TRIDENT
Air Operated Priming System

AIR PRIME™

PROVEN
PRIMING
PERFORMANCE

# AirPrime™

## Installation and Operation Guide

All AirPrime Models


### Automatic Controls

Lift Gauge Option ▶

▼ Standard Control



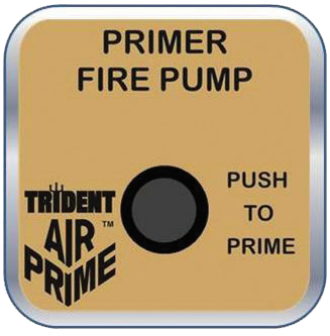

**AirPrime Pressure Regulator**

For use with high pressure SCBA cylinders


### Manual Controls

◀ Lift Gauge Option

Standard Control ▼




TRIDENT AIRPOWER™

MANUAL AIR PRIME™

AUTOMATIC AIR PRIME™

INDUSTRIAL AIR PRIME™

SCBA 1906™
Self Contained Priming System

World Class Fire Industry Products

## Contents



## Available Models

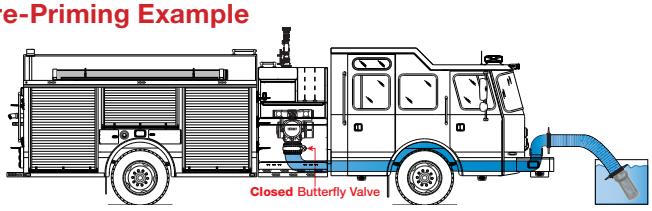
### Automatic Control

- Auto Base Model
- Auto Base Model w/ Lift Gauge
- Auto Multi Location
- Auto Multi Location w/ Lift Gauge
- Industrial Pumper Units

### Manual Control

- Manual Base Model
- Manual Base Model with Lift Gauge
- Manual Multi Location
- Manual Multi Location w/ Lift Gauge
- AirPrime SC 1906 Wildland Unit

### Pre-Priming Example




Please Visit the Trident YouTube Channel


## AirPrime™ Overview

Trident has several **AirPrime** models to meet specific needs:

**Base Models**: All models are available in 2 or 3 barrel design (depending on your water pump capacity and chassis air compressor output CFM).

**Direct Mount**: Connects to a **Hale Q Model** midship pump priming port with two bolts. The Hale pump model name must begin with a **Q** such as **Qmax**. Hale supplies a filter for the Direct Mount.

**Remote Mount**: This version can be used with any pump. It has a ¾" female NPT connection and requires a simple bracket to hold the unit to the pump house structure.

**Multi-Location**: Priming from multiple inlet locations.

**Variations and Options:**

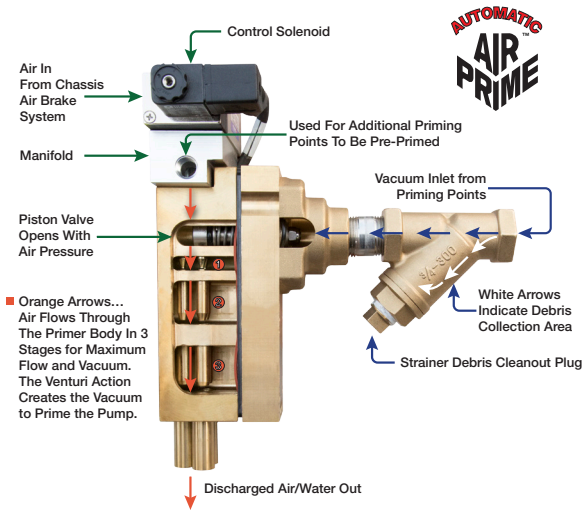
1. The base **AirPrime** single location units are available with either Automatic or Manual controls.
2. The **Multi-Location** units are available with Automatic or Manual controls. Up to four remote locations are available. This allows for pre-priming up to the butterfly valve for rapid water delivery and safer fireground operations.
3. Automatic versions are available in 12 and 24 Volt models.
4. Adding a Lift Gauge which indicates how much vacuum (in feet/meters of water) the primer is creating to prime the pump.
5. Conversion Kits for Manual to Automatic and for adding more locations are available. Refer to **Page 16**.
6. AirPrime is also available for small trucks without air brakes. See **Page 5** for additional information.
7. Industrial AirPrime units are available for large fire pumps.

**For more information on all available models please visit:**
TridentDirect.com or TridentAutoAirPrime.com

**Replacing a Rotary Vane Primer?**
View our AirPrime Retrofit and Upgrade Guide


Trident Emergency Products, LLC
2940 Turnpike Drive | Suite #9 | Hatboro, PA 19040 USA

## AirPrime™ - How Does It Work




# How Does It Work?

**AirPrime** utilizes air supplied from the chassis air brake system to operate the fire pump primer. This is proven to be far more efficient and reliable than rotary vane primers driven by an electric motor.

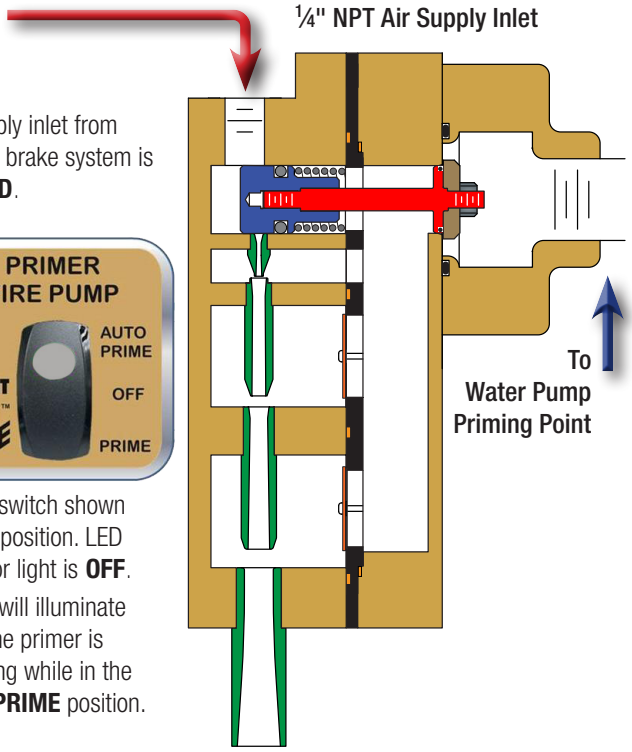
**AirPrime** virtually eliminates the impact load on the electrical system and improves vehicle reliability.

**AirPrime** also improves performance in the elapsed time for establishing water supply. This results in improved fire ground operations and safety.

**Auto Prime** Depress switch into the upper position. The Green LED light will illuminate while priming occurs. The primer will only activate when the **OK TO PUMP** light is **ON** and the Pump Pressure is below 20 PSIG.

## Off Position

Incoming Air Flow **OFF**.




Air supply inlet from chassis brake system is **CLOSED**.

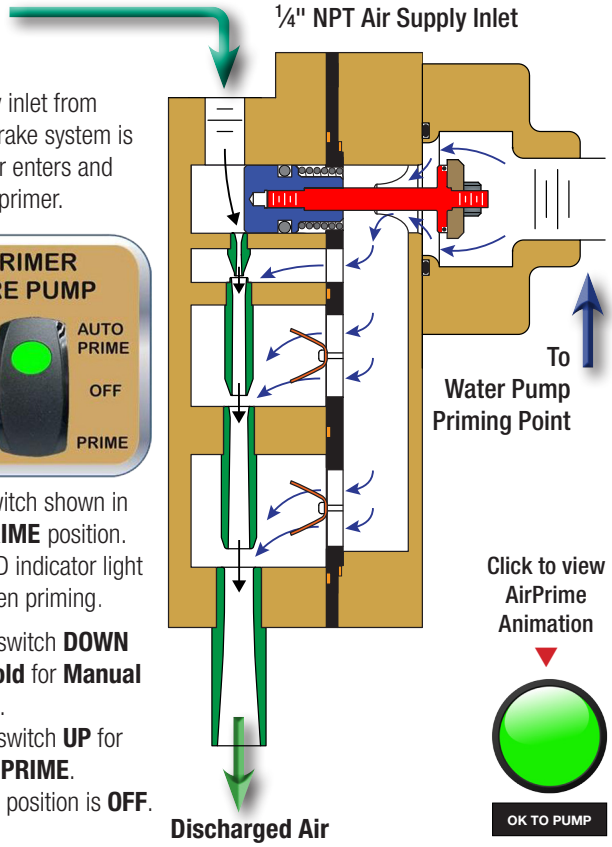



Primer switch shown in **OFF** position. LED indicator light is **OFF**.

Switch will illuminate while the primer is operating while in the **AUTO PRIME** position.

## Auto Prime Position

Incoming Air Flow **ON**.




Air supply inlet from chassis brake system is **OPEN**. Air enters and activates primer.




Primer switch shown in **AUTO PRIME** position. Green LED indicator light is **ON** when priming.

1. Press switch **DOWN** and **hold** for **Manual Prime**.
2. Press switch **UP** for **AUTO PRIME**.
3. Center position is **OFF**.

Click to view AirPrime Animation




NFPA® NATIONAL FIRE PROTECTION ASSN.

**NFPA #1901 and #1906** – Fully Compliant to Standards
Pump Panel Noise Level – **Lowest** dB in the Industry

**Click Here** for the **AirPrime™ Retrofit Guide**

**AirPrime** Primers can be used for both **New** and **Retro-Fit** installations. In Retro-Fit scenarios, an **AirPrime** replacement installation requires minimal tools and time. Automatic **AirPrime** models provide instant re-priming of the pump when required.

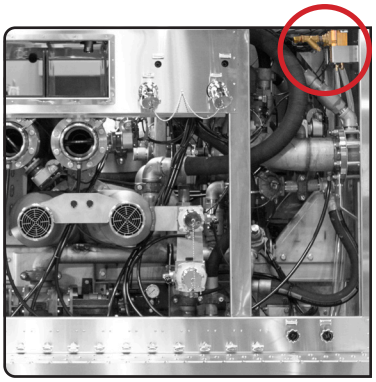
A worn out rotary vane primer can be easily replaced by an **AirPrime™** unit with **Automatic** or **Manual** control.

## Installer Responsibilities

### Air Compressor Size

1. The 2-barrel AirPrime must be used only on fire pumps rated 1000 GPM [3800 LPM] and less. A minimum air compressor size of 13.2 CFM [0.374 Cubic Meters per Minute] must be used.
2. The 3-barrel AirPrime must be used only on fire pumps rated 1250 GPM [4700 LPM] and more. A minimum air compressor size of 15.6 CFM [0.442 Cubic Meters per Minute] must be used.
3. For Industrial Pumpers The **Dual Unit** requires an air compressor with capacity greater than 20 CFM [6.09 Cubic Meters per Minute]. The **Triple Unit** requires an air compressor with capacity greater than 30 CFM [9.14 Cubic Meters per Minute].
4. **NOTE**: For operations above 4000 feet [1219 meters] of elevation and lifts greater than 15 feet [4.5 meters], a minimum air compressor size of 18 CFM [0.510 Cubic Meters per Minute] or larger is required.

