

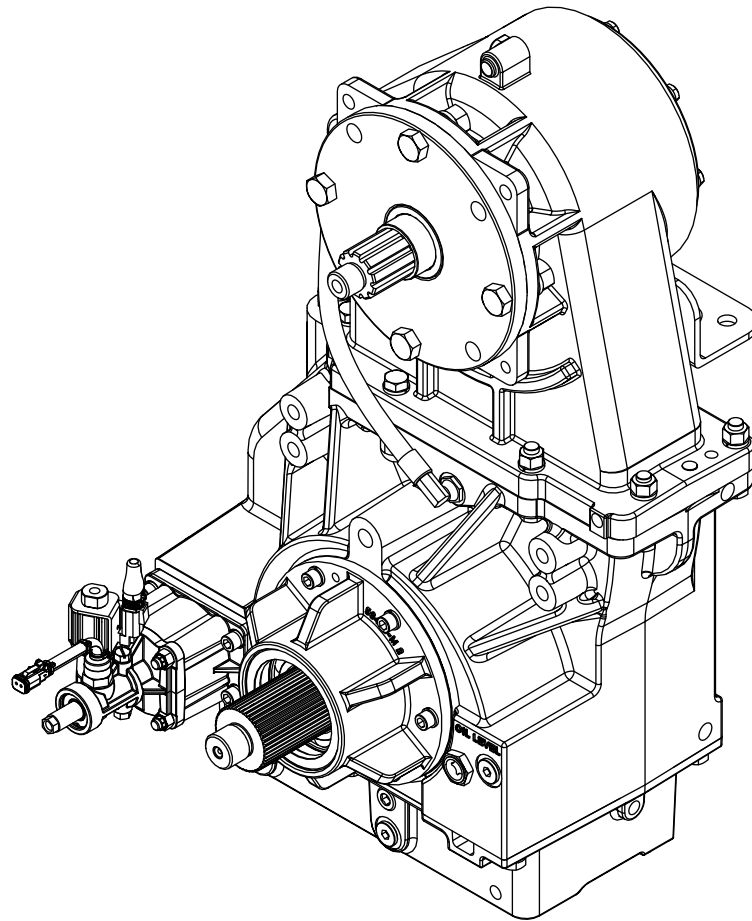
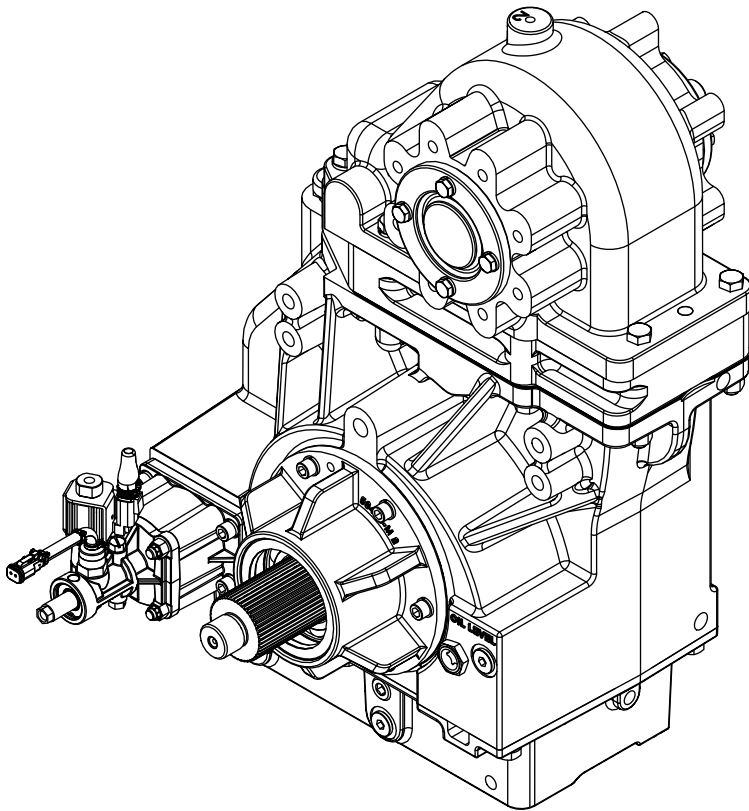
WATEROUS

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TC22 & TC23 Series Power Take-Offs

Installation



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www.waterousco.com

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Safety Precautions

- Read and understand all the associated documentation before you begin installing the product.
- Contact Waterous when you have questions about installing 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.

 WARNING	
<p>Sudden Unexpected Movement</p> <ul style="list-style-type: none"> • Unexpected movement can cause injury or death. • Make sure the shift unit is in the proper mode before operation. 	

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

NOTICE	
<p>Before Operation</p> <ul style="list-style-type: none"> • 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. 	

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 installing 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 (SPL) 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 instruction.



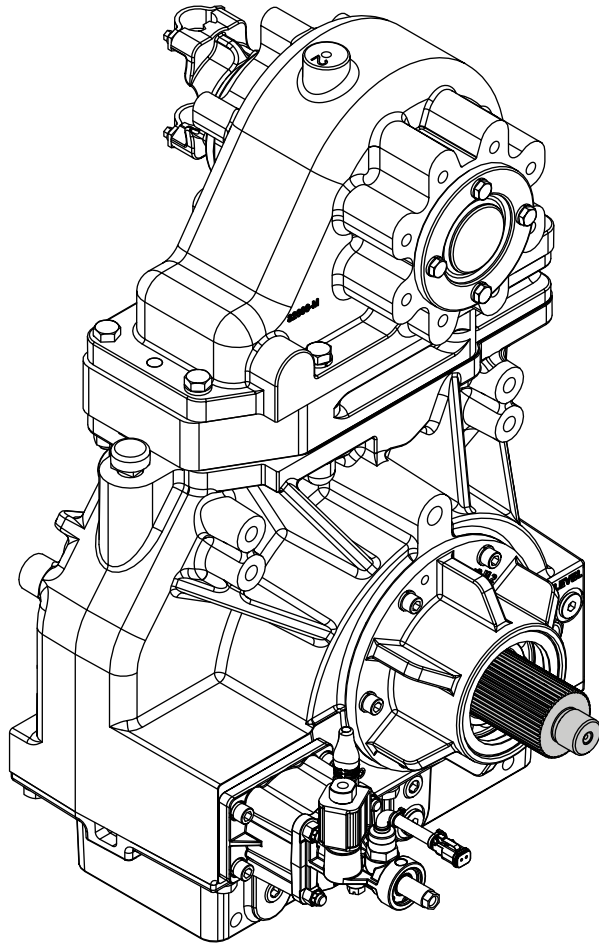
Anti-seize compound—This symbol tells you to apply the appropriate anti-seize compound to the part.



