WATEROUS

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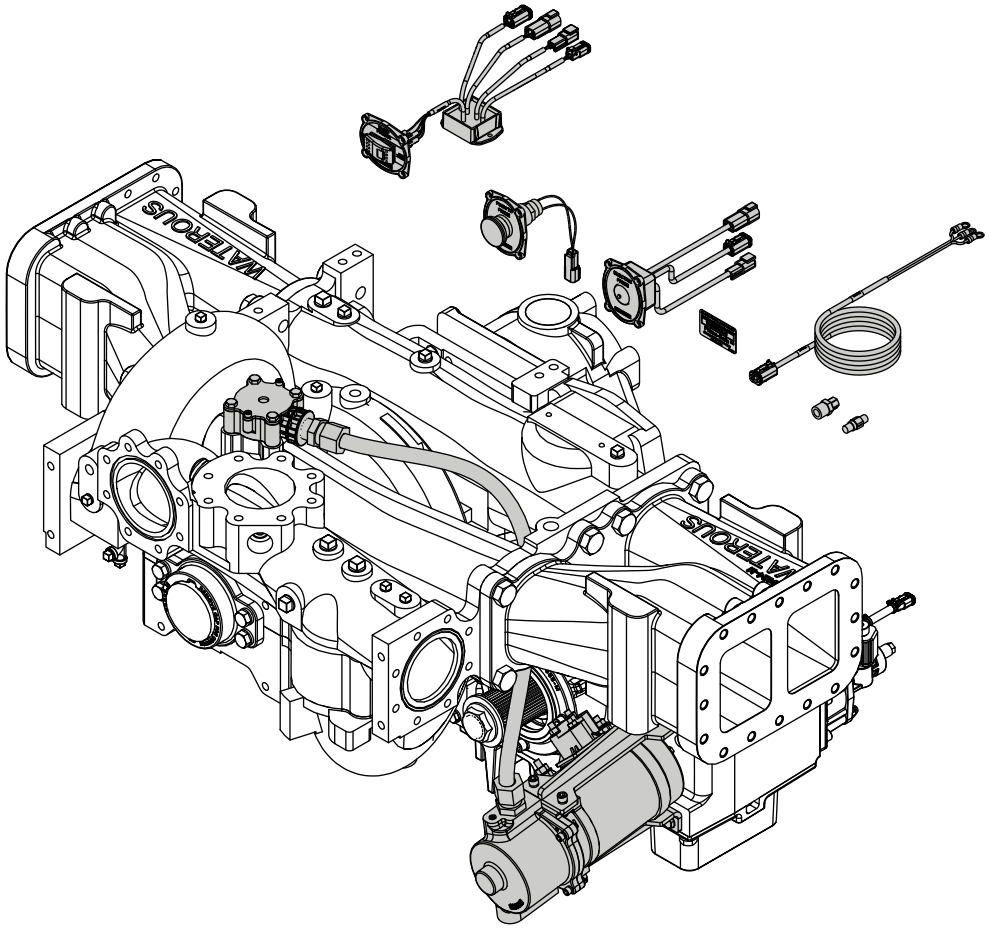
VPO Priming System

Installation, Operation, and Maintenance



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Safety Precautions

- Read and understand all the associated documentation before you begin operating the product.
- Contact Waterous when you have questions about operating or maintaining the equipment.
- Read and understand all the notices and safety precautions.
- Do not operate the equipment when safety guards are removed.
- Do not modify the equipment.

NOTICE

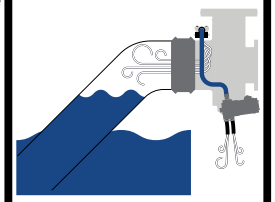
Before Operation

- **Read and understand all the instructions provided.**
- **Check all fluid levels and replenish if necessary.**
- **Remove all shipping plugs and install the operation plugs or caps.**

NOTICE

Priming Pump Damage

- **Do not prime the pump for more than 1 minute.**
- **Operating the priming pump more than 1 minute can damage the motor or the motor solenoid.**



Read and understand all notices following this symbol.

Use this document to install and operate your Waterous equipment. Understand the following conditions before proceeding:

- The instructions may refer to options or equipment that you may not have purchased with your system.
- The illustrations in this document are intended to convey concepts. Do not use the illustrations to determine physical attributes, placement, or proportion.
- Understand that your application may require additional steps, that are not described in the illustrations or instructions, to perform the installation.
- The equipment described in this document is intended to be installed by a person or persons with the necessary skills and knowledge to perform the installation.
- The equipment described in this document is intended to be operated by a person or persons with the basic knowledge of operating similar equipment.
- The information in this document is subject to change without notice.

This document is divided into the following sections:

SAFETY

This section describes general precautions and alert symbols in the document.

INTRODUCTION

This section is an overview of the document.

OVERVIEW

This section describes the components that make up the system.

INSTALLATION

This section describes the installation and initial setup procedures.

OPERATION

This section describes the equipment operation.

MAINTENANCE

This section describes maintaining the equipment.

Using this Document

Use the guidelines below when viewing this document.

Viewing the Document Electronically

- View this document in landscape orientation.
- Use the table of contents to navigate directly to that section.
- Text **with this appearance** is linked to a reference.

Printing the Document

- The document is designed to be printed on both sides and in color.
- Use a 3-ring binder to store the document.

Additional Documentation

Additional documentation is available through the MyWaterous login at waterousco.com. Use your serial number to gain access to the service parts list associated with your system. Dimensional drawings are available through the Waterous Service department.

Symbols

Symbols are used to illustrate additional tools or operations that are required to complete the instructions.

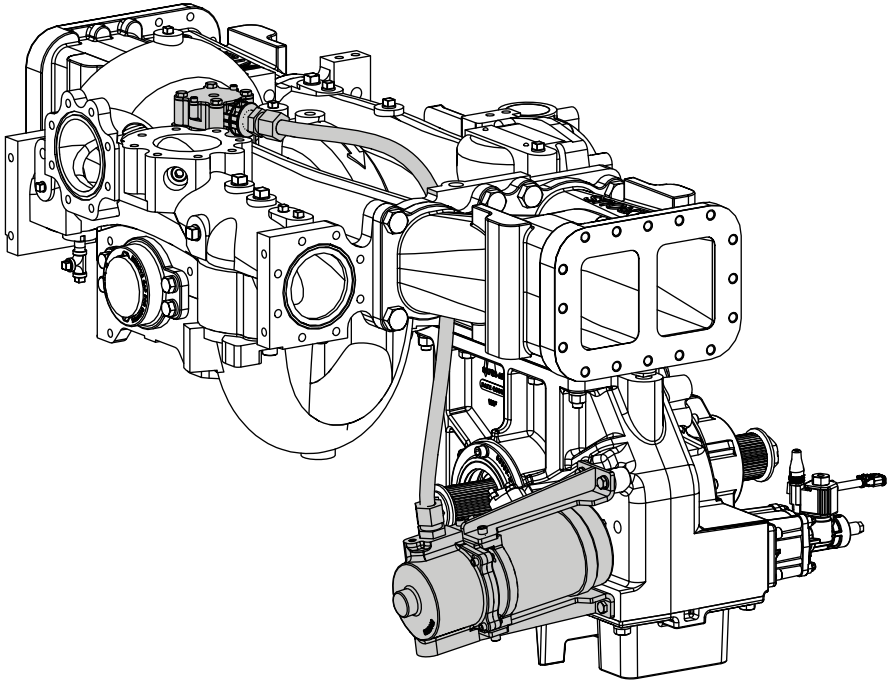
Drill—This symbol tells you to drill the mounting holes in the apparatus.

Jig saw—This symbol tells you to make a cutout in the apparatus.

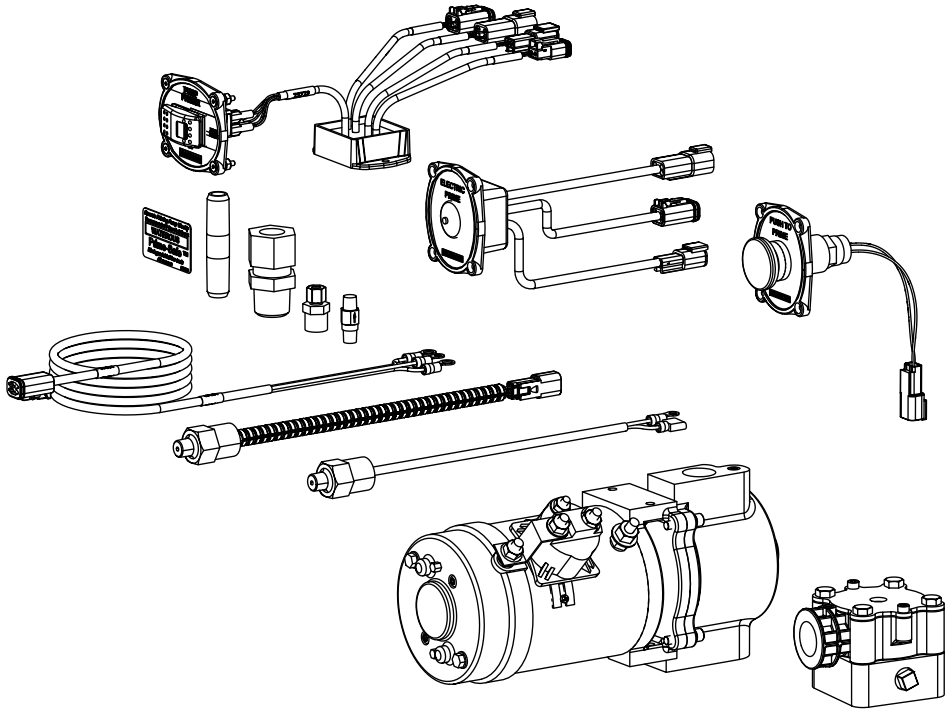
Torque to specification—This symbol tells you to torque the hardware to the specified value.

Configurations

When ordered together with the pump and transmission, depending on the configuration, the priming pump (VPO), priming valve (VAP), hose, and panel cable are installed at the factory. Otherwise, components are shipped loose and installed individually.



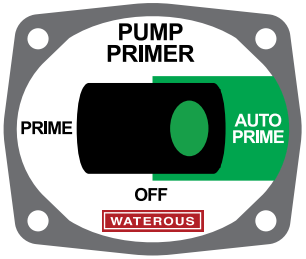
Factory Mounted Priming System



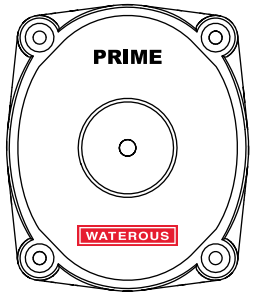
Individually Installed Components

Individually Installed Components

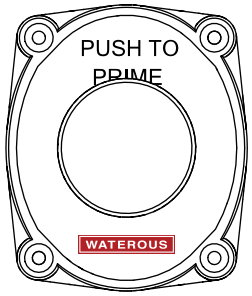
Individually installed components in your application may include the following items.



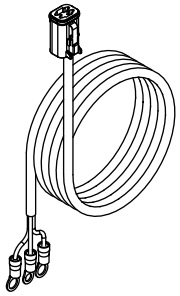
Auto-Prime Switch



Standard Push Button Switch

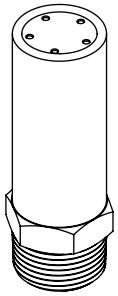


Oversized Push Button Switch

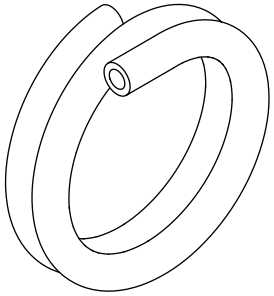


Switch Cable—70 inches

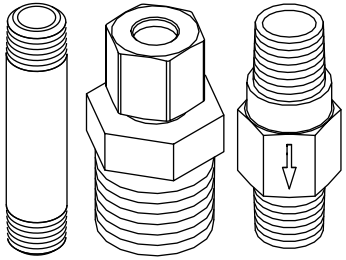
Panel Plate



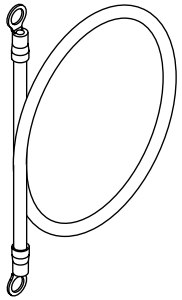
Priming Pump Outlet Muffler



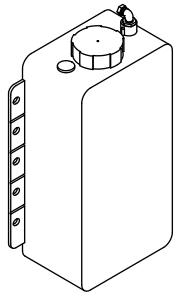
Priming Hose Kit—48 inches



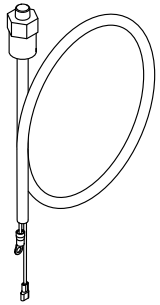
Additional Fittings



Dual Priming Pump Jumper Wire—18 inches



Safe-Prime™ Lubrication System



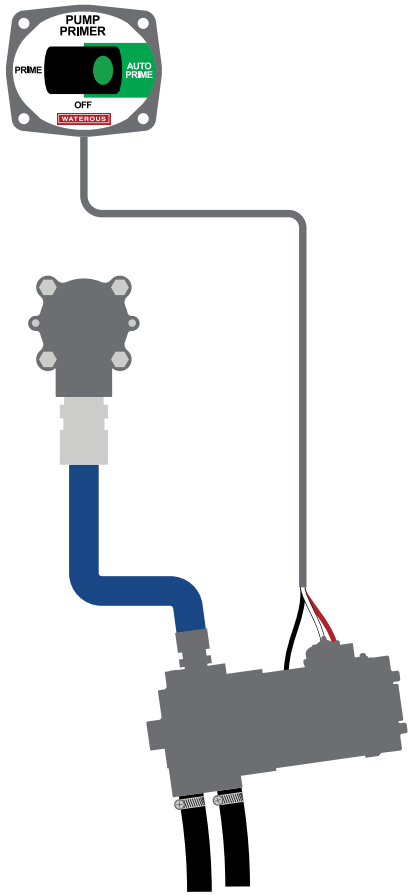
Auto-Prime Cable—18 inches

Simple Configuration Overview

There are 3 panel switch options available that operate the priming system. The priming system may be configured to operate without a panel switch.

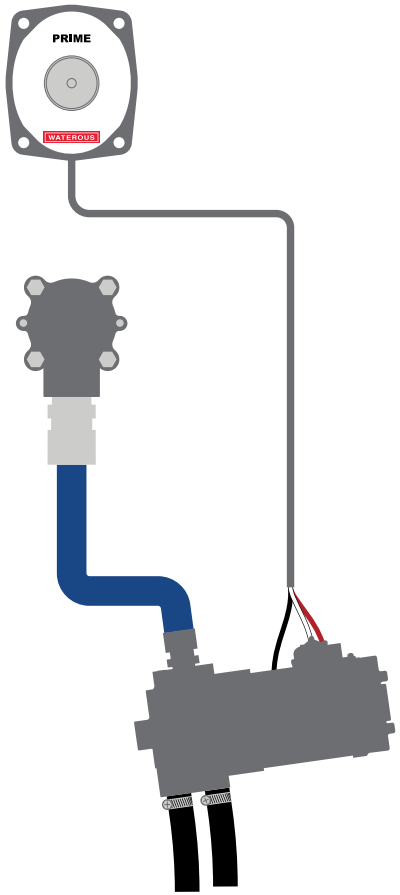
Auto-Prime Switch

Auto-prime with integrated push-to-prime operation.



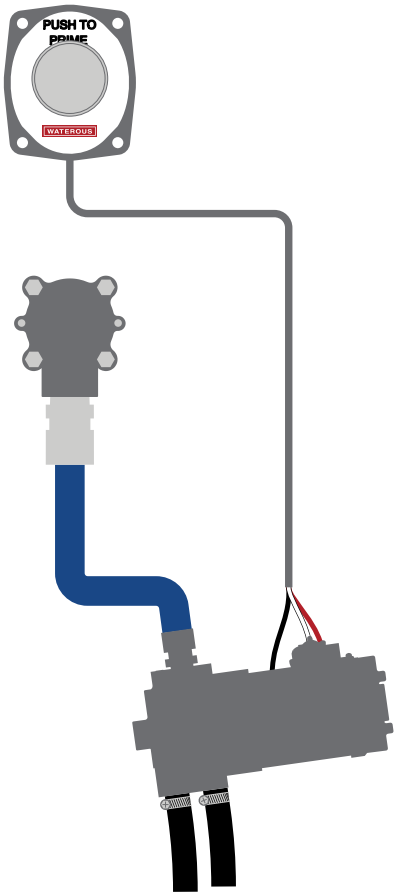
Standard Push Button Switch

Standard push-to-prime switch.



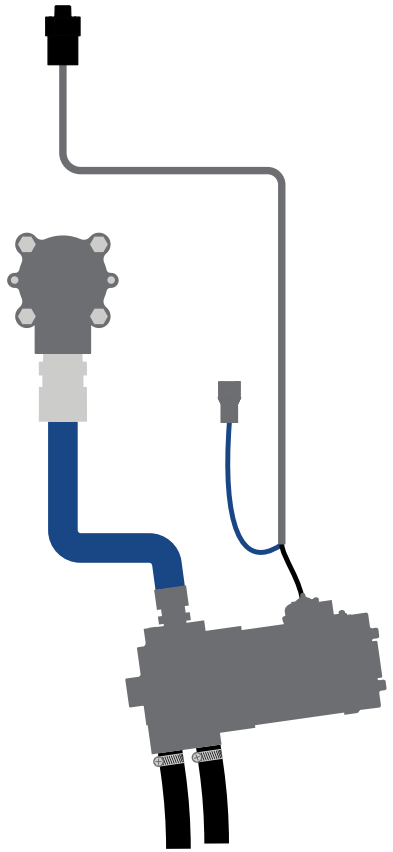
Oversized Push Button Switch

Larger button push-to-prime switch preferred by some operators.



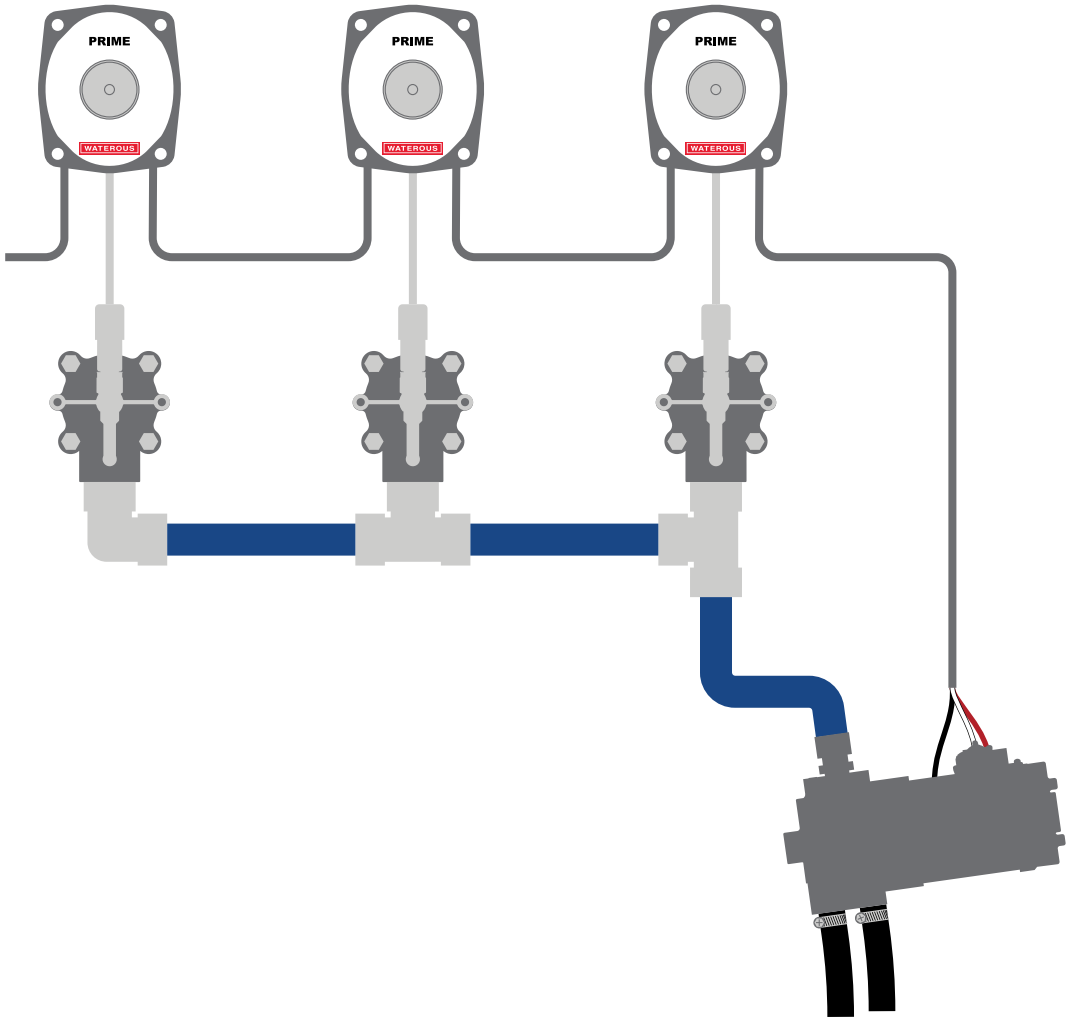
Auto-Prime Cable

Option for auto-prime operation without a panel switch.



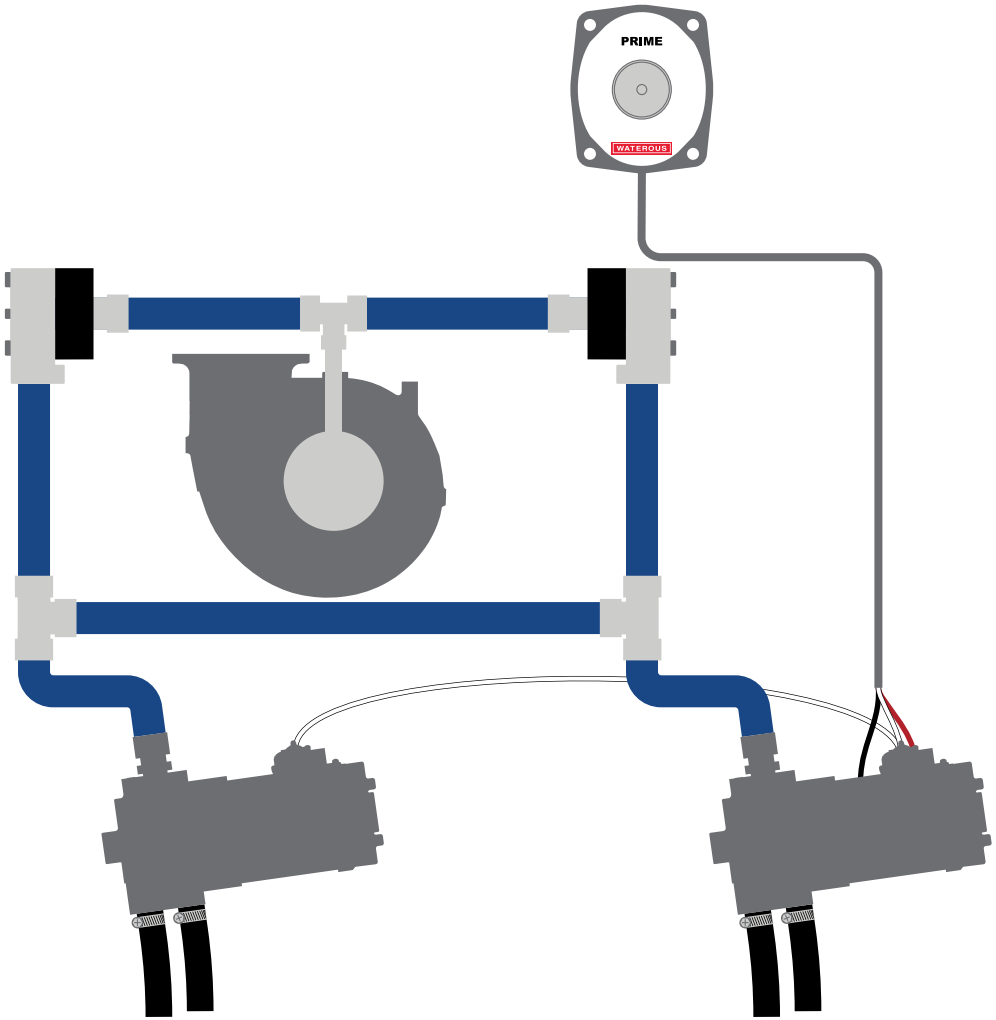
Multiple Priming Valve System Overview

Your application may include up to 6 priming valves, each operated by a dedicated switch and solenoid. This allows the system to prime specific locations in the apparatus plumbing.



Dual Priming Pump System Overview

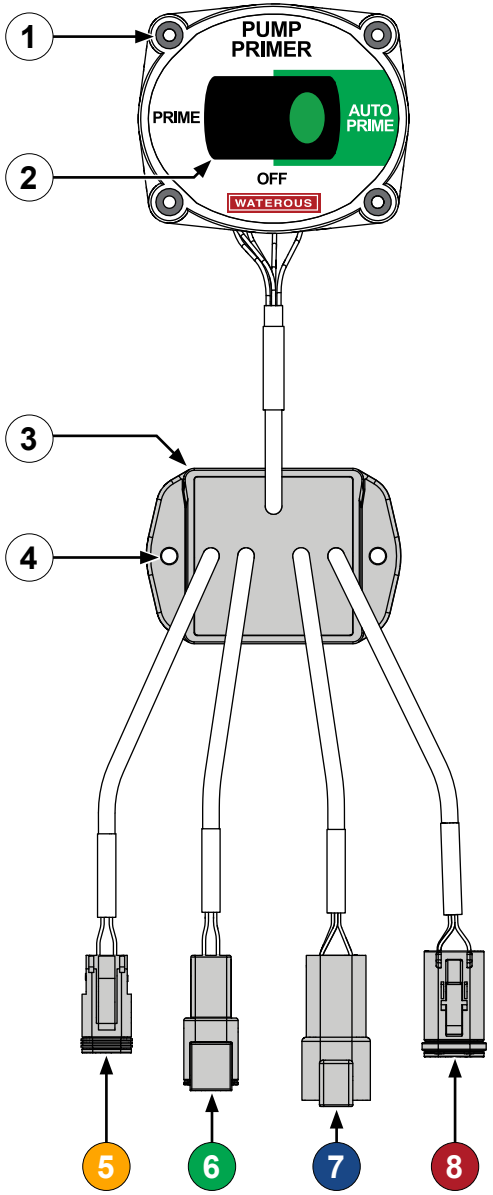
Your application may include 2 priming pumps controlled by a single push button switch.



