

# WATEROUS

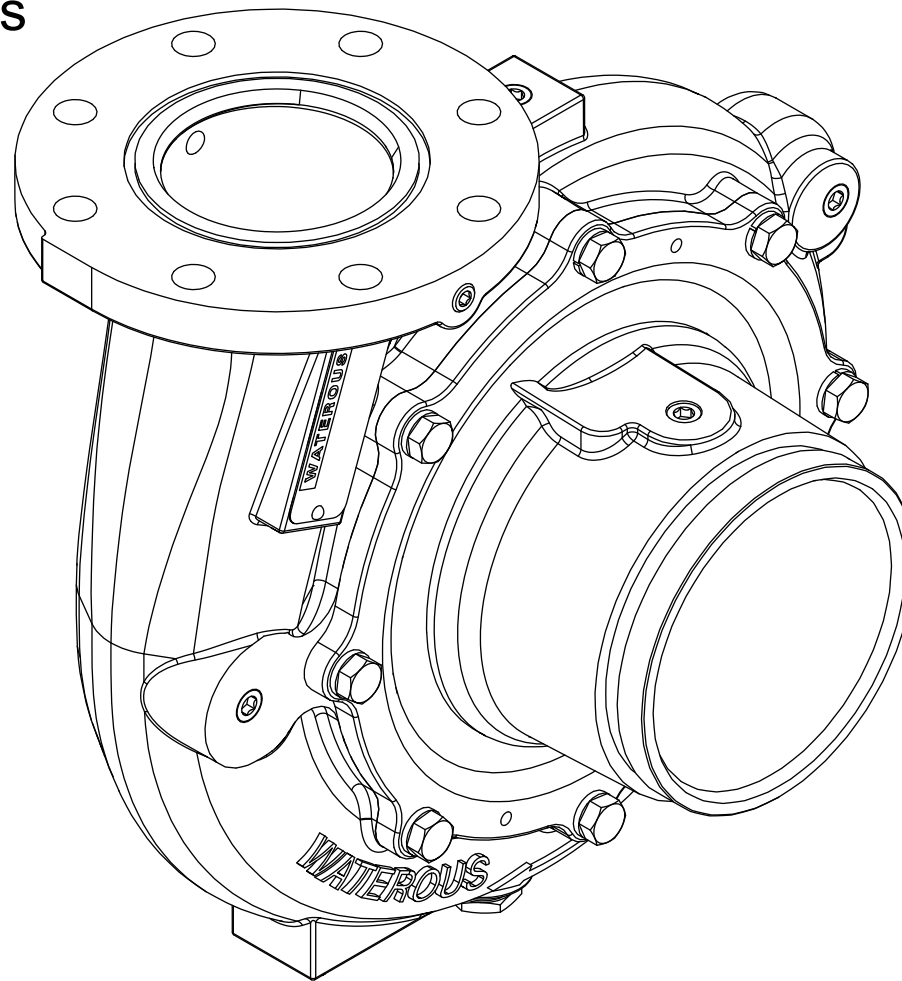
Form Number: F-3062

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## CX Series Fire Pumps

### Overhaul Instructions

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[www.waterousco.com](http://www.waterousco.com)




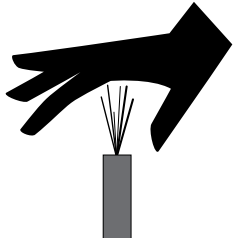
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## Safety Precautions

- Read and understand this document before you begin the overhaul.
- Read and understand all the notices and safety precautions.
- Be aware that these instructions are only guidelines and are not meant to be definitive. Contact Waterous when you have questions.
- Do not overhaul this equipment if you are not familiar with the tools and skills needed to safely perform the required procedures.
- Do not modify the equipment.

 <b>WARNING</b>	
<b>High Pressure</b> <ul style="list-style-type: none"><li>• Liquid ejected at high pressure can cause serious injury.</li><li>• Drain the pump after use and before servicing.</li></ul>	

 <b>WARNING</b>	
<b>Hot Surface</b> <ul style="list-style-type: none"><li>• Hot surfaces can burn you.</li><li>• Do not touch the surface during operation—allow it to cool after operating.</li></ul>	

 <b>WARNING</b>	
<b>Unsupported Equipment</b> <ul style="list-style-type: none"><li>• Unsupported equipment may shift or fall during disassembly, causing injury or damage.</li><li>• Always support heavy equipment while servicing.</li></ul>	

## This image shows a full page of blank, lined paper. It features approximately 20 evenly spaced horizontal grey lines across its entire width, providing a guide for handwriting or typing. The paper itself is a clean, off-white color.

Use this document to overhaul your Waterous equipment. Please understand the following conditions:

- Be aware that these instructions are only guidelines and are not meant to be definitive. Contact Waterous when you have questions.
- Understand that your configuration may require additional steps, that are not described in the illustrations or instructions, to perform the overhaul.
- The equipment described in this document is intended to be overhauled by a person or persons with the necessary skills and knowledge to perform the overhaul.
- Waterous reserves the right to make modifications to the instructions without notice.

This document is divided into the following sections:

#### SAFETY

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

#### INTRODUCTION

This section is an overview of the document.

#### DISASSEMBLY

This section describes disassembly procedures.

#### ASSEMBLY

This section describes assembly procedures.

## 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 best viewed when 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](http://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.



Anti-seize compound—This symbol tells you to apply the appropriate anti-seize compound to the part.



Arbor press—This symbol tells you to use an arbor press to complete this step.



Discard—This symbol tells you to discard or recycle the part in accordance with local regulations.



Lubrication—This symbol tells you to apply the appropriate lubricant to the part.



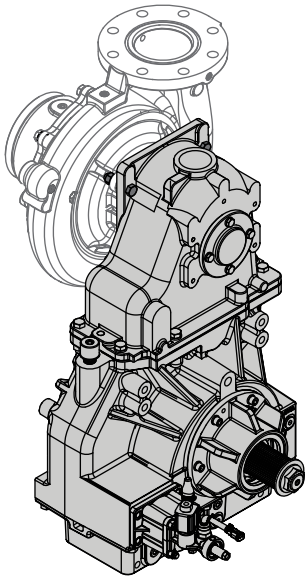
Torque to specification—This symbol tells you to torque the hardware to the specified value.



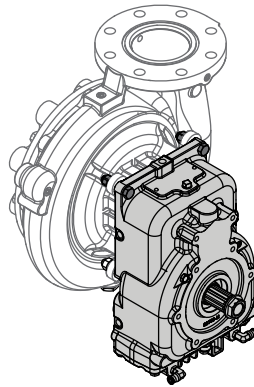
Retaining compound—This symbol tells you to apply retaining compound to the component.

## CX Series Drive Configurations

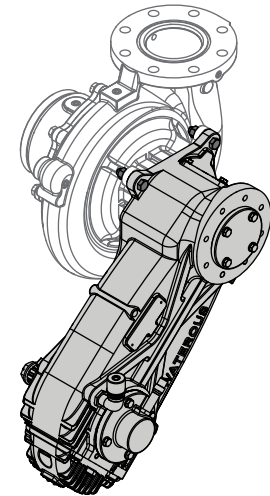
The CX series pump is available with the following drive options. Every CX series pump application is different. However, all CX series pump applications require the pump and transmission be removed from the apparatus together before servicing. Refer to the transmission overhaul instructions to drain and add the lubricant during servicing.



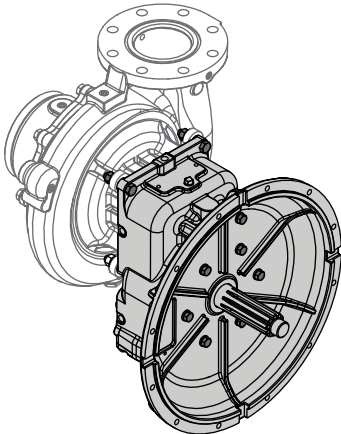
CX with C22 Transmission



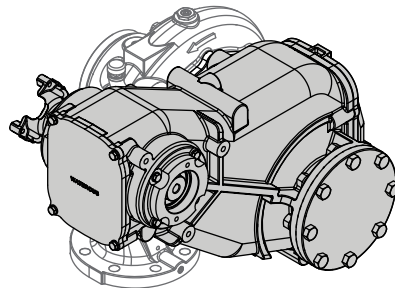
CX with K Transmission



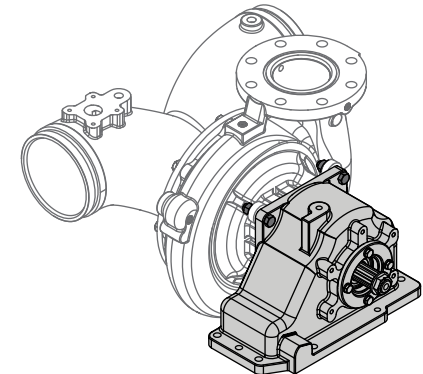
CX with PA Transmission



CX with T Transmission



CX with QB Transmission



CX with Direct Drive

## Preparing to Disassemble the Equipment

- Read and understand the instructions before disassembling the equipment.
- Prepare a workspace suitable to accommodate and support the equipment.
- Gather the necessary tools, cleaning cloths, brushes, and penetrating fluids.
- Understand that your configuration may require additional steps that are not described in the illustrations or instructions to perform the disassembly.
- This equipment is intended to be disassembled by a person or persons with the basic knowledge of servicing similar equipment. Contact Waterous for more information.

