

# **AirPrime**<sup>TM</sup> Retrofit and Upgrade Guide



## "Quick, Reliable Pump Priming... When You Need It!"



## World Class Fire Industry Products



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#### **Safety Notifications**

The following indicators may be used throughout this manual for your safety.



**NOTICES** are used to indicate situations that at worst will only result in property damage and will not result in physical injuries.



**CAUTIONS** are used to indicate a hazardous situation that, if not avoided, could result in minor or moderate injury. Property damage could also be a result, if the hazardous situation is not avoided.

WARNINGS are used to indicate a hazardous situation that, if not avoided, could result in death or serious injury. Property damage could also be a result, if the hazardous situation is not avoided.

## DANGER

**DANGERS** are used to indicate a hazardous situation that, if not avoided, will result in death or serious injury. Property damage will also be a result, if the hazardous situation is not avoided.

#### **Tool and Bracket Requirements**

- Standard hand tools are all that is required for mounting the primer.
- A saw or grinder and drill may be needed to attach the control to the pump panel. Panel may be stainless steel so appropriate blades and bits will be needed. The area where the original primer control was positioned should be adequate for the placement of the AirPrime control.
- A fabricated bracket will be needed to mount the primer higher than the highest priming points on the truck. The Hale Direct Mount attaches directly to the pump and does not require a bracket.
- A Pressure Protection Valve for installation on the air tank which supplies the primer. This ensures that adequate air remains for the braking system. Available from Trident as Part Number 30.053.0.

#### **AirPrime<sup>™</sup> - How Does It Work**

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

**AirPrime** virtually eliminates the impact load on the vehicles electrical system thereby improving reliability.

AirPrime improves performance in the elapsed time for establishing water supply, resulting in improved fire ground operations and safety.

**AirPrime** has systems available for large flow industrial pumpers and trailers.

AirPrime is also available for use on vehicles without air brake systems.

Auto AirPrime function. Move the Rocker Switch to the upper position. The Green LED Light will illuminate. The Primer will Activate when the OK TO PUMP light is ON and the Pump Discharge Pressure is below 20 PSIG.

The Auto Mode only operates when the fire pump is engaged.



#### **Removing the Electric Primer**



#### **Removal Preparation**

- Wear Eye, Face and Hand protection. There will be dirty water, grease, oil and road dirt present.
- Ensure that the Electrical Master Switch is OFF.
- Verify that there is NO electric power being supplied to the primer motor by using an electrical tester.
- Chock the wheels.
- ► Tag the vehicle as being **OUT OF SERVICE**.

#### **Removing the Electric Primer**

- the battery or group of batteries.
- 2. Remove the ground strap or wire for the electric primer.
- 4. Disconnect any drainage piping if it exists.
- 5. Remove any water lines going to the pump panel.
- according to environmental regulations.
- 8. Remove any bracketry that exists for the electric primer.
- that should also be removed.

#### Panel Cutout Requirements

## AirPrime Manual is also used for any additional priming controls being installed. The templates are full scale.

#### **AirPrime™ Info**

- Takes less space and weighs less than rotary vane primers.
- Weighs only 8.5 pounds [3.9 kg.].
- Requires an installation area of only 12" high x 4" wide.
- No high amp draw on battery.
- No primer water lines to pump panel.
- Lowest noise level in the industry.
- Installs on any fire pump.
- Easy to retrofit in the fire station by a mechanic.
- ► Automatic AirPrime<sup>™</sup> available.
- Optional Lift Gauge on control panel.
- Multiple priming location systems available.
- Primer can be tested without fire pump being in gear.
- ► Air Compressor Requirements:

Pumps 1000 GPM or less require a minimum 13.2 CFM compressor and utilize a 2 barrel primer. Pumps 1250 GPM and above require 15.6 CFM and utilize a 3 barrel primer. Pumps 2000 to 3000 GPM require a minimum 20 CFM compressor and utilize two 2 barrel primers. Pumps over 3000 GPM require a minimum **30 CFM** compressor and utilize three 2 barrel primers.

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

1. Remove the heavy electrical wiring that powers the primer. This may be located at the Master Switch or directly run from

3. Disconnect the priming hoses from the primer to the fire pump. **NOTE**: If this is 3/4" NPT it may be able to be reused.

6. If this is an oil lubricated primer, be sure to contain any oil leakage that may occur. The lubricant should be disposed of

7. Unbolt the primer from its bracket. **NOTE:** This unit is heavy, use caution. A platform jack should be utilized for support.