Notes

Auto-Prime Switch

This allows you to manually or automatically prime the pump. When auto-prime is enabled, the pump is primed to 10 psi (0.7 Bar).

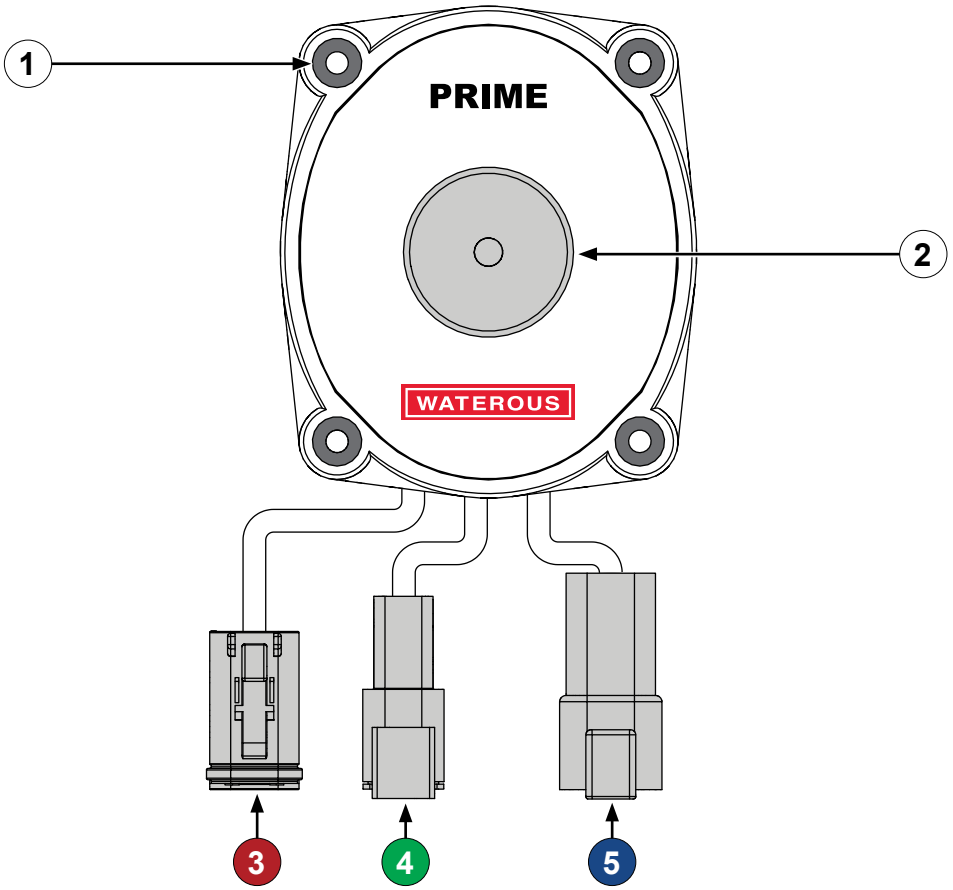


Auto-Prime Switch

	Feature	Description
1	Mounting holes—Panel	This mounts the switch to the apparatus.
2	Button	This operates the priming function.
3	Enclosure	This contains the electronic components.
4	Mounting holes—Enclosure	This mounts the enclosure to the apparatus.
5	Pressure switch connector	This connects to the pressure switch—DT06-2S.
6	Priming valve solenoid connector	This connects to the priming valve solenoid when applicable—DTM04-2P.
7	Priming pump connector	This connects to the priming pump switch cable—DT04-4P.
8	Power connector	This connects to apparatus power or to the previous switch—DT06-4S.

Standard Push Button Switch

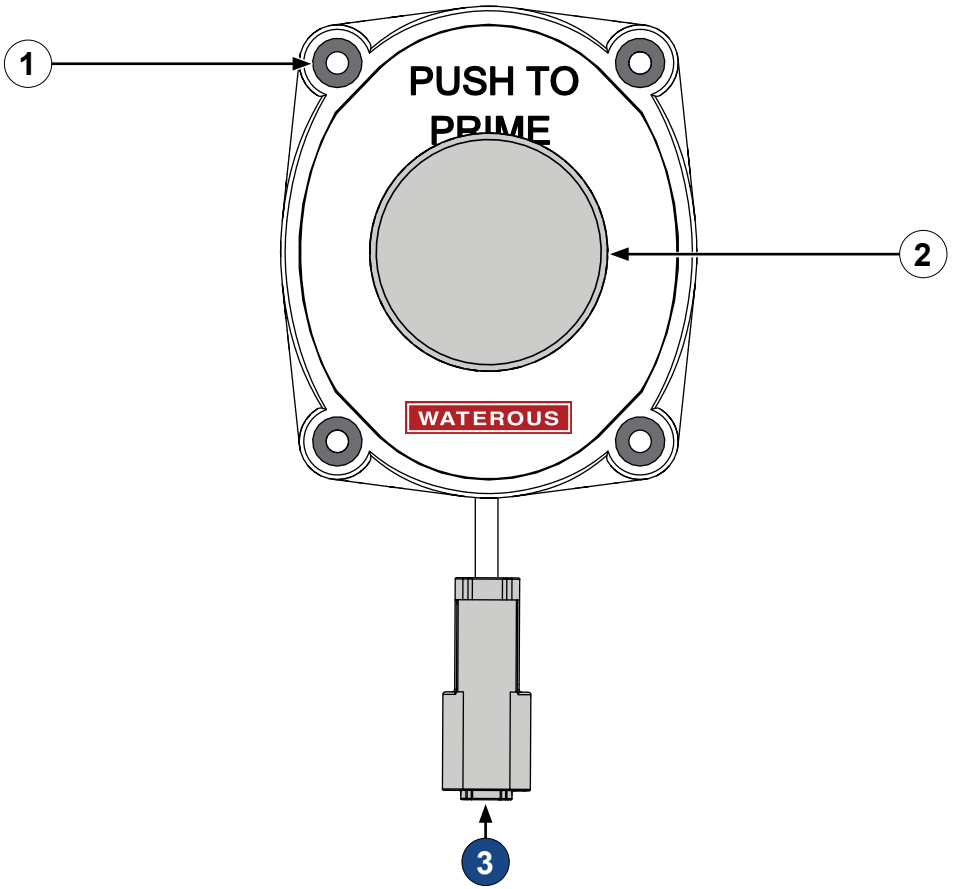
This allows you to manually prime the pump.



	Feature	Description
1	Mounting holes	This mounts the switch to the apparatus.
2	Prime button	This activates the priming operation.
3	Additional panel connector	This connects to the next switch, when applicable—DT06-4S, Pin 1=12 V, Pin 2=Ground.
4	Priming valve solenoid connector	This connects to the priming valve solenoid, when applicable—DTM04-2P.
5	Priming pump connector	This connects to the priming pump switch cable—DT04-4P.

Oversize Push Button Switch

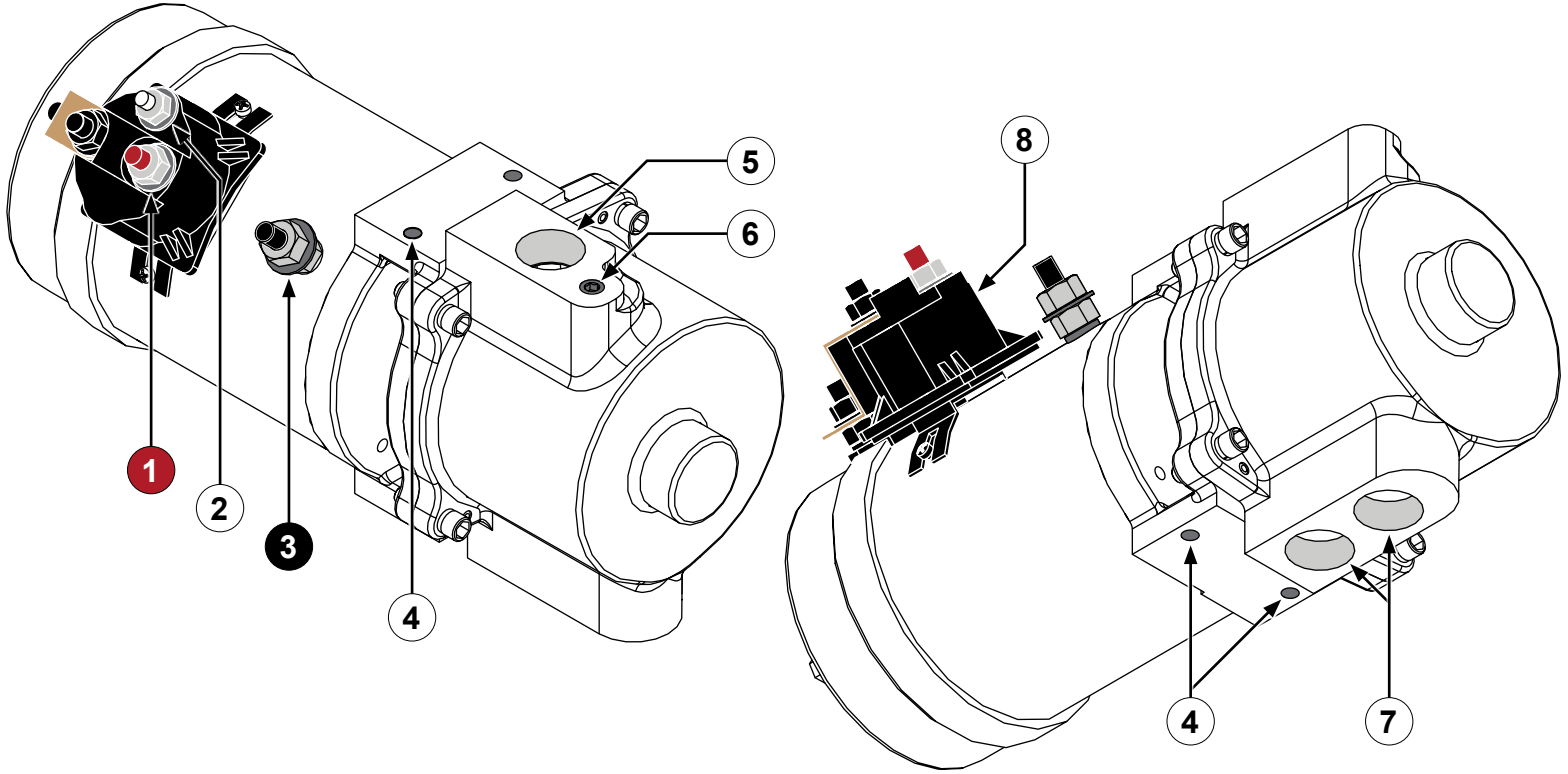
This allows you to manually prime the pump.



	Feature	Description
1	Mounting holes	This mounts the switch to the apparatus.
2	Prime button	This activates the priming operation.
3	Priming pump connector	This connects to the priming pump switch cable—DT04-4P.

Priming Pump—12V

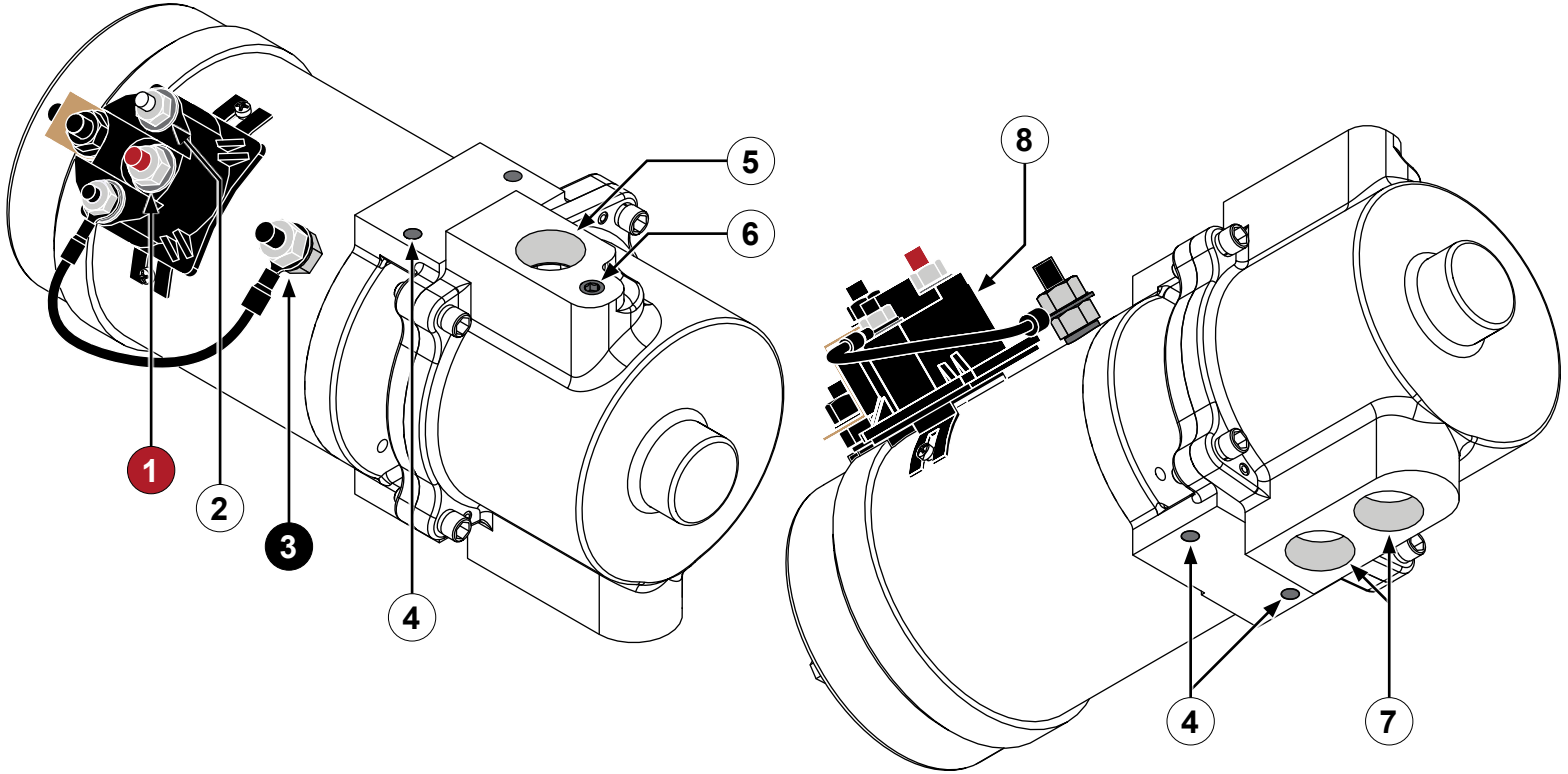
This generates the vacuum that primes the pump.



	Feature	Description
1	Power terminal	This is connected to the red extension cable wire.
2	Signal terminal	This is connected to the white extension cable wire.
3	Ground terminal	This is connected to the black extension cable wire.
4	Mounting holes	This mounts the priming pump to the transmission bracket.
5	Inlet	This connects to the hose fitting—3/4 NPT.
6	Priming lubricant port	This connects to the optional prime-lubricant tank—1/8 NPT.
7	Outlet	This exhausts the evacuated air—3/4 NPT.
8	Solenoid	This engages the priming pump. ***Note:*** *The solenoid does not incorporate flyback voltage protection.*

Priming Pump—24V

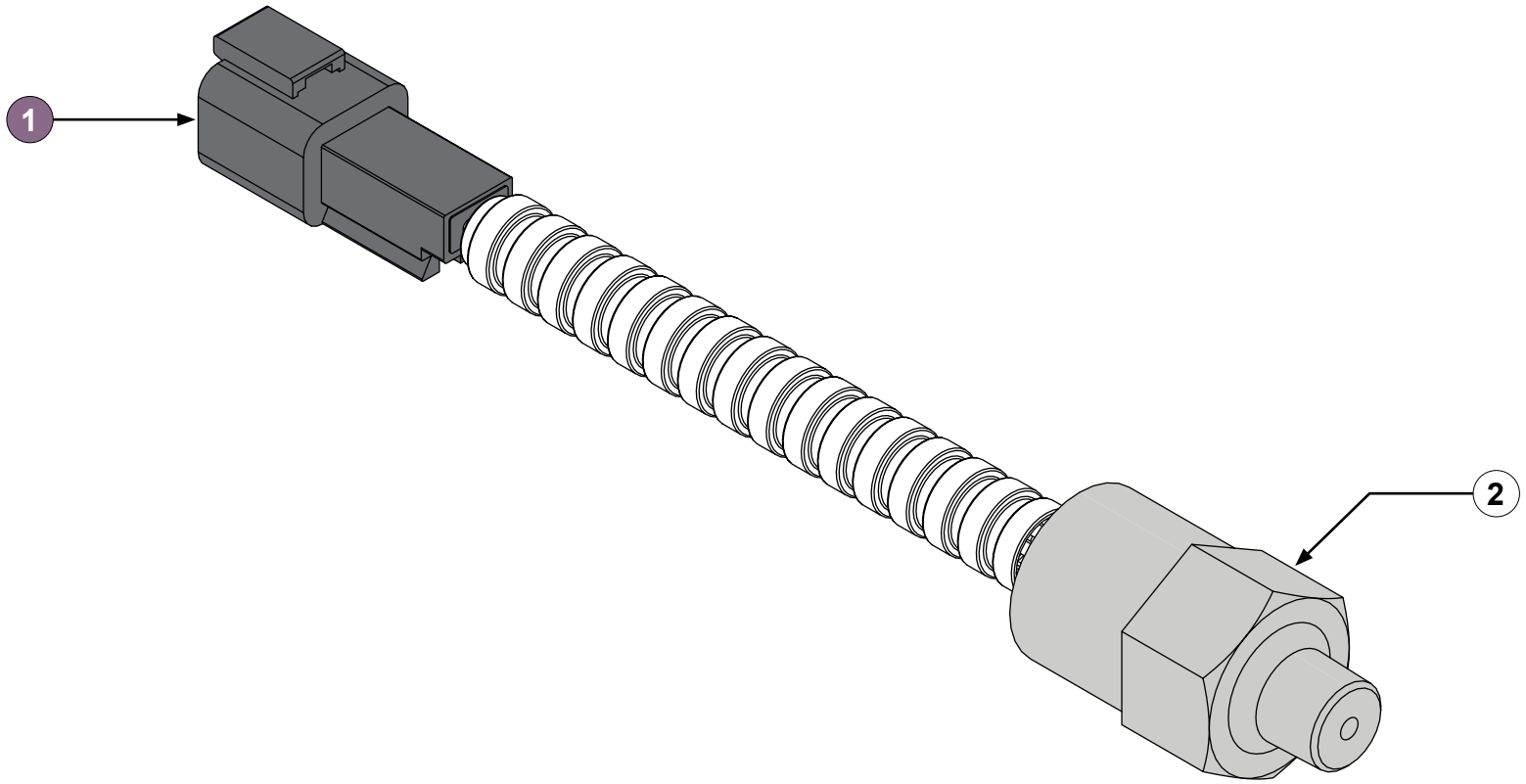
This generates the vacuum that primes the pump.



	Feature	Description
1	Power terminal	This is connected to the red extension cable wire.
2	Signal terminal	This is connected to the white extension cable wire.
3	Ground terminal	This is connected to the black extension cable wire—the 24V incorporates an additional jumper wire.
4	Mounting holes	This mounts the priming pump to the transmission bracket.
5	Inlet	This connects to the hose fitting—3/4 NPT.
6	Priming lubricant port	This connects to the optional prime-lubricant tank—1/8 NPT.
7	Outlet	This exhausts the evacuated air—3/4 NPT.
8	Solenoid	This engages the priming pump. ***Note:*** *The solenoid does not include flyback voltage protection.*

Pressure Switch

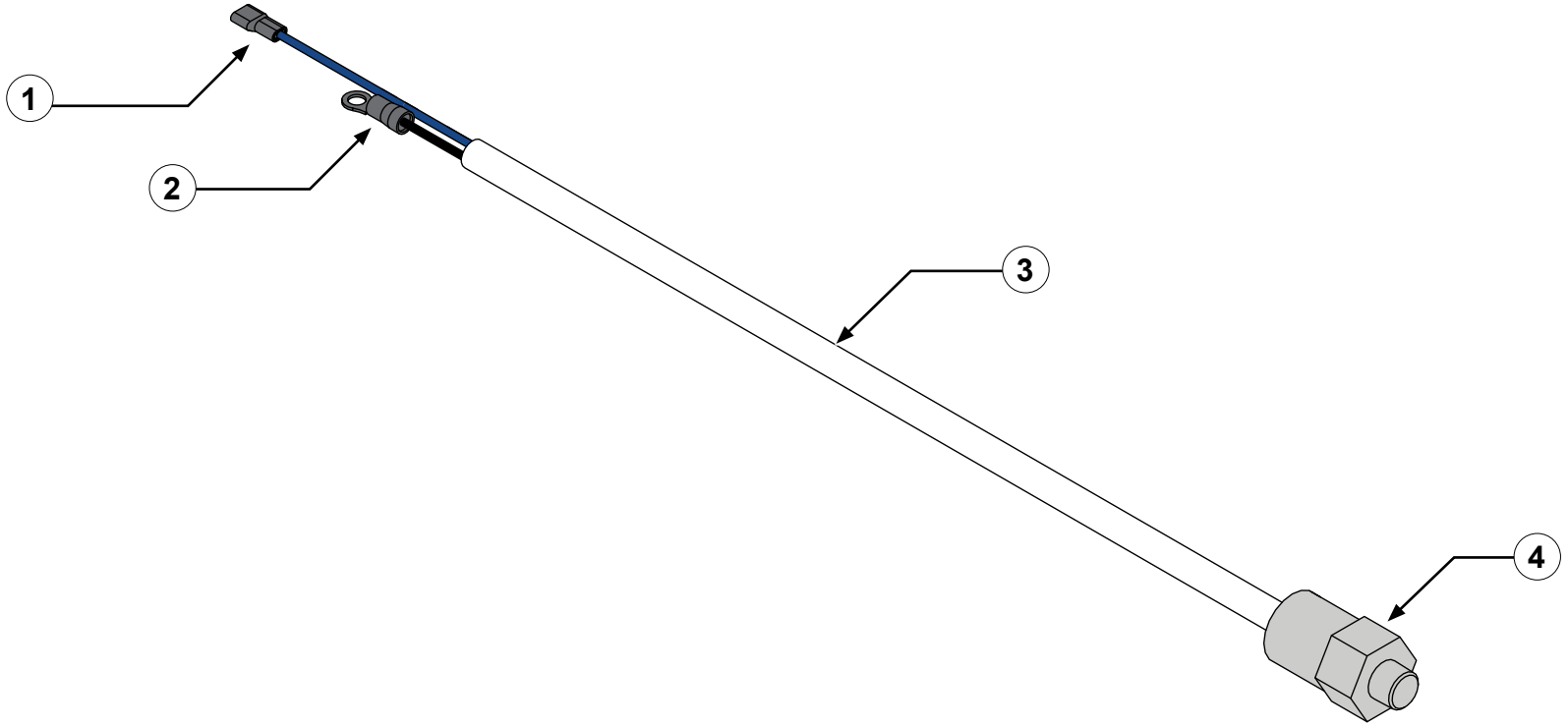
This facilitates the auto-prime operation.



	Feature	Description
1	Connector	This connects to the auto-prime switch—DT04-2P, cable length: 10 inches (254 mm).
2	Switch housing	This threads into the fire-pump intake—1/4 NPT.

Auto-Prime Cable

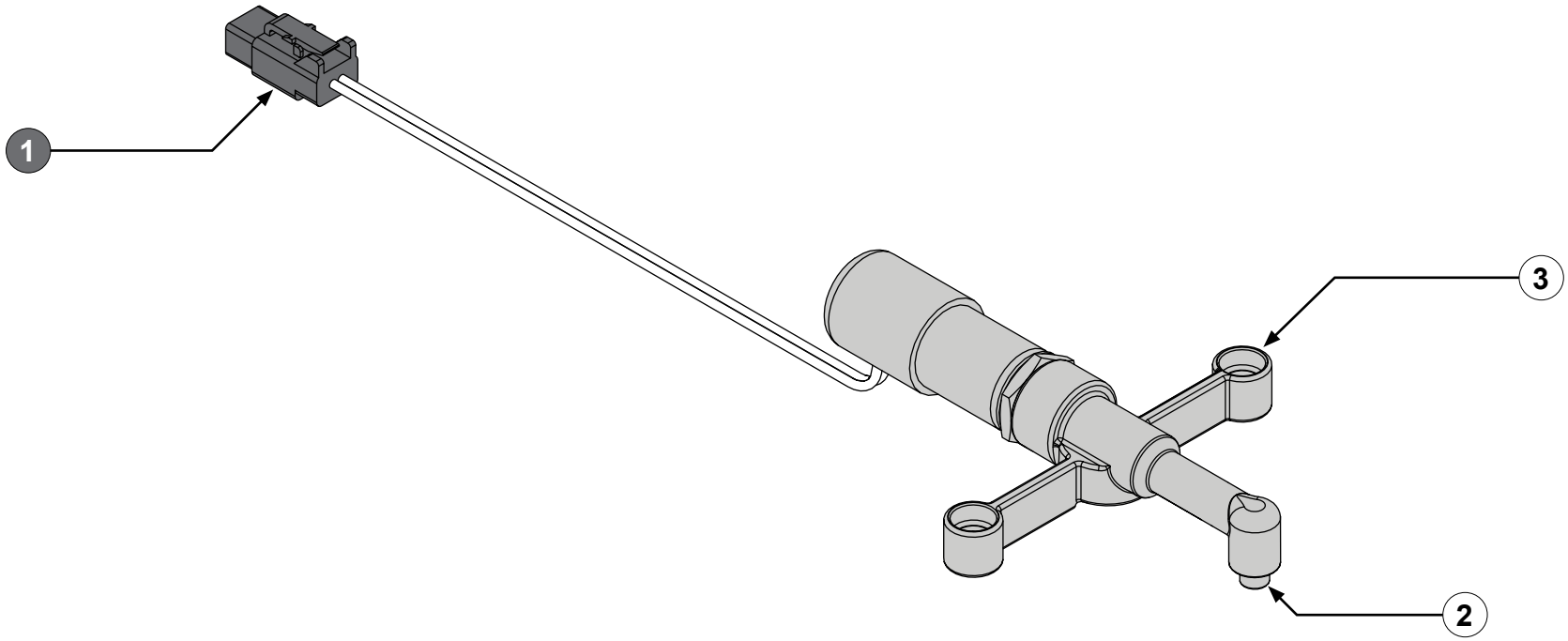
This facilitates the auto-prime operation without a panel switch.