### Basic Materials Supplied by Installer



1. A 3/8" OD (.251 ID) air hose from the air tank (primary or auxiliary tank) with 1/4" NPT connections (length determined by installer).
2. Primer mounting bracket to **install high in the pump enclosure**. (Only required for remote mount.) See **Figure #2.**
3. Non-collapsible 3/4" inside diameter (ID) air hose from primer to fire pump with 3/4" NPT fittings.
4. A Pressure Protection Valve (PPV) (Optionally available from Trident, **Part # 30.053.0**).
5. A 1-1/4" [32 mm] ID drain hose may be connected to the primer outlet using a hose clamp to secure it in place. **NOTE:** Loosely tighten the hose clamp to avoid damage to the discharge ports. This hose directs water from the primer to any location under the vehicle. Be sure this hose is properly secured, short as possible and away from any moving components, free of any sharp bends and pitched to allow drainage.
6. Liquid thread sealant or Teflon tape is required for all threaded pneumatic fittings.
   **NOTE:** Use sparingly while applying sealant to avoid blockage of the internal mesh filter. See **Page 5, Figure #5.**

### Remote Primer Mounting

1. A fabricated primer bracket to secure the primer within the pump enclosure. The mounting height for all priming components must be **ABOVE** the highest priming point on the pump suction side (or above the highest remote priming valve for multiple location systems) to permit air removal and allow for complete drainage. See **Figure #2** for the bolt hole mounting template. An actual size bolt hole template is provided in the primer shipping carton for your convenience.
   **NOTE:** Primer **MUST** be mounted **VERTICALLY** with the primer outlet discharge (round) ports facing downward as shown in **Figure #1.**
2. A non-collapsible hose from the 3/4" NPT cleanable wye strainer on the primer inlet to the 3/4" NPT fire pump priming port. A 3/4" minimum inside diameter hose must be used.
3. The AirPrime and attached wye strainer must be installed in a location for ease of maintenance per **Figure #3** on **Page 5**. The installer may choose from one of the options below as a method of draining the strainer:
   a) Remove threaded plug on wye strainer for draining during annual pump service. Refer to **Page 13** for Troubleshooting Guide.
   b) For draining, the strainer may be piped to the pump master drain by the installer. This helps in climates prone to freezing conditions.
   c) Alternatively a separate drain with valve and label may be piped to the bottom of the pump enclosure by the installer.

**NOTE**: If the vehicle includes a front suction inlet, adding a **Primer Front Intake** control is required. Refer to drawings of front suction plumbing on **Pages 11** and **12**.

### Primer Mounting

**Figure #1** Shows the proper mounting of the primer to a Hale **Q Series** cross-frame midship fire pump. Use the black plastic strainer that Hale supplies with the fire pump.

**Figure #2** Shows the dimensions for the tapped holes in the primer body.

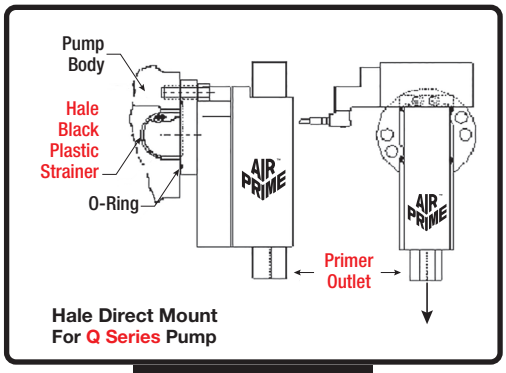



Figure 1

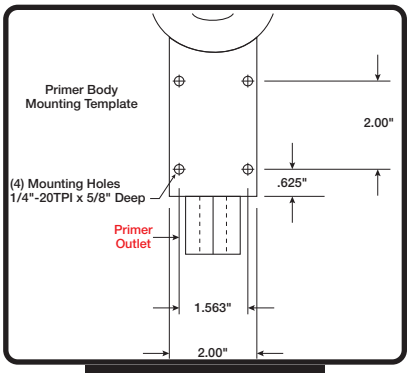


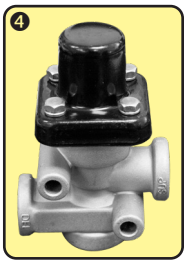

Figure 2

## Air Schematic, PPV, Air Hose and Connections

### Air Supply Schematic

The AirPrime unit must be connected to the vehicle's air brake system exactly as shown in **Figure 4** below. This schematic is typical for most trucks built today.

1. Air compressor supply is shown as ❶.
2. Supply reservoir (wet tank) is shown as ❷.
3. Primary reservoir (typically for the rear brakes) is shown as ❸.
4. Pressure Protection Valve (PPV) is shown as ❹ and in photo at right.
5. Figure ❹a shows a customer supplied SCBA Cylinder used with the Trident Pressure Regulator for use on trucks without airbrakes.
   The regulator ❹b is available separately as Part #14.013.0.




**PPV**
#30.053.0
Sold Separately

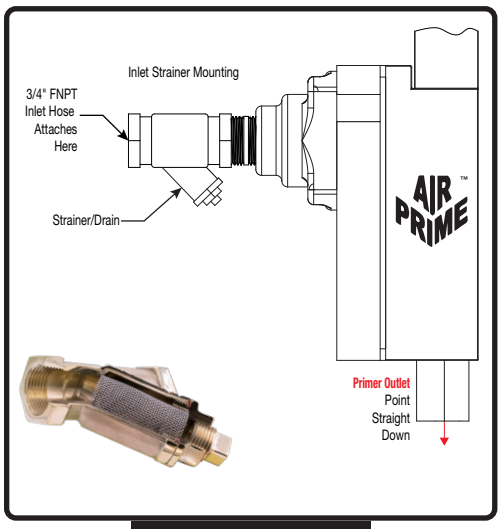




Figure 3

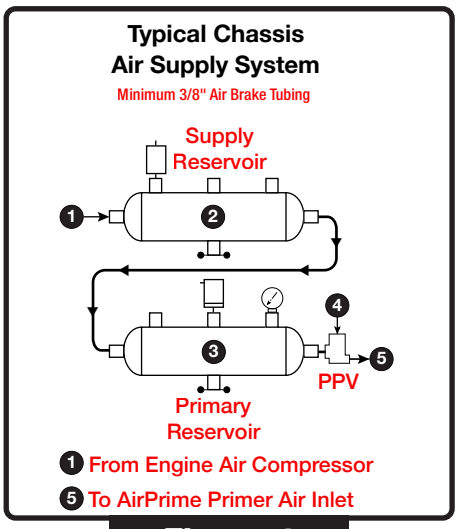



Figure 4

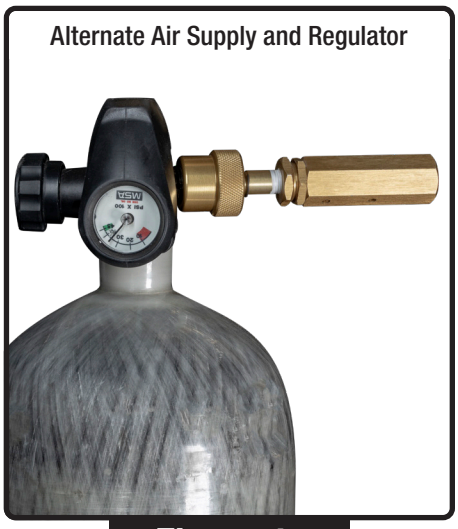



Figure 4a

### Air Supply, Hose and Connections

The air source used to supply the AirPrime shall be from the primary air reservoir ❸ in **Figure #4** or a secondary air reservoir (normally used for air horns, air accessories, fire pump shift or AirMax intake relief valve).

The supply line from the Pressure Protection Valve (PPV) ❹ in **Figure #4** to the primer control should be a minimum size of 3/8" OD air brake tubing and connected at both ends with 1/4" NPT fittings (connections and tubing must be rated for air brake service). The tubing should be kept as short as possible, secured at regular intervals, free of any kinks or bends and must not be run near exhaust components or rotating shafts. Stay 6" [150 mm] away from any exhaust or hot components. Use rubber grommets to protect the tubing from sharp metal edges at all hole locations.

When the installed length of the air brake tubing exceeds 20 feet [6.1 m], a minimum size of 1/2" OD air brake tubing should be used.

### Pressure Protection Valve (PPV)

A Pressure Protection Valve (4) is not supplied with the primer. A **Trident PPV**, Part #30.053.0 may be purchased separately. Alternatively a Bendix PPV, Style PR-4, Part #288323 or its equivalent may also be used. The PPV valve must be installed per **Figure #4** between the primary air supply reservoir ❸ and the primer air inlet. The valve protects the air brake system from any leaks that may occur in the primer or in the air line from the PPV to the primer. The pressure setting for the PPV is 80 PSIG maximum.

### Filter Port

This cleanable porous filter is located inside the top of the primer body, below the threaded area of the air supply connection fitting or solenoid valve connection. See **Figure #5**.
A replacement filter is available as **Part #21.002.0**.

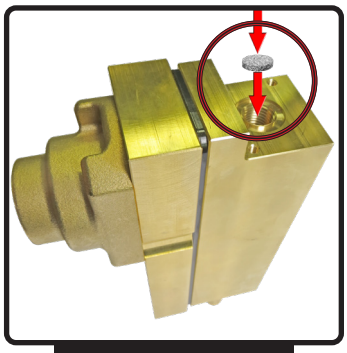


Figure 5

## Automatic Single Location AirPrime™ System

### Installation


Figure 6

1. Install the primer within pump enclosure. Unit must be **VERTICAL** and mounted **ABOVE** the highest priming point in the suction piping.
2. Install 3/8" OD air hose tubing from the Pressure Protected (PPV) air tank to the primer solenoid (See **Figure #7**).
3. Install the rocker switch primer control on the pump panel (See **Figure #8**).
4. Install the pump pressure switch in a 1/4" NPT pressure opening on the top of the fire pump. Install switch in a vertical orientation and in a position that allows for proper drainage (See **Figure #6**).
5. Install the Automatic AirPrime wiring harness as follows: (See **Page 7** and **Figures 10, 11, 12**)
   - 5a Female Deutsch connector to 6" male Deutsch connector of the pump panel rocker switch.
   - 5b White Wire to Hot (+) Side of **OK TO PUMP** light circuit or to fire pump shift control circuit (PTO or split shaft) (1.5 feet long) [.5 m].
   - 5c Red (+) and Black (-) Wires to 12/24 volt vehicle power source (1 foot long) (wiring and 1 amp fuse by installer).
   - 5d Plug the Male Deutsch connector into the Female Deutsch connector on the AirPrime solenoid, 5 feet of cable [1.8 m].
   - 5e Connect to the Male Deutsch connector on the pump discharge pressure switch, 5 feet of cable [1.8 m] (See **Figure #6** above).

