



Instruction Manual

Alfa Laval Toftejorg™ SaniJet 25



Covering: Standard Machines

Q-doc - Equipment Documentation (3.1 Inspection Certificate – EN 10204)

Q-doc + FAT-SAT - Qualification Documentation

Machines delivered with ATEX Certification in accordance with Directive 2014/34/EU

USP Class VI materials. TE91A760-EN15

ESE01842-EN15 08-2016

Original manual

The information herein is correct at the time of issue but may be subject to change without prior notice

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1 EC/EU Declaration of Conformity

The Designated Company

Alfa Laval Kolding A/S

Company Name

Albuen 31, DK-6000 Kolding, Denmark

Address

+45 79 32 22 00

Phone No.

hereby declare that

Tank Cleaning Machine

Designation

Alfa Laval Toftejorg SaniJet 25

Type

From serial number 2016-0001 to 2030-99999

is in conformity with the following directive with amendments:

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

FDA 21CFR§177


Regulation (EC) 1935/2004

Equipment Explosive Atmospheres (ATEX) Directive 2014/34/EU

(Applicable for machine certified as category 1 and 2 component, see machine engraving)

DS/EN 13463-1:2009, DS/EN 13463-5:2011, DS/EN ISO/IEC 80079-34:2011, Annex A, paragraph A.5.3 Rotating machines

EC Type Examination Certificate no. Baseefa04ATEX0358X

Marking:  II 1 GD c T140°C

SGS Baseefa Ltd., Certification body number 1180, Rockhead Business Park, Staden Lane, Buxton, Derbyshire SK17 9RZ, United Kingdom

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

Global Product Quality Manager
Pumps, Valves, Fittings and Tank Equipment

Title

Lars Kruse Andersen

Name



Signature

ATEX Responsible Engineer

Title

Denniz Høxbroe

Name



Signature

Kolding

Place

2016-05-01

Date

(This Declaration of Conformity replaces Declaration of Conformity dated 2016-01-01)



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 :



3.1 Introduction

Based on more than 30 years of experience from practical tank cleaning and production of tank cleaning equipment, the Alfa Laval Toftebjerg SaniJet 25 has been developed to meet the highest demands for efficiency, reliability and hygiene within food, beverage, pharmaceutical and biotechnology industry.

This manual has been prepared as a guide for the persons who will be operating and maintaining your tank cleaning machine.

The Alfa Laval Toftebjerg SaniJet 25 is the first ever tank cleaning machine to obtain a certificate of in-place cleanability from EHEDG (European Hygienic Engineering Design Group). It is designed, tested and approved according to EHEDG's requirement for self cleanability (EHEDG Doc. 2) and tested to be sterilizable (EHEDG Doc. 5).



Warning:



In order to maintain the hygienic state of the machine it is of highest importance that the Alfa Laval Toftebjerg SaniJet 25 is handled and installed according to the instructions in this manual. Scratched surfaces and/or destroyed O-rings reduce performance and hygienic design. Therefore, it is recommended to use the correct tools specially designed for maintenance of the Alfa Laval Toftebjerg SaniJet 25 (TE81B149).

Alfa Laval offers maintenance by a trained and certified Alfa Laval Toftebjerg SaniJet 25 service engineers.

Alfa Laval offers education of you service engineer(s) for your maintenance of the Alfa Laval Toftebjerg SaniJet 25 using the special maintenance tools, teaching how to maintain the Alfa Laval Toftebjerg SaniJet 25 and its hygienic state and how to test the Alfa Laval Toftebjerg SaniJet 25 after maintenance.

If the Alfa Laval Toftebjerg SaniJet 25 stops rotating unintentionally within the warranty period, please return the machine to Alfa Laval Kolding A/S. Please do not try to fix any mechanical problems before shipping.

You will find the information contained in this manual simple to follow, but should you require further assistance, our Customer Service Department and world-wide net of Distributors will be pleased to help you. Please quote the type and serial number with all your enquiries; this will help us to help you. The type and serial number are placed on the body of the tank cleaning machine.

Warning:



Before installing the machine and setting it into operation carefully read the General Safety and Installation Instructions (page 13) and the Specific Conditions for Safe Use in accordance with the ATEX certification (page 15) and take all necessary precautions according to your application and local regulations.

Note: The illustrations and specifications contained in this manual were effective at the date of printing. However, as continuous improvements are our policy, we reserve the right to alter or modify any unit specification on any product without prior notice or any obligation.

The English version of the instruction manual is the original manual. We make reservations in regard to possible mistranslations in language versions of the instruction manual. In case of doubt, the English version of the instruction manual applies.

3 Introduction

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3.2 Intended Use

It is to be verified by the end-user:

- the Alfa Laval Toftejorg SaniJet 25 tank cleaning machine is in conformity with respect to tank -, vessel - or container size in which it intended to be used.
- the constructions materials (both metallic and non-metallic) are compatible with product, flushing media, cleaning media, temperatures and pressure under the intended use.

To ensure the self cleanability and drainability the machine must be installed in vertical position

3.3 Patents and Trademarks

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

Alfa Laval Kolding A/S. All rights reserved.

The Alfa Laval logotype is a trademark or a registered trademark of Alfa Laval Corporate AB. "Toftejorg" and "SaniJet" are trademarks or registered trademarks of Alfa Laval Kolding A/S. The Toftejorg™ SaniJet™ 25 product has patents in the EPO member states (EP 0 560 778), in the US (5333630) and in other countries and has a new patent pending (200600176 & 200600177 & 200700902). 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

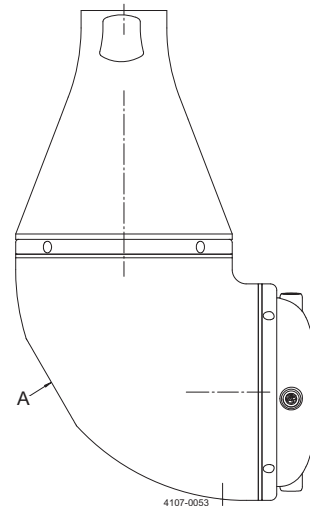
Rotary Jet Head
SaniJet 25
Patent Pending
s/n.: yyyy-xxxxx

Alfa Laval, DK-6000 Kolding, Albuen 31
CE

or

Rotary Jet Head
SaniJet 25
Patent Pending
s/n.: yyyy-FAT-SAT-xxx

Alfa Laval, DK-6000 Kolding, Albuen 31
CE



A: Marking area

Serial number explanation

Machines supplied with or without normal documentation:

yyyy-xxxxx: serial number

yyyy: year

xxxxx: 5 digit sequential number

Serial number explanation

Machines supplied with or without normal documentation:

yyyy-FAT-SAT-xxx: serial number

yyyy: year

xxx: 3 digit sequential number

3 Introduction

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3.5 ATEX Marking

The Alfa Laval Toftebjerg SaniJet 25 is certified as category I components. The certification is carried out by the notified body SGS Baseefa, who has issued the certificate no. 04ATEX0358X. The marking on the ATEX certified Alfa Laval Toftebjerg SaniJet 25 is as follows (see previous page for position of marking):

**Rotary Jet Head
SaniJet 25
Patent Pending
s/n.: yyyy-xxxxx**
Alfa Laval, DK-6000 Kolding, Albuen 31
 II 1GD c T 140°C
CE 1180 Baseefa 04ATEX0358X

**Rotary Jet Head
SaniJet 25
Patent Pending
s/n.: yyyy-FAT-SAT-xxx**
Alfa Laval, DK-6000 Kolding, Albuen 31
 II 1GD c T 140°C
CE 1180 Baseefa 04ATEX0358X

Serial number explanation

Machines supplied with or without normal documentation:

yyyy-xxxxx: serial number

yyyy: year

xxxxx: 5 digit sequential number

Serial number explanation

Machines supplied with or without normal documentation:

yyyy-FAT-SAT-xxx: serial number

yyyy: year

xxx: 3 digit sequential number

Changes to the machine are not allowed without approval by the person responsible for the ATEX certification at Alfa Laval Kolding A/S. If changes are made – or spare parts other than Alfa Laval original spare parts are used - the EC Type Examination certification (the ATEX Directive) is no longer valid.

Important ATEX information: Also see "Maintenance" page 18 regarding special conditions for repair of ATEX certified machines.



4.1 General description

The Alfa Laval Toftejorg SaniJet 25 is a media driven and media lubricated tank cleaning machine. No lubricating substances such as oil, grease etc. are used. All materials complies with FDA 21CFR§177 and for polymers also EU 10/2011, which makes the SaniJet 25 suited for sanitary and hygienic applications such as Food and Pharmaceutical industries. The machine is self-cleaning; i.e. all internal and external surfaces are cleanable, drainable and sterilizable.

The Alfa Laval Toftejorg SaniJet 25 is a sanitary cleaning device of the rotary jet head type for permanent installation that provides a 360° indexed cleaning pattern. Provided it is installed in a vertical position, the Alfa Laval Toftejorg SaniJet 25 is proven completely self-cleaning by the EHEDG test method and self-draining. Using the Sanitary welding connection between down pipe and machine provides a self cleanable connection. All product contact surfaces are AISI 316L, duplex SAF 2205 stainless steel or FDA compliant polymer materials.

No exposed threads or screws are present in the product contact areas.

The Alfa Laval Toftejorg SaniJet 25 is designed for use in pharmaceutical, biotechnology, food and dairy processing applications. Recommended for use in tanks and vessels between 0.5-30 m³ (130-8,000 US gallons) for larger tanks multiple units may be used.

4.2 Quality system

The SaniJet 25 is designed in accordance with the EHEDG design guidelines for sanitary design of processing equipment and is the first ever rotating jet head that has been awarded the certificate of compliance from EHEDG, showing that the machine has passed the EHEDG test (Doc. 2) for cleanability. In addition the machine is proven to be sterilizable based on EHEDG test (Doc. 5). It is produced according to Alfa Laval Kolding's ISO 9001 International Standard certified quality system. All parts are made from certified material and all non-metal parts are made from FDA and EU compliant materials and also available as USP Class VI materials. All materials has full traceability according to EU1935/2004/EC.

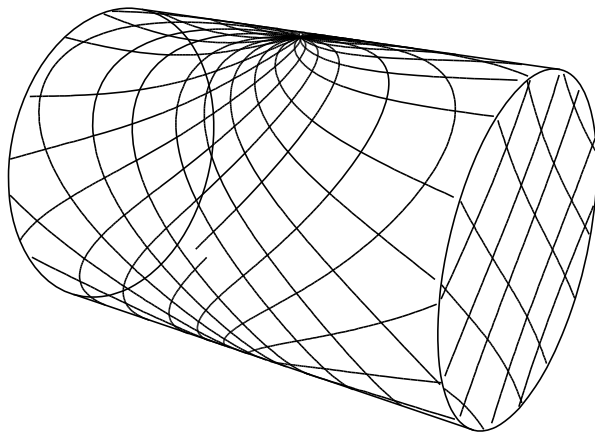
4 Installation

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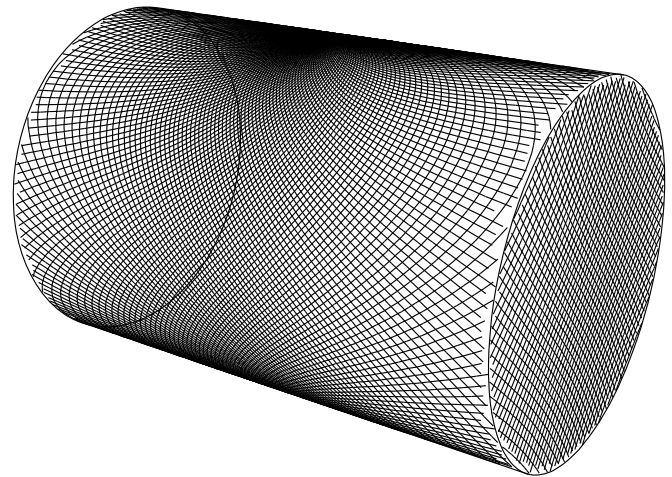
4.3 Functionality

The cleaning fluid passing through the machine passes through a turbine, which accordingly is set into rotation. The turbine rotation is transmitted through a set of gears and drive shaft to the machine body and the hub cover with nozzles.

The combined rotation of the machine body and the nozzles ensure a fully indexed tank cleaning coverage as illustrated below for a spherical tank with the machine placed in the centre. For light soiling only 1 cycle could be sufficient and for heavier soiling a full pattern (8 cycles) may be needed. One cycle provides a coarse pattern and is build from $5^{5/8}$ revolutions of the hub cover with nozzles; corresponding to $5^{3/8}$ revolutions of the machine body. During the following cycles, this coarse pattern is repeated 7 times, each coarse pattern displaced slightly. Hence, the pattern gradually becomes denser. Finally, after 8 cycles (a total of 45 revolutions of the hub cover with nozzles and 43 revolutions of the machine body), a complete cleaning pattern has been laid out, and the pattern starts over from the original starting point.



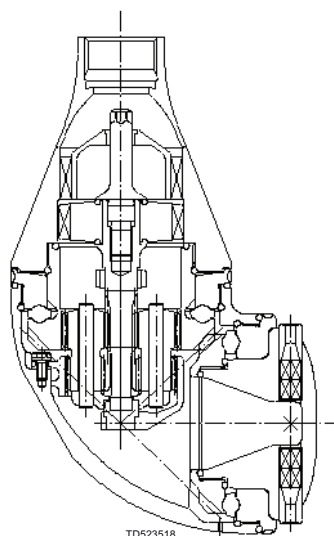
First cycle



Full pattern

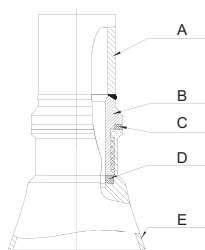
The number of cycles needed to perform a proper cleaning depends on type of soil, distance between tank cleaning machine and tank wall, cleaning procedure and cleaning agent. For residues that are easily mobilized, i.e. easy to remove, one cycle could be sufficient. Heavier soiling (high viscous, sticky substances, etc.) requires more cycles (a denser pattern).

The rotation speed of the turbine depends on the flow rate through the machine. The higher the flow rate, the higher the speed of rotation. In order to control the RPM of the machine for the wide range of flow rates, the machine has different turbines according to the nozzle size.



Self-cleaning is ensured by flushing the planet gear, the hub, the bevel gear, the nozzle head, the nozzles and the ball bearings with the CIP liquid. Furthermore, all gaps between moving parts are flushed with CIP liquid and finally also the outside surfaces of the machine is cleaned with the main flow of CIP liquid. In the bottom of the body, the machine is equipped with a hole to ensure self-draining. This self-draining is only ensured, if the machine is installed in vertical position and the drain hole is not blocked.

The threaded connection between downpipe and machine is not a product contact surface as it is enclosed using two seals and the welding adaptor. A welding adaptor, depending on downpipe dimensions, comes as standard with the machine.



A: Downpipe
 B: Welding Adapter
 C: Seal PTFE
 D: Seal EPDM
 E: SaniJet 25

4.4 General Safety and Installation Instructions

The Alfa Laval Toftejorg SaniJet 25 tank cleaning machine should be installed in vertical upright position with the connections pointing upward. Failure to do so means that the Alfa Laval Toftejorg SaniJet 25 is no longer gravity drainable (influences cleanability and increases risk of corrosion) and the maintenance intervals may be shortened.

It is recommended that the cleaning fluid supply line is equipped with a filter that traps solids with a particle size of 250µm (0.01") or smaller. **Avoid solid particles**, to minimize wear and unscheduled maintenance as particles can be caught in one of the internal passages of the machine and cause it to stop rotating.

In order to separate the CIP system from the process it is recommended to install a shutoff valve close to the machine inlet. This also prevents back-flow of liquid from the tank through the machine in case the cleaner head is submerged and there is an over-pressure inside the tank. The installation and operation shall be made in such a way that the gravity draining of the machine is ensured.

It is recommended that the fluid valve fitted is of a type that **prevents hydraulic shocks**, which may cause severe damage to the Alfa Laval Toftejorg SaniJet 25 and/or the entire installation. Ideally, a frequency controlled pump with a ramp function for start-up is used for supply of cleaning liquid.

Before connecting the machine to the system, **all supply lines and valves should be flushed** in order to remove foreign objects.

During handling and installation handle the machine with care in order not to damage surfaces of the machine.

4 Installation

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The Alfa Laval Toftejorg SaniJet 25 machine has been tested at the factory before shipping. You can check that the machine is in operating condition by blowing compressed air into the inlet, while holding the machine by the cone (Pos. 1) and verify that the rest of the machine rotates evenly. If resistance is recognised, the machine should be disassembled in order to localise the cause or returned to the nearest Alfa Laval Service Centre.

Connect the welding adaptor to the supply line. Screw the machine tightly onto the welding adaptor using a 36 mm flat jawed spanner (tool No. TE81B159) on the flats machined on the inlet cone.

Note: Do not try to turn the nozzle head by hand, since this may damage the gear. The nozzle head can be turned by blowing compressed air through the inlet connection.

Note: The machine shall be installed in accordance with national regulations for safety and other relevant regulations and standards. In EU-countries the complete system must fulfil the EU-Machinery Directive and depending of application, the EU-Pressure Equipment Directive, the EU-ATEX Directive and other relevant Directives and shall be CE-marked before it is set into operation.

