



Instruction Manual

Alfa Laval GJ 7



Covering:
Standard Machines
First published: 2015-08

ESE032025-EN1 2015-08

Original manual

1. EC Declaration of Conformity	1
2. Safety.....	2
2.1. Important information	2
2.2. Warning signs	2
2.3. Safety precautions	3
3. Introduction	4
3.1. Description	4
3.2. Intended Use.....	4
3.3. Patents and trademarks.....	4
3.4. Marking.....	4
4. Installation	5
4.1. Unpacking/delivery	5
4.2. Installation	6
4.3. Recycling Information.....	8
5. Operation	9
5.1. Operation/Control	9
5.2. Trouble Shooting.....	10
5.3. Cleaning Solution Leakage	12
5.4. Poor Cleaning Performance	13
5.5. Recommended Cleaning	14
6. Maintenance	15
6.1. General Maintenance.....	15
6.2. General dismantling set up	16
6.3. General dismantling.....	17
6.4. Inspection and Service of Components	18
6.5. Reassembly	21
7. Technical Data	23
7.1. Technical Data.....	23
7.2. Performance Data.....	24
7.3. Dimensions	25
7.4. Trax Simulation Tool	26
8. Parts List and Service Kits	27
8.1. GJ7 View	27
8.2. Assembly Drawings – 1, 2, 3 & 4.....	28
8.3. Assembly Drawings – 5, 6 & 7	30
8.4. Assembly Drawings – 8, 9, 10 & 11.....	32
8.5. Assembly Drawings – 12, 13 & 14.....	35
8.6. Assembly Drawings – 15 & 16.....	37
8.7. Parts List	38
8.8. Minor Service Kit	41
8.9. Major Service Kit	42
Appendix A	43

1. EC Declaration of Conformity

The designated company

Alfa Laval Tank Equipment Inc.

Company name

604 Jeffers Circle – Exton, PA – 19341, United States

Address

+1 610 408 9940

Phone no.

hereby declare that

Tank Cleaning Machine

Denomination

Alfa Laval GJ 7

Type

From serial numbers from BZ-001 to BZ-XXXX

is in conformity with the following regulations and directives with amendments:

- The Machinery Directive 2006/42/EC

DS/EN ISO 12100:2011

- The Pressure Directive 97/23/EC

According to its own volume and the rated pressure range the product is regarded an Article 3, paragraph 3 Equipment

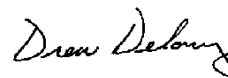
The person authorised to compile the technical file is the signer of this document.

Executive VP Operations

Title

Andrew Delaney

Name



Signature

2015-05-18

Date

Exton, United States

Place



2. Safety

Unsafe practices and other important information are emphasized in this manual. Warnings are emphasized by means of special signs.

Always read the manual before using the tank cleaning machine!

2.1 Important information

WARNING

Indicates that special procedures must be followed to avoid serious personal injury.

CAUTION

Indicates that special procedures must be followed to avoid damage to the tank cleaning machine.

NOTE

Indicates important information to simplify or clarify procedures.

2.2 Warning signs

General warning:



Dangerous electrical voltage:



Caustic agents:



2. Safety

All warnings in the manual are summarized on this page.

Pay special attention to the instructions below so that severe personal injury and/or damage to the tank cleaning machine are avoided.

2.3 Safety Precautions

Installation:

Always read the technical data thoroughly. (See chapter 7 Technical Data)



Any tank-cleaning machine can develop a static electricity charge while in operation.



If the tank being cleaned contains a combustible liquid or vapor having a risk of ignition or explosion, it is imperative to have the Alfa Laval Gamajet properly grounded using the provided location on the unit.

Operation:

Always read the technical data thoroughly. (See chapter 7 Technical Data)



Necessary precautions must be taken if leakage occurs as this can lead to hazardous situations.

Always handle lye and acid with great care.



When an Alfa Laval Gamajet is operating, there should be covers over every tank opening.

These covers should be sealed well enough to withstand the full force of the jet striking the cover plate.

If the cleaning solution were hot, corrosive, or toxic, a leak would present a serious hazard to any personnel in the immediate vicinity or to any exposed electrical equipment.



Warning: Any tank-cleaning machine can develop a static electricity charge while in operation. If the tank being cleaned contains a combustible liquid or vapor having a risk of ignition or explosion, it is imperative to have the Alfa Laval Gamajet properly grounded using the provided location on the unit.

Maintenance:

Always read the technical data thoroughly. (See chapter 7 Technical Data).



Never service the tank cleaning machine when it is hot.

Always use Alfa Laval genuine spare parts.

Transportation of the tank cleaning machine:

Always drain the tank cleaning machine head and accessories of any liquid

Always use original packaging or similar during transportation.

4. Installation

3.1 Description

The Alfa Laval GJ 7 is a fluid-driven (turbine-driven) 360° rotary nozzle machine designed for cleaning the interior surfaces of a wide variety of small process and storage barrels, drums or containers with a minimum opening of 1-½" (38.1 mm) in diameter. It is powered entirely by the cleaning solution; it requires no electricity, compressed air or lubricant for operation. The Alfa Laval GJ 7 is designed primarily for portable service; however, the unit may also be permanently installed in a vessel. If the Alfa Laval GJ 7 is permanently mounted inside a tank, we strongly recommend inspecting the unit every few hundred hours of operation. (See Chapter 6 - Maintenance for more information.)

WARNING: Under no conditions, whatsoever, should the Alfa Laval GJ 7 ever be immersed in anything, unless you have prior approval from Alfa Laval Tank Equipment, Inc. Failure to comply with this restriction will void the warranty!!

In order to handle the broadest possible range of applications, the stainless steel Alfa Laval GJ 7 is available with dual or triple nozzles, and an extensive selection of nozzle sizes, stators (non-rotating turbine) O-ring material and gear ratios. Alfa Laval Gamajet nozzles are available in several interchangeable sizes ranging from 0.070" to 0.100" (1.7 mm to 2.5 mm). The Alfa Laval Gamajet wash cycle time can be adjusted for special applications by changing the stators and nozzle size. Interchangeable stators and nozzle sizes are available for either low or high pressures and/or flow rates. The performance capabilities of these options are detailed in Chapter 7 Technical Data.

3.2 Intended Use

It is to be verified by the end-user:

- that the tank cleaning machine is in conformity with respect to tank, vessel or container size in which it will be used.
- that the construction materials (both metallic and non-metallic) are compatible with product, flushing media, cleaning media, temperatures and pressure under the intended use.

3.3 Patents and trademarks

This Instruction Manual is published by Alfa Laval Tank Equipment without any warranty. Improvements and changes to this Instruction Manual may at any time be made by Alfa Laval Tank Equipment without prior notice. Such changes will, however, be incorporated in new editions of this Instruction Manual.

© Alfa Laval Tank Equipment. All rights reserved.

The Alfa Laval logotype is a trademark or a registered trademark of Alfa Laval Corporate AB. "Gamajet" is a trademark or registered trademark of Alfa Laval Tank Equipment. The Alfa Laval GJ 7 product has patent in the US (US 6.123.271). Other products or company names mentioned herein may be the trademarks of their respective owners. Any rights not expressly granted herein are reserved.

3.4 Marking

Alfa Laval tank cleaning machines are all marked to allow recognition of machine type, machine name, Serial number and manufacturing address. The marking is placed on the body of the tank cleaning machine.

Alfa Laval Tank Equipment – Exton, PA
Patent #: 6,123,271



4. Installation

4.1 Unpacking/Delivery

Step 1

CAUTION

Alfa Laval cannot be held responsible for incorrect unpacking.

Check the delivery for:

1. Complete Cleaning Machine
 2. Delivery note
-

Step 2

Remove any packing material.

Step 3

Inspect the tank cleaning machine for visible transport damage.

Inspection!

4. Installation

Read the instructions carefully and pay special attention to the warnings! Always check the tank cleaning machine before operation.

4.2 Installation

Step 1



Always read the technical data thoroughly.

(See chapter 7 Technical Data)

Step 2

Assembly

Every Alfa Laval Gamajet is operationally tested before shipment and is ready to run after unpacking. No assembly is required prior to use. The Alfa Laval Gamajet has been configured to meet the operating conditions (at the Alfa Laval Gamajet, not at the pump) given to us, e.g., pressure, flow, temperature, cycle time, chemical adders, etc.

Note: Any change to the original operating conditions will affect the Alfa Laval Gamajet accordingly.

WARNING: Do not force Tee (4) & Nozzle Housing (5) to rotate. Doing so will damage internal components.

Step 3

Inlet Connections

The Alfa Laval GJ 7 is supplied with a 1/2" NPT/ BSP female inlet connection. It is recommended that the mating male thread should be wrapped with PTFE pipe joint tape prior to mounting. This will minimize any chance of leakage and will make subsequent removal much easier.

Step 4

Mounting

Before mounting the Alfa Laval GJ 7, make sure the supply line has been adequately flushed. It should be mounted on a rigid 1/2" (12.7 mm) pipe using a 1-1/8" (28.5 mm) open-end or adjustable wrench. In most applications, the Alfa Laval GJ 7 will be mounted with the inlet connection pointing down; however, the Alfa Laval Gamajet will function at any orientation. We do not recommend attaching the machine to a hose while in the inverted or horizontal orientation. This form of mounting is not rigid and, thus, will not maintain the Alfa Laval Gamajet's position should the unit become unbalanced due to clogging of the nozzles. In addition, we do not recommend using a Triple Nozzle machine with a flexible supply line. The dynamic imbalance of the Triple Nozzle will affect the Alfa Laval Gamajet's performance accordingly.

WARNING: When attaching the Alfa Laval GJ 7 onto the supply pipe, **ALWAYS** use the wrench flats on the Inlet Collar at the top/inlet of the unit. **Never** use a wrench on Stem or Tee Housing to tighten the unit onto the pipe. Doing so risks internally damaging the machine. Please refer to Drawing 16.

Step 5

Location inside Tank

Generally, a single Alfa Laval Gamajet should be positioned in the approximate center of the vessel in order to equalize the cleaning radius in all directions. Some vessels may have specific cleaning problems such as coils or heavy deposits such as the liquid level line (bathtub ring). In these situations the Alfa Laval Gamajet should be located closer to the difficult area for the best cleaning results.

Tanks with internal mechanisms or structures such as an agitator shaft, impellers or baffles will require careful positioning to minimize the "shadow" on areas which do not receive direct jet impact. Sometimes, more than one machine, or, more than one placement of a single machine, may be necessary to completely avoid shadow problems.

4. Installation

Read the instructions carefully and pay special attention to the warnings! Always check the tank cleaning machine before operation.

Step 6

Entry Openings

When using the Alfa Laval GJ 7, the vessels being cleaned must provide entry openings large enough to avoid interference during insertion and removal. The minimum opening size required for the Alfa Laval GJ 7 is 1-½" (38.1 mm) in diameter for free-hand installation, and 1-15/16" (49.2 mm) for fixed-centerline installation.

Step 7

Vessel Drainage

If it is necessary to clean the floor of a vessel, remember that standing liquid will diminish the effectiveness of the jet by covering any soils underneath. Wherever possible, the tank floor should be pitched toward the drain and the drainage opening should be large enough to eliminate or reduce any liquid buildup or puddling. If gravity alone is insufficient, a scavenger or stripper pump should be connected to the drain to suck out the excess wash fluid. In extreme cases, it may be necessary to use smaller nozzles on the Alfa Laval Gamajet, or even to operate it intermittently to allow time for draining.

Step 8

Filters and Strainers

As an accessory, Alfa Laval Tank Equipment, Inc. sells a strainer to be used in conjunction with the machine. The main component is a heavy duty Y-Strainer that allows for on-line cleaning of the screen without disassembly of the surrounding plumbing. By simply opening the included ball valve, the heavy particulate that has collected on the screen can be blown-down. The screen can also be visually inspected by simply removing the cover of the strainer and, again, without disassembly of the piping.

If Alfa Laval Gamajet's strainer is not used, the systems should be equipped with a filter or strainer that will trap solids 0.004"/0.1 mm (100 micron/ 140 mesh) or larger. The use of a filter ensures adequate removal of particles and debris that can come from hard water, dirty heating coils, line sediment, and well water. A supply of clean wash fluid to the Alfa Laval GJ 7 and, more importantly, the vessel is a must.

Step 9

Capacity of Supply Pump

In the majority of cases a positive displacement (PD) style pump (i.e. a pressure washer, piston pump, plunger pump, and mechanical diaphragm pump) will supply the wash fluid to the Alfa Laval GJ 7. PD pumps are fixed volume pumps whose flow rate is dependent upon the speed of the pump; the pumps also have a pressure rating which is the maximum operating pressure. Do not confuse the maximum operating pressure of a PD pump with the actual operating pressure. The actual operating pressure is dictated by the fixed flow rate of the pump, the Alfa Laval GJ 7 and the plumbing system. If a PD pump is used, the Alfa Laval GJ 7 should be sized to, first, match the flow capability of the pump and, second, not exceed the pump's maximum operating pressure (taking the plumbing system into account, also).

Centrifugal pumps are not designed for use with the Alfa Laval GJ 7, because of the high pressure (300+ psig/ 20+ Bar) and low flow rate (2 to 8 gpm/ 0.45 to 1.8 m³/Hr) operating conditions of most applications. If a centrifugal pump must be used it will not damage the Alfa Laval GJ 7; however, the life expectancy of the pump will be greatly reduced. Please contact Alfa Laval Tank Equipment, Inc. for consultation before using an Alfa Laval GJ 7 with a centrifugal pump.

Step 9

Safety

When Alfa Laval Gamajets are operating, there should be covers over any tank openings. These covers should be sealed well enough to withstand the full force of the jet striking the cover plate. If the cleaning solution were hot, corrosive, or toxic, a leak would present a serious hazard to any personnel in the immediate vicinity or to any exposed electrical equipment.

WARNING: Any tank-cleaning machine can develop a static electricity charge while in operation. If the tank being cleaned contains a combustible liquid or vapor having a risk of ignition or explosion, it is imperative to have the Alfa Laval Gamajet properly grounded.

4. Installation

Read the instructions carefully and pay special attention to the warnings! Always check the tank cleaning machine before operation.

4.3 Recycling Information

• Unpacking

- Packing material consists of wood, plastics, cardboard boxes and in some cases metal straps.
- Wood and cardboard boxes can be reused, recycled or used for energy recovery.
- Plastics should be recycled or burnt at a licensed waste incineration plant.
- Metal straps should be sent for material recycling.

• Maintenance

- All metal parts should be sent for material recycling.

• Scrapping

- At end of use, the equipment must be recycled according to relevant, local regulations. Beside the equipment itself, any hazardous residues from the process liquid must be considered and dealt with in a proper manner. When in doubt, or in the absence of local regulations, please contact your local Alfa Laval sales company.
-

5. Operation

Read the instructions carefully and pay special attention to the warnings! Always check the tank cleaning machine before operation.

5.1 Operation/Control

Step 1



Always read the technical data thoroughly. See chapter 7 Technical Data

CAUTION

Alfa Laval cannot be held responsible for incorrect operation/control.

Step 2



Never touch the tank cleaning machine or the pipelines when pumping hot liquids.

