

Displacement Pump

311076A

Part No. 287657, Series A

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



Important Safety Instructions

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

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Warnings

The following general warnings are for the setup, use, grounding, maintenance, and repair of this equipment. Additional, more specific warnings may be found throughout the body of this manual where applicable. *Symbols appearing in the body of the manual refer to these general warnings. When these symbols appear throughout the manual, refer back to these pages for a description of the specific hazard.*

 WARNING	
	<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 MSDS's 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.
	<p>PERSONAL PROTECTIVE EQUIPMENT</p> <p>You must wear appropriate protective equipment when operating, servicing, or when in the operating area of the equipment to help protect you from serious injury, including eye injury, inhalation of toxic fumes, burns, and hearing loss. This equipment includes but is not limited to:</p> <ul style="list-style-type: none"> • Protective eyewear • Clothing and respirator as recommended by the fluid and solvent manufacturer • Gloves • Hearing protection
	<p>SKIN INJECTION HAZARD</p> <p>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.</p> <ul style="list-style-type: none"> • 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. • Do not spray without tip guard and trigger guard installed. • Engage trigger lock when not spraying. • Follow Pressure Relief Procedure in this manual, when you stop spraying and before cleaning, checking, or servicing equipment.
	<p>FIRE AND EXPLOSION HAZARD</p> <p>Flammable fumes, such as solvent and paint fumes, in work area can ignite or explode. To help prevent fire and explosion:</p> <ul style="list-style-type: none"> • 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 arc). • 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. • Ground equipment and conductive objects in work area. See Grounding instructions. • Use only grounded hoses. • Hold gun firmly to side of grounded pail when triggering into pail. • If there is static sparking or you feel a shock, stop operation immediately. Do not use equipment until you identify and correct the problem. • Keep a fire extinguisher in the work area.


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.
- Check equipment daily. Repair or replace worn or damaged parts immediately.
- Do not alter or modify equipment.
- For professional use only.
- Use equipment only for its intended purpose. Call your Graco distributor for information.
- Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.
- Do not kink or over bend hoses or use hoses to pull equipment.
- Comply with all applicable safety regulations.

**MOVING PARTS HAZARD**

Moving parts can pinch 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** in this manual. Disconnect power or air supply.

Repair

Tools Needed

- Vice with flat jaws
- 12 in. adjustable, open end wrench (2)
- Non-sparking hammer, 20 oz maximum
- Small screwdriver
- Throat Seal Liquid (TSL), Graco Part No. 206995
- ISO Pump Oil, Graco Part No. 217374
- Pick or long small screwdriver
- 3/4 in. deep-well socket
- Dropcloth and rags

Repair Kit

Repair kit 249855 is available for your pump. Kit parts are marked with an asterisk, for example (3*). Kit must be purchased separately. For best results, use all parts in the kit.

Clean and Inspect Parts

Clean and inspect all parts. Intake and piston ball seats, cylinder, and displacement rod must not be worn, scratched, or damaged.

Pressure Relief

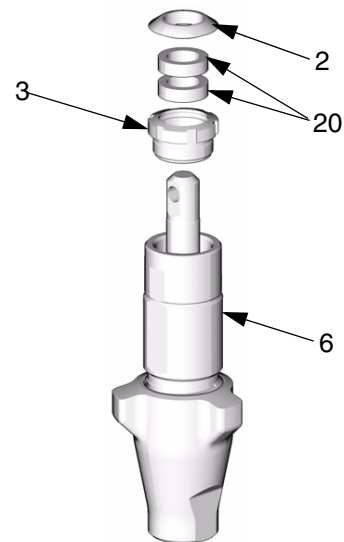


Before repair, relieve all system pressure as explained in your system manual.

Pump Disassembly

1. Relieve pressure. Remove pump as detailed in your separate system manual.

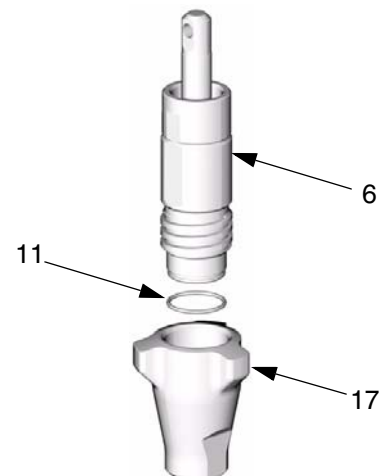
2. Clamp pump intake valve in a vise.
3. Loosen packing nut (3) from cylinder (6) using a hammer and punch, then unscrew. Remove plug (2) and washers (20). See Fig. 1.