Warning:



Precautions shall be made to prevent starting of the cleaning operation, while personnel are inside the tank or otherwise can be hit by jets from the nozzles.

ALWAYS use the welding adaptor included with the machine to connect the machine to the down-pipe. Otherwise the hygienic state of the installation is compromised. The welding adaptor's one end is welded onto the downpipe (weld must be of a hygienic quality following e.g. EHEDG guideline nr. 35 or 3-A recommendations of using AWS/ANSI D18.1)

Subjected to the environment of intended use and any in-house user requirements or policies adhesive such as Loctite No. 243 or equivalent could be used. Other methods could be acceptable and subject to customer preference.

Warning:



If the machine is used in potential explosive atmospheres, tapes or joint sealing compounds which are electrical insulators must not be used on threads or joints, unless an electrical connection is otherwise established to ensure an effective earthing. In addition, connecting pipe work, must be electrically conductive and earthed to the tank structure. The resistance between the nozzles and the tank structure should not exceed 20,000 Ohm. This is essential to avoid the build-up of static electricity on the machine. For further information see IEC/TS 60079-32-1:2013, guidance and recommendations for the avoidance of hazards due to static electricity.

4.5 Specific Conditions for Safe Use in accordance with ATEX Certification

In accordance with the ATEX Certification, Directive 2014/34/EU the following special conditions shall be obeyed.

ATEX warning: The unit may be operated, in a hazardous area, only when filled with the process fluid.



ATEX warning: If a medium other than the process fluid is passed through the equipment the flow must not be high enough to cause the equipment to operate. If this cannot be avoided the rotor must be removed or secured to prevent rotation.



ATEX warning: Working temperature max.
The maximum permitted process fluid temperature and ambient temperature when the machine is operating is 95°C.
Ambient temperature:
When the machine is **not** operating, the maximum permitted ambient temperature is 140°C.



ATEX warning: The maximum permitted process fluid working pressure is 8 bar.



ATEX warning: The unit must not be operated in a vessel having an enclosed volume of greater than 100 m³.
Tanks larger than 100 m³:
To use Tank Cleaning Machines in tanks larger than 100m³ is possible under certain conditions. It is necessary to know the current factors such as tank size, cleaning solvent and product. Additives can be used in the cleaning solvent, or, for example, the tank can be filled with nitrogen. The basic rules are described in the guide "IEC/TS 60079-32-1:2013".
Following a guidance document such as "IEC/TS 60079-32-1:2013" to establish safe use of machinery and process is the users own responsibility and is not covered by the ATEX certification for this product.



ATEX warning: The unit must be effectively earthed at all times when in use.



ATEX warning: The user must address the electrostatic hazards generated from the process of the equipment in accordance with guidance document IEC/TS 60079-32-1:2013.



In addition to the above mentioned precautions relating to the ATEX guidelines Directive 2014/34/EU, the Safety Precautions on page 13 must be observed.

5 Operation

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5.1 Normal operation

Cleaning Media

Use only cleaning fluids, which are compatible with Stainless Steel AISI 316L, SAF2205, PEEK, PFA HP, PTFE and EPDM. Normal detergents, moderate solutions of acids and alkalis are acceptable as well as a number of solvents at ambient temperature during cleaning. Aggressive chemicals, excessive concentrations of chemicals at elevated temperatures as well as certain solvents and hydrochlorides should be avoided. If you are in doubt, contact your local Alfa Laval sales office.

Note: Please note that PEEK is not resistant to concentrated sulfuric acid.

Product

In cases where the machine is submerged in, or in other ways exposed to, product the compatibility between stainless steel AISI 316L, SAF 2205, PEEK, PFA and EPDM and the product must be considered carefully.

Note: EPDM swells significantly exposed to fatty materials

Pressure

Avoid hydraulic shocks. Increase pressure gradually. Do not exceed 8 bar inlet pressure. Recommended inlet pressure: 5-7 bar. High pressure in combination with high flow rate may increase consumption of wear parts. Too high pressure will also reduce the cleaning effect.

ATEX warning: Steam cleaning pressure



If steam cleaning is done through the machine, the steam pressure must not cause the machine to rotate.

ATEX warning: Draining



If the machine is drained using compressed air, then the compressed air pressure must not cause the machine to rotate.

After-use cleaning

After use flush the machine with fresh water. Cleaning media should never be allowed to dry or settle in the system due to possible "salting out" or "scaling" of the cleaning media. If cleaning media contains volatile chloride solvents, it is recommended not to flush with water after use, as this might create hydrochloric acid.

Temperature

The maximum recommended process fluid temperature is 90°C. The recommended ambient temperature range is 0°C to 140°C. For higher ambient temperatures the machine can be fitted with gasket of compatible material.

In accordance with the ATEX specifications regarding special conditions for safe use, see page 15.

ATEX warning: Atmosphere/surface temperature



In potentially explosive atmospheres, the temperature must not exceed the maximum surface temperature according to the temperature class for the combustible gas or liquid.

ATEX warning: Steam cleaning



Tanks with capacities greater than 100 m³ that could contain a flammable atmosphere should not be steam cleaned, as steam issuing from a nozzle could contain charged droplets. Tanks smaller than this may be steam cleaned providing that: the steam nozzles and other metal parts of the system are reliably earthed and grounded to the tank structure.

5.2 Safety Precautions

The machine is intended for use inside a tank only. As peak velocity of main jets reaches 40 m/s, Alfa Laval Toftejorg SaniJet 25 must not be operated in open air or when tank is open.

ATEX warning: Hot chemicals and steam under pressure may be used for cleaning and sterilising. Protect against scalding and burning. Never tamper with or try to open clamps or other connections while system is in operation. Make sure that system is de-pressurised and drained before disassembly.



The cleaning jets impinging the tank surface are a source of noise. Depending on pressure and distance to the tank walls, noise level may reach up to 85 dB.

ATEX warning: In case potentially explosive liquids are used, precautions should be taken against incidental creation of an explosive mixture with oxygen in the tank atmosphere.



ATEX warning: Tanks may contain poisonous/hazardous products or products which represent an environmental or safety risk. Never open tank and dismount the machine without checking previous tank contents and necessary precautions.



6 Maintenance

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6.1 Preventive Maintenance

Following the Alfa Laval Tank Equipment Preventive Maintenance Guidelines and using the Alfa Laval Service Kits ensures the availability of your equipment at all times and enables you to plan your operating budget and your downtime. The risk of unscheduled breakdowns due to component failure is virtually eliminated and in the long term your operating costs are reduced.

Alfa Laval Tank Cleaning Equipment Service Kits contain all you need. They comprise genuine Alfa Laval spare parts, manufactured to the original specifications.

The recommended preventive maintenance program is based on tank cleaning machines working in average conditions. However, a tank cleaning machine, exposed to heavy soiling and recirculation CIP liquid containing abrasives and/or particulates, needs more frequent attention than one exposed to light/no soiling and recirculation with ordinary CIP liquid. Alfa Laval Kolding A/S recommends you to adjust the maintenance program to suit the cleaning task in hand. Contact your local Alfa Laval sales office for discussion.

For further information regarding Alfa Laval Service Kits and service intervals, see paragraph 6.4 Maintenance Intervals and Service Kits on page 20 of this manual or the Spare Parts Manual.

Note: Handle the Alfa Laval Toftejorg SaniJet 25 with care. Take proper action to protect surfaces from being damaged. Always use proper tools and the Alfa Laval Toftejorg SaniJet 25 standard tool kit (page 31). Never use force, hammer or pry components together or apart. Always perform all assembly/disassembly steps in the order described in this manual. Clean all surfaces prior to assembling. Especially take care of the mating surfaces. Work in a clear well-lighted work area.

6.2 Service and Repair of ATEX Certified Machines

All service and repair of ATEX certified machines can be performed by Alfa Laval Tank Equipment, Kolding, Denmark or by an Alfa Laval service center approved by Alfa Laval Tank Equipment.

**ATEX
warning:**



In order to ensure compliance with the ATEX regulations and keep the machine ATEX certification valid the service or repair must be performed by an authorized person with knowledge of the ATEX requirements and regulations.

All spare parts must be original Alfa Laval spare parts and the repair or service must be done according to the instructions in the related manual.

If a customer wishes to carry out service or repair himself, it is the responsibility of the repair shop to ensure that the ATEX requirements are met in any way possible. After performing service or repair, the repair shop thus carries the full responsibility for traceability of all relevant documents in order to ensuring the retention of the ATEX certification of the machine.

6.3 Service and repair of machines ordered with Q-doc and with Q-doc + FAT-SAT

In order to ensure full traceability and to obtain full qualification and validation documentation, all service and repair of machines ordered with Q-doc (Equipment Documentation) and Q-doc + FAT-SAT (Qualification Documentation) should be handled and ordered in one of the 3 different ways described below:

1. Q-doc + FAT-SAT Service/Repair Order (Item no. TEREP-Qdoc):

(This maintenance order should be selected if the customer wishes to have Alfa Laval Tank Equipment to obtain full file log of all FAT (Factory Acceptance Test) documents for the Tank Cleaning Machine).

- Maintenance/Repair is carried out at Alfa Laval Tank Equipment and Q-doc + FAT-SAT Maintenance Log. FAT-SURFACE (if necessary), FAT-WELD (if necessary) and FAT-PERFORMANCE is performed. The FAT documents are stored in the Q-doc + FAT-SAT Maintenance Log as PDF-files.
- Q-doc (Equipment Documentation) for all steel spare parts are stored in the Q-doc + FAT-SAT Maintenance Log as PDF-files.
- The machine is returned to the customer incl. the Q-doc + FAT-SAT Log CD and hardcopy of all FAT documents, for further qualification (SAT: Site Acceptance Test) and validation (PV: Process Validation).
- Word and PDF documents are stored in the Alfa Laval Q-doc + FAT-SAT Maintenance Log folder.

2. Q-doc Spare Part Order (Item no.: TE20JXXX-9X)

(This maintenance order should be selected if the customer wishes to carry out service or repair. The customer or the repair shop thus carries the full responsibility for the full traceability of the material and FAT documentation for the Tank Cleaning Machine).

- The spare part is sent to the customer incl. Q-doc (Equipment Documentation) as hardcopy.

3. Q-doc + FAT-SAT Spare Part Order (Item no. TE20JXXX-5X)

(This maintenance order should be selected if the customer wishes to carry out service or repair himself. The customer or the repair shop thus carries the full responsibility for the full traceability of the material and FAT documentation for the Tank Cleaning Machine).

- The spare part is sent to the customer incl. Q-doc (Equipment Documentation) incl. Weld-Log documentation (if necessary) as hardcopy.
- This service information will not be recorded in the Alfa Laval Q-doc + FAT-SAT folder. The customer has to perform all Qualification tests and documentation himself (FAT, SAT, IQ & OQ).

Contact local Alfa Laval service and support (see. www.alfalaval.com). Important information to give to Alfa Laval:

- Serial No.
- Q-doc maintenance order type:
 - Item no.: TEREP-Qdoc
 - Item no.: TE20JXXX-9X
 - or
 - Item no.: TE20JXXX-5X (see page 26 for more information)

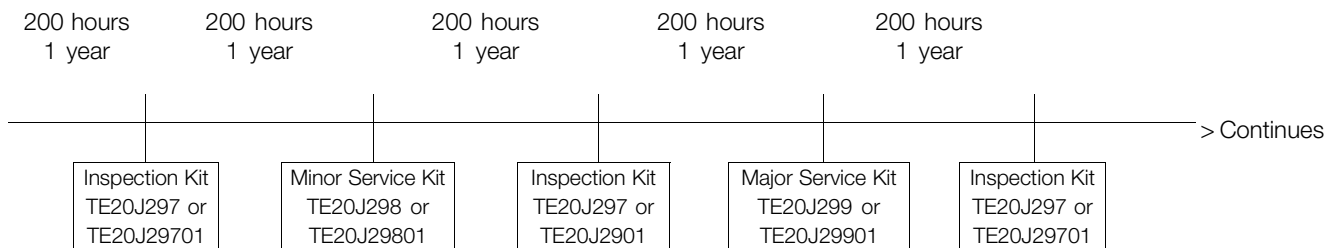
6 Maintenance

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6.4 Maintenance Intervals and Service Kits

Alfa Laval Service Kits for Tank Cleaning Machine type Alfa Laval Toftejorg SaniJet 25 available in three levels: Inspection Kit, Minor Service Kit and Major Service Kit.

Service Intervals



It is recommended to inspect the Alfa Laval Toftejorg SaniJet 25 after every 200 running hours or after 1 year to ensure the conditions of the machine is acceptable. During the inspection it is recommended that the inspection kit is used in order not to compromise the hygienic state of the machine.

Major Service kit includes the corresponding Minor Service Kit parts and the Minor Service Kit includes the corresponding Inspection Kit parts.

TE20J297 and TE20J297-01 Inspection Kit f. Alfa Laval Toftejorg SaniJet 25

Pos.	P/n (20J000_004-0x/7x)	P/n (20J000_004-5x/6x/8x/9x)	Qty	Denomination
	TE20J297	TE20J29701		
2	TE51T212	TE51T212	1	Gasket
3.3	TE51T135	TE51T135	2	O-ring
6	TE51T138	TE51T194	1	O-ring
7	TE51T139	TE51T139	1	O-ring
9	TE51T141	TE51T196	2	O-ring
10	TE51T140	TE51T195	2	O-ring
16	TE51T136	TE51T192	1	O-ring
17	TE51T137	TE51T193	1	O-ring
19.2	TE52D561	TE52D561	1	Gasket

Inspection Kit is recommended to be replaced every 200 working hours or every year, whichever comes first.

TE20J298 and TE20J298-01 Minor Service Kit f. Alfa Laval Toftejorg SaniJet 25

	P/n (20J000_004-0x/7x)	P/n (20J000_004-5x/6x/8x/9x)		
Pos.	TE20J298	TE20J29801	Qty	Denomination
1.2	TE20J514	TE20J514	1	Bushing
5	TE20G318	TE20G318	2	Ball retainer with balls
13.3	TE20J508	TE20J508	1	Bearing for body
-	TE20J297	TE20J29701	1	Inspection Kit f. SJ25

Every 400 working hours or 2 years, whichever comes first, disassemble the machine according to the disassembly instruction given later in this manual and check the parts in the Minor Service Kit for excessive wear and replace if needed.

TE20J299 and TE20J29901 Inspection Kit f. Alfa Laval Toftejorg SaniJet 25

	P/n (20J000_004-0x/7x)	P/n (20J000_004-5x/6x/8x/9x)		
Pos.	TE20J299	TE20J29901	Qty	Denomination
4	TE20J627	TE20J627	1	Nut for stem
8	TE20J624	TE20J624	1	Stem
11.1	TE20G521	TE20G521	1	Bushing
12	TE20J515	TE20J515	1	Planet gear assembly
14	TE20J522	TE20J522	1	Bevel gear
15	TE20J638	TE20J638	1	Nut for hub
-	TE20J298	TE20J29801	1	Minor Service Kit

Every 800 working hours or 4 years, whichever comes first, disassemble the machine according to the disassembly instruction given later in this manual and check the parts in the Minor Service Kit for excessive wear and replace if needed.

Available add-ons:

Available add-on's regarding material certificates, Declaration of Conformity and Q-doc documents, see page 32 for more information.

6 Maintenance

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General recommendations

- Always read the instruction and maintenance manuals carefully before undertaking the service.
- Always replace all parts included in the Service Kit.
- Prior to assembly/disassembly clean all tools and fixtures to ensure that scratches and marks and trace of soil/corrosion from tools are avoided.
- Do not scratch or damage the surfaces of the machine.
 - Always place components on soft material

Check surfaces for product residues and clean all parts before assembly.

Assembly of the machine is described on the following pages.

