

# Xtreme Lowers

311762C

*High volume lowers for protective coatings.*

See page 3 for model information, see page 27 for maximum working pressure.



**Important Safety Instructions**

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

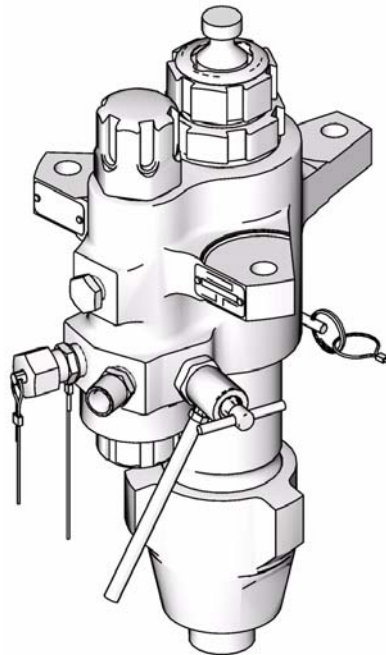
Patents:

U.S. 6,925,926

U.S. 7,025,087

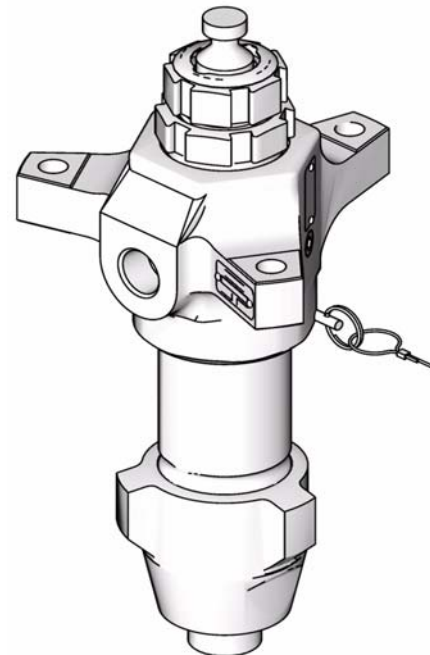
Taiwan 185733

Other patents pending



T18630a

Model L220C2 Lower with Built-in Filter



T18405a

Model L220C1 Lower without Filter

PROVEN QUALITY. LEADING TECHNOLOGY.

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## Related Manuals

Component Manuals in U.S. English:

| Manual | Description   |
|--------|---|
| 311164 | Xtreme Packages Instructions and Parts                        |
| 311238 | NXT Air Motor Instructions and Parts                          |
| 311239 | Air Control Modules for NXT Air Motors Instructions and Parts |

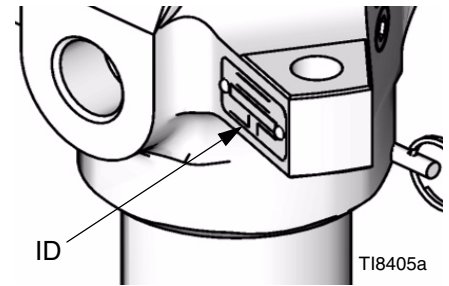
The Xtreme Lowers manual is available in the following languages. See the following chart for specific languages and corresponding part numbers.

| Manual | Language |
|--------|----------|
| 311762 | English  |
| 312451 | Chinese  |
| 312452 | Dutch    |
| 312453 | Finnish  |
| 312454 | French   |
| 312455 | German   |
| 312456 | Greek    |


| Manual | Language   |
|--------|------------|
| 312457 | Italian    |
| 312458 | Japanese   |
| 312459 | Korean     |
| 312460 | Portuguese |
| 312461 | Russian    |
| 312462 | Spanish    |
| 312463 | Swedish    |
| 312464 | Turkish    |

# Models

Check the identification plate (ID) on your lower for the 6-digit part number of your lower. Use the following matrix to define the construction of your lower, based on the six digits. For example, Lower Part Number **L180C1** represents the lower (**L**), output volume (**180**), carbon steel construction (**C**), and no filter with Xtreme Seal™ packing stack (**1**).



To order replacement parts, see **Parts**, starting on page 14.





 For maximum fluid working pressures, see **Technical Data** section starting on page 27.






| <b>L</b>            | <b>180</b>                              | <b>C</b>           |                 | <b>1</b>           |                          |                              |                             |
|---------------------|---|--------------------|-----------------|--------------------|--------------------------|------------------------------|-----------------------------|
| <b>First Digit</b>  | <b>Second, Third, and Fourth Digits</b> | <b>Fifth Digit</b> |                 | <b>Sixth Digit</b> |                          |                              |                             |
|                     | <b>Lower Volume (cc)</b>                |                    | <b>Material</b> |                    | <b>Integrated Filter</b> | <b>Xtreme Seal™ Packings</b> | <b>Tuff Stack™ Packings</b> |
| <b>L</b><br>(lower) | <b>85★</b>                              | C                  | Carbon Steel    | 1                  |                          | ✓                            |                             |
|                     | <b>115★</b>                             |                    |                 | 2                  | ✓                        | ✓                            |                             |
|                     | <b>145</b>                              |                    |                 | 3                  |                          |                              | ✓                           |
|                     | <b>14A★</b>                             |                    |                 | 4                  | ✓                        |                              | ✓                           |
|                     | <b>180</b>                              |                    |                 |                    |                          |                              |                             |
|                     | <b>18A★</b>                             |                    |                 |                    |                          |                              |                             |
|                     | <b>220</b>                              |                    |                 |                    |                          |                              |                             |
|                     | <b>22A★</b>                             |                    |                 |                    |                          |                              |                             |
|                     | <b>250</b>                              |                    |                 |                    |                          |                              |                             |
|                     | <b>290</b>                              |                    |                 |                    |                          |                              |                             |
|                     | <b>29A★</b>                             |                    |                 |                    |                          |                              |                             |

★ Models with a 5.9 in. bolt pattern; see page 26.

# Warnings

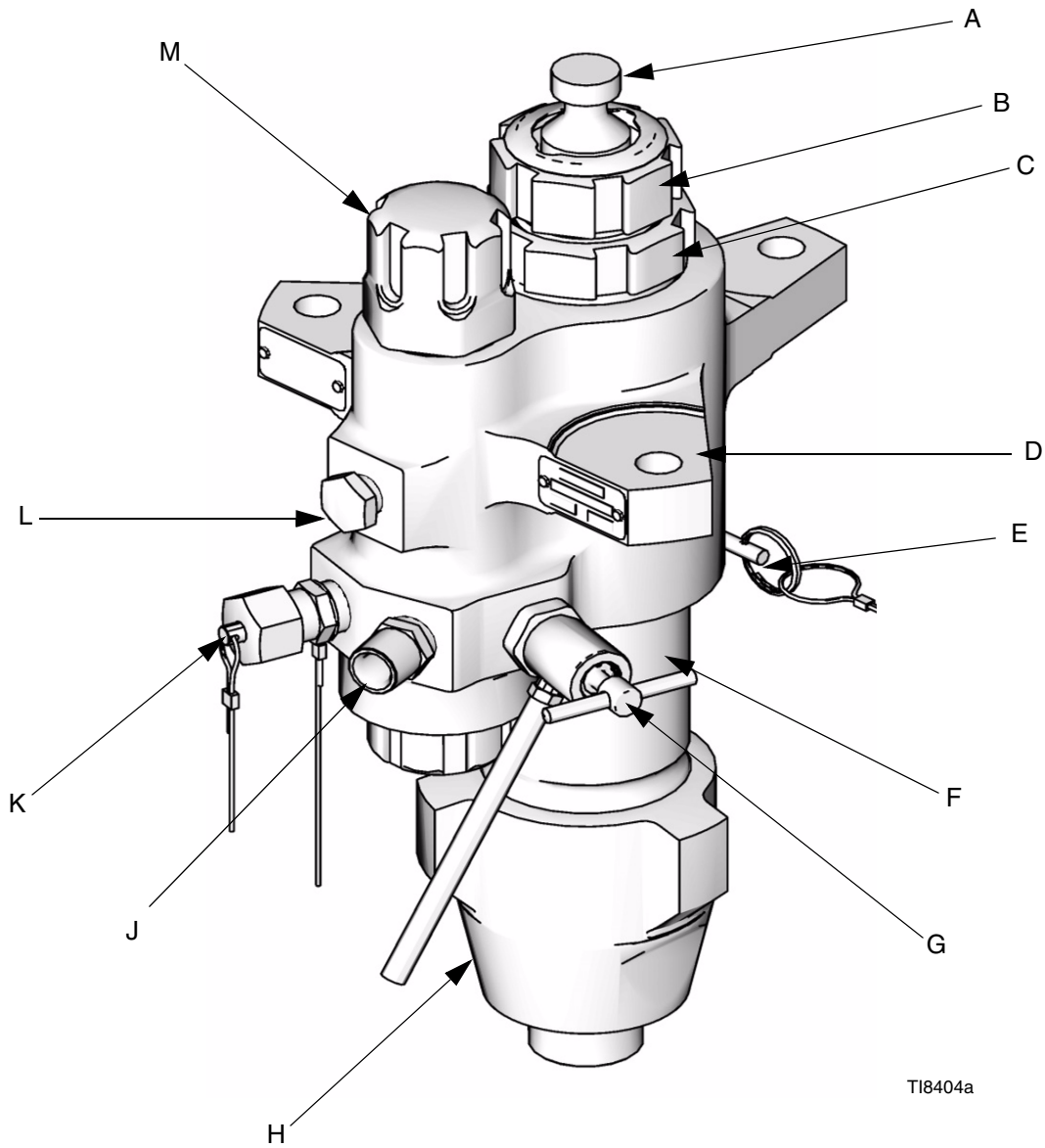
The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbol refers to procedure-specific risk. Refer back to these warnings. Additional, product-specific warnings may be found throughout the body of this manual where applicable.