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FIG. 1

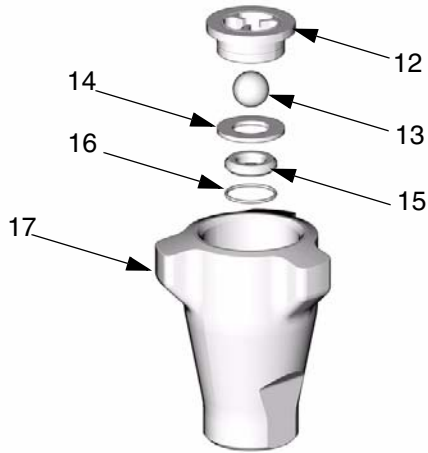
4. Unscrew cylinder (6) from intake valve (17). Remove o-ring (11). See Fig. 2.



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FIG. 2

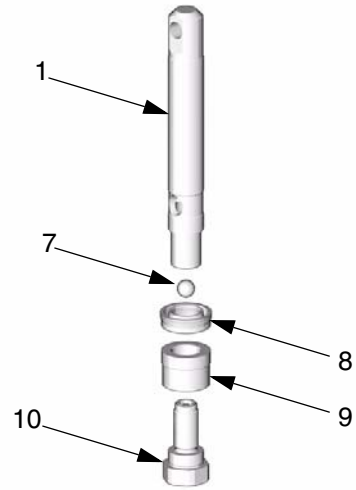
5. Disassemble intake valve (17). Be sure to remove o-ring (16). See Fig. 3.



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FIG. 3

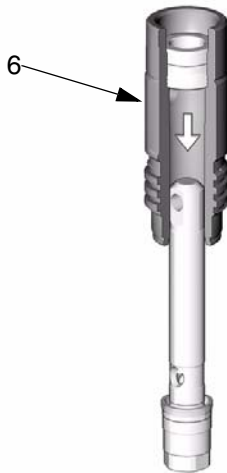
7. Using a 3/4 in. deep well socket, unscrew piston (10) from rod (1). Remove ball (7), u-cup (8), and bushing (9). See Fig. 5.



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FIG. 5

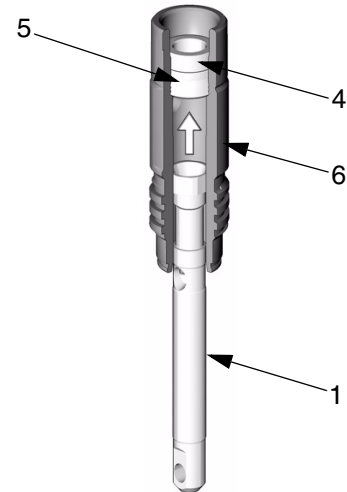
6. Tap piston rod assembly with a non-sparking hammer to drive it out of cylinder (6). See Fig. 4.



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FIG. 4


8. Screw piston (10) part way back onto rod (1), then insert piston end of rod into cylinder (6) and push u-cup (5) and bearing (4) out. See Fig. 6.



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FIG. 6

Pump Reassembly

 Coat all parts that do not use threadlocker with Graco 217374 ISO Pump Oil before reassembly, to ease future disassembly. Threadlocker on piston (10) threads can be used three times.

1. Install ball (7*) in rod (1). Center u-cup (8*) on rod (1). Lips of u-cup must face up. Use piston (10) to evenly push u-cup onto rod, then remove piston. Slide bushing (9) onto rod (1). Wide outside end of bushing must face up, toward u-cup. Install piston (10). Be careful not to damage sealing edges of u-cup. Torque to 24–30 ft/lbs (32.4–40.5 N•m).

