Instructions

178MM (7 IN.) DIAMETER

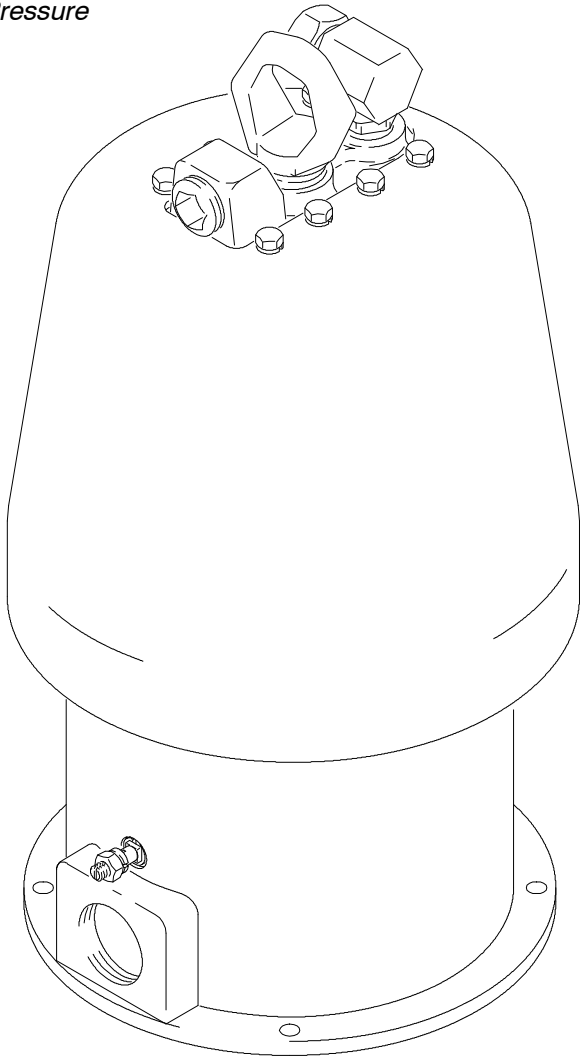
Quiet Bulldog® Air Motor 307304ZAA

100 psi (0.7 MPa, 7 bar) Maximum Air Input Pressure

Part No. 215255, Series G
Standard Quiet Air Motor.
Adapts to all existing Bulldog Pumps.
Includes auxiliary air exhaust port for use in a Header system.

Part No. 233077, Series A
Remote Exhaust Quiet Air Motor.
Adapts to all existing Bulldog Pumps.

Part No. 237001, Series A
Reduced Icing Quiet Air Motor.
Adapts to all existing Bulldog Pumps.



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Model 215255 Shown

Read warnings and instructions.
See page 2 for **Table of Contents**.

PROVEN QUALITY. LEADING TECHNOLOGY.

GRACO INC. P.O. BOX 1441 MINNEAPOLIS, MN 55440-1441

Table of Contents

Symbols

Warning Symbol

⚠ WARNING

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

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

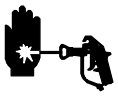
INSTRUCTIONS

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 uncertain about usage, 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** for your equipment. Do not exceed the maximum working pressure of the lowest rated component in your system.
- Use fluids and solvents which are compatible with the equipment wetted parts. Refer to the **Technical Data** section of all equipment manuals. Read the fluid and solvent manufacturer's warnings.
- 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 180°F (82°C) or below -40°F (-40°C).
- Wear hearing protection when operating this equipment.
- Do not lift pressurized equipment.
- Do not lift the equipment by the air motor lift ring if the total weight of the equipment exceeds 550 lb (250 kg).
- Comply with all applicable local, state, and national fire, electrical, and safety regulations.

⚠ WARNING



INJECTION HAZARD

Spray from the gun/valve, hose 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 medical attention.**
- Do not point the gun/valve 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.
- Do not “blow back” fluid; this is not an air spray system.
- Always have the tip guard and the trigger guard on the gun when spraying.
- Check the gun diffuser operation weekly. Refer to the gun manual.
- Be sure the gun/valve trigger safety operates before spraying/dispensing.
- Lock the gun/valve trigger safety when you stop spraying/dispensing.
- Follow the **Pressure Relief Procedure** on page 10 whenever you: are instructed to relieve pressure; stop spraying/dispensing; clean, check, or service the equipment; and install or clean the spray tip/nozzle.
- Tighten all fluid connections before operating the equipment.
- Check the hoses, tubes, and couplings daily. Replace worn, damaged, or loose parts immediately. Permanently coupled hoses cannot be repaired; replace the entire hose.
- Use only Graco approved hoses. Do not remove any spring guard that is used to help protect the hose from rupture caused by kinks or bends near the couplings.

MOVING PARTS HAZARD

Moving parts, such as the air motor piston, can pinch or amputate your fingers.

- Keep clear of all moving parts when starting or operating the pump.
- Before servicing the equipment, follow the **Pressure Relief Procedure** on page 10 to prevent the equipment from starting unexpectedly.

⚠ 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. Refer to **Grounding** on page 6.
- If there is any static sparking or you feel an electric shock while using this equipment, **stop spraying/dispensing 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/dispense area free of debris, including solvent, rags, and gasoline.
- Electrically disconnect all equipment in the spray/dispense area.
- Extinguish all open flames or pilot lights in the spray/dispense area.
- Do not smoke in the spray/dispense area.
- Do not turn on or off any light switch in the spray/dispense area while operating or if fumes are present.
- Do not operate a gasoline engine in the spray/dispense 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.

Notes

Installation

General Information

NOTE: Reference numbers and letters in parentheses in the text refer to the callouts in the figures and the parts drawing.

NOTE: Always use Genuine Graco Parts and Accessories, available from your Graco distributor.

Grounding

⚠ WARNING

FIRE AND EXPLOSION HAZARD
Before operating the pump, ground the system as explained below. Also read the section **FIRE AND EXPLOSION HAZARD** on page 4.

1. *Pump:* use a ground wire and clamp as shown in Fig. 1. Loosen the grounding lug locknut (W) and washer (X). Insert one end of a 12 ga (1.5 mm^2) minimum ground wire (Y) into the slot in lug (Z) and tighten the locknut securely. Connect the other end of the wire to a true earth ground. Order Part No. 237569 Grounding Clamp and Wire.

2. *Air and fluid hoses:* use only electrically conductive hoses.

3. *Air compressor:* follow manufacturer's recommendations.

4. *Spray gun or dispensing valve:* ground through connection to a properly grounded fluid hose and pump.

5. *Object being sprayed:* follow your local code.

6. *Fluid supply container:* follow your local code.

7. *Solvent pails used when flushing:* follow your local code. Use only metal pails, which are conductive, placed on a grounded surface. Do not place the pail on a nonconductive surface, such as paper or cardboard, which interrupts the grounding continuity.

8. *To maintain grounding continuity when flushing or relieving pressure*, hold a metal part of the spray gun/dispense valve firmly to the side of a grounded *metal* pail, then trigger the gun/valve.

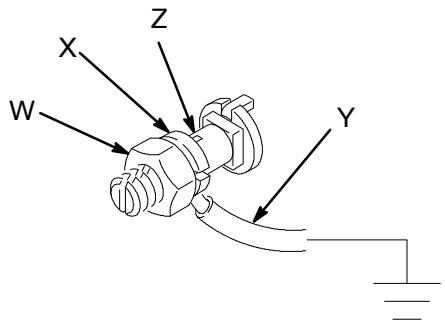


Fig. 1

Installation

For the recommended air supply system installation, see Instruction Manual 307375.

The following are additional recommendation for Maximum Noise Reduction.

- See Fig. 2. The air line should be connected to the air motor inlet (S) with an electrically conductive flexible hose. Also, use a flexible fluid outlet and suction hoses. Where possible, avoid using solid plumbing, which carries noise vibrations.

- Mount the air motor on resilient rubber pads, rather than sheet metal.

- Determine the minimum air inlet pressure and pump cycle rate necessary to achieve the desired spray/dispensing results, or minimum fluid pressure and flow. This will result in less system wear and less overall noise.

Air Motor Icing

Moisture in the compressed air can collect in the air motor and freeze, causing the motor to stall. This is called icing. If icing occurs, shut off the air supply and allow the ice to thaw.

To minimize icing, reduce the moisture in your compressed air supply by using an air dryer or a filter which traps water.

The main air line should slope slightly downward so water will collect at the end of the line, where it can be drained. Additionally, plumb each drop line from the top of the main air line. Install an automatic drain or a drain valve at the bottom of each drop.

Model 237001 Reduced Icing Air Motor allows you to divert a stream of air over the air valves. This flow of warm air minimizes water collecting and freezing. The amount of air is adjustable with a needle valve (88, see the parts drawing on page 16).

For additional assistance in designing your system, contact your Graco distributor.

Auxiliary Air Exhaust (Model 215255)

An auxiliary air exhaust line may be connected to Model 215255, for use in a header system. Remove the pipe plug (15, see the parts drawing) from the 1" npt(f) auxiliary air exhaust port (L) at the top of the motor. Connect a 1" npt(m) exhaust hose (M) to this port. The exhaust hose **must** slope downward, and the exhaust manifold (N) connection **must** be lower than the base of the motor (P), to prevent moisture from accumulating in the line and draining back into the motor. See Fig. 2.

Plug the 17 air exhaust holes (R) in the air motor cylinder with size 3.5 x 1.3, 13 mm long self-tapping screws.

