Instructions – Parts List

Fast-Flo® Air Motor

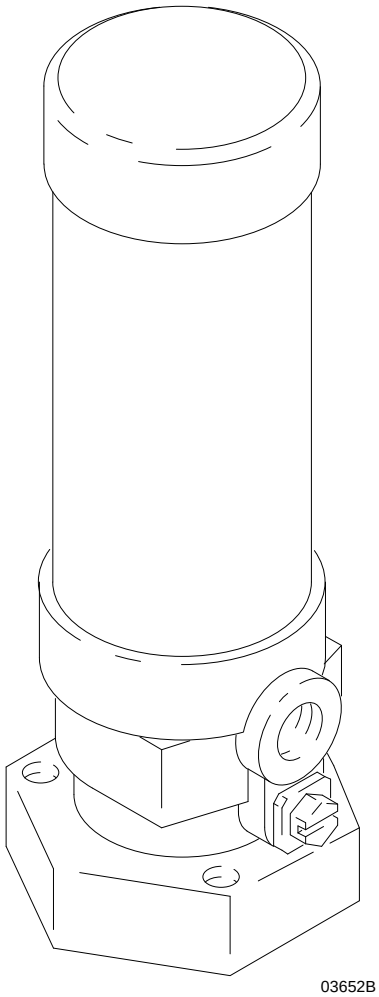
307456V

12.5 bar (1.25 MPa, 180 psi) Maximum Air Working Pressure

Model 215963, Series A
101.6 mm (4 in.) stroke

NOTE: To replace Air Motor 215963, order Motor Replacement Kit 223099. See manual 307977 for parts.

Important Safety instructions
Read all warnings and instructions in this manual.
Save these instructions.
See page 2 for table of contents.



03652B

Model 215963 Shown

PROVEN QUALITY. LEADING TECHNOLOGY.

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Symbols

Caution Symbol

⚠ CAUTION

This symbol alerts you to the possibility of damage to or destruction of equipment if you do not follow the instructions.

Warning Symbol

⚠ WARNING

This symbol alerts you to the possibility of serious injury or death if you do not follow the instructions.

⚠ WARNING

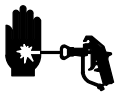
INSTRUCTIONS

EQUIPMENT MISUSE HAZARD

Equipment misuse can cause the equipment to rupture or malfunction and result in serious injury.

- This equipment is for professional use only.
- Read all instruction manuals, tags, and labels before operating the equipment.
- Use the equipment only for its intended purpose. If you are not sure, call your Graco distributor.
- Do not alter or modify this equipment. Use only genuine Graco parts and accessories.
- Check equipment daily. Repair or replace worn or damaged parts immediately.
- Do not exceed the maximum working pressure stated on the equipment or in the **Technical Data** section for your equipment. Do not exceed the maximum working pressure of the lowest rated component in your system.
- Handle hoses carefully. Do not use hoses to pull equipment.
- Route hoses away from traffic areas, sharp edges, moving parts, and hot surfaces. Do not expose Graco hoses to temperatures above 66°C (150°F) or below –40°C (–40°F).
- Wear hearing protection when operating this equipment.
- Comply with all applicable local, state, and national fire, electrical, and safety regulations.

⚠ WARNING



SKIN INJECTION HAZARD

Spray from the gun, leaks, or ruptured components can inject fluid into your body and cause extremely serious injury, including the need for amputation. Fluid splashed in the eyes or on the skin can also cause serious injury.

- Fluid injected into the skin might look like just a cut, but it is a serious injury. **Get immediate surgical treatment.**
- Do not point the gun at anyone or at any part of the body.
- Do not put your hand or fingers over the spray tip/nozzle.
- Do not stop or deflect leaks with your hand, body, glove, or rag.
- Always have the tip guard and the trigger guard on the gun when spraying.
- Be sure the gun trigger safety operates before spraying.
- Close the gun ball valves when you stop spraying.
- Lock the gun trigger safety when you stop spraying.
- Follow the **Pressure Relief Procedure** on page 5 if the spray tip/nozzle clogs and before cleaning, checking, or servicing the equipment.
- Tighten all fluid connections before operating the equipment.
- Check the hoses, tubes, and couplings daily. Replace worn or damaged parts immediately. Do not repair high pressure couplings; you must replace the entire hose.