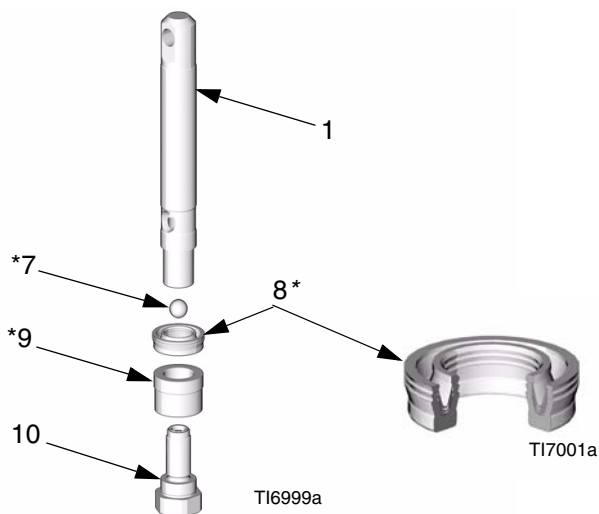


FIG. 7

2. Lubricate piston u-cup (8*). Push piston assembly into bottom of cylinder (6). Drive in with a non-sparking hammer.

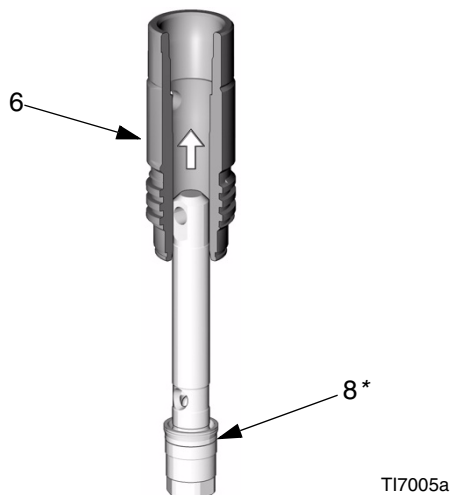



FIG. 8

3. Reassemble intake valve with o-ring (16*), seat (15*), spacer (14*), and ball (13*). Install ball guide (12).

 Seat may be flipped over and used on other side. Clean seat thoroughly. No scratches permitted on sealing surface.

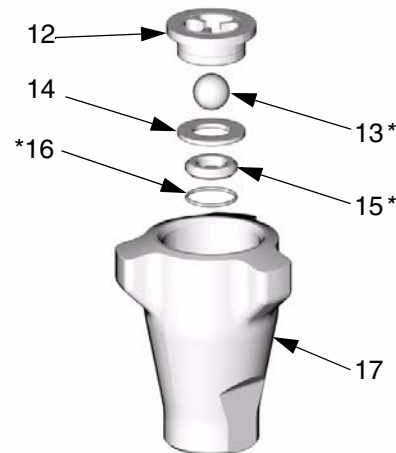


FIG. 9

4. Use your fingers to replace o-ring (11*). Install intake valve. Torque housing (17) to approximately 55–65 ft/lb (74.25–87.75 N•m), or be sure intake valve is snug against cylinder.

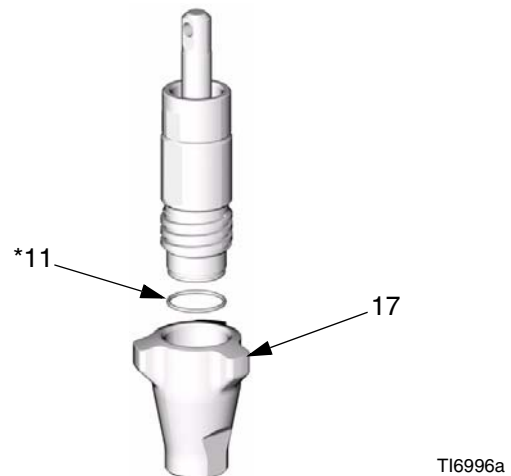


FIG. 10

5. Install throat u-cup (5*). Grease u-cup and cylinder (6). U-cup lips must be facing down. Press u-cup carefully over rod wrench flats, then into cylinder with a 3/4 in. deep-well socket (A). Remove socket.