|  <b>WARNING</b> |   |
|--|---|
|                 | <p><b>FIRE AND EXPLOSION HAZARD</b></p> <p>Flammable fumes, such as solvent and paint fumes, in <b>work area</b> can ignite or explode. To help prevent fire and explosion:</p> <ul style="list-style-type: none"> <li>• Use equipment only in well ventilated area.</li> <li>• Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static arc).</li> <li>• Keep work area free of debris, including solvent, rags and gasoline.</li> <li>• Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present.</li> <li>• Ground all equipment in the work area. See <b>Grounding</b> instructions.</li> <li>• Use only grounded hoses.</li> <li>• Hold gun firmly to side of grounded pail when triggering into pail.</li> <li>• If there is static sparking or you feel a shock, <b>stop operation immediately</b>. Do not use equipment until you identify and correct the problem.</li> <li>• Keep a working fire extinguisher in the work area.</li> </ul>   |
|               | <p><b>SKIN INJECTION HAZARD</b></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. <b>Get immediate surgical treatment.</b></p> <ul style="list-style-type: none"> <li>• Do not point gun at anyone or at any part of the body.</li> <li>• Do not put your hand over the spray tip.</li> <li>• Do not stop or deflect leaks with your hand, body, glove, or rag.</li> <li>• Do not spray without tip guard and trigger guard installed.</li> <li>• Engage trigger lock when not spraying.</li> <li>• Follow <b>Pressure Relief Procedure</b> in manual 311164, when you stop spraying and before cleaning, checking, or servicing equipment.</li> </ul>   |
|               | <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 operate the unit when fatigued or under the influence of drugs or alcohol.</li> <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 <b>Technical Data</b> in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request MSDS forms from distributor or retailer.</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.</li> <li>• Use equipment only for its intended purpose. Call your distributor for information.</li> <li>• Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.</li> <li>• Do not kink or over bend hoses or use hoses to pull equipment.</li> <li>• Keep children and animals away from work area.</li> <li>• Comply with all applicable safety regulations.</li> </ul> |

|  <b>WARNING</b>   |  |
|--|--|
| <br> | <p><b>MOVING PARTS HAZARD</b></p> <p>Moving parts can pinch 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> in manual 311164. Disconnect power or air supply.</li> </ul>   |
|   | <p><b>TOXIC FLUID OR FUMES HAZARD</b></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"> <li>• Read MSDS's to know the specific hazards of the fluids you are using.</li> <li>• Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.</li> <li>• Always wear impervious gloves when spraying or cleaning equipment.</li> </ul>   |
|   | <p><b>PERSONAL PROTECTIVE EQUIPMENT</b></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"> <li>• Protective eyewear</li> <li>• Clothing and respirator as recommended by the fluid and solvent manufacturer</li> <li>• Gloves</li> <li>• Hearing protection</li> </ul> |

# Component Identification

(Shown with Built-in Filter)



**Key:**

- |   |                  |   |  |
|---|------------------|---|--|
| A | Displacement Rod | G | Drain/Purge Valve                            |
| B | Packing Nut      | H | Inlet Housing                                |
| C | Throat Cartridge | J | Fluid Outlet                                 |
| D | Outlet Housing   | K | Optional Fluid Outlet (for second spray gun) |
| E | Locking Pin      | L | Pipe Plug                                    |
| F | Cylinder         | M | Fluid Filter                                 |


# Repair

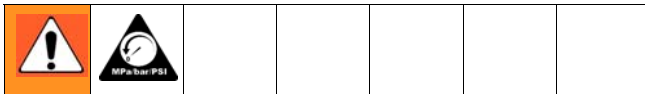
## Required Tools

- Set of adjustable wrenches
- Torque wrench
- Rubber mallet
- Arbor press
- Soft wooden block (approx. 1 square ft in size)
- Large vise with soft jaws
- Thread lubricant
- Petroleum jelly
- Anti-seize lubricant 222955
- Loctite® 2760™ or equivalent

## Disassembly

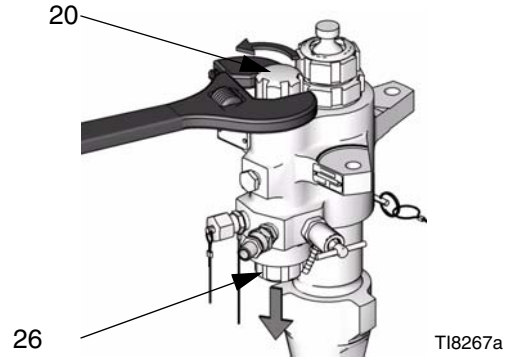
Layout all removed parts in sequence to ease reassembly. Clean all parts with a compatible solvent and inspect them for wear or damage.

 Repair kits are available to replace the throat (T) and piston (P) packings, and to replace the o-rings and cylinder seals. For best results, use all new parts in the kit. Kit parts are marked with an asterisk, for example (25\*). These kits can also be used to convert the lower to different packing materials. See **Packing Kits**, page 22.

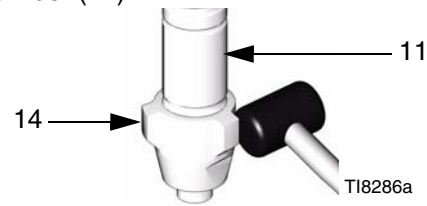


1. Relieve pressure. See your Xtreme Packages manual (311164) for instructions.
2. Disconnect lower from motor as illustrated in your Xtreme Packages manual (311164). Or, if you have a cart mounted system, tip cart up to service lower on cart.

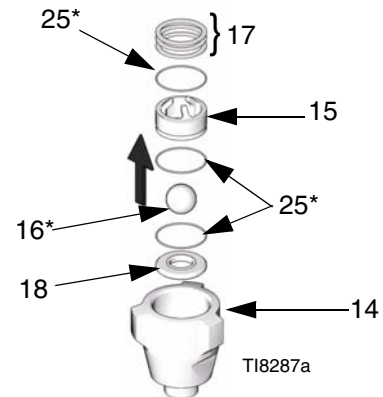
3. For lowers with built-in filters, loosen and remove both top filter cap (20) and bottom filter cap (26). See **Service Built-in Filter**, page 13.



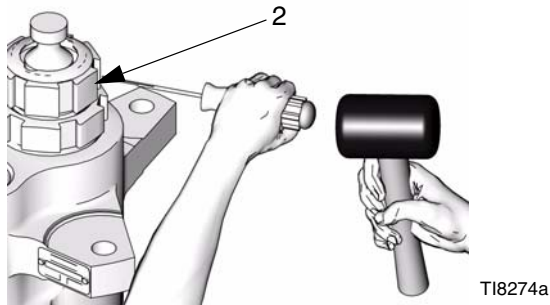
4. Loosen and remove inlet housing (14) from lower cylinder (11).



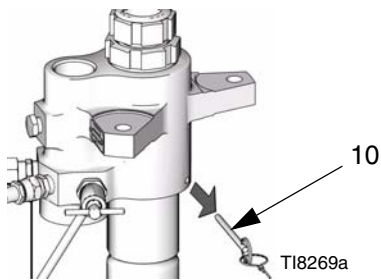
5. Remove shims (17), o-rings (25\*), inlet ball guide (15), inlet ball (16\*), and seat (18) from inlet housing (14). Inspect all parts for wear or damage.



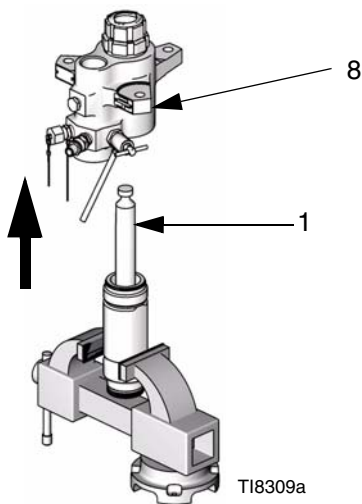
6. Stand lower upright in large vise. Using a rubber mallet, loosen, but do not remove packing nut (2).



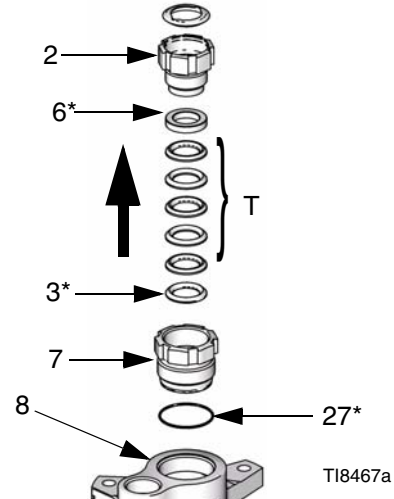
7. Remove locking pin (10) from lower cylinder (11).



8. Unscrew and lift outlet housing (8) straight up off cylinder. Be careful not to scratch displacement rod (1).



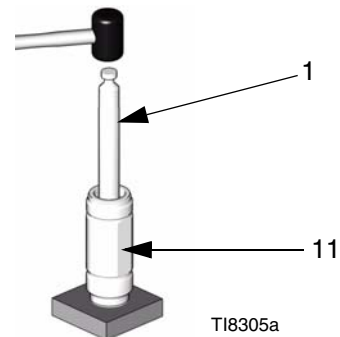
9. Remove cartridge assembly. Remove o-ring (27\*) from bottom of outlet housing (8), and then unscrew packing nut (2) from packing cartridge (7). Remove female gland (6\*), male gland (3\*), and v-packings (T) from packing cartridge (7).



**CAUTION**

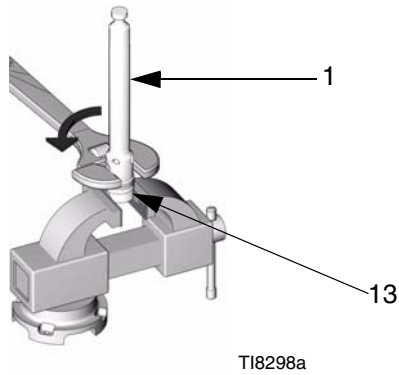
To reduce the possibility of costly damage to displacement rod (1) and lower cylinder (11), first place lower cylinder on a soft block of wood. Always use a rubber mallet or an arbor press to drive the displacement rod out of the lower cylinder. Never use a hammer to drive the rod out. Damage to the rod end will shorten pump life.

10. Stand lower cylinder (11) upright on a wooden block. Using a rubber mallet or an arbor press, drive displacement rod (1) and piston assembly (P) down in the cylinder as far as possible. Then place the cylinder on its side and continue to drive rod out of the bottom until the piston comes free. Pull the rod and piston from the cylinder, being careful not to scratch the rod or cylinder.

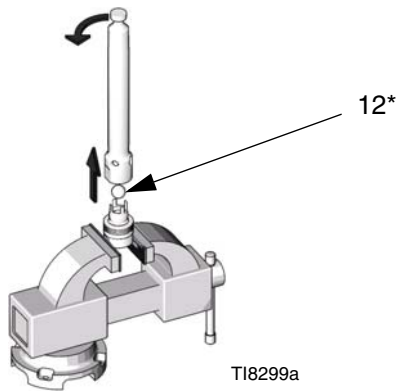




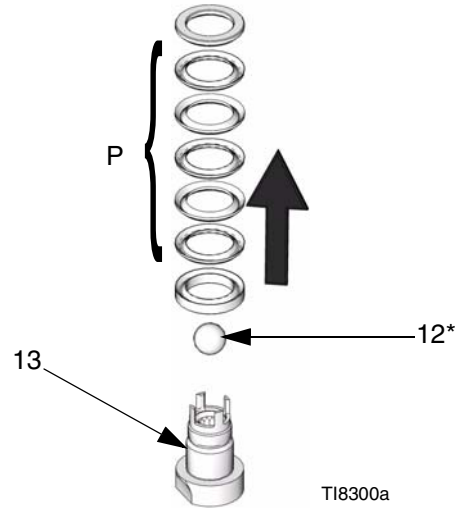
- 11. Inspect outer surface of displacement rod (1) and inner surface of lower cylinder (11) for scoring or wear; replace if damaged.
- 12. Put flats of piston valve (13) in a vise. Use a wrench to loosen displacement rod (1) from piston valve.