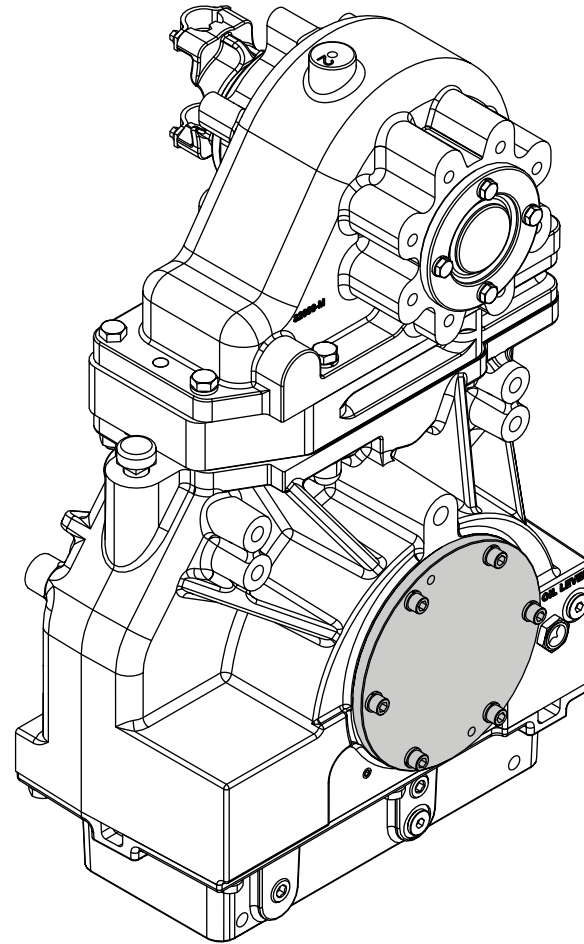
Torque to specification—This symbol tells you to torque the hardware to the specified value.

Driveline Options

TC22 and TC23 Series power take-offs (PTOs) are available with an input and output shaft or an input shaft only. The driveline options depend on the pump model and mounting location. Input shaft only configurations do not include a pneumatic shift unit.



