

# Displacement Pump

333028D

EN

**For professional use only.**

*3300 psi (22.7 MPa, 227 bar) Maximum Working Pressure*

**Model 16Y598, Series A**

UltraMax II and Ultimate MX II 695/795

GMAX II 3900

SL 1250, Mustang 11500

ASM H3150, Storch ST900

**Model 16X428, Series A**

TexSpray Mark IV

**Model 16Y706, Series A**

UltraMax II and Ultimate MX II 1095/1595

GMAX II 5900

**Model 16X429, Series A**

TexSpray Mark V and 5900 HD

TS 1750, ASM H3750, PFT Samba XL

Storch ST 1700/ST 1700<sup>+</sup>

**Model 16Y601, Series A**

TexSpray Mark VII

**Model 16X423, Series A**

GMAX II 7900

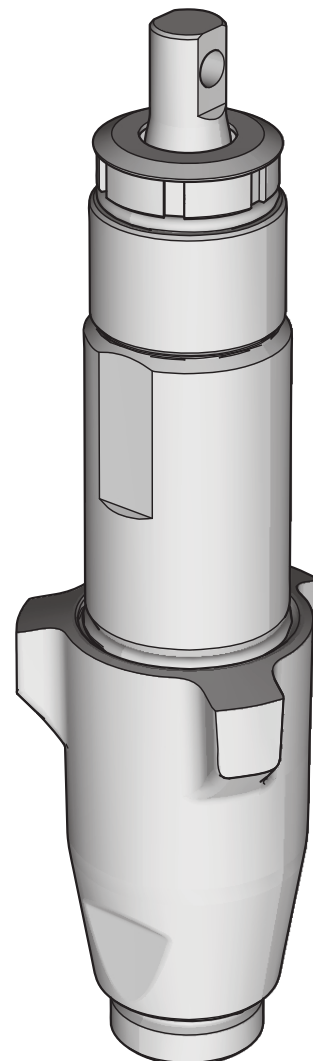
**Model 16X425, Series A**

TexSpray Mark X and 7900HD



**Important Safety Instructions**

Read all warnings and instructions in this manual. Save these instructions.











ti23116a

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# Warnings

The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbols refer to procedure-specific risks. When these symbols appear in the body of this manual or on warning labels, refer back to these Warnings. Product-specific hazard symbols and warnings not covered in this section may appear throughout the body of this manual where applicable.

 <b>WARNING</b>	
 	<p><b>EQUIPMENT MISUSE HAZARD</b></p> <p>Misuse can cause death or serious injury.</p> <ul style="list-style-type: none"> <li>• Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See <b>Technical Data</b> in all equipment manuals.</li> <li>• Use fluids and solvents that are compatible with equipment wetted parts. See Technical Data in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request MSDS from distributor or retailer.</li> <li>• Turn off all equipment and follow the <b>Pressure Relief Procedure</b> when equipment is not in use.</li> <li>• Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only.</li> <li>• Do not alter or modify equipment. Alterations or modifications may void agency approvals and create safety hazards.</li> <li>• Use equipment only for its intended purpose. Call your distributor for information.</li> <li>• Do not use 1,1,1-trichloroethane, methylene chloride, other halogenated hydrocarbon solvents or fluids containing such solvents.</li> <li>• Comply with all applicable safety regulations.</li> </ul>
 	<p><b>MOVING PARTS HAZARD</b></p> <p>Moving parts can pinch, cut or amputate fingers and other body parts.</p> <ul style="list-style-type: none"> <li>• Keep clear of moving parts.</li> <li>• Do not operate equipment with protective guards or covers removed.</li> <li>• Pressurized equipment can start without warning. Before checking, moving, or servicing equipment, follow the <b>Pressure Relief Procedure</b> and disconnect all power sources.</li> </ul>
  	<p><b>SKIN INJECTION HAZARD</b></p> <p>High-pressure spray is able to inject toxins into the body and cause serious bodily injury. In the event that injection occurs, <b>get immediate surgical treatment.</b></p> <ul style="list-style-type: none"> <li>• Do not aim the gun at, or spray any person or animal.</li> <li>• Keep hands and other body parts away from the discharge. For example, do not try to stop leaks with any part of the body.</li> <li>• Always use the nozzle tip guard. Do not spray without nozzle tip guard in place.</li> <li>• Do not leave the unit energized or under pressure while unattended. When the unit is not in use, turn off the unit and follow the <b>Pressure Relief Procedure</b> for turning off the unit.</li> <li>• Always engage the trigger lock when not spraying. Verify the trigger lock is functioning properly.</li> </ul>

# Service

## Pressure Relief Procedure



Follow the Pressure Relief Procedure whenever you see this symbol.



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.

1. Engage trigger lock.
2. Turn ON/OFF switch to OFF.
3. Unplug power cord.
4. Disengage trigger lock. Hold metal part of gun against grounded metal pail and trigger gun into pail to relieve pressure.
5. Engage the trigger lock.
6. Open all fluid drain valves in the system, having a waste container ready to catch drainage. Leave drain valve(s) open until you are ready to spray again.
7. If you suspect the spray tip or hose is clogged or that pressure has not been fully relieved after following the steps above, VERY SLOWLY loosen tip guard retaining nut or hose end coupling to relieve pressure gradually, then loosen completely. Clear hose or tip obstruction.

## Pump Repair Kits

Pump	Repair Kit
16Y598	248212
16Y706	248213
16X423	249123
16X425	249123 (Stainless steel check balls); 16X431 (Ceramic check balls)
16X428	287285 (Stainless steel check balls); 24V063 (Ceramic check balls)
16X429	248213 (Stainless steel check balls); 249189 (Ceramic check balls)
16Y601	24M830

## Tools Needed

- Vise
- 12 in. adjustable, open-end wrench (2)
- Hammer (20 oz maximum)
- Small screwdriver
- Throat Seal Liquid
- Pick or long small screwdriver

## Cleaning and Inspecting Parts

Clean and inspect parts. Pay particular attention to the ball seats in the intake valve and piston, which must have no nicks or wear, and to the inside of the sleeve and the outside of the piston rod, which must not be worn or scratched. Replace worn or damaged parts.



### COMPONENT RUPTURE HAZARD

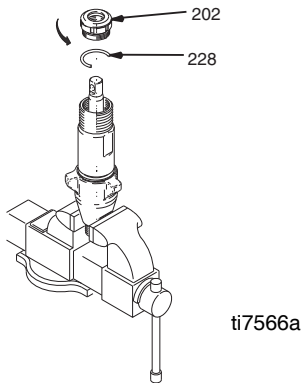
To reduce the risk of serious injury from pressurized fluid, never use sharp or pointed tools to remove sleeve. If the sleeve cannot be removed easily, return the sleeve and cylinder to a Graco distributor for removal.

