

Installation,
Operation, and
Maintenance Manual



Serie B35



Serie C17



Serie C35



Domestic[®] Pump Centrifugal Pumps

Series B35, C17, C35



Bell & Gossett
a xylem brand

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Introduction and Safety

Introduction

Purpose of this manual

The purpose of this manual is to provide necessary information for:

- Installation
- Operation
- Maintenance



CAUTION:

Read this manual carefully before installing and using the product. Improper use of the product can cause personal injury and damage to property, and may void the warranty.

NOTICE:

Save this manual for future reference, and keep it readily available at the location of the unit.

Safety



WARNING:

- The operator must be aware of safety precautions to prevent physical injury.
 - Any pressure-containing device can explode, rupture, or discharge its contents if it is over-pressurized. Take all necessary measures to avoid over-pressurization.
 - Operating, installing, or maintaining the unit in any way that is not covered in this manual could cause death, serious personal injury, or damage to the equipment. This includes any modification to the equipment or use of parts not provided by Xylem. If there is a question regarding the intended use of the equipment, please contact a Xylem representative before proceeding.
 - This manual clearly identifies accepted methods for disassembling units. These methods must be adhered to. Trapped liquid can rapidly expand and result in a violent explosion and injury. Never apply heat to impellers, propellers, or their retaining devices to aid in their removal.
 - Do not change the service application without the approval of an authorized Xylem representative.
-



CAUTION:

You must observe the instructions contained in this manual. Failure to do so could result in physical injury, damage, or delays.




Safety terminology and symbols

About safety messages

It is extremely important that you read, understand, and follow the safety messages and regulations carefully before handling the product. They are published to help prevent these hazards:

- Personal accidents and health problems
- Damage to the product
- Product malfunction

Hazard levels

Hazard level	Indication
 <p>DANGER:</p>	A hazardous situation which, if not avoided, will result in death or serious injury
 <p>WARNING:</p>	A hazardous situation which, if not avoided, could result in death or serious injury
 <p>CAUTION:</p>	A hazardous situation which, if not avoided, could result in minor or moderate injury
<p>NOTICE:</p>	<ul style="list-style-type: none"> • A potential situation which, if not avoided, could result in undesirable conditions • A practice not related to personal injury

Hazard categories

Hazard categories can either fall under hazard levels or let specific symbols replace the ordinary hazard level symbols.

Electrical hazards are indicated by the following specific symbol:



Electrical Hazard:

These are examples of other categories that can occur. They fall under the ordinary hazard levels and may use complementing symbols:

- Crush hazard
- Cutting hazard
- Arc flash hazard

User safety

General safety rules

These safety rules apply:

- Always keep the work area clean.
- Pay attention to the risks presented by gas and vapors in the work area.
- Avoid all electrical dangers. Pay attention to the risks of electric shock or arc flash hazards.
- Always bear in mind the risk of drowning, electrical accidents, and burn injuries.

Safety equipment

Use safety equipment according to the company regulations. Use this safety equipment within the work area:

- Hard hat
- Safety goggles, preferably with side shields
- Protective shoes

- Protective gloves
- Gas mask
- Hearing protection
- First-aid kit
- Safety devices

NOTICE:

Never operate a unit unless safety devices are installed. Also see specific information about safety devices in other chapters of this manual.

Electrical connections

Electrical connections must be made by certified electricians in compliance with all international, national, state, and local regulations. For more information about requirements, see sections dealing specifically with electrical connections.

Precautions before work

Observe these safety precautions before you work with the product or are in connection with the product:

- Provide a suitable barrier around the work area, for example, a guard rail.
- Make sure that all safety guards are in place and secure.
- Make sure that you have a clear path of retreat.
- Make sure that the product cannot roll or fall over and injure people or damage property.
- Make sure that the lifting equipment is in good condition.
- Use a lifting harness, a safety line, and a breathing device as required.
- Allow all system and pump components to cool before you handle them.
- Make sure that the product has been thoroughly cleaned.
- Disconnect and lock out power before you service the pump.
- Check the explosion risk before you weld or use electric hand tools.

Environmental safety

The work area

Always keep the station clean to avoid and/or discover emissions.

Waste and emissions regulations

Observe these safety regulations regarding waste and emissions:

- Appropriately dispose of all waste.
- Handle and dispose of the processed liquid in compliance with applicable environmental regulations.
- Clean up all spills in accordance with safety and environmental procedures.
- Report all environmental emissions to the appropriate authorities.