	Feature	Description
1	1/4 inch male spade	This connects to the PTO/pump engage source.
2	Ground terminal	This is connected to the ground on the VPO.
3	Cable	This cable length is 18 inches (457 mm).
4	Switch housing	This threads into the fire-pump intake—1/4 NPT.

Priming Valve Solenoid

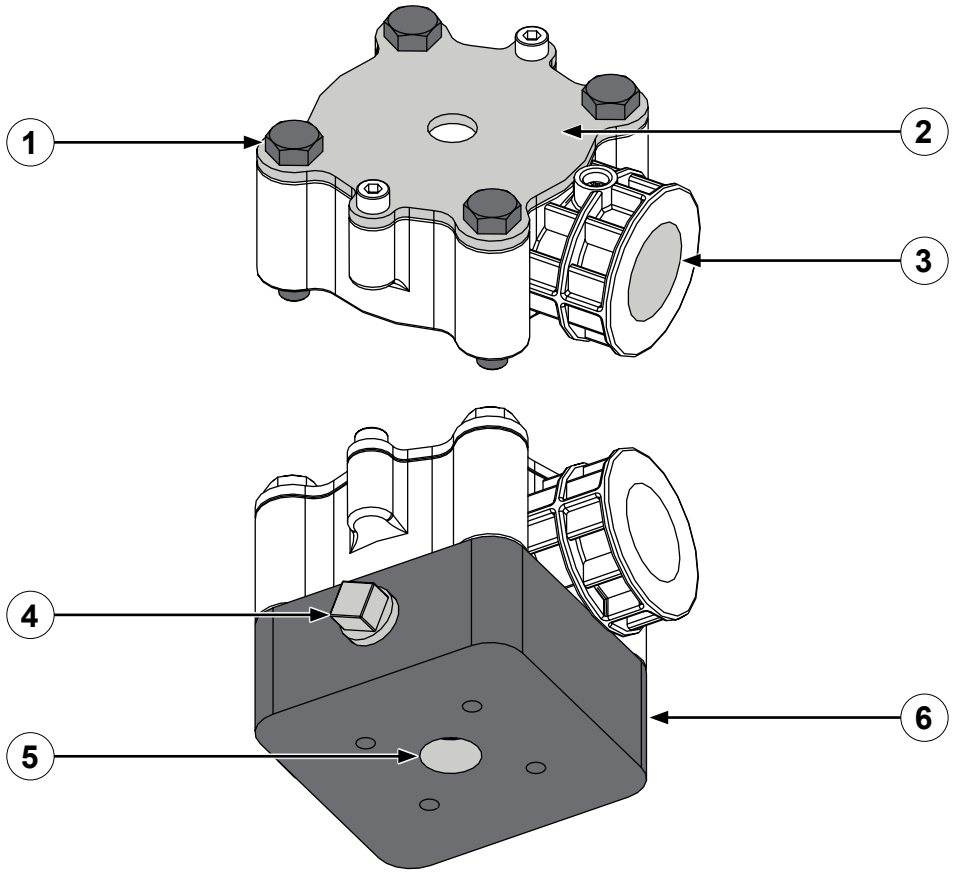
This allows multiple priming valves to be isolated from each other. Only used with single priming pump/multiple priming valve applications.



	Feature	Description
1	Connector	This connects to the switch—DTM06-2S, cable length: 6.5 inches (165 mm).
2	Vent port	This allows vacuum to be pulled from the top of diaphragm.
3	Mounting holes	This mounts the solenoid to the priming valve.

Priming Valve

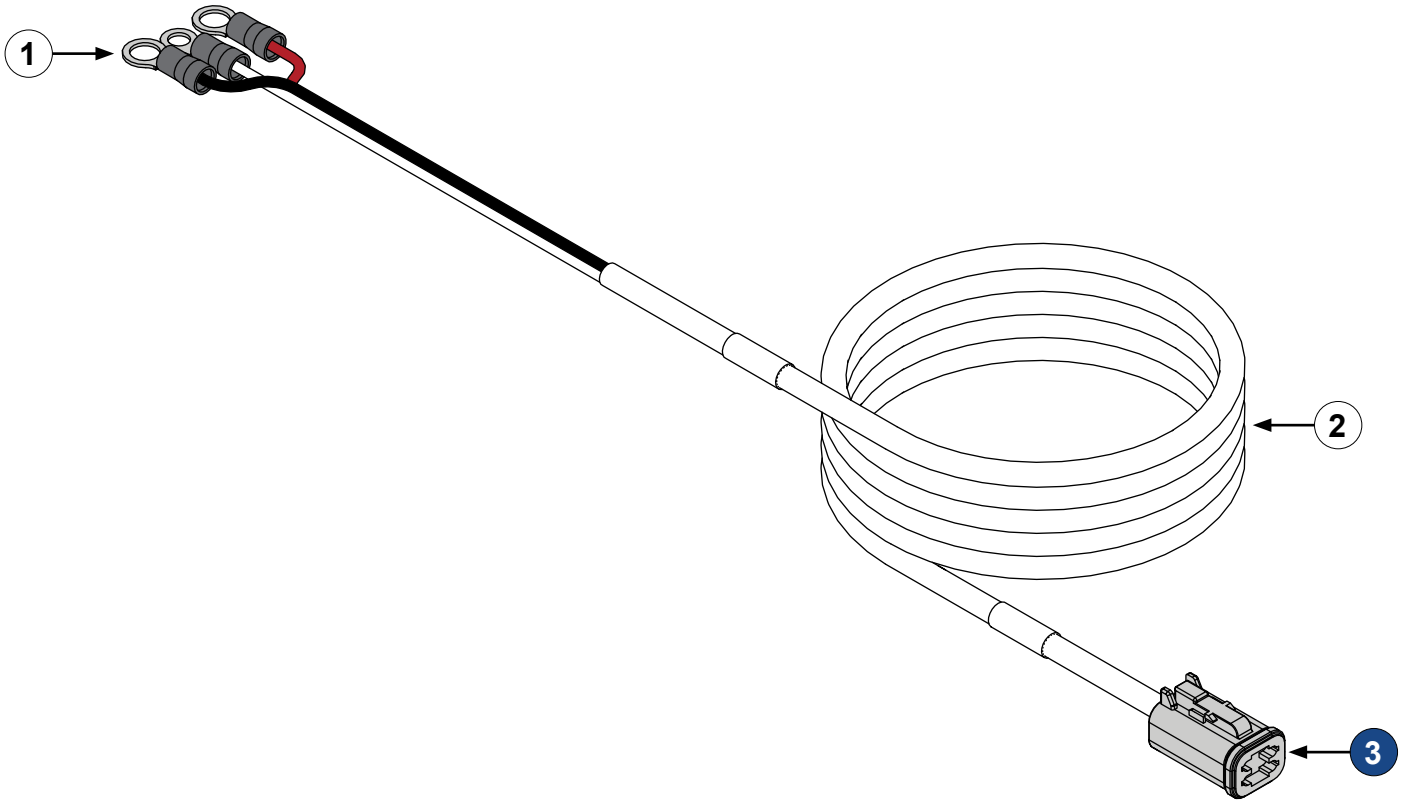
This allows air to evacuate the fire pump.



	Feature	Description
1	Mounting hardware	This mounts the priming valve to the fire-pump intake or priming valve base.
2	Priming valve top	This is the top of the priming valve.
3	Priming valve outlet	This connects to the priming pump.
4	Priming valve inlet plug	This plugs the unused inlets.
5	Priming valve intake	This draws the vacuum from the pump.
6	Priming valve base	This is an alternative mount for certain fire pump models.

Priming Pump Cable

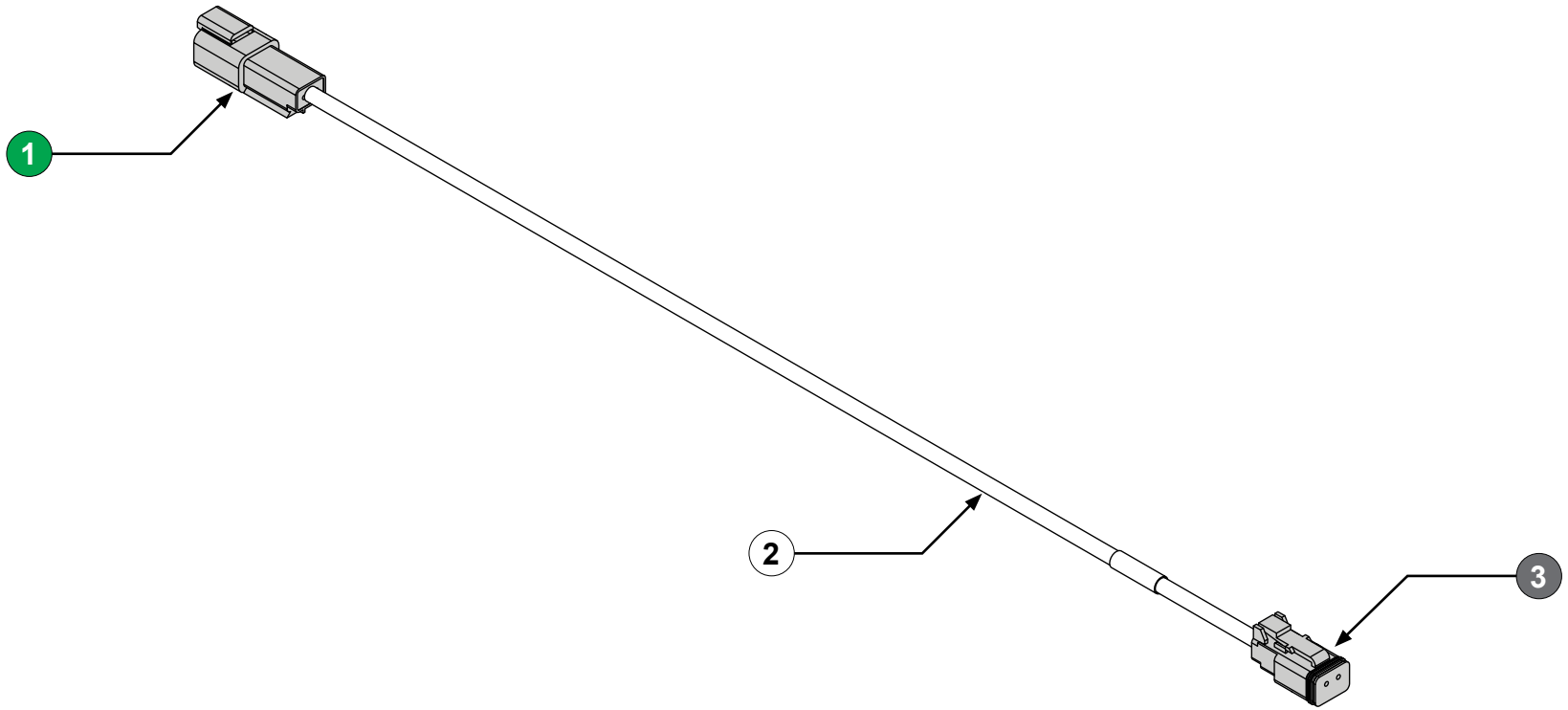
This connects the push button switch to the priming pump.



	Feature	Description
1	Priming pump connections	This connects to the priming pump.
2	Cable	This cable length is 70 inches (1,778 mm).
3	Panel connector	This connects to the push button switch—DT06-4S.

Priming Valve Solenoid Extension Cable

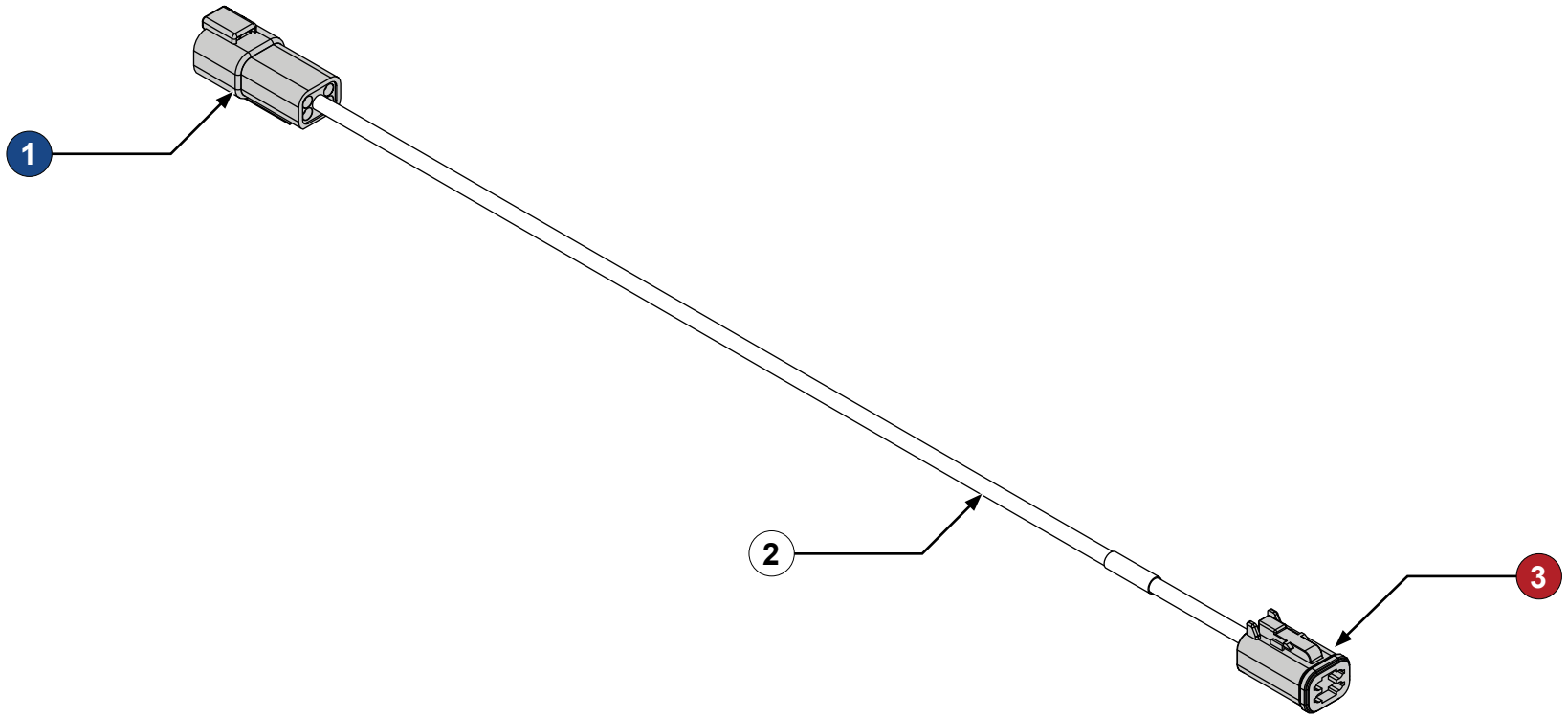
This cable extends the distance between the push button switch and the priming valve solenoid install location. ***Note:*** *The inclusion of this cable is dependent on your configuration. It is also available separately if required by your application.*



	Feature	Description
1	Connector	This connects to the push button switch—DTM04-2P.
2	Cable	This cable length is 120 inches (3048 mm).
3	Connector	This connects to the priming-valve solenoid—DTM06-2S.

Extension Cable—Optional

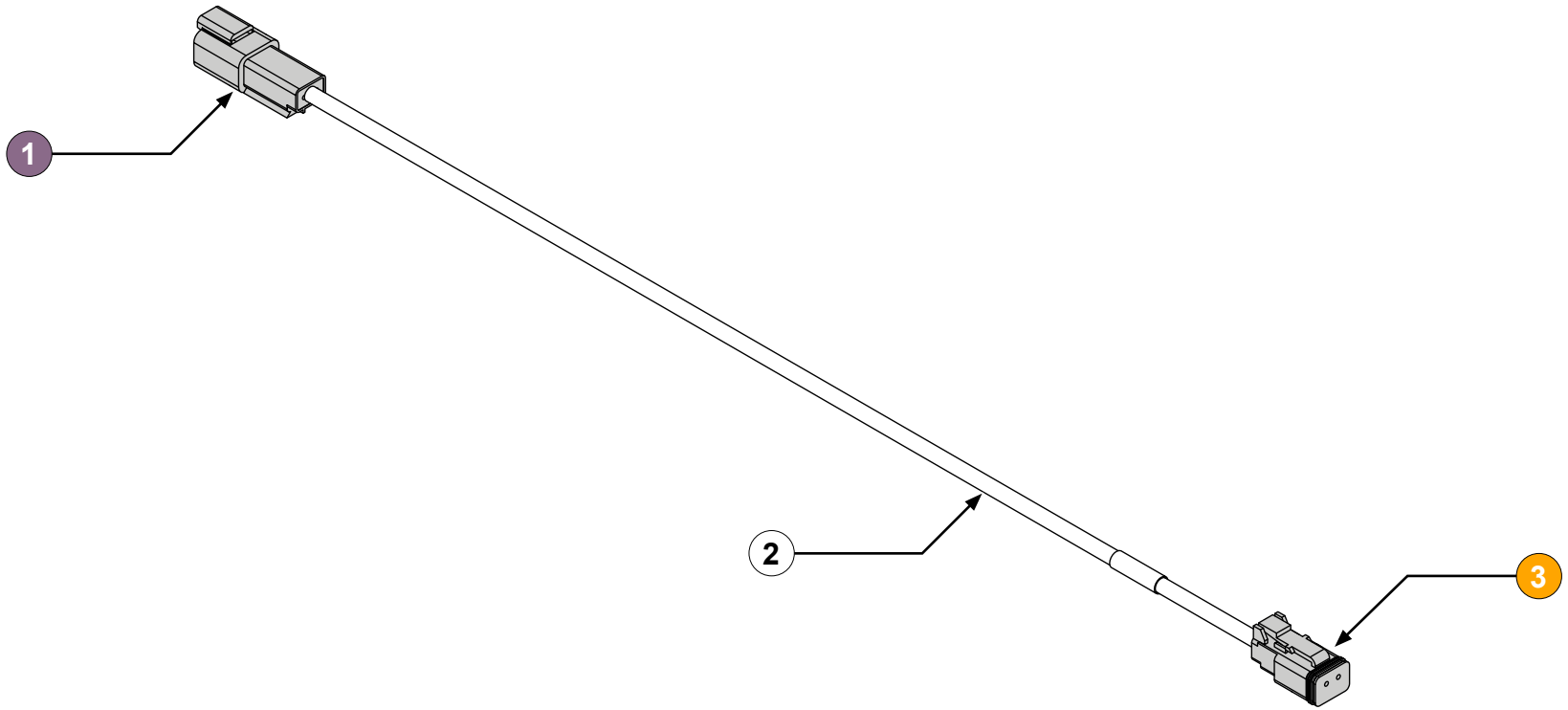
This extends the cable length of the priming pump cable.



	Feature	Description
1	Connector	This connects to the priming pump solenoid or a solenoid-equipped priming valve—DT04-4P.
2	Cable	This cable length is 70 inches (1,778 mm).
3	Connector	This connects to the push button switch—DT06-4S.

Pressure Switch Extension Cable

This cable extends the distance between the switch and the pressure switch install location. ***Note:*** *The inclusion of this cable is dependent on your configuration. It is also available separately if required by your application.*



	Feature	Description
1	Connector	This connects to the auto-prime switch—DT04-2P.
2	Cable	This cable length is 70 inches (1,778 mm).
3	Connector	This connects to the pressure switch—DT06-2S.

Notes

Installation Overview

This equipment is intended to be installed by a person or persons with the basic knowledge of installing similar equipment. Contact Waterous with questions about installing the equipment. The installation may require the following tasks and abilities:

- Locating, drilling, and cutting features into the apparatus.
- Connecting electronic devices.
- Configuring and calibrating the system.
- Final testing.

- Do not install the equipment if you are not familiar with the tools and skills needed to safely perform required procedures—proper installation is the responsibility of the purchaser.

Determining Cable and Wire Routing

Use the *Wiring Best Practices* document, available at www.waterousco.com, as a guide to select and route wiring for your application.

Preparing for the Installation

Read and understand all the installation instructions before installing the equipment. Prepare a suitable, well-lit area, and gather all the necessary tools before you begin the installation.

Optional Equipment

Be aware that the installation instruction may include optional equipment not included in your application.

Hose and Tubing Requirements

Use the following specifications to locally source hoses and tubing for your application. This is only required if priming pump and priming valve are not installed at the factory.

Tubing

Locally source a tube of the appropriate length with the following specifications:

- Outer diameter: 3/4-inch
- Inner diameter: 1/2-inch to 5/8-inch
- Color: Black, ultraviolet resistant
- Durometer: 61A minimum, must be compression fitting compatible
- Must withstand 25-inch Hg of vacuum
- Must be capable of servicing water
- Connection: 3/4-inch compression fitting

Hose

Locally source a hose of the appropriate length with the following specifications:

- Outer diameter: 1-1/8-inch
- Inner diameter: 5/8-inch
- Must have 2 fiber braids with oil resistant jacket
- Minimum working pressure: 200 psi
- Minimum burst pressure: 1000 psi
- Must withstand 25-inch Hg of vacuum
- Connection: 3/4-inch pipe fitting

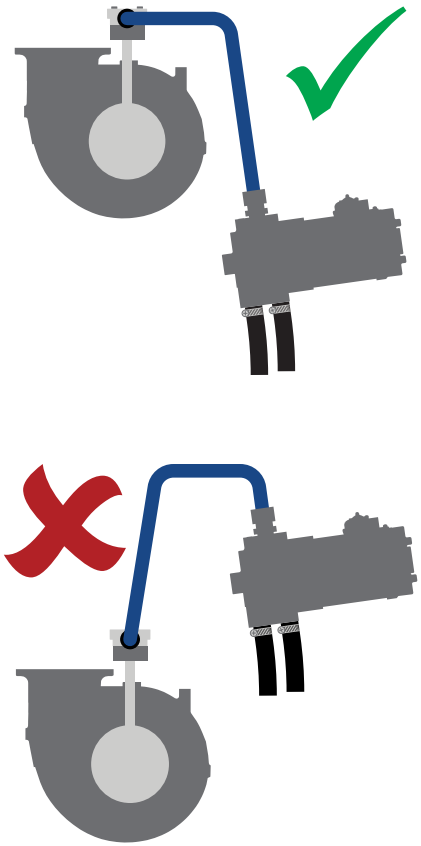
Determining the Installation Requirements

The priming system is available in various configurations. The priming system is available in various configurations, ranging from factory installed on the pump and transmission to individual, uninstalled components. The following instructions describe how to install and connect each of the components in the priming system. Use the instruction appropriate to your application to install your system.

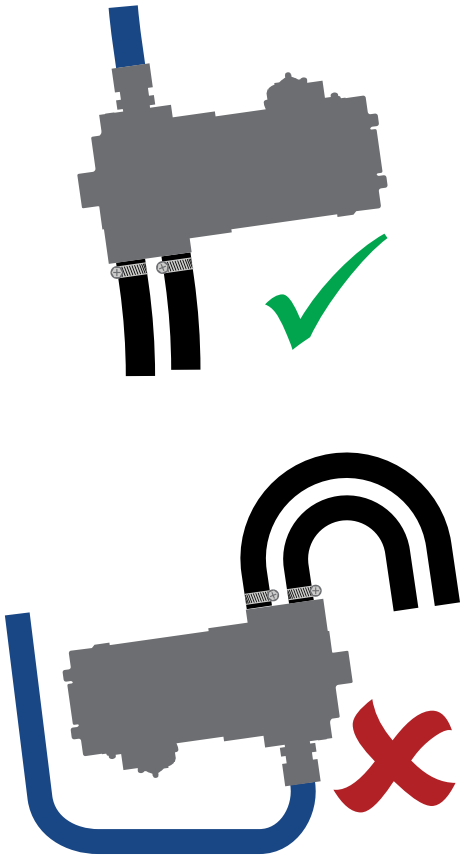
Installation Requirements

Use the following information to properly install the defined components.

