

BELT-DRIVEN, STAINLESS STEEL, PNEUMATIC

Twistork[®] Helix Agitator with Suction Feature

308345T

EN

For use in closed-head, bung-type, 55-gallon drums.

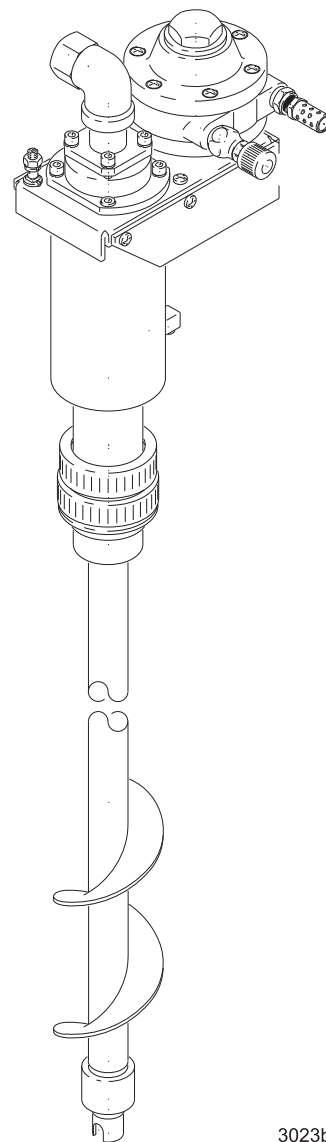
100 psi (0.7 MPa, 7 bar) Maximum Working Pressure

See page 2 for model information.



Important Safety Instructions

Read all warnings and instructions in this manual before using the equipment. Save these instructions.



3023b



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ITS03ATEX11226X

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Models






Part	Series	Description
236629	C	Standard Agitator, 0.75 HP (0.55 kW)
236760	C	Oil-less Reversible Agitator, 0.75 HP (0.55 kW)

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 symbols refer to procedure-specific risks. When these symbols appear in the body of this manual or on warning labels, refer back to these Warnings. Product-specific hazard symbols and warnings not covered in this section may appear 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. • 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>MOVING PARTS HAZARD</p> <p>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. • Do not wear loose clothing, jewelry or long hair while operating equipment. • Equipment can start without warning. Before checking, moving, or servicing equipment, follow the Pressure Relief Procedure and disconnect all power sources.
	<p>SPECIAL CONDITIONS FOR SAFE USE</p> <ul style="list-style-type: none"> • Electrostatic charging hazard. Clean surfaces with a damp cloth and read instructions for additional techniques to mitigate risk of electrostatic discharge. • The Ambient Temperature Range of each agitator depends on the air motor included in the assembly. Refer to Models and Technical Specifications in Instruction manual for additional information.

WARNING

 	<p>EQUIPMENT MISUSE HAZARD</p> <p>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>TOXIC FLUID OR FUMES HAZARD</p> <p>Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.</p> <ul style="list-style-type: none"> • Read 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</p> <p>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.

Component Identification

The Twistork Helix Agitator is intended to mix and maintain paints and similar fluids in closed-head, 55-gallon (200-liter) drums with 2 in. npt bung connections. The Twistork Helix Agitator provides suction porting through its siphon tube, which allows you to siphon fluid to a pump while mixing it.

Standard Agitator, Model 236629

The standard agitator operates in a center-lift fluid rotation mode, which is preferred in most applications because it minimizes fluid aeration. The helix rotates counterclockwise and mixes fluid by lifting it up from the bottom of the drum. See FIG. 1.

Standard agitator Model 236629 **cannot** reverse its helix rotation.

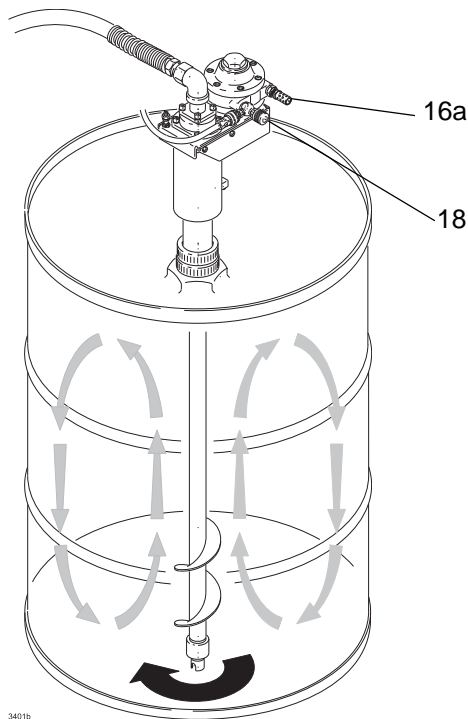


FIG. 1: Model 236629: Standard (counterclockwise) Rotation

Oil-less Reversible Agitator, Model 236760

The oil-less reversible agitator operates the same as the standard agitator, but it uses a non-lubricated air supply, and the helix rotation can be reversed.

NOTE: Although the air motor can operate without oil, motor life is increased when lubrication is provided.

To reverse the helix rotation on reversible agitator Model 236760, remove the air motor muffler (16a) and needle valve (18), and switch the ports they are installed into. See FIG. 2.

When the helix rotation is reversed, the agitator operates in a pull-down fluid rotation mode, which can be better for agitating fluids that are difficult to put into suspension. The helix rotates clockwise and mixes fluid by pulling it down from the surface. See FIG. 2.

With clockwise (pull-down fluid rotation), care must be used at high speeds to prevent cavitation, which could be caused by air being drawn down to the siphon inlet.