**NOTE:** Remove and clean sleeve when repacking pump.

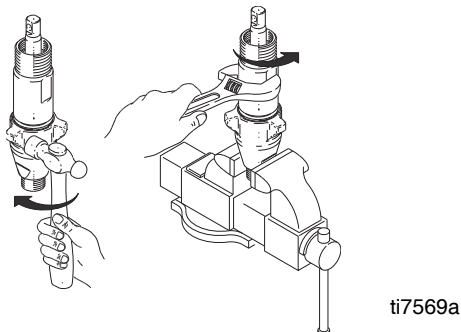
# Repair When Pump is Separated From Sprayer

## Disassembling the Pump

1. Remove packing nut (202) and o-ring (228).

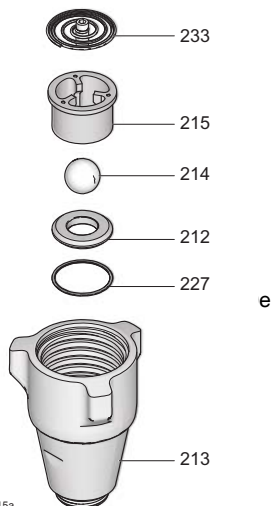


2. Unscrew intake valve from cylinder.



3. Disassemble intake valve. Clean and inspect o-ring (227).

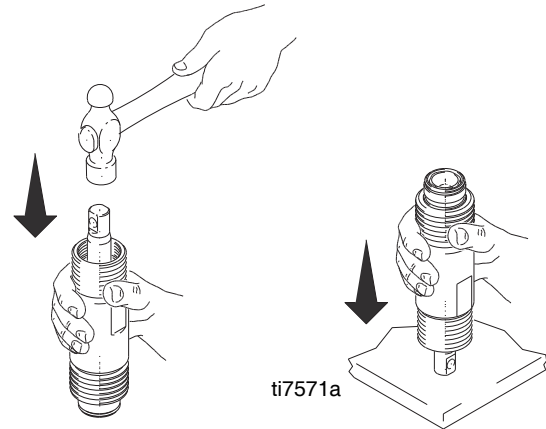
**NOTE:** A pick may be required to remove o-ring.



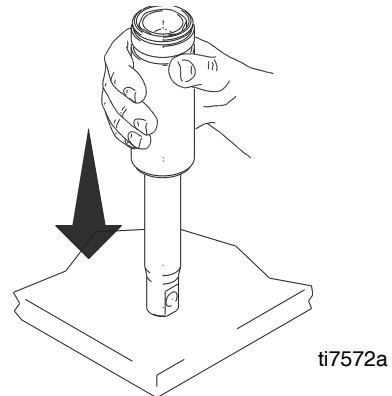
**NOTE:** Spring (233) only used on 16Y601, 16X423, and 16X425

4. Tap piston rod out of cylinder with a hammer or flip over and tap piston rod out against a bench.

**NOTE:** Sleeve may come out of cylinder with piston rod.

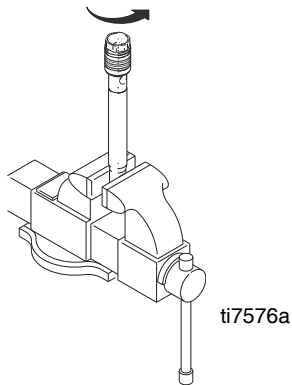


5. Remove piston rod from sleeve, or remove sleeve from cylinder. **Mark IV and Mark VII models:** Remove sleeve spacer (230) from sleeve.

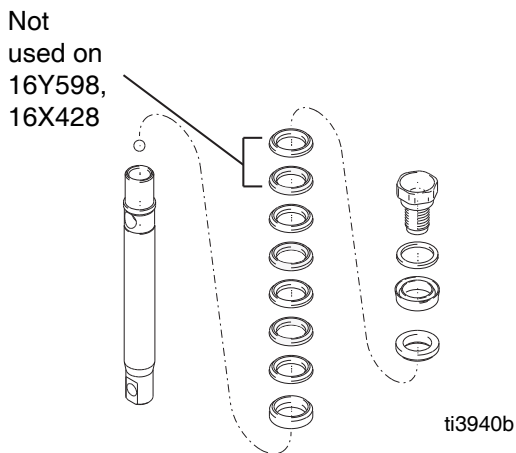


<p><b>COMPONENT RUPTURE HAZARD</b></p> <p>To reduce the risk of serious injury from pressurized fluid, do not clean or wipe the piston valve threads. Cleaning the piston valve threads could destroy the special sealing patch and cause the piston valve to come loose during operation.</p>							

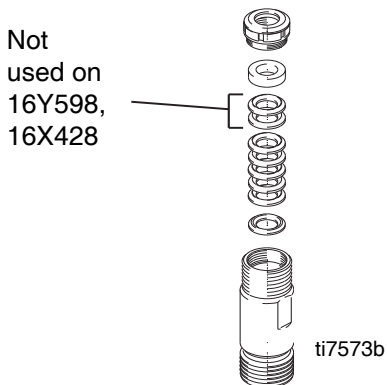
- Unscrew piston valve from piston rod. Clean and inspect parts. The piston has a special thread locking/sealing patch. Do not remove the patch. The patch allows four disassembly/assembly procedures before it is necessary to apply thread sealant to the threads.



- Remove packings and glands from piston rod.

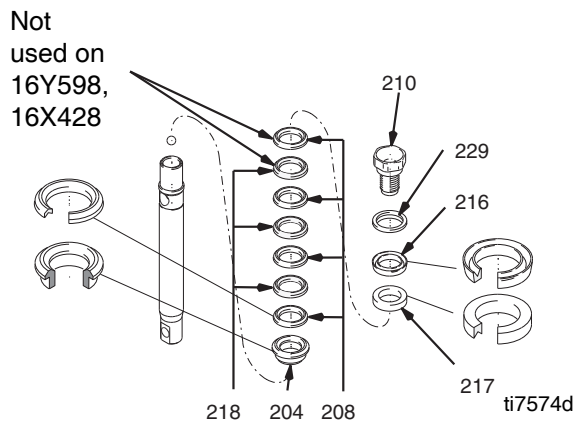


- Remove throat packings and glands from cylinder. Discard throat packings and glands.

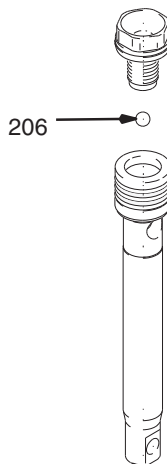


## Assembling the Pump

- Soak all leather packings in SAE 30W oil for 1 hour minimum prior to assembly. Stack male gland (204) on piston rod. Alternately stack UHMWPE (208) and leather (218) packings (note orientation) on piston rod. Install female gland (217). Install piston wiper (216) (note orientation) and backup washer (229) on piston valve, threads are good for four repackings. Use thread sealant on piston valve threads after four repackings.

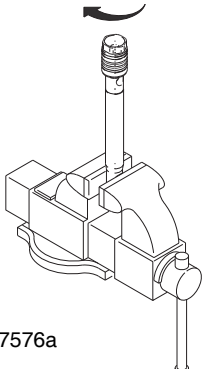


- Install ball (206) in piston rod. If thread sealant is applied to piston valve threads, make sure that none gets on ball.