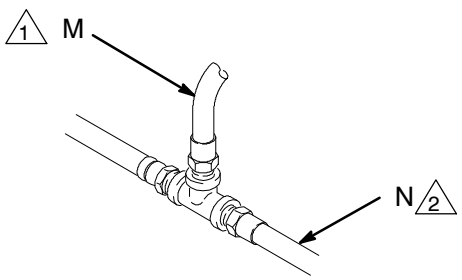
KEY

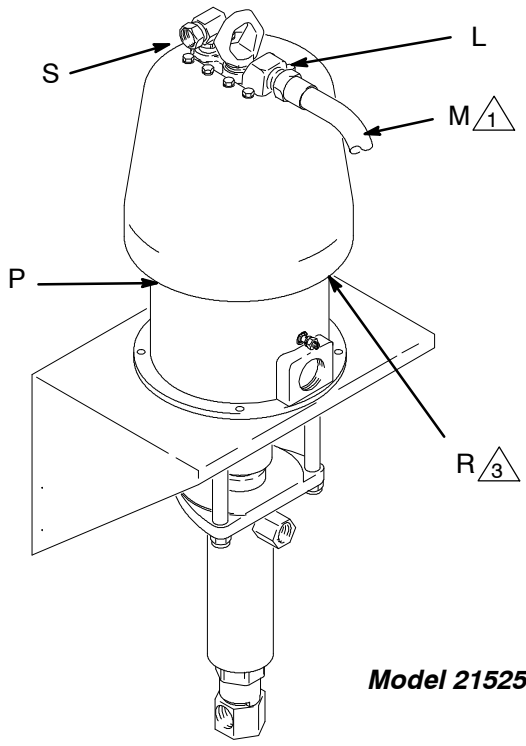
L Auxiliary Air Exhaust Port
M 1" npt(m) Air Exhaust Hose
N Exhaust Manifold
P Motor Base
R Location of Air Exhaust Holes
S Main Air Inlet

1 Must slope downward from motor to exhaust manifold.

2 Exhaust manifold must be lower than base of motor.

3 Plug exhaust holes when using auxiliary air exhaust.





Model 215255 Shown

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Fig. 2

Troubleshooting

To restart a stalled motor, close the bleed-type master air valve to bleed off all trapped air pressure. Turn the air back on. This will trip the air valve of the air motor, causing the piston to go to the top or bottom of its stroke.

⚠ WARNING

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 10.

Locating Air Leaks

The piston in the air motor moves when air is supplied to the motor. Always relieve the pressure before troubleshooting this motor.

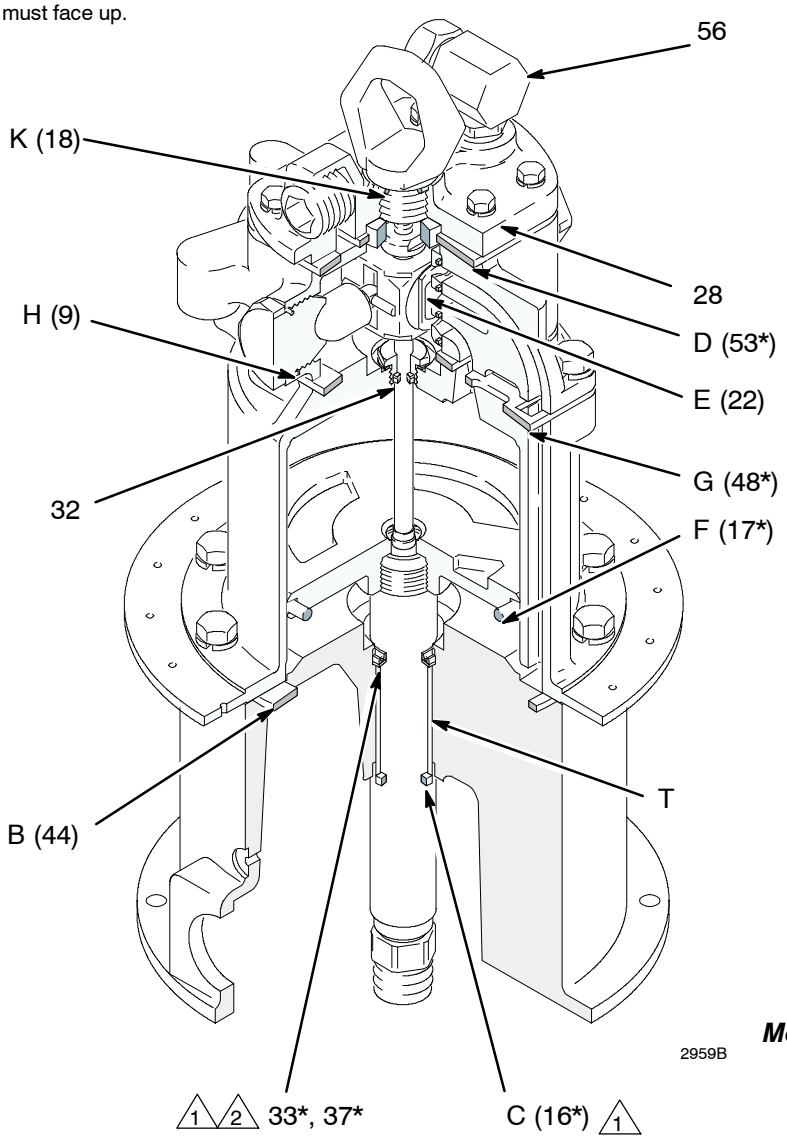
To locate where air is leaking, shut off the air supply and disconnect the hose. Screw the air inlet assembly (56) out of the air manifold cap (28), remove the shield (54), then screw the inlet assembly back into the manifold. See Fig. 3. Connect the air hose and turn the air on. Stall the pump on both the up and down stroke as indicated in the **Check Chart** below, and adjust the air regulator to 0.7–1.0 bar (10–15 psi). Use the methods listed in the **Check Chart** to find where air is leaking.

Check Chart

Stroke Position	Letter Ref. Points	Check method	Cause of leakage
UP stroke only	F	By listening for air leak at exhaust outlets.	Worn trip rod packing (32).
	B	By feel.	Blown air cylinder gasket (44).
	C	Squirt oil around wiper (16).	Worn throat packing (33).
	G	By feel.	Damaged cylinder gasket (48).
DOWN stroke only	G	By feel.	Damaged air manifold gasket (53).
BOTH strokes	E	By feeling exhaust, or hearing a high-pitched sound.	Worn director valve (22). Replace or lap faces with no. 500 grit sandpaper.
	F	By feel, or hearing a high-pitched sound.	Worn piston o-ring (17).
	D or G	By feel.	Blown manifold gaskets (48 and 53).
	H	Squirt oil around o-ring (9).	Damaged housing o-ring (9).
	K	By feel.	Damaged o-ring (18).

△1 Grease.

△2 Lips of packing (33*) must face up.



Model 215255 Shown

Fig. 3

Service

Pressure Relief Procedure

⚠ WARNING

INJECTION HAZARD
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/nozzles.

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

If you suspect that the spray tip or hose is completely clogged, or that pressure has not been fully relieved after following the steps above, ***very slowly*** loosen the tip guard retaining nut or hose end coupling and relieve pressure gradually, then loosen completely. Now clear the tip or hose.

Tools Required

- Padded pliers, Part No. 207579 (for use on trip rod).
- Torque wrench
- 1 in. deep well socket wrench
- Set of socket or box wrenches
- Adjustable wrench
- O-ring pick
- Light waterproof grease
- Loctite® 242 or equivalent

General Information

⚠ WARNING

To avoid serious injury and equipment damage, do not lift the equipment by the air motor lift ring if the total weight of the equipment exceeds 550 lb (250 kg). The lift ring cannot support that weight.

NOTE: Repair Kit 215906 is available. Parts included are marked with an asterisk, for example (16*). For the best results, use all the new parts in the kit.

NOTE: Inspect all parts as they are disassembled and replace worn or damaged parts.

Service

Disassembly

⚠ WARNING

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 10.

1. Relieve the pressure.

2. Disconnect the displacement pump. Disconnect the ground wire. Disconnect all hoses, rods, tubes, controls, etc. from the air motor as necessary to provide ease in servicing. Set the motor upright on a workbench.

NOTE: Refer to Fig. 4 for steps 3 to 5.

3. To remove the shield, perform step a. or b. as applicable.

   a. *Models 215255 and 233077:* Remove the lift ring (26), o-ring (18), screws (12), washers (3), air inlet fitting (56) and shield (54). See Fig. 4.

   b. *Model 237001:* Remove the lift ring (26), o-ring (18), screws (12), washers (3), air inlet fitting (56), and mufflers (76). Remove the air tube (83) from the fitting (87) and push it down through the grommet (81). Remove the shield (54). See page 26.

4. Remove the gasket (69). Lift off the manifold cap (28). Remove the gasket (53).

5. Unscrew the toggle retainers (47) and remove the o-rings (9), housing guides (51), springs (31), housings (52), and pins (11) from each side of the manifold (29).