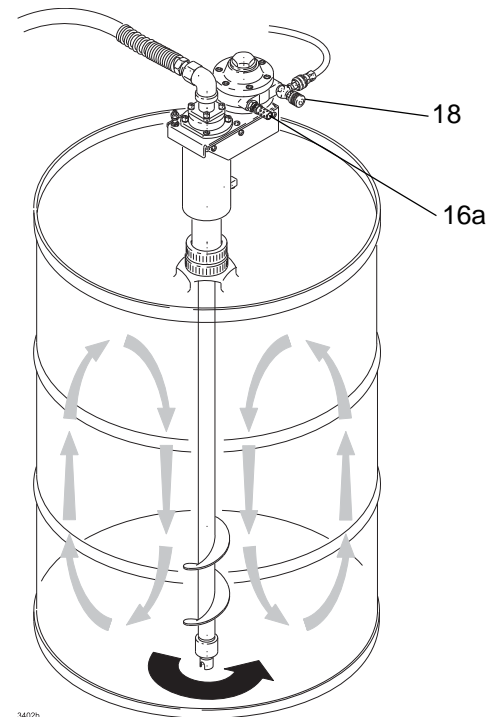


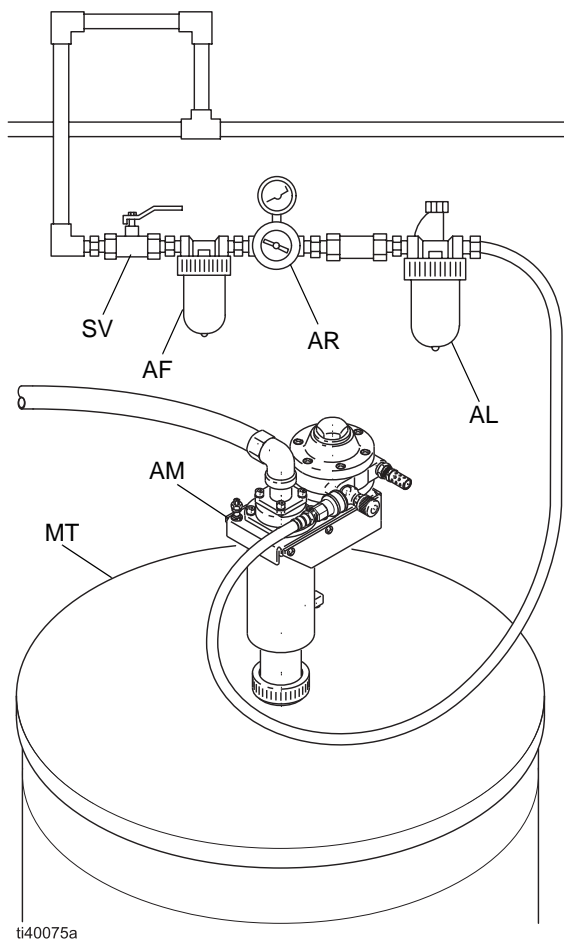


FIG. 2: Model 236760: Reversed (clockwise) Rotation

Installation




				
<p>To reduce the risk of fire and explosion, always maintain a minimum of 1 in. (25.4 mm) clearance between rotating agitator parts and container to prevent sparks from contact.</p>				



ti40075a
FIG. 3: Typical Installation

- Key:**
- SV: Bleed-type air shutoff valve
 - AF: Air line filter
 - AR: Air regulator and gauge
 - AL: Air line lubricator
 - AM: Agitator motor
 - MT: Mix tank (reference only)

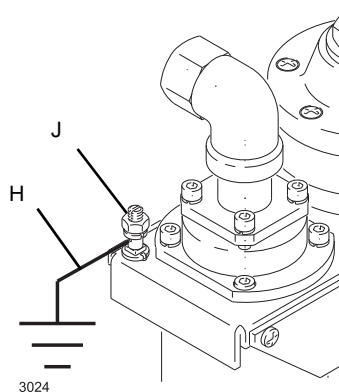
Grounding

				
<p>The equipment must be grounded to reduce the risk of static sparking. Static sparking can cause fumes to ignite or explode. To reduce the risk of static sparking, all electrically conductive objects or devices in the spray area must be properly grounded.</p>				

Check your local electrical code for detailed grounding instructions for your area and type of equipment.

To ground the Twistork Helix agitator, connect the ground wire (H) to the grounding lug (J) on the collar. Connect the grounding wire clamp to a true earth ground. See FIG. 4.

Order part number 222011, ground wire and clamp.

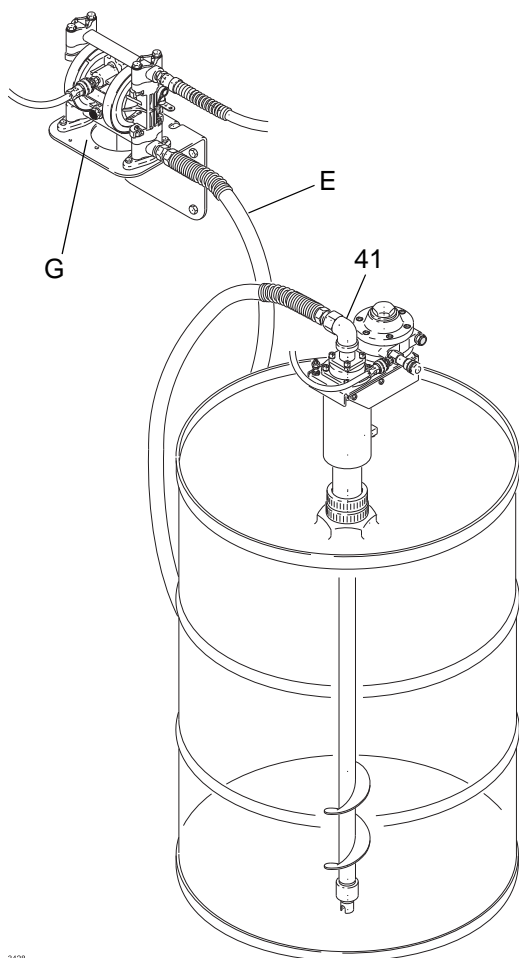


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FIG. 4: Ground the Agitator

NOTICE
<p>The bearing nut (8) is made of acetal, which is not compatible with some of the solvents used in paints or coatings and is not compatible with acidic fluids and will be damaged by them. Order part number 189660, optional Rulon® bearing nut. Check your material data sheet and/or supplier for compatibility.</p>

NOTICE

To avoid damaging the agitator, do not mount the pump (G) directly to the agitator outlet fitting (41). Make sure the pump is properly supported, and install a flexible suction hose (E) between the agitator outlet fitting and the pump, as shown in FIG. 5.



3428

Fig. 5: Install Flexible Suction Hose

Air Line Accessories

A bleed-type air shutoff valve (SV) is required; it isolates the air line components for servicing. The air shutoff valve should be installed in the supply line and can be used to stop and start the agitator. If the valve is used to stop and start the agitator, you do not need to set the agitator speed each time it is used.

Order air shutoff valves by the part numbers listed below:

110223	1/4" npt(f) x 1/4" npt(f)
110224	3/8" npt(f) x 3/8" npt(f)
113333	3/8" npt(m) x 3/8" npt(f)

The following air line accessories help to increase motor life and ease of operation.

Air Line Filter

Air line filters remove harmful dirt and moisture from the air supply. Order one of the following:

106148	3/8 npt(f) air line filter
106149	1/2 npt(f) air line filter

Air Line Lubricator (for Model 236629 only)

NOTICE

Not lubricating the air motor will cause air motor failure.

Downstream from the filter, install an air line lubricator for automatic air motor lubrication. Set the lubricator feed rate at 1 drop of oil per minute for high speed or continuous duty usage. Do not overfeed oil or exhaust air may become contaminated. To manually lubricate the air motor, see **Lubricate the Air Motor (Model 236629 Only)**, page 13. Order one of the following:

214847	3/8 npt(f) air line lubricator
214848	1/2 npt(f) air line lubricator

Air Line Quick-Disconnect

Install an air line quick-disconnect (F) or bleed-type air shutoff valve at the air inlet (D). See FIG. 6. Order one of the following:

169969	1/8 npt(m) air line quick-disconnect
208536	1/4 npt(f) air line quick-disconnect

Install the Agitator

The agitator weighs 24 lb (11 kg). To manually lift it in and out of the drum, grasp the housing (3), and guide the helix tube (7) through the drum bung. See FIG. 6. Order part number 189658, accessory handle, to connect a lift hook to raise and lower the agitator or hang the agitator to store it.

NOTICE

To avoid damaging the siphon tube, lower the agitator to the drum bottom; do not drop it.

Do not install the agitator without the bearing nut (8) in place. See FIG. 7. If the bearing nut is not installed, the siphon tube (4) and helix tube (7) will rub against each other during operation and cause damage. Replace the bearing nut if damaged or worn.