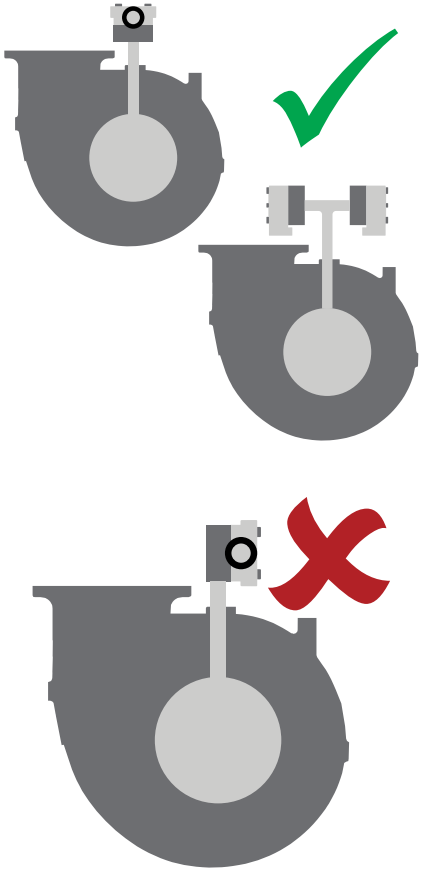
Install the priming valve above the priming pump.



Install the priming pump with the outlet ports oriented downward.

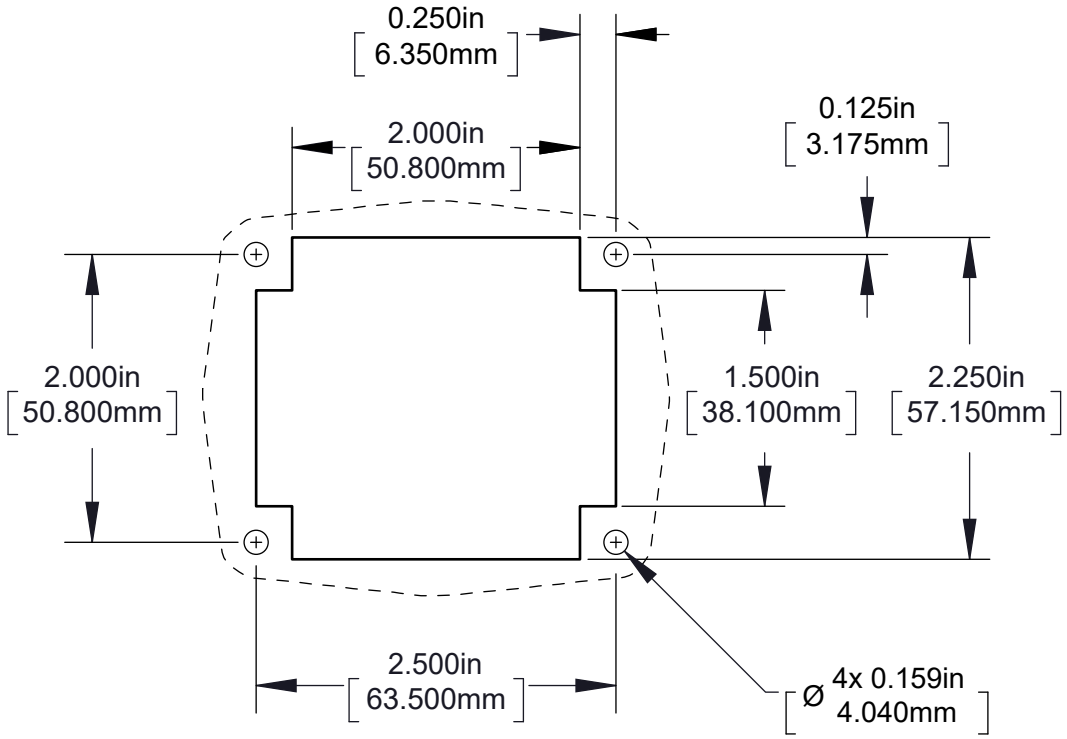


Install the priming valve with the top oriented upwards, or with the priming valve outlet oriented downwards.



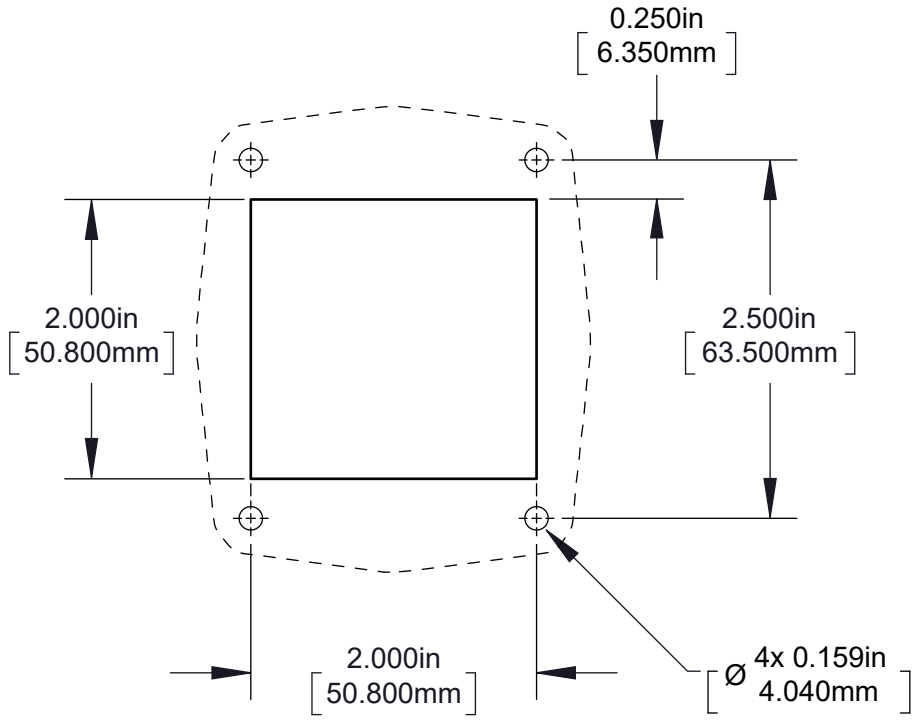
Auto-Prime Switch Cutout Dimensions

Use the illustration to create the cutout and drill the mounting holes for the auto-prime switch.



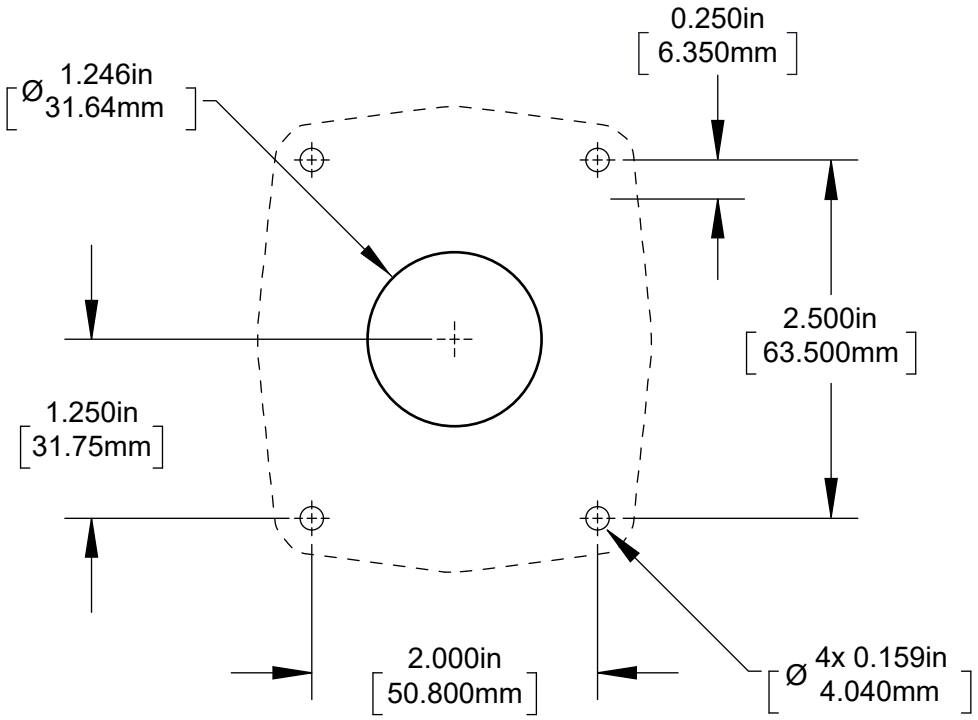
Standard Push Button Switch Dimensions

Use the illustration to create the cutout and drill the mounting holes for the standard push button switch.

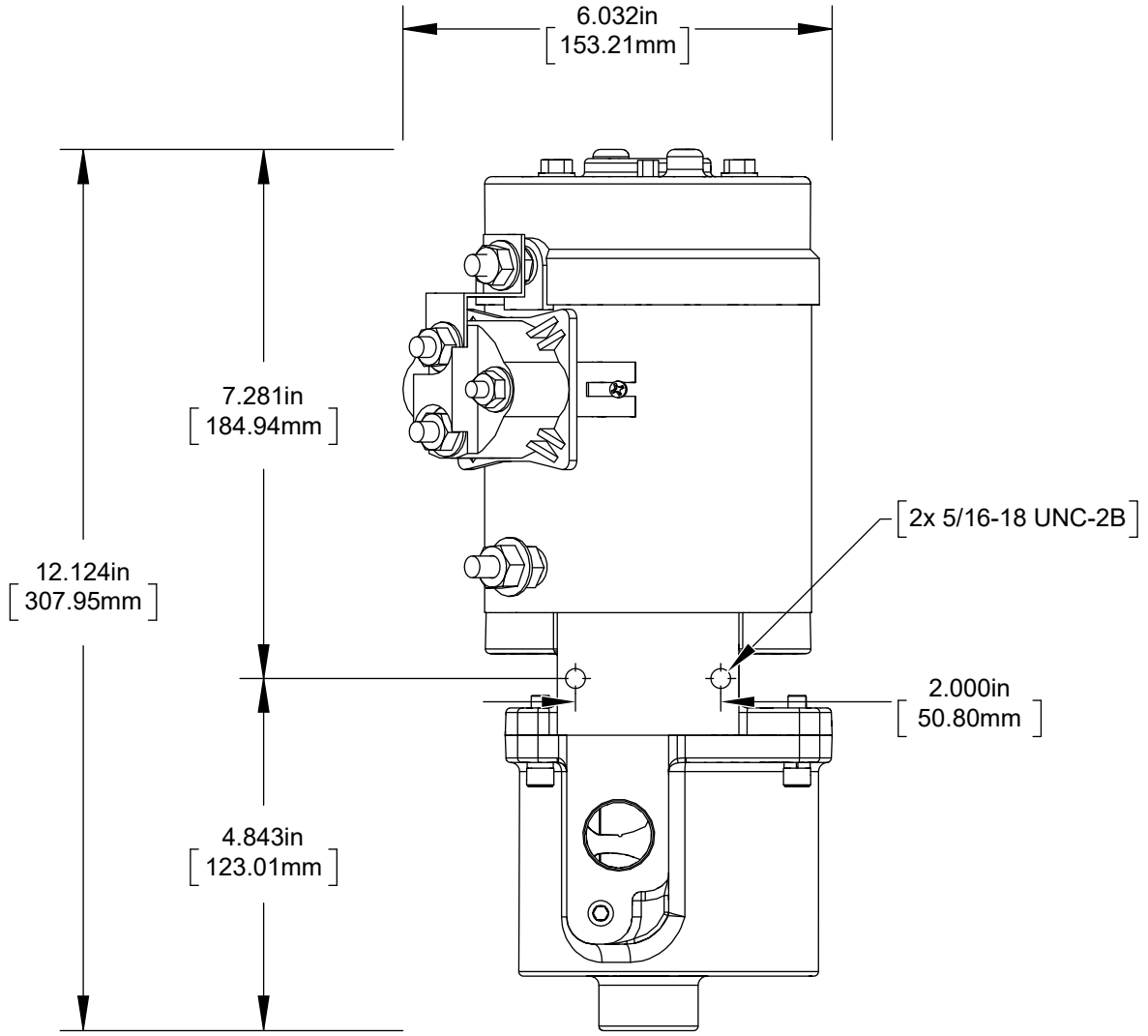


Oversized Push Button Switch Dimensions

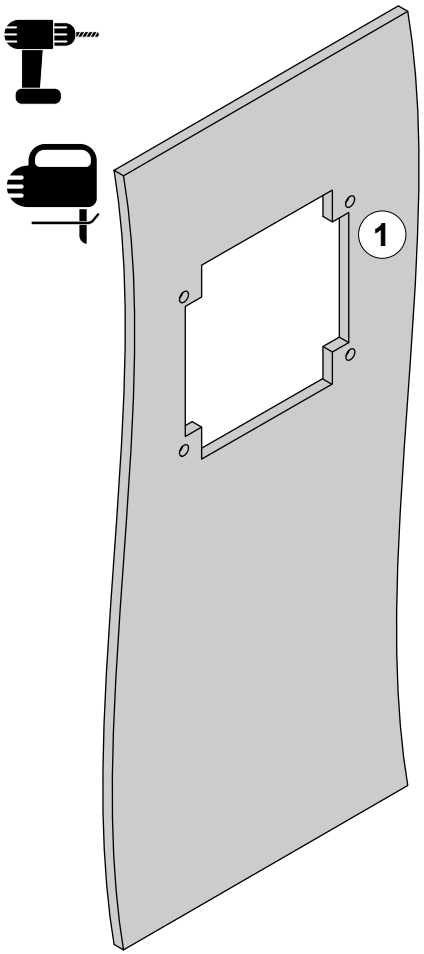
Use the illustration to create the cutout and drill the mounting holes for the oversized push button switch.



Priming Pump Dimensions



Installing the Auto-Prime Switch

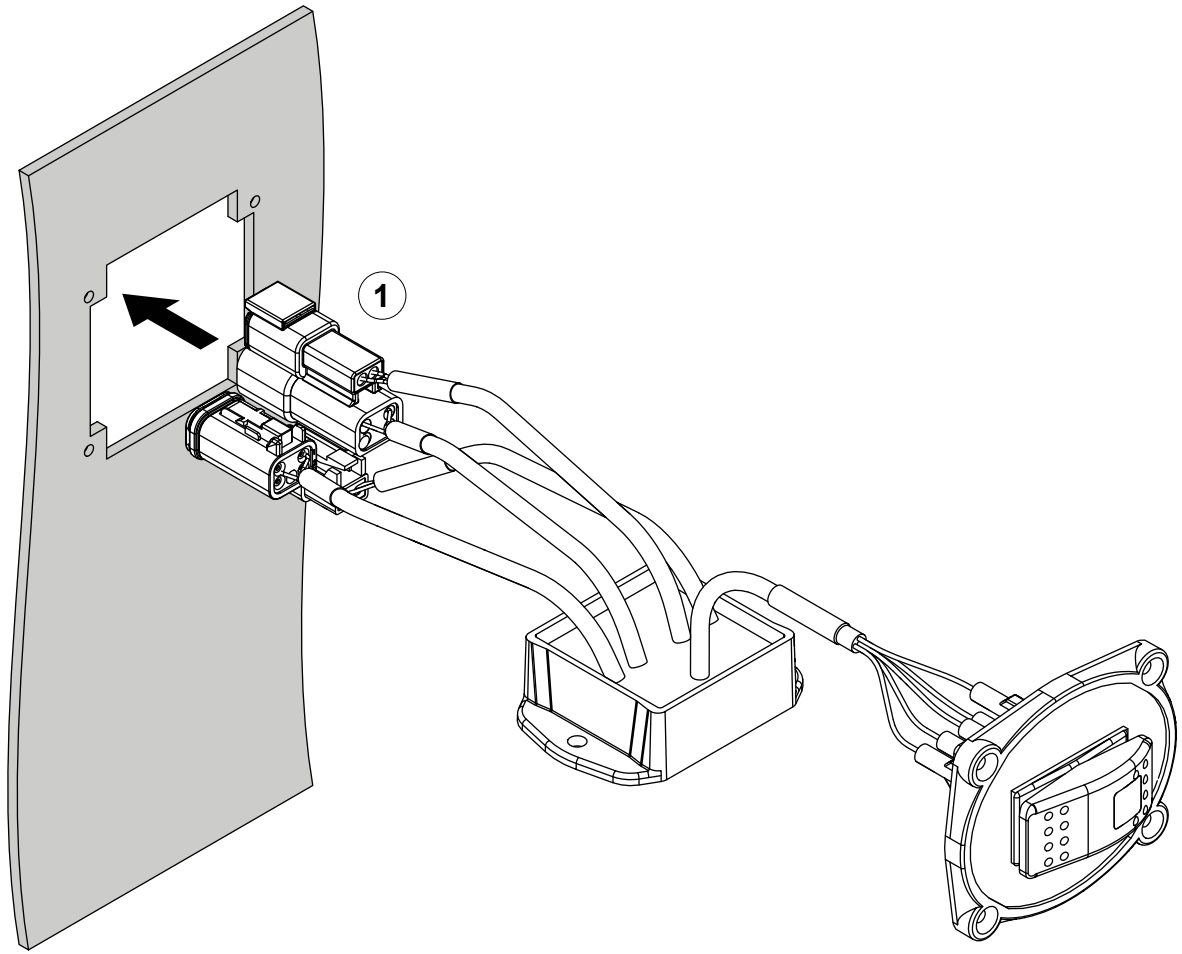


Panel Cutout and Mounting Holes

Use the illustration and instruction to create the cutout and mounting holes for the auto-prime switch.

1 Create the cutout and drill the mounting holes for the switch. Refer to: **"Auto-Prime Switch Cutout Dimensions" on page 29.**

Installing the Auto-Prime Switch

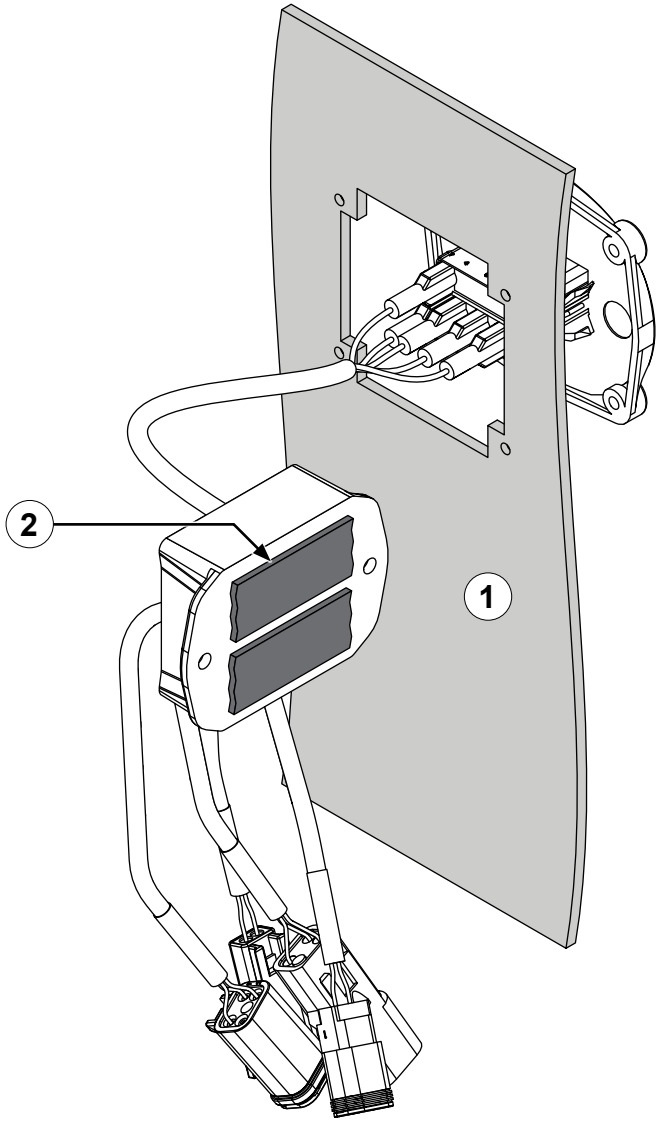


Positioning the Switch

Use the illustration and instruction to mount the auto-prime switch on the panel.

1 Route the plugs and enclosure through the cutout to position it for installation.

Installing the Auto-Prime Switch

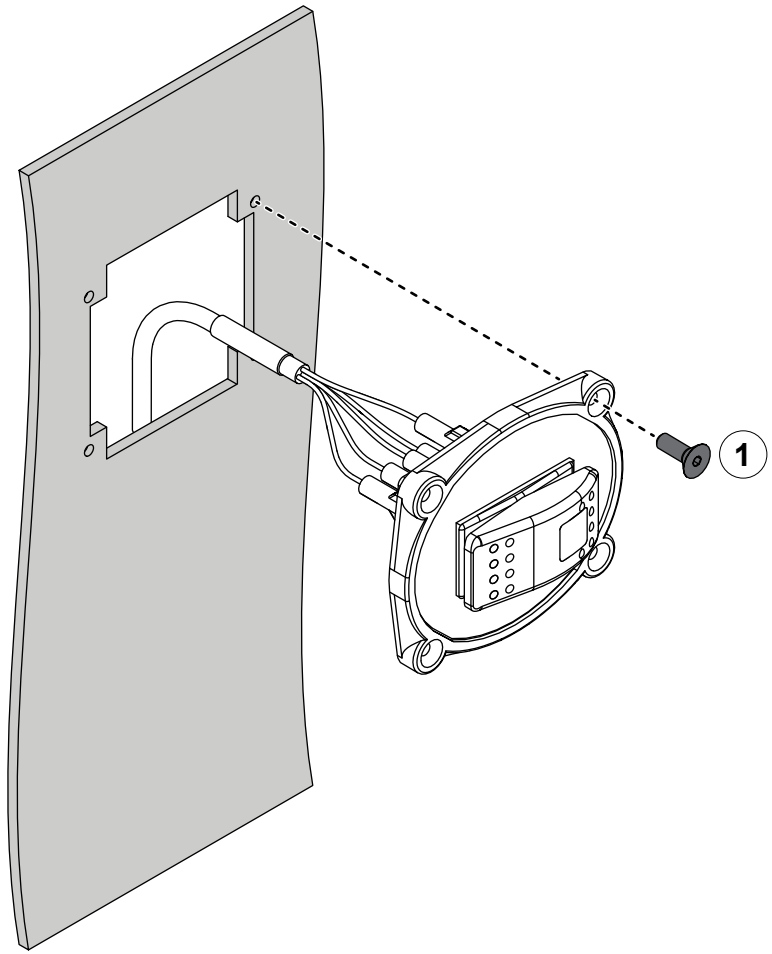


Mounting the Enclosure

Use the illustration and instructions to mount the auto-prime switch to the panel.

1. Use a clean rag and alcohol to clean the area where you intend to mount the enclosure.
2. Use the included high-bond tape to affix the enclosure to the panel.

Installing the Auto-Prime Switch

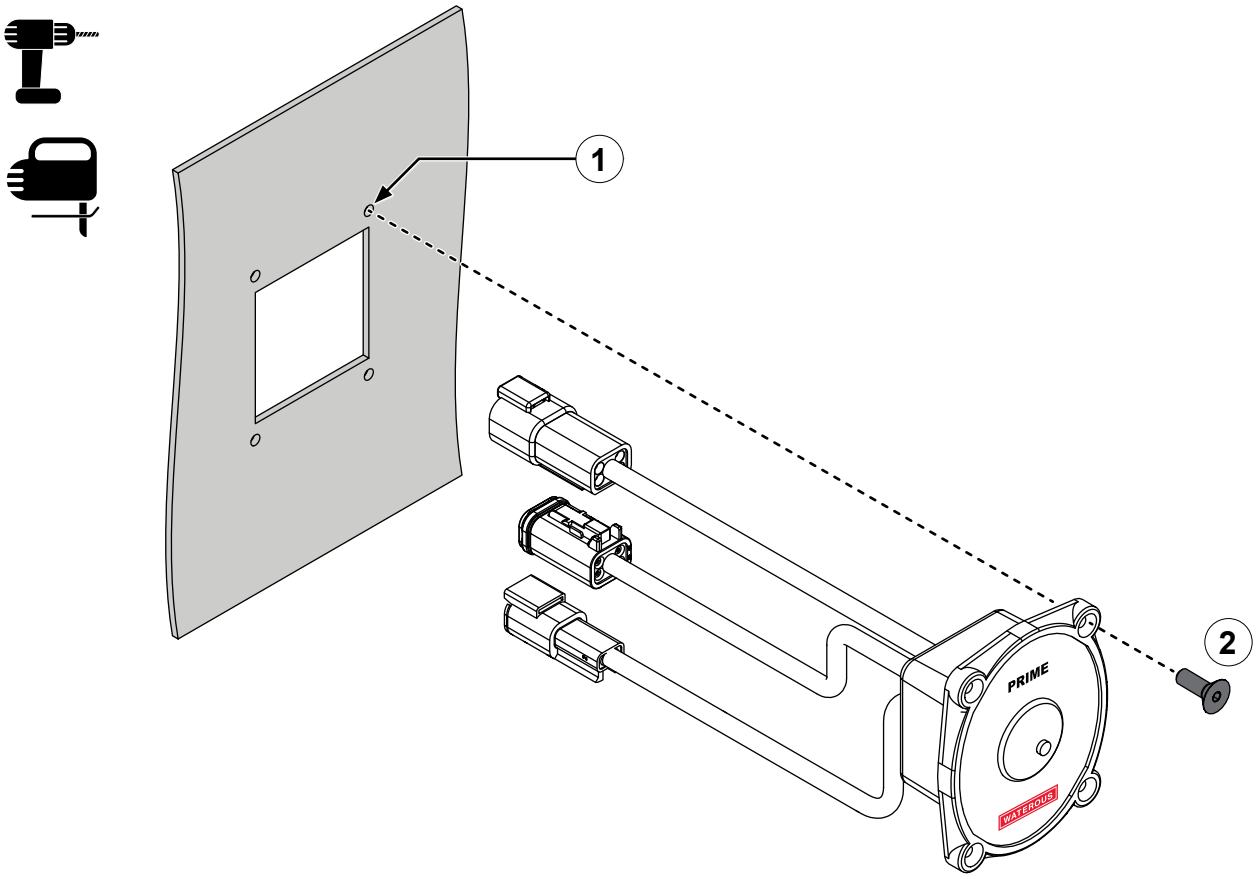


Mounting the Panel

Use the illustration and instruction to mount the auto-prime switch on the panel.

