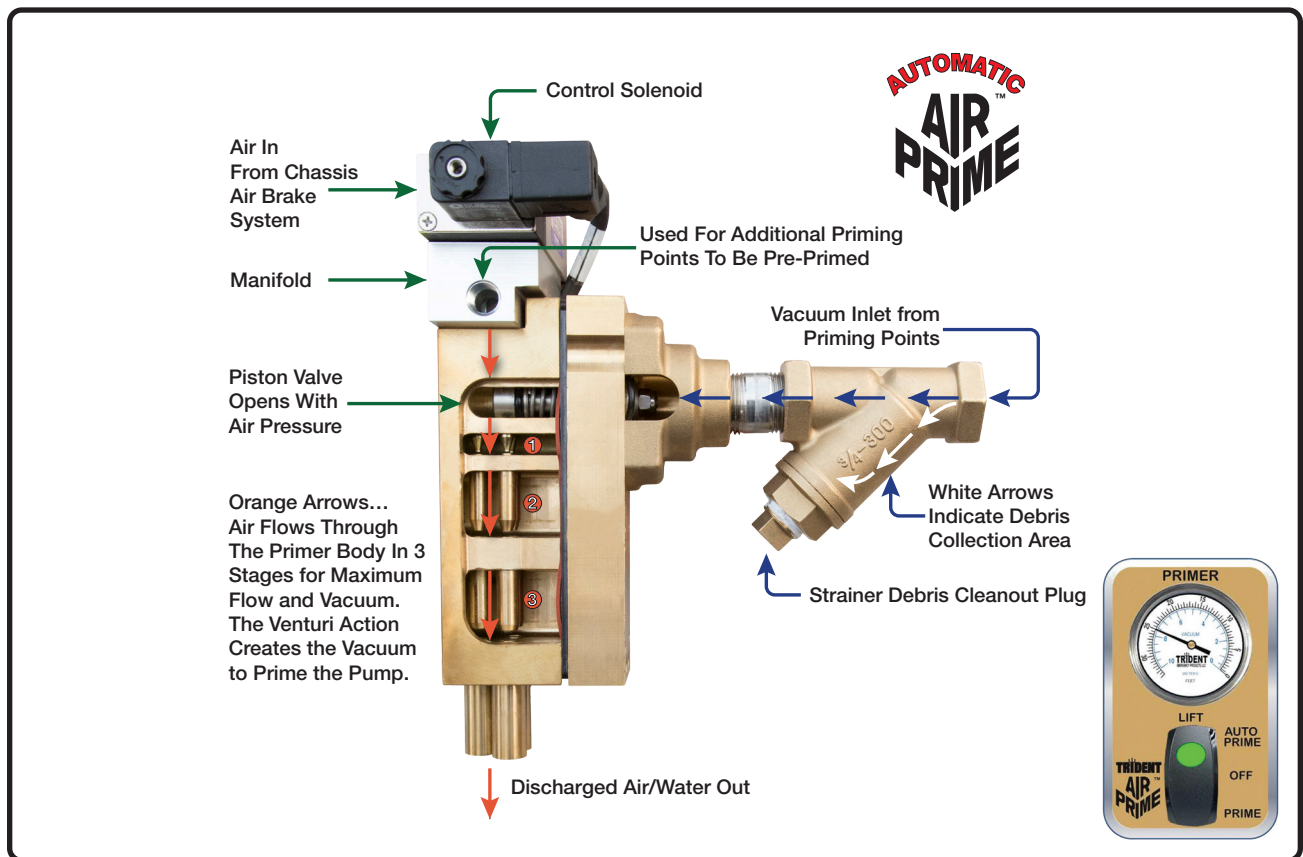


AirPrime™

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.

NOTICE

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

CAUTION

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.

WARNING

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™ - 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