WARNING:

Do NOT send the product to the Xylem manufacturer if it has been contaminated by any nuclear radiation. Inform Xylem so that accurate actions can take place.

Electrical installation

For electrical installation recycling requirements, consult your local electric utility.

Product warranty

Coverage

Xylem undertakes to remedy defects in products from Xylem under these conditions:

- The faults are due to defects in design, materials, or workmanship.
- The faults are reported to an local sales and service representative within the warranty period.
- The product is used only under the conditions described in this manual.
- The monitoring equipment incorporated in the product is correctly connected and in use.
- All service and repair work is done by Xylem authorized personnel.
- Genuine Xylem parts are used.
- Only Ex-approved spare parts and accessories authorized by an EX-approved Xylem representative are used in Ex-approved products.

Limitations

The warranty does not cover defects caused by these situations:

- Deficient maintenance
- Improper installation
- Modifications or changes to the product and installation made without consulting an Xylem authorized representative
- Incorrectly executed repair work
- Normal wear and tear

Xylem assumes no liability for these situations:

- Bodily injuries
- Material damages
- Economic losses

Warranty claim

Xylem products are high-quality products with expected reliable operation and long life. However, should the need arise for a warranty claim, then contact your local sales and service representative.

Transportation and Storage

Inspect the delivery

Inspect the package

1. Inspect the package for damaged or missing items upon delivery.
2. Note any damaged or missing items on the receipt and freight bill.
3. File a claim with the shipping company if anything is out of order.
If the product has been picked up at a distributor, make a claim directly to the distributor.

Inspect the unit

1. Remove packing materials from the product.
Dispose of all packing materials in accordance with local regulations.
2. Inspect the product to determine if any parts have been damaged or are missing.
3. If applicable, unfasten the product by removing any screws, bolts, or straps.
For your personal safety, be careful when you handle nails and straps.
4. Contact your sales representative if anything is out of order.

Lifting



WARNING:

Any lifting eyes supplied are for lifting the pump only. Failure to do so could result in death or serious injury.

Use care in handling the unit.

Long-term storage

If the unit is stored for more than 6 months, these requirements apply:

- Store in a covered and dry location.
- Store the unit free from heat, dirt, and vibrations.
- Rotate the shaft by hand several times at least every three months.

Treat bearing and machined surfaces so that they are well preserved. Refer to the drive unit and coupling manufacturers for their long-term storage procedures.

For questions about possible long-term storage treatment services, please contact your local sales and service representative.

Product Description

General description

Features

The Series B35, C17, and C35 are bronze-fitted, centrifugal pumps with these features:

- Vertical mounting, which protects the motor from moisture and dirt
- Heavy-duty ball bearing motor
- Stainless steel shaft
- Low NPSH, enclosed impeller
- Additional axial flow booster impeller for 2 ft. (0.6 m) NPSH_R in Series B35 pumps
- Large impeller eyes and generously sized suction pipes and passages to facilitate the pumping of hot water in condensate and boiler feed applications
- 35 psi suction pressure
- Suction flange for mounting pump directly on a tank or receiver
- Available feet for free-standing operation

Applications



WARNING:

California Proposition 65 warning! This product contains chemicals known to the state of California to cause cancer and birth defects or other reproductive harm.

The pumps are basic components in condensate-handling equipment and are also suitable for these types of service:

- Hot water heating
- Irrigation
- Evaporative condensers
- Cooling towers
- Air-conditioning units
- Milk coolers
- Booster service

Operational specifications

Pressure limits



WARNING:

Explosion hazard. Do not pressurize the volute beyond its pressure rating, which is 35 psi, unless otherwise specified.

Temperature limits

Motors are designed to operate in 104°F (40°C) maximum ambient temperature. Insulate or ventilate the pump as required.

Pumped fluids



CAUTION:

Always inject the boiler compounds from the chemical feed tank into the boiler feed piping, and never ahead of the pump.

Nameplate information

Every pump not installed on an assembled condensate unit has a nameplate that provides information about the pump. Make sure that the nameplate ratings agree with the job specifications and actual conditions.



Figure 1: Nameplate used on pumps not installed on an assembled condensate unit

When you order spare parts, identify this pump information:

- Model
- Size
- Serial number

If the pump is installed on an assembled condensate unit, the pump information is included on the nameplate of the unit. See the condensate unit manual for pump information.