Step 3

Initial Startup

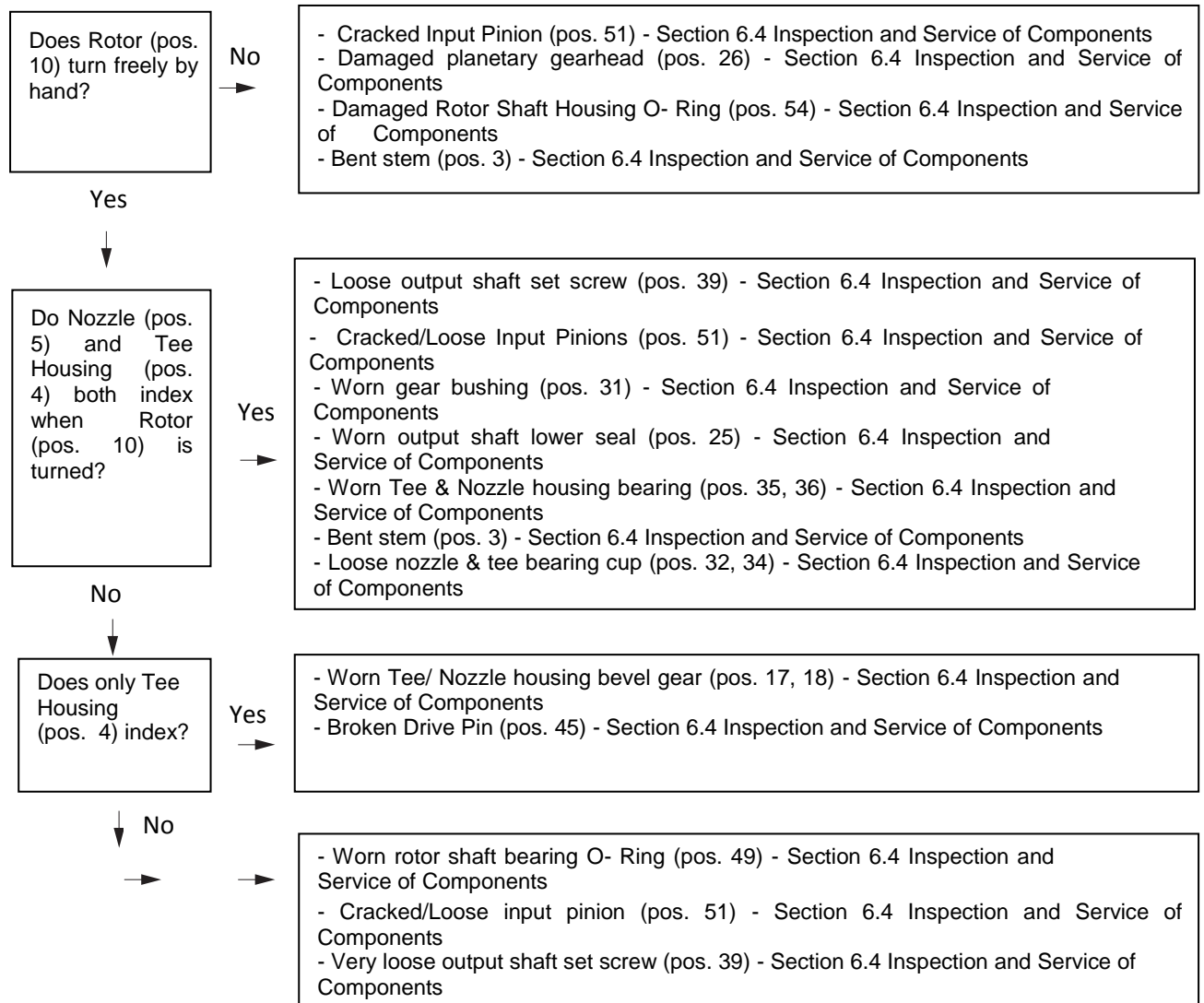
When using a pressure washer to feed the unit, Alfa Laval Tank Equipment Inc. strongly recommends running the pressure washer at the beginning of each use, without the Alfa Laval GJ 7 attached, for a period of time of about one minute. Alfa Laval Tank Equipment has noted, through our testing with pressure washers, a high level of dirt in the initial wash fluid. This procedure will lessen the buildup of debris inside the Alfa Laval GJ 7 and potential for premature wear of components.

Every Alfa Laval GJ 7 that ships is accompanied by a Birth Certificate. This document indicates how the machine performed in our testing tank before it shipped based on the operating conditions supplied to Alfa Laval Tank Equipment Inc. To ensure the longest possible life of the Alfa Laval GJ 7, please verify the operating conditions and, most importantly, the machines cycle time. The cycle time is determined by picking a fixed point inside of a vessel (i.e. bung hole of a wine barrel) as a reference, and timing how long it takes the same nozzle to pass back over that fixed point in the vessel. (This, naturally, will not be the exact same spot because the spray pattern is indexing.) This timed value in seconds corresponds directly to the full cycle time in minutes.

5. Operation

*Pay attention to possible faults
Read the instructions carefully.*

5.2 Trouble Shooting



5. Operation

*Pay attention to possible faults
Read the instructions carefully*

Step 1

INSUFFICIENT FLOW

The Gamajet was configured to meet certain operating conditions outlined at the time of the initial sale, such as flow rate (m³/Hr/ GPM), pressure (Bar/ PSI), temperature, chemical content of the wash fluid, cycle time, etc. If the Nozzle size is too small and/or the opening at the bottom of the Stator is too large, the Tee Housing will not turn.

Look for restrictions in the fluid supply such as a clogged filter, kinked hose, or deposits in the piping.

Step 2

TIGHT CLEARANCES

A newly overhauled Alfa Laval GJ 7 may fail to operate when first returned to service. If the machine seems otherwise fine, try running it with at least one Nozzle removed. The reduction in pressure and additional flow will invariably be enough to overcome the extra resistance of new Bearings and Seals. Fifteen minutes of operation should loosen the machine to run normally with the Nozzles reinstalled.

Step 3

DEBRIS INSIDE

Loosen the Inlet Collar Set Screw (38), and remove the Inlet Collar (1), then lift out the Stator (9). Look for and remove any debris caught in the vanes of Stator and Rotor (10). Remove any material wound around the Input Shaft (22). In addition, check for any debris caught in the outlet holes of the Stem (3), the nose of the Tee Housing (4), and the Nozzle Housing (5).

5. Operation

*Pay attention to possible faults
Read the instructions carefully.*

5.3 Cleaning Solution Leakage

- Worn or Improperly Installed Seals

Excessive leakage from the Tee Housing or Nozzle Housing usually indicates worn Housing Bearings and Seals (61), (59) and (36). Inspect them for wear (sealing lips are worn to a smooth surface) or damaged lips or loss of spring tension (indicated by excessive dry deposits of dirty or abrasive cleaning solution on the spring), and replace as required.

- Worn Bearing Cups

Inspect the Bearing Cups (34) and (32) for excessive wear (grooved or scored), particularly near the inside flange where they contact the Bearings and Seals (61), (59) and (36). Replace any that show distinct grooves.

- Worn Static Seal Contact Surfaces

Inspect the Bearing and Seal contact surfaces of the Stem (3) and the nose of the Tee Housing (4). If these are worn or grooved, new Bearings and Seals will be ineffective. Replace the damaged parts as required.

- Worn Stem Cap O-Rings

Severe leakage between the Inlet Collar (1) and Stem Cap (2) may indicate worn or damaged Stem Cap O-rings (47) and (48). Remove the (1) as described in Chapter 6, and inspect the O-rings for signs of damage or wear.

5. Operation

*Pay attention to possible faults
Read the instructions carefully.*

5.4 Poor Cleaning Performance

- Inadequate Flow and Pressure

Check the pressure at the Alfa Laval Gamajet inlet under actual operating conditions. The supply piping and hoses must be large enough to handle the flow rate required for the nozzle size being used to ensure adequate pressure. Insufficient pressure may also result from line losses when the machine is far from the pump, so the line size must be increased accordingly for long runs. Although the Alfa Laval Gamajet will rotate at low flow rates, effective cleaning may require considerably more flow. Proper mechanical operation (the unit turns) is NOT the same thing as effective cleaning (the soils have been removed)!

- Chemical Concentration and Temperature

Verify that the cleaning solution is the correct compound and in the concentration needed for the deposit being cleaned. If heating is necessary, also check that the solution is at the proper temperature.

- Plugged Nozzles

Inspect the orifices in the nozzle (5) for debris.

- Slow or no Rotation of the Housings

This will result in partial or erratic washing coverage. Refer to previous sections for more information.

- Alfa Laval Gamajet Configuration

Determine if the deposit being cleaned requires greater jet impact or longer jet dwell time (slower rotation) for more thorough scrubbing. Confirm that the Alfa Laval Gamajet nozzle size, turbine, and gearing are correct for the specific application. Refer to the machine's Birth Certificate for specific information regarding its configuration. Contact a Alfa Laval Tank Equipment Inc. representative if assistance is required.

- Inadequate Drainage

Ensure that the vessel drains the effluent or used wash fluid as fast as it's being sprayed in through the Alfa Laval Gamajet. The floor of the vessel should be sloped or pitched toward the drain and the drainage opening should be large enough to gravity-drain the effluent from the vessel. If you still have puddling (build-up of the wash fluid so it covers the floor and shields the residues underneath), use some form of pump to suck out the effluent.

5. Operation

The Tank Cleaning machine is designed for cleaning in place (CIP). CIP = Cleaning In Place. Study the instructions carefully and pay special attention to the warnings! NaOH = Caustic Soda, HNO₃ = Nitric Acid.

5.5 Recommended Cleaning

Step 1



Always handle lye and acid with great care.

Caustic danger!



Always use rubber gloves!



Always use protective goggles!

Step 2



Never touch the pump or the pipelines when sterilizing.

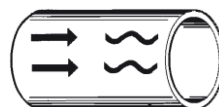
Danger of burns!

Step 3



Always rinse well with clean water after using a cleaning agent.

Always rinse!



Clean Water Cleaning agent

NOTE

Cleaning agents must be stored/disposed of in accordance with current regulations/directives.

6. Maintenance

*Maintain the Tank Cleaning Machine with care. Read the instructions carefully and pay special attention to the warnings!
Always keep Minor spare parts kit in stock.*

6.1 General Maintenance

Step 1



Always read the technical data thoroughly. (see chapter 7 technical Data) .

Step 2

Recommended spare parts:

Order service kits from the service kits list

(See 8.8 Minor Service Kit & 8.9 Major Service Kit)

Ordering spare parts:

Contact your local Alfa Laval Sales Company.

6. Maintenance

Maintain the Tank Cleaning Machine with care. Read the instructions carefully and pay special attention to the warnings! Always keep Minor spare parts kit in stock.

6.2 General dismantling set up

Step 1

NOTE

A rigorously implemented preventative maintenance program will significantly reduce repair costs over the life of the Alfa Laval Gamajet. The foundation of such a program is regularly scheduled inspections to discover and replace worn or damaged parts before they can cause the failure of other, more costly, components. The inspection intervals required will depend on the severity of the application, but a complete internal inspection at 100 hours of operation is recommended initially.

Note: Part numbers appearing below may be used to identify parts in Chapter 8.

Step 2

STORAGE

The Alfa Laval Gamajet should be washed out with clean water after each use to remove any foreign material or soft substances left in the machine that may harden during storage and cause the Alfa Laval Gamajet to seize or lock up. A clean water rinse through the Alfa Laval Gamajet followed by a short (1 to 2 seconds maximum) air blow down, will purge any residues of chemical cleaners or recirculated wash water that could adversely affect the seals and O-rings during the prolonged contact of storage.

Step 3

DAILY INSPECTION

Before every shift, ensure that the Name Plate (6) is tight. The Tee Housing (4) should not have any axial play. If it does, retighten the Tee Housing Bevel Gear Screws (44) that hold down the Bevel Gear (17). Also, the Stator (9) and the orifices in the Nozzle Housing (5) should be inspected for debris. Look into each orifice for signs of debris or build-up. Examine the Stator by loosening the Inlet Collar Set Screw (38) and removing the main section of the machine from the Inlet Collar (1).

Note: One does not have to remove the Alfa Laval Gamajet from the supply pipe when performing this check.

Step 4

INTERNAL INSPECTION INTERVALS

The Alfa Laval Gamajet should be internally inspected every 100-200 hours of operation, depending on the severity of use, or after a season of use and before the unit is placed into long term (over a month) storage. Regardless, the unit should be inspected after the first 100 hours of operation, or the first season.

Step 5

TIPS

All the Bearings, Bushings, Seals and O-rings are wear parts. Ideally, they should all be replaced, **as a group**, every 150-200 hours of operation, depending on the severity of use. At first, an interval of 150 hours is recommended.

For balance and wear uniformity, if just one Bearing or Seal is worn or damaged, replace both it and its mate, not just the worn or damaged part.

6. Maintenance

Read the instructions carefully. The items refer to the parts list and service kits section.

6.3 General dismantling

Step 1

Inlet Collar

Loosen the Inlet Collar Set Screw (38) with the 5/64" (2 mm) Hex Key, minimum 2 turns.
Remove the Inlet Collar (1) and Stator (9).

Step 2

Base Assembly

Remove the Socket Head Cap Screws (SHCS) (40) with a 7/64"(2.8 mm) Hex Key, the Lockwashers (41), and Base (28) from the Tee Housing.
Remove the Nut (43) with a 3/16"(4.76 mm) socket and Lockwasher (42) from the Output Shaft (12).
Using needle nose pliers, remove the Idlers Shafts (15), Idler Gear Assemblies (16), and the Output Pinion (11). Be careful not to mangle the gears or shafts with the pliers.

Step 3

Stem Cap and Gear Train Assembly

Unscrew the Stem Cap Screw (37) with 3/32" (2.3 mm) Hex Key, and remove them.
Pull the Stem Cap (2) from the Rotor Shaft Bearing Housing (57).
Remove the Gear Train Assembly from the body by tapping on the Output Shaft at the Base end of the machine with the handle of a screw driver.

Step 4

Nozzle Housing

Unscrew the Name Plate Screw (6) with a 1/4" (6.35 mm) slotted screwdriver.
Pull the Nozzle Housing (5) off the nose of the Tee Housing.
Remove the inner Nozzle Housing Bearing & Seal (36).
Tip: Use a small slotted screwdriver to get under the flange of (36).

Step 5

Tee Housing

Using a 1/8" (3.17 mm) slotted screwdriver, remove the Ring Gear Retaining Ring (21), and pullout the Ring Gear (20).
Unscrew the Phillips Pan Head Screws (44), and remove the Idler Shaft Base (29).
Tip: if the Idler Shaft Base is difficult to remove, screw the SHCS (40) back into the base and use them for leverage.
Remove the second set of Phillips Pan Head Screws (44), and pull out the Tee Housing Bevel Gear (17). Be careful not to strip the heads of the screws, they should have a mild thread lock on them.
Pull the Tee Housing (4), lower Tee Housing Seal (59) and lower Bearing (35) from the Stem.

6. Maintenance

Read the instructions carefully. The items refer to the parts list and service kits section.

6.4 Inspection and Service of Components

Drawing 16

Stator

Inspect the openings at the top and the veins of the Stator (9) to be sure that they are clear and free of debris.

Drawing 12, 14

Base Assembly

Inspect the Output Pinion (11) and Idler Gear (16) for worn, damaged, or sharp/pointed teeth.

Check for signs of scoring on the Idler Shafts (15).

Examine the Idler Gear Bushings (31) on the Idler Gears and the Idler Shaft Bushing (33) on the Base for signs of wear. The inside diameter of the (31) Bushings should not exceed 0.110" (2.8 mm). This can be measured with a plug gauge or a #35 drill bit. The inside diameter of the (33) should not exceed 0.103" (2.6 mm). If Bushings need to be replaced, remove them with a small slotted screwdriver or razor blade, and then push replacements back into place.

Drawing 14

Stem Cap

Inspect the Small and Large Stem Cap O-rings (47 and 48), for deterioration (hardening or deformation) or damage and replace if necessary.

Drawing 7

Gear Train Assembly

General Disassembly and Inspection

Unscrew the Nut (43) with a 3/16" (4.76 mm) socket and remove it with the Lockwasher (42) from the Input Shaft (22).

Remove the Rotor (10) from (22). Use a slotted screwdriver for assistance.

Remove the input assembly by pulling and twisting on the Rotor Shaft Bearing Housing (57) while pushing down on the tip of (22) with your index finger to keep it in place. This is done to prevent the accidental disassembly of the Gearhead, (26) (inside of (8)). A thin spacer from the Gearhead may stick to the underside of the input assembly. If it does, remove it and place it back on the top of the Gearhead.

Pull and twist the Output Shaft Seal Housing (14) from the Gearhead Housing (8).

Loosen the Output Shaft Set Screw (39) with a 0.050" (1.27 mm) Hex Key. Pull Output Shaft (12) from the Gearhead assembly.

