

MANUAL NUMBER X020224 | REVISION B | ENGLISH (US)

Endurance™ ProConnect® Displacement Pumps

High volume pump lowers for protective coatings. For professional use only.

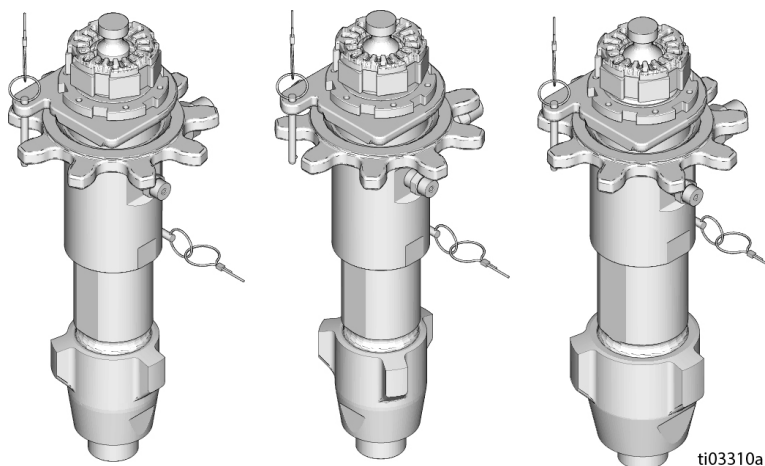


Important Safety Instructions

Read all warnings and instructions in this manual and all related manuals before using the equipment. Be familiar with the proper control and usage of the equipment. Save these instructions.



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C O N T E N T S

Models	3
Related Manuals	4
Safety Symbols	5
General Warnings	6
Technical Specifications	9
Pressure Relief Procedure (King E-Max XT)	10
Pressure Relief Procedure (King PC Sprayer)	12
Disassemble Pump	14
Assemble Pump	16
Throat Packing Adjustment	20
Endurance™ ProConnect® Displacement Pumps Parts	21
145 cc Parts	21
180 cc Parts	24
220 cc Parts	27
290 cc Parts	30
Repair Kits	33
Graco-Formulated UHMWPE/Leather	33
PTFE	34
Graco-Formulated UHMWPE/PTFE	35
Inlet Ball Spring Kits	36
Ceramic Ball Kits	36
California Proposition 65	37

MODELS

Part numbers reflect distinct features and characteristics of the Endurance™ ProConnect® Displacement Pumps.

Table 1-1: Models for Endurance ProConnect Displacement Pumps

MODEL	MAXIMUM WORKING PRESSURE	DISPLACEMENT	SPRAYER
2013811	7250 psi (50 MPa, 500 bar)	145 cc	King® PC
2009332			King E-Max
2013812		180 cc	King PC
2009333	6000 psi (41.3 MPa, 413 bar)	180 cc	King E-Max
2013813		220 cc	King PC
2009334	4000 psi (27.6 MPa, 276 bar)	220 cc	King E-Max
2013814	4500 psi (31 MPa, 310 bar)	290 cc	King PC
2013815	7250 psi (50 MPa, 500 bar)		

RELATED MANUALS


Additional documents are available to support the operation, repair, and maintenance of the Endurance™ ProConnect® Displacement Pumps. Find English manuals and any available translations at www.graco.com.

Table 2-1: Related Manuals for Endurance ProConnect Displacement Pumps Repair Manual X020224

ENGLISH MANUAL	DESCRIPTION
X021279	King® E-Max™ XT™ Electric Airless Sprayers, Operation
X040210	King® PC Spray Packages and Pumps, Instruction

SAFETY SYMBOLS

The following safety symbols appear throughout this manual and on warning labels. Read the table below to understand what each symbol means.

SYMBOL	MEANING	SYMBOL	MEANING
	Equipment Misuse Hazard		Do Not Stop Leaks with Hand, Body, Glove or Rag
	Fire and Explosion Hazard		Eliminate Ignition Sources
	Moving Parts Hazard		Follow Pressure Relief Procedure
	Skin Injection Hazard		Ground Equipment
	Skin Injection Hazard		Read Manual
	Splash Hazard		Ventilate Work Area
	Toxic Fluid or Fumes Hazard		Wear Personal Protective Equipment
	Do Not Place Hands or Other Body Parts Near Fluid Outlet		



Safety Alert Symbol

This symbol indicates: Attention! Become Alert! Look for this symbol throughout the manual to indicate important safety messages.

GENERAL WARNINGS

The following warnings apply throughout this manual. Read, understand, and follow the warnings before using this equipment. Failure to follow these warnings can result in serious injury.



WARNING



FIRE AND EXPLOSION HAZARD

Flammable fumes, such as solvent and paint fumes, **in work area** can ignite or explode. Paint or solvent flowing through the equipment can cause static sparking. To help prevent fire and explosion:



- Use equipment only in well-ventilated area.



- Eliminate all ignition sources, such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static sparking).



- Ground all equipment in the work area. See **Grounding** instructions.
- Never spray or flush solvent at high pressure.
- Keep work area free of debris, including solvent, rags and gasoline.
- Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present.
- Use only grounded hoses.
- Hold gun firmly to side of grounded pail when triggering into pail. Do not use pail liners unless they are anti-static or conductive.
- **Stop operation immediately** if static sparking occurs or you feel a shock. Do not use equipment until you identify and correct the problem.
- Keep a working fire extinguisher in the work area.



SKIN INJECTION HAZARD

High-pressure fluid from gun, hose leaks, or ruptured components will pierce skin. This may look like just a cut, but it is a serious injury that can result in amputation. **Get immediate surgical treatment.**



- Do not spray without tip guard and trigger guard installed.



- Engage trigger lock when not spraying.



- Do not point gun at anyone or at any part of the body.









- Do not put your hand over the spray tip.

- Do not stop or deflect leaks with your hand, body, glove, or rag.

- Follow the **Pressure Relief Procedure** when you stop spraying and before cleaning, checking, or servicing equipment.

- Tighten all fluid connections before operating the equipment.

- Check hoses and couplings daily. Replace worn or damaged parts immediately.

 WARNING	
 	<p>MOVING PARTS HAZARD</p> <p>Moving parts can pinch, cut, or amputate fingers and other body parts.</p> <ul style="list-style-type: none"> • Keep clear of moving parts. • Do not operate equipment with protective guards or covers removed. • Equipment can start without warning. Before checking, moving, or servicing equipment, follow the Pressure Relief Procedure and disconnect all power sources.
 	<p>EQUIPMENT MISUSE HAZARD</p> <p>Misuse can cause death or serious injury.</p> <ul style="list-style-type: none"> • Do not operate the unit when fatigued or under the influence of drugs or alcohol. • Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See Technical Specifications in all equipment manuals. • Use fluids and solvents that are compatible with equipment wetted parts. See Technical Specifications in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request Safety Data Sheets (SDSs) from distributor or retailer. • Do not leave the work area while equipment is energized or under pressure. • Turn off all equipment and follow the Pressure Relief Procedure when equipment is not in use. • Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only. • Do not alter or modify equipment. Alterations or modifications may void agency approvals and create safety hazards. • Make sure all equipment is rated and approved for the environment in which you are using it. • Use equipment only for its intended purpose. Call your distributor for information. • Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces. • Do not kink or overbend hoses or use hoses to pull equipment. • Keep children and animals away from work area. • Comply with all applicable safety regulations.
	<p>TOXIC FLUID OR FUMES HAZARD</p> <p>Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.</p> <ul style="list-style-type: none"> • Read Safety Data Sheets (SDSs) to know the specific hazards of the fluids you are using. • Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.



WARNING



PERSONAL PROTECTIVE EQUIPMENT

Wear appropriate protective equipment when in the work area to help prevent serious injury, including eye injury, hearing loss, inhalation of toxic fumes, and burns. Protective equipment includes but is not limited to:

- Protective eyewear and hearing protection.
- Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer.

TECHNICAL SPECIFICATIONS

The table provides important information related to the Endurance™ ProConnect® Displacement Pumps, including product attributes, measurements, and performance characteristics that support the use of the equipment.

Table 5-1: Technical Specifications for Endurance ProConnect Displacement Pumps

	US	METRIC
Maximum operating temperature*	180°F	82°C
Stroke length	4.75 in.	12.06 cm
Maximum fluid working pressure		
2013811	7250 psi	50 MPa, 500 bar
2009332		
2013812		
2009333	6000 psi	41.3 MPa, 413 bar
2009334	4000 psi	27.6 MPa, 276 bar
2013813	6000 psi	41.3 MPa, 413 bar
2013814	4500 psi	31 MPa, 310 bar
2013815	7250 psi	50 MPa, 500 bar
Nominal displacement per cycle*		
2013811	145 cc	
2009332		
2013812	180 cc	
2009333		
2009334	220 cc	
2013813		
2013814	290 cc	
2013815		
Wetted Parts		
Carbon Steel; Alloy Steel; 304, 440 and 17-4 PH Grades of Stainless Steel; Zinc and Nickel Plating; Ductile Iron; Tungsten Carbide; PTFE; Leather		
Notes		
* Do not dry stroke the unit.		
All trademarks or registered trademarks are the property of their respective owners.		

PRESSURE RELIEF PROCEDURE (KING E-MAX XT)

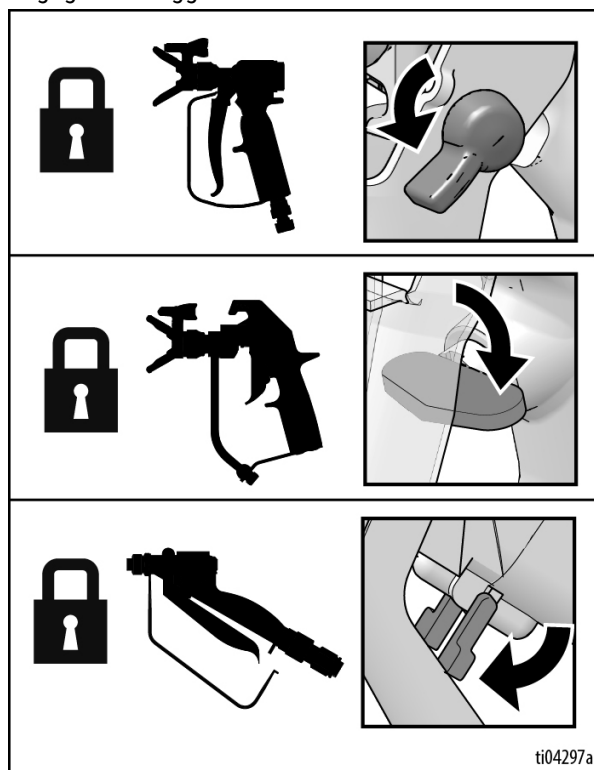
Relieve pressure on the King® E-Max XT™ Sprayer when operation is stopped, and before cleaning, checking, or servicing the equipment.



