Repair

Displacement Pump

332922D

EN

For professional use only.

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

Model 16X414, Series A
UltraMax II and Ultimate MX II 695/795
GMAX II 3900

Model 16X418, Series A
TexSpray Mark IV

Model 16X419, Series A
UltraMax II and Ultimate MX II 1095/1595
GMAX II 5900

Model 16X420, Series A
UltraMax II and Ultimate MX II 1095/1595 IronMan
GMAX 5900 IronMan

Model 16X421, Series A
TexSpray Mark V and 5900 HD

Model 16Y602, Series A
TexSpray Mark VII

Model 16X426, Series A
GMAX II 7900

Model 16X427, Series A
TexSpray Mark X and 7900HD

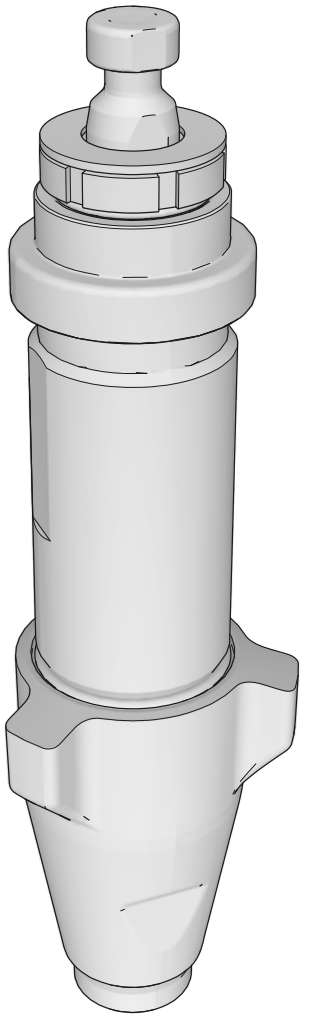
Model 16Y599, Series A
TexSpray Mark V and IronMan

Model 17N693, Series A
APX 6200 (MaxLife)

Model 17R044, Series A
APX 6200 (Chrome)

Model 17N694, Series A
APX 8200 (MaxLife)

Model 17R042, Series A
APX 8200 (Chrome)



ti23273a

Important Safety Instructions

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

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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.

⚠ WARNING

EQUIPMENT MISUSE HAZARD

Misuse can cause death or serious injury.

- Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See **Technical Data** in all equipment manuals.
- 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.
- 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.
- Use equipment only for its intended purpose. Call your distributor for information.
- Do not use 1,1,1-trichloroethane, methylene chloride, other halogenated hydrocarbon solvents or fluids containing such solvents.
- Comply with all applicable safety regulations.

MOVING PARTS HAZARD

Moving parts can pinch, cut or amputate fingers and other body parts.

- Keep clear of moving parts.
- Do not operate equipment with protective guards or covers removed.
- Pressurized equipment can start without warning. Before checking, moving, or servicing equipment, follow the **Pressure Relief Procedure** and disconnect all power sources.

SKIN INJECTION HAZARD

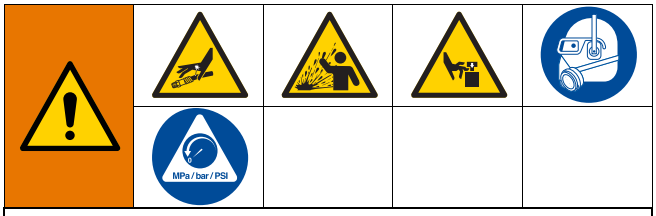
High-pressure spray is able to inject toxins into the body and cause serious bodily injury. In the event that injection occurs, **get immediate surgical treatment.**

- Do not aim the gun at, or spray any person or animal.
- Keep hands and other body parts away from the discharge. For example, do not try to stop leaks with any part of the body.
- Always use the nozzle tip guard. Do not spray without nozzle tip guard in place.
- 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 **Pressure Relief Procedure** for turning off the unit.
- Always engage the trigger lock when not spraying. Verify the trigger lock is functioning properly.

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
16X414	248212
16X419	248213 (stainless steel check balls) 249189 (ceramic check balls)
16X426	249123 (stainless steel check balls) 17A578 (ceramic check balls)
16X427, 17N694	17A578 (ceramic check balls)
16X418	24V063
16X421	249189
16Y602	24M830
16X420	17K162 (stainless steel check balls)
16Y599	17K475 (ceramic check balls)
17N693	17N703 (ceramic check balls)
17R042	17R119 (ceramic SI-N check balls)
17R044	17R114 (ceramic SI-N check balls)

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.

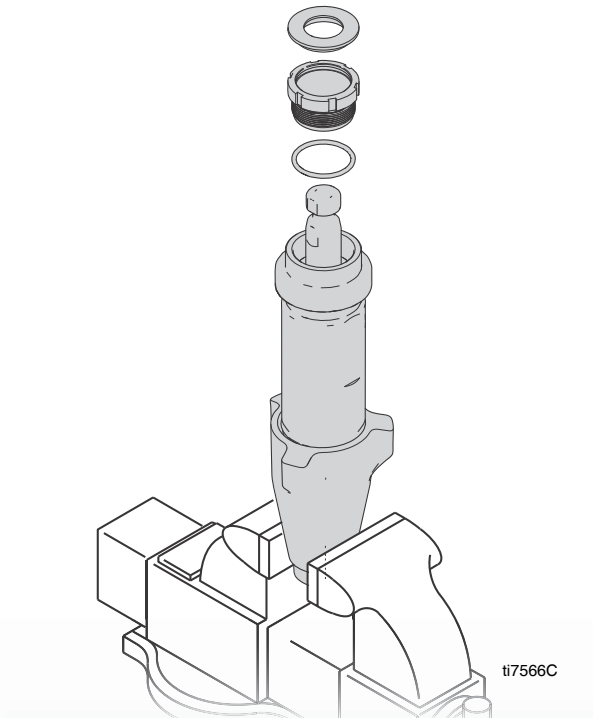
COMPONENT RUPTURE HAZARD
To reduce the risk of serious injury from pressurized fluid, never use sharp or pointed tools to remove sleeve. If the sleeve cannot be removed easily, return the sleeve and cylinder to a Graco distributor for removal.

NOTE: Remove and clean sleeve when repacking pump.