If liquid is found in the gearhead, a careful and thorough inspection should be made of the (8), (12), (57), (14), (22), (23), (24), (27), (49), and (54). If scratched or worn, they will present a possible leak path into the gearhead.

Drawing 3, 7

Gearhead & Rotor Shaft Assembly

Inspect the Output Shaft (12) for signs of scoring and wear, especially in the area of (24) contact. Replace if worn.

Using a small slotted screwdriver, ensure that the Gearhead Screws (46) are tight.

WARNING: If you suspect that the Gearhead (26) requires service, proceed with caution. If at any time you do not feel completely comfortable servicing (26), contact Alfa Laval Tank Equipment Inc. immediately. To eliminate losing the small internal components, service (26) over a small tray or container. Refer to Section 6.2 for more information.

Using a needle nose pliers carefully remove the internal components of the (26). Examine the gears of the three different stages for any worn or broken teeth. Also, examine the main internal ring gear for bent or sharp teeth. If any damage is found contact Alfa Laval Tank Equipment Inc. immediately. Please note, the gears, at the mid and lower level are interchangeable.

6. Maintenance

Read the instructions carefully. The items refer to the parts list and service kits section.

Drawing 1, 4, 5, 7

Input Assembly

Pull (22) and (51) from the Rotor Shaft Bearing Housing (13) assembly.

Remove the Rotor Shaft Lower Bearing (27) from (13).

Inspect the Input Pinion (51) for hairline cracks on the end face or for worn, damaged, or sharp/pointed teeth. Input Pinion (51) should be flush with the shoulder of (22) (circular scoring on the top of the Rotor (10) and underside of Stator (9) is an indication of (51) slippage). Press input pinion (51) back onto (22) if it has slipped, or replace if cracked.

Check for signs of scoring and wear on (22), especially in the area of input shaft seal (23) contact. Replace if worn.

Inspect the Rotor Shaft Housing and Rotor Shaft Bearing Housing O-rings, (54 and 49), for deterioration (hardening, swelling, or deformation) or damage. Replace as needed.

Remove the Input Shaft Seal (23) for inspection from the rotor shaft lower bearing (27) by, first, removing the Retaining Ring (55). Press down on the middle of the ring's "C" with the small screwdriver so that the retaining ring (55) is at an angle in the (27) and only the tips of the "C" remain in the gland. Then, pull up on the tips of the "C" to eject the ring. Now, inspect the input shaft seal (23) for wear, damage, or deformation. It should be tight on the outside diameter of the input shaft (22) and snug on the inside diameter of the rotor shaft lower bearing (27). If the (23) must be replaced, do not lubricate the new seal's O-ring when installing it into the (27).

Check the Housings, (8), (13) and (27), for scoring or scratches in the areas of (23), (49) and (54) contact.

The Gearhead Pin (53) should be firmly pressed into the (13).

The vent holes of the (13) should be clear.

Drawing 2

Output Shaft Seal Housing

Inspect the Rotor Shaft Bearing Housing O-ring (49) for deterioration (hardening or deformation) or damage and replace if necessary.

Check the (24) for wear by placing back onto the Output Shaft (12) and twisting. There will be a little drag if (24) is still good. If not, remove the old one by prying it out of the (14) and replace it.

Check the Housings, (8) and (14), for scoring or scratches in the areas of (24) and (49) contact.

Drawing 15, 16

Nozzle Housing

If the unit is a "Standard Version" with a tapered Nozzle Housing, inspect the orifices in the (5) for debris. The inside diameter must be smooth, round, and free of damage (especially any nicks) for maximum jet impact. If worn or oversized, replace the (5) to achieve the original flow rate and pressure.

If the unit is a "Low-Pressure (Non-Teed) Version," unscrew the Nozzles (7) with pliers and inspect orifice as mentioned above.

Inspect Nozzle O-rings (52) for permanent set or deterioration. Replace if needed.

Inspect the Nozzle Housing Bevel Gear (18) for wear such as sharp/pointed or worn teeth. If it needs to be replaced, remove the Nozzle Bevel Gear Retaining Ring (19) with a small slotted screwdriver and pry (18) from the Nozzle Housing (5).

Inspect the Nozzle Housing Bearing and Seals (36) and discard any that are worn or distorted. Clean any deposits from the exterior of (36) and check their fit in the Nozzle Housing Bearing Cups (34). While they should turn freely, (36) should be replaced if the thickness of the flange is 0.023" (058 mm), or less, to avoid shortening the life of the Bevel Gears. The outside of the seal section of (36) should still have a bead; replace if it has worn even with the main body of the bearing section. Inspect the interior of nozzle housing bearing and seal (36) for loss of spring tension (indicated by excessive dry deposits of dirty or abrasive cleaning solution on the spring), replace as required.

Clean any deposits from nozzle housing bearing cup (34) and examine for excessive wear. Light scoring is acceptable, but the Cups should be replaced if they are grooved in the seal contact area. A good maintenance program will require replacing many (34), therefore, it may be worthwhile to make or obtain press tools for pressing (34) out of (5). The press tools are available from Alfa Laval Tank Equipment Inc. Before installing new (34), clean the housing bores and remove any burrs resulting from (34) removal. Press them in so that their flanges are flush against nozzle housing (5).

6. Maintenance

Read the instructions carefully. The items refer to the parts list and service kits section.

Drawing 9, 10, 11

Tee Housing

Inspect the Tee Housing (4) for damage to the keyway that engages the Ring Gear (20). If the Ring Gear was difficult to remove, check to see if (4) is out-of-round (as the result of an external blow, such as dropping) where the Gear seats.

Check the water outlets on the nose of (4); they should be free of debris.

Inspect the Tee Housing Bevel Gear (17) for worn, damaged or sharp/pointed teeth.

Inspect (20) for worn, damaged or sharp/pointed teeth, and for damage to the key that engages the slot in (4).

Inspect the Tee Housing Nose O-ring (50) for deterioration (hardening, swelling, or deformation) or damage and replace if necessary.

Check the Output Shaft Lower Seal (25) for wear, paying close attention to the spring and inside diameter. If the (25) has started to extrude through the (29), replace it. Place the Output Shaft (12) through the center of (25) and twist. There will be a little drag if (25) is still good. Replace if necessary.

Inspect the Tee Housing Bearing and Seals (61), (35) and (59), discard any that are worn or distorted. Clean any deposits from the exterior of (61) and (57); check their fit in the Tee Housing Bearing Cups (32). While they should turn smoothly, (61) or (35) should be replaced if the thickness of the flange is 0.045" (1.14 mm) or less, to avoid shortening the life of the Bevel Gears. The outside of the seal section of (61) and (59) should still have a bead. In the case of the (61), replace if it has worn even with the main body of the bearing section. Replace the (59) if it has worn even with the outside diameter of the seal's heel. Inspect the interior of (61) and (59) for loss of spring tension (indicated by excessive dry deposits of dirty or abrasive cleaning solution on the spring), replace as required.

Clean any deposits from tee housing bearing cup (32) and examine for excessive wear. Light scoring is acceptable, but the Cups should be replaced if they are grooved in the seal contact area. A good maintenance program will require replacing many (32), therefore, it may be worthwhile to make or obtain press tools for pressing (32) out of (4). The press tools are available from Alfa Laval Tank Equipment Inc. Before installing new (32), clean the housing bores and remove any burrs resulting from (32) removal. Press them in so that their flanges are flush against (4).

Drawing 8

Stem

Inspect the water outlets of the Stem (3); they should be free of debris.

Check the Output Shaft Lower Bushing (30) by inserting the Output Shaft (12) into (30) in the opposite direction. There should be a slight drag during insertion, but (12) should wobble only slightly when rocked back and forth. However, if the spring of the output shaft lower seal (25) has broken, replace the output shaft lower bushing (30). The (30) can be replaced by pushing it into (3). Tap its replacement back into place.

If the machine has been roughly handled, acting erratically with hot water, or some of the components in the Gearhead (26) have failed, check the (3) to ensure that it is not bent. If the total run-out is 0.004" (01 mm), or greater, replace the (3).

6. Maintenance

Read the instructions carefully. The items refer to the parts list and service kits section.

6.5 Reassembly

General Notes

All parts must be cleaned thoroughly before reassembling. Any deposits remaining on the parts can cause difficult disassembly the next time the Alfa Laval Gamajet needs servicing.

Unless otherwise stated, apply a dab of a Teflon-based anti-seize compound to all threads when reassembling; this will prevent galling of threads and ease any future disassembly.

To ease installation of all O-rings, they should be lubricated prior to reassembly. A Silicon based lubricant must be used for EP O-rings (standard material, black colored (50)). Lithium-based grease is acceptable, for Viton® O-rings (caramel colored (50)). In either case, however, a food grade lubricant may be used.

Refer to illustrations chapter 8 for clarification during reassembly.

Drawing 8, 9, 10 & 11

Tee Housing

Turn to (drawing 8): Place the lower Tee Housing Bearing (35) & Seal (59) (spring side up) onto the Stem (3).

Push the Tee Housing (4) over it until it is flush and fully seated.

Place the combo Bearing and Seal (61) over Stem (spring side down) and push it down between (3) and the Tee Housing Bearing Cup (32). (A large diameter pin will aid in the insertion). Use the Tee Housing Bevel Gear (17) to full seat the (61).

Turn to (drawing 11): Align the through holes of the (17) with the threaded holes in the top of the (3). Apply a small amount of a mild thread lock to the four Phillips Pan Head Screws (44) and screw them in, tightening them in a star pattern. (Needle nose pliers will help insert the small screws.) The (4) should not have any axial play.

Turn to (drawing 10): Ensure that the Output Shaft Lower Seal (25) is in the Idler Shaft Base (29) (spring side out). Then, repeat the procedure in the previous step for the Idler Shaft Base (29). No thread lock is required for this set of four screws.

Insert the Ring Gear (20) into the Tee Housing, being sure to align the key and key way of the two components.

Reinstall the Ring Gear Retaining Ring (21).

Drawing 9, 15, 16

Nozzle Housing

Turn to (drawing 9): Place the first Nozzle Housing Bearing & Seal (36) (spring side out) onto the nose of the Tee Housing (4).

Turn to (drawing 15): If the unit is a "Low-Pressure (Non-Teed) Version," apply a small amount of mild thread lock to the threads of each Nozzle (7) and screw them into the Nozzle Housing (5) with the aid of pliers.

Using your thumb, push the Nozzle Housing (5) onto the nose of the Tee Housing. Rotate the Tee Housing Assembly slightly to mesh the Bevel Gears (17) and (18). Failure to ensure that the Bevel Gears have properly mated could damage them.

Turn to (drawing 16): If you have not done so, put the Tee Housing Nose O-ring (50) into the nose of the Tee Housing.

Push the outer (36), spring first, into the annular space between the nose of the (4) and Tee Housing Cup (34).

Apply a mild thread lock to the threads of the (6). Then, using a 1/4" slotted screwdriver, screw (6) into (4).

6. Maintenance

Read the instructions carefully. The items refer to the parts list and service kits section.

Drawing 1 to 7

Gear Train

Turn to (drawing 3): Reassemble the internal components of the Gearhead (26). Make sure to lightly repack it with grease as it reassembled. Check that the Gearhead Screws (46) are tight.

Turn to (drawing 7): Place the Output Shaft (12) over the output shaft of the (26). Align the flat with the Output Shaft Set Screw (39). Alfa Laval Tank Equipment Inc. recommends using a new (39) during reassembly. Using a 0.050" (1.27 mm) Hex Key, screw into the (12). The (39) should fall into the dimple on the output shaft of the (26).

Turn to (drawing 4): Check that the (23) and (55) are inside and (54) is on the (27).

Turn to (drawing 5): Insert the input shaft & input pinion (22) & (51) assembly through the (27).

Turn to (drawing 7): Push the Rotor Shaft Lower Bearing (27) into Rotor Shaft Bearing Housing (57).

Ensure that the thin spacer is on the (26) top idler gears.

Engage the (51) into the (26). This can be made easier by extending the (22) assembly slightly from the (57) assembly.

Push the (57) into the Gearhead Housing (8), aligning the Gearhead Pin (53) with the keyway of the (8).

Turn to (drawing 6): Place the Rotor (10) (Carbide Bearing (58) down) over the Input Shaft (22).

Using a 3/16" (4.7 mm) socket, screw the Nut (43) and Lockwasher (42) onto the top of the Input Shaft.

Place the (14) assembly (O-ring side first) over the (12) and push and twist it into the Gearhead Housing (8) until it is flush and fully seated.

The captured air will try to push the ends of the assembly off, so, quickly insert this assembly into the Stem (3) and proceed to the next section.

Drawing 14

Stem Cap

Place the Stem Cap (2) on the (57), making sure the screw holes are aligned.

Using a 3/32" (2.4 mm) Hex Key, screw the stem cap screw (37) into the Stem (3). Tighten in a star pattern.

Drawing 12, 14

Base assembly

Turn to (drawing 14): Place the Output Pinion (11) (round opening down) onto the Output Shaft (12).

Insert the Idler Shafts (15) into their respective holes in the Idler Shaft Base (29).

Turn to (drawing 12): Install the Idler Gears (16) (Idler Gear Bushing (31) down) onto the Idler Shafts. Twisting the Tee Housing (4) slightly will help the Idler Gears drop into place.

Turn to (drawing 14): Using a 3/16" (4.7 mm) socket, screw the Nut (43) and the Lockwasher (42) onto the Output Shaft.

Put the Base (28) back onto the Tee Housing.

Using a 7/64" (2.8 mm) Hex Key, screw the (40) and Lockwashers (41) into the Idler Shaft Base (29).

Drawing 16

Stator and inlet collar

Rotate the Rotor (10) using a small Hex Key. It should spin fairly easily and its veins must not strike the walls of the Stem Cap (2). Continue turning the Rotor. The Nozzle and Tee Housing will slowly rotate if everything has been assembled correctly.

Insert the Stator (9) into the (2).

Screw on the Inlet Collar (1) (hand-tight only), and tighten the Inlet Collar Set Screw (38) with a 5/64" (2 mm) Hex Key.

This completes the reassembly process.

7. Technical Data

It is important to observe the technical data during installation, operation and maintenance. Inform personnel about the technical data.

7.1 Technical Data

The Alfa Laval GJ 7 Tank Cleaning Machine is a highly efficient machine at a range of pressures and flows. The instruction manual is part of the delivery. Read the instructions carefully.

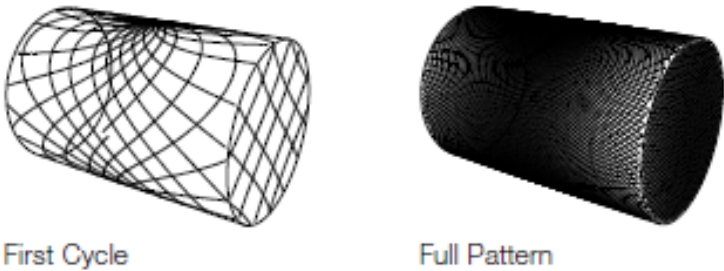
TECHNICAL DATA

Lubricant Food grade
Max. throw length 2-2.5 m (7-8 ft.)

Pressure

Working pressure 3.5 - 83 bar (50-1,200 PSI)
Recommended pressure 5.5 - 55 bar (80 - 800 PSI)

Cleaning Pattern



The above drawings show the cleaning pattern achieved on a cylindrical horizontal vessel. The difference between the first cycle and the full pattern represents the number of additional cycles available to increase the density of the cleaning.

Certificate

2.1 material certificate

PHYSICAL DATA

Materials
1.4404 (316L), PPS, PTFE, FKM (EPDM and FFKM available).

Temperature

Max. working temperature 95°C (203°F)
Max. ambient temperature 140°C (284°F)
Weight 6.8 kg (1.5 lbs.)

Connections

Standard thread 1½" NPT, 1½" BSP

Options

Electronic rotation sensor to verify 3D coverage.