Follow the Pressure Relief Procedure whenever you see this symbol.

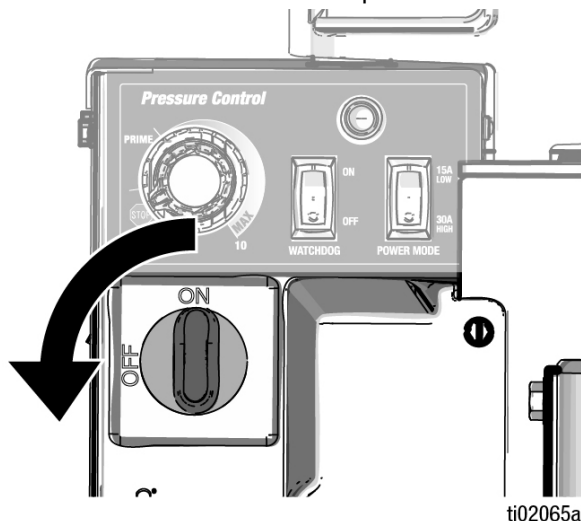
WARNING				
<p>This equipment stays pressurized until pressure is manually relieved. To help prevent serious injury from pressurized fluid, such as skin injection, splashing fluid and moving parts, follow the Pressure Relief Procedure whenever sprayer is stopped and before sprayer is cleaned or checked, and before equipment is serviced.</p>				

1. Engage the Trigger Lock.



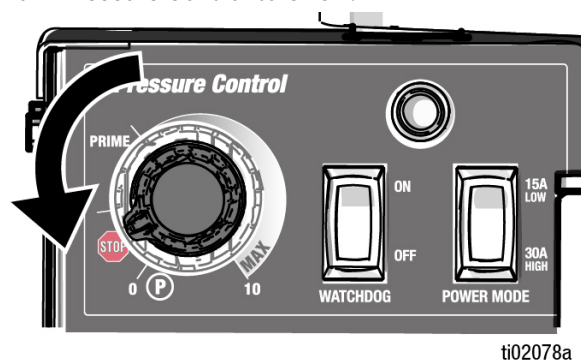
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2. Turn ON/OFF Switch to the **OFF** position.



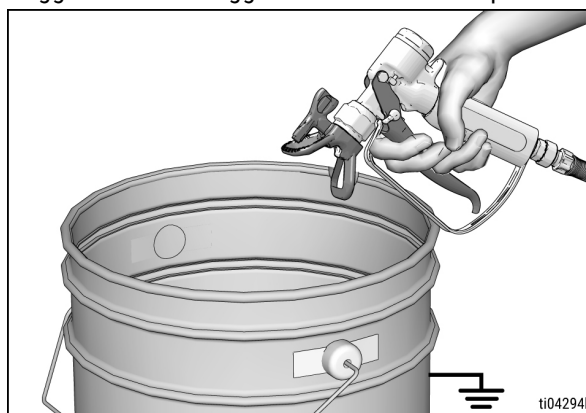
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3. Turn Pressure Control to **STOP**.



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4. Hold a metal part of the Gun firmly to a grounded metal pail. Point Gun into pail. Disengage the Trigger Lock and trigger the Gun to relieve pressure.

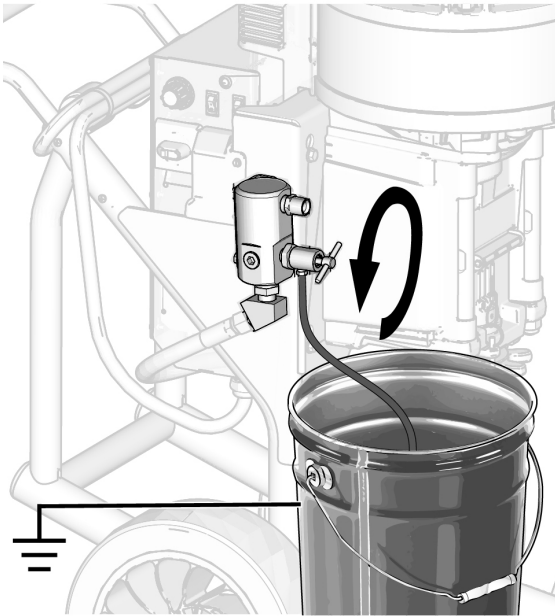


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5. Engage the Trigger Lock.

PRESSURE RELIEF PROCEDURE (KING E-MAX XT)

6. Drain fluid. To drain fluid, slowly open Fluid Drain/Purge Valve into a waste pail. Close valve after fluid is drained.



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7. If you suspect the Spray Tip or hose is clogged or that pressure has not been fully relieved:
 - a. Using a wrench, VERY SLOWLY loosen the Tip Guard retaining nut or the hose end coupling to relieve pressure gradually.
 - b. Using a wrench, loosen the nut or coupling completely.
 - c. Clear hose or tip obstruction.

PRESSURE RELIEF PROCEDURE (KING PC SPRAYER)

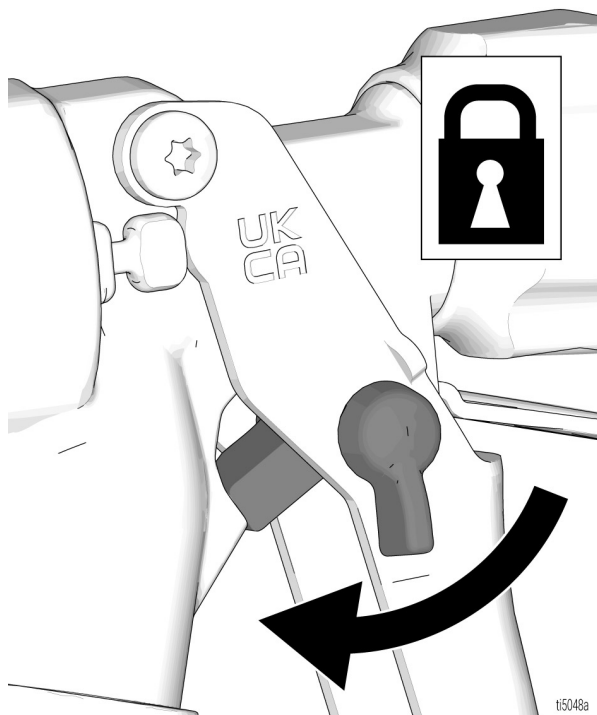
Relieve pressure on the King® PC Sprayer when operation is stopped, and before cleaning, checking, or servicing the equipment.



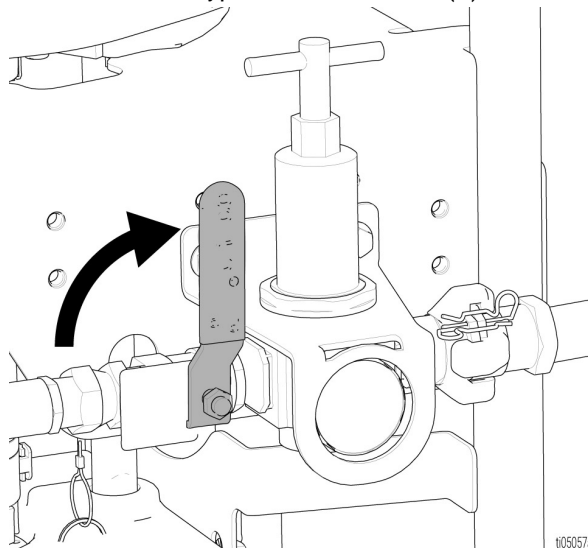
Follow the Pressure Relief Procedure whenever you see this symbol.

! WARNING				
<p>This equipment stays pressurized until pressure is manually relieved. To help prevent serious injury from pressurized fluid, such as skin injection, splashing fluid and moving parts, follow the Pressure Relief Procedure when you stop spraying and before cleaning, checking, or servicing the equipment.</p>				

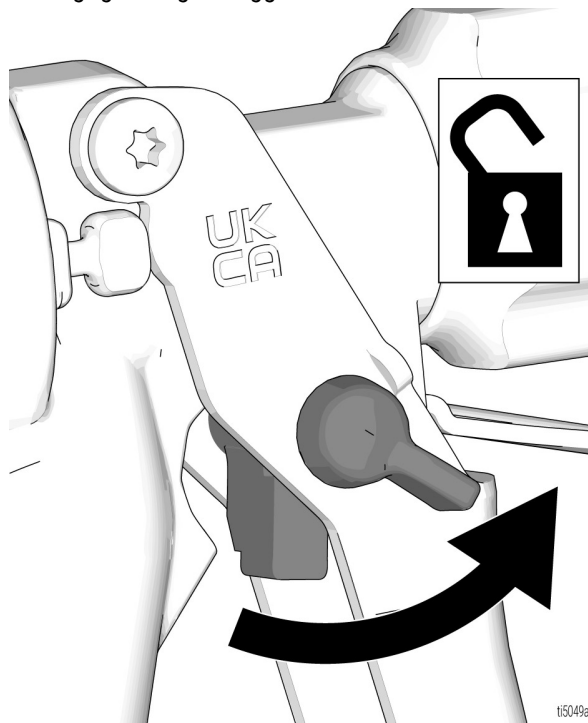
1. Engage the gun trigger lock.