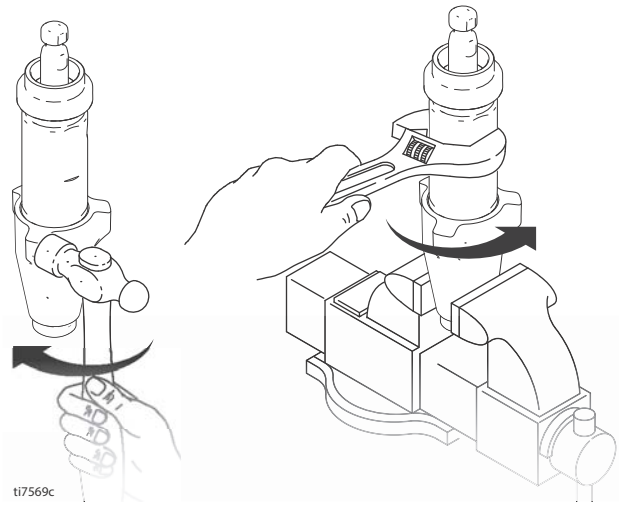
Repair When Pump is Separated From Sprayer

Disassembling the Pump

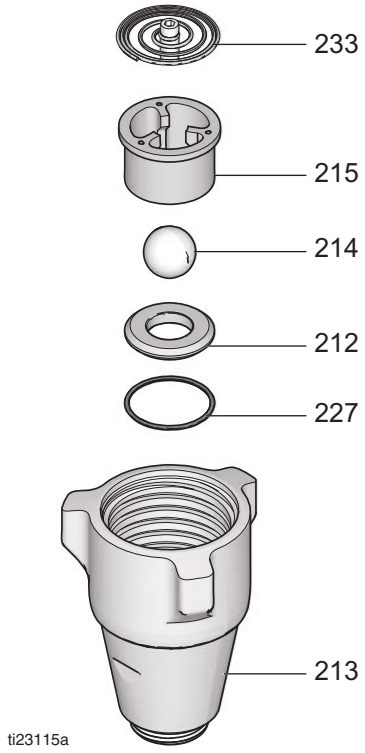
1. Remove packing nut (202) and o-ring (228).



2. Unscrew intake valve from cylinder.



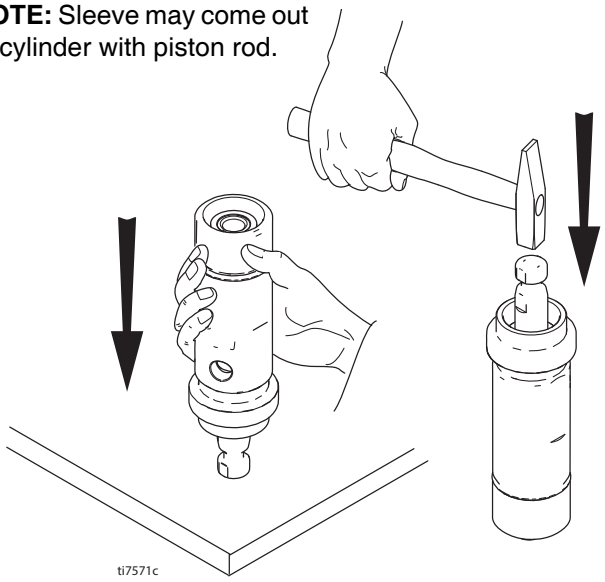
3. Disassemble intake valve. Clean and inspect o-ring (227). **NOTE:** A pick may be required to remove o-ring.



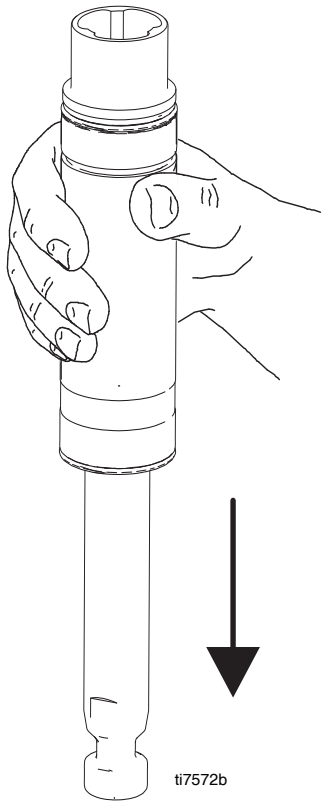
NOTE: Spring (233) only used on 16X426, 16X427, 16Y602, 17N693, 17N694, 17R042, and 17R044.

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.

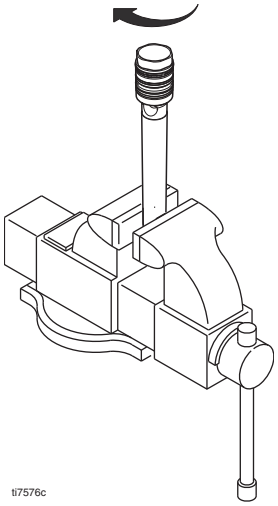


5. Remove piston rod from sleeve, or remove sleeve from cylinder. **Mark IV, Mark VII, and APX 6200 models:** Remove sleeve spacer (230) from sleeve.

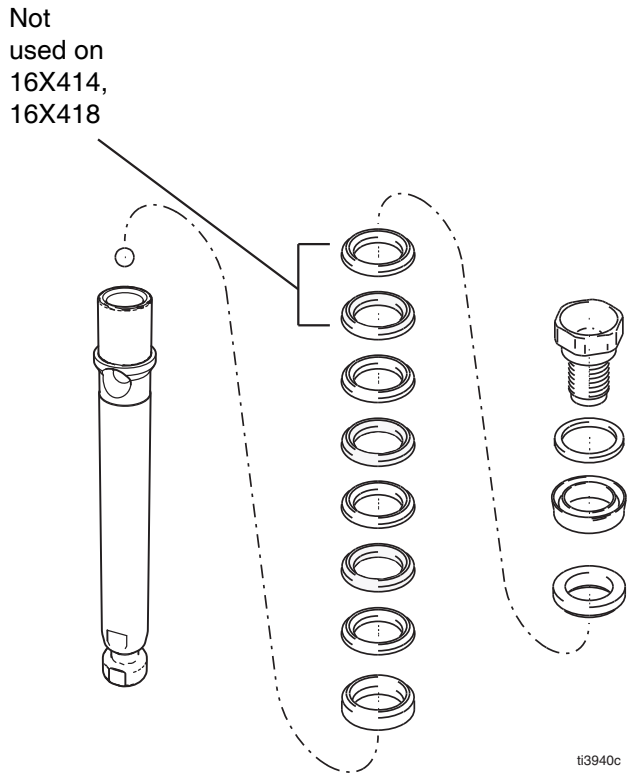


COMPONENT RUPTURE HAZARD
To reduce the risk of serious injury from pressurized fluid, never use sharp or pointed tools to remove sleeve. If the sleeve cannot be removed easily, return the sleeve and cylinder to a Graco distributor for removal.

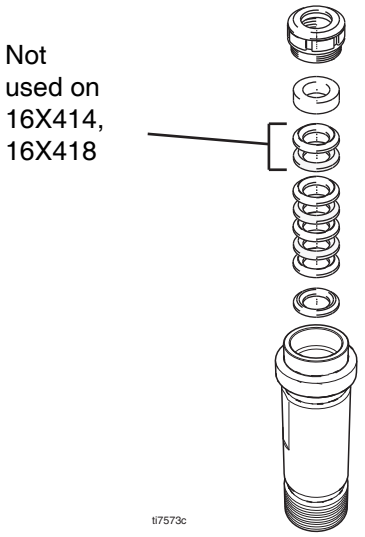
6. Unscrew piston valve from piston rod. Clean and inspect parts. The piston has a special thread locking/sealing patch. Do not remove the patch. The patch allows four disassembly/assembly procedures before it is necessary to apply thread sealant to the threads.