- 13. Remove displacement rod from piston valve. Be careful that piston ball (12\*) does not fall as you separate piston valve and rod.



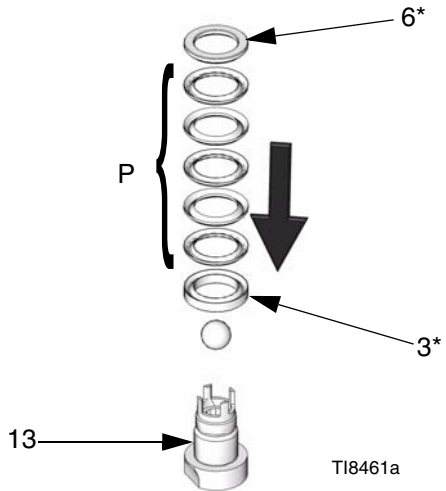
- 14. Remove glands and v-packings (P) from piston valve (13). Inspect piston ball (12\*) and piston valve for wear or damage.




- 15. Clean all parts with a compatible solvent.

## Reassembly

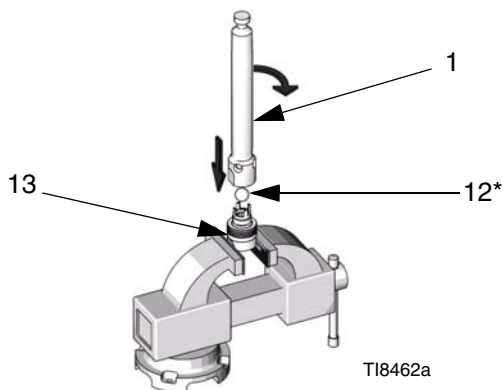
1. Replace female gland (3\*) on piston valve (13). Install the five v-packings (P) one at a time with lips facing up. Refer to **Packing Kits**, page 22 for the correct packing order for your lower. Install the male gland (6\*).



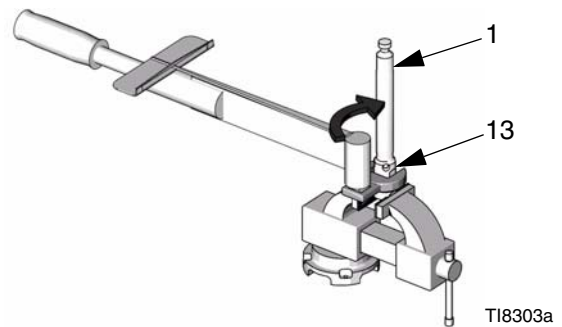
 To convert the lower to a different packing material, see **Packing Kits**, page 22.

For best results, soak leather packings in oil before reassembly.

2. Apply anti-seize lubricant to threads and mating surfaces of displacement rod (1) and piston valve (13). Place flats of piston valve in a vise. Place piston ball (12\*) on piston valve.



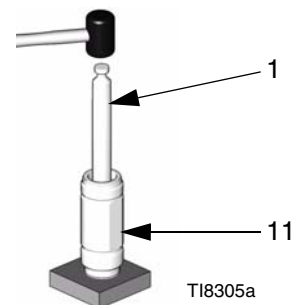
3. Screw displacement rod (1) onto piston valve (13), hand tight, and then torque to 190-210 ft-lb (258-285 N•m).




### CAUTION

To reduce the possibility of costly damage to displacement rod (1) and lower cylinder (11), first place lower cylinder on a soft block of wood. Always use a rubber mallet or an arbor press to drive the displacement rod into the lower cylinder. Never use a hammer to drive the rod.

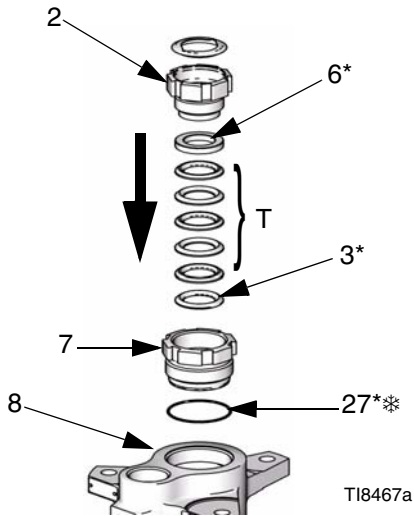
4. To reinstall displacement rod (1) into lower cylinder (11), first lubricate piston packings (P). Then, with piston end facing down, lower rod into cylinder. Start piston into cylinder as much as possible, then drive rod and piston the rest of the way into the cylinder with an arbor press or rubber mallet.



- Lubricate inside of packing cartridge (7), outside threads of packing nut (2), and throat packings (T). Install packing cartridge into housing. Place male gland (3\*) in packing cartridge. Install the five v-packings one at a time with lips facing down. Refer to **Packing Kits** (page 22) for the correct packing order for your lower. Install female gland (6\*). Then, reassemble packing nut (2), but do not tighten.

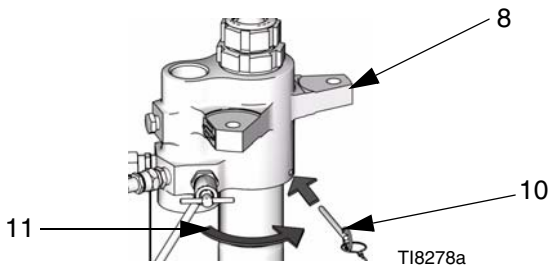
 To convert lower to a different packing material, see **Packing Kits**, page 22.

For best results, soak leather packings in oil before reassembly.




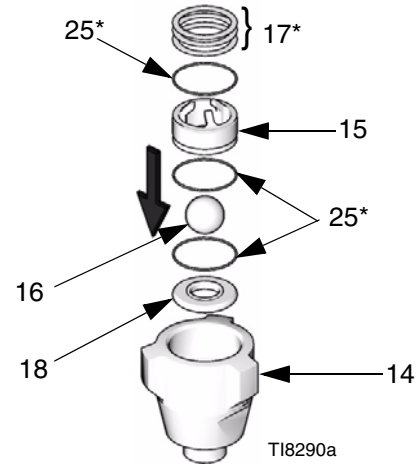
\*Blue o-ring for 220cc, 250cc, 290cc lowers.

- Screw lower cylinder (11) onto outlet housing (8) until it bottoms out. Use a wrench to tighten lower cylinder. Back off as little as possible until hole in housing lines up with flat on cylinder. Insert locking pin (10) into cylinder.



- Lubricate o-rings (25\*) and reinstall. Install inlet seat (18), inlet ball (16\*), inlet ball guide (15), and shims (17) into inlet housing.

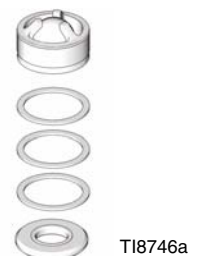
 Shims can be assembled either for short ball travel or long ball travel. See illustrations below for example of each.



Shortest Ball Travel



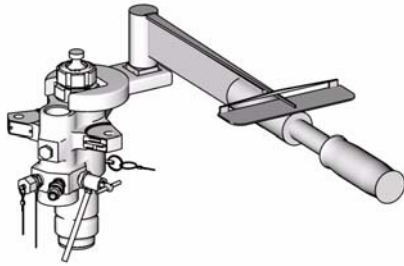
Longest Ball Travel



- Thread inlet housing (14) onto lower cylinder (11). Torque to 140-150 ft-lb (189-203 N•m).

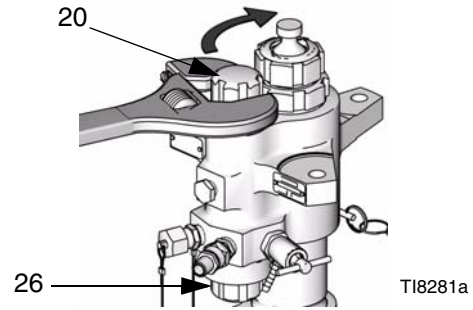
Repair

- Using torque wrench, torque packing cartridge to outlet housing. Torque to 25-30 ft-lb (34-41 N•m).



T18279a

- For lowers with built-in filter, see **Service Built-in Filter**, page 13, if filter needs service. Then reinstall both top filter cap (20) and bottom filter cap (26).



T18281a

- Reconnect lower to air motor. See Xtreme Packages manual (311164).

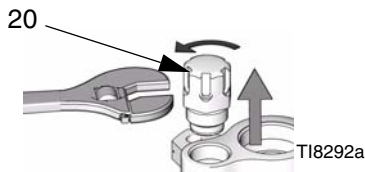
## Service Built-in Filter

Select models have a built-in filter in the lower housing.

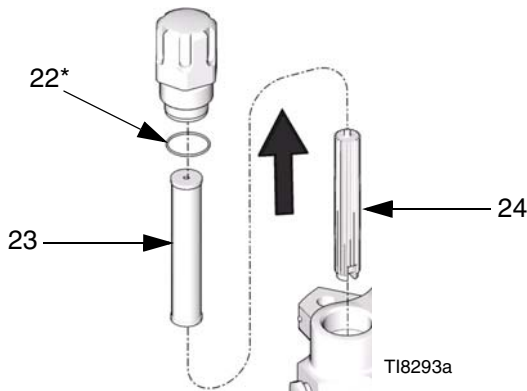
### Disassembly

To remove and clean the built-in filter:

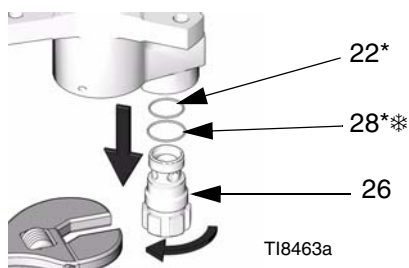
1. Use wrench to loosen and remove top filter cap (20).