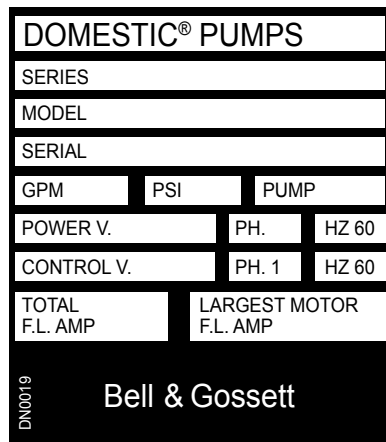


Figure 2: Nameplate on an assembled condensate unit with pump information included

If these nameplates are missing or not readable, contact your local sales and service representative for a replacement.

Installation

Preinstallation

Pump location guidelines

Follow these guidelines for locating the unit:

- Position the unit for easy access to all parts.
- Allow adequate space for servicing.
- Check ambient conditions.

Piping checklist



WARNING:

- The heating of water and other fluids causes volumetric expansion. The associated forces can cause the failure of system components and the release of high-temperature fluids. In order to prevent this, install properly sized and located compression tanks and pressure-relief valves. Failure to follow these instructions can result in serious personal injury or death, or property damage.
- Avoid serious personal injury and property damage. Make sure that the flange bolts are adequately torqued.
- Never force piping to make a connection with a pump.

Check	Explanation/comment	Checked
Check that a section of straight pipe, with a length that is five times its diameter, is installed between the suction side of the pump and the first elbow, or that a suction diffuser is installed.	This reduces suction turbulence by straightening the flow of liquid before it enters the pump.	
Check that the suction and discharge pipes are supported independently by use of pipe hangers near the pump .	This eliminates pipe strain on the pump .	
Check that there is a strong, rigid support for the suction and discharge lines.	As a rule, ordinary wire or band hangers are not adequate to maintain proper alignment.	
For pumps with flanges, check that the bolt holes in the pump flanges match the bolt holes in the pipe flanges.	–	
Check that the suction or discharge lines are not forced into position.	–	
Check that fittings for absorbing expansion are installed in the system when considerable temperature changes are expected.	This helps to avoid strain on the pump.	
Check that a triple duty valve is installed in the discharge line.	This valve serves as a check valve that protects the pump from water hammer, and serves as an isolation valve for servicing and for throttling.	
Check that the pipeline has isolation valves around the pump and has a drain valve in the suction pipe.	–	
Use PTFE tape sealer or a high quality thread sealant when you install the suction and discharge connections to a threaded pump housing.	–	

Check	Explanation/comment	Checked
Check that gauge ports are installed in the suction and discharge pipes.	–	

A vent is provided. When appropriate, a 3/16 in. (4.76 mm) tube can be run up to a tank on the suction side of the pump for automatic air venting.

System conditions

Make sure that the system has been properly cleaned before you install the pump. Foreign matter such as dirt, pipe scale, or core sand may clog the impeller and damage the mechanical seal.

It is recommended that you install a strainer in the return line to the pump.

For operation at extremely high or low temperatures, you must install guarding or insulation.

Connect the wiring



WARNING:

Disconnect and lock out electrical power before installing or servicing the pump.

Motors must have properly sized starters with properly sized heaters in order to provide overload and undervoltage protection.

All single-phase motors have internal thermal protection.

Three-phase motors must use starters with properly sized overload relays. The furnished overload relays are designed for manual reset.

1. Connect the power wiring in accordance with all local, state, national, and international regulations.
2. Recheck the nameplate information against job specifications and actual conditions.

Commissioning, Startup, Operation, and Shutdown

Prepare for startup



WARNING:

- Explosion hazard. Do not pressurize the volute beyond its pressure rating, which is 35 psi, unless otherwise specified.
 - Disconnect and lock out electrical power before installing or servicing the pump.
-



CAUTION:

Operating the pump in reverse rotation can result in the contact of metal parts, heat generation, and breach of containment.

1. Make sure that the unit is piped in accordance with the system design.
2. Check the power leads in accordance with the wiring diagram. Check the motor wiring against the available voltage.
3. Install the drain plugs.
4. Prime the pump to prevent possible damage to the pump seals.
Avoid freezing conditions after the unit receiver has been filled.
5. Check for proper rotation of all three-phase motors.
Rotation must be clockwise looking down on the motor, as indicated by the directional arrow on the pump casing. If the pump runs backwards, interchange two wires (three-phase only).

Start the pump



CAUTION:

Never operate the pump without liquid supplied to mechanical seal. If you run a mechanical seal dry, even for a few seconds, this can cause seal damage. Physical injury can occur if a mechanical seal fails.