## Tools Required

- Typical automotive mechanics hand tools.
- Suitable arbor press.
- Suitable support and lifting equipment.

## Preparing the Apparatus

- Park the apparatus on a level surface in a well-lit area.
- Engage the parking brake.
- Shut off the engine and remove the key from the ignition switch.
- Allow the apparatus to cool before servicing.

## Best Practices

- Remove any dirt, sand, grease, or oil from the enclosure before you disassemble the equipment. Surface debris can transfer into the equipment interior and prematurely wear internal parts.
- Only use a clean, lint-free cloth, a debris-free work surface, and properly maintained tools to perform the disassembly.
- Replace any gaskets and O-ring seals during the overhaul.
- Do not reuse lock nuts.
- Apply penetrating oil to screws and nuts before disassembly.

## Removing the Equipment

Removing the equipment for overhaul varies by application. Your application may require components such as drain lines, support brackets, plumbing connections, and other accessories to be removed or disconnected before removing the equipment.

Additionally, when overhauling some pump and transmission combinations you are required to remove the pump and transmission together before separating the pump from the transmission. Refer to the transmission instructions before proceeding.

Record the process used to remove the equipment from the apparatus. Use this information to install the equipment into the apparatus after the overhaul.

## Disassembling the Equipment Components

- Refer to the service parts list (SPL) for part identification and disassemble order.

**Note:** Documents specific to your application are available through the MyWaterous login at [waterousco.com](https://waterousco.com) by entering the serial number for your system. Depending on the application, the serial number for your equipment is located on the operator panel, pump, transmission, or some combination of the three.

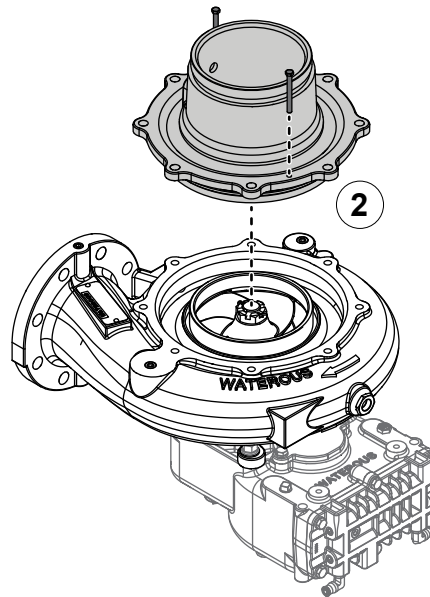
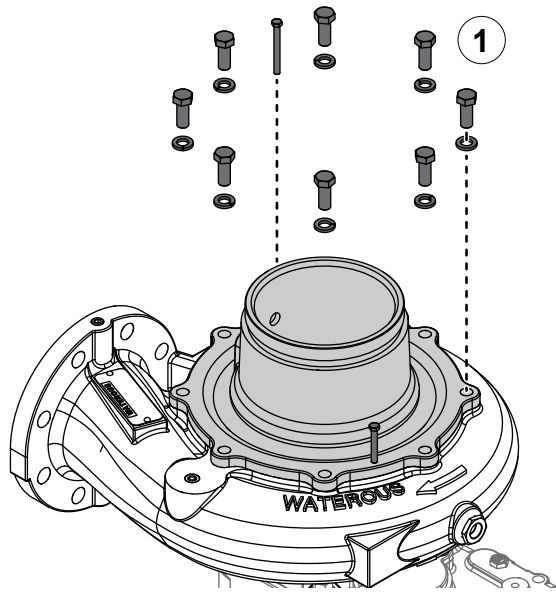
- Use established industry practices to disassemble the equipment.
- Record or mark components as you remove them to make sure that you install them in the same orientation.
- Discard or recycle drained fluids collected during the overhaul in accordance with local regulations.

## Optional Equipment

Be aware that the disassembly instructions may include optional equipment not included in your application.

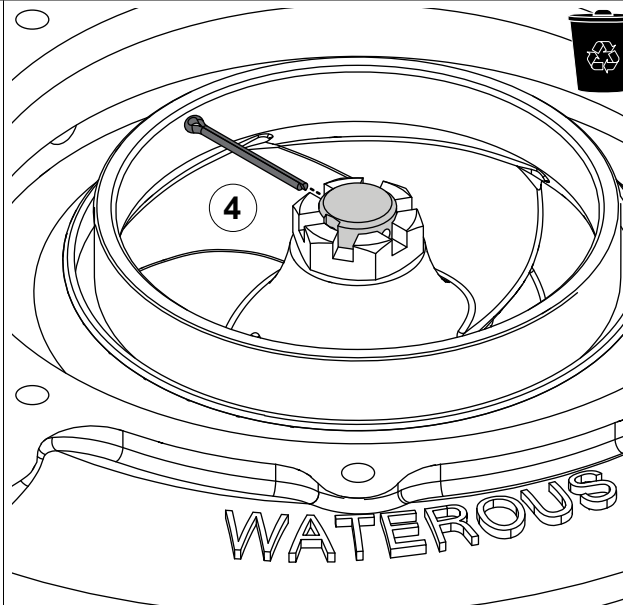
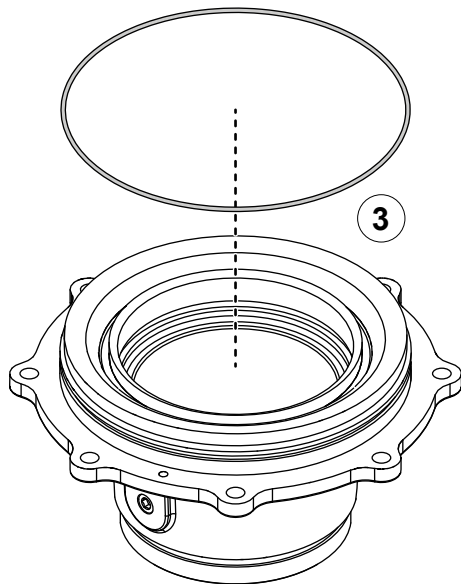


