

Dura-Flo™ Lowers

311825R

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Carbon Steel or Stainless Steel Lowers. For use on Graco pumps, sprayers and fluid handling systems. For professional use only.

Dura-Flo 1800 (430 cc) Lowers

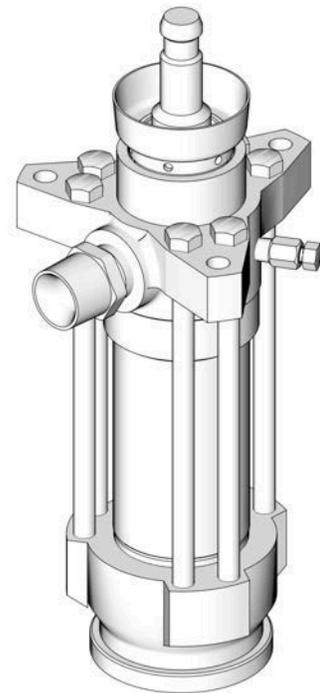
Dura-Flo 2400 (580 cc) Lowers



Important Safety Instructions

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

See page 3 for model information, including maximum working pressure.



T18341b

Contents

Models	3
430cc Lowers	3
580cc Lowers	4
Warnings	6
Repair	8
Pressure Relief Procedure	8
Required Tools	8
Disassembly	9
Reassembly	10
Parts	12
Dura-Flo 1800 (430 cc) Lowers	13
Dura-Flo 2400 (580 cc) Lowers	16
Repair Kits	19
Repair Fixture Kit	19
UHMWPE and PTFE Packings	19
PTFE and Leather Packings	21
PTFE Packings	22
UHMWPE and Leather Packings	22
Dimensions	24
Technical Specifications	24
California Proposition 65	25
Graco Standard Warranty	26
Graco Information	26

Models

Severe-Duty: For wear and corrosion resistance in addition to low friction characteristics.

MaxLife: MaxLife is a proprietary Graco hard coating for piston pump rods and cylinders. MaxLife provides a smooth and harder wear surface with no porosity while providing excellent corrosion/chemical resistance.

430cc Lowers

Maximum Fluid Working Pressure: 32 MPa (324 bar, 4700 psi).

Lower Part	Body	Size	Rod Construction	Cylinder Construction	Ball Construction	Seat Construction	Piston Packings	Throat Packings
222796	CS	430cc	SST with Severe-Duty	SST with Severe-Duty	SST	Tungsten Carbide	3 15% glass-filled PTFE/2 leather	3 PTFE/2 leather
24W644*	CS	430cc	SST with Severe-Duty	SST with Severe-Duty	SST	Tungsten Carbide	3 UHMWPE/ 2 leather	3 UHMWPE /2 leather
222988	CS	430cc	SST with Severe-Duty	SST with Severe-Duty	SST	Tungsten Carbide	5 15% glass-filled PTFE	5 PTFE
222805	SS	430cc	SST with Severe-Duty	SST with Severe-Duty	SST	Tungsten Carbide	3 UHMWPE/ 2 15% glass-filled PTFE	3 UHMWPE /2 PTFE
241956	SS	430cc	SST with Ceramic	SST with Severe-Duty	Tungsten Carbide	Tungsten Carbide	3 UHMWPE/ 2 15% glass-filled PTFE	3 UHMWPE /2 PTFE
246925	SS	430cc	SST with Severe-Duty	SST with Severe-Duty	Tungsten Carbide	Tungsten Carbide	3 UHMWPE/ 2 leather	3 UHMWPE /2 leather
246987	SS	430cc	SST with Severe-Duty	SST with Severe-Duty	Silicone Nitride	Tungsten Carbide	3 UHMWPE/ 2 leather	3 UHMWPE /2 leather
246988	SS	430cc	SST with Ceramic	SST with Severe-Duty	Silicone Nitride	Tungsten Carbide	3 UHMWPE/ 2 leather	4 leather/3 UHMWPE
249992	SS	430cc	SST with MaxLife	SST with MaxLife	Silicone Nitride	Tungsten Carbide	3 UHMWPE/ 2 oil-filled UHMWPE	4 leather/3 UHMWPE
687055	SS	430cc	SST with Severe-Duty	SST with Severe-Duty	SST	Tungsten Carbide	3 UHMWPE/ 2 carbon-filled PTFE	3 UHMWPE /2 carbon- filled PTFE
C59703	SS	430cc	SST with Severe-Duty	SST with Severe-Duty	Tungsten Carbide	Tungsten Carbide	3 UHMWPE/ 2 15% glass-filled PTFE	3 UHMWPE /2 PTFE
L430CM	CS	430cc	SST with MaxLife	SST with MaxLife	Silicone Nitride	Tungsten Carbide	3 UHMWPE/ 2 oil-filled UHMWPE	4 leather/3 UHMWPE
L430CS	CS	430cc	SST with Severe-Duty	SST with Severe-Duty	SST	Tungsten Carbide	3 UHMWPE/ 2 15% glass-filled PTFE	3 UHMWPE /2 PTFE

* 3/4 in. NPT (m) outlet.

Models

Lower Part	Body	Size	Rod Construction	Cylinder Construction	Ball Construction	Seat Construction	Piston Packings	Throat Packings
L430C2	CS	430cc	SST with Chromex	SST with Severe-Duty	SST	Tungsten Carbide	UHMWPE	UHMWPE
L430SS	SS	430cc	SST with Severe-Duty	SST with Severe-Duty	SST	Tungsten Carbide	3 UHMWPE/ 2 15% glass-filled PTFE	3 UHMWPE /2 PTFE
L430SM	SS	430cc	SST with MaxLife	SST with MaxLife	Silicone Nitride	Tungsten Carbide	3 UHMWPE/ 2 oil-filled UHMWPE	4 leather/3 UHMWPE
L430S1	SS	430cc	SST with Chromex	SST with Severe-Duty	SST	Tungsten Carbide	UHMWPE	UHMWPE
L430S2	SS	430cc	SST with Chromex	SST with Severe-Duty	SST	Tungsten Carbide	UHMWPE	UHMWPE
20B119*	CS	430cc	SST with Severe-Duty	SST with Severe-Duty	SST	Tungsten Carbide	3 15% glass-filled PTFE/2 leather	3 PTFE/2 leather
20B123*	SS	430cc	SST with MaxLife	SST with MaxLife	Silicone Nitride	Tungsten Carbide	3 UHMWPE/ 2 oil-filled UHMWPE	4 leather/3 UHMWPE
20B139*	SS	430cc	SST with Severe-Duty	SST with Severe-Duty	Silicone Nitride	Tungsten Carbide	3 UHMWPE/ 2 leather	3 UHMWPE /2 leather

* 3/4 in. NPT (m) outlet.