1. Throttle the plug cock or triple duty valve in the discharge line until the pressure at the pump, while the pump is discharging, approaches the rated pressure for the pump.
2. Tighten the plug nut to secure the adjustment.
3. If the pump is used as a boiler feed pump, observe the following warning:



WARNING:

Maintain boiler safety features. When you connect the boiler feed unit to the boiler, make sure that all boiler safety controls (burner cutoff, etc.) are always operational. With certain control arrangements, dedicated boiler controllers are required for the boiler feed pumps. Failure to follow these instructions could result in serious injury, death, or extensive property damage.

4. Bleed all air from the volute.
Where appropriate, use an air bleed line to a tank ahead of the pump.
5. Remove the start-up label, if applicable, after you have complied with the instructions on the label.

ELECTRICIAN / INSTALLER / OPERATOR
REMOVE AND DESTROY THIS TAG AFTER —
1. ASSURING THAT ALL PUMPS ROTATE CLOCKWISE PER ARROWS CAST ON VOLUTES.
(JOG PUMP MOMENTARILY TO TEST — INTERCHANGE ANY TWO MOTOR POWER WIRES
TO REVERSE 3PH MOTORS.)
2. ASSURING THAT SHIPPING LOCKS HAVE BEEN REMOVED FROM ALL FLOAT SWITCHES.

6. If possible, observe the operation through several cycles.

Pump operation precautions



WARNING:

The installed boiler feed pump becomes an integral part of the boiler system. Boiler operation and maintenance require specific skills and training and may require licensing or certification. The boiler feed unit must be operated and maintained so as not to jeopardize the boiler operation.



CAUTION:

A unit that shows symptoms of possible problems, such as overflow, noise, leaks, vibrations, or continual operation, must be corrected immediately.

Shut down the pump

1. Slowly close the discharge valve.
2. Shut down and lock the driver to prevent accidental rotation.

Maintenance

General maintenance guidelines

Lubrication requirements

The pumps require no lubrication.
Check the motor nameplate for motor lubrication requirements.

Auto restart

Single-phase motors will restart automatically after the thermal overload protector trips.
You must manually reset overload thermal relays in starters.

Periodic checks

A properly installed unit should function unattended for long periods of time. Periodic checks to assure proper operation are highly recommended. Refer to the Troubleshooting section when necessary.



WARNING:

The installed boiler feed pump becomes an integral part of the boiler system. Boiler operation and maintenance require specific skills and training and may require licensing or certification. The boiler feed unit must be operated and maintained so as not to jeopardize the boiler operation.



CAUTION:

A unit that shows symptoms of possible problems, such as overflow, noise, leaks, vibrations, or continual operation, must be corrected immediately.

Disassembly

Disassembly precautions



WARNING:

- This manual clearly identifies accepted methods for disassembling units. These methods must be adhered to. Trapped liquid can rapidly expand and result in a violent explosion and injury. Never apply heat to impellers, propellers, or their retaining devices to aid in their removal.
 - Make sure that the pump is isolated from the system and that pressure is relieved before you disassemble the pump, remove plugs, open vent or drain valves, or disconnect the piping.
 - Always disconnect and lock out power to the driver before you perform any installation or maintenance tasks. Failure to disconnect and lock out driver power will result in serious physical injury.
 - Crush hazard. The unit and the components can be heavy. Use proper lifting methods and wear steel-toed shoes at all times.
-

NOTICE:

Make sure that all replacement parts are available before you disassemble the pump for overhaul.

Drain the pump



WARNING:

Always disconnect and lock out power to the driver before you perform any installation or maintenance tasks. Failure to disconnect and lock out driver power will result in serious physical injury.



CAUTION:

Allow all system and pump components to cool before you handle them to prevent physical injury.

1. Close the pump isolation valve or system return line valve or inlet line gate valve.
2. Operate the pump momentarily in order to discharge as much water as possible.
3. Close the pump discharge valve or discharge line gate valve.
4. Shut off and lock out the power.
5. If the pump is a Series C35 model 609PF, disconnect the wiring to the motor.
6. Make sure that the unit is cool enough so that the pump can be handled safely.
7. Open the drain in order to remove the remaining liquid.
8. Carefully remove the pump drain plug and the bleed line.

Do not proceed with the disassembly until the pump has completely drained.

Disassemble the Series B35 pump



CAUTION:

Pressurized device. The system may contain very hot water. Close the inlet and open the drains before servicing the unit. Loosen screws and move components in order to make sure that pressure is relieved before you remove the screws. Keep the drains open while you service the unit.