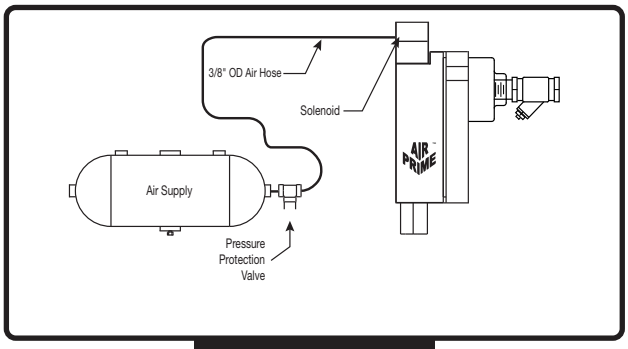



Figure 7

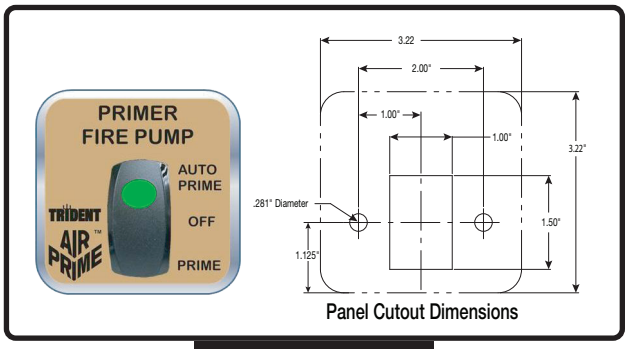



Figure 8

### Operation: Automatic Priming Control

#### AUTO PRIME Automatic Mode (Top Position)

- Normally, leave the AirPrime rocker switch in **AUTO PRIME** mode.
- If drafting, connect all suction hoses, strainer and tighten accordingly. Utilize wheel chocks. **In Cab**: Apply parking brake, Engage pump per manufacturers recommendations (AirPrime will start priming automatically when the pump is engaged). **NOTE:** Never run a fire pump dry for more than 45 seconds.
- Pump Panel: Verify that the green **OK TO PUMP** light is **ON** and then increase RPM. When the discharge pressure increases above 20 PSIG [1.4 Bar] the primer will turn off. When the discharge master gauge indicates greater than 20 PSIG [1.4 Bar] pressure, the discharge valves can now be opened to deliver water.
- Automatic Operation: If the pump prime is lost, AirPrime will automatically start (Green Light Turns On) to re-prime the fire pump. It will automatically turn off when the pump pressure reaches 20 PSIG [1.4 Bar].

#### OFF Neutral Mode (Center Position)

- Disables the pump primer at all times.

#### PRIME Manual Mode (Lower Position) (Spring Loaded, Momentary Activation)

- Push and Hold the switch for manual engagement of the primer at any time.
- For Operation: Properly engage the fire pump, verify that the green **OK TO PUMP** light is on, advance the throttle to 1000 RPM, push and hold the momentary switch until the pump is primed, open discharges slowly. Rocker switch position can be changed to the **AUTO PRIME** mode at any time.
- The manual mode can be used without having the fire pump engaged for vacuum testing or training on the primer system.


Trident Emergency Products, LLC
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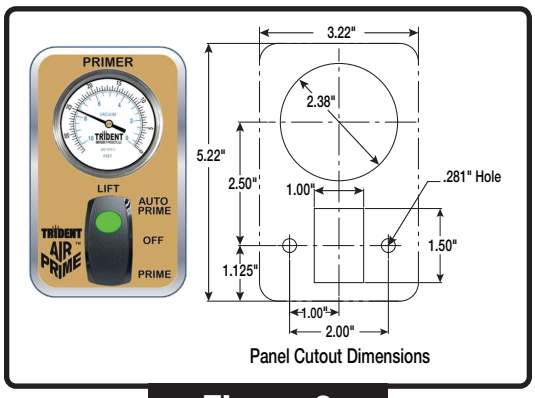
## Automatic Single Location AirPrime™ System with Optional Vacuum Gauge

### Installation

1. Install the primer within pump enclosure. Unit must be **VERTICAL** and mounted **ABOVE** the highest priming point in the suction piping.
2. Install 3/8" OD air tubing from the pressure protected air tank (PPV valve) to the primer.
3. Cut and install on the pump panel the rocker switch primer control assembly with lift gauge (See **Figure #9**).
4. Install the pump pressure switch in a 1/4" NPT pressure opening on the top of the fire pump (See **Figure #6** on **Page 6**).
5. Install the Automatic AirPrime wiring harness as follows (See **Figures 10, 11, 12**):
   - 5a Female Deutsch connector to 6" Male Deutsch connector of the rocker switch on pump panel.
   - 5b White Wire to Hot (+) Side of **OK TO PUMP** light circuit or to fire pump shift control circuit (PTO or split shaft) (1.5 feet long) [.5 m].
   - 5c Connect Red (+) to a constant 12/24 volt vehicle power source. Connect Black (-) to chassis ground on the vehicle. Wires (1 foot long) (wiring and 1 amp fuse by installer).
   - 5d Plug the Male Deutsch connector into the Female Deutsch connector on the AirPrime solenoid, 5 feet of cable [1.8 m].
   - 5e Connect to the Male Deutsch connector on the pump discharge pressure switch, 5 feet of cable [1.8 m] (See **Figure #6** on **Page 6**).
6. Connect a 1/4" OD [6.35 mm] air hose tube (not supplied) from the push-to-connect fitting supplied on the back of the panel lift gauge to the 1/8" NPT connection on side of the primer body using the 1/8" male NPT x 1/4" push-to-connect swivel elbow provided with the AirPrime unit. See photo below.

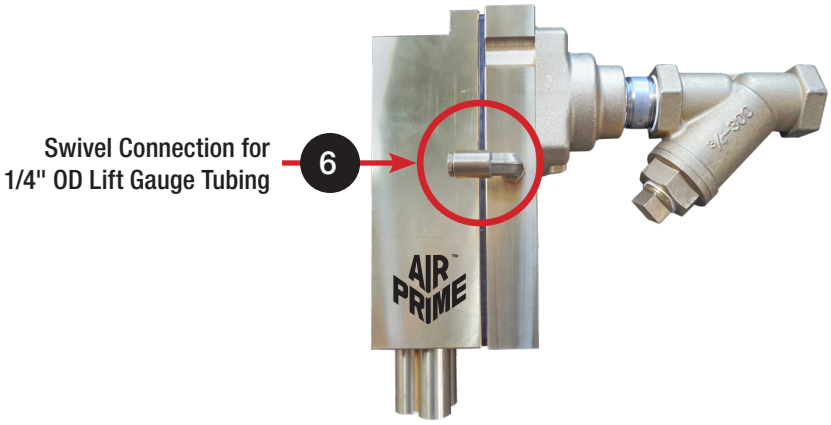
### The lift gauge provides the following features:

- Indication of the vertical lift of water in feet and meters during priming operation.
- Lift gauge will not be damaged by positive water pressure supply line.
- Lift gauge can be used for positive periodic in-service ramp test without having the fire pump engaged.
- Operation is the same as Automatic AirPrime without a lift gauge.




Panel Cutout Dimensions

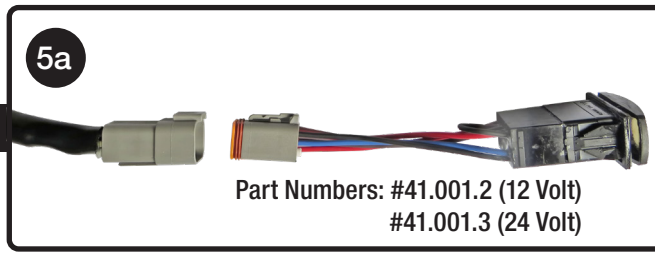
**Figure 9**




Wiring Harness
Part #41.001.2

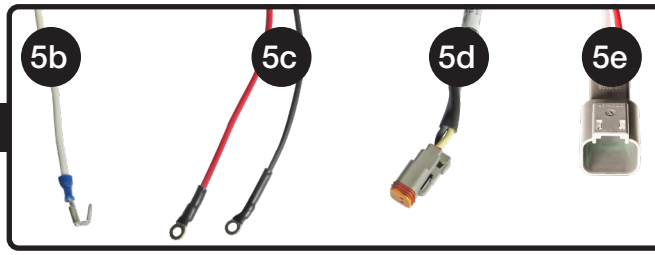
**Figure 10**

**Figure 11**

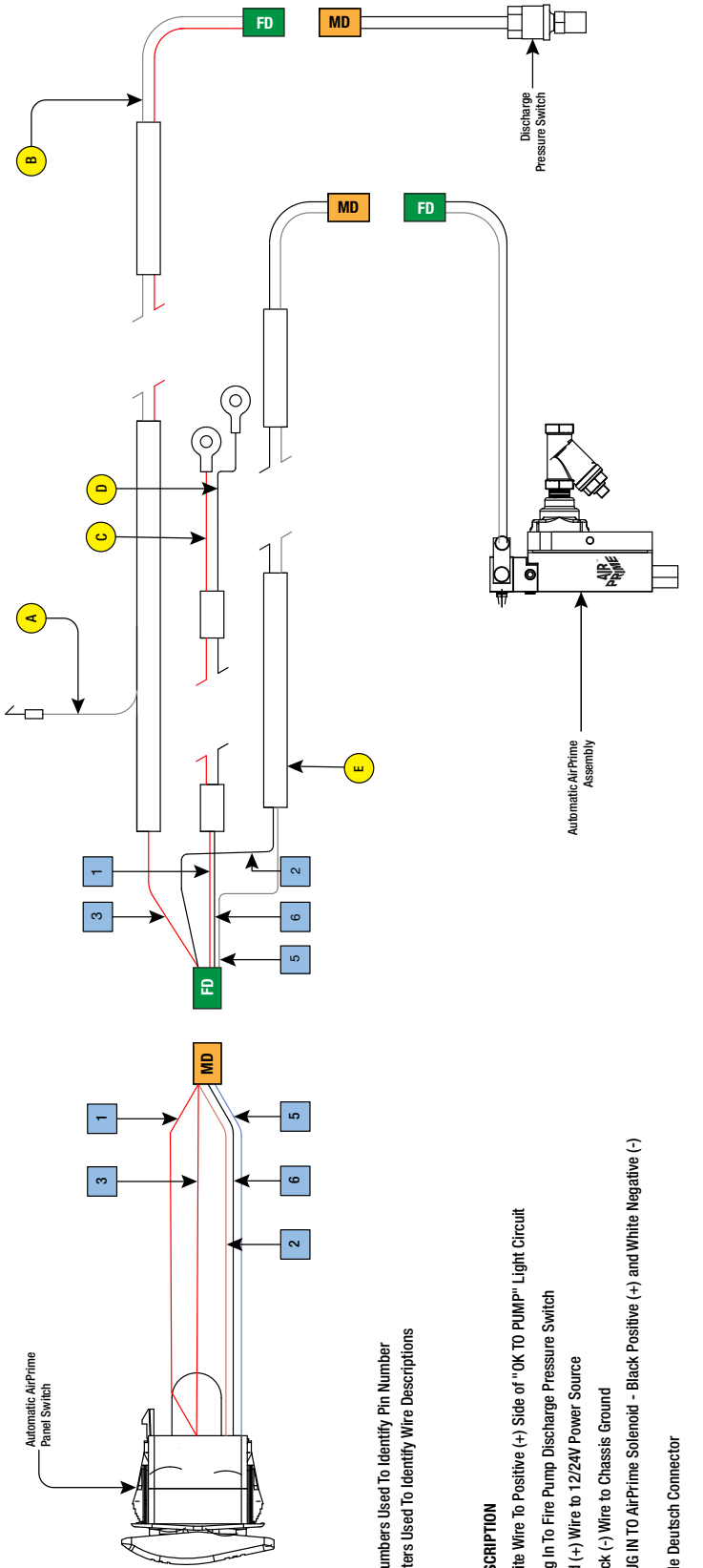



Part Numbers: #41.001.2 (12 Volt)
#41.001.3 (24 Volt)