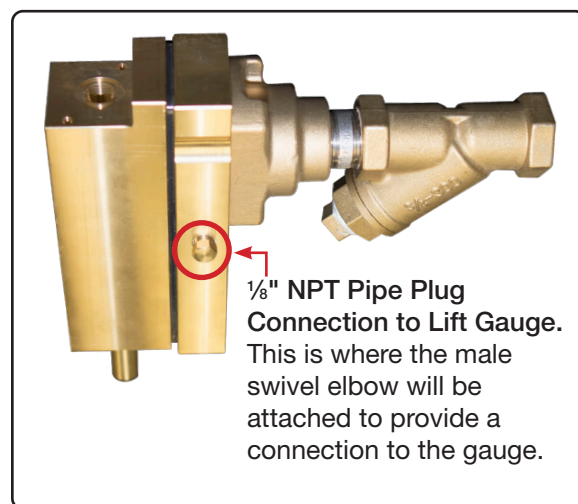
1. Remove the heavy electrical wiring that powers the primer. This may be located at the Master Switch or directly run from the battery or group of batteries.
2. Remove the ground strap or wire for the electric primer.
3. Disconnect the priming hoses from the primer to the fire pump. **NOTE:** If this is 3/4" NPT it may be able to be reused.
4. Disconnect any drainage piping if it exists.
5. Remove any water lines going to the pump panel.
6. If this is an oil lubricated primer, be sure to contain any oil leakage that may occur. The lubricant should be disposed of according to environmental regulations.
7. Unbolt the primer from its bracket. **NOTE:** This unit is heavy, use caution. A platform jack should be utilized for support.
8. Remove any bracketry that exists for the electric primer.
9. Remove the primer actuator and its related parts from the pump panel. There may be wiring for an electric control switch that should also be removed.