Model 215255 Shown

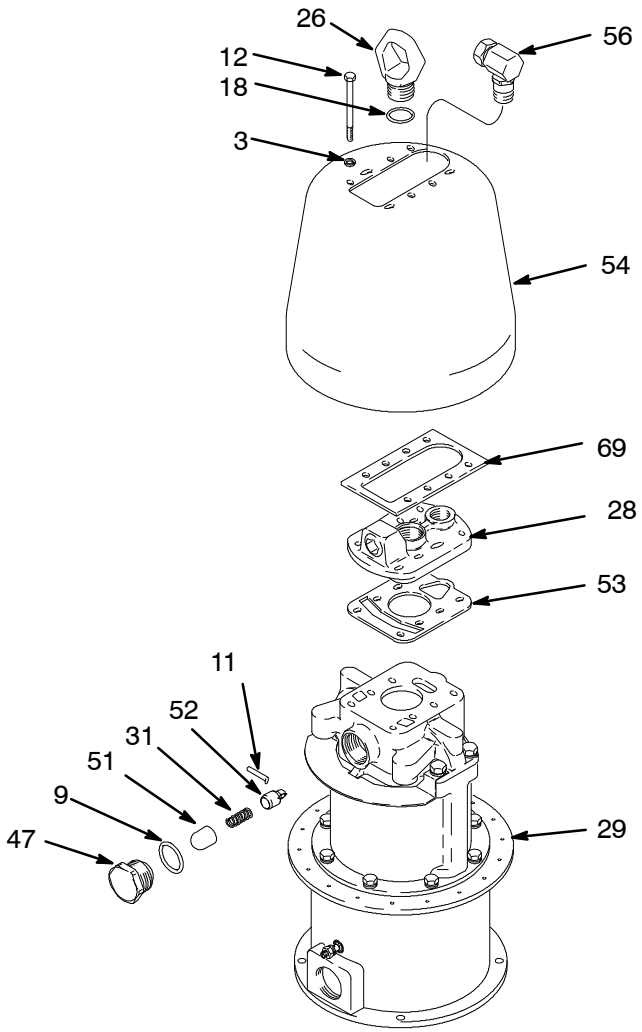


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Fig. 4

Service

NOTE: Refer to Fig. 5 for steps 6 to 11.

6. Remove the screws (14) and lockwashers (65) from the manifold (29). Remove the deflector (68, Model 215255 only).

7. **To prevent the spring-loaded director valves (22) from popping out,** carefully lift the manifold (29) up about 51 mm (2 in.) from the cylinder (27). Place one hand under the manifold to hold the director valves in the valve housing (23), then continue lifting the manifold. Remove your hand slowly to allow the director valve springs to release gently. Inspect the director valves (22) and compression springs (30).

8. Turn the manifold (29) over. Place wrenches on the flats of the adjusting screw (36) and nut (34) and turn the screw further into the nut until you can remove it. Do this in all four positions.

⚠ WARNING

The openings in the valve plates (25) are very sharp. Be careful not to cut yourself.

9. Remove and check the valve plates (25), handling them carefully. Clean the plates and mating surfaces of the manifold (29). Remove the rubber pad (35).

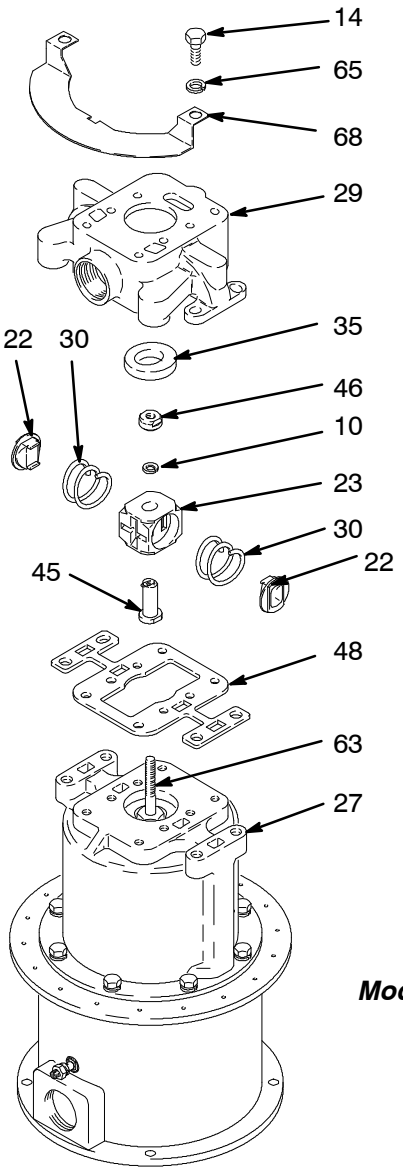
NOTE: If you replace the valve plates, also replace the seals (19).

⚠ CAUTION

Be careful not to damage the surface of the trip rod (63) which would restrict its free movement. Special padded pliers, 207579, are available.

10. Pull the trip rod (63) up and grasp it with the padded locking pliers (order 207579). Hold the flats of the valve housing hub (45) with a wrench, screw off the trip rod nut (46) and remove the air valve housing (23). Remove the lockwasher (10) and screw off the hub (45). Now release the pliers.

11. Remove the gasket (48) from the air cylinder (27).



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Detail of Air Manifold and Valve Plates

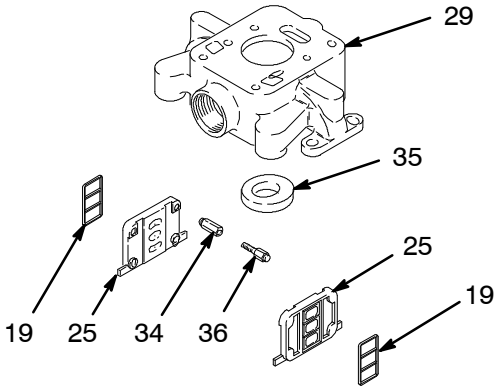

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Fig. 5

NOTE: Refer to Fig. 6 for steps 12 to 18.

12. Remove the rubber pad (73) from the cylinder (27). Remove the trip rod bearing (5), using a 1 in. deep-well socket wrench. Remove the gasket (75), v-block packing (32), and backup washer (74) from the bearing.

⚠ CAUTION

Be careful not to tilt the cylinder when removing it from the piston to avoid damaging the smooth inner surface of the cylinder.

13. Remove the screws (14) and lockwashers (65) and carefully pull the cylinder (27) straight up off the piston (64).

14. Pull the piston (64) and trip rod (63) up out of the base (61). Remove the piston o-ring (17) and check for wear or damage.

NOTE: The connecting rod stud (42) is fastened to the piston shaft (64) with anaerobic sealant, and may be difficult to remove.

⚠ CAUTION

Be careful not to damage the polished surface of the piston shaft.

15. Lock the hex of the piston shaft (64) in a vise and unscrew the connecting rod stud (42) from the piston shaft.

⚠ CAUTION

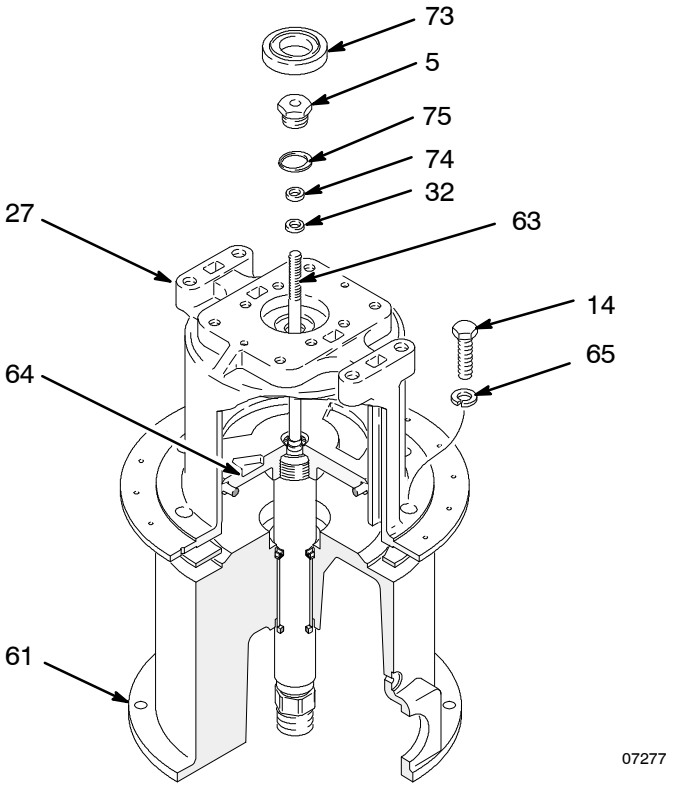
Handle the trip rod assembly (63) carefully. Nicks and scratches cause premature spring failure.

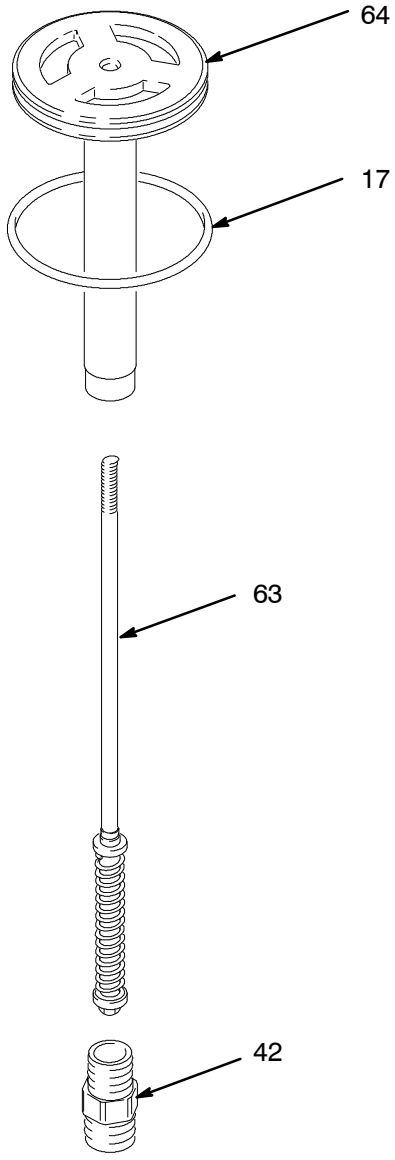
NOTE: A damaged trip rod cannot be repaired; use a new one.