1. Loosen both the discharge connection and the fasteners that hold the suction housing to the pump volute.
2. Make sure that the pressure has been relieved before proceeding.
3. Remove the loosened hardware.
4. Remove the pump and motor assembly and place it on a workbench.
5. Remove the suction housing capscrews and separate the pump and motor assembly from the suction housing.

Note that the diffuser should separate from the suction housing in order to allow removal of the pump and motor assembly.

6. Remove the propeller, propeller stem, and diffuser from the assembly:

If...	Then...
The motor shaft is threaded	<ol style="list-style-type: none"> 1. Remove the propeller locknut. 2. Remove the propeller and propeller stem as an assembly with the diffuser. 3. If you are installing a new propeller, remove the propeller setscrews and separate the propeller from the stem.
The motor shaft is keyed	<ol style="list-style-type: none"> 1. Remove the propeller setscrews. 2. Remove the propeller. 3. Remove the diffuser. 4. Unscrew the propeller stem.

7. Remove the capscrews that hold the motor bracket and pump volute together.

8. Remove the motor and bracket assembly from the volute by lifting straight away from the volute.
9. Remove the impeller from the motor shaft:

If...	Then...
The motor shaft is threaded	Hold the end of the motor shaft that is opposite the pump with a large screwdriver or other suitable tool and back off the impeller with a rectangular bar or other flat tool inserted between the vanes of the impeller.
The motor shaft is keyed	Remove the impeller with a gear puller or other means that will not damage the impeller or bend the motor shaft.

10. Remove the rotating part of the seal from the shaft.
Take care not to break the carbon face.
11. Remove the capscrews that hold the motor bracket to the motor and remove the bracket.
12. Remove the stationary part of the seal assembly.
Take care not to chip or break the ceramic seal.

Disassemble the Series C17 and C35 pump (except model 609)



CAUTION:

Pressurized device. The system may contain very hot water. Close the inlet and open the drains before servicing the unit. Loosen screws and move components in order to make sure that pressure is relieved before you remove the screws. Keep the drains open while you service the unit.

1. Loosen the capscrews that hold the motor bracket to the pump volute.
2. Make sure that the pressure has been relieved before proceeding.
3. Remove the loosened hardware.
4. Remove the pump and motor assembly and place it on a workbench.
5. Remove the self-locking stainless steel capscrews and the stainless steel washer, or the self-locking brass cap nut and washer, that secure the impeller in place.
6. Remove the impeller from the motor shaft:

If...	Then...
The motor shaft is threaded	Hold the end of the motor shaft that is opposite the pump with a large screwdriver or other suitable tool and back off the impeller with a rectangular bar or other flat tool inserted between the vanes of the impeller.
The motor shaft is keyed	Remove the impeller with a gear puller or other means that will not damage the impeller or bend the motor shaft.

7. Remove the rotating part of the seal from the shaft.
Take care not to break the carbon face.
8. Remove the capscrews that hold the motor bracket to the motor and remove the bracket.
9. Remove the stationary part of the seal assembly.
Take care not to chip or break the ceramic seal.

Disassemble the Series C35 model 609PF



CAUTION:

Pressurized device. The system may contain very hot water. Close the inlet and open the drains before servicing the unit. Loosen screws and move components in order to make sure that pressure is relieved before you remove the screws. Keep the drains open while you service the unit.

1. Loosen the fasteners that hold the motor to the pump volute.
2. Make sure that the pressure has been relieved before proceeding.
3. Remove the four capscrews that hold the pump casing to the motor and lift the motor and impeller out of the pump casing.
4. Remove the pump and motor assembly and place it on a workbench.
5. Hold the top end of the motor shaft with a large screwdriver inserted in the screwdriver slot in the shaft, and back off the impeller, counter-clockwise, with a rectangular bar or other flat tool inserted between the vanes of the impeller.
6. Remove the rotating part of the mechanical seal from the end of the shaft.
7. Remove the seal holder with the stationary ceramic part of the mechanical seal and the cup rubber from the end of the shaft.
8. Remove the stationary ceramic part of the mechanical seal and the cup rubber from the recess in the seal holder.