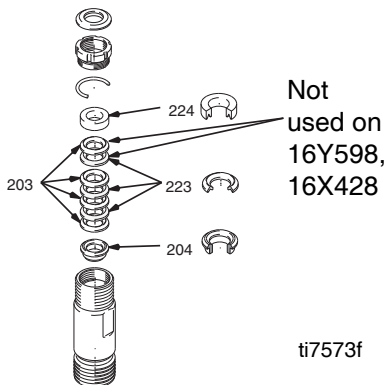


3. Tighten piston valve to piston rod as specified:

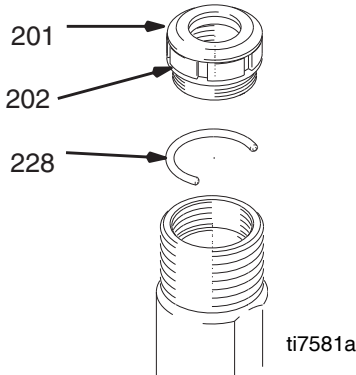
Models	Torque
16Y598, 16X428	27 ± 3 ft-lb.(36.6 ± 4.1 N•m)
16Y706, 16X429, 16Y601	55 ± 3 ft-lb.(74.6 ± 4.1 N•m)
16X423, 16X425	100 ± 5 ft-lb.(136 ± 7 N•m)



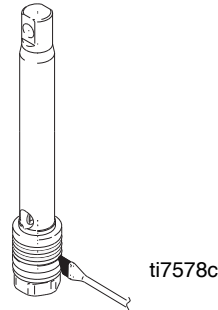
4. Soak all leather packings in SAE 30W oil for one hour minimum prior to assembly. Place male gland (204) in cylinder. Alternately stack UHMWPE (203) and leather packings (223) (note orientation). Place female gland (224) in top of cylinder seat packings.



5. Install seal (201) into packing nut (202). Install o-ring (228) onto packing nut. Loosely install packing nut into cylinder.

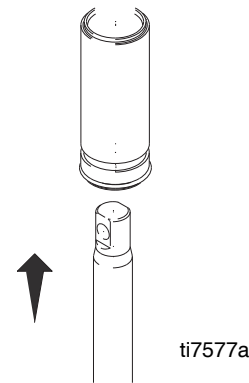


6. Grease piston packings.

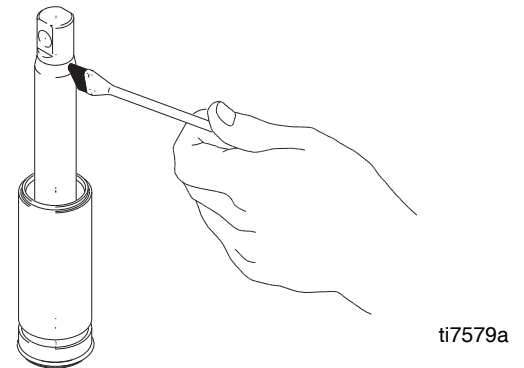


**NOTICE**  
Do not slide piston assembly into top of sleeve as this may damage piston packing.

7. Slide piston assembly into bottom of sleeve.

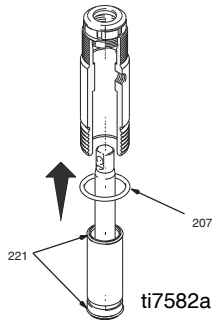


8. Grease top inch or two of piston rod that will go through the cylinder throat packings.

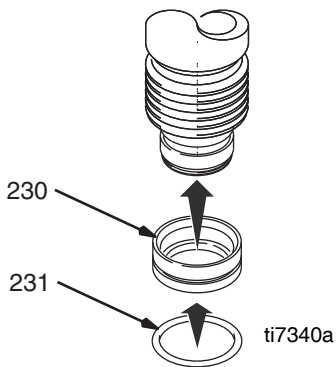


9. Grease o-rings (221) and place on sleeve. Slide sleeve/piston rod assembly into bottom of cylinder. Replace o-ring (207) if desired.

**NOTE:** O-ring (207) is not required for safe pump operation.

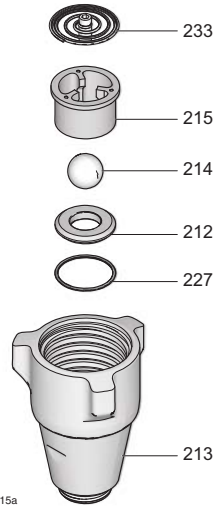


10. **Mark IV and Mark VII models:** Install o-ring (231) on sleeve spacer (230) and install sleeve spacer on sleeve.



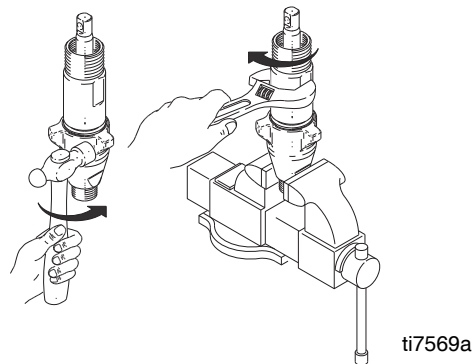
11. Reassemble intake valve with new o-ring (227), seat (212) and ball (214). Seat may be flipped over and used on other side. Clean seat thoroughly.

**NOTE:** Spring (233) only used on 16Y601, 16X423, and 16X425.



12. Install intake valve on cylinder. If a wrench is used torque as follows:

Models	Torque
16Y598, 16X428	67 ± 5 ft-lb (90.8 ± 6.8 N•m)
16Y706, 16X429, 16Y601	80 ± 5 ft-lb (108.5 ± 6.8 N•m)
16X423, 16X425	200 ± 15 ft-lb (271.2 ± 20.3 N•m)

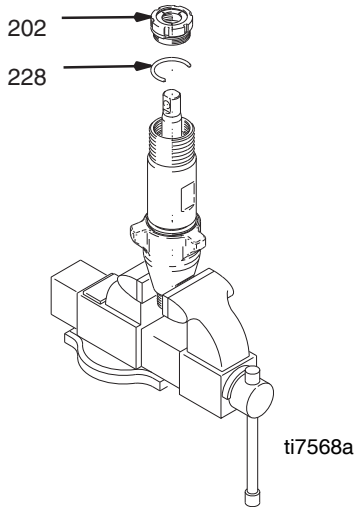




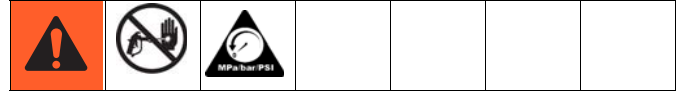
13. Torque packing nut (202) as follows:

Models	Torque
16Y598, 16X428, 16Y706, 16Y601, 16X429	100 ± 10 in-lb (11.3 ± 1.1 N•m)
16X423, 16X425	140 ± 10 in-lb (15.8 ± 1.1 N•m)

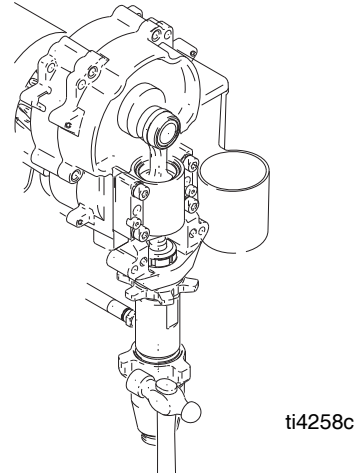
14. Remove o-ring (228) when pump packings begin to leak after extended use. Then tighten packing nut down until leakage stops or lessens. This allows approximately 100 gallons of additional operation before a repacking is required.



