Instruction Manual

Alfa Laval Toftejorg™ SaniJet 25 Rotary Jet Head

Covering: Standard Machines
Q-doc - Equipment Documentation (3.1 Inspection Certificate – EN 10204)
Q-doc + FAT-SAT - Qualification Documentation
Machines delivered with ATEX/IECEx Certification in accordance with Directive 2014/34/EU
USP Class VI materials. TE91A760. First published: 2004-05

ESE01842-EN18 2022-11

Original manual

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

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EU Declaration of Conformity

The Designated Company

Alfa Laval Kolding A/S, Albuen 31, DK-6000 Kolding, Denmark, +45 79 32 22 00
Company name, address and phone number

Hereby declare that

Rotary Jet Head
Designation

SaniJet 25, SaniJet 25 UP
Type

Serial number from 2018-0001 to 2030-99999

is in conformity with the following directives with amendments:
- Machinery Directive 2006/42/EC
- ATEX Directive 2014/34/EU and the following harmonized standards are used:
EN ISO 80079-36:2016, EN ISO 80079-37:2016, DS/EN ISO/IEC 80079-34:2011, Annex A, paragraph A.5.3 Rotating machines

EC Type Examination Certificate no. Baseefa04ATEX0358X and IECEx BAS 18.0067X

Marking:  II 1G Ex h IIC 85°C... 175°C Ga
II 1D Ex h IIIC T85°C... T140°C Da

The QAN (Quality Assurance Notification) is carried out by SGS Fimko Oy, Särkiniementie 3, Helsinki 00211, Finland. Notified Body No. 0598.
EU Type Examination Certification is carried out by SGS Fimko Oy, Särkiniementie 3, Helsinki 00211, Finland. Notified Body no. 0598.
IECEx Certificate of Conformity is carried out by Baseefa Ltd., Rockhead Business Park, Staden Lane, Buxton, Derbyshire SK17 9RZ, United Kingdom. IECEx Accepted Certification Body (ExCB).

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

Global Product Quality Manager		Lars Kruse Andersen
Title		Name
Kolding, Denmark	2022–11–09	
Place	Date (YYYY-MM-DD)	Signature

This Declaration of Conformity replaces Declaration of Conformity dated 2019-05-01

1 Declarations of Conformity

UK Declaration of Conformity

The Designated Company

Alfa Laval Kolding A/S, Albuen 31, DK-6000 Kolding, Denmark, +45 79 32 22 00
Company name, address and phone number

Hereby declare that

Rotary Jet Head
Designation

SaniJet 25, SaniJet 25 UP
Type

Serial number from 2018-0001 to 2030-99999

is in conformity with the following directives with amendments:
- The Supply of Machinery (Safety) Regulations 2008
- The Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 2016

and the following harmonized standards are used: EN ISO 80079-36:2016, EN ISO 80079-37:2016, DS/EN ISO/IEC 80079-34:2011, Annex A, paragraph A.5.3 Rotating machines

EC Type Examination Certificate no. Baseefa04ATEX0358X and IECEx BAS 18.0067X

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Signed on behalf of: Alfa Laval Kolding A/S

Global Product Quality Manager	Lars Kruse Andersen
Title	Name
Kolding, Denmark	2022–11–09
Place	Date (YYYY-MM-DD)
	Signature

DoC Revison_01_112022

SaniJet 25

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:

ATEX/IECEx warning:

3.1 Introduction

The Alfa Laval Toftejorg SaniJet 25 Rotary Jet Head has been developed to meet the highest demands for efficiency, reliability and hygiene within food and beverage, pharmaceutical and biochemical industry

This manual has been prepared as a guide for installing, operating and maintaining your Alfa Laval Toftejorg tank cleaning machine.

The Alfa Laval Toftejorg 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).

CERTIFICATE OF COMPLIANCE

EHEDG

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

Signed _____ Date 26.05.2014
Per Vinggerhøe Nielsen, Evaluation Officer

Signed _____ Date 26.05.2014
Jens Adler-Nissen, Head of Department

DTU Center for Hygienic Design
National Food Institute

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

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

Warning:

In order to maintain the hygienic state of the machine it is of highest importance that the Alfa Laval Toftejorg 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 Toftejorg SaniJet 25 (TE81B149).

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

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

If the Alfa Laval Toftejorg 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.

Should you require further assistance, our Technical Sales Support department and worldwide net of sales offices are pleased to help you. Please quote the type, article and serial numbers with all of your enquiries; this helps 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 15) and the Specific conditions for safe use in accordance with the ATEX/IECEx directive 2014/34/EU (page 17) 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.

3.2 Intended use

The end-user should verify:

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

The tank cleaning machine/rotary jet mixer is intended for use in closed tank, vessel or container. If used in open environment see 4.3 General safety and installation instructions (page 15).

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.

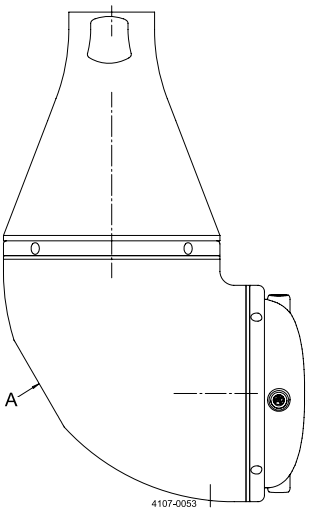
The Alfa Laval logotype is a trademark or a registered trademark of Alfa Laval Corporate AB. "Toftejorg" and “SaniJet” are trademarks or registered trademarks of Alfa Laval Kolding A/S. The Toftejorg™ SaniJet™ 25 product has patents in the EPO member states (EP 0 560 778), in the US (5333630) and in 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 standard documentation:
yyyy-xxxxx: serial number
yyyy: year
xxxxx: 5 digit sequential number

Serial number explanation
Machines supplied with Q-doc + FAT-SAT documentation:
yyyy-FAT-SAT-xxx: serial number
yyyy: year
xxx: 3 digit sequential number

3.5 ATEX/IECEx marking

The Alfa Laval Toftejorg SaniJet 25 is certified as category I component. The ATEX certification is carried out by the Notified Body SGS Fimko Oy, who has issued the certificate no. Baseefa04ATEX0358X.

The IECEx certification is carried out by the Certification Body SGS Baseefa Ltd., who has issued the certificate no. IECEx BAS 18.0067X.

Note
Explosion protection type is constructional safety “c”.

The marking on the ATEX/IECEx certified Alfa Laval Toftejorg SaniJet 25 is as follows (for information on marking position see section 3.4 Marking).

Serial number explanation
Machines supplied with or without standard documentation:
yyyy-xxxxx: serial number
yyyy: year
xxxxx: 5 digit sequential number

Serial number explanation
Machines supplied with Q-doc + FAT-SAT documentation:
yyyy-FAT-SAT-xxx: serial number
yyyy: year
xxx: 3 digit sequential number

3.6 ATEX/IECEx temperature class and code

The maximum surface temperature depends mainly on operating conditions which are the temperature of the cleaning fluid and the ambient temperature.

Group II EPL Ga
The gas temperature class is corrected with a safety margin of 80% due to a requirement for Group II EPL Ga equipment. The gas temperature class depends on the cleaning fluid temperature or the ambient temperature, whichever of the two is the highest.

Table for determining temperature class (gas atmospheres)		
Temperature Class	Cleaning fluid temperature, T_p (°C)	Ambient temperature, T_{amb} (°C)
85°C (T6)	≤ +68°C	≤ +68°C
100°C (T5)	≤ +80°C	≤ +80°C
135°C (T4)	≤ +108°C	≤ +108°C
175°C	≤ +140°C	≤ +140°C

Group III EPL Da
The dust temperature class depends on the cleaning fluid temperature or the ambient temperature, whichever of the two is the highest.
No dust layer is considered.

Table for determining temperature class (dust atmospheres)		
Temperature code	Cleaning fluid temperature, T_p (°C)	Ambient temperature, T_{amb} (°C)
T85°C	≤ +85°C	≤ +85°C
T100°C	≤ +100°C	≤ +100°C
T135°C	≤ +135°C	≤ +135°C
T140°C	≤ +140°C	≤ +140°C

Example of gas class determination

Cleaning fluid temperature is 67°C and ambient temperature is 75°C.
Gas class = T5

ATEX/IECEx marking on the equipment:

II 1G Ex h IIC 85°C…175°C Ga
II 1D Ex h IIIC T85°C…T140°C Da

3.7 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 10/2011 compliant materials and also available as USP Class VI materials. All materials has full traceability according to EU1935/2004/EC.

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.

For use in explosive hazard zones the ATEX/IECEx version can be used, provided it is installed according to safety instructions in local regulations.

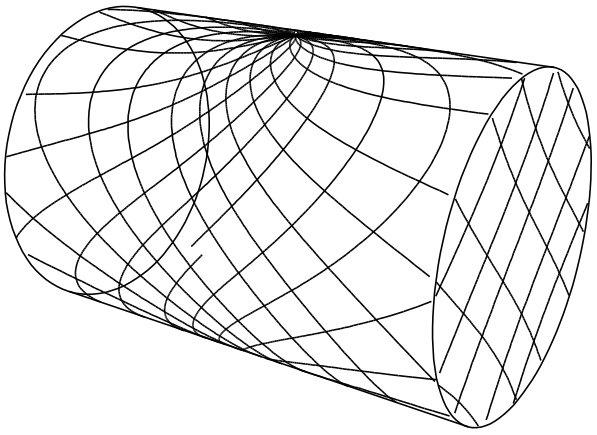
No exposed threads or screws are present in the product contact areas.

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 m^3 (130-8,000 US gallons) for larger tanks multiple units may be used.

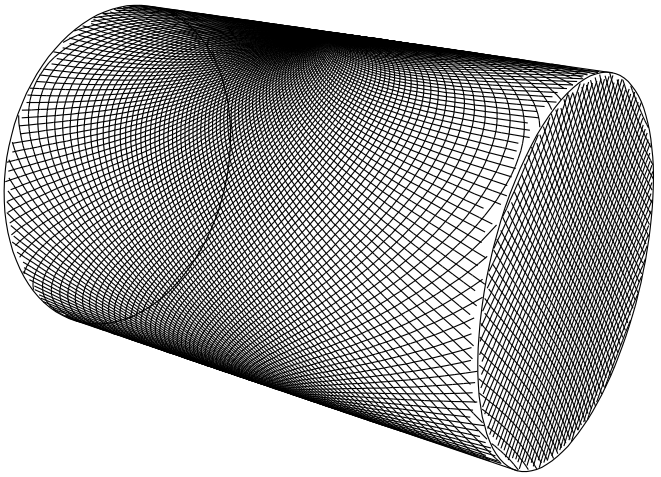
4.2 Functioning

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.



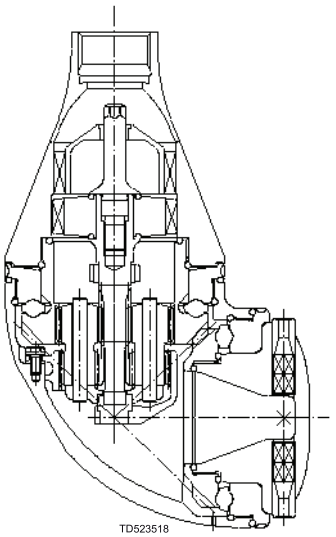
First cycle



Full pattern

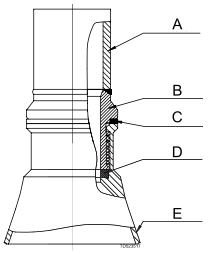
The number of cycles needed to perform a proper cleaning depends on type of soil, distance between tank cleaning machine and tank wall, cleaning procedure and cleaning agent. For residues that are easily mobilized, i.e. easy to remove, one cycle could be sufficient. Heavier soiling (high viscous, sticky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

4.3 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.

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 (position 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/IECEx 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/mixing 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.

For information on use in potential explosive atmospheres see section 4.4 Specific conditions for safe use in accordance with ATEX/IECEx Certification.

4.4 Specific conditions for safe use in accordance with ATEX/IECEx Certification

Directive 2014/34/EU

NOTE
Explosion protection type is constructional safety “c”.

Warning: **Operated in a hazardous area**

The unit my be operated in a hazardous area only when completely filled with cleaning fluid/steam.
If a medium other than the cleaning fluid/steam is passed through the equipment the flow must not be high enough to cause the equipment to operate.

Warning: **Operating guidance**

The unit shall be operated in line with guidance provided by IEC/TS 60079-32-1 for tank cleaning.

Warning: **Temperature class and ambient temperature range**

The maximum surface temperature depends mainly on operations conditions which is the temperature of the cleaning fluid and ambient temperature.
The temperature class and ambient temperature range are shown in paragraph 3.6 ATEX/IECEx temperature class and code, page 12.

Warning: **Max. permitted temperature**

When working:
The maximum permitted cleaning fluid temperature and ambient temperature is 95°C.
When not working:
The maximum permitted ambient temperature is 140°C.

Warning: **Draining using compressed air**

Draining using compressed air must not be done in ex classified zone.
Draining using compressed air is possible in non ex classified zones (see page 20).

Warning: **Earthing**

All metal and other conductive or dissipative material should be connected to earth with the exception of very small items.
For further information see IEC/TS 60079-32-1:2013 Explosive atmospheres – Part 32-1: Electrostatic hazards, guidance. With focus on clause 6.2.3, 7.2.1, 7.3, 7.9.2, 13.

Warning: **Earthed when in use**

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

4.4 Specific conditions for safe use in accordance with ATEX/IECEx certification

Warning: **Max. permitted steaming temperatur e**

The maximum permitted steam temperature trough the machine and ambient temperature is 140°C.

Warning: **Steaming tanks larger than 100 m³**

Tanks with capacities larger than 100 m³ that could contain a flammable atmosphere should not be steam cleaned, as steam cleaning tanks produces an electrostatically charged mist. Tanks smaller than 100 m³ may be steam cleaned.
For further information see IEC/TS 60079-32-1:2013 Explosive atmospheres – Part 32-1: Electrostatic hazards, guidance. With focus on clause 7.10 and 8.5.

Tank size information

NOTE: The tank cleaning machine has been certified by accredited notified body and can operate in tanks having an enclosed volume up to 100 m³ as long as all ATEX/IECEx warnings in the instruction manual are complied with.

General guidelines for tanks larger than 100 m³:

Tanks larger than 100 m³ must not be steam cleaned – See guide IEC/TS 60079-32-1:2013 clause 7.10.5 and 8.5.
To use the unit 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 guidelines are described in the guide IEC/TS 60079-32-1:2013.
It must be ensured that the equipollently bonding of all conductive metal objects is in accordance with national regulations for use.

The cleaning fluid conductivity must correspond to the products in the group “High conductivity”, cf. IEC/TS 60079-32-1:2013 clause 7.1 and 7.2.

High conductivity	> 10 000 pS/m
Medium conductivity	between 25 × εr pS/m and 10 000 pS/m
Low conductivity	< 25 × εr pS/m

For liquids with a dielectric constant of around 2, (e.g. hydrocarbons), these classifications reduce to:

High conductivity	> 10 000 pS/m
Medium conductivity	between 50 pS/m and 10 000 pS/m
Low conductivity	< 50 pS/m

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/IECEx certification for this unit except for tanks up to 100 m³. For further information see IEC/TS 60079-32-1:2013 Explosive atmospheres – Part 32-1: Electrostatic hazards, guidance with focus on clause 7.1.3, 7.1.4, 7.2.1, 7.2.4.

4.4 Specific conditions for safe use in accordance with ATEX/IECEx certification

Warning: **Process generated electrostatic**

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.

Warning: **Electrostatically charged liquid**

Liquids can become electrostatically charged when they move relative to contacting solids or the spraying of liquids can also create a highly charged mist or spray. The liquid must be made electrically conductive by additives or otherwise.
For further information see IEC/TS 60079-32-1:2013 Explosive atmospheres – Part 32-1: Electrostatic hazards, guidance. With focus on clause 7.1.3, 7.1.4, 7.2.1, 7.2.4.

Warning: **Appropriate cleaning fluid**

The cleaning fluid should be appropriate for the application (e.g. so no chemical reaction can take place between the cleaning fluid and the residue of process fluid/powder/compound which can generate heat or a hybrid mixture).

