Instructions – Parts List

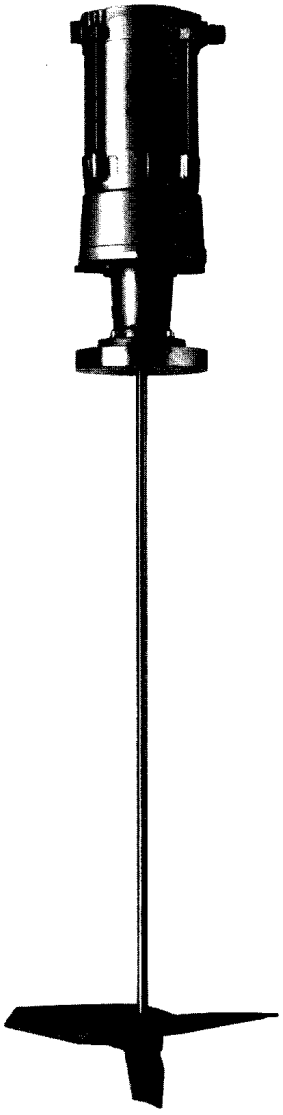
Parts

Low Shear Agitators

310500 rev.F

Important Safety Instructions
Read all warnings and instructions in this manual.
Save these instructions.

See page 2 for Table of Contents.



LSA 200, LSA 220, LSA 300

The Graco LSA series, low-shear agitators are designed to reduce energy consumption and decrease material degradation. Electric, air, and hydraulic motors are available, as are various shaft lengths and impeller sizes.

LSA 200

5.04:1 ratio gear reducer, and a standard maximum shaft output of 350 RPM with 1750 RPM shaft input. Choice of the air-powered (variable speed) or the electric motor.

LSA 200H

(hydraulic) direct drive, with 0 – 350 RPM shaft output using the 0.25 HP motor.

LSA 220

6.32:1 ratio gear reducer, and a standard maximum shaft output of 280 RPM with 1750 RPM shaft input. Choice of the air-powered (variable speed) or the electric motor.

LSA 220H

(hydraulic) direct drive, developing 0 to 280 RPM shaft output using the 0.25 HP motor.

LSA 300

6.32:1 ratio gear reducer, and a standard maximum shaft output of 140 RPM with 900 RPM shaft input. Choice of the air-powered (variable speed) or the electric motor.

LSA 300H

(hydraulic) direct drive, with 0 – 140 RPM shaft output using the 0.25 HP motor.

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

PROVEN QUALITY. LEADING TECHNOLOGY.

Table of Contents

Manual Conventions

Symbols

Be sure you read and understand each of these terms before reading the rest of the manual.

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.

NOTE: Gives additional information or helpful hints.

⚠ WARNING

FIRE, EXPLOSION, AND ELECTROSTATIC SHOCK HAZARD

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

- Ground the equipment and the object being sprayed.
- If there is any static sparking while using the equipment, **stop dispensing immediately**. Identify and correct the problem.
- Provide fresh air ventilation to avoid the buildup of flammable fumes from solvent or material.
- Do not smoke in the dispense area.
- Extinguish all open flames or pilot lights in the dispense area.
- Do not turn on or off any light switch in the dispense area.
- Keep the dispense area free of debris, including solvent, rags and gasoline.
- Keep a fire extinguisher in the work area.

MOVING PARTS HAZARD

Moving parts, such as an impeller blade, can pinch or amputate fingers.

- Keep clear of any moving parts when starting or operating the equipment.
- Disconnect the power supply before checking or servicing the equipment to prevent starting it accidentally.
- For hydraulic driven units, follow the **Pressure Relief Procedure** before checking or servicing the agitator to prevent it from starting accidentally.

HOT SURFACE HAZARD

- The surfaces of equipment which dispense hot materials can become heated enough to cause burns if touched. When working with such equipment, wear appropriate protective gloves and clothing. Allow hot surfaces time to cool, if possible, before servicing.

TOXIC FLUID HAZARD

The improper handling of hazardous fluids or inhaling toxic fumes can cause extremely serious injury, even death, due to splashing in the eyes, ingestion, or bodily contamination.

- 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.
- Wear appropriate clothing, gloves, eyewear and respirator.
- Pipe and dispose of the exhaust air safely. See your separate pump manual for further information.

⚠ WARNING

EQUIPMENT MISUSE HAZARD

Equipment misuse can cause the equipment to rupture, malfunction or start unexpectedly 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 the usage, call Graco Technical Assistance at (313) 416–3400.
- Do not alter or modify this equipment. Use only genuine Graco parts and accessories.
- Check the equipment daily. Repair or replace any worn or damaged parts immediately.
- Do not exceed the power supply requirement of the electrical equipment.
- For air-powered and hydraulic-powered agitators, the *Maximum Input Pressure* depends on the model type – refer to the **Technical Data** section on page 23. **Never** exceed these pressures.
- Be sure that all accessories on the system's air and/or hydraulic power lines are rated to withstand the system pressure. **Never** exceed the maximum working pressure of the lowest-rated component in your system.
- Do not move or lift any pressurized equipment.
- Use fluids or solvents that are compatible with equipment wetted parts. See the **Technical Data** section of all equipment manuals. Read the fluid and solvent manufacturer's warnings.
- The fluid hoses must have spring guards on both ends to protect them from rupture caused by kinks or bends at or close to the couplings.
- Comply with all applicable local, state and national fire, electrical and other safety regulations.

ELECTRIC SHOCK HAZARD

Beware of HIGH VOLTAGE in systems with electrical equipment. CONTACT WITH HIGH VOLTAGE ELECTRICITY CAN BE FATAL!

- Be sure all electrical installations and service is performed by a qualified electrician only.
- Be sure electrical installations comply with applicable codes.
- Be sure power is disconnected when servicing and repairing equipment.

Installation

For best results, do not remove any protective wrappings from any of the agitator parts until just prior to assembly and installation. Also, store the agitator parts indoors, in clean, dry air, with an ambient temperature between 59° – 104° F (15° – 40° C).

Impeller Installation

1. Slide the impeller(s) onto the shaft so the side marked DOWN faces away from the agitator.

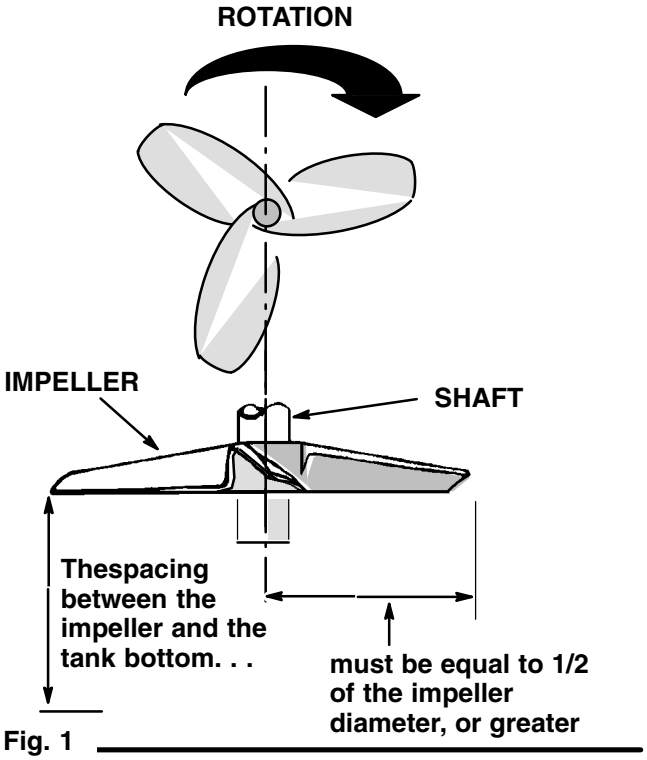


Fig. 1

2. Position the impeller(s) along the shaft as required. The distance from the tank bottom to the lowest impeller blade should be equal or greater than 1/2 the impellor blade's diameter. See Fig. 1.

NOTE: If installing more than one impeller onto the shaft, call Graco technical assistance for spacing recommendations.

3. After positioning the impeller(s) along the shaft as required, secure them by tightening the impeller set screw to 15-30 ft-lbs.

Agitator Installation

1. Be sure the agitator mounting surface is prepared with a bung-hole to accommodate the agitator shaft, and with holes drilled for the agitator mounting bolts. Refer to the appropriate agitator drawing in the **Parts** section for dimensions.

2. Securely attach a lifting device to the agitator for use in positioning.

⚠ WARNING

EQUIPMENT MISHANDLING HAZARD
To reduce risk of injury or damage to equipment due to mishandling, **do not** lift the agitator by hand; use a properly-rated lifting device to position the agitator for assembly and installation.

3. Place the supplied gasket (140) over the flange (75), then place the agitator body and gasket over the mounting holes, orienting the agitator so the power connections are accessible.

4. Secure the agitator in place:

   a. Place each of the four mounting bolts through the holes in the agitator mounting flange, gasket, and mounting surface.

   b. For each mounting bolt, install a flat washer and nut on the mounting bolt. Tighten the four nuts securely.