2. Close the Bleed-Type Master Air Valve (B).



3. Disengage the gun trigger lock.

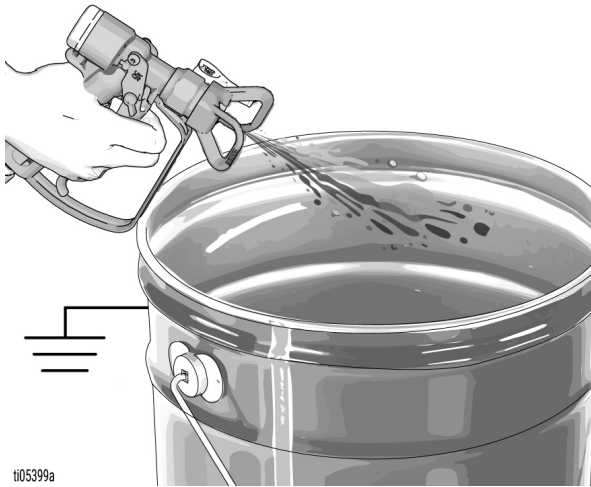


NOTE:

If using an air-assisted gun, turn the gun air regulator counterclockwise to relieve pressure.

PRESSURE RELIEF PROCEDURE (KING PC SPRAYER)

4. Hold a metal part of the gun firmly to a grounded metal pail. Trigger the gun until pressure is relieved.

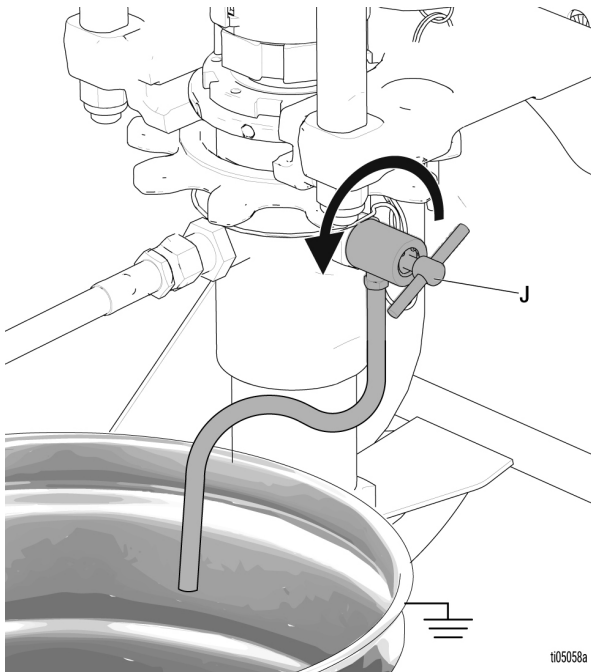


NOTE:

If fluid does not flow from the gun, see **Clear Tip Clogs**.

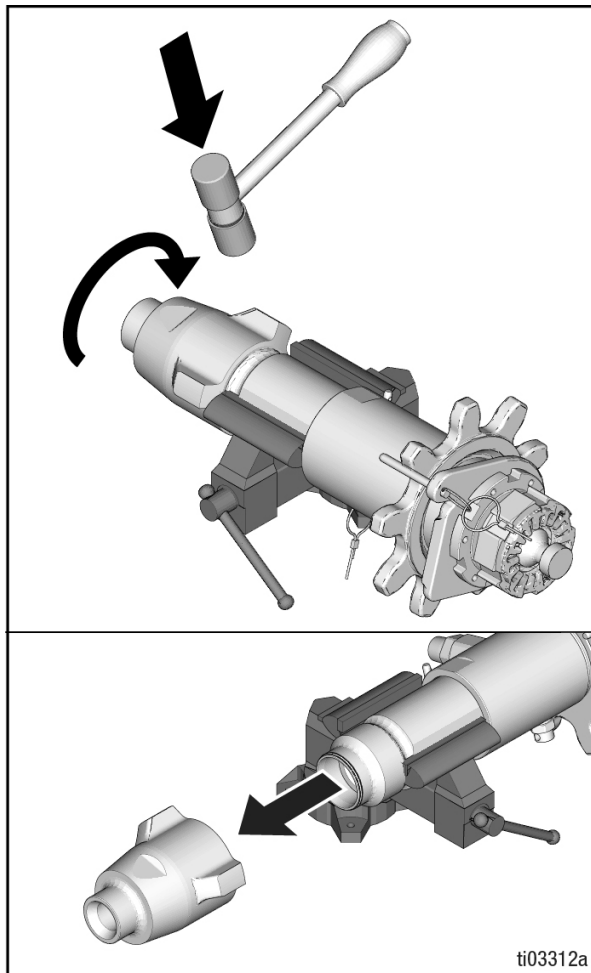
7. If you suspect the spray tip or hose is clogged or that pressure has not been fully relieved:
 - a. Using a wrench, VERY SLOWLY loosen the tip guard retaining nut or the hose end coupling to relieve pressure gradually.
 - b. Using a wrench, loosen the nut or coupling completely.
 - c. Clear obstruction in the hose or tip.

5. Engage the gun trigger lock.
6. Drain fluid by slowly opening all fluid drain valves, including the Fluid Drain/Purge Valve/Second Fluid Outlet (J), into a waste pail. If there is a return tube, open return line ball valve. Close valve after fluid is drained.

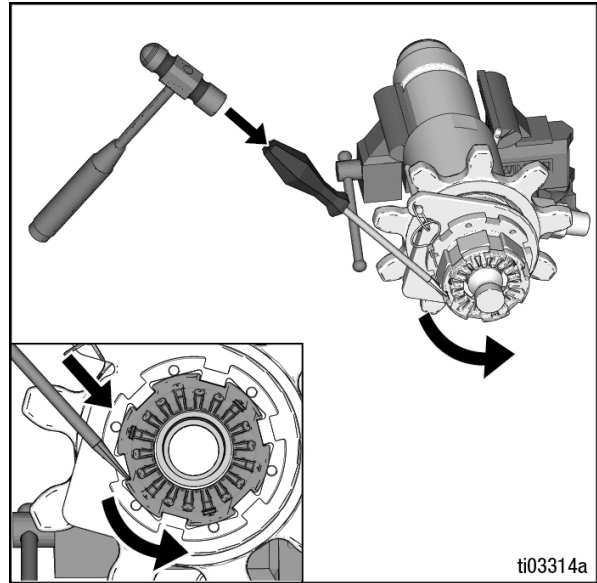


DISASSEMBLE PUMP

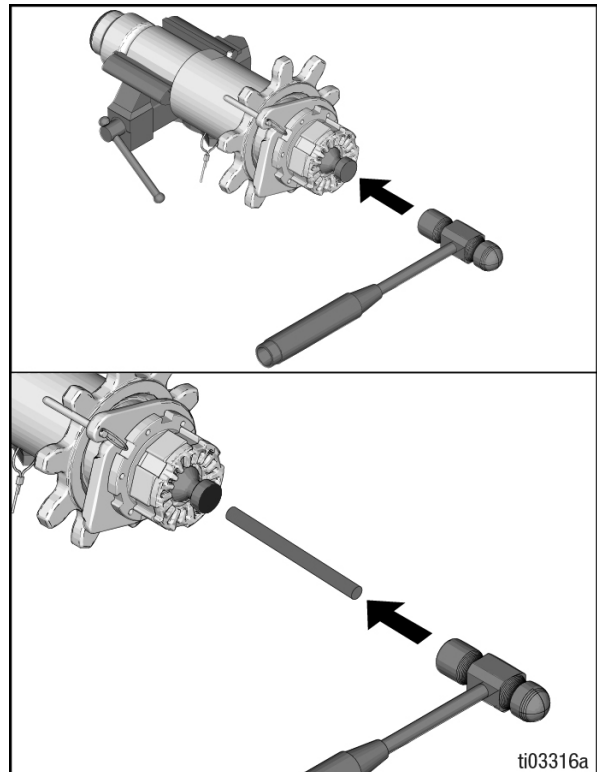
1. Perform the **Pressure Relief Procedure**.
2. Remove the pump (see your sprayer manual).
3. Unscrew cylinder from intake valve.



4. Loosen and remove packing nut.

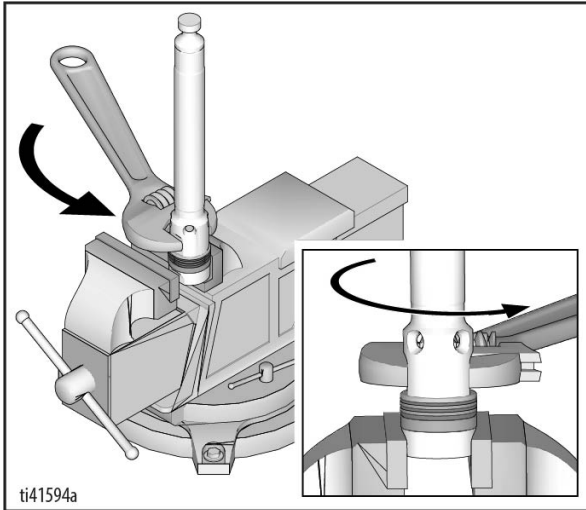


5. Tap piston rod out of cylinder with a plastic hammer being careful of the threads. Use a thin, soft rod if necessary.

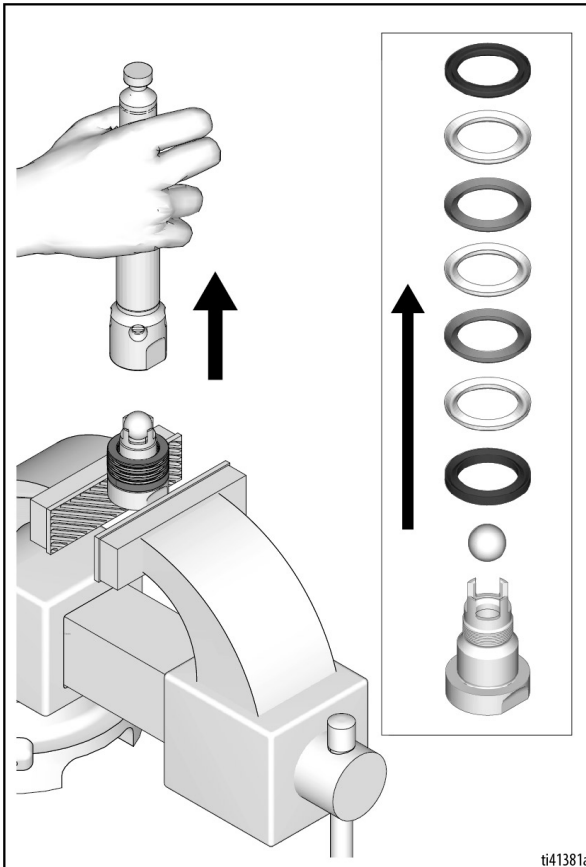


DISASSEMBLE PUMP

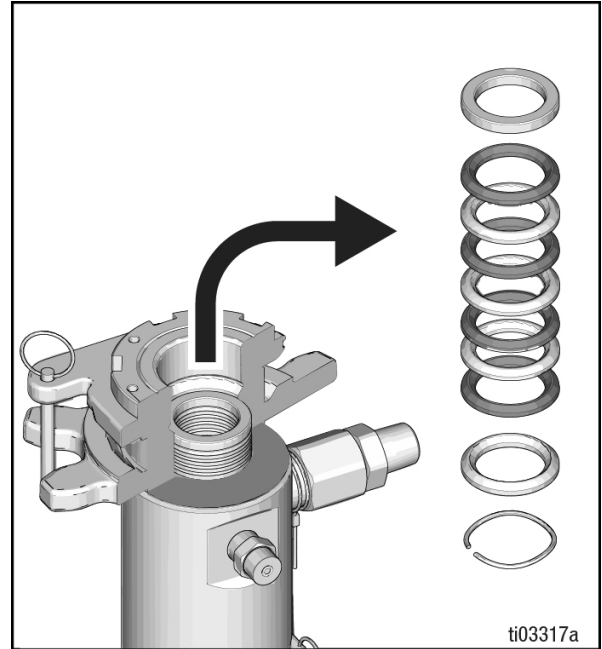
6. Unscrew displacement rod from piston valve.