## Disassembling the Pump

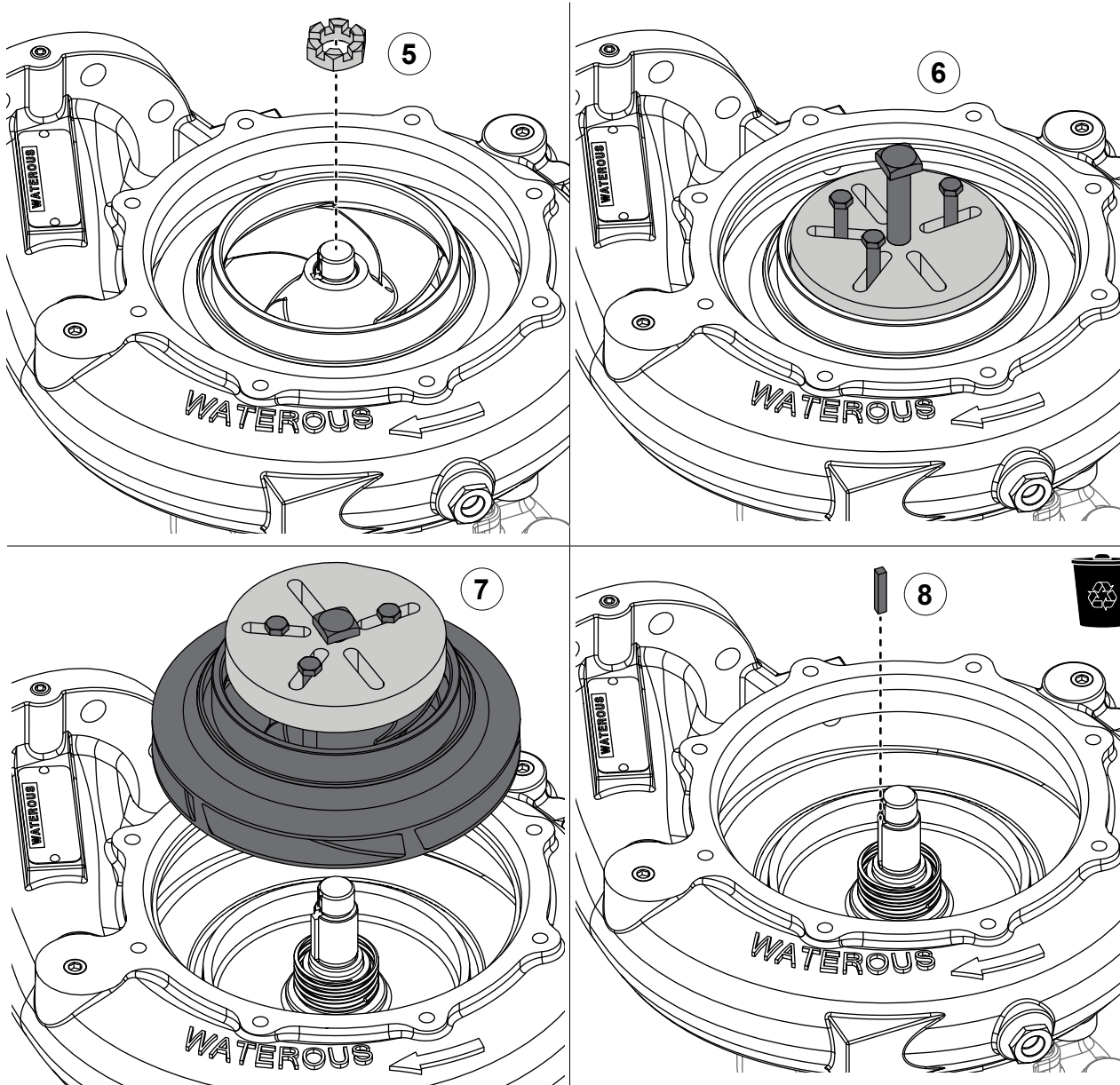


Use the illustrations and instructions to separate the pump from the transmission.

- 1 Remove the intake adapter hardware and use jacking screws separate the adapter from the volute.
- 2 Remove the adapter and jacking screws.
- 3 Remove and discard the O-ring.
- 4 Remove and discard the cotter pin.



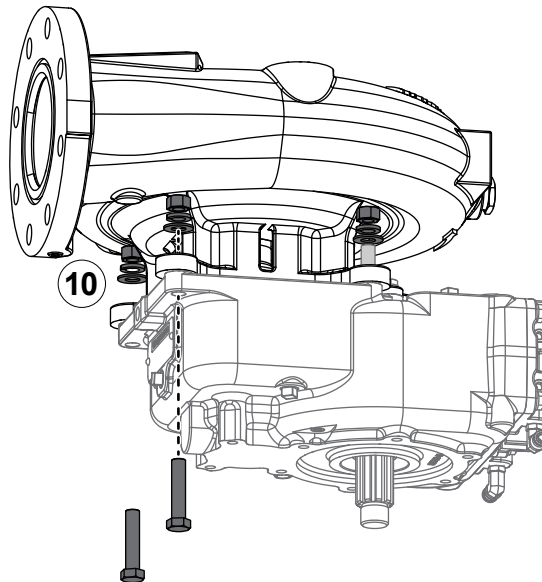
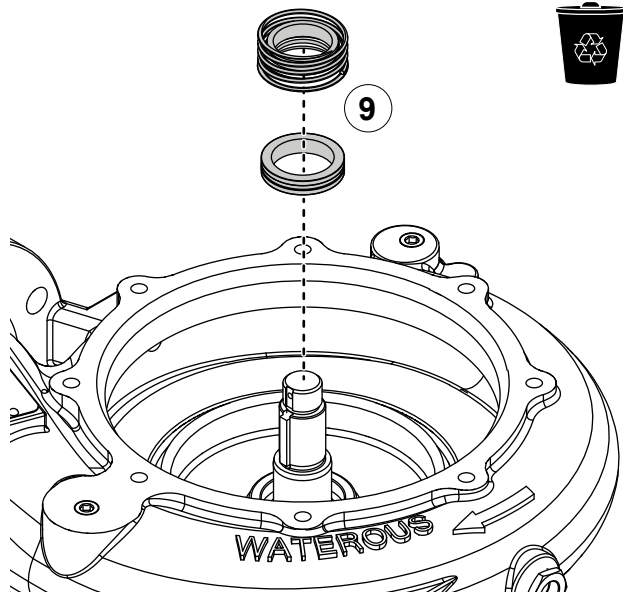
## Disassembling the pump



Use the illustrations and instructions to separate the pump from the transmission.

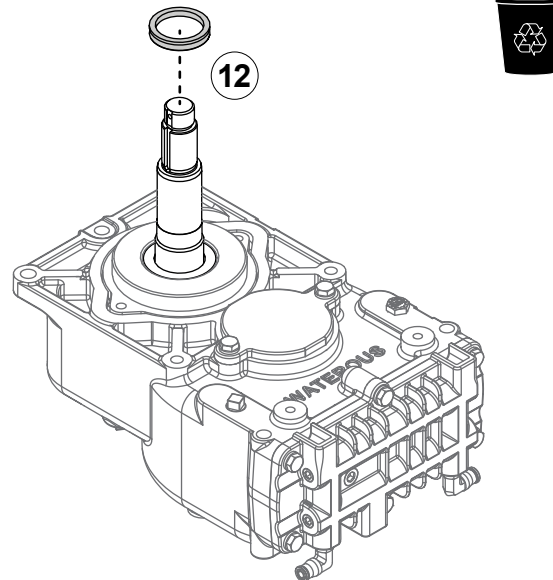
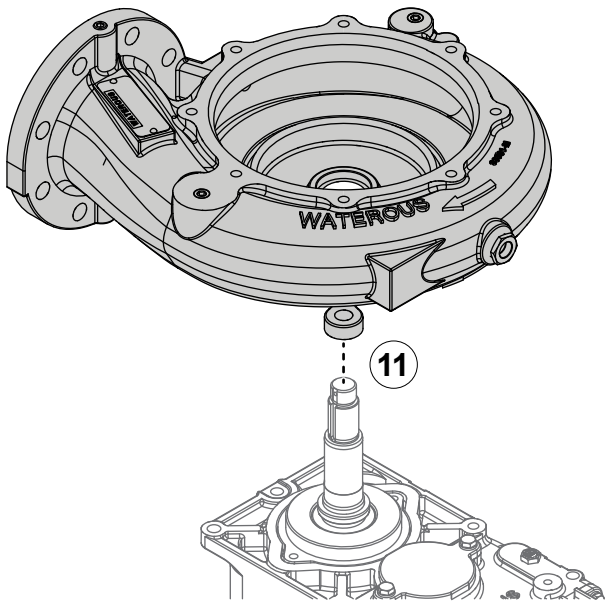
- 5 Remove the castle nut.
- 6 Use appropriate hardware to affix a puller to the impeller.
- 7 Use the puller to remove the impeller.
- 8 Remove the key.

## Disassembling the Pump

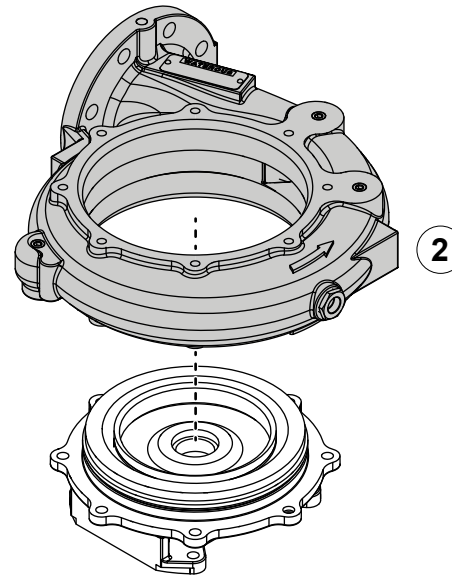
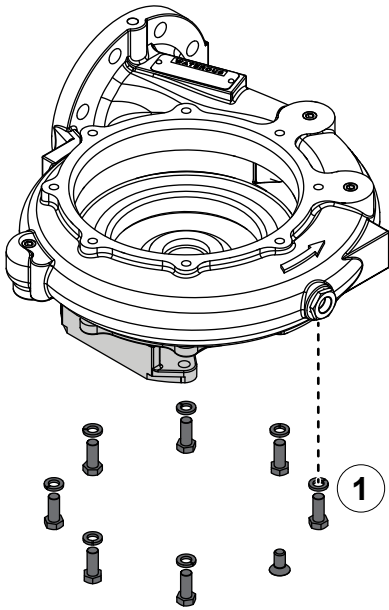


Use the illustrations and instructions to separate the pump from the transmission.

- 9 Remove and discard the mechanical seal.
- 10 Remove the hardware securing the volute to the transmission.
- 11 Remove the volute.
- 12 Remove and discard the flinger ring.