**Figure 12**



## Automatic Primer Switch Wiring Details

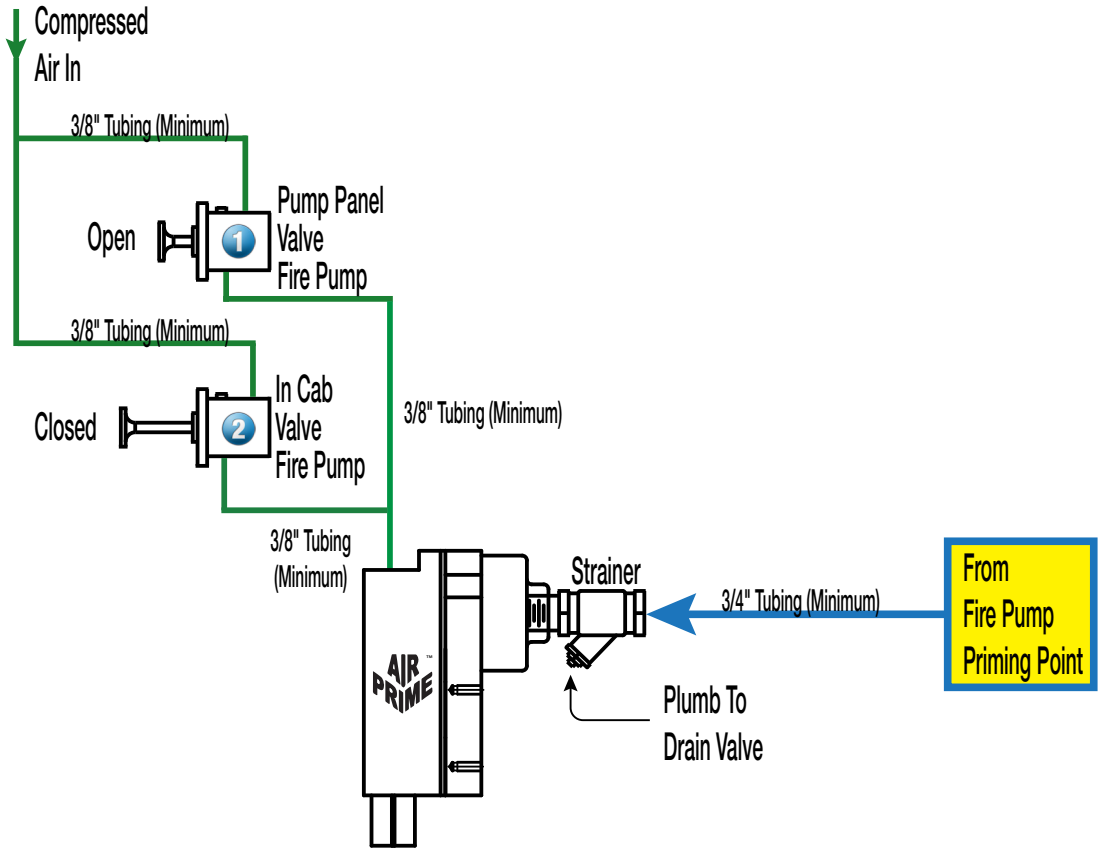



**NOTES**

1. ☐ Squared Numbers Used To Identify Pin Number
2. ◯ Circled Letters Used To Identify Wire Descriptions

| LETTER | DESCRIPTION |
|---|---|
| A | White Wire To Positive (+) Side of "OK TO PUMP" Light Circuit |
| B | Plug In To Fire Pump Discharge Pressure Switch |
| C | Red (+) Wire to 12/24V Power Source |
| D | Black (-) Wire to Chassis Ground |
| E | PLUG IN TO AirPrime Solenoid - Black Positive (+) and White Negative (-) |
| MD | Male Deutsch Connector |
| FD | Female Deutsch Connector |

## Optional In Cab Primer Control




Color Key

- Air Supply Lines
- Vacuum Priming Lines

**Manual AirPrime**
**Second Control Point**
**In Cab Valve**
**Depress to Activate**

## Manual Single Location AirPrime™ Systems

### Installation

1. Install the primer within pump enclosure. Unit must be **VERTICAL** and mounted **ABOVE** the highest priming point in the suction piping.
2. Install the manually operated **Push To Prime** control on the pump panel (see **Figure #13**).
3. Install 3/8" OD air hose tubing with 1/4" NPT fittings from the pressure protected air tank (PPV valve) to the primer control and then to the primer unit. (See **Figure #14**).
4. If the AirPrime is equipped with the optional lift gauge, connect 1/4" air hose tubing from the push to connect fitting supplied on the back of the panel lift gauge to the 1/8" NPT connection on side of the primer body using the 1/8" male NPT x 1/4" push to connect swivel elbow provided with the AirPrime unit. (See **photo bottom right** for tubing connection location).

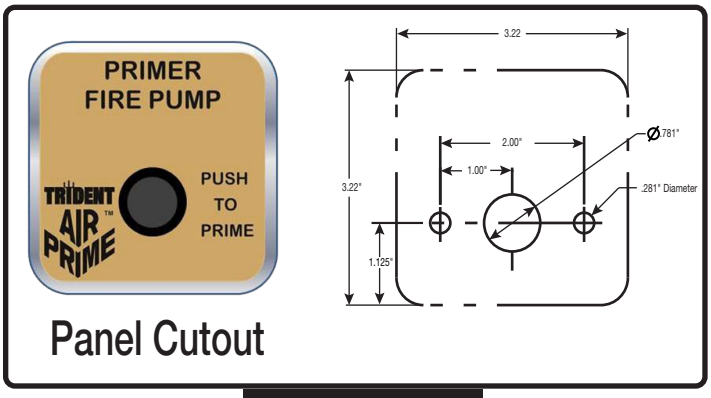



Figure 13

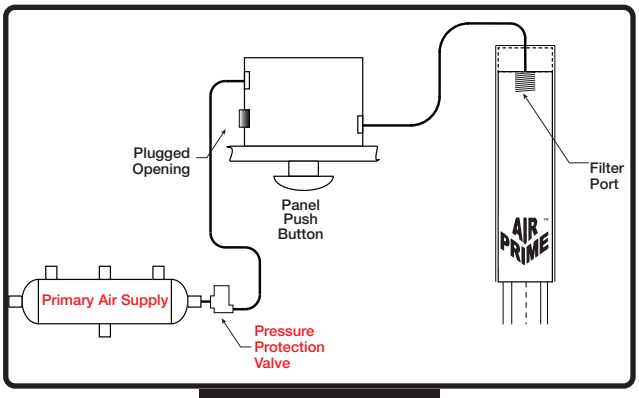



Figure 14

### OPERATION: Manual Priming Control

The manual fire pump primer is operated simply by increasing the engine speed to a maximum of 1000 RPM and depressing the push button on the panel. Hold the button down until the discharge pressure gauge begins to rise. The primer will stop operating when the push button is released. The push button will operate the primer regardless of whether the fire pump is engaged or not.

- Depressing the **Push To Prime** button directs air to the primer inlet.
- An internal valve to the fire pump is opened with air pressure from the chassis air brake system when the button is depressed.
- Vacuum for drafting is created by air flowing through multi-stage internal venturi nozzles.
- The Primer Control Valve has no water, plumbing or electrical lines.
- Never run a dry pump at engine speeds above 1200 RPM for more than 45 seconds in accordance with the operating instructions provided from the fire pump manufacturer.
- **NOTE**: It is recommended that the **Push Button Control** be depressed monthly to exercise the spring and seals. The fire pump does not have to be engaged during this process. This also applies to any other intake Push Button Controls you may have. Parker O-Lube or equivalent O-Ring safe lubricant should be applied annually to lubricate the mechanism. It is available at Amazon or through a local automotive parts supplier.

Parker O-Lube

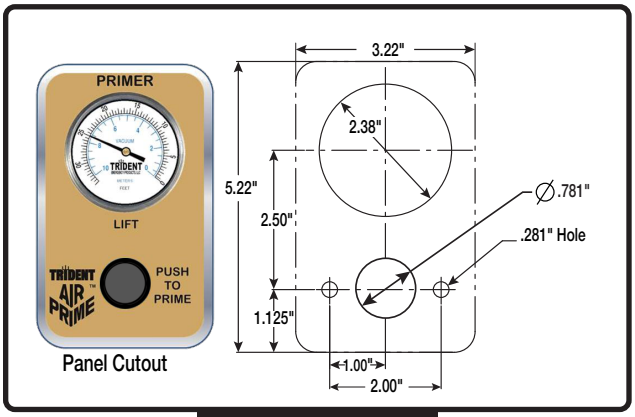
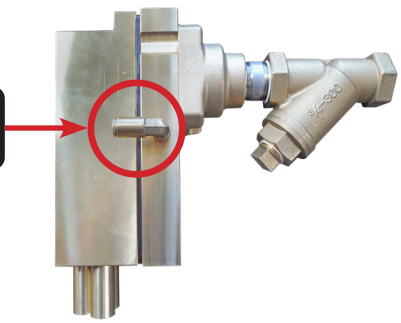



Figure 15

### The lift gauge provides the following features:

- Indicates the water lift in feet and meters during priming operation.
- Lift gauge will not be damaged by positive water pressure supply line.
- Lift gauge can be used for positive periodic in-service ramp test without pump engagement.
- Operation is the same as a manual AirPrime without the lift gauge.

Swivel Elbow for 1/4" OD tubing that connects to the Lift Gauge.