Installation

Shaft Installation

1. Check the access hole in the drive unit housing to see if the drive quill set screw (58) is accessible (see Fig. 2).

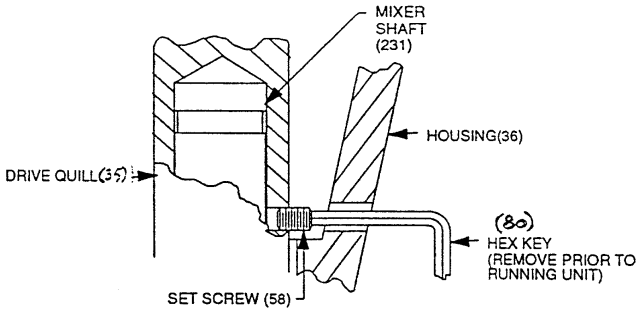


Fig. 2

2. If the drive quill set screw is not accessible, jog the motor to align the drive quill (35):

⚠ WARNING

MOVING PARTS HAZARD
Moving equipment parts can cause injury, including amputating of hands or fingers. To reduce risk of injury or equipment damage, do not jog the motor with the shaft and impeller in the drive quill.

   a. Refer to the **Power Connection** section for your motor type to connect power to motor.

   b. Supply power in short intervals, rotating the drive quill until the drive quill set screw is accessible by a hex wrench.

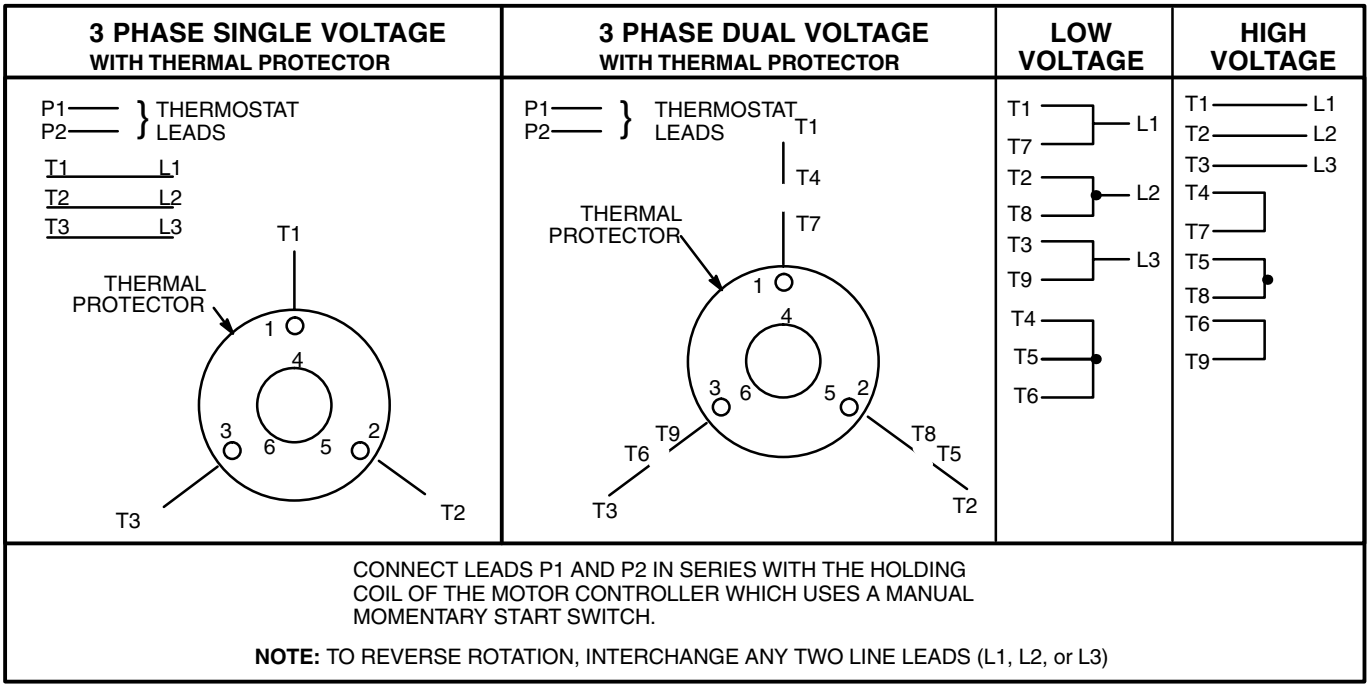
   c. Disconnect the power from the motor.

3. With power disconnected, insert the top end of the shaft into the drive quill so that the shaft contacts the top of the quill.

4. With the shaft fully inserted into the drive quill, use a hex key wrench to secure the set screw.

Connecting Power

MOTOR WIRING



CONNECT LEADS P1 AND P2 IN SERIES WITH THE HOLDING COIL OF THE MOTOR CONTROLLER WHICH USES A MANUAL MOMENTARY START SWITCH.

NOTE: TO REVERSE ROTATION, INTERCHANGE ANY TWO LINE LEADS (L1, L2, or L3)

Fig. 3

Installation

Connecting Power *(cont.'d)*

Electric Agitators

Refer to the motor wiring diagram (Fig. 3).

The required power supply varies depending on your model number. For the power supply requirements, see the Technical Data in this manual.

⚠ WARNING

ELECTROCUTION HAZARD
Make sure that your installation complies with National, State, and Local codes for the installation of electrical equipment. Have only a qualified electrician make the connections.

1. Verify the electrical supply and control equipment is properly rated for the motor being used.
2. Check the stator winding insulation resistance. If the resistance is less than 1 megohm, call Graco Customer Service for assistance.
3. With the power disconnected, connect all the electrical leads as indicated in the wiring diagram.

⚠ WARNING

ELECTROCUTION HAZARD
Contact with electricity can be fatal! To reduce risk of serious injury or death, make sure the power supply lines to the agitator are disconnected from the power supply when servicing and repairing the equipment.

NOTE: The blade rotation should be clockwise, looking down from the motor to the blade. To change the direction of rotation, disconnect power from the agitator power supply lines, and change the leads as indicated in Fig. 3.

Hydraulic Agitators

The required hydraulic power supply varies, depending on your model. For power supply requirements, see the Technical Data in this manual.

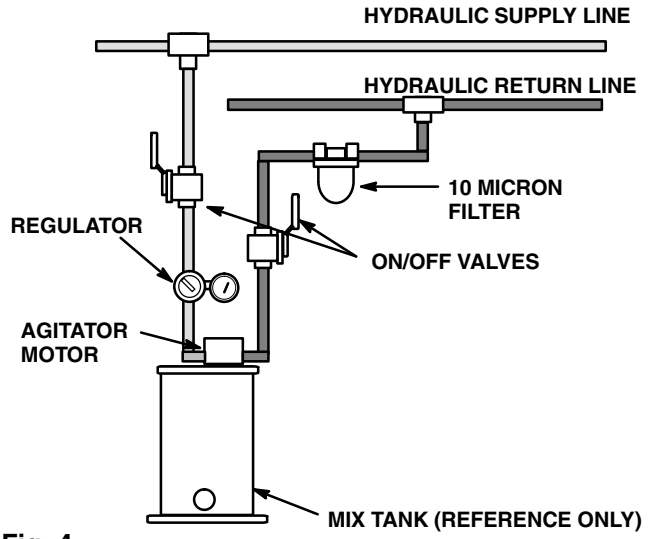


Fig. 4

When connecting hydraulic power (see Fig. 4):

NOTE: The hydraulic motor ports are 3/8" NPT.

1. Connect the hydraulic supply line to the hydraulic motor supply inlet. The supply line should have a shutoff valve, and a hydraulic fluid regulator to regulate the hydraulic motor speed.
2. Connect the hydraulic return line to the hydraulic motor return outlet. The return line should have a shutoff valve installed. It is recommended that a return line filter be installed, with a 10 micron or finer filter screen.

NOTE: The return line should be open whenever hydraulic power is supplied to the agitator.

Always shut off and disconnect the hydraulic power before servicing the agitator.

⚠ WARNING

PRESSURIZED FLUID HAZARD
To reduce the risk of serious injury, such as fluid injection or splashing fluid in the eyes or on the skin, follow the **Hydraulic Pressure Relief Procedure** on page 10.

Installation

Connecting Power *(cont.'d)*

Air-powered Agitators

The required power supply varies, depending on your model. For power supply requirements, see the Technical Data in this manual.

NOTE: The air motor air inlet is 1/4" NPT.

When connecting the air power (see Fig. 5):

1. Install an air line filter (5 micron, Graco part no. 515873, or equivalent) to remove harmful dirt and moisture from the air supply.

⚠ CAUTION

Not lubricating the air motor will cause air motor failure.

2. 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 **Lubricating the Air Motor** on page 11. *To order a 3/8" npt air line lubricator, order Part No. 214847.*

To disconnect the air power:

1. Close the main valve for the air supply to the motor.
2. Close the air motor needle valve.
3. Disconnect the air supply lines to motor.

Always shut off and disconnect the air power before servicing the agitator.