Chemical reactions in Zone 20 - Hybrid mixtures:

End-user must ensure that the cleaning fluid used does not create a hybrid mixture according to IEC 60079-10-1:2015 Annex I.1 in connection with powder / dust residues in the tank in zone 20.
This should ensure that the atmosphere does not change to a classification that lies outside the machine's certified scope. When the machine is used for cleaning tanks containing potentially flammable dust atmospheres, and a potentially flammable fluid is used as the cleaning fluid then an assessment of the hybrid mixture shall be undertaken by the user, prior to operation.
For further information see IEC 60079-10-1:2015 Explosive atmospheres – Part 10-1: Classification of areas – Explosive gas atmospheres. With focus on clause 3.6.6 and Annex I – Hybrid mixtures.

Warning: **Fluid pressure**

The maximum permitted cleaning fluid pressure is 8 bar.

In addition to the above mentioned precautions relating to Directive 2014/34/EU, the Safety Precautions on page 15 must be observed.

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 alkalics 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

PEEK is not resistant to concentrated sulphuric 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 increase consumption of wear parts. High pressure also reduces the cleaning effect.

Draining using compressed air

If the machine is drained using compressed air, then the compressed air pressure must not cause the machine body rotation to exceed 4.5 rpm (corresponding to approx. 13 sec. per rev of the body) in order to avoid risk of machine breakdown. Draining should always be done inside the tank.
See paragraph 4.4 Specific conditions for safe use in accordance with ATEX/IECEx Certification (page 17).

Steam cleaning

If stream cleaning is done through the machine, the steam pressure must not cause the machine body rotation to exceed 12 rpm (corresponding to approx. 5 sec. per rev of the body) in order to avoid risk of machine breakdown. See paragraph 4.4 Specific conditions for safe use in accordance with ATEX/IECEx Certification (page 17).

Temperature

The maximum recommended cleaning fluid temperature is 95°C. The maximum recommended steam temperature is 140°C. The maximum ambient temperature is 140°C.

See paragraph 4.4 Specific conditions for safe use in accordance with ATEX/IECEx Certification page 17.

After use cleaning

After use flush the machine with fresh water. Cleaning media should never allow 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.

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.

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.

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.

See also section 3.6 ATEX/IECEx temperature class and code, page 12.

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 24 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 41). 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.

According to “Regulation (EC) No 1935/2004 - Article 17” effective from 27th of October 2006, producers of food shall ensure traceability of the materials and articles intended to come into contact with foodstuffs. It is recommended that a traceability system is setup for replacement of wear parts and spare parts. This makes it possible to identify into which machine a given wear part or spare part has been inserted.

6.2 Service and repair of ATEX/IECEx certified machines

Warning:

All service and repair of ATEX/IECEx certified machines can be performed by Alfa Laval Kolding A/S, Denmark, or by an Alfa Laval service center approved by Alfa Laval Kolding A/S.

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

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

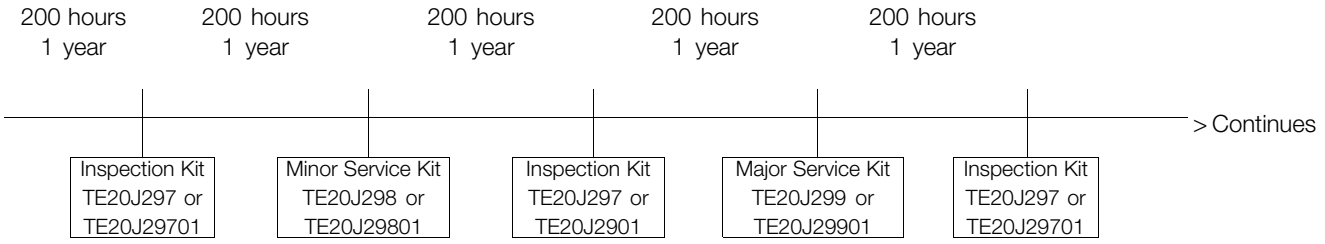
Contact local Alfa Laval service and support (see. www.alfalaval.com). Important information to give to Alfa Laval:

- Serial No.
- Q-doc maintenance order type:
  - Item no.: TEREP-Qdoc
  - Item no.: TE20JXXX-9X
    or
  - Item no.: TE20JXXX-5X (see page 30 for more information)

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.

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

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.

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.

Apart from the parts specifically mentioned above, all the remaining wear parts should regularly be inspected for wear. Which parts that are wear parts appear from the Spare Part Manual, available from the on-line Alfa Laval product catalogue Anytime or the Close at hand spare part catalogue.

Available add-ons:
Available add-on´s regarding material certificates, Declaration of Conformity and Q-doc documents, see page 31 for more information.

6.5 General assembly/disassembly recommendations

- Always read the instruction and maintenance manuals carefully before 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.

7 Trouble shooting guide

SaniJet 25

*The items (#) refer to section **10 Parts lists and drawings, service kits and tools***

Symptom: Slow rotation or failure of machine to rotate

Possible Causes	Fault finding
No or insufficient liquid flow	A. Check if supply valve is fully open. B. Check if inlet pressure to machine is correct. C. Check supply line/filter for restrictions/clogging.
Impeller jammed	D. Insert socket spanner on “nut” in top of turbine shaft (3.4) and easily turn turbine shaft clockwise. If any resistance is recognised, disassemble machine to localise cause. 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. F. Remove turbine shaft with impeller and carrier assembly (see paragraph 11.1 Disassembly into main subassemblies step 5-7) and remove foreign material. If particles repeatedly get jammed in the machine, install filter or reduce mesh size of installed filter in supply line.
Turbine shaft sluggish in bearings	G. Remove turbine shaft with impeller (see paragraph 11.3 Disassembly of top parts (cone and turbine) step 5-6) and clean bearings.
Planet gear jammed/sluggish	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.
Galling	I. Check stem (8) and hub (18) for wear between these parts and the nuts (4 and 15).

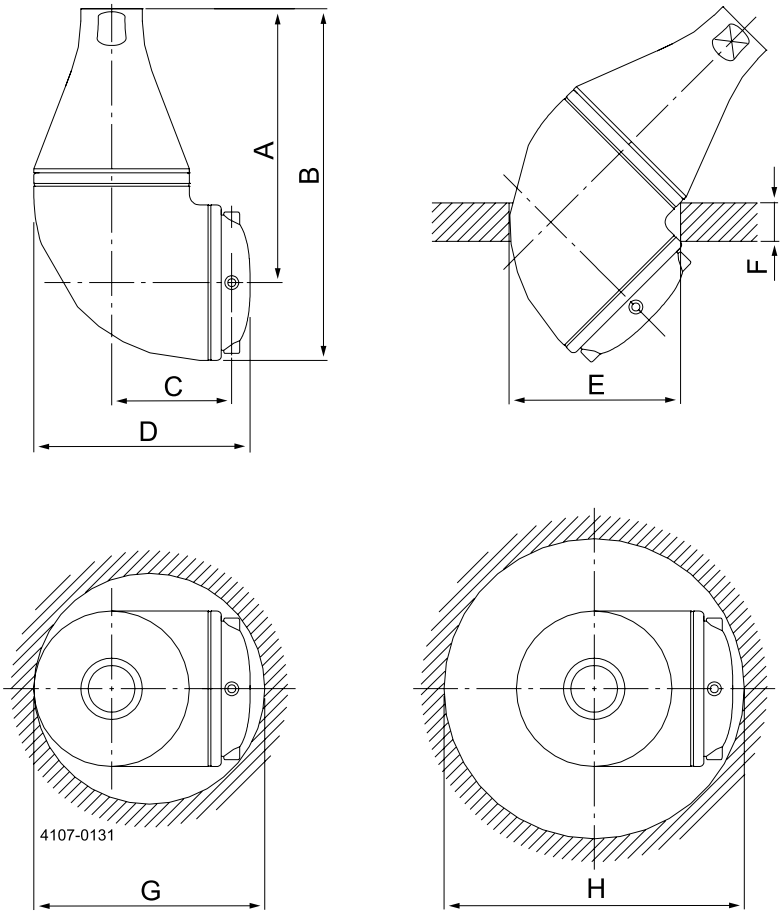
Symptom: Jets are incoherent within 1 m of the nozzles

Possible Causes	Fault finding
Guidevanes in the nozzles are clogged	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.

8.1 Technical data

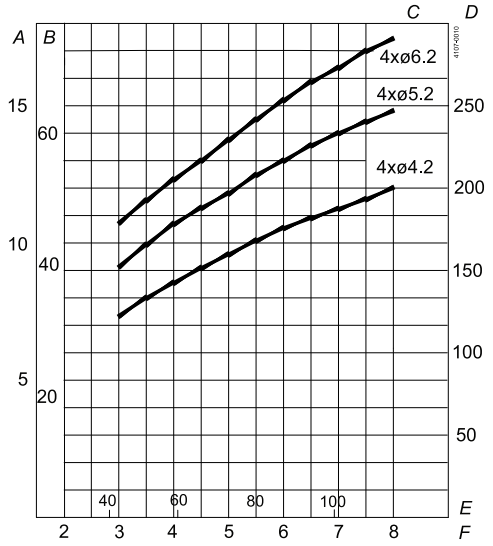
Weight of machine:	6.3 kg (13.2 lbs)
Working pressure:	3-8 bar (40-115 psi)
Recommended inlet pressure:	5-7 bar (70-100 psi)
Max. inlet pressure:	8 bar (115 psi).
Max. recommended working liquid temperature:	95°C (200°F)
Max. recommended working steam temperature:	140°C (284°F)
Max. ambient temperature:	140°C (284°F) when **not** operated
Materials:	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

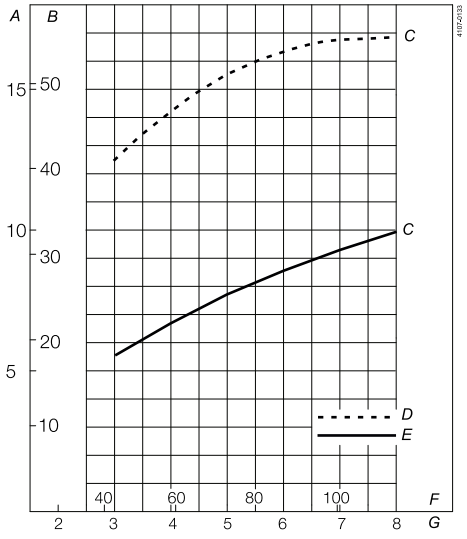
Flow rate



Inlet pressure

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

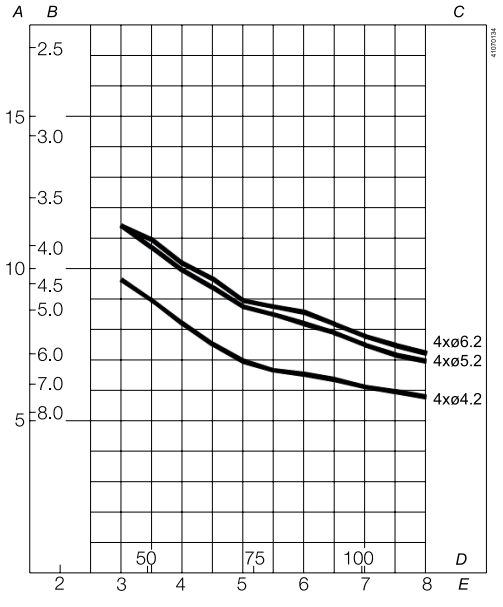
Impact throw length



Inlet pressure

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

Cleaning time, complete patter n



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

SaniJet 25

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

9.1 Standard configurations

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 add-ons

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

Explanation to Add-ons		
Q-doc (Equipment Documentation)	-doc	Equipment Documentation includes: - EN 1935/2004 DoC - EN 10204 type 3.1 inspection Certificate and DoC - FDA DoC - GMP EC 2023/2006 DoC - EU 10/2011 DoC - ADI DoC - QC DoC
Q-doc + FAT-SAT (Qualification Documentation)	-doc	Qualification Documentation includes: - 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
ATEX/IECEx	Ex	ATEX/IECEx includes: ATEX/IECEx approved machine for use in explosive atmospheres. Category 1 for installation in zone 0/20 (inside tank) in accordance with Directive 2014/34/EU. II 1G Ex h IIC 85°C...175°C Ga II 1D Ex h IIIC T85°C...T140°C Da

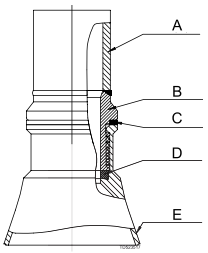
SaniJet 25

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

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



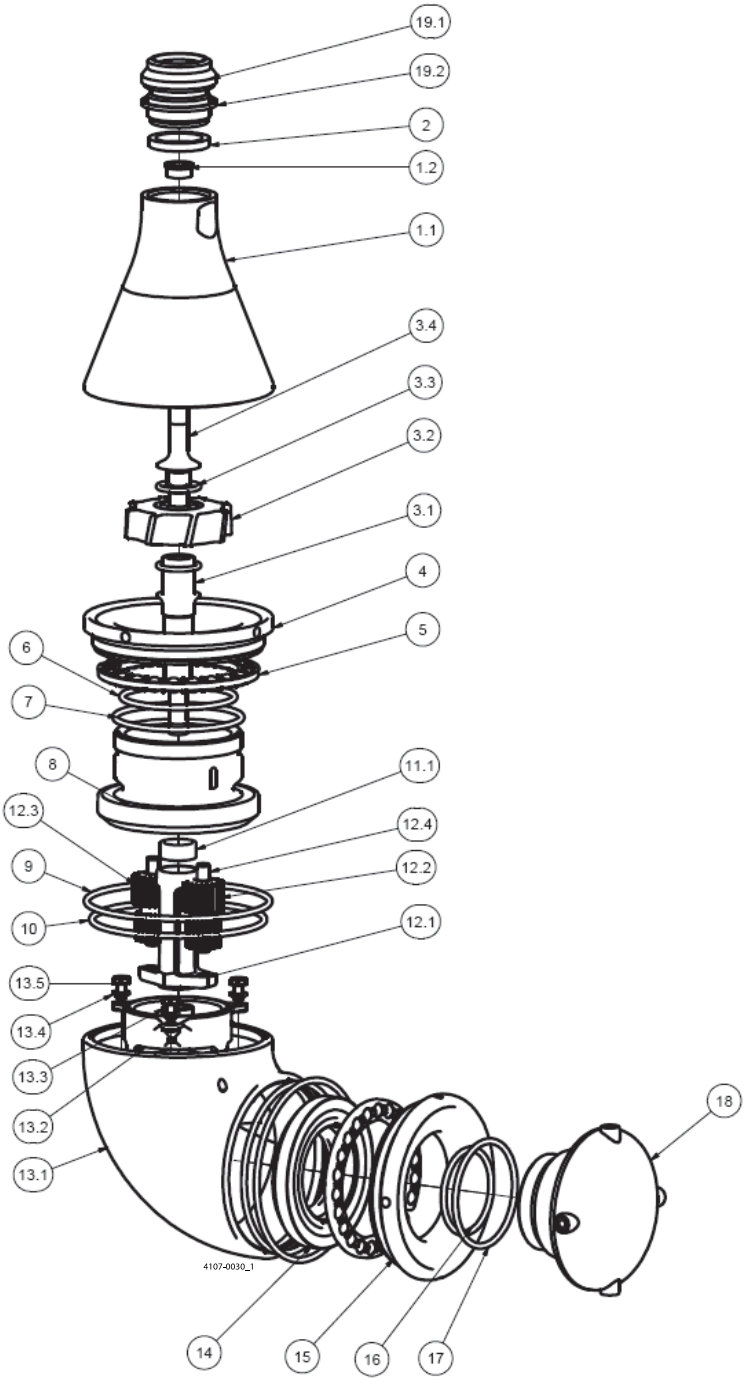
A: Downpipe
B: Welding Adapter
C: Seal PTFE
D: Seal EPDM
E: SaniJet 25

9.3 Available add-ons for spare parts

Item no.	Description
TE20JXXX**9X**	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
TE20JXXX**5X**	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 add-ons page 30 for more information.