2. Remove o-ring (22\*), strainer (23), and filter support (24).



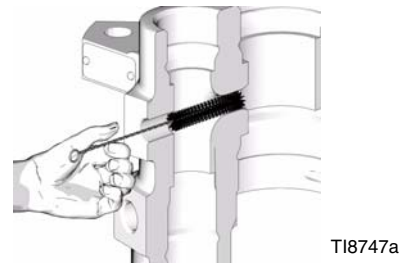
3. Use wrench to loosen and remove bottom filter cap (26). Remove o-rings (22\*, 28\*).



\*Blue o-ring


4. Inspect o-rings (22\*, 28\*), strainer (23), and filter support (24). Replace if necessary.

5. Remove pipe plug (49), and use brush or drill to clean port as necessary.

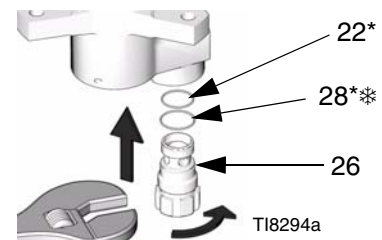


### Reassembly

To reassemble the built-in filter:

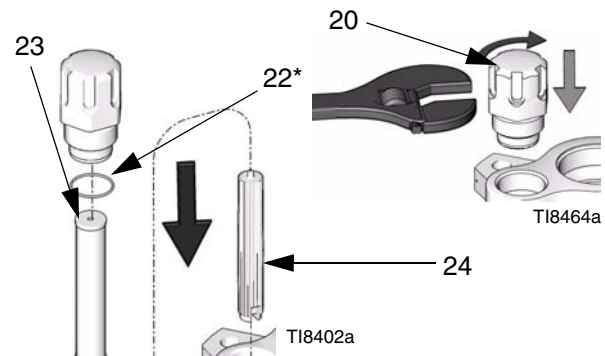
 Lubricate all o-rings with petroleum jelly before installation.

1. Install o-rings (22\*, 28\*) onto bottom filter cap (26). Then use wrench to reassemble and tighten bottom filter cap. Torque to 40-60 ft-lb (52-82 N•m).



\*Blue o-ring

2. Reassemble o-ring (22\*) onto top filter cap (20). Install strainer (23), and filter support (24) in top filter cap. Then use wrench to install and tighten top filter cap. Torque to 40-60 ft-lb (52-82 N•m).



# Parts

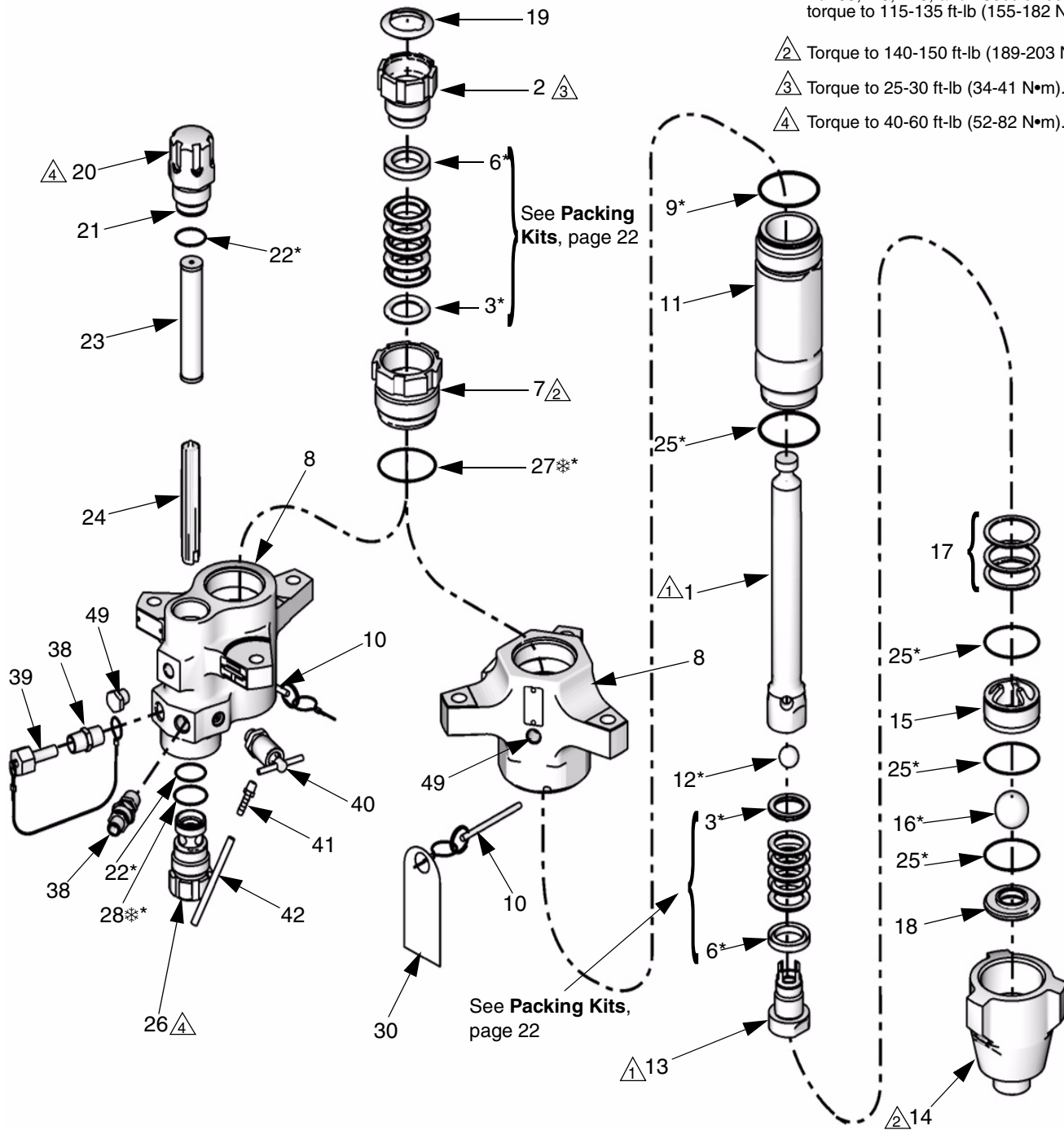
⚠1 For 220, 250, and 290cc sizes, torque to 190-210 ft-lb (258-285 N•m).

For 85, 115, 145, and 180cc sizes, torque to 115-135 ft-lb (155-182 N•m).

⚠2 Torque to 140-150 ft-lb (189-203 N•m).

⚠3 Torque to 25-30 ft-lb (34-41 N•m).

⚠4 Torque to 40-60 ft-lb (52-82 N•m).



\* Parts included in packing kits (purchase separately).  
See **Packing Kits**, page 22.

\* 27 is a blue o-ring for 220cc, 250cc, and 290cc lowers only. 28 is a blue o-ring.

T18403a

## 85cc Lowers

## Models L085C1, L085C2, L085C3, L085C4

| Ref. | Part    | Description   | Qty. | Ref.   | Part    | Description                       | Qty. |
|------|---------|---|------|--|---------|-----------------------------------|------|
|      |         |   |      | 23†  |         | STRAINER, 60 mesh screen          |      |
|      |         |   |      |  | 236496  | Pack of 2                         |      |
|      |         |   |      |  | 238446  | Pack of 25                        |      |
| 1    | 15J091  | ROD, displacement                                     | 1    | 24†  | 188420  | SUPPORT, filter                   | 1    |
| 2    | 15K029  | NUT, packing  | 1    | 25*  | 244896  | O-RING, PTFE, bottom cylinder     |      |
| 3*   | ✓288070 | GLAND, male (pack of 4)                               |      |  |         | (pack of 10)                      |      |
|      | ✖288072 |   |      | 26†  | 197339  | CAP, filter, bottom               | 1    |
| 4*✘  | ✓288079 | V-PACKING, PTFE (pack of 10)                          |      | 27*  | 288068  | O-RING, PTFE (pack of 10)         |      |
|      | ✖288082 |   |      | 28*†   | 244896  | O-RING, PFTE, filter bottom, blue |      |
| 5*✘  | ✓288078 | V-PACKING, leather (pack of 10)                       |      |  |         | (pack of 10)                      |      |
|      | ✖288081 |   |      | 30▲  | 172479  | TAG, warning                      | 1    |
| 6*   | ✓288069 | GLAND, female (pack of 4)                             |      | 35*✘   | ✓288077 | V-PACKING, UHMWPE                 |      |
|      | ✖288071 |   |      |  |         | (pack of 10)                      |      |
| 7    | 15F660  | CARTRIDGE, packing                                    | 1    |  | ✖288080 |                                   |      |
| 8    |         | HOUSING, outlet                                       |      | 38†  | 158491  | FITTING, nipple                   | 2    |
|      | 15F654  | Standard; models L085C1, L085C3                       | 1    | 39†  | 244517  | PLUG, packless, 0.5 in.           | 1    |
|      | 15F659  | With built-in filter; models L085C2, L085C4           | 1    | 40†  | 245143  | VALVE, pressure, dump             | 1    |
| 9*   | 288067  | O-RING, top cylinder, PTFE                            |      | 41†  | 116746  | FITTING, barbed, plated           | 1    |
|      |         | (pack of 10)  |      | 42†  | 116750  | TUBE, nylon                       | 1    |
| 10   | 244826  | PIN, self-locking                                     | 1    | 49   |         | PLUG, pipe                        |      |
| 11   | 15F682  | CYLINDER, lower                                       | 1    |  | 101754  | Models L085C1, L085C3             | 1    |
| 12*  | 288065  | BALL, piston; 9/16 in. (14.3 mm) diameter (pack of 3) |      |  | 198292  | Models L085C2, L085C4             | 1    |
| 13   | 15F669  | VALVE, piston   | 1    | ▲ Replacement Danger and Warning labels, tags, and cards are available at no cost. |         |                                   |      |
| 14   | 15F667  | HOUSING, inlet  | 1    | † For models L085C2 and L085C4 only.   |         |                                   |      |
| 15   | 15F664  | GUIDE, ball, inlet                                    | 1    | ✓ Throat packings.   |         |                                   |      |
| 16*  | 244899  | BALL, inlet; 1.0 in. (25.4 mm) diameter (pack of 3)   |      | ✖ Piston packings.   |         |                                   |      |
| 17   | 288064  | SHIM, inlet, ball guide (pack of 9)                   |      | ✘ Not shown.   |         |                                   |      |
| 18   | 15F665  | SEAT, inlet   | 1    | * Parts included in packing kit (purchase separately). See Packing Kits, page 22.  |         |                                   |      |
| 19   | 247393  | PLUG, throat seal (pack of 10)                        |      |  |         |                                   |      |
| 20†  | 15F859  | CAP, filter, top                                      | 1    |  |         |                                   |      |
| 21†  | 171941  | SPRING, compression                                   | 1    |  |         |                                   |      |
| 22*† | 244895  | O-RING, PTFE, filter (pack of 10)                     |      |  |         |                                   |      |