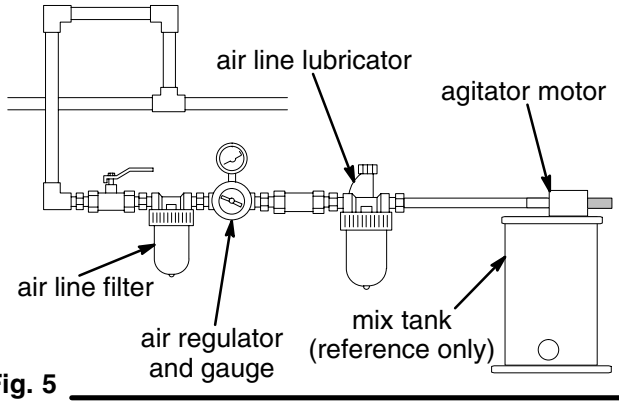


Fig. 5

Grounding the Agitator

Fluid dispensing can cause a static charge to build, which can spark, and cause electrical shock, or explosions. Always ground the agitator and all dispensing equipment before operating. Refer to the **FIRE, EXPLOSION, OR ELECTRIC SHOCK HAZARD** on page 3.

⚠ WARNING

FIRE, EXPLOSION, AND ELECTROSTATIC SHOCK HAZARD

Fluid dispensing can cause a static charge to build, which can spark, and cause electrical shock, or explosions. Always ground the dispensing equipment before operating. Refer to the **FIRE, EXPLOSION, OR ELECTRIC SHOCK HAZARD** on page 3.

Ground The System

To reduce the risk of static sparking, ground the valve and all other dispensing equipment used or located in the dispensing area. Check your local electrical code for detailed grounding instructions for your area and type of equipment.

1. *Agitator:* connect a ground wire and clamp to a true earth ground.
2. *Pump:* connect a ground wire and clamp to a true earth ground as shown in your separate pump manual.
3. *Valve:* connect to ground through grounded material lines to valve.
4. *Fluid and air hoses:* use only grounded material and air hoses.
5. *Dispense gun:* obtain grounding through the connection of the hose, or cable.
6. *Air compressor:* follow the manufacturer's recommendations.
7. *Object being sprayed:* according to local code.
8. *Fluid supply container:* according to local code.

Operation

General Operation

⚠ WARNING

MOVING PARTS HAZARD
Moving parts, such as an impeller blade, can pinch or amputate fingers. To reduce risk of injury or damage to equipment, before supplying power to equipment:

1. Be sure the agitator shaft rotates freely by hand; the movement of the shaft and impeller must not be hindered by the container, pump, or any other objects.
2. Be sure the cap screws and set screws are tightened as required.
3. Be sure all the protective guards and covers are in place.

To connect the power to the agitator, see the **Power Connection** section. Disconnect the power supply before checking or servicing the agitator.

Activate the agitator to mix fluid thoroughly before supplying fluid to the dispensing equipment. Continue mixing fluid while the dispensing equipment is being supplied.

NOTE: Always use moderate agitation speeds; excessive agitator speed may cause vibration, foaming of fluid and increased wear on parts.

⚠ WARNING

HOT SURFACE HAZARD
During operation, the motor can get hot enough to cause burns if touched. When working with such equipment, wear appropriate protective gloves and clothing. Allow the motor to cool for at least one hour power before touching either the motor or the shaft near the motor, which can also get hot.

Operation – Electric Motor

The agitator speed is fixed for electric motor models; the specific speed depends on the model type. See the Technical Data for your model type for electrical requirements.

1. To start the agitator, turn on the electric power to the motor.
2. To stop the agitator, turn off the electrical power to the motor. Disconnect the electrical power before checking or servicing the agitator.

NOTE: The motor has thermal protection circuitry which shuts down the motor if overheating occurs. If this happens, disconnect power and recheck your wiring connections and electrical supply.

⚠ WARNING

MOVING PARTS HAZARD
The thermal protection circuit resets automatically when the motor cools down. To reduce the risk of injury or damage to equipment, always disconnect the power supply before checking or servicing the agitator motor.

Operation – Air Motor

The agitator speed for air motor models is variable over a certain range, depending on the model type. See the Technical Data for your model type.

1. To start the agitator, turn on the air supply and slowly open the air needle valve.
2. To stop the agitator slowly close the air needle valve.

Turn off the air supply and disconnect the air hose from the air motor before servicing the agitator.

Operation

Operation – Hydraulic Motor

The agitator speed for hydraulic motor models is variable over a certain range, depending on the model type. See the Technical Data for your model type.

To start the agitator:

1. Open the shutoff valve at the hydraulic return line.
2. Open the shutoff valve on the hydraulic supply line to the agitator.
3. Adjust the regulator to increase or decrease the agitator speed.
4. To stop the agitator, close the hydraulic shutoff valve in the hydraulic supply line.

Disconnect the power supply before checking or servicing the agitator.

⚠ WARNING

PRESSURIZED FLUID HAZARD
To reduce the risk of serious injury, such as fluid injection or splashing fluid in the eyes or on the skin, follow the **Hydraulic Pressure Relief Procedure**.

Hydraulic Pressure Relief Procedure

For hydraulic agitators, to reduce the risk of serious bodily injury, including splashing in the eyes or on the skin, and injury from moving parts, always follow this procedure whenever you shut off the agitator, and before inspecting, removing, cleaning or repairing the agitator.

1. Shut off the main hydraulic power supply.
2. Close the regulator to the motor.
3. Shut off the hydraulic return valve.
4. Disconnect the hydraulic lines to the agitator.

Maintenance

⚠ WARNING

MOVING PARTS HAZARD
Moving parts, such as an impeller blade, can pinch or amputate fingers. To reduce risk of injury or damage to equipment, always disconnect power from the agitator before performing maintenance or service.

⚠ WARNING

HOT SURFACE HAZARD
During operation, the motor can get hot enough to cause burns if touched. When working with such equipment, wear appropriate protective gloves and clothing. Allow the motor to cool for at least one hour with power removed before touching either the motor or the shaft near the motor, which can also get hot.

Check Screw and Bolt Tightness

Within the first two weeks of operation, check all cap screws and set screws to make sure the screws are tightened. Retighten as required.

Routine Periodic Maintenance

Check and retighten all cap screws every six months or during down times if they occur more frequently.

Gear Housing Grease Check

NOTE: This procedure does not pertain to hydraulic models, nor to the LSA 100 model, which do not have gear housings.

The gear housing is factory filled with grease; this grease normally does not need to be changed, unless ambient air conditions are harsh, or unless some other service is being performed.

Harsh air conditions, including high humidity, dusty or chemical laden air, or widely varying air temperatures, can increase the deterioration of the grease.

If harsh conditions are present, check the grease at least every six months for deterioration. If necessary, replace the grease. See the **Gear Reducer Lubrication** heading in the **Service** section.

⚠ CAUTION

Use only Mobil Mobilith SHC 007 lubricant to lubricate the gear housing. The use of any other may cause part deterioration or inadequate performance.

Power Supply System Check

Check your power supply system equipment regularly and repair or replace worn or damaged parts immediately. Have the supply system maintenance performed by a qualified technician only.

Air Motor Flush

If the air motor performs sluggishly, try flushing with a suitable solvent (recommended solvents include Gast Flushing Solvent AH255, Loctite Safety Solvent, Inhibisol Safety Solvent, or Dow Chemical Chlorothane).

⚠ WARNING

TOXIC FLUIDS HAZARD
Improper handling of hazardous fluids or inhaling toxic fumes can cause extremely serious injury, even death, due to splashing in the eyes, ingestion, or bodily contamination. See **Toxic Fluids Hazard** on page 3.

To flush the air motor:

1. Shut off air supply to the motor, and disconnect air line from motor.
2. Pour several teaspoons of solvent directly into motor through the air inlet.
3. Rotate the motor by hand, if possible, in both directions, for a few minutes.
4. Reconnect the air line. Open air valve, and slowly open needle valve until no solvent is exhausted.

If the air motor performance is still sluggish, repeat the procedure. Further sluggish performance may indicate motor repair or replacement.

Lubricating the Air Motor

⚠ CAUTION

Not lubricating the air motor will cause air motor failure.

If an air line lubricator 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. Run the agitator for about 30 seconds.

Service

⚠ WARNING

MOVING PARTS HAZARD
Moving parts, such as an impeller blade, can pinch or amputate fingers. To reduce risk of injury or damage to equipment, always disconnect power from the agitator before performing maintenance or service.

⚠ WARNING

HOT SURFACE HAZARD
During operation, the motor can get hot enough to cause burns if touched. When working with such equipment, wear appropriate protective gloves and clothing. Allow the motor to cool for at least one hour power before touching either the motor or the shaft near the motor, which can also get hot.

⚠ WARNING

TOXIC FLUIDS HAZARD
Improper handling of hazardous fluids or inhaling toxic fumes can cause extremely serious injury, even death, due to splashing in the eyes, ingestion, or bodily contamination. See **Toxic Fluids Hazard** on page 3.

Agitator and Shaft Removal

1. Make sure power is disconnected from the unit (see **Power Connection**).
2. Rotate the agitator shaft by hand until the drive quill set screw is accessible through the access hole in the housing. See Fig. 2, page 6.
3. Make sure the shaft is supported, and, with a hex key wrench, loosen the drive quill set screw two turns to release the shaft.
4. Remove the shaft from the drive quill.
5. Remove the agitator from the tank:
   a. Make sure any lifting device used is of adequate capacity for the agitator.
   b. Loosen and remove the nuts and washers securing the agitator to the mounting surface.
   c. Lift and remove the agitator.

Lip Seal Removal and Replacement

NOTE: This procedure does not apply to the LSA 100 models.