7. Remove displacement rod from piston. Clean and inspect parts.



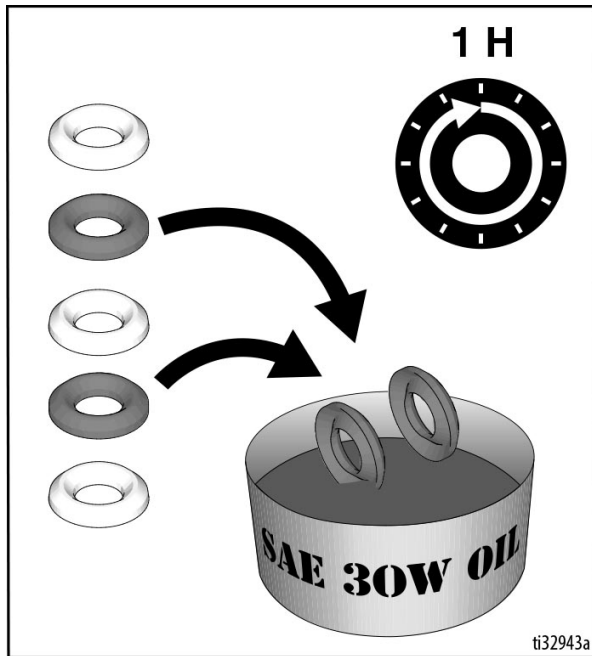
8. Remove and discard throat packing and glands from the cylinder.



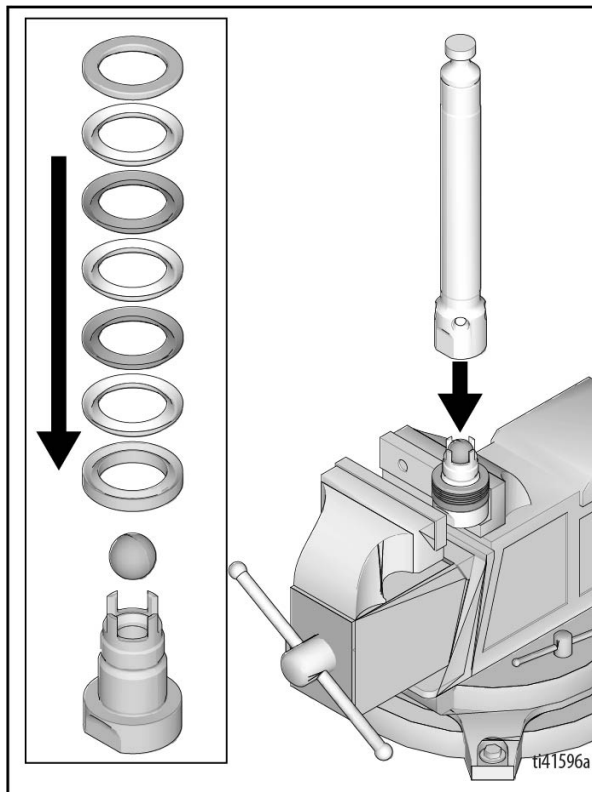
9. Clean all parts with compatible solvent.

ASSEMBLE PUMP

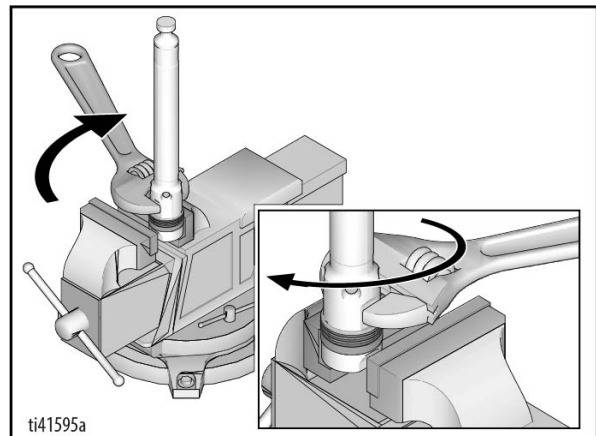
1. If applicable, soak leather packings in SAE 30W oil for 1 hour before assembly.



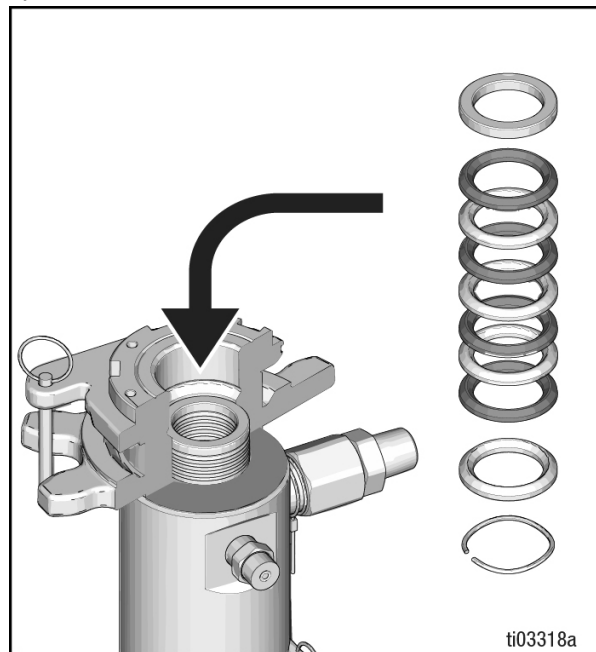
2. Assemble packings, then apply anti-seize to threads and assemble ball to piston and piston rod.



3. Torque piston and piston rod together. For torque values, see **Parts** section.

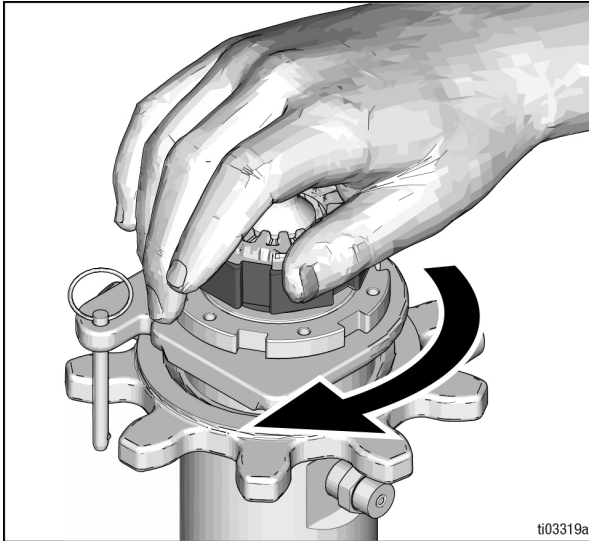


4. Assemble throat packings and place in pump cylinder.

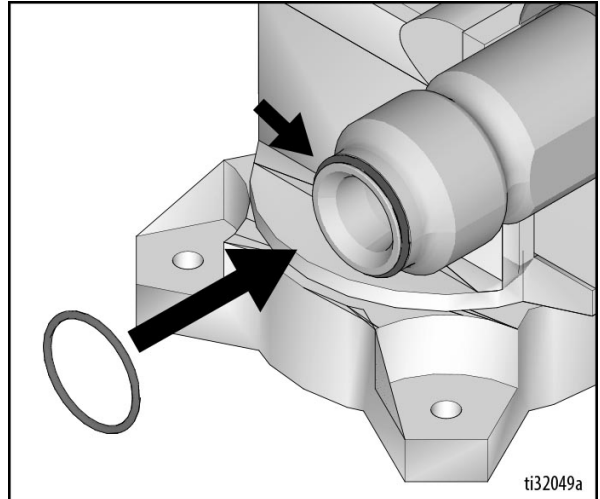


ASSEMBLE PUMP

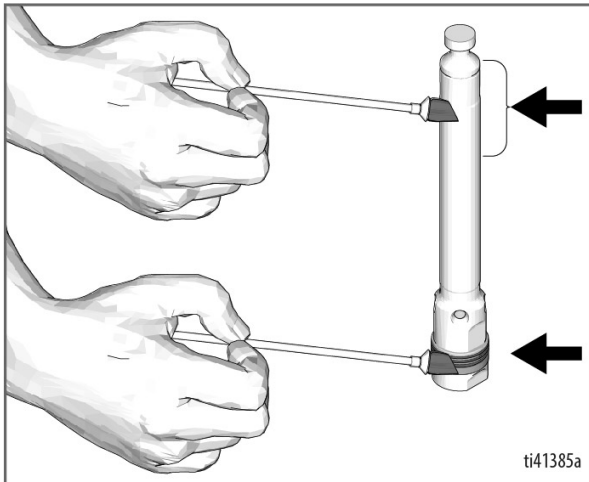
5. Hand-screw packing nut to retain packings during rod assembly.