16. Remove the trip rod (63) from the piston (64).

17. Remove the v-block packing (33), backup washer (37), and gasket (44) from the base (61).

18. Turn the base over and remove the wiper seal (16). Inspect the bearing (70) in place. Remove only if damaged.





Detail of Base

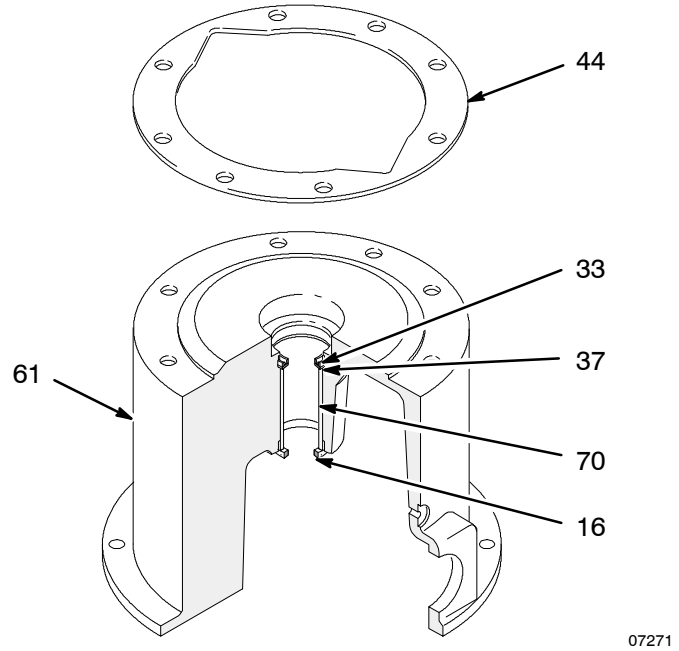


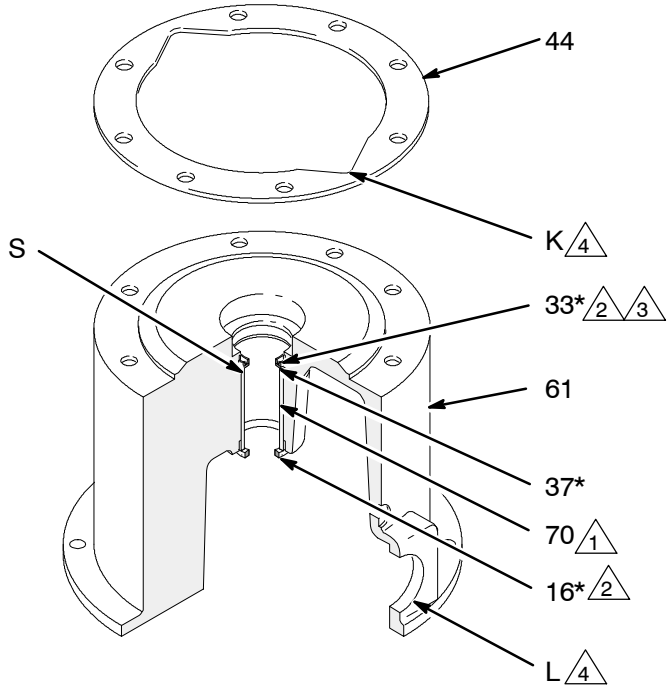
Fig. 6

Reassembly

1. Clean all parts thoroughly and inspect for wear or damage. Replace parts as necessary.

NOTE: Refer to Fig. 7 for steps 2 to 6.

2. Turn the base (61) upside down.
3. If the bearing (70) was removed, press-fit the new bearing so its top edge is flush with the shoulder (S) of the packing cavity. After installation, measure the inner diameter of the bearing. It must be uniformly 1.375 in. (35 mm) to ensure that the piston shaft does not bind. If incorrect, size the bearing while in place; this can be done with a 1.375 in. diameter steel ball.
4. Grease the wiper seal (16*) and press-fit in the base (61).
5. Turn the base upright. Install the backup washer (37*) in the base (61). Grease the v-block packing (33*) and install it in the base so the lips face up.
6. Place the gasket (44) on the base (61) so one of its notches (K) aligns with the optional fluid outlet (L).



1 Inner diameter of the bearing must be uniformly 1.375 in. (35 mm).

2 Grease.

3 Lips of packing must face up.

4 Align notch (K) in gasket (44) with the optional fluid outlet (L) in the base (61).

Fig. 7

Service

NOTE: Refer to Fig. 8 for steps 7 to 11.

7. Grease the trip rod (63) with light, water-proof grease and slide it into the piston (64) shaft. Clean the threads of the piston and the connecting rod stud (42). Apply Loctite® 242 or the equivalent to both. Screw the stud into the piston and torque to 148–162 ft-lb (200–220 N•m).

8. Place the cylinder (27) upside down on the base (61). Grease the piston (64), o-ring (17*), and inside of the cylinder. Place the o-ring around the piston; the o-ring is larger than the piston groove. Install the piston in the cylinder so the excess of the o-ring fits into one of the air channels (M) of the cylinder. Use your fingers to push the o-ring out of the channel and seat it in the piston groove. Very carefully lower the piston into the cylinder.

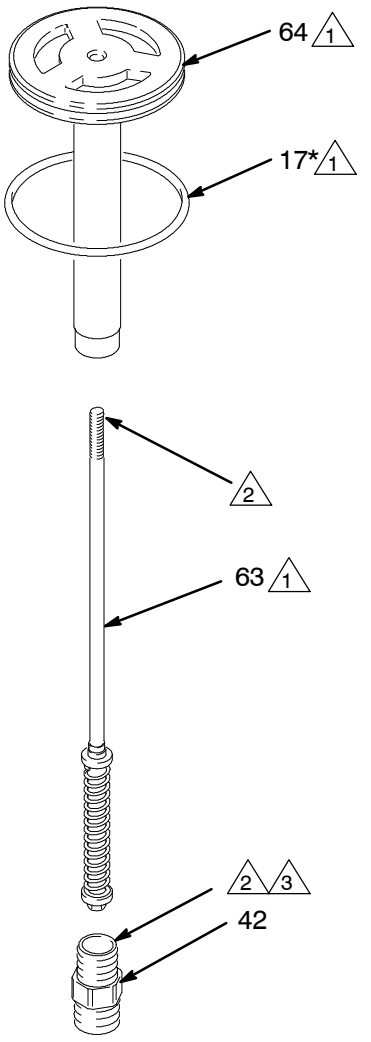
9. Regrease the inside of the cylinder (61). Carefully turn the piston assembly and cylinder over and guide it into the base (61). Align one of the cylinder's air channels (M) with the notch (K) in the gasket (44) and with the optional fluid outlet (L) of the base. Install the lockwashers (65) and screws (14) and torque to 25 ft-lb (34 N•m).

10. Install the backup washer (74) and v-block packing (32) in the bearing (5) so the lips of the packing face *out of* the bearing. Install the gasket (75) on the bearing. Grease the trip rod (63) and thread the bearing onto the trip rod and into the cylinder (27). Use a 1 in. deep-well socket wrench to tighten the bearing to 14–18 ft-lb (19–24 N•m).

11. Install the rubber pad (73) in the cylinder (27), with the ribs facing up.

Model 215255 Shown

Detail of Piston



1 Grease with light, waterproof grease.
2 Apply Loctite® 242 or equivalent to threads.
3 Torque to 148–162 ft-lb (200–220 N•m).
4 Grease inside wall of cylinder.
5 Torque to 25 ft-lb (34 N•m).
6 Lips of packing must face out of the bearing.
7 Torque to 14–18 ft-lb (19–24 N•m).
8 Align air channel (M) and notch (K) in gasket (44) with the optional fluid outlet (L) in the base (61).