⚠ WARNING

FIRE AND EXPLOSION HAZARD

Improper grounding, poor ventilation, open flames, or sparks can cause a hazardous condition and result in a fire or explosion and serious injury.

- Ground the equipment and the object being sprayed/dispensed. Refer to **Grounding** on page 5.
- If there is any static sparking or you feel an electric shock while using this equipment, **stop spraying immediately.** Do not use the equipment until you identify and correct the problem.
- Provide fresh air ventilation to avoid the buildup of flammable fumes from solvents or the fluid being sprayed/dispensed.
- Keep the spray/dispensing area free of debris, including solvent, rags, and gasoline.
- Before operating this equipment, extinguish all open flames or pilot lights in the spray/dispensing area.
- Do not smoke in the spray/dispensing area.
- Do not turn on or off any light switch in the spray/dispensing area while operating or if fumes are present.
- Do not operate a gasoline engine in the spray/dispensing area.

TOXIC FLUID HAZARD

Hazardous fluid or toxic fumes can cause serious injury or death if splashed in the eyes or on the skin, inhaled, or swallowed.

- Know the specific hazards of the fluid you are using.
- Store hazardous fluid in an approved container. Dispose of hazardous fluid according to all local, state, and national guidelines.
- Always wear protective eyewear, gloves, clothing, and respirator as recommended by the fluid and solvent manufacturer.

Installation

Grounding

Proper grounding is an essential part of maintaining a safe system.

To reduce the risk of static sparking, ground the pump. Check your local electrical code for detailed grounding instructions for your area and type of equipment. Be sure to ground all of this equipment:

- *Pump:* Use a ground wire and clamp as shown in Fig. 1.
- *Air compressor:* Follow manufacturer's recommendations.
- *Object being sprayed:* Follow your local code.
- *All solvent pails used when flushing or relieving pressure,* always hold a metal part of the gun firmly to the side of a grounded metal pail, then trigger the gun.
- *To maintain grounding continuity when flushing or relieving pressure,* always hold a metal part of the spray gun firmly to the side of a grounded metal pail, then trigger the spray gun.

To ground the pump:

1. *UL–Listed Pumps:* Use a ground wire, connector, and clamp. See Fig. 1. Loosen screw (X). Insert one exposed end of a 12 ga (1.5 mm^2) minimum ground wire (Y) through the eye of the ground terminal connector (W) and tighten screw (X) securely. Connect the other end of the wire to a true earth ground. Order Part No. 237569 Ground Wire and Clamp.
2. *Non UL–Listed Pumps:* See Fig. 1. Remove the ground screw (Z). Fasten the ground connector (W) onto the pump with the ground screw (Z) and tighten securely. Loosen screw (X). Insert one exposed end of a 12 ga (1.5 mm^2) minimum ground wire (Y) through the eye of the ground terminal connector (W) and tighten screw (X) securely. Connect the other end of the wire to a true earth ground. Order Part No. 222011 Ground Connector/Wire and Clamp.

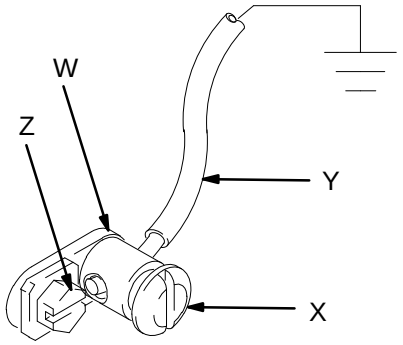
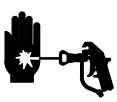


Fig. 1 TI1052

Operation

Pressure Relief Procedure

⚠ WARNING



INJECTION HAZARD
The system pressure must be manually relieved to prevent the system from starting or spraying accidentally. Fluid under high pressure can be injected through the skin and cause serious injury. To reduce the risk of an injury from injection, splashing fluid, or moving parts, follow the **Pressure Relief Procedure** whenever you:

- are instructed to relieve the pressure,
- stop spraying/dispensing,
- check or service any of the system equipment,
- or install or clean the spray tips or nozzles.