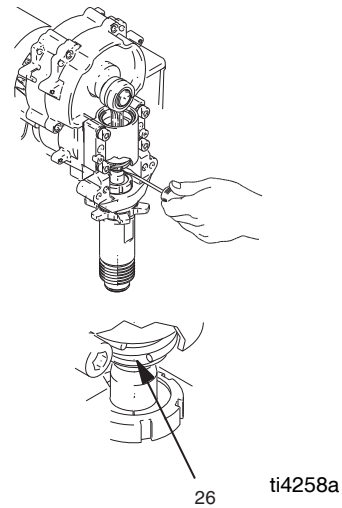
## Repair When Pump is On Sprayer



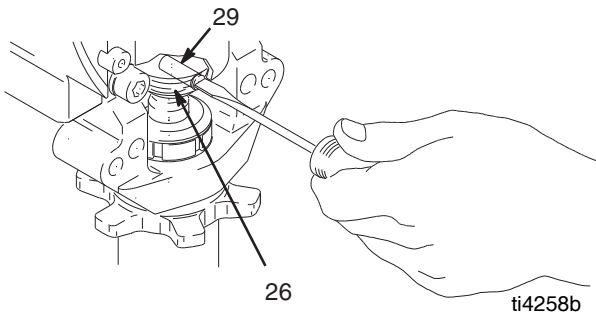
1. Relieve pressure, page 4.
2. Remove intake valve.



3. Push up retaining spring (26).

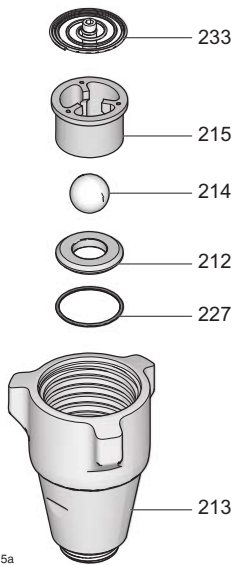


4. Push out pin (29).

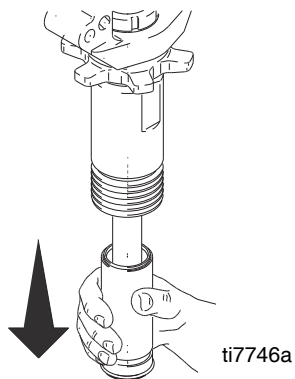


5. Disassemble intake valve. Clean and inspect.  
O-ring (227) may require a pick for removal.

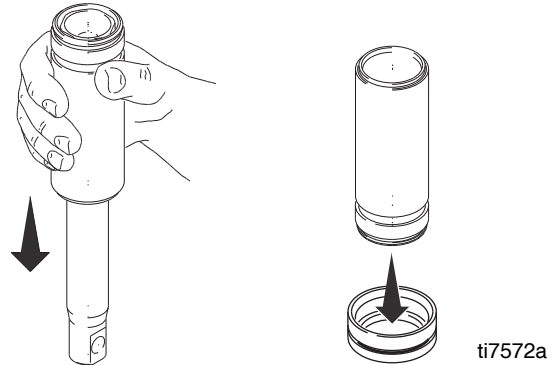
**NOTE:** Spring (233) only used on 16Y601, 16X423, and 16X425.



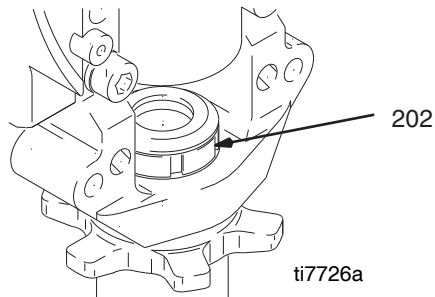
6. Remove piston rod and sleeve.



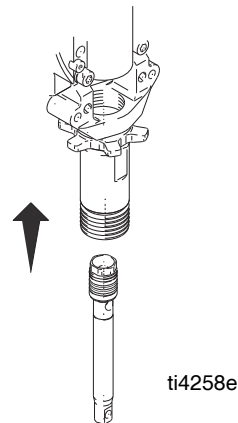
7. Invert piston rod and sleeve and pound on hard surface until piston rod comes out of sleeve.  
**Mark IV and Mark VII models:** Remove sleeve spacer from sleeve.



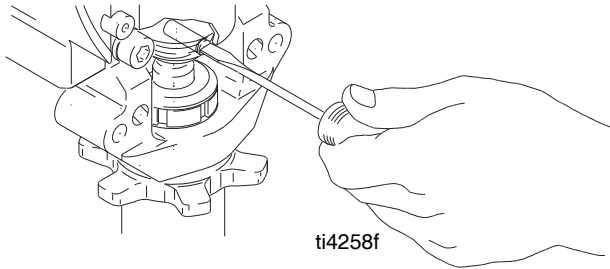
8. Remove packing nut (202).



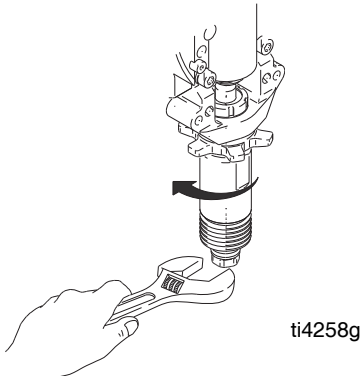
9. Invert piston rod and insert into cylinder to force out throat packings.



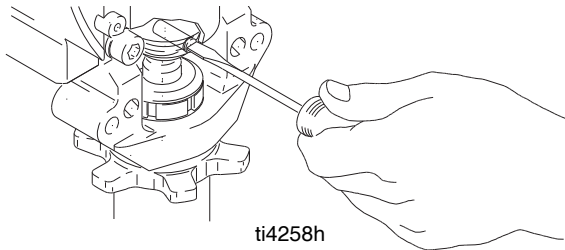
10. Insert piston rod into cylinder with pin hole up and piston valve down. Insert pin into piston rod and crank shaft.



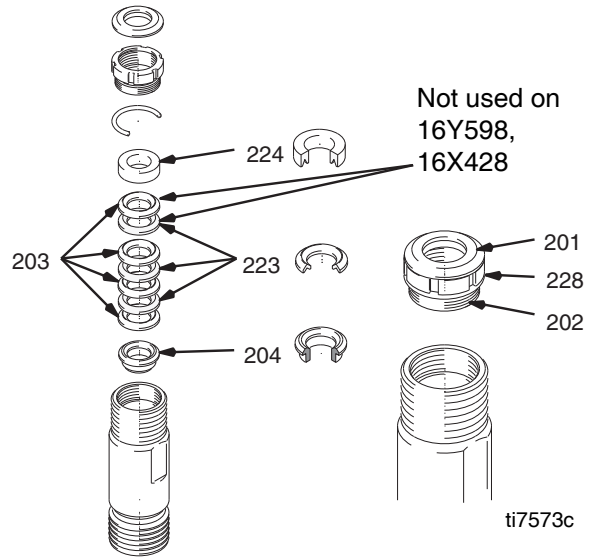
11. Remove piston valve from piston rod with a wrench.