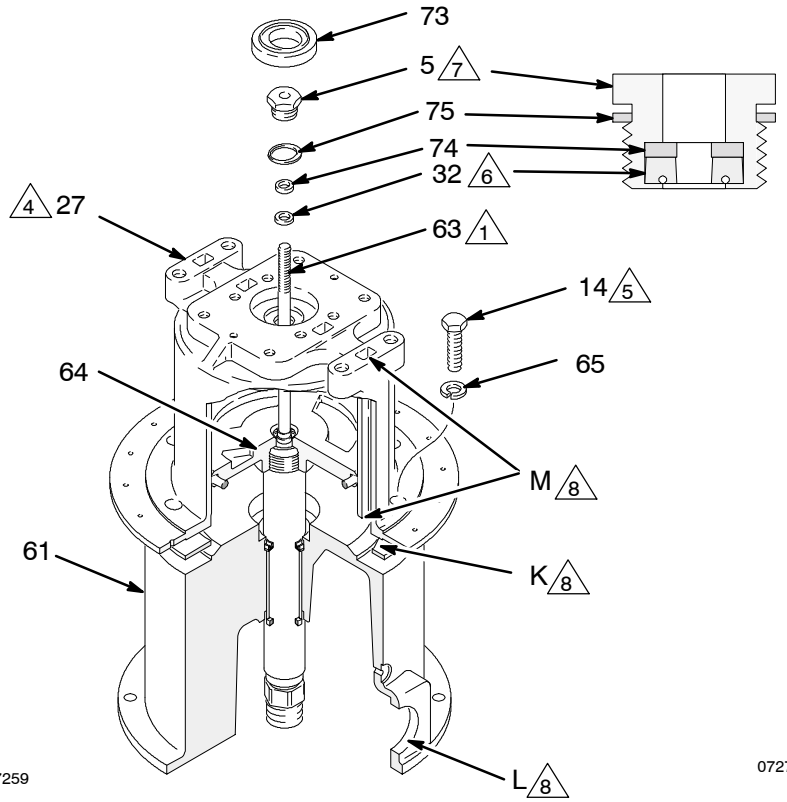


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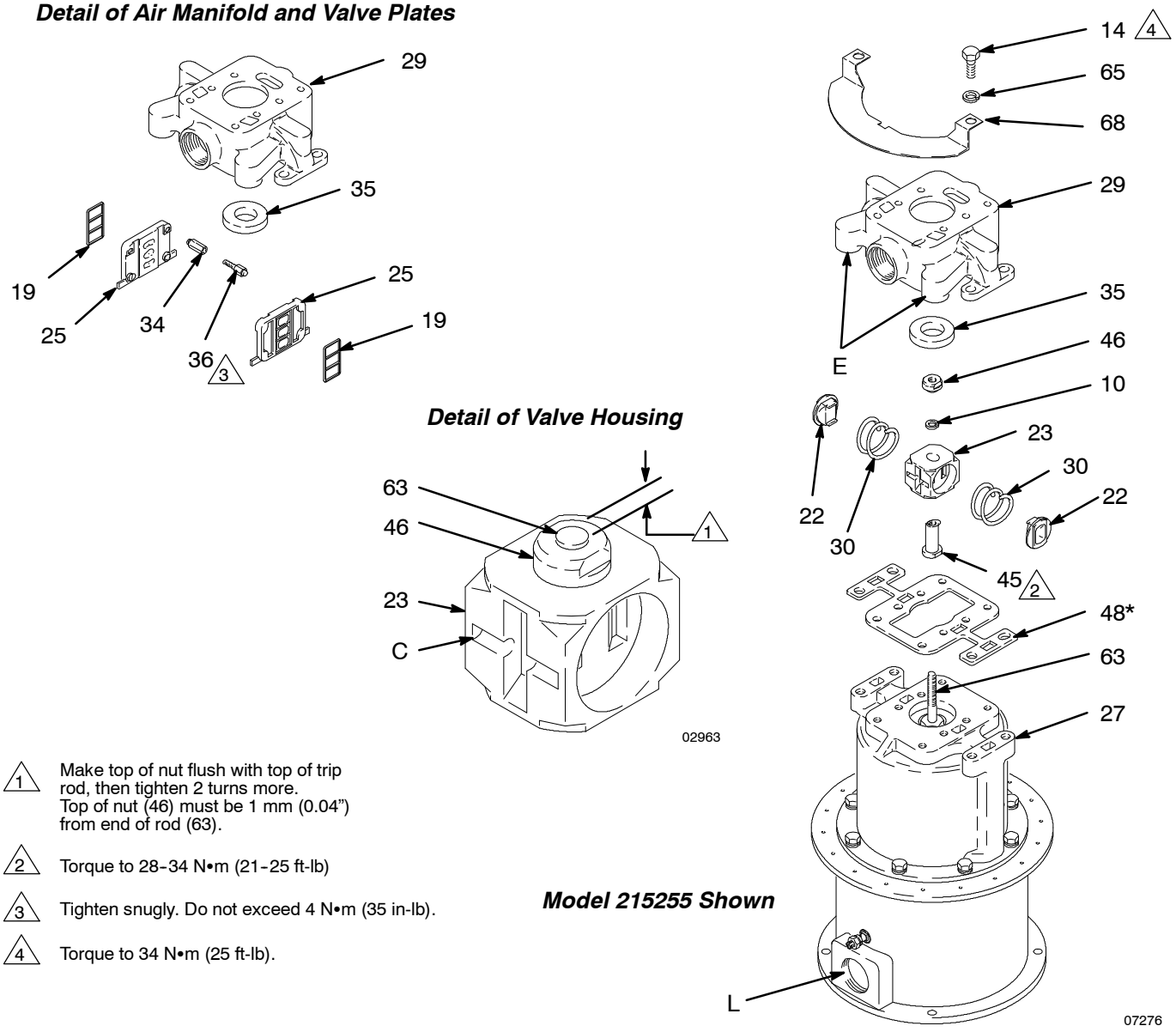
Fig. 8

NOTE: Refer to Fig. 9 for steps 12 to 17.

12. Place the gasket (48*) on top of the cylinder (27).
13. Thread the hub (45) onto the trip rod (63). Lift the rod and grasp it with the padded locking pliers. Screw the hub down as far as possible by hand.
14. Install the air valve housing (23), lockwasher (10), and trip rod nut (46) so the nut is flush with the top of the trip rod (63). Tighten the nut 2 turns more, so there is 1 mm (0.04 in.) clearance between the top of the rod and the top of the nut. Hold the flats of the trip rod nut with a wrench. With another wrench, tighten the hub (45) to 28–34 N•m (21–25 ft-lb). Release the pliers.
15. Place the plate seals (19) on the valve plates (25). Place the plates in the air manifold (29). Install the adjusting screw (36) and nut (34) assemblies in all four corners of the plates. ***Important:*** Adjust the screws and nuts evenly so they snugly hold the plates. Do not exceed 4 N•m (35 in-lb).
16. Install the rubber pad (35) in the air manifold (29).

NOTE: *On Model 237001,* check that the tubing (82) is securely attached to the air manifold (29). See page 26.

17. Place the springs (30) and air director valves (22) into the valve housing (23). Hold the springs and valves in place and install the air manifold (29) over the housing, making sure it is properly oriented. The exhaust ports (E) must be oriented to the optional outlet (L) of the base as shown. Be sure the valve housing (23) moves up and down freely. Position the deflector (68, Model 215255 only) as shown, and then install and tighten the screws (14) and lockwashers (65) holding the manifold (29) to the cylinder (27).



1 Make top of nut flush with top of trip rod, then tighten 2 turns more. Top of nut (46) must be 1 mm (0.04") from end of rod (63).

2 Torque to 28-34 N•m (21-25 ft-lb)

3 Tighten snugly. Do not exceed 4 N•m (35 in-lb).

4 Torque to 34 N•m (25 ft-lb).

Fig. 9

Service

NOTE: Refer to Fig. 10 for steps 18 to 21.

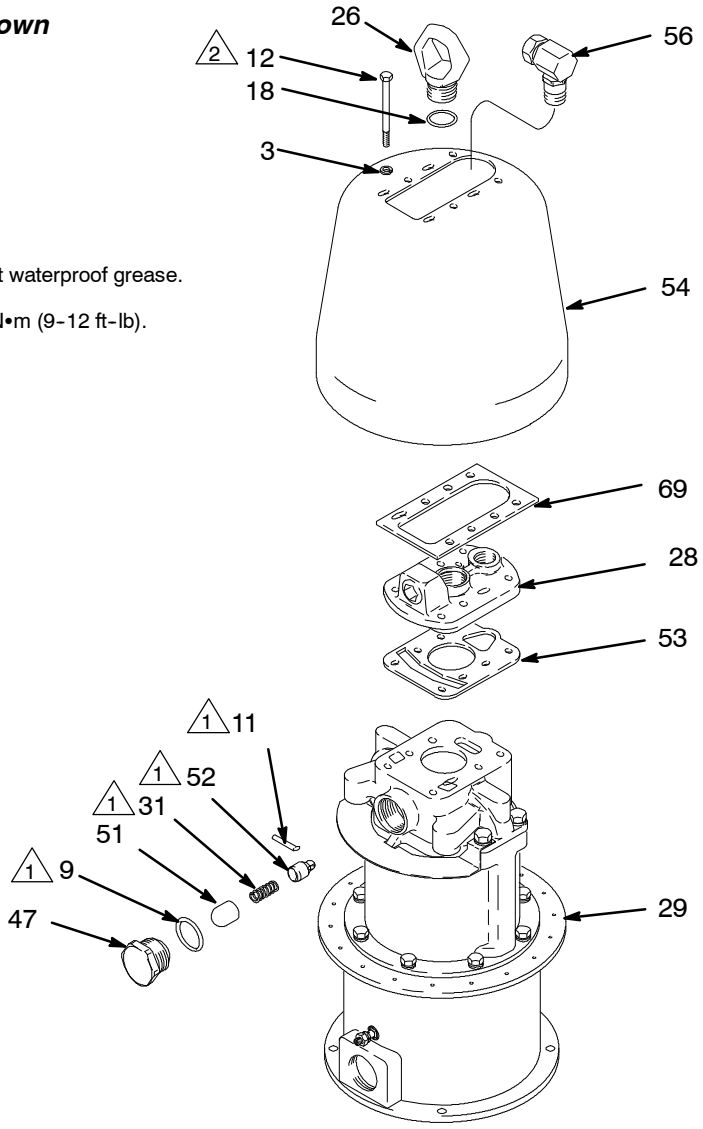
18. Lubricate the housing (52), spring (31), and guide (51) with light, water-proof grease. Assemble the housing and spring into the guide. Lubricate the pin (11) and slide it into the housing. Slide these assembled parts into the air manifold (29). Be sure the pin (11) is aligned with the slot (C, Fig. 9) of the air valve housing (23) before assembling the rest of the air valve. Repeat for the other side.
19. Install the o-ring (9) on the retainer (47). Screw the retainers into both sides of the manifold (29); they should readily screw all the way into the manifold by hand. If they do not, the parts are not assembled correctly; inspect, and correct any misalignment. Now firmly tighten the retainers (47).
20. Place the gasket (53*), cap (28), and gasket (69) on the air manifold (29). Check the parts list for your model for the correct gasket (53*) to use. Be sure these parts are oriented as shown in the parts drawing for your model.