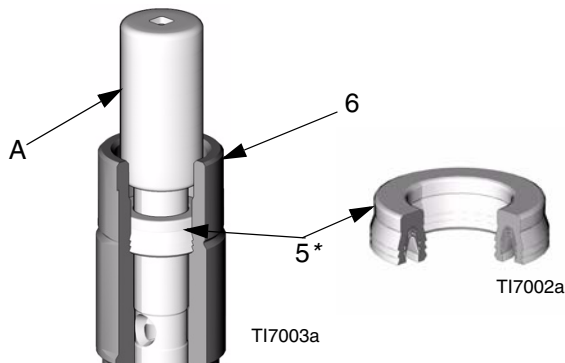


FIG. 11

6. Insert bushing (4*) into cylinder. Press bushing in place to seat u-cup against shoulder in cylinder (6).

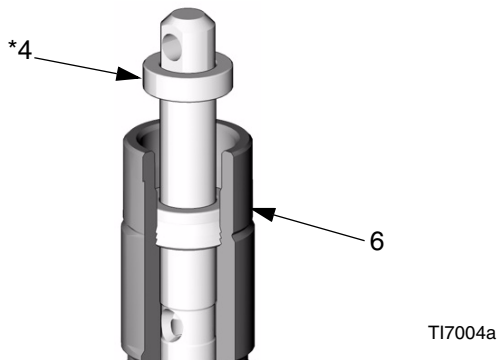



FIG. 12

 Assemble felt washers (20) into packing nut (3), and retain with plastic cap (2). Soak assembly in 217374 ISO oil for a minimum 10 minutes before assembling on pump.

7. Screw packing nut assembly (3) into cylinder (6). Hand tighten, then tighten securely with a punch and hammer.

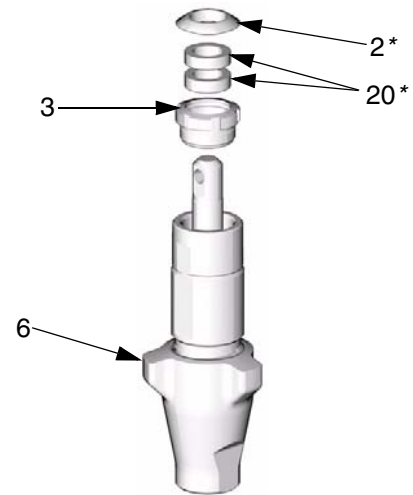


FIG. 13

8. Expose 1/2 in. (12.7 mm) of polished section of rod by inserting screwdriver into pinhole and twisting while carefully pulling up. This will leave enough rod exposed for mounting on the drive housing.

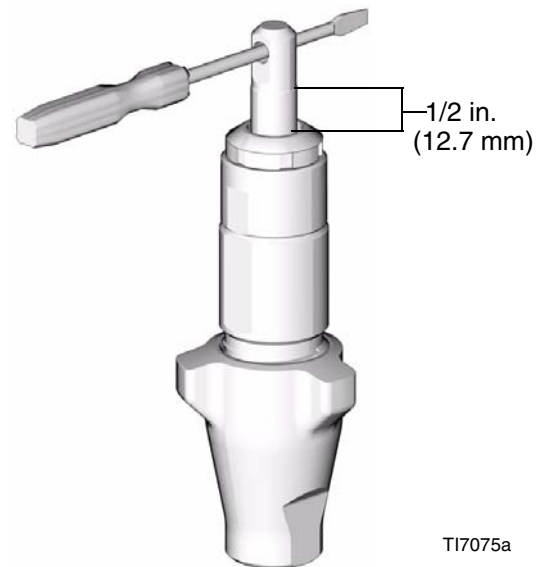
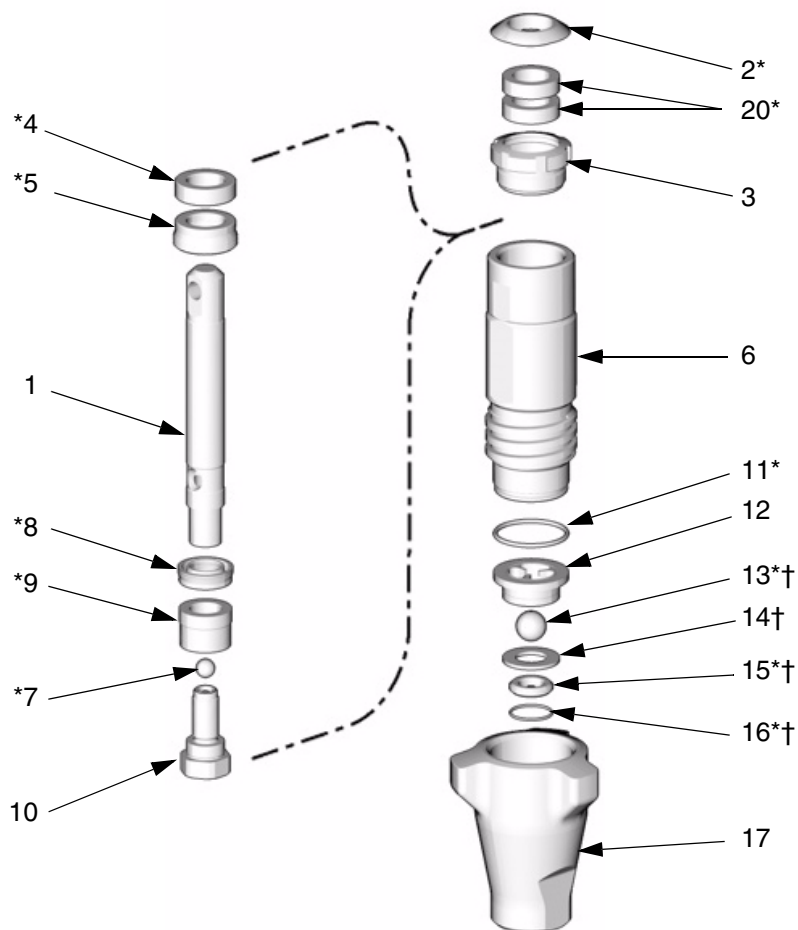