580cc Lowers

Maximum Fluid Working Pressure: 23 MPa (234 bar, 3400 psi)

Lower Part	Body	Size	Rod Construction	Cylinder Construction	Ball Construction	Seat Construction	Piston Packings	Throat Packings
222801	CS	580cc	SST with Severe-Duty	SST with Severe-Duty	SST	Tungsten Carbide	3 15% glass-filled PTFE/2 leather	3 PTFE/2 leather
222991	CS	580cc	SST with Severe-Duty	SST with Severe-Duty	SST	Tungsten Carbide	4 leather/1 15% glass-filled PTFE	4 leather/1 PTFE
222992	CS	580cc	SST with Severe-Duty	SST with Severe-Duty	SST	Tungsten Carbide	5 15% glass-filled PTFE	5 PTFE
C59798	CS	580cc	SST with Severe-Duty	SST with Severe-Duty	Tungsten Carbide	Tungsten Carbide	3 15% glass-filled PTFE/2 leather	3 PTFE/2 leather
222803	SS	580cc	SST with Severe-Duty	SST with Severe-Duty	SST	Tungsten Carbide	3 UHMWPE/ 2 15% glass-filled PTFE	3 UHMWPE /2 PTFE
222993	SS	580cc	SST with Severe-Duty	SST with Severe-Duty	SST	Tungsten Carbide	3 15% glass-filled PTFE/2 leather	3 PTFE/2 leather

* 3/4 in. NPT (m) outlet.

Lower Part	Body	Size	Rod Construction	Cylinder Construction	Ball Construction	Seat Construction	Piston Packings	Throat Packings
222994	SS	580cc	SST with Severe-Duty	SST with Severe-Duty	SST	Tungsten Carbide	5 15% glass-filled PTFE	5 PTFE
236226	SS	580cc	SST with Severe-Duty	SST with Severe-Duty	SST	Tungsten Carbide	3 UHMWPE/ 2 15% glass-filled PTFE	3 UHMWPE /2 PTFE
236230	SS	580cc	SST with Severe-Duty	SST with Severe-Duty	SST	Tungsten Carbide	4 leather/1 15% glass-filled PTFE	4 leather/1 PTFE
241648	SS	580cc	SST with Severe-Duty	SST with Severe-Duty	SST	Tungsten Carbide	3 UHMWPE/ 2 carbon-filled PTFE	3 UHMWPE /2 carbon-filled PTFE
249991	SS	580cc	SST with MaxLife	SST with MaxLife	Silicone Nitride	Tungsten Carbide	3 UHMWPE/ 2 oil-filled UHMWPE	4 leather/ 3 UHMWPE
15F298	SS	580cc	SST with Severe-Duty	SST with Severe-Duty	Silicone Nitride	Tungsten Carbide	3 PTFE/2 leather	4 leather/ 3 UHMWPE
L580CS	CS	580cc	SST with Severe-Duty	SST with Severe-Duty	SST	Tungsten Carbide	3 UHMWPE/ 2 glass-filled PTFE	3 UHMWPE /2 PTFE
L580SS	SS	580cc	SST with Severe-Duty	SST with Severe-Duty	SST	Tungsten Carbide	3 UHMWPE/ 2 glass-filled PTFE	3 UHMWPE /2 PTFE
L580SM	SS	580cc	SST with MaxLife	SST with MaxLife	Silicone Nitride	Tungsten Carbide	3 UHMWPE/ 2 oil-filled UHMWPE	4 leather/ 3 UHMWPE
L580S1	SS	580cc	SST with Chromex	SST with Chromex	SST	Tungsten Carbide	UHMWPE	UHMWPE
L580S2	SS	580cc	SST with Chromex	SST with Severe-Duty	SST	Tungsten Carbide	UHMWPE	UHMWPE
L580S3	SS	580cc	SST with MaxLife	SST with MaxLife	Silicone Nitride	Tungsten Carbide	3 UHMWPE/ 2 PTFE	3 UHMWPE/ 2 PTFE
L580S4	SS	580cc	SST with Chromex	SST with Severe-Duty	SST	Tungsten Carbide	3 UHMWPE/ 2 PTFE	3 UHMWPE/ 2 PTFE
L580C2	CS	580cc	SST with Chromex	SST with Chromex	SST	Tungsten Carbide	UHMWPE	UHMWPE
L580S5	SS	580cc	SST with MaxLife	SST with MaxLife	Tungsten Carbide	Tungsten Carbide	3 UHMWPE/ 2 PTFE	3 UHMWPE/ 2 PTFE
20B120*	CS	580cc	SST with Severe-Duty	SST with Severe-Duty	SST	Tungsten Carbide	3 15% glass-filled PTFE/2 leather	3 PTFE/2 leather
20B121*	SS	580cc	SST with Severe-Duty	SST with Severe-Duty	SST	Tungsten Carbide	3 UHMWPE/ 2 15% glass-filled PTFE	3 UHMWPE /2 PTFE
20B125*	SS	580cc	SST with MaxLife	SST with MaxLife	Silicone Nitride	Tungsten Carbide	3 UHMWPE/ 2 oil-filled UHMWPE	4 leather/ 3 UHMWPE

* 3/4 in. NPT (m) outlet.

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.

 <h2 style="margin: 0;">WARNING</h2>	
   	<p>FIRE AND EXPLOSION HAZARD</p> <p>Flammable fumes, such as solvent and paint fumes, in work area can ignite or explode. Paint or solvent flowing through the equipment can cause static sparking. To help prevent fire and explosion:</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 sparking). • Ground all equipment in the work area. See Grounding instructions in your pump manual. • Never spray or flush solvent at high pressure. • Keep work area free of debris, including solvent, rags and gasoline. • Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present. • Use only grounded hoses. • Hold gun firmly to side of grounded pail when triggering into pail. Do not use pail liners unless they are anti-static or conductive. • Stop operation immediately if static sparking occurs or you feel a shock. Do not use equipment until you identify and correct the problem. • Keep a working fire extinguisher in the work area.
    	<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 spray without tip guard and trigger guard installed. • Engage trigger lock when not spraying. • Do not point gun at anyone or at any part of the body. • Do not put your hand over the spray tip. • Do not stop or deflect leaks with your hand, body, glove, or rag. • Follow the Pressure Relief Procedure when you stop spraying and before cleaning, checking, or servicing equipment. • Tighten all fluid connections before operating the equipment. • Check hoses and couplings daily. Replace worn or damaged parts immediately.

WARNING

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

Repair

Pressure Relief Procedure

				
<p>Trapped air can cause the pump to cycle unexpectedly, which could result in serious injury from splashing or moving parts.</p>				

1. Engage trigger lock.
2. Shutoff the pump:
 - a. *For air-powered pumps*, close the bleed-type master air valve.
 - b. *For hydraulic-powered pumps*, close the supply line shutoff valve (U) first, then close the return line shutoff valve (V).
3. Disengage the trigger lock.
4. Hold a metal part of the gun firmly to a grounded metal pail. Trigger the gun 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.

Required Tools

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

Disassembly

Lay out all the removed parts in sequence, to ease reassembly. Clean all parts with a compatible solvent and inspect them for wear or damage. Refer to FIG. 1.

NOTE: Repair Kits are available to replace the throat (T) and piston (P) packings, and to replace the o-rings and cylinder seals. For the best results, use all the new parts in the kit. Kit parts are marked with an asterisk, for example (11*). These kits also can be used to convert the lower to different packing materials. Refer to pages 19-23.