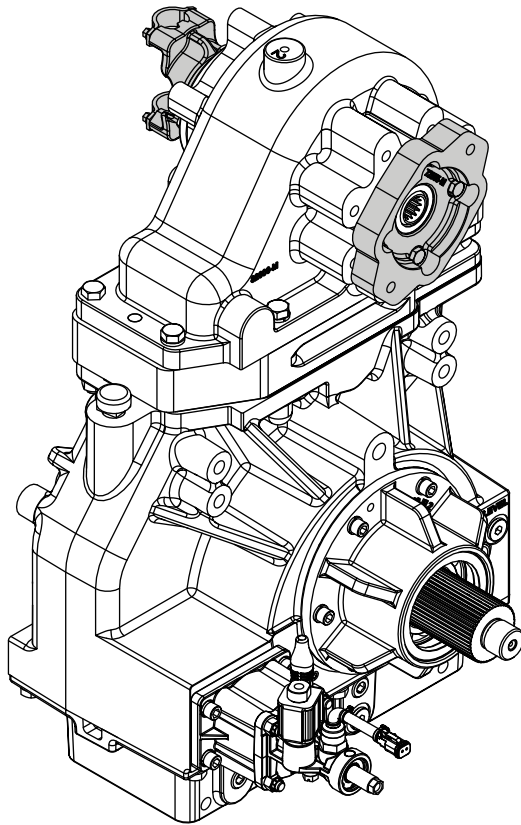
Input and Output Shaft



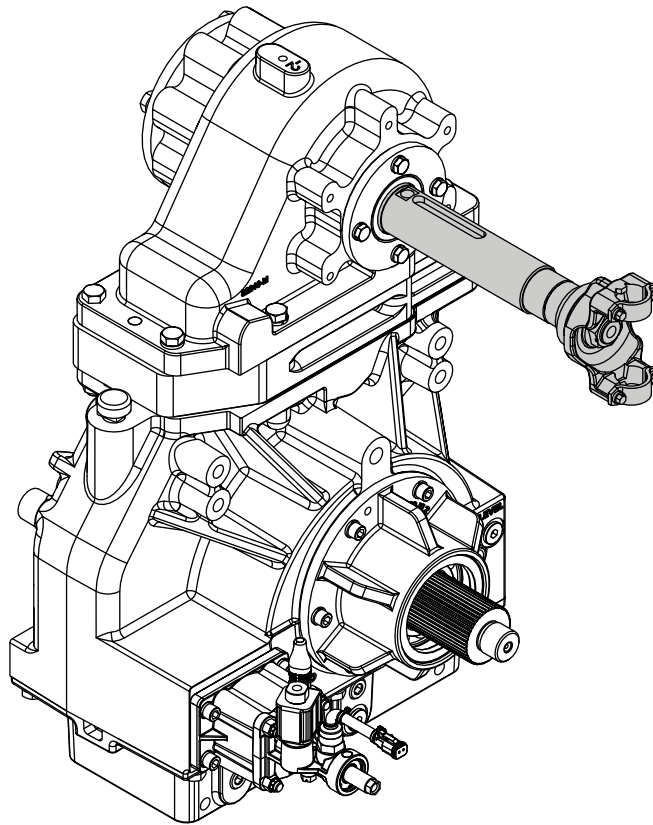
Input Shaft Only

Driven Shaft Outputs

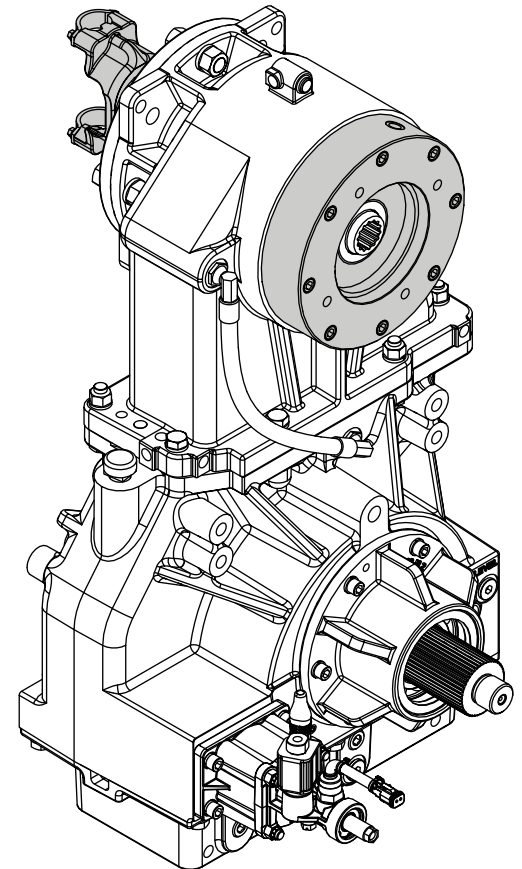
TC22 Series PTOs are available with three connection options for the driven shaft output: a hydraulic adapter, an end yoke, or a CAFS drive. TC23 Series PTOs are available with a hydraulic adapter or an end yoke. Output connections can be placed on either or both sides of the PTO to suit your application.