10.1 SaniJet 25 for machines with -0x and -7x (after August 2012)



SaniJet 25

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

Parts list

Pos.		Qty	Denomination
1.1		1	Cone
1.2	○	1	Bushing
2	○✧●	1	Gasket
3.1		1	Impeller Shaft
3.2	□	1	Impeller
3.3	○✧●	2	O-ring
3.4		1	Shaft end
4		1	Nut for stem
5	○	2	Ball retainer with balls
6	○✧●	1	O-ring
7	○✧●	1	O-ring
8		1	Stem
9	○✧●	2	O-ring
10	○✧●	2	O-ring
11.1		1	Bushing
12		1	Planet gear
13.1		1	Body
13.2		1	Gear ring
13.3	○	1	Bearing for body
13.4		6	Seal ring
13.5		3	Screw for body assembly
14		1	Bevel gear
15		1	Nut for hub
16	○✧●	1	O-ring
17	○✧●	1	O-ring
18	□	1	Nozzle head
19.1	□	1	Welding adaptor
	□	1	Welding adaptor
19.2	○✧●	1	Gasket

Service kits

	Denomination		
Service kits			
✧	**Inspection kit**	**TE20J297**	**TE20J29790***
○	**Minor service kit**	**TE20J298**	**TE20J29890***
●	**Major service kit**	**TE20J299**	**TE20J29990***

❑ Configuration according to delivery note/order.

Parts marked with ◇ are included in the Inspection Kit: TE20J297 & TE20J29790*
Parts marked with ○ are included in the Minor Service Kit: TE20J298 & TE20J29890*
Parts marked with ● are included in the Major Service Kit: TE20J299 & TE20J29990*

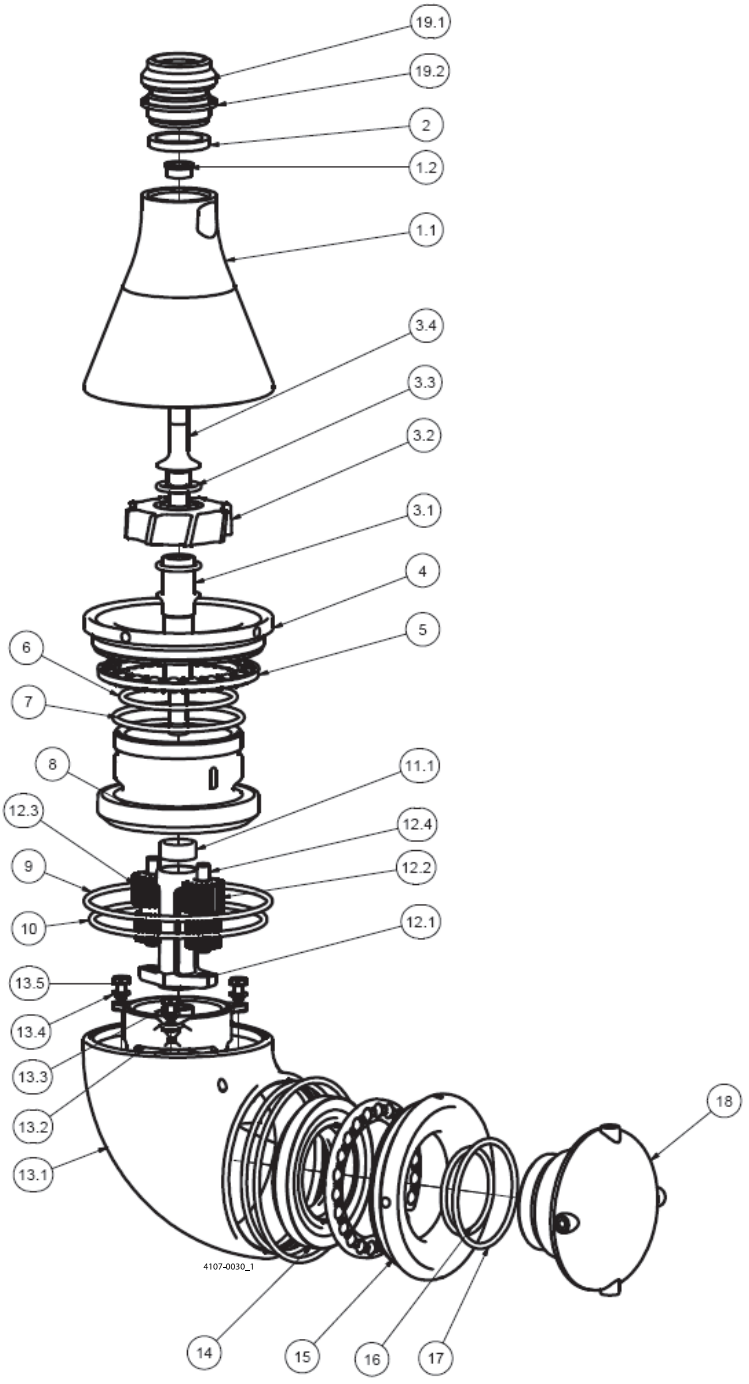
The machine can be delivered with ATEX/IECEx certification.
*With Q-Doc

See page 30 for more information on available add-ons.

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

Please refer to the Spare Part Manual for information on item numbers and materials. The Spare Part manual is available from the on-line Alfa Laval product catalogue Anytime or the Close at hand spare part catalogue.

10.2 SaniJet 25 for machines with -5x, -6x, -8x and -9x (after August 2012)



SaniJet 25

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

Parts list

Pos.		Qty	Denomination
1.1		1	Cone
1.2	○⊙	1	Bushing
2	○●⊙	1	Gasket
3.1		1	Impeller Shaft
3.2	□	1	Impeller
3.3	○●⊙	2	O-ring
3.4		1	Shaft end
4		1	Nut for stem
5	○⊙	2	Ball retainer with balls
6	○●⊙	1	O-ring
7	○●⊙	1	O-ring
8		1	Stem
9	○●⊙	2	O-ring
10	○●⊙	2	O-ring
11.1		1	Bushing
12		1	Planet gear
13.1		1	Body
13.2		1	Gear ring
13.3	○⊙	1	Bearing for body
13.4		6	Seal ring
13.5		3	Screw for body assembly
14		1	Bevel gear
15		1	Nut for hub
16	○●⊙	1	O-ring
17	○●⊙	1	O-ring
18	□	1	Nozzle head
19.1	□	1	Welding adaptor
	□	1	Welding adaptor
19.2	○●⊙	1	Gasket

❑ Configuration according to delivery note/order.

Parts marked with ● are included in the Inspection Kit: TE20J29701*
Parts marked with are included in the Minor Service Kit: TE20J29801*
Parts marked with ○are included in the Major Service Kit: TE20J29901*

* with Q-Doc and USP VI certificate

The machine can be delivered with ATEX/IECEx certification.

Service kits

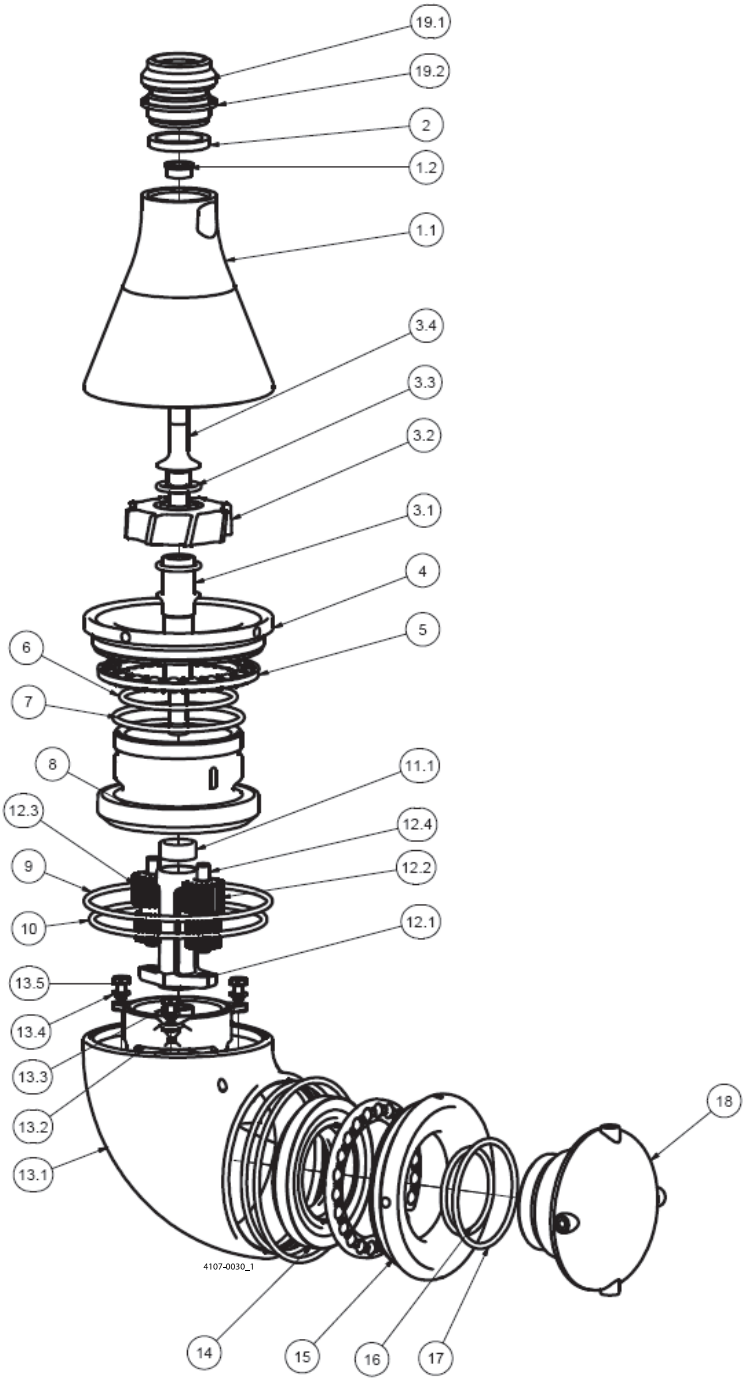
Denomination	
Service kits	
Inspection kit*	TE20J29701
Minor service kit*	TE20J29801
Major service kit*	TE20J29901

See page 30 for more information on available add-ons.

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

Please refer to the Spare Part Manual for information on item numbers and materials. The Spare Part manual is available from the on-line Alfa Laval product catalogue Anytime or the Close at hand spare part catalogue.

10.3 SaniJet 25 FFKM/SS FFKM



Parts list

Pos.		Qty	Denomination
1.1		1	Cone
1.2	○✪	1	Bushing
2	◆○✪	1	Gasket
3.1		1	Impeller Shaft
3.2	□	1	Impeller
3.3	◆○✪	2	O-ring
3.4		1	Shaft end
4	○	1	Nut for stem
5	○✪	2	Ball retainer with balls
6	◆○✪	1	O-ring
7	◆○✪	1	O-ring
8	○	1	Stem
9	◆○✪	2	O-ring
10	◆○✪	2	O-ring
11.1	○	1	Bushing
12	○	1	Planet gear
13.1		1	Body
13.2		1	Gear ring
13.3	○✪	1	Bearing for body
13.4		6	Seal ring
13.5		3	Screw for body assembly
14	○	1	Bevel gear
15	○	1	Nut for hub
16	◆○✪	1	O-ring
17	◆○✪	1	O-ring
18	□	1	Nozzle head
19.1	□	1	Welding adaptor
19.2	◆○✪	1	Gasket

❑ Configuration according to delivery note/order.

Parts marked with ◆ are included in the Inspection Kit: 9690012601*
Parts marked with✪ are included in the Minor Service Kit: 9690012702*
Parts marked with ○are included in the Major Service Kit: 9690012802*

* with Q-Doc and USP VI certificate

The machine can be delivered with ATEX/IECEx certification.
See page 30 for more information on available add-ons.

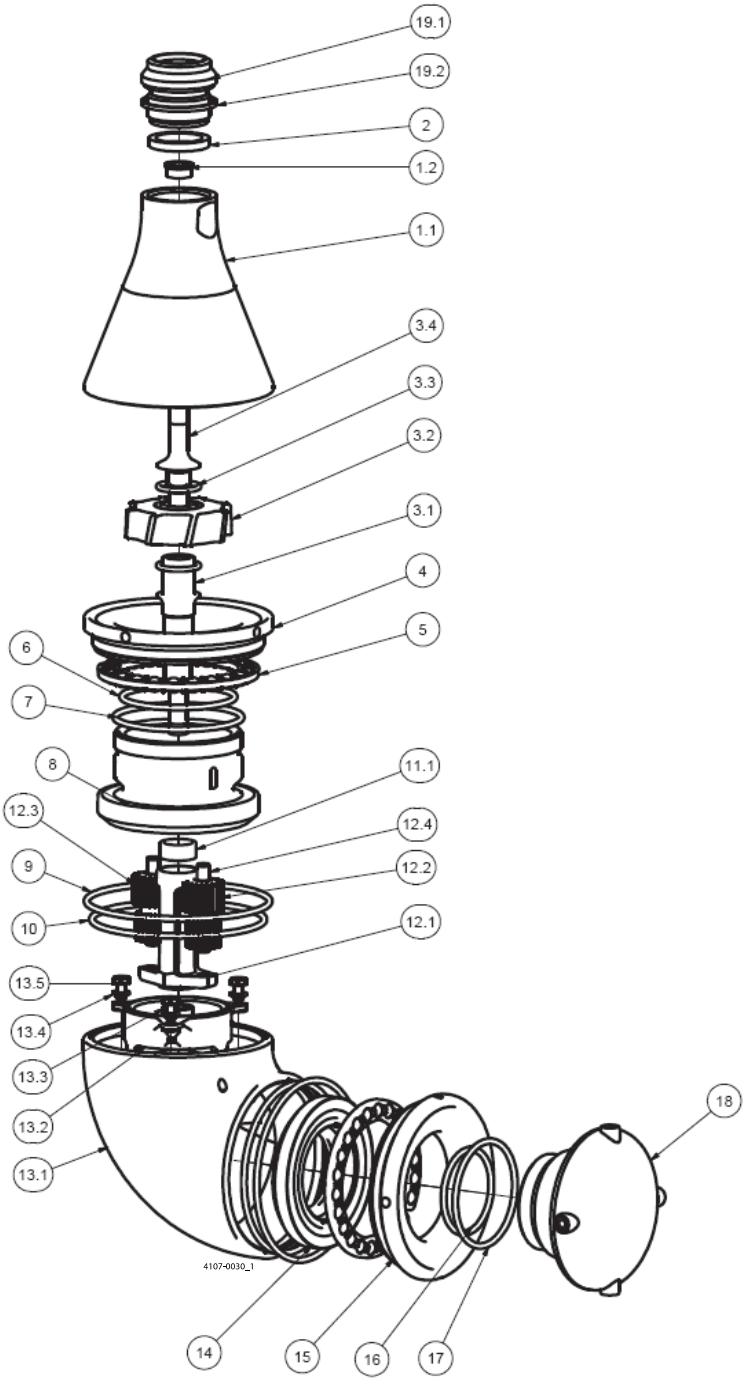
Please note that some of the polymer parts are in PEEK, which is not resistant to concentrated sulfuric acid.

Please refer to the Spare Part Manual for information on item numbers and materials. The Spare Part manual is available from the on-line Alfa Laval product catalogue Anytime or the Close at hand spare part catalogue.

Service kits

Denomination	
Service kits	
Inspection kit*	9690012601
Minor service kit*	9690012702
Major service kit*	9690012802

10.4 SaniJet 25 duplex FFKM



Exploded view drawing

Parts list

Pos.	Qty	Denomination
1.1	1	Cone, welded
1.2 ○✪	1	Bushing
2 ◆○✪	1	Gasket
3.1	1	Impeller Shaft
3.2 □	1	Impeller
3.3 ◆○✪	2	O-ring
3.4	1	Shaft end
4 ○	1	Nut for stem
5 ○✪	2	Ball retainer with balls
6 ◆○✪	1	O-ring
7 ◆○✪	1	O-ring
8 ○	1	Stem
9 ◆○✪	2	O-ring
10 ◆○✪	2	O-ring
11.1 ○	1	Bushing
12 ○	1	Planet gear assembly
13.1	1	Body
13.2	1	Gear ring
13.3 ○✪	1	Bearing for body
13.4	6	Seal ring
13.5	3	Screw for body assembly
14 ○	1	Bevel gear
15 ○	1	Nut for hub
16 ◆○✪	1	O-ring
17 ◆○✪	1	O-ring
18 □	1	Nozzle head
19.1 □	1	Welding adapter
19.2 ◆○✪	1	Gasket

❑ Configuration according to delivery note/order.