7. Remove packings and glands from piston rod.

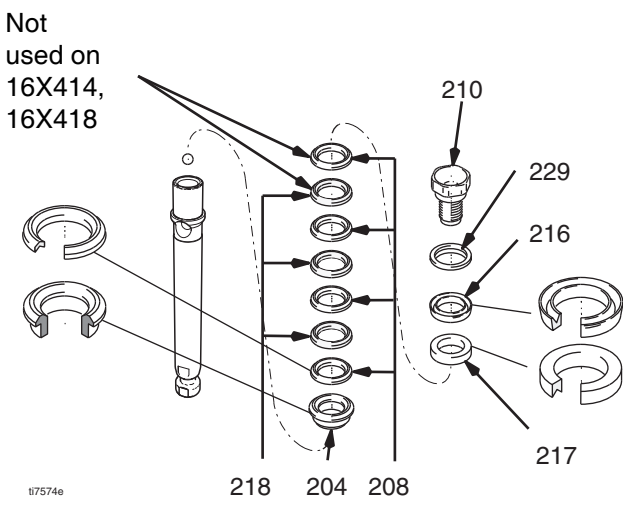


8. Remove throat packings and glands from cylinder. Discard throat packings and glands.

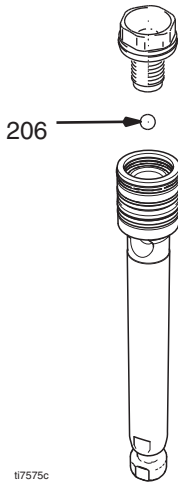


Assembling the Pump

1. 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.

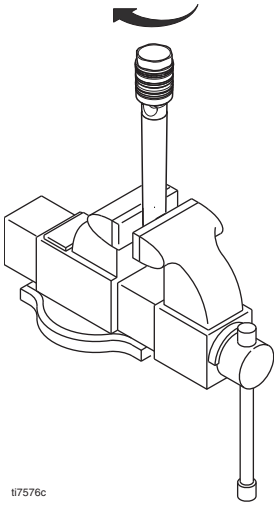


2. Install ball (206) in piston rod. If thread sealant is applied to piston valve threads, make sure that none gets on ball.

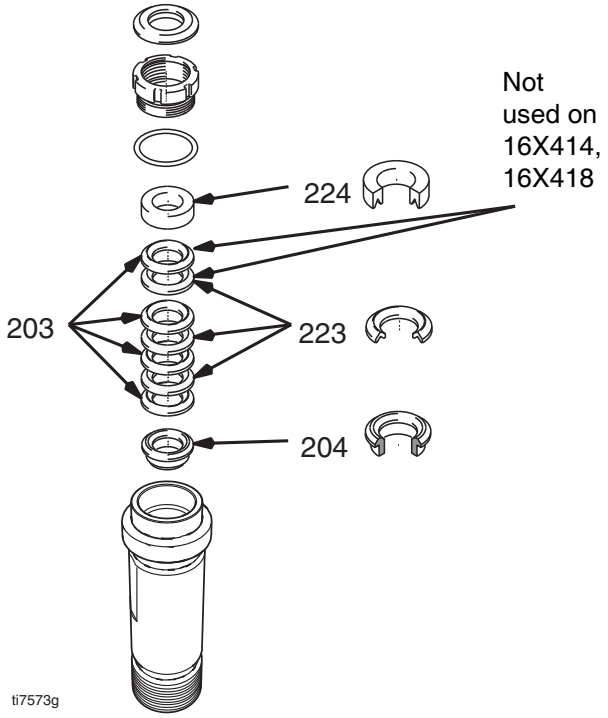


3. Tighten piston valve to piston rod as specified:

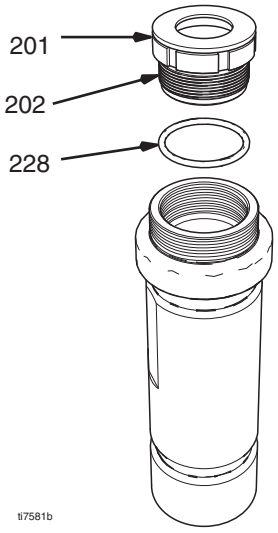
Models	Torque
16X414, 16X418	27 ± 3 ft-lb. (36.1 ± 4.1 N•m)
16X419, 16X420, 16X421, 16Y602, 16Y599,17N693, 17R044	55 ± 3 ft-lb. (74.6 ± 4.1 N•m)
16X426, 16X427, 17N694, 17R042	100 ± 5 ft-lb. (136 ± 7 N•m)



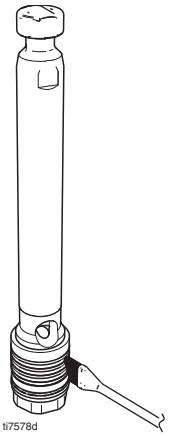
4. Soak all leather packings in SAE 30W oil for one hour minimum prior to assembly. Place male gland (204) in cylinder. Alternately stack UHMWPE (203) and leather packings (223) (note orientation). Place female gland (224) in top of cylinder seat packings.



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



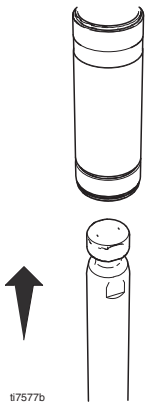
6. Grease piston packings.



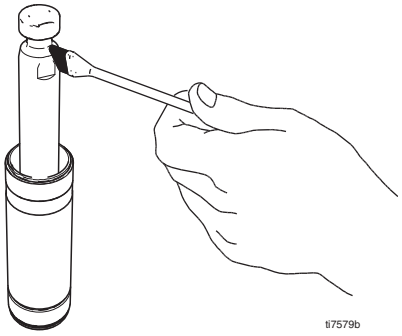
NOTICE

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

7. Slide piston assembly into bottom of sleeve.

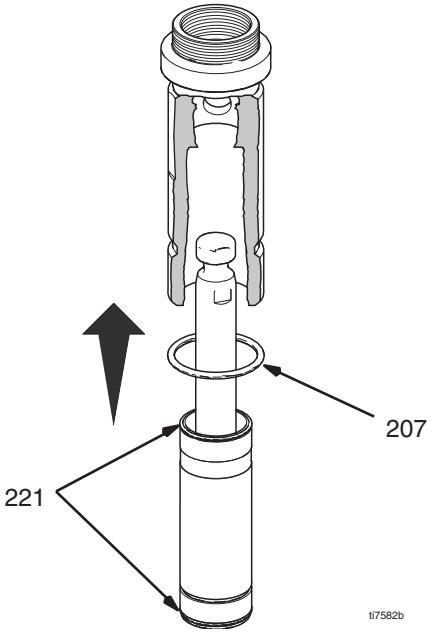


8. Grease top inch or two of piston rod that will go through the cylinder throat packings.

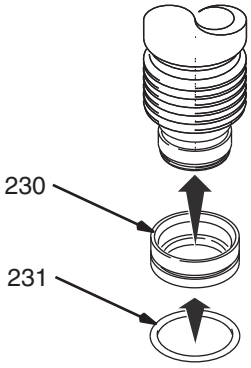


9. Grease o-rings (221) and place on sleeve. Slide sleeve/piston rod assembly into bottom of cylinder. Replace o-ring (207) if desired.