# Multi Location Installation and Operating Instructions

## Key Points for All Installations

1. The AirPrime unit **MUST** be **VERTICALLY** mounted **ABOVE** the highest priming point in suction piping.
2. All Remote Priming Valves (RPV) **MUST** be mounted **ABOVE** the highest priming point in the suction piping.
3. If the RPV priming valve is mounted below the AirPrime unit, add drain lines from all low points to a drain valve to prevent freezing.
4. It is common to have up to four (4) remote locations with AirPrime Multi-Location priming systems.
5. If front suction pre-priming is required, refer to drawings on the bottom **Pages 11** and **12** for installation recommendations.

## Installation Notes for Multi-Location Priming Systems

1. For **Automatic System**: Follow the instructions on **Page 6** and **Page 7** with lift gauge for mounting the first control on the pump panel.
2. For **Automatic System**: Refer to schematic in **Figure 17** on **Page 11** for air tubing, electric wiring and suction plumbing.
3. For **Automatic AirPrime Connections**: See **Figure 7** on **Page 6** and information on **Page 5**.
4. For **Manual System**: Follow the instructions on **Page 8** for mounting the first control on the pump panel.
5. For **Manual System**: Refer to schematics in **Figure 16** on **Page 10** for air tubing and suction piping.
6. For additional priming locations mount a Push-Button Control as shown in **Photo 5**.
7. Identifying **Gold Labels** are provided for **LEFT**, **RIGHT**, **FRONT** and **REAR** remote priming locations as shown in **Photo 6**.
8. See **Photos 3** and **4** to note that the cast in arrows on the RPVs and Check Valves are in the proper flow direction.

## Operating Instructions for Multi-Location Automatic Priming System

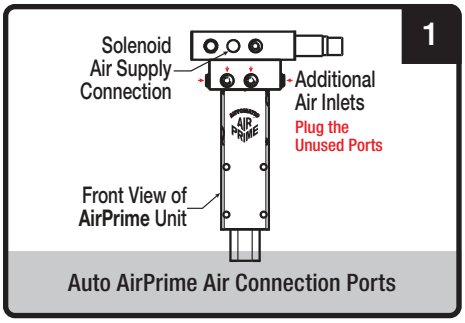
1. See operating instructions for the Auto Priming System on **Page 6** for the initial fire pump priming procedures.
2. Be sure the AirPrime switch is in the **AUTO PRIME** position when opening a remote location valve control.
3. To pre-prime a remote location, push in the **PRIME** button of that location for 45 seconds or until water appears at top of the hose.

## Operating Instructions for Multi-Location Manual Priming System

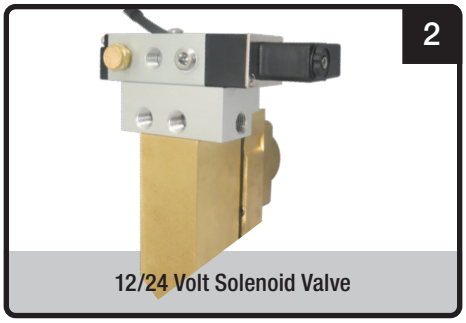
1. Refer to the operating instructions for Manual Priming System on **Page 8** for the initial fire pump priming procedures.
2. To pre-prime a remote location, push in the **PRIME** button for that location for 45 seconds or until water appears at top of the hose.
3. Be prepared to push the **FIRE PUMP PUSH TO PRIME** button when a remote location valve is opened to remove any trapped air.

## Multi-Location Components

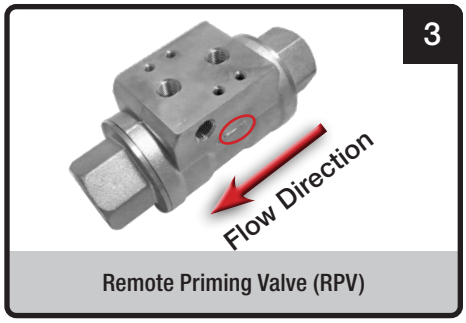
1. Primer solenoid and Multi Location air inlets are shown below in **Photos 1** and **2**.
2. The Remote Priming Valve (RPV) and Air Line Check Valve include flow direction arrows as shown in **Photos 3** and **4** below.
3. Additional pre-priming panel control valve and location labels are shown in **Photos 5** and **6**.



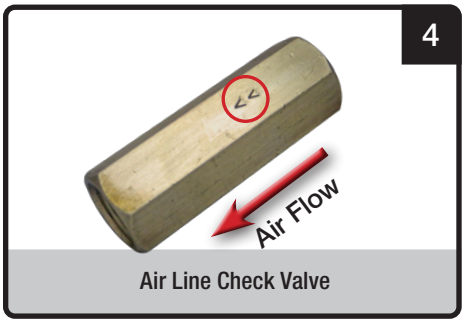
Auto AirPrime Air Connection Ports



12/24 Volt Solenoid Valve

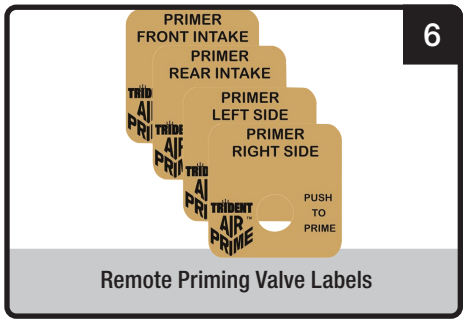


Remote Priming Valve (RPV)



Air Line Check Valve

Manual AirPrime/Remote Location Valve



Remote Priming Valve Labels

## Multi Location Automatic AirPrime™ System Diagram

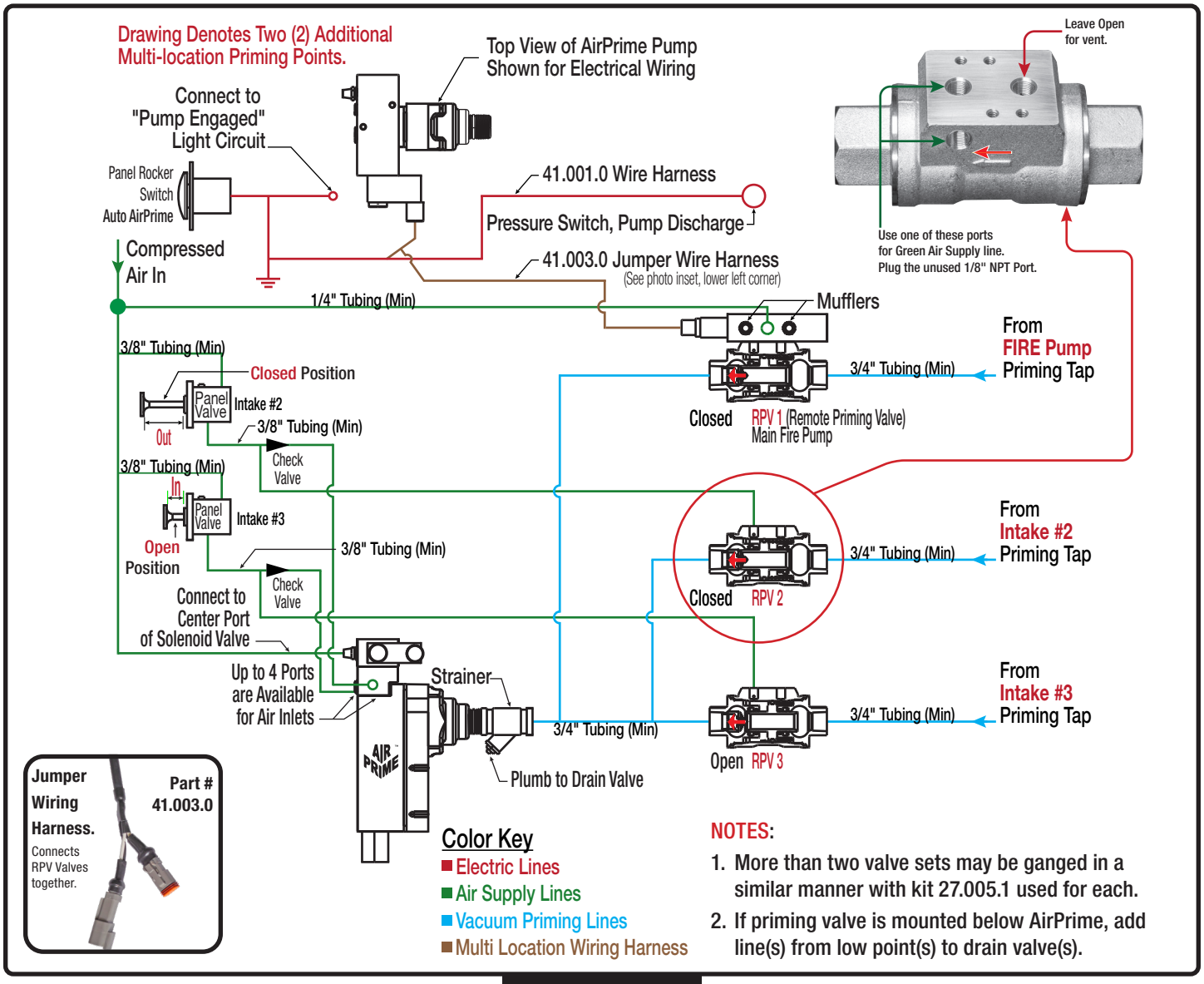
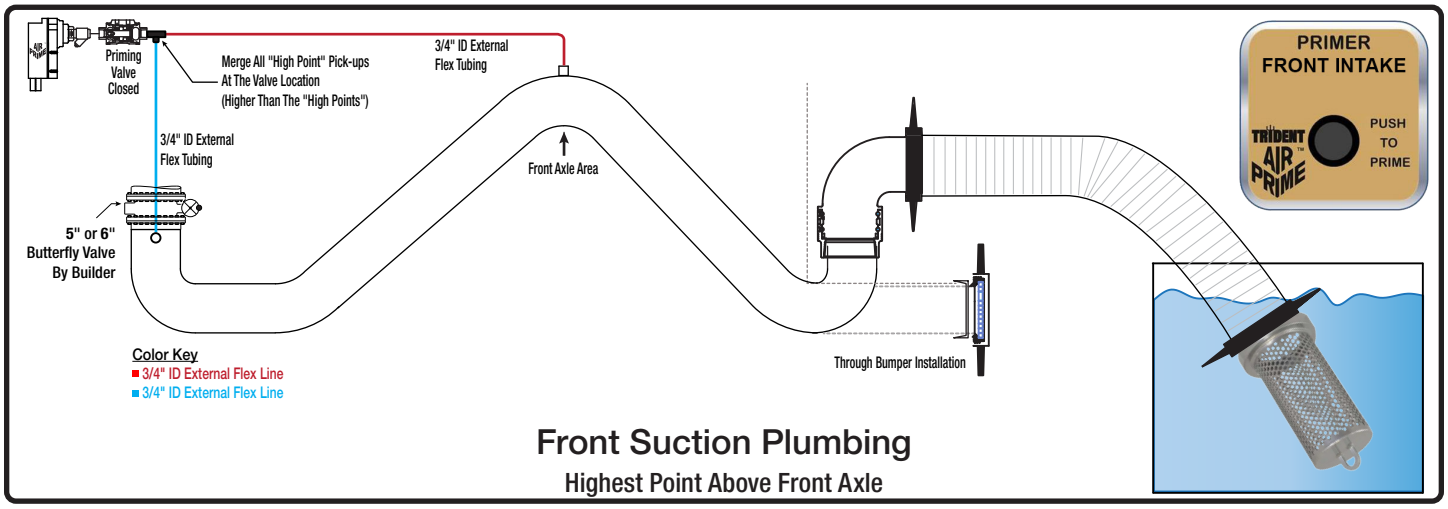