## 115cc Lowers

## Models L115C1, L115C2, L115C3, L115C4

| Ref. | Part   | Description  | Qty. | Ref. | Part   | Description   | Qty. |
|------|--------|--|------|------|--------|---|------|
|      |        |  |      | 22*† | 244895 | O-RING, PTFE, filter (pack of 10)                         |      |
|      |        |  |      | 23†  |        | STRAINER, 60 mesh screen                                  |      |
| 1    | 15J092 | ROD, displacement  | 1    |      | 236496 | Pack of 2   |      |
| 2    | 15K029 | NUT, packing   | 1    |      | 238446 | Pack of 25  |      |
| 3*   | 288074 | GLAND, packing, male (pack of 4)                         |      | 24†  | 188420 | SUPPORT, filter   | 1    |
| 4*✿  | 288066 | V-PACKING, PTFE (pack of 10)<br>Models L115C3, L115C4;   |      | 25*  | 244896 | O-RING, PTFE (pack of 10)                                 |      |
| 5*✿  | 288076 | V-PACKING, leather (pack of 10)<br>Models L115C1, L115C2 |      | 26†  | 197339 | CAP, filter, bottom                                       | 1    |
| 6*   | 288073 | GLAND, female (pack of 4)                                |      | 27*  | 288068 | O-RING; PTFE (pack of 10)                                 |      |
| 7    | 15F661 | CARTRIDGE, packing                                       | 1    | 28*  | 244896 | O-RING; PTFE, filter bottom, blue<br>(pack of 10)         |      |
| 8    |        | HOUSING, outlet  |      | 30▲  | 172479 | TAG, warning  | 1    |
|      | 15F654 | Standard; models L115C1, L115C3                          | 1    | 35*✿ | 288075 | V-PACKING, UHMWPE, (pack of<br>10), Models L115C1, L115C2 |      |
|      | 15F659 | With built-in filter;<br>models L115C2, L115C4           | 1    | 38†  | 158491 | FITTING, nipple   | 2    |
| 9*   | 288067 | O-RING, PTFE, top cylinder<br>(pack of 10)               |      | 39†  | 244517 | PLUG, packless, 0.5 in.                                   | 1    |
| 10   | 244826 | PIN, self-locking  | 1    | 40†  | 245143 | VALVE, pressure, dump                                     | 1    |
| 11   | 15F656 | CYLINDER, lower  | 1    | 41†  | 116746 | FITTING, barbed, plated                                   | 1    |
| 12*  | 288065 | BALL, piston; 9/16 in. (14 mm)<br>diameter (pack of 3)   |      | 42†  | 116750 | TUBE, nylon   | 1    |
| 13   | 15F657 | VALVE, piston  | 1    | 49   |        | PLUG, pipe  |      |
| 14   | 15F667 | HOUSING, inlet   | 1    |      | 101754 | Models L115C1, L115C3                                     | 1    |
| 15   | 15F664 | GUIDE, ball, inlet                                       | 1    |      | 198292 | Models L115C2, L115C4                                     | 1    |
| 16*  | 244899 | BALL, inlet; 1 in. (25 mm) diameter<br>(pack of 3)       |      |      |        |   |      |
| 17   | 288064 | SHIM, inlet, ball guide (pack of 9)                      |      |      |        |   |      |
| 18   | 15F665 | SEAT, 1 in. ball   | 1    |      |        |   |      |
| 19   | 247393 | PLUG, throat seal (pack of 10)                           |      |      |        |   |      |
| 20†  | 15F859 | CAP, filter, top   | 1    |      |        |   |      |
| 21†  | 171941 | SPRING, compression                                      | 1    |      |        |   |      |

▲ Replacement Danger and Warning labels, tags, and cards are available at no cost.

† For models L115C2 and L115C4 only.

✿ Not shown.

\* Parts included in packing kit (purchase separately).  
See **Packing Kits**, page 22.



## 145cc Lowers

| Models L145C1, L145C2, L145C3, L145C4, L14AC1, |        |                                     |   | Ref. | Part  | Description                       | Qty. |
|--|--------|-------------------------------------|---|------|---|-----------------------------------|------|
|  |        |                                     |   | 23†  |   | STRAINER, 60 mesh screen          |      |
|  |        |                                     |   |      | 224459  | Pack of 2                         |      |
|  |        |                                     |   |      | 238438  | Pack of 25                        |      |
| 1  | 15J093 | ROD, displacement                   | 1 | 24†  | 186075  | SUPPORT, filter                   | 1    |
| 2  | 15K030 | NUT, packing                        | 1 | 25*  | 244890  | O-RING; PTFE, bottom cylinder     |      |
| 3*   | 244881 | GLAND, male (pack of 4)             |   |      |   | (pack of 10)                      |      |
| 4*✿  | 244857 | V-PACKING, PTFE (pack of 10)        |   | 26†  | 197339  | CAP, filter, bottom               | 1    |
| 5*✿  | 244869 | V-PACKING, leather (pack of 10)     |   | 27*  | 244890  | O-RING; PTFE (pack of 10)         |      |
| 6*   | 244875 | GLAND, female                       |   | 28*† | 244896  | O-RING; PTFE, filter bottom, blue |      |
|  |        | (pack of 4)                         |   |      |   | (pack of 10)                      |      |
| 7  | 197325 | CARTRIDGE, packing                  | 1 | 30▲  | 172479  | TAG, warning                      | 1    |
| 8  |        | HOUSING, outlet                     |   | 35*✿ | 244863  | V-PACKING, UHMWPE                 |      |
|  | 197334 | Standard; models L145C1, L145C3     | 1 |      |   | (pack of 10)                      |      |
|  | 197336 | With built-in filter;               | 1 | 38†  | 158491  | FITTING, nipple                   | 2    |
|  |        | models L145C2, L145C4               |   | 39†  | 244517  | PLUG, packless, 0.5 in.           | 1    |
|  | 15J673 | Standard; model L14AC1              | 1 | 40†  | 245143  | VALVE, pressure, dump             | 1    |
| 9*   | 244892 | O-RING, PTFE, top cylinder          |   | 41†  | 116746  | FITTING, barbed, plated           | 1    |
|  |        | (pack of 10)                        |   | 42†  | 116750  | TUBE, nylon                       | 1    |
| 10   | 244826 | PIN, self-locking                   | 1 | 49   |   | PLUG, pipe                        |      |
| 11   | 197315 | CYLINDER, lower                     | 1 |      | 101754  | Models L145C1, L145C3             | 1    |
| 12*  | 253029 | BALL, piston; 9/16 in. (14 mm)      |   |      | 198292  | Models L145C2, L145C4             | 1    |
|  |        | diameter (pack of 3)                |   |      |   |                                   |      |
| 13   | 197309 | VALVE, piston                       | 1 |      |   |                                   |      |
| 14   | 197303 | HOUSING, inlet                      | 1 | ▲    | <i>Replacement Danger and Warning labels, tags, and cards are available at no cost.</i> |                                   |      |
| 15   | 197307 | GUIDE, ball, inlet                  | 1 | †    | <i>For models L145C2 and L145C4 only.</i>   |                                   |      |
| 16*  | 253031 | BALL, inlet; 1.25 in. diameter      |   | ✿    | <i>Not shown.</i>   |                                   |      |
|  |        | (pack of 3)                         |   | *    | <i>Parts included in packing kit (purchase separately). See Packing Kits, page 22.</i>  |                                   |      |
| 17   | 244855 | SHIM, inlet, ball guide (pack of 9) |   |      |   |                                   |      |
| 18   | 196358 | SEAT, 1 in. ball                    | 1 |      |   |                                   |      |
| 19   | 247394 | PLUG, throat seal (pack of 10)      |   |      |   |                                   |      |
| 20†  | 197338 | CAP, filter, top                    | 1 |      |   |                                   |      |
| 21†  | 171941 | SPRING, compression                 | 1 |      |   |                                   |      |
| 22*†   | 244895 | O-RING; PTFE, filter (pack of 10)   |   |      |   |                                   |      |

## 180cc Lowers

## Models L180C1, L180C2, L180C3, L180C4, L18AC1

| Ref. | Part   | Description   | Qty. | Ref. | Part   | Description  | Qty. |
|------|--------|---|------|------|--------|--|------|
| 1    | 15J094 | ROD, displacement                                   | 1    | 23†  |        | STRAINER, mesh, screen, 60   |      |
| 2    | 15K030 | NUT, packing  | 1    |      | 224459 | Pack of 2  |      |
| 3*   | 244882 | GLAND, male (pack of 4)                             |      |      | 238438 | Pack of 25   |      |
| 4*✿  | 244858 | V-PACKING, PTFE (pack of 10)                        |      | 24†  | 186075 | SUPPORT, filter  | 1    |
| 5*✿  | 244870 | V-PACKING, leather (pack of 10)                     |      | 25*  | 244890 | O-RING, PTFE, bottom cylinder (pack of 10)                                       |      |
| 6*   | 244876 | GLAND, female (pack of 4)                           |      | 26†  | 197339 | CAP, filter, bottom  | 1    |
| 7    | 197326 | CARTRIDGE, packing                                  | 1    | 27*  | 244890 | O-RING, PTFE (pack of 10)  |      |
| 8    |        | HOUSING, outlet                                     |      | 28*† | 244896 | O-RING, PTFE filter bottom, blue (pack of 10)                                    |      |
|      | 197334 | Standard; models L180C1, L180C3                     | 1    | 30▲  | 172479 | TAG, warning   | 1    |
|      | 197336 | With built-in filter; models L180C2, L180C4         | 1    | 35*✿ | 244864 | V-PACKING, UHMWPE (pack of 10)   |      |
|      | 15J673 | Standard; model L18AC1                              | 1    | 38†  | 158491 | FITTING, nipple  | 2    |
| 9*   | 244892 | O-RING, PTFE, top cylinder (pack of 10)             |      | 39†  | 244517 | PLUG, packless, 0.5 in.  | 1    |
| 10   | 244826 | PIN, self-locking                                   | 1    | 40†  | 245143 | VALVE, pressure, dump  | 1    |
| 11   | 197316 | CYLINDER, lower                                     | 1    | 41†  | 116746 | FITTING, barbed, plated  | 1    |
| 12*  | 253029 | BALL, piston; 9/16 in. (14 mm) diameter (pack of 3) |      | 42†  | 116750 | TUBE, nylon  | 1    |
| 13   | 197310 | VALVE, piston                                       | 1    | 49   |        | PLUG, pipe   |      |
| 14   | 197303 | HOUSING, inlet                                      | 1    |      | 101754 | Models L180C1, L180C3  | 1    |
| 15   | 197307 | GUIDE, ball, inlet                                  | 1    |      | 198292 | Models L180C2, L180C4  | 1    |
| 16*  | 245128 | BALL, inlet; 1.25 in. diameter (pack of 3)          |      | ▲    |        | Replacement Danger and Warning labels, tags, and cards are available at no cost. |      |
| 17   | 244855 | SHIM, inlet, ball guide (pack of 3)                 |      | †    |        | For models L180C2 and L180C4 only.   |      |
| 18   | 196358 | SEAT, inlet   | 1    | ✿    |        | Not shown.   |      |
| 19   | 247394 | PLUG, throat seal (pack of 10)                      |      | *    |        | Parts included in packing kit (purchase separately). See Packing Kits, page 22.  |      |
| 20†  | 197338 | CAP, filter, top                                    | 1    |      |        |  |      |
| 21†  | 171941 | SPRING, compression                                 | 1    |      |        |  |      |
| 22*† | 244895 | O-RING, PTFE, filter (pack of 10)                   |      |      |        |  |      |