9. Remove the primer actuator and its related parts from the pump panel. There may be wiring for an electric control switch

See the Page 6 for Automatic Panel Cutout Dimensions and Page 7 for Manual AirPrime models. The template labeled





#### **Choosing Features of an AirPrime**



#### **AirPrime Model Information**

Part Number	Part Number	Panel Control(s)	Location(s)	Туре	Mounting	Compressor		
Ctondard Madal	Model With	Control Tupo	Number of	Number of	<sup>3</sup> / <sub>4</sub> " NPT, Any Pump, Remote Mount	Minimum		
Stanuaru Mouer	Lift Gauge		Priming Locations	Barrels	Hale-Midship Q Series Direct Mount	CFM Rating		
Automatic with Rocker Switch – Single Priming Location – 2 Barrel								
31.003.5	31.013.5	12-Volt Switch	Fire Pump Only	2 Barrel	Any Pump, Remote Mount	13.2 CFM		
Automatic with Rocker Switch – Single Priming Location – 3 Barrel								
31.001.3	31.011.3	12-Volt Switch	Fire Pump Only	3 Barrel	Any Pump, Remote Mount	15.6 CFM		
31.001.0	31.011.0	12-Volt Switch	Fire Pump Only	3 Barrel	Hale-Midship Q Series Direct Mount	15.6 CFM		
Automatic with Rocker Switch – Multiple Priming Locations								
31.001.21	31.011.21	12-Volt Switch + 1 Push Button	Pump + 1 Inlet	3 Barrel	Any Pump, Remote Mount	15.6 CFM		
31.001.22	31.011.22	12-Volt Switch + 2 Push Buttons	Pump + 2 Inlets	3 Barrel	Any Pump, Remote Mount	15.6 CFM		
31.001.23	31.011.23	12-Volt Switch + 3 Push Buttons	Pump + 3 Inlets	3 Barrel	Any Pump, Remote Mount	15.6 CFM		
31.001.25	31.011.25	12-Volt Switch + 4 Push Buttons	Pump + 4 Inlets	3 Barrel	Any Pump, Remote Mount	15.6 CFM		
Manual with Push Button – Single Priming Location – 2 Barrel								
31.003.7	31.013.7	Push Button	Fire Pump Only	2 Barrel	Any Pump, Remote Mount	13.2 CFM		
31.003.2	31.013.2	Push Button	Fire Pump Only	2 Barrel	Hale-Midship Q Series Direct Mount	13.2 CFM		
Manual with Push Button – Single Priming Locations – 3 Barrel								
31.001.7	31.011.7	Push Button	Fire Pump Only	3 Barrel	Any Pump, Remote Mount	15.6 CFM		
31.001.2	31.011.2	Push Button	Fire Pump Only	3 Barrel	Hale-Midship Q Series Direct Mount	15.6 CFM		
Manual with Push Button – Multiple Priming Locations – 3 Barrel								
31.001.11	31.011.11	2 Push Buttons	Pump + 1 Inlet	3 Barrel	Any Pump, Remote Mount	15.6 CFM		
31.001.12	31.011.12	3 Push Buttons	Pump + 2 Inlets	3 Barrel	Any Pump, Remote Mount	15.6 CFM		
31.001.13	31.011.13	4 Push Buttons	Pump + 3 Inlets	3 Barrel	Any Pump, Remote Mount	15.6 CFM		
31.001.15	31.011.15	5 Push Buttons	Pump + 4 Inlets	3 Barrel	Any Pump, Remote Mount	15.6 CFM		
Industrial AirPrime – Automatic with Rocker Switch								
31.013.44	31.013.43	12-Volt Switch	2000-3000 GPM	Two - 2 Barrels	Any Pump, Remote Mount	20 CFM		
Not Available	31.013.42	12-Volt Switch	Over 3000 GPM	Three - 2 Barrels	Any Pump, Remote Mount	30 CFM		
Vehicles Without Air Brakes - AirPrime SC – Manual with Push Button								
31.001.50	Not Available	Push Button	Fire Pump Only	3 Barrel	Small Pump, Remote Mount	100 PSI from SCBA		

#### Advantages of Auto AirPrime when in Auto Prime Position

- ▶ When the switch is left in the **Auto Prime** position, the primer will automatically activate upon placing the pump in gear. When the rocker switch is in the Auto Prime position, the Green Light will illuminate.
- Automatic AirPrime monitors for interruptions of incoming water supply when the switch is in the Auto Prime position. The primer will activate when the discharge pressure drops below 20 PSI.
- Leave the rocker switch in the **Auto Prime** position to automatically remove slugs of air that may occur.
- ▶ When in the Auto Prime position the primer will remove air trapped within multiple lengths of Large Diameter Hose (LDH).
- When the rocker switch is left in the **AutoPrime** position it is one less function for the pump operator to perform.
- When the rocker switch is left in the **AutoPrime** position it will help maintain consistent discharge water flow.