Symptom: Slow rotation or failure of machine to rotate

Possible Causes	Fault finding
No or insufficient liquid flow	<p>A. Check if supply valve is fully open.</p> <p>B. Check if inlet pressure to machine is correct.</p> <p>C. Check supply line/filter for restrictions/clogging.</p>
Impeller jammed	<p>D. Insert socket spanner on “nut” in top of turbine shaft (Pos. 3.4) and easily turn turbine shaft clockwise. If any resistance is recognised, disassemble machine to localise cause.</p> <p>E. Remove cone (see paragraph 11.3 Disassembly of top parts (Cone and Turbine) step 3- 4) and check for clogging in impeller of inlet guide inside cone and in impeller area.</p> <p>F. Remove turbine shaft with impeller and carrier assembly (see paragraph 11.1 Disassembly into main subassemblies step 5-7) and remove foreign material.</p> <p>If particles repeatedly get jammed in the machine, install filter or reduce mesh size of installed filter in supply line.</p>
Turbine shaft sluggish in bearings	<p>G. Remove turbine shaft with impeller (see paragraph 11.3 Disassembly of top parts (Cone and Turbine) step 5-6) and clean bearings.</p>
Planet gear jammed/sluggish	<p>H. Remove foreign material from planet wheel and internal gears. Check rotation of planet wheel. If restriction is recognized, try to flush the spacing between the planet wheels and their shaft under running tap water. If restriction cannot be removed a replacement planet gear is required.</p>
Galling	<p>I. Check stem (Pos. 8) and hub (Pos. 18) for wear between these parts and the nuts (Pos. 4 and 15).</p>

Symptom: Jets are incoherent within 1 m of the nozzles

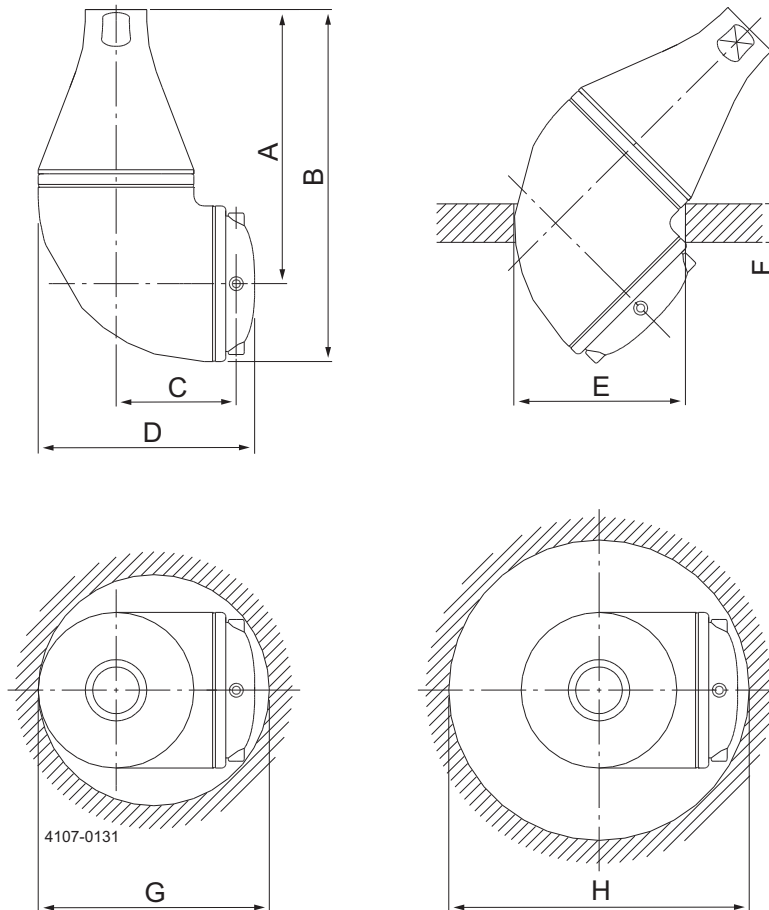
Possible Causes	Fault finding
Guide vanes in the nozzles are clogged	<p>A. Visually inspect the inside of nozzles to see if product is trapped. If so remove unwanted objects using either pressurized air or a pointy object.</p>

8 Technical Data

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Weight of machine:	6.3 kg (11.2 lbs)
Working pressure:	3-8 bar (40-115 psi)
Recommended inlet pressure:	5-7 bar (70-100 psi)
Working temperature max.:	95°C (200°F)
Max. temperature:	0-140°C (95°C/200°F - 140°C/284°F when not operated)
Materials:	- steam pressure = 2.5 bar Stainless Steel AISI 316L, SAF 2205, PEEK, EPDM, PFA HP, PTFE

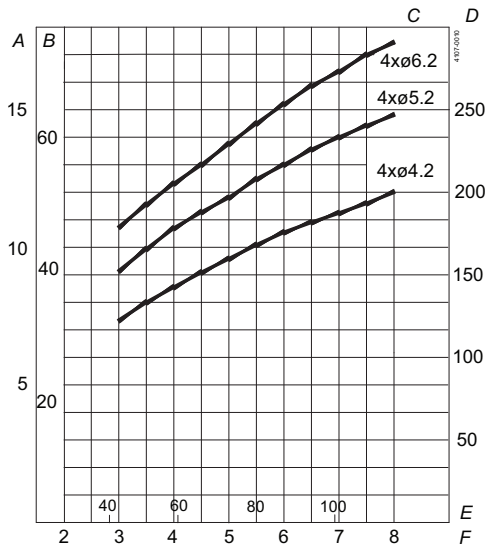
Dimensions in mm



A	B	C	D	E	F	G	H
178	228.5	78	140	ø110	max. 25	ø150	ø195

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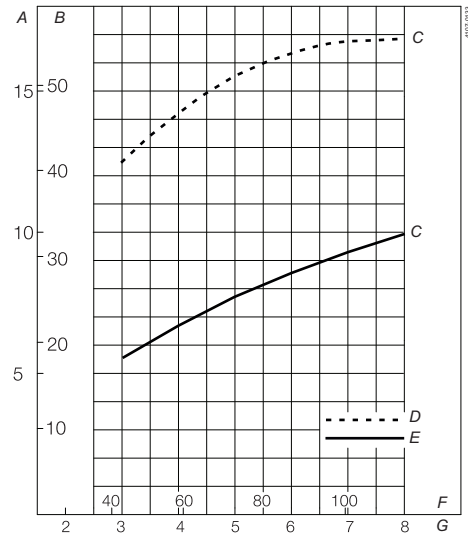
Flow rate



Inlet pressure

A: m³/h. B: USgpm. C: Nozzles mm. D: l/min. E: psi. F: bar

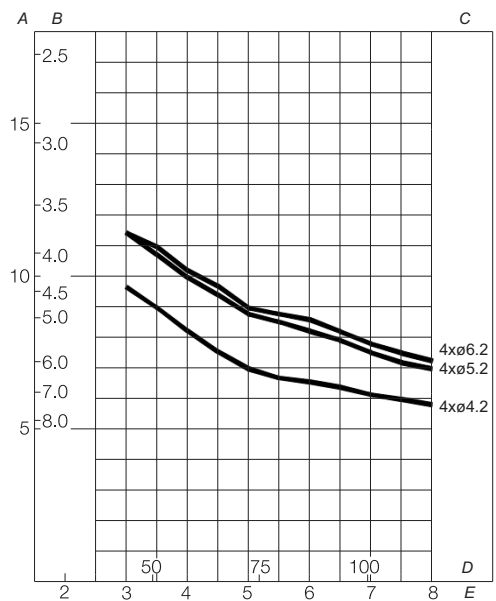
Impact throw length



Inlet pressure

A: m. B: ft. C: All nozzle sizes. D: max. static. E: Effective. F: psi. G: bar

Cleaning time, complete pattern



Inlet pressure

A: min. B: RPM of machine body. C: Nozzles mm. D: l/min. E: psi. F: bar

The throw length is measured as described in Technical Specification no. 93P000.

Note: Throw lengths are measured as horizontal throw length at static condition.

Vertical throw lengths upwards are approx. 1/3 less.

The inlet pressure has been measured immediately at the machine inlet. In order to achieve the performance indicated in the curves, pressure drop in the supply lines between pump and machine must be taken into consideration.

From August 2011 (serial number SJ25 1010 039 and from SJ25 1107 XXX) design changes resulted in a higher flow rate and a slightly shorter time for a full pattern. Current graphs are for the new configuration.

9 Product program

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9.1 Standard configurations




This manual covers the product program for the EHEDG certified Alfa Laval Toftejorg SaniJet 25 tank cleaning machine:

Standard (see below for choices of welding connectors)

Item no.	Description
TE20J0000X	ø4.2mm Nozzle size w. ISO228 thread
TE20J0020X	ø5.2mm Nozzle size w. ISO228 thread
TE20J0040X	ø6.2mm Nozzle size w. ISO228 thread

9.2 Available documentation add-ons

TE20J00X5X: Q-doc + FAT-SAT
 TE20J00X6X: Q-doc + FAT-SAT + ATEX
 TE20J00X7X: ATEX
 TE20J00X8X: Q-doc + ATEX
 TE20J00X9X: Q-doc

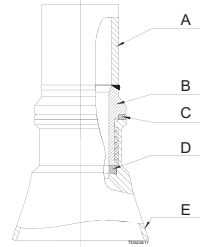
Explanation to Add-ons		
<p>Q-doc (Equipment Documentation)</p>		<p>Equipment Documentation includes:</p> <ul style="list-style-type: none"> - EN 1935/2004 DoC - EN 10204 type 3.1 inspection Certificate and DoC - FDA DoC - GMP EC 2023/2006 DoC - EU 10/2011 DoC - USP Class VI DoC - ADI DoC - QC DoC
<p>Q-doc + FAT-SAT (Qualification Documentation)</p>		<p>Qualification Documentation includes:</p> <ul style="list-style-type: none"> - RS, Requirement Specification - DS, Design Specification incl. Traceability Matrix - FAT, Factory Acceptance Test incl. IQ & OQ - SAT, Site Acceptance Test Protocol incl. IQ & OQ for End-User Execution - Q-doc
<p>ATEX</p>		<p>ATEX includes: ATEX approved machine for use in explosive atmospheres. Category 1 for installation in zone 0/20 (inside tank) in accordance with Directive 2014/34/EU. Ex II 1 GD c T140°C</p>

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Available welding connection:

Sanitary welding adapter (see right) with sealing assembly between Down pipe, Welding adapter and machine (use cone with seal – seals come with machines)

Pipe dimensions in mm		
TE20J00X-X3	1½" BSP US/SWG pipe	ø38.1 x 1.63
TE20J00X-X4	1" ISO pipe	ø33.7 x 3.2
TE20J00X-X6	1½" ISO Dairy pipe	ø38 x 1.2
TE20J00X-X7	1" ANSI/Sch.40S	ø33.4 x 3.38
TE20J00X-X8	NW40	ø41 x 1.5



A: Downpipe
 B: Welding Adapter
 C: Seal PTFE
 D: Seal EPDM
 E: SaniJet 25

9.3 Available add-ons for Spare parts

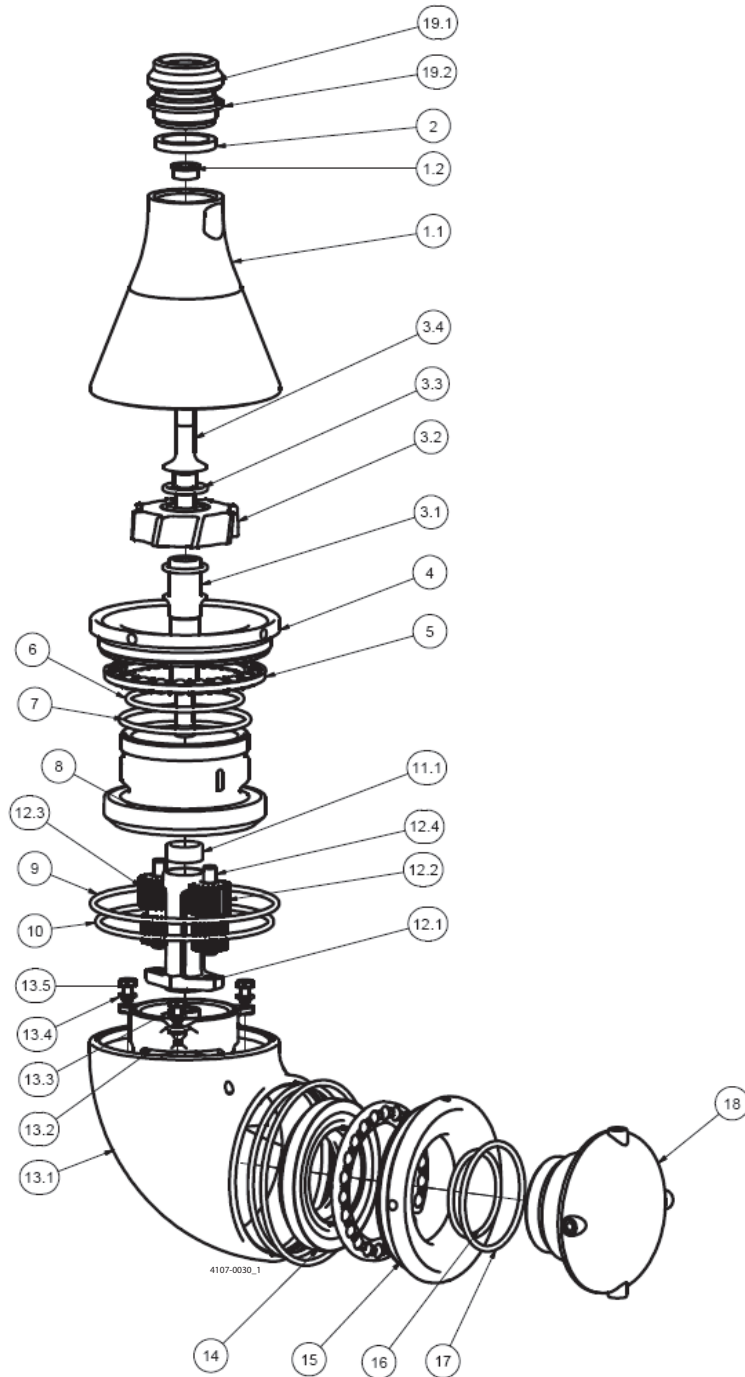
Item no.	Description
TE20JXXX9X	Q-doc including - EN 1935/2004 DoC - EN 10204 type 3.1 inspection Certificate and DoC - FDA DoC - GMP EC 2023/2006 DoC - EU 10/2011 DoC - USP Class VI DoC - ADI DoC - QC DoC
TE20JXXX5X	Q-doc + FAT-SAT including - Q-doc •Weld-Log documentation (if necessary) as hardcopy

Available add-on's regarding material certificates, Declaration of Conformity and Q-doc documents, see 9.2 Available documentation add-ons page 26 for more information.

10 Part List Drawing and Lists, Service Kits and Tools

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10.1 Part List Drawing



10 Part List Drawing and Lists, Service Kits and Tools

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10.2 For machines with -0x and -7x (after August 2012)

Pos.	Item no.	Qty.	Denomination	Materials	Remarks
1.1	TE20J510	1	Cone	Stainless steel	Spare part
1.2	TE20J514	1	Bushing	Polymer	Wear part
2	TE51T212	1	Gasket	Elastomer	Wear part
3.1	TE20J540	1	Impeller Shaft	Stainless steel	Spare part
3.2	<input type="checkbox"/> TE20J544	1	Impeller (ø4.2mm nozzle)	Polymer	Spare part
	<input type="checkbox"/> TE20J545	1	Impeller (ø5.2mm nozzle)	Polymer	Spare part
	<input type="checkbox"/> TE20J546	1	Impeller (ø6.2mm nozzle)	Polymer	Spare part
3.3	TE51T135	2	O-ring	Elastomer	Wear part
3.4	TE20J542	1	Shaft end	Stainless steel	Spare part
4	TE20J627	1	Nut for stem	Stainless steel	Wear part
5	TE20G318	2	Ball retainer with balls	Polymer/Stainless steel	Wear part
6	TE51T138	1	O-ring	Elastomer	Wear part
7	TE51T139	1	O-ring	Elastomer	Wear part
8	TE20J624	1	Stem	Stainless steel	Wear part
9	TE51T141	2	O-ring	Elastomer	Wear part
10	TE51T140	2	O-ring	Elastomer	Wear part
11.1	TE20J521	1	Bushing	Polymer	Wear part
12	TE20J515	1	Planet gear	Polymer/Stainless steel	Wear part
13.1		1	Body	Stainless steel	*Note
13.2	TE20J506	1	Gear ring	Stainless steel	Spare part
13.3	TE20J508	1	Bearing for body	Polymer	Wear part
13.4	TE20J509	6	Seal ring	Polymer	Spare part
13.5	TE20J550	3	Screw for body assembly	Stainless steel	Spare part
14	TE20J522	1	Bevel gear	Stainless steel	Wear part
15	TE20J638	1	Nut for hub	Stainless steel	Wear part
16	TE51T136	1	O-ring	Elastomer	Wear part
17	TE51T137	1	O-ring	Elastomer	Wear part
18	<input type="checkbox"/> TE20J320	1	Nozzle head (ø4.2mm nozzle)	Stainless steel	Spare part
	<input type="checkbox"/> TE20J321	1	Nozzle head (ø5.2mm nozzle)	Stainless steel	Spare part
	<input type="checkbox"/> TE20J322	1	Nozzle head (ø6.2mm nozzle)	Stainless steel	Spare part
19.1	<input type="checkbox"/> TE52D552	1	Welding adaptor (1½" Dairy)	Stainless steel	Spare part
	<input type="checkbox"/> TE52D554	1	Welding adaptor (1"ANSI/Sch40)	Stainless steel	Spare part
	<input type="checkbox"/> TE52D556	1	Welding adaptor (NW40)	Stainless steel	Spare part
	<input type="checkbox"/> TE52D558	1	Welding adaptor (1½"BPE US/SWG)	Stainless steel	Spare part
19.2	TE52D561	1	Gasket	Polymer	Wear part

Configuration according to delivery note/order

Please note that some of the polymer parts are in PEEK, which is not resistant to concentrated sulfuric acid.

*Note: Pos. 13.1 is not sold as single spare part component but only as part of a machine maintenance/repair order. For further information, please contact Alfa Laval Customer Support.