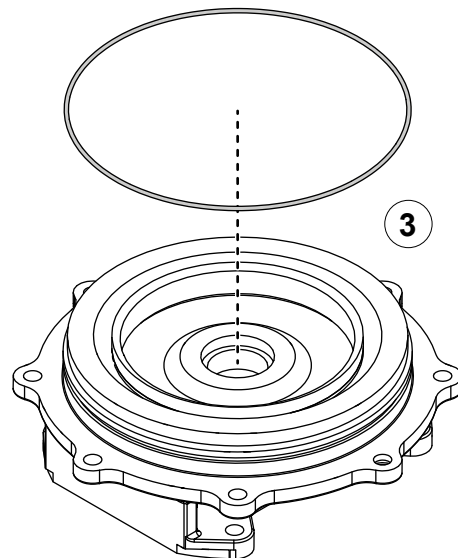


## Separating the Separable Volute

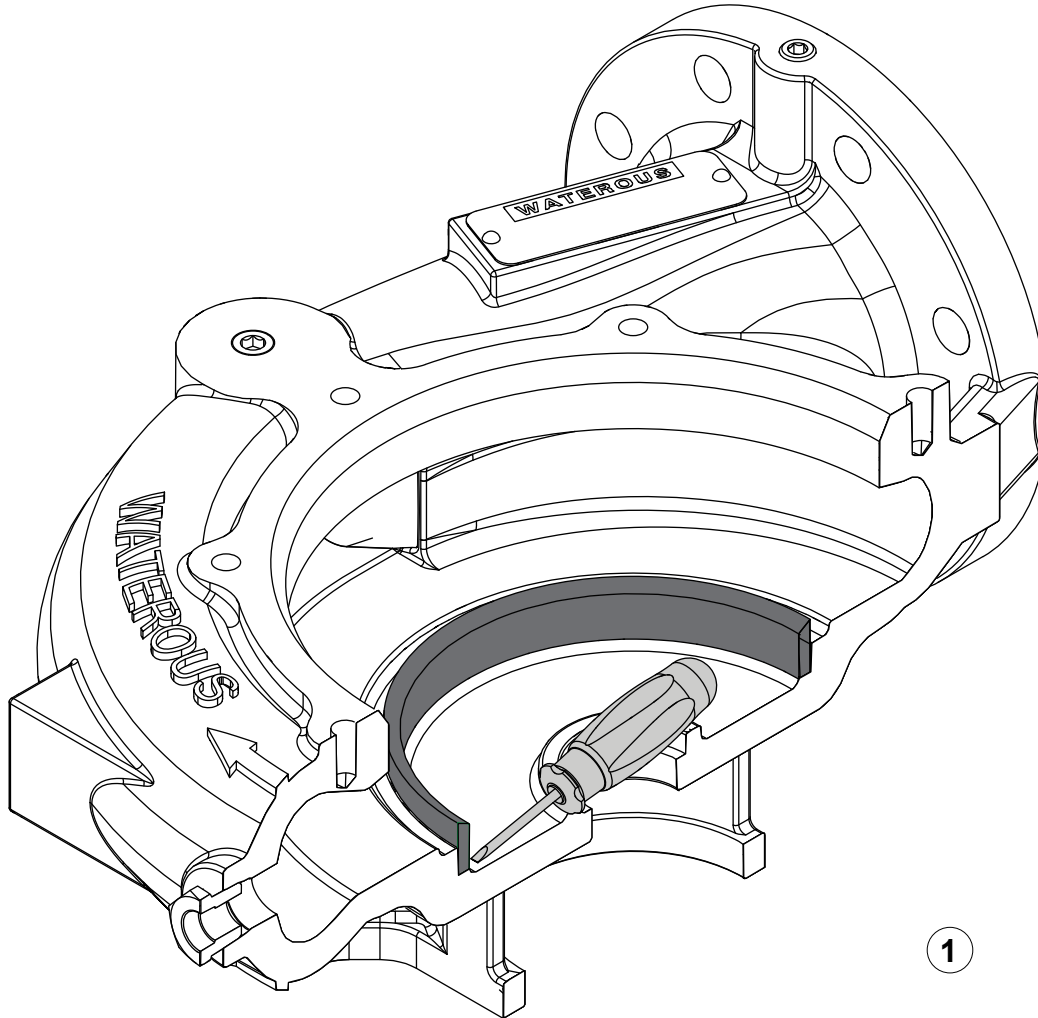


Use the illustrations and instructions to separate the pump head and volute.

- 1 Remove the mounting hardware that secures the pump head to the volute.
- 2 Remove the volute from the pump head.
- 3 Remove and discard the O-ring.



## Removing the Wear Ring—Volute

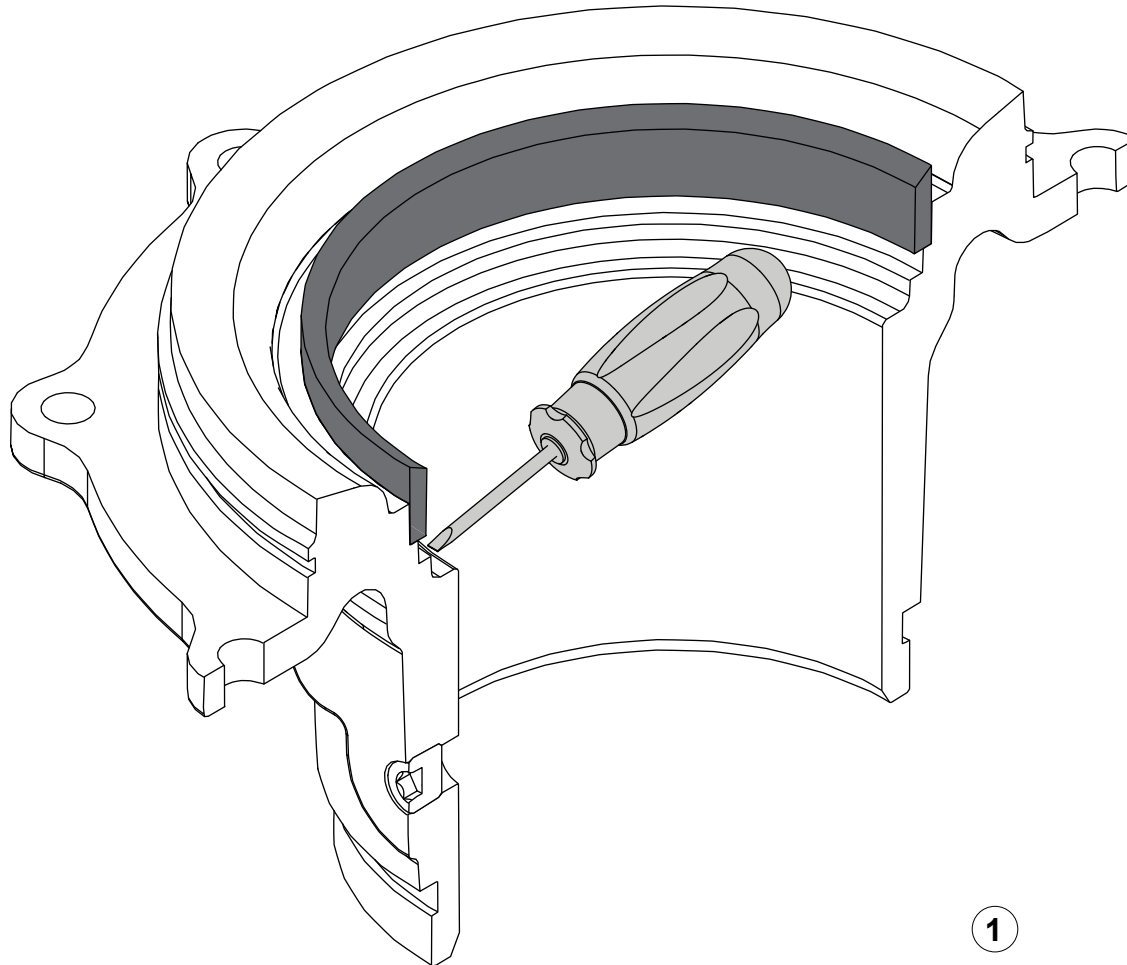


Use the illustration and instructions to remove the wear ring.

**Note:** Only remove the wear rings if damaged or if the deterioration of the wear ring affects the pump performance.

- 1 Use the appropriate tool to gently pry the wear ring from the volute.