1. Flush the pump, if possible. Stop the pump at the bottom of its stroke. Relieve the pressure, page 8.
2. Disconnect the lower from the motor. See your separate pump assembly manual.
3. Stand the lower upright in a large vise. Loosen, but do not remove, the packing nut (3). Remove the six long cap screws (20).
4. Lift the outlet housing (19) straight up off the lower. Be careful not to scratch the displacement rod (1) while removing the housing.
5. Lift the cylinder (7), displacement rod (1), and piston assembly off the intake housing (17).
6. Remove the seal (6), ball guide (14), intake ball (16), intake seat housing (15), and o-ring (27) from the intake housing (17). Inspect the ball (16) and the ball seat (A) on the housing (15) for wear or damage.
7. Remove the seal (6) from the bottom of the outlet housing (19). Unscrew the packing nut (3). Remove the glands and v-packings (T) from the housing. Do not remove the outlet fitting (4) and o-ring (5) unless they need replacement.
8. Unscrew the bleeder valve plug (35) completely from the valve body (34). Clean the valve threads and the bleed hole. It is not necessary to remove the valve body.

NOTICE

To reduce the possibility of costly damage to the rod (1) and cylinder (7), first place the cylinder on a soft block of wood. Always use a rubber mallet or an arbor press to drive the rod (1) out of the cylinder (7). Never use a hammer to drive the rod.

9. Stand the cylinder (7) upright on a wooden block. Using a rubber mallet or an arbor press, drive the displacement rod (1) and piston assembly down into the cylinder as far as possible, then place the cylinder on its side and continue to drive the rod out the bottom until the piston comes free. Pull the rod and piston from the cylinder, being careful not to scratch the rod or cylinder.
 10. Put the flats of the piston seat housing (12) in a vise. Unscrew the rod (1) from the housing (12), leaving the ball guide (9) assembled to the rod. Be careful that the piston ball (10) doesn't fall as you separate the housing (12) and ball guide (9).
 11. Remove the glands and v-packings (P) from the piston seat housing (12). Inspect the ball (10) and ball seat (B) on the housing (12) for wear or damage.
 12. Inspect the outer surface of the displacement rod (1) and the inner surface of the cylinder (7) for scoring or wear; replace if damaged. If replacing the rod, remove the ball guide (9) (see step 13).
- NOTE:** Do not remove the ball guide (9) from the displacement rod (1) unless either part needs replacement.
13. Place the flats of the ball guide (9) in a vise. Using a 24 in. adjustable wrench or 3/4 in. drive socket, unscrew the rod (1) from the ball guide.

Reassembly

1. If the ball guide (9) was removed, place the flats of the displacement rod (1) in a vise. Apply anti-seize lubricant 222955 to the threads and mating faces of the rod and the ball guide. Screw the ball guide onto the rod, hand tight. Remove from the vise. See FIG. 1.
2. Install the piston packings (P) on the piston (12) in the correct order for your lower, see **Repair Kits**, pages 19-23. Install the v-packings one at a time with the lips facing up.

NOTE: To convert the lower to a different packing material, see pages 19-23.

3. Apply anti-seize lubricant to the threads and mating faces of the ball guide (9) and piston seat housing (12). Place the flats of the piston seat housing in a vice or fixture installation kit (see **Repair Fixture Kit**, page 19). Tighten the assembled rod (1) and ball guide (9) onto the piston assembly by hand, and then torque to 459-481 nm (338-354 ft-lb).

NOTICE

To reduce the possibility of costly damage to the rod (1) and cylinder (7), first place the cylinder on a soft block of wood. Always use a rubber mallet or an arbor press to drive the rod (1) into the cylinder (7). Never use a hammer to drive the rod.

4. Use an arbor press to reinstall the rod (1) into the cylinder (7), as follows. (The cylinder is symmetrical, so either end may face up.) Lubricate the piston packings (P). With the piston end facing down, lower the rod into the cylinder. Start the piston into the cylinder as much as possible, then drive the rod and piston the rest of the way into the cylinder with the arbor press.

5. Lubricate the o-ring (27*) and seal (6*). Install the o-ring on the intake seat housing (15). Install the intake seat housing (15), intake ball (16), ball guide (14), and seal (6*) in the intake housing (17). Set the intake housing all the way into the vise.
6. Place the cylinder (7) on the intake housing (17). Tap on the top of the displacement rod (1) with a rubber mallet, to seat the cylinder.
7. Lubricate the throat packings (T). Install the throat packings (T) in the outlet housing (19) in the correct order for your lower, see **Repair Kits**, pages 19-23. Install the v-packings one at a time with the lips facing down.

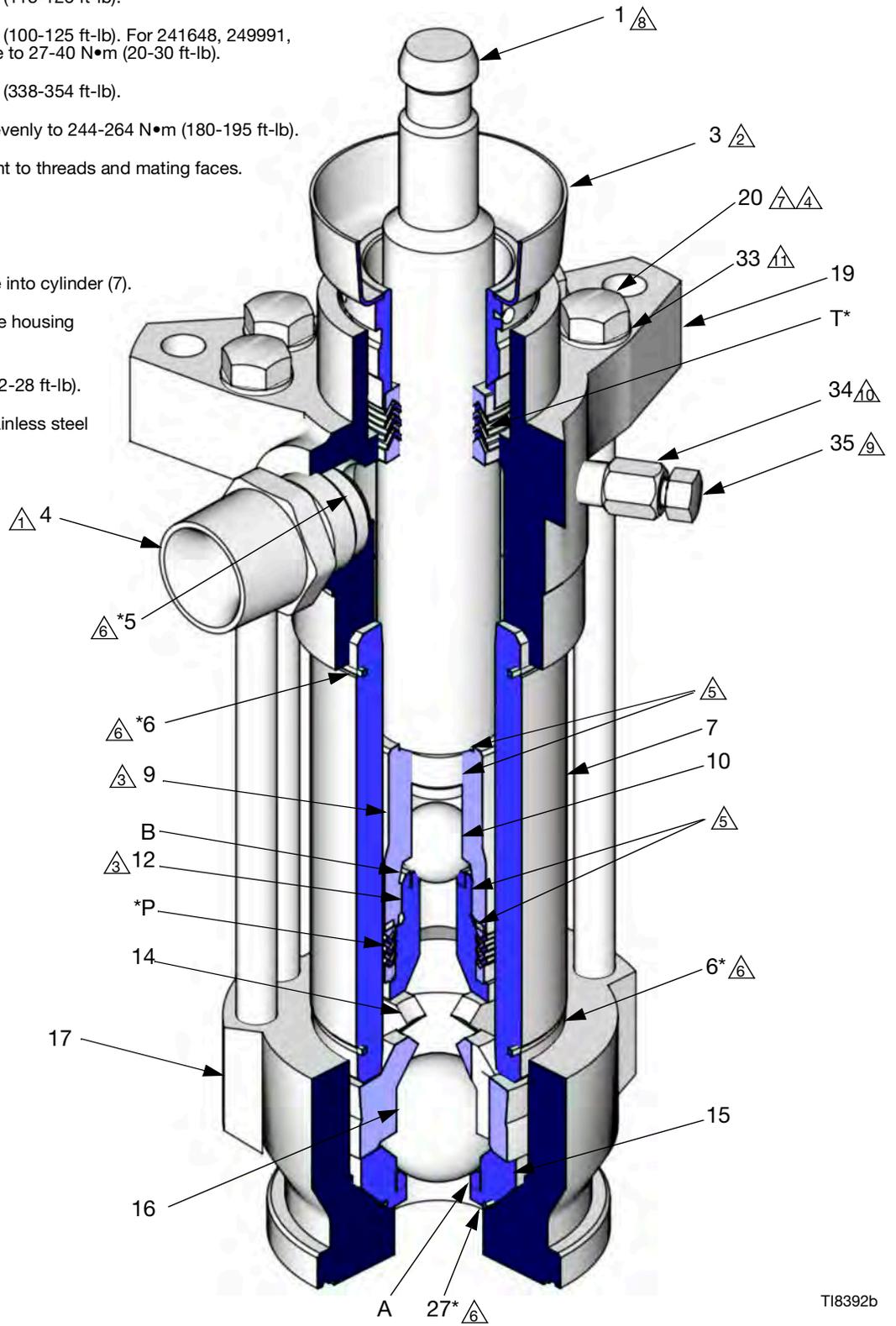
NOTE: To convert the lower to a different packing material, see pages 19-23.