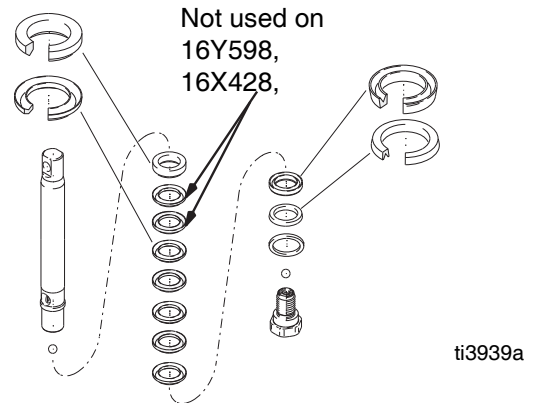
12. Remove pin and piston rod from cylinder.



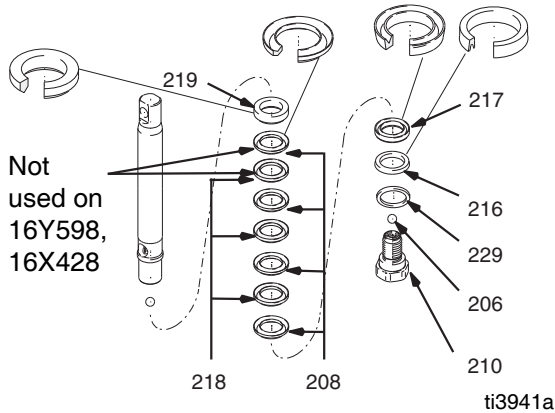
13. Soak all leather packings in SAE 30W oil for 1 hour minimum prior to assembly. Stack male gland (204). Alternately stack UHMWPE (203) and leather (223) packings (note orientation). Install female gland (224). Install seal (201) and packing nut (202) and o-ring (228).



14. Remove packings and glands from piston rod.



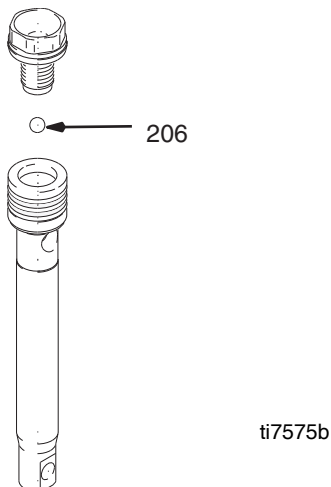
15. Soak all leather packings in SAE 30W oil for one hour minimum prior to assembly. Stack male gland (219) on piston rod. Alternately stack UHMWPE (208) and leather (218) packings (note orientation) on piston rod. Install female gland (217). Install piston wiper (216) and backup washer (229) (note orientation) on piston valve (210). The special sealing patch on piston valve threads is good for four repackings. Use thread sealant on piston valve threads after four repackings.



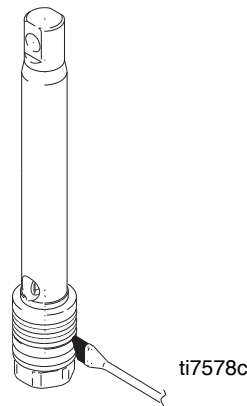
16. Install ball (206) in piston rod.

**NOTE:** If thread sealant is applied to piston valve threads, make sure none gets on ball. Install piston valve on piston rod. Torque as follows:

Models	Torque
16Y598, 16X428	27 ± 3 ft-lb (36.6 ± 4.1 N•m)
16Y706, 16Y601, 16X429	55 ± 3 ft-lb (74.6 ± 4.1 N•m)
16X423, 16X425	100 ± 5 ft-lb (136 ± 7 N•m)



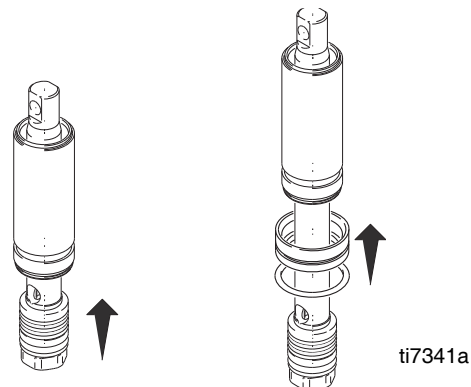
17. Grease piston packings.



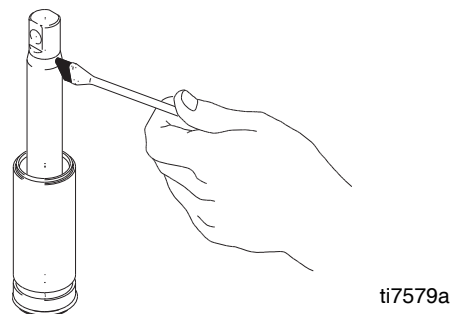
**NOTICE**

Do not slide piston assembly into top of sleeve as this may damage piston packing.

18. Slide piston assembly into bottom of sleeve. Make sure V-packing and u-cup are not rolled over or damaged. **Mark IV and Mark VII models:** Install o-ring (231) on sleeve spacer (230). Install sleeve spacer on sleeve.

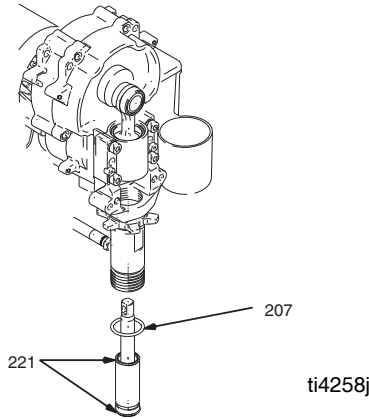


19. Grease top inch or two of piston rod that will go through the cylinder throat packings.



20. Grease o-ring (221) and place on sleeve. Slide sleeve/piston rod assembly into bottom of cylinder. Replace o-ring (207) if desired.

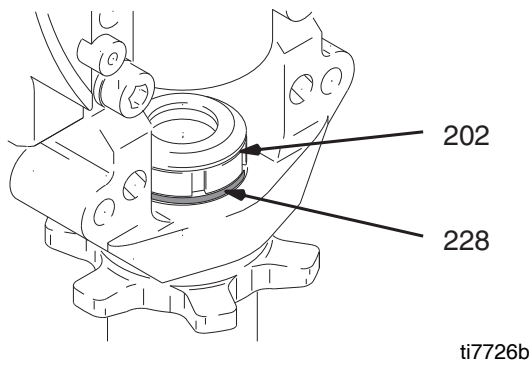
**NOTE:** O-ring (207) is not required for safe pump operation.