Caution

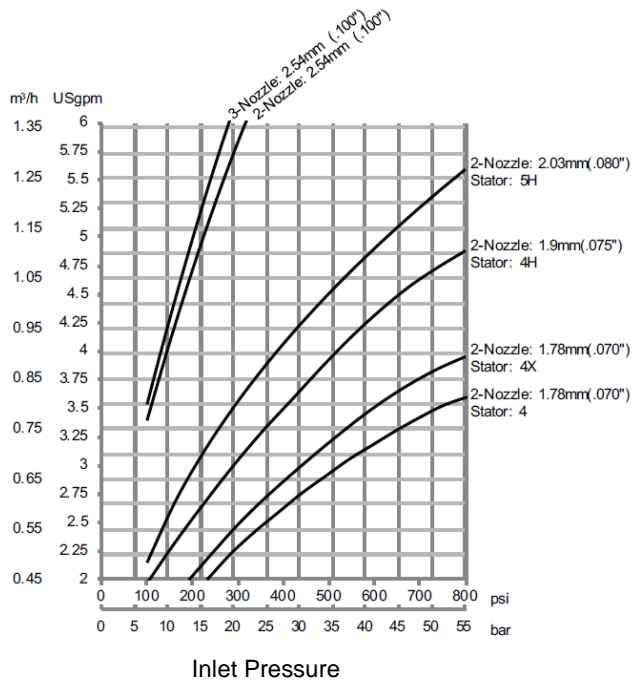
Do not use for gas evacuation or air dispersion.

7. Technical Data

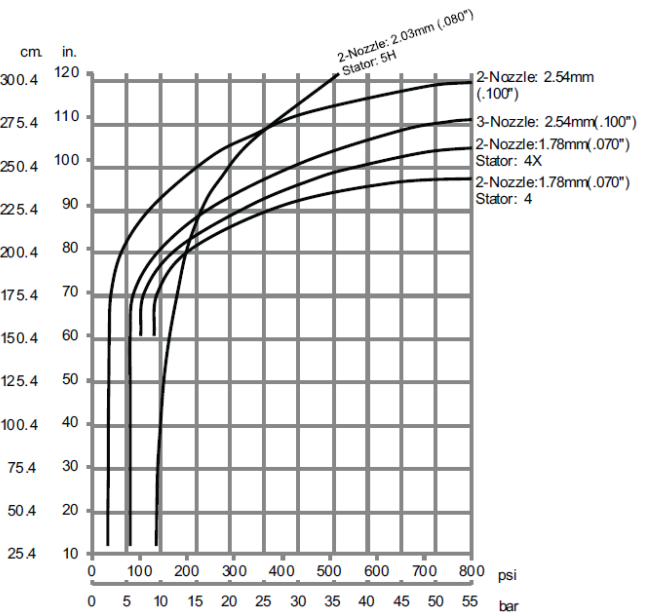
It is important to observe the technical data during installation, operation and maintenance. Inform personnel about the technical data.

7.2 Performance Data

Flow Rate

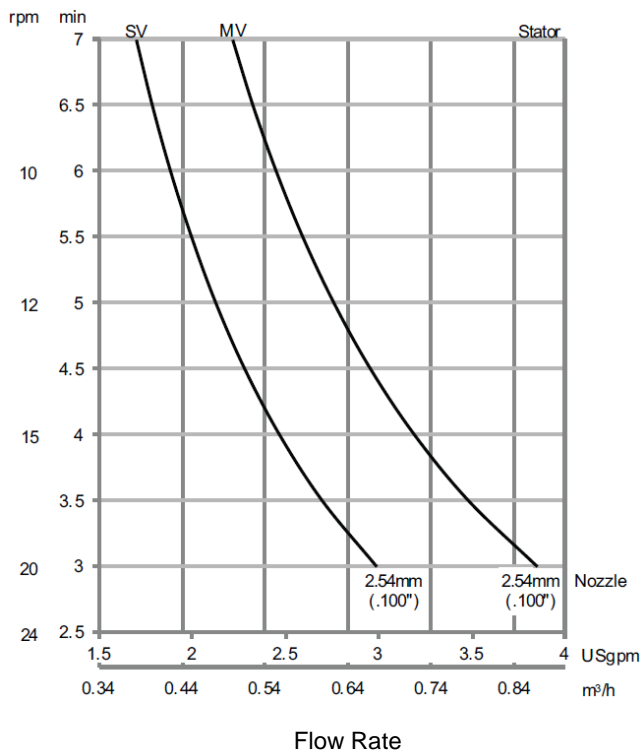


Impact Throw Length

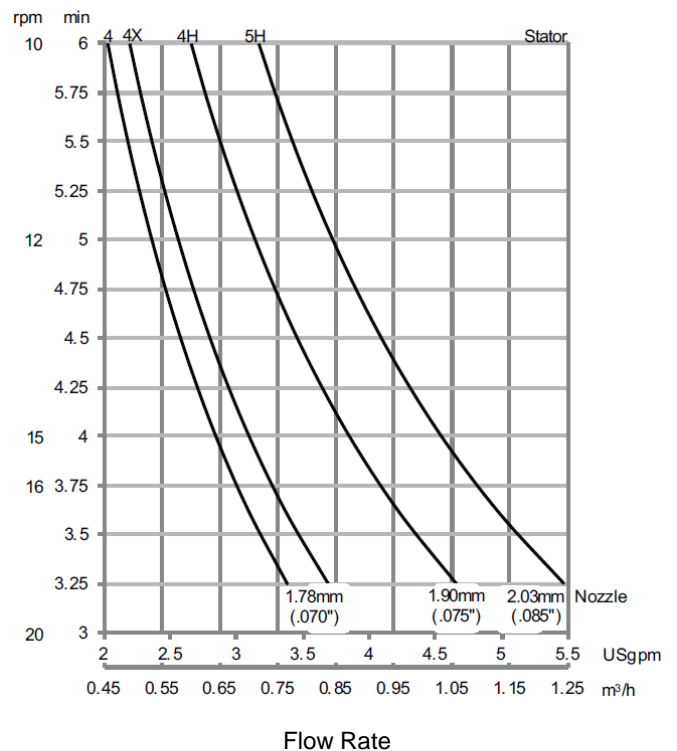


--- Wetting, --- Impact cleaning

Cleaning Time 0.100 Noz.



Cleaning Time 0.7-0.8 Noz.

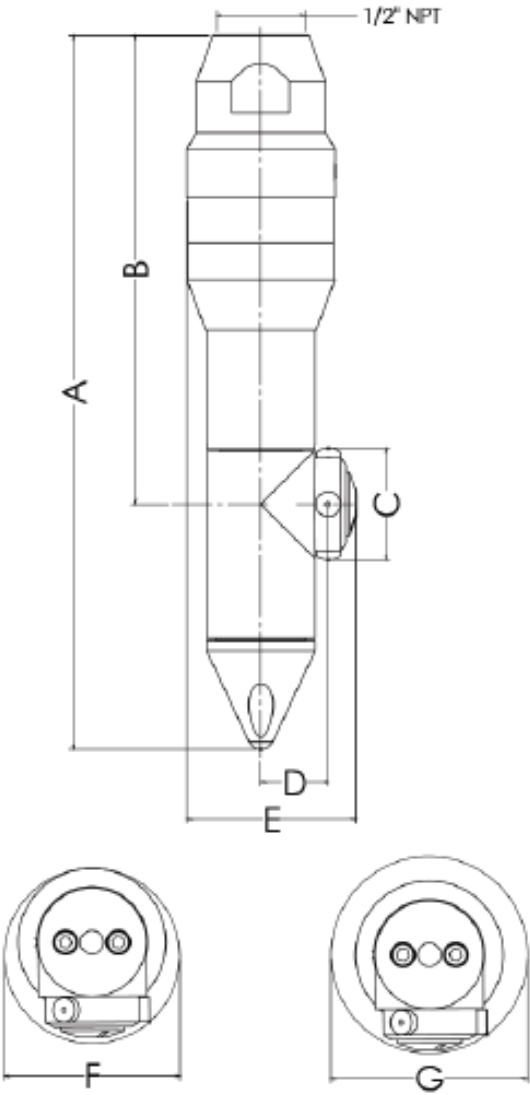


7. Technical Data

It is important to observe the technical data during installation, operation and maintenance. Inform personnel about the technical data.

7.3 Dimensions

Dimensions



Dimensions

	A	B	C	D	E	F	G
mm	176	115	27	17	42	43	48
in	6.9	4.5	1.1	0.7	1.7	1.7	1.9

7. Technical Data

It is important to observe the technical data during installation, operation and maintenance. Inform personnel about the technical data.

7.4 Trax Simulation Tool

Standard Design

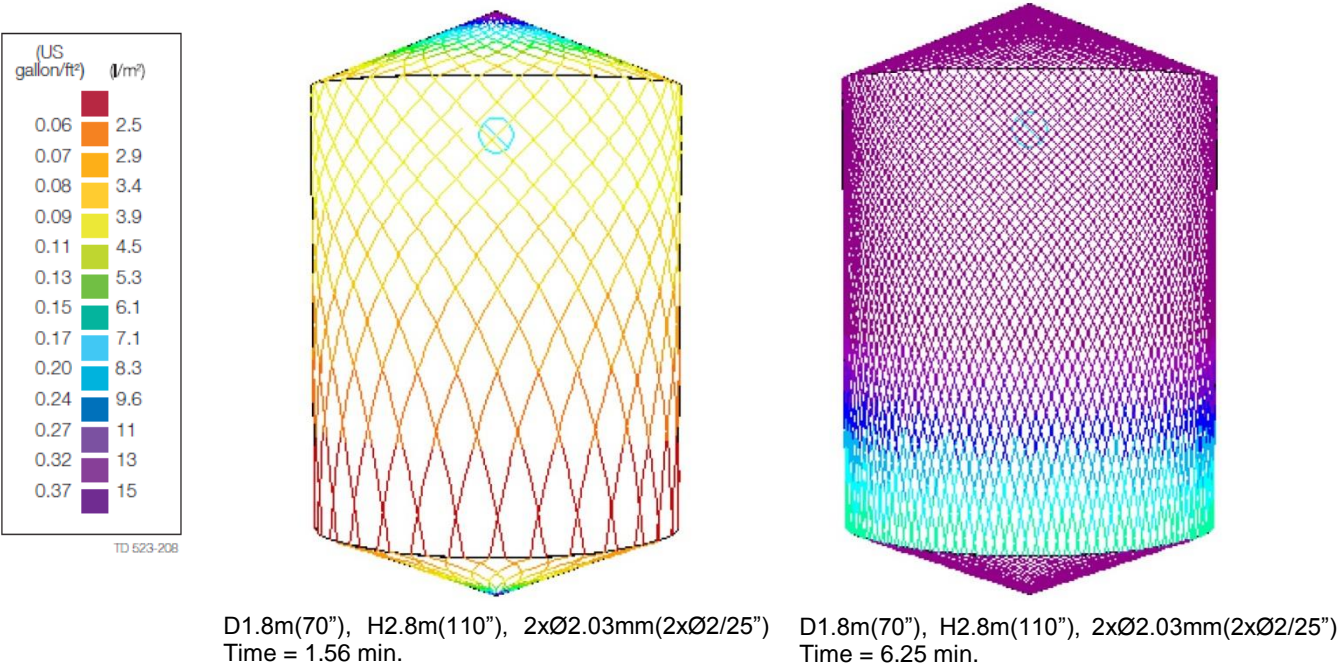
The choice of nozzle diameters can optimize jet impact length and flow rate at the desired pressure. As standard documentation, the Alfa Laval GJ 7 can be supplied with a “Declaration of Conformity” for material specifications.

TRAX simulation tool

TRAX is an unique software that simulates how the Alfa Laval GJ 7 performs in a specific tank or vessel. The simulation gives information on wetting intensity, pattern mesh width and cleaning jet velocity. This information is used to determine the best location of the tank cleaning device and the correct combination of flow, time, and pressure to implement.

A TRAX demo containing different cleaning simulations covering a variety of applications can be used as a reference and documentation for tank cleaning applications. The TRAX demo is free and available upon request.