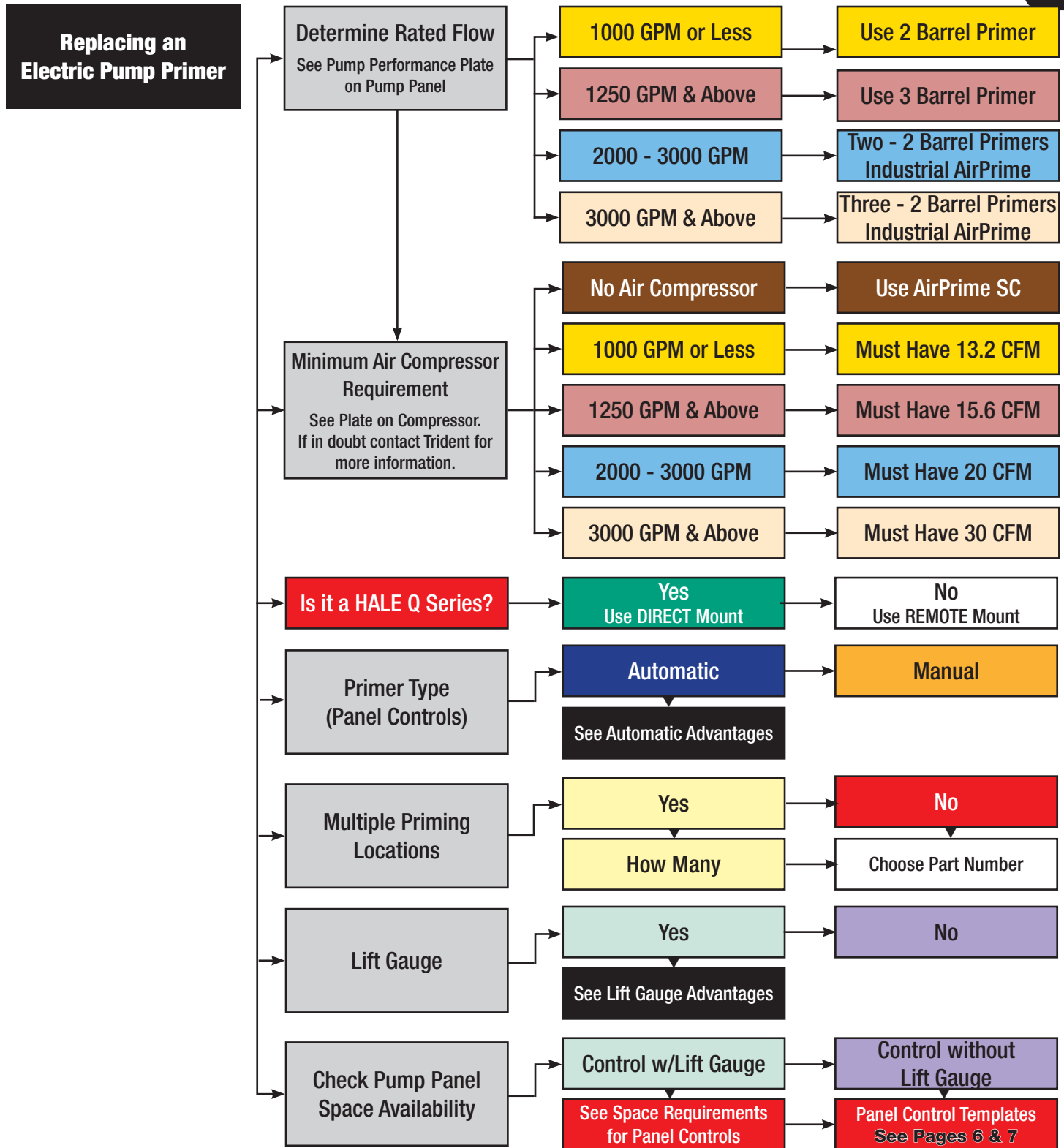
Panel Cutout Requirements

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







Advantages of AirPrime with Switch 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.
- ▶ Auto AirPrime monitors for interruptions of incoming water supply when the switch is in the Auto Prime position. The primer will start if the discharge pressure is < 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.

Type	Compressor	Mounting	Panel Control(s)	Location(s)	Part Number	Part Number
Number of Barrels	Minimum CFM Rating	$\frac{3}{4}$ " NPT, Any Pump, Remote Mount	Automatic	Number of Priming Locations	Model Without Lift Gauge	Model With Lift Gauge
		Hale-Midship Q Series Direct Mount	Manual			





Automatic with Rocker Switch – Single Priming Location – 2 Barrel

2 Barrel	13.2 CFM	Any Pump, Remote Mount	12-Volt Switch	Fire Pump Only	31.003.5 	31.013.5 
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Manual with Push Button – Single Priming Location – 2 Barrel

2 Barrel	13.2 CFM	Any Pump, Remote Mount	Push Button	Fire Pump Only	31.003.7 	31.013.7 
2 Barrel	13.2 CFM	Hale-Midship Q Series Direct Mount	Push Button	Fire Pump Only	31.003.2 	31.013.2 









Automatic with Rocker Switch – Single Priming Location – 3 Barrel

3 Barrel	15.6 CFM	Any Pump, Remote Mount	12-Volt Switch	Fire Pump Only	31.001.3 	31.011.3 
3 Barrel	15.6 CFM	Hale-Midship Q Series Direct Mount	12-Volt Switch	Fire Pump Only	31.001.0 	31.011.0 









Manual with Push Button – Single Priming Location – 3 Barrel

3 Barrel	15.6 CFM	Any Pump, Remote Mount	Push Button	Fire Pump Only	31.001.7 	31.011.7 
3 Barrel	15.6 CFM	Hale-Midship Q Series Direct Mount	Push Button	Fire Pump Only	31.001.2 	31.011.2 




Automatic with Rocker Switch – Multiple Priming Locations – 3 Barrel

3 Barrel	15.6 CFM	Any Pump, Remote Mount	12-Volt Switch + 1 Push Button	Pump + 1 Inlet	31.001.21 	31.011.21 
3 Barrel	15.6 CFM	Any Pump, Remote Mount	12-Volt Switch + 2 Push Buttons	Pump + 2 Inlets	31.001.22 	31.011.22 
3 Barrel	15.6 CFM	Any Pump, Remote Mount	12-Volt Switch + 3 Push Buttons	Pump + 3 Inlets	31.001.23 	31.011.23 
3 Barrel	15.6 CFM	Any Pump, Remote Mount	12-Volt Switch + 4 Push Buttons	Pump + 4 Inlets	31.001.25 	31.011.25 

Manual with Push Button – Multiple Priming Locations – 3 Barrel

3 Barrel	15.6 CFM	Any Pump, Remote Mount	2 Push Buttons	Pump + 1 Inlet	31.001.11 	31.011.11 
3 Barrel	15.6 CFM	Any Pump, Remote Mount	3 Push Buttons	Pump + 2 Inlets	31.001.12 	31.011.12 
3 Barrel	15.6 CFM	Any Pump, Remote Mount	4 Push Buttons	Pump + 3 Inlets	31.001.13 	31.011.13 
3 Barrel	15.6 CFM	Any Pump, Remote Mount	5 Push Buttons	Pump + 4 Inlets	31.001.15 	31.011.15 

Industrial AirPrime – Automatic with Rocker Switch

2 - 2 Barrels	20 CFM	Any Pump, Remote Mount	12-Volt Switch	Pump + 1 Inlet	31.013.44 	31.013.43 
3 - 2 Barrels	30 CFM	Any Pump, Remote Mount	12-Volt Switch	Pump + 2 Inlets	Not Available	31.013.42 