1 Use locally sourced mounting hardware to install the switch.

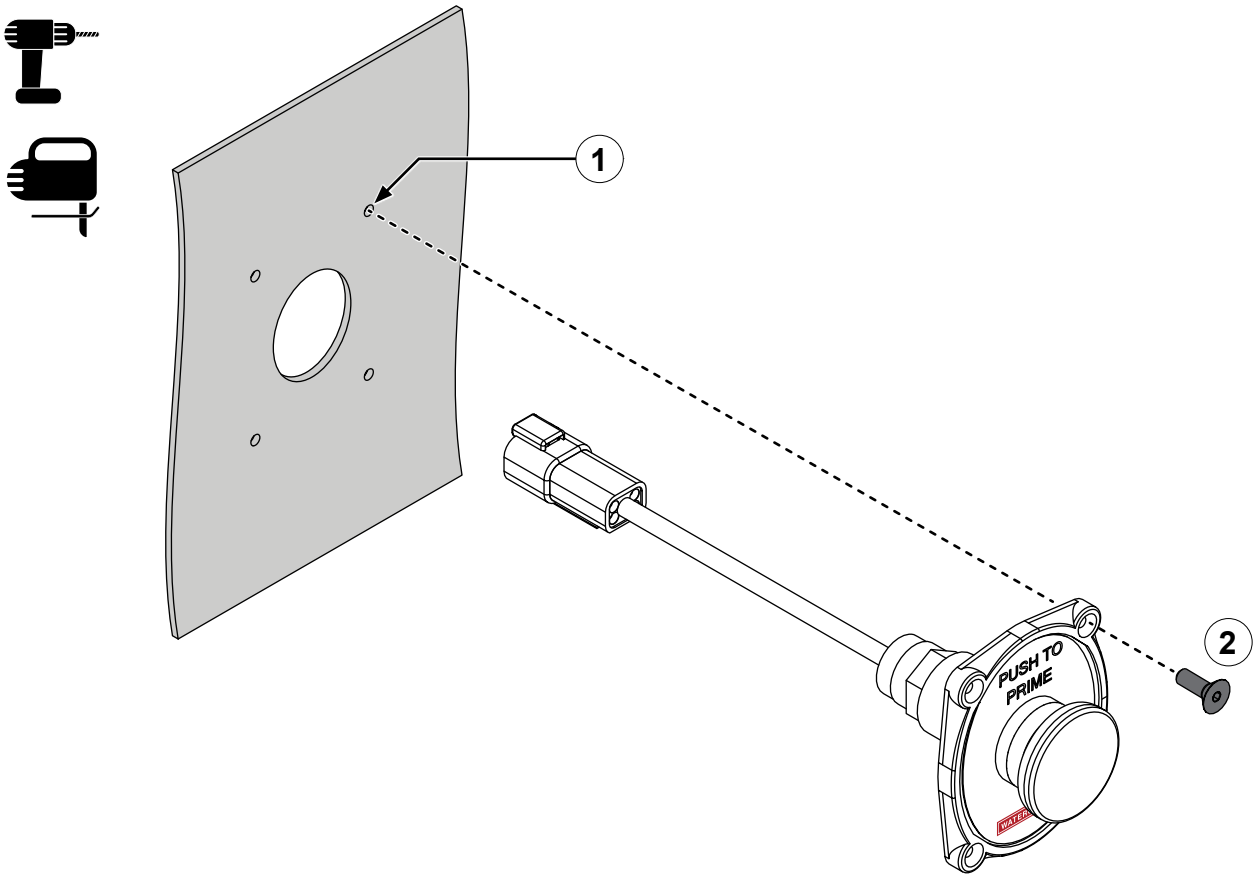
Installing the Standard Push Button Switch



Use the illustration and instructions to install the standard push button switch.

1. Create the cutout and drill the mounting holes for the switch. Refer to: **"Standard Push Button Switch Dimensions" on page 30.**
2. Insert the wiring through the cutout, then use locally sourced mounting hardware to mount the switch to the panel.

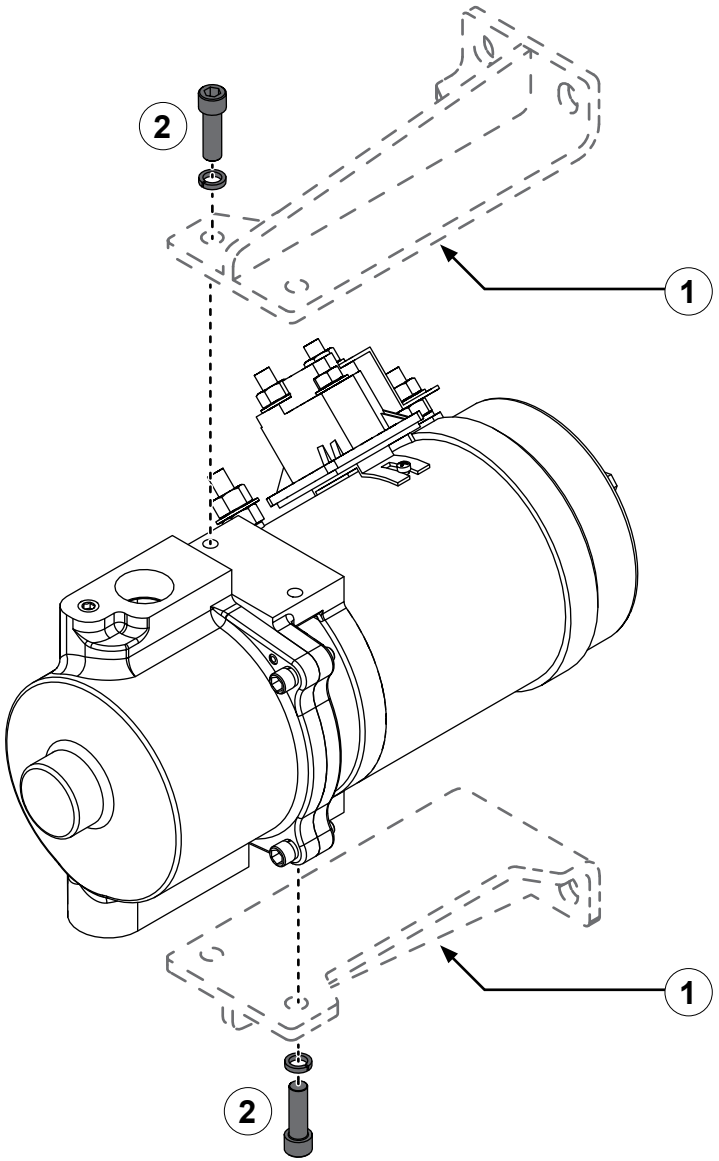
Installing the Oversized Push Button Switch



Use the illustration and instructions to mount the oversized push button switch.

1. Create the cutout and drill the mounting holes for the switch. Refer to: **"Oversized Push Button Switch Dimensions" on page 31.**
2. Insert the wiring through the cutout, then use locally sourced mounting hardware to mount the switch to the panel.

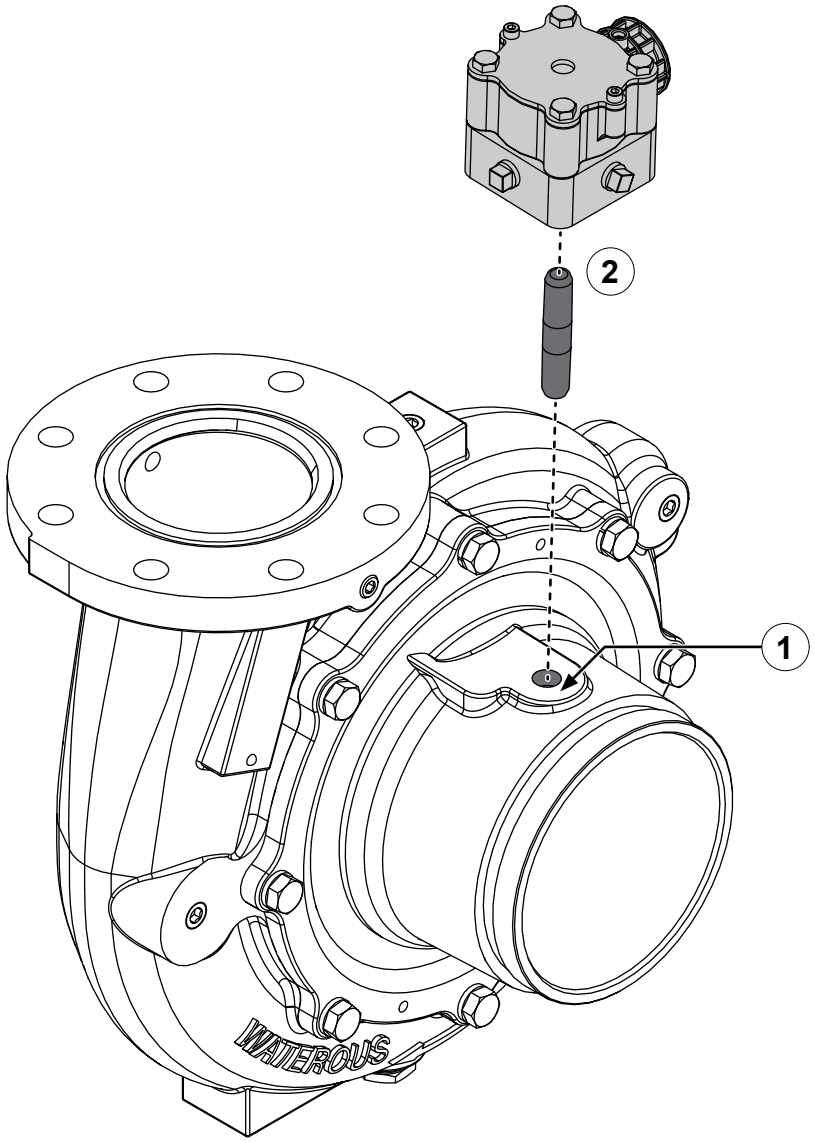
Installing the Priming Pump



Use the illustration and instructions to install a remote mounted priming pump.

1. Make a bracket suitable for your application to securely mount the priming pump to the apparatus. Refer to **"Priming Pump Dimensions" on page 32.**
2. Use 4 locally sourced 5/16-18 screws and washers, of the appropriate length to secure the priming pump to your bracket.

Installing the Priming Valve

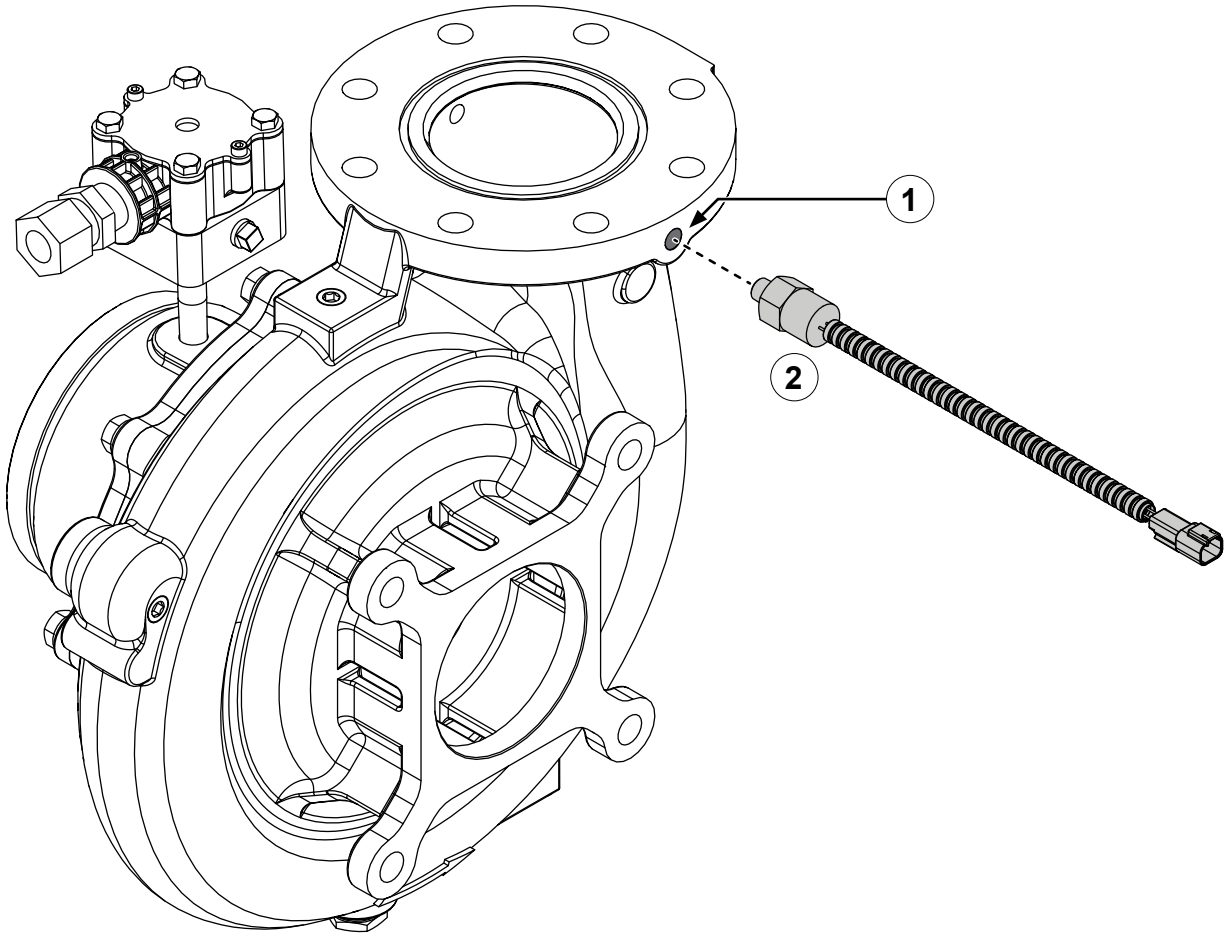


Use the illustration and instructions to install the priming valve. The illustration shows a typical priming valve installation on a typical fire pump—your specific application my differ in appearance. Use the following guidelines when installing the priming valve in your application:

- The priming valve must be mounted above the priming pump.
- The vacuum hose or tubing must allow water to drain from the priming valve to the priming pump.
- If additional priming valves are installed on the discharge side of fire pump, know that trapped water can impede proper priming.
- If required, use a hose or tube between the fire pump intake and the priming valve instead of a length of 3/8 NPT pipe.

1. Locate a suitable port on the pump intake.
2. Install an appropriate length of 3/8 NPT pipe into the port on the inlet. Then install the priming valve to the pipe.

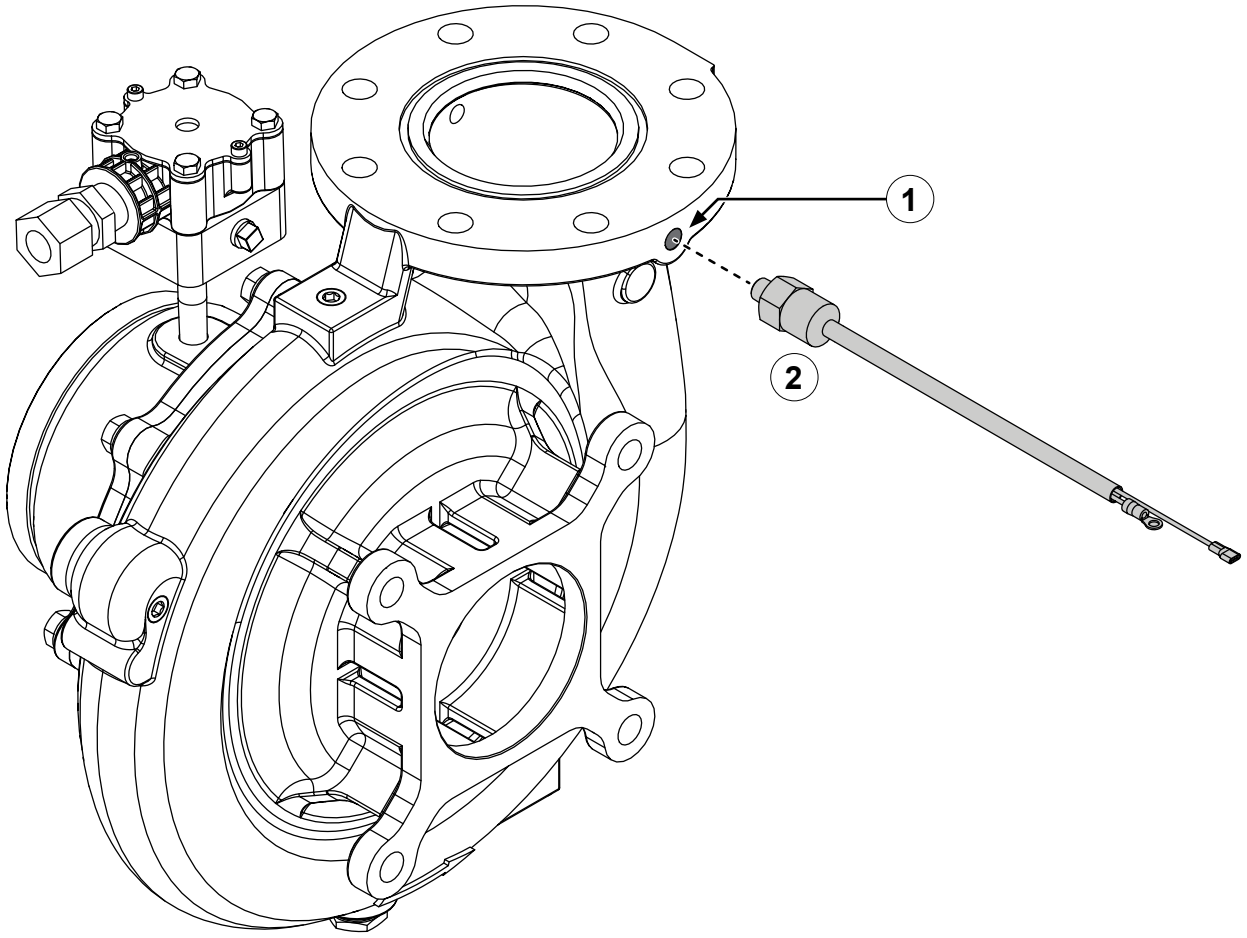
Installing the Pressure Switch



Use the illustration and instruction to install the pressure switch. The pressure switch is only required when operating the pump in auto-prime mode.

1. Locate a suitable 1/4 NPT port on the pump discharge.
2. Securely install the pressure switch to the pump.

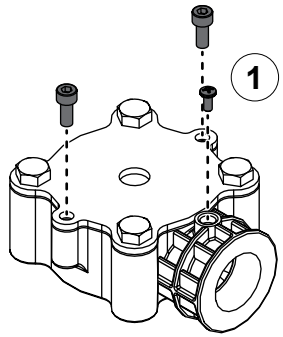
Installing the Auto-Prime Cable

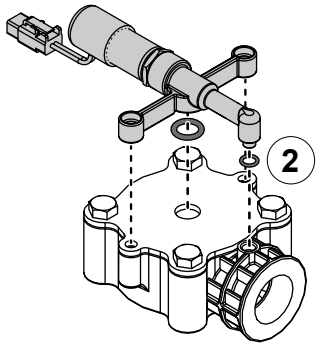


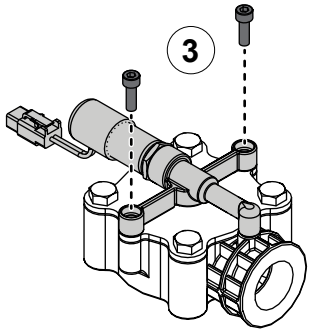
Use the illustration and instruction to install the pressure switch. The pressure switch is only required when operating the pump in auto-prime mode.

1. Locate a suitable 1/4 NPT port on the pump discharge.
2. Securely install the pressure switch to the pump.

Installing the Priming Valve Solenoid







Use the illustrations and instructions to install the optional priming valve solenoid.

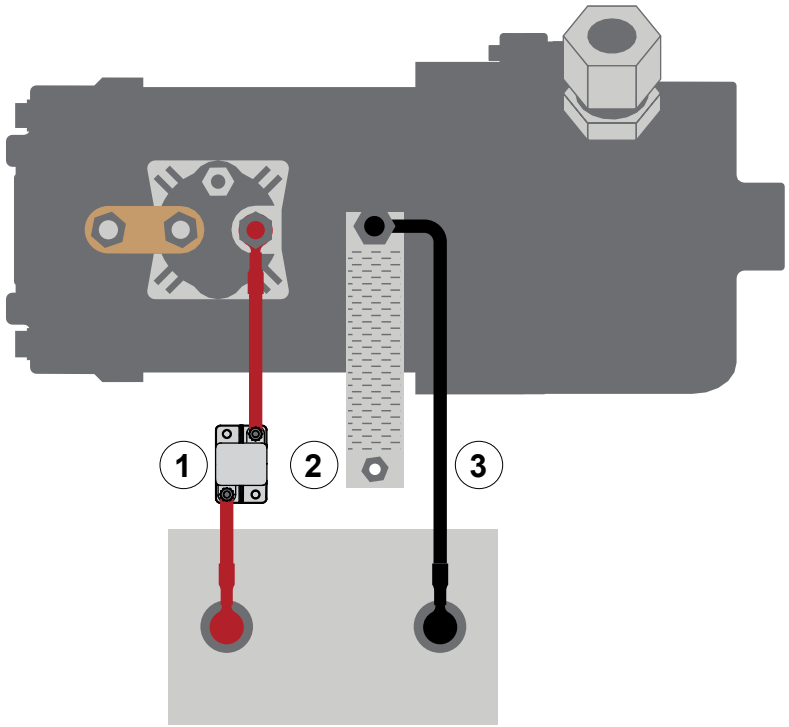
1. Remove the #6 and the M5 screws from the priming valve.

   Note: *The removed screws are no longer needed, re-purpose, recycle, or discard them.*

2. Install the O-ring seals and align the solenoid over the priming valve.

3. Use the M5 x 16mm screw to secure the solenoid to the priming valve.

Connecting to Apparatus Power



4.5 ft-lb
6 N·m

Priming Pump—12V

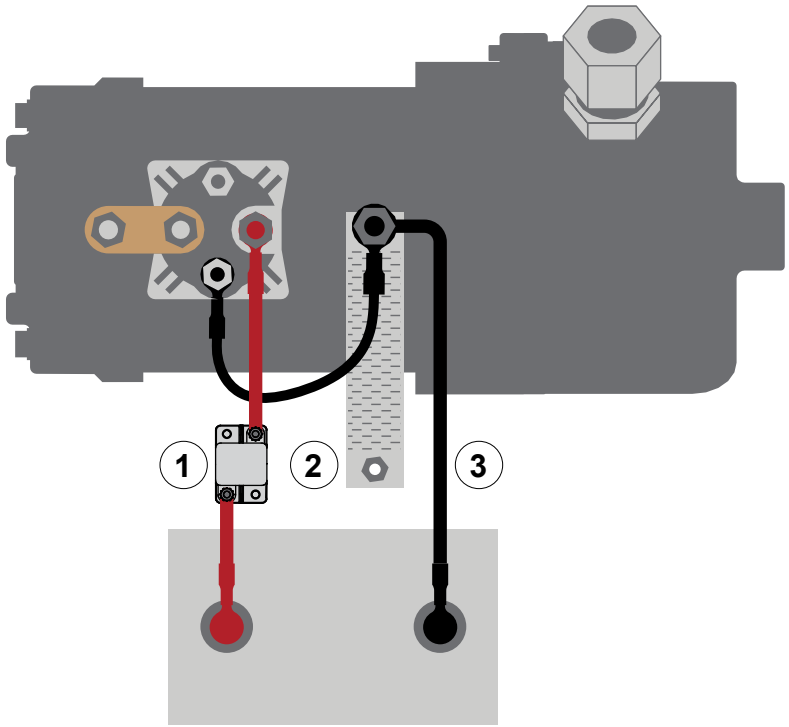
Use the illustration and instructions to connect the priming pump to apparatus power. Refer to *F-2825 Wiring Best Practices* instruction, available at waterousco.com.

Include the following when installing the priming pump:

- The 12V priming pump draws 325 amps of current and the 24V priming pump draws 170 amps of current. Make sure your wiring is rated for the current draw in your application.
- It is recommended that you isolate the priming pump power and ground circuits for best performance.
- Make sure that you include adequate circuit protection.
- Provide flyback voltage protection if required by your application.

1	Connect apparatus power to the priming pump power terminal. Make sure that you include an appropriately sized breaker in the circuit. Torque the nut on the priming pump to 4.5 ft-lb (6 N·m).
2	Connect a ground strap from the priming pump ground terminal to the apparatus frame.
3	Connect apparatus ground to the priming pump ground terminal. Torque the nut on the priming pump to 4.5 ft-lb (6 N·m).