1. Shut off the air to the pump.
2. Close the bleed-type master air valve (required in your system).
3. Hold a metal part of the gun to the side of a grounded metal pail and trigger the gun to relieve pressure.
4. Open the fluid drain valve (required in your system), having a container ready to catch the drainage.
5. Leave the drain valve open until you are ready to spray/dispense again.

If you suspect that the spray tip/nozzle or hose is clogged or that fluid pressure is not fully relieved after following the steps above, **very slowly** loosen the tip guard retaining nut or hose end coupling and relieve pressure gradually. Clear the tip or hose obstruction.

Troubleshooting

⚠ WARNING

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 5.

Relieve the Pressure before you check or service any system equipment.

NOTE: Check all other possible problems and solutions before disassembling the pump.

Problem	Solution
Air motor stalls	Turn off and relieve air pressure to the motor. Turn on the air supply . If the motor does not start, service the air piston (11) or springs (5 and 20).
Air leaks down along the piston shaft (23)	Replace the v-block packing (9).
Air leaks from the piston shaft relief holes (23a)	Clean and service the piston (11).
Slow operation	Icing; allow the air motor to thaw.
	Muffler (26) clogged. Clean the muffler with mineral spirits. See **Cleaning the Muffler** on page 7.

Service

NOTE: Repair Kit 214584 is available. For best results, use all the new parts in the kit, even if the old parts look good. Parts included in the kit are marked with a dagger, for example (6†), in the text and illustrations.

Air Piston and Lower Spring Service

⚠ WARNING

To reduce the risk of injury from trapped air pressure when servicing the air motor, always remove air cap (7) from air cylinder (8) before removing air cylinder from base (22).

1. Unscrew the cylinder cap (7) from the cylinder (8). To remove the spring (5), pry gently under the coils in the direction of the helix.

2. Unscrew the cylinder (8) from the base (22) and lift the cylinder off the air piston (11). Using a pliers (B) on the air exhaust plate (16) and a wrench (C) on the piston shaft (23), unscrew the piston from the shaft. See Fig. 2.

⚠ CAUTION

Ketone fumes may damage the piston o-rings. When pumping ketones (such as acetone, MEK, etc.), use Conversion Kit 221038. This kit replaces the standard fluoroelastomer o-rings with EPDM o-rings which are resistant to ketones.

3. Disassemble the piston and wash all parts in compatible solvent. Refer to the parts list on page 9. Blow parts dry and inspect for wear or damage. If any of the valve plate spacers (13) are damaged, replace all three to maintain proper clearance between the valve plates and the seats.

4. Remove and inspect the lower spring (20). Replace if necessary, and reinstall.

5. A decrease in performance accompanied by a slower than normal cycle rate is commonly caused by icing. It is recommended that the pump is shut down, and the ice is allowed to thaw.

6. Reassemble the air piston (11), using new parts as needed. Apply a good grade of thread sealant to the threads of the screws (12). and torque evenly to 1.1–1.6 N•m (10–14 in-lb). With the washer (4) in place, apply thread sealant to the threads of the piston. Carefully screw the piston (11) onto the shaft (23) by hand so it is securely fastened. Do not use pliers on the air exhaust plate while tightening. When installed, there should be 0.8 mm (0.032 in.) minimum clearance between the washer (4) and the piston shaft shoulder. See Fig. 2.

Packing Replacement

1. Unscrew the cylinder cap (7) from the cylinder (8). To remove the spring (5), pry gently under the coils in the direction of the helix.