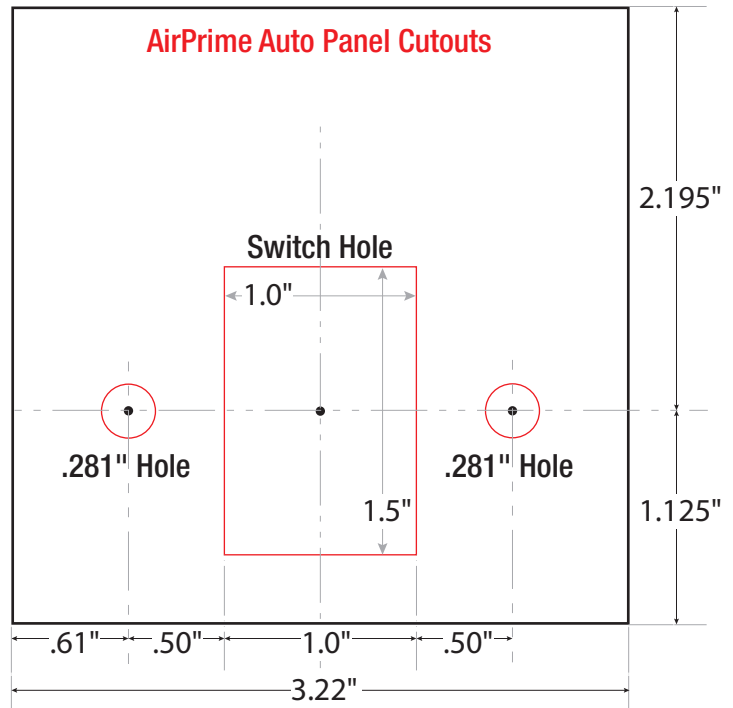
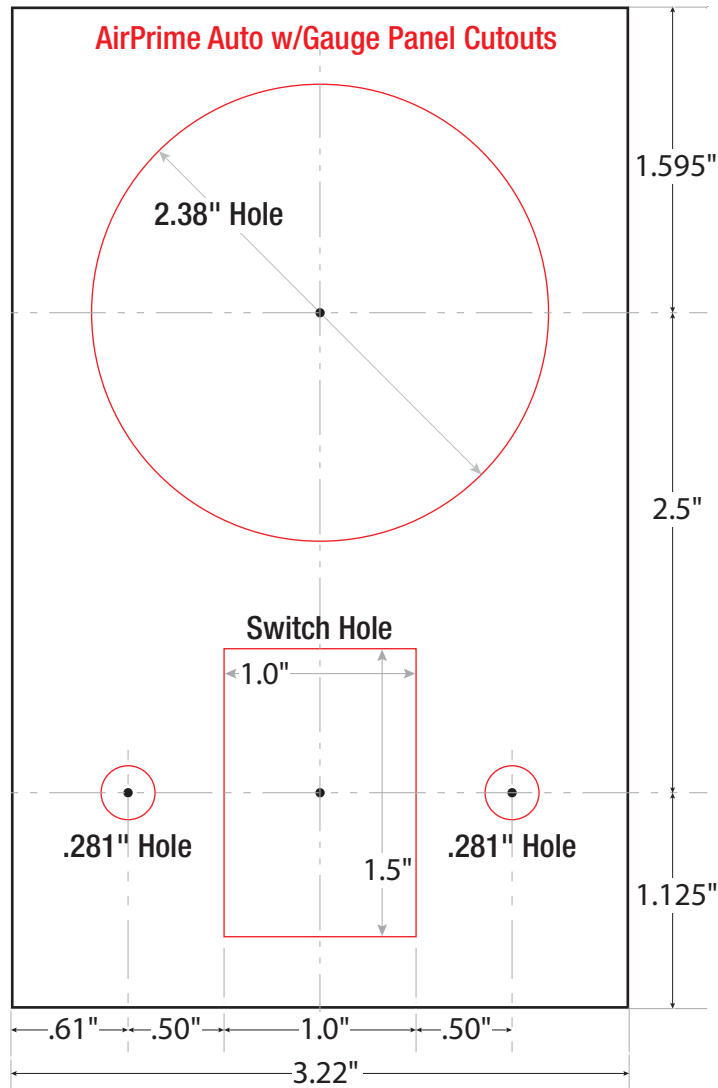
Vehicles Without Air Brakes - AirPrime SC – Manual with Push Button

3 Barrel	100 PSI from SCBA	Small Pump, Remote Mount	Push Button	Fire Pump Only	31.001.50 	Not Available
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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.