Reassembly

Install the mechanical seal (except Series C35 model 609)

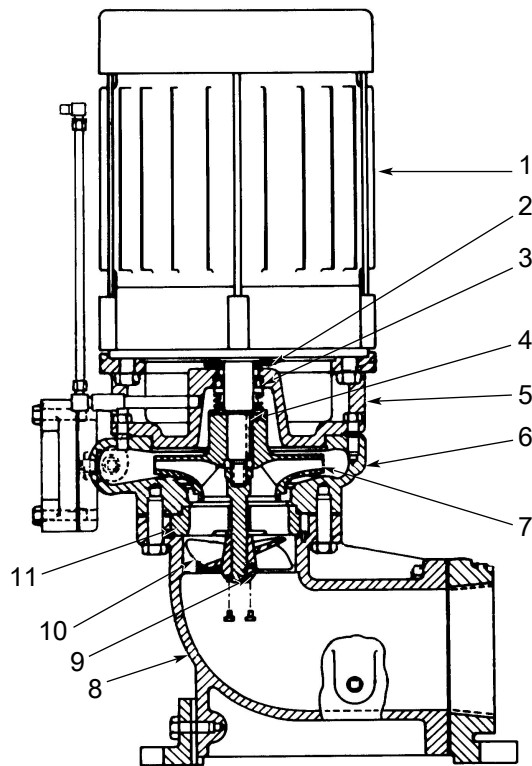
1. Thoroughly clean the recess in the bracket.
2. Coat the recess and the rubber portion of the seal with a soap solution.
3. Firmly press the seal into the recess by hand.
Make certain that both parts bottom evenly. If the seal cannot be bottomed with the fingers, then place a cardboard shipping disc on the ceramic and force the seal into place with a flat tool.
4. Carefully place the bracket in position on the motor shaft without displacing the ceramic seal.
5. Secure the bracket to the motor with capscrews.
6. Position the motor vertically with the pump end up.
Do not attempt to assemble the seal and impeller with the shaft in a horizontal position.
7. Make sure that the carbon of the rotating part of the seal is not loose.
If the carbon is loose, do the following:
 - a) Hold the carbon in place with grease.
 - b) Wipe the mating surfaces perfectly clean with a clean, lint-free cloth.
 - c) Soap the shaft.
 - d) Push the seal onto the shaft so that the carbon contacts the ceramic seal.
 - e) If a spacer is required, use grease to adhere the spacer to the bottom of the seal after the seal has been put on the shaft.
Make sure that the spacer is on the larger diameter of the shaft so that it will not catch between the shoulder and the impeller.

Install the mechanical seal (Series C35 model 609PF)

1. Thoroughly clean the recess in the seal holder.

2. Orient the motor so that the conduit opening on the motor is to the left when looking at the motor shaft.
3. Orient the wire spacer eye to the left, midway between the motor lugs.
4. Replace the seal holder over the wire spacer on the face of the motor, maintaining concentricity with the motor face.
5. Place the new ceramic part of the seal in the cup rubber over the motor shaft and press firmly into the recess of the seal holder by hand.
Make sure that both parts bottom evenly. If the assembly cannot be bottomed with the fingers, then place a wooden or cardboard tube over the shaft onto the ceramic and push it into place.
6. Wipe the mating surfaces of the seal clean with a clean, lint-free cloth.
7. Moisten the carbon section of the rotating part of the seal and place it onto the shaft to seat against the ceramic.
8. Place the seal spring onto the shaft.

Assemble the Series B35 pump

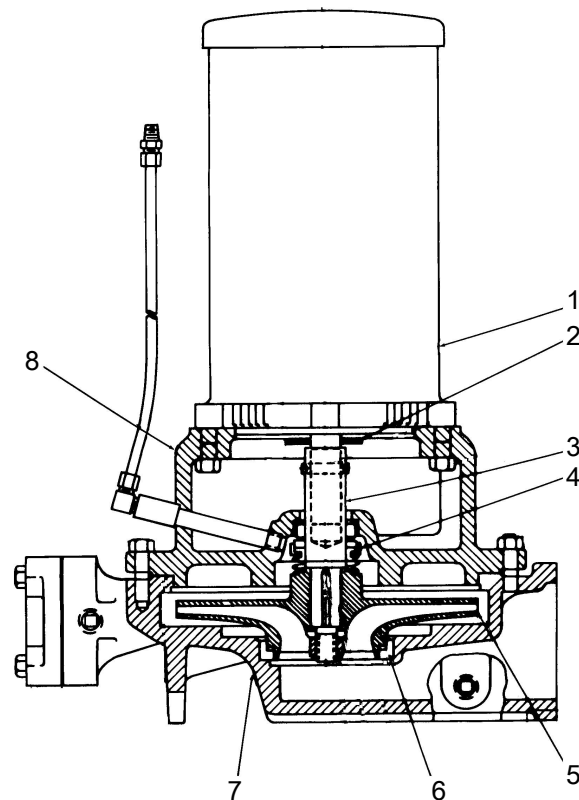


1. Heavy-duty, ball bearing motor
2. Water slinger
3. Mechanical seal
4. Stainless steel shaft
5. Motor bracket
6. Pump volute with wear ring
7. Impeller
8. Suction housing
9. Propeller setscrew
10. Axial flow propeller
11. Diffuser