Parts marked with ◆ are included in the Inspection Kit: 9690012601*
Parts marked with✪ are included in the Minor Service Kit: 9690012701*
Parts marked with ○are included in the Major Service Kit: 9690012801*

* with Q-Doc and USP VI certificate

The machine can be delivered with ATEX/IECEx certification.
See page 30 for more information on available add-ons.

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

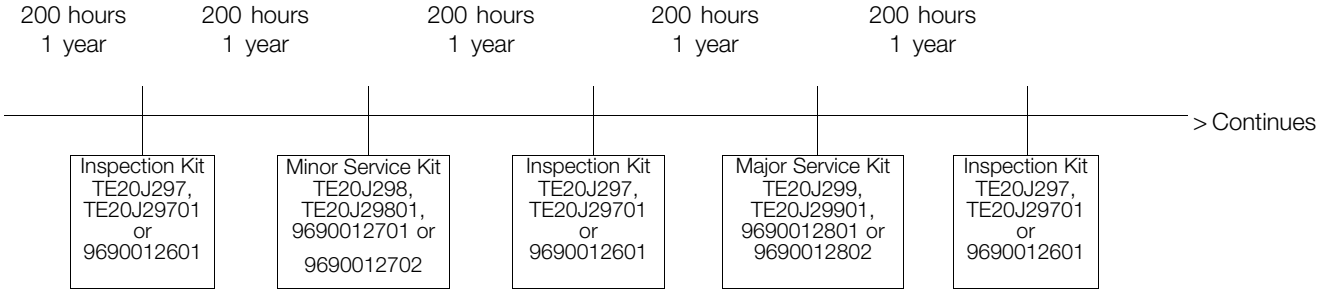
Please refer to the Spare Part Manual for information on item numbers and materials. The Spare Part manual is available from the on-line Alfa Laval product catalogue Anytime or the Close at hand spare part catalogue.

Service kits

Denomination	
Service kits	
Inspection kit*	9690012601
Minor service kit*	9690012701
Major service kit*	9690012801

10.5 Service intervals

Service Intervals



10.6 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

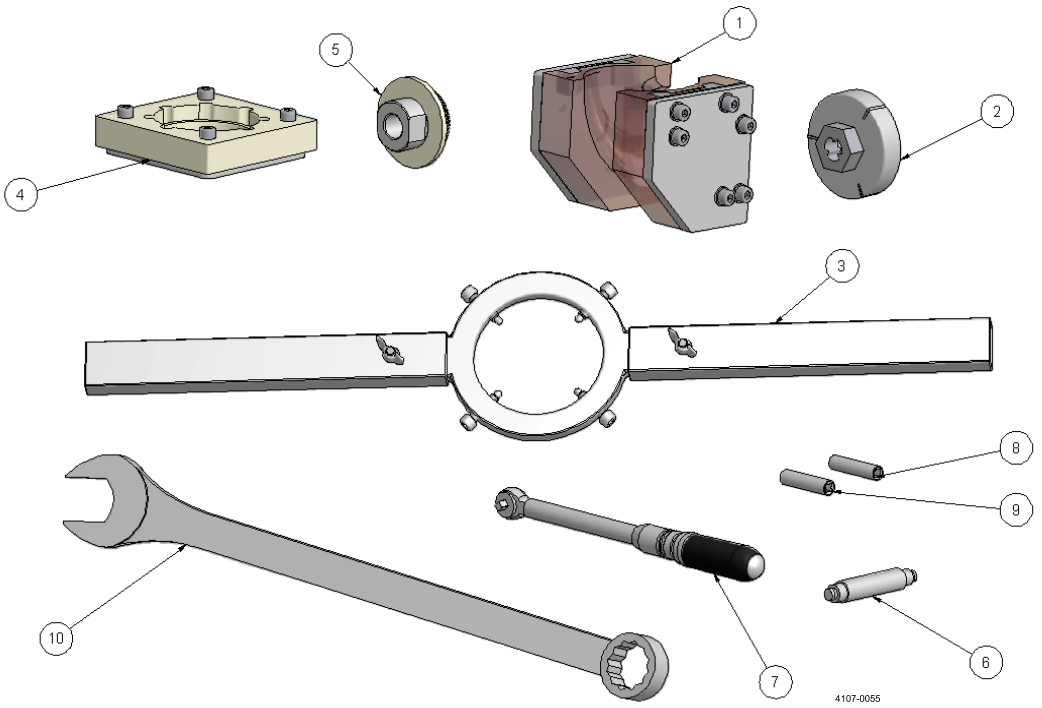
+ Bench vise (jaw opening > 160 mm)

+ 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

SaniJet 25

The items (#) refer to section ***10 Parts lists and drawings, service kits and tools***

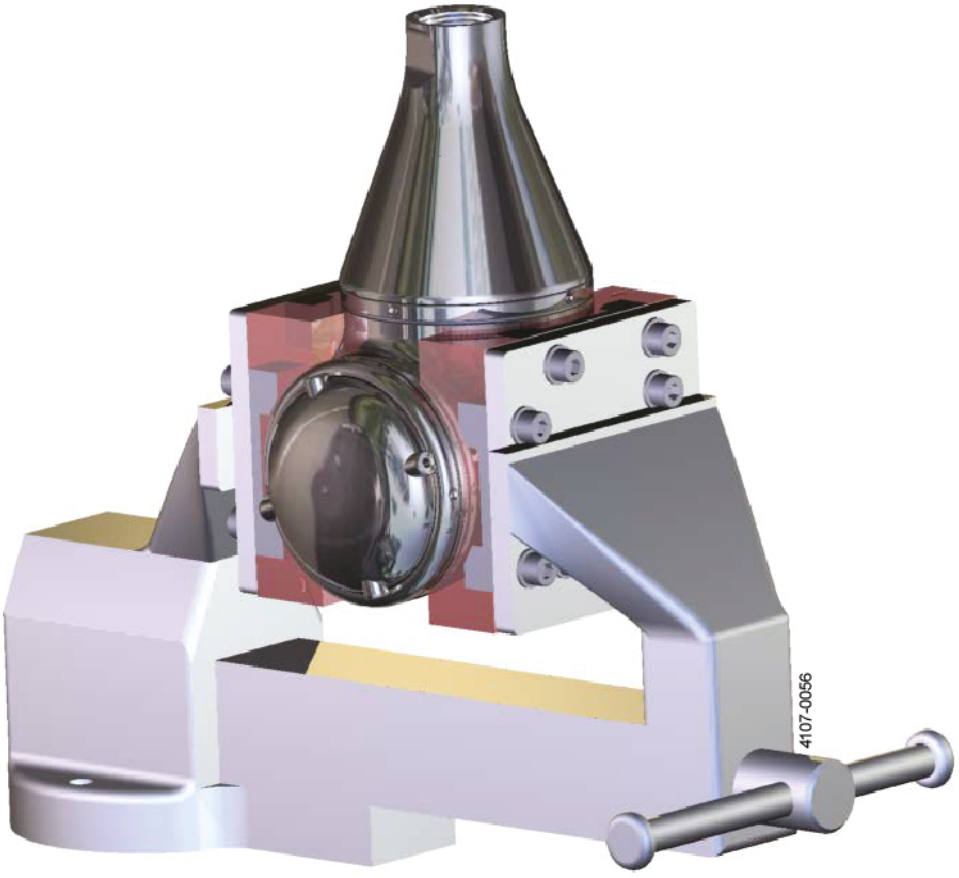
11.1 Disassembly into main subassemblies

Tools needed for disassembly

Standard tool kit

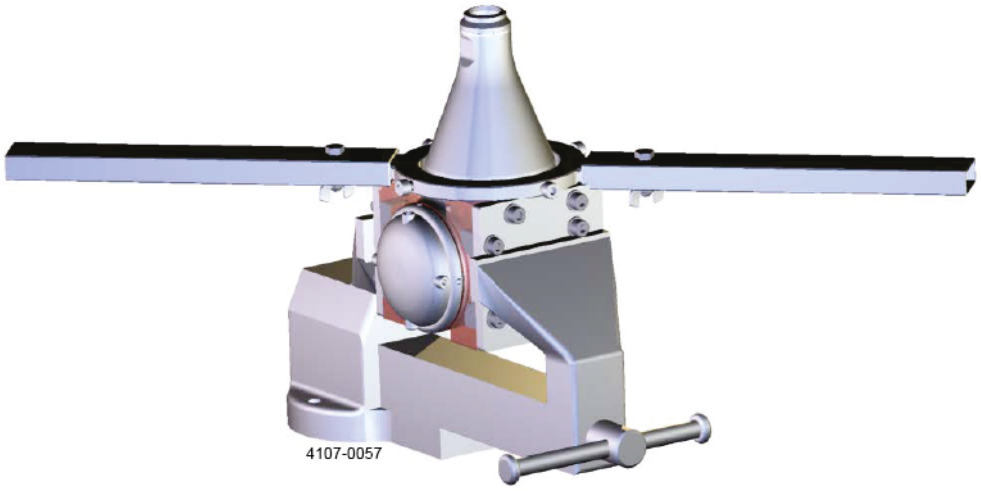
Item no.	**Denomination**
TE20J386	Fixture tool f. body
TE20J593	Ring key f. nuts (dismountable)
TE81B157	NV8 socket, long, ¼"
TE81B156	Torque wrench (4-24 Nm) – ¼"

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.



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 (4).

NOTE
Be careful not to damage the surfaces.



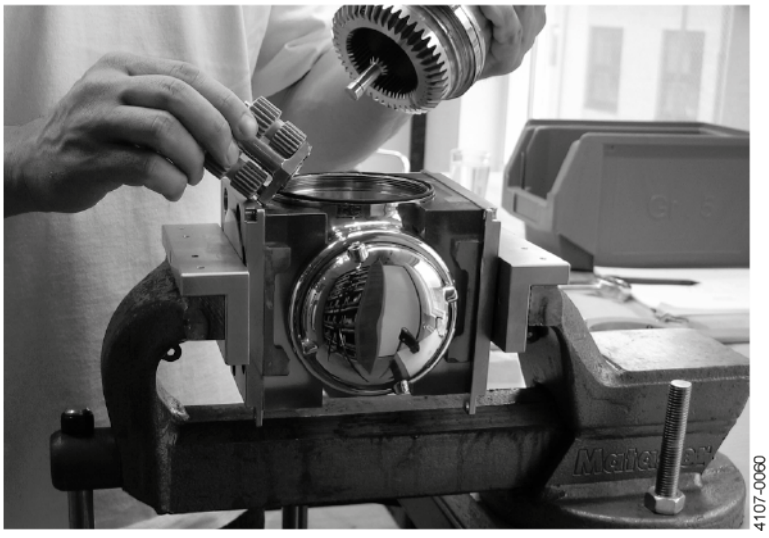
3. Tighten the 4 screws (by hand only) symmetrically into the 4 hygienic recesses in the stem nut (4).

4. Loosen the stem nut (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.**

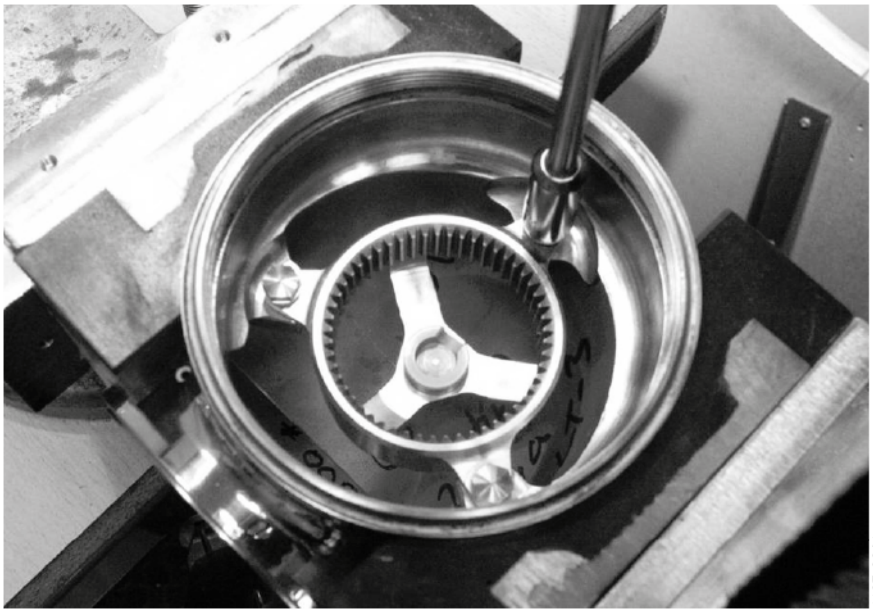
5. Loosen the stem nut (4) by hand while lifting the cone (1.1).

6. Remove the assembled top parts from the machine (lift vertically).

7. Remove assembled plant gear (12) from the gear ring (13.2).

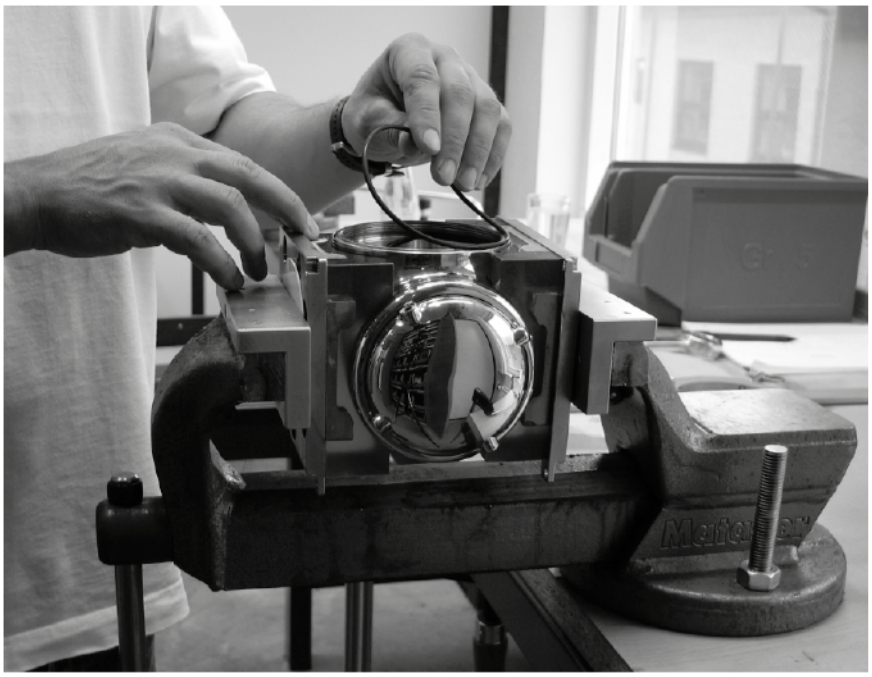


8. Remove the 3 screws (13.5) securing the gear ring (13.2) to the body using the torque wrench and NV8 socket long (TE81B156 + TE81B157)