The lip seal (71) and seal retainer plate (88) are located at the bottom of the agitator flange. The lip seal should be inspected periodically, per usage, for wear or damage, and replaced if necessary.

To inspect and replace the lip seal, with the agitator removed from its mount, and the shaft removed (see **Agitator and Shaft Removal**):

1. Remove the flat head screws (87) holding the retainer plate (88) in place. See Fig. 6.
2. Remove the retainer plate, and lip seal (71) from the housing.
3. Inspect the seal for damage. Replace if necessary.
4. To reinstall, place the new lip seal in flange (75), and place retainer plate over the lip seal.
5. Secure the retainer plate and lip seal in place with the flat head screws (87). Tighten securely.

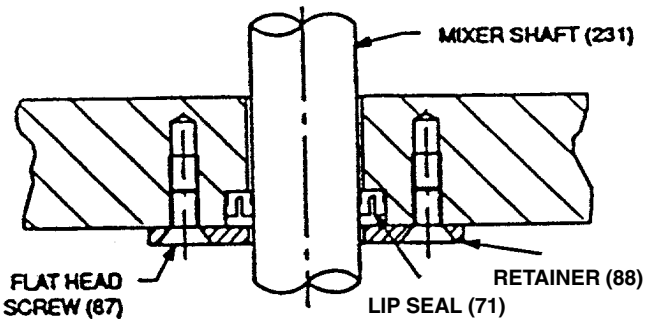


Fig 6

Service

Air or Electric Motor Removal

NOTE: Agitators with hydraulic motors, and the LSA 100, are direct drive, and do have not reducers. See **Hydraulic** or **LSA 100 Motor Removal and Replacement** for these types.

1. Make sure the power is disconnected from the unit (see **Power Connection**).

2. Remove the agitator (see **Agitator and Shaft Removal**). Place the agitator on a clean, level surface capable of supporting its weight.

NOTE: The gear housing is filled with grease, which may be in a liquid state. To prevent spillage, secure the gear housing in an upright position when removing the motor from the gear housing.

3. Remove the four socket head cap screws (60) holding the bearing housing (36) and gear housing (21) to the motor (101). See Fig. 8.

4. Lift the motor (101), drive coupling (102), and sun gear (9) off the gear housing (21) and gear carrier assembly (1).

5. If replacing the motor:

   a. Carefully measure and record the dimension from the motor face to the opposite side of the sun gear. This dimension is required for reassembly.

   b. Remove the drive coupling (102) and sun gear (9) as a unit from the old motor shaft. Inspect the sun gear, and replace if necessary.

   c. Unpack the new motor.

   d. Inspect the O-ring (23) and replace if necessary (part. no. 51A026).

   e. Place the drive coupling and sun gear as a unit onto the new motor shaft. Set the elevation of the sun gear and coupler from the motor as shown in Fig. 7 (use recorded dimension from step 5.a, or nominal, as shown).

6. If replacing the gear carrier assembly, continue with **Gear Carrier Assembly Replacement**. Otherwise, see **Air or Electric Motor Replacement**.

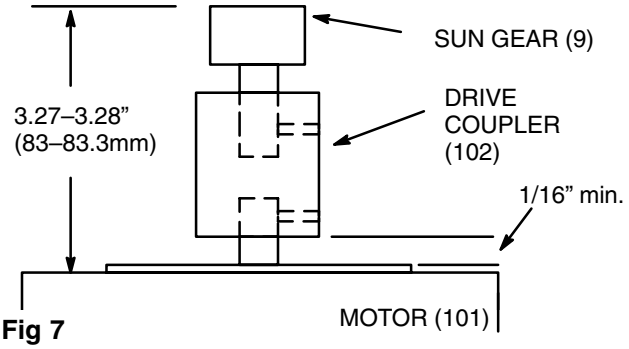


Fig 7

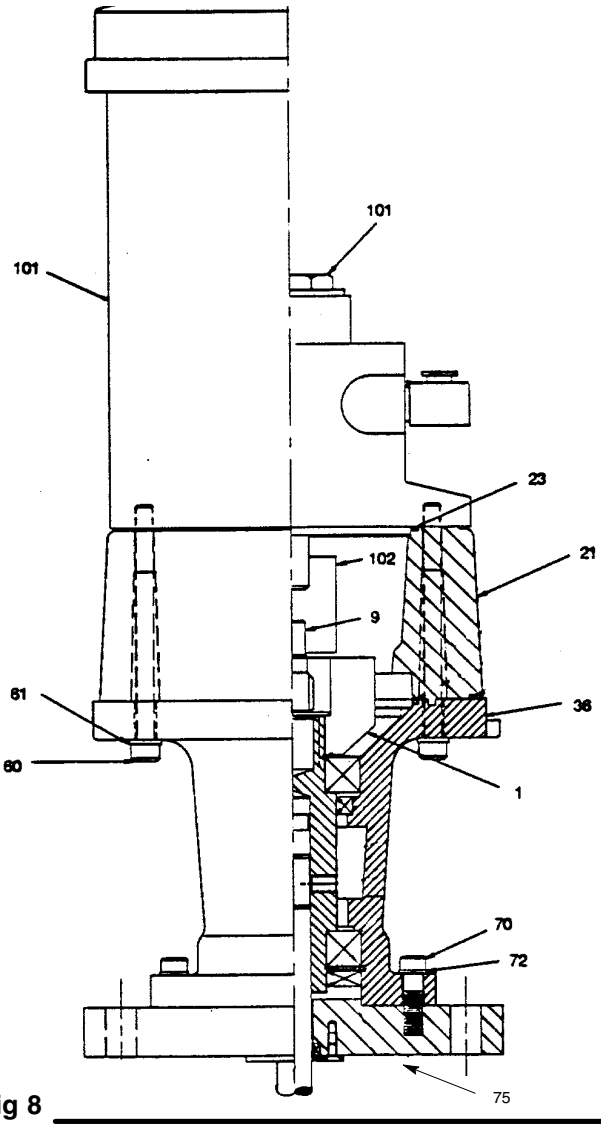


Fig 8

Service

Gear Reducer / Bearing Assembly Replacement

This procedure assumes the motor has been removed (see **Air or Electric Motor Removal**, page 13). Refer to Fig. 8, page 13 for this procedure.

1. Loosen and remove the socket head cap screws (70) and lock washers (72) holding the bearing housing to the flange.

2. Remove the gear reducer and bearing housing (21 and 36) from the flange (75) as an assembly.

3. Unpack the new gear reducer and bearing assembly (21 and 36), being very careful not to alter the orientation and alignment of the gears.

4. Install the socket head cap screws (70) and lock washers (72) to secure the bearing housing to the flange, and tighten.

NOTE: For best results, apply lubricant to screws when reassembling, such as grease, or anti-seize compound.

5. Loosen the set screw on the sun gear (9), and remove from the new gear carrier, if desired, and replace the old sun gear on the motor shaft. Set the elevation of the sun gear and drive coupling (102) from the motor as shown in Fig. 7, page 13 (use recorded dimension from step 5.a, or nominal, as shown).

6. Pack the new gear carrier with grease (see **Gear Carrier Lubrication**), and continue with **Air or Electric Motor Replacement** on page 15.

Gear Carrier Lubrication

All agitator bearings are sealed and pre-packed with lubricant. Lubrication of these bearings is not necessary.

Change the gear housing grease when performing service involving motor or gear removal, or whenever a grease change is necessary due to deterioration or discoloration.

To change the gear housing lubricant:

1. Remove the motor from the gear housing (see **Air or Electric Motor Removal**). Secure the gear housing in an upright position when removing the motor from the gear housing to avoid spillage.

2. Remove all old grease from the gear chamber and wipe clean.

3. Pack the gear chamber with fresh grease (use Mobil Mobilith SHC 007 or equivalent). The housing grease capacity is approximately 1 lb. (.45 kg). Fill the gear housing to a level about two inches (50mm) from the top of the housing.

⚠ CAUTION

Use only Mobil Mobilith SHC 007 lubricant to lubricate the gear housing. The use of any other may cause part deterioration or inadequate performance.

NOTE: When packing grease, paddle the grease, while rotating the shaft manually, and shake the housing, for more complete coverage.

Service

Air or Electric Motor Replacement

This procedure assumes the motor has already been removed, and the gear reducer and bearing housing have been replaced, if necessary (see pages 13–14 for procedures). Refer to Fig. 9 for this procedure.

1. Verify the elevation of the sun gear (9) and coupler (102) on the motor shaft to be as shown in Fig. 7, page 13 (or use dimensions obtained prior to removal, as suggested on page 13, in step 5a.).

2. Clean and repack the gear carrier (1) and gear housing (21) with new grease (see **Gear Carrier Lubrication**, page 14), if this has not been done.

3. Mount the motor onto the gear carrier (1), aligning the sun gear (9) so that the sun gear meshes with the “planet” gears in the gear carrier assembly.

4. Align the motor, rotating the shaft as necessary, and bolt the motor to the gear housing (21) and bearing housing (36), using the socket head cap screws (60) and washers (61). Alternately tighten the cap screws to 9 ft-lb (12 N-m).

NOTE: For best results, apply lubricant to screws when reassembling, such as grease, or anti-seize compound.

This completes the motor replacement. To reinstall the agitator, refer to the **Installation** instructions.

