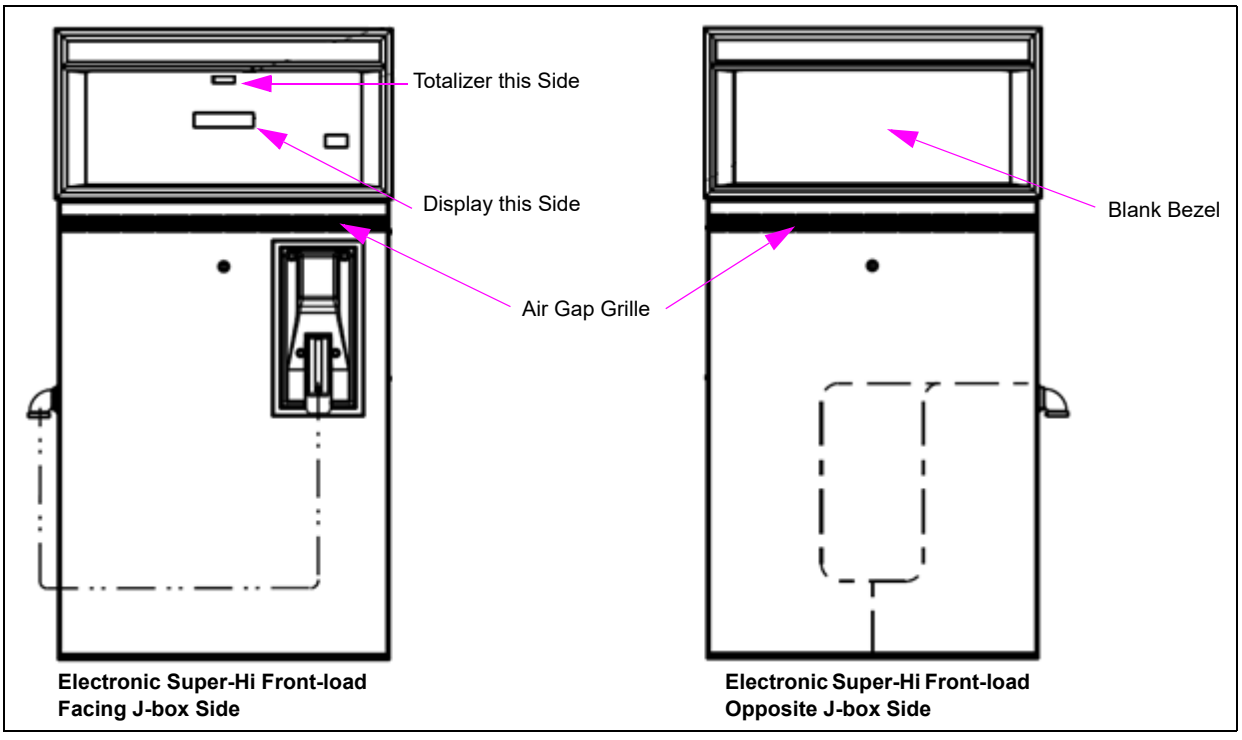


Figure 8-13: Single Ultra-Hi Unit Facing J-box

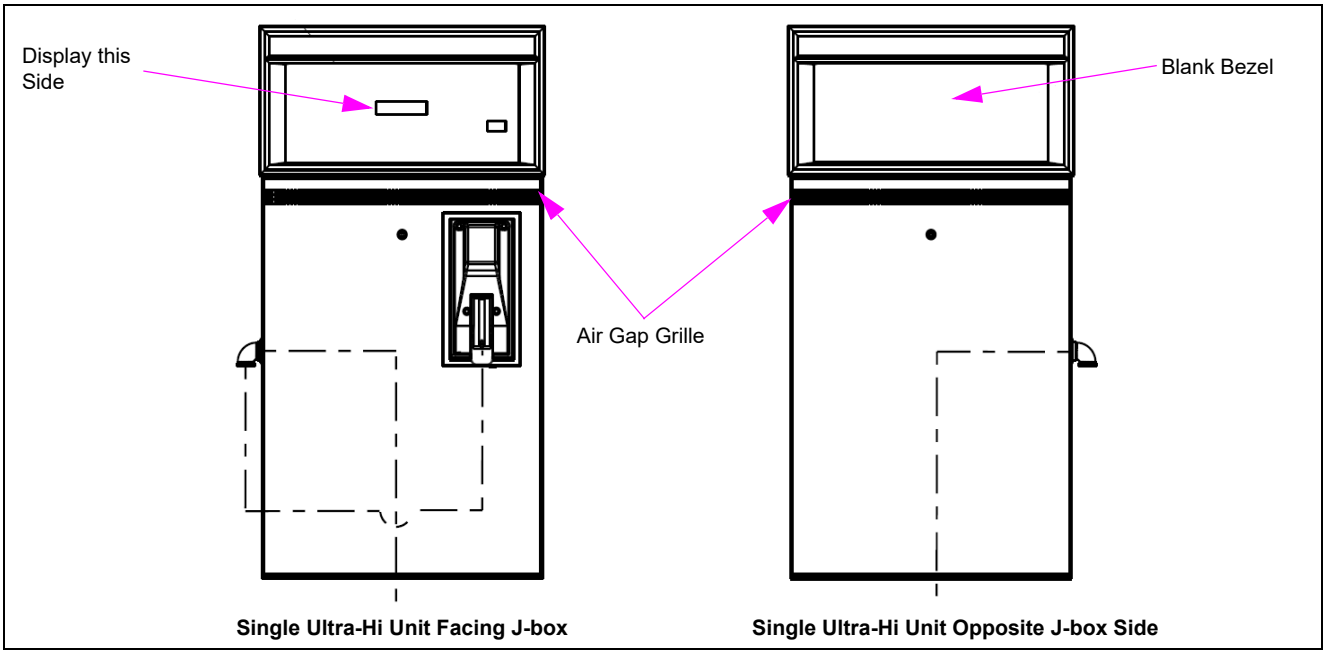


Figure 8-14: Ultra-Hi Single Side-Load Facing J-box

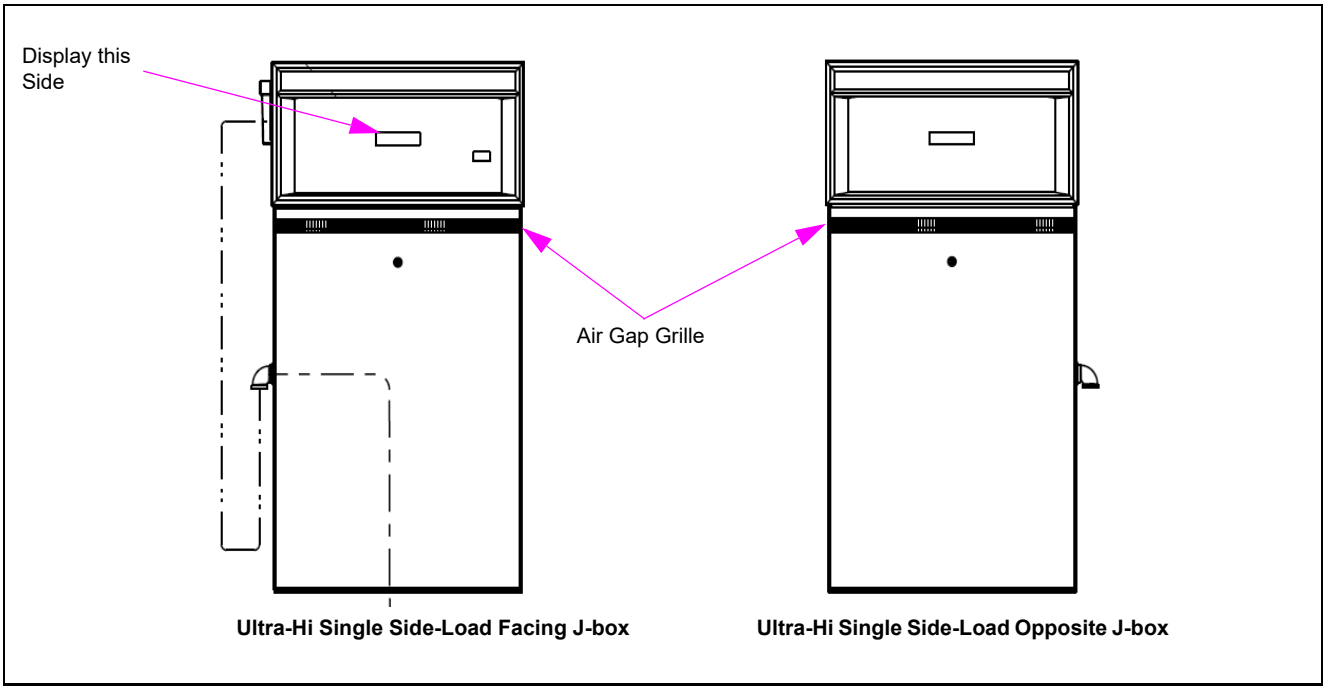


Figure 8-15: Combo Units

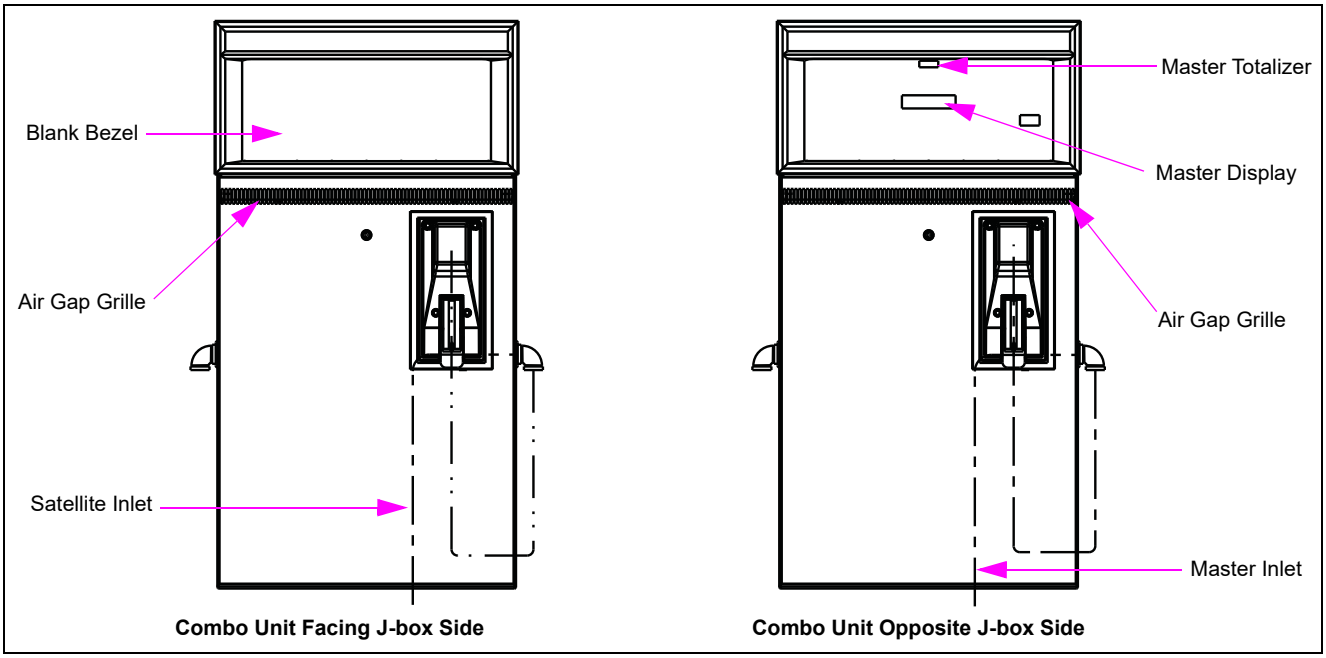


Figure 8-16: Ultra-Hi Units Facing J-box

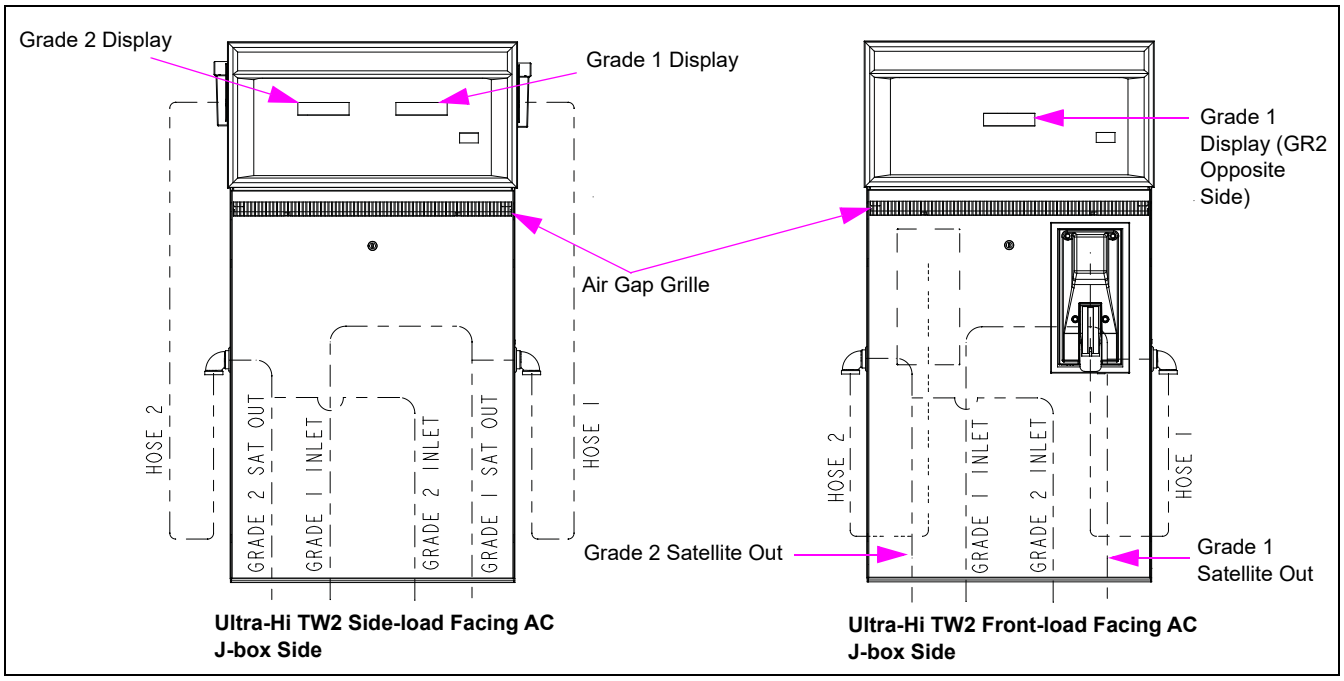