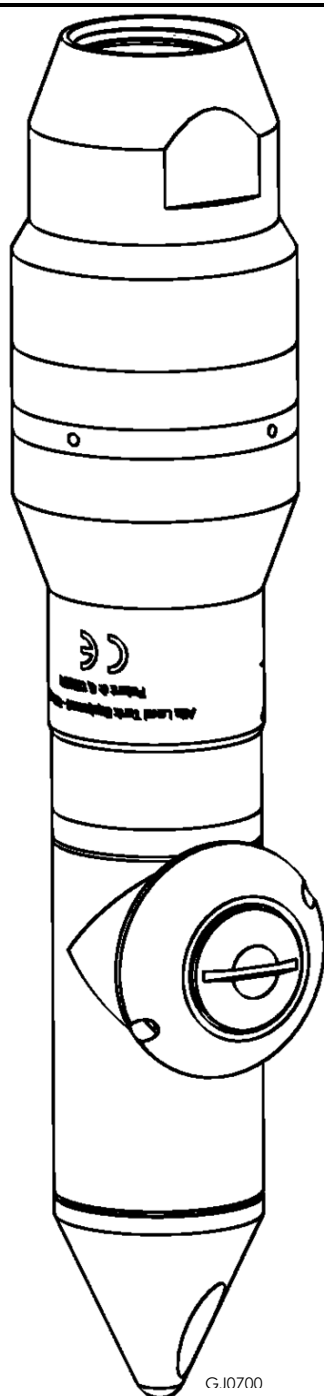
Wetting Intensity



8. Parts List and Service Kits

The drawing shows Alfa Laval GJ 7 Tank Cleaning Machine

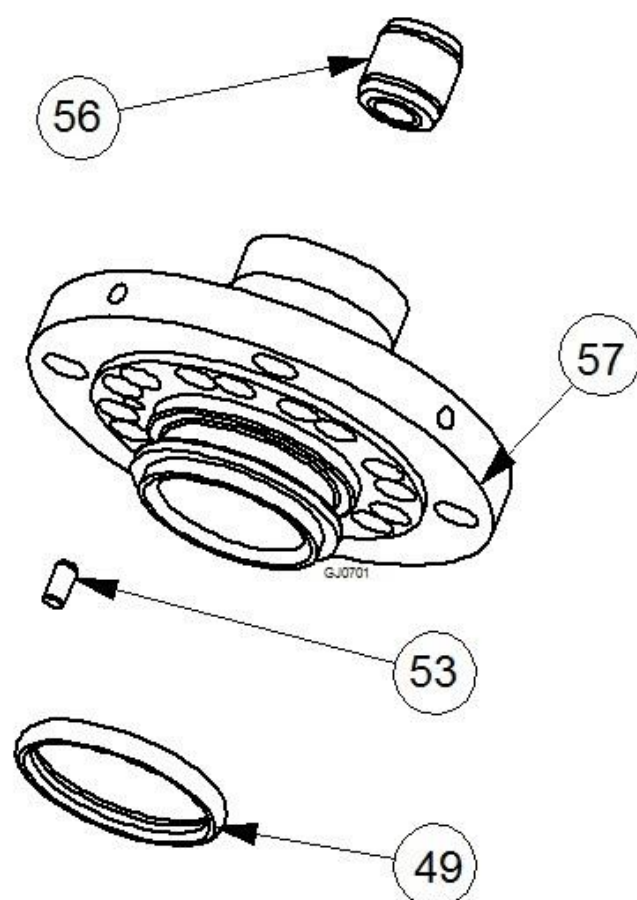
8.1 AL GJ 7 View



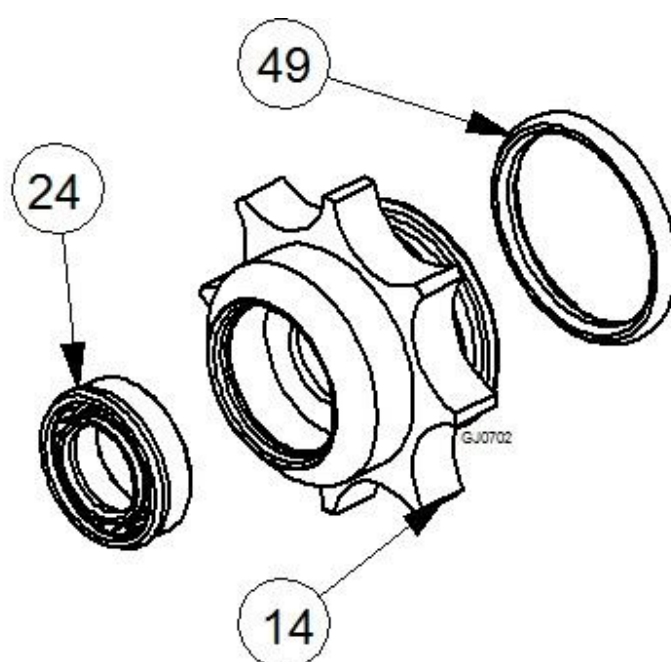
8. Parts List and Service Kits

The drawing shows Alfa Laval GJ 7 Tank Cleaning Machine

8.2 Assembly Drawings – 1, 2, 3 & 4



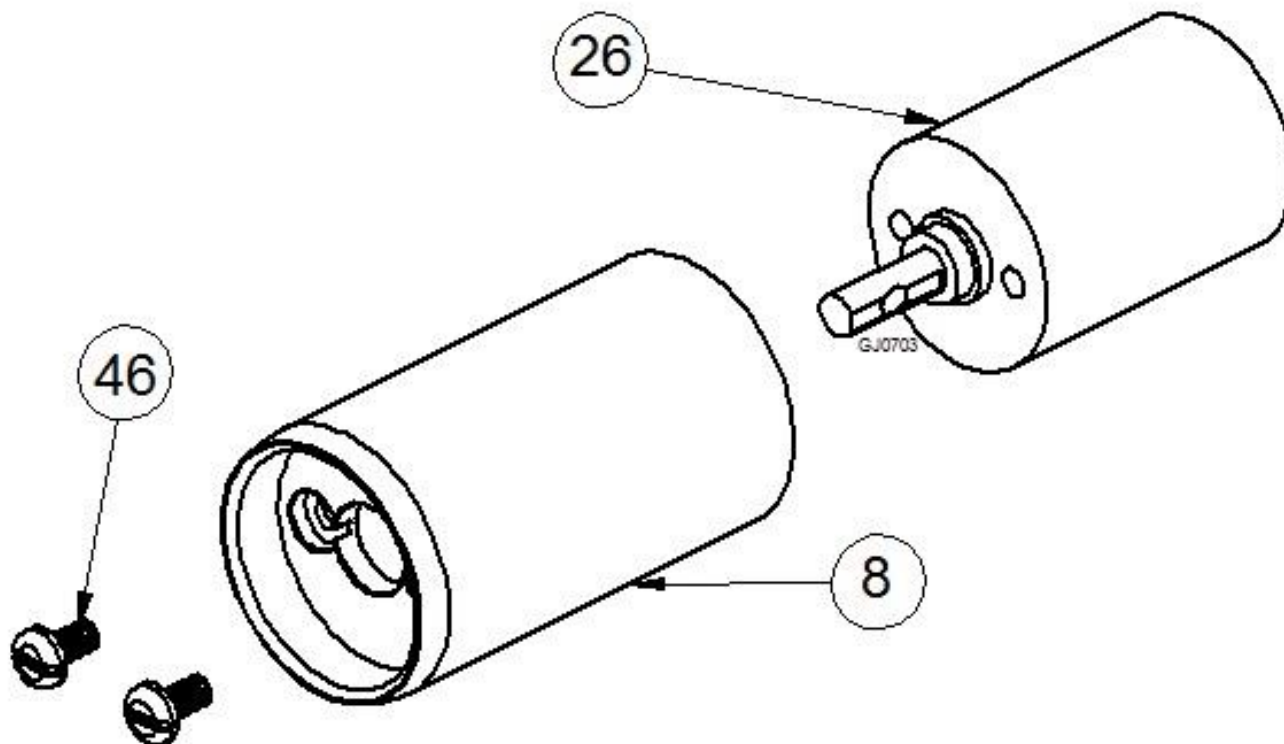
Drawing 1: Rotor Shaft Bearing Housing Assembly



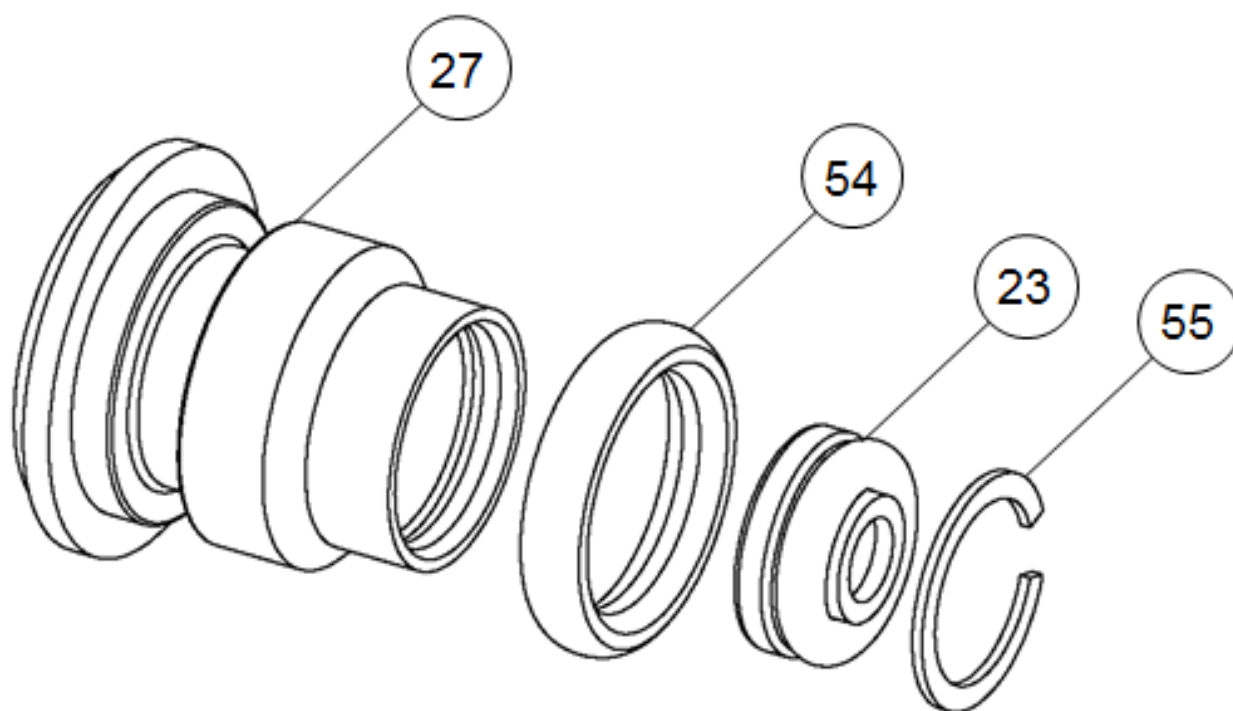
Drawing 2: Output Shaft Seal Housing Assembly

8. Parts List and Service Kits

The drawing shows Alfa Laval GJ 7 Tank Cleaning Machine



Drawing 3: Gearhead Installation



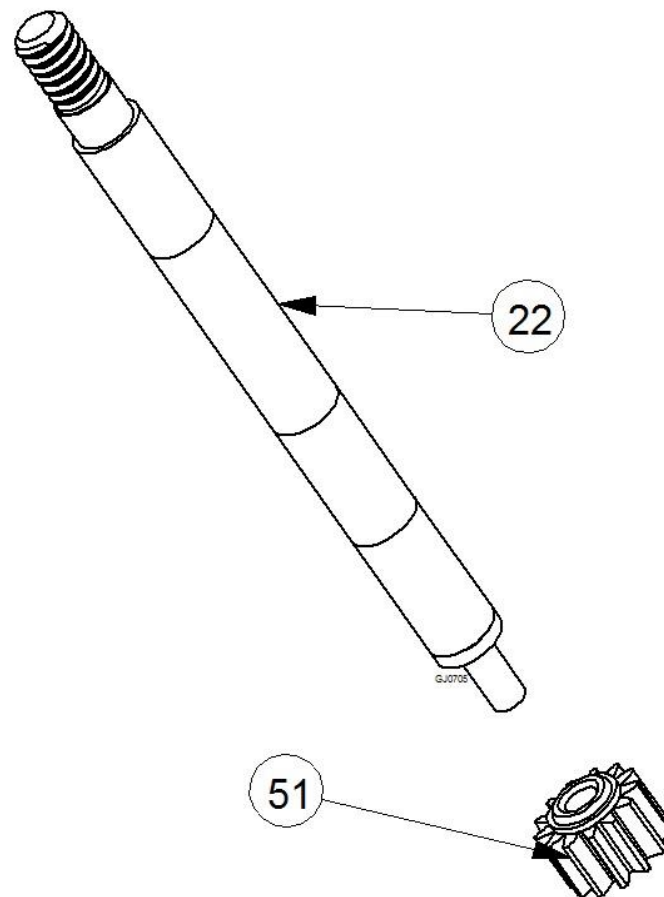
Drawing 4: Rotor Shaft Lower Bearing Housing

(For Low Pressure Applications, refer to Appendix A)