8. Lubricate the threads of the packing nut (3), and loosely install it in the outlet housing (19).
9. Lubricate the seal (6*) and install it in the bottom of the outlet housing (19). Set the outlet housing on top of the cylinder (7). Apply thread lubricant to the six long cap screws (20). Install the cap screws through the outlet housing (19) and thread them loosely by hand into the intake housing (17). Tighten the cap screws oppositely and evenly, then torque to 244-264 N•m (180-195 ft-lb).
10. Install the bleeder valve plug (35). The plug has two sets of threads. Be sure to screw the plug fully into the valve body (34). Torque the plug to 30-38 N•m (22-28 ft-lb).

NOTE: It is not ordinarily necessary to remove the outlet fitting (4) and o-ring (5*). However, if they were replaced because of damage, lubricate the o-ring and place it on the fitting. Screw the fitting into the outlet housing (19). Torque to 156-171 N•m (115-126 ft-lb).

11. Reconnect the lower to the motor as explained in your separate pump assembly manual.

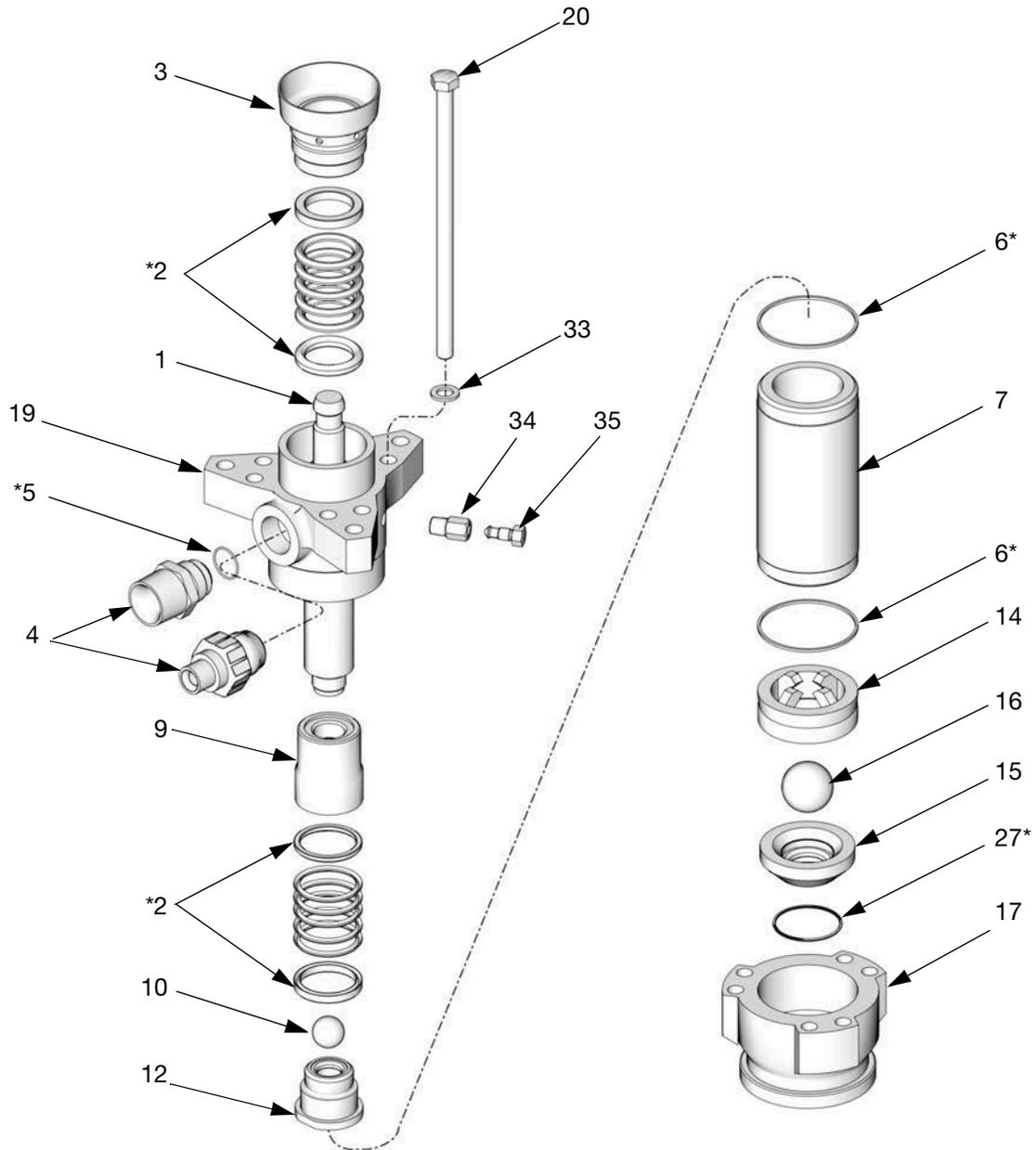
- ⚠ Torque to 156-171 N•m (115-126 ft-lb).
- ⚠ Torque to 135-169 N•m (100-125 ft-lb). For 241648, 249991, and 15F298, limit torque to 27-40 N•m (20-30 ft-lb).
- ⚠ Torque to 459-481 N•m (338-354 ft-lb).
- ⚠ Torque oppositely and evenly to 244-264 N•m (180-195 ft-lb).
- ⚠ Apply anti-seize lubricant to threads and mating faces.
- ⚠ Lubricate.
- ⚠ Apply thread lubricant.
- ⚠ Use arbor press to drive into cylinder (7).
- ⚠ Unscrew plug from valve housing and clean.
- ⚠ Torque to 30-38 N•m (22-28 ft-lb).
- ⚠ Used on lowers with stainless steel capscrews only.



T18392b

FIG. 1. Cutaway View

Parts



TI8340c

Dura-Flo 1800 (430 cc) Lower

See the parts drawing on page 12. Part numbers vary by lower. To find the part number used in your lower, read down the chart to find the desired ref. no., then read left to right to find the part number for your lower.