1. Hold the agitator by the housing (3) or by the accessory handle. Lower the helix tube (7) through the bung using a turning motion until the siphon tube rests on the bottom of the drum.

NOTE: The tube must rest on the bottom to evacuate the maximum amount of material from the drum and to stabilize the agitator.

2. Make sure the gasket (46) is in place, screw the bung adapter (44) into the bung, and tighten the bung adapter. See FIG. 6.
3. Make sure the o-ring (20) is in place inside the lock-ring (45), then tighten the lock-ring (45).

NOTE: To keep the helix tube pointed straight down, make sure the bung adapter (44) and lock ring (45) are tight.

4. Position the air motor so the air line (C) can be attached to the inlet (D) on the needle valve without obstructing any other system components.
5. **When using the agitator suction feature**, connect a suction hose (E) between the agitator fluid outlet fitting (41) and the pump. See FIG. 6. The hose connector must have a 30° bevel to match the fluid outlet fitting with an airtight seal. See **Maximum Siphon Flow Rate**, page 9.

When not using the siphon feature, plug the fluid outlet fitting (41) to prevent excess fluid evaporation.

The air motor exhaust can be piped out as follows: Remove the air motor muffler (16a), and connect an exhaust line to the exhaust port.

NOTE: Model 236629 has a 1/4 npt(f) exhaust port. Model 236760 has a 3/8 npt(f) exhaust port.

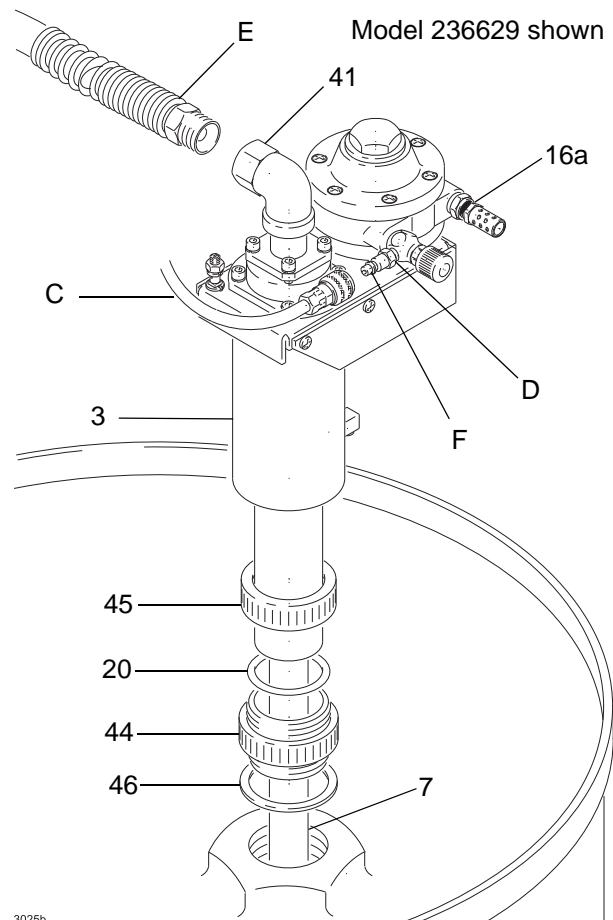



FIG. 6: Agitator

Operation



Moving parts, such as an impeller blade, can cut or amputate fingers. To reduce the risk of serious injury, always shut off the agitator and disconnect the air line before moving, checking, or repairing the agitator.

Find the Proper Agitator Speed

NOTE: Attach ground wire before using agitator.

1. Fill the fluid supply container to about 3–4 inches (75–100 mm) above the agitator blade.
2. Start the agitator, and gradually increase the speed by turning the needle valve (14) until a vortex begins to form in the paint.
3. Reduce the speed slightly, then fill the fluid container. Use the lowest agitator speed needed for thorough agitation of the paint. Excessive agitator speed may cause the paint to foam.

Pressure Relief Procedure



This equipment stays pressurized until pressure is manually relieved. To help prevent serious injury from splashing fluid and moving parts, follow the Pressure Relief Procedure before cleaning, checking, or servicing the equipment.

1. Close the bleed-type air shutoff valve (SV) to relieve pressure to the air motor.
2. Disconnect the air line.

Maximum Siphon Flow Rate

The volume of fluid that can be siphoned through the agitator inlet is determined by the viscosity of the fluid.

- The maximum flow rate is approximately 12 gpm (45 lpm) with 100-centipoise fluid.
- The maximum flow rate is approximately 1.2 gpm (4.5 lpm) with much heavier 1000-centipoise fluid.

To prevent pump cavitation, avoid flow rates higher than these. Check the fluid periodically for signs of cavitation.

Air Requirements

For continuous use, the 0.75 HP air motor typically requires 2.5 scfm (0.071 m³/min.) of air at 400 rpm or 5.7 scfm (0.162 m³/min.) of air at 800 rpm.

Nitrogen Charge the Drum

NOTICE

If you are using nitrogen to charge the drum, use a maximum of 0.25 psi (1.7 kPa, 0.02 bar). Such low pressure requires special regulation equipment. Use a passive, non-pressurized system when possible. Higher pressure could push fluid through the shaft seal (21) and into the top bearings (11), damaging them. See **Parts**, page 18.

Operate the Agitator

See FIG. 7.

The bearing nut (8) helps prevent excessive fluid flow between the siphon tube (4) and helix tube (7), but it is not intended to be a complete seal. Fluids can pass through the bearing nut into the gap between the two tubes. Before you change colors or coatings or store the agitator, clean the fluid tubes. See **Clean the Fluid Tubes**, page 12.

NOTE: Thoroughly agitate the fluid before you use the suction feature. Agitating maximizes fluid quality and helps avoid solids getting drawn into the siphon tube and clogging it. Order part number 236984, strainer inlet

kit, to help prevent thick sediment from being forced into the siphon inlet.

NOTICE

Do not operate the agitator at a high speed for a long period of time. Excessive agitator speed can cause the fluid to foam and can cause vibration and increased wear on parts and damage to the drum bung. Only agitate the fluid fast enough to maintain even mixing. You can view fluid movement through the 0.75-in. port on the drum cover.

NOTE: If you install an air shutoff valve, the same agitator speed is set each time it is turned on without requiring repeated needle valve adjustments.

You can also use an air line quick-disconnect (F) as a shutoff. See FIG. 6. See **Air Line Quick-Disconnect**, page 7.

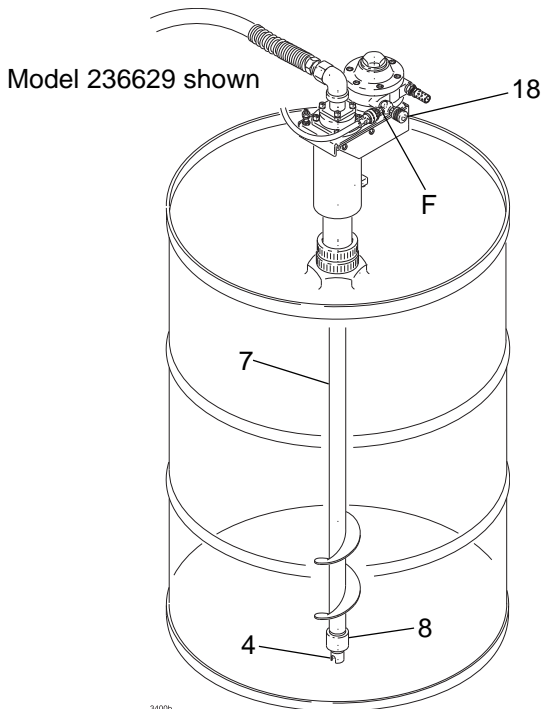


FIG. 7: Operate the Agitator

Shutdown Procedure

1. To stop the agitator, close the needle valve (18), or disconnect the quick-disconnect (F), or close the air valve in the air supply line.
2. Follow the **Pressure Relief Procedure**, page 9.
3. If you remove the agitator from the drum, remove the bearing nut (8), and hang or tilt the agitator upright over a container to allow it to drain. Order part number 189658, accessory handle, so you can connect a lift hook to raise and lower the agitator or hang the agitator to store it.