10 Part List Drawing and Lists, Service Kits and Tools

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10.3 For machines with -5x, -6x, -8x and -9x (after August 2012)

Pos.	Item no.	Qty	Denomination	Materials	Remarks
1.1	TE20J510	1	Cone	Stainless steel	Spare part
1.2	TE20J514	1	Bushing	Polymer	Wear part
2	TE51T212	1	Gasket	Elastomer	Wear part
3.1	TE20J540	1	Impeller Shaft	Stainless steel	Spare part
3.2	<input type="checkbox"/> TE20J544	1	Impeller (ø4.2mm nozzle)	Polymer	Spare part
	<input type="checkbox"/> TE20J545	1	Impeller (ø5.2mm nozzle)	Polymer	Spare part
	<input type="checkbox"/> TE20J546	1	Impeller (ø6.2mm nozzle)	Polymer	Spare part
3.3	TE51T135	2	O-ring	Elastomer	Wear part
3.4	TE20J542	1	Shaft end	Stainless steel	Spare part
4	TE20J627	1	Nut for stem	Stainless steel	Wear part
5	TE20G318	2	Ball retainer with balls	Polymer/Stainless steel	Wear part
6	TE51T194	1	O-ring	Elastomer	Wear part
7	TE51T139	1	O-ring	Elastomer	Wear part
8	TE20J624	1	Stem	Stainless steel	Wear part
9	TE51T196	2	O-ring	Elastomer	Wear part
10	TE51T195	2	O-ring	Elastomer	Wear part
11.1	TE20J521	1	Bushing	Polymer	Wear part
12	TE20J515	1	Planet gear	Polymer/Stainless steel	Wear part
13.1		1	Body	Stainless steel	*Note
13.2	TE20J506	1	Gear ring	Stainless steel	Spare part
13.3	TE20J508	1	Bearing for body	Polymer	Wear part
13.4	TE20J509	6	Seal ring	Polymer	Spare part
13.5	TE20J550	3	Screw for body assembly	Stainless steel	Spare part
14	TE20J522	1	Bevel gear	Stainless steel	Wear part
15	TE20J638	1	Nut for hub	Stainless steel	Wear part
16	TE51T192	1	O-ring	Elastomer	Wear part
17	TE51T193	1	O-ring	Elastomer	Wear part
18	<input type="checkbox"/> TE20J320	1	Nozzle head (ø4.2 mm nozzle)	Stainless steel	Spare part
	<input type="checkbox"/> TE20J321	1	Nozzle head (ø5.2 mm nozzle)	Stainless steel	Spare part
	<input type="checkbox"/> TE20J322	1	Nozzle head (ø6.2 mm nozzle)	Stainless steel	Spare part
19.1	<input type="checkbox"/> TE52D552	1	Welding adaptor (1½" Dairy)	Stainless steel	Spare part
	<input type="checkbox"/> TE52D554	1	Welding adaptor (1"ANSI/Sch40)	Stainless steel	Spare part
	<input type="checkbox"/> TE52D556	1	Welding adaptor (NW40)	Stainless steel	Spare part
	<input type="checkbox"/> TE52D558	1	Welding adaptor (1½"BPE US/SWG)	Stainless steel	Spare part
19.2	TE52D561	1	Gasket	Polymer	Wear part

Configuration according to delivery note/order

Please note that some of the polymer parts are in PEEK, which is not resistant to concentrated sulfuric acid.

*Note: Pos. 13.1 is not sold as single spare part component but only as part of a machine maintenance/repair order. For further information, please contact Alfa Laval Customer Support.

10 Part List Drawing and Lists, Service Kits and Tools

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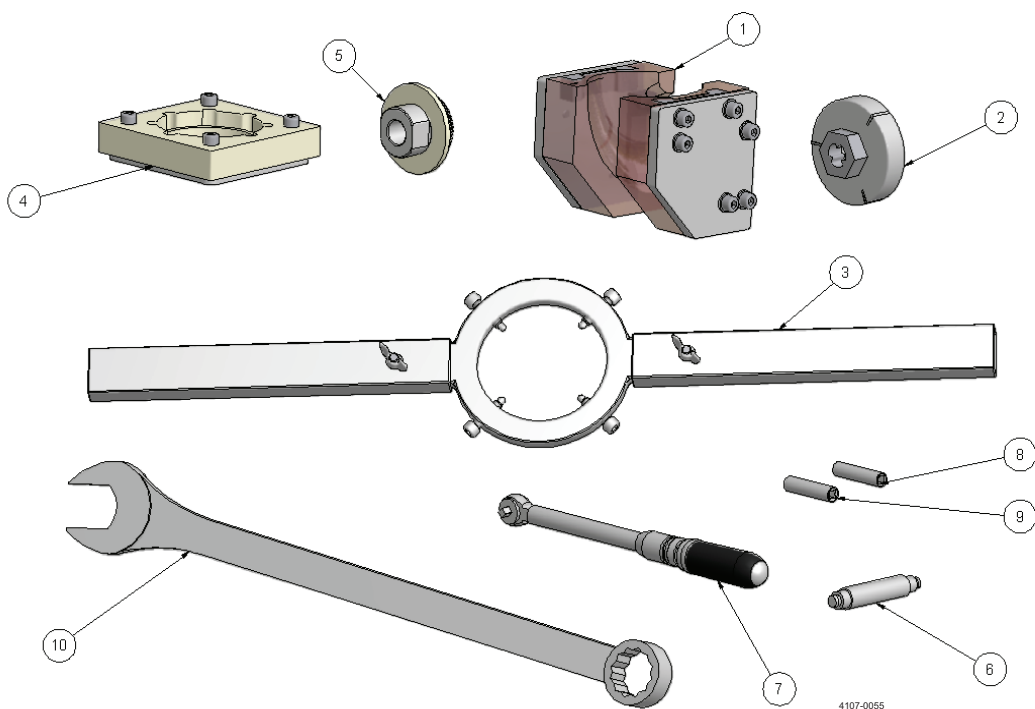
10.4 Tool kit and tools for assembly and disassembly

TE81B155 Standard tool kit for Alfa Laval Toftejorg SaniJet 25

Pos	Item no.	Qty.	Denomination
1	TE20J386	1	Fixture tool f. body
2	TE20J392	1	Fixture tool f. hub and turbine
3	TE20J393	1	Ring key f. nuts (dismountable)
4	TE20J366	1	Fixture tool f. nozzle
5	TE20J360	1	Fixture tool f. stem
6	TE81B139	1	Drift f. bushings
7	TE81B156	1	Torque wrench (4-24 Nm) – ¼"
8	TE81B157	1	NV8 socket, long, ¼"
9	TE81B158	1	NV9 socket, long, ¼"
10	TE81B159	1	NV36 Ring/Fork key

- + Bench vise (jaw opening > 160 mm)
- + Hammer (soft - plastic)
- + 3-5 mm standard drift
- + brush for applying food grade/FDA compliant grease

All tool surfaces that come into contact with the machine shall be of a material that is not corroded and free of imperfections and soil.



11 Disassembly

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11.1 Disassembly into main subassemblies

Tools needed for disassembly

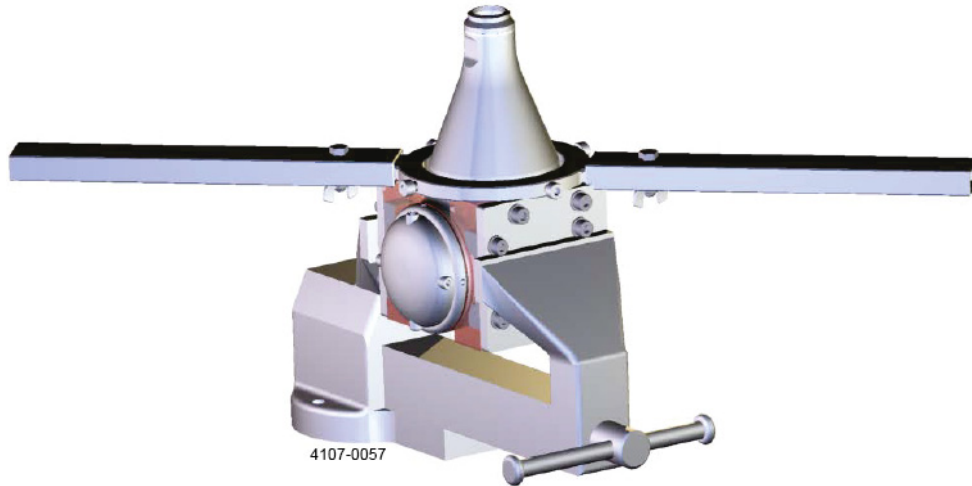
Standard tool kit	
Item no.	Denomination
TE20J386	Fixture tool f. body
TE20J593	Ring key f. nuts (dismountable)
TE81B157	NV8 socket, long, 1/4"
TE81B156	Torque wrench (4-24 Nm) – 1/4"

1. Put the two fixtures (TE20J386) around the house and slide the assembly between the jaws of the bench vise. Let the bolt ends slide on-top of the jaws. With the SaniJet 25 centred between the jaws tighten the bench vise.



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2. Lower the ring key (TE20J393) around the cone until the screws in the ring key are level with the hygienic recesses in the stem nut (Pos. 4). NOTE: Be careful not to damage the surfaces.



3. Tighten the 4 screws (by hand only) symmetrically into the 4 hygienic recesses in the stem nut (Pos. 4).
4. Loosen the stem nut (Pos. 4) with the ring key (TE20J393) just enough to be able to loosen the stem nut by hand. Large torque might be needed to loosen the stem nut. **Right handed thread.**



11 Disassembly

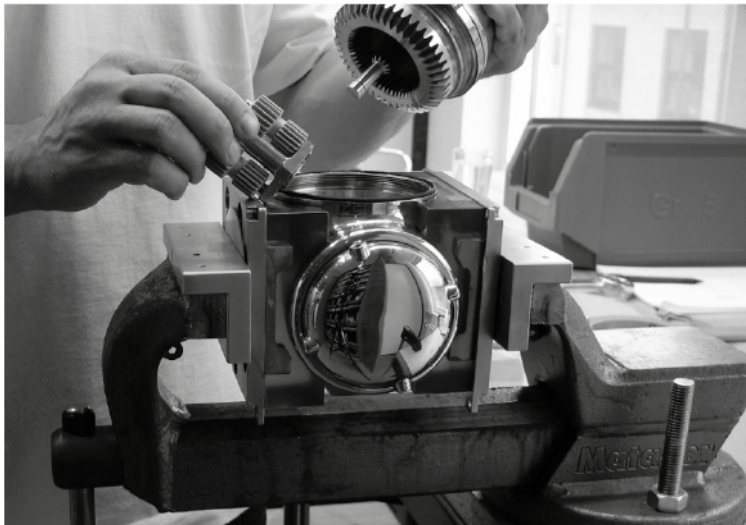
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5. Loosen the stem nut (Pos. 4) by hand while lifting the cone (Pos. 1.1).



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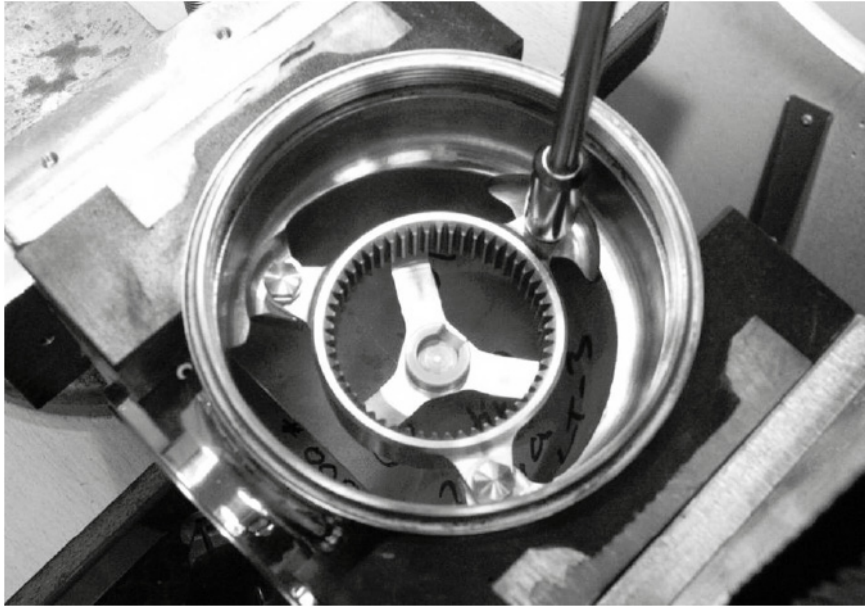
6. Remove the assembled top parts from the machine (lift vertically).
7. Remove assembled plant gear (Pos. 12) from the gear ring (Pos. 13.2).



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8. Remove the 3 screws (Pos. 13.5) securing the gear ring (Pos. 13.2) to the body using the torque wrench and NV8 socket long (TE81B156 + TE81B157)



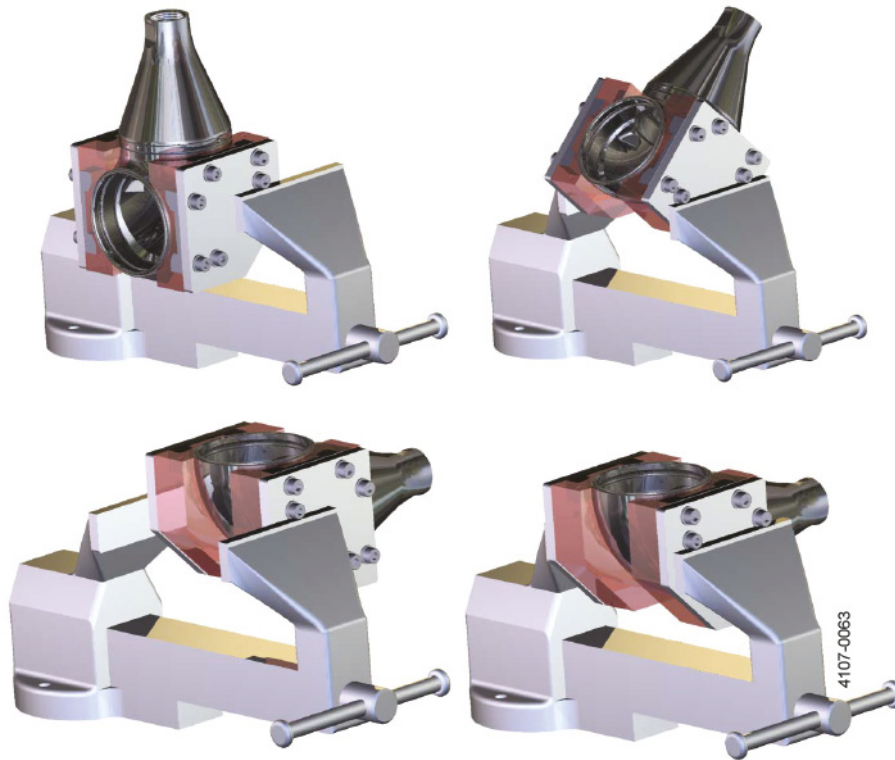
9. Remove the assembled gear ring (Pos. 13.2) from the body and remove the 6 seal rings (Pos. 13.4)
10. Remove the two O-rings (Pos. 9 and 10).



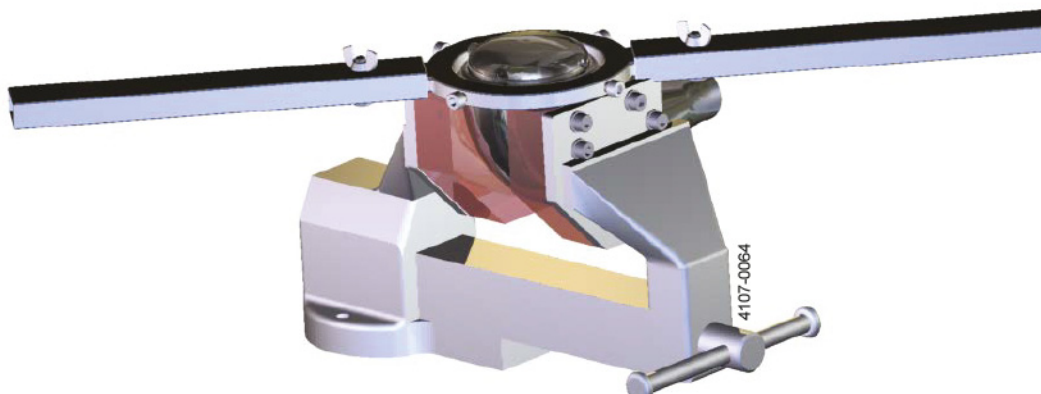
11 Disassembly

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11. Loosen the bench vice slightly and turn the machine 90° and tighten the bench vice again



12. Lower the ring key (TE20J393) around the hub nut (Pos. 15) and tighten the 4 screws (by hand only) symmetrically on the 4 hygienic recesses in the hub nut (Pos. 15). Loosen the hub nut (Pos. 15). **Left handed thread.** When hub nut is loosened unscrew with hands.