## 220cc Lowers

## Models L220C1, L220C2, L220C3, L220C4, L22AC1

| Ref. | Part    | Description  | Qty. | Ref. | Part    | Description   | Qty. |
|------|---------|--|------|------|---------|---|------|
|      |         |  |      | 23†  |         | STRAINER, 60 mesh screen  |      |
|      |         |  |      |      | 224459  | Pack of 2   |      |
|      |         |  |      |      | 238438  | Pack of 25  |      |
| 1    | 15J095  | ROD, displacement                                  | 1    | 24†  | 186075  | SUPPORT, filter   | 1    |
| 2    | 15K031  | NUT, packing                                       | 1    | 25*  | 244894  | O-RING, PTFE, bottom cylinder   |      |
| 3*   | ✓244883 | GLAND, male (pack of 4)                            |      |      |         | (pack of 10)  |      |
|      | ✖244884 |  |      | 26†  | 197339  | CAP, filter, bottom   | 1    |
| 4*✱  | ✓244859 | V-PACKING, PTFE (pack of 10)                       |      | 27*  | 244891  | O-RING, PTFE (pack of 10)   |      |
|      | ✖244860 |  |      | 28*† | 244896  | O-RING, PFTE, filter bottom, blue   |      |
| 5*✱  | ✓244871 | V-PACKING, leather (pack of 10)                    |      |      |         | (pack of 10)  |      |
|      | ✖244872 |  |      | 30▲  | 172479  | TAG, warning  | 1    |
| 6*   | ✓244877 | GLAND, female (pack of 4)                          |      | 35*✱ | ✓244865 | V-PACKING, UHMWPE   |      |
|      | ✖244878 |  |      |      |         | (pack of 10)  |      |
| 7    | 197327  | CARTRIDGE, packing                                 | 1    |      | ✖244866 |   |      |
| 8    |         | HOUSING, outlet                                    |      | 38†  | 158491  | FITTING, nipple   | 2    |
|      | 197335  | Standard; models L220C1, L220C3                    | 1    | 39†  | 244517  | PLUG, packless, 0.5 in.   | 1    |
|      | 197337  | With built-in filter; models L220C2, L220C4        | 1    | 40†  | 245143  | VALVE, pressure, dump   | 1    |
|      | 15H722  | Standard, 5.9 in. bolt pattern; model L22AC1 only  | 1    | 41†  | 116746  | FITTING, barbed, plated   | 1    |
| 9*   | 244893  | O-RING, top cylinder, PTFE (pack of 10)            |      | 42†  | 116750  | TUBE, nylon   | 1    |
| 10   | 244826  | PIN, self-locking                                  | 1    | 49   |         | PLUG, pipe  |      |
| 11   | 197317  | CYLINDER, lower                                    | 1    |      | 101754  | Models L220C1, L220C3   | 1    |
| 12*  | 244898  | BALL, piston; 7/8 in. (22 mm) diameter (pack of 3) |      |      | 198292  | Models L220C2, L220C4   | 1    |
| 13   | 197311  | VALVE, piston                                      | 1    | ▲    |         | Replacement Danger and Warning labels, tags, and cards are available at no cost.        |      |
| 14   | 197304  | HOUSING, inlet                                     | 1    | †    |         | For models L220C2 and L220C4 only.  |      |
| 15   | 197308  | GUIDE, ball, inlet                                 | 1    | ✓    |         | Throat packings.  |      |
| 16*  | 253030  | BALL, inlet; 1.5 in. diameter (pack of 3)          |      | ✖    |         | Piston packings.  |      |
| 17   | 244856  | SHIM, inlet, ball guide (pack of 9)                |      | ✱    |         | Not shown.  |      |
| 18   | 197344  | SEAT, inlet  | 1    | *    |         | Parts included in packing kit (purchase separately). See <b>Packing Kits</b> , page 22. |      |
| 19   | 247395  | PLUG, throat seal (pack of 10)                     |      |      |         |   |      |
| 20†  | 197338  | CAP, filter, top                                   | 1    |      |         |   |      |
| 21†  | 171941  | SPRING, compression                                | 1    |      |         |   |      |
| 22*† | 244895  | O-RING, PTFE, filter (pack of 10)                  |      |      |         |   |      |

## 250cc Lowers

## Models L250C1, L250C2, L250C3, L250C4

| Ref. | Part   | Description  | Qty. | Ref. | Part  | Description                                     | Qty. |
|------|--------|--|------|------|---|---|------|
|      |        |  |      | 22*† | 244895  | O-RING, PTFE, filter (pack of 10)               |      |
|      |        |  |      | 23†  |   | STRAINER, 60 mesh screen                        |      |
| 1    | 15J096 | ROD, displacement                                  | 1    |      | 224459  | Pack of 2                                       |      |
| 2    | 15K031 | NUT, packing                                       | 1    |      | 238438  | Pack of 25                                      |      |
| 3*   | 245232 | GLAND, male (pack of 4)                            |      | 24†  | 186075  | SUPPORT, filter                                 | 1    |
| 4*✿  | 245229 | V-PACKING, PTFE (pack of 10)                       |      | 25*  | 244894  | O-RING, PTFE, bottom cylinder (pack of 10)      |      |
| 5*✿  | 245230 | V-PACKING, leather (pack of 10)                    |      | 26†  | 197339  | CAP, filter, bottom                             | 1    |
| 6*   |        | GLAND, female (pack of 4)                          |      | 27*  | 244891  | O-RING, PTFE (pack of 10)                       |      |
|      | 245233 | MODELS, L250C1, L250C2                             |      | 28*† | 244896  | O-RING, PTFE, filter, bottom, blue (pack of 10) |      |
|      | 246530 | MODELS L250C3, L250C4                              |      | 30▲  | 172479  | TAG, warning                                    | 1    |
| 7    | 197328 | CARTRIDGE, packing                                 | 1    | 35*✿ | 245231  | V-PACKING, UHMWPE (pack of 10)                  |      |
| 8    |        | HOUSING, outlet                                    |      | 38†  | 158491  | FITTING, nipple                                 | 2    |
|      | 197335 | Standard; models L250C1, L250C3                    | 1    | 39†  | 244517  | PLUG, packless, 0.5 in.                         | 1    |
|      | 197337 | With built-in filter; models L250C2, L250C4        | 1    | 40†  | 245143  | VALVE, pressure, dump                           | 1    |
|      | 15H722 | Standard, 5.9 in. bolt pattern; model L29AC1 only  | 1    | 41†  | 116746  | FITTING, barbed, plated                         | 1    |
| 9*   | 244893 | O-RING, PTFE, top cylinder (pack of 10)            |      | 42†  | 116750  | TUBE, nylon                                     | 1    |
| 10   | 244826 | PIN, self-locking                                  | 1    | 49   |   | PLUG, pipe                                      |      |
| 11   | 197318 | CYLINDER, lower                                    | 1    |      | 101754  | Models L250C1, L250C3                           | 1    |
| 12*  | 244898 | BALL, piston; 7/8 in. (22 mm) diameter (pack of 3) |      |      | 198292  | Models L250C2, L250C4                           | 1    |
| 13   | 197312 | VALVE, piston                                      | 1    | ▲    | <i>Replacement Danger and Warning labels, tags, and cards are available at no cost.</i>       |   |      |
| 14   | 197304 | HOUSING, inlet                                     | 1    | †    | <i>For models L250C2 and L250C4 only.</i>   |   |      |
| 15   | 197308 | GUIDE, ball, inlet                                 | 1    | ✿    | <i>Not shown.</i>   |   |      |
| 16*  | 253030 | BALL, inlet; 1.5 in. diameter (pack of 3)          |      | *    | <i>Parts included in packing kit (purchase separately). See <b>Packing Kits</b>, page 22.</i> |   |      |
| 17   | 244856 | SHIM, inlet, ball guide (pack of 9)                |      |      |   |   |      |
| 18   | 197344 | SEAT, inlet  | 1    |      |   |   |      |
| 19   | 247395 | PLUG, throat seal (pack of 10)                     |      |      |   |   |      |
| 20†  | 197338 | CAP, filter, top                                   | 1    |      |   |   |      |
| 21†  | 171941 | SPRING, compression                                | 1    |      |   |   |      |