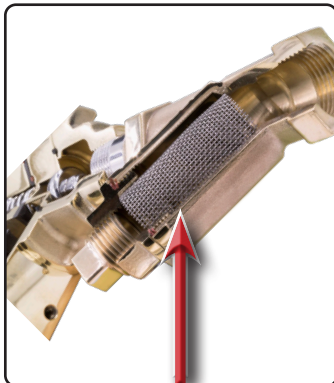


AirPrime™ Automatic Panel Cutout Templates

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

Automatic AirPrime in Action ▼

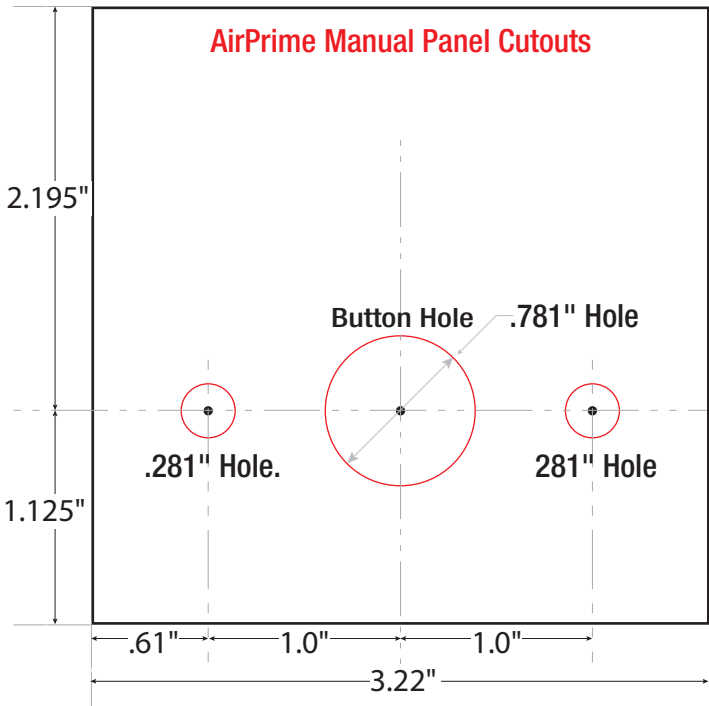
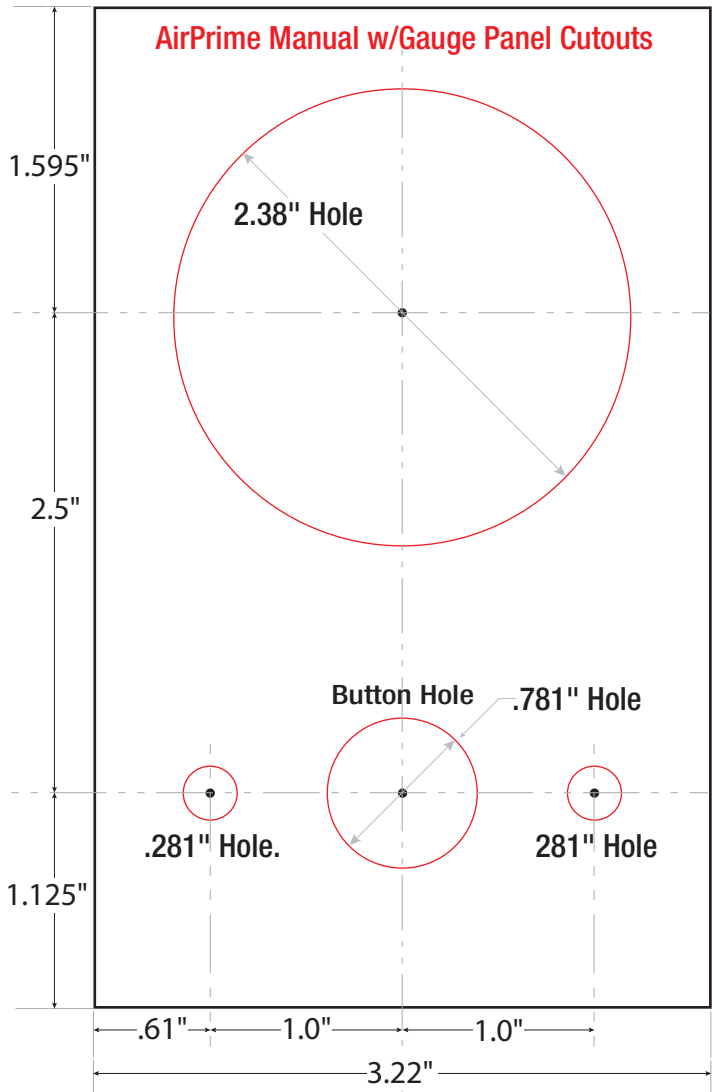
Ten sections of 6" suction hose (100') performing a 10' lift from a dry hydrant.
One minute and 53 seconds to prime.