Figure 8-17: E85 Units

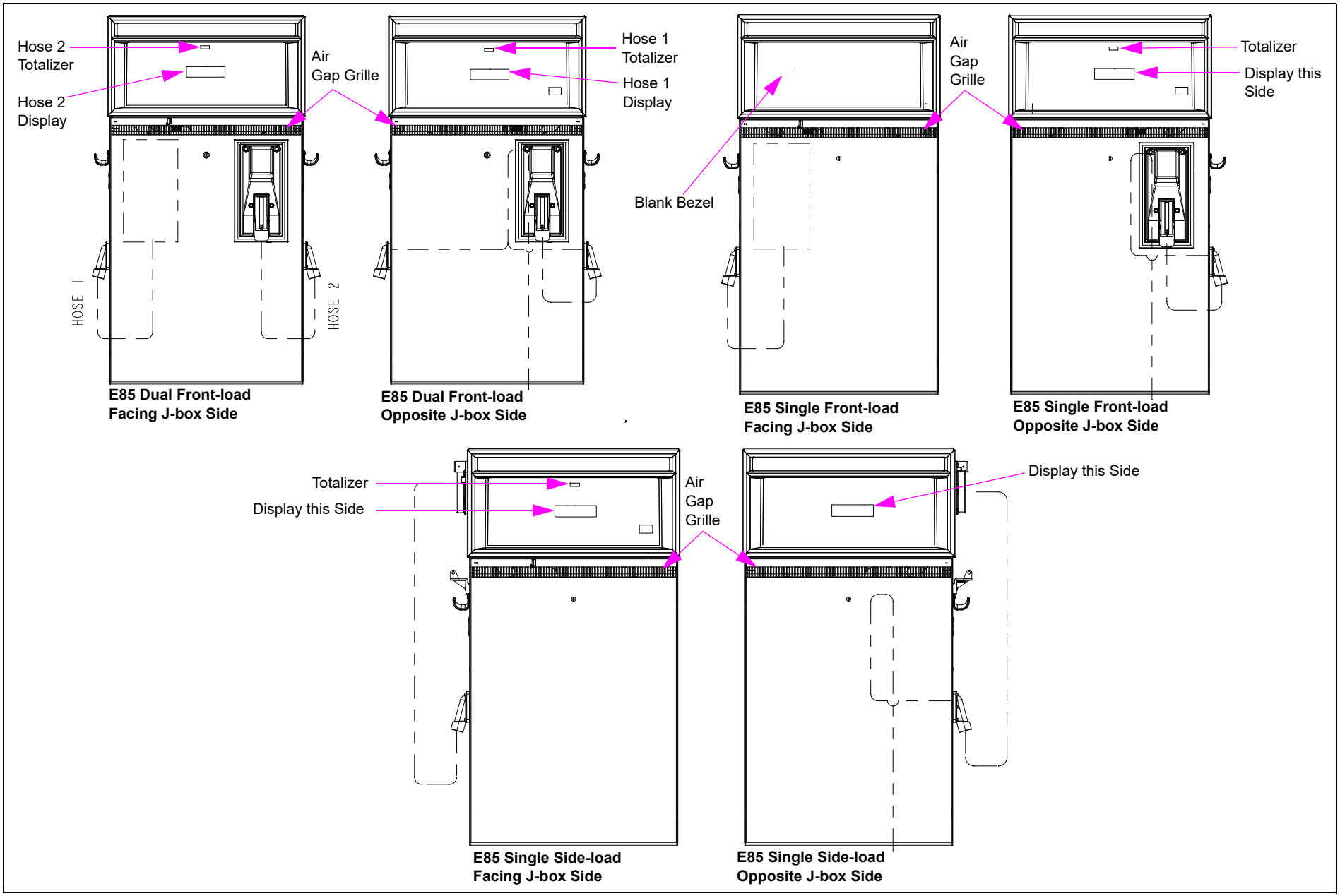
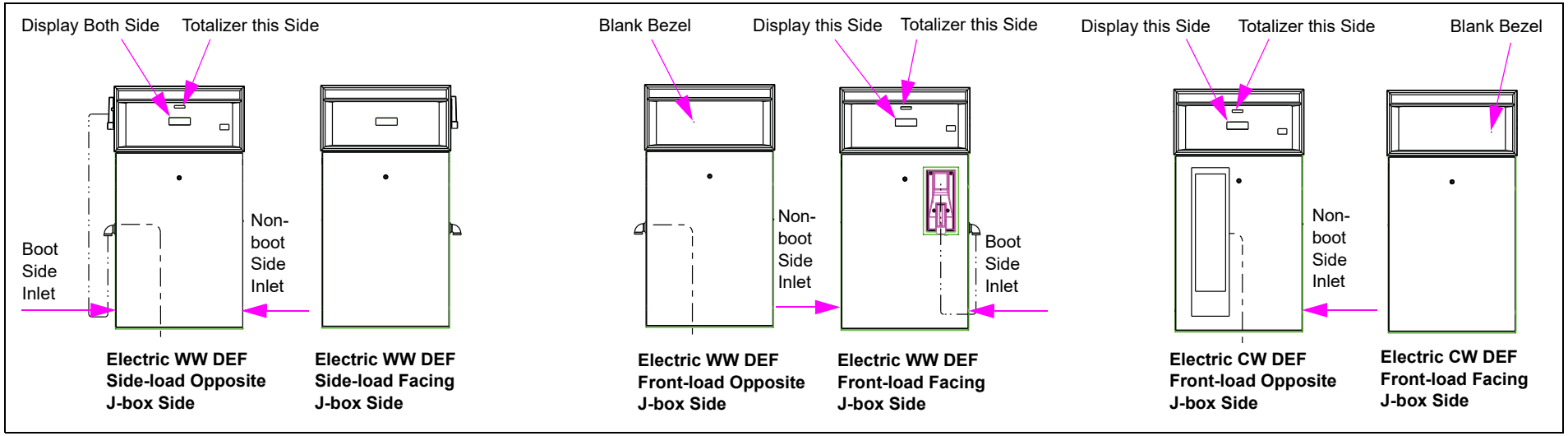


Figure 8-18: Electric DEF Units



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9 – Preventive Maintenance and Inspection

Introduction

Purpose

This section provides information on preventive maintenance and associated inspections. Preventive maintenance is essential to prevent the unexpected downtime of units. The "Preventive Maintenance Table" on page 9-6 provides maintenance recommendations.

Important Information About Releases

Sections of this manual may be released or updated independently to supply the most current data. Information about release date and version for independently released sections will be included in the section title and footer of the document. For the latest updates, refer to GOLD.

This section was last updated in July 2013.

Topics in This Section

How to Use This Section

Discuss the suggested maintenance items with the station owner. Review the "Preventive Maintenance Table" on page 9-6 to be familiar with preventive maintenance tasks you may have to perform at the site.