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#### **AirPrime<sup>™</sup> Automatic Panel Cutout Templates**





**Integral Stainless Steel Strainer** Located on Primer Intake. **Replaceable Screen.** Shown With Red Arrow Above.



Please install the primer with the barrels pointing straight down to allow for proper drainage.

Automatic AirPrime in Action Ten sections of 6" suction hose (100') performing a 10' lift from a dry hydrant. One minute and 53 seconds to prime.



#### **AirPrime<sup>™</sup> Manual Panel Cutout Templates**



#### Advantages of a Lift Gauge

- ► A vacuum gauge indicates the lift of water in feet and meters while the primer is operating.
- Allows for visual verification of the status of the incoming water.
- Assists in noisy environments to validate that your efforts to obtain a water supply are working.
- Minimal cost, additional primer functionality.
- ▶ Utilizes vacuum created by the primer to activate the gauge.
- ► Works automatically, no additional controls.
- ▶ Only requires 2" more space on the pump panel to incorporate the gauge.
- ▶ Highly recommended for all installations with multiple priming locations to indicate when pre-priming of a location is complete.

#### Manual **AirPrime**<sup>™</sup> Pump Panel Templates





#### **Multi Location Systems**

#### **Additional Considerations**

A single AirPrime fire pump primer can be used for multiple priming locations. Labels are provided for the LEFT, RIGHT, FRONT and **REAR** locations. A Push Button control must be installed for each additional location. Please verify that adequate space exists for each Push Button control. These additional priming controls provide pre-priming abilities.

- Only REMOTE MOUNT versions of the primer are capable of becoming Multiple Location installations. **NOTE:** If you have a Hale Direct Mount primer installed, it will have to be replaced with a Remote Mount primer to add additional priming locations.
- Other than the pump, each additional location requires the installation of one Remote Priming Valve (RPV) and one Push to **Prime** button for each location with **Pre-Priming** capabilities.
- > Plumbing for each additional inlet is easily accomplished with hose and fittings available at an auto parts store, home improvement center or plumbing supply house.

The details for the items required are listed in the AirPrime Operation and Installation Guide available at this QR code.

#### **Pre-Priming Explained**

The ability to bring water to additional priming points adds efficiency and safety to your operation on the fire ground. When an additional priming location is **Pre-Primed**, the chance of air entering the pump is reduced significantly. When tank water gets low, having pre-primed water immediately available for the pump is vital for uninterrupted fire attack and firefighter safety.

The first image below illustrates before Pre-Priming and second image shows **Pre-Priming** up to the front suction butterfly valve. The advantages of **Pre-Priming** are visible, as soon as the butterfly valve is opened you will have a sustained water supply. If possible, it is also a good time to top off your on board water tank for use as an emergency water supply. Any priming point can be equipped with this functionality. Water sources can be either portable tanks commonly used in a tanker shuttle, accessible streams or lakes etc.

#### **Before Pre-Priming Front Intake**



#### **After Pre-Priming Front Intake**



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#### Firefighter Instruction Information and Resources

#### Using and Understanding AirPrime<sup>™</sup>

- AirPrime utilizes compressed air from the chassis braking system as its power source. It will not deplete the brake system when equipped with a Pressure Protection Valve.
- The primer will not overheat and can be run for extended periods without harm.
- ► The Automatic AirPrime will not function unless the fire pump is engaged.
- ► AirPrime quickly removes entrapped air prior to opening an LDH intake valve.
- When the fire pump is being supplied from tank water, the pump operator can pre-prime other suction intakes using **PUSH TO PRIME** buttons for the equipped additional priming locations.











TridentDirect.com TridentAutoAirPrime.com



The AirPrime primer is discussed in the current versions of the IFSTA and Jones & Bartlett Learning curriculum. The AirPrime website has a vast amount of product information. You can access it here: www.tridentautoairprime.com



## Trident AirPrime<sup>™</sup> Panel Control Options



AirPrime Efficiencies...