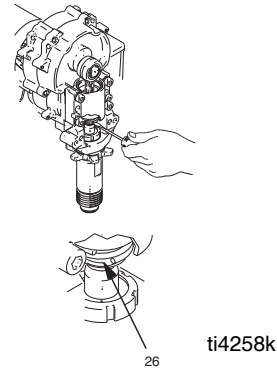
21. Torque seal and packing nut (202) to the following:

Models	Torque
16Y598, 16X428, 16Y706, 16Y601, 16X429	100 ± 10 in-lb (11.3 ± 1.1 N•m)
16X423, 16X425	140 ± 10 in-lb (15.8 ± 1.1 N•m)

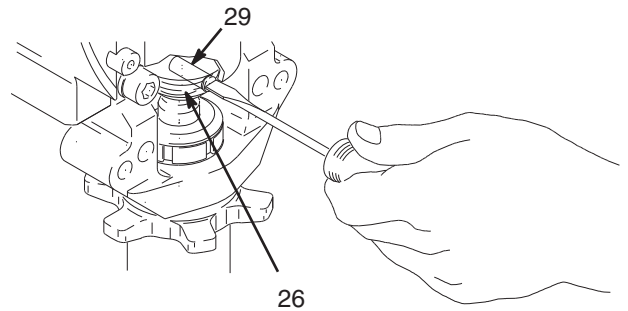
Remove o-ring when pump packings begin to leak after extended use. Then tighten packing nut down until leakage stops or reduces. This allows approximately 100 gallons of additional operation before a repacking is required.



22. Push up retaining spring (26) with screwdriver.

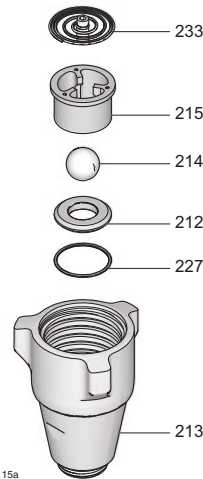


23. Push in pin (29).



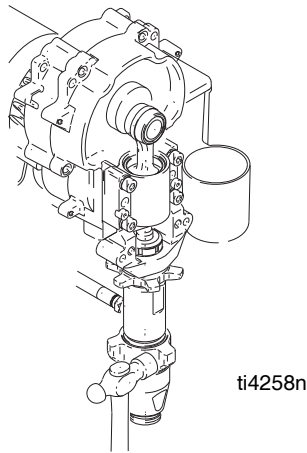
24. Reassemble intake valve with new o-rings (227) and (230), seat (212) and ball (214). Seat may be flipped over and used on other side. Clean seat thoroughly.

**NOTE:** Spring (233) only used on 16Y601, 16X423, and 16X425.

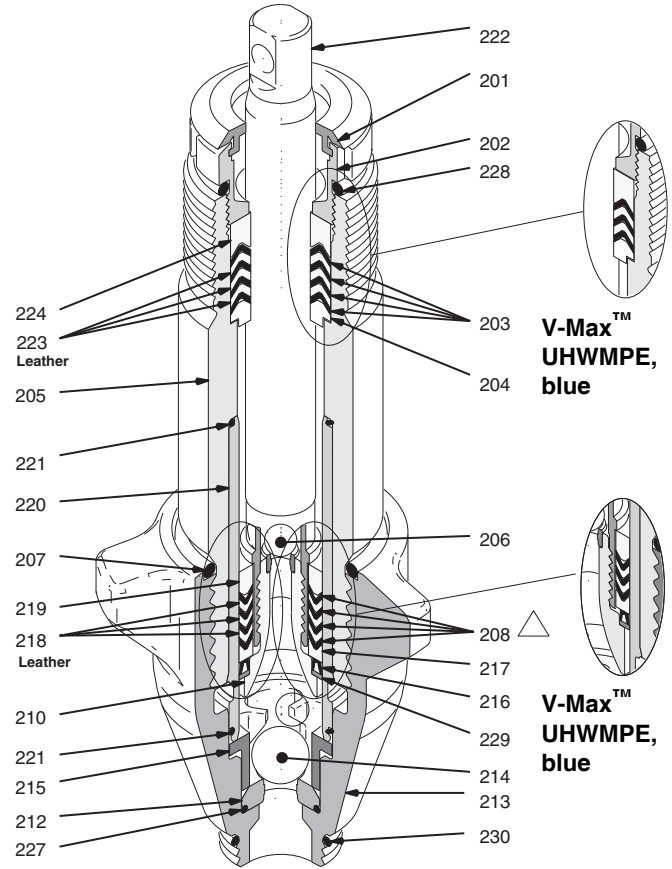


25. Install intake valve on cylinder. Torque as follows:

Models	Torque
16Y598, 16X428	70 ± 5 ft-lb (94.9 ± 6.8 N•m)
16Y706, 16X429, 16Y601	80 ± 5 ft-lb (108.5 ± 6.8 N•m)
16X423, 16X425	200 ± 10 ft-lb (271.2 ± 13.6 N•m)



## Pump Packings



Pump 16Y706

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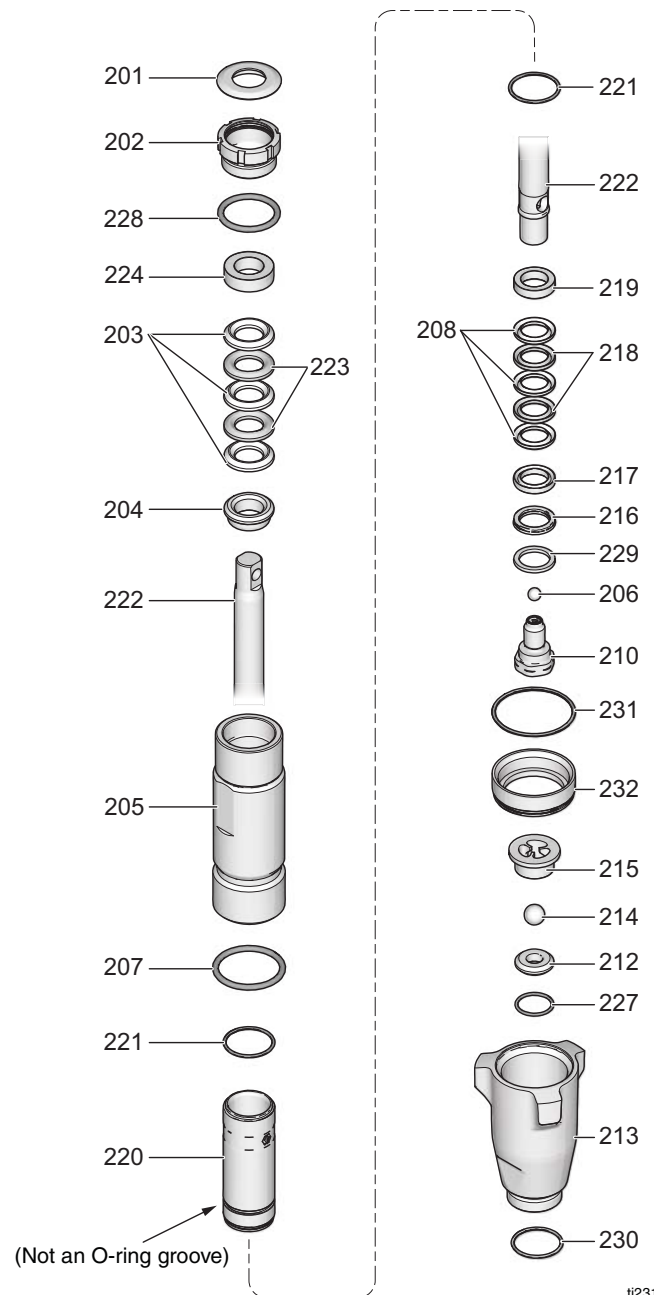
# Parts - Pump 16Y598, 16X428