FIG. 14

Parts

Part No. 287657, Displacement Pump



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Ref. No.	Part No.	Description	Qty.	Ref. No.	Part No.	Description	Qty.
1	249125	ROD, piston (includes #10 piston)	1	12	196896	GUIDE, ball	1
2*	180656	PLUG, button	1	13*†	105445	BALL, intake	1
3	193047	NUT, packing	1	14†	195134	SPACER, ball, guide	1
4*	15F745	BUSHING, rod	1	15*†	195132	SEAT, intake valve, carbide	1
5*	15F747	SEAL, u-cup, rod	1	16*†	195136	O-RING, special	1
6	243176	CYLINDER, pump	1	17	196755	HOUSING, valve, intake	1
7*	105444	BALL, piston	1	20*	117603	WASHER, felt	2
8*	15F748	SEAL, u-cup, piston	1				
9*	15F746	BUSHING, piston	1				
10		VALVE, piston (included in #1)	1				
11*	108526	PACKING, o-ring	1				

* Parts included in Kit 249855 (purchase separately).

† Parts included in Kit 243190

Technical Data

Category	Data
Maximum working pressure (pump only)	3300 psi (22.7 MPa, 227 bar)
Effective area of displacement	0.301 in. ² (1.94 cm ²)
Fluid inlet size	3/4 npt(f)
Fluid outlet size	1/4 npt(f)
Wetted parts	stainless steel, PTFE, zinc-plated carbon steel, acetal, tungsten carbide, chrome plating, ultra-high molecular weight polyethylene
Stroke Length	0.72 in. (18.29 mm) on E-10 Reactor
Volume Per Cycle (single pump)	.00176 gal. (.0066 Liter)

Graco Standard Warranty

Graco warrants all equipment referenced in this document which is manufactured by Graco and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser for use. With the exception of any special, extended, or limited warranty published by Graco, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by Graco to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

This warranty does not cover, and Graco shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-Graco component parts. Nor shall Graco be liable for malfunction, damage or wear caused by the incompatibility of Graco equipment with structures, accessories, equipment or materials not supplied by Graco, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Graco.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Graco distributor for verification of the claimed defect. If the claimed defect is verified, Graco will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

THIS WARRANTY IS EXCLUSIVE, AND IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

Graco's sole obligation and buyer's sole remedy for any breach of warranty shall be as set forth above. The buyer agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available. Any action for breach of warranty must be brought within two (2) years of the date of sale.

GRACO MAKES NO WARRANTY, AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, IN CONNECTION WITH ACCESSORIES, EQUIPMENT, MATERIALS OR COMPONENTS SOLD BUT NOT MANUFACTURED BY GRACO. These items sold, but not manufactured by Graco (such as electric motors, switches, hose, etc.), are subject to the warranty, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

In no event will Graco be liable for indirect, incidental, special or consequential damages resulting from Graco supplying equipment hereunder, or the furnishing, performance, or use of any products or other goods sold hereto, whether due to a breach of contract, breach of warranty, the negligence of Graco, or otherwise.

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