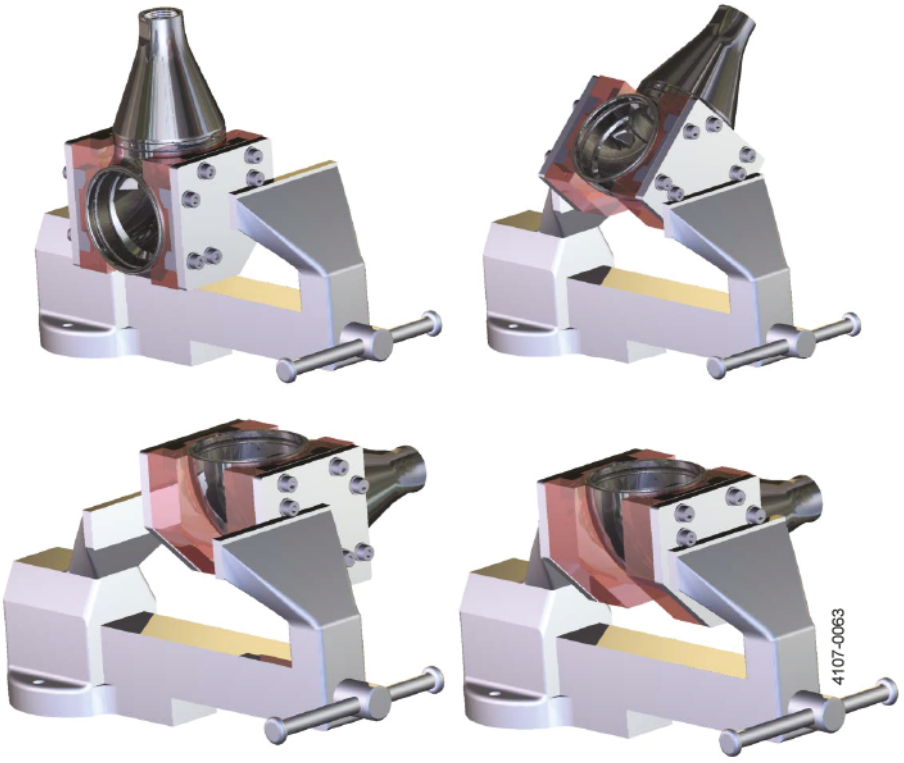


9. Remove the assembled gear ring (13.2) from the body and remove the 6 seal rings (13.4)

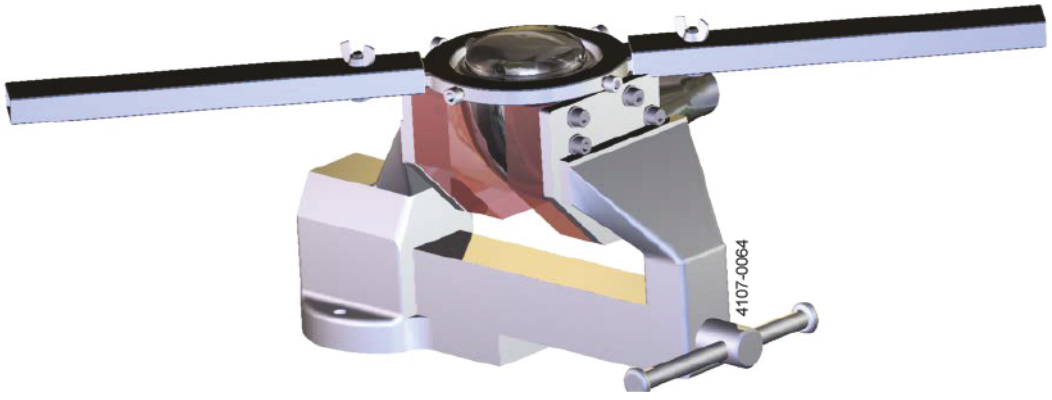
10. Remove the two O-rings (9 and 10).



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



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



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

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

15. Assembled parts after disassembly into main subassemblies.

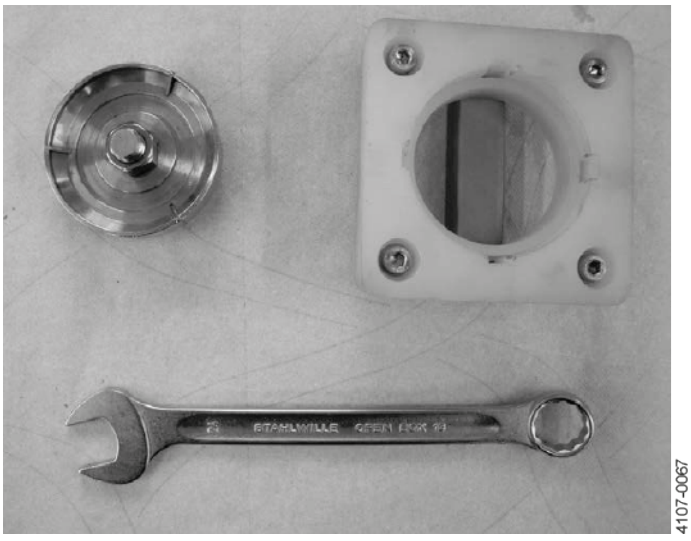
11 Disassembly

*The items (#) refer to section **10 Parts lists and drawings, service kits and tools***

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



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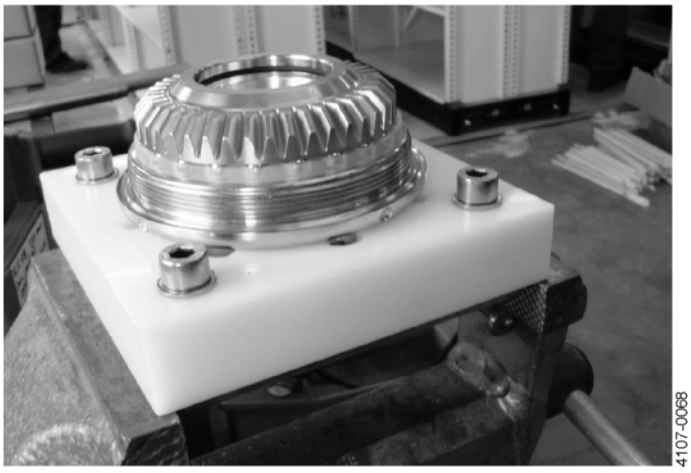
1. Place the fixture for nozzle (TE20J366) into the bench vise and secure it

2. Place the hub assembly into the fixture for nozzle (TE20J366)



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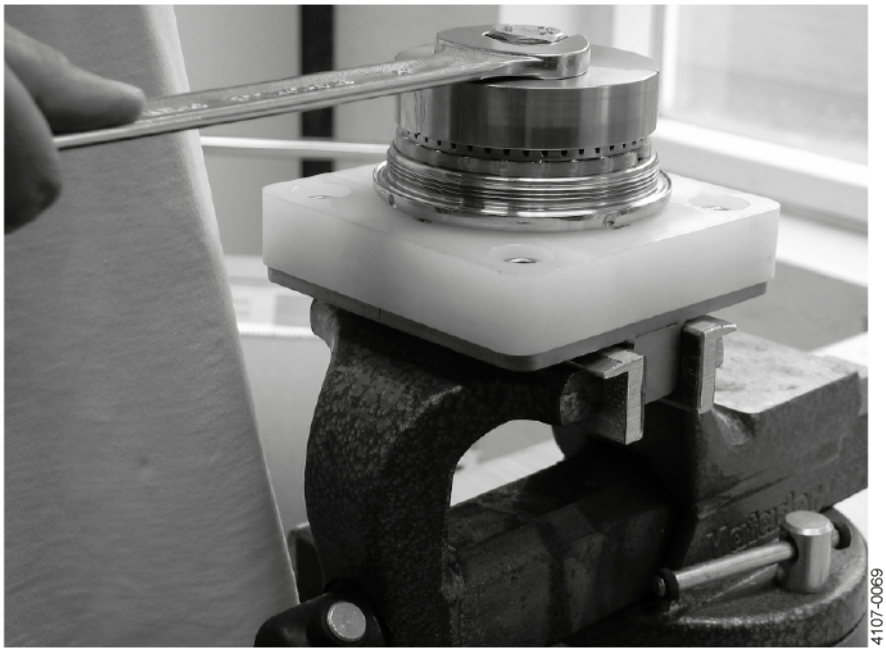
3. Put the hub tool kit (TE20J392) on top of the bevel gear (14) and loosen the bevel gear using ring key NV36 (TE81B159).



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

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

6. Parts from the disassembled lower part (hub)

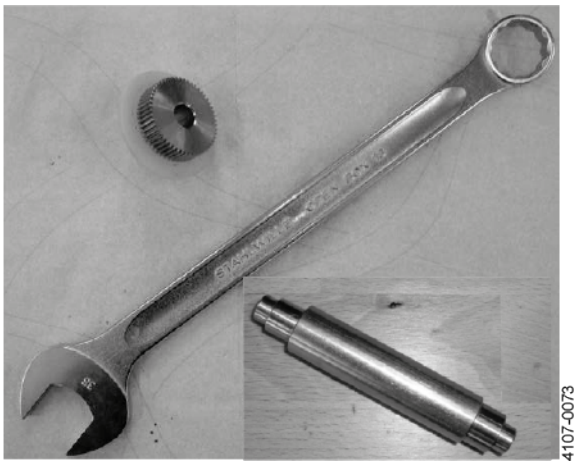
*The items (#) refer to section **10 Parts lists and drawings, service kits and tools***

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)

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

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

5. Remove the impeller assembly

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

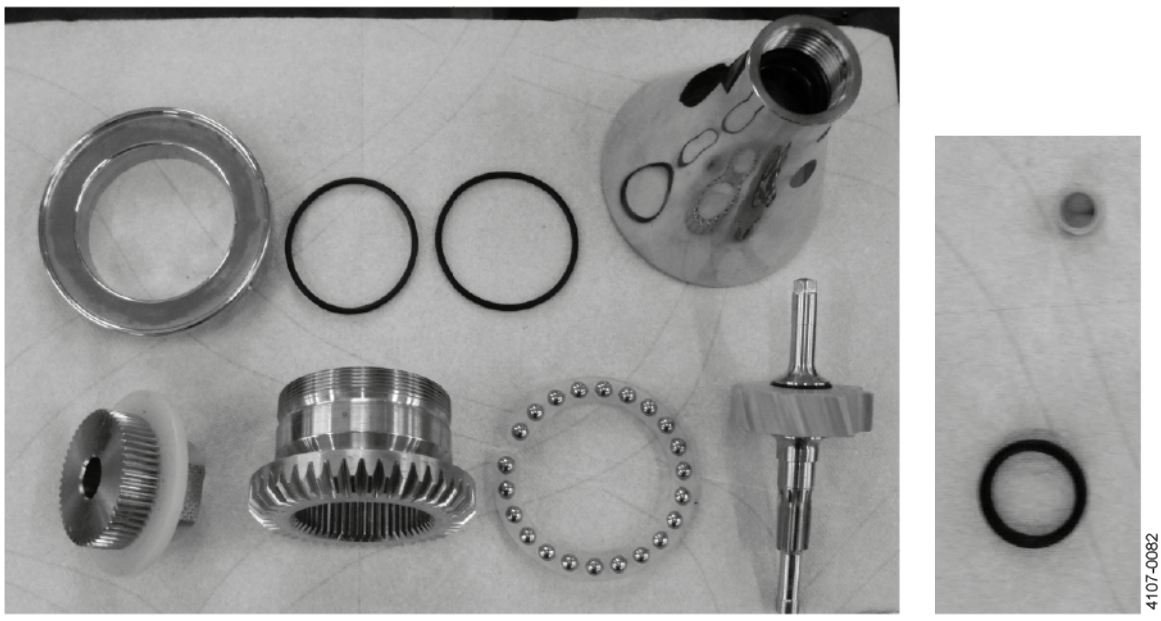
7. Carefully lift the stem nut (4) of the stem (8) while keeping it horizontally to avoid scratching the surfaces

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

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

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

11. Parts from disassembled top parts

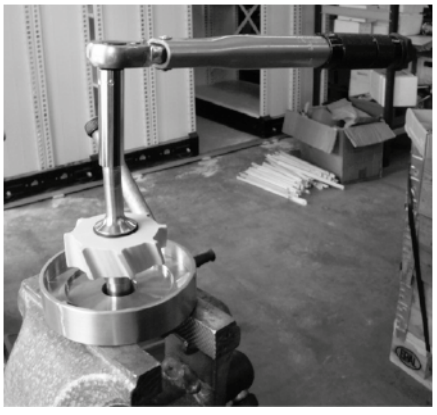


11.4 Disassembly of impeller shaft assembly

Tools needed for disassembly

Standard tool kit	
Item no.	**Denomination**
TE20J392	Fixture tool f. hub and turbine
TE81B156	Torque wrench (4-24 Nm) - ¼"
TE81B158	NV9 socket, long, ¼"

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



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

*The items (#) refer to section **10 Parts lists and drawings, service kits and tools***

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

Tools needed for disassembly

Standard tool kit	
Item no.	**Denomination**
TE81B139	Drift
	Hammer

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

11.6 Disassembly of planet gear (bushing – position 11.1)

Tools needed for disassembly

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

1. Withdraw the bushing (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.

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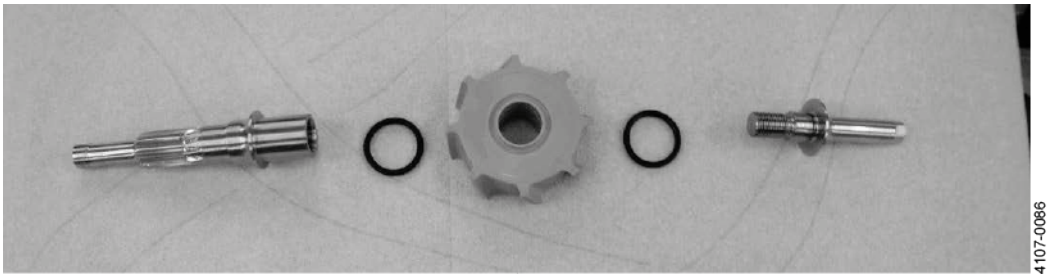
The items (#) refer to section ***10 Parts lists and drawings, service kits and tools***

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

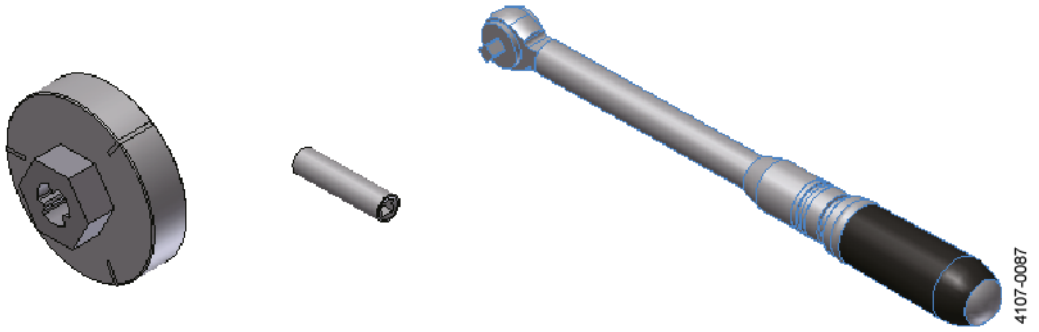
Pos.		Item no.	Qty.	Denomination
3.1		TE20J540	1	Impeller shaft
3.2	❑	TE20J544	1	Impeller (ø4.2mm nozzle)
	❑	TE20J546	1	Impeller (ø6.2mm nozzle)
	❑	TE20J545	1	Impeller (ø5.2mm nozzle)
3.3		TE51T135	2	O-ring
3.4		TE20J542	1	Shaft end



Tools needed for assembly

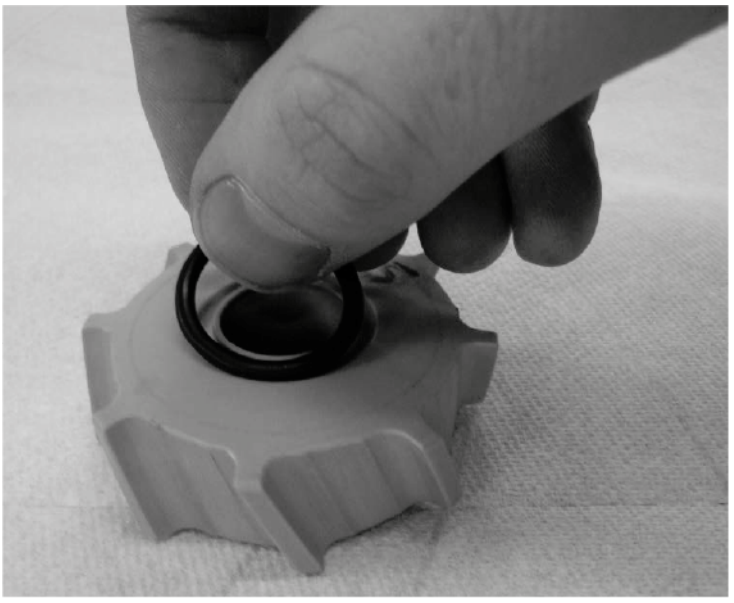
Standard tool kit

Item no.	**Denomination**
TE20J392	Fixture tool f. hub and turbine
TE81B156	Torque wrench (4-24 Nm) - ¼”
TE81B158	NV9 socket, long, 1/4”