TC22 Dual Output

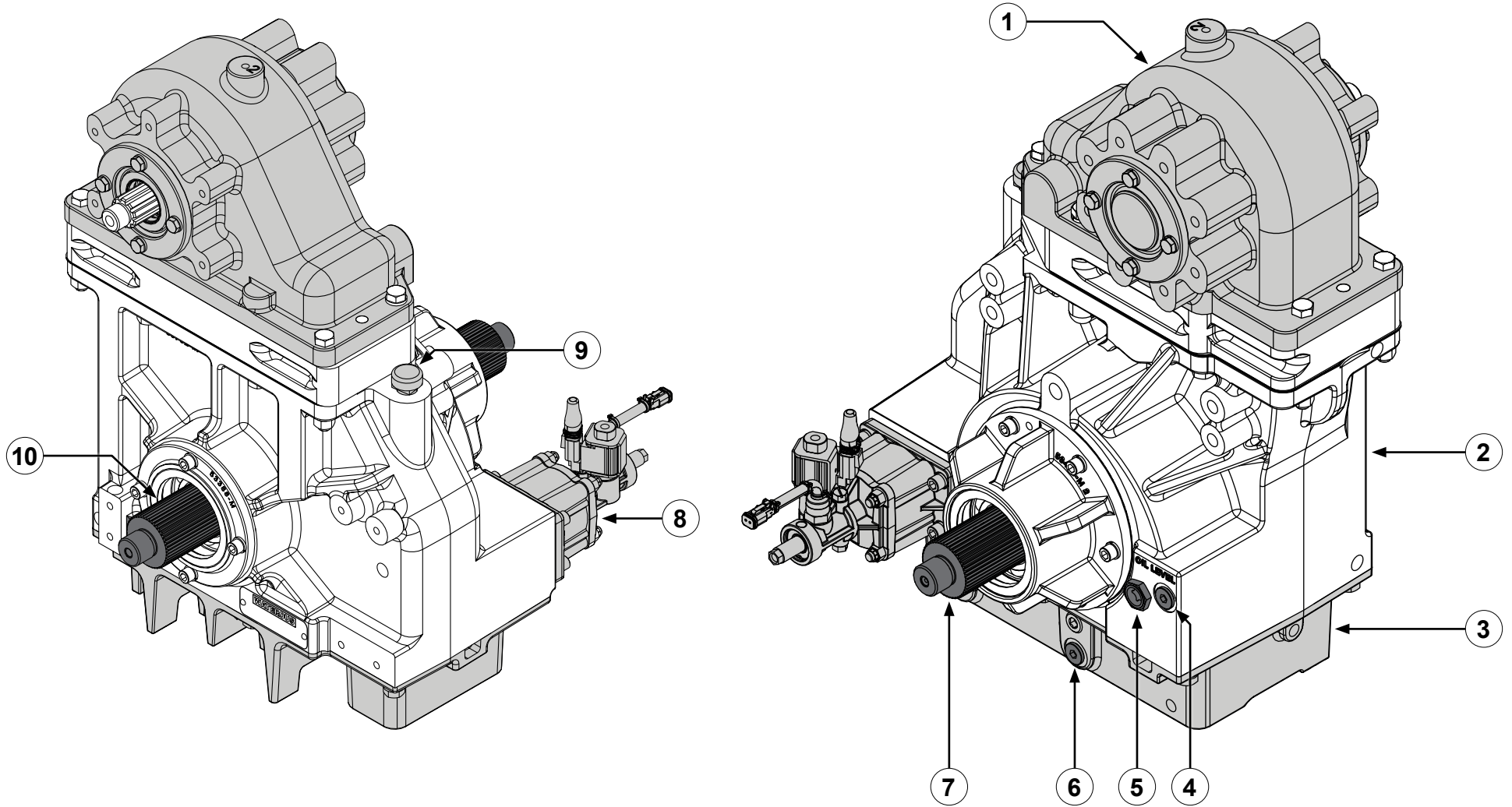


TC22 CAFS Drive



TC23 Dual Output

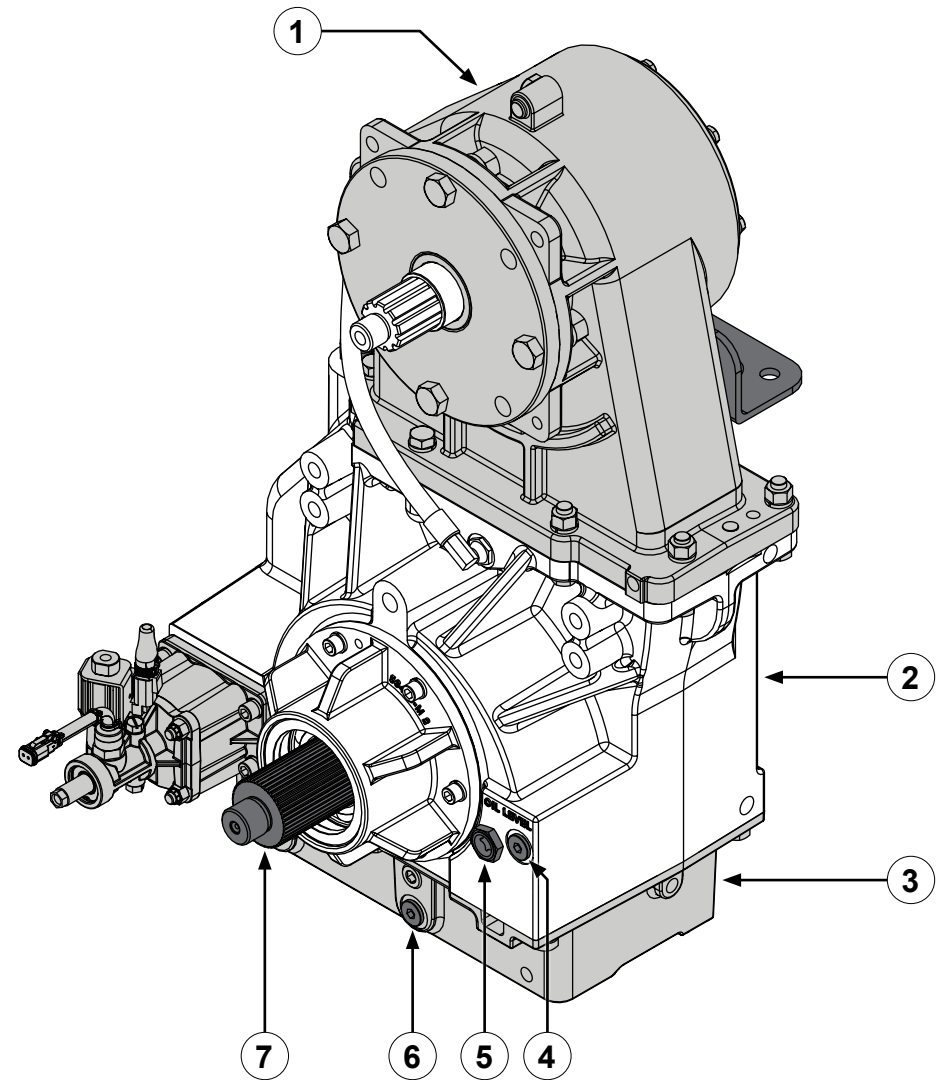
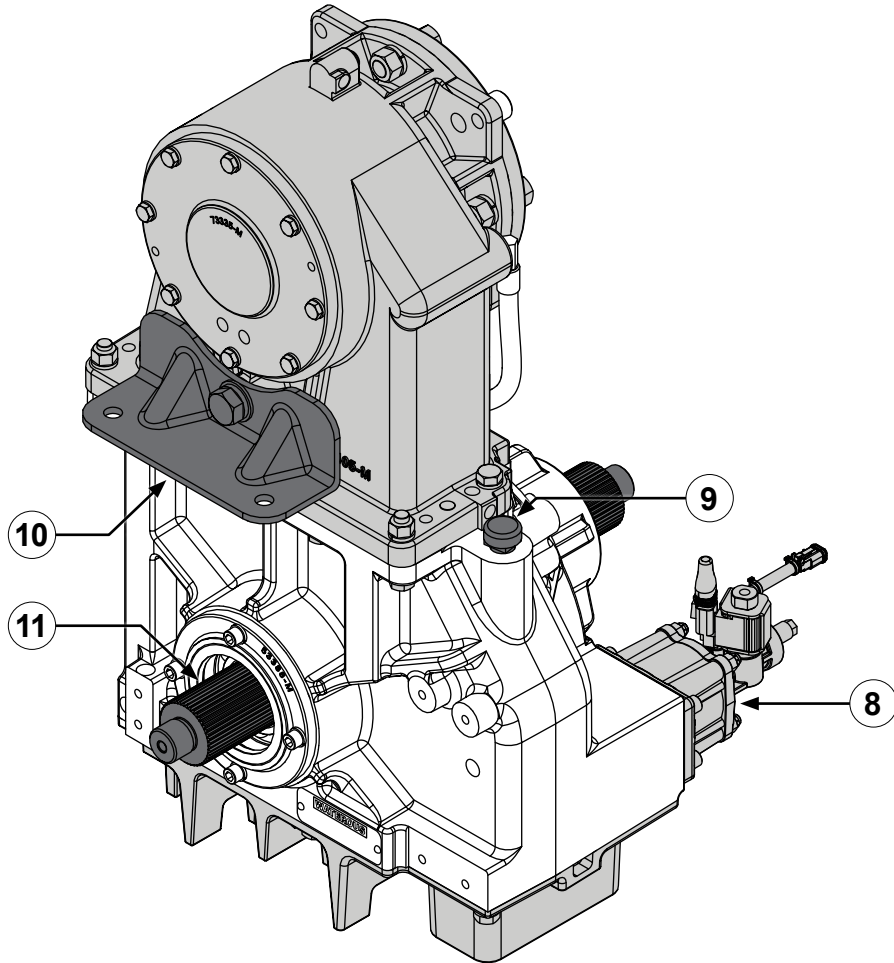
TC22 Overview



TC22 Overview

Feature	Description
1 Transmission cap	This accommodates the different requirements between the PTO mounting location and driveline.
2 Transmission case	This houses the internal components.
3 Transmission pan	This provides access to the internal components.
4 Magnetic plug—oil fill	This allows you to add lubricant to the PTO.
5 Oil level sight plug	This allows you to visually determine the fluid level.
6 Magnetic plug—oil drain	This is where the lubricant drains from the PTO.
7 Coupling shaft—output	This connects the apparatus driveline to the wheels in drive mode.
8 Pneumatic shift unit	This switches the PTO between drive mode and pump mode.
9 Breather	This prevents internal pressure buildup during operation.
10 Drive shaft—input	This connects to the apparatus driveline.

TC23 Overview



TC23 Overview

Feature	Description
1 Transmission cap	This accommodates the different requirements between the PTO mounting location and driveline.
2 Transmission case	This houses the internal components.
3 Transmission pan	This provides access to the internal components.
4 Magnetic plug—oil fill	This allows you to add lubricant to the PTO.
5 Oil level sight plug	This allows you to visually determine the fluid level.
6 Magnetic plug—oil drain	This is where the lubricant drains from the PTO.
7 Coupling shaft—output	This connects the apparatus driveline to the wheels in drive mode.
8 Pneumatic shift unit	This switches the PTO between drive mode and pump mode.
9 Breather	This prevents internal pressure buildup during operation.
10 Mounting bracket	This provides an additional mounting point for the PTO—rear-mounted configurations only.
11 Drive shaft—input	This connects to the apparatus driveline.