Carbon Steel Lower

Ref.	Description	Lower Part No.							Qty
		222796 CST	222988 CST	L430CS CST	24W644 CST	L430C M CST	20B119 CST	20B123 CST	
1	ROD, displacement; sst	184276	184276	184276	184276	15G852	184276	184276	1
2*	KIT, repair; includes throat and piston packings, and items 5, 6, and 27; see pages 19-19	222849	222846	222845	222845	253244	222849	222845	1
3	PACKING NUT/WET-CUP	24U017	24U017	24U017	24U017	24U017	24U017	24U017	1
4	FITTING, outlet; 1-1/2 in. npt(m) x M42 x 20; sst	184279	184279	184279		184279			1
	FITTING, outlet; 3/4 npt(m) x M42 x 20; cs				184470		184470	184470	1
5*	O-RING; PTFE	109213	109213	109213	109213	109213	109213	109213	1
6*	SEAL; acetal	184072	184072	184072	184072	184072	184072	184072	2
7	CYLINDER	184461	184461	184461	184461	15G853	184461	184461	1
9	GUIDE, ball, piston	184283	184283	184283	184283	184283	184283	184283	1
10	BALL, piston; sst; 1.25 in. (31.8 mm)	102973	102973	102973	102973		102973	102973	1
	BALL, piston; carbide; 1.25 in. (31.8 mm)					15C869			1
	BALL, piston; silicone nitride; 1.25 in. (31.8 mm)								1
12	PISTON; carbide seat	222795	222795	222795	222795	253743	222795	222795	1
14	GUIDE, ball, intake	184406	184406	184406	184406	184406	184406	184406	1
15	SEAT, intake valve; carbide	222794	222794	222794	222794	253742	222794	222794	1
16	BALL, intake; sst; 2 in. (50.8 mm)	102974	102974	102974	102974		102974	102974	1
	BALL, intake; carbide; 2 in. (50.8 mm)					15C868			1
17	HOUSING, intake	184275	184275	184275	184275	184275	184275	184275	1
19	HOUSING, outlet	222918	222918	222918	222918	222918	222918	222918	1
20	SCREW, cap; 5/8-11 x 12 in. (305 mm); cst	109203	109203	109203	109203	109203	109203	109203	6
27*	O-RING; PTFE	102857	102857	102857	102857	102857	102857	102857	1
33	WASHER; sst					184618			6
34	BODY, valve, bleeder	190126	165702	190126	190126	190126	190126	190126	1
35	PLUG, valve, bleeder	190128	190128	190128	190128	190128	190128	190128	1

* Parts included in Repair Kit (purchase separately). See page 19.

Stainless Steel Lowers

Ref. No.	Description	Lower Part No.					Qty
		222805 SST	241956 SST	246925 SST	C59703 SST	249992S ST	
1	ROD, displacement; sst	184276		184276	184276	15G852	1
	ROD, displacement; Ultralife		687118				1
2*	KIT, repair; includes throat and piston packings, and items 5, 6, and 27; see pages 19-19	222845	222845	222848	222845	253744	1
3	PACKING NUT/WET-CUP	24U019	24U019	24U019	24U019	24U019	1
4	FITTING, outlet; 1-1/2 in. npt(m) x M42 x 20; sst	184387	184387	184387	184387	184387	1
5*	O-RING; PTFE	109213	109213	109213	109213	109213	1
6*	SEAL; acetel	184072	184072	184072	184072	184072	2
7	CYLINDER	184461	184461	184461	184461	15G853	1
9	GUIDE, ball, piston	184283	184283	184283	184283	184283	1
10	BALL, piston; sst; 1.25 in. (31.8 mm)	102973					1
	BALL, piston; carbide; 1.25 in. (31.8 mm)		112267	112267	112267		1
	BALL, piston; silicone nitride; 1.25 in. (31.8 mm)					15C869	1
12	PISTON; carbide seat	222795	222795	222795	222795	253743	1
14	GUIDE, ball, intake	184282	184282	184282	184282	184282	1
15	SEAT, intake valve; carbide	222838	222838	222838	222838	253742	1
16	BALL, intake; sst; 2 in. (50.8 mm)	110294					1
	BALL, intake; carbide; 2 in. (50.8 mm)		C59027	C59027	C59027		1
	BALL, intake; silicone nitride; 2 in. (50.8 mm)					15C868	1
17	HOUSING, intake	184390	184390	184390	184390	184390	1
19	HOUSING, outlet	222917	222917	222917	222917	222917	1
	SCREW, cap; 5/8-11 x 12 in. (305 mm); sst	109470	109470	109470	109470	109470	6
27*	O-RING; PTFE	102857	102857	102857	102857	102857	1
33	WASHER; sst	184618	184618	184618	184618	184618	6
34	BODY, valve, bleeder	184392	190126	190126	184392		1
35	PLUG, valve, bleeder	190293	190293	190293	190293		1
	PLUG, pipe					101748	1

* Parts included in Repair Kit (purchase separately). See page 19.

Ref. No.	Description	Lower Part No					Qty
		246987 SST	246988 SST	20B139 SST	L430SS SST	L430SM SST	
1	ROD, displacement; sst	184276			184276	15G852	1
	ROD, displacement; Ultralife		687118	687118			1
2*	KIT, repair; includes throat and piston packings, and items 5, 6, and 27; see pages 19-19	222850	222850	222850	222845	253744	1
3	PACKING NUT/WET-CUP	24U019	24U019	24U019	24U019	24U019	1
4	FITTING, outlet; 1-1/2 in. npt(m) x M42 x 20; sst	184387	184387		184387	184387	1
	FITTING, outlet; 3/4 npt(m) x M42 x 20; cs			184470			
5*	O-RING; PTFE	109213	109213	109213	109213	109213	1

* Parts included in Repair Kit (purchase separately). See page 19.

Ref. No.	Description	Lower Part No					Qty
		246987 SST	246988 SST	20B139 SST	L430SS SST	L430SM SST	
6*	SEAL; acetal	184072	184072	184072	184072	184072	2
7	CYLINDER	184461	184461	184461	184461	15G853	1
9	GUIDE, ball, piston	184283	184283	184283	184283	184283	1
10	BALL, piston; sst; 1.25 in. (31.8 mm)				102973		1
	BALL, piston; silicone nitride; 1.25 in. (31.8 mm)	15C869	15C869	15C869		15C869	1
12	PISTON; carbide seat	222795	222795	222795	222795	253743	1
14	GUIDE, ball, intake	184282	184282	184282	184282	184282	1
15	SEAT, intake valve; carbide	222838	222838	222838	222838	253742	1
16	BALL, intake; sst; 2 in. (50.8 mm)				110294		1
	BALL, intake; silicone nitride; 2 in. (50.8 mm)	15C868	15C868	15C868		15C868	1
17	HOUSING, intake	184390	184390	184390	184390	184390	1
19	HOUSING, outlet	222917	222917	222917	222917	222917	1
	SCREW, cap; 5/8-11 x 12 in. (305 mm); sst	109470	109470	109470	109470	109470	6
27*	O-RING; PTFE	102857	102857	102857	102857	102857	1
33	WASHER; sst	184618	184618	184618	184618	184618	6
34	BODY, valve, bleeder				184392	184392	1
35	PLUG, valve, bleeder				190293	190293	1
	PLUG, pipe	101748	101748	101748			1

* Parts included in Repair Kit (purchase separately). See page 19.

Dura-Flo 2400 (580 cc) Lowers

See the parts drawing on page 12. Part numbers vary by lower. To find the part number used in your lower, read down the chart to find the desired ref. no., then read left to right to find the part number for your lower.