Connecting to Apparatus Power



Priming Pump—24V

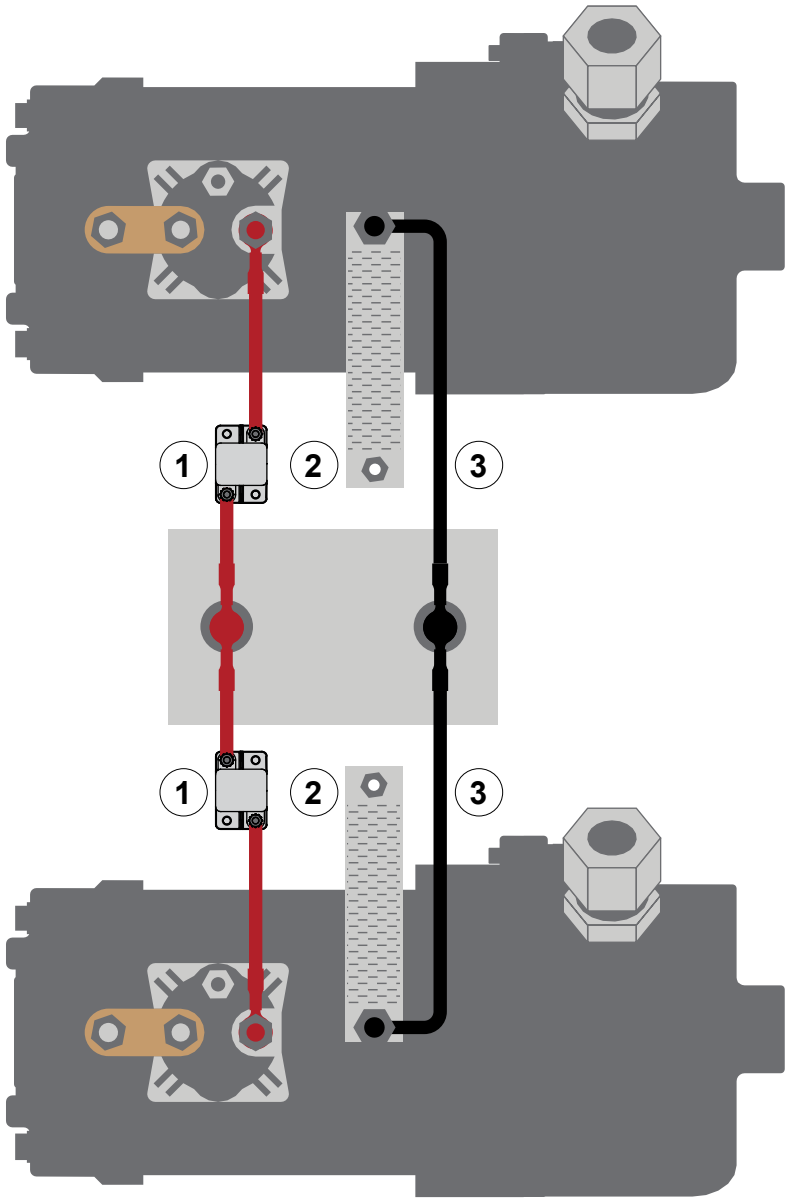
Use the illustration and instructions to connect the priming pump to apparatus power. Refer to *F-2825 Wiring Best Practices* instruction, available at waterousco.com.

Include the following when installing the priming pump:

- The 12V priming pump draws 325 amps of current and the 24V priming pump draws 170 amps of current. Make sure your wiring is rated for the current draw in your application.
- Make sure that you include adequate circuit protection.
- It is recommended that you isolate the priming pump power and ground circuits for best performance.
- Provide flyback voltage protection if required by your application.

1	Connect apparatus power to the priming pump power terminal. Make sure that you include an appropriately sized breaker in the circuit. Torque the nut on the priming pump to 4.5 ft-lb (6 N·m).
2	Connect a ground strap from the priming pump ground terminal to the apparatus frame.
3	Connect apparatus ground to the priming pump ground terminal. Torque the nut on the priming pump to 4.5 ft-lb (6 N·m).

Connecting to Apparatus Power



4.5 ft-lb
6 N·m

Dual Priming Pumps—12V

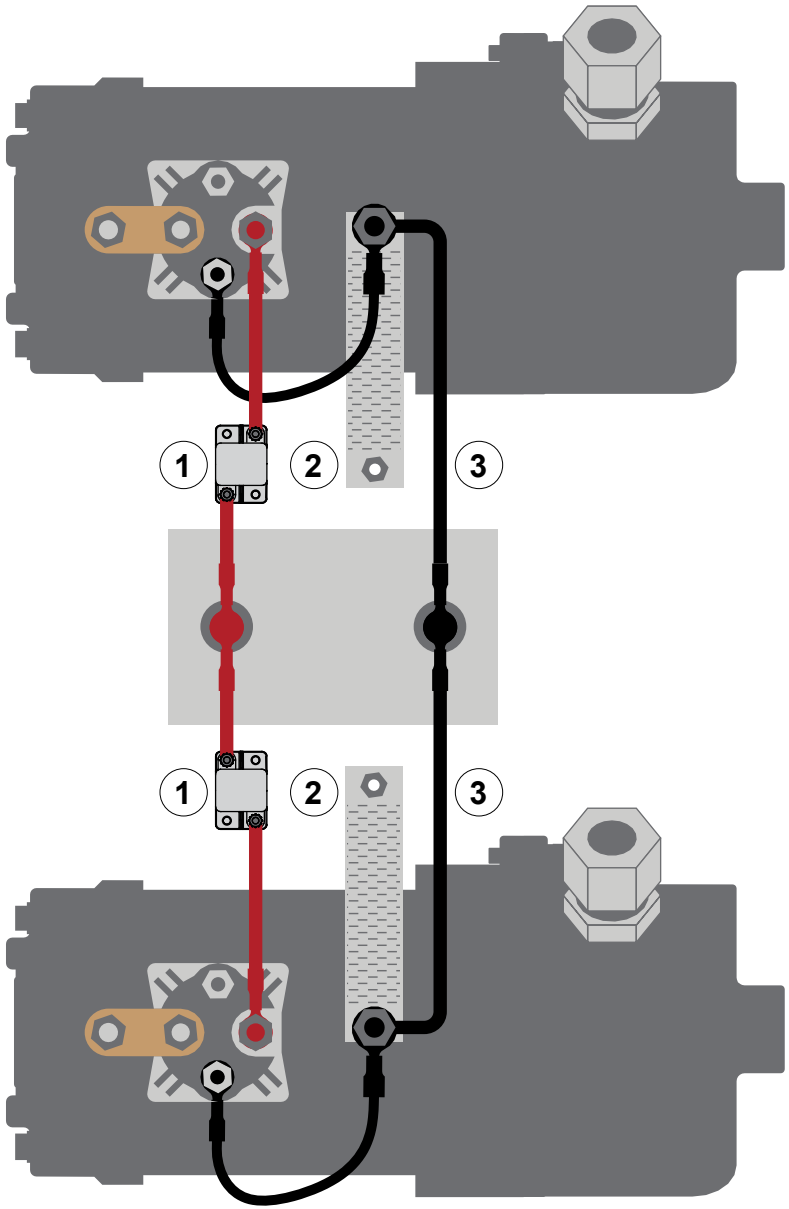
Use the illustration and instructions to connect the a dual priming pump application to apparatus power. Refer to *F-2825 Wiring Best Practices* instruction, available at waterousco.com.

Include the following when installing the priming pump:

- The 12V priming pump draws 325 amps of current and the 24V priming pump draws 170 amps of current. Make sure your wiring is rated for the current draw in your application.
- Make sure that you include adequate circuit protection.
- It is recommended that you isolate the priming pump power and ground circuits for best performance.
- Provide flyback voltage protection if required by your application.

1	Connect apparatus power to the priming pump power terminal. Make sure that you include an appropriately sized breaker in the circuit. Torque the nut on the priming pump to 4.5 ft-lb (6 N·m).
2	Connect a ground strap from the priming pump ground terminal to the apparatus frame.
3	Connect apparatus ground to the priming pump ground terminal. Torque the nut on the priming pump to 4.5 ft-lb (6 N·m).

Connecting to Apparatus Power



4.5 ft-lb
6 N·m

Dual Priming Pumps—24V

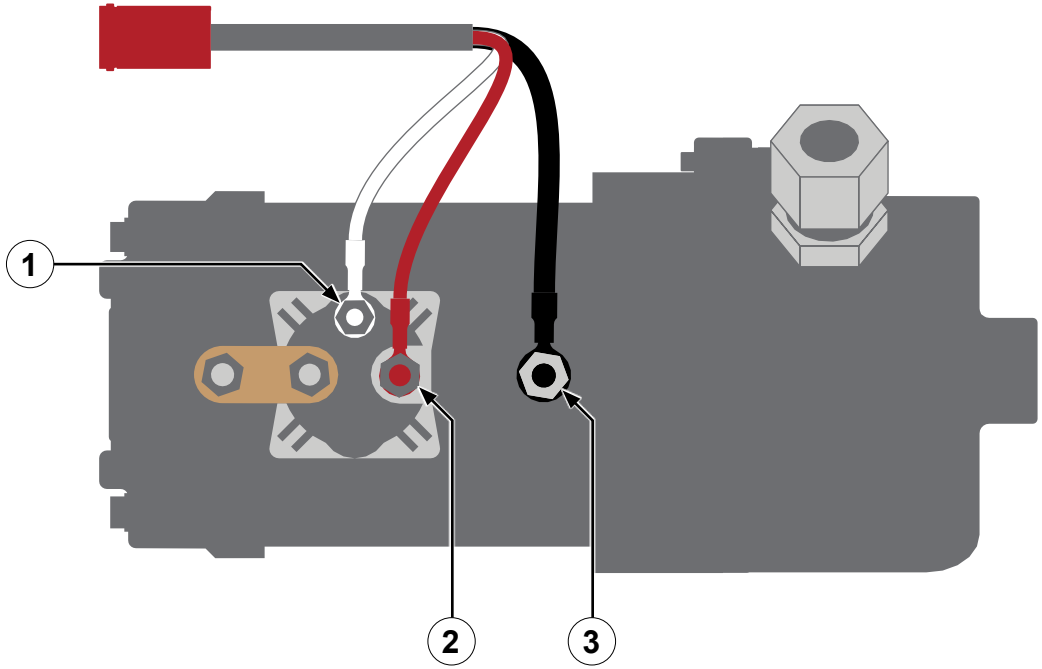
Use the illustration and instructions to connect the a dual priming pump application to apparatus power. Refer to *F-2825 Wiring Best Practices* instruction, available at waterousco.com.

Include the following when installing the priming pump:

- The 12V priming pump draws 325 amps of current and the 24V priming pump draws 170 amps of current. Make sure your wiring is rated for the current draw in your application.
- Make sure that you include adequate circuit protection.
- It is recommended that you isolate the priming pump power and ground circuits for best performance.
- Provide flyback voltage protection if required by your application.

1	Connect apparatus power to the priming pump power terminal. Make sure that you include an appropriately sized breaker in the circuit. Torque the nut on the priming pump to 4.5 ft-lb (6 N·m).
2	Connect a ground strap from the priming pump ground terminal to the apparatus frame.
3	Connect apparatus ground to the priming pump ground terminal. Torque the nut on the priming pump to 4.5 ft-lb (6 N·m).

Connecting the Extension Cable



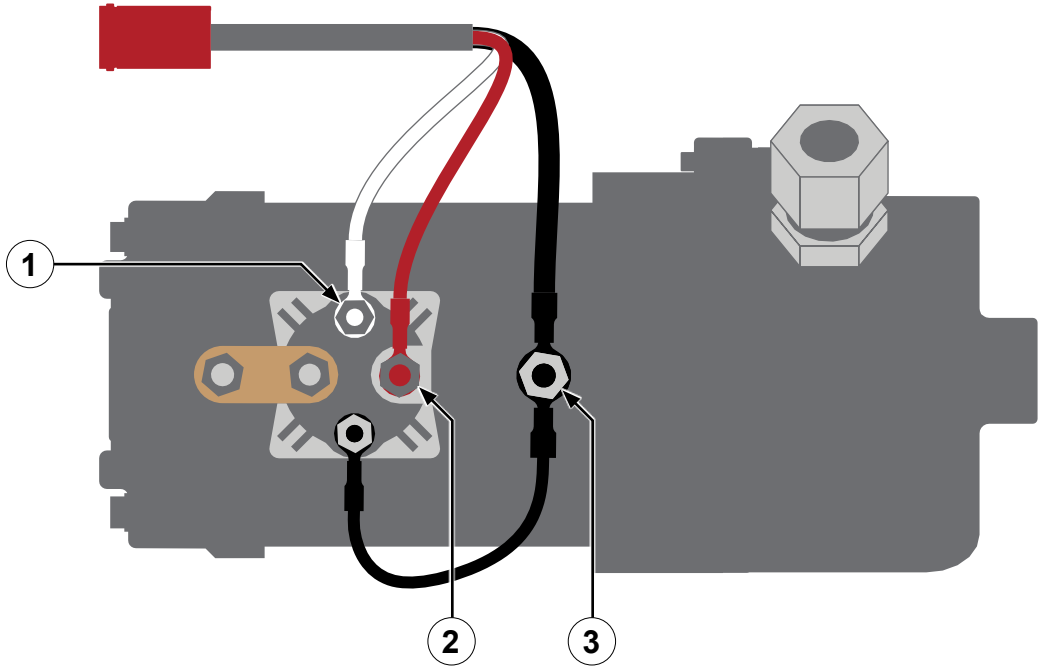
4.5 ft-lb
6 N·m

Priming Pump—12V

Use the illustration and instructions to connect the extension cable to the priming pump.

1. Connect the white wire from the extension cable to the signal terminal on the priming pump terminal. Torque the nut to 1.5 ft-lb (2 N·m).
2. Connect the red wire from the extension cable to the power terminal. Torque the nut to 4.5 ft-lb (6 N·m).
3. Connect the black wire from the extension cable to the ground terminal. Torque the nut to 4.5 ft-lb (6 N·m).

Connecting the Extension Cable



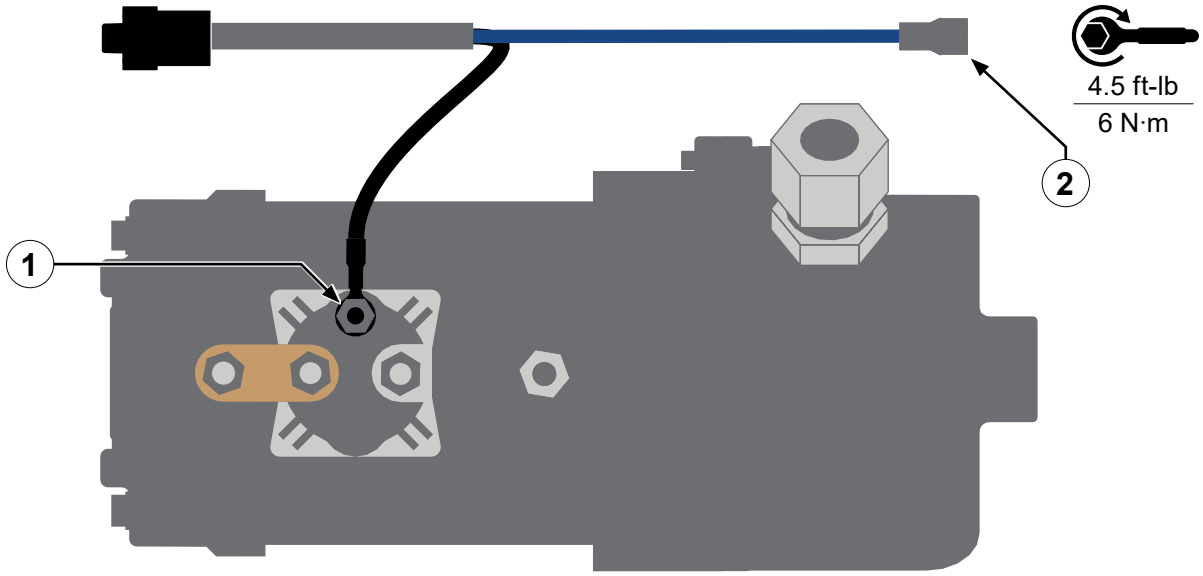
4.5 ft-lb
6 N·m

Priming Pump—24V

Use the illustration and instructions to connect the extension cable to the priming pump.

1. Connect the white wire from the extension cable to the signal terminal on the priming pump terminal. Torque the nut to 1.5 ft-lb (2 N·m).
2. Connect the red wire from the extension cable to the power terminal. Torque the nut to 4.5 ft-lb (6 N·m).
3. Connect the black wire from the extension cable to the ground terminal. Torque the nut to 4.5 ft-lb (6 N·m).

Connecting the Auto-Prime Cable

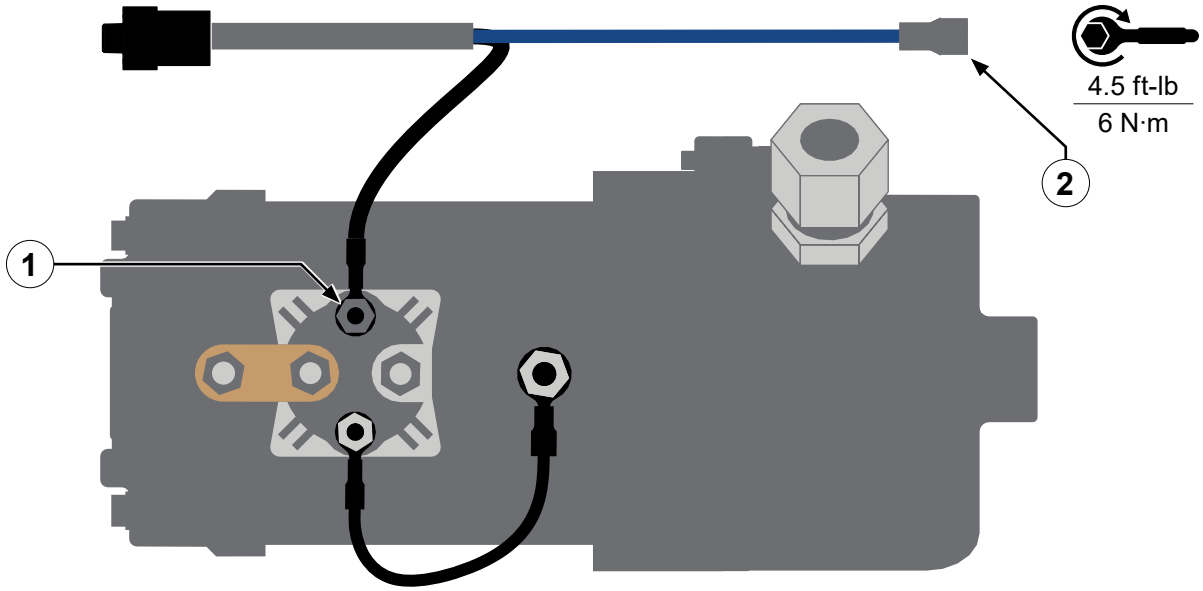


Priming Pump—12V

Use the illustration and instructions to connect the auto-prime cable to the priming pump.

1. Connect the black wire from the auto-prime cable to the signal terminal on the priming pump terminal. Torque the nut to 1.5 ft-lb (2 N·m).
2. Connect the blue wire from the auto-prime cable to the PTO/pump engage source on the apparatus.

Connecting the Auto-Prime Cable

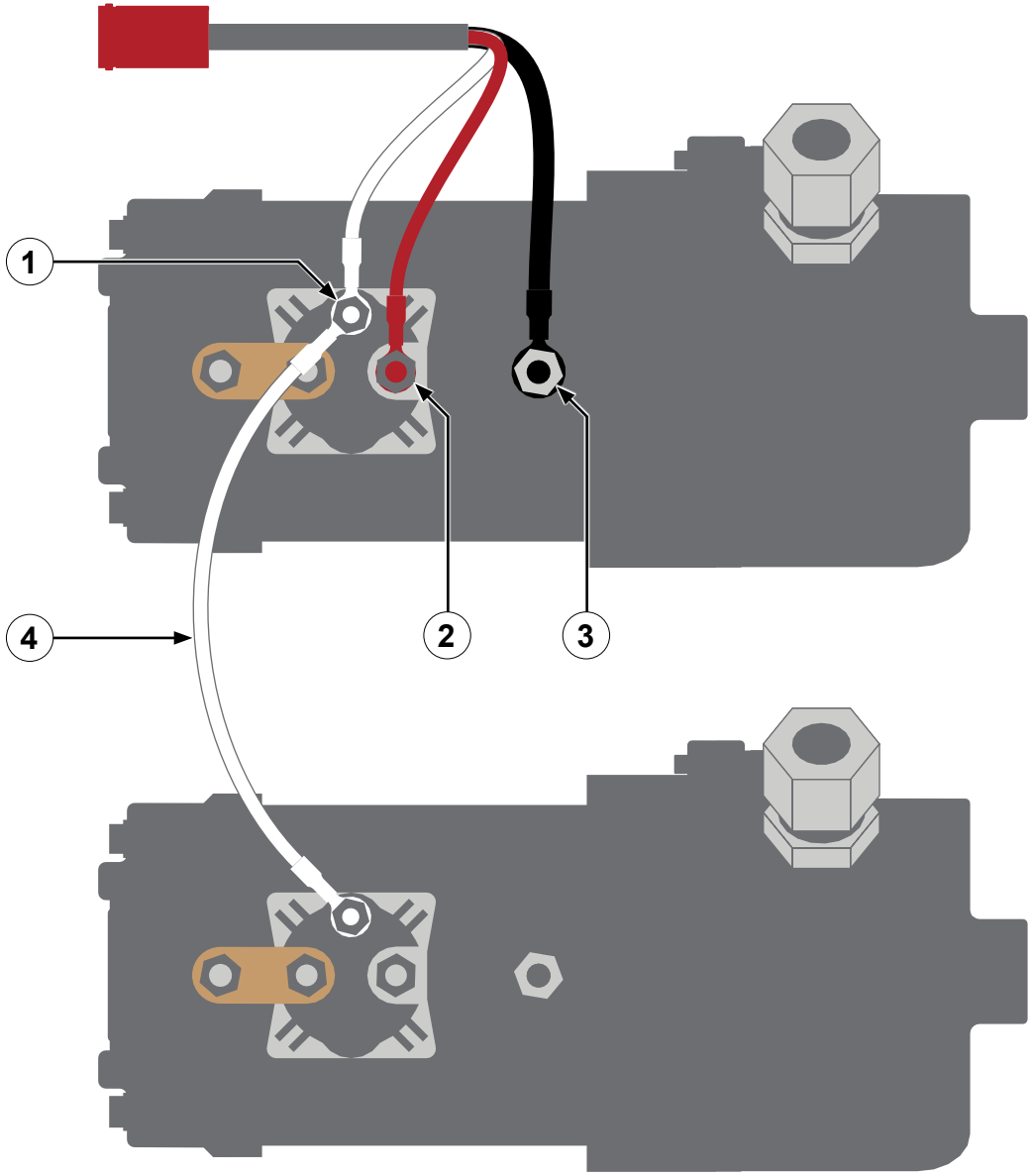


Priming Pump—24V

Use the illustration and instructions to connect the auto-prime cable to the priming pump.

1. Connect the black wire from the auto-prime cable to the signal terminal on the priming pump terminal. Torque the nut to 1.5 ft-lb (2 N·m).
2. Connect the blue wire from the auto-prime cable to the PTO/pump engage source on the apparatus.

Connecting the Extension Cable



4.5 ft-lb
6 N·m

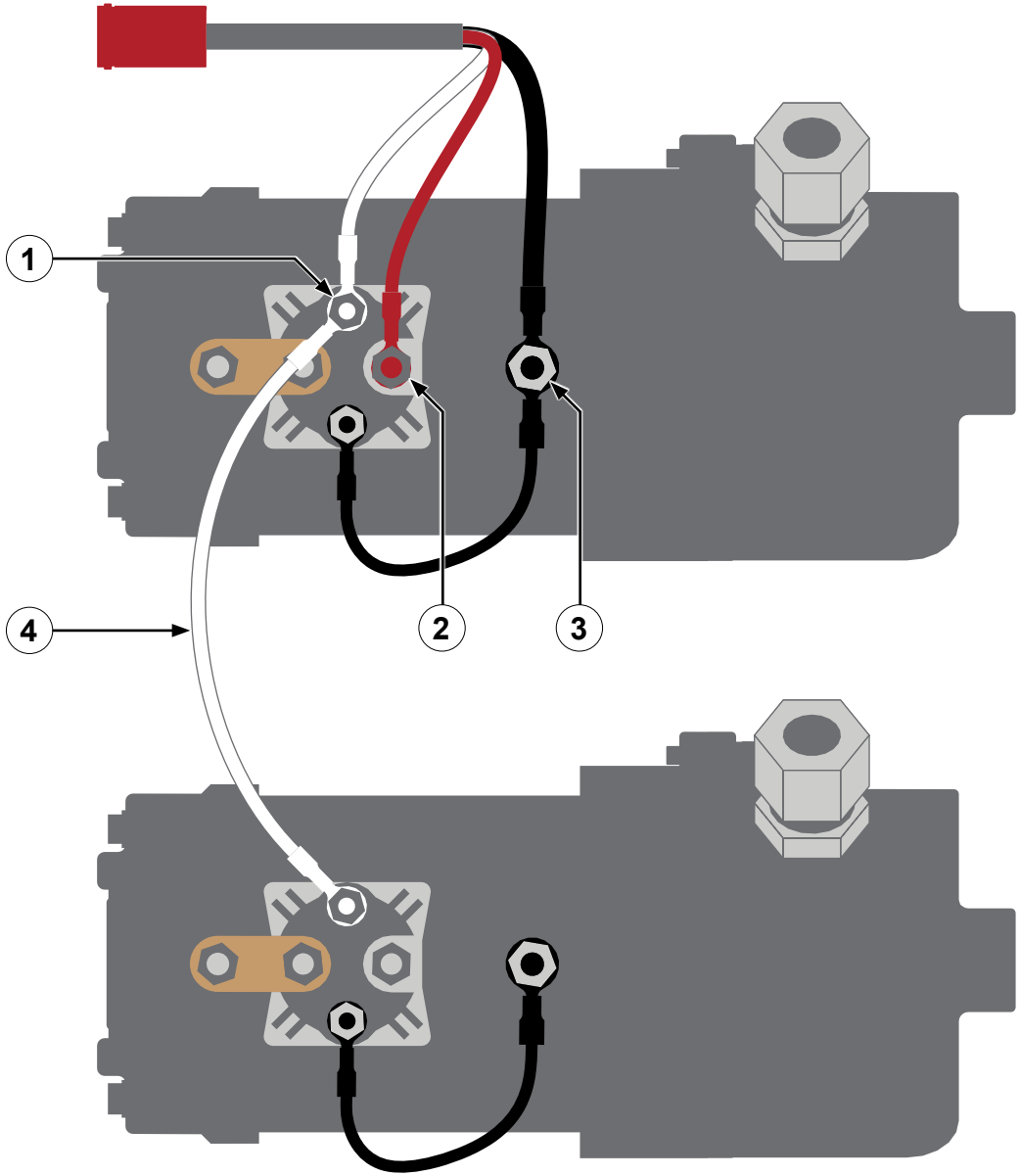
Dual Priming Pumps—12V

Use the illustration and instructions to connect the extension cable to the priming pump.