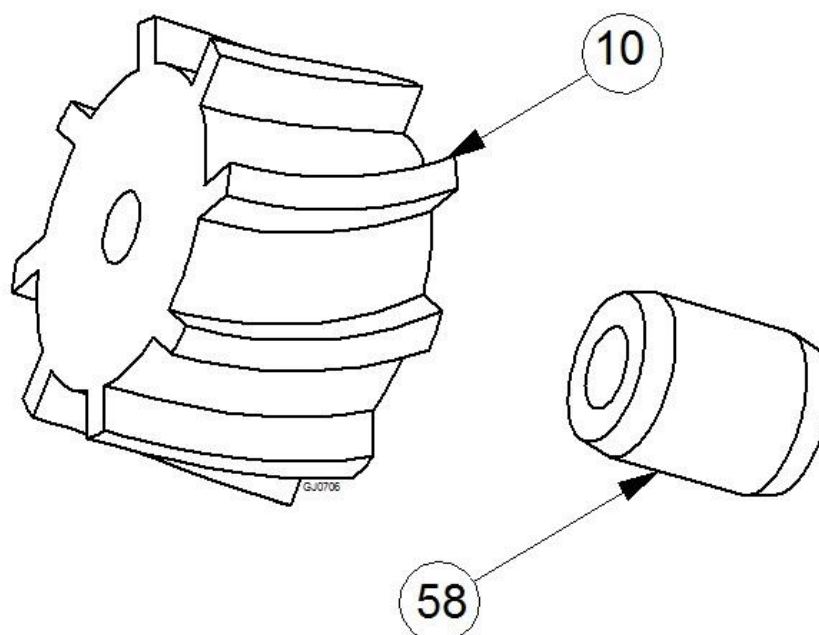
8. Parts List and Service Kits

The drawing shows Alfa Laval GJ 7 Tank Cleaning Machine

8.3 Assembly Drawings – 5, 6 & 7



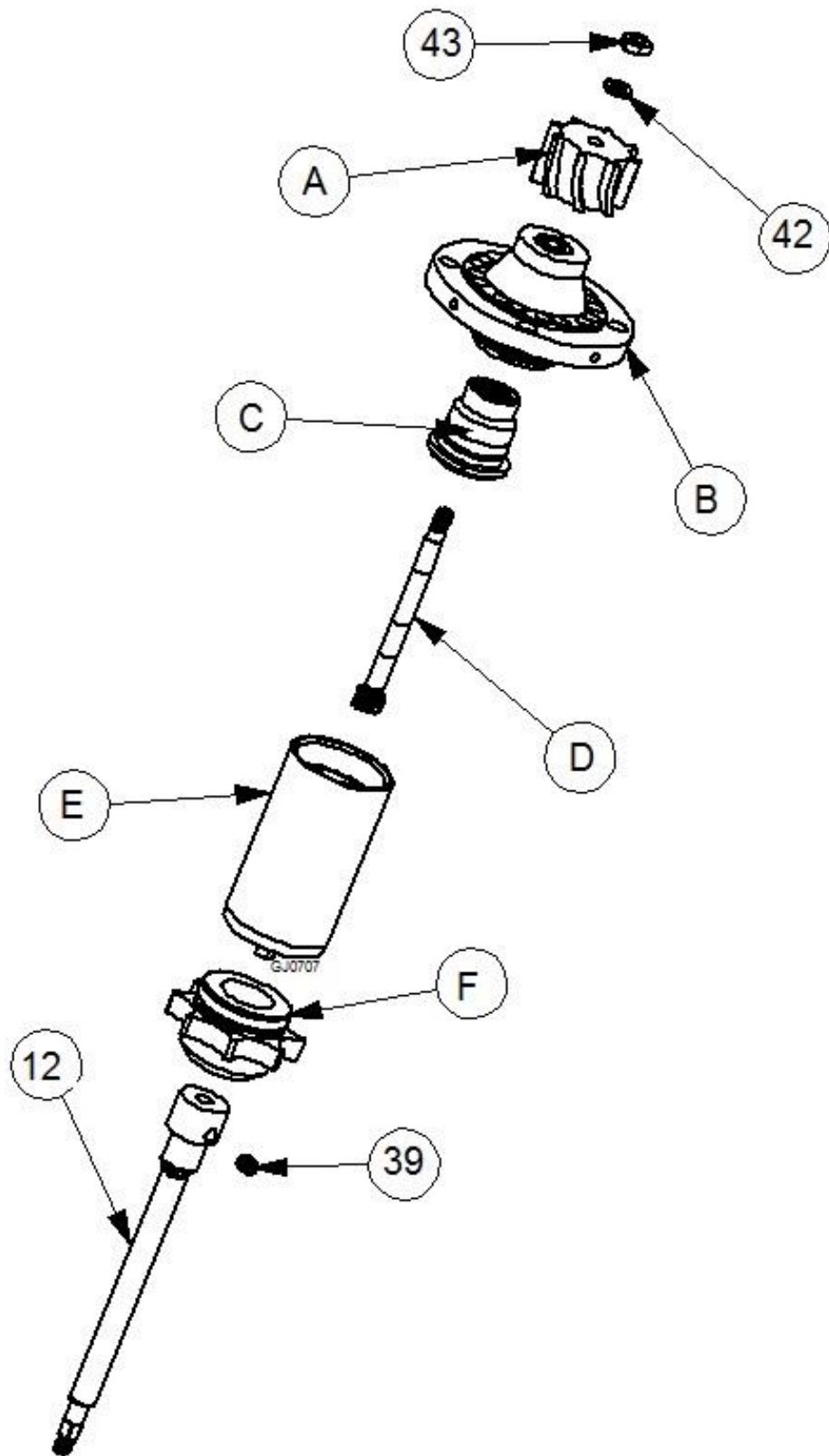
Drawing 5: Rotor Shaft Assembly



Drawing 6: Rotor Assembly

8. Parts List and Service Kits

The drawing shows Alfa Laval GJ 7 Tank Cleaning Machine



Drawing 7: Gear Train Assembly

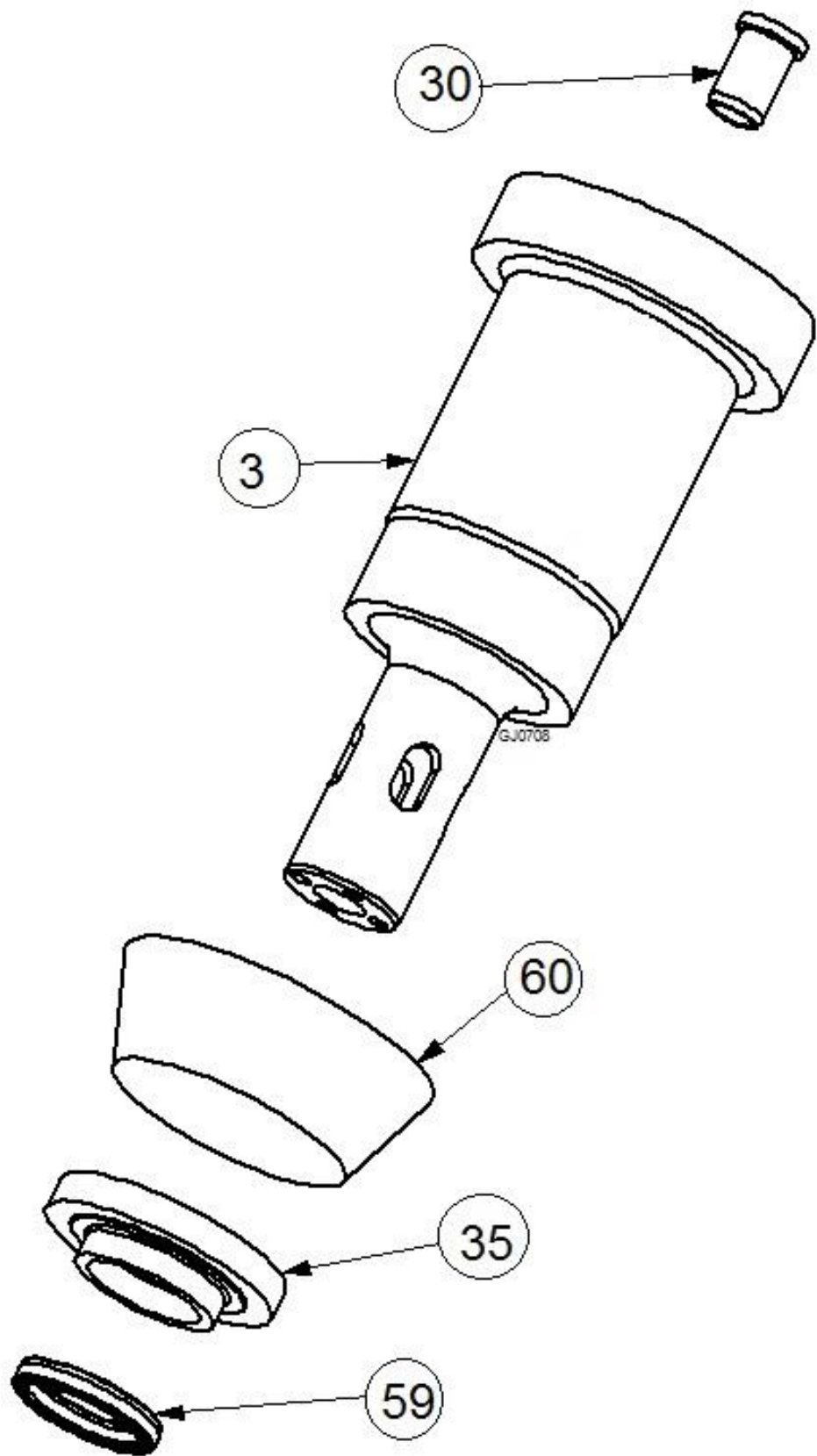
(For Low Pressure Applications, refer to Appendix A)

- | | |
|--------------|--------------|
| A: Drawing 6 | D: Drawing 5 |
| B: Drawing 1 | E: Drawing 3 |
| C: Drawing 4 | F: Drawing 2 |