Preventive Maintenance

Maintenance Procedures and Parts

Gasboy Atlas pumps and remote dispensers are designed for years of uninterrupted service. However, certain pump or dispenser parts will experience normal wear and therefore will require periodic inspections. For example, detecting fuel leaks that may occur, belt tension and belt condition, lubrication and strainer cleanliness, are all important to maintain safe and efficient unit operation. Therefore, to avoid annoying pump shut downs, a periodic preventive maintenance inspection plan must be established and followed.

Procedures requiring leak repair, shear valve maintenance, and disassembly of portions of the pump/remote dispenser must be performed by an ASC.

> **⚠ WARNING**
>
> To avoid electrical shock or hazard of an explosion or fire or a fuel spill when servicing remote pump/dispenser:
> - Shut off and lockout all power to the pump/remote dispenser (in submersible pump applications, shut off and lockout power to the submersible pump and any other remote dispensers that use that submersible pump. AC power can feed back into a shut-off dispenser, when remote dispensers share a common STP or starter relay).
> - Shut off and lockout all power to the remote dispenser and submersible pumps at the master panel and close and test any impact valve before performing any maintenance or service to the remote dispenser, including change of any fuel filters or strainers.
> - Block the island so that no vehicles can pull up to the remote dispenser, when the dispenser is being worked on.

> **⚠ CAUTION**
>
> Moisture from rain can damage the internal components of a pump/dispenser.
>
> Internal components exposed to moisture may not operate correctly. Do *not* open the electronics cabinet to perform any other tasks while it is raining. Exposing board to rain will void warranty for any resultant damage.

Maintenance of Vendor Supplied Parts

Certain parts of the pump/dispenser are produced by vendors for Gasboy (hoses, nozzles, and so on) and as such may have documentation different from the one that Gasboy supplies. In these cases, consult the vendor documentation for service intervals and any adjustments, if required, for your pump/dispenser.

Note: Do not rely entirely on Gasboy supplied documentation for dispenser components not manufactured by Gasboy.

Use Only Authorized Parts

The use of unauthorized parts can void your warranty, cause you to lose continuity of the Underwriters Label on the pump, cause inefficient operation, and possibly an operational hazard. Always use new gaskets and seals when servicing or rebuilding Gasboy Atlas equipment.

Performing Inspections

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

Safety Warnings

You are performing inspections and maintenance in a potentially dangerous environment of flammable fuels/vapors and high voltage. Follow all safety precautions to prevent injury when inspecting a pump/dispenser at the island.

⚠ WARNING

You are performing inspection and maintenance in a potentially dangerous environment of flammable fuels/vapors and high voltage.

Fire, explosion, or electrical shock could result in severe injury or death if you do not follow safety procedures.

Read and obey all safety precautions in this manual to prevent potential injury or death.

General Inspections

Note: For more information, refer to MDE-4363 Atlas Fuel Systems Owner's Manual.

Perform a general inspection of each pump/dispenser as follows:

- Every week, to verify if all pumps/dispensers are operating properly
- Whenever you receive a complaint about potential unit problems

As part of the general inspection, inspect all areas for signs of damage or sharp edges. Replace any missing or damaged warning labels. Gasboy also strongly recommends that an ASC periodically inspects the equipment, as outlined in the next sub-section.

⚠ WARNING

Leaking fuel can be ignited, causing a fire or explosion.

Fire, explosion, or electrical shock could result in severe injury or death if you continue to use damaged pumps/dispensers.

If you find any leaks or damage, stop using the pump/dispenser.

⚠ WARNING

Personnel servicing a pump/dispenser can be injured if the pump/dispenser is not barricaded to all unauthorized personnel and vehicles.

If proper precautions are not taken, the person servicing the unit can be injured by a vehicle.

Before servicing a pump/dispenser, evacuate all unauthorized persons and vehicles, and then use your vehicle, safety tape, or cones as barricades.

Component Inspections

To schedule component inspections, refer to "Preventive Maintenance Table" on page 9-6. The station owner must only *inspect* for problems. For safety reasons, several tasks in the "Preventive Maintenance Table" on page 9-6 including all repairs, must be performed only by an ASC. To determine the tasks performed by an ASC, refer to the column entitled "Who Performs the Inspection/Repair" on page 9-6.

⚠ WARNING

The pump/dispenser contains pressurized flammable fuel and lethal voltages.

Servicing a Gasboy Atlas unit incorrectly could result in severe injury or death.

Do *not* attempt to service Gasboy Atlas pumps/dispensers yourself and do *not* allow untrained personnel to service Gasboy Atlas pumps/dispensers. Only Gasboy Atlas-trained ASCs must service a Gasboy Atlas unit.

⚠ WARNING

Leaking fuel can be ignited, causing a fire or explosion.

Fire, explosion, or electrical shock could result in severe injury or death if you continue to use damaged pumps/dispensers.

If you find any leaks or damage, stop using the pump/dispenser.

⚠ WARNING

Improperly installed or maintained equipment can create a hazard.

Improperly installed or maintained equipment could cause a fire, explosion, or electrical shock.

For any component not supplied by Gasboy Atlas (for example, hoses and nozzles), consult and follow the installation and maintenance instructions provided by the manufacturer.