Carbon Steel Lowers

Ref No.	Description	Lower Part No.						Qty
		222801 CST	222991 CST	222992 CST	C59798 CST	L580CS CST	20B120 CST	
1	ROD, displacement; sst	184002	184002	184002	184002	184002	184002	1
2*	KIT, repair; includes throat and piston packings, and items 5, 6, and 27; see pages 19-22	222879	222877	222876	222879	222875	222879	1
3	PACKING NUT/WET-CUP	24U016	24U016	24U016	24U016	24U016	24U016	1
4	FITTING, outlet; 1-1/2 in. npt(m) x M42 x 20; sst	184279	184279	184279	184279	184279		1
	FITTING, outlet; 3/4 npt(m) x M42 x 20; sst						15B316	
5*	O-RING; PTFE	109213	109213	109213	109213	109213	109213	1
6*	SEAL; acetal	184072	184072	184072	184072	184072	184072	2
7	CYLINDER	184003	184003	184003	184003	184003	184003	1
9	GUIDE, ball, piston	184297	184297	184297	184297	184297	184297	1
10	BALL, piston; sst; 1.5 in. (38.1 mm)	108001	108001	108001		108001	108001	1
	BALL, piston; carbide; 1.5 in. (38.1 mm)				C59805			1
12	PISTON; carbide seat	222802	222802	222802	222802	222802	222802	1
14	GUIDE, ball, intake	184406	184406	184406	184406	184406	184406	1
15	SEAT, intake valve; carbide	222794	222794	222794	222794	222794	222794	1
16	BALL, intake; sst; 2 in. (50.8 mm)	102974	102974	102974		102974	102974	1
	BALL, intake; carbide; 2 in. (50.8 mm)				C59027			1
17	HOUSING, intake	184275	184275	184275	184275	184275	184275	1
19	HOUSING, outlet	222922	222922	222922	222922	222922	222922	1
20	SCREW, cap; 5/8-11 x 12 in. (305 mm); cst	109203	109203	109203	109203	109203	109203	6
27*	O-RING; PTFE	102857	102857	102857	102857	102857	102857	1
34	BODY, valve, bleeder	165702	165702	165702	165702	165702	165702	1
35	PLUG, valve, bleeder	190128	190128	190128	190128	190128	190128	1

* Parts included in Repair Kit (purchase separately). See page 19.

Stainless Steel Lower

Ref No.	Description	Lower Part No.						Qty
		L580SS SST	L580S M SST	222803 SST	222993 SST	222994 SST	236226 SST	
1	ROD, displacement; sst	184002	15G854	184002	184002	184002	184002	1
2*	KIT, repair; includes throat and piston packings, and items 5, 6, and 27; see pages 19-22	222875	253745	222875	222879	222876	222875	1
3	PACKING NUT/WET-CUP	24U018	24U018	24U018	24U018	24U018	24U018	1
4	FITTING, outlet; 1-1/2 in. npt(m) x M42 x 20; sst	184387	184387	184387	184387	184387	184387	1
	FITTING, outlet; 3/4 npt(m) x M42 x 20; sst							
5*	O-RING; PTFE	109213	109213	109213	109213	109213	109213	1
6*	SEAL; acetal	184072	184072	184072	184072	184072	184072	2
7	CYLINDER	184003	15G855	184003	184003	184003	184003	1
9	GUIDE, ball, piston	184297	184297	184297	184297	184297	184297	1
10	BALL, piston; sst; 1.5 in. (38.1 mm)	109220		109220	109220	109220	109220	1
	BALL, piston; silicone nitride; 1.5 in. (38.1 mm)		119669					1
12	PISTON; carbide seat	222802	253741	222802	222802	222802	222802	1
14	GUIDE, ball, intake	184282	184282	184282	184282	184282	184282	1
15	SEAT, intake valve; carbide	222838	253742	222838	222838	222838	222838	1
16	BALL, intake; sst; 2 in. (50.8 mm)	110294		110294	110294	110294	110294	1
	BALL, intake; silicone nitride; 2 in. (50.8 mm)		15C868					1
17	HOUSING, intake	184390	184390	184390	184390	184390	184390	1
19	HOUSING, outlet	222921	222921	222921	222921	222921	222921	1
20	SCREW, cap; 5/8-11 x 12 in. (305 mm); cst				109203		109203	6
	SCREW, cap; 5/8-11 x 12 in. (305 mm); sst	109470	109470	109470		109470		6
27*	O-RING; PTFE	102857	102857	102857	102857	102857	102857	1
33	WASHER; sst	184618	184618	184618		184618		6
34	BODY, valve, bleeder	184392	184392	184392	184392	184392	184392	1
35	PLUG, valve, bleeder	190293	190293	190293	190293	190293	190293	1

* Parts included in Repair Kit (purchase separately). See page 19.

Ref No.	Description	Lower Part No.						Qty
		236230 SST	241648 SST	15F298 SST	249991 SST	20B125 SST	20B121 SST	
1	ROD, displacement; sst	184002	184002	184002	15G854	15G854	184002	1
2*	KIT, repair; includes throat and piston packings, and items 5, 6, and 27; see pages 19-22	222877	222880	222881	253745	253745	222875	1
3	PACKING NUT/WET-CUP	24U018	24U018	24U018	24U018	24U018	24U018	1
4	FITTING, outlet; 1-1/2 in. npt(m) x M42 x 20; sst	184387		184387	184387	184387		1
	FITTING, outlet; 3/4 npt(m) x M42 x 20; sst		15B31 6			15B31 6	15B31 6	
5*	O-RING; PTFE	109213		109213	109213	109213	109213	1
6*	SEAL; acetal	184072	184072	184072	184072	184072	184072	2
7	CYLINDER	184003	184003	184003	15G855	15G855	184003	1
9	GUIDE, ball, piston	184297	184297	184297	184297	184297	184297	1

* Parts included in Repair Kit (purchase separately). See page 19.

Parts

Ref No.	Description	Lower Part No.						Qty
		236230 SST	241648 SST	15F298 SST	249991 SST	20B125 SST	20B121 SST	
10	BALL, piston; sst; 1.5 in. (38.1 mm)	109220	109220				109220	1
	BALL, piston; silicone nitride; 1.5 in. (38.1 mm)			119669	119669	119669		1
12	PISTON; carbide seat	222802	222802	222802	253741	253741	222802	1
14	GUIDE, ball, intake	184282	184282	184282	184282	184282	184282	1
15	SEAT, intake valve; carbide	222838	222838	222838	253742	253742	222838	1
16	BALL, intake; sst; 2 in. (50.8 mm)	110294	110294				110294	1
	BALL, intake; silicone nitride; 2 in. (50.8 mm)			15C868	15C868	15C868		1
17	HOUSING, intake	184390	184390	184390	184390	184390	184390	1
19	HOUSING, outlet	222921	222921	222921	222921	222921	222921	1
20	SCREW, cap; 5/8-11 x 12 in. (305 mm); cst	109203						6
	SCREW, cap; 5/8-11 x 12 in. (305 mm); sst		109470	109470	109470	109470	109470	6
27*	O-RING; PTFE	102857	102857	102857	102857	102857	102857	1
33	WASHER; sst		184618	184618	184618	184618	184618	6
34	BODY, valve, bleeder	184392	184392			184392	184392	1
35	PLUG, valve, bleeder	190293	190293	101748	101748	190293	190293	1

* Parts included in Repair Kit (purchase separately). See page 19.