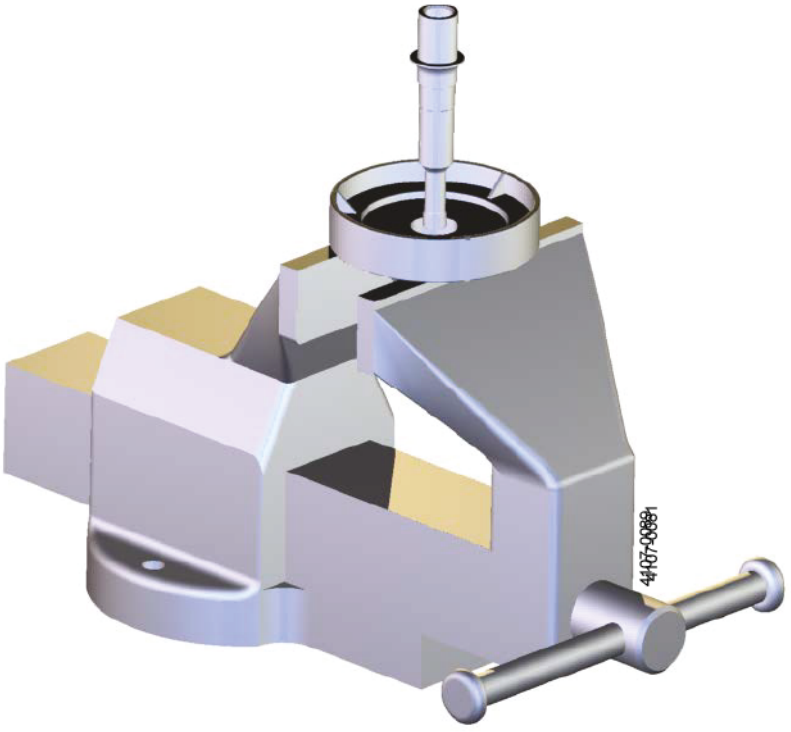


The items (#) refer to section ***10 Parts lists and drawings, service kits and tools***

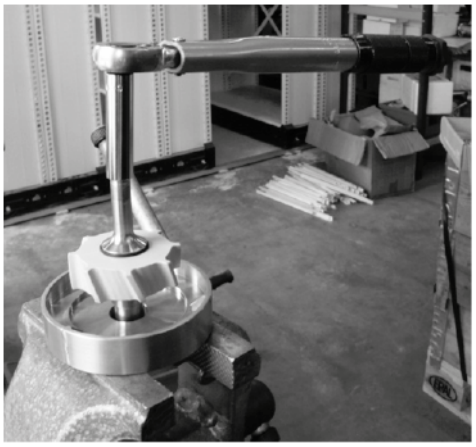
1. Place the O-rings (3.3) into the grooves of the impeller (3.2).



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



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



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

*The items (#) refer to section **10 Parts lists and drawings, service kits and tools***

12.2 Assembly of cone

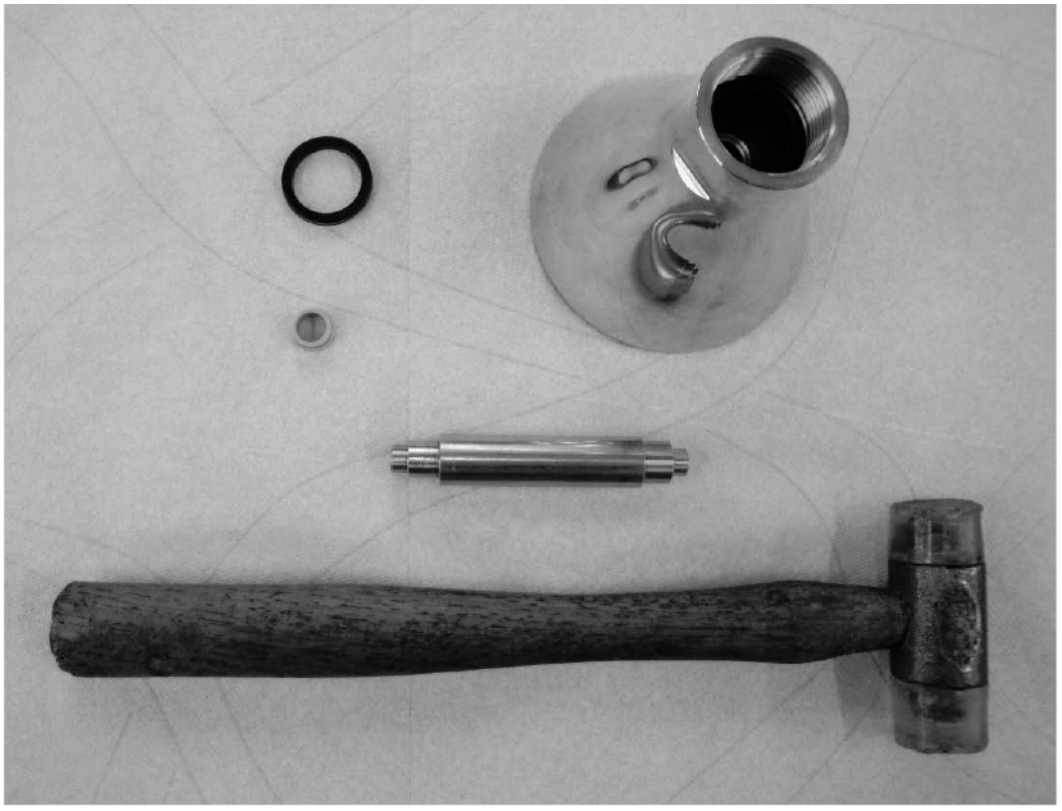
Parts required for the assembly

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



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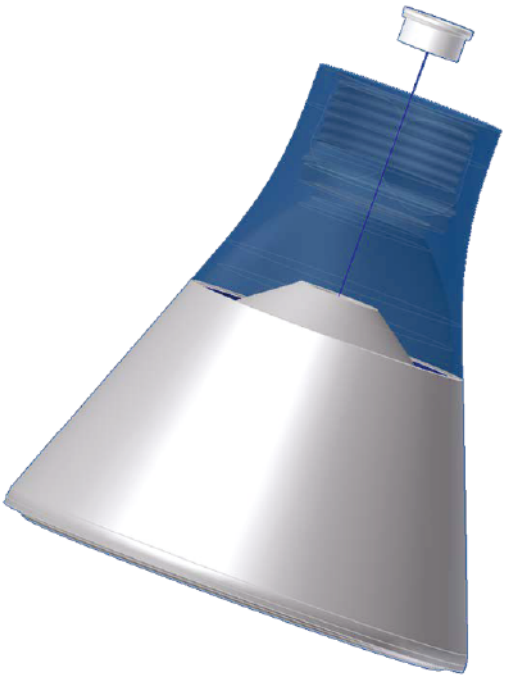
SaniJet 25

The items (#) refer to section ***10 Parts lists and drawings, service kits and tools***

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



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

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

SaniJet 25

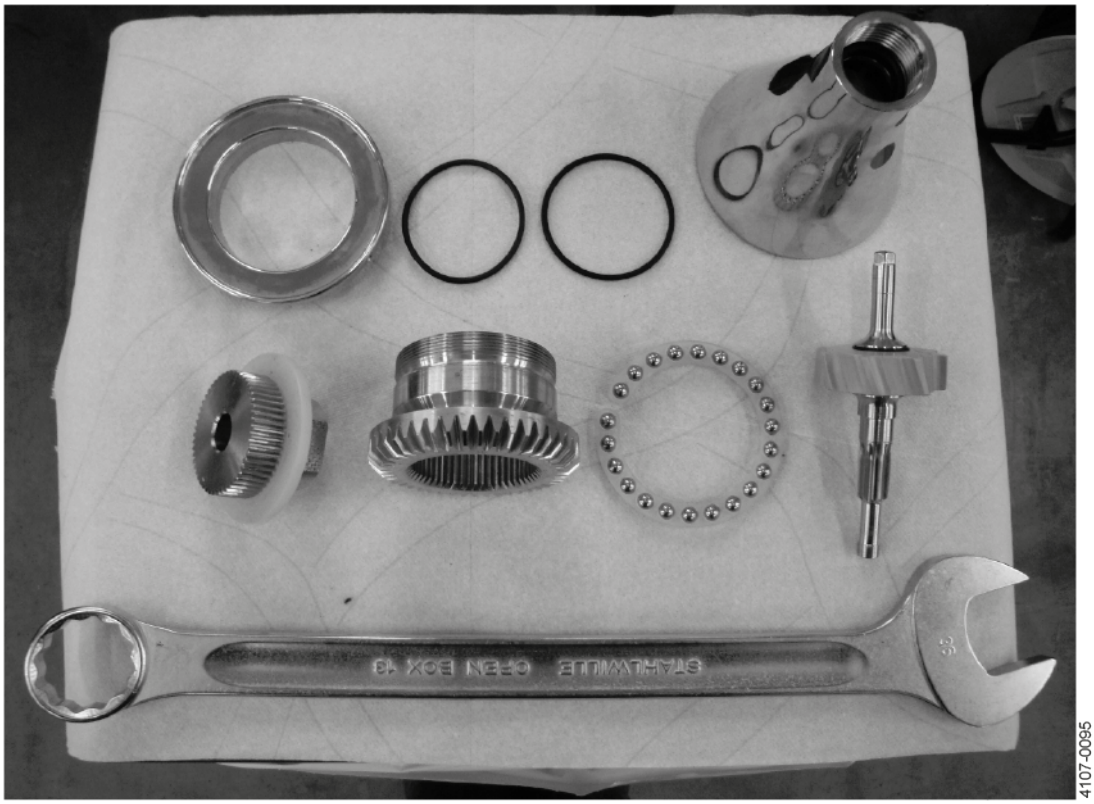
The items (#) refer to section ***10 Parts lists and drawings, service kits and tools***

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

Standard tool kit

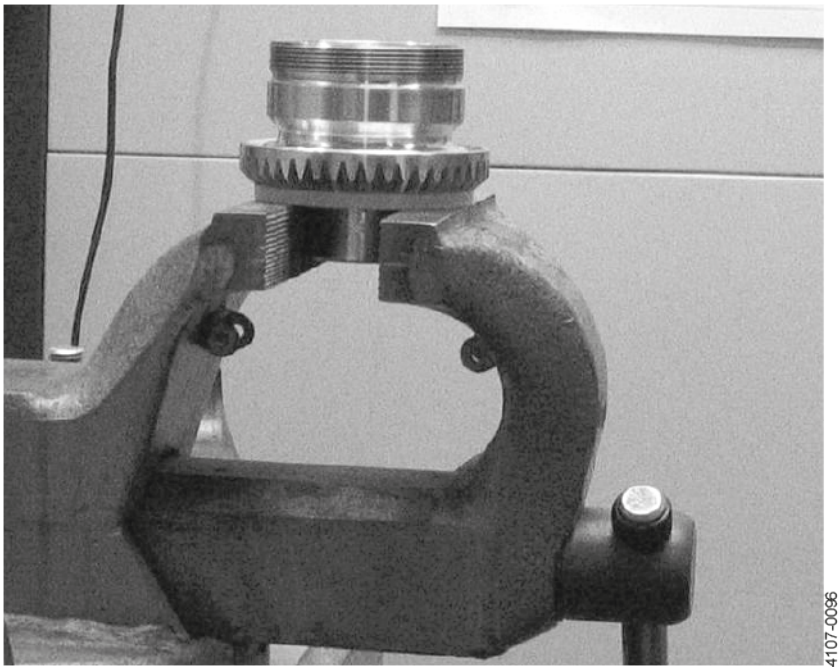
Item no.	**Denomination**
TE20J360	Fixture tool f. stem
TE81B159	NV36 Ring/Fork key
	Brush for applying grease
	Glass of water
	Grease compliant with FDA, (if allowed)



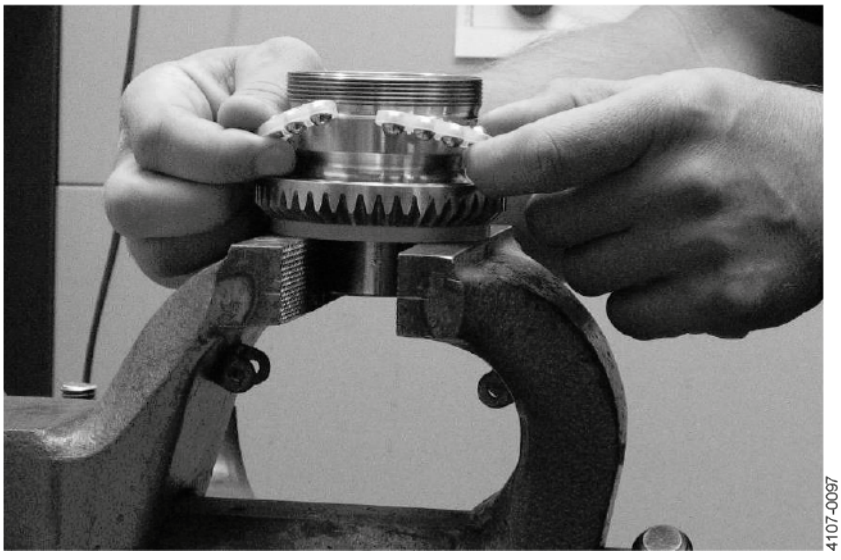
*The items (#) refer to section **10 Parts lists and drawings, service kits and tools***

1. Secure the fixture tool for stem (TE20J360) in bench vise

2. Fit the stem (8) onto the fixture tool for stem (TE20J360)



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



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

5. Preparation of O-rings (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 (1.1.) onto the stem.

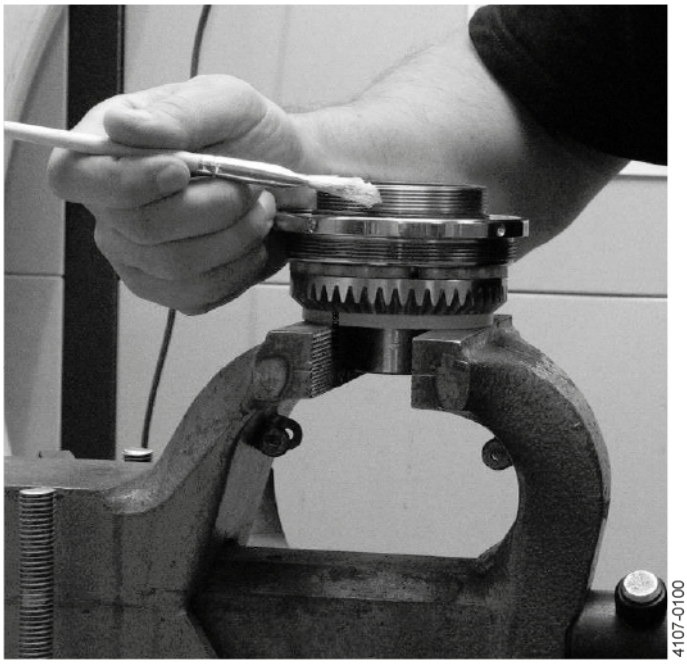
6. Mount O-ring (6) in groove around stem and O-ring (7) in groove on top of stem

*The items (#) refer to section **10 Parts lists and drawings, service kits and tools***

7. Preparation before mounting the cone (1.1) on stem (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 (8)

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

10. Tighten the cone (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

The items (#) refer to section ***10 Parts lists and drawings, service kits and tools***