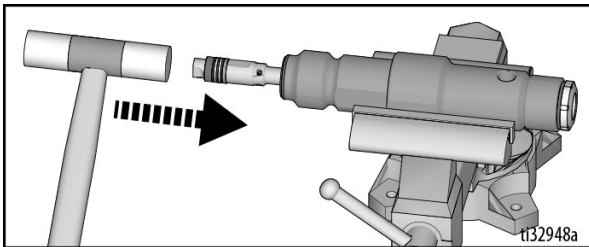
8. Grease o-ring and place on outside diameter ring groove.



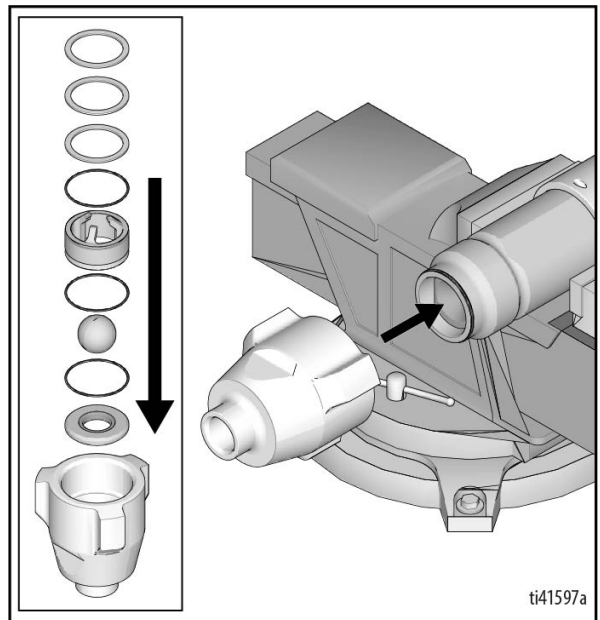
6. Apply liberal amounts of grease or oil to piston packings. Grease top inch or two of piston rod that will go through the cylinder throat packings.



7. Gently guide displacement rod up through throat packings. Tap bottom of piston valve as necessary with a leather or plastic hammer.

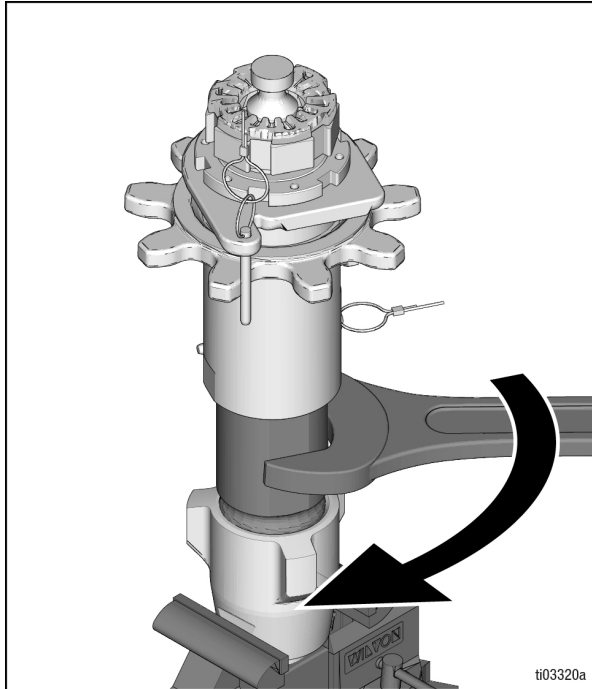


9. Clean seat thoroughly. Reassemble intake valve with a seat, ball, and new o-ring. Seat may be flipped over and used on other side.

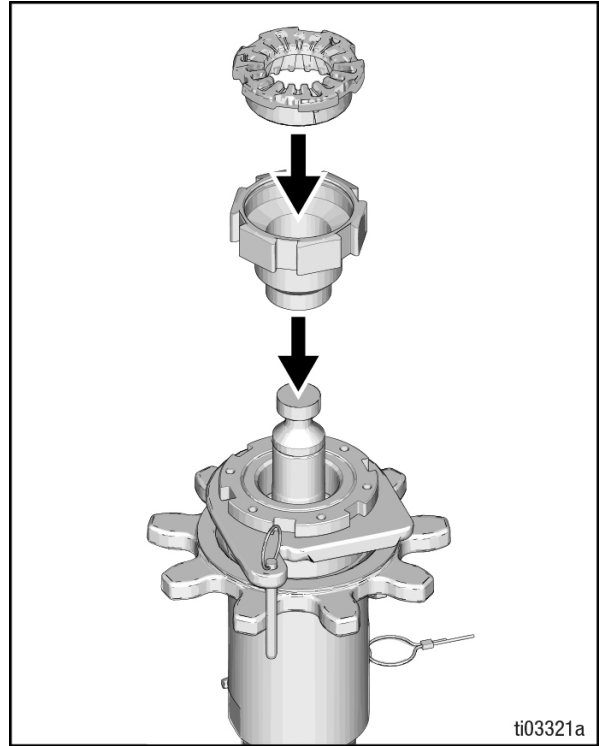


ASSEMBLE PUMP

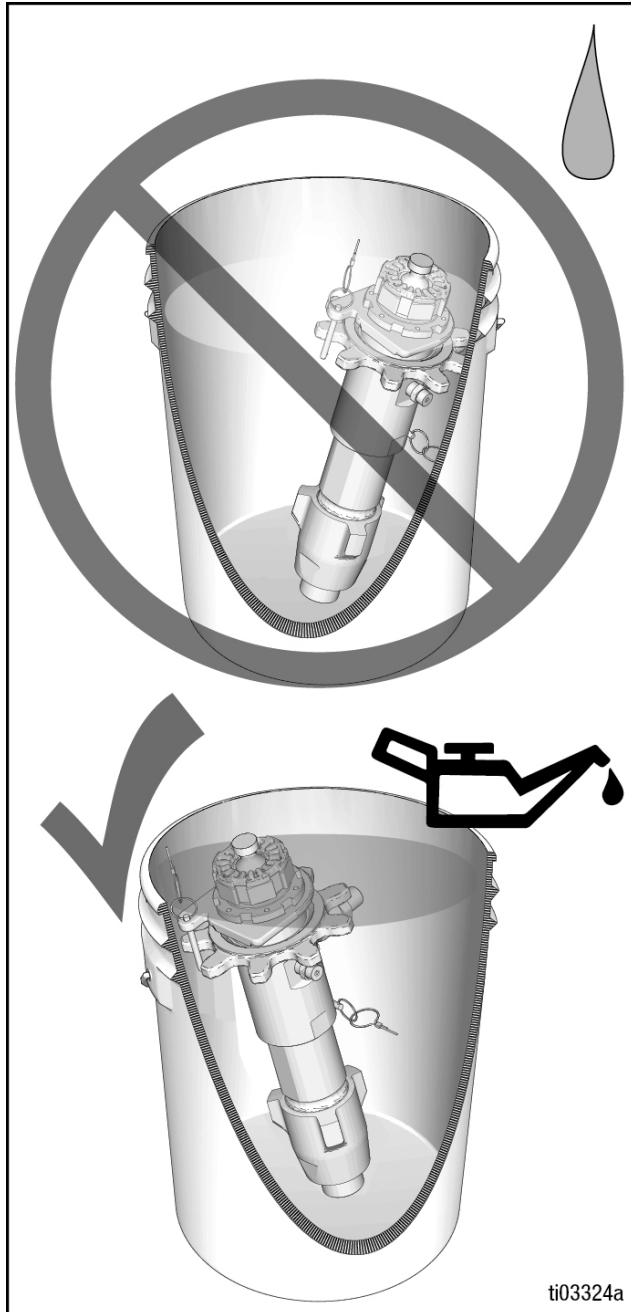
10. Torque foot valve. For torque values, see **Parts** section.