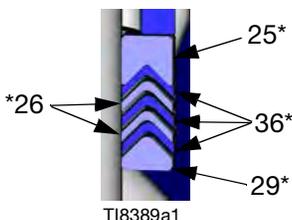
Repair Kits

Repair Fixture Kit

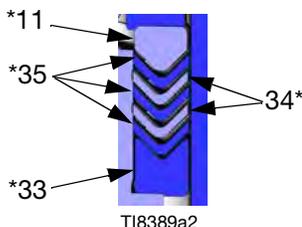
Ref.	Description
18E282	Repair fixture. Fits Dura-Flo 1800 Lower (430 cc) and Dura-Flo 2400 (580 cc) Lower

UHMWPE and PTFE Packings

Throat Packings



Piston Packings



222845 Repair Kit, for Dura-Flo 1800 (standard for 222805, 241956, L430CS, L430SS)

Ref.	Part No.	Description	Qty
11*	184232	GLAND, male, piston; stainless steel	1
25*	184181	GLAND, female, throat; stainless steel	1
26*	109311	V-PACKING, throat; PTFE	2
29*	184231	GLAND, male, throat; stainless steel	1
33*	184182	GLAND, female, piston; stainless steel	1
34*	109312	V-PACKING, piston; PTFE	2
35*	109262	V-PACKING, piston; UHMWPE	3
36*	109261	V-PACKING, throat; UHMWPE	3

222875 Repair Kit, for Dura-Flo 2400 (standard for 222803, 236226, L580CS, L580SS)

Ref.	Part No.	Description	Qty
11*	184236	GLAND, male, piston; stainless steel	1
25*	184185	GLAND, female, throat; stainless steel	1
26*	109315	V-PACKING, throat; PTFE	2
29*	184235	GLAND, male, throat; stainless steel	1
33*	184186	GLAND, female, piston; stainless steel	1
34*	109316	V-PACKING, piston; PTFE	2
35*	109266	V-PACKING, piston; UHMWPE	3
36*	109265	V-PACKING, throat; UHMWPE	3

17L796 Repair Kit, for Part No. 687055 Dura-Flo 1800

Ref.	Part No.	Description	Qty
11	184232	GLAND, male, piston; stainless steel	1
25	184181	GLAND, female, throat; stainless steel	1
26	687056	V-PACKING, throat; graphite/PTFE	2
29	184231	GLAND, male, throat; stainless steel	1
33	184182	GLAND, female, piston; stainless steel	1
34	687057	V-PACKING, piston; graphite/PTFE	2
35	109262	V-PACKING, piston; UHMWPE	3
36	109261	V-PACKING, throat; UHMWPE	3

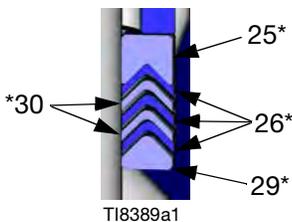
**222880 Repair Kit, for Dura-Flo 2400
(standard for 241648)**

NOTE: Carbon-filled PTFE for use with water up to 60°C (140°F). Limit packing nut torque to 27-40 N•m (20-30 ft-lb).

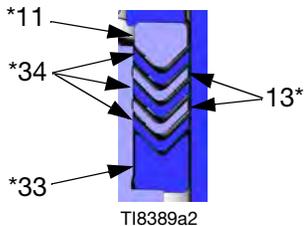
Ref.	Part No.	Description	Qty
11*	184236	GLAND, male, piston; stainless steel	1
25*	184185	GLAND, female, throat; stainless steel	1
26*	109317	V-PACKING, throat; carbon-filled PTFE	2
29*	184235	GLAND, male, throat; stainless steel	1
33*	184186	GLAND, female, piston; stainless steel	1
34*	109318	V-PACKING, piston; carbon-filled PTFE	2
35*	109266	V-PACKING, piston; UHMWPE	3
36*	109265	V-PACKING, throat; UHMWPE	3

PTFE and Leather Packings

Throat Packings



Piston Packings



222849 Repair Kit, for Dura-Flo 1800 (standard for 222796)

Ref.	Part No.	Description	Qty
11*	184232	GLAND, male, piston; stainless steel	1
13*	184312	V-PACKING, piston; leather	2
25*	184181	GLAND, female, throat; stainless steel	1
26*	109311	V-PACKING, throat; PTFE	3
29*	184231	GLAND, male, throat; stainless steel	1
30*	184311	V-PACKING, throat; leather	2
33*	184182	GLAND, female, piston; stainless steel	1
34*	109312	V-PACKING, piston; PTFE	3

222879 Repair Kit, for Dura-Flo 2400 (standard for 222801, 222993)

Ref.	Part No.	Description	Qty
11*	184236	GLAND, male, piston; stainless steel	1
13*	184316	V-PACKING, piston; leather	2
25*	184185	GLAND, female, throat; stainless steel	1
26*	109315	V-PACKING, throat; PTFE	3
29*	184235	GLAND, male, throat; stainless steel	1
30*	184315	V-PACKING, throat; leather	2
33*	184186	GLAND, female, piston; stainless steel	1
34*	109316	V-PACKING, piston; PTFE	3

222847 Leather/PTFE Backup Conversion Kit, for Dura-Flo 1800

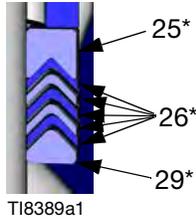
Ref.	Part No.	Description	Qty
11*	184232	GLAND, male, piston; stainless steel	1
13*	184312	V-PACKING, piston; leather	4
25*	184181	GLAND, female, throat; stainless steel	1
26*	109311	V-PACKING, throat; PTFE	1
29*	184231	GLAND, male, throat; stainless steel	1
30*	184311	V-PACKING, throat; leather	4
33*	184182	GLAND, female, piston; stainless steel	1
34*	109312	V-PACKING, piston; PTFE	1

222877 Leather/PTFE Repair Kit, for Dura-Flo 2400 (standard for 222991, 236230)

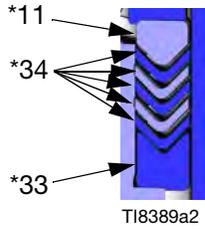
Ref.	Part No.	Description	Qty
11*	184236	GLAND, male, piston; stainless steel	1
13*	184316	V-PACKING, piston; leather	4
25*	184185	GLAND, female, throat; stainless steel	1
26*	109315	V-PACKING, throat; PTFE	1
29*	184235	GLAND, male, throat; stainless steel	1
30*	184315	V-PACKING, throat; leather	4
33*	184186	GLAND, female, piston; stainless steel	1
34*	109316	V-PACKING, piston; PTFE	1

PTFE Packings

Throat Packings

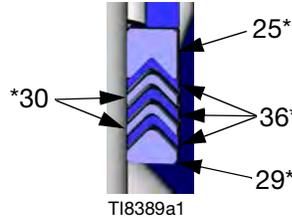


Piston Packings

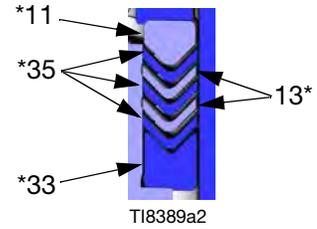


UHMWPE and Leather Packings

Throat Packings



Piston Packings



222846 Repair Kit, for Dura-Flo 1800 (standard for 222998)

Ref.	Part No.	Description	Qty
11*	184232	GLAND, male, piston; stainless steel	1
25*	184181	GLAND, female, throat; stainless steel	1
26*	109311	V-PACKING, throat; PTFE	5
29*	184231	GLAND, male, throat; stainless steel	1
33*	184182	GLAND, female, piston; stainless steel	1
34*	109312	V-PACKING, piston; PTFE	5