NOTICE



Keep the agitator upright. Do not lay it on its side or upside down, because fluid might flow into the beltdrive area causing damage.





If you use the accessory agitator handle, make sure the agitator is loosened from the drum before you raise it with a lift. The handle will not support the weight of the drum.

Do not let fluid dry in the fluid tubes. See **Clean the Fluid Tubes**, page 12.

Maintenance

Flush the Air Motor

				
Do not use kerosene or other flammable solvents to flush the air motor. Flushing with flammable solvents could cause fire or explosion and result in serious injury or property damage.				

				
Hazardous fluids or toxic fumes can cause serious injury or death if splashed in the eyes or on the skin, swallowed, or inhaled. When flushing the air motor:				
<ul style="list-style-type: none"> • Perform the procedure in a well ventilated area. • Keep your face away from the exhaust port. • Wear the appropriate protective clothing, gloves, eyewear, and respirator. 				

If the air motor is sluggish or inefficient, follow this procedure.

The recommended solvent for air motors and lubricated pumps is Gast[®] Flushing Solvent (Gast part number AH255 or AH255A) or Inhibisol[®] Safety Solvent.

1. Disconnect the air line and muffler (16a). See **Parts**, page 18.
2. Add several teaspoons of solvent, or spray the solvent directly into the motor.
3. Rotate the shaft by hand in both directions for a few minutes.
4. Reconnect the air line, and slowly increase the air pressure until there is not trace of solvent in the exhaust air.
5. Re-lubricate the motor with a squirt of lightweight oil in the chamber.

Prolong the Life of the Bearing Nut

NOTICE

Use a compatible solvent to clean parts. The bearing nut (8) is made of acetal, which is not compatible with acidic fluids and will be damaged by them. Check your material data sheet and/or supplier for compatibility. Avoid getting any solvent on the air motor belt.

- Replace the bearing nut (8) if it is damaged or worn.
- Do not allow fluids to dry out in the fluid section. Dry fluid will adhere to the bearing nut (8) and could destroy it the next time you start the agitator. Flush the fluid section before you change colors or coatings or store the agitator.
- Do not operate the agitator without fluid in the drum as this can cause excessive bearing nut (8) wear.

Clean the Fluid Tubes

To prevent fluid from drying on the tubes and interfering with helix rotation, clean the siphon tube (4) and helix tube (7) when you change colors or coatings and when the agitator is removed from the drum long enough for the fluid to dry. Also, clean the fluid tubes for periodic maintenance as follows:

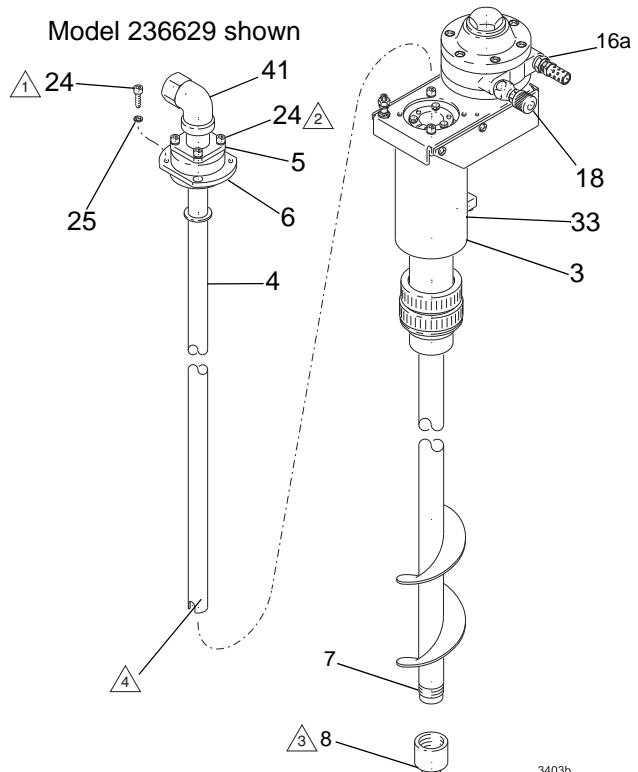
1. Remove the bearing nut (8). See FIG. 8.
2. Remove the two diagonal socket-head screws (24) and lockwashers (25) protruding from the top of the siphon cover (6).
3. Remove the siphon tube (4) as follows:
 - a. Rest the agitator on its side on the drive belt housing so the inlet is lower than the outlet. This orientation prevents fluid from running into the bearing and drive belt area.
 - b. Pull up on the fluid outlet fitting (41) to remove the siphon tube (4).
4. Clean the siphon tube (4), helix tube (7), and bearing nut (8). The inside diameter of the tubes can be cleaned by pulling a solvent-soaked rag through them.

NOTE: After you mix or pump catalyzed materials that could set up between the tubes without air, always remove the siphon tube, and clean both tubes.

5. Apply PTFE spray lubricant to the siphon tube (4) inlet end only. Install the siphon tube through the top of the agitator housing (3). Lubricant must have an auto-ignition rating of 482°F (250°C) or greater.
6. Install the two socket-head screws (24) and lockwashers (25) into the top of the siphon cover

(6). Torque the screws oppositely and evenly to 60 to 70 in-lbs (6.8 to 7.9 N•m).

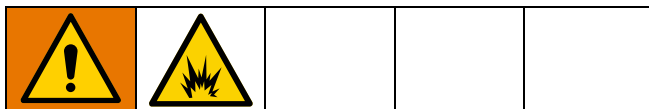
7. Apply PTFE spray lubricant to the inside lip of the bearing nut (8), and tighten it onto the helix tube (7).



- 1 Torque oppositely and evenly to 60 to 70 in-lbs (6.8 to 7.9 N•m).
- 2 Torque oppositely and evenly to 80 to 100 in-lbs (9 to 11.3 N•m).
- 3 Apply PTFE spray lubricant to inside lip of bearing nut before you install it.
- 4 Apply PTFE spray lubricant to the siphon tube (4) inlet end before you install it.

FIG. 8: Apply PTFE Spray Lubricant

Agitator Blades



Materials can become electrostatically charged when stirred or blended. To prevent fire and explosion, ground equipment and do not allow material buildup on the agitator. Dried material could allow static build up and interfere with grounding.

Regularly check the agitator for dried material buildup. Clean using a rag soaked in solvent that is compatible with the spray material and the surfaces being cleaned.