Replacements and Adjustments

Filter Strainer Replacement

If the unit is equipped with a strainer and filter, check and change it at regular intervals (refer to "Preventive Maintenance Table" on page 9-6). A dirty strainer and/or filter in a pump or remote dispenser will cause a slower delivery rate. To ensure that you replace the strainer and filter required with the one designed for your model, refer to the accessories section of your parts manual. Always use a drip pan and absorbent material directly below the filter when removing the cartridge, to prevent contamination of both soil and electrical components within the cabinet. This service must not be performed by untrained individuals.

Special Setup Required for Aircraft Fueling

⚠ WARNING

Aircraft require finely filtered fuel.

Improperly filtered fuel could cause the engine to fail.

Do *not* use Gasboy Atlas pumps/dispensers without auxiliary filters, separators, and other equipment required to ensure product purity, for direct fueling of the aircraft.

Adjusting Belts (Suction Pumps Only)

With proper care, belts will give exceptionally good service. A loose or overtightened belt not only cuts down dispensing speed due to slipping, it also results in excessive wear of pump and/or motor bearings causing premature failures. Refer to "Preventive Maintenance Table" on page 9-6. This service must not be performed by untrained individuals.

Preserving Finish

Preserving Finish of Fueling Equipment

Nearly all gasoline pumps are installed outdoors where their surfaces are subject to weather conditions. As a result, it is required to give the finish a reasonable amount of care if an attractive appearance is to be maintained.

The finish on Gasboy Atlas pump housings is a high-heat baked synthetic enamel, similar to that used on automobiles. The life of this finish can be lengthened several years if the painted surfaces are thoroughly cleaned with a high grade automobile polish and then protected with a coat of paste wax at regular intervals.

To prolong the life of the finish, avoid the following:

- Use of abrasive cleaners or polish.
- Use of high pressure spraying equipment.
- Use of window cleaner with ammonia on the electronic display.
- Do not wax the textured surfaces. Waxing the textured surfaces can damage the units by adversely affecting the appearance of units.
- Do not use cleaners containing ammonia on display windows.

To retain the unmarked finish on stainless steel, occasional cleaning is required. In corrosive atmospheres, such as coastal areas, a more frequent cleaning schedule is required. Under ordinary conditions, washing with detergent or soap and water followed by a clean water rinse is sufficient. If hard water is used, the surface must be wiped dry with a soft clean cloth to prevent the formation of water spots. Marks or spots such as grease, oily fingerprints, and smudges, which resist soap and detergents, must be removed with a stronger cleaner. Do not use ordinary steel wool as iron particles may adhere to the surface and cause corrosion. Care must be taken in choosing a cleaner as cleaning compounds or powders that contain abrasives can scratch the mill-rolled metallic finish. Exercise care so that the polishing is done along the lines in the steel and never across them. After cleaning, an application of paste wax is recommended to protect the surface and prolong the interval between cleaning.

Preventive Maintenance Table

Components	Recommended Frequency	Recommended Maintenance	Who Performs the Inspection/Repair
Stainless steel sheathing and lower doors	Once every three months (once a month in harsh environments)	For stains on stainless steel, use a cleaner specifically formulated for cleaning stainless steel. Gasboy recommends Bar Keepers Friend®. Ensure that you thoroughly rinse off the cleaner.	Owner - Inspect/ Repair and test
Hoses, swivels	At least once a week or if a customer complaint arises	1 Inspect each hose for leaks, abuse, and excessive wear. 2 Inspect each hose, breakaway, whip hose, and vapor hose for the following wear or damage: • Bulges reinforcement showing • Cracks - Soft spots • Damage - Tears • Flattened spots - Weaknesses • Holes - Wear through **⚠ WARNING** Leaking fuel can be ignited, causing a fire or explosion. Fire, explosion, or electrical shock could result in severe injury or death if you continue to use damaged pumps/dispensers. If you find any leaks or damage, stop using the pump/dispenser. 3 Ensure that vapor recovery hoses do *not* touch the ground, when the nozzle is seated properly in the nozzle boot. 4 For any additional inspections required, consult the manufacturer. If repair is required, call an ASC to make the repairs.	Owner - Inspect
Hose Retrievers	Once a week or if a customer complaint arises	1 Inspect hose retrievers for frayed or broken cables. 2 Inspect hose retrievers for cables wrapped around hoses. 3 If repair is required, call an ASC to make the repairs. **⚠ WARNING** The pump/dispenser contains pressurized flammable fuel and lethal voltages. Servicing a Gasboy Atlas unit incorrectly could result in severe injury or death. Do *not* allow untrained personnel to service Gasboy Atlas pumps/dispensers. Only Gasboy Atlas-trained ASCs must service a Gasboy Atlas unit.	• Owner - Inspect • ASC only - Repair and Test