## 290cc Lowers

## Models L290C1, L290C2, L290C3, L290C4, L29AC1

| Ref. | Part    | Description  | Qty. | Ref. | Part    | Description   | Qty. |
|------|---------|--|------|------|---------|---|------|
|      |         |  |      | 23†  |         | STRAINER, 60 mesh screen  |      |
|      |         |  |      |      | 224459  | Pack of 2   |      |
|      |         |  |      |      | 238438  | Pack of 25  |      |
| 1    | 15J097  | ROD, displacement                                  | 1    | 24†  | 186075  | SUPPORT, filter   | 1    |
| 2    | 15K031  | NUT, packing                                       | 1    | 25*  | 244894  | O-RING, PTFE, bottom cylinder   |      |
| 3*   | ✓244885 | GLAND, male (pack of 4)                            |      |      |         | (pack of 10)  |      |
|      | ✖244886 |  |      | 26†  | 197339  | CAP, filter, bottom   | 1    |
| 4*✱  | ✓244861 | V-PACKING, PTFE (pack of 10)                       |      | 27*  | 244891  | O-RING, PTFE (pack of 10)   |      |
|      | ✖244862 |  |      | 28*† | 244896  | O-RING, PTFE, filter bottom, blue   |      |
| 5*✱  | ✓244873 | V-PACKING, leather (pack of 10)                    |      |      |         | (pack of 10)  |      |
|      | ✖244874 |  |      | 30▲  | 172479  | TAG, warning  | 1    |
| 6*   | ✓244879 | GLAND, female (pack of 4)                          |      | 35*✱ | ✓244867 | V-PACKING, UHMWPE   |      |
|      | ✖244880 |  |      |      |         | (pack of 10)  |      |
| 7    | 197327  | CARTRIDGE, packing                                 | 1    |      | ✖244868 |   |      |
| 8    |         | HOUSING, outlet                                    |      | 38†  | 158491  | FITTING, nipple   | 2    |
|      | 197335  | Standard, models L290C1, L290C3                    | 1    | 39†  | 244517  | PLUG, packless, 0.5 in.   | 1    |
|      | 197337  | With built-in filter; models L290C2, L290C4        | 1    | 40†  | 245143  | VALVE, pressure, dump   | 1    |
|      | 15H722  | Standard, 5.9 in. bolt pattern, model L29AC1 only  |      | 41†  | 116746  | FITTING, barbed, plated   | 1    |
| 9*   | 244893  | O-RING, PTFE, top cylinder                         |      | 42†  | 116750  | TUBE, nylon   | 1    |
|      |         | (pack of 10)                                       |      | 49   |         | PLUG, pipe  |      |
| 10   | 244826  | PIN, self-locking                                  | 1    |      | 101754  | Models L290C1, L290C3   | 1    |
| 11   | 197319  | CYLINDER, lower                                    | 1    |      | 198292  | Models L290C2, L290C4   | 1    |
| 12*  | 244899  | BALL, piston; 7/8 in. (22 mm) diameter (pack of 3) |      | ▲    |         | Replacement Danger and Warning labels, tags, and cards are available at no cost.        |      |
| 13   | 197313  | VALVE, piston                                      | 1    | †    |         | For models L290C2 and L290C4 only.  |      |
| 14   | 197304  | HOUSING, inlet                                     | 1    | ✓    |         | Throat packings.  |      |
| 15   | 197308  | GUIDE, ball, inlet                                 | 1    | ✖    |         | Piston packings.  |      |
| 16*  | 253030  | BALL, inlet; 1.5 in. diameter (pack of 3)          |      | ✱    |         | Not shown.  |      |
| 17   | 244856  | SHIM, inlet, ball guide (pack of 9)                |      | *    |         | Parts included in packing kit (purchase separately). See <b>Packing Kits</b> , page 22. |      |
| 18   | 197344  | SEAT, inlet  | 1    |      |         |   |      |
| 19   | 247395  | PLUG, throat seal (pack of 10)                     |      |      |         |   |      |
| 20†  | 197338  | CAP, filter, top                                   | 1    |      |         |   |      |
| 21†  | 171941  | SPRING, compression                                | 1    |      |         |   |      |
| 22*† | 244895  | O-RING, PTFE, filter (pack of 10)                  |      |      |         |   |      |

## Packing Kits

### Xtreme Seal™ Repair Kits

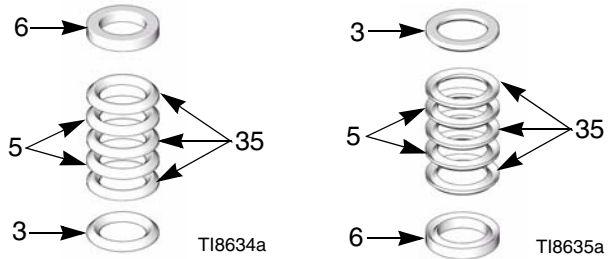
Kit 288058 for 115 cc Lowers  
 Kit 244850 for 145 cc (600) Lowers  
 Kit 244851 for 180 cc (750) Lowers  
 Kit 244853 for 250 cc (1045) Lowers

| Ref. | Description            | Qty. |
|------|------------------------|------|
| 3    | GLAND, packing, male   | 2    |
| 5    | V-PACKING, leather     | 4    |
| 6    | GLAND, packing, female | 2    |
| 35   | V-PACKING, UHMWPE      | 6    |

Kit also includes items 9, 12, 16, 22, 25, 27, 28 (see **Parts**, starting on page 14).

**Throat Packings:**  
Lips Face Down

**Piston Packings:**  
Lips Face Up



**Lubricate Packings**

### Tuff Stack™ Repair Kits

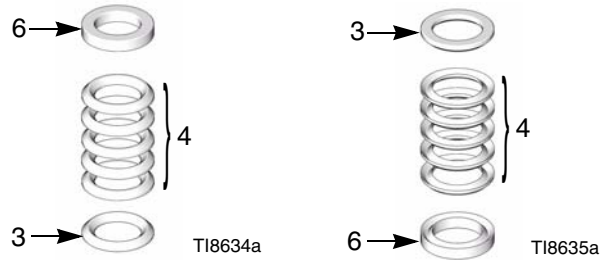
Kit 288060 for 115 cc Lowers  
 Kit 244900 for 145 cc (600) Lowers  
 Kit 244901 for 180 cc (750) Lowers  
 Kit 244903 for 250 cc (1045) Lowers

| Ref. | Description            | Qty. |
|------|------------------------|------|
| 3    | GLAND, packing, male   | 2    |
| 4    | V-PACKING, PTFE        | 10   |
| 6    | GLAND, packing, female | 2    |

Kit also includes items 9, 12, 16, 22, 25, 27, 28 (see **Parts**, starting on page 14).

**Throat Packings:**  
Lips Face Down

**Piston Packings:**  
Lips Face Up



**Lubricate Packings**

### Xtreme Seal™ Repair Kits

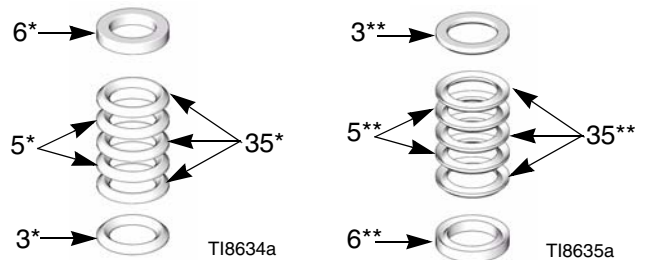
Kit 288054 for 85 cc Lowers  
 Kit 244852 for 220 cc (900) Lowers  
 Kit 244854 for 290 cc (1200) Lowers

| Ref. | Description            | Qty. |
|------|------------------------|------|
| 3*   | GLAND, packing, male   | 1    |
| 3**  | GLAND, packing, male   | 1    |
| 5*   | V-PACKING, leather     | 2    |
| 5**  | V-PACKING, leather     | 2    |
| 6*   | GLAND, packing, female | 1    |
| 6**  | GLAND, packing, female | 1    |
| 35*  | V-PACKING, UHMWPE      | 3    |
| 35** | V-PACKING, UHMWPE      | 3    |

Kit also includes items 9, 12, 16, 22, 25, 27, 28 (see **Parts**, starting on page 14).

**Throat Packings:**  
Lips Face Down

**Piston Packings:**  
Lips Face Up



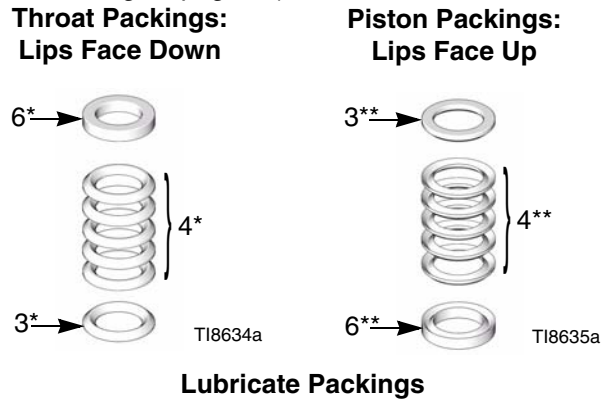
**Lubricate Packings**

### Tuff Stack™ Repair Kits

Kit 288056 for 85 cc Lowers  
 Kit 244902 for 220 cc (900) Lowers  
 Kit 244904 for 290 cc (1200) Lowers

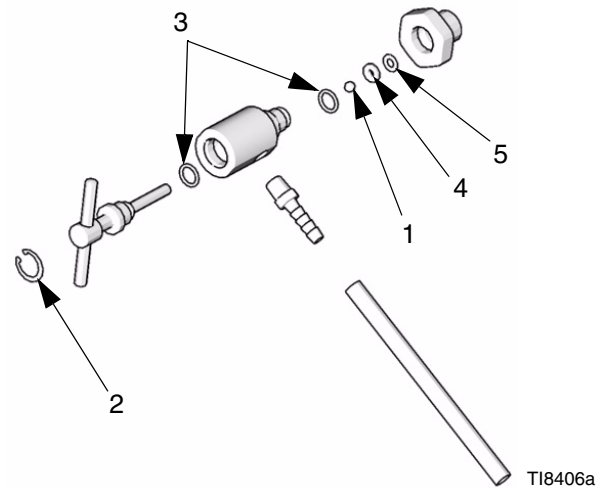
| Ref. | Description            | Qty. |
|------|------------------------|------|
| 3*   | GLAND, packing, male   | 1    |
| 3**  | GLAND, packing, male   | 1    |
| 4*   | V-PACKING, PTFE        | 5    |
| 4**  | V-PACKING, PTFE        | 5    |
| 6*   | GLAND, packing, female | 1    |
| 6**  | GLAND, packing, female | 1    |

Kit also includes items 9, 12, 16, 22, 25, 27, 28 (see **Parts**, starting on page 14).