Additionally, extra precautions need to be taken if using lower conductive materials (<1000 pS/m) such as:

- Avoid stirring/mixing at high speeds.
- Avoid insoluble mixtures.
- When possible, increase the material conductivity with additives.
- Use liquids with a high conductivity (>1000 pS/m)

Lubricate the Air Motor (Model 236629 Only)

NOTICE

Not lubricating the air motor will cause air motor failure.

If an air line lubricator (AL) is not installed, the air motor must be manually lubricated every 8 hours. Lubricate the agitator air motor by placing 10 - 20 drops of SAE #10 light oil in the motor's air inlet. Oil must have an auto-ignition rating of (482°F) 250°C or greater. Run the agitator for about 30 seconds.

Clean the Air Intake Check Valve

The air intake check valve (33) allows make-up air to enter the closed drum as fluid is drawn out through the agitator outlet port. See FIG. 8. The air intake check valve should be inspected and cleaned every 2000 operating hours or when there are any signs of the drum beginning to collapse as fluid is drawn out.

Pump priming problems can indicate a plugged air intake check valve. Paint overspray in the air can be drawn into the valve and cause the ball to stick in the closed position.

To clean the air intake check valve

1. Remove the seat (33) and ball (34). See **Parts**, page 18.
2. Clean the parts with compatible solvent, and reassemble the valve.
3. Insert the ball (34), and tighten seat (33) until just snug.

NOTE: The seat should not be flush with the elbow (32). Installing the seat too tightly could jam the ball against the seat.

Correct a Bad Suction Line Seal

Air that is pulled into the suction line makes the pump inefficient. This can happen for the following reasons:

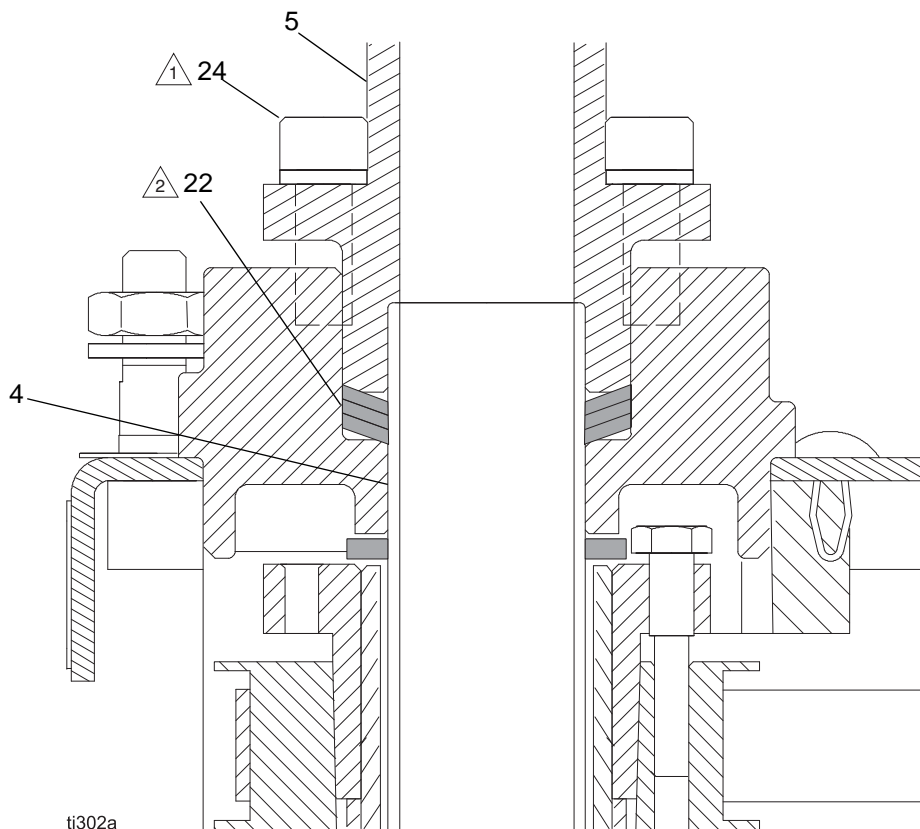
- Cavitation is occurring because the pump or helix is going too fast.
- Siphon hose connection is leaking.
- Nylon rings (22) are not sealing. See FIG. 9.

To correct the problem (see FIG. 9):

1. Torque the four socket-head screws (24) in the siphon fitting (5) oppositely and evenly to 80 to 100 in-lbs (9.0 to 11.3 N•m).

NOTE: If Step 1 does not correct the problem, continue with Steps 2 through 5.





2. Replace the rings (22). Make sure the outer lips face up, as shown in FIG. 9.
3. Insert the inlet tube (4) into the bottom of the siphon fitting (5).
4. Tap the bottom of the inlet tube (4) to make sure the tube passes through the rings (22) and seats on the siphon fitting (5).
5. Torque the four socket-head screws (24) in the siphon fitting (5) oppositely and evenly to 80 to 100 in-lbs (9.0 to 11.3 N•m).



1. Torque screws oppositely and evenly to 80 to 100 in-lbs (9.0 to 11.3 N•m).
2. Install with outer lips facing up.

FIG. 9: Correct a Bad Suction Line Seal

Service

				
<p>Moving parts, such as an impeller blade, can cut or amputate fingers. To reduce the risk of serious injury, always shut off the agitator and disconnect the air line before moving, checking, or repairing the agitator.</p>				

If the unit requires more than installation of a service kit, it is usually quickest and easiest to send the unit to the Graco distributor for repair or replacement.

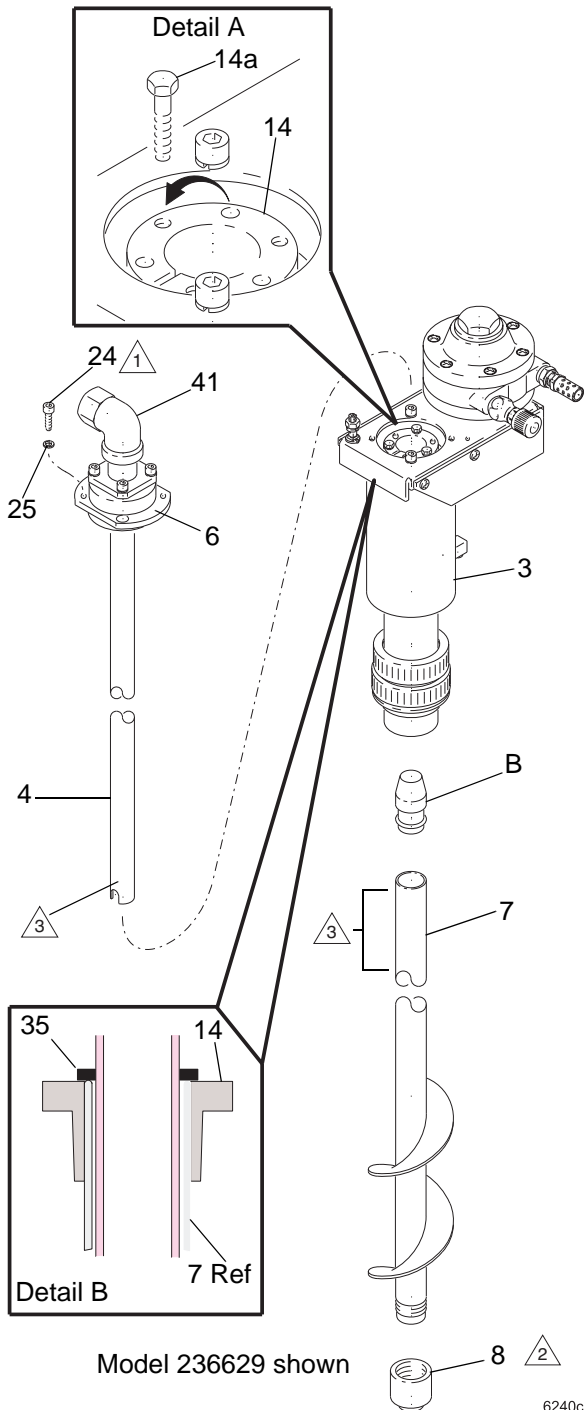
NOTICE

Do not pry with a screwdriver. It will dent the surface of the plate and body, causing leaks. Use a puller tool, which will remove the end plate while maintaining the position of the shaft.