- No draw on the electrical system Maintenance free Lighter weight
- Lowest noise of any primer
- Lower cost
- No lubrication required
- The Benefits of Adding a Lift Gauge..
- A visual indication of successful priming Indicates lift of water in feet
- Shows priming progress
- Indicates if there is a leak or problem



#### **Add Versatility To Your Primer**

**Optional Multi Location AirPrime™ Controls** 





#### Keeping Score...

The photo below shows the interior parts of a typical rotary vane primer. The rotor has an eccentric rotation and holds four (4) composite vanes that move up against the cylindrical housing wall similar to a centrifugal clutch. The inside wall of the primer housing is hard-coat anodized when new but easily becomes scored due to sand/minerals present in the water. After scoring occurs, the efficiency of the primer is compromised due to loss of vacuum. Vanes when new have rounded edges and become flat with usage. These vanes are designed to wear and will require periodic inspection and maintenance. Modern rotary vane primers are oil-less according to NFPA Standards resulting from EPA Regulations and may wear out more frequently due to the greater amount of friction caused by not having a lubricant present. Scoring may also occur around the end surface of the rotor where it contacts the end plate of the housing. This will add to the loss of priming vacuum and reduce the efficiency of the primer.

The rotary vane primer is powered by a starter motor similar to what starts your car engine. The difference however is that in your car the motor only runs briefly and disengages once the car engine starts. On a fire pump primer, the motor can run for extended periods to obtain a water supply while creating heat, wear and a huge draw on the vehicles electrical system. The primer motor runs at over 2000 RPM and creates considerable heat and noise. It may reach temperatures of 600°F during long activation periods.

The Trident AirPrime primer can be run continuously, has no moving parts, is quieter, remains cool and requires little to no maintenance. It has virtually no impact to the chassis electrical system.



#### Enhancing an Existing AirPrime Unit

Upgrade Kits for an Existing AirPrime unit.



**NOTE:** The Hale Direct

will only prime the fire

pump. It will not work

when multiple priming

11b

locations are needed.

Mount primer (Photo 11a)

Converts a Manual A Automatic AirPrime.

**Converts** a **Manual** *A* priming point into ar primer + one primin

**Converts** a **Manual** A **Manual** AirPrime fire **NOTE**: The original p unit.

Converts an Automa an Automatic AirPrin point. NOTE: The orig Mount unit.

Converts a Manual A AirPrime system with must have a 1/8" NP ◀ See red circle in P

Adds an Additional AirPrime system wit

Adds a Lift Gauge to
The primer must have body. 
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Adds a Lift Gauge to NOTE: The primer m primer body. See rec

Rebuild Kit. Contain Mesh Inlet Filter and

10

### **AirPrime**<sup>™</sup> Upgrade Kits

	Scan QR Code for Installation Instructions.	
AirPrime fire pump primer into an	Kit Part Numbers → 27.014.0	
AirPrime fire pump primer + one n <b>Automatic</b> AirPrime fire pump g point.	→ 27.014.1	
AirPrime fire pump primer into a e pump primer + one priming point. rimer <b>must</b> be a Remote Mount	→ 27.005.2	
a <b>tic</b> AirPrime fire pump primer into ne fire pump primer + one priming ginal primer <b>must</b> be a Remote	→ 27.005.3	
AirPrime system into an <b>Automatic</b> h <b>Lift Gauge. NOTE</b> : The primer PT port on the primer body. <b>Photo 11b</b> .	→ 27.005.6	
priming location to an existing h multiple priming locations.	→ 27.005.1	
o a Manual AirPrime system. <b>NOTE</b> : ve a 1/8" NPT port on the primer le in <b>Photo 11b</b> .	→ 27.005.4	
o an <b>Automatic</b> AirPrime system. ust have a 1/8" NPT port on the d circle in <b>Photo 11b</b> .	→ 27.005.5	
s Seals, Spring, Check Valve Plate, I Fasteners.	→ 27.003.3	



# The AirPrime<sup>™</sup> Advantage



Optional Air Pressure Protection Valve Trident Part# 30.053.0

All **AirPrime™** models are covered by US Patent # 6,682,313

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2 Barrel Design

13.2 CFM Minimum Air Compressor Rating 1000 GPM or Less Fire Pump Rating

**3 Barrel Design** 

15.6 CFM Minimum Air Compressor Rating 1250 GPM or Larger Fire Pump Rating

Industrial AirPrime 20 CFM Minimum Air Compressor Rating 2000 - 3000 GPM Fire Pump Rating 30 CFM Minimum Air Compressor Rating Over 3000 GPM Fire Pump Rating



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