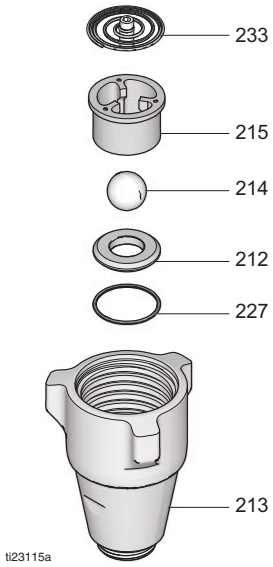
   NOTE: O-ring (207) is not required for safe pump operation.



10. **Mark IV, Mark VII, and APX6200 models:** Install o-ring (231) on sleeve spacer (230) and install sleeve spacer on sleeve.



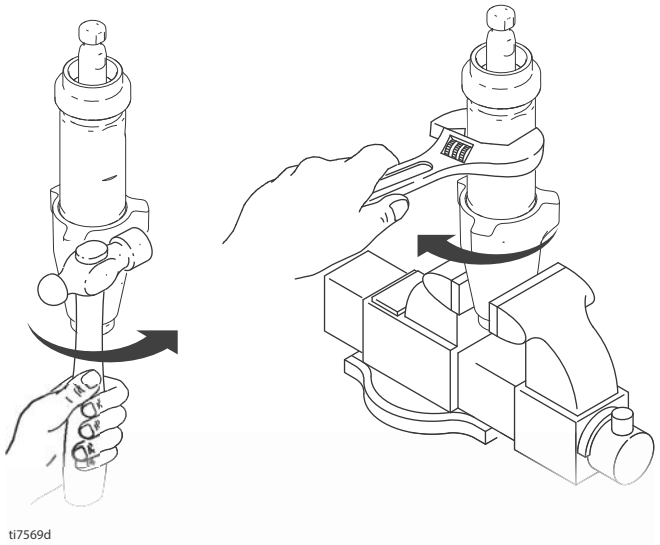
11. Reassemble intake valve with new o-ring (227), seat (212) and ball (214). Seat may be flipped over and used on other side. Clean seat thoroughly.



NOTE: Spring (233) only used on 16X426, 16X427, 16Y602, 17N693, 17N694, 17R042, and 17R044.

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

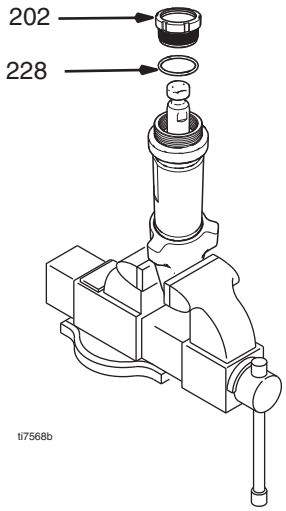
Models	Torque
16X414, 16X418	67 ± 5 ft-lb (90.8 ± 6.8 N•m)
16X419, 16X420, 16X421, 16Y602, 16Y599	80 ± 5 ft-lb (108.5 ± 6.8 N•m)
16X426, 16X427, 17N693, 17N694, 17R041, 17R044	200 ± 15 ft-lb (271.2 ± 20.3 N•m)



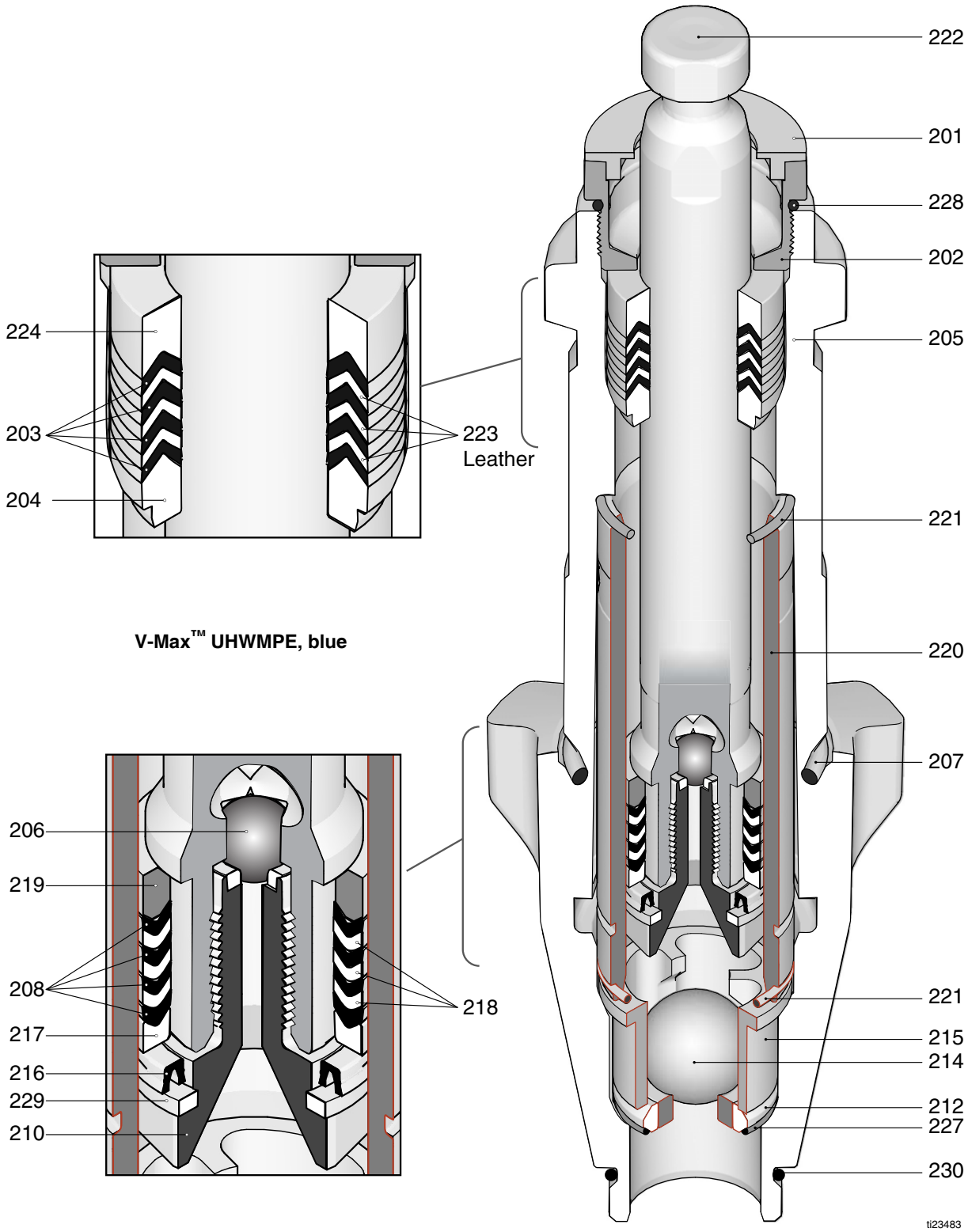
13. Torque packing nut (202) as follows:

Models	Torque
16X414, 16X418, 16X419, 16X420, 16X421, 16Y602, 16Y599, 17N693, 17R044	100 ± 10 in-lb (11.3 ± 1.1 N•m)
16X426, 16X427, 17N694, 17R042	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.