2. Unscrew the cylinder (8) from the base (22) and lift the cylinder off the air piston (11). Disconnect the piston shaft (23) from the pump connecting rod and pull the shaft up out of the air motor base. Remove and inspect the packing (9†), being careful not to mar the inner lip. See Fig. 2.

NOTE: Fluoroelastomer packing 111383 is available as an accessory, for use with solvents not compatible with the standard nitrile rubber packing.

3. Replace the packing and reassemble the air motor in the reverse order of disassembly.

Upper Spring Replacement

Unscrew the cylinder cap (7) from the cylinder (8). To remove the spring (5), pry gently under the coils in the direction of the helix.

Cleaning the Muffler

To clean the muffler (26), remove it from the unit and soak it in mineral spirits, then blow dry with air to remove excess solvent.

Service

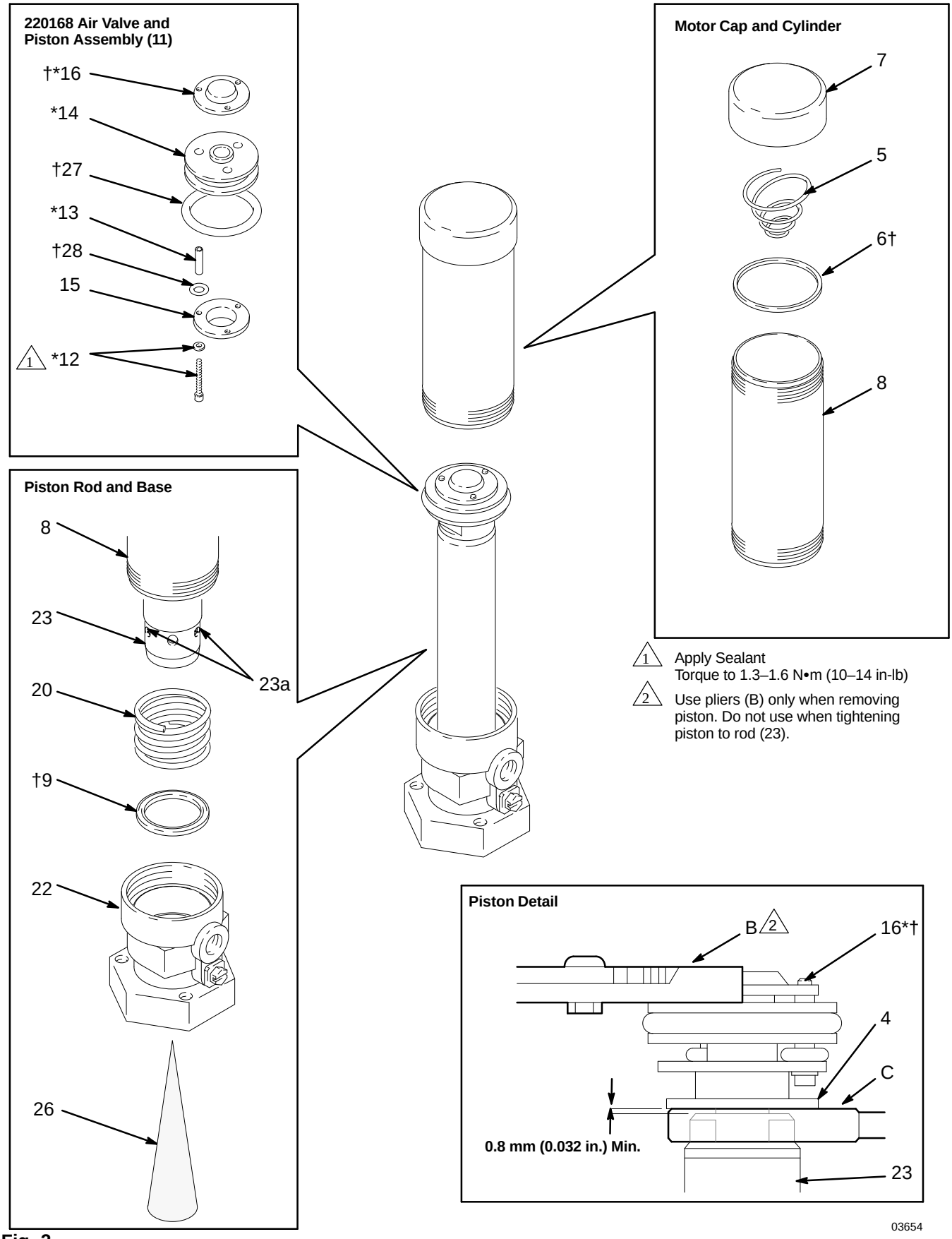
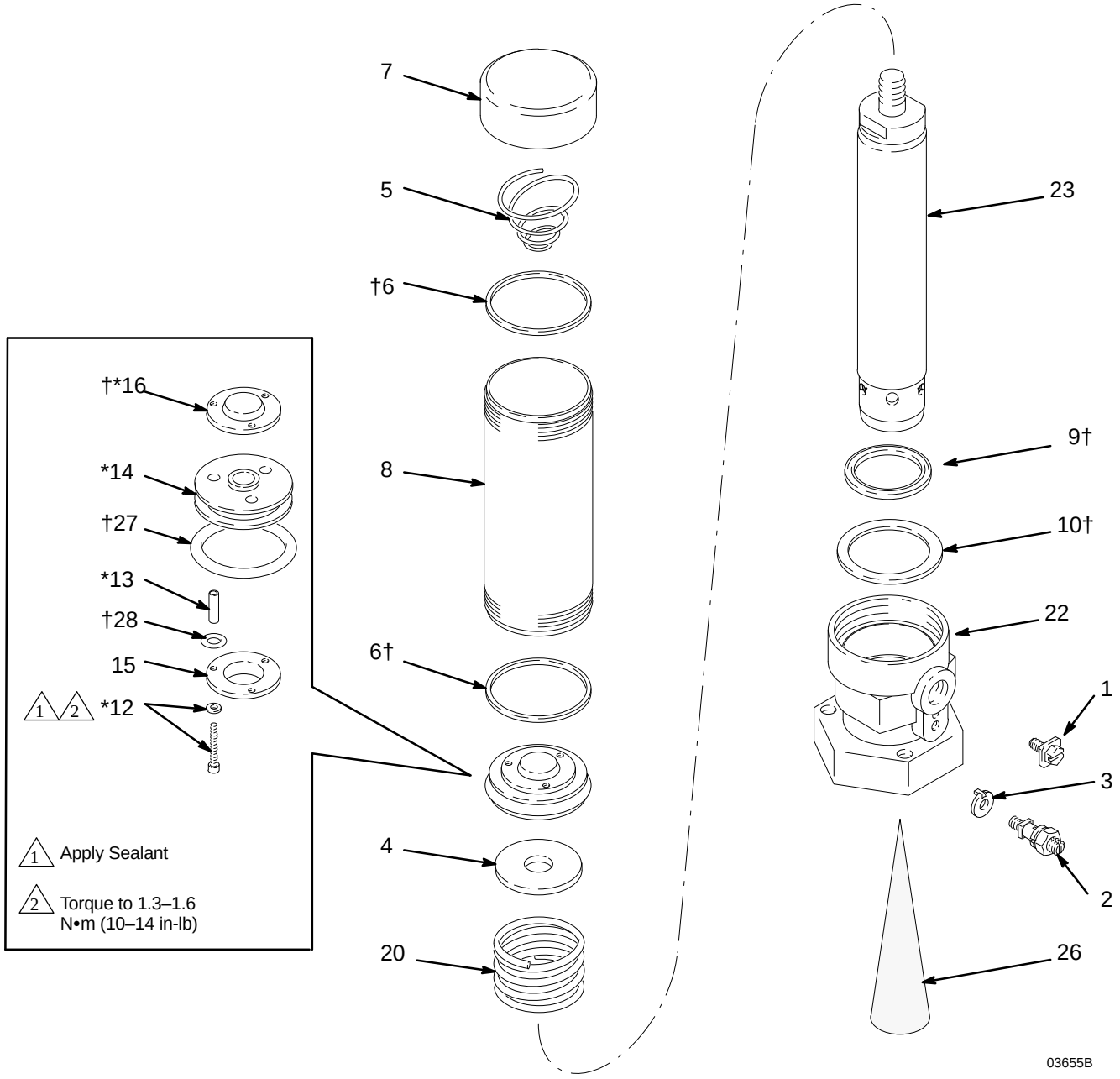