Components	Recommended Frequency	Recommended Maintenance	Who Performs the Inspection/Repair
Nozzles and boot area	Once a week or when notified about a potential problem	1 Inspect nozzles for the following wear or damage: • Damage • Leaks • Loose nozzle spouts • Missing parts, such as retainer springs and splash guards **⚠ WARNING** Leaking fuel can be ignited, causing a fire or explosion. Fire, explosion, or electrical shock could result in severe injury or death if you continue to use damaged pumps/dispensers. If you find any leaks or damage, stop using the pump/dispenser. 2 Inspect vapor recovery boots (bellows) for proper seal and damage. 3 Consult the nozzle manufacturer for additional inspections, if required. 4 If repair is required, call an ASC to make the repairs. **⚠ WARNING** The pump/dispenser contains pressurized flammable fuel and lethal voltages. Servicing a Gasboy Atlas unit incorrectly could result in severe injury or death. Do *not* allow untrained personnel to service Gasboy Atlas pumps/dispensers. Only Gasboy-trained ASCs must service a Gasboy Atlas unit.	• Owner - Inspect • ASC only - Repair and test
Leaks, external	Once a week or when notified about a potential leak	1 Inspect the following for any signs of damage or leaks, such as cracks, cuts, wear, or flattening: • Breakaways • Couplings • Hose outlet castings • Hoses • Nozzles • Swivels 2 Review the documentation provided by the manufacturer of each component. 3 If a leak is found, stop using the pump/dispenser and make arrangements to repair the leak. **⚠ WARNING** Leaking fuel can be ignited, causing a fire or explosion. Fire, explosion, or electrical shock could result in severe injury or death if you continue to use damaged pumps/dispensers. If you find any leaks or damage, stop using the pump/dispenser.	
Leaks, external (continued)		**⚠ WARNING** The pump/dispenser contains pressurized flammable fuel and lethal voltages. Servicing a Gasboy Atlas unit incorrectly could result in severe injury or death. Do *not* allow untrained personnel to service Gasboy Atlas pumps/dispensers. Only Gasboy Atlas-trained ASCs must service a Gasboy Atlas unit.	

Components	Recommended Frequency	Recommended Maintenance	Who Performs the Inspection/Repair
Displays (Electronic units)	Once a week	1 Inspect the displays for proper reading of all digits. 2 Verify if the displays are properly backlit.	• Owner - Inspect • ASC only - Repair and test
Breakaways	Once a week or after drive-offs	1 Inspect breakaways for secure connections to the hose and for any leaks. 2 For units with hose retrievers, position the breakaway coupling between the retriever connection to the hose and the nozzle. The breakaway whip hose must be attached to the nozzle. 3 For any additional required inspections, consult the breakaway manufacturer. 4 If repair is required, call an ASC to make the repairs.	• Owner - Inspect • ASC only - Repair and test
Warning tags and operating instructions	Once a week	Inspect for and replace all missing, damaged, or unreadable warning tags or operating instructions.	• Owner - Inspect • Owner or ASC -Replace
Hose continuity	Once a month	Verify if the hose continuity (including breakaway whip hose) complies with the hose manufacturer's requirements.	• ASC only - Inspect and Repair

⚠ WARNING

Leaking fuel can be ignited, causing a fire or explosion.

Fire, explosion, or electrical shock could result in severe injury or death if you continue to use damaged pumps/dispensers.

If you find any leaks or damage, stop using the pump/dispenser.

⚠ WARNING

The pump/dispenser contains pressurized flammable fuel and lethal voltages.

Servicing a Gasboy Atlas unit incorrectly could result in severe injury or death.

Do *not* allow untrained personnel to service Gasboy Atlas pumps/dispensers. Only Gasboy Atlas-trained ASCs must service a Gasboy Atlas unit.

⚠ WARNING

Spilled fuel and fuel vapors may be present in or around the pump or dispenser.

A spark can ignite the fuel or its vapors. Testing for hose continuity incorrectly could result in severe injury or death. Refer to Petroleum Equipment Institute PEI publication RP-500.

Use only approved methods and instruments. Do *not* allow untrained personnel to service the Gasboy Atlas pumps/dispensers. Only Gasboy Atlas-trained ASCs must service a Gasboy Atlas unit.

Hoses and end connections must be completely dry before checking for continuity.

Components	Recommended Frequency	Recommended Maintenance	Who Performs the Inspection/Repair
Leaks, internal	Once a month, after a drive off, or as notified about a potential leak	1 Whenever possible, Gasboy recommends shutting off power to the unit before performing these inspections. 2 Block off the pump/dispenser to prevent customers from operating the pump/dispenser during inspection. 3 Remove the lower panels slowly and carefully. 4 Inspect all hydraulic connections and seals, including the following: • Meters • Valves 5 If wetness or dripping fuel is found, stop using the pump/dispenser, and make arrangements for repairing the leak. *Note: Some staining of parts around seals is normal and does not necessarily indicate a leak.* 6 Monitor the repaired components closely during subsequent inspections. **⚠ WARNING** Gasoline or other fuels can damage the eyes. Fuel sprayed into the eye can burn the eye tissue. To prevent potential injury, wear eye protection when performing these inspections.	• Owner - Inspect • ASC only - Repair and test
Leaks, internal (continued)		**⚠ WARNING** Leaking fuel can be ignited, causing a fire or explosion. Fire, explosion, or electrical shock could result in severe injury or death if you continue to use damaged pumps/dispensers. If you find any leaks or damage, stop using the pump/dispenser. **⚠ WARNING** The pump/dispenser contains pressurized flammable fuel and lethal voltages. Servicing a Gasboy Atlas unit incorrectly could result in severe injury or death. Do *not* allow untrained personnel to service Gasboy Atlas pumps/dispensers. Only Gasboy Atlas-trained ASCs must service a Gasboy Atlas unit.	
Filter change and strainer cleaning	New Installations - After 50,000 gallons (200,000 liters), or after one month After the first filter change - Every 300,000 gallons (1.0 million liters), every six months, or when the fuel delivery rate significantly slows	Replace the filters and clean the strainers regularly. An ASC must perform these tasks. DEF strainers must be cleaned after purging and calibration during start-up. Else, clean when the flow rate drops noticeably. Replace strainers that are permanently clogged. **⚠ WARNING** The pump/dispenser contains pressurized flammable fuel and lethal voltages. Servicing a Gasboy Atlas unit incorrectly could result in severe injury or death. Do *not* allow untrained personnel to service Gasboy Atlas pumps/dispensers. Only Gasboy Atlas-trained ASCs must service a Gasboy Atlas unit.	