1. Connect the white wire from the extension cable to the signal terminal on the priming pump terminal. Torque the nut to 1.5 ft-lb (2 N·m).
2. Connect the red wire from the extension cable to the power terminal. Torque the nut to 4.5 ft-lb (6 N·m).
3. Connect the black wire from the extension cable to the ground terminal. Torque the nut to 4.5 ft-lb (6 N·m).
4. Use the included jumper wire to connect both signal terminals. Torque the nut to 1.5 ft-lb (2 N·m).

   Note: *If the included jumper wire is shorter than required for your application, fabricate a jumper wire of the appropriate length by sourcing a white, 18 AWG wire that meets or exceeds SAE J1128-GPT standard. Terminate each end with a #10 ring terminal.*

Connecting the Extension Cable



4.5 ft-lb
6 N·m

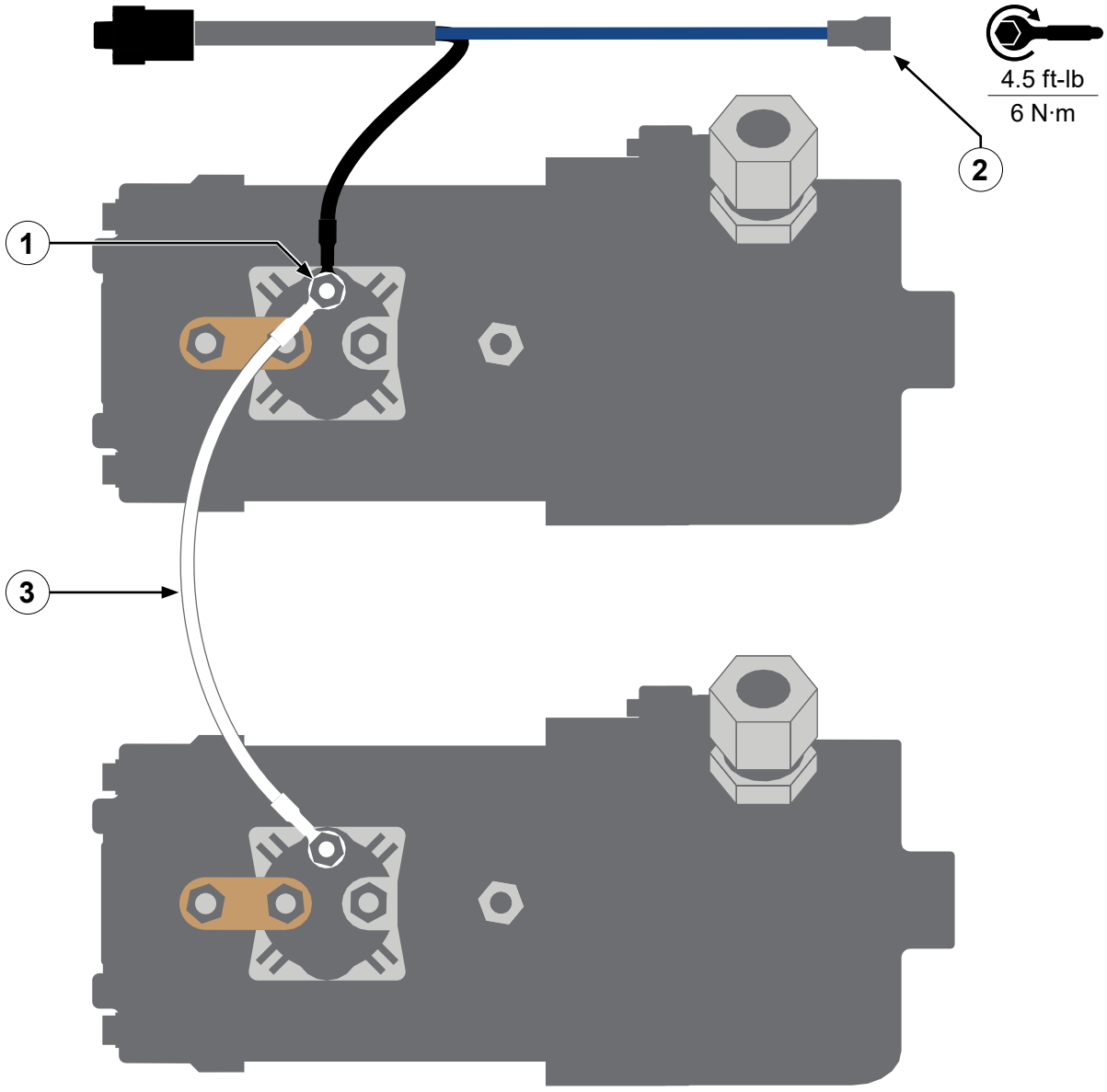
Dual Priming Pumps—24V

Use the illustration and instructions to connect the extension cable to the priming pump.

1. Connect the white wire from the extension cable to the signal terminal on the priming pump terminal. Torque the nut to 1.5 ft-lb (2 N·m).
2. Connect the red wire from the extension cable to the power terminal. Torque the nut to 4.5 ft-lb (6 N·m).
3. Connect the black wire from the extension cable to the ground terminal. Torque the nut to 4.5 ft-lb (6 N·m).
4. Use the included jumper wire to connect both signal terminals. Torque the nut to 1.5 ft-lb (2 N·m).

   Note: *If the included jumper wire is shorter than required for your application, fabricate a jumper wire of the appropriate length by sourcing a white, 18 AWG wire that meets or exceeds SAE J1128-GPT standard. Terminate each end with a #10 ring terminal.*

Connecting the Auto-Prime Cable



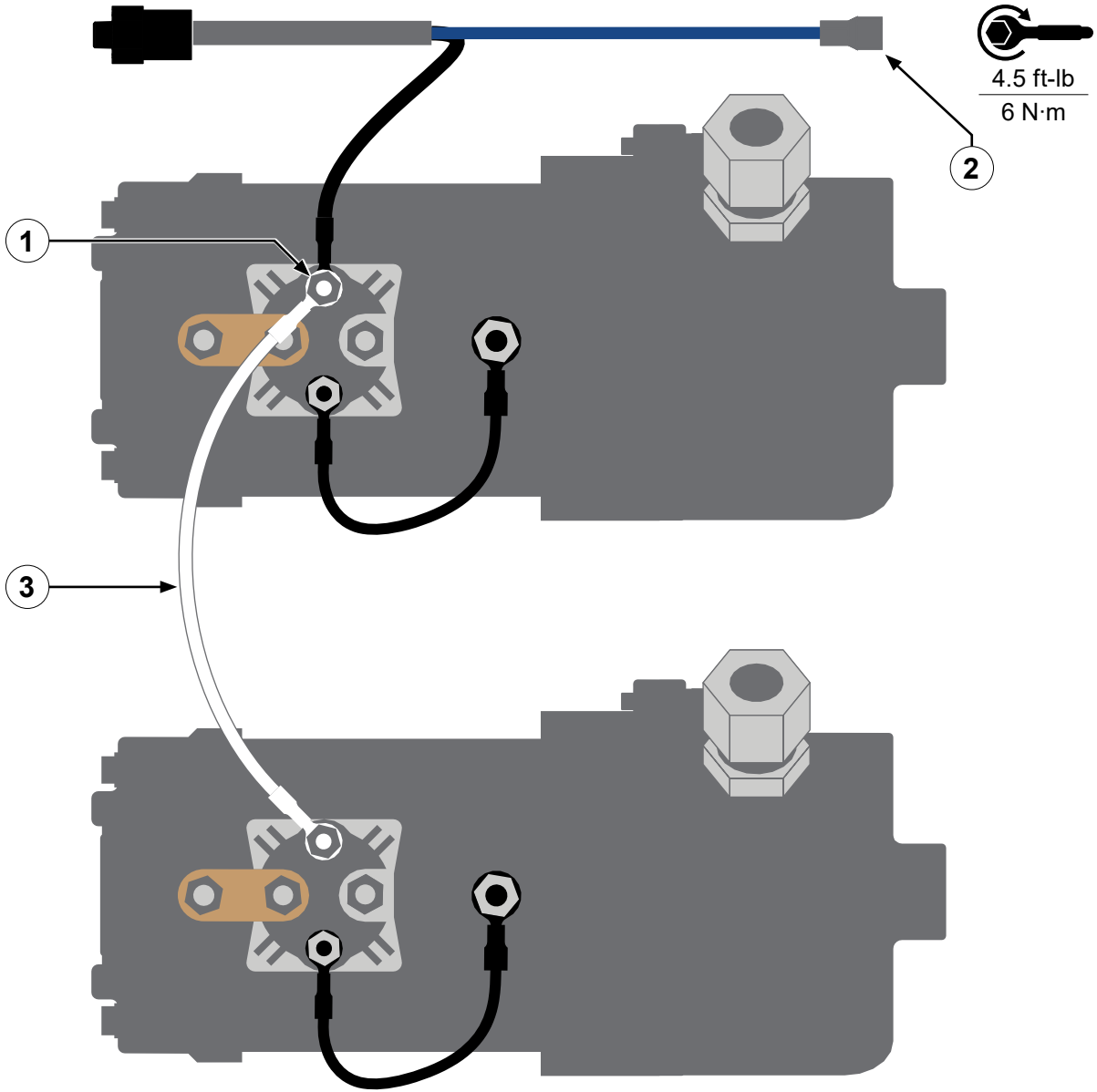
Dual Priming Pumps—12V

Use the illustration and instructions to connect the auto-prime cable to the priming pump.

1. Connect the black wire from the auto-prime cable to the signal terminal on the priming pump terminal. Torque the nut to 1.5 ft-lb (2 N·m).
2. Connect the blue wire from the auto-prime cable to the PTO/pump engage source on the apparatus.
3. Use the included jumper wire to connect both signal terminals. Torque the nut to 1.5 ft-lb (2 N·m).

   Note: *If the included jumper wire is shorter than required for your application, fabricate a jumper wire of the appropriate length by sourcing a white, 18 AWG wire that meets or exceeds SAE J1128-GPT standard. Terminate each end with a #10 ring terminal.*

Connecting the Auto-Prime Cable



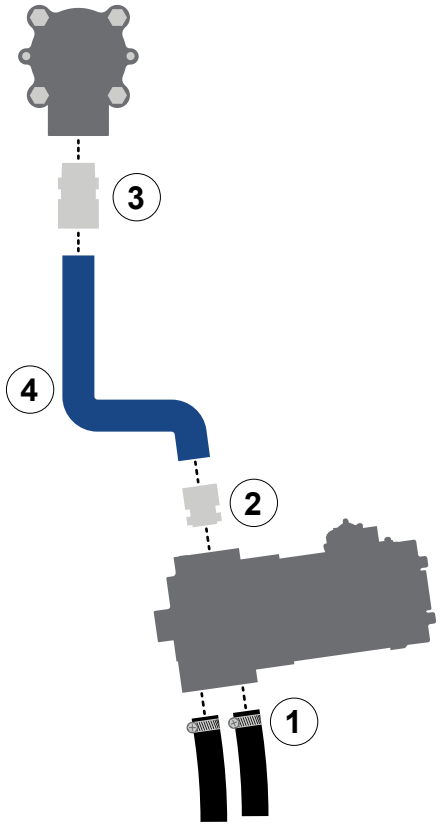
Dual Priming Pumps—24V

Use the illustration and instructions to connect the auto-prime cable to the priming pump.

1. Connect the black wire from the auto-prime cable to the signal terminal on the priming pump terminal. Torque the nut to 1.5 ft-lb (2 N·m).
2. Connect the blue wire from the auto-prime cable to the PTO/pump engage source on the apparatus.
3. Use the included jumper wire to connect both signal terminals. Torque the nut to 1.5 ft-lb (2 N·m).

   Note: *If the included jumper wire is shorter than required for your application, fabricate a jumper wire of the appropriate length by sourcing a white, 18 AWG wire that meets or exceeds SAE J1128-GPT standard. Terminate each end with a #10 ring terminal.*

Connecting the Priming Components



Priming Pump and Priming Valve

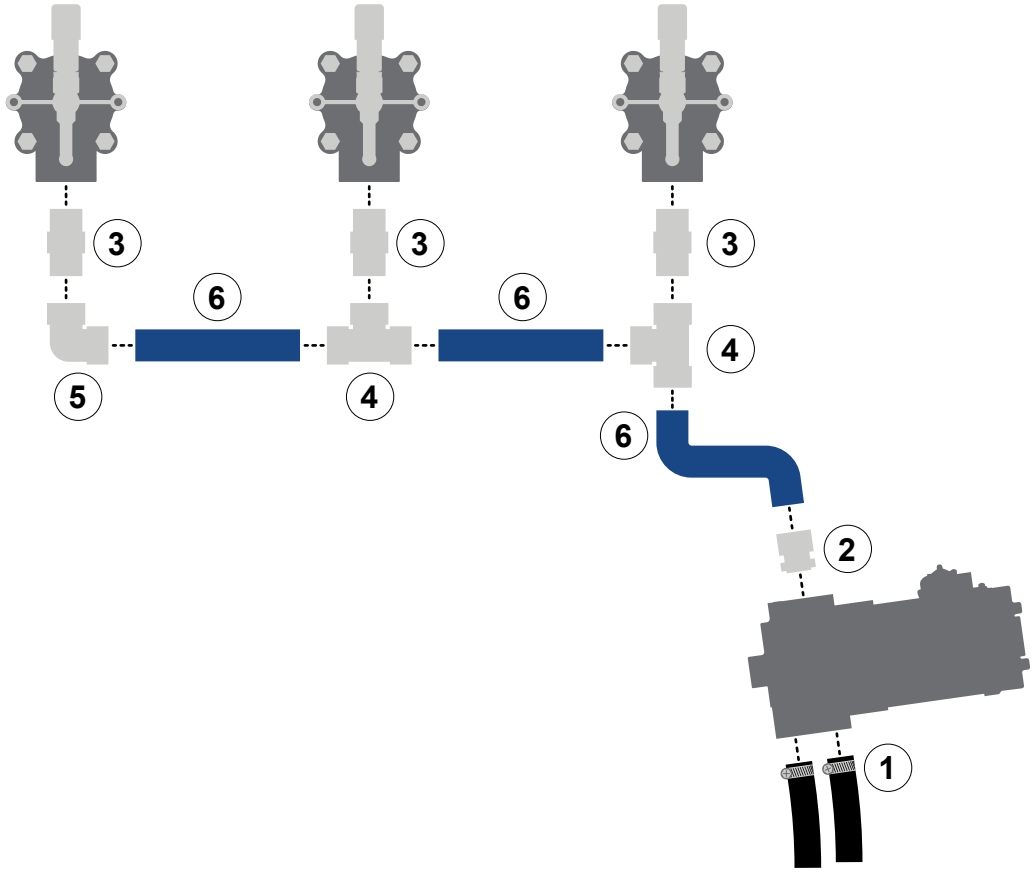
Use the illustration and instructions to make the connections on a single priming pump and single priming valve application.

1. Install the outlet muffler if it is suitable to your application. Alternatively, locally source the components required in your application to direct the priming pump exhaust away from people to avoid injury and equipment to avoid damage.

   Note: *Make sure to use a minimal bend radius and arrange the hose to allow proper draining.*

2. Install a 3/4 NPT fitting with a 3/4-inch hose connection to the priming pump inlet.
3. Install a 3/4 NPT fitting with a 3/4-inch hose connection to the priming valve outlet.
4. Use an appropriate hose to connect to the fittings on the priming pump and priming valve. Refer to **"Hose and Tubing Requirements" on page 27** to select the appropriate hose. Make sure that you install the hose so that it drains from the priming valve to the priming pump.

Connecting the Priming Components



Multiple Priming Valves

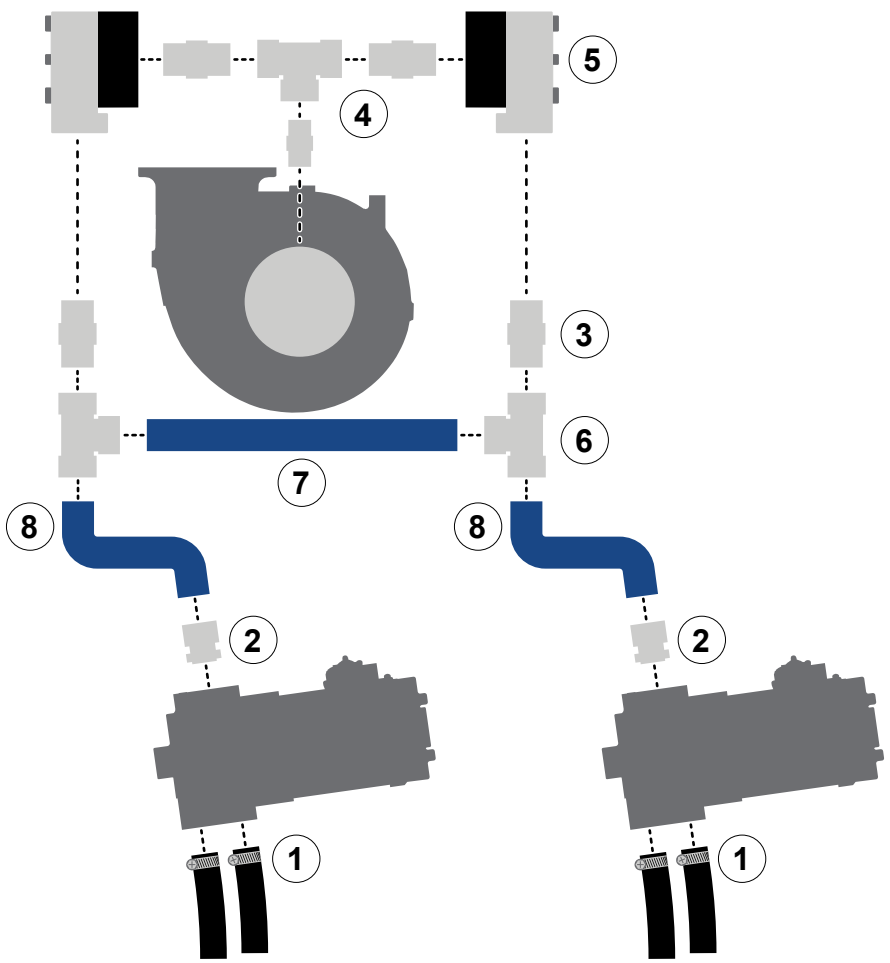
Use the illustration and instructions to make the connections on a multiple priming valve application.

1. Install the outlet muffler if it is suitable to your application. Alternatively, locally source the components required in your application to direct the priming pump exhaust away from people to avoid injury and equipment to avoid damage.

   Note: *Make sure to use a minimal bend radius and arrange the hose to allow proper draining.*

2. Install a 3/4 NPT fitting with a 3/4-inch hose connection to the priming pump inlet.
3. Install a 3/4 NPT fitting with a 3/4-inch hose connection to the priming valve outlet.
4. Use a tee fitting with the appropriate terminations to connect between the priming valve and hoses.
5. Use an elbow fitting with the appropriate terminations to connect between the priming valve and hoses.
6. Use the appropriate hoses to connect the priming valves to the priming pump. Refer to **"Hose and Tubing Requirements" on page 27** to select the appropriate hose. Make sure that you install the hoses so that they drain from the priming valves to the priming pump.

Connecting the Priming Components



Dual Priming Pumps

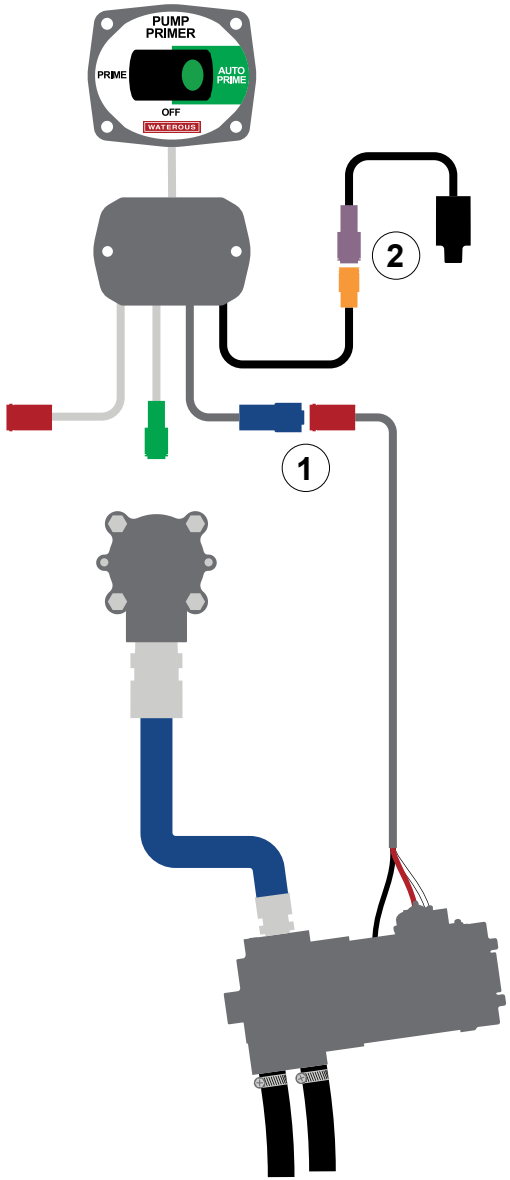
Use the illustration and instructions to make the connections on a dual priming pump application.

1. Install the outlet muffler if it is suitable to your application. Alternatively, locally source the components required in your application to direct the priming pump exhaust away from people to avoid injury and equipment to avoid damage.

   Note: *Make sure to use a minimal bend radius and arrange the hose to allow proper draining.*

2. Install an 3/4 NPT fitting with a 3/4-inch hose connection to the priming pump inlet.
3. Install an 3/4 NPT fitting with a 3/4-inch hose connection to the priming valve outlet.
4. Use a tee fitting and the required adapters to make an assembly and install it to the highest point on the pump intake.
5. Connect the 2 priming valves to the tee fitting assembly on the pump intake.
6. Use a tee fitting and the required adapters and install the priming valves.
7. Use the appropriate hose to connect to the tee fitting assembly on the priming valves. Refer to **"Hose and Tubing Requirements" on page 27** to select the appropriate hose.
8. Use the appropriate hoses to connect the priming valves to the priming pumps. Refer to **"Hose and Tubing Requirements" on page 27** to select the appropriate hose. Make sure that you install the hoses so that they drain from the priming valves to the priming pumps.

Connecting the Priming Components



Auto-Prime Push Button Switch

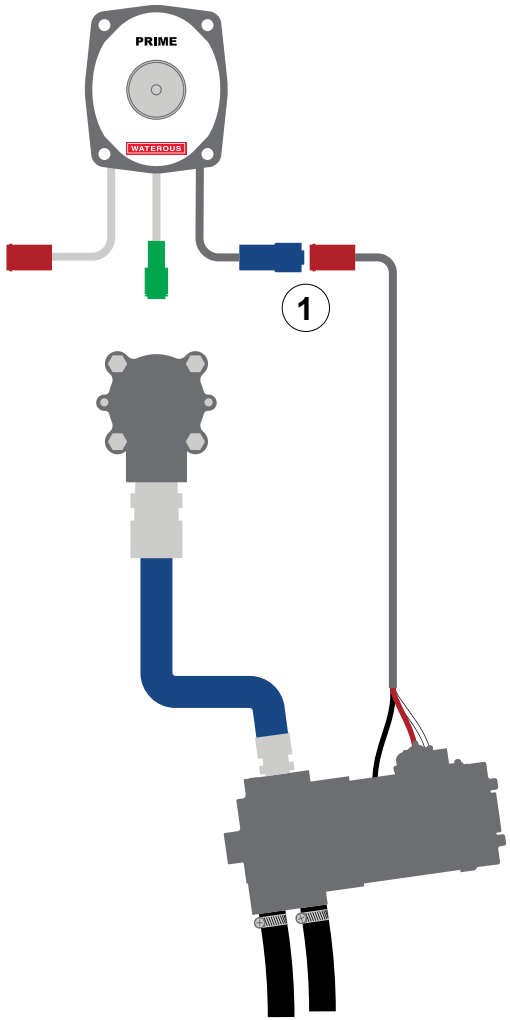
Use the illustration and instructions to connect the standard push button switch to the priming pump cable.

1. Connect the priming pump connector (DT04-2P) on the switch to the priming pump connector (DT04-4P).
2. Connect the pressure switch connector (DT06-2S) on the switch to the pressure switch connector (DT04-2P).

Connecting the Priming Components

Standard Push Button Switch

Use the illustration and instruction to connect the standard push button switch to the priming pump cable.