**Figure 16**




## Front Suction Plumbing

Highest Point Above Front Axle

## Multi Location Manual AirPrime™ System Diagram

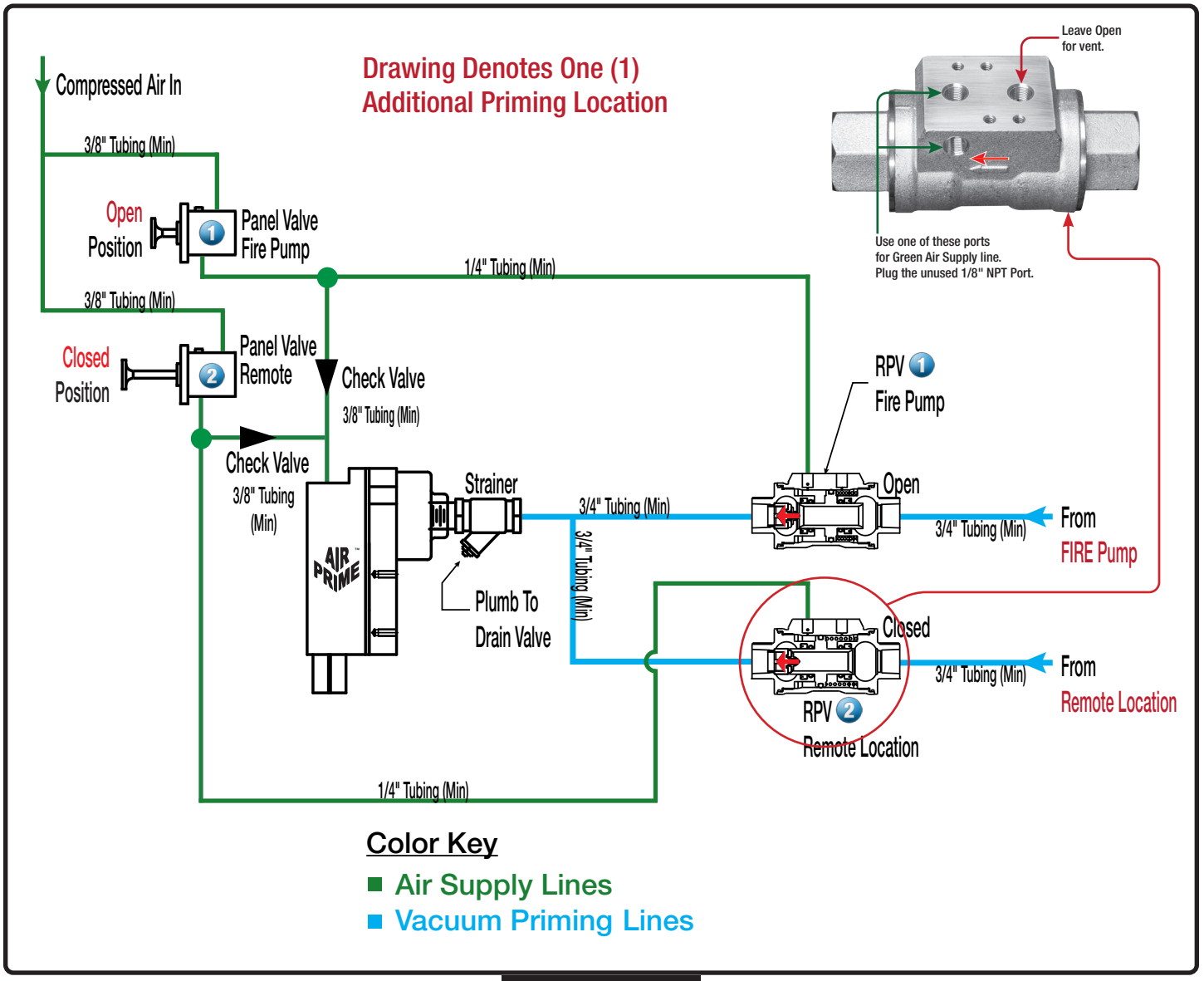
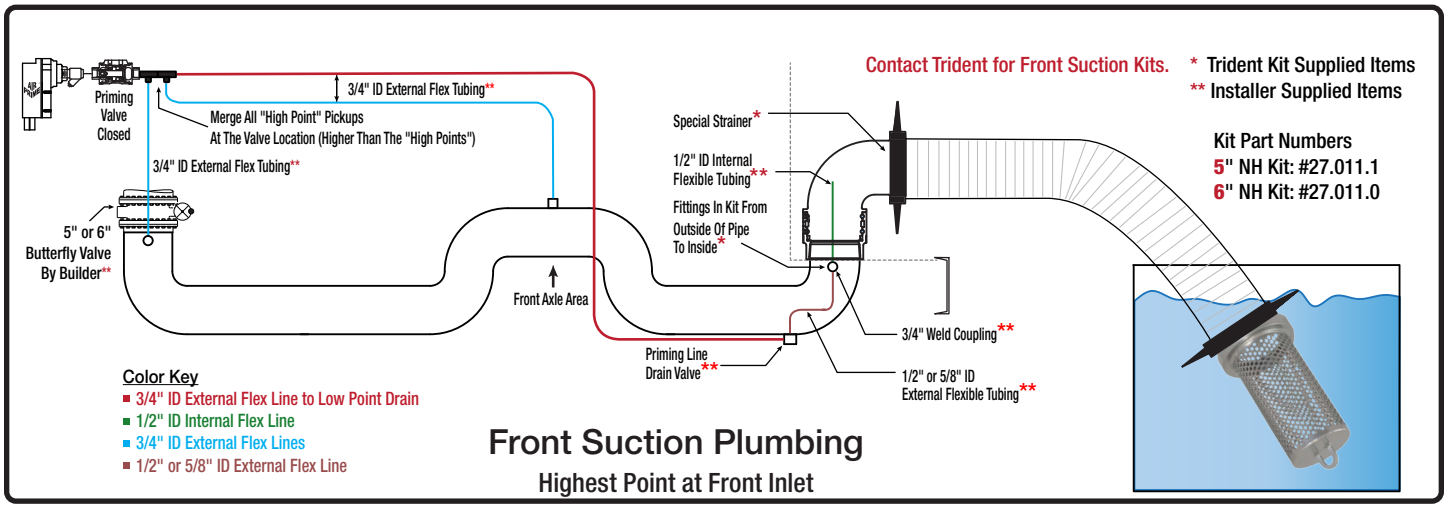



**Figure 17**




**Front Suction Plumbing**

Highest Point at Front Inlet

Kit 27.003.3 Instructions

## Trouble Shooting Guide

| Problem | Likely Cause | Corrective Action |
|---|---|---|
| System **Does Not** Hold Vacuum. | • Master Drain Valve Open.<br>• Discharge or Intake Valves Open.<br>• Bleeder or Drain Valves Open.<br>• Relief Valve Drain Open. | Double check all drains, discharge and intake valves to make sure all of them are closed. |
| | Intake Relief Valve Allowing Air Into Pump System. For conventional intake relief valves only. Procedure differs when using an AirMax™ valve. | a) Adjust intake valve to closed position (be careful to count the number of turns to close and re-open the same number of turns).<br>b) Cap the discharge side of the intake relief valve (NPT or NH). Be sure to remove cap after testing. |
| | AirPrime Exhaust Outlets Drawing Back Vacuum. | The integral priming valve is not closing all the way, air is moving upward into the barrels, into the pump, as the water falls back into the hard suction hose to the water level or as vacuum is lost through the fire pump system. |
| Filter Info Manual<br>System **Will Not** Reach 22" Hg.<br>Filter Info Auto | Inadequate Air Supply. | a) Check the CFM rating of the engine air compressor. **See Page 4.**<br>b) Check air pressure at "supply" side of AirPrime (should be over 70-PSIG/ [3.8 Bar]). Install a tee and air gauge in input for test purposes. If the air pressure is not the same as the cab dash air pressure gauge, check for under sized airline, kinks or obstructions in air line, or air line is too long. Air line length should be less than 20 ft [6 m] from primary storage tank. |
| | Pressure Protection Valve. | c) Check Pressure Protection Valve air on/off settings (should shut-off in the 60 to 80-PSIG / [4.2 to 5.5 Bar] range) and OPEN no higher than 80-PSIG / [5.5. Bar] to the AirPrime supply. |
| | Air filter on intake side of air supply connection to AirPrime body. For details on filter inspection/ replacement visit/scan QR codes at right. | a) Manual AirPrime: Remove air supply piping, remove fine mesh filter, clean or replace. Part#: 21.002.0.<br>b) Automatic AirPrime: Remove air supply piping, remove air solenoid assembly, remove fine mesh filter, clean or replace. Part #: 21.002.0 |
| | Slight air leak in discharge or intake valves in fire pump plumbing. | c) Hydrostatic test the plumbing system to the NFPA #1901 standard with wet fire pump & closed valves: 250-PSIG [17.2 Bar] for 10 minutes without pressure loss. |
| | Check the interior check valves inside the primer. | Remove and disassemble primer to inspect the three (3) small internal rubber check valves to the venturi orifices. |
| | Check the interior primer body venturi nozzles for foreign material or blockage. | Remove and disassemble primer to inspect the three (3) internal venturi nozzle openings or clean with small wire to assure open orifices. |
| | Defective Primer. | Replace or rebuild primer with Kit #27.003.3. See Instructions Here ▶ |
| AirPrime **Leaks** Water. | Check the AirPrime integral priming valve. | a) The priming valve is not seating in the shut-off position: Remove primer, disassemble, and check the priming valve spring, seat and operation.<br>b) The priming valve is "stuck", check for damaged O-Ring or check to see if piston is fully threaded on the valve stem. |
| **Manual System**: Air continues to flow when button is released. | Bad manual Push Button valve.<br><br>Push Button air plumbing installed incorrectly. | Replace the Push Button with a new valve, Part #27.003.1. **Note:** *It is recommended that the Push Button Control be depressed regularly to exercise the spring and seals. The fire pump does not have to be engaged during this process.*<br><br>Refer to air schematic drawing, Figure 14 on Page #8 of this manual. |
| **Auto System**: Air continues to flow when button is released. | Panel switch inoperable.<br><br>Air solenoid on top of primer is defective.<br><br>Solenoid is on backwards. | Refer to parts list on Page 16, order replacement switch, Part #27.003.2.<br><br>Refer to parts list, order replacement solenoid, Part #30.003.0 (12 Volt) or #30.003.1 (24 Volt).<br><br>Reverse orientation of solenoid on top of manifold. Ports on solenoid and manifold should be on the same side. |

Visit TridentAutoAirPrime.com for additional AirPrime information.