8. Parts List and Service Kits

The drawing shows Alfa Laval GJ 7 Tank Cleaning Machine

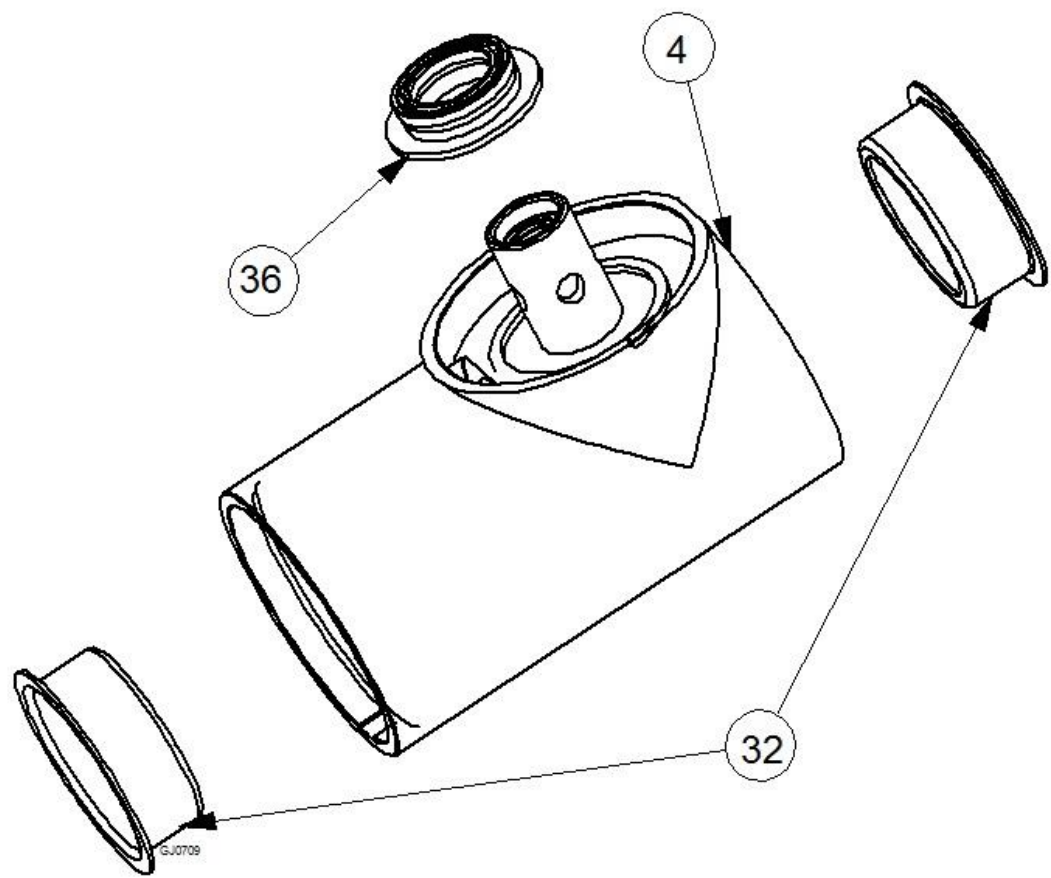
8.4 Assembly Drawings – 8, 9, 10 & 11



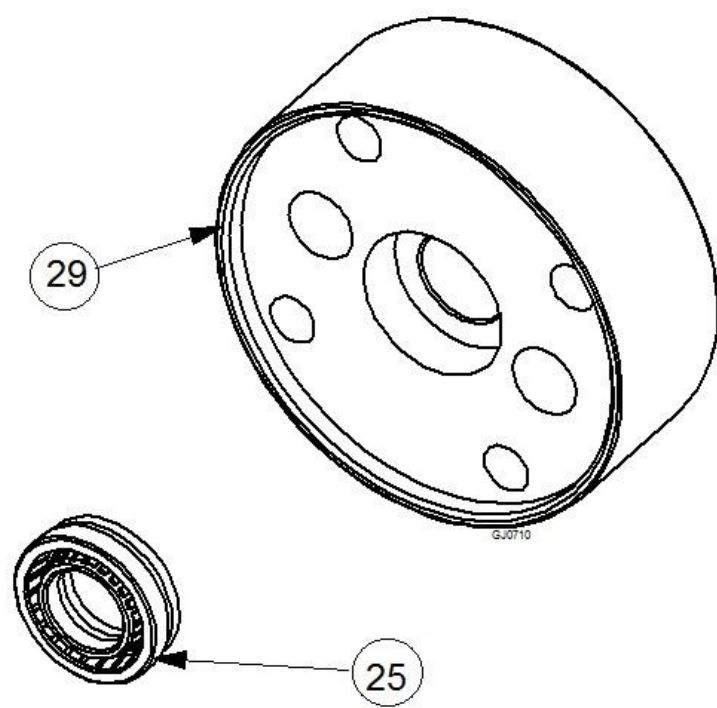
Drawing 8: Stem Assembly

8. Parts List and Service Kits

The drawing shows Alfa Laval GJ 7 Tank Cleaning Machine



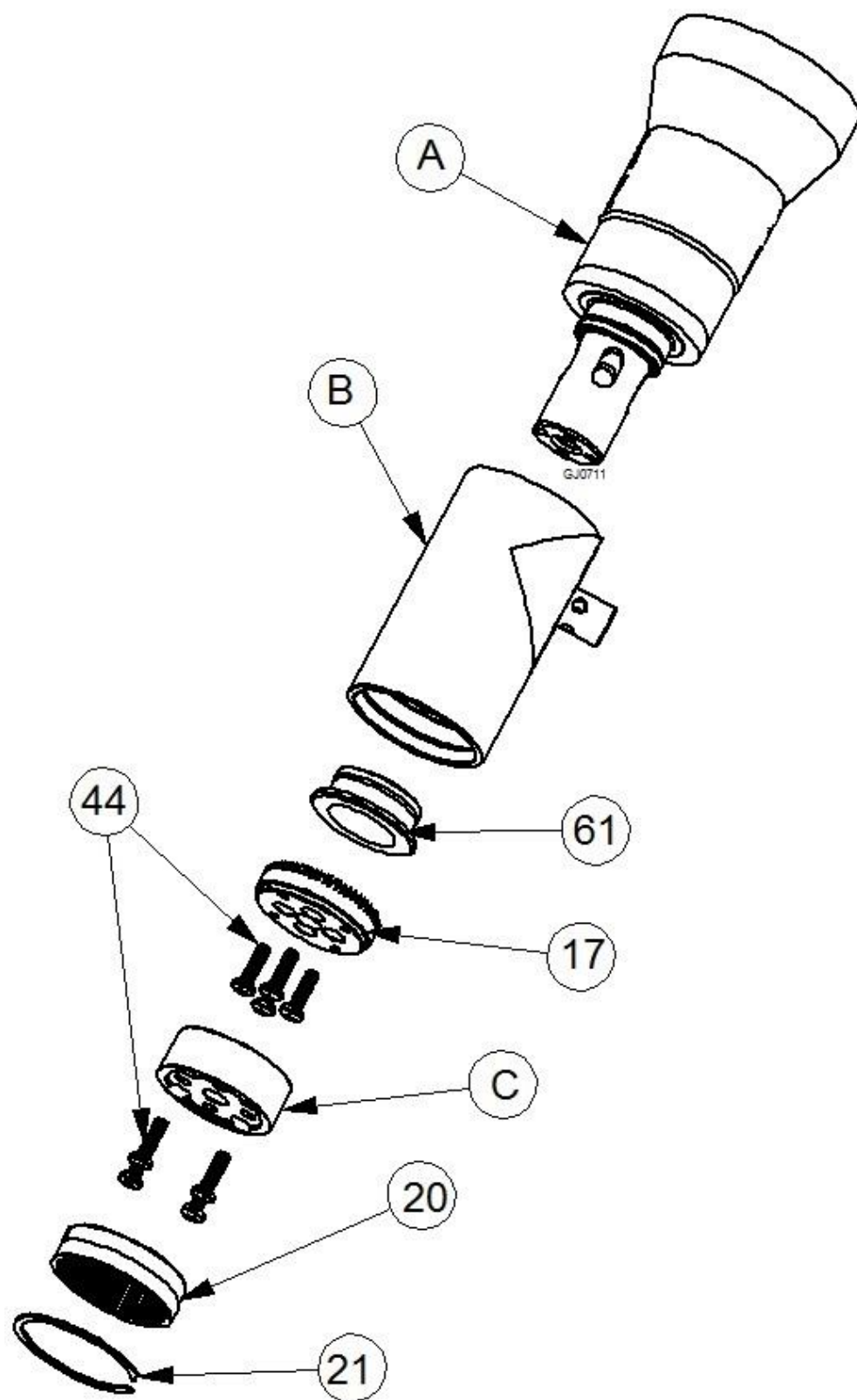
Drawing 9: Tee Housing Assembly



Drawing 10: Idler Shaft Base Assembly

8. Parts List and Service Kits

The drawing shows Alfa Laval GJ 7 Tank Cleaning Machine



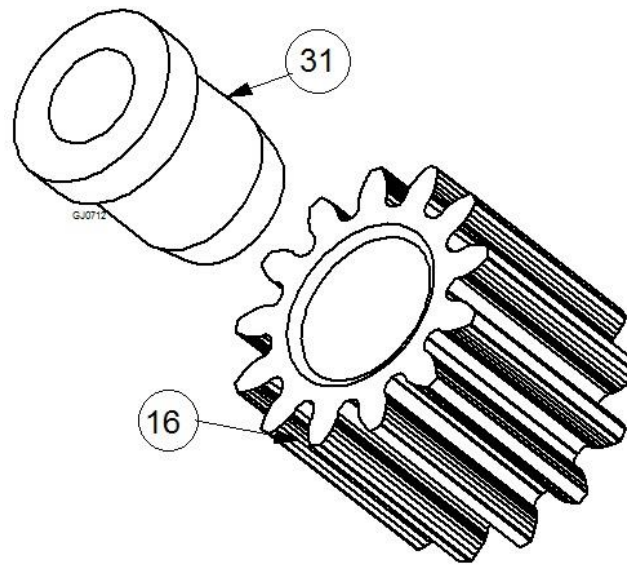
Drawing 11: Body Assembly

A: Drawing 8
B: Drawing 9
C: Drawing 10

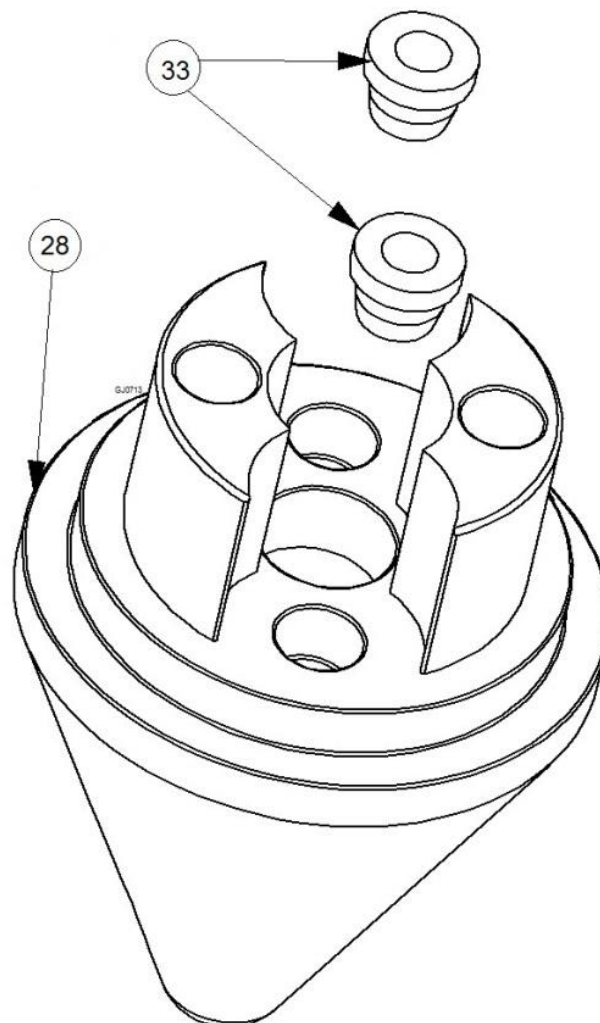
8. Parts List and Service Kits

The drawing shows Alfa Laval GJ 7 Tank Cleaning Machine

8.5 Assembly Drawings – 12, 13 & 14



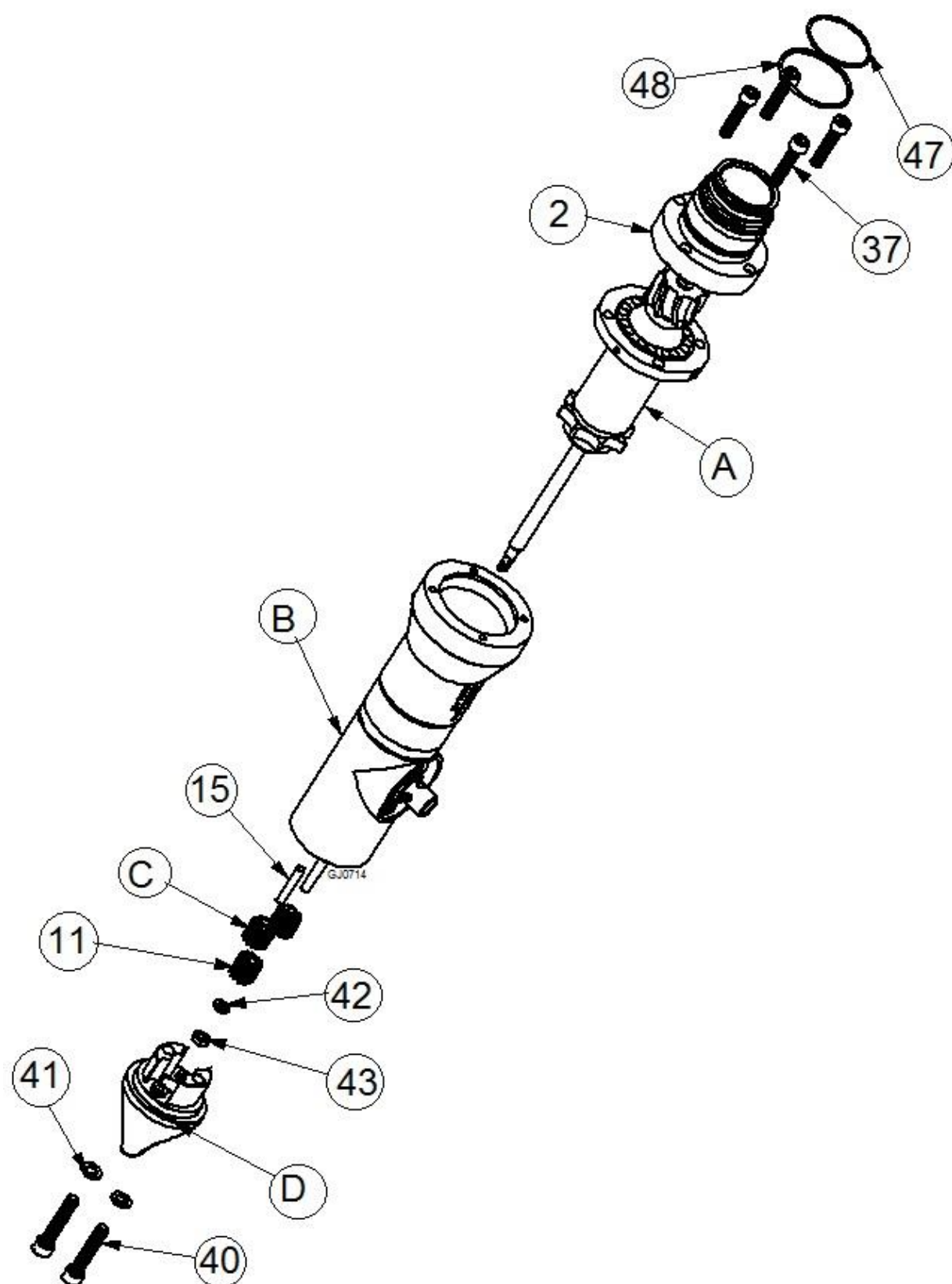
Drawing 12: Idler Gear Assembly



Drawing 13: Idler Shaft Base Assembly

8. Parts List and Service Kits

The drawing shows Alfa Laval GJ 7 Tank Cleaning Machine



Drawing 14: Installing Gear Train into Body

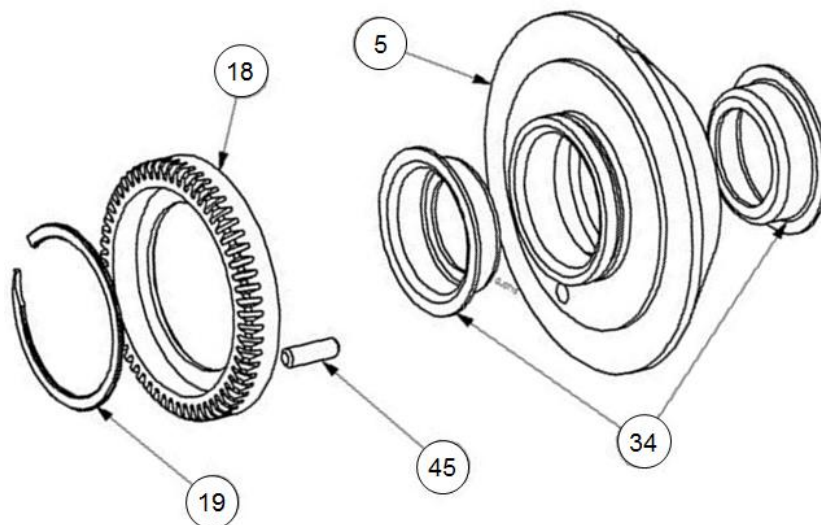
A: Drawing 7
B: Drawing 11

C: Drawing 12
D: Drawing 13

8. Parts List and Service Kits

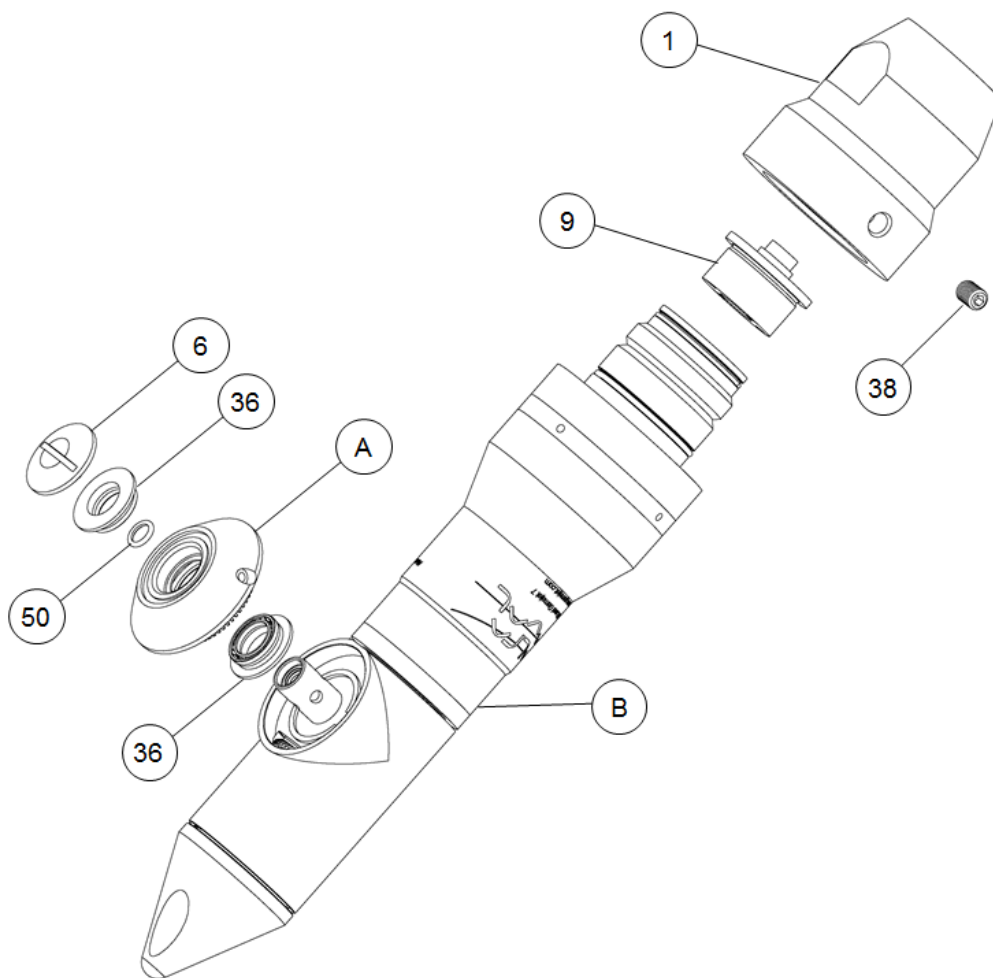
The drawing shows Alfa Laval GJ 7 Tank Cleaning Machine

8.6 Assembly Drawings – 15 & 16



Drawing 15: Nozzle Housing Assembly

(For Low Pressure Applications, refer to Appendix A)



Drawing 16: Completing the Assembly

(For Low Pressure Applications, refer to Appendix A)

A: Drawing 15
B: Drawing 14

8. Parts List and Service Kits

8.7 Parts List

Pos.	AL No.	Gamajet No.	Description	No.
1	9614680301	7-701-S	INLET COLLAR	1
2	9614680401	7-702-S	STEM CAP	1
3.1	9614680501	7-703-E	STEM GUIDE – OPTIONAL, FOR LP ONLY	1
3.2	9614680601	7-703-L	STEM	1
4	9614680701	7-704	TEE HOUSING	1
5.1	9614681101	7-705-DT	DUAL NOZZLE HOUSING	1
5.2	9614681001	7-705-DN	DUAL NOZZLE HOUSING – FOR LP ONLY	1
5.3	9614681201	7-705-TN	TRIPLE NOZZLE HOUSING – FOR LP ONLY	1
6	9614681301	7-706	NAME PLATE	1
7.1	9614681401	7-707	NOZZLE - 0.070" – FOR LP ONLY	2 or 3
7.2	9614681402	7-707	NOZZLE - 0.075" – FOR LP ONLY	2 or 3
7.3	9614681403	7-707	NOZZLE - 0.080" – FOR LP ONLY	2 or 3
7.4	9614681404	7-707	NOZZLE - 0.100" – FOR LP ONLY	2 or 3
8	9614681501	7-708-S	GEARHEAD HOUSING	1
9.1	9614681601	7-709-3	STATOR – 3.0	1
9.2	9614681602	7-709-4	STATOR – 4.0	1
9.2	9614681603	7-709-4H	STATOR – 4H	1
9.4	9614681604	7-709-4X	STATOR – 4X	1
9.5	9614681605	7-709-5	STATOR – 5.0	1
9.6	9614681606	7-709-5H	STATOR – 5H	1
9.7	9614681607	7-709-MV	STATOR – MV	1
9.8	9614681608	7-709-SV	STATOR – SV	1
9.9	9614681609	7-709-SV2	STATOR – SV2	1
10	9614681701	7-710	ROTOR	1
11	9614681901	7-711	OUTPUT PINION	1
12	9614682001	7-712-L	OUTPUT SHAFT	1
13	9614682101	7-713-AS	ROTOR SHAFT BEARING HOUSING	1
14	9614682301	7-714-S	OUTPUT SHAFT SEAL HOUSING	1
15	9614682401	7-715	IDLER SHAFT	2
16	9614682501	7-716	IDLER GEAR	2
17	9614682601	7-717	TEE HOUSING BEVEL GEAR	1
18	9614682701	7-718	NOZZLE HOUSING BEVEL GEAR	1
19	9614682801	7-719	NOZZLE BEVEL GEAR RETAINING RING	1
20	9614682901	7-720	RING GEAR	1
21	9614683001	7-721	RING GEAR RETAINING RING	1

8. Parts List and Service Kits

22	9614683101	7-722	INPUT SHAFT	1
23	9614683501	7-723-S	INPUT SHAFT SEAL	1
24	9614683601	7-724-S	OUTPUT SHAFT UPPER SEAL	1
25	9614683701	7-725	OUTPUT SHAFT LOWER SEAL	1
26	9614683801	7-726	GEARHEAD	1
27	9614684001	7-727-T	ROTOR SHAFT LOWER BEARING w/ BEARING	1
28	9614684101	7-728-E	BASE	1
29	9614684201	7-729	IDLER SHAFT BASE	1
30	9614684301	7-730	OUTPUT SHAFT LOWER BUSHING	1
31	9614684401	7-731	IDLER GEAR BUSHING	2
32	9614684501	7-732	TEE HOUSING BEARING CUP	2
33	9614684601	7-733	IDLER SHAFT BUSHING	2
34	9614684701	7-734	NOZZLE HOUSING BEARING CUP	2
35	9614684901	7-735-B	TEE HOUSING LOWER BEARING	1
36	9614685101	7-736	NOZZLE HOUSING BEARING & SEAL	2
37	9614685501	7-740	STEM CAP SCREW	4
38	9614685601	7-741	INLET COLLAR HEX SOCKET SET SCREW	1
39	9614685701	7-742	OUTPUT SHAFT HEX SOCKET SET SCREW	1
40	9614685801	7-743	BASE SCREW	2
41	9614685901	7-744	BASE LOCKWASHER	2
42	9614686001	7-746	ROTOR & OUTPUT PINION LOCKWASHER	2
43	9614686101	7-747	ROTOR & OUTPUT PINION NUT	2
44	9614686201	7-748	T.H.BEVEL GEAR & IDLER SHAFT BASE SCREW	8
45	9614686301	7-749	DRIVE PIN	2
46	9614686401	7-750	GEARHEAD SCREW	2
47.1	9614686501	7-751-E	STEM CAP SMALL O-RING – EPDM	1
47.2	9614686502	7-751-K	STEM CAP SMALL O-RING – VITON	1
47.3	9614686503	7-751-V	STEM CAP SMALL O-RING - KALREZ	1
48.1	9614686601	7-752-E	STEM CAP LARGE O-RING – EPDM	1
48.2	9614686602	7-752-K	STEM CAP LARGE O-RING – KALREZ	1
48.3	9614686603	7-752-V	STEM CAP LARGE O-RING - VITON	1
49.1	9614686801	7-754-E	ROTOR SHAFT BEARING HOUSING O-RING - EPDM	2
49.2	9614686802	7-754-K	ROTOR SHAFT BEARING HOUSING O-RING – KALREZ	2
49.3	9614686803	7-754-V	ROTOR SHAFT BEARING HOUSING O-RING - VITON	2
50.1	9614686901	7-755-E	TEE HOUSING NOSE O-RING – EPDM	1
50.2	9614686902	7-755-K	TEE HOUSING NOSE O-RING – KALREZ	1
50.3	9614686903	7-755-V	TEE HOUSING NOSE O-RING – VITON	1
51	9614687001	756	INPUT PINION	1

8. Parts List and Service Kits

52.1	9614687101	7-757-E	NOZZLE O-RING – EPDM - FOR LP ONLY	2 or 3
52.2	9614687102	7-757-V	NOZZLE O-RING – VITON - FOR LP ONLY	2 or 3
53	9614687201	7-758	GEARHEAD PIN	1
54	9614687501	7-763-E	ROTOR SHAFT HOUSING O-RING – EPDM	1
55	9614687601	7-764	INPUT SHAFT SEAL RETAINING RING	1
56	9614685201	7-738	SHORT CARBIDE BEARING	1
57	9614682201	7-713-S	ROTOR SHAFT BEARING HOUSING	1
58	9614685301	7-739	LONG CARBIDE BEARING	1
59	9614685001	7-735-S	TEE HOUSING LOWER SEAL	1
60	9614680501	7-703-E	STEM GUIDE (OPTIONAL FOR LP ONLY)	1
61	9614684801	7-735	TEE HOUSING UPPER BEARING & SEAL	1
62.1	9614687401	760-E	ROTOR SHAFT HOUSING O-RING - EPDM - FOR LP ONLY	1
62.2	9614687402	760-V	ROTOR SHAFT HOUSING O-RING - VITON - FOR LP ONLY	1
63	9614683901	7-727-SAS	ROTOR SHAFT LOWER BEARING, FOR LP ONLY	1
64	9614683301	7-723-B	LOWER BEARING HOUSING SEAL, FOR LP ONLY	1
65.1	9614687301	759-E	ROTOR SHAFT O-RING - EPDM - FOR LP ONLY	1
65.2	9614687302	759-V	ROTOR SHAFT O-RING - VITON - FOR LP ONLY	1

8. Parts List and Service Kits

8.8 Minor Service Kit

Article no: 9614688001 7ZE ALFA LAVAL GJ 7 KIT - EPDM				
Pos. no.	Part No.	Gamajet Part No.	Description	No.
23	9614683501	7723S	GJ VII INPUT SHAFT SEAL	1 pcs.
24	9614683601	7724S	GJ VII OUTPUT SHAFT SEAL	1 pcs.
25	9614683701	7725	GJ VII OUTPUT SHAFT LOWER SEAL	1 pcs.
30	9614684301	7730	GJ VII OUTPUT SHAFT LOWER BUSH	1 pcs.
31	9614684401	7731	GJ VII IDLER GEAR BUSHING	2 pcs.
33	9614684601	7733	GJ VII IDLER SHAFT BUSHING	2 pcs.
61	9614684801	7735	GJ 7 TEE HSG SEAL	1 pcs.
35	9614684901	7735B	GJ VII TH LOWER BEARING	1 pcs.
59	9614685001	7735S	GJ VII TH LOWER SEAL	1 pcs.
36	9614685101	7736	GJ VII NH BEARING & SEAL	2 pcs.
39	9614685701	7742	GJ VII OUTPUT SHAFT SET SCREW	1 pcs.
44	9614686201	7748	GJ VII CAP SCREW	8 pcs.
47.1	9614686501	7751E	GJ VII STEM CAP SMALL O-RING	1 pcs.
48.1	9614686601	7752E	GJ VII STEM CAP LARGE O-RING	1 pcs.
49.1	9614686801	7754E	GJ VII ROTOR SHAFT BEARING HOU	2 pcs.
50.1	9614686901	7755E	GJ VII TEE HOUSING NOSE O-RING	1 pcs.
52.1	9614687101	7757E	GJ VII NOZZLE O-RING EP	3 pcs.
54	9614687501	7763E	GJ VII RTR SHFT HSG O-RING EP	1 pcs.