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



AirPrime™ Manual Panel Cutout 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.

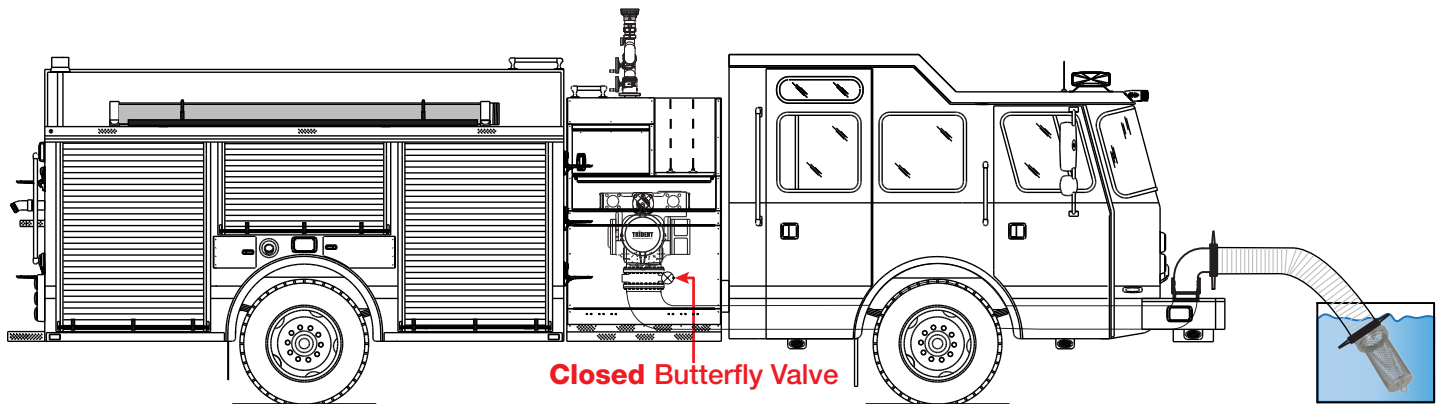


Pre-Priming Explained

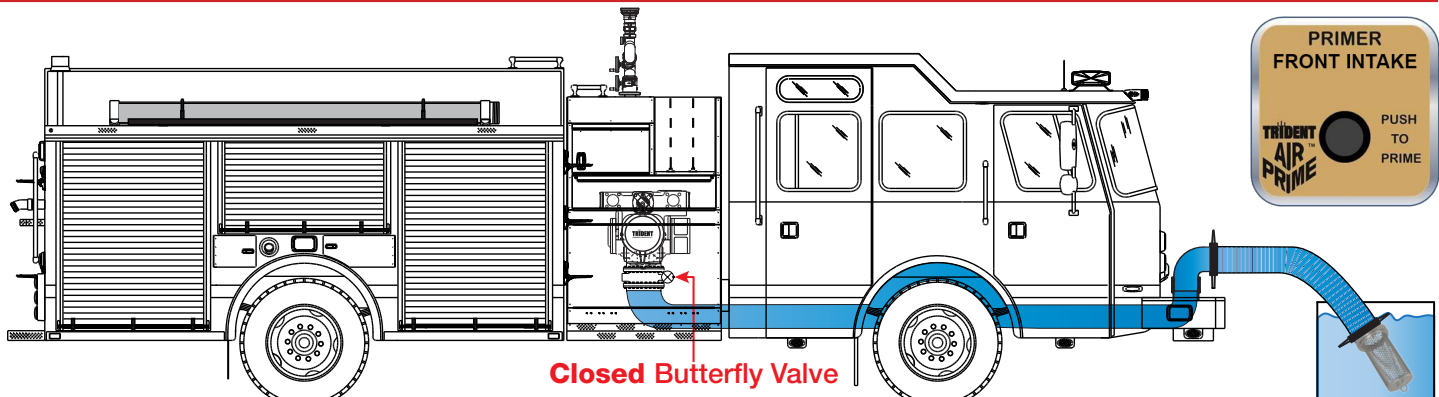
The ability to bring water to additional priming points adds efficiency and safety to your operation on the fire ground. When an additional priming location is **Pre-Primed**, the chance of air entering the pump is reduced significantly. When tank water gets low, having pre-primed water immediately available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