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.
- Installing and securing plumbing.
- Welding.
- Routing and securing the wiring.
- Calibration and final testing.

Preparing for the Installation

Use the following guidelines before, during, and after 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.
- Make sure that you remove any shipping plugs or caps before installing any components.
- Make sure that you bring all fluids to operating levels before using 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.**



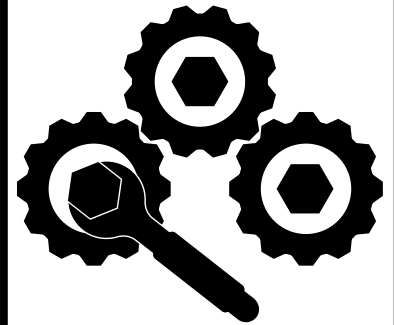
Modifying the Equipment

This equipment is intended to operate as designed. Do not remove, modify, or change the components in the system. Doing so will void your warranty. Contact Waterous for more information.

NOTICE

Modification

- **Modifying the equipment can damage components and void your warranty.**
- **Do not modify the system or any of its components.**



Do not modify the system or any of its components. Doing so will void your warranty.

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.

Optional Equipment

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

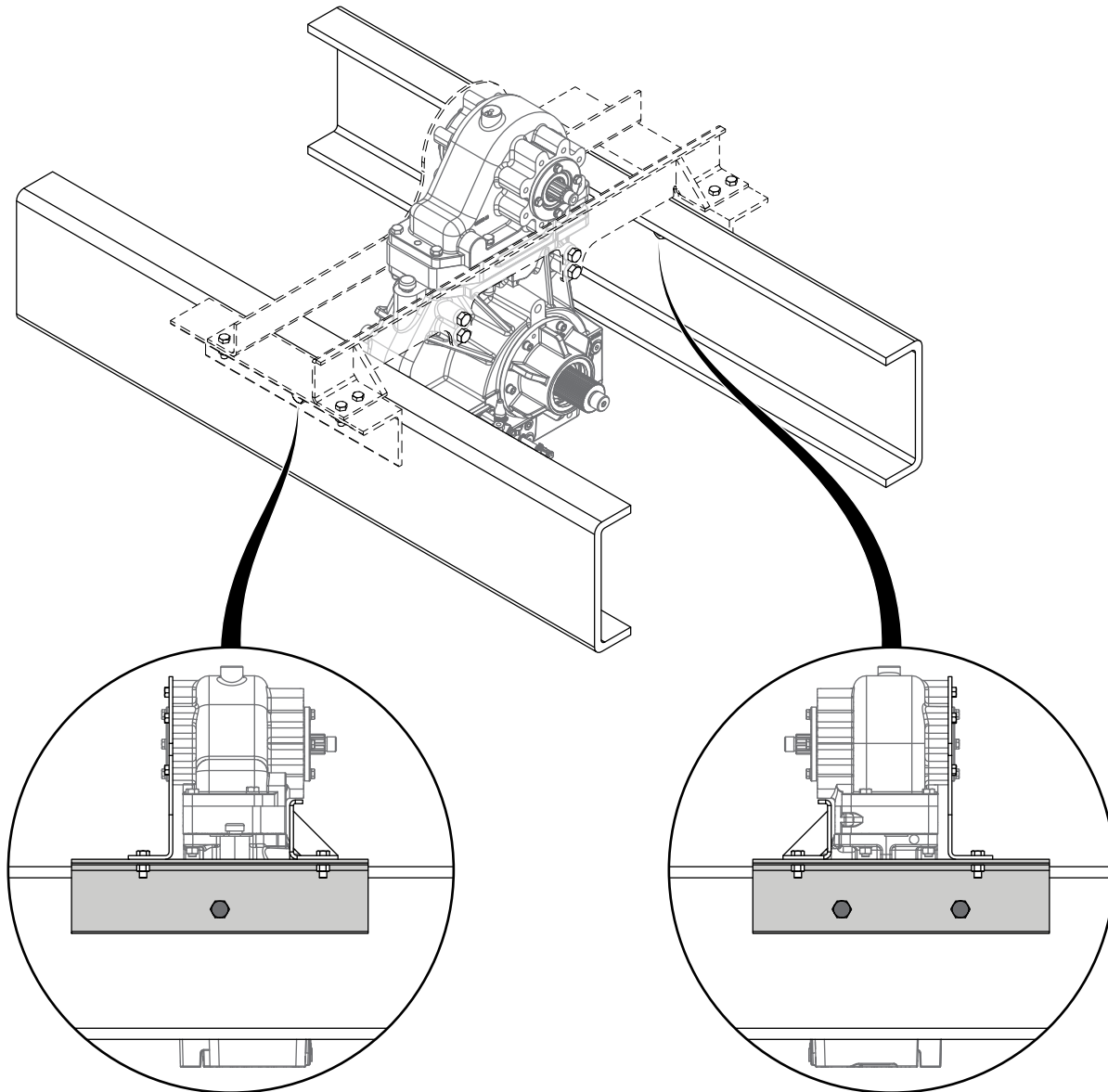
Testing After Installation

Perform standard tests associated with the operation of centrifugal pumps, along with any tests outlined in the transmission instructions or required by the National Fire Protection Association (NFPA). During the tests, listen for unusual noises, check for leaks, and monitor the smoothness of operation.