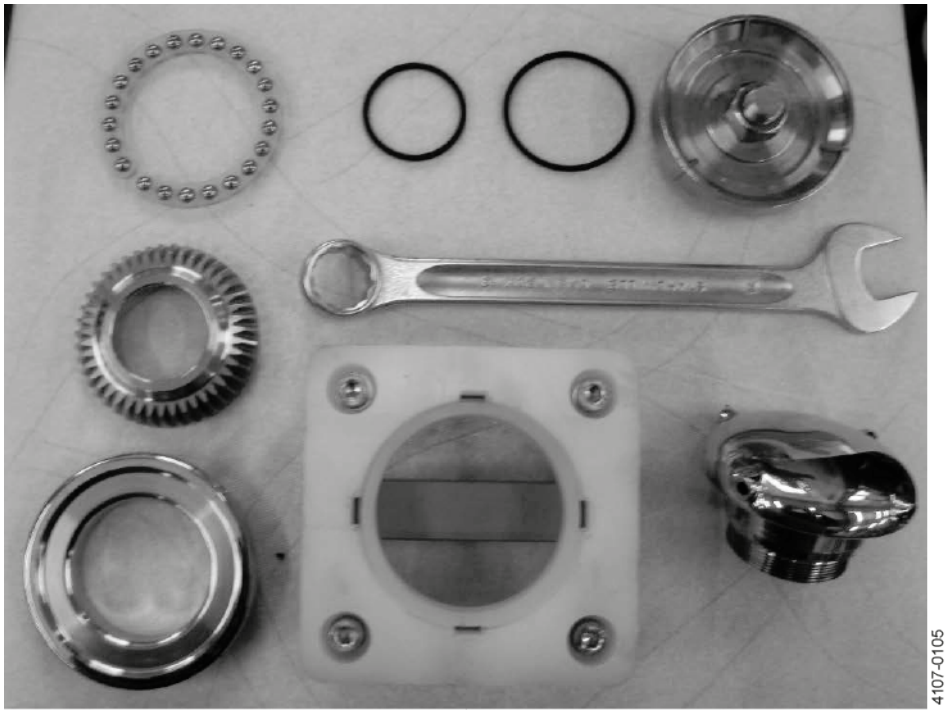
12.4 Assembly of lower parts

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 ❑	TE20J320	1	Nozzle head (ø4.2mm nozzle)
❑	TE20J321	1	Nozzle head (ø5.2mm nozzle)
❑	TE20J322	1	Nozzle head (ø6.2mm nozzle)

Tools required for the assembly

Standard tool kit 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)

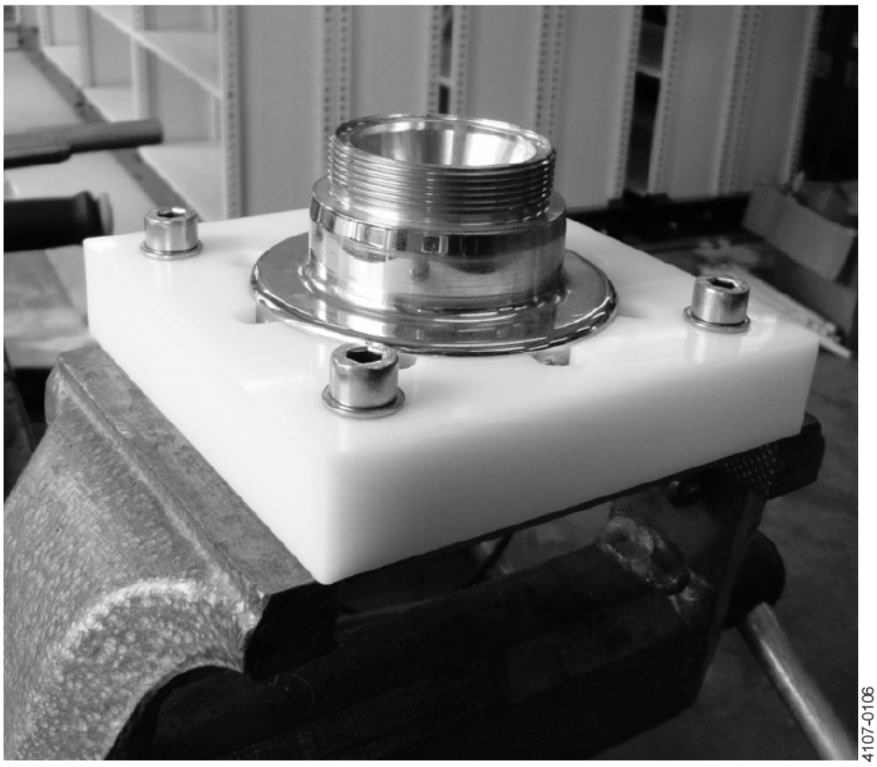


SaniJet 25

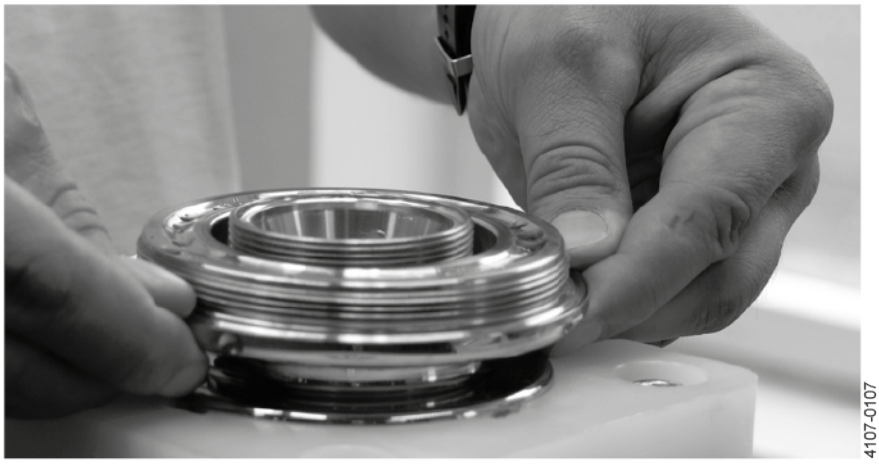
The items (#) refer to section ***10 Parts lists and drawings, service kits and tools***

1. Secure the fixture for the nozzles (TE20J366) in bench vise.

2. Place the nozzle head (18) into the fixture for the nozzle (TE20J366)



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



4. Preparation of O-rings (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.

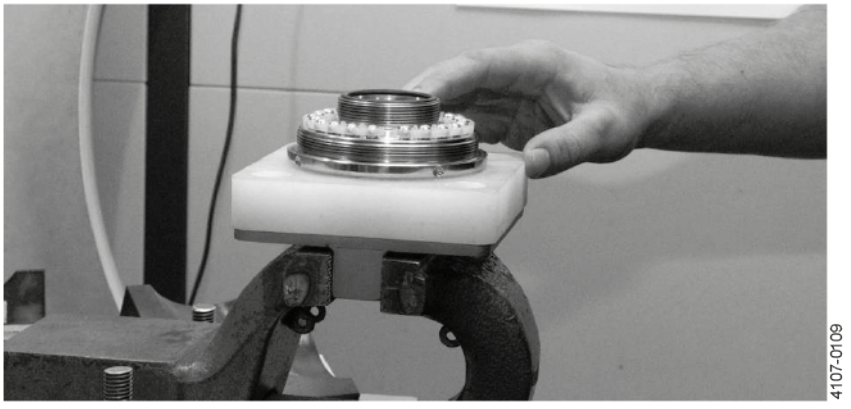
5. Mount O-ring (16) in groove on top of nozzle head (18)

6. Preparation before mounting the bevel gear (14) on nozzle head (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!

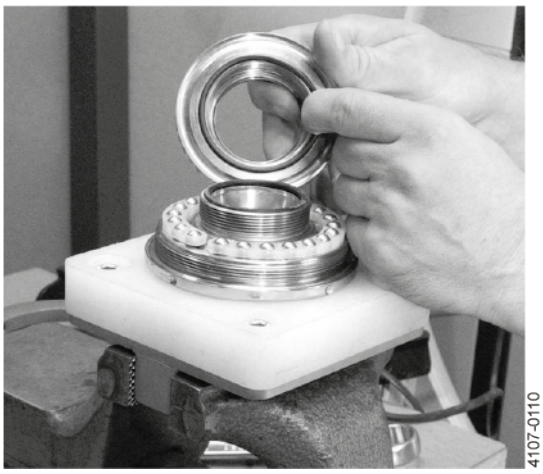
   If the food graded/FDA compliant grease is not allowed into the SaniJet 25 for some reason, it is recommended to be very careful when joining threaded parts.

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



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 (17) in the groove on the bevel gear (14)



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

11. Screw the bevel gear (14) with the hub tool (TE20J392) while pressing on the tool.
    Tighten the bevel gear (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.

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

12.5 Assembly of planet gear

Parts and tools required for the assembly

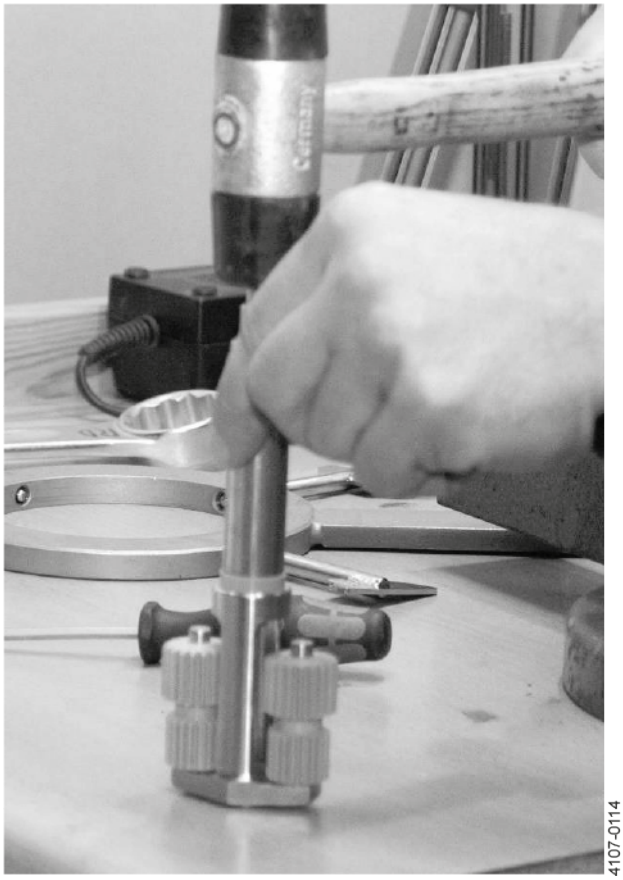
Pos.	Item no.	Qty	Denomination
11.1	TE20J521	1	Bushing
12	TE20J515	1	Planet gear

Tools required for the assembly

Standard tool kit

Item no.	**Denomination**
TE81B139	Drift
	Hammer

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



*The items (#) refer to section **10 Parts lists and drawings, service kits and tools***

12.6 Assembly of gear ring

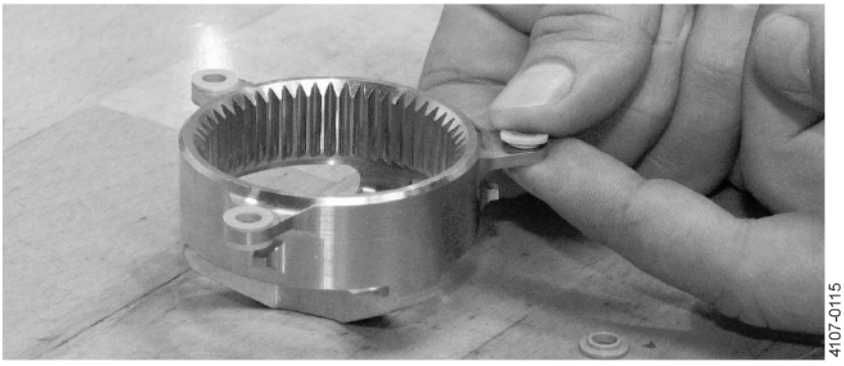
Parts and tools required for the assembly

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

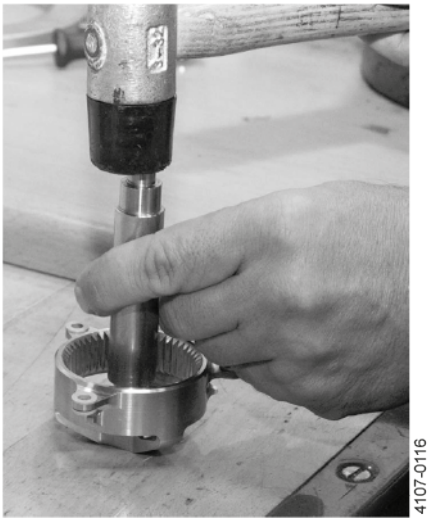
Tools needed for the assembly

Standard tool kit	
Item no.	**Denomination**
TE81B139	Drift
	Hammer

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



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



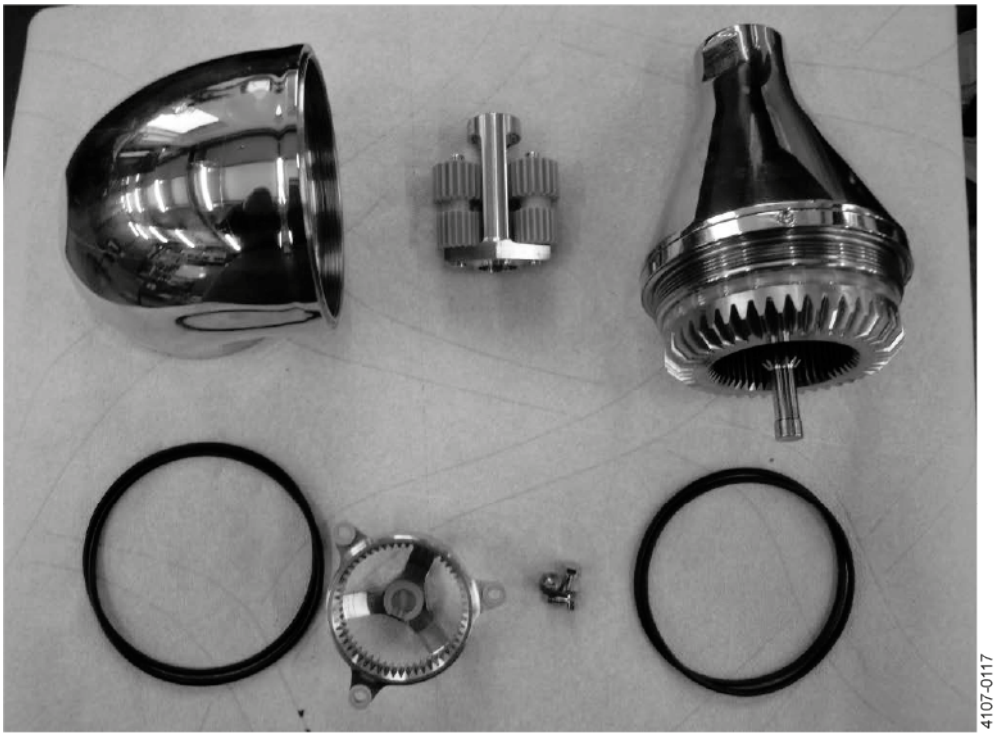
SaniJet 25

The items (#) refer to section ***10 Parts lists and drawings, service kits and tools***

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

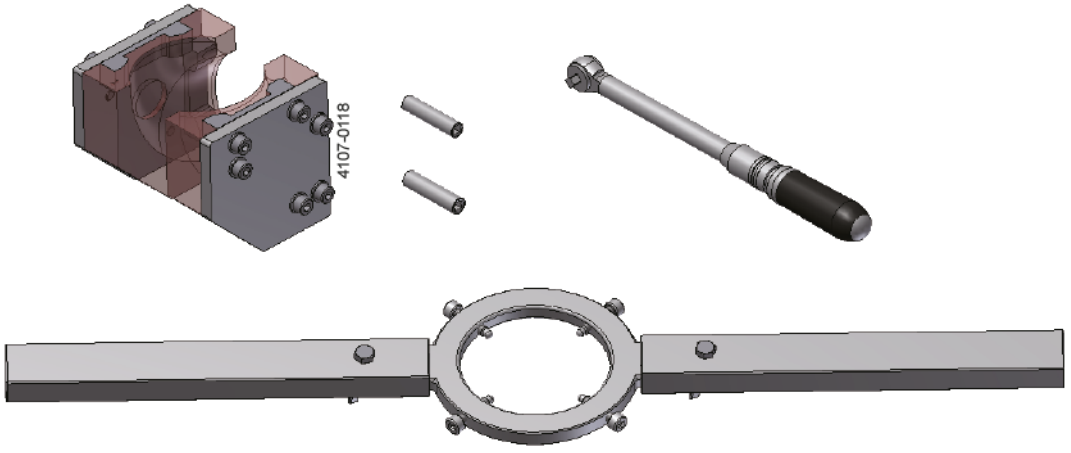
The items (#) refer to section ***10 Parts lists and drawings, service kits and tools***

Tools needed for the disassembly and checking assembly.