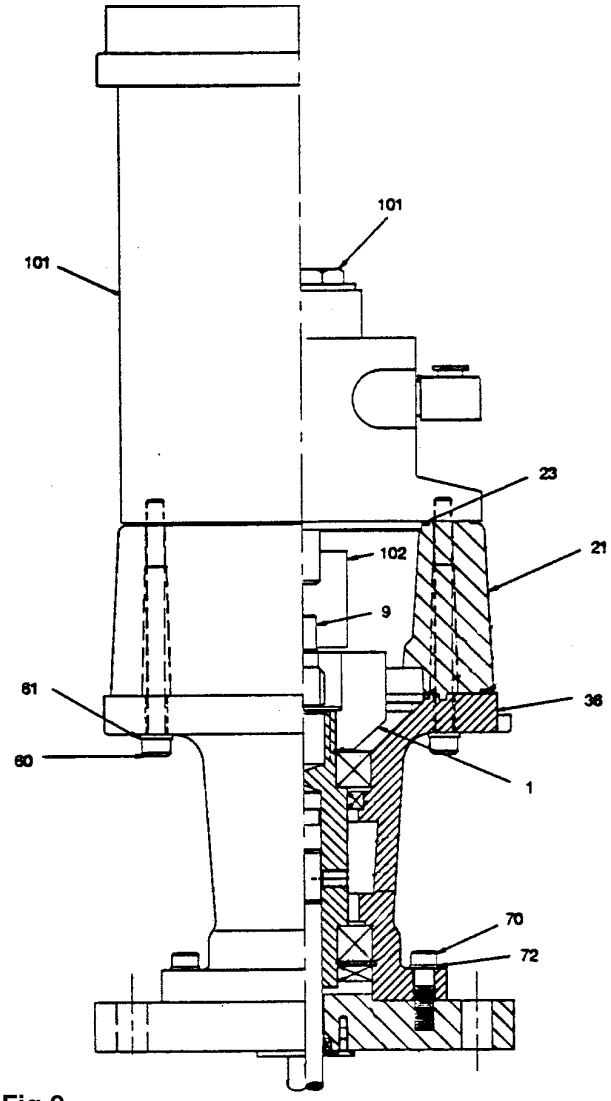


Fig 9

Service

Hydraulic Motor Replacement

1. Make sure power is disconnected from the unit (see **Power Connection**).

⚠ WARNING

PRESSURIZED FLUID HAZARD
To reduce the risk of serious injury, such as fluid injection or splashing fluid in the eyes or on the skin, follow the **Hydraulic Pressure Relief Procedure** on page 10.

2. Remove the agitator (see **Agitator and Shaft Removal**), and place on a clean level surface capable of supporting its weight.

3. Remove the four socket head cap screws (60) and washers (61) holding the motor adapter (131) to the bearing housing (36).

4. Carefully lift the motor adapter off the bearing housing. It may be necessary to gently tap the bearing housing to separate it from the adapter.

5. Inspect O-ring (43) and replace if necessary.

6. Loosen the set screws for the coupling half (103) and insert (105) and remove from the motor shaft.

7. Loosen the machine screws (130) holding the motor to the motor adapter, and remove the motor from the adapter.

NOTE: If you intend to replace the bearing assembly, see **Bearing Assembly Replacement** on this page this point, then, continue this procedure.

8. Unpack the new motor.

9. Install the motor onto the motor adapter (131), and tighten the machine screws (130) to secure the motor to the motor adapter.

NOTE: For best results, apply lubricant to screws when reassembling, such as grease, or anti-seize compound.

10. Install the motor coupling half and insert removed from the old motor onto the new motor shaft.

11. Position the motor (or motor adapter on hydraulic units) on the bearing housing (36), aligning the coupling halves of the motor shaft and bearing housing as necessary, so the two halves mesh.

12. With the motor adapter in place on the bearing housing, install the washers (61) and four socket head cap screws (60) to secure the motor to the bearing housing.

This completes the motor replacement. To reinstall the agitator, refer to the **Installation** instructions.

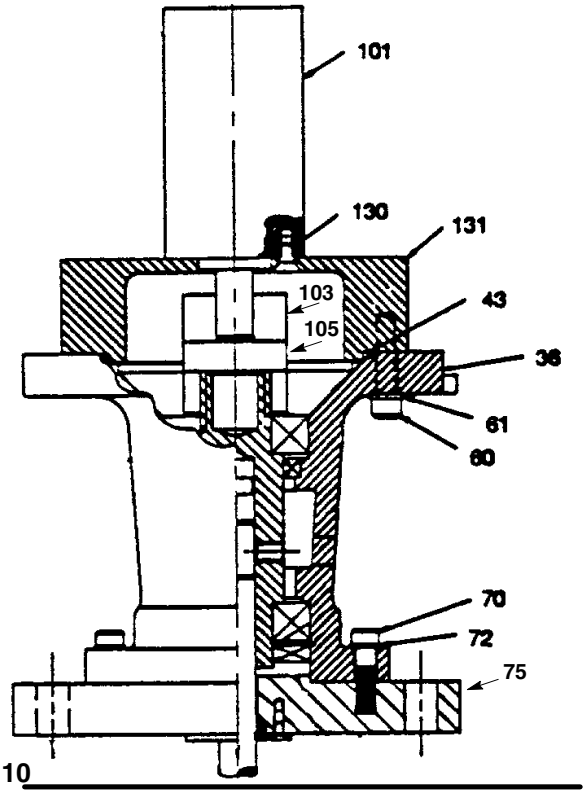


Fig 10

Bearing Assembly Replacement

This procedure assumes the motor has been removed (see steps 1–7 **Hydraulic Motor Replacement**). See Fig. 10 for this procedure.

1. Loosen and remove the socket head cap screws (70) and lock washers (72) holding the bearing housing to the flange.

2. Remove the bearing housing (36) from the flange (75) as an assembly.

3. Unpack the new bearing housing assembly, being very careful not to alter the orientation and alignment of the components.

4. Place the new bearing housing onto the flange, and secure tightly in place with the socket head cap screws (70) and lock washers (72).

NOTE: For best results, apply lubricant to screws when reassembling, such as grease, or anti-seize compound.

5. Continue with step 8 of the **Hydraulic Motor Replacement** procedure, or with step 11, if a new motor is not being installed.