PTO Temperature Specifications

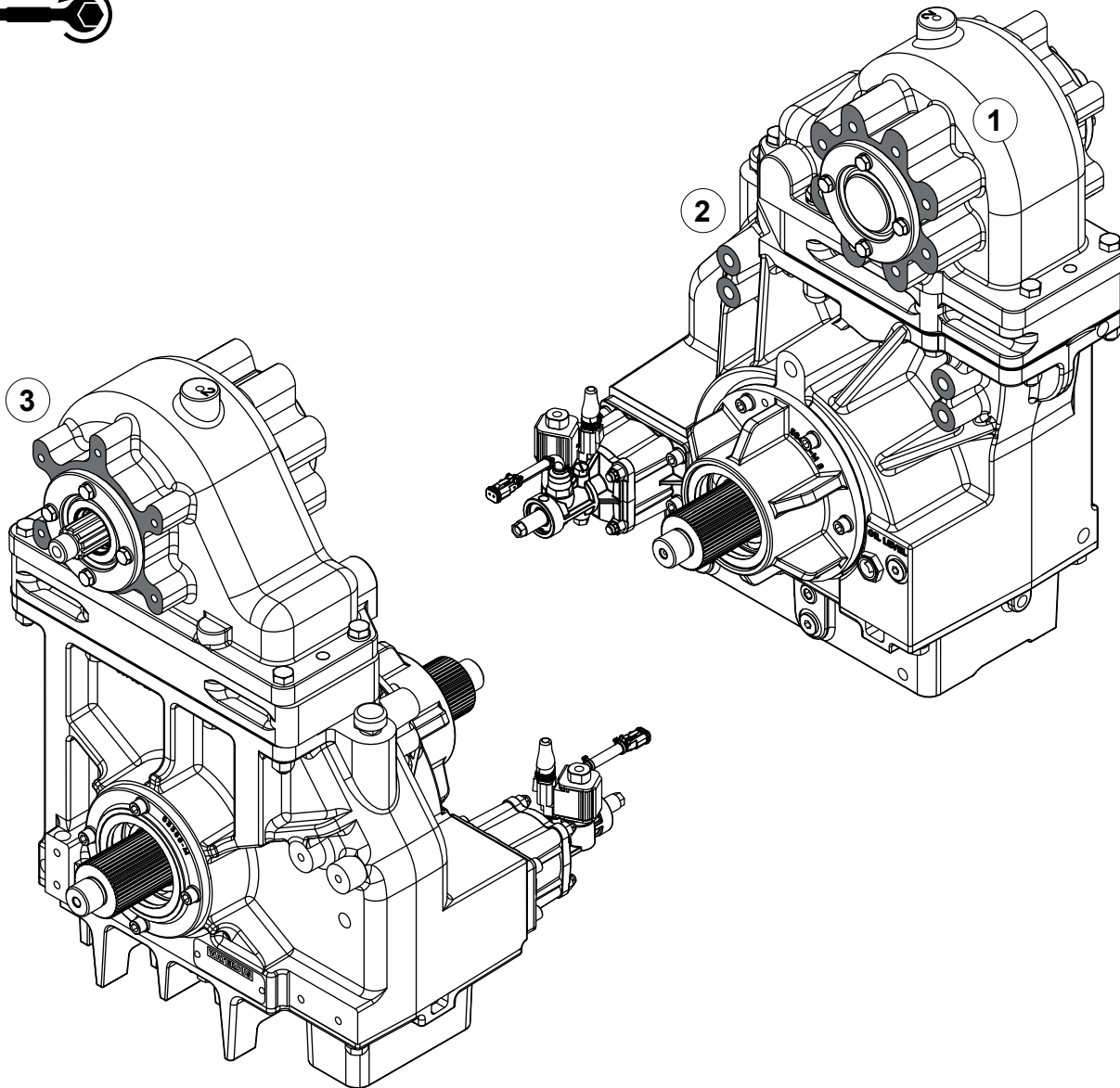
For all PTOs, the maximum acceptable temperature at external surfaces is 250°F (121°C).

Three-Point Mounting



Use the three-point mounting method when installing the PTO into the apparatus frame. This method uses one bolt on the left side of the vehicle and two bolts on the right side of the vehicle to attach the mounting brackets. (Determine left and right from the driver's seat of the vehicle.) A three-point mount allows the frame to flex around the equipment, whereas a rigid mount could damage the equipment and void the warranty. It is the responsibility of the purchaser to effectively mount the PTO to avoid damage.