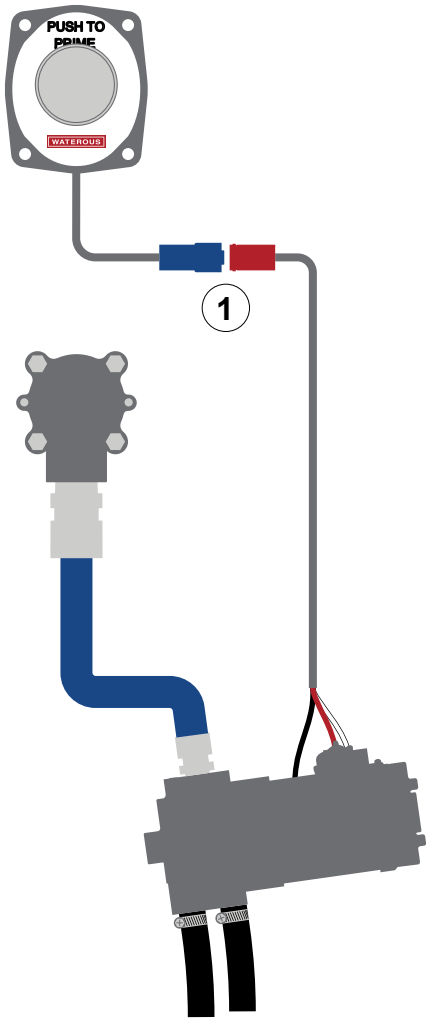


1 Connect the priming pump connector (DT04-2P) on the switch to the priming pump connector (DT04-4P).

Connecting the Priming Components

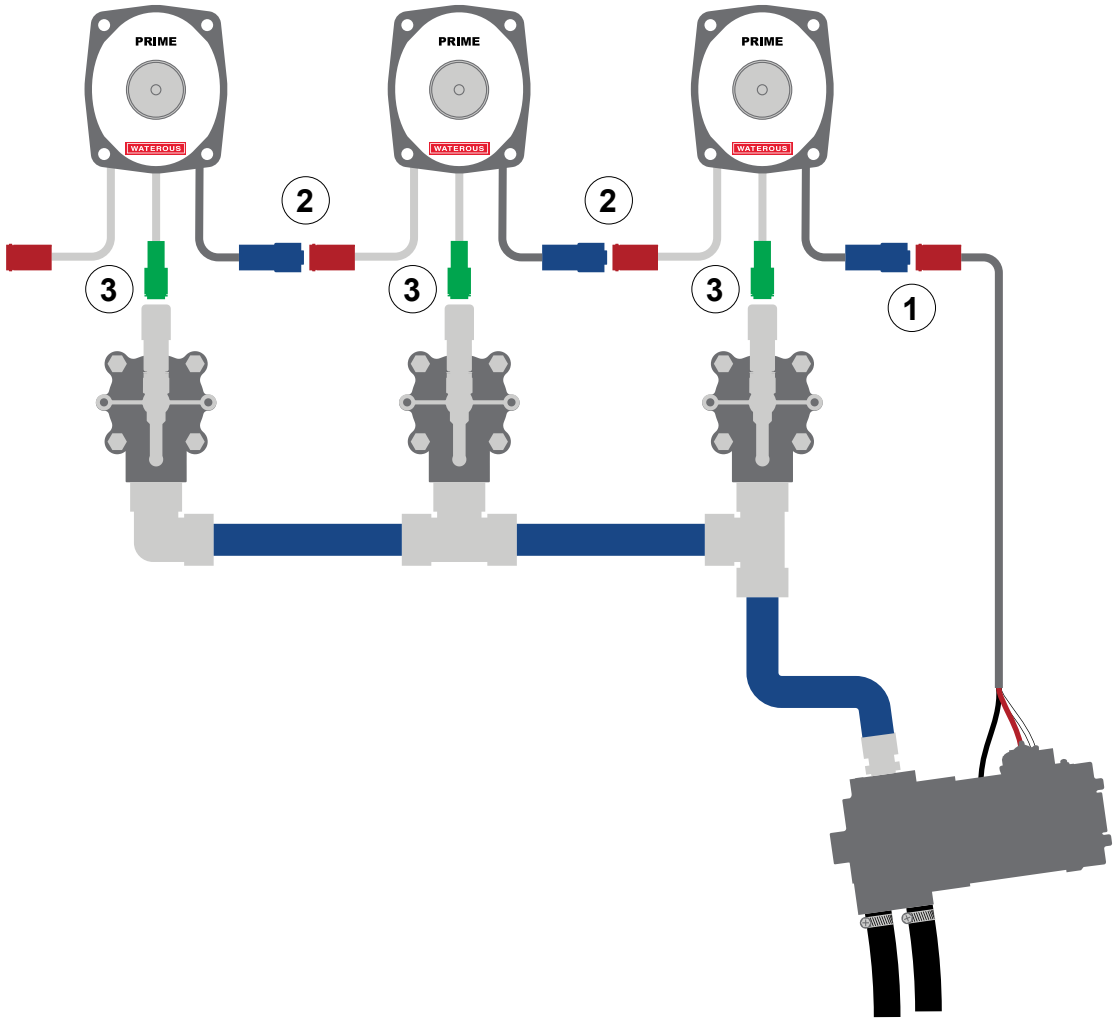
Oversized Push Button Switch

Use the illustration and instruction to connect the oversized push button switch to the priming pump cable.



1 Connect the priming pump connector (DT04-2P) on the switch to the priming pump connector (DT04-4P).

Connecting the Priming Components



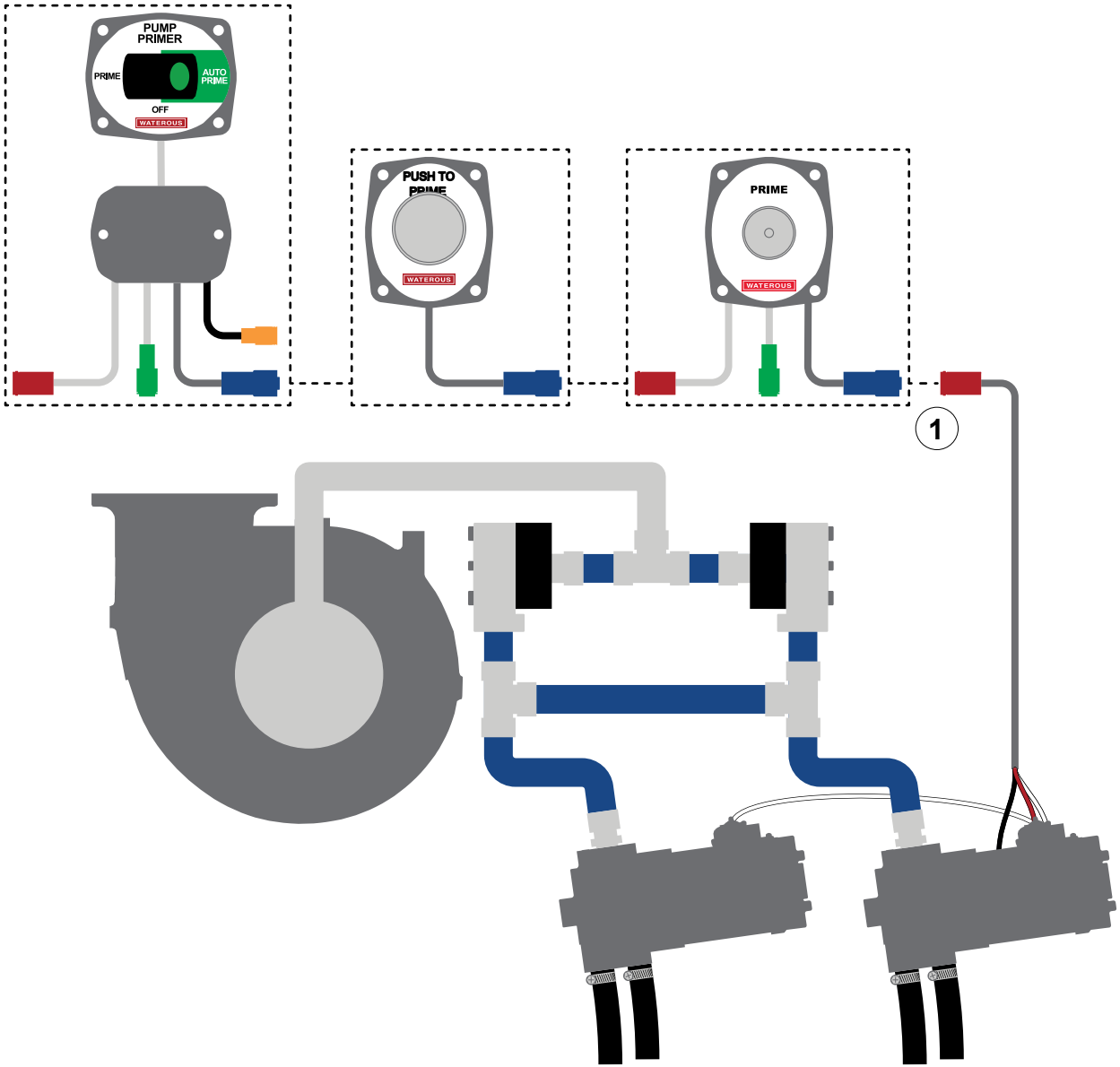
Multiple Priming Valves

Use the illustration and instructions to connect the push button switch to the priming electronics.

Note: *You can connect up to 6 solenoid controlled priming valves, each with a dedicated switch, in your application.*

1	Connect the priming pump connector (DT04-2P) on the push button switch to the priming pump connector (DT04-4P).
2	Connect the priming pump connector (DT04-4P) from the previous switch to the power connector (DT06-4S) on the switch.
3	Connect the priming valve solenoid connector (DTM04-2P) on the switch to the solenoid connector (DMT06-2S).

Connecting the Priming Components



Multiple Priming Pumps

Use the illustration and instruction to connect the push button switch to the priming electronics.

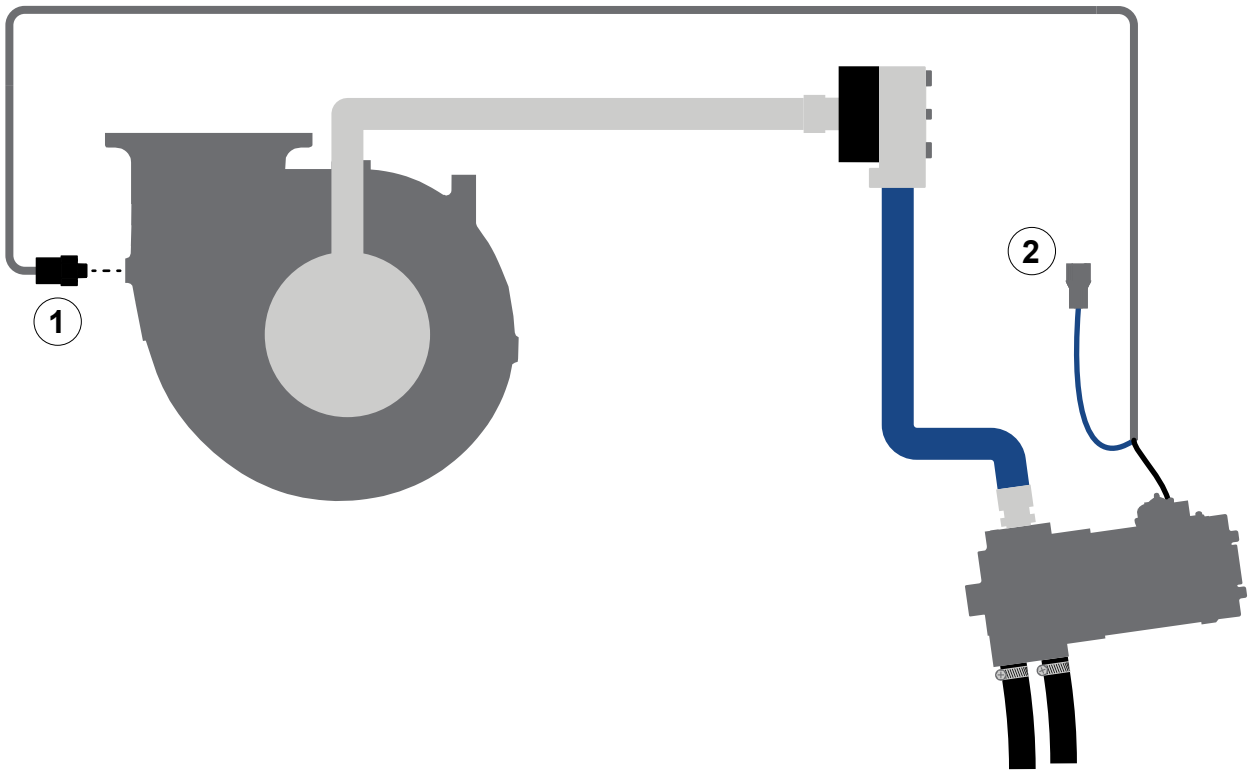
1 Connect the priming pump connector (DT04-2P) on the panel switch in your application to the priming pump connector (DT04-4P).

Connecting the Priming Components

Auto-Prime Cable

Use the illustration and instruction to connect the auto-prime cable to the priming electronics.

1. Connect the ground terminal of auto-prime cable to priming pump ground.
2. Connect the 1/4 inch male spade of auto-prime cable to PTO/pump engage source on the apparatus.

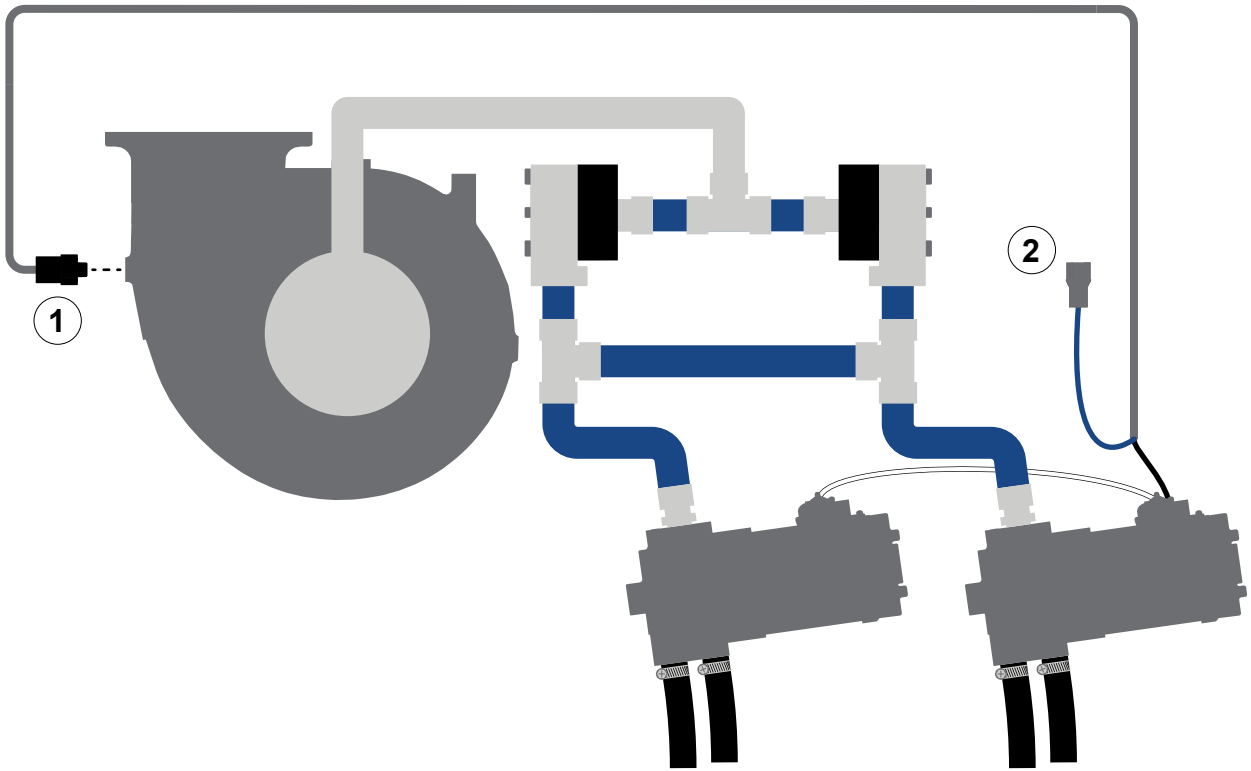


Connecting the Priming Components

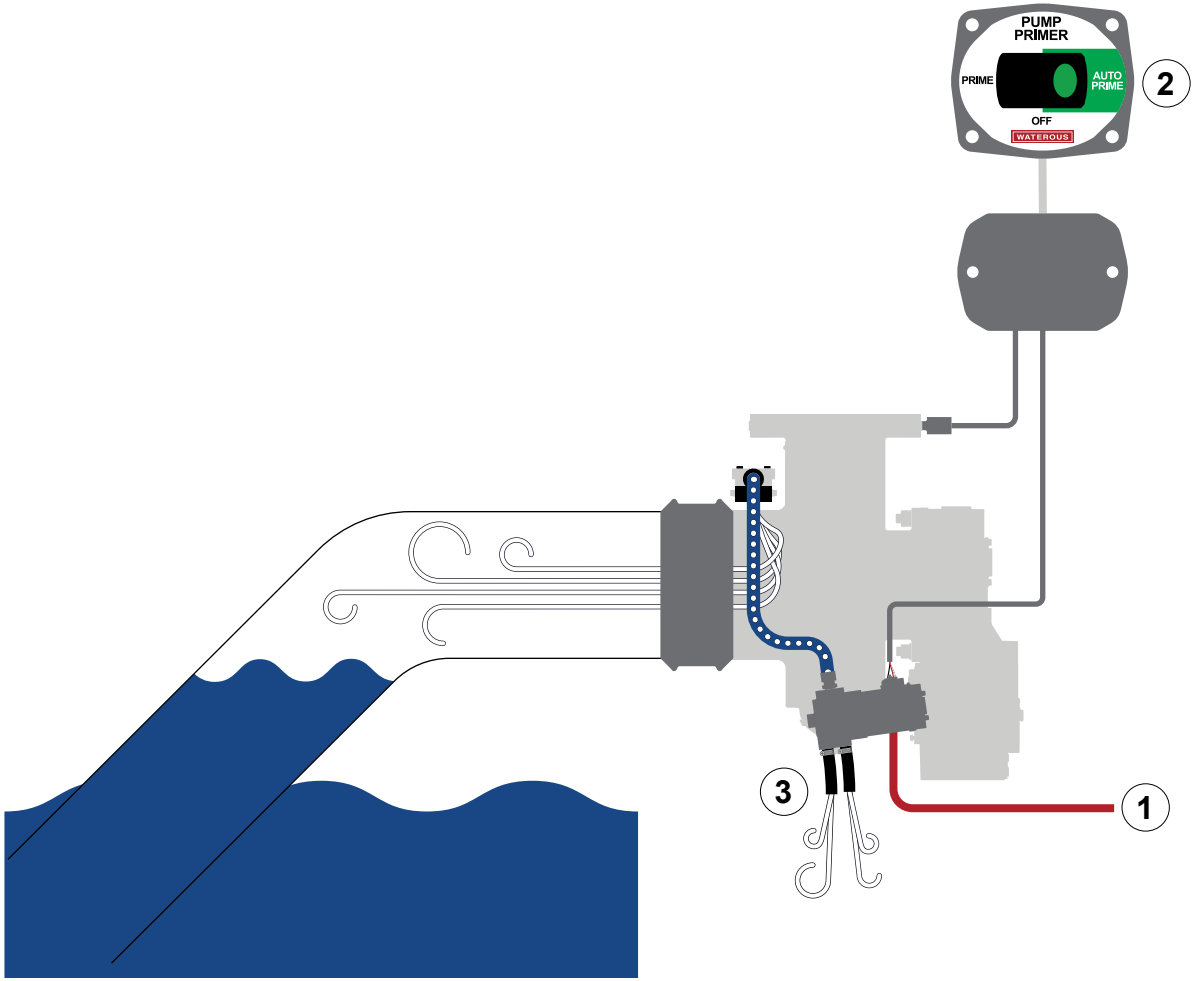
Auto-Prime Cable—Multiple Priming Pumps

Use the illustration and instruction to connect the auto-prime cable to the priming electronics.

1. Connect the ground terminal of auto-prime cable to priming pump ground.
2. Connect the 1/4 in male spade of auto-prime cable to PTO/pump engage source on the apparatus.



Priming the Pump—Auto-Prime Switch



Use the illustration and instructions to operate the priming system using the push button switch.

Do the following when operating the primer:

- Close all openings in the plumbing you are priming.
- Make sure all intake connections are tight.
- Continue priming until a solid stream of water is discharged.
- Prime a 1,250 gpm or smaller pump for 30 seconds and 1,500 or larger pump for 45 seconds. An additional 15 seconds may be required for a 4-inch or larger intake. If your pump does not prime in that time, verify that all openings are closed.
- Allow 1 minute of cool-down time between priming intervals.

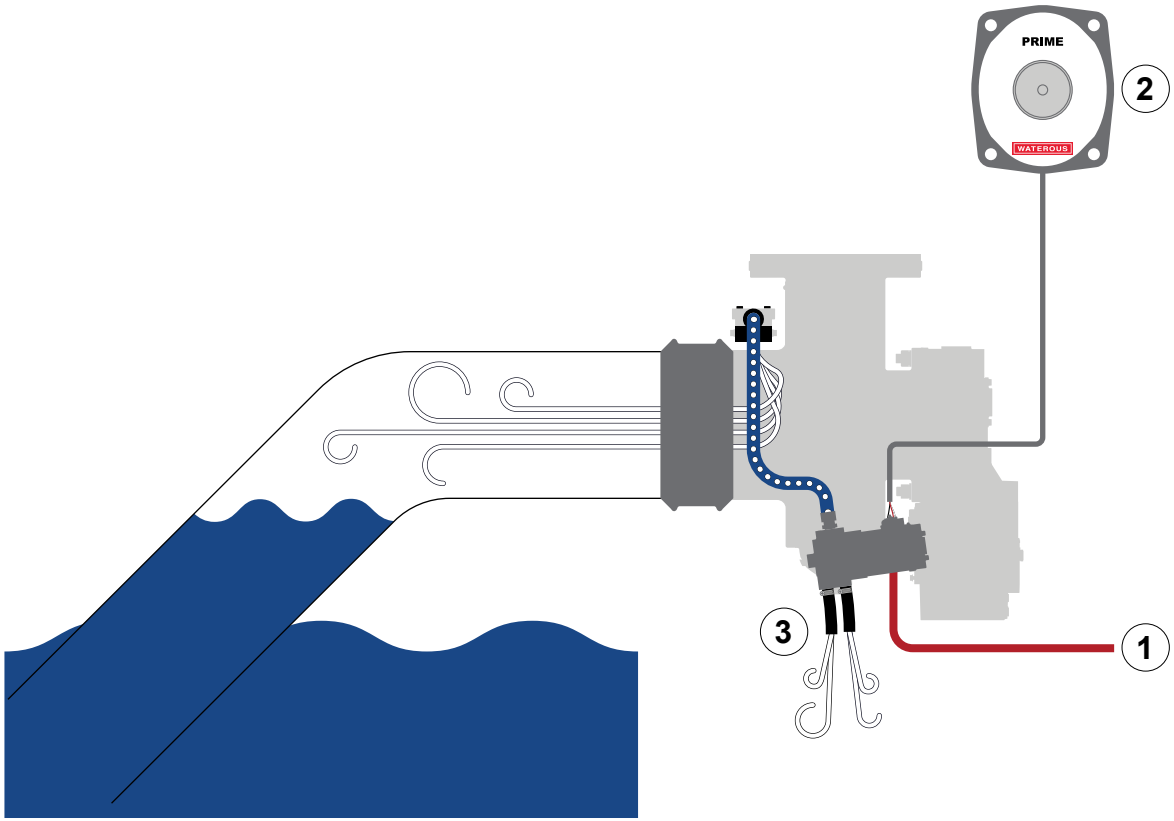
1 Once power is applied, the priming system is enabled.

2 Enable auto-prime or press and hold the prime button until the priming process is complete or the priming time limit is reached.

Priming pump damage: *Extended priming may damage the motor or motor solenoid. Do not prime longer than 1 minute.*

3 While priming, the priming pump begins evacuating the air in the intake which is replaced with water, this primes the water pump.

Priming the Pump—Manual-Prime Switch



Use the illustration and instructions to operate the priming system using the push button switch.

Do the following when operating the primer:

- Close all openings in the plumbing you are priming.
- Make sure all intake connections are tight.
- Continue priming until a solid stream of water is discharged
- Prime a 1,250 gpm or smaller pump for 30 seconds and 1,500 or larger pump for 45 seconds. An additional 15 seconds may be required for a 4-inch or larger intake. If your pump does not prime in that time, verify that all openings are closed.
- Allow 1 minute of cool-down time between priming intervals.

1 Once power is applied, the priming system is enabled.

2 Press and hold the prime button until the priming process is complete or the priming time limit is reached.

Priming pump damage: *Extended priming may damage the motor or motor solenoid. Do not prime longer than 1 minute.*

3 While priming, the priming pump begins evacuating the air in the intake which is replaced with water, this primes the water pump.

Maintenance Schedule

Perform the following procedures at the recommended intervals at a minimum. Environmental conditions determine the maintenance intervals. Inspect the components frequently, and create a maintenance schedule suitable to your application and environmental conditions. Replace wear components with equivalent components.

Operation	Weekly	Monthly	As Required	Comment
Cycle fresh lubricant	X			Cycle lubrication when using Prime-Safe or other biodegradable lubrication.
Check lubrication line orifice	X			Check for obstruction the impedes airflow.
Vacuum testing		X		Perform a vacuum test monthly.
Priming valve spring and seals			X	Replace the wave spring and seals as required.
NFPA testing			X	Test per NFPA requirements.

Vacuum Testing

Perform the following test monthly:

- Remove all caps except openings without valves.
- Close all intake, discharge, drain, and similar openings.
- Operate the priming system to create a vacuum of 22 inHg.
- If the vacuum pressure drops 10 inHg in 5 minute inspect areas around the packing glands, gaskets, and valves for leaks.

Priming Valve

Replace the wave spring and seal once a leak is detected.

Priming Tank

Verify that the orifice at the top of the lubrication tank is not impeded.

Priming Pump

When using biodegradable/non-toxic lubricant, operate the priming pump weekly to refresh any degraded lubricant. Also, verify that the orifice in the lubricant line is not impeded. Over time, the wear on the housing and vanes diminishes pump efficiency. Replace wear items when the vacuum test is unable to produce a vacuum of 22 inHg. Make sure that no other leaks are hindering vacuum generation. Contact Waterous for the appropriate repair kit.

Notes

WATEROUS

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www.waterousco.com