⚠ WARNING

MOVING PARTS HAZARD
Do not operate without the air motor shield in place. Pinching or amputation of fingers or hands may occur. See **MOVING PARTS HAZARD** on page 3.

21. To install the shield (54), perform step a. or b. as applicable.
    a. *For Models 215255 and 233077:* Install the o-ring (18), lift ring (26), screws (12), lockwashers (3), air inlet fitting (56) and shield (54). Torque the screws to 12–16 N•m (9–12 ft-lb).
    b. *For Model 237001:* Install the o-ring (18), lift ring (26), screws (12), lockwashers (3), air inlet fitting (56), air tube (83), mufflers (76), and shield (54). Torque the screws to 12–16 N•m (9–12 ft-lb). See page 26.
22. Test the motor at 15–30 psi (1–2 bar) before reconnecting to the pump, to be sure it operates properly.
23. Reconnect the motor to the displacement pump, remount the pump and connect the air and fluid lines. Reconnect the ground wire before operating the pump.

Model 215255 Shown



1 Lubricate with light waterproof grease.

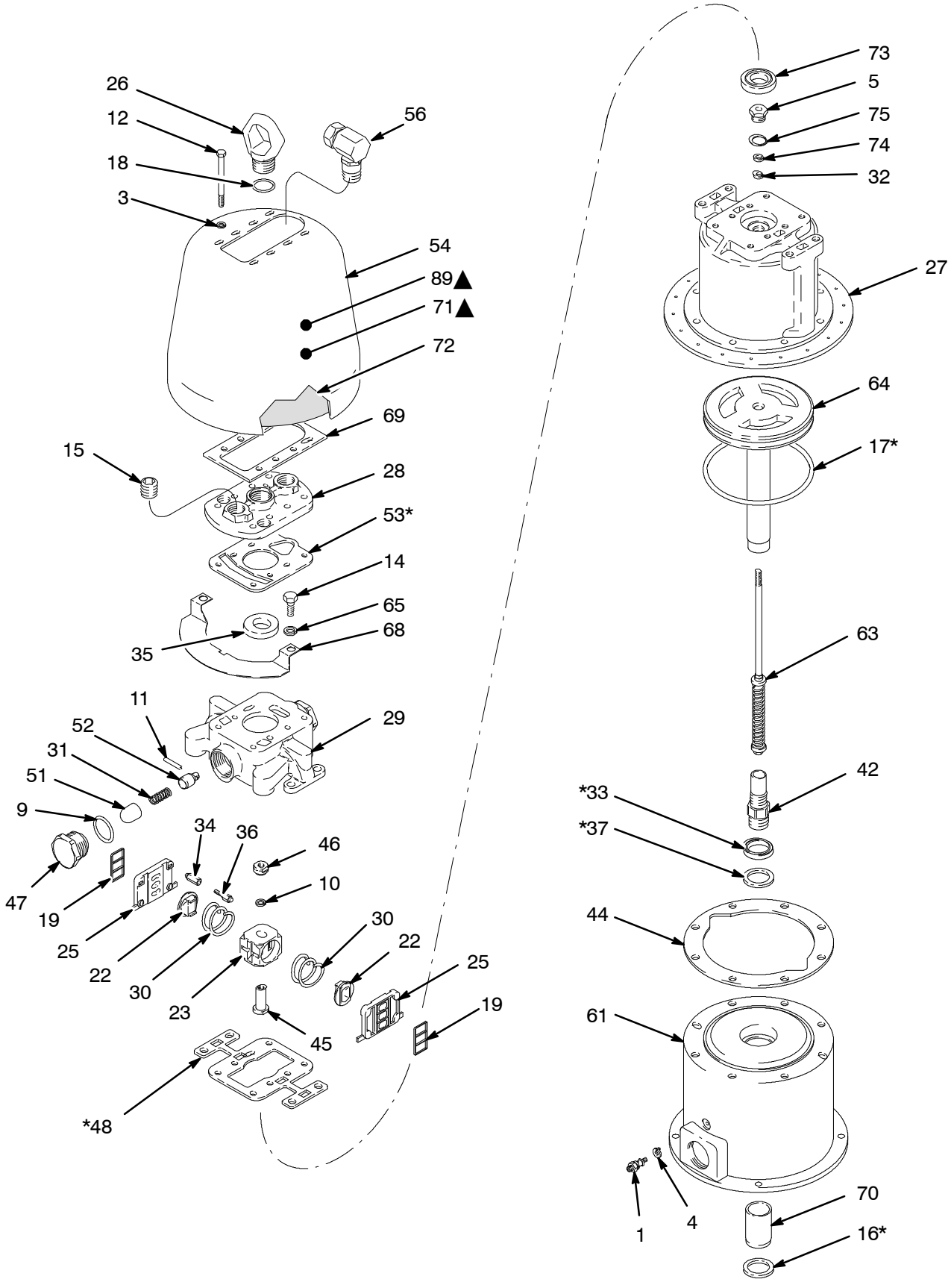
2 Torque to 12–16 N•m (9–12 ft-lb).

07275B

Fig. 10

Parts

Model 215255, Series G
Standard Quiet Air Motor



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Parts

Model 215255, Series G
Standard Quiet Air Motor

Ref No.	Part No.	Description	Qty
1	104029	CLAMP, grounding	1
3	104572	LOCKWASHER; 8 mm	8
4	104582	WASHER, tab	1
5✓	215933	BEARING, trip rod	1
9✓	105318	O-RING; nitrile rubber	2
10	105319	LOCKWASHER; 10 mm	1
11✓	105321	PIN, dowel	2
12	105322	CAPSCREW, hex hd; M8 x 1.5 x 100	8
14	105324	CAPSCREW, hex hd; M12 x 1.75 x 30	12
15	105325	PLUG, pipe; 1” npt	1
16*	161569	SEAL, wiper	1
17*	161578	O-RING; nitrile rubber	1
18✓	166221	O-RING; nitrile rubber	1
19	168184	SEAL, plate	2
22✓	176518	VALVE, director	2
23✓	176519	HOUSING, air valve	1
25	176536	PLATE, valve	2
26	176537	RING, lift	1
27	176538	CYLINDER	1
28	176539	CAP, manifold	1
29	176540	MANIFOLD, air	1
30	176543	SPRING, compression	2
31✓	178429	SPRING, compression	2
32✓	161560	V-PACKING; polyurethane	1
33*	161562	V-PACKING; nitrile rubber	1
34	176548	NUT, adjusting	4
35✓	161577	PAD, rubber	1
36	176550	SCREW, adjusting	4
37*	161563	WASHER, backup	1
42	176564	STUD, connecting rod	1
44✓	161556	GASKET; accopac	1
45	176568	HUB, valve housing	1
46	176569	NUT, trip rod	1
47	178428	RETAINER, toggle	2
48*	176575	GASKET; cellulose fibre	1
51✓	178427	GUIDE, housing	2
52✓	178426	HOUSING, spring	2
53*	176580	GASKET; cellulose fibre	1
54	177079	SHIELD	1
56	207648	FITTING, union, adapter, 90°	1
61	235996	AIR MOTOR BASE ASSY includes item 70	1
63✓	218597	TRIP ROD ASSY	1
64	215891	PISTON ASSY	1
65	100018	LOCKWASHER	12
68	177078	DEFLECTOR	1
69✓	177081	GASKET; neoprene	1
70	189058	BEARING	1
71▲	290331	LABEL, warning; English	1
72	177074	PAD, dampener	1
73✓	176549	PAD, rubber, ribbed	1
74	161559	WASHER, backup	1
75✓	150647	GASKET; copper	1
89▲	189991	LABEL, warning	1