11. Install TSL Retainer. Torque packing nut to torque values listed in **Parts** section.

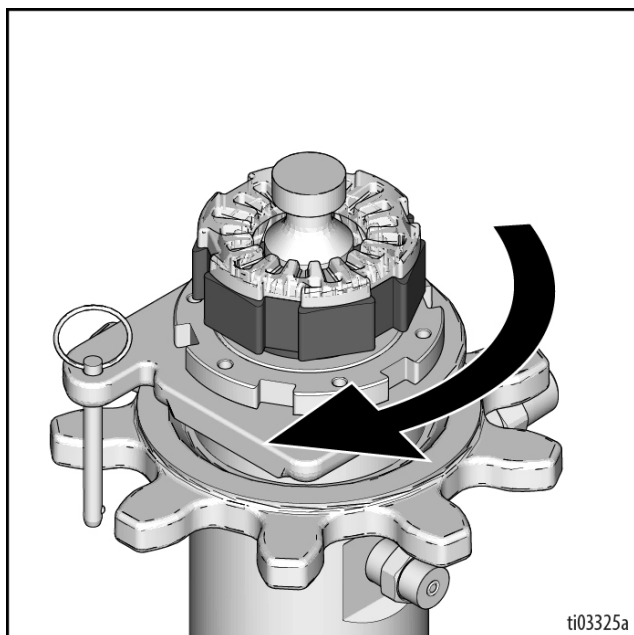


STORAGE



THROAT PACKING ADJUSTMENT

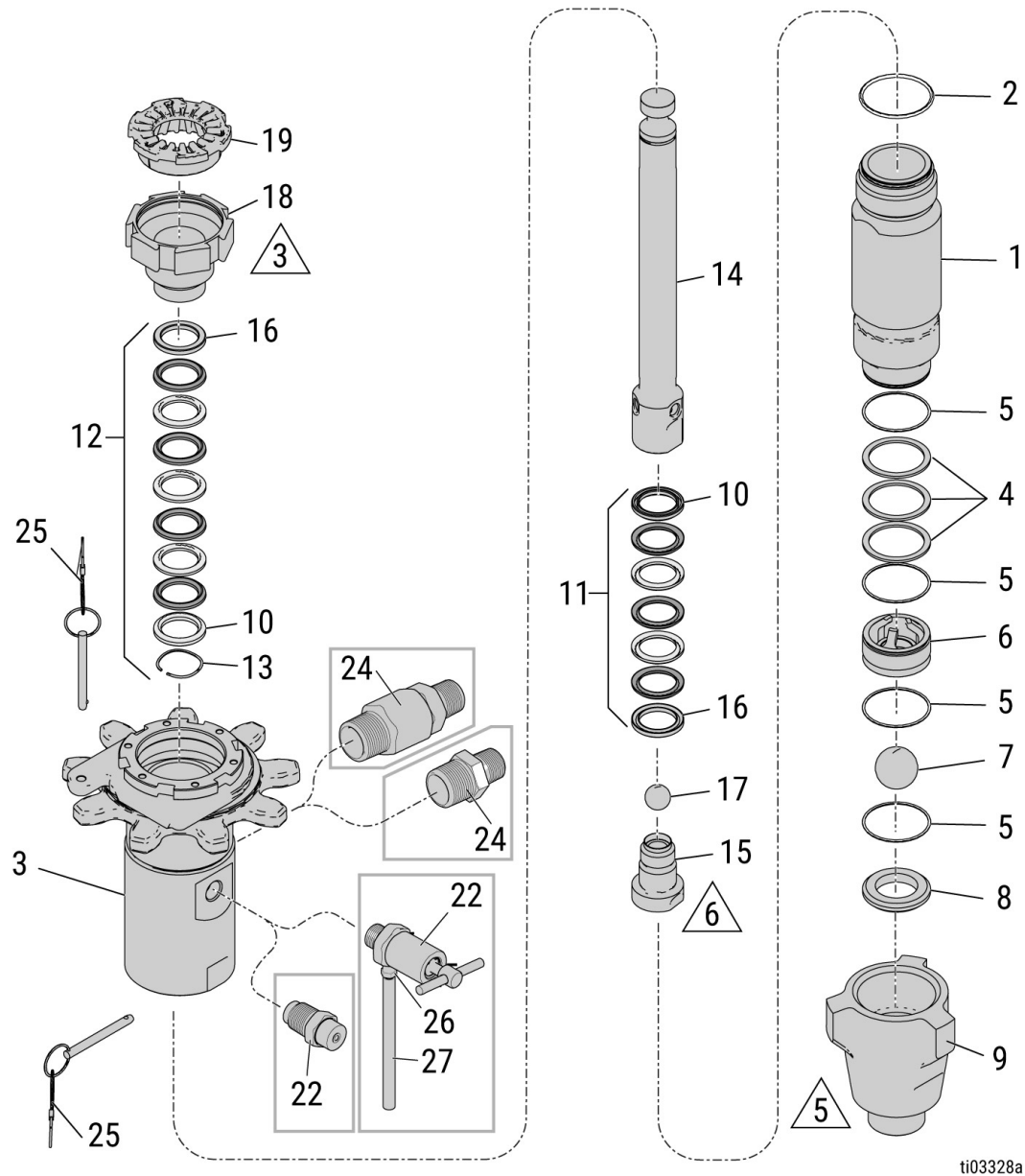
When pump packings begin to leak after much use, perform the **Pressure Relief Procedure**, and tighten packing nut until leakage stops or lessens. This allows for additional operation before a repacking is required.



ENDURANCE™ PROCONNECT® DISPLACEMENT PUMPS PARTS

The parts illustrations and lists show the components of the Endurance ProConnect Displacement Pumps and their connections that are required for assembly, repair, and maintenance.

145 CC PARTS



△3 70-80 ft-lb (95-108 N·m)

△5 135-150 ft-lb (183-203 N·m)

△6 105-145 ft-lb (155-185 N·m)

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ENDURANCE™ PROCONNECT® DISPLACEMENT PUMPS PARTS

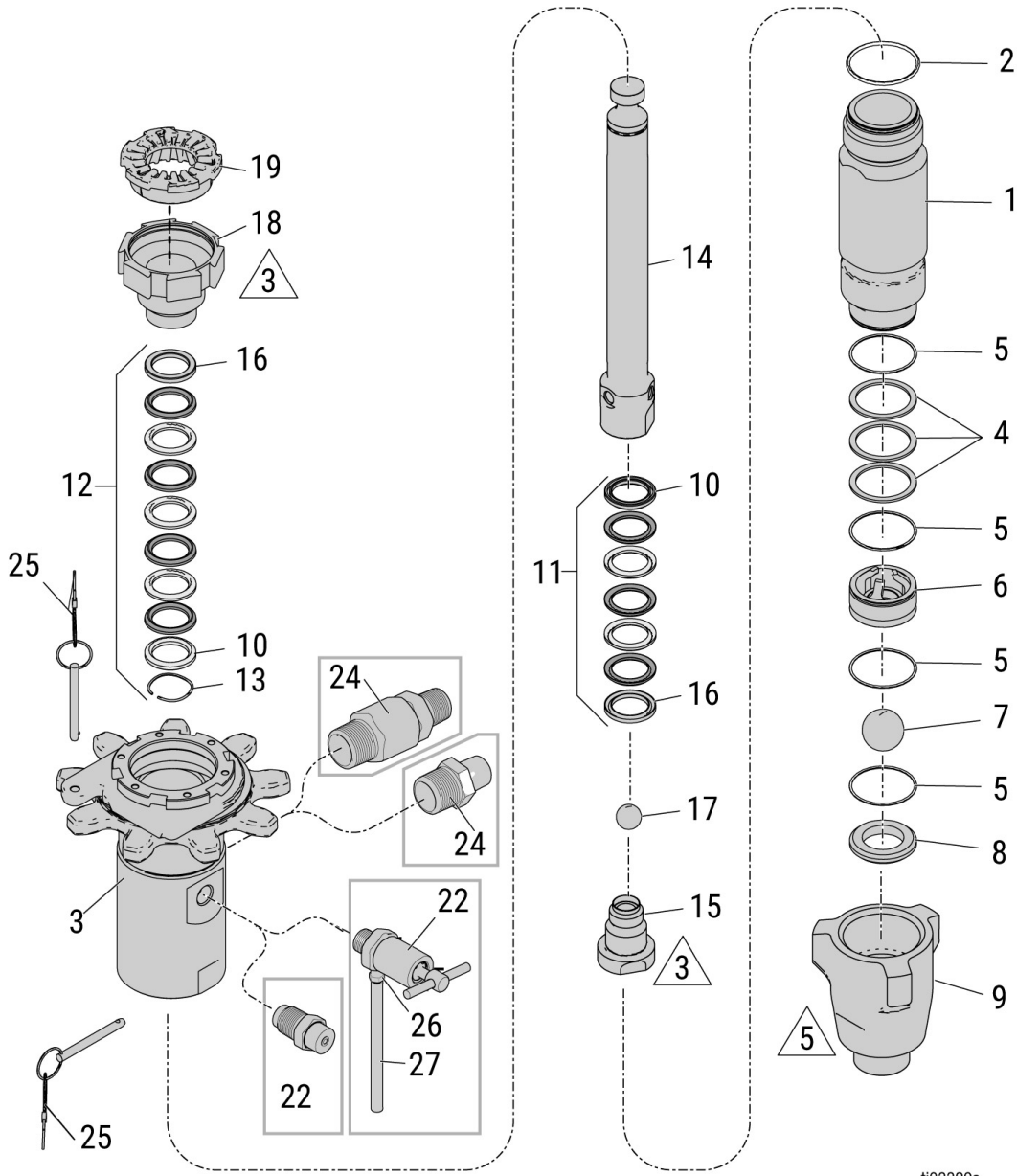
PARTS LIST

REF.	PART	DESCRIPTION	QTY.	
			2009332	2013811
1	2007078	CYLINDER, pump	1	1
2	244892	PACKING, o-ring (pack of 10)	1	1
3	2010846	HOUSING, outlet	1	
	2013816	HOUSING, outlet		1
4	244855	SHIM, inlet (pack of 9)	3	3
5	244890	PACKING, o-ring, PTFE (pack of 10)	4	4
6	198646	GUIDE, ball	1	1
7	245128	BALL, metallic (pack of 3)	1	1
8	2007056	SEAT, carbide	1	1
9	2007069	HOUSING, inlet	1	1
10	17G919	GLAND, packing, male	2	2
11	see repair kits	PACKING, piston packings	7	7
12	see repair kits	PACKING, throat packings	5	5
13	17G974	SPRING, wave	1	1
14	2006286	ROD, displacement	1	1
15	2006281	VALVE, piston, 145 cc	1	1
16	17G897	GLAND, packing, female	2	2
17	253029	BALL (pack of 3)	1	1
18	15K030	NUT, packing	1	1
19	2003199	PLUG, throat seal	1	
	247394	PLUG, throat seal		1
22	2012645	HOUSING, rupture, disc	1	
	245143	VALVE, pressure dump		1
24	2010828	KIT, valve, check, outlet pump	1	
	16R883	FITTING, nipple, reducing, 3/4 x 1/2		1
25	244826	PIN, self-locking	2	2
26	116746	FITTING, barbed, plated		1

ENDURANCE™ PROCONNECT® DISPLACEMENT PUMPS PARTS

REF.	PART	DESCRIPTION	QTY.	
			2009332	2013811
27	116750	TUBE, nylon		1

180 CC PARTS



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△ 3 150-145 ft-lb (155-185 N·m)

△ 5 135-150 ft-lb (183-203 N·m)