13. Remove hub nut (Pos. 15) from body. Lift vertically.

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14. Remove O-rings (Pos. 9 and 10 – Same as those used at other end of body)



15. Assembled parts after disassembly into main subassemblies.



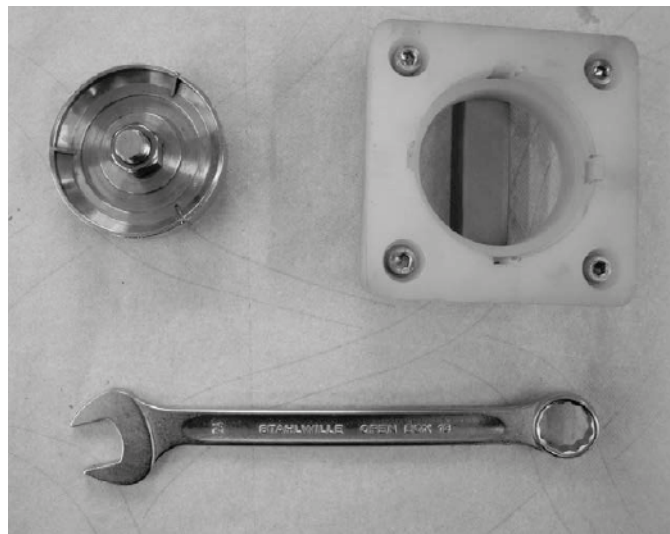
11 Disassembly

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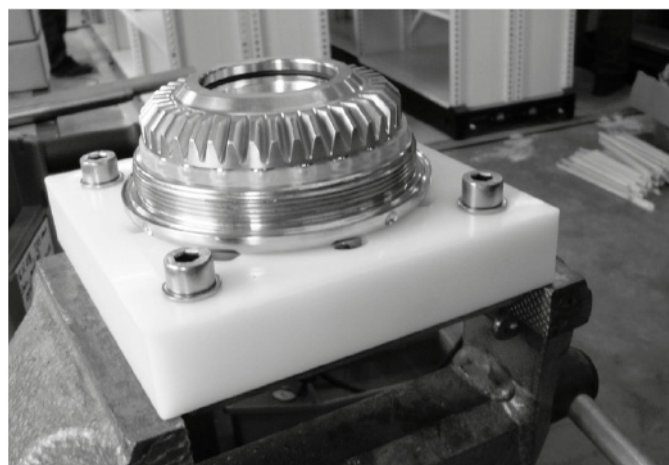
11.2 Disassembly of lower parts (Hub)

Tools needed for disassembly

Standard tool kit	
Item no.	Denomination
TE20J366	Fixture tool f. nozzle
TE20J392	Fixture tool f. hub and turbine
TE81B159	NV36 Ring/Fork key

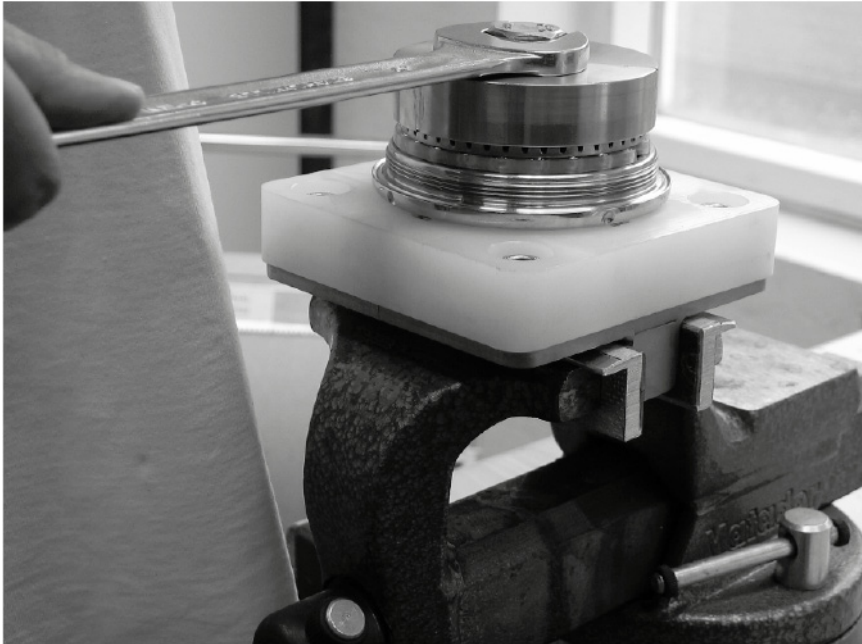


1. Place the fixture for nozzle (TE20J366) into the bench vise and secure it
2. Place the hub assembly into the fixture for nozzle (TE20J366)



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- Put the hub tool kit (TE20J392) on top of the bevel gear (Pos. 14) and loosen the bevel gear using ring key NV36 (TE81B159).



- Remove the bevel gear (Pos. 14), the O-rings (Pos. 16 and 17) and the ball race (Pos. 5 – identical with the one used around the stem)



11 Disassembly

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5. Carefully lift the hub nut (Pos. 15) of the nozzle head (Pos. 18) while keeping it horizontal to avoid damaging the surfaces.



6. Parts from the disassembled lower part (hub)

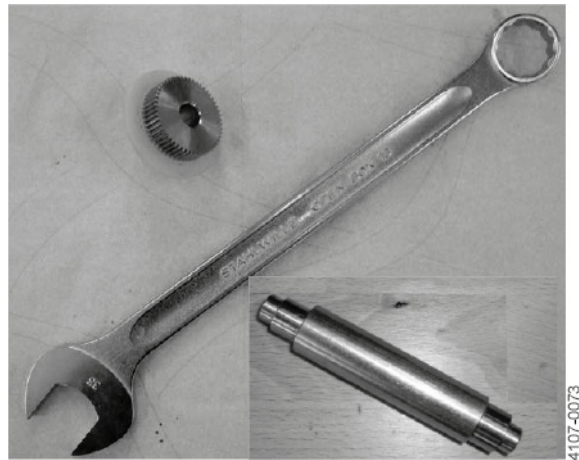


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11.3 Disassembly of top parts (Cone and Turbine)

Tools needed for disassembly

Standard tool kit	
Item no.	Denomination
TE20J360	Fixture tool f. stem
TE81B159	NV36 Ring/Fork key
TE81B139	Drift f. bushings



1. Fasten the stem fixture (TE20J360) in bench vise.
2. Put the cone assembly onto the stem fixture (TE20J360)



11 Disassembly

ESE01842

3. Loosen cone (Pos. 1.1) using the NV36 spanner (TE81B159).



4. Loosen the cone (Pos. 1.1) by hand while lifting the cone vertically and finally remove the cone (Pos. 1.1)



ESE01842

5. Remove the impeller assembly



6. Remove the O-rings (Pos. 6 and 7)



11 Disassembly

ESE01842

7. Carefully lift the stem nut (Pos. 4) of the stem (Pos. 8) while keeping it horizontally to avoid scratching the surfaces



4107-0079

8. Remove the ball race (Pos. 5) from the stem (Pos. 8).



4107-0080

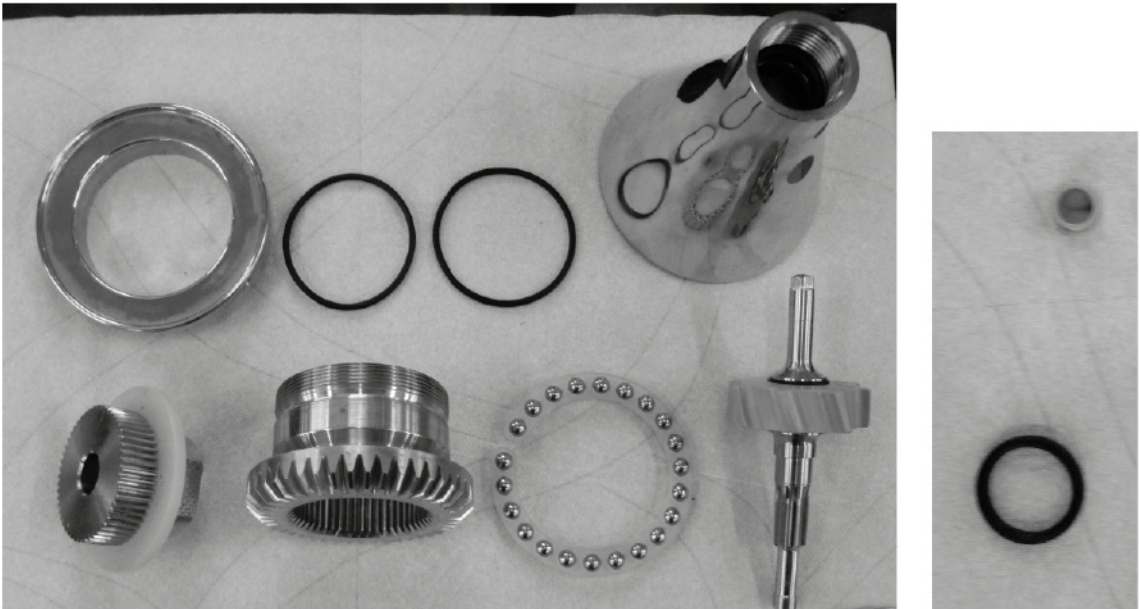
ESE01842

9. Extract gasket (Pos. 2) from the inside of the top of the cone (Pos. 1.1)



10. Push out bushing (Pos. 1.2) from the top of the cone using the drift (TE81B139)

11. Parts from disassembled top parts



11 Disassembly

ESE01842

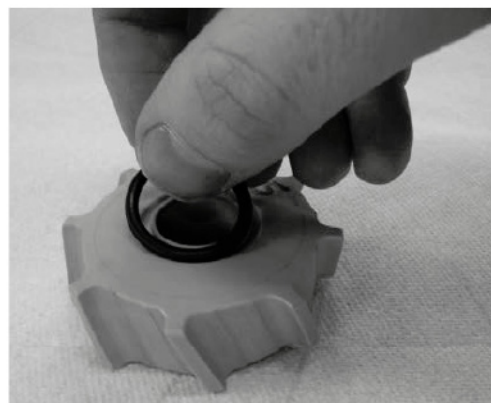
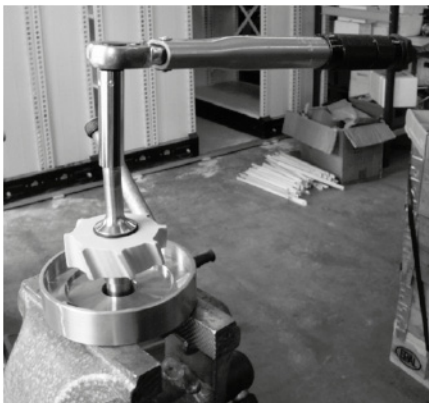
11.4 Disassembly of Impeller Shaft Assembly

Tools needed for disassembly

Standard tool kit	
Item no.	Denomination
TE20J392	Fixture tool f. hub and turbine
TE81B156	Torque wrench (4-24 Nm) - 1/4"
TE81B158	NV9 socket, long, 1/4"



1. Mount the impeller turbine fixture (TE20J392) in bench vise. Loosen the shaft end (Pos. 3.4) using the torque wrench and NV9 socket long (TE81B156 + TE81B158) and unscrew with hand.



2. Remove impeller (Pos. 3.2) from impeller shaft (Pos. 3.1).
3. Remove the two O-rings (Pos. 3.3) from the impeller (Pos. 3.2)

11.5 Disassembly of gear ring (bearing for body – Pos. 13.3)

Tools needed for disassembly

Standard tool kit	
Item no.	Denomination
TE81B139	Drift Hammer

1. Push out bearing for body (Pos. 13.3.) using the drift (TE81B139)



11 Disassembly

ESE01842

11.6 Disassembly of planet gear (bushing – Pos. 11.1)

Tools needed for disassembly

Standard tool kit	
Item no.	Denomination
	3-5 mm drift
	Hammer

1. Withdraw the bushing (Pos. 11.1) from the top of the planet gear assembly using a small diameter drift. Mount the assembly up-side-down in the bench vise and gently hammer the bushing out using the drift.
-

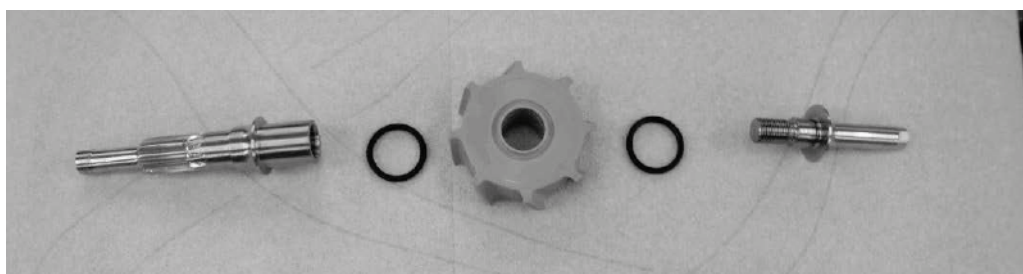
ESE01842

Prior to assembly all parts should be cleaned and checked for damage, scratches, crevices and other imperfections.

12.1 Assembly of turbine

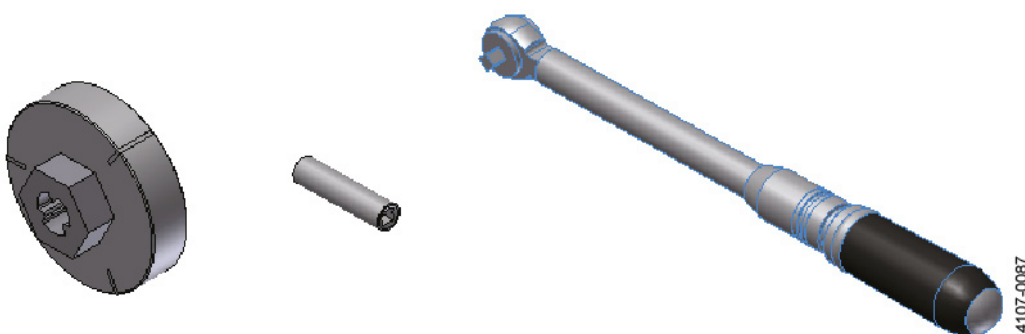
Parts required for the assembly

Pos.	Item no.	Qty.	Denomination
3.1	TE20J540	1	Impeller shaft
3.2	<input type="checkbox"/> TE20J544	1	Impeller (ø4.2mm nozzle)
	<input type="checkbox"/> TE20J546	1	Impeller (ø6.2mm nozzle)
	<input type="checkbox"/> TE20J545	1	Impeller (ø5.2mm nozzle)
3.3	TE51T135	2	O-ring
3.4	TE20J542	1	Shaft end



Tools needed for assembly

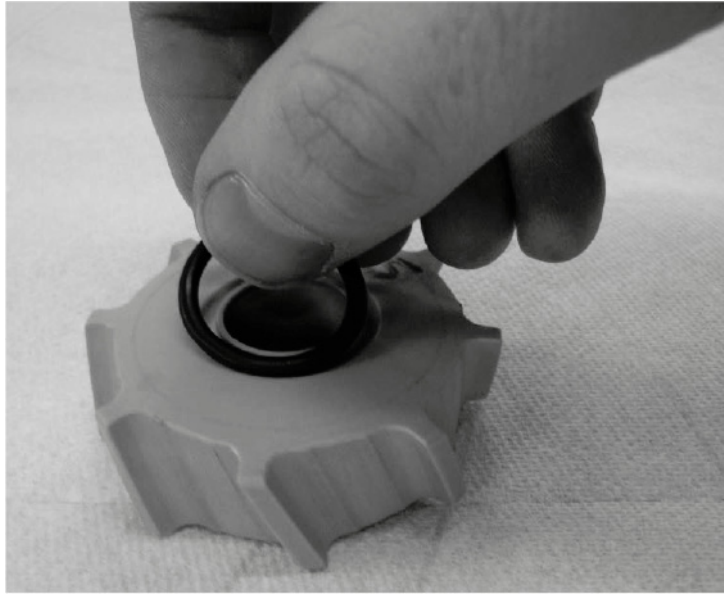
Standard tool kit	
Item no.	Denomination
TE20J392	Fixture tool f. hub and turbine
TE81B156	Torque wrench (4-24 Nm) - 1/4"
TE81B158	NV9 socket, long, 1/4"



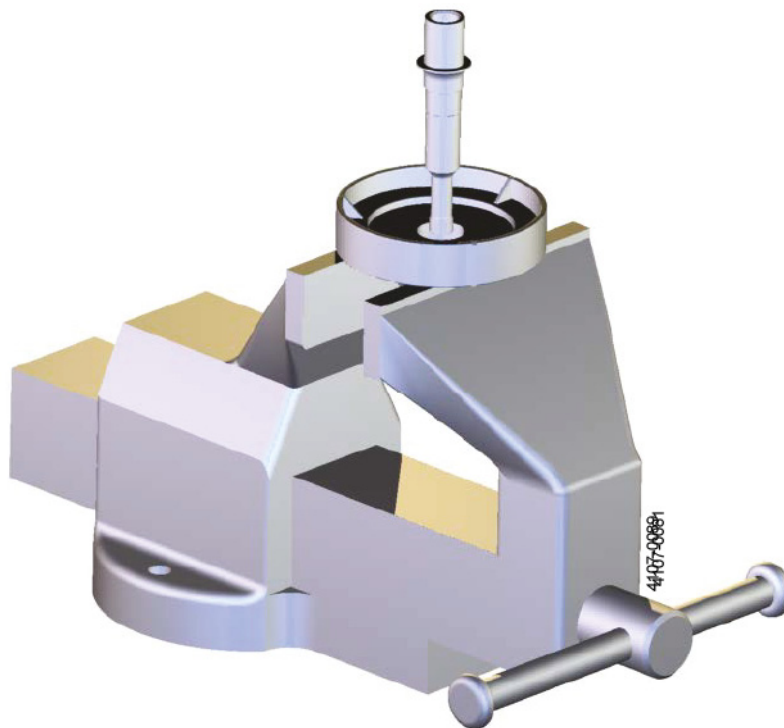
12 Assembly

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1. Place the O-rings (Pos. 3.3) into the grooves of the impeller (Pos. 3.2).