Parts

LSA 200, LSA 220, LSA 300

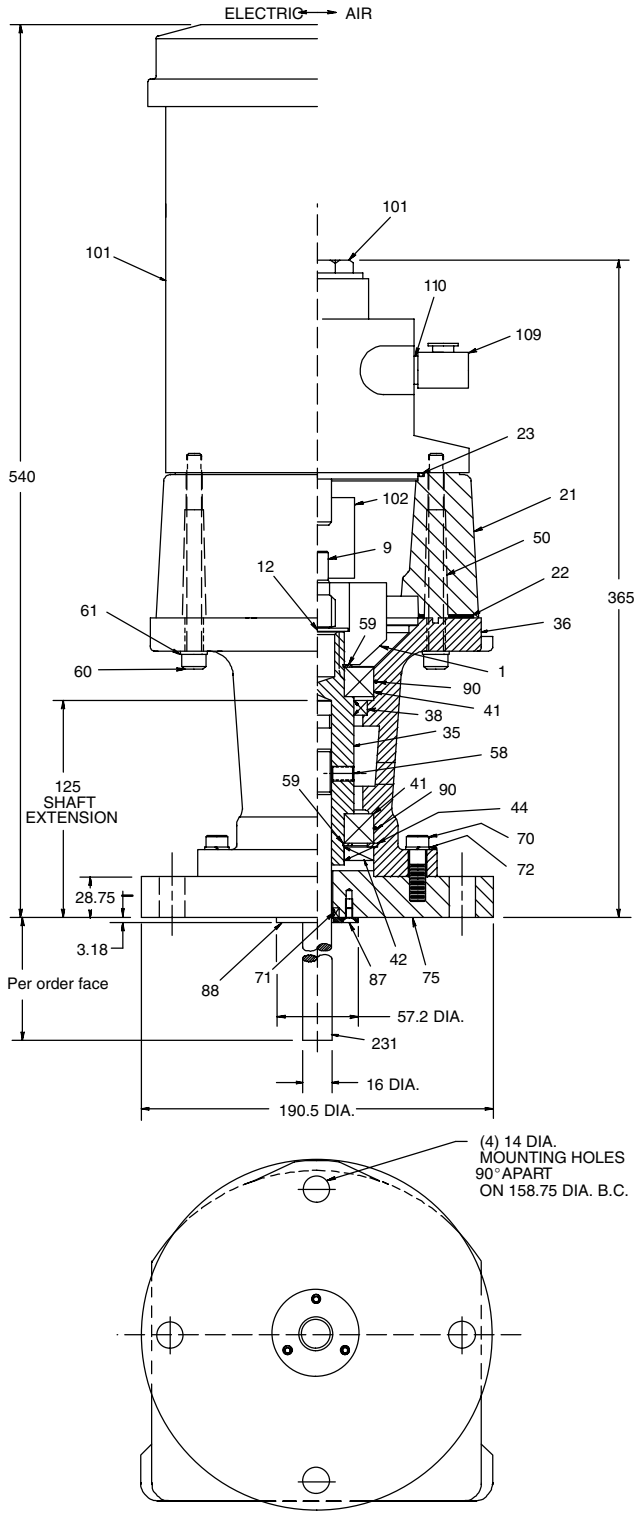


Fig 11

Ref No.	Part No.	Description	Qty
*1	51A023	Gear carrier assembly (LSA 200 only)	1
	51A024	Gear carrier assembly (LSA 220, 300)	1
9		Gear	1
12		Washer, thrust	1
21	51A027	Gear housing	1
*22	51A025	O-ring	1
*23	51A026	O-ring	1
35	51A021	Quill shaft – 16mm (LSA 200, 220)	1
	51A022	Quill shaft – 20mm (LSA 300 only)	1
36	51A029	Bearing housing	1
*38	51A030	Oil seal	1
*41	51A031	Ball bearing	2
*42	51A032	Oil seal	1
*44	51A033	Retaining ring	1
58	51A035	Hex socket set screw	1
*59	51A036	Retaining ring	2
60	51A038	Socket head cap screw	4
61	51A039	Flat washer	4
70	51A037	Socket head cap screw	4
*71	51A043	Lip seal, PTFE (LSA 200, 220)	1
	51A044	Lip seal, PTFE (LSA 300 only)	1
72	51A045	Lock washer	4
75	51A046	Flange	1
87	51A972	Socket flat head screw	4
88	51A974	Seal retainer plat**e** (LSA 200,220 only)	**1**
	51A975	Seal retainer plate **(**LSA 300 only)	**1**
*90	51A971	O–ring	1
101	51A049	Non-lubricated air motor	1
101a	51A051	Electric motor (LSA 200, 220)	1
	51A053	Electric motor (LSA 300 only)	1
*102	Drive coupling comprised of		
	51A052	Coupling half	1
	51A054	Coupling half	1
	51A055	Insert	1
*109	51A056	Needle valve	1
110	51A057	Pipe nipple	1
135	51A059	Speed control muffler (LSA 300 only) (not shown)	1
*140	516315	Gortex gasket (ID 2.5”, OD 7.5 ”x0.06”) (not shown)	1
231		Lower shaft	1

*Indicates replacement items

NOTE: Gortex gasket (not shown), item 140, is supplied for placement between flange and mounting surface

Additional Replacement Items

Ref No.	Part No.	Description	Qty
101a	51A051	Electric motor (LSA 200, 220)	1
	51A053	Electric motor (LSA 300 only, 900 rpm)	1
101	51A049	Non-lubricated air motor	1
**150	51A775	Air motor repair kit (not shown)	1

****NOTE:** When ordering this repair kit, also order the O-ring, ref. no. 23, part no. 51A-026.

Parts

LSA 200H, LSA 220H, LSA 300H

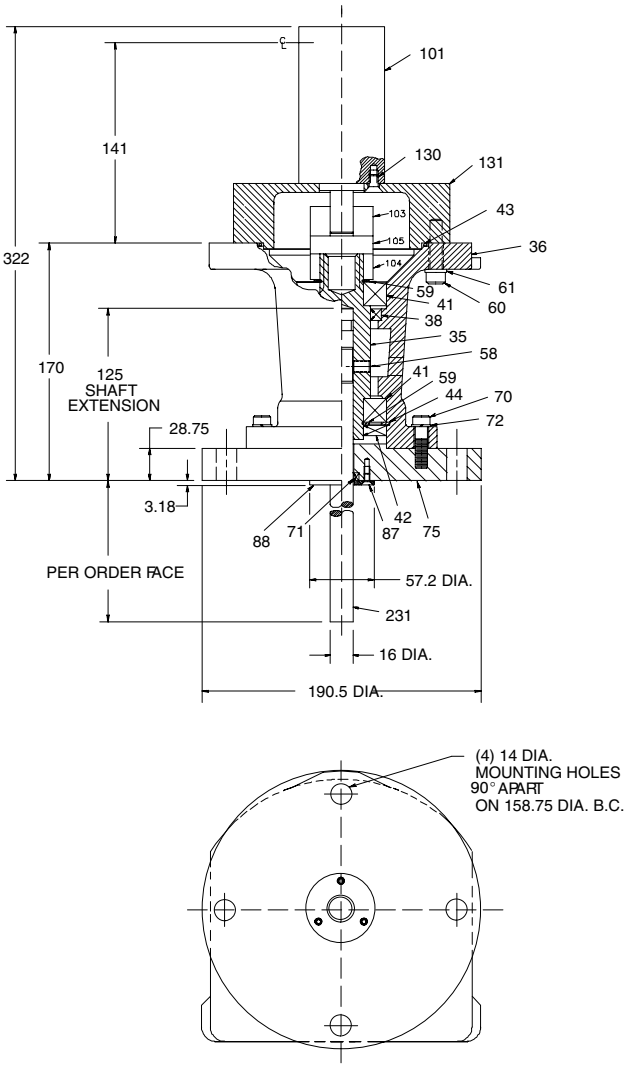


Fig 12

Ref No.	Part No.	Description	Qty
35	51A021	Quill shaft – 16mm	1
	51A022	Quill shaft – 20mm (LSA 300 only)	1
36	51A029	Bearing housing	1
*38	51A030	Oil seal	1
*41	51A031	Ball bearing	2
*42	51A032	Oil seal	1
*43	51A026	O-ring	1
*44	51A033	Retaining ring	1
58	51A035	Hex socket set screw	1
*59	51A036	Retaining ring	2
60	51A038	Socket head cap screw	4
61	51A039	Flat washer	4
70	51A037	Socket head cap screw	4
*71	51A043	Lip seal, PTFE (LSA 200, 220)	1
	51A044	Lip seal, PTFE (LSA 300 only)	1
72	51A045	Lock washer	4
75	51A046	Flange	1
87	51A972	Socket flat head screw	4
88	51A974	Seal retainer plate (LSA 200,220 only)	**1**
	51A975	Seal retainer plate (LSA 300 only)	**1**
101a	51A976	Hydraulic motor (LSA 200H only)	1
	51A977	Hydraulic motor (LSA 220H only)	1
	51A978	Hydraulic motor (LSA 300H only)	1
103	51A052	Coupling half	1
104	51A054	Coupling half	1
*105	51A055	Insert	1
130	51A973	Hex socket machine screw	3
131	51A980	Motor Adapter (hydraulic only)	1
140	516315	Gortex gasket (ID 2.5”, OD 7.5 ”x0.06”) (not shown)	1
231		Lower shaft	1

*Indicates replacement items

NOTE: Gortex gasket (not shown), item 140, is supplied for placement between flange and mounting surface

Additional Replacement Items

Ref No.	Part No.	Description	Qty
101a	51A976	Hydraulic motor (LSA 200H only)	1
	51A977	Hydraulic motor (LSA 220H only)	1
	51A978	Hydraulic motor (LSA 300H only)	1

****NOTE:** When ordering this repair kit, also order the O-ring, ref. no. 43, part no. 51A-026.

Parts

LSA – 200 AGITATOR

LSA Drive Units	Part No.	Form No.
Air	516552*	305633
Electric	516556	305633
Hydraulic	516560	305633

*Requires 96A498 Filter Kit (5 Micron)
51B373 Filter Element (5 Micron)
NOTE: LSA–200 Agitator shaft diameter is 16 mm.

Shaft Part No.	Length in. (mm)	Shaft Part No.	Length in. (mm)
516889	18 (457)	516909	28 (711)
516900	19 (483)	516910	29 (737)
516901	20 (508)	516911	30 (762)
516902	21 (533)	516912	31 (787)
516903	22 (539)	516913	32 (813)
516904	23 (584)	516914	33 (838)
516905	24 (610)	516915	34 (864)
516906	25 (635)	516916	35 (889)
516907	26 (660)	516917	36 (914)
516908	27 (686)	516918	37 (940)

Impeller Part No.	Impeller Diameter in.(mm)	Impeller gpm (lpm)	LSA 220 Shaft Lengths allowed in. (mm)
515770	7.6 (193)	371 (1404)	0–37 (0–940)
515771	8.8 (224)	574 (2173)	0–36 (0–914)
515772	10.0 (254)	844 (3196)	0–35 (0–889)
515773	11.2 (284)	1187 (4493)	0–32 (0–813)

Parts

Agitator Part No.	Drive Type	Shaft Length in. (mm)	Impeller Diameter in. (mm)
922000	Electric	29 (737)	7.6 (193)
922198	Electric	29 (737)	8.8 (224)
922001	Electric	29 (737)	10.0 (254)
922002	Electric	29 (737)	11.2 (284)
962602	Air	29 (737)	7.6 (193)
922003	Air	29 (737)	8.8 (224)
922004	Air	29 (737)	10.0 (254)
922199	Air	29 (737)	11.2 (284)
922005	Electric	30 (762)	7.6 (193)
922006	Electric	30 (762)	8.8 (224)
922200	Electric	30 (762)	10.0 (254)
922007	Electric	30 (762)	11.2 (284)
922008	Air	30 (762)	7.6 (193)
922201	Air	30 (762)	8.8 (224)
922202	Air	30 (762)	10.0 (254)
922009	Air	30 (762)	11.2 (284)
922203	Electric	31 (787)	7.6 (193)
922010	Electric	31 (787)	8.8 (224)
922011	Electric	31 (787)	10.0 (254)
922012	Electric	31 (787)	11.2 (284)
922204	Air	31 (787)	7.6 (193)
922013	Air	31 (787)	8.8 (224)
922014	Air	31 (787)	10.0 (254)
922015	Air	31 (787)	11.2 (284)
922016	Electric	32 (787)	7.6 (193)
922205	Electric	32 (787)	8.8 (224)
922017	Electric	32 (787)	10.0 (254)
922206	Electric	32 (787)	11.2 (284)
922018	Air	32 (787)	7.6 (193)
922019	Air	32 (787)	8.8 (224)
922020	Air	32 (787)	10.0 (254)
922021	Air	32 (787)	11.2 (284)