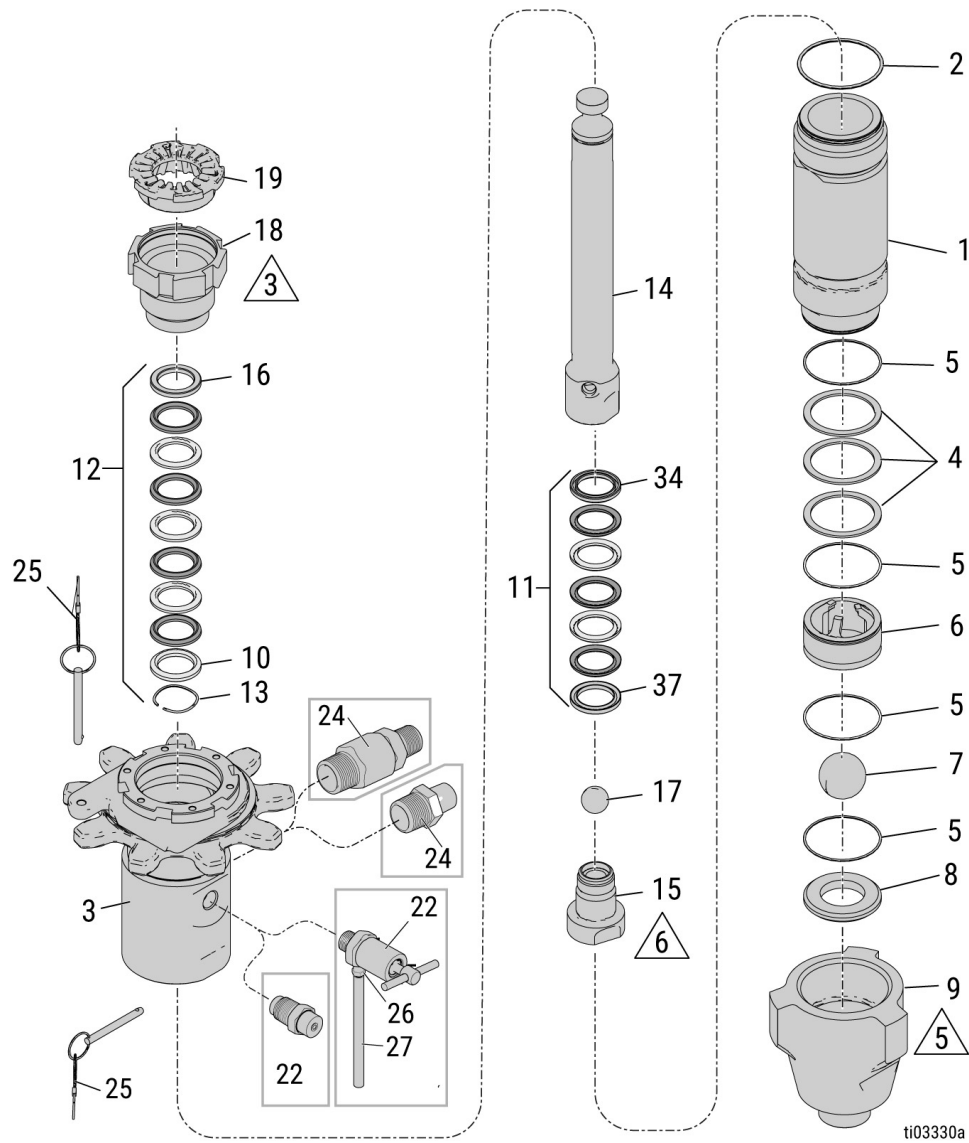
PARTS LIST

REF.	PART	DESCRIPTION	QTY.	
			2009333	2013812
1	2007060	CYLINDER, pump	1	1
2	244892	PACKING, o-ring (pack of 10)	1	1
3	2010847	HOUSING, outlet	1	1
	2013817	HOUSING, outlet		1
4	244855	SHIM, inlet (pack of 9)	3	3
5	244890	PACKING, o-ring, PTFE (pack of 10)	4	4
6	198646	GUIDE, ball	1	1
7	245128	BALL, metallic (pack of 3)	1	1
8	2007056	SEAT, carbide	1	1
9	2007069	HOUSING, inlet	1	1
10	17G931	GLAND, packing, male	2	2
11	see repair kits	PACKING, piston packings	7	7
12	see repair kits	PACKING, throat packings	5	5
13	17G975	SPRING, wave	1	1
14	2006287	ROD, displacement	1	1
15	2006282	VALVE, piston, 180 cc	1	1
16	17G898	GLAND, packing, female	2	2
17	253029	BALL (pack of 3)	1	1
18	15K030	NUT, packing	1	1
19	2003199	PLUG, throat seal	1	
	247394	PLUG, throat seal		1
22	2012645	HOUSING, rupture, disc	1	
	245143	VALVE, pressure dump		1
24	2010828	KIT, valve, check, outlet pump	1	
	16R883	FITTING, nipple, reducing, 3/4 x 1/2		1
25	244826	PIN, self-locking	2	2
26	116746	FITTING, barbed, plated		1

ENDURANCE™ PROCONNECT® DISPLACEMENT PUMPS PARTS

REF.	PART	DESCRIPTION	QTY.	
			2009333	2013812
27	116750	TUBE, nylon		1

220 CC PARTS



△ 3 105-145 ft-lb (155-185 N·m)

△ 5 135-150 ft-lb (183-203 N·m)

△ 6 160-240 ft-lb (220-320 N·m)

ENDURANCE™ PROCONNECT® DISPLACEMENT PUMPS PARTS

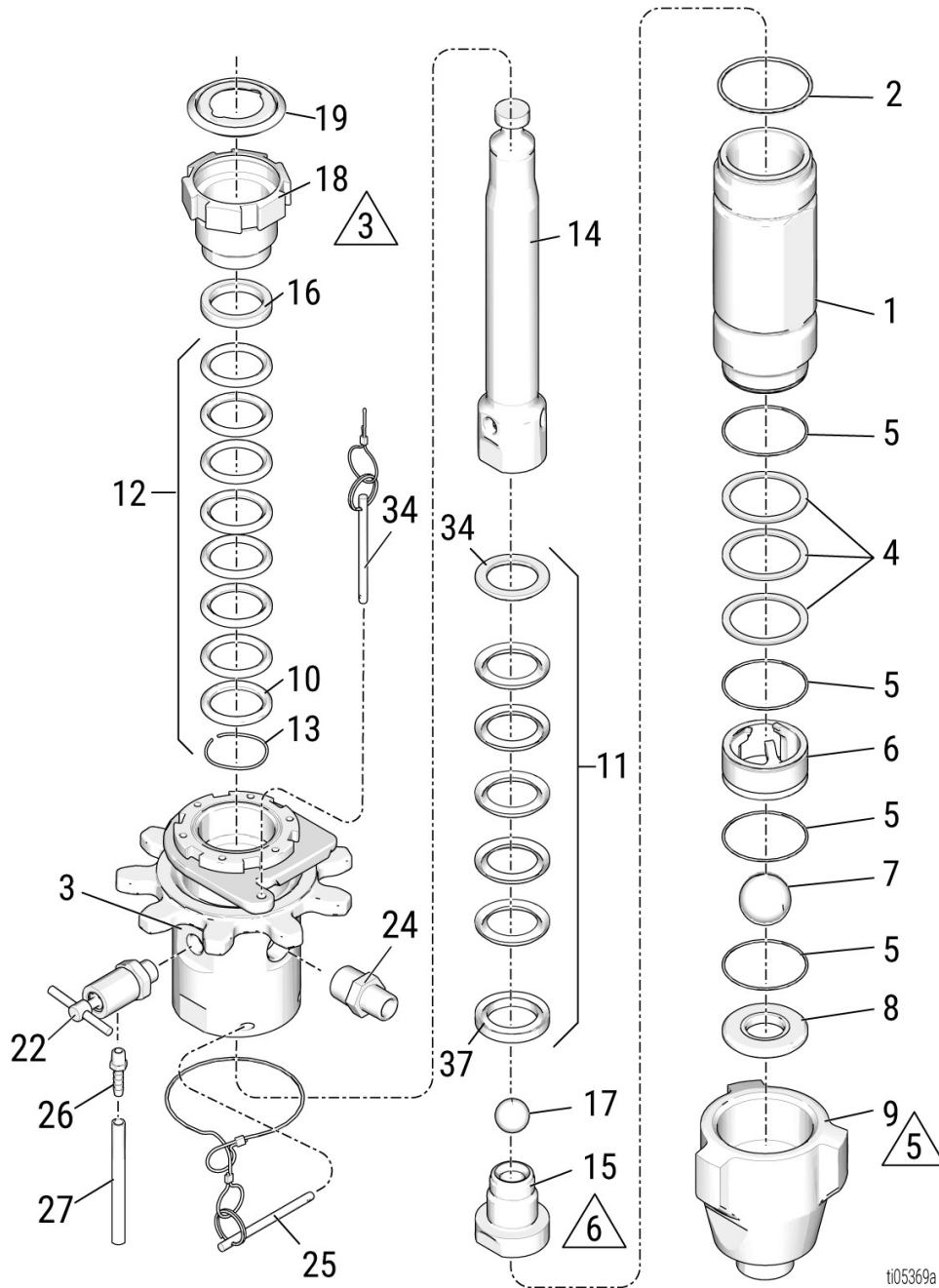
PARTS LIST

REF.	PART	DESCRIPTION	QTY.	
			2009334	2013813
1	2007070	CYLINDER, pump	1	1
2	244893	PACKING, o-ring (pack of 10)	1	1
3	2010848	HOUSING, outlet	1	
	2013818	HOUSING, outlet		1
4	244856	SHIM, inlet (pack of 9)	3	3
5	244894	PACKING, o-ring (pack of 10)	4	4
6	2007062	GUIDE, ball, 1.5 in., spring load	1	1
7	253030	BALL, metallic (pack of 3)	1	1
8	2007055	SEAT, carbide	1	1
9	2007072	HOUSING, inlet	1	1
10	17G932	GLAND, packing, male	1	1
11	see repair kits	PACKING, piston packings	4	4
12	see repair kits	PACKING, throat packings	3	3
13	17G976	SPRING, wave	1	1
14	2006288	ROD, displacement	1	1
15	2006283	VALVE, piston, 220 cc	1	1
16	17G899	GLAND, packing, female	1	1
17	244898	BALL (pack of 3)	1	1
18	15K031	NUT, packing	1	1
19	2003199	PLUG, throat seal	1	
	247395	PLUG, throat seal		1
22	2012645	HOUSING, rupture, disc	1	
	245143	VALVE, pressure dump		1
24	2010828	KIT, valve, check, outlet pump	1	
	16R883	FITTING, nipple, reducing, 3/4 x 1/2		1
25	244826	PIN, self-locking	2	2
26	116746	FITTING, barbed, plated		1

ENDURANCE™ PROCONNECT® DISPLACEMENT PUMPS PARTS

REF.	PART	DESCRIPTION	QTY.	
			2009334	2013813
27	116750	TUBE, nylon		1
34	17G933	GLAND, packing, male	1	1
37	17G910	GLAND, packing, female	1	1

290 CC PARTS



△ 3 105-145 ft-lb (155-185 N·m)

△ 5 135-150 ft-lb (183-203 N·m)