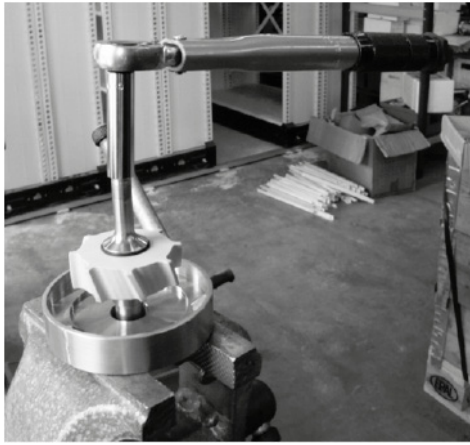


2. Secure the turbine shaft fixture (TE20J392) in the bench vise
3. Insert turbine shaft (Pos. 3.1) into turbine shaft fixture (TE20J392)



ESE01842

4. Place impeller (Pos. 3.2) with O-rings (Pos. 3.3) onto the impeller shaft



5. Screw the shaft end (Pos. 3.4) into the turbine shaft (Pos. 3.1) using the torque wrench (TE81B156) and NV9 spanner socket (TE81B158). Tighten with torque of 10-12 Nm.

12 Assembly

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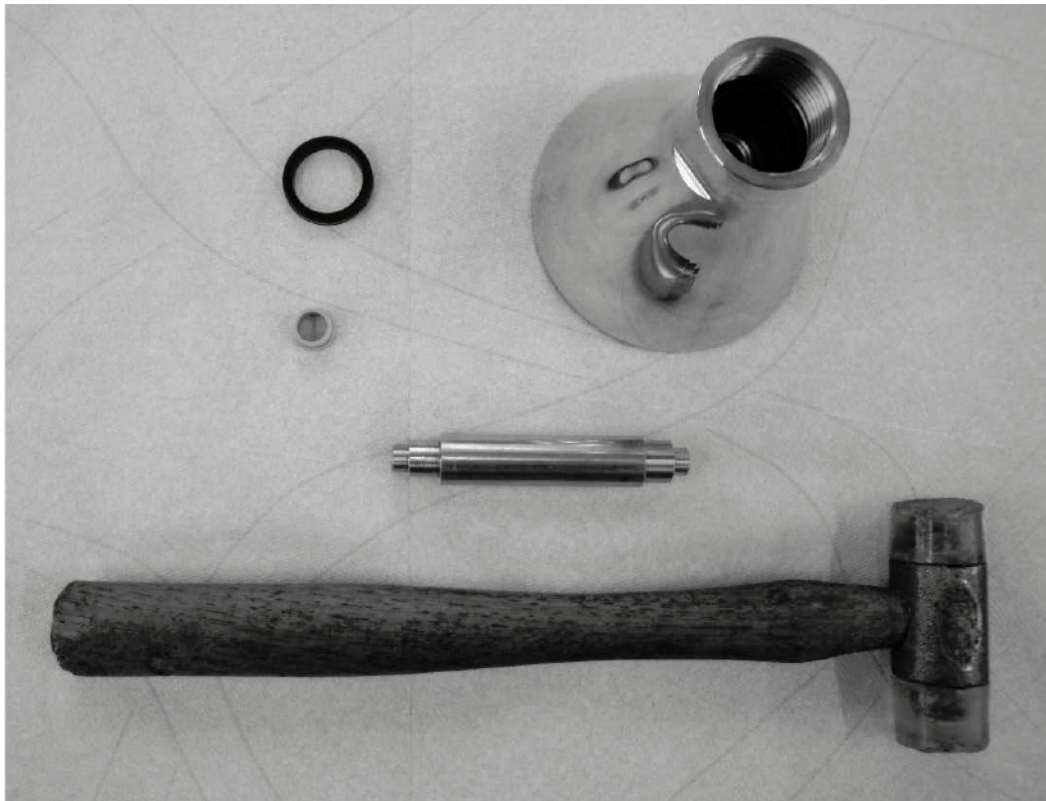
12.2 Assembly of cone

Parts required for the assembly

Pos.	Item no.	Qty.	Denomination
1.1	TE20J510	1	Cone
1.2	TE20J514	1	Bushing
2	TE51T212	1	Gasket

Tools needed for assembly

Standard tool kit	
Item no.	Denomination
TE81B139	Drift
	Hammer



ESE01842

1. Mount bushing (Pos. 1.2) in cone (Pos. 1.1) using the drift punch (TE81B139)



4107-0092



2. Use hammer to gently fix the bushing (Pos. 1.2)



4107-0093

12 Assembly

ESE01842

3. Mount the gasket (Pos. 2) into the groove at the bottom of the thread at the top of the cone (Pos. 1.1)



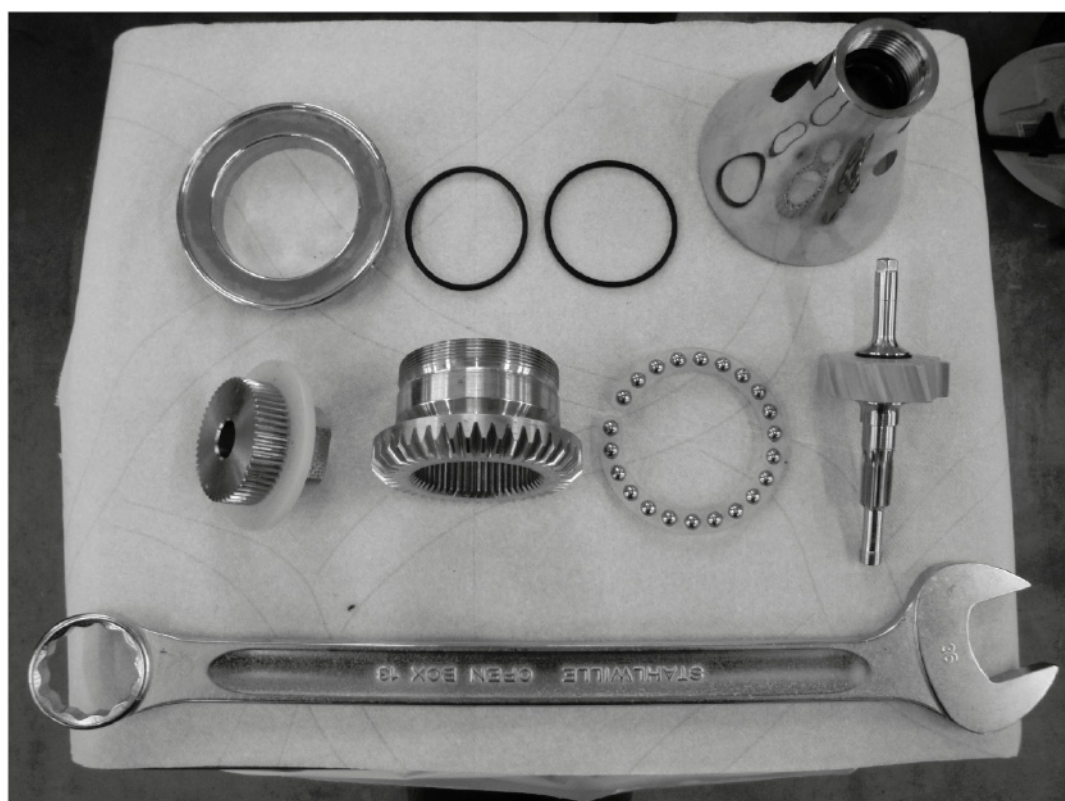
ESE01842

12.3 Assembly of top parts

Pos.	Item no.	Qty.	Denomination
		1	Assembled cone
		1	Assembled turbine
4	TE20J627	1	Nut for stem
5	TE20G318	2	Ball retainer with balls
6	TE51T138 or TE51T194	1	O-ring
7	TE51T139	1	O-ring
8	TE20J624	1	Stem

Tools needed for assembly

Standard tool kit	
Item no.	Denomination
TE20J360	Fixture tool f. stem
TE81B159	NV36 Ring/Fork key
	Brush for applying grease
	Glass of water
	Grease compliant with FDA, (if allowed)

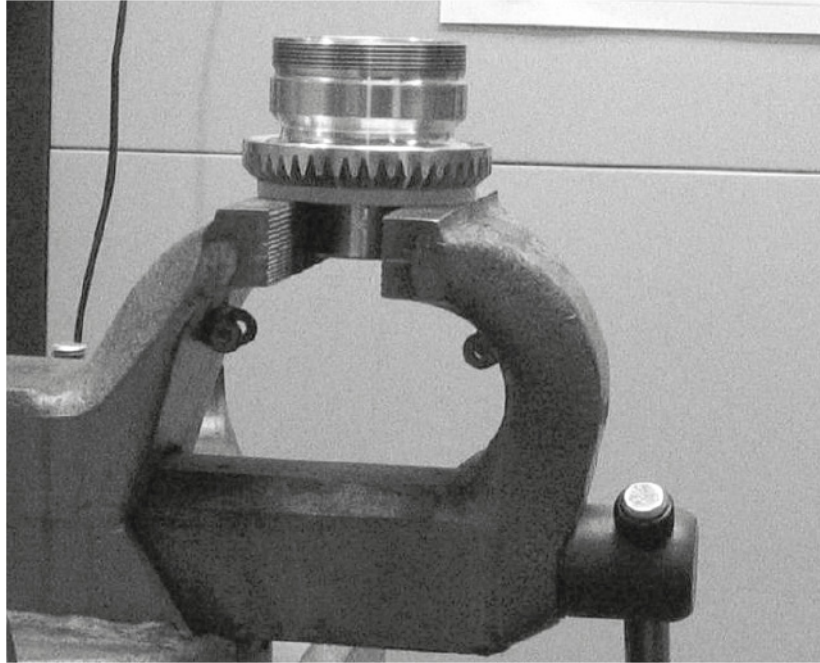


4107-0095

12 Assembly

ESE01842

1. Secure the fixture tool for stem (TE20J360) in bench vise
2. Fit the stem (Pos. 8) onto the fixture tool for stem (TE20J360)



3. Place the ball retainer with balls (Pos. 5) onto the ball race on the stem (Pos. 8).



ESE01842

4. Place the stem nut (Pos. 4) onto the stem (Pos. 8), while keeping the stem horizontal. Do not apply any force to it.



5. Preparation of O-rings (Pos. 6 and 7) before mounting: Dip the O-rings in water. If water is not used then be very careful about how the O-rings behave when screwing the cone (Pos. 1.1.) onto the stem.
6. Mount O-ring (Pos. 6) in groove around stem and O-ring (Pos. 7) in groove on top of stem



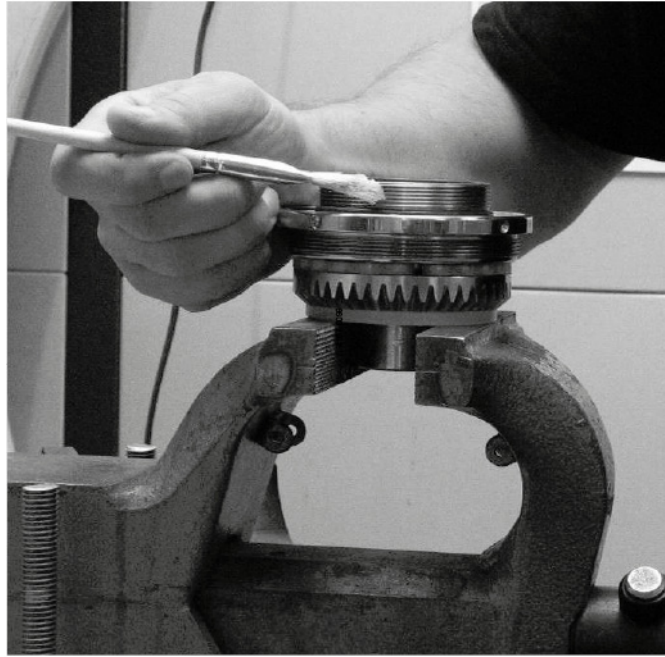
12 Assembly

ESE01842

7. Preparation before mounting the cone (Pos. 1.1) on stem (Pos. 8): It is recommended to grease the stem thread with food graded/FDA compliant grease. The grease reduces the risk of galling in threads. The grease is enclosed between the O-rings and, therefore, it will not come into contact with the cleaning media.

Be very careful not to put grease onto the O-rings as the O-rings swells in contact with grease!

If the food graded/FDA compliant grease is not allowed into the SaniJet 25 for some reason, it is recommended to be very careful when joining threaded parts.



8. Place turbine assembly into the stem (Pos. 8)



ESE01842

9. Carefully screw the cone (Pos. 1.1) onto the stem (Pos. 8) by hand.



10. Tighten the cone (Pos. 1.1) using the ring key spanner (TE81B141 or TE81B159) until you feel a stop and then tighten it a bit more. The stop you feel is two surfaces connecting.



11. Check that the turbine assembly can move freely in the top part assembly



12 Assembly

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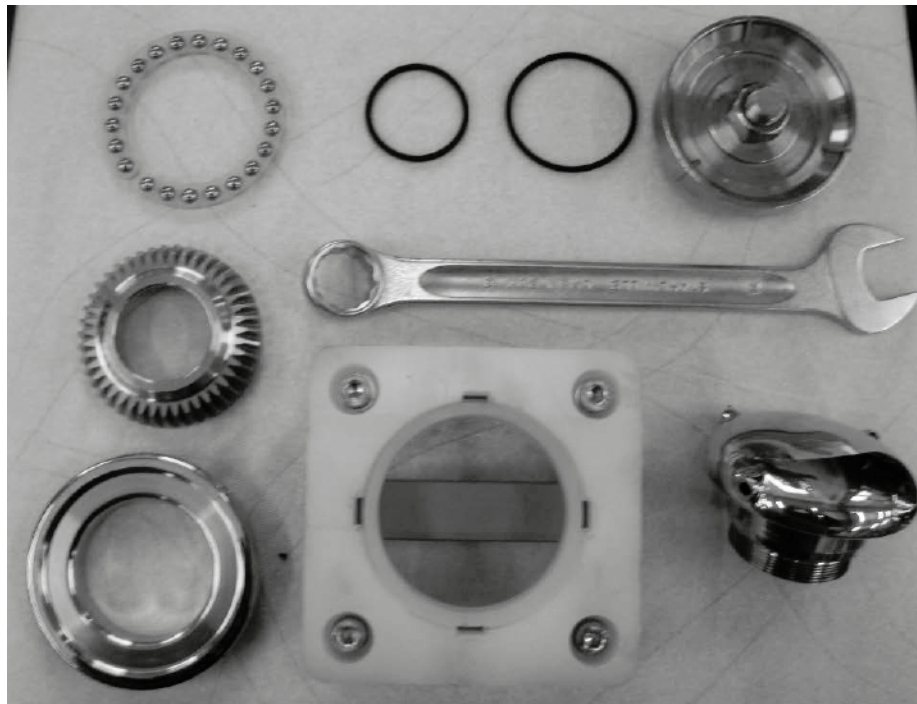
12.4 Assembly of lower parts

Parts required for the assembly

Pos.	Item no.	Qty.	Denomination
14	TE20J522	1	Bevel gear
15	TE20J638	1	Nut for hub
16	TE51T136 or TE51T192	1	O-ring
17	TE51T137 or TE51T193	1	O-ring
18	<input type="checkbox"/> TE20J320	1	Nozzle head (ø4.2mm nozzle)
	<input type="checkbox"/> TE20J321	1	Nozzle head (ø5.2mm nozzle)
	<input type="checkbox"/> TE20J322	1	Nozzle head (ø6.2mm nozzle)

Tools required for the assembly

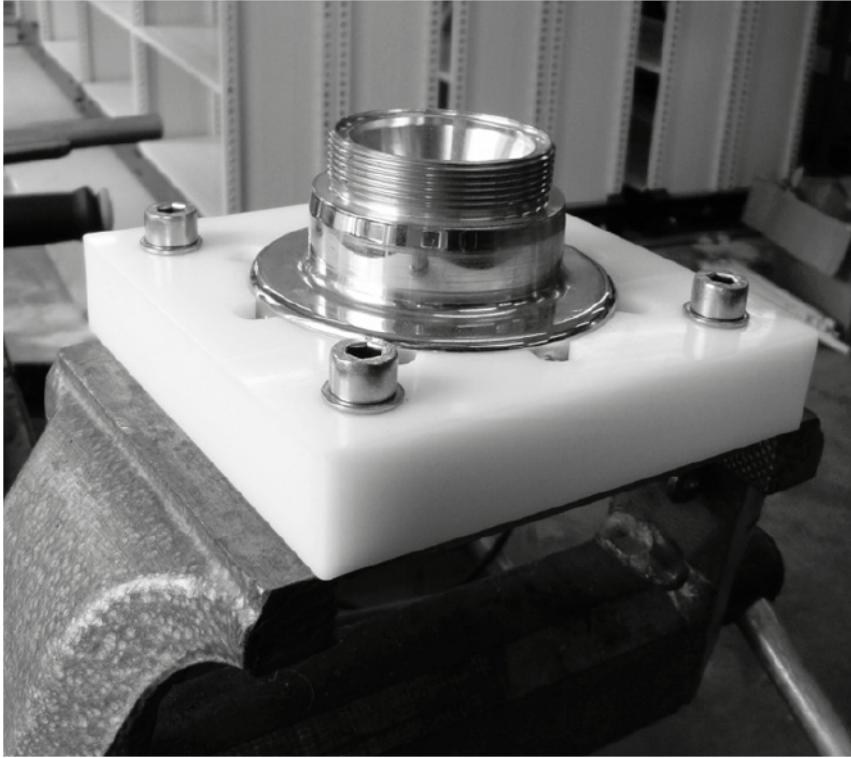
Standard toolkit	
Item no.	Denomination
TE20J366	Fixture tool f. nozzle
TE20J392	Fixture tool f. hub and turbine
TE81B159	NV36 Ring/Fork key
	Brush for applying grease
	Glass of water
	Grease compliant with FDA (if allowed)