- If the vanes need replacing, or foreign material is present in the motor chamber, an experienced mechanic may remove the end plate opposite the drive shaft end.
- New vanes should have the edges with cut corners (or the notched edges, if the vanes are reversible) pointing toward the bottom of the vane slot.

Remove the Siphon and Helix Tubes

1. Remove the bearing nut (8). See FIG. 10.
2. Remove the two diagonal socket-head screws (24) and lockwashers (25) protruding from the top of the siphon cover (6).
3. Remove the siphon tube (4) as follows:
 - a. Rest the agitator on its side on the drive belt housing so the inlet is lower than the outlet. This orientation prevents fluid from running into the bearing and drive belt area.
 - b. Pull up on the fluid outlet fitting (41) to remove the siphon tube (4).
4. Remove the three hex-head screws (14a) from the bushing (14), and install the screws into the bushing's threaded holes as shown in Detail A of FIG. 10. Tighten the screws evenly to loosen the bushing from the helix tube (7).
5. Pull the helix tube (7) through the bottom of the agitator housing (3).



Model 236629 shown

- 1 Torque oppositely and evenly to 60 to 70 in-lb (6.8 to 7.9 N•m).
- 2 Apply PTFE spray lubricant to inside lip of bearing nut before you install it.
- 3 Apply PTFE spray lubricant to siphon tube (4) inlet end and to top 6 in. (150 mm) of helix tube before you install them.

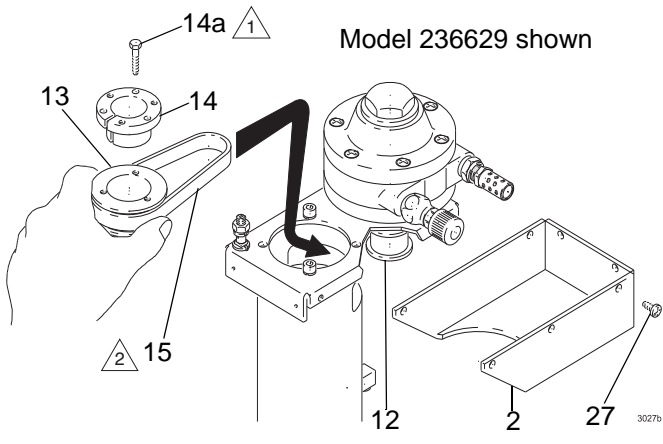
FIG. 10: Siphon and Helix Tubes

Remove the Drive Belt

<p>To avoid static electricity buildup and possible sparking, which could cause fire and explosion, replace the drive belt with a genuine ESD rated and marked belt only. Order part number 112552.</p>				

Replace the drive belt (15) if it is cracked or worn.

1. Remove the siphon tube (4) and helix tube (7) as instructed above.
2. Remove the eight screws (27) and the drive belt cover (2). See FIG. 11.
3. Remove the three hex-head screws (14a) and the bushing (14).
4. Slide the drive belt (15) over the smaller pulley (12). Then remove the larger pulley (13) and the drive belt (15) as shown in FIG. 11. Belt must have no tension after installation.



- 1 With helix tube (7) flush with top of bushing (14), torque the screws oppositely and evenly to 55 to 60 in-lbs (6.2 to 6.8 N•m).
- 2 Replace with a genuine ESD rated and marked belt only.

FIG. 11: Drive Belt

Assemble the Agitator

1. Make sure the spacer (10) is in place (see **Parts**, page 18). With its larger-I.D. taper facing up, install the larger pulley (13) and the drive belt (15) through the agitator housing. See FIG. 11.
2. Slide the other end of the drive belt over the smaller pulley (12). The drive belt should not be tight after it is installed. Make sure the pulleys are aligned, then secure the small pulley (12) by tightening its setscrew. Torque setscrew to 45 to 55 in- lbs (5.1 to 6.2 N•m).
3. Place the bushing (14) into the larger pulley (13).
4. Install the screws (14a) in the non-threaded holes in the bushing (14); do not tighten the screws yet.
5. Place the installation tool (B) on the end of the helix tube. See FIG. 10.

NOTE: The installation tool (B) is included with 236762, shaft seal kit

NOTICE

Use the installation tool (B) to insert the helix tube (7) through the shaft seal (21) without damaging the seal lip. See FIG. 10. See **Parts**, page 18, for the location of the seal.

6. Apply PTFE spray lubricant to the top 6 in. (150 mm) of the helix tube (7). While holding the pulley (13) down, push the helix tube and tool (B) up

through the bottom of the agitator housing (3) until the tube is flush with the top of the bushing (14). Then remove the installation tool.

Wedge a screwdriver blade into the gap of the bushing (14) to spread the bushing while inserting tube (7).