Firefighter Instruction Information and Resources

Using and Understanding AirPrime™

- ▶ 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.
- ▶ 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



Scan For
Download Page



Trident AirPrime™ 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

As of 2020, There Are
Over 20,000 AirPrime
Units In Service

Add Versatility To Your Primer

Optional Multi Location
AirPrime™ Controls



TridentDirect.com
TridentAutoAirPrime.com

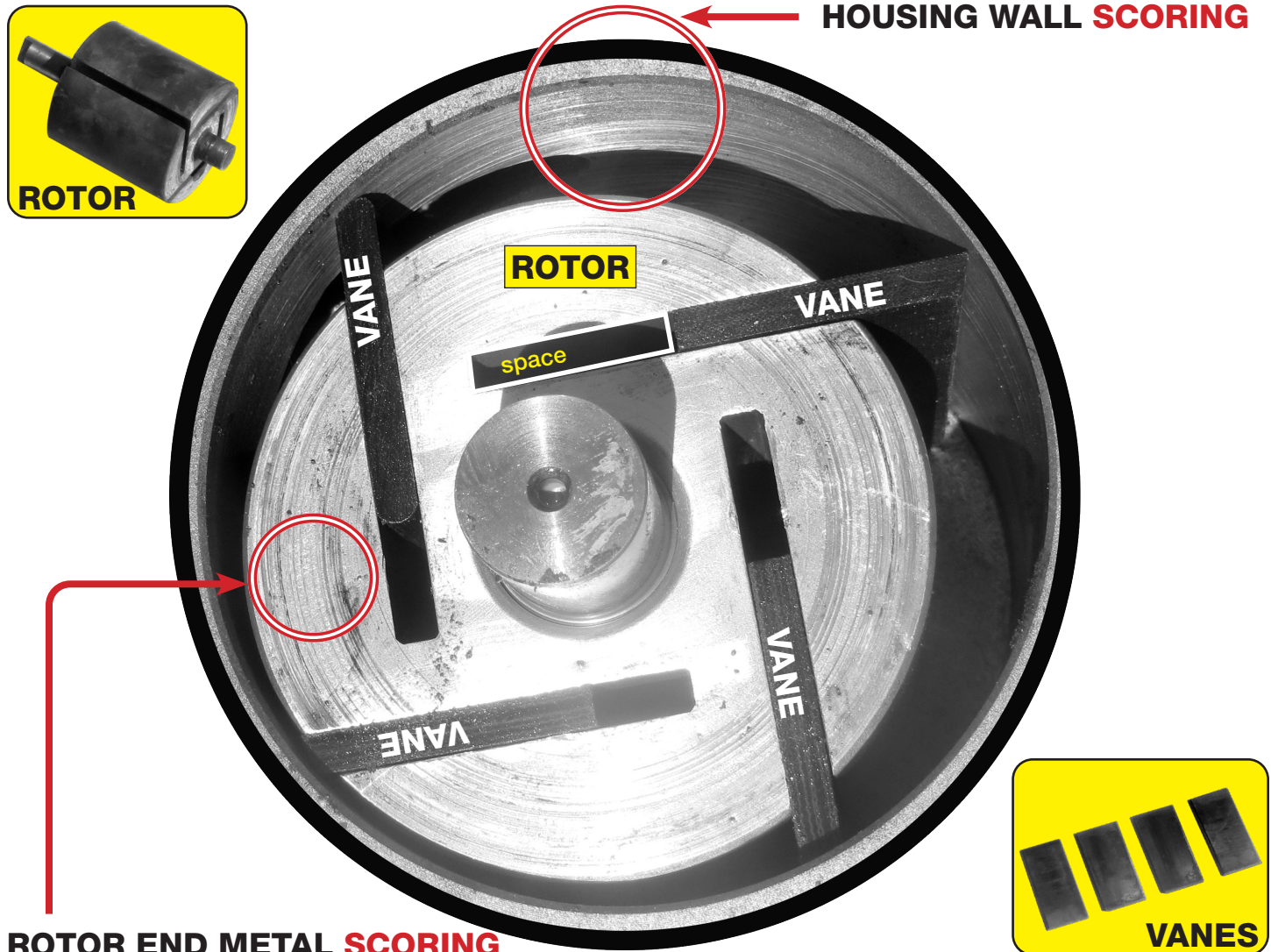
Wear Inside a Rotary Vane Primer

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.