Fig. 2

Parts

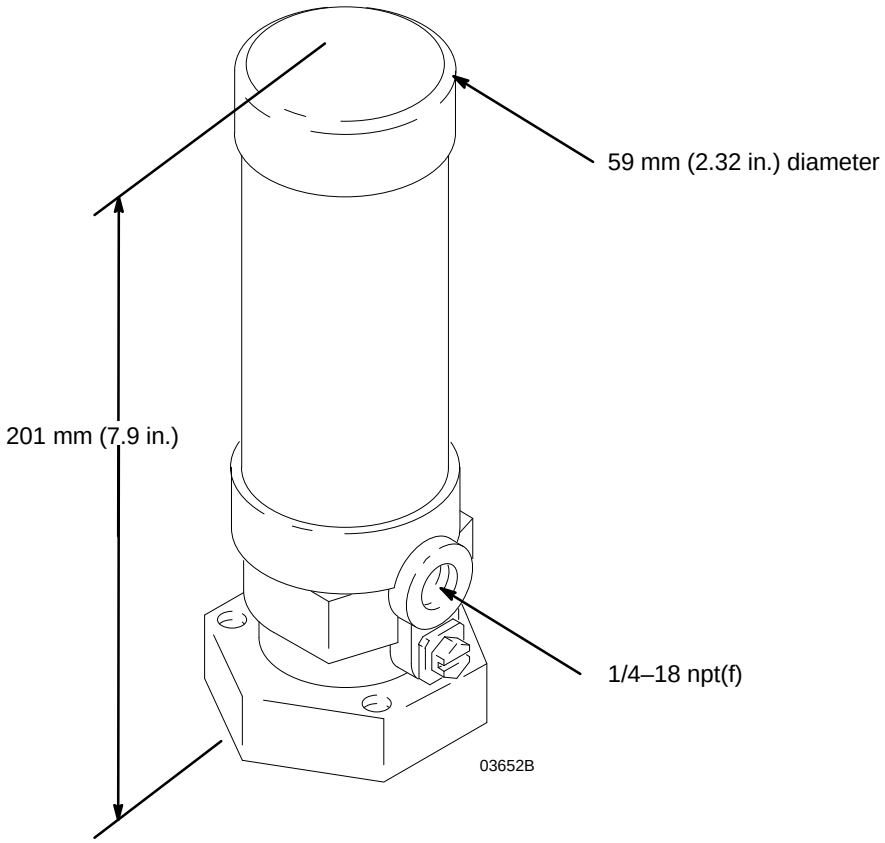


Ref No.	Part No.	Description	Qty.
1	116343	SCREW, grounding, for non–listed pumps	1
2	104029	LUG, grounding, for UL–listed pumps	1
3	104582	WASHER, tab, for UL–listed pumps	1
4	157872	WASHER, valve	1
5	178866	SPRING, compression	1
6†	172404	GASKET, neoprene	2
7	172406	GAP, cylinder	1
8	172407	CYLINDER	1
9†	172585	PACKING, v-block; nitrile rubber	1
10†	172595	WASHER, backup	
11	220168	AIR VALVE & PISTON ASSEMBLY Includes items 12–16, 27 & 28	1
12*	220884	. SCREW, socket hd cap; No. 6–32 25 mm (1 in.) lg; with copper gasket	3
13*	181485	. SPACER, valve plate	3
14*	189210	. PISTON, air, aluminum	1
15	181487	. PLATE, air intake valve	1
16*†	162729	. PLATE, air exhaust valve	1
20	178780	SPRING, compression	1
22	215946	BASE, air motor (include item 9)	1
23	215947	SHAFT, piston (Includes item 26)	1
26	178490	. MUFFLER	1
27†	108357	O-RING; fluoroelastomer	1
28†	108358	O-RING; fluoroelastomer	3