Installing the TC22—Mounting Points

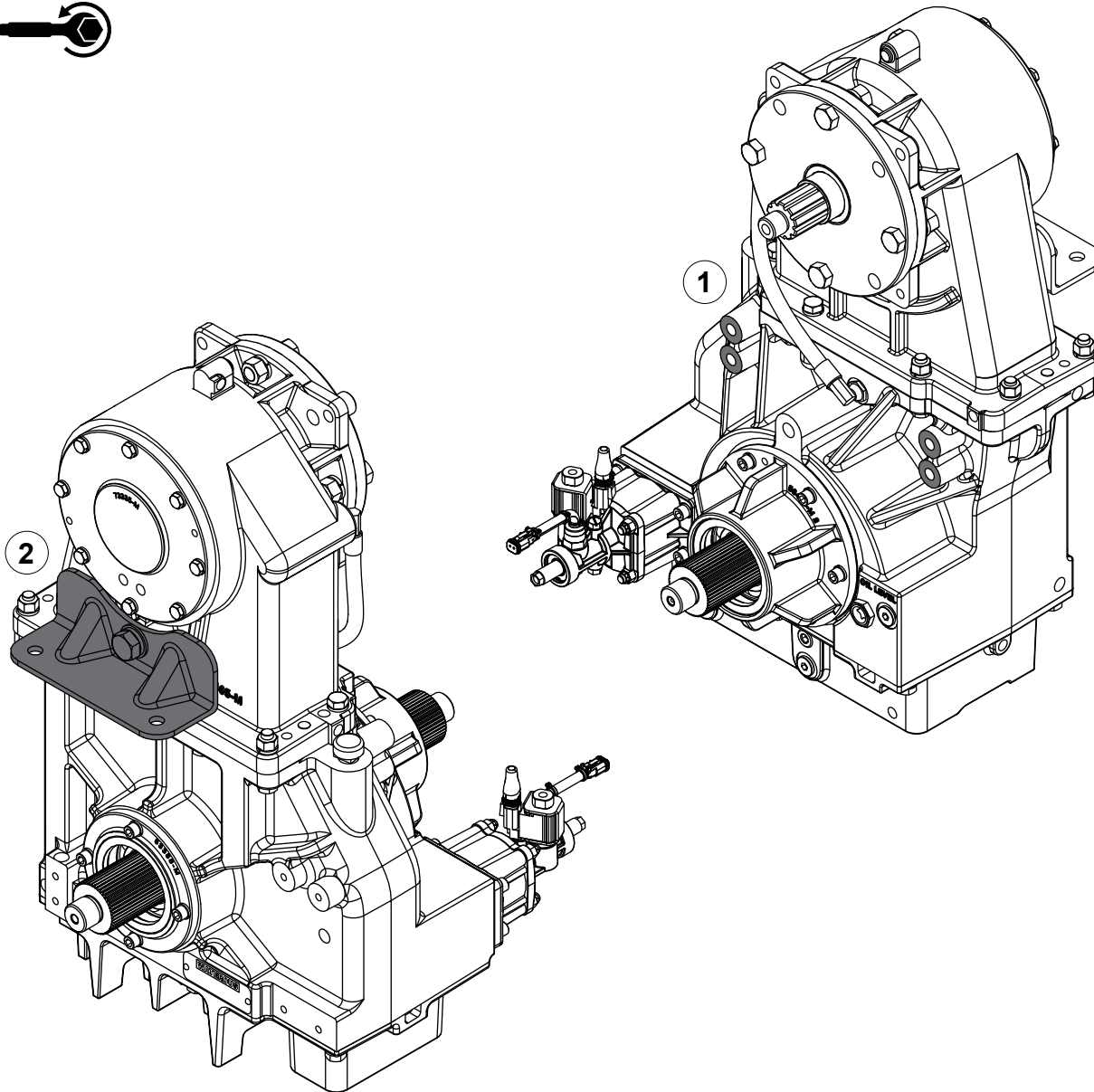


Use the illustration and instructions to mount the PTO.

Note: Refer to dimensional drawings for mounting hole spacing.

- 1 Use the cap mounting pad to secure the PTO to the apparatus. Torque the hardware to 55 ft-lb (75 N·m).
- 2 Use the case mounting holes to secure the PTO to the apparatus. Torque the hardware to 110 ft-lb (150 N·m).
- 3 Use the cap mounting pad to secure the PTO to the apparatus. Torque the hardware to 20 ft-lb (25 N·m).

Installing the TC23—Mounting Points

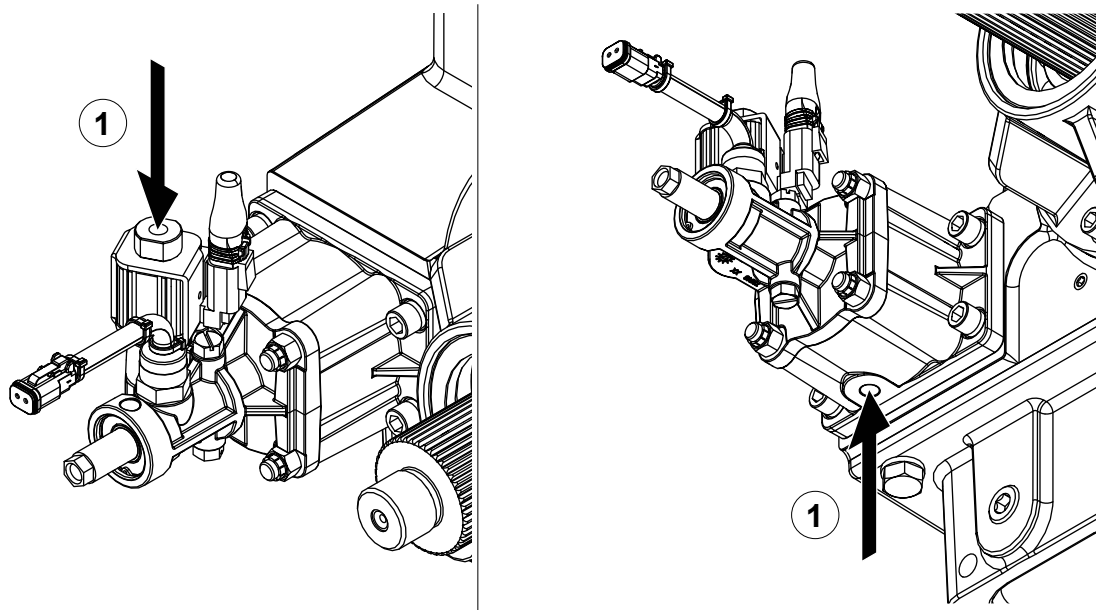


Use the illustration and instructions to mount the PTO.

Note: Refer to dimensional drawings for mounting hole spacing.

- 1 Use the case mounting holes to secure the PTO to the apparatus. Torque the hardware to 110 ft-lb (150 N·m).
- 2 Use the mounting bracket to secure the PTO to the apparatus.

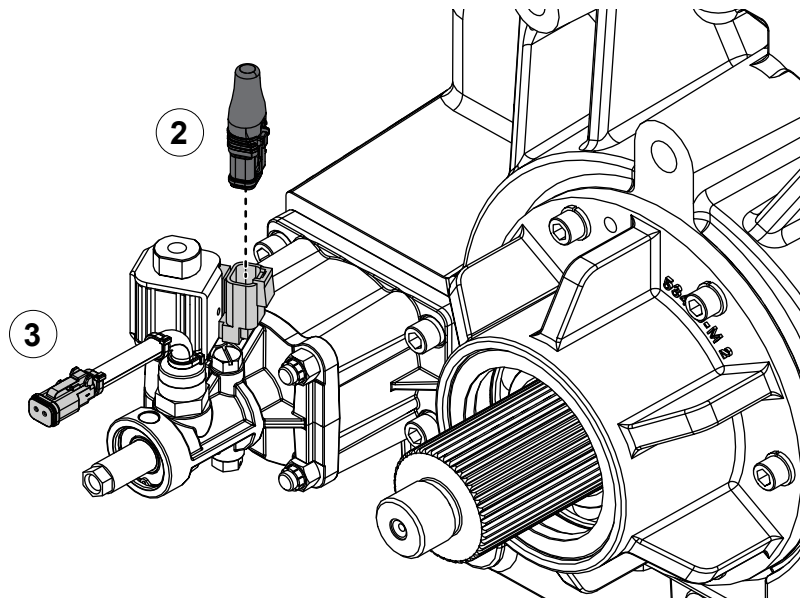
Connecting the Pneumatic Shift Unit



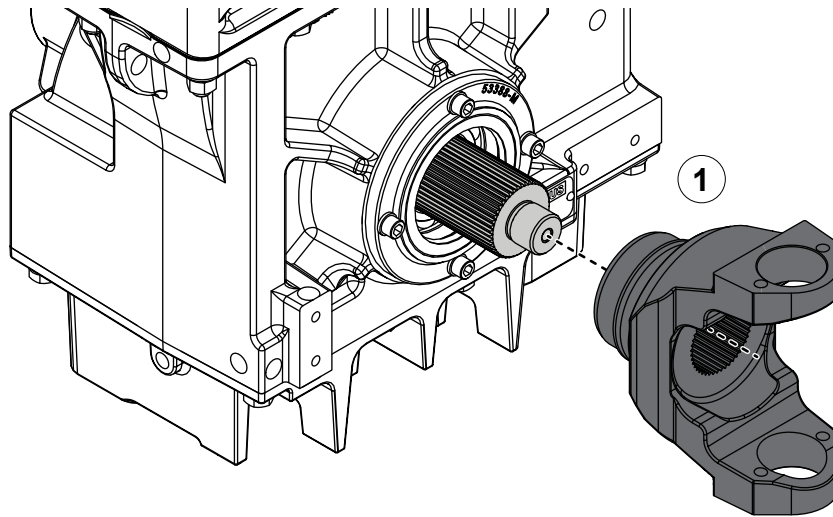
Use the illustrations and instructions to connect the pneumatic shift unit to the shift unit control panel and the engine speed control interlock system (ESCIS) on the apparatus.