Cross-Section Reference



V-Max™ UHWMPE, blue

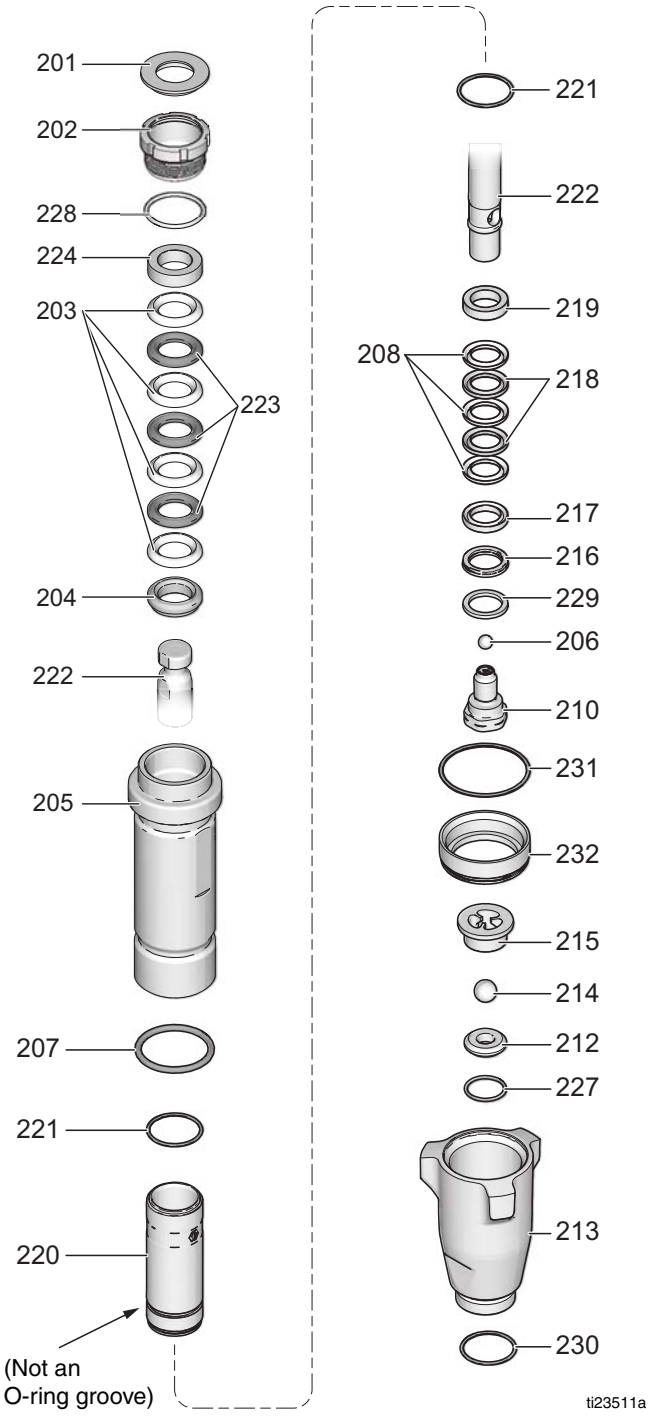
Pump 16X419, 16X420

Parts - Pump 16X414, 16X418

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
	16X450	Model 16X414	
	16X456	Model 16X418	
206		BALL check	1
	105444*	Model 16X414 (Stainless steel)	
	119259†	Model 16X418 (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 16X414, *includes 214, 215, 227*	
	244571	Model 16X418 *includes 214, 227*	
213		VALVE, intake (foot)	1
	15C785	Model 16X414	
	287878	Model 16X418	
214		BALL, check, inlet	1
	105445*	Model 16X414 (Stainless steel)	
	111453†	Model 16X418 (Ceramic)	
	102972	Model 16X418 (Stainless steel)	
215		GUIDE, ball	1
	192624	Model 16X414	
	196967	Model 16X418	
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, ptfe	1
222		ROD, piston	1
	16X434	Model 16X414	
	16X440	Model 16X418	
223*†	178940	V-PACKING, leather, throat	2
224*†	15C988	GLAND, female, throat	1
227		O-RING, ptfe	1
	107079*	Model 16X414	
	108526†	Model 16X418	
228*†	158776	O-RING	1
229*†	15C997	WASHER, backup	1
230*	118494	O-RING, fluoroelastomer (Model 16X414)	1
231†	107098	O-RING (Model 16X418 only)	1
232	15G494	SPACER, sleeve (Model 16X418 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.