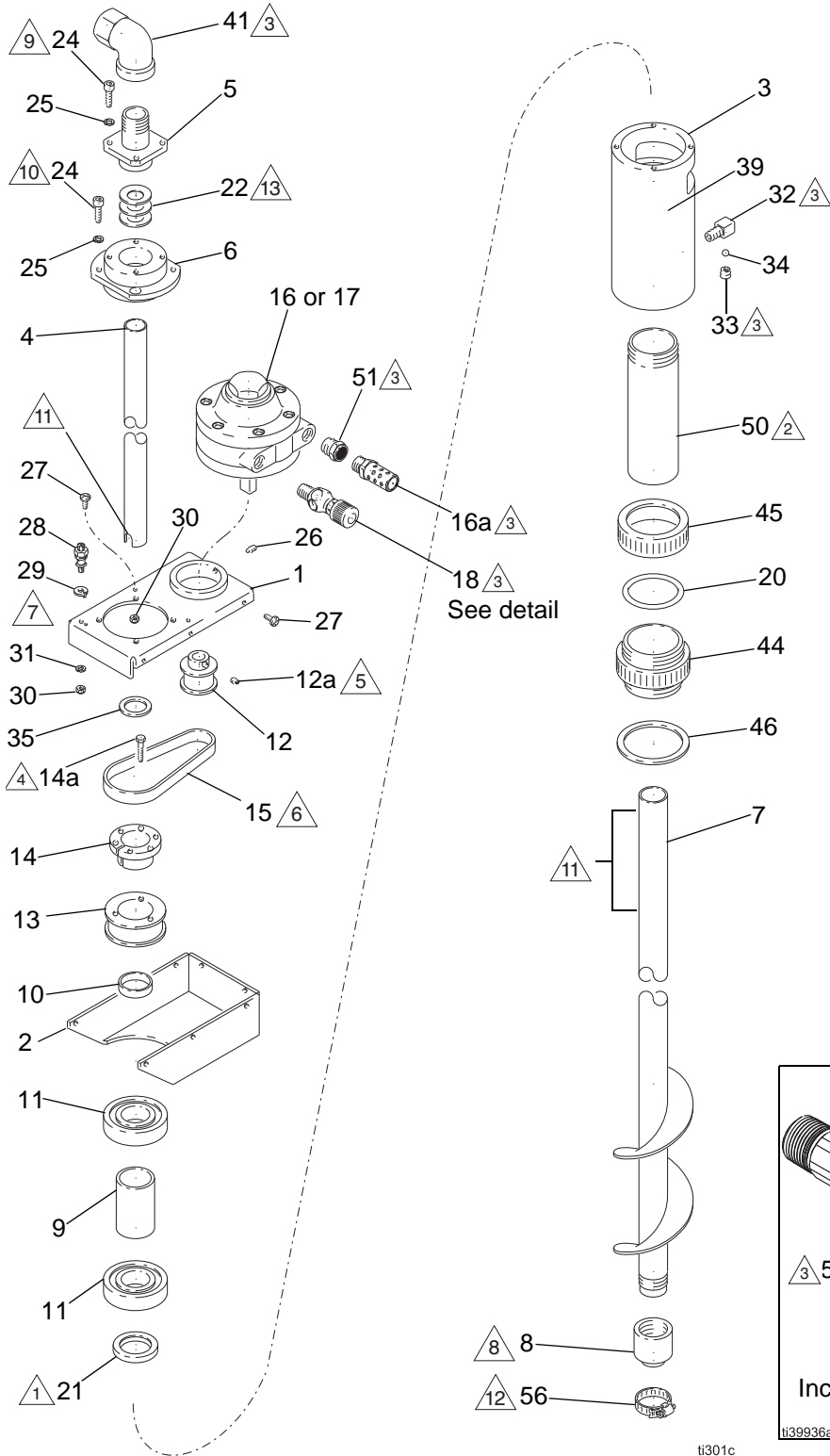
7. Torque the three hex-head screws (14a) oppositely and evenly to 55 to 60 in-lbs (6.2 to 6.8 N•m). See FIG. 11.
8. Install the thrust washer (35) flush to the bushing (14) as shown in Detail B of FIG. 10.
9. Secure the drive belt cover (2) with the eight screws (27).
10. Apply PTFE spray lubricant to the siphon tube (4) inlet end only. Install the siphon tube through the top of the agitator housing (3). See FIG. 10.
11. Install the two socket-head screws (24) and lock-washers (25) into the top of the siphon cover (6). Torque the screws oppositely and evenly to 60 to 70 in-lbs (6.8 to 7.9 N•m).

NOTE: The helix tube (7) should move up and down about 0.05 inch (1.3 mm). If it does not, the bearings (11) are not fully seated. Push the bearings in until they are fully seated. See **Parts**, page 18 for the location of the bearings.

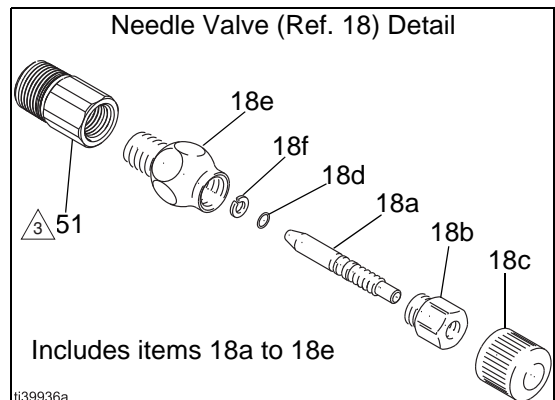
12. Apply PTFE spray lubricant to the inside lip of the bearing nut (8), and tighten it onto the helix tube (7).

Parts

Model 236629 Standard Agitator Model 236760 Oil-less Reversible Agitator



- 1 Press into place; lips face down.
- 2 Apply high-strength thread sealant to threads.
- 3 Apply anaerobic PTFE pipe sealant to threads.
- 4 With helix tube (7) flush with top of bushing (14), torque oppositely and evenly to 55 to 60 in-lbs (6.2 to 6.8 N•m).
- 5 Tighten after you align pulleys (12 and 13). Torque setscrew to 45 to 55 in-lbs (5.1 to 6.2 N•m).
- 6 Drive belt must not be tight after it is installed.
- 7 Bend washer tab up to lock.
- 8 Apply PTFE spray lubricant to inside lip of bearing nut before you install it.
- 9 Torque oppositely and evenly to 80 to 100 in-lbs (9 to 11.3 N•m).
- 10 Torque oppositely and evenly to 60 to 70 in-lbs (6.8 to 7.9 N•m).
- 11 Apply PTFE spray lubricant to siphon tube (4) inlet end and to top 6 in. (150 mm) of helix tube (7) before you install them.
- 12 Install flush with top of nut (8), and torque to 40 to 45 in-lb (4.5 to 5.1 N•m).
- 13 Install with outer lips facing up. See Fig. 9 on page 14.



Model 236629 Standard Agitator

Includes items 1 to 16 and 18 to 50, 57–58

Model 236760 Oil-less Reversible Agitator

Includes items 1 to 15 and 17 to 58

Ref.	Part No.	Description	Qty.	Ref.	Part No.	Description	Qty.
1	236720	BRACKET	1	25	108050	LOCKWASHER, spring; M6	8
2	189648	COVER, belt drive	1	26	112557	SCREW, set; M6	1
3	189649	HOUSING, agitator	1	27	106084	SCREW, pan-head; M5 x 10	10
4	189651	TUBE, siphon	1	28	104029	LUG, grounding	1
5	189653	FITTING, siphon	1	29	104582	WASHER, tab	1
6	189654	COVER, siphon	1	30	105332	LOCK NUT, hex	3
7	236719	TUBE, helix	1	31	100718	LOCKWASHER; #10	1
8 ^{✓‡}	189655	NUT, bearing; acetal AF	1	32	100839	ELBOW, street; 1/8 npt	1
9	189656	SPACER, bearing	1	33	189659	SEAT, check valve	1
10	189657	SPACER, pulley	1	34	105691	BALL; 1/4 in. diameter; SST	1
11	112548	BEARING, ball	2	35	189662	WASHER, thrust	1
12	112549	PULLEY (small), drive Includes item 12a	1	41	112572	UNION, swivel; 90°	1
12a	—	SETSCREW, pulley; belt, 1/4 x 20 x 3/16 in. (not a replacement part)	1	44	178575	ADAPTER, bung	1
13	112550	PULLEY (large), drive belt	1	45	178576	RETAINER, o-ring	1
14	112551	BUSHING, QD taper lock; includes items 14a	1	46 [✓]	106537	GASKET; polyethylene	1
14a	—	SCREW, hex head; #10- 24 x 1 in. (not a replacement part)	3	50	189650	TUBE, housing	1
15 [✓]	112552	BELT, drive; ESD rated / marked	1	51	159841	ADAPTER; 3/8 npt(m) x 1/4 npt(f); Model 236760 only	2
16*	101140	AIR MOTOR, standard; 0.75 HP. Model 236629 only. Includes item 16a	1	56	110980	CLAMP, hose Model 236760 only	1
16a	113779	MUFFLER, exhaust; 1/4 npt	1	57 [▲]	17P806	KIT, safety tag (not shown)	1
17**	112723	AIR MOTOR, reversible, oil-less; 0.75 HP Model 236760 only; Includes item 16a	1	58 [▲]	16A614	LABEL, notice (not shown)	1
18	206264	Valve, needle Includes items 18a to 18f	1				
18a	166529	VALVE, needle	1				
18b	166532	NUT, packing	1				
18c	164698	KNOB, adjusting	1				
18d	157628	O- RING, packing	1				
18e	165722	BODY, valve	1				
18f	166531	WASHER	1				
20 [✓]	112553	O-RING; PTFE	1				
21 ^{^✓}	112555	SEAL, shaft; graphite-filled PTFE	1				
22 [✓]	195045	RING, seal, tube support; Nylon	3				
24	112556	SCREW, socket-head; M6 x 16	8				