## Removing the Wear Ring—Adapter

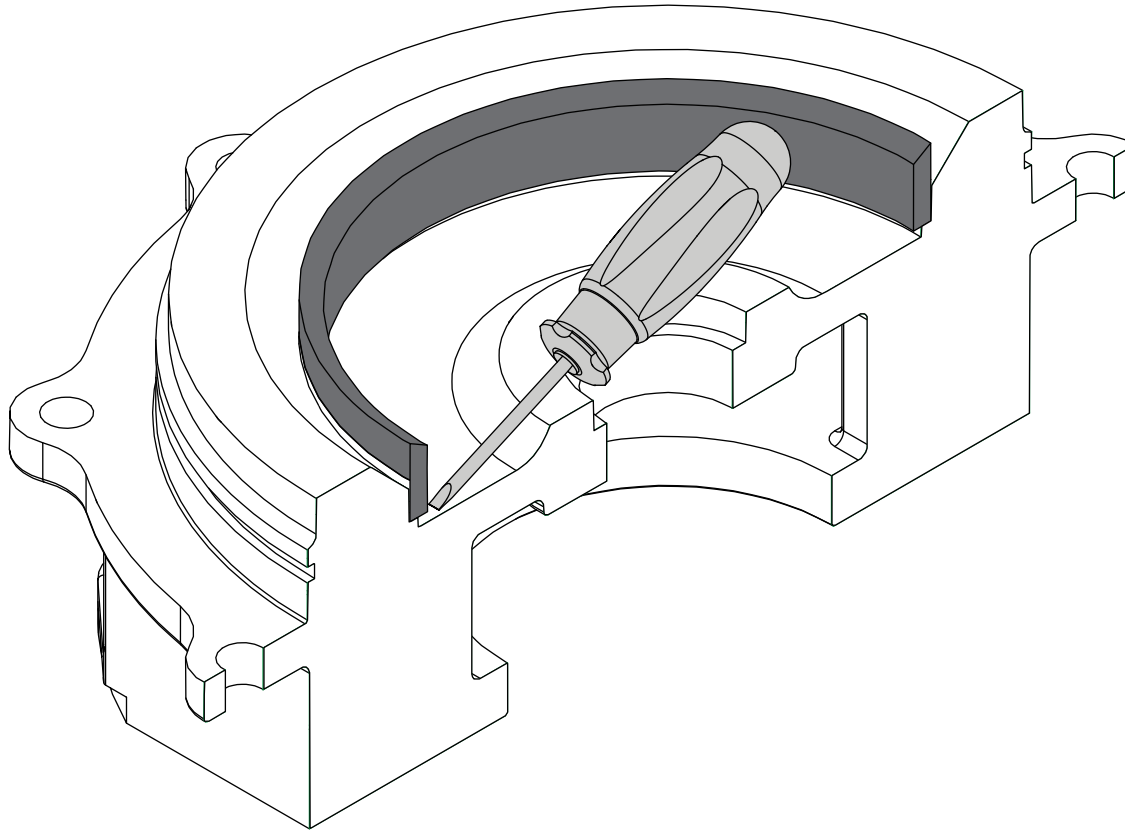


Use the illustration and instructions to remove the wear ring.

**Note:** Only remove the wear rings if damaged or if the deterioration of the wear ring affects the pump performance.

- 1 Use the appropriate tool to gently pry the wear ring from the adapter.

## Removing the Wear Ring—Pump Head



Use the illustration and instructions to remove the wear ring.

**Note:** Only remove the wear rings if damaged or if the deterioration of the wear ring affects the pump performance.

- 1 Use the appropriate tool to gently pry the wear ring from the pump head.

1



## Preparing to Assemble the Equipment

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- Read and understand the instructions before assembling the equipment.
- Prepare a workspace suitable to accommodate and support the equipment.
- Gather the necessary tools and assembly aids.
- Gather the necessary overhaul components, such as lubricant, bearings, seals, and O-rings—only use equivalent components.
- Understand that your configuration may require additional steps that are not described in the illustrations or instructions to perform the assembly.
- This equipment is intended to be assembled by a person or persons with the basic knowledge of servicing similar equipment. Contact Waterous for more information.

## Tools Required

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- Typical automotive mechanics hand tools.
- Suitable arbor press.
- Suitable support and lifting equipment.

## Best Practices

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- Remove any dirt, sand, grease, or oil from the enclosure before you begin the assembly. Surface debris can transfer into locations that could prematurely wear internal parts.
- Replace any gaskets and O-ring seals during the assembly.
- Do not reuse the lock nuts.
- Apply anti-seize compound to lock nut threads before installation.

## Optional Equipment

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Be aware that the assembly instructions may include optional equipment not included in your application.

## Assembling the Equipment Components

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- Refer to the service parts list (SPL) for part identification.

**Note:** Documents specific to your application are available through the MyWaterous login at [waterousco.com](http://waterousco.com) by entering the serial number for your system. Depending on the application, the serial number for your equipment is located on the operator panel, pump, transmission, or some combination of the three.

- Use established industry practices to assemble the equipment.
- Tighten hardware to industry standard torque specification—unless otherwise noted.
- Make sure that you do not over-tighten plugs.
- Install retaining rings with the rounded face toward the component you are retaining.
- Replace items such as O-rings, bearings, gaskets, oil seals, lubricants, and locknuts with their equivalent.

## Installing the Equipment

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Use the information that you recorded when you removed the equipment to install it into the apparatus.

## Understanding the Illustrations

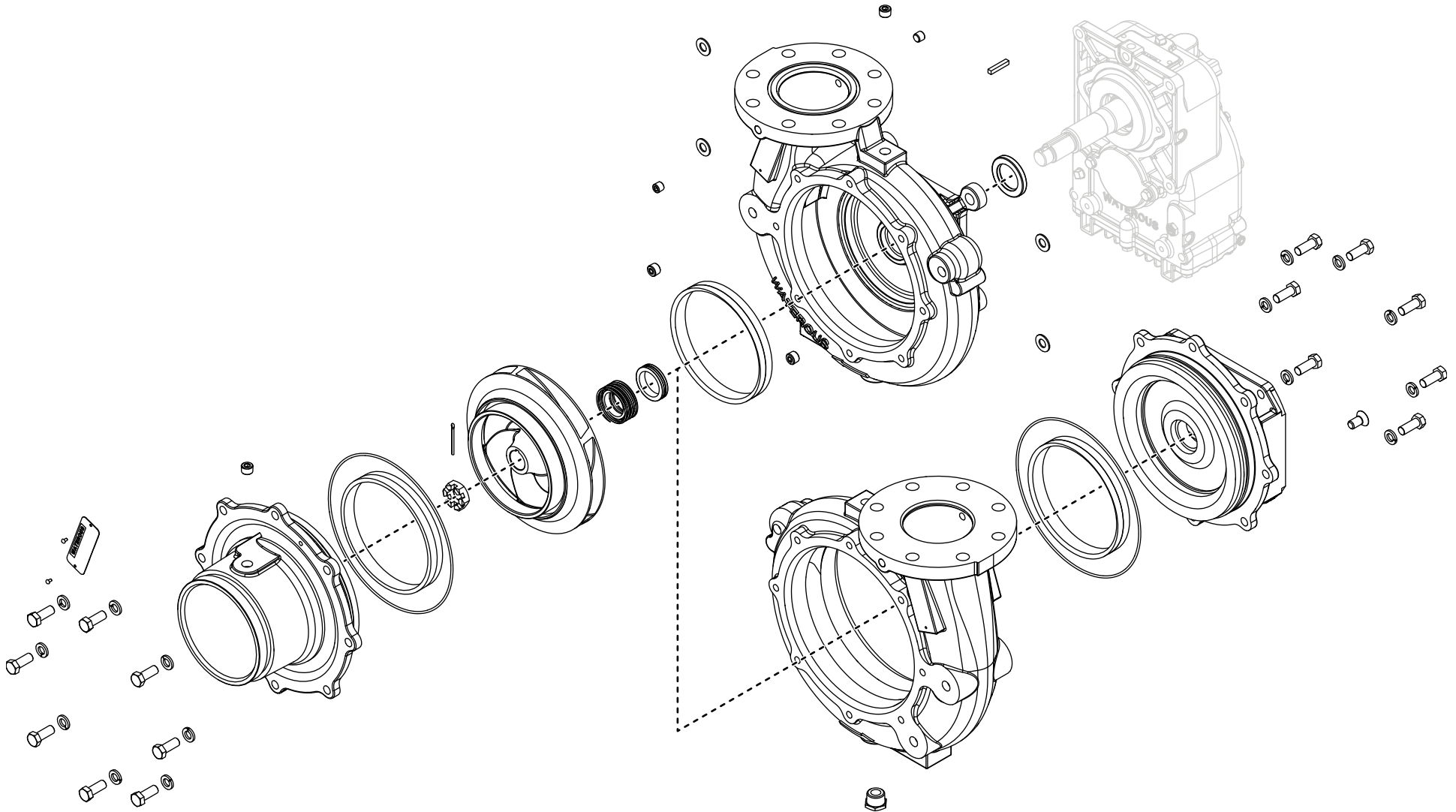
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The assembly illustrations depict a typical application. Plugs, breathers, cooling hoses, and fittings are not illustrated, as they may be in a different location on your application. Refer to the SPL for your application to identify the various plug locations.