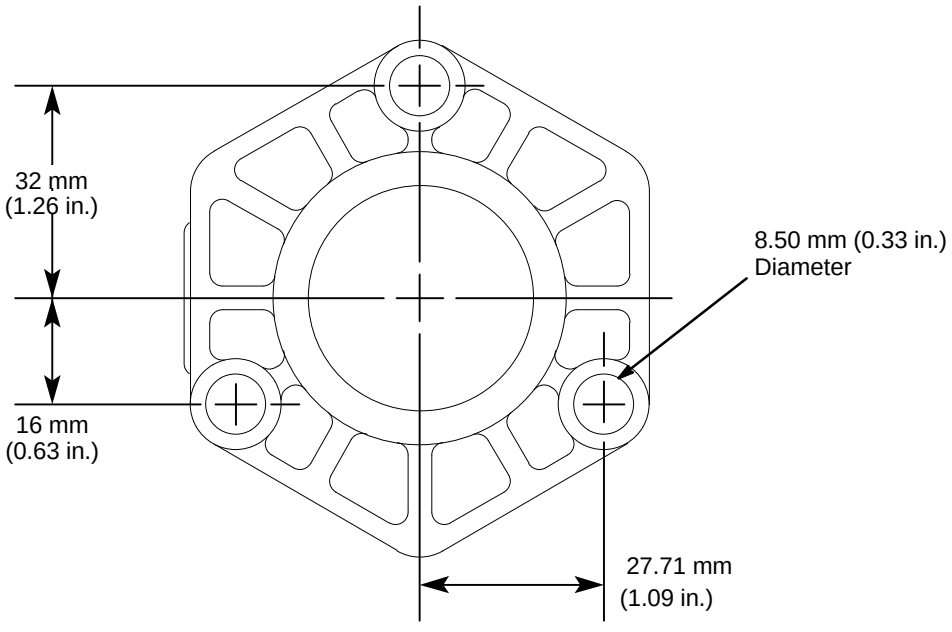
* Recommended tool box spare parts. Keep these spare parts on hand to reduce downtime.

† Supplied in Repair Kit 214584.

Dimensions



Mounting Hole Layout



Technical Data

Maximum inbound air pressure	12.5 bar (1.25 MPa,180 psi)
Air inlet size	1/4 npt (f)
Effective piston area	10 cm^2 (1.6 sq. in.)
Effective piston diameter	35.2 mm (1.4 in.)
Stroke length	101.6 (4 in.)
Weight	1.8 kg (4 lb)

The Graco Standard Warranty

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

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

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

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

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

Graco makes no warranty, and disclaims all implied warranties of merchantability and fitness for a particular purpose in connection with accessories, equipment, materials or components sold but not manufactured by Graco. These items sold, but not manufactured by Graco (such as electric motors, switches, hose, etc.), are subject to the warranty, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

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

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The parties acknowledge that they have required that the present document, as well as all documents, notices and legal proceedings entered into, given or instituted pursuant hereto or relating directly or indirectly hereto, be drawn up in English. Les parties reconnaissent avoir convenu que la rédaction du présente document sera en Anglais, ainsi que tous documents, avis et procédures judiciaires exécutés, donnés ou intentés à la suite de ou en rapport, directement ou indirectement, avec les procedures concernées.

Graco Information

For the latest information about Graco products, visit www.graco.com.

TO PLACE AN ORDER, contact your Graco distributor, or call one of the following numbers to identify the distributor closest to you:

1–800–328–0211 Toll Free
612–623–6921
612–378–3505 Fax

All written and visual data contained in this document reflects the latest product information available at the time of publication. Graco reserves the right to make changes at any time without notice.

Original instructions. This manual contains English. MM 307456

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