## Trouble Shooting Guide (Continued)

| Problem | Likely Cause | Corrective Action |
|---|---|---|
| Slow Prime Time. | Leaking air into the plumbing system. | Double check all drains, discharge, and intake valves to make sure all are closed. |
| | Low air pressure. | Check air pressure at supply side of AirPrime (Should be over 70-PSIG/[3.8 Bar]). Install a tee and air gauge in air line for test purposes. If the air pressure is not the same as the cab dash air pressure gauge, check for an under sized airline, kinks or obstructions in air line. Or the air line may be too long (Must be under 20 feet [6 m] from primary tank). |
| | Pressure Protection Valve. | Check Pressure Protection Valve air on/off settings (should shut-off in 60 to 80-PSIG / [4.2 to 5.5 Bar] range) and OPEN no higher than 80-PSIG / [5.5 Bar] to AirPrime. |
| | Check wye strainer on intake from fire pump, could be clogged. | Remote primer installation: The line from the fire pump to the AirPrime has a wye type strainer just before connecting into the primer body. Remove the plug, then strainer, and clean the strainer of debris, reinstall strainer and plug.<br>a) Direct mount on Hale pump installation: Remove the primer from the Hale Q fire pump, check the black plastic strainer for debris (Supplied by Hale). |
| | Check Air line to the AirPrime. | The air supply line from the air tank is either kinked, undersized or over length. Replace air line accordingly (**NOTE:** Found mainly on new installations). |
| | Check discharge and intake valves. | Cap or plug the discharge and intake valves to prove the valves are not leaking air into the plumbing system (Hydrostatic pump test is useful for such testing). |
| | Check gated Master Intake Valves on suction intakes. | a) Remove the MIV and cap intake.<br>b) Install a cap on the discharge side of the relief valve.<br>c) Cap the Storz or NH intake. |
| | Check the AirPrime internal priming valve. | a) The priming valve is not seating in the shut-off position, remove primer, disassemble, and check the priming valve spring, seat, and operation.<br>b) The priming valve is "stuck". Check for damaged O-Ring or check to see that the piston is still fully threaded on the valve stem. |
| | Suction lift too high. | Do not attempt lifts exceeding 24 feet [7.3 m]. |
| | Blocked suction strainer. | Remove any obstructions or debris from hose strainer, do not allow suction hose or strainer to rest on the bottom of the water supply. |
| | Leaking Suction Hose connections. | Clean and tighten all suction hose connections, check hose washers and replace as necessary. |
| | Air Trap in suction line. | Suction hose should be positioned with a constant decline to the water supply. If a trap is unavoidable, repeated priming may be required to eliminate air pocket. |
| **Multi Location Specific** | | |
| Problem | Likely Cause | Corrective Action |
| Trouble Priming or Pre-Priming from Locations Other Than Pump. | Not priming from highest suction plumbing point. | Check suction plumbing elevations, shown on bottom of Pages 10 and 11. Check for changes in suction high point when truck is drafting on an incline. |
| | Remote Priming Valve (RPV) not opening. | Defective RPV, defective panel push button, check system plumbing using schematics on **Page 10** (Automatic) **Figure 16** and **Page 11** (Manual) **Figure 17**. |
| | Water trap in RPV line. | Lines must ascend from highest suction plumbing points to RPV(s) for natural drainage and to avoid water traps. |

## AirPrime™ Industrial and SC Systems

AirPrime units are available for high volume Industrial Pumpers/Trailers with engine driven air compressors. Also available for small Wildland Trucks without air brakes by utilizing a SCBA cylinder. Visit TridentAutoAirPrime or Contact Trident via email for more information.

## Annual Primer Testing

The AirPrime™ primer is designed to meet the NFPA requirements of: **Dry Vacuum** (TEST #1) and **Priming Time** (TEST #2). These tests should be performed on an annual basis, or whenever major repairs or modifications have been made to the fire pump, plumbing or primer.

**TEST #1 Dry Vacuum Test:** Checks the primer's ability to produce 22 inches (Hg) [.745 Bar] of vacuum, and the pump and plumbing's ability to hold that vacuum. The fire pump does not have to be engaged. If you have an Automatic AirPrime, use the lower **PRIME** position on the rocker switch. If you have a Manual AirPrime, use the **Push Button** control. Never run a dry pump at engine speeds above 1200 RPM. There is no time requirement for the vacuum to reach 22 inches. If the compressor has a capacity of 13.2 CFM [374 Cubic Centimeter Displacement], it can take several minutes to reach 22 inches [.75 Bar]. This time can be shortened by engaging the pump and increasing the engine speed to 1200 RPM. The test process is as follows:

1. Drain all water from pump and plumbing.
2. Close all valves and drains. Cap all suction openings and the outlet off of the suction side relief valve (if so equipped).
3. Connect a vacuum test gauge to the intake test gauge connection on the pump panel.
4. Operate the AirPrime with the air system at over 100 PSIG [7.0 Bar] pressure, air tanks filled to capacity, and at 1000 RPM engine speed; until the vacuum gauge indicates 22 inches (Hg) [.75 Bar] or more of vacuum. For a **Manual** AirPrime, depress the valve on the pump panel. If the primer is an **Automatic** AirPrime, depress the rocker switch to the **PRIME** (lower position) to activate the primer.
5. Watch the gauge, if the vacuum falls more than 10 inches in 5 minutes the test has failed and is a certain indication of an air leak(s). Vacuum leaks may be detected by ear, with the engine turned off. Correct leaks immediately and test the priming system again.

**TEST #2 Priming Time Test:** This test is to prove that the fire pump and primer have the capability of attaining a prime and creating discharge water pressure in a set period of time. This test is also conducted by the apparatus builder prior to delivery. The fire pump shall be engaged and primer actuated. This test is part of an annual pump performance test and is performed as follows:

1. Set up the apparatus in accordance with the pump test outlined in the NFPA 1901 Standards.
2. Engage the pump, and increase the throttle to a maximum engine speed of 1000 RPM.
3. Operate the AirPrime with the air system over 100 PSIG [7.0 Bar] pressure, air tanks filled to capacity, and at 1000 RPM engine speed.
   - For the **Manuallly** controlled primer, release the push button when a discharge pressure over 20 PSIG [1.4 Bar] is obtained.
   - For the **Automatic** primer, place the switch in the **AUTO PRIME** (upper position), the primer will turn off automatically when prime is achieved.
4. The priming time should not exceed 30 seconds for 1250 GPM [4700 LPM] and smaller pumps. The priming time should not exceed 45 seconds for 1500 GPM [5600 LPM] and larger pumps. An additional 15 seconds is allowed for pumps with auxiliary suctions using 4" or larger piping.

Higher lifts and operating at higher elevations will slow down the priming time. The air compressor rating should be a minimum of 18 CFM [410 Cubic Centimeter Displacement] for elevations over 4000 feet [1200 m] and lifts in excess of 15 feet [4.5 m]. Operation at these extremes may require the primer to be operated at engine speeds in excess of 1000 RPM without engaging the pump, until water reaches the impeller. Never run a dry pump at engine speeds above 1200 RPM.

### IN-SERVICE OPERATIONAL RAMP TEST

The integrity and operation of the primer can be quickly checked (on a daily or weekly basis) as outlined below, without fire pump engagement:

1. Drain all water from pump and plumbing.
2. Close all valves and drains. Cap all suction openings.
   - Operate the AirPrime with the air brake system pressure over 100 PSIG [7.0 Bar], air tanks filled to capacity, and the engine running at 1000 RPM (with an **Auto AirPrime** electrically controlled model, depress the switch in the lower **PRIME** mode position).
3. Stop running the primer.

Time to reach 15 inches HG [.50 Bar] or 17 feet [5.0 m] on lift gauge should be within the times listed below for the volume of the pump being tested.

**Small Body Pump (Up To 1250 GPM): Vacuum Time**

10 inches HG [.33 Bar] (11 Feet) **6 Seconds**

15 inches HG [.50 Bar] (17 Feet) **15 Seconds**

**Large Body Pump (Over 1250 GPM): Vacuum Time**

10 inches HG [.33 Bar] (11 Feet) **8 Seconds**

15 inches HG [.50 Bar] (17 Feet) **20 Seconds**

**Note:** Vacuum Times listed in the table at left are for operations up to 2,000 feet [609 m] of elevation above sea level.
When performing this **In-Service Operational Ramp Test** at higher elevations, the vacuum should be reduced by 1 inch (1.13 Feet) for each 1,000 feet [304 m] of elevation above 2,000 feet [609 m].

## Warranty and Product Information

### 5 Year Warranty


For five years after the date of purchase, Trident Emergency Products, LLC warrants its products to be free from defects in materials and workmanship when properly installed, operated, and maintained.

If during the warranty period, a product is discovered to be defective, Trident will, at its option, replace or repair the warranted product or grant the purchaser a credit for the product claimed to be defective. Trident will have the sole discretion to determine whether the product was defective.

This warranty is null and void if the product is damaged due to abuse, misuse, negligence or accidental causes.

No warranty of merchantability or fitness for a particular purpose, nor any warranty, express or implied, is made by Trident. The foregoing states Trident Emergency Products, LLC's entire and exclusive liability and buyer's exclusive remedy for any claim or damages In connection with the sale of its products. In no event shall Trident be liable for any special incidental, or consequential damages whatsoever.

### Ordering

Please use Trident part numbers and descriptions when placing orders. All orders must be submitted via **E-Mail** (sales@tridentdirect.com) or placed online at **www.tridentdirect.com**. All orders will be acknowledged by Trident within one (1) business day of receipt unless a scheduled holiday(s) prevents this. **No verbal orders will be accepted.**

### Terms

1%10-NET30 days on approved credit, or with a Visa/MC/AMEX credit card. Service charge 1.5% on past due accounts.

### Order Processing/Fulfillment:

Trident Emergency Product's normal operating hours are Monday thru Friday, 7:00AM to 3:30PM Eastern Standard Time. We strive to ship orders as soon as possible however, depending on the size and type of order, we will not always be able to complete same day shipping. In general, please add 1-2 business days to allow for processing time. If we anticipate a longer lead time we will contact you immediately. For questions regarding lead times please contact sales@tridentdirect.com.

Our daily UPS ground pickup occurs at 3PM Eastern Stand Time. To ensure order fulfillment, we suggest that orders requiring expedited shipping methods (UPS Next Day Air etc.) are submitted by 12PM EST to allow for order entry, packing and processing.

Please note that Trident must be notified of items missing from a shipment or order within ten (10) business days of receipt. After ten business days the customer assumes full and complete responsibility for any and all missing items.

### Return Policy

Most items are returnable within 30 days of sale. Each return must be damage free, include all components and be in a new (saleable) condition. A 20% restocking fee is applied upon acceptance of the return. A Return Goods Authorization (RGA) number must be obtained from Trident prior to returning an item. Submit your return request with the original order number to sales@tridentdirect.com.