△ 6 160-240 ft-lb (220-320 N·m)

ti05369a

PARTS LIST

REF.	PART	DESCRIPTION	QTY.	
			2013814	2013815
1	2007075	CYLINDER, pump	1	
	2007089	CYLINDER, pump		1
2	244893	PACKING, o-ring (pack of 10)	1	1
3	2013818	HOUSING, outlet	1	
	2013819	HOUSING, outlet		1
4	244856	SHIM, inlet (pack of 9)	3	3
5	244894	PACKING, o-ring (pack of 10)	4	4
6	2007062	GUIDE, ball, 1.5 in., spring load	1	1
7	253030	BALL, metallic (pack of 3)	1	1
8	2007055	SEAT, carbide	1	1
9	2007072	HOUSING, inlet	1	
	2013824	HOUSING, inlet		1
10	17G934	GLAND, packing, male	1	1
11	see repair kits	PACKING, piston packings	4	4
12	see repair kits	PACKING, throat packings	3	3
13	17G976	SPRING, wave	1	1
14	2013821	ROD, displacement	1	
	2013822	ROD, displacement		1
15	2013823	VALVE, piston, 290 cc	1	1
16	17G917	GLAND, packing, female	1	1
17	244899	BALL (pack of 3)	1	1
18	15K031	NUT, packing	1	1
19	247395	PLUG, throat (pack of 10)	1	1
22	245143	VALVE, pressure dump	1	1
24	16R883	FITTING, nipple, reducing 1/2 x 3/4 NPT	1	1
25	244826	PIN, self-locking	2	2
26	116746	FITTING, barbed, plated	1	1

ENDURANCE™ PROCONNECT® DISPLACEMENT PUMPS PARTS

REF.	PART	DESCRIPTION	QTY.	
			2013814	2013815
27	116750	TUBE, nylon	1	1
34	17G935	GLAND, packing, male	1	1
37	17G918	GLAND, packing, female	1	1

REPAIR KITS

GRACO - FORMULATED UHMWPE / LEATHER

Repair kits contain a set of four Ultra-high-molecular-weight polyethylene (UHMWPE) and three leather packings for the throat, and a set of three UHMWPE and two leather packings for the piston that are ideal for abrasive applications. Full repair kits also include items 2, 5, 7, 17, and 19 on the parts list. Packings are items 11 and 12 on the parts lists.

Pump Model	Lower Size	Full Repair Kit	DESCRIPTIONS, REFERENCE NUMBERS, AND QUANTITY	
			Throat Seal Kit (12a-12e)	Piston Seal Kit (11a-11e)
			Replaces entire packing stack in throat (see Throat Packings figure)	Replaces entire packing stack in piston (see Piston Packings figure)
2013811	145 cc	25D234	25D134	25D141
2009332				
2013812	180 cc	25D235	25D135	25D142
2009333				
2013813	220 cc	25D236	25D136	25D143
2009334				
2013814	290 cc	25D238	25D138	25D145
2013815				

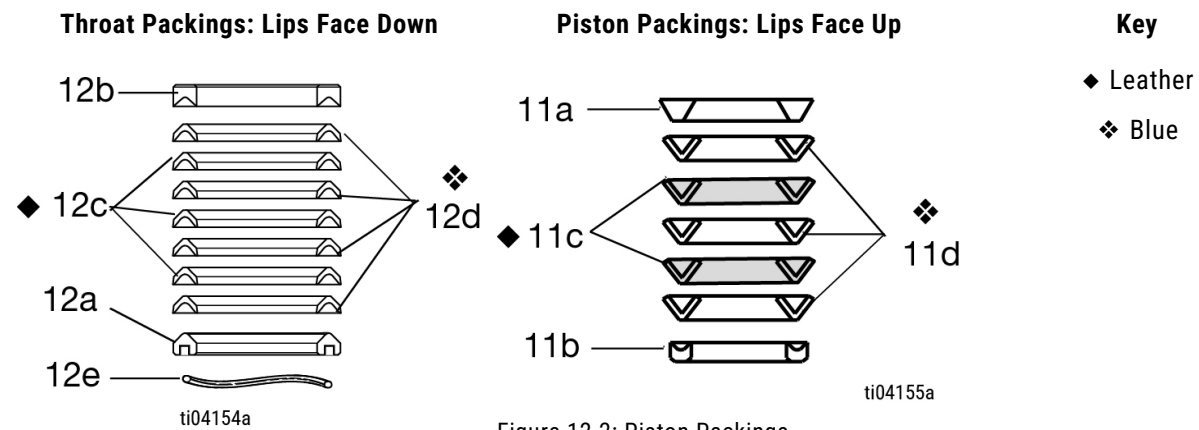


Figure 12-1: Throat Packings

Figure 12-2: Piston Packings

Lubricate packings; soak leather packings in oil for one hour before assembly.

REPAIR KITS

PTFE

Repair kits contain a set of seven Polytetrafluoroethylene (PTFE) packings for the throat, and five PTFE packings for the piston that are ideal for chemical resistance and higher temperatures. Not ideal for abrasive applications. Full repair kits also include items 2, 5, 7, 17, and 19 on the parts list. Packings are items 11 and 12 on the parts lists.

Pump Model	Lower Size	Full Repair Kit	DESCRIPTIONS, REFERENCE NUMBERS, AND QUANTITY	
			Throat Seal Kit (12a-12e)	Piston Seal Kit (11a-11e)
			Replaces entire packing stack in throat (see Throat Packings figure)	Replaces entire packing stack in piston (see Piston Packings figure)
2013811	145 cc	25D244	25D151	25D161
2009332				
2013812	180 cc	25D245	25D152	25D162
2009333				
2013813	220 cc	25D246	25D153	25D163
2009334				
2013814	290 cc	25D248	25D155	25D165
2013815				

Throat Packings: Lips Face Down

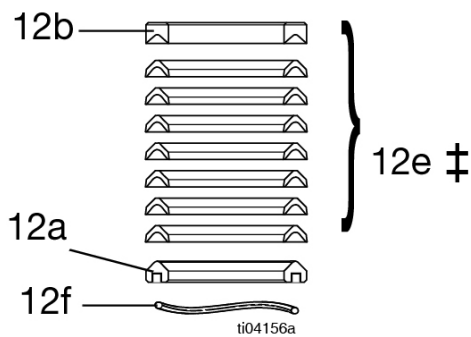


Figure 12-3: Throat Packings

Piston Packings: Lips Face Up

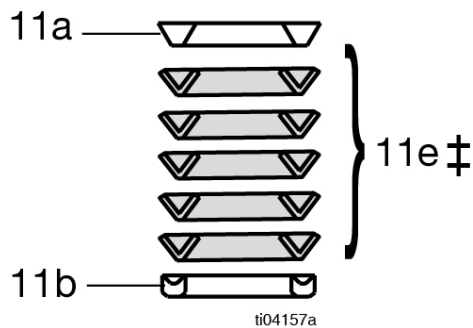


Figure 12-4: Piston Packings

Key

‡ White

Lubricate Packings

REPAIR KITS

GRACO - FORMULATED UHMWPE / PTFE

Repair kits contain a set of four Ultra-high-molecular-weight polyethylene (UHMWPE) and three Polytetrafluoroethylene (PTFE) packings for the throat, and three UHMWPE and two PTFE packings for the piston that are for chemical resistance and durability in applications below 140°F (60°C). Full repair kits also include items 2, 5, 7, 17, and 19 on the parts list. Packings are items 11 and 12 on the parts lists.

Pump Model	Lower Size	Full Repair Kit	DESCRIPTIONS, REFERENCE NUMBERS, AND QUANTITY	
			Throat Seal Kit (12a-12e)	Piston Seal Kit (11a-11e)
			Replaces entire packing stack in throat (see Throat Packings figure)	Replaces entire packing stack in piston (see Piston Packings figure)
2013811	145 cc	25D258	25D175	25D189
2009332				
2013812	180 cc	25D259	25D176	25D190
2009333				
2013813	220 cc	25D260	25D177	25D191
2009334				
2013814	290 cc	25D248	25D179	25D193
2013815				

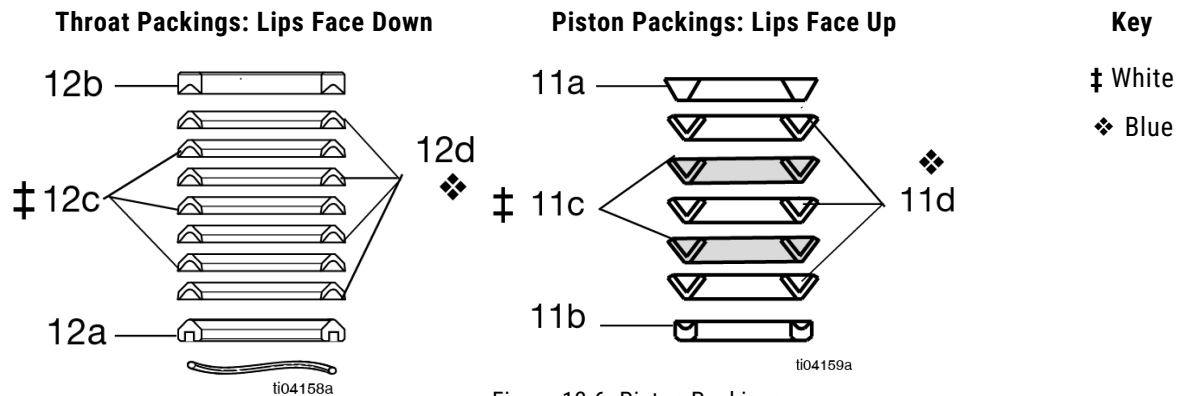


Figure 12-5: Throat Packings

Figure 12-6: Piston Packings

Lubricate Packings

REPAIR KITS

INLET BALL SPRING KITS

Use to improve changeover rates in longer ball-travel configurations. Order kit that corresponds with your lower model.


KIT	LOWER MODEL
245190	145 cc
	180 cc
245191	220 cc
	290 cc

CERAMIC BALL KITS

LOWER	CERAMIC PISTON BALL	CERAMIC INLET BALL
145 cc	111453	119264
180 cc		
220 cc	118602	131271
290 cc	117321	

CALIFORNIA PROPOSITION 65

CALIFORNIA RESIDENTS

 **WARNING** Cancer and reproductive harm – www.P65warnings.ca.gov.



APPLICATION FAST SET

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