4107-0105

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1. Secure the fixture for the nozzles (TE20J366) in bench vise.
2. Place the nozzle head (Pos. 18) into the fixture for the nozzle (TE20J366)



3. Lower the hub nut (Pos. 15) vertically around the nozzle head (Pos. 18).



12 Assembly

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- Preparation of O-rings (Pos. 16 and 17) before mounting: Dip the O-rings in water. If water is not used then be very careful about how the O-rings behave when screwing the cone onto the stem.
- Mount O-ring (Pos. 16) in groove on top of nozzle head (Pos. 18)

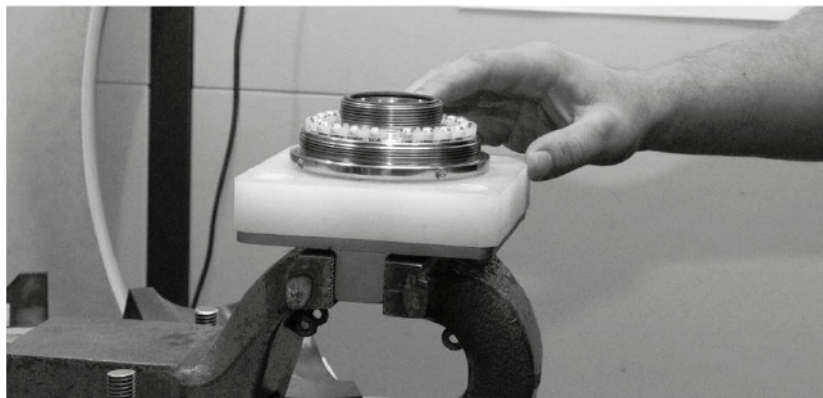


- Preparation before mounting the bevel gear (Pos. 14) on nozzle head (Pos. 18): It is recommended to grease the nozzle head thread with food graded/FDA compliant grease. The grease reduces the risk of galling in threads. The grease is enclosed between the O-rings and, therefore, it will not come into contact with the cleaning media.

Be very careful not to put grease onto the O-rings as the O-rings swells in contact with grease!

If the food graded/FDA compliant grease is not allowed into the SaniJet 25 for some reason, it is recommended to be very careful when joining threaded parts.

- Mount the ball retainer with balls (Pos. 5) in the ball race on the hub nut (Pos. 15).



ESE01842

8. Preparation of O-rings before mounting: Dip the O-rings in water. If water is not used then be very careful about how the O-rings behave when screwing the cone onto the stem.

9. Mount the O-ring (Pos. 17) in the groove on the bevel gear (Pos. 14)



10. Screw the bevel gear (Pos. 14) on to the nozzle head (Pos. 18) thread by hand



12 Assembly

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11. Screw the bevel gear (Pos. 14) with the hub tool (TE20J392) while pressing on the tool.
Tighten the bevel gear (Pos. 14) using Ring key (TE81B159) until you feel a stop and then tighten it a bit more. The stop you feel is two surfaces connecting.



4107-0112

12. Check that the hub nut (Pos. 15) can rotate freely and that O-rings inside are mounted correctly (Pos. 16 and 17).



4107-0113

ESE01842

12.5 Assembly of planet gear

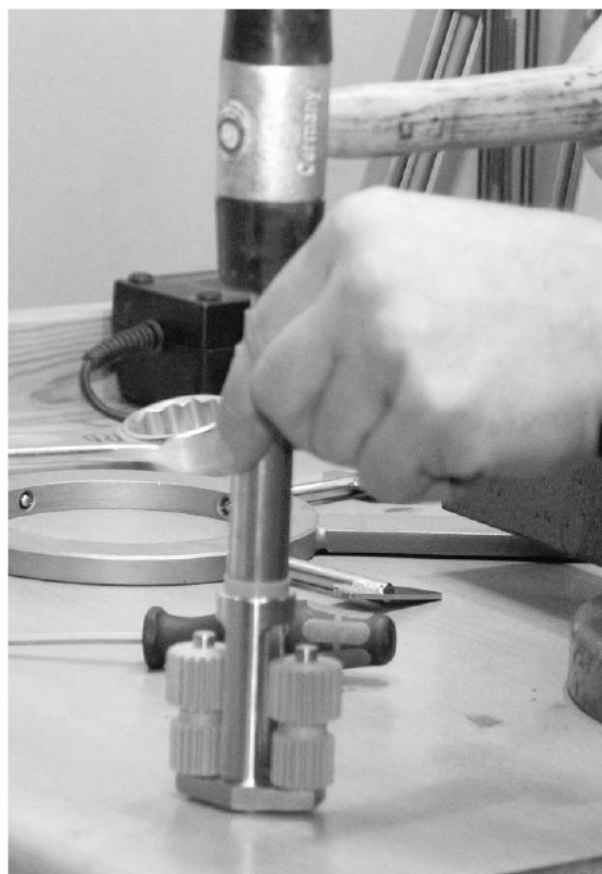
Parts and tools required for the assembly

Pos.	Item no.	Qty	Denomination
11.1	TE20J521	1	Bushing
12	TE20J515	1	Planet gear

Tools needed for assembly

Standard tool kit	
Item no.	Denomination
TE81B139	Drift
	Hammer

1. Mount the bushing (Pos. 11.1) on the gear frame (Pos. 12). Push down using Drift (TE81B139) and hammer. The bushing should be flush with the top of the gear frame.



4107-0114

12 Assembly

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12.6 Assembly of gear ring

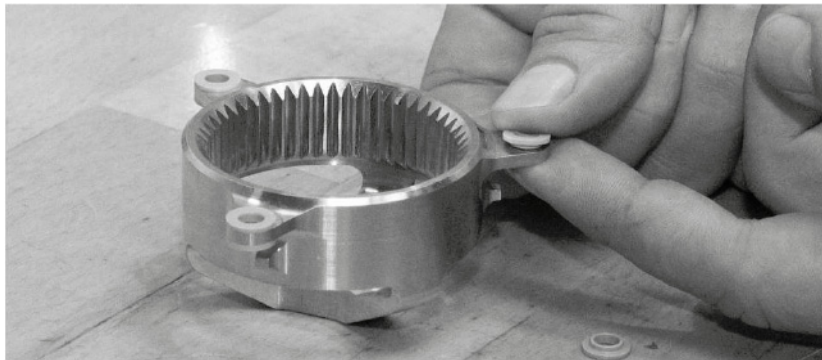
Parts and tools required for the assembly

Pos.	Item no.	Qty.	Denomination
13.2	TE20J506	1	Gear ring
13.3	TE20J508	1	Bearing for body
13.4	TE20J509	6	Seal ring

Tools needed for assembly

Standard tool kit	
Item no.	Denomination
TE81B139	Drift
	Hammer

1. Mount seals (Pos. 13.4) on both sides of the three holes on the gear ring (Pos. 13.2)



2. Mount bearing for body (Pos. 13.3) on the gear frame (Pos. 13.2). Use Drift (TE81B139) and hammer to apply pressure.

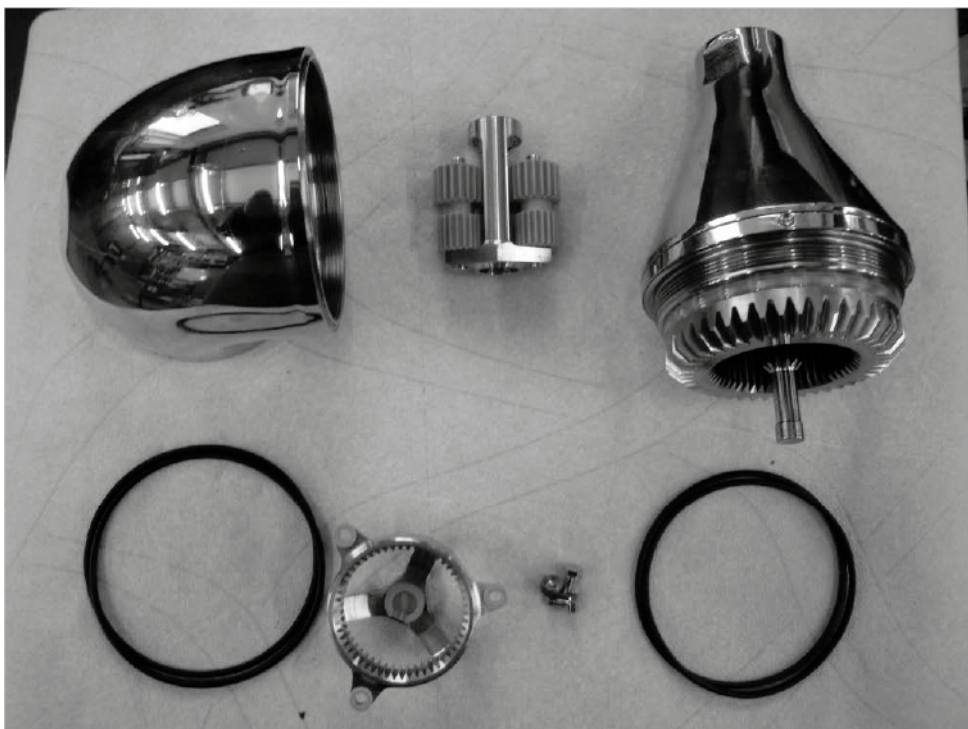


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12.7 Assembly of body parts

Parts and tools need for assembly

Pos.	Item no.	Qty.	Denomination
			Assembled top parts
			Assembled lower parts
			Assembled gear ring
			Assembled planet gear
9	TE51T141 or TE51T196	2	O-ring
10	TE51T140 or TE51T197	2	O-ring
13.5	TE20J550	3	Screw for body assembly

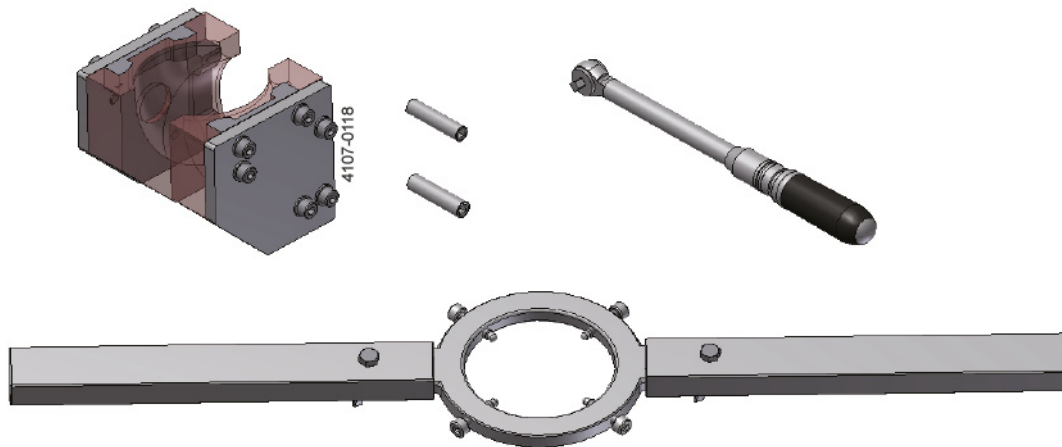


12 Assembly

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Tools needed for disassembly and checking assembly

Standard toolkit	
Item no.	Denomination
TE20J386	Fixture tool f. body
TE20J393	Ring key f. nuts (dismountable)
TE81B157	NV8 socket, long, ¼"
TE81B158	NV9 socket, long, ¼"
TE81B156	Torque wrench (4-24 Nm) – ¼"
	Brush for applying grease
	Glass of water
	Grease compliant with FDA (if allowed)
	Hammer



1. Put the two fixtures (TE20J386) around the house and slide the assembly between the jaws of the bench vise. Let the bolt ends slide on-top of the jaws. With the SaniJet 25 centred between the jaws tighten the bench vise.

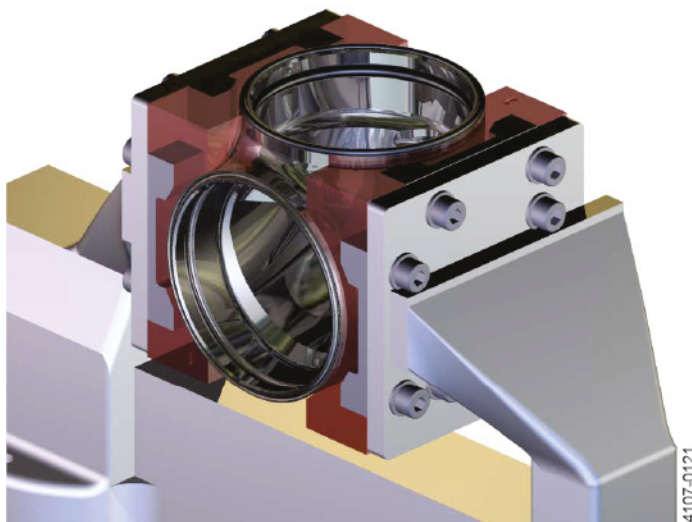


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2. Mount assembled gear ring in body (Pos. 13.1). Tighten screws (Pos. 13.5) using the torque wrench (TE81B156+TE81B157) to maximum 5 Nm. Too much torque breaks the screws.



3. Preparation of O-rings before mounting: Dip the O-rings in water. If water is not used then be very careful about how the O-rings behave when screwing the cone onto the stem.
4. Mount the O-ring (Pos. 9) in the O-ring groove on the outside of body. (Pos. 13.1). If the length of O-ring does not fit precisely to the O-ring groove, then you can stretch the O-ring.
5. Mount the O-ring (Pos. 10) in the O-ring groove inside the body (Pos. 13.1).



12 Assembly

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6. Preparation before mounting the assembled top parts on body (Pos. 13.1): It is recommended to grease the body thread with food graded/FDA compliant grease. The grease reduces the risk of galling in threads. The grease is enclosed between the O-rings. Hence, it does not come into contact with the cleaning media.

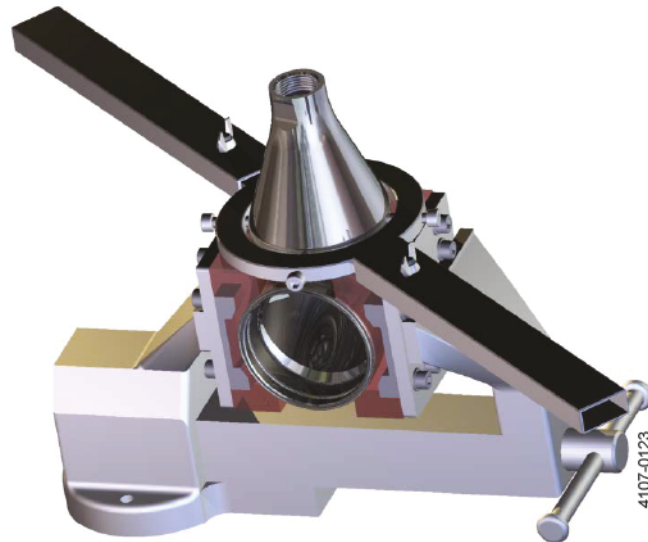
Be very careful not to put grease onto the O-rings as the O-rings swells in contact with grease!

If the food graded/FDA compliant grease is not allowed into the SaniJet 25 for some reason, it is recommended to be very careful when joining threaded parts.



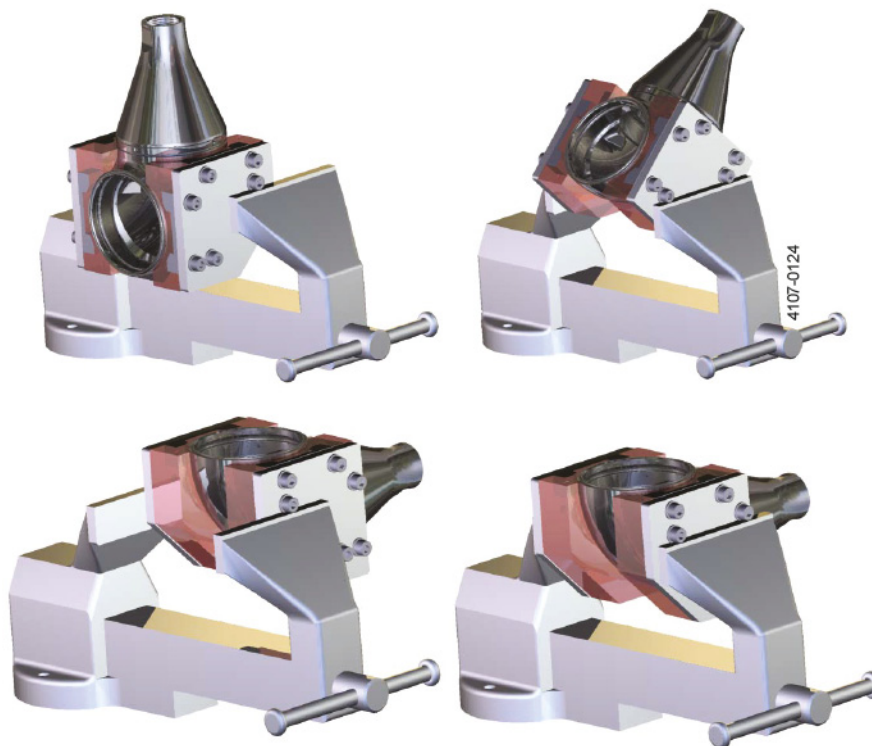
7. Mount assembled planet gear in the gear ring (Pos. 13.2)
8. Place impeller shaft (Pos. 3.1) of the assembled top parts into the planet gear (Pos. 12) in the gear ring (Pos. 13.2). Then lower the cone assembly while trying to fit the gear wheels into each other.
9. Lower the assembled top parts onto the threads. Catch the thread while turning the stem nut (Pos. 4) by hand.