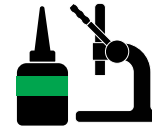
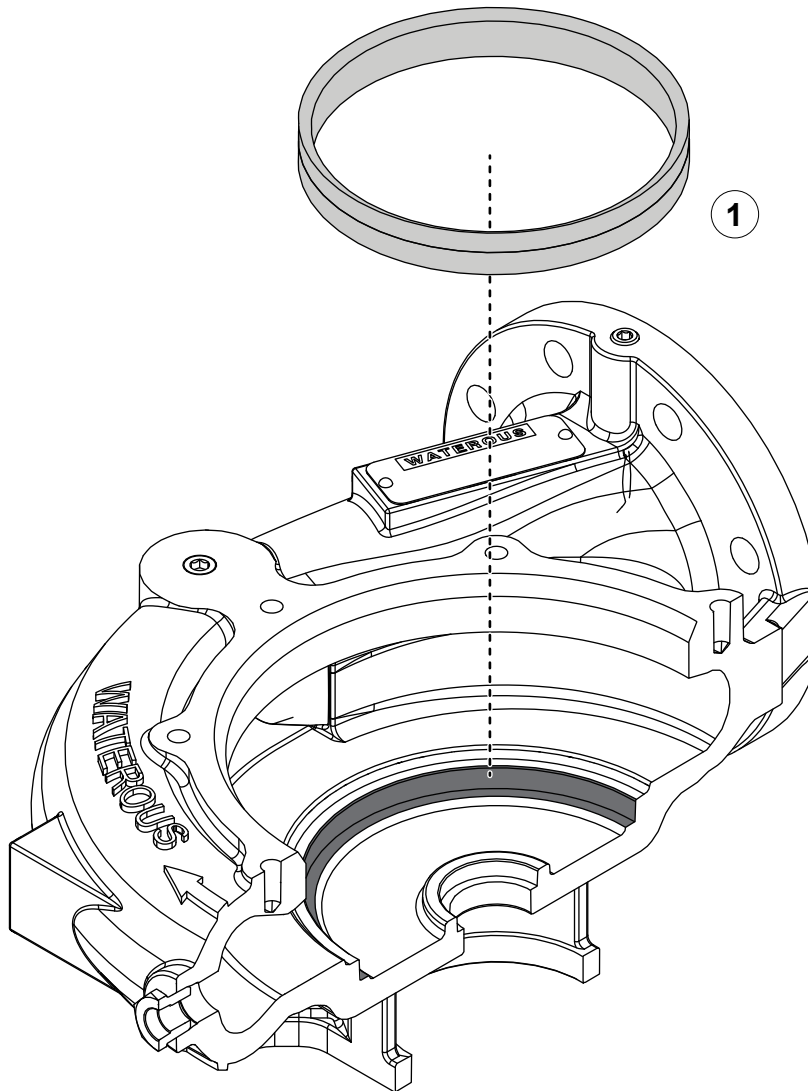


## Assembling the Pump

The pump volute is available as a single unit or as a volute with a separable pump head.



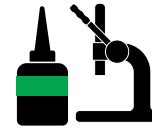
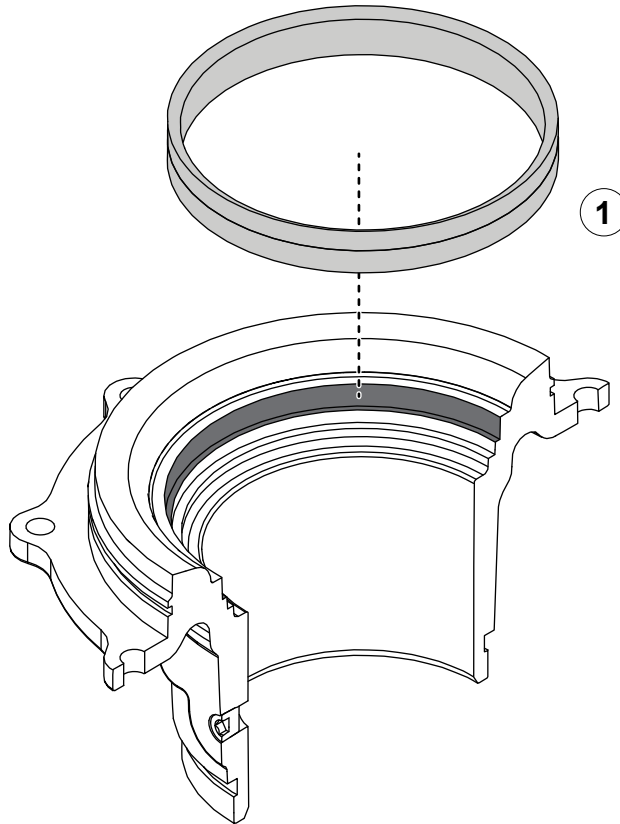
## Install the Wear Ring—Volute



Use the illustration and instructions to install the wear rings.

- 1 Apply retaining compound to the mating surfaces. Align the wear ring with the bore and press it into place.

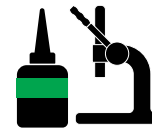
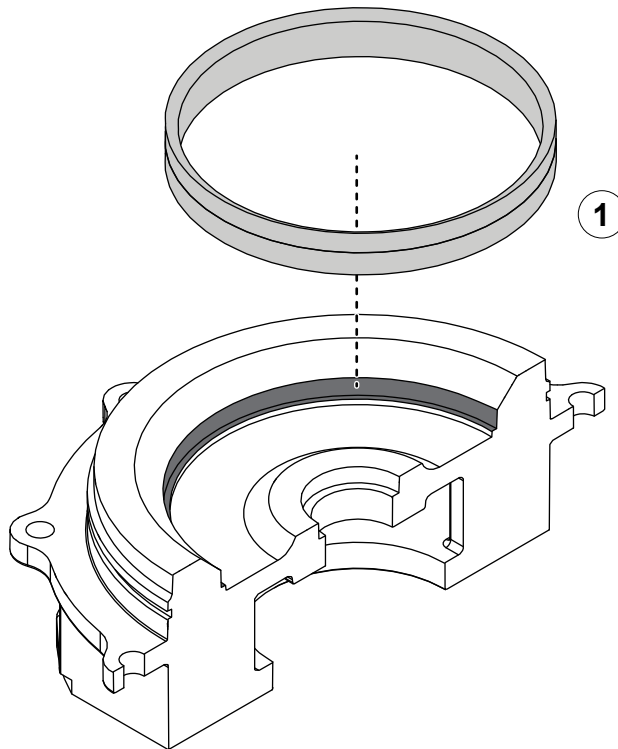
## Install the Wear Ring—Adapter



Use the illustration and instructions to install the wear rings.

- 1 Apply retaining compound to the mating surfaces. Align the wear ring with the bore and press it into place.

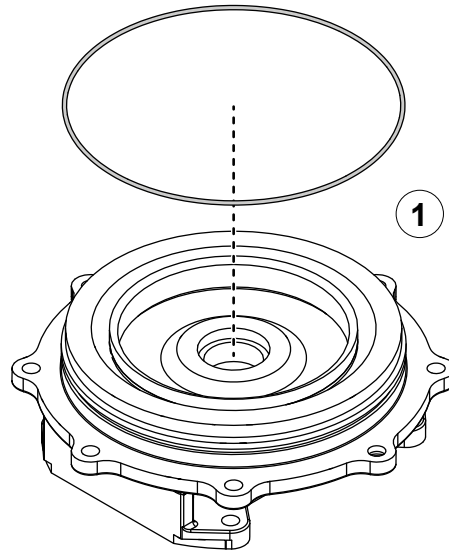
## Install the Wear Ring—Pump Head



Use the illustration and instructions to install the wear rings.

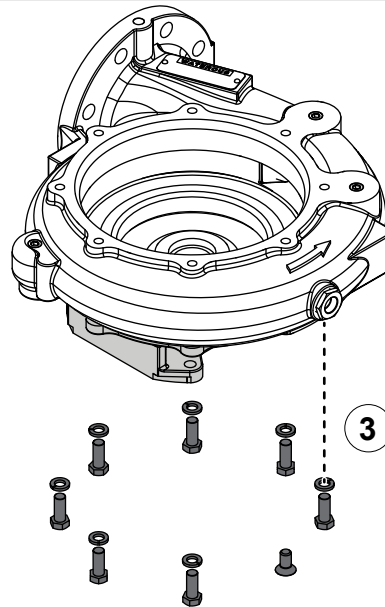
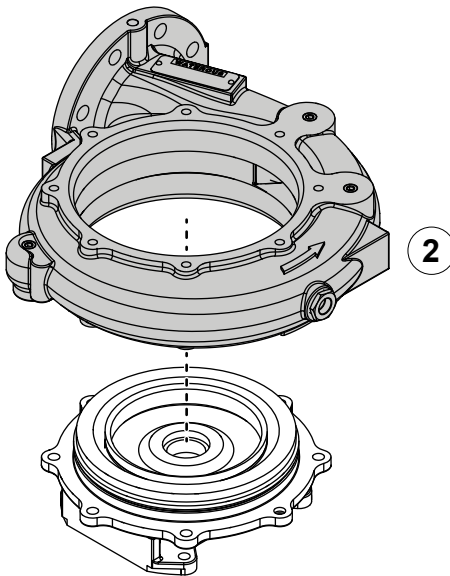
- 1 Apply retaining compound to the mating surfaces. Align the wear ring with the bore and press it into place.