Agitator Part No.	Drive Type	Shaft Length in. (mm)	Impeller Diameter in. (mm)
922022	Electric	33 (838)	7.6 (193)
962686	Electric	33 (838)	8.8 (224)
922023	Electric	33 (838)	10.0 (254)
922024	Air	33 (838)	7.6 (193)
962684	Air	33 (838)	8.8 (224)
922207	Air	33 (838)	10.0 (254)
922025	Electric	34 (864)	7.6 (193)
922208	Electric	34 (864)	8.8 (224)
922209	Electric	34 (864)	10.0 (254)
922026	Air	34 (864)	7.6 (193)
962601	Air	34 (864)	8.8 (224)
922027	Air	34 (864)	10.0 (254)
922028	Electric	35 (889)	7.6 (193)
922029	Electric	35 (889)	8.8 (224)
922210	Electric	35 (889)	10.0 (254)
922030	Air	35 (889)	7.6 (193)
922031	Air	35 (889)	8.8 (224)
96A381	Air	35 (889)	10.0 (254)
922032	Electric	36 (914)	7.6 (193)
922033	Electric	36 (914)	8.8 (224)
922211	Air	36 (914)	7.6 (193)
922034	Air	36 (914)	8.8 (224)

Parts

LSA–220 AGITATOR

LSA Drive Units	Part No.	Form No.
Air	561553*	305519
Electric	516557	305519
Hydraulic	516561	305519

*Requires 96A498 Filter Kit (5 Micron)
51B373 Filter Element (5 Micron)
NOTE: LSA–220 Agitator shaft diameter is 16 mm.

Shaft Part No.	Length in. (mm)	Shaft Part No.	Length in. (mm)
516889	18 (457)	516909	28 (711)
516900	19 (483)	516910	29 (737)
516901	20 (508)	516911	30 (762)
516902	21 (533)	516912	31 (787)
516903	22 (539)	516913	32 (813)
516904	23 (584)	516914	33 (838)
516905	24 (610)	516915	34 (864)
516906	25 (635)	516916	35 (889)
516907	26 (660)	516917	36 (914)
516908	27 (686)	516918	37 (940)
		516919	38 (965)

Impeller Part No.	Impeller Diameter in.(mm)	Impeller gpm (lpm)	LSA 220 Shaft Lengths allowed in. (mm)
515770	7.6 (193)	297 (1124)	0–38 (0–965)
515771	8.8 (224)	459 (1737)	0–38 (0–965)
515772	10.0 (254)	675 (2555)	0–38 (0–965)
515773	11.2 (284)	949 (3591)	0–37 (0–940)
515774	11.8 (300)	1112 (4209)	0–36 (0–914)
515775	12.8 (325)	1417 (5363)	0–34 (0–864)
515776	13.6 (345)	1700 (6435)	0–32 (0–812)

Parts

Agitator Part No.	Drive Type	Shaft Length in. (mm)	Impeller Diameter in. (mm)
922036	Electric	29 (737)	10.0 (254)
922037	Electric	29 (737)	11.2 (284)
922213	Electric	29 (737)	11.8 (300)
922211	Electric	29 (737)	12.8 (325)
922215	Electric	29 (737)	13.6 (345)
922040	Air	29 (737)	10.0 (254)
962613	Air	29 (737)	11.2 (284)
922216	Air	29 (737)	11.8 (300)
922217	Air	29 (737)	12.8 (325)
922218	Air	29 (737)	13.6 (345)
962553	Electric	30 (762)	10.0 (254)
922043	Electric	30 (762)	11.2 (284)
922219	Electric	30 (762)	11.8 (300)
922220	Electric	30 (762)	12.8 (325)
922221	Electric	30 (762)	13.6 (345)
962552	Air	30 (762)	10.0 (254)
922045	Air	30 (762)	11.2 (284)
922222	Air	30 (762)	11.8 (300)
922223	Air	30 (762)	12.8 (325)
922224	Air	30 (762)	13.6 (345)
922047	Electric	31 (787)	10.0 (254)
922048	Electric	31 (787)	11.2 (284)
922225	Electric	31 (787)	11.8 (300)
922226	Electric	31 (787)	12.8 (325)
922227	Electric	31 (787)	13.6 (345)
922050	Air	31 (787)	10.0 (254)
922051	Air	31 (787)	11.2 (284)
922228	Air	31 (787)	11.8 (300)
922229	Air	31 (787)	12.8 (325)
922230	Air	31 (787)	13.6 (345)

Agitator Part No.	Drive Type	Shaft Length in. (mm)	Impeller Diameter in. (mm)
922231	Electric	32 (787)	10.0 (254)
962826	Electric	32 (787)	11.2 (284)
922232	Electric	32 (787)	11.8 (300)
922233	Electric	32 (787)	12.8 (325)
922234	Electric	32 (787)	13.6 (345)
922055	Air	32 (787)	10.0 (254)
922056	Air	32 (787)	11.2 (284)
922235	Air	32 (787)	11.8 (300)
922236	Air	32 (787)	12.8 (325)
922237	Air	32 (787)	13.6 (345)
922059	Electric	33 (838)	10.0 (254)
962674	Electric	33 (838)	11.2 (284)
922238	Electric	33 (838)	11.8 (300)
922239	Electric	33 (838)	12.8 (325)
962829	Air	33 (838)	10.0 (254)
922240	Air	33 (838)	11.2 (284)
922241	Air	33 (838)	11.8 (300)
922242	Air	33 (838)	12.8 (325)
962764	Electric	34 (864)	10.0 (254)
922243	Electric	34 (864)	11.2 (284)
922244	Electric	34 (864)	11.8 (300)
922245	Electric	34 (864)	12.8 (325)
922246	Air	34 (864)	11.2 (284)
922247	Air	34 (864)	11.8 (300)
922248	Air	34 (864)	12.8 (325)
962841	Electric	35 (889)	10.0 (254)
922249	Electric	35 (889)	11.2 (284)
922250	Electric	35 (889)	11.8 (300)
962707	Air	35 (889)	10.0 (254)
922251	Air	35 (889)	11.2 (284)
922252	Air	35 (889)	11.8 (300)
922253	Electric	36 (914)	10.0 (254)
962642	Electric	36 (914)	11.2 (284)
922254	Electric	36 (914)	11.8 (300)
922255	Air	36 (914)	10.0 (254)
962732	Air	36 (914)	11.2 (284)
962824	Air	36 (914)	11.8 (300)

Parts

LSA–300 AGITATOR

LSA Drive Units	Part No.	Form No.
Air	561554	305520
Electric	516558	305520
Hydraulic	516562	305520

*Requires 96A498 Filter Kit (5 Micron)
51B373 Filter Element (5 Micron)
NOTE: LSA–300 Agitator shaft diameter is 16 mm.

Shaft Part No.	Length in. (mm)	Shaft Part No.	Length in. (mm)
516920	36 (914)	516935	51 (1295)
516921	37 (940)	516936	52 (1321)
516922	38 (965)	516937	53 (1346)
516923	39 (991)	516938	54 (1372)
516924	40 (1016)	516939	55 (1397)
516925	41 (1041)	516940	55 (1422)
516926	42 (1067)	516941	57 (1448)
516927	43 (1092)	516943	58 (1473)
516928	44 (1118)	516944	59 (1499)
516929	45 (1143)	516945	60 (1524)
516930	46 (1168)		
516931	47 (1094)		
516932	48 (1219)		
516933	49 (1245)		
516934	50 (1270)		

Impeller Part No.	Impeller Diameter in.(mm)	Impeller gpm (lpm)	LSA 300 Shaft Lengths allowed in. (mm)
51A018	15.1 (384)	1163 (4402)	0–60 (0–1524)
515777	15.6 (396)	1268 (4799)	0–59 (0–1499)
515778	17.0 (432)	1652 (6253)	0–57 (0–1448)
515779	18.0 (457)	1960 (7419)	0–55 (0–1397)
515780	19.0 (483)	2310 (8743)	0–54 (0–1372)