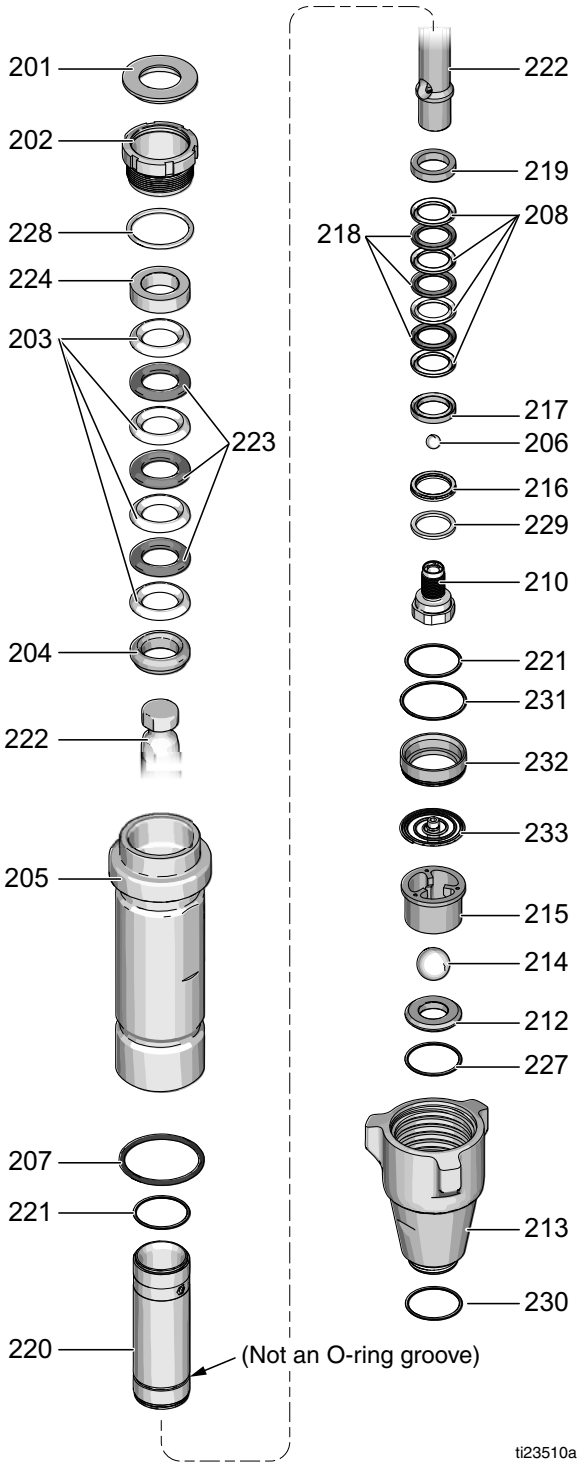


Parts - Pump 16X420, 16Y599

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
	16X452	Model 16X420	
	16X461	Model 16Y599	
206		BALL, check	1
	101947*	Model 16X420 (Stainless steel)	
	116327†	Model 16Y599 (Ceramic)	
207		PACKING, o-ring	1
	156633*†	Model 16X420, 16Y599	
208*†	128779	V-PACKING, piston, UHMWPE, blue	4
		Model 16X420, 16Y599	
210	24U993	VALVE, piston	1
212		KIT, seat, carbide	1
	244199	Model 16X420 *includes 214, 227*	
	244571	Model 16Y599 *includes 214, 227*	
213		VALVE, intake (foot)	1
	15E654	Model 16X420	
	196753	Model 16Y599	
214		BALL, check, inlet	1
	102972*	Model 16X420 (Stainless steel)	
	111453†	Model 16Y599 (Ceramic)	
215		GUIDE, ball	1
	193027	Model 16X420	
	196967	Model 16Y599	
216*†	118504	WIPER, piston	1
217*†	183185	GLAND, female, piston	1
218*†	128296	V-PACKING, brown poly seal	3
		Model 16X420, 16Y599	
219*†	183178	GLAND, male, piston	1
220		SLEEVE, cylinder	1
	257031	Model 16X420, 16Y599	
221*†	107098	O-RING, ptfe	2
222		ROD, piston	1
	16X436	Model 16X420	
	16X441	Model 16Y599	
223*†	183175	V-PACKING, leather, throat	3
224*†	15C990	GLAND, female, throat	1
227		O-RING, ptfe	1
	108526*†	Model 16X420, 16Y599	
228*†	C20987	O-RING	1
229*†	15C998	WASHER, backup	1
230*	118494	O-RING, fluoroelastomer (Model 16X419, 16X420 only)	1

** These parts are also included in Repair Kit 17K162 (stainless steel balls), which may be purchased separately.*

† These parts are also included in Repair Kit 17K475 (ceramic balls), which may be purchased separately.



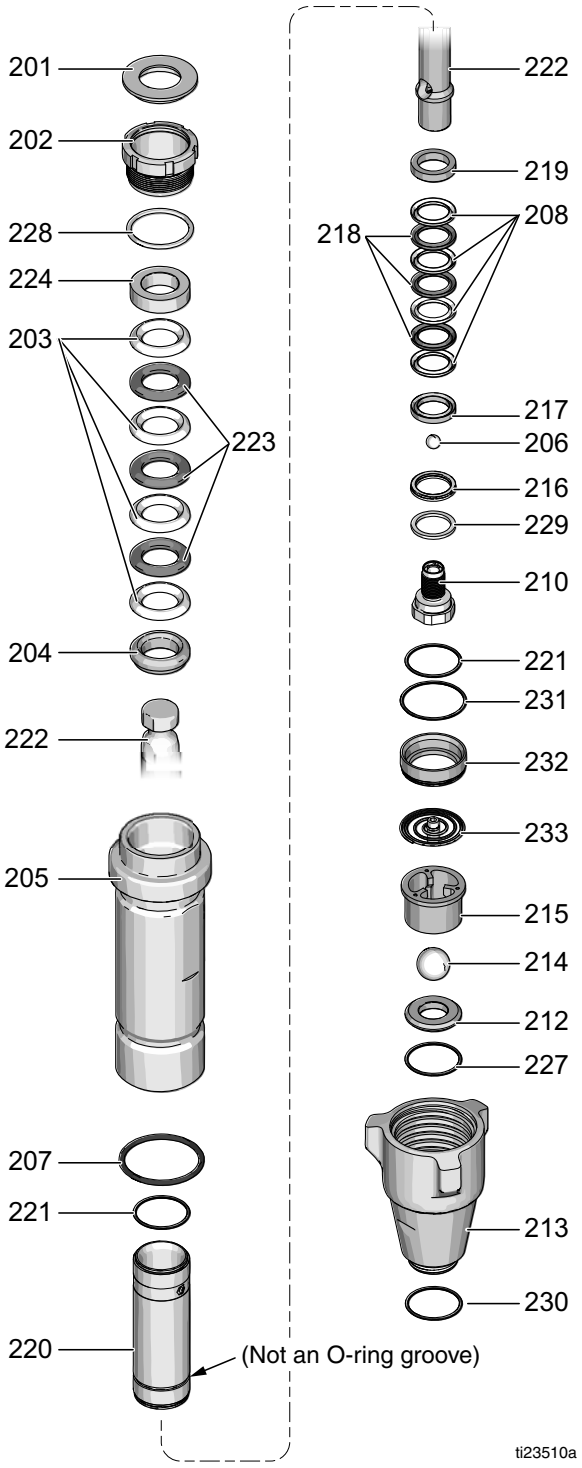
Parts - Pump 16X419, 16X421, 16Y602

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
	16X451	Model 16X419	
	16X457	Model 16X421	
	17A033	Model 16Y602	
206		BALL, check	1
	101947*	Model 16X419 (Stainless steel)	
	116327†❄	Model 16X421, 16Y602 (Ceramic)	
207		PACKING, o-ring	1
	156633*†	Model 16X419, 16X421	
	160325❄	Model 16Y602	
208*†❄	193125	V-PACKING, piston, V-MAX, UHMWPE, blue	4
210	24U993	VALVE, piston	1
212		KIT, seat, carbide	1
	244199	Model 16X419 *includes 214, 227*	
	244571	Model 16X421 *includes 214, 227*	
	24N013	Model 16Y602 *includes 214, 227, 233*	
213		VALVE, intake (foot)	1
	15E654	Model 16X419	
	196753	Model 16X421	
	15A303	Model 16Y602	
214		BALL, check, inlet	1
	102972*	Model 16X419 (Stainless steel)	
	111453†	Model 16X421 (Ceramic)	
	118602❄	Model 16Y602(Ceramic)	
	107167	Model 16Y602 (Stainless steel)	
215		GUIDE, ball	1
	193027	Model 16X419, 16X420	
	196967	Model 16X421, 16Y599	
	16M658	Model 16Y602	
216*†❄	118504	WIPER, piston	1
217*†❄	183185	GLAND, female, piston	1
218*†❄	15E329	V-PACKING, leather, piston	3
219*†❄	183178	GLAND, male, piston	1
220		SLEEVE, cylinder	1
	248210	Model 16X419, 16X421, 16Y602	
221*†❄	107098	O-RING, ptfe	2
222		ROD, piston	1
	16X435	Model 16X419	
	16X441	Model 16X421, 16Y602	
223*†❄	183175	V-PACKING, leather, throat	3
224*†❄	15C990	GLAND, female, throat	1
227		O-RING, ptfe	1
	108526*†	Model 16X419, 16X421	
	107098❄	Model 16Y602	
228*†	C20987	O-RING	1
229*†❄	15C998	WASHER, backup	1
230*	118494	O-RING, fluoroelastomer (Model 16X419 only)	1
231❄	108822	O-RING (Model 16Y602 only)	1
232❄	16M291	SPACER, sleeve (Model 16Y602 only)	1
233	24E027	SPRING, intake, ball (Model 16Y602 only)	1