## Assembling the Separable Volute

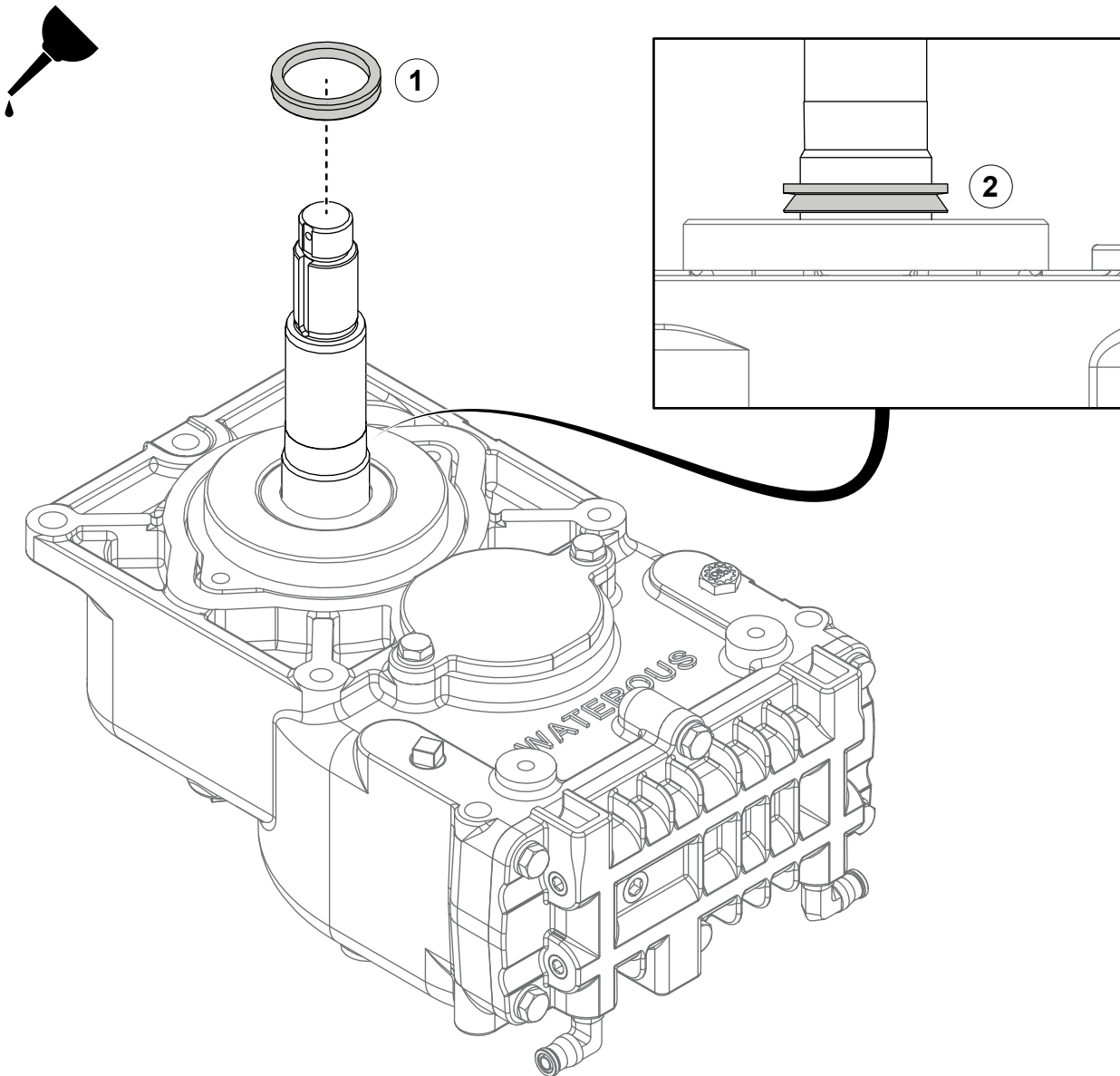


Use the illustrations and instructions to assemble the separable volute.

- 1 Apply the appropriate lubricant to the O-ring and install it.
- 2 Align and install the volute to the pump head.
- 3 Use the mounting hardware to secure the pump head to the volute.



## Installing the Flinger Ring



Use the illustration and instructions to install the flinger ring.

- 1 Apply the appropriate lubricant to the flinger ring and install it onto the drive shaft.
- 2 Position the flinger ring close to the oil seal housing without making contact.