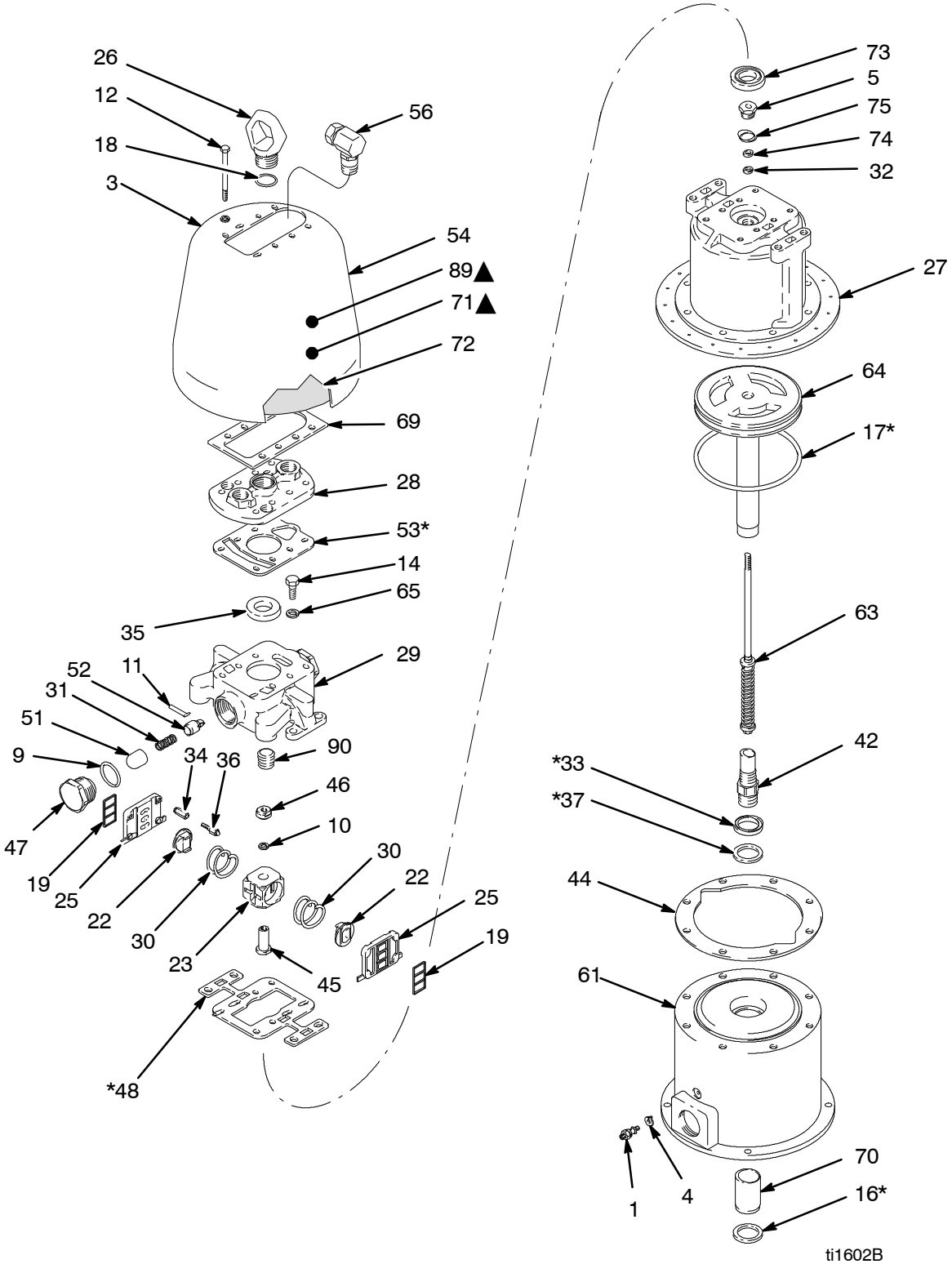
* *These parts are included in Repair Kit 215906, which may be purchased separately.*

✓ *Keep these spare parts on hand to reduce down time.*

▲ *Replacement Danger and Warning labels, tags and cards are available at no cost. The 290331 label is also available in the following languages:*
German (Part No. 290396)
French (Part No. 290397)
Spanish (Part No. 290398).

Parts

Model 233077, Series A
Remote Exhaust Quiet Air Motor



Parts

Model 233077, Series A
Remote Exhaust Quiet Air Motor

Ref No.	Part No.	Description	Qty
1	104029	CLAMP, grounding	1
3	104572	LOCKWASHER; 8 mm	8
4	104582	WASHER, tab	1
5✓	215933	BEARING, trip rod	1
9✓	105318	O-RING; nitrile rubber	2
10	105319	LOCKWASHER; 10 mm	1
11✓	105321	PIN, dowel	2
12	105322	CAPSCREW, hex hd; M8 x 1.5 x 100	8
14	105324	CAPSCREW, hex hd; M12 x 1.75 x 30	12
16*	161569	SEAL, wiper	1
17*	161578	O-RING; nitrile rubber	1
18✓	166221	O-RING; nitrile rubber	1
19	168184	SEAL, plate	2
22✓	176518	VALVE, director	2
23✓	176519	HOUSING, air valve	1
25	176536	PLATE, valve	2
26	176537	RING, lift	1
27	176538	CYLINDER	1
28	176539	CAP, manifold	1
29	176540	MANIFOLD, air	1
30	176543	SPRING, compression	2
31✓	178429	SPRING, compression	2
32✓	161560	V-PACKING; polyurethane	1
33*	161562	V-PACKING; nitrile rubber	1
34	176548	NUT, adjusting	4
35✓	161577	PAD, rubber	1
36	176550	SCREW, adjusting	4
37*	161563	WASHER, backup	1
42	176564	STUD, connecting rod	1
44✓	161556	GASKET; accopac	1
45	176568	HUB, valve housing	1
46	176569	NUT, trip rod	1
47	178428	RETAINER, toggle	2
48*	176575	GASKET; cellulose fibre	1
51✓	178427	GUIDE, housing	2
52✓	178426	HOUSING, spring	2
53*	176580	GASKET; cellulose fibre	1
54	177079	SHIELD	1
56	207648	FITTING, union, adapter, 90°	1
61	235996	AIR MOTOR BASE ASSY includes item 70	1
63✓	218597	TRIP ROD ASSY	1
64	215891	PISTON ASSY	1
65	100018	LOCKWASHER	12
69✓	177081	GASKET; neoprene	1
70	189058	BEARING	1
71▲	290331	LABEL, warning; English	1
72	177074	PAD, dampener	1
73✓	176549	PAD, rubber, ribbed	1
74	161559	WASHER, backup	1
75✓	150647	GASKET; copper	1
89▲	189991	LABEL, warning	1
90	100361	PLUG, pipe	2

* *These parts are included in Repair Kit 215906, which may be purchased separately.*

✓ *Keep these spare parts on hand to reduce down time.*

▲ *Replacement Danger and Warning labels, tags and cards are available at no cost. The 290331 label is also available in the following languages:*
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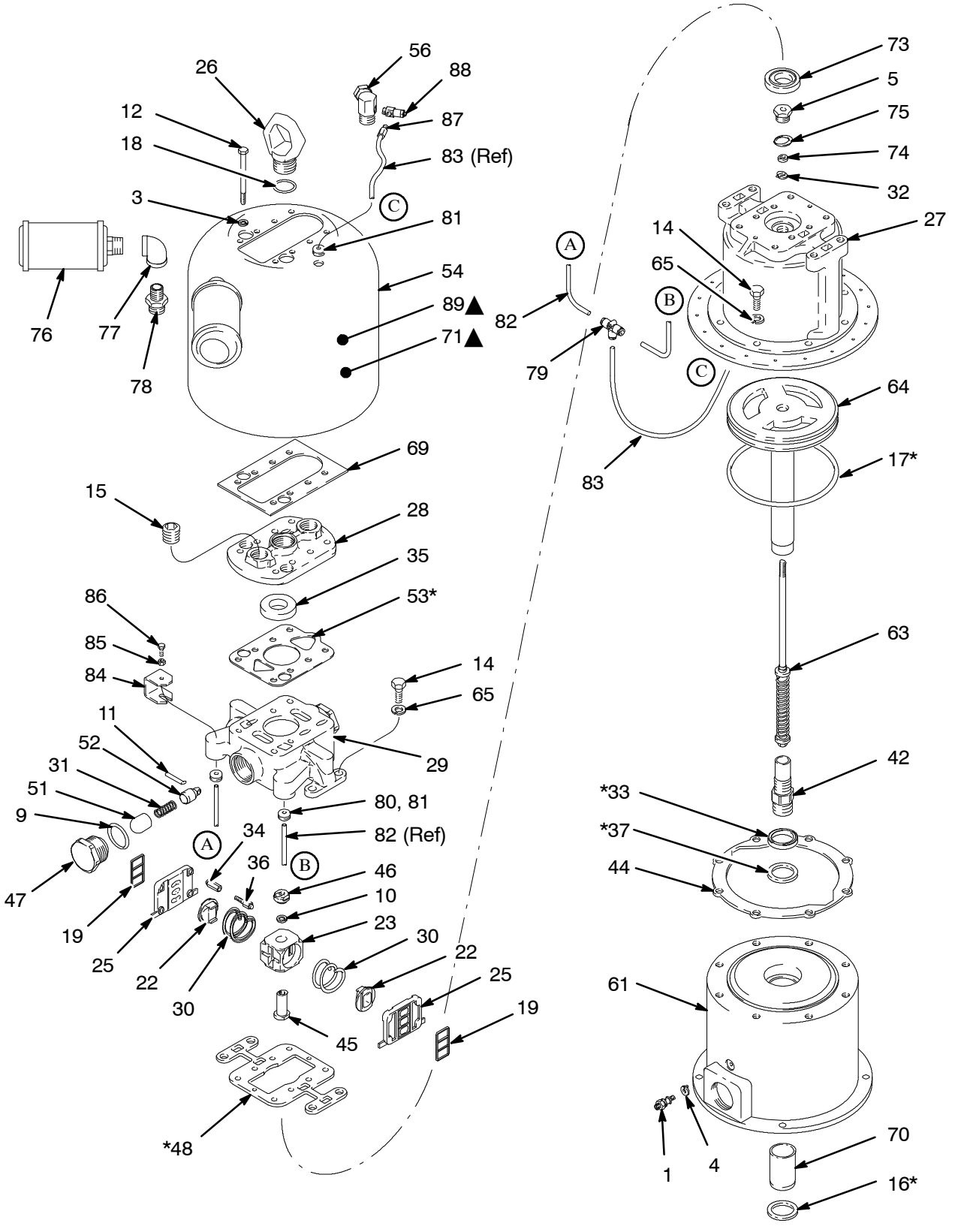
Spanish (Part No. 290398).