1. Place the impeller on the shaft.
Make sure the impeller is seated properly.
2. Reassemble the volute to the bracket.

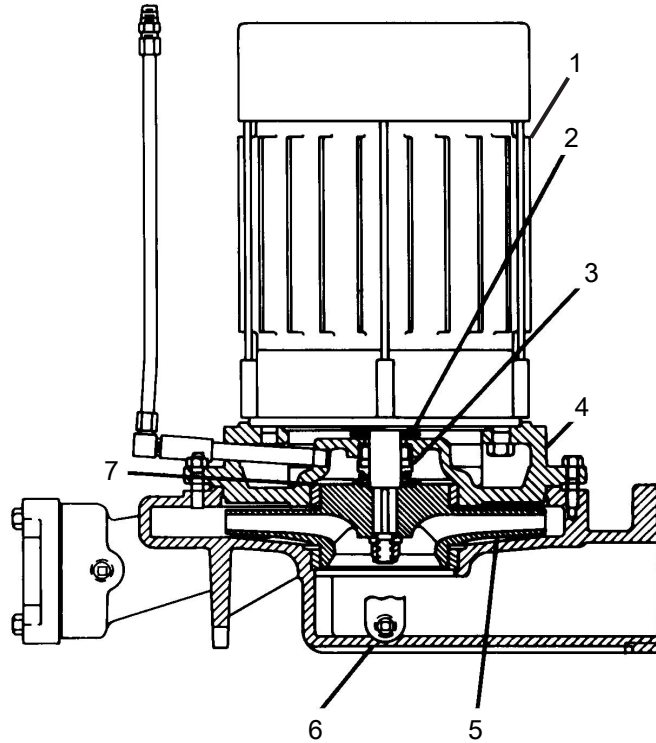
3. Install the stem over the drive pin in the impeller eye and tighten the locknut.
4. Set the stem to 0.004 in. (0.1 mm) TIR.
5. Install the diffuser.
6. Install the propeller and tighten the setscrews.
7. Use a new gasket and note the alignment pin when you install the assembly on the suction housing.
8. Install the suction housing and discharge fasteners, and tighten.

Assemble the Series C17 and C35 pump



1. Motor
2. Water slinger
3. Shaft
4. Mechanical seal
5. Impeller
6. Wear ring
7. Volute
8. Motor bracket

Figure 3: Series C17

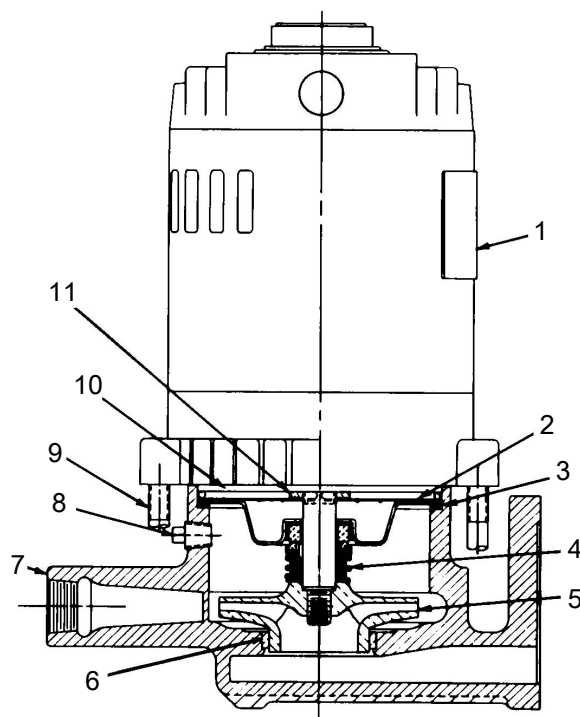


- 1. Motor
- 2. Water slinger
- 3. Mechanical seal
- 4. Motor bracket
- 5. Impeller
- 6. Volute
- 7. Wear ring

Figure 4: Series C35

- 1. Place the impeller on the shaft.
- 2. Reinstall the stainless steel washer and secure the impeller with the capscrew or cap nut.
- 3. Place a new gasket on the pump volute.
- 4. Reassemble the motor and pump subassembly on the pump volute.