Ref.	Part	Description	Qty.
201*†	179810	SEAL, throat	1
202	193046	NUT, packing	1
203*†	192692	V-PACKING, throat, V-Max, UHMWPE, blue	3
204*†	15C987	GLAND, male, throat,	1
205		CYLINDER, pump	1
	17A030	Model 16Y598	
	287876	Model 16X428	
206		BALL check	1
	105444*	Model 16Y598 (Stainless steel)	
	119259†	Model 16X428 (Ceramic)	
207*†	156593	PACKING, o-ring	1
208*†	192693	V-PACKING, piston, V-MAX, UHMWPE, blue	3
210	287877	VALVE, piston	1
212		KIT, seat, carbide	1
	239922	Model 16Y598, (includes 214, 215, 227)	
	244571	Model 16X428 (includes 214, 227)	
213		VALVE, intake (foot)	1
	15C785	Model 16Y598	
	287878	Model 16X428	
214		BALL, check, inlet	1
	105445*	Model 16Y598 (Stainless steel)	
	111453†	Model 16X428 (Ceramic)	
	102972	Model 16X428 (Stainless steel)	
215		GUIDE, ball	1
	192624	Model 16Y598	
	196967	Model 16X428	
216*†	118503	WIPER, piston	1
217*†	178969	GLAND, female, piston	1
218*†	178939	V-PACKING, leather, piston	2
219*†	196880	GLAND, male, piston	1
220	248209	SLEEVE, cylinder	1
221*†	108526	O-RING, ptfе	2
222		ROD, piston	1
	248206	Model 16Y598	
	249969	Model 16X428	
223*†	178940	V-PACKING, leather, throat	2
224*†	15C988	GLAND, female, throat	1
227		O-RING, ptfе	1
	107079*	Model 16Y598	
	108526†	Model 16X428	
228*†	158776	O-RING	1
229*†	15C997	WASHER, backup	1
230*	118494	O-RING, fluoroelastomer (not used on Lo-Boy or 16X428)	1
231†	107098	O-RING (Model 16X428 only)	1

Ref.	Part	Description	Qty.
232	15G494	SPACER, sleeve (Model 16X428 only)	1

\* These parts are also included in Repair Kit 248212, which may be purchased separately.

† These parts are also included in Repair Kit 24V063, which may be purchased separately.



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# Parts - Pump 16Y706, 16X429, 16Y601

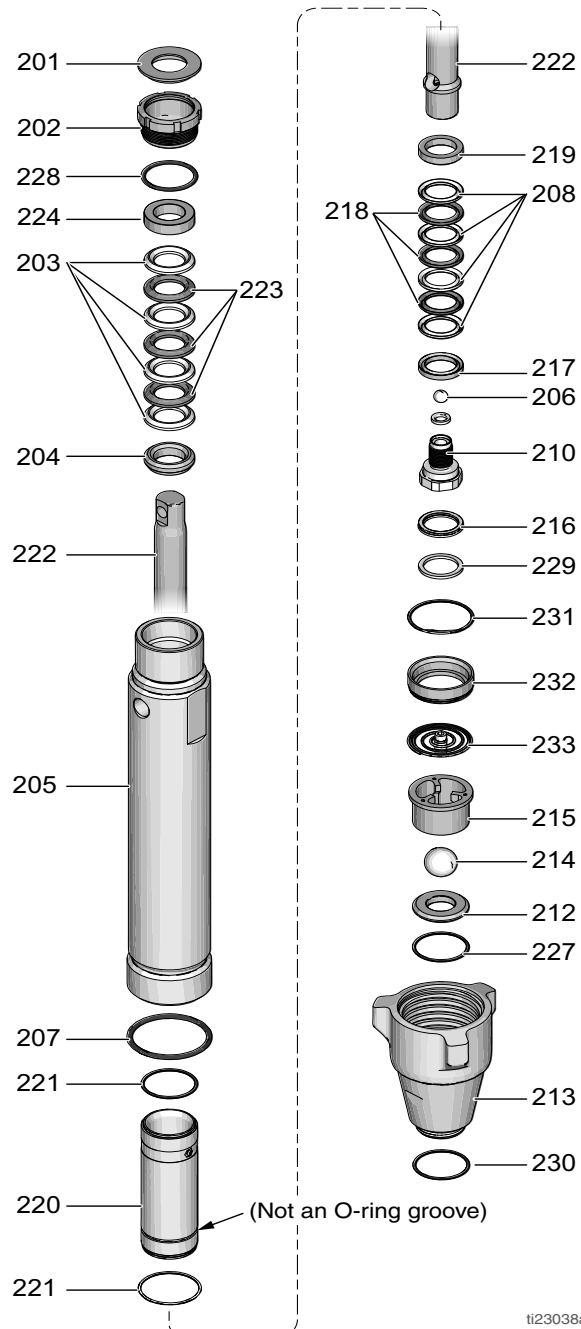
Ref.	Part	Description	Qty.
201*†	183171	SEAL, throat	1
202	193032	NUT, packing	1
203*†*	193124	V-PACKING, throat, V-Max, UHMWPE, blue	4
204*†*	15C989	GLAND, male, throat	1
205		CYLINDER, pump	1
	243347	Model 16Y706	
	196754	Model 16X429	
	17A032	Model 16Y601	
206		BALL, check	1
	101947*	Model 16Y706 (Stainless steel)	
	116327†	Model 16X429, 16Y601 (Ceramic)	
	*		
207		PACKING, o-ring	1
	156633*†	Model 16Y706, 16X429	
	160325*	Model 16Y601	
208*†*	193125	V-PACKING, piston, V-MAX, UHMWPE, blue	4
210	24U993	VALVE, piston	1
212		KIT, seat, carbide	1
	244199	Model 16Y706 (includes 214, 227)	
	244571	Model 16X429 (includes 214, 227)	
	24N013	Model 16Y601 (includes 214, 227, 233)	
213		VALVE, intake (foot)	1
	15E654	Model 16Y706	
	196753	Model 16X429	
	15A303	Model 16Y601	
214		BALL, check, inlet	1
	102972*	Model 16Y706 (Stainless steel)	
	111453†	Model 16X429 (Ceramic)	
	118602*	Model 16Y601 (Ceramic)	
	107167	Model 16Y601 (Stainless steel)	
215		GUIDE, ball	1
	193027	Model 16Y706	
	196967	Model 16X429	
	16M658	Model 16Y601	
216*†*	118504	WIPER, piston, Model 16X429, 16Y601	1
217*†*	183185	GLAND, female, piston	1
218*†*	15E329	V-PACKING, leather, piston	3
219*†*	183178	GLAND, male, piston	1
220	248210	SLEEVE, cylinder	1
221*†*	107098	O-RING, ptfe	2
222		ROD, piston	1
	248207	Model 16Y706	
	249028	Model 16X429	
	241285	Model 16Y601	
223*†*	183175	V-PACKING, leather, throat	3
224*†*	15C990	GLAND, female, throat	1
227		O-RING, ptfe	1
	108526*†	Model 16Y706, 16X429	
	107098*	Model 16Y601	
228*†	C20987	O-RING	1
229*†*	15C998	WASHER, backup	1
230*	118494	O-RING, fluoroelastomer (not used on 16X429, 16Y601)	1
231*	108822	O-RING (Model 16Y601 only)	1