** These parts are also included in Repair Kit 248213 (stainless steel balls), which may be purchased separately.*

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

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

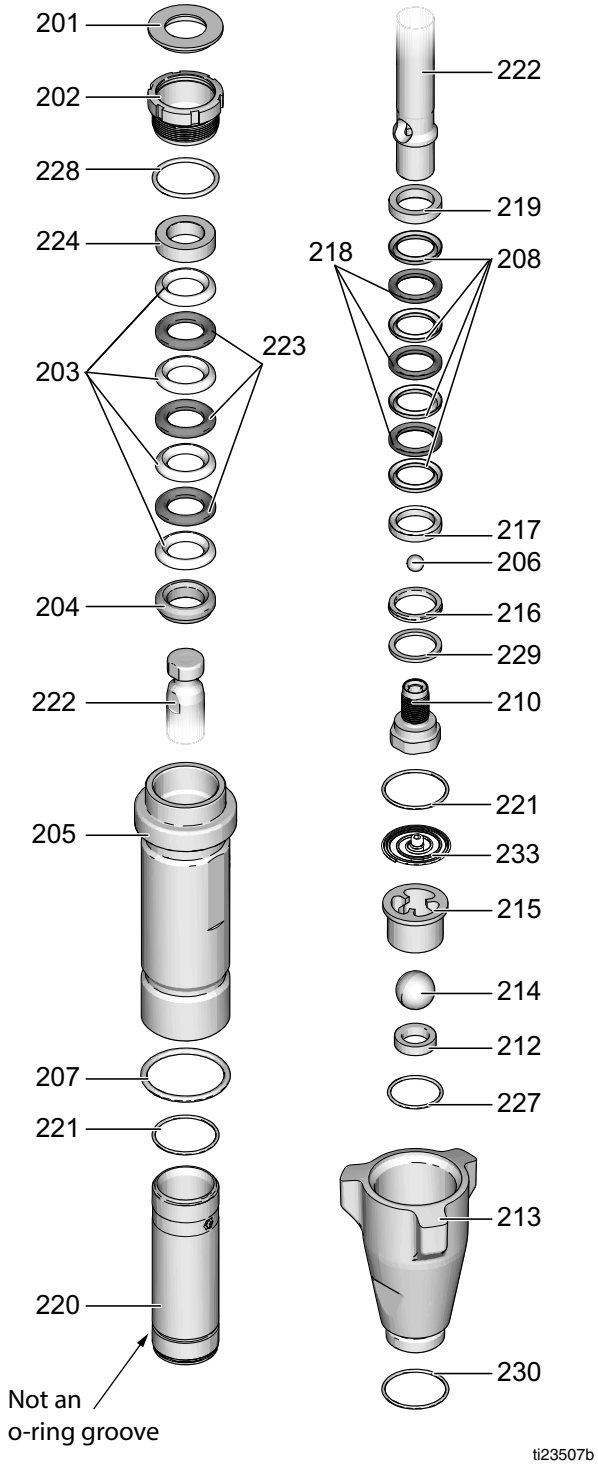


Parts - Pump 16X426, 16X427

Ref.	Part	Description	Qty.
201*❄	112590	SEAL, throat	1
202	16X768	NUT, packing	1
203*❄	193722	V-PACKING, throat, V-Max, UHMWPE, blue	4
204*❄	15G658	GLAND, male, throat	1
205		CYLINDER, pump	1
	16X455	Model 16X426	
	16X460	Model 16X427	
206		BALL, check	1
	107203*	Model 16X426 (Stainless steel)	
	118601❄	Model 16X427 (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 16X426 *includes 214, 227* (stainless steel check ball)	
	16X467	Model 16X426 *includes 214, 227, 233* (ceramic check ball)	
	24N013	Model 16X427, *includes 214, 227, 233*	
213		VALVE, intake (foot)	1
	15E655	Model 16X426	
	15A303	Model 16X427	
214		BALL, check, inlet	1
	107167*	Model 16X426 (Stainless steel)	
	118602❄	Model 16X427 (Ceramic)	
215		GUIDE, ball	1
	198505	Model 16X426	
	193391	Model 16X427	
216*❄	119636	WIPER, piston	1
217*❄	189588	GLAND, female, piston	1
218		V-PACKING, leather, piston	3
	15E639*❄	16X426, 16X427	
219* ❄	189585	GLAND, male, piston	1
220	249121	SLEEVE, cylinder, MaxLife	1
221*❄	108822	O-RING, ptfe	2
222		ROD, piston	1
	16X439	Model 16X426	
	16X443	Model 16X427	
223*❄	112591	V-PACKING, leather, throat	3
224*❄	15G657	GLAND, female, throat	1
227*❄	107098	O-RING, ptfe	1
228*❄	156593	O-RING	1
229*❄	15J800	WASHER, backup	1
230	118494	O-RING, fluoroelastomer (Model 16X426 only)	1
233		SPRING, intake, ball	1
	249770	Model 16X426	
	24E027	Model 16X427	

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

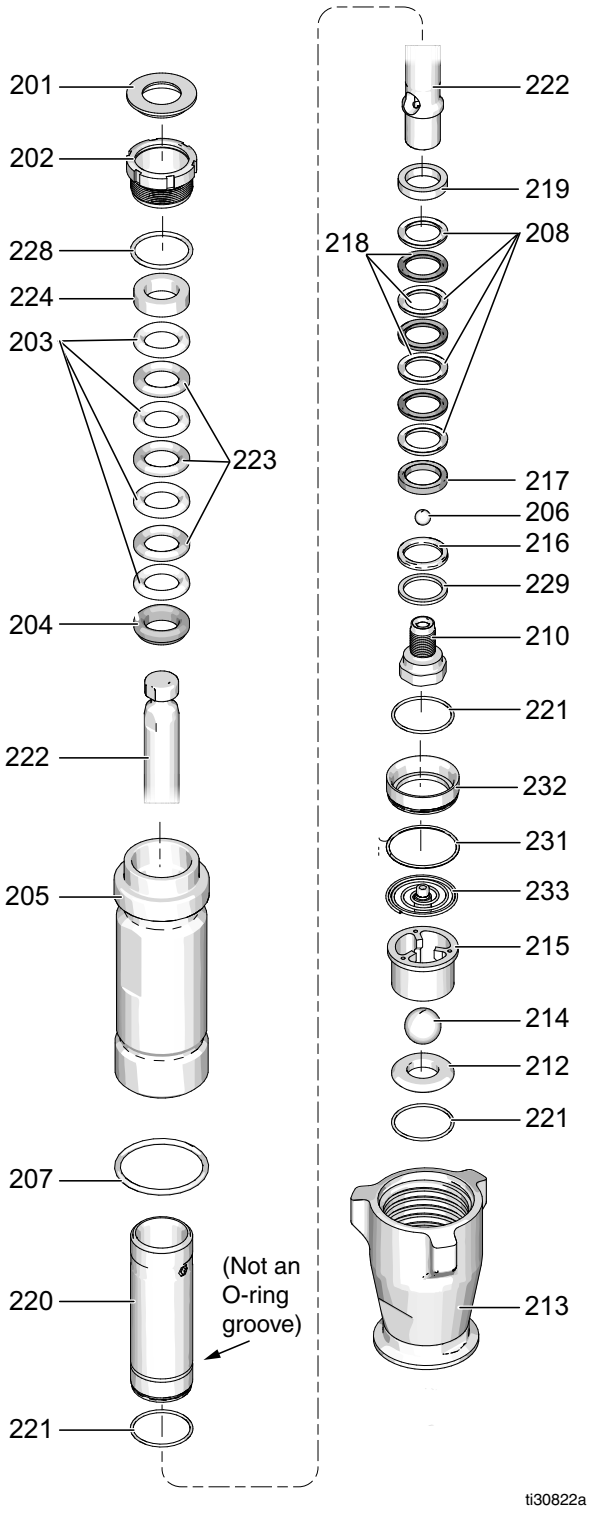
❄ These parts are also included in Repair Kit 17A578 (ceramic balls), which may be purchased separately.