Assemble the Series C35 model 609PF pump



1. Motor
2. Seal holder
3. Gasket
4. Seal
5. Impeller
6. Wear ring
7. Casing
8. Pipe plug
9. Capscrew, motor to volute
10. Wire spacer
11. Slinger

1. Hold the top end of the motor shaft with a large screwdriver inserted in the screwdriver slot in the shaft and install the impeller on the shaft (clockwise rotation).
Make sure that the impeller is tight.
2. Orient the motor for pump reassembly with the conduit opening to the left.
3. Mount the pump casing with the discharge positioned 90° to the right of the wire spacer eye and conduit opening on the motor.
Ensure a tight gasket fit in order to prevent water leaks. Also make sure that the wire spacer eye is seated in the notch in the pump casing. If this does not occur, then inspect for proper alignment and reassemble the unit.
4. Replace the four capscrews and tighten them evenly to avoid damage.

Complete the reassembly

1. Reconnect the pump bleed line.
2. Reconnect the motor wiring.



CAUTION:

Never operate the pump without liquid supplied to mechanical seal. If you run a mechanical seal dry, even for a few seconds, this can cause seal damage. Physical injury can occur if a mechanical seal fails.

3. Close the drain and slowly open the inlet valves.



WARNING:

Explosion hazard. Do not pressurize the receiver. Do not plug the overflow. Pipe the vent opening to the atmosphere. Do not restrict. Open valves slowly.

4. Jog the motor to check the rotation. If the pump runs backwards, interchange two wires (three-phase only).
-

NOTICE:

Reverse operation can cause extensive damage to pumps. Do not reverse. Jog the motor to test for direction of rotation.

5. Observe the operation through several cycles.

Troubleshooting

The pump does not start

Cause	Remedy
The power supply has been interrupted, the disconnect switch is open, or the control switch is improperly positioned.	Adjust the relevant switch.
The voltage is not correct for the motor.	Check the voltage and wiring against the motor nameplate data.
The starter coil is not correct for the power supply.	–
The overload relays in the starter have tripped out. The ambient temperature may be too high.	Reset the overload relays.
The wiring to the control is incorrect, or the connections are loose.	Adjust the wiring or tighten the connections.
The control signals are for the pump to be "off."	–

Pump capacity is reduced

Cause	Remedy
The pump is running backwards.	Rotation should be clockwise looking down on the motor toward the pump. Rotation of three-phase motors can be corrected by interchanging any two of the three wires. NOTICE: Any electrical service should be performed by a qualified electrician.
The total pressure at the pump discharge is too high.	Check the pressure requirement. This includes system back pressure, friction, and static head.
There is excessive suction lift or the piping is incorrect.	–
A valve in the pump discharge line or suction line is closed or throttled too tightly. A check valve is installed backwards.	–
The impeller eye is clogged with trash.	Clean out the impeller eye.
The pump is too small for the system.	–
A strainer is dirty and is retarding the flow.	Clean out the strainer.
The pump has lost its prime.	Release the trapped air in the pump and reprime.
Steam traps are blowing through. This causes condensate to return at excessive temperatures. This may reduce the capacity of the pump below its rating, depending on the unit and type of pump furnished.	Repair or replace the traps.
Excessive temperatures can reduce the capacity of the pump below its rating.	Use Series B35 pumps for low NPSH conditions.

The pump makes noise

Cause	Remedy
The pump is running backwards.	<p>Rotation should be clockwise looking down on the motor toward the pump.</p> <p>Rotation of three-phase motors can be corrected by interchanging any two of the three wires.</p> <hr/> <p>NOTICE: Any electrical service should be performed by a qualified electrician.</p> <hr/>
The pump is working at a pressure that is lower than that for which it was designed.	Install a square-headed plug cock or a 3D valve in the discharge line and throttle until the operating pressure at the pump approaches the rated pressure of the pump. Secure the adjustment of the plug cock by tightening the locknut.
There is a magnetic hum or bearing noise in the motor.	Consult an authorized service station of the motor manufacturer.
The starter chatters.	Check and correct possible low line voltage, poor connections, defective starter coil, or burned contacts.
Temperature is excessive.	Correct system conditions.
Air is trapped in the system.	Release the trapped air.

Dealer servicing

If trouble occurs that cannot be rectified, contact your local sales and service representative and be prepared to provide this information:

- Complete nameplate data of the pump and motor
- Suction and discharge pipe pressure gauge readings
- Ampere draw of the motor
- A sketch of the pump hookup and piping

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- 1) The tissue in plants that brings water upward from the roots
- 2) A leading global water technology company

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