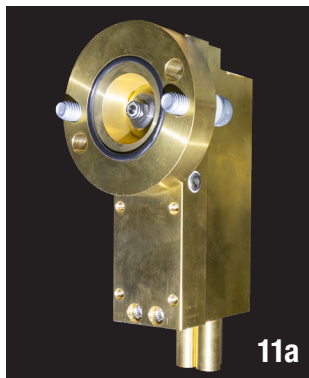
The Trident AirPrime primer can be run continuously, has no moving parts, is quieter, remains cool and requires little to no maintenance. It has virtually no impact to the chassis electrical system.



Enhancing an Existing AirPrime Unit

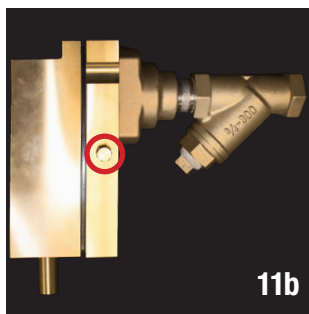
Scan QR Code for
Installation Instructions.

Upgrade Kits for an Existing AirPrime unit.








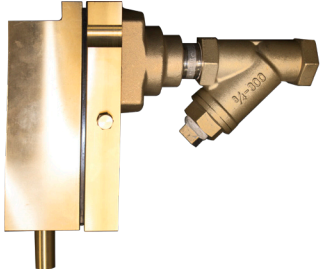


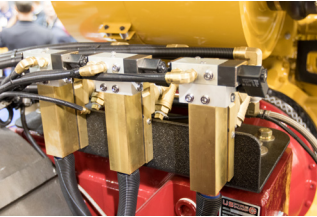



11a

NOTE: The Hale Direct Mount primer (Photo 11a) will only prime the fire pump. It will not work when multiple priming locations are needed.

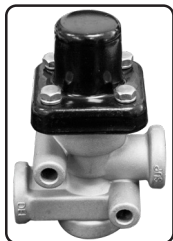


11b

		Kit Part Numbers	
→	Converts a Manual AirPrime fire pump primer into an Automatic AirPrime.	27.014.0	
→	Converts a Manual AirPrime fire pump primer + one priming point into an Automatic AirPrime fire pump primer + one priming point.	27.014.1	
→	Converts a Manual AirPrime fire pump primer into a Manual AirPrime fire pump primer + one priming point. NOTE: The original primer must be a Remote Mount unit.	27.005.2	
→	Converts an Automatic AirPrime fire pump primer into an Automatic AirPrime fire pump primer + one priming point. NOTE: The original primer must be a Remote Mount unit.	27.005.3	
→	Converts a Manual AirPrime system into an Automatic AirPrime system with Lift Gauge. NOTE: The primer must have a 1/8" NPT port on the primer body. ◀ See red circle in Photo 11b .	27.005.6	
→	Adds an Additional priming location to an existing AirPrime system with multiple priming locations.	27.005.1	
→	Adds a Lift Gauge to a Manual AirPrime system. NOTE: The primer must have a 1/8" NPT port on the primer body. ◀ See red circle in Photo 11b .	27.005.4	
→	Adds a Lift Gauge to an Automatic AirPrime system. NOTE: The primer must have a 1/8" NPT port on the primer body. See red circle in Photo 11b .	27.005.5	
→	Rebuild Kit. Contains Seals, Spring, Check Valve Plate, Mesh Inlet Filter and Fasteners.	27.003.3	

  	  	  	  
Automatic AirPrime	Manual AirPrime	Industrial AirPrime	Self Contained AirPrime

The AirPrime™ 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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TridentDirect.com Document #02.003.18 • 04/07/2021



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<https://www.facebook.com/tridentemergency>

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



World Class Fire Industry Products

AirPrime™ is a trademark of Trident Emergency Products, LLC