222848 Repair Kit, for Dura-Flo 1800 (standard for 246925, 24W644)

Ref.	Part No.	Description	Qty
11*	184232	GLAND, male, piston; stainless steel	1
13*	184312	V-PACKING, piston; leather	2
25*	184181	GLAND, female, throat; stainless steel	1
29*	184231	GLAND, male, throat; stainless steel	1
30*	184311	V-PACKING, throat; leather	2
33*	184182	GLAND, female, piston; stainless steel	1
35*	109262	V-PACKING, piston; UHMWPE	3
36*	109261	V-PACKING, throat; UHMWPE	3

222876 Repair Kit, for Dura-Flo 2400 (standard for 222992, 222994)

Ref.	Part No.	Description	Qty
11*	184236	GLAND, male, piston; stainless steel	1
25*	184185	GLAND, female, throat; stainless steel	1
26*	109315	V-PACKING, throat; PTFE	5
29*	184235	GLAND, male, throat; stainless steel	1
33*	184186	GLAND, female, piston; stainless steel	1
34*	109316	V-PACKING, piston; PTFE	5

253744 Repair Kit, for Dura-Flo 1800 (standard for 249992, L430SM, L430CM)

Ref.	Part No.	Description	Qty
11	184232	GLAND, male, piston; stainless steel	1
13	120533	V-PACKING, piston; UHMWPE	2
25	184181	GLAND, female, throat; stainless steel	1
29	184231	GLAND, male, throat; stainless steel	1
30	184311	V-PACKING, throat; leather	4
33	184182	GLAND, female, piston; stainless steel	1
35	109262	V-PACKING, piston; UHMWPE	3
36	109261	V-PACKING, throat; UHMWPE	3

222878 Conversion Kit, for Dura-Flo 2400

Ref.	Part No.	Description	Qty
11*	184236	GLAND, male, piston; stainless steel	1
13*	184316	V-PACKING, piston; leather	2
25*	184185	GLAND, female, throat; stainless steel	1
29*	184235	GLAND, male, throat; stainless steel	1
30*	184315	V-PACKING, throat; leather	2
33*	184186	GLAND, female, piston; stainless steel	1
35*	109266	V-PACKING, piston; UHMWPE	3
36*	109265	V-PACKING, throat; UHMWPE	3

222850 Repair Kit, for Dura-Flo 1800 (standard for 246987, 246988)

Ref.	Part No.	Description	Qty
11*	184232	GLAND, male, piston; stainless steel	1
13*	184312	V-PACKING, piston; leather	2
25*	184181	GLAND, female, throat; stainless steel	1
29*	184231	GLAND, male, throat; stainless steel	1
30*	184311	V-PACKING, throat; leather	4
33*	184182	GLAND, female, piston; stainless steel	1
35*	109262	V-PACKING, piston; UHMWPE	3
36*	109261	V-PACKING, throat; UHMWPE	3

222881 Repair Kit, for Dura-Flo 2400 (standard for 15F298)

NOTE: Limit packing nut torque to 27-40 N•m (20-30 ft-lb).

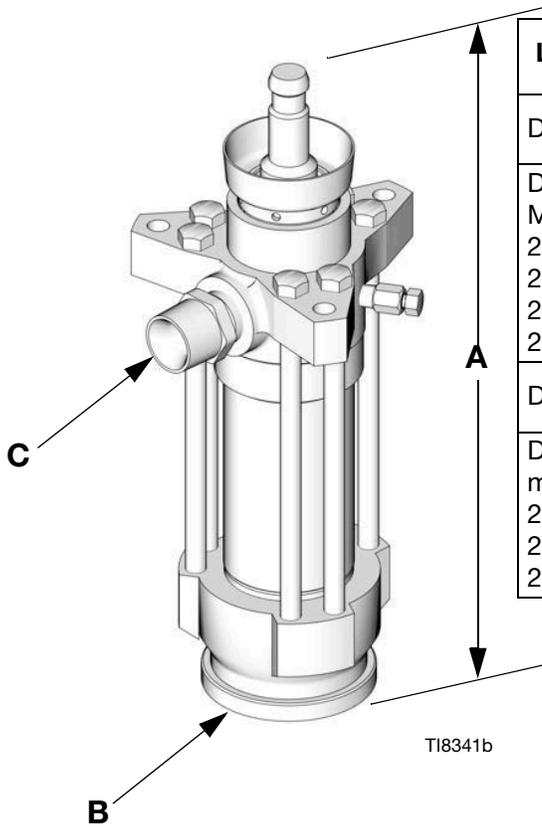
Ref.	Part No.	Description	Qty
11*	184236	GLAND, male, piston; stainless steel	1
13*	184316	V-PACKING, piston; leather	2
25*	184185	GLAND, female, throat; stainless steel	1
29*	184235	GLAND, male, throat; stainless steel	1
30*	184315	V-PACKING, throat; leather	4
33*	184186	GLAND, female, piston; stainless steel	1
35*	109266	V-PACKING, piston; UHMWPE	3
36*	109265	V-PACKING, throat; UHMWPE	3

253745 Repair Kit, for Dura-Flo 2400 (standard for 249991, L580SM)

NOTE: Limit packing nut torque to 27-40 N•m (20-30 ft-lb).

Ref.	Part No.	Description	Qty
11*	184236	GLAND, male, piston; stainless steel	1
13*	120532	V-PACKING, piston; UHMWPE	2
25*	184185	GLAND, female, throat; stainless steel	1
29*	184235	GLAND, male, throat; stainless steel	1
30*	184315	V-PACKING, throat; leather	4
33*	184186	GLAND, female, piston; stainless steel	1
35*	109266	V-PACKING, piston; UHMWPE	3
36*	109265	V-PACKING, throat; UHMWPE	3

Dimensions



Lower Model	A mm (in.)	B Fluid Inlet	C Fluid Outlet	Weight kg (lb)
Dura-Flo 1800	533 (21)	2 in. npt(f)	1-1/2 in. npt(m)	33 (72)
Dura-Flo 1800 Models 24W644, 20B119, 20B123, 20B139			3/4 npt (m)	
Dura-Flo 2400	533 (21)	2 in. npt(f)	1-1/2 in. npt(m)	33 (73)
Dura-Flo 2400 models 20B120, 20B121, 20B125			3/4 npt (m)	

Technical Specifications

Maximum fluid working pressure	See Models , page 3.
Lower effective area	Dura-Flo 1800 (430 cc): 18 cm ² (2.79 in. ²) Dura-Flo 2400 (580 cc): 24 cm ² (3.72 in. ²)
Fluid inlet size	See Dimensions , page 24.
Fluid outlet size	See Dimensions , page 24.
Wetted parts	<i>Carbon steel lowers:</i> Carbon steel, chrome, zinc, and electroless nickel plating, 304, 440, and 17-4 PH grades of stainless steel, tungsten carbide, ductile iron, acetal <i>Stainless steel lowers:</i> 304, 329, and 17-4 PH grades of stainless steel, tungsten carbide, acetal, PTFE silicone nitride (lowers 249992, 246987, 246988, and 15F298 only) <i>Packing materials:</i> See Repair Kits , pages 19-22.

California Proposition 65

CALIFORNIA RESIDENTS

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

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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.

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Original instructions. This manual contains English. MM 311825

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