Ref.	Part	Description	Qty.
232*	16M291	SPACER, sleeve (Model 16Y601 only)	1
233	24E027	SPRING, intake, ball (Model 16Y601 only)	1

\* These parts are also included in Repair Kit 248213, which may be purchased separately.

† These parts are also included in Repair Kit 249189, which may be purchased separately.

\* These parts are also included in Repair Kit 24M830, which may be purchased separately.



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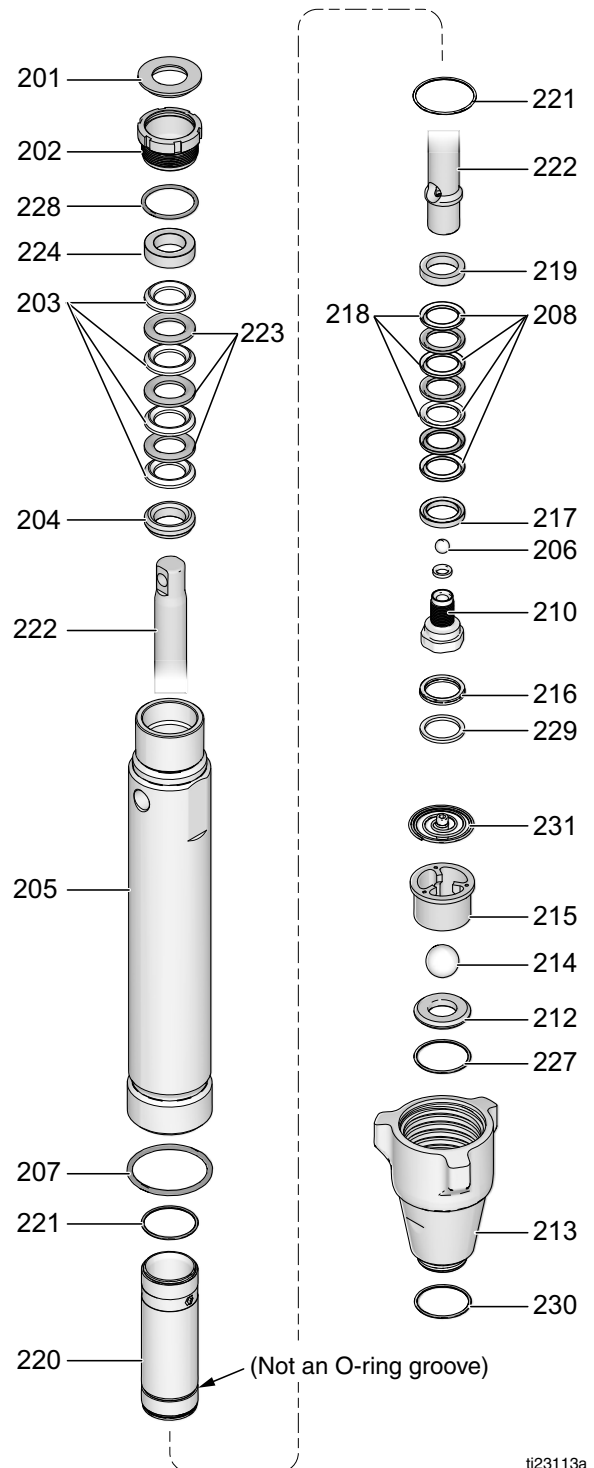


# Parts - Pump 16X423, 16X425

Ref.	Part	Description	Qty.
201*†	112590	SEAL, throat	1
202	15E962	NUT, packing	1
203*†	193722	V-PACKING, throat, V-Max, UHMWPE, blue	4
204*†	15G658	GLAND, male, throat	1
205		CYLINDER, pump	1
	16X454	Model 16X423	
	16X458	Model 16X425	
206		BALL, check	1
	107203*	Model 16X423(Stainless steel)	
	118601†	Model 16X425 (Ceramic)	
207*†	160325	PACKING, o-ring	1
208*†	193722	V-PACKING, piston, V-MAX, UHMWPE, blue	4
210	249177	VALVE, piston	1
212		KIT, seat, carbide	1
	240918	Model 16X423 (includes 214, 227)	
	24N013	Model 16X425 (includes 214, 227, 231)	
213		VALVE, intake (foot)	1
	15E655	Model 16X423	
	15A303	Model 16X425	
214		BALL, check, inlet	1
	107167*	Model 16X423 (Stainless steel)	
	118602†	Model 16X425 (Ceramic)	
215		GUIDE, ball	1
	198505	Model 16X423	
	193391	Model 16X425	
216*†	119636	WIPER, piston	1
217*†	189588	GLAND, female, piston	1
218		V-PACKING, leather, piston	3
	15E639*†	16X423, 16X425	
219*†	189585	GLAND, male, piston	1
220	249121	SLEEVE, cylinder	1
221*†	108822	O-RING, ptfе	2
222		ROD, piston	1
	249119	Model 16X423	
	288103	Model 16X425	
223*†	112591	V-PACKING, leather, throat	3
224*†	15G657	GLAND, female, throat	1
227*†	107098	O-RING, ptfе	1
228*†	157195	O-RING	1
229*†	15J800	WASHER, backup	1
230	118494	O-RING, fluoroelastomer (Model 16X423 only)	1
231		SPRING, intake, ball	1
	249770	Model 16X423	
	24E027	Model 16X425	

\* These parts are also included in Repair Kit 249123 (SST balls), which may be purchased separately.

† These parts are also included in Repair Kit 17A578 (ceramic balls), which may be purchased separately.



## Technical Data

	<b>U.S.</b>	<b>Metric</b>
Maximum Working Pressure	3300 psi	227 bar, 22.7 MPa
Fluid Inlet Size	1-5/16-12 un(m)	1-5/16-12 un(m)
Fluid Outlet Size		
16Y598, 16X428, 16Y706, 16X433, 16Y601, 16429	3/8 npt(f)	3/8 npt(f)
16X425	1/2 npt(f)	1/2 npt(f)
Wetted Parts	stainless steel, PTFE, leather, nylon, zinc-plated carbon steel, tungsten carbide, chrome plating, fluoroelastomer, acetal, polyethylene	



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