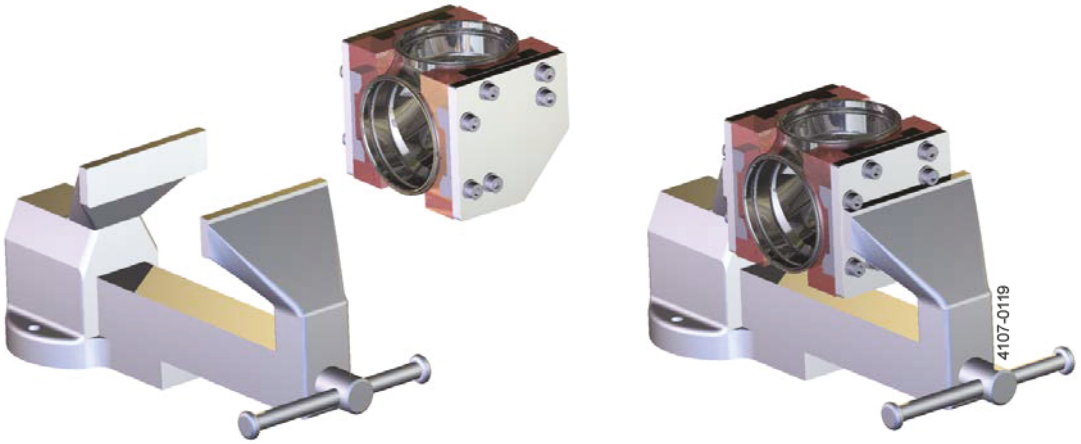
Standard tool kit

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"

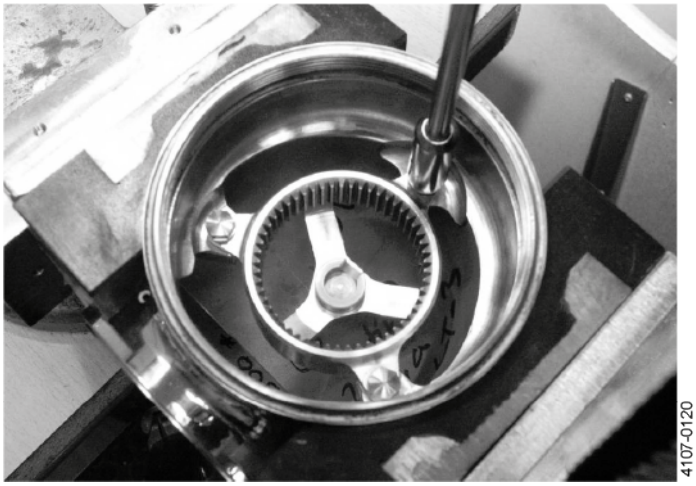
Brush for applying grease
Glass of water
Grease compliant with FDA (if allowed)
Hammer



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.



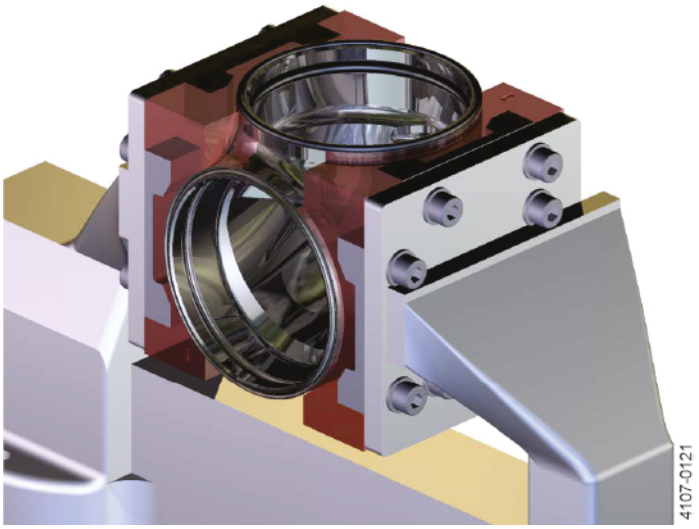
2. Mount assembled gear ring in body (13.1). Tighten screws (13.5) using the torque wrench (TE81B156+TE81B157) to maximum 5 Nm. Too much torque breaks the screws.



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 (9) in the O-ring groove on the outside of body. (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 (10) in the O-ring groove inside the body (13.1).



6. Preparation before mounting the assembled top parts on body (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.

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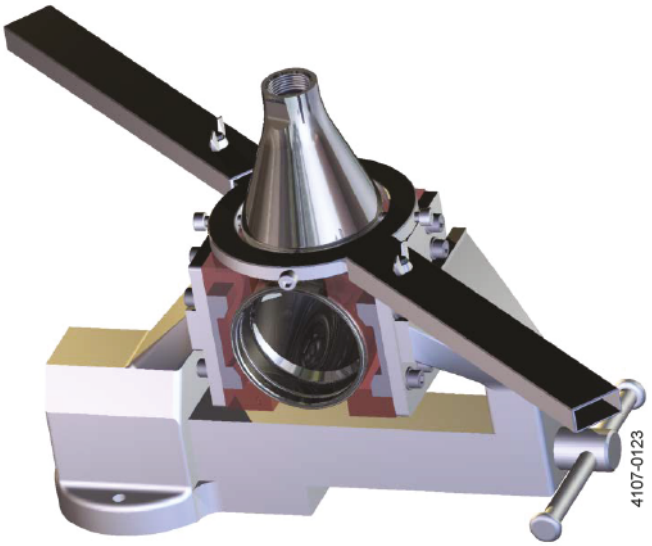
7. Mount assembled planet gear in the gear ring (13.2)

8. Place impeller shaft (3.1) of the assembled top parts into the planet gear (12) in the gear ring (13.2). Then lower the cone assembly while trying to fit the gear wheels into each other.

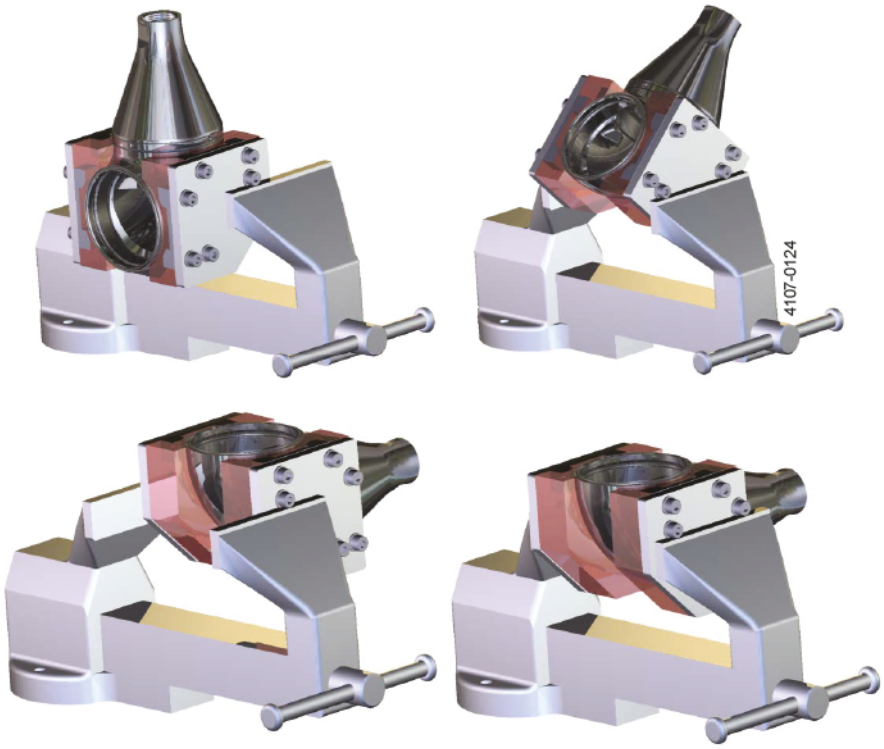
9. Lower the assembled top parts onto the threads. Catch the thread while turning the stem nut (4) by hand.

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



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

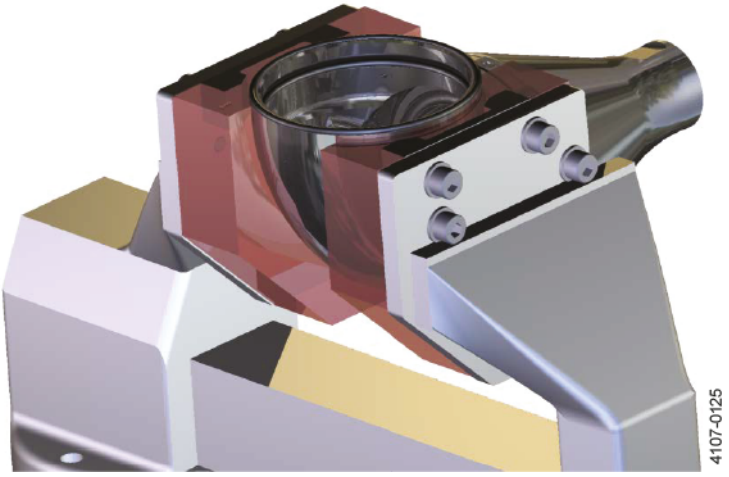
12. Loosen the bench vise and turn the assembly 90 degrees.



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 (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 (10) in the O-ring groove inside the body.

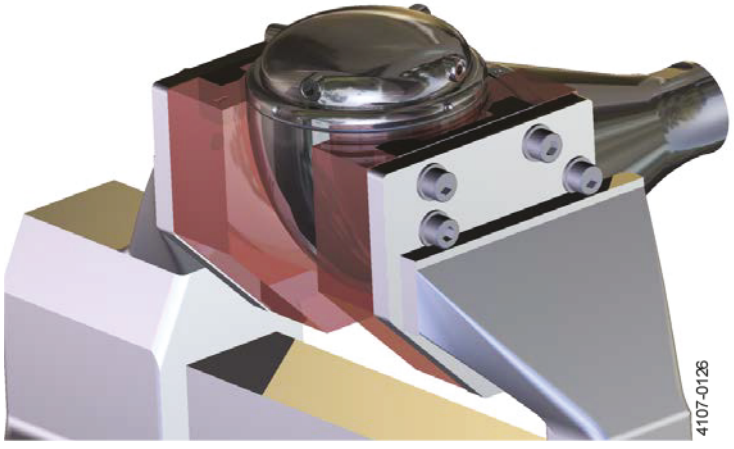


16. Preparation before mounting the assembled lower parts on body (13.1): It is recommended to grease the body thread with food graded/FDA compliant grease. The grease reduces the risk of galling in threads. The grease is enclosed between the O-rings and, therefore, it will not come into contact with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

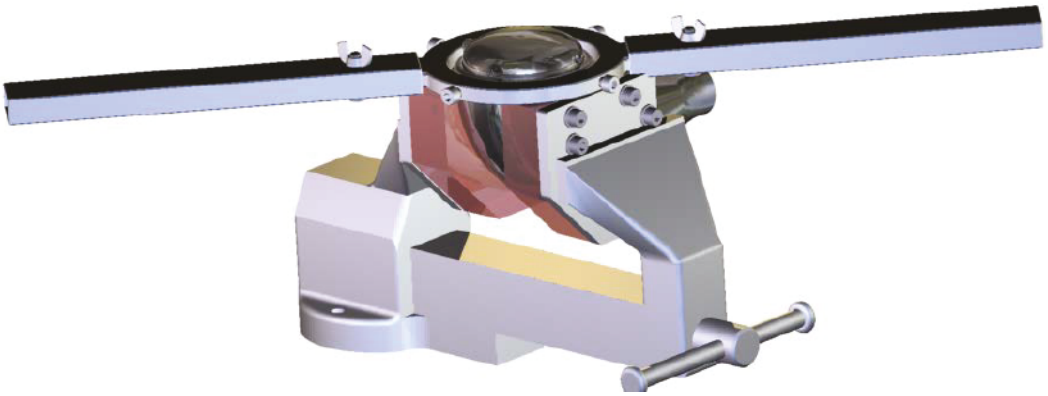
17. Lower the assembled hub while trying to fit the bevel gear wheels into each other. Then tighten the hub nut (15) only by hand. **Note: Left handed thread!!**



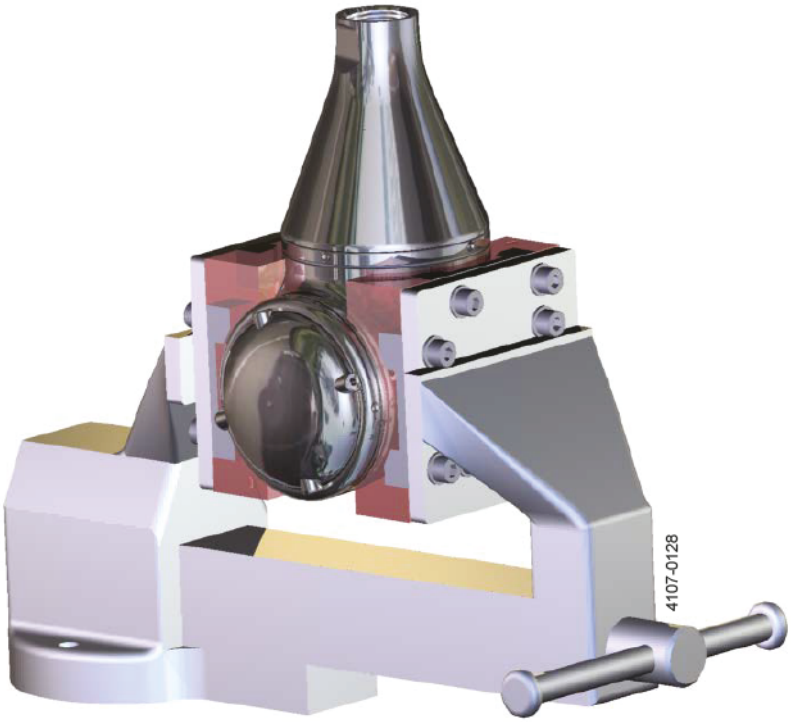
The items (#) refer to section ***10 Parts lists and drawings, service kits and tools***

18. Lower the ring-key (TE20J393) carefully around the nozzle head (18). Tighten the four screws (by hand only) symmetrically on the hub nut (15).

19. Tighten the hub nut (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



The items (#) refer to section ***10 Parts lists and drawings, service kits and tools***

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 (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 (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 parts drawings as well as on all instruction drawings, the individual parts have a position number, which is the same on all drawings. From the position number, the part is easily identified in the parts lists, page 32 ff.

Individual parts should always be ordered from the parts lists, page 32 ff. Item number and denomination should be clearly stated. Please refer to the Spare part manual for information on item numbers. The Spare part manual is available from the on-line Alfa Laval product catalogue Anytime or the Close at hand spare part catalogue.

Please also quote the type of machine and serial number. This will help us to help you. The type and serial numbers are stamped on the body of the tank cleaning machine.

In cases where spare parts are ordered for machines originally delivered with Q-doc - Equipment Doc (3.1 Inspection Certificate - EN 10204), 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 23 “Service and Repair of machines ordered with Q-doc”.

13.3 How to contact Alfa Laval Kolding A/S

For further information please feel free to contact:

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

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.