Parts

Model 237001, Series A
Reduced Icing Quiet Air Motor



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Parts

Model 237001, Series A
Reduced Icing Quiet Air Motor

Ref No.	Part No.	Description	Qty
1	104029	CLAMP, grounding	1
3	104572	LOCKWASHER; 8 mm	8
4	104582	WASHER, tab	1
5✓	215933	BEARING, trip rod	1
9✓	105318	O-RING; nitrile rubber	2
10	105319	LOCKWASHER; 10 mm	1
11✓	105321	PIN, dowel	2
12	105322	CAPSCREW, hex hd; M8 x 1.5 x 100	8
14	105324	CAPSCREW, hex hd; M12 x 1.75 x 30	12
15	102726	PLUG, pipe; 1” npt	1
16*	161569	SEAL, wiper	1
17*	161578	O-RING; nitrile rubber	1
18✓	166221	O-RING; nitrile rubber	1
19	168184	SEAL, plate	2
22✓	176518	VALVE, director	2
23✓	176519	HOUSING, air valve	1
25	176536	PLATE, valve	2
26	176537	RING, lift	1
27	176538	CYLINDER	1
28	189985	CAP, manifold	1
29	181322	MANIFOLD, air	1
30	176543	SPRING, compression	2
31✓	178429	SPRING, compression	2
32✓	161560	PACKING, v-block; polyurethane	1
33*	161562	PACKING, v-block; nitrile rubber	1
34	176548	NUT, adjusting	4
35✓	161577	PAD, rubber	1
36	176550	SCREW, adjusting	4
37*	161563	WASHER, backup	1
42	176564	STUD, connecting rod	1
44✓	161556	GASKET; accopac	1
45	176568	HUB, valve housing	1
46	176569	NUT, trip rod	1
47	178428	RETAINER, toggle	2
48*	176575	GASKET; cellulose fibre	1
51✓	178427	GUIDE, housing	2
52✓	178426	HOUSING, spring	2
53*	112741	GASKET; cellulose fibre	1
54	112742	SHIELD	1
56	189986	AIR INLET FITTING; 3/4 npt(m) x 3/4 npt(f) swivel x 1/8 npt(f)	1
61	235996	AIR MOTOR BASE ASSY includes item 70	1
63✓	218597	TRIP ROD ASSY	1
64	215891	PISTON ASSY	1
65	100018	LOCKWASHER	12
69✓	112740	GASKET; neoprene	1
70	189058	BEARING	1
71▲	290331	LABEL, warning; English	1
73✓	176549	PAD, rubber, ribbed	1
74	161559	WASHER, backup	1
75✓	150647	GASKET; copper	1
76	111897	MUFFLER	2
77	112885	ELBOW; 1” x 1/2 npt (fbe)	2
78	801523	ADAPTER; 1/2 npt x 1/2 btp (mbe)	2
79	112739	TEE; 1/4” (6 mm) OD tube	1
80	109018	O-RING; nitrile	2
81	112738	GROMMET	3
82	190009	TUBE; nylon; 1/4” (6 mm) OD; 8” (203 mm) long	2
83	190010	TUBE; nylon; 1/4” (6 mm) OD; 21” (533 mm) long	1
84	112735	BRACKET	2
85	105912	NUT, hex; M6 x 1	2
86	112117	SCREW, cap, hex hd; M6 x 1.0; 16 mm (5/8”) long	2
87	104172	FITTING, tube; 1/8 npt(m)	1
88	203743	VALVE, needle	1
89▲	189991	LABEL, warning	1

* *These parts are included in Repair Kit 215906, which may be purchased separately.*

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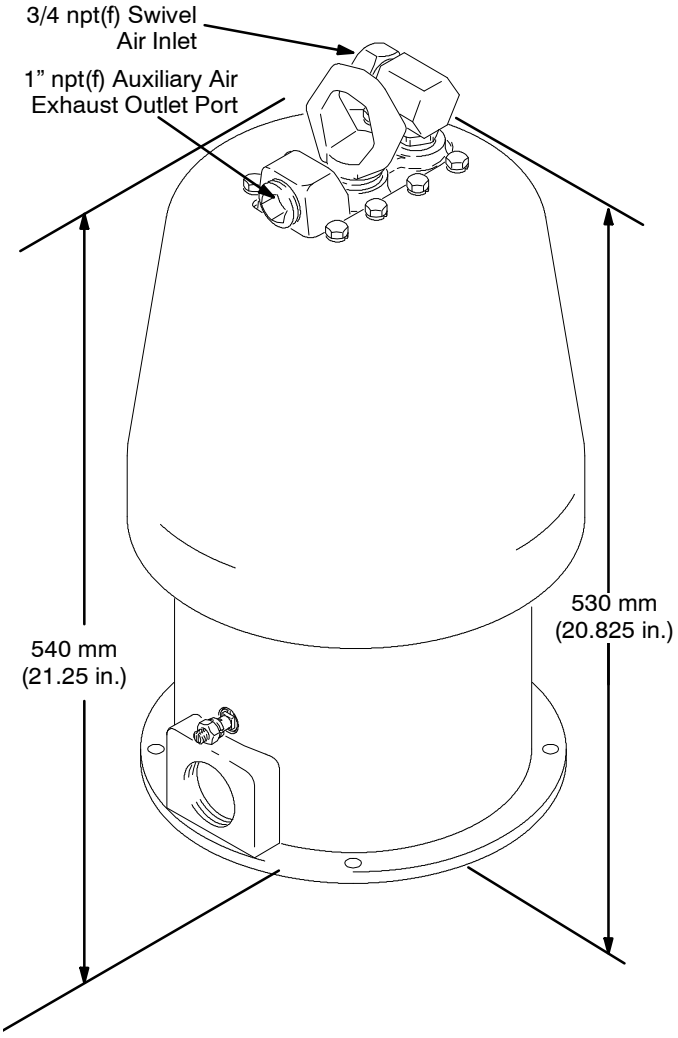
French (Part No. 290397)
Spanish (Part No. 290398).

Technical Data

Category	Data
Maximum Incoming Air Pressure	100 psi (0.7 MPa, 7 bar)
Effective Piston Area	38 sq. in. (248 cm^2)
Piston Diameter	7 in. (178 mm)
Stroke Length	4.75 in. (121 mm)
Air Valves	Dual, slide type
Valve Housing	Balanced, opposing seals and detent rollers
Weight	Approximately 74 lb (33.3 kg)

Loctite® is a registered trademark of the Loctite Corporation.

Dimensions



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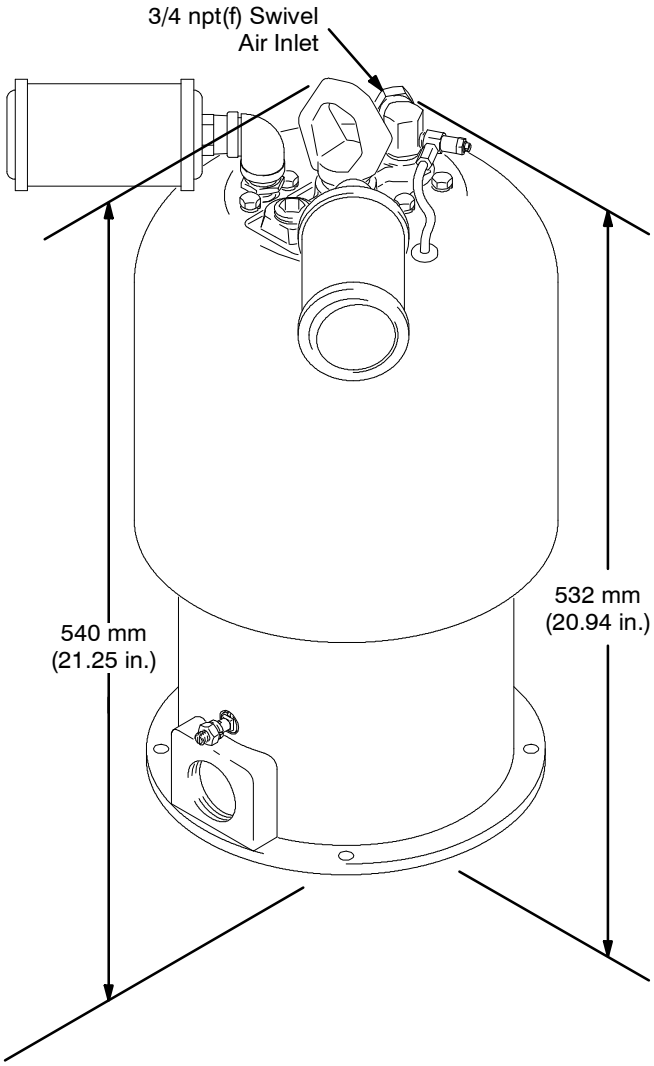

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The Graco Standard Warranty

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 by an authorized Graco distributor 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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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.

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