Parts

LSA–300 AGITATOR

Agitator Part No.	Drive Type	Shaft Length in. (mm)	Impeller Diameter in. (mm)
922080	Electric	34 (864)	15.1 (384)
922081	Electric	34 (864)	15.6 (396)
922082	Electric	34 (864)	17.0 (432)
922083	Electric	34 (864)	18.0 (457)
922084	Electric	34 (864)	19.0 (483)
922085	Air	34 (864)	15.1 (384)
922086	Air	34 (864)	15.6 (396)
922087	Air	34 (864)	17.0 (432)
922088	Air	34 (864)	18.0 (457)
922089	Air	34 (864)	19.0 (483)
922090	Electric	35 (889)	15.1 (384)
922091	Electric	35 (889)	15.6 (396)
9222092	Electric	35 (889)	17.0 (432)
9222093	Electric	35 (889)	18.0 (457)
922094	Electric	35 (889)	19.0 (483)
962095	Air	35 (889)	15.1 (384)
922096	Air	35 (889)	15.6 (396)
922097	Air	35 (889)	17.0 (432)
922098	Air	35 (889)	18.0 (457)
922099	Air	35 (889)	19.0 (483)
962742	Electric	36 (914)	15.1 (384)
922100	Electric	36 (914)	15.6 (396)
962568	Electric	36 (914)	17.0 (432)
922101	Electric	36 (914)	18.0 (457)
922102	Electric	36 (914)	19.0 (483)
922103	Air	36 (914)	15.1 (384)
922104	Air	36 (914)	15.6 (396)
962567	Air	36 (914)	17.0 (432)
922105	Air	36 (914)	18.0 (457)
922106	Air	36 (914)	19.0 (483)

Agitator Part No.	Drive Type	Shaft Length in. (mm)	Impeller Diameter in. (mm)
922107	Electric	37 (940)	15.1 (384)
962715	Electric	37 (940)	15.6 (396)
922108	Electric	37 (940)	17.0 (432)
922109	Electric	37 (940)	18.0 (457)
922110	Electric	37 (940)	19.0 (483)
922111	Air	37 (940)	15.1 (384)
922112	Air	37 (940)	15.6 (396)
922113	Air	37 (940)	17.0 (432)
922114	Air	37 (940)	18.0 (457)
922115	Air	37 (940)	19.0 (483)
922116	Electric	38 (965)	15.1 (384)
922117	Electric	38 (965)	15.6 (396)
922118	Electric	38 (965)	17.0 (432)
922119	Electric	38 (965)	18.0 (457)
922120	Electric	38 (965)	19.0 (483)
922121	Air	38 (965)	15.1 (384)
922122	Air	38 (965)	15.6 (396)
922123	Air	38 (965)	17.0 (432)
922124	Air	38 (965)	18.0 (457)
922125	Air	38 (965)	19.0 (483)
922126	Electric	39 (991)	15.1 (384)
922127	Electric	39 (991)	15.6 (396)
922128	Electric	39 (991)	17.0 (432)
922129	Electric	39 (991)	18.0 (457)
922130	Electric	39 (991)	19.0 (483)
922131	Air	39 (991)	15.1 (384)
922132	Air	39 (991)	15.6 (396)
922133	Air	39 (991)	17.0 (432)
962607	Air	39 (991)	18.0 (457)
922134	Air	39 (991)	19.0 (483)

Parts

LSA–300 AGITATOR (continued)

Agitator Part No.	Drive Type	Shaft Length in. (mm)	Impeller Diameter in. (mm)
922135	Electric	40 (1016)	15.1 (384)
922136	Electric	40 (1016)	15.6 (396)
922137	Electric	40 (1016)	17.0 (432)
922138	Electric	40 (1016)	18.0 (457)
922139	Electric	40 (1016)	19.0 (483)
922140	Air	40 (1016)	15.1 (384)
922141	Air	40 (1016)	15.6 (396)
922142	Air	40 (1016)	17.0 (432)
922143	Air	40 (1016)	18.0 (457)
922144	Air	40 (1016)	19.0 (483)
922145	Electric	41 (1041)	15.1 (384)
922146	Electric	41 (1041)	15.6 (396)
922147	Electric	41 (1041)	17.0 (432)
922148	Electric	41 (1041)	18.0 (457)
922149	Electric	41 (1041)	19.0 (483)
922150	Air	41 (1041)	15.1 (384)
922151	Air	41 (1041)	15.6 (396)
922152	Air	41 (1041)	17.0 (432)
922153	Air	41 (1041)	18.0 (457)
922154	Air	41 (1041)	19.0 (483)
96A272	Electric	42 (1067)	15.1 (384)
962730	Electric	42 (1067)	15.6 (396)
962731	Electric	42 (1067)	17.0 (432)
922155	Electric	42 (1067)	18.0 (457)
922156	Electric	42 (1067)	19.0 (483)
922157	Air	42 (1067)	15.1 (384)
922158	Air	42 (1067)	15.6 (396)
962570	Air	42 (1067)	17.0 (432)
922159	Air	42 (1067)	18.0 (457)
922160	Air	42 (1067)	19.0 (483)

Agitator Part No.	Drive Type	Shaft Length in. (mm)	Impeller Diameter in. (mm)
962795	Electric	43 (1092)	15.1 (384)
922161	Electric	43 (1092)	15.6 (396)
922162	Electric	43 (1092)	17.0 (432)
922163	Electric	43 (1092)	18.0 (457)
922164	Electric	43 (1092)	19.0 (483)
922165	Air	43 (1092)	15.1 (384)
962680	Air	43 (1092)	15.6 (396)
922166	Air	43 (1092)	17.0 (432)
922167	Air	43 (1092)	18.0 (457)
922168	Air	43 (1092)	19.0 (483)
922169	Electric	44 (1118)	15.1 (384)
922170	Electric	44 (1118)	15.6 (396)
922171	Electric	44 (1118)	17.0 (432)
922172	Electric	44 (1118)	18.0 (457)
922173	Electric	44 (1118)	19.0 (483)
922174	Air	44 (1118)	15.1 (384)
922175	Air	44 (1118)	15.6 (396)
922176	Air	44 (1118)	17.0 (432)
922177	Air	44 (1118)	18.0 (457)
922178	Air	44 (1118)	19.0 (483)
922179	Electric	45 (1092)	15.1 (384)
922180	Electric	45 (1092)	15.6 (396)
922181	Electric	45 (1092)	17.0 (432)
922182	Electric	45 (1092)	18.0 (457)
922183	Electric	45 (1092)	19.0 (483)
922184	Air	45 (1092)	15.1 (384)
922185	Air	45 (1092)	15.6 (396)
922186	Air	45 (1092)	17.0 (432)
922187	Air	45 (1092)	18.0 (457)
922188	Air	45 (1092)	19.0 (483)

Parts

LSA–300 AGITATOR (continued)

Agitator Part No.	Drive Type	Shaft Length in. (mm)	Impeller Diameter in. (mm)
962828	Electric	46 (1118)	15.1 (384)
922189	Electric	46 (1118)	15.6 (396)
922190	Electric	46 (1118)	17.0 (432)
922191	Electric	46 (1118)	18.0 (457)
922192	Electric	46 (1118)	19.0 (483)
922193	Air	46 (1118)	15.1 (384)
922194	Air	46 (1118)	15.6 (396)
922195	Air	46 (1118)	17.0 (432)
922196	Air	46 (1118)	18.0 (457)
922197	Air	46 (1118)	19.0 (483)

Impeller blades, 0.79 in. (20 mm) bore (LSA 300, 300H)

Part No.	Diameter in. (mm)	Gal/Rev. [1]
51A018	15.1 (383.5)	8.31
515777	15.6 (396.2)	9.16
515778	17.0 (431.8)	11.8
515779	18.0 (457.2)	14.0
515780	19.0 (482.6)	16.5

[1] Multiply by RPM to obtain gallons per minute flow capacity

Accessories

Part No.	Description
618776	Adapter plate (LSA 117 to LSA 200/220)
962802	Adapter plate (LSA 80 to LSA 200/220)
516315	Gortex gasket (ID 2.5 in, OD 7.5 in x 0.06 in)

Technical Data

Model	Motor Type	Motor RPM	Gear Ratio	Shaft RPM	Voltage Input	Amp/Air/Oil Consumption	Maximum Working Pressure
LSA 200	Electric[1]	1750	5.04:1	350	230/460	.8 @ 460 /1.5 @ 230	——
	Air[2]	0-1750	5.04:1	0-350	——	15 scfm (6.5 bar) @ 90 psi	90 psi
LSA 200H	Hydraulic[3]	0-350	——	0-350	——	.85 gpm @ 800 psi	800 psi
LSA 220	Electric[1]	1750	6.3:1	280	230/460	.8 @ 460 /1.5 @ 230	——
	Air[2]	0-1750	6.3:1	0-280	——	15 scfm (6.5 bar) @ 90 psi	90 psi
LSA 220H	Hydraulic[4]	0-280	——	0-280	——	1.0 gpm @ 600 psi	600 psi
LSA 300	Electric[1]	900	6.3:1	145	230/460	.9 @ 460 /1.7 @ 230	——
	Air[2]	0-900	6.3:1	0-145	——	15 scfm (6.5 bar) @ 90 psi	90 psi
LSA 300H	Hydraulic[5]	0-145	——	0-145	——	.85 gpm @ 800 psi	800 psi

[1] Standard electric motor is .25hp, 3-phase, 60 Hz, Class 1, Group D, Explosion Proof
[2] Air motors are non-lubricated, and require 5 micron air filter (part no. 515873).
[3] Hydraulic motor is direct drive, .5 cu. in. displacement.
[4] Hydraulic motor is direct drive, .79 cu. in. displacement.
[5] Hydraulic motor is direct drive, 1.21 cu. in. displacement.

Wetted Parts Materials

All shafts and impellers are 316 stainless steel.
Flange is electroless nickel plated.

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.

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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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