Parts - Pump 17N693, 17R044

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
	17N697	Model 17N693 (Maxlife)	
	17R115	Model 17R044 (Chrome)	
206		BALL, check	1
	101947	Stainless steel	
	124249❄	Ceramic, SI-N	
207❄	160325	PACKING, o-ring	1
208❄	193125	V-PACKING, piston, V-MAX, UHMWPE, blue	4
210	24U993	VALVE, piston	1
212	17N703	KIT, seat, carbide *includes 214, 227, 233*	1
213	17N698	VALVE, intake (foot)	1
214		BALL, check, inlet	1
	17R046❄	Ceramic, SI-N	
	107167	Stainless steel	
215	16M658	GUIDE, ball	1
216❄	118504	WIPER, piston	1
217❄	183185	GLAND, female, piston	1
218❄	15E329	V-PACKING, piston, brown	3
219❄	183178	GLAND, male, piston	1
220		SLEEVE, cylinder	1
	257031	Model 17N693 (Maxlife)	
	248210	Model 17R044 (Chrome)	
221❄	107098	O-RING, ptfe	3
222		ROD, piston	1
	16X436	Model 17N693 (Maxlife)	
	17R146	Model 17R044 (Chrome)	
223❄	183175	V-PACKING, leather, throat	3
224❄	15C990	GLAND, female, throat	1
228	C20987	O-RING	1
229❄	15C998	WASHER, backup	1
231❄	108822	O-RING	1
232❄	16M291	SPACER, sleeve	1
233	24E027	SPRING, intake, ball	1

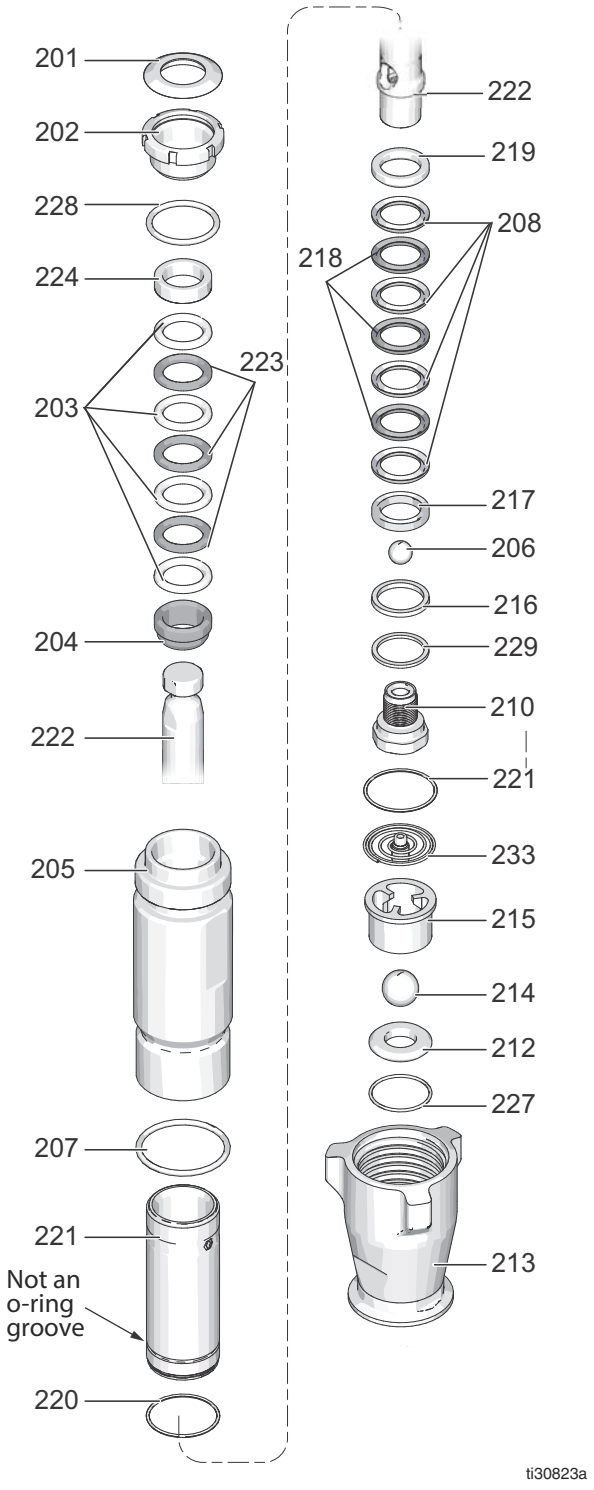
❄ *These parts are also included in Repair Kit 17R114 (ceramic balls SI-N), which may be purchased separately.*



Parts - Pump 17N694, 17R042

Ref.	Part	Description	Qty.
201❄	112590	SEAL, throat	1
202	16X768	NUT, packing	1
203❄	193722	V-PACKING, throat, V-Max, UHMWPE, blue	4
204❄	15G658	GLAND, male, throat	1
205		CYLINDER, pump	1
	17R116	Model 17R042 (Chrome)	
	17N695	Model 17N694 (Maxlife)	
206		BALL, check	
	17R047❄	Ceramic SI-N	1
	107203	Stainless steel(	1
207❄	160325	PACKING, o-ring	1
208❄	193722	V-PACKING, piston, V-MAX, UHMWPE, blue	4
210	249177	VALVE, piston	1
212	17N703	KIT, seat, carbide *includes 214,* ceramic SI-N check ball *227, 233*	1
213	17N698	VALVE, intake (foot)	1
214		BALL, check, inlet	
	17R046❄	Ceramic SI-N	1
	107167	Stainless steel(	1
215	193391	GUIDE, ball	1
216❄	119636	WIPER, piston	1
217❄	189588	GLAND, female, piston	1
218	15E639❄	V-PACKING, piston, brown	3
219 ❄	189585	GLAND, male, piston	1
220		SLEEVE, cylinder, Chrome	1
	248979	Model 17R042 (Chrome)	
	249121	Model 17N694 (Maxlife)	
221❄	108822	O-RING, ptfe	2
222		ROD, piston	1
	17R147	Model 17R042 (Chrome)	
	16X439	Model 17N694 (MaxLife)	
223❄	112591	V-PACKING, leather, throat	3
224❄	15G657	GLAND, female, throat	1
227❄	107098	O-RING, ptfe	1
228❄	156593	O-RING	1
229❄	15J800	WASHER, backup	1
233	24E027	SPRING, intake, ball	1

❄ *These parts are also included in Repair Kit 17R119 (ceramic SI-N balls), which may be purchased separately.*



Notes

Technical Data

	U.S.	Metric
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		
16X414, 16X418, 16X419, 16X420, 16X421, 16Y602, 16Y599, 17N693, 17R044	3/8 npt(f)	3/8 npt(f)
16X426, 16X427, 17N694, 17R042	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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