**Special orders and items with special threads are not returnable.**

### Safety First!!!

**Serious Injury and Destruction of Property can result from improper selection or improper use of products described in this instruction manual. Since TRIDENT has no control over the number and variety of applications for which its products may be purchased or the conditions under which they may be used, TRIDENT liability on any claim, whether in contract, tort (including negligence), or otherwise, for any loss or damage shall in no case exceed the price paid for the product or any part thereof which give rise to claim. As always, TRIDENT technical assistance and support is available for your convenience.**

### **Warning** - User Responsibilities

The customer, installer and end-user shall assume sole responsibility in making the final selection of products and accessories. Furthermore, these parties shall hold TRIDENT harmless for all liability, claims, suits and expenses incurred. These parties shall ensure maintenance, safety precautions and warnings regarding the application are enforced at all times. TRIDENT is not responsible for use of products in excess of rated and recommended capacities, design functions or abnormal conditions.

### **Caution** - Proper Selection of Accessories

TRIDENT offers a wide variety of accessory items and optional features for its products. It is the sole responsibility of the customer, installer and end users to ensure that the proper items and features have been selected to fit the application.

### **Warning** - Follow Instructions

The customer, installer, and end users shall ensure that all potential users of these products receive continual training and access to all relevant product manuals and safety instructions. This information should be thoroughly reviewed prior to installation, stored and reviewed continually during use of the product. TRIDENT assumes no responsibility for fitness of installation and continued use in specific applications.

### **Customer Service Phone** (215) 293-0700

We pride ourselves with exceptional customer service and are available to answer questions pertaining to new or existing orders and any of your after the sale support concerns. If a product needs to be returned, please call and request a Returned Goods Authorization (RGA) number. Warranty claims must be made by an authorized TRIDENT employee. Be prepared to provide the product model number and purchase invoice number. Replacement parts ordered will be invoiced to your account. Once an RGA number is received, you must write it on all boxes and paperwork. TRIDENT will not accept your returned goods without an RGA number. Upon receiving the return, if it is determined to be covered under warranty, a credit memo will be issued and mailed to you for your records.

**Note:** All designs, specifications, and dimensional data contained in this catalog are subject to change without notice. No additional warranties, express or implied, including warranties of merchantability for fitness for a particular purpose, are created by the descriptions and depictions of the products on or in this catalog. Not responsible for typographical errors.

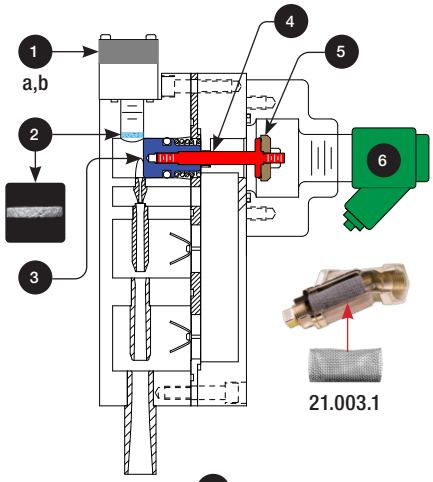
## Installation/Operation Notes

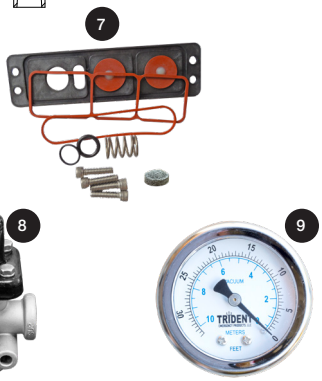
| Vehicle Number: | |
|---|---|

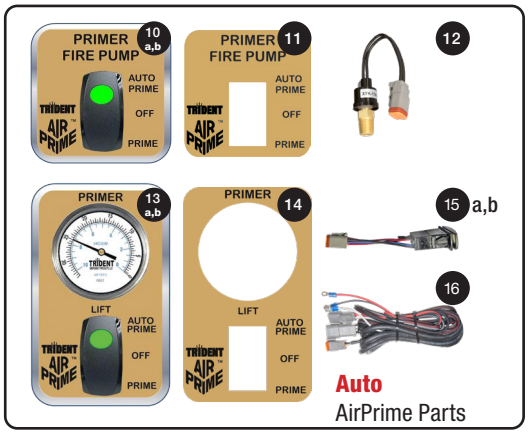
## Installation/Operation Notes

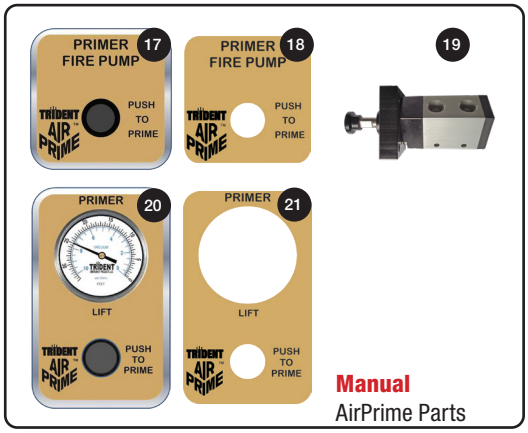
**Primer Testing Notes:**

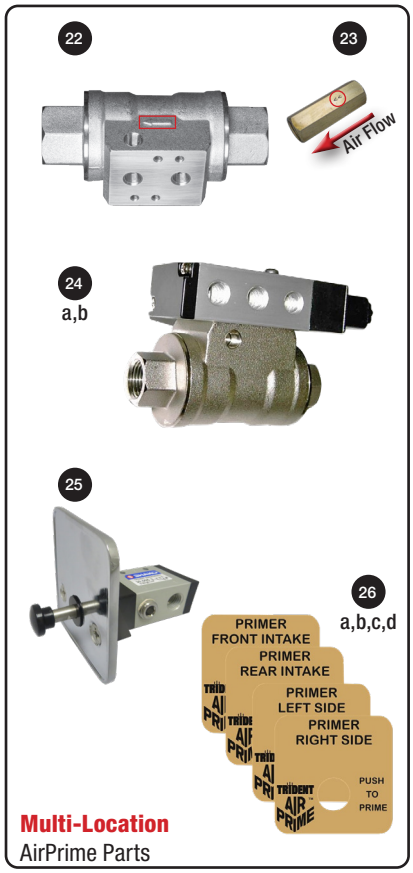
# Repair/Replacement Parts




| REF # | DESCRIPTION | PART # |
|---|---|---|
| 1a | Solenoid Valve 12-Volt | 30.003.2 |
| 1b | Solenoid Valve 24-Volt | 30.003.3 |
| 2 | Air Filter Replacement for 1/4" NPT Bore | 21.002.0 |
| 3 | Piston | 11.001.0 |
| 4 | Valve Stem | 05.002.0 |
| 5 | Seal Washer | 04.004.0 |
| 6 | 3/4" Wye Strainer (Replacement Screen: 21.003.1) | 21.003.0 |
| 7 | Rebuild Kit (Seals, Mesh Filter, Spring Valve Plate, Fasteners) | 27.003.3 |
| 8 | Pressure Protection Valve (PPV) | 30.053.0 |
| 9 | Lift Gauge | 14.006.0 |
| 10a | Rocker Switch 12-Volt and Label Assembly | 27.003.5 |
| 10b | Rocker Switch 24-Volt and Label Assembly | 27.003.6 |
| 11 | Label Only Auto AirPrime: **PRIMER FIRE PUMP** | 02.004.2 |
| 12 | Pressure Switch and Connector | 40.002.1 |
| 13a | Rocker Switch 12-Volt, Label, Mounting Plate, Lift Gauge Assembly | 27.003.7 |
| 13b | Rocker Switch 24-Volt, Label, Mounting Plate, Lift Gauge Assembly | 27.003.8 |
| 14 | Label Only Auto Air Prime: **PRIMER w/ LIFT GAUGE** | 02.004.4 |

| REF # | DESCRIPTION | PART # |
|---|---|---|
| 15a | Rocker Switch 12-Volt Replacement | 40.001.2 |
| 15b | Rocker Switch 24-Volt Replacement | 40.001.3 |
| 16 | Wiring Harness for Auto AirPrime | 41.001.0 |
| 17 | Push Button, Label, and Mounting Plate Assembly | 27.003.1 |
| 18 | Label Only Manual AirPrime: **PRIMER FIRE PUMP** | 02.006.4 |
| 19 | Push Button Replacement | 30.005.3 |
| 20 | Push Button, Label, Mounting Plate and Lift Gauge Assembly | 30.005.4 |
| 21 | Label Only Manual AirPrime: **PRIMER w/ LIFT GAUGE** | 02.006.10 |
| 22 | Remote Priming Valve (RPV) | 30.035.1 |
| 23 | 1/4" NPT Air Check Valve | 30.012.0 |
| 24a | Remote Priming Valve with 12-Volt Solenoid | 30.035.10 |
| 24b | Remote Priming Valve with 24-Volt Solenoid | 30.035.11 |
| 25 | Multi-Location Push-Button w/ Mounting Plate | 27.003.9 |
| 26a | Label Only: **PRIMER FRONT INTAKE** | 02.006.5 |
| 26b | Label Only: **PRIMER REAR INTAKE** | 02.006.6 |
| 26c | Label Only: **PRIMER LEFT SIDE** | 02.006.7 |
| 26d | Label Only: **PRIMER RIGHT SIDE** | 02.006.8 |

| AirPrime Conversion Kits and Rebuild Kit - Each Part Number is Linked to More Information | |
|---|---|
| **Conversion Kit:** Single Location AirPrime System, Converts Manual to Automatic | 27.014.0 |
| **Conversion Kit:** Multi-Location AirPrime System, Converts Manual to Automatic | 27.014.1 |
| **Conversion Kit:** Manual AirPrime System, Converts Single (1) Location to Dual (2) Location | 27.005.2 |
| **Conversion Kit:** Automatic AirPrime System, Converts Single (1) Location to Dual (2) Location | 27.005.3 |
| **Conversion Kit:** Multi-Location AirPrime System, Adds Additional Locations Going From (2) Location to (3) Location. Or From (3) Location to (4) Location | 27.005.1 |
| **Conversion Kit:** Automatic AirPrime System, Adding a Lift Gauge to existing Automatic AirPrime. Requires .125" NPT Port. Contact Factory for Details | 27.005.5 |
| **Conversion Kit:** Manual AirPrime System, Adding a Lift Gauge to existing Manual AirPrime. Requires .125" NPT Port. Contact Factory for Details | 27.005.4 |
| **Conversion Kit:** Manual AirPrime, Converting to Auto with Lift Gauge. Requires .125" NPT Port. Contact Factory for Details | 27.005.6 |
| **Rebuild Kit:** Contains Seals, O-Rings, Spring Valve Plate, Inlet Filter and Fasteners | 27.003.3 |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