### Fluid Drain Valve Repair Kit 245145

| Ref. | Description     | Qty. |
|------|-----------------|------|
| 1    | BALL, carbide   | 1    |
| 2    | RING, retaining | 1    |
| 3    | O-RING, PTFE    | 2    |
| 4    | SEAT, valve     | 1    |
| 5    | GASKET          | 1    |



### Strainers (Ref. 23)

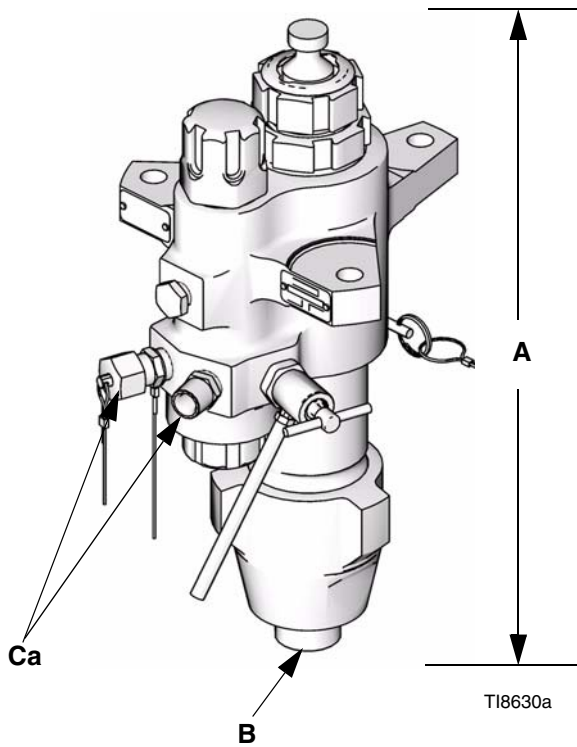
| Lower Size | 2 Pack  |         |          | 25 Pack |         |          |
|------------|---------|---------|----------|---------|---------|----------|
|            | 30 mesh | 60 mesh | 100 mesh | 30 mesh | 60 mesh | 100 mesh |
| 85cc       | 236495  | 236496  | 236497   | 238444  | 238446  | 238448   |
| 115cc      |         |         |          |         |         |          |
| 145cc      | 244458  | 224459  | 224468   | 238436  | 238438  | 238440   |
| 180cc      |         |         |          |         |         |          |
| 220cc      |         |         |          |         |         |          |
| 250cc      |         |         |          |         |         |          |
| 290cc      |         |         |          |         |         |          |



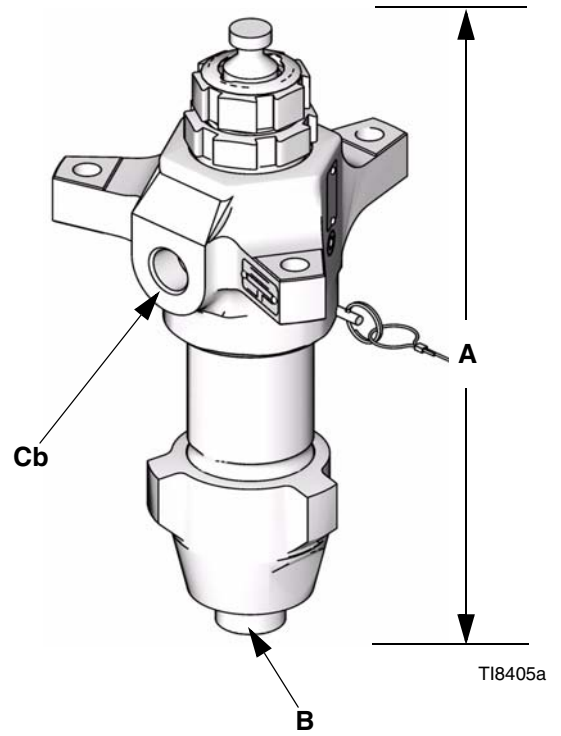
A series of 20 horizontal lines spanning the width of the page, providing a template for writing. The lines are evenly spaced and extend from the left margin to the right margin.



# Dimensions



**Lowers with Built-in Filters**



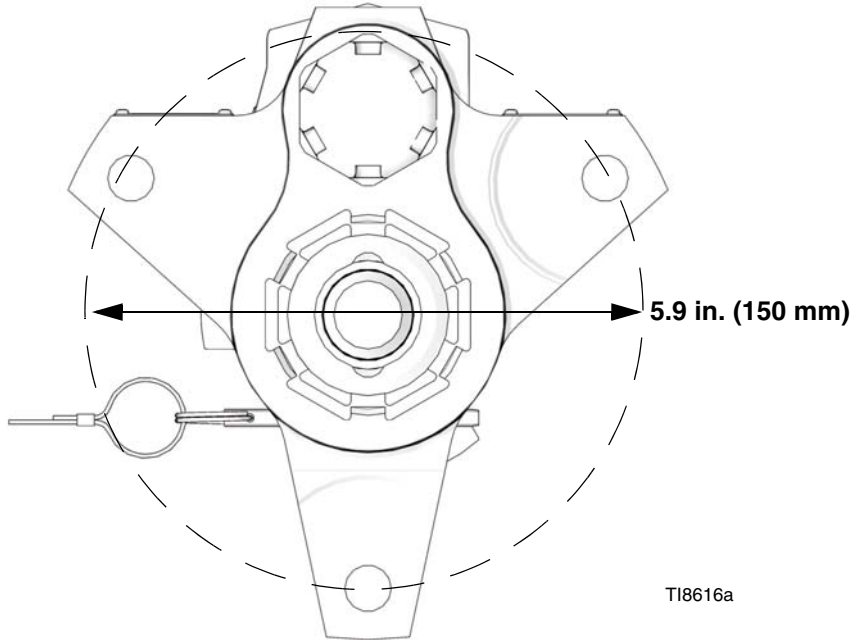
**Lowers without Built-in Filters**

## Lower Dimensions

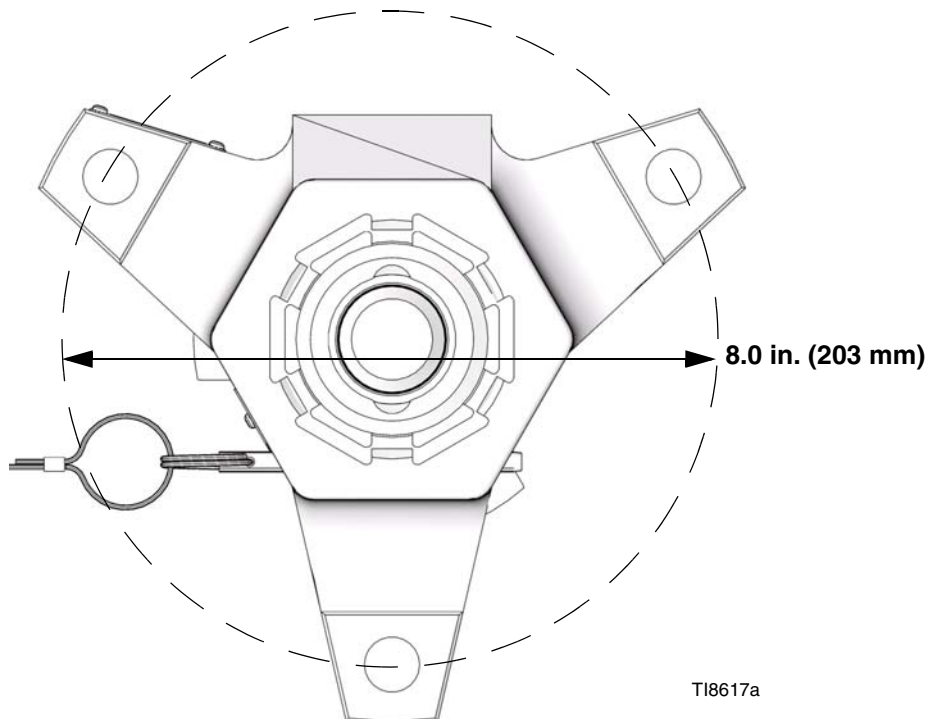
| Lower | A<br>(Height)<br>in. (mm) | B<br>(Inlet)<br>in. npt(m) | Ca<br>(Outlet)<br>in. npt(m) | Cb<br>(Outlet)<br>in. npt(f) | Weight<br>lbs (kg) |             |
|-------|---------------------------|----------------------------|------------------------------|------------------------------|--------------------|-------------|
|       |                           |                            |                              |                              | Without Filter     | With Filter |
| 85cc  | 17.0 (432)                | 1-1/4                      | 2x1/2                        | 1/2                          | 28 (12.7)          | 36 (16.3)   |
| 115cc | 17.0 (432)                | 1-1/4                      | 2x1/2                        | 1/2                          | 28 (12.7)          | 36 (16.3)   |
| 145cc | 17.0 (432)                | 1-1/4                      | 2x1/2                        | 3/4                          | 38 (17.3)          | 48 (21.8)   |
| 14Acc | 17.0 (432)                | 1-1/4                      | 2x1/2                        | 3/4                          | 38 (17.3)          | 48 (21.8)   |
| 180cc | 17.0 (432)                | 1-1/4                      | 2x1/2                        | 3/4                          | 38 (17.3)          | 48 (21.8)   |
| 18Acc | 17.0 (432)                | 1-1/4                      | 2x1/2                        | 3/4                          | 38 (17.3)          | 48 (21.8)   |
| 220cc | 17.0 (432)                | 1-1/4                      | 2x1/2                        | 1                            | 42 (19.1)          | 52 (23.6)   |
| 22Acc | 17.0 (432)                | 1-1/4                      | 2x1/2                        | 1                            | 42 (19.1)          | 52 (23.6)   |
| 250cc | 17.0 (432)                | 1-1/4                      | 2x1/2                        | 1                            | 42 (19.1)          | 52 (23.6)   |
| 290cc | 17.0 (432)                | 1-1/4                      | 2x1/2                        | 1                            | 43 (19.5)          | 53 (24.1)   |
| 29Acc | 17.0 (432)                | 1-1/4                      | 2x1/2                        | 1                            | 43 (19.5)          | 53 (24.1)   |

# Outlet Housing Mounting Hole Layout

**5.9 in. (150 mm) Outlet Housing (example) Shown**  
Applies to 85, 115, 14A, 18A, 22A, and 29Acc Lowers



**8.0 in. (203 mm) Outlet Housing (example) Shown**  
Applies to 145, 180, 220, 250, and 290cc Lowers



# Technical Data

All lower models have the same maximum operating temperature and wetted parts.

Maximum operating temperature ..... 180° F (82° C)  
 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

| Lower | Max. Fluid Working Pressure  | Displacement per Cycle |
|-------|------------------------------|------------------------|
| 85cc  | 7250 psi (50 MPa, 500 bar)   | 85cc                   |
| 115cc | 7250 psi (50 MPa, 500 bar)   | 115cc                  |
| 145cc | 7400 psi (51 MPa, 511 bar)   | 145cc                  |
| 180cc | 7400 psi (51 MPa, 511 bar)   | 180cc                  |
| 220cc | 6000 psi (41.4 MPa, 414 bar) | 220cc                  |
| 250cc | 5600 psi (38.6 MPa, 386 bar) | 250cc                  |
| 290cc | 5600 psi (38.6 MPa, 386 bar) | 290cc                  |

# 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.

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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.

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# Graco Information

**TO PLACE AN ORDER**, contact your Graco distributor or call to identify the nearest distributor.

**Phone:** 612-623-6921 **or Toll Free:** 1-800-328-0211 **Fax:** 612-378-3505

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MM 311762C

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