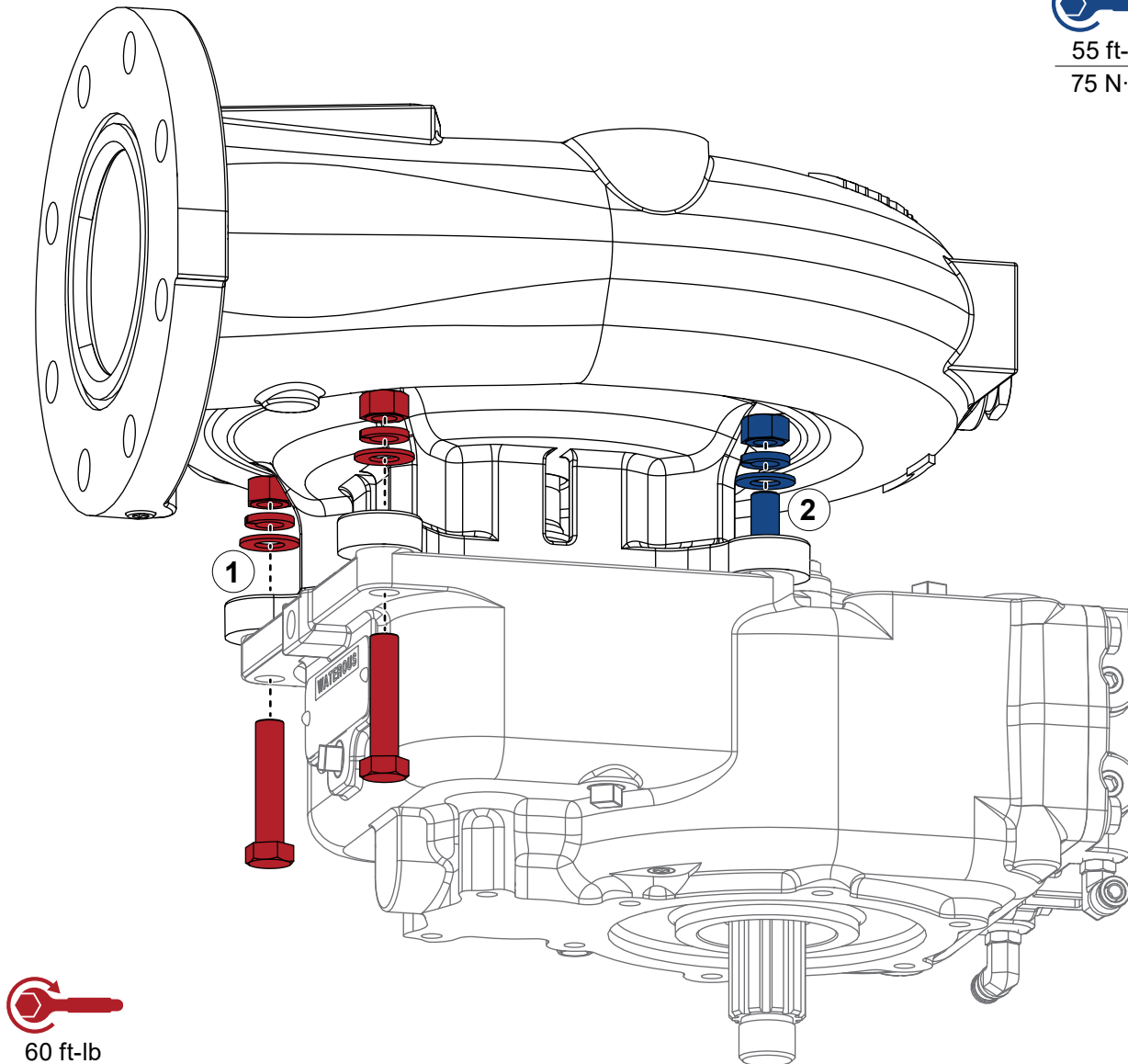
## Installing the Volute



55 ft-lb  
75 N·m

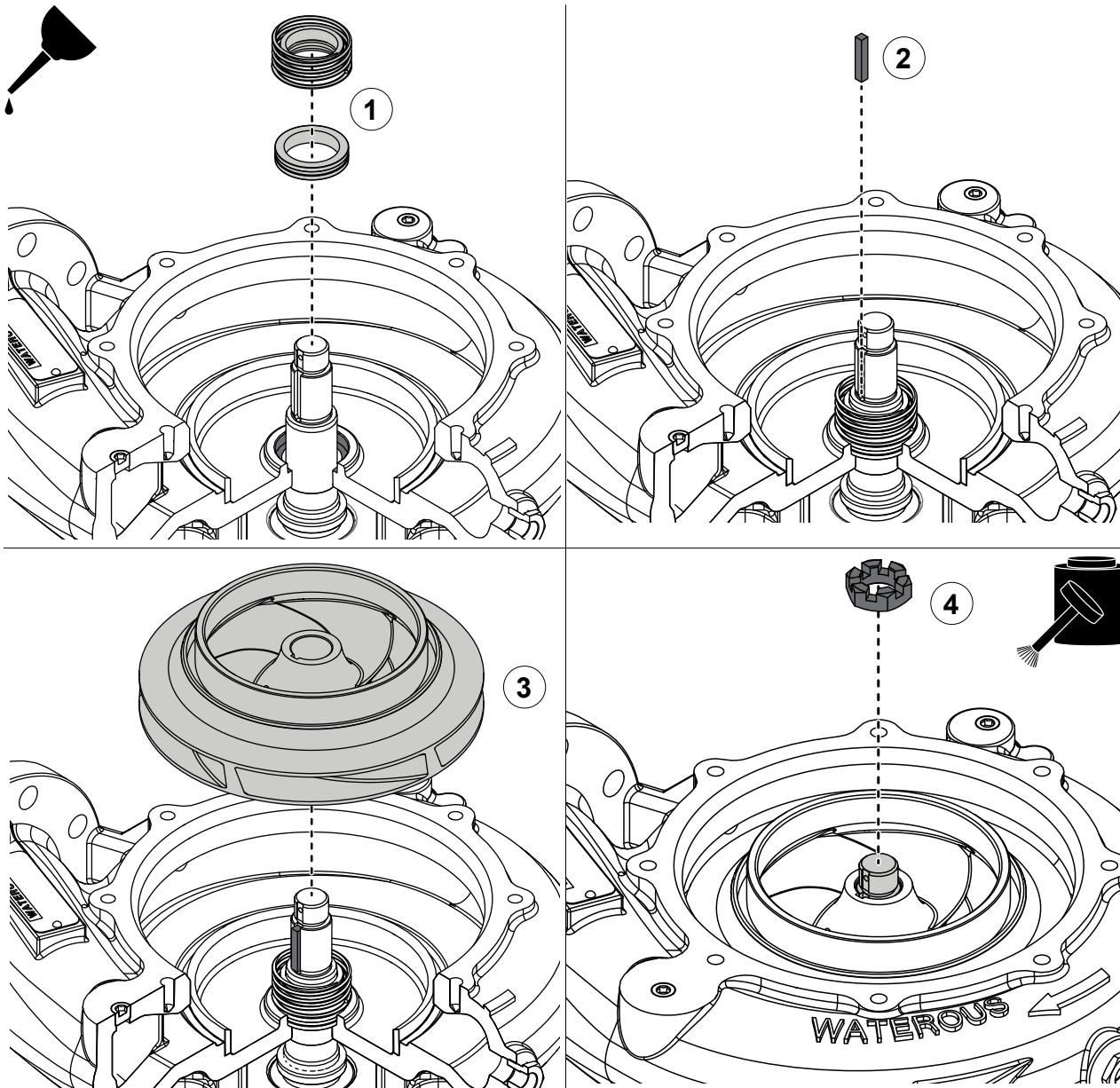
Use the illustration and instructions to install the volute.

- 1 Use the mounting hardware to secure the pump to the transmission. Torque the upper hardware to 60 ft-lb (81N·m).
- 2 Use the mounting hardware to secure the pump to the transmission. Torque the lower hardware to 55 ft-lb (75 N·m).



60 ft-lb  
81N·m

## Installing the Pump Components

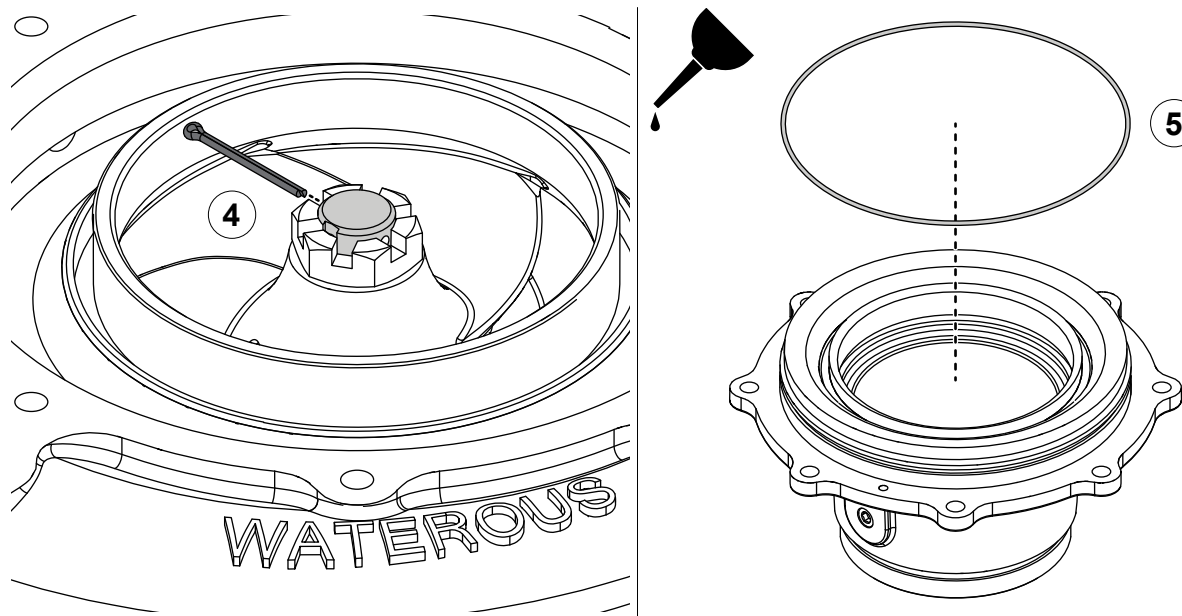


Use the illustrations and instructions to install the pump components.

- 1 Clean the bore before apply the appropriate lubricant and install the mechanical seal.
- 2 Install the key into the keyway.
- 3 Align the impeller to the key and install it.
- 4 Apply anti-seize to the threads and install the castle nut to the impeller shaft.



## Installing the Pump Components

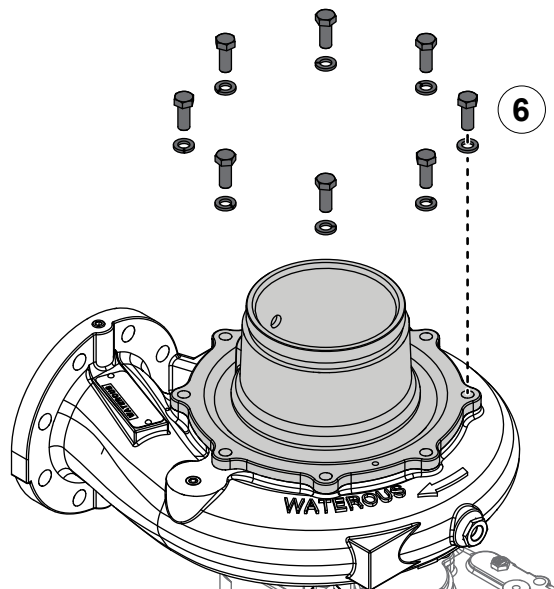


Use the illustrations and instructions to install the pump components.

- 4 Tighten the castle nut so that a slot on the nut aligns with a hole on the impeller shaft. Install the cotter pin and bend the ends to secure it.

**Note:** Do not loosen the nut to align it with the cotter pin hole. Tighten the nut purposefully to achieve alignment.

- 5 Apply the appropriate lubricant to the O-ring and install it.
- 6 Apply the appropriate lubricant to the mating surfaces between the adapter and volute. Use the adapter hardware to secure the adapter to the volute.



# **WATEROUS**

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