Note: Refer to the installation instructions for the pneumatic shift unit for more information.

- 1 Connect the air supply tubing from the shift unit control panel to the ports on the pneumatic shift unit.
- 2 Connect the safety interlock solenoid to the ESCIS.
- 3 Connect the position switch to the ESCIS.



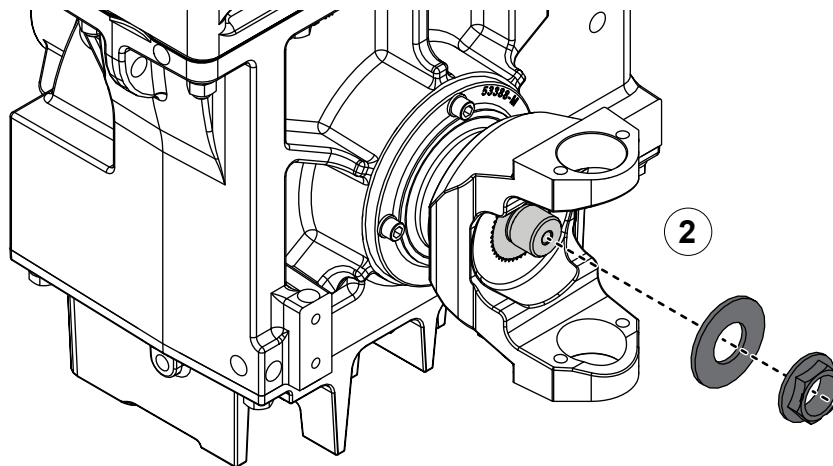
Installing the Driveline Couplers



Use the illustration and instructions to install the driveline couplers.

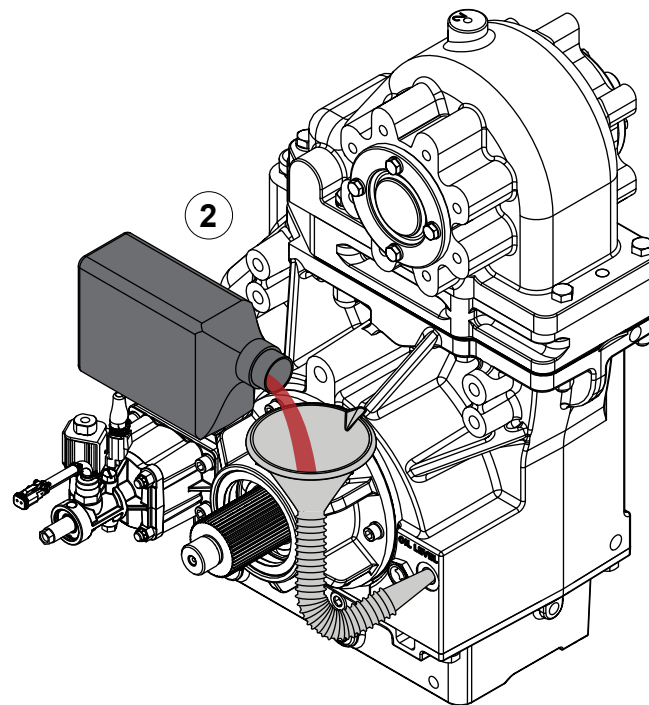
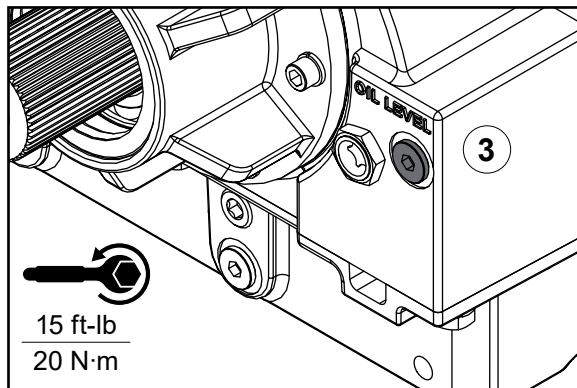
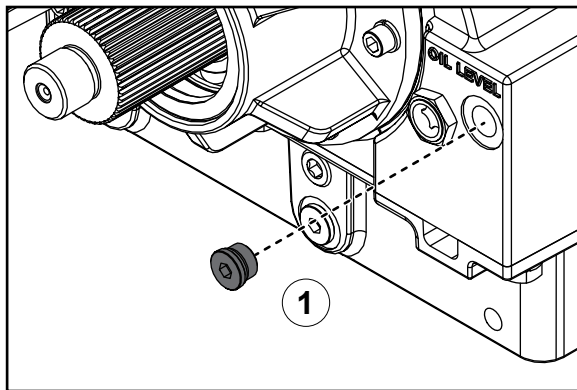
Note: *The type and number of couplers used will depend on your application.*

- 1 Install the appropriate driveline coupler onto the input shaft.
- 2 Apply anti-seize compound to the lock nut threads, then install the washer and lock nut onto the shaft.
- 3 If your configuration includes an output shaft, repeat the process to install the appropriate coupler onto the output shaft.



500 ft-lb
678 N·m

Adding Lubricant to the PTO



Use the illustrations and instructions to add lubricant to the PTO. The PTO capacity is approximately 6 qt (5.68 L). Use automatic transmission fluid that meets the requirements of DEXRON III or MERCON V.

- 1 Remove the oil fill plug.
- 2 Add lubricant to the PTO until it reaches halfway up the oil level sight plug.
Note: After pouring some lubricant into the case, allow it to settle before adding more to avoid over-filling.
- 3 Securely install the oil fill plug.
Note: Make sure that you do not over-tighten the plug.

WATEROUS

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