8. Parts List and Service Kits

8.9 Major Service Kit

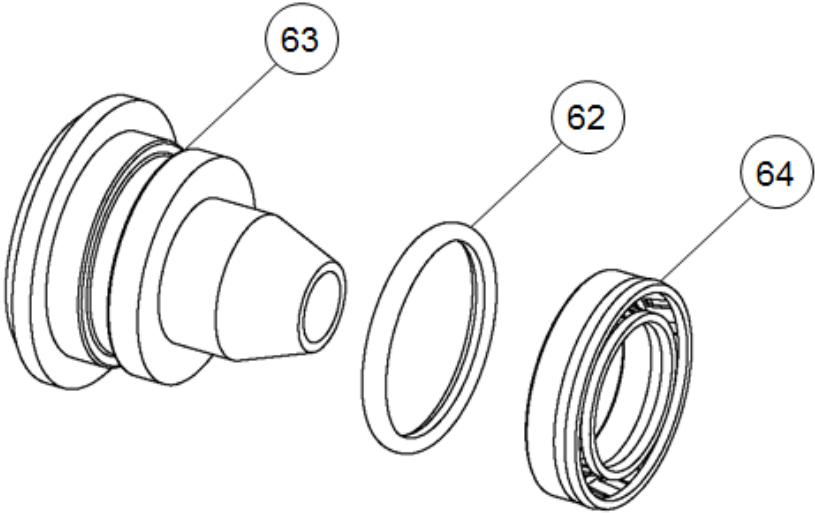
Article no: 9614688101 7ZEMAJKIT ALFA LAVAL GJ 7 MAJOR KIT - EPDM				
Pos. no.	Part No.	Gamajet Part No.	Description	No.
23	9614683501	7723S	GJ VII INPUT SHAFT SEAL	1 pcs.
24	9614683601	7724S	GJ VII OUTPUT SHAFT SEAL	1 pcs.
25	9614683701	7725	GJ VII OUTPUT SHAFT LOWER SEAL	1 pcs.
30	9614684301	7730	GJ VII OUTPUT SHAFT LOWER BUSH	1 pcs.
31	9614684401	7731	GJ VII IDLER GEAR BUSHING	2 pcs.
33	9614684601	7733	GJ VII IDLER SHAFT BUSHING	2 pcs.
61	9614684801	7735	GJ 7 TEE HSG SEAL	1 pcs.
35	9614684901	7735B	GJ VII TH LOWER BEARING	1 pcs.
59	9614685001	7735S	GJ VII TH LOWER SEAL	1 pcs.
36	9614685101	7736	GJ VII NH BEARING & SEAL	2 pcs.
39	9614685701	7742	GJ VII OUTPUT SHAFT SET SCREW	1 pcs.
44	9614686201	7748	GJ VII CAP SCREW	8 pcs.
47.1	9614686501	7751E	GJ VII STEM CAP SMALL O-RING	1 pcs.
48.1	9614686601	7752E	GJ VII STEM CAP LARGE O-RING	1 pcs.
49.1	9614686801	7754E	GJ VII ROTOR SHAFT BEARING HOU	2 pcs.
50.1	9614686901	7755E	GJ VII TEE HOUSING NOSE O-RING	1 pcs.
52.1	9614687101	7757E	GJ VII NOZZLE O-RING EP	3 pcs.
54	9614687501	7763E	GJ VII RTR SHFT HSG O-RING EP	1 pcs.
11	9614681901	7711	GJ VII OUTPUT PINION	1 pcs.
12	9614682001	7712L	GJ VII OUTPUT SHAFT	1 pcs.
16	9614682501	7716	GJ VII IDLER GEAR	2 pcs.
22	9614683201	7722AS	GJ VII INPUT SHAFT W/ INPUT PI	1 pcs.
26	9614683801	7726	GJ VII PLANETARY GEARHEAD	1 pcs.
32	9614684501	7732	GJ VII TEE HOUSING BEARING CUP	2 pcs.
34	9614684701	7734	GJ VII NOZZLE HOUSING BEARING	2 pcs.

Appendix A

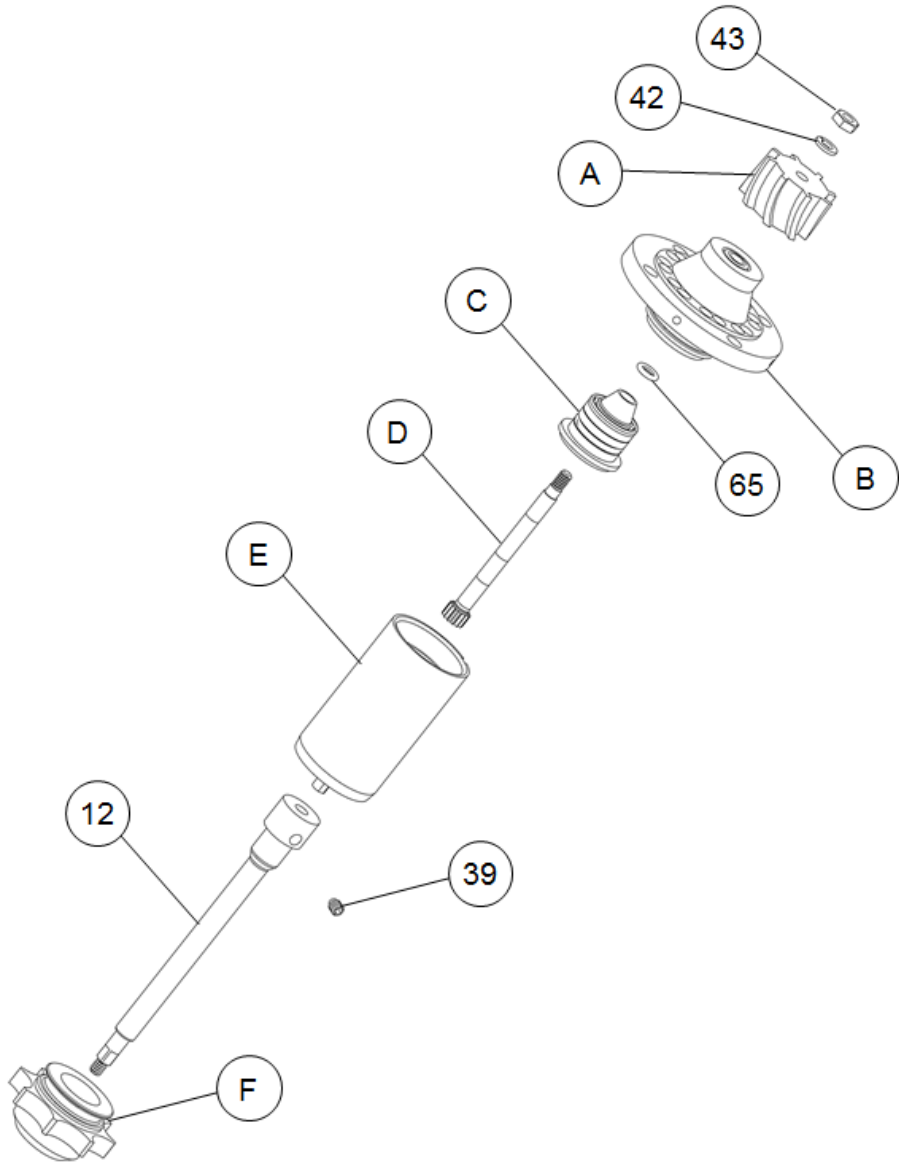
AL GJ 7 (For Low Pressure Applications)



8. Parts List and Service Kits



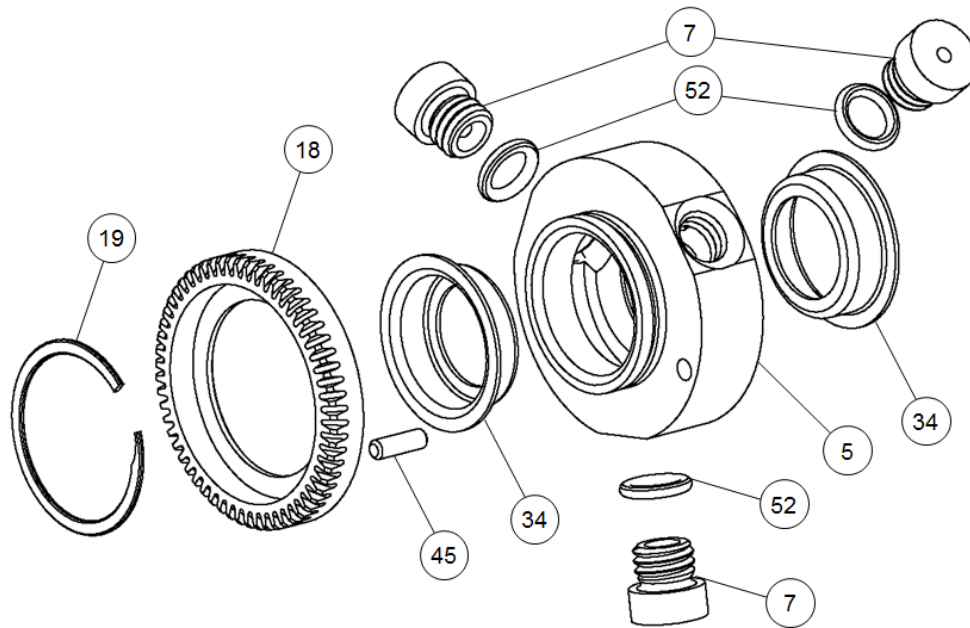
Drawing 4A: Rotor Shaft Lower Bearing Housing



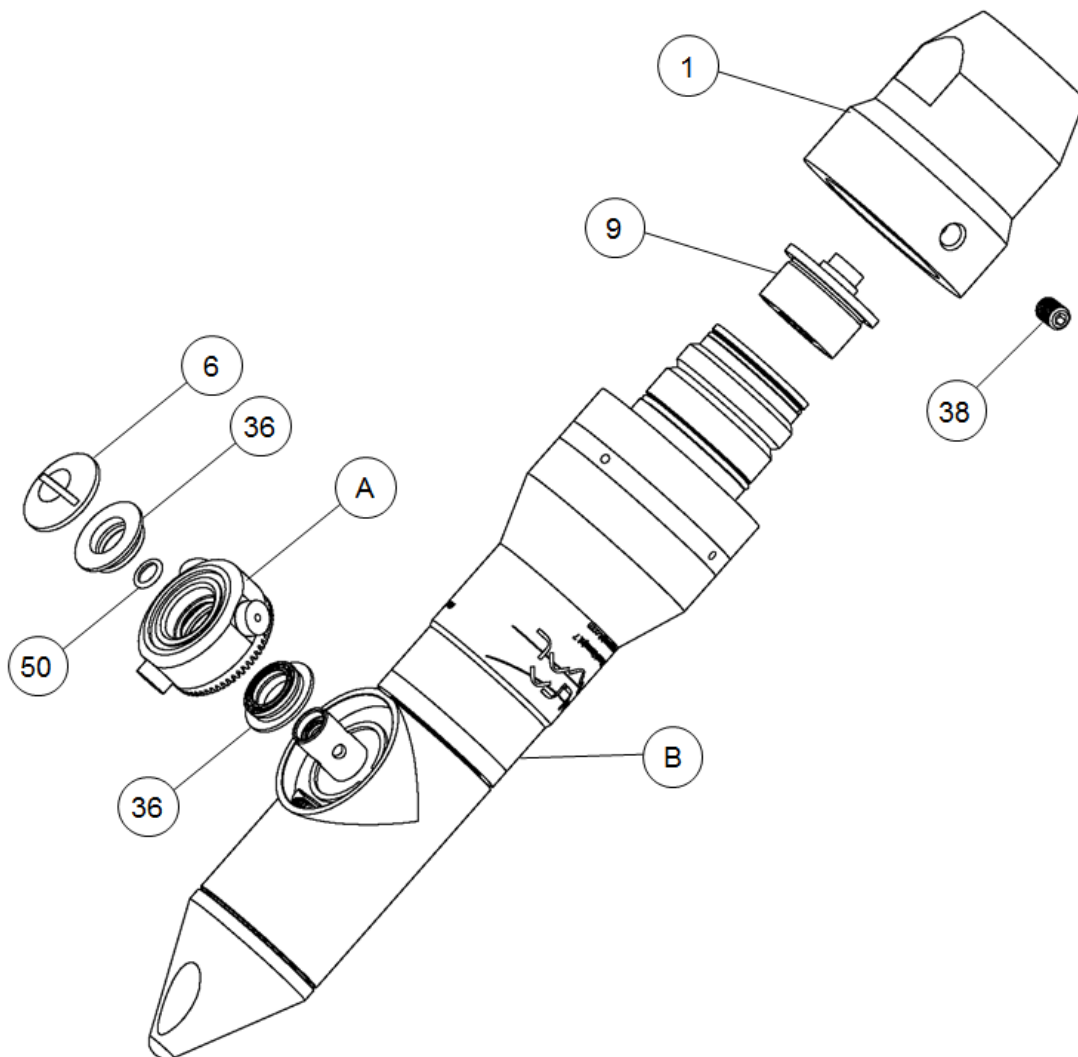
Drawing 7A: Gear Train Assembly

- | | |
|---------------|--------------|
| A: Drawing 6 | D: Drawing 5 |
| B: Drawing 1 | E: Drawing 3 |
| C: Drawing 4A | F: Drawing 2 |

8. Parts List and Service Kits



Drawing 15A: Nozzle Housing Assembly



Drawing 16A: Completing the Assembly

A: Drawing 15A
B: Drawing 14

How to contact Alfa Laval Tank Equipment

For further information please feel free to contact:

Alfa Laval Tank Equipment

604 Jeffers Circle, Exton, PA 19341 USA

Tel switchboard: +01 610 408 9940 - Fax switchboard: +01 610 408 9945

<http://www.gamajet.com>, www.alfalaval.com, customerservice.exton@alfalaval.com

Contact details for all countries are continually updated on our websites.

© Alfa Laval Corporate AB

This document and its contents is owned by Alfa Laval Corporate AB and protected by laws governing intellectual property and thereto related rights. It is the responsibility of the user of this document to comply with all applicable intellectual property laws. Without limiting any rights related to this document, no part of this document may be copied, reproduced or transmitted in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise), or for any purpose, without the expressed permission of Alfa Laval Corporate AB. Alfa Laval Corporate AB will enforce its rights related to this document to the fullest extent of the law, including the seeking of criminal prosecution.