* A repair kit is available. Order Repair Kit 207335 for standard air motor (Part No. 101140).

** A repair kit is available. Order Repair Kit 236996 for reversible oil-less air motor (Part No. 112723). You must also order two adapters (Part No. 159841), to adapt the needle valve and muffler.

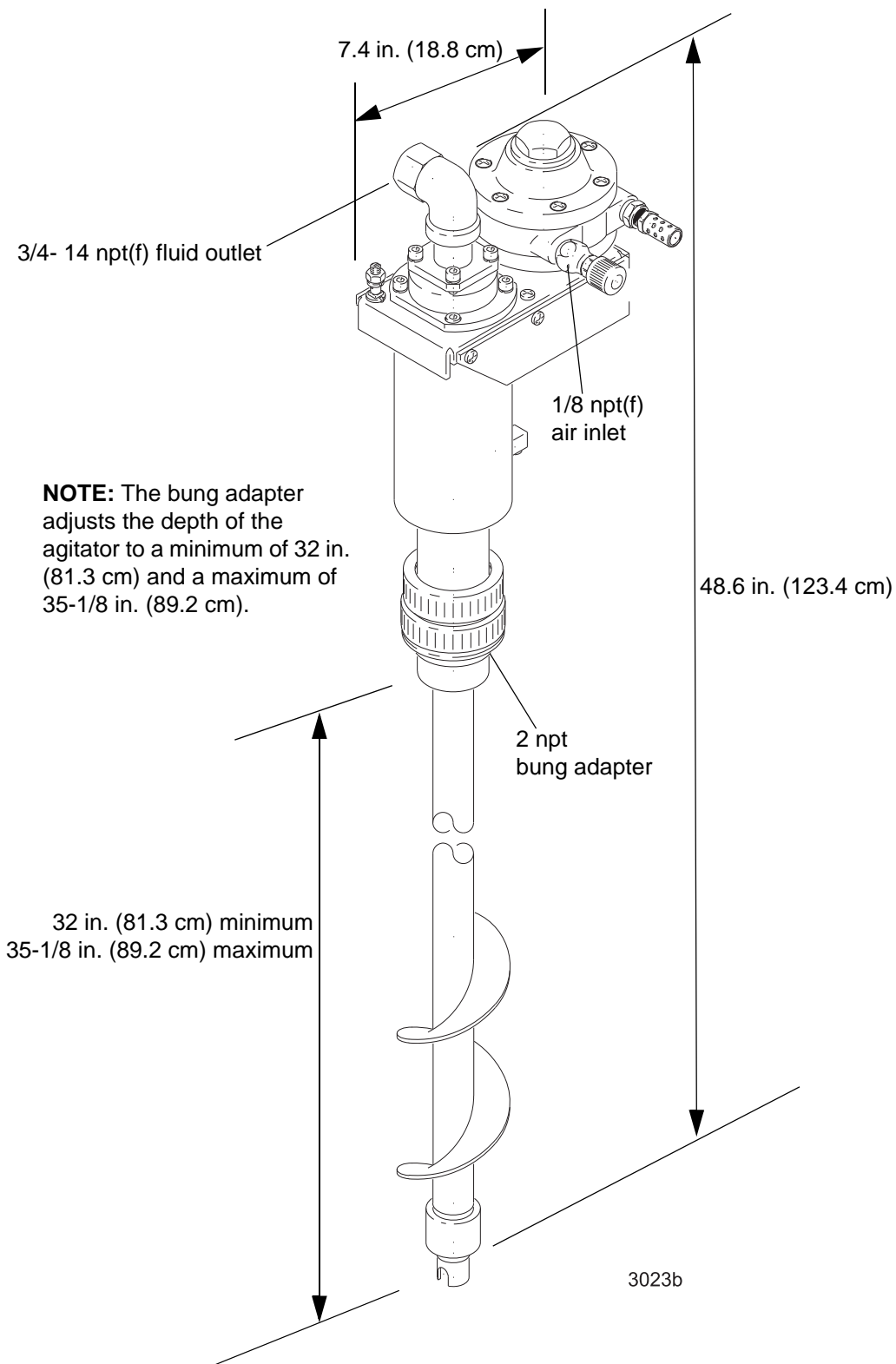
[^] This part is included in Repair Kit 236762, which may be purchased separately. The kit also includes an installation tool, which is needed to insert the helix tube through the shaft seal without damaging the seal lip.

[‡] An optional Rulon bearing nut is available. Order part number 189660.

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

[▲] Replacement safety labels, tags, and cards are available at no cost.

Dimensions



Technical Specifications

Twistork Helix Agitator with Suction Feature		
	US	Metric
Maximum air working pressure	100 psi	0.7 MPa, 7 bar
Maximum recommended helix speed	800 atm	
Ambient operating temperature range		
Model 236629	+33.8° F < Ta < +104° F	+1° C < Ta < +40° C
Model 236760	-4° F < Ta < +104° F	-20° C < Ta < +40° C
Maximum siphon flow rate		
with 100 centipoise material	approximately 12 gpm	approximately 45 lpm
with 1000 centipoise material	approximately 1.2 gpm	approximately 4.5 lpm
Air consumption		
at 400 rpm	2.5 scfm	0.071 m ³ /min
at 800 rpm	5.7 scfm	0.162 m ³ /min
Noise (dBa)		
Maximum sound pressure <i>Tested to CAGI-PNEUROP- 1969</i>	< 70 dBA at 400 to 800 rpm	
Materials of Construction**		
Wetted materials on all models	304 and 316 stainless steel, graphite-filled PTFE, acetal AF, Rulon LR	
External parts that may come in contact with fluid		Material
Bung adapter (Ref. No. 44)		Carbon steel
Air check valve elbow (Ref. No. 32)		Carbon steel
Housing (Ref. No. 3)		Aluminum
Weight		
All models	24 lb.	11 kg
Notes		
<i>All trademarks or registered trademarks are the property of their respective owners.</i>		

California Proposition 65

CALIFORNIA RESIDENTS

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

Graco Standard Warranty

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

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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.

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Original instructions. This manual contains English. MM 308345

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