<table>
<tr><th>Components</th><th>Recommended Frequency</th><th>Recommended Maintenance</th><th>Who Performs the Inspection/Repair</th></tr>
<tr><td>Inspect and lubricate shear valves</td><td>Every six months</td><td>To check valve operation, perform the following tasks:
Note: Shear valves are typically used only on the dispensers. If you have pumps, consult your installer to determine if they were installed on your pump.

⚠ WARNING
The pump/dispenser contains pressurized flammable fuel and lethal voltages.

Servicing a Gasboy Atlas unit incorrectly could result in severe injury or death.

Do not allow untrained personnel to service Gasboy Atlas pumps/dispensers. Only Gasboy Atlas-trained ASCs must service a Gasboy Atlas unit.

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.
6 Place a few drops of SAE10 oil on the valve body shaft.
7 Open and close the valve with a wrench several times.
8 Place the valve back in service.
9 An ASC must make any required repairs.</td><td>• ASC only - Inspect, repair and test</td></tr>
<tr><td>Pump pulleys, belts, and belt tension</td><td>Every six months or if a squealing noise occurs during unit operation</td><td>1 Shut off power to the unit.
2 Inspect belts for fraying/cracks.
3 Inspect pulleys for excessive wear in grooves and excessive bearing play.

⚠ WARNING
Failure to shut off power to the unit before servicing could result in injury.

Failure to shut off power could create a hazard, such as electrical shock.

Shut off power to the unit before servicing as power could allow the unit to be operated while servicing the pulleys or belts.

⚠ WARNING
Self-contained pumps have a pinch point between the belts and the pulleys.

Severe injury could occur if part of the body is pulled into the pinch point.

To prevent injury while inspecting self-contained units, do not place your hands near the belts, pulleys, or motors. Shut off power before servicing the unit. Do not operate the unit with the door removed.</td><td>• Owner - Inspect
• ASC only - Repair and test</td></tr>
</table>

Components	Recommended Frequency	Recommended Maintenance	Who Performs the Inspection/Repair
Nozzle hooks and shafts	Every six months	1 Lubricate with silicone spray, if required. 2 Check for damage. 3 Verify if 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). 4 If repair is required, call an ASC to make the repairs. 5 An ASC must make any required repairs. **⚠ WARNING** The pump/dispenser contains pressurized flammable fuel and lethal voltages. Servicing a Gasboy Atlas unit incorrectly could result in severe injury or death. Do *not* allow untrained personnel to service Gasboy Atlas pumps/dispensers. Only Gasboy Atlas-trained ASCs must service a Gasboy Atlas unit.	• Owner - Inspect • ASC only - Repair and test
Mechanical computers	Every six months	Lubricate well. Refer to Veeder-Root manuals for lubrication points. **⚠ WARNING** The pump/dispenser contains pressurized flammable fuel and lethal voltages. Servicing a Gasboy Atlas unit incorrectly could result in severe injury or death. Do *not* allow untrained personnel to service Gasboy Atlas pumps/dispensers. Only Gasboy Atlas-trained ASCs must service a Gasboy Atlas unit.	ASC only
Door locks	Every six months or if the door locks become difficult to open and close	Lubricate with a graphite lubricant or lock oil. Follow the manufacturer's instructions. Do *not* over-lubricate. Use a rag to wipe any excess lubricant that may drip.	Owner
Tank	Every month	Monitor water levels in the tank with an electronic tank monitor or water detection pasted on the tank measuring stick.	Owner - Inspect
Water in dispenser/Pit box	After every fuel tank fill-up	Remove with explosion proof sump pump. 1 Gasboy recommends shutting off power to the unit before performing these inspections and process. 2 Block off the pump/dispenser to prevent customers from operating the pump/dispenser during procedure. 3 Access and insert the sump pump into the tank and draw off the water. **⚠ WARNING** The water in the pit box could contain gasoline or a flammable fluid. Use of an electrical pump directly in the pit box could result in a fire or explosion. Do not use an electrical pump unless explosion proof. A mechanical hand pump is recommended.	• Owner - Inspect • ASC only - Repair and test

Components	Recommended Frequency	Recommended Maintenance	Who Performs the Inspection/Repair
Wash pump/dispenser	As required *Note: Gasboy recommends more frequent cleaning for pumps/ dispensers located in salty or corrosive environments, such as near the ocean or near pollution sources.*	Clean with automobile cleaning products. Clean plastic surfaces with water and mild detergent. Do *not* wash with a hose. Do not use window cleaners with ammonia on electronic display windows. Adhere to the following guidelines while washing pumps/dispensers: • Clean and protect your equipment with automobile cleaning and protection products. • Clean plastic surfaces and polycarbonate graphics with a solution of water and mild detergent. • Use a soft cloth, paper towel, or sponge to clean displays separately. Window cleaners are preferred. Wash pumps/dispensers by hand, or use a hose nozzle set to a fine gentle spray. **⚠ CAUTION** Moisture can damage the internal components of a pump/dispenser. Internal components exposed to moisture may not operate correctly or fail. Water damage of electronic components where pressurized hoses are used during cleaning is not covered by warranty. Do not use a pressure washer to clean the pumps/dispensers.	Owner

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