10. Lower the ring key (TE20J393) carefully around the cone (Pos. 1.1). Tighten the four screws (by hand only) symmetrically on stem nut.



11. Tighten the stem nut (Pos. 4) until you feel a stop and then tighten a bit more (the stop you feel are two surfaces connecting).

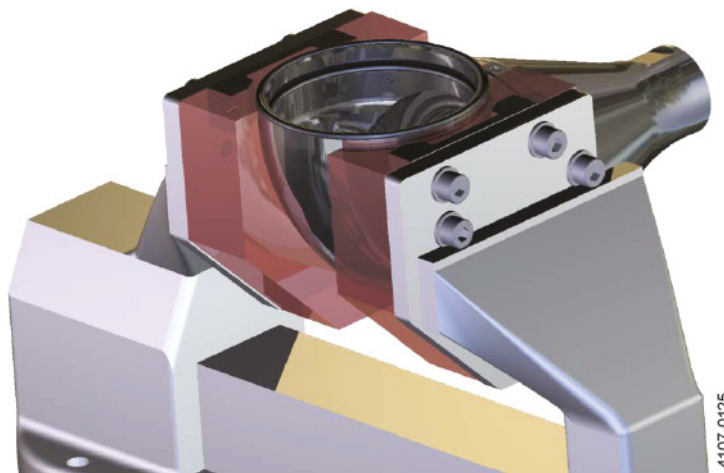
12. Loosen the bench vise and turn the assembly 90 degrees.



12 Assembly

ESE01842

13. Preparation of O-rings before mounting: Dip the O-rings in water. If water is not used then be very careful about how the O-rings behave when screwing the cone onto the stem.
14. Mount the O-ring (Pos. 9) in the O-ring groove on the outside of body (Pos.13.1). If the length of O-ring does not fit precisely to O-ring groove, then you can stretch the O-ring.
15. Mount the O-ring (Pos. 10) in the O-ring groove inside the body.

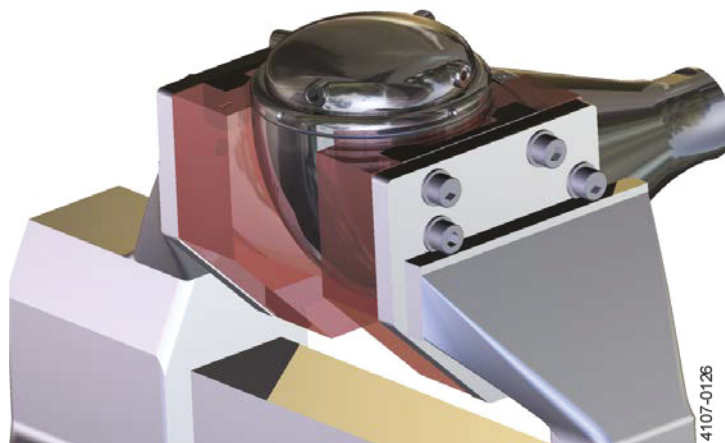


16. Preparation before mounting the assembled lower parts on body (Pos. 13.1): It is recommended to grease the body thread with food graded/FDA compliant grease. The grease reduces the risk of galling in threads. The grease is enclosed between the O-rings and, therefore, it will not come into contact with the cleaning media.

Be very careful not to put grease onto the O-rings as the O-rings swells in contact with grease!

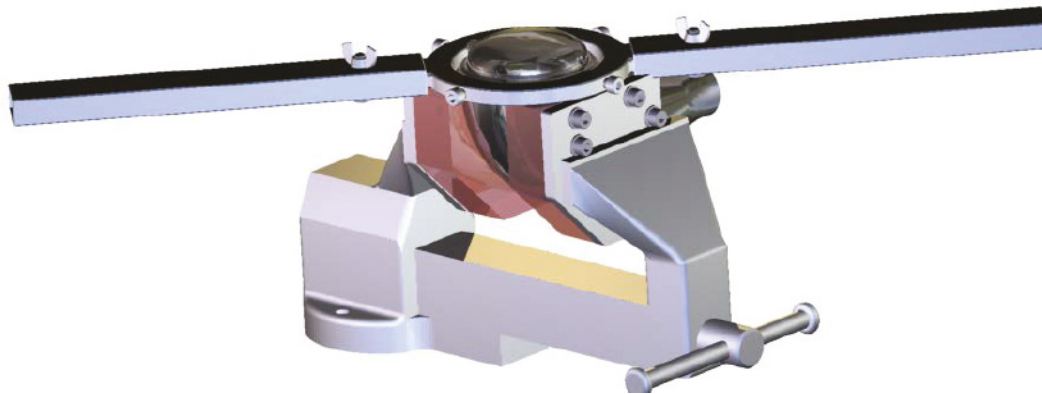
If the food graded/FDA compliant grease is not allowed into the SaniJet 25 for some reason, it is recommended to be very careful when joining threaded parts.

17. Lower the assembled hub while trying to fit the bevel gear wheels into each other. Then tighten the hub nut (Pos. 15) only by hand. **Note: Left handed thread!!**

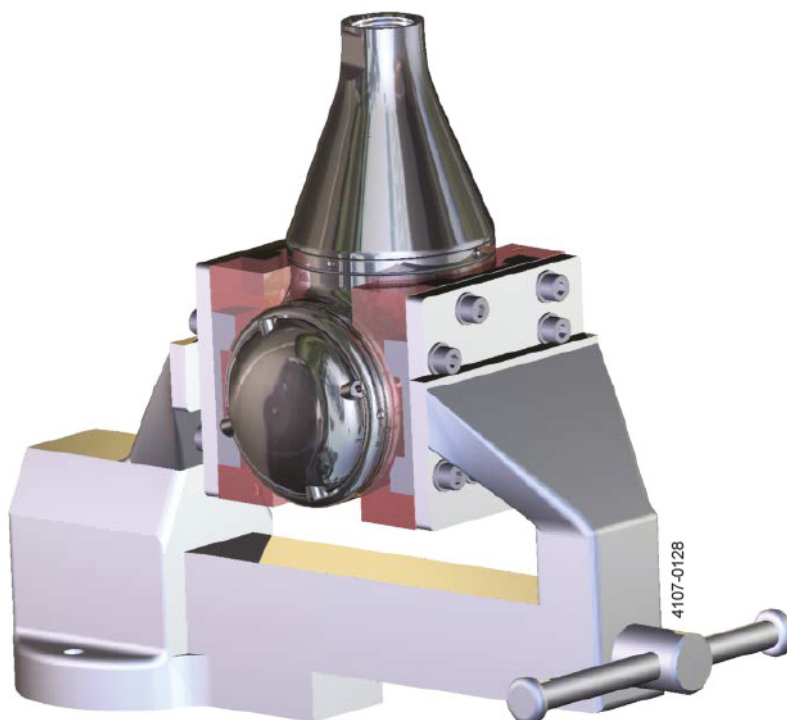


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18. Lower the ring-key (TE20J393) carefully around the nozzle head (Pos. 18). Tighten the four screws (by hand only) symmetrically on the hub nut (Pos. 15).
19. Tighten the hub nut (Pos. 15) until you feel a stop and then tighten a bit more (the stop you feel are two surfaces connecting).
Note: Left handed thread!!



20. The assembly of SaniJet25 is finished



12 Assembly

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12.8 Checking the assembly of body parts

1. Lift the Alfa Laval Toftejorg SaniJet 25 up by hand and rotate the shaft end clockwise using the wrench extension (TE81B156) and NV9 spanner socket (TE81B158). The body (Pos. 13.1) and nozzle head (Pos. 18) should rotate easily (very little movement is seen by each turn of the torque wrench extension).

Be careful lifting the SaniJet25, do not drop the machine!



2. Check the O-rings (Pos. 10) and see if they are in place.
3. Finally, it is highly recommended to test the machine in working conditions.



13.1 Service and repair

Upon every return of a product, no matter if for modifications or repair, it is necessary to contact your local Alfa Laval office to guarantee a quick execution of your request.

You will receive instructions regarding the return procedure from your local Alfa Laval office. Be sure to follow the instructions closely.

13.2 How to order spare parts

On the Part List Drawing (page 28) as well as on all instruction drawings, the individual parts have a pos. number, which is the same on all drawings. From the pos. numbers, the part is easily identified in the Reference Lists of Parts, page 29 and 30.

Individual parts should always be ordered from the Reference Lists of Parts, page 29 and 30. Ref. No. and description should be clearly stated.

Please also quote the type of machine and serial No. This will help us to help you. The serial number is placed on the body of the tank cleaning machine.

Note: In cases where spare parts are ordered for machines originally delivered with 3.1 certificates, please state this information on your ordering form together with the machine type and serial number. This is to ensure full traceability henceforward.

Note: In connection with ordering of spare parts for machines originally delivered with Q-doc (Qualification Documentation) please note that all service and repair should be performed by Alfa Laval Kolding A/S, Denmark, see page 19 "Service and Repair of machines ordered with Q-doc".

13.3 How to contact Alfa Laval Tank Equipment

For further information please feel free to contact:

Alfa Laval Tank Equipment

Alfa Laval Kolding A/S

31, Albuen - DK 6000 Kolding - Denmark

Registration number: 30938011

Tel switchboard: +45 79 32 22 00 - Fax switchboard: +45 79 32 25 80

www.toftejorg.com, www.alfalaval.dk - info.dk@alfalaval.com

Contact details for all countries are continually updated on our websites

14.1 Declaration of Conformity, EN 10204 sub clause 2.2 Test Report



- 2 -

Non-Metal Materials
 21CFR§177.2415 PEEK
 21CFR§177.1550 PFA
 21CFR§177.2600 EPDM
 21CFR§177.1550 PTFE

Surface Finish
 All parts are finished with a nominal external surface roughness Ra = 0.5 µm (20 micro inch) and nominal internal surface roughness Ra=0.8 µm (30 micro inch)

Non-Specific Controls on Product Quality "As-Supplied"
 All metallic part material certifications are inspected upon receipt before assembly. Parts inspections are completed according to the approved ISO 9001:2008 standard program. The Quality Control Department only accepts the product in component parts for assembly according to this program if the parts comply with the above material specification documentation.

Product welds are executed, inspected and finished (polished where accessible), according to written, approved procedures. Parts produced from FDA approved polymers are only sourced from suppliers that have met "pre-qualification" standards established by Alfa Laval Tank Equipment's ISO 9001:2008 program. Materials of construction of component parts are controlled through clear and explicit specifications in purchase orders. These specifications include the materials of construction specified by the parts designers, making them subject to the contractual terms and conditions.

The following item numbers are covered by this certificate:

TJ20J000-xx	TJ20J002-xx	TJ20J004-xx
TJ20J010-xx	TJ20J012-xx	TJ20J014-xx
Options with ATEX:		
TE20JXXX-8x		
TE20JXXX-7x		
TE20JXXX-8x		

Kolding, Denmark, 2014.01.02

Annie Dahl, CHSE Manager, Alfa Laval

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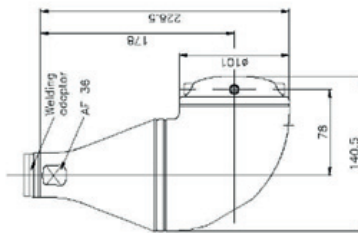
This certificate is delivered in compliance with the latest valid design and construction. Alfa Laval Kolding A/S reserve the right to alter or modify any part of the information without notice or any obligation. 04/2014 2014



Declaration Of Conformity
 per
 EN 10204, Sub Clause 2.2 Test Report
Materials of Construction and Surface Finishes

Alfa Laval Kolding A/S (supplier)
 declare, under our sole responsibility, that the following product:

Description:
 Tokejorg SanJet 25 Rotary Jet Head



has been subjected to non-specific controls for product quality and is found to conform with the following standards and other normative documents:

Metal Materials
 ANSI 316 Werkstoffno. 1.4401
 ANSI 316L Werkstoffno. 1.4404
 SAE 2205 Werkstoffno. 1.4462

1/2

This certificate is delivered in compliance with the latest valid design and construction. Alfa Laval Kolding A/S reserve the right to alter or modify any part of the information without notice or any obligation. 04/2014 2014

14.2 EHEDG certificate of self-cleanability

CERTIFICATE OF COMPLIANCE



*DTU National Food Institute
hereby declares that the product*

*Tank Cleaning machine
Toftejorg SaniJet Rotary Jet Head*

from

Alfa Laval Kolding A/S, Albuen 31 6000 Kolding Denmark

*has been evaluated for compliance with the
Hygienic Equipment Design Criteria of the EHEDG, Document No.8 by*

*DTU National Food Institute, EHEDG Test Center, DTU
and meets the criteria of this document as demonstrated by:*

Evaluation Report No. 010704

<i>Signed</i>	 <i>Per Væggenløse Nielsen, Evaluation Officer</i>	<i>Date 26.05.2014</i>
<i>Signed</i>	 <i>Jens Adler-Nissen, Head of Department</i>	<i>Date 26.05.2014</i>

DTU Center for Hygienic Design
National Food Institute

Certificate No. DTU2014/05
Date first issue DTI 2004/01

DTU National Food Institute, Søtofts Plads 222, DK-2800 Kgs. Lyngby, Denmark
©EHEDG

14 Miscellaneous

ESE01842

14.3 Declaration of compliance for food contact materials

Declaration of compliance for food contact materials



Article Nr: TE20J0XX-XX
Product SaniJet 25

We, Alfa Laval Kolding A/S, hereby certify that the plastic articles intended to come into contact with product included in the article stated above comply with the Regulation (EC) No. 1935/2004 and the Regulation (EC) No. 10/2011 both in their relevant versions on materials and articles intended to come in contact with food.

Finished articles subject to an overall migration limit of 10 mg/dm² or 60 mg/kg.
The following substances subject to limitations are used in the above stated article:
SML:

PEEK Natur
Diphenylsulphor: 3 mg/kg food
1,4 Dihydroxybenzol: 0.6 mg/kg food
4,4' Defluorobenzopheneone: 0.05 mg/kg food

PFA and PTFE
TFE: 0.05 mg/kg food
PPVE: 0.05 mg/kg food

Migration from the plastic articles has been investigated by calculations as laid down in paragraph (32) in Regulation (EC) No. 10/2011, to control that the migration limits and other requirements are fulfilled. The articles can be used, within its application area, with all type of foods at batch size above 1,200 kg*.

We also certify that the plastic articles intended to come into contact with product included in the article stated above are also entirely in accordance with the present US regulation FDA CFR 21§ 177.

Kolding, 22-08-2014

A handwritten signature in blue ink, appearing to read 'Henrik Falster-Hansen', is written over a horizontal line.

Henrik Falster-Hansen,
R&D Manager
Alfa Laval Kolding A/S

*Based on worst case scenario = all of the free monomer in the plastic migrates to one batch.

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14.4 ATEX - Specific Conditions for Safe Use

ATEX CERTIFICATION

EC – Type Examination Certificate Number: Baseefa04ATEX0358X

 II 1GD c T140°C

BASEEFA CUSTOMER REFERENCE No. 5102
PROJECT FILE No. 16/0126

Special Condition for Safe Use

1. The unit may be operated, in a hazardous area, only when filled with the process fluid.
2. If a medium other than the process fluid is passed through the equipment, the flow must not be high enough to cause the equipment to operate. If this cannot be avoided, the rotor must be removed or secured to prevent rotation.
3. The maximum permitted process fluid temperature is 95°C, with an ambient temperature range of 0°C to 140°C.
4. The maximum permitted process fluid pressure is 8 bar.
5. The unit must not be operated in a vessel having an enclosed volume of greater than 100m³.
6. The unit must be effectively earthed at all times when in use.
7. The user must address the electrostatic hazards generated from the process of the equipment in accordance with guidance document IEC/TS 60079-32-1:2013.

This product fully complies to ATEX category 1 as long as the 7 special conditions above are adhered to.

Please read the above conditions prior to installation & ensure that all conditions are met.

Explanation of T (temperature) rating.

The ATEX classification

The standard machine is approved for an ambient temperature range of 0°C to +140°C and is marked

 II 1GD c T140°C

How to contact Alfa Laval

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

Please visit www.alfalaval.com to access the information directly.

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