
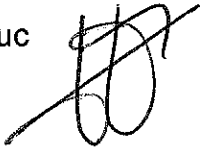

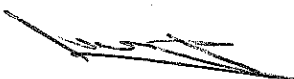


INSTALLATION MANUAL

TURBOPACK TC7-500

CARTRIDGE

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1. INTRODUCTION

This document gives the instructions of installation for the DTA expander, serial TC7-500.

It includes:

- The first installation of the cartridge.
- Further cartridge removal and installation.
- External process filter removal and installation (external filter configuration).

2. GENERAL INSTRUCTIONS

Always comply with the local safety regulations.

Any intervention on the expander must be approved by the plant manager, or his representative.

Any modification of the expander must be approved by Air Liquide DTA.

It is recommended that all unused parts be located in a clean area.

3. FIRST INSTALLATION OF A CARTRIDGE

3.1 EXPANDER STATUS

At this stage, the expander is welded on the cold box, and all pipes are connected. The links to the PLC have been fully checked.

The cleaning tool is inside the casing, in place of the cartridge (state of delivery from Air Liquide DTA).

The cold box has been fully cleaned.

The expander environment is therefore such that the expander could be safely started.

All the internal volumes must be depressurised.

3.2 REMOVAL OF THE CLEANING TOOL

Figure 1: Dismount the 2 flanges connected to the junction part (spanner size: 30).

Figure 2: Remove the pressurization tube of the brake loop (spanner size: 22).

Figure 3 & 4: Secure the junction part of the cooler and remove it from the cleaning tool (spanner size: 24), the piping between the cooler and the junction part must have first been dismantled.

Figure 5: Remove the seal gas line (spanner size: 22).

Figure 6: Dismount the bearing high pressure line (Allen key hexagon 5).

Figure 7: Dismount the bearing low pressure line (Allen key hexagon 5 & spanner size: 24).

Figure 8 & 9: Secure the cleaning tool and remove it from the casing by a translation movement along the 2 guides (spanner size: 27).

Figure 10: View of the inner part of the casing, without the cleaning tool. In the case of an internal filter configuration:

- remove the inlet filter,
- remove the cryogenic seal of the inlet filter,
- inspect the cryogenic seal and clean it with a wiper,
- blow the filter, degrease it if necessary,
- remount the cryogenic seal of the inlet filter.

3.3 INSTALLATION OF THE CARTRIDGE

Figure 10: In the case of an internal filter configuration: insert the inlet filter inside the casing, against the cryogenic seal.

Figure 11: Take out the cartridge from the transportation box (Cartridge weigh = 180 kg). Then, remove the front protection tool with care (spanner size: 24).

Figure 12: View of the cartridge, check the presence of the 2 cryogenic seals. Check also the presence of the o-ring seal on the casing.

Figure 10: Check that the plastic sheet is in his housing, and not on the cryogenic seal seat. If it is not the case push it in his housing.

Figure 13: Install the cartridge on the 2 guides, and smoothly push it against the casing (always secure the cartridge).

Figure 14: Fully screw the cartridge flange, in staggered rows (spanner size: 27).

Figure 15: Dismount the bearing low pressure cap (Allen key hexagon 5).

Figure 16: Install the bearing low pressure line (Allen key hexagon 5 & spanner size: 24). Check the presence of the 2 o-ring seals.

Figure 17: Dismount the bearing high pressure cap (Allen key hexagon 5).

Figure 18: Install the bearing high pressure line (Allen key hexagon 5). Check the presence of the o-ring seal.

Figure 19: Install the seal gas line (spanner size: 22).

Figure 20: Remove the 3 caps with Allen key hexagon.

Figure 21: Insert the temperature insert with its seal, for the brake temperature sensor.

Figure 22: Insert the temperature insert with its seal, for the bearing temperature sensor.

Figure 23: Insert the speed insert with its seal, for the speed sensor.

Figure 24: Install the optic fiber, and manually fasten the gland. Do not excessively bend the optic fiber.

Figure 25: Install the 2 temperature sensors, and fasten the conical nut.

Figure 26: Remove the back protection tool (spanner size: 24).

Figure 27: View of the cartridge with the compressor wheel.

Figure 28 & 29: Install the brake loop seal on the junction part, check that the cartridge seal is in place, and remount the junction part (spanner size: 24).

Figure 30: Install the pressurization tube of the brake loop (spanner size: 22).

Figure 31: Install the 2 flanges on the junction part (spanner size: 30).

4. EXCHANGE OF A CARTRIDGE

4.1 EXPANDER STATUS

The procedure is to be used if there is a necessity to remove the cartridge.

The expander must imperatively been warmed up to room temperature, and all pipes vented with Nitrogen if the process gas is dangerous.

All the internal volumes must be depressurised.

4.2 REMOVAL OF A CARTRIDGE

Figure 31: Dismount the 2 flanges connected to the junction part (spanner size: 30).

Figure 30: Dismount the pressurization tube of the brake loop (spanner size: 22).

Figure 28 & 29: Secure the junction part of the cooler and remove it from the cartridge (spanner size: 24), the piping between the cooler and the junction part must have first been dismantled.

Figure 27: View of the cartridge with the compressor wheel.

Figure 26: Install the back protection tool (spanner size: 24).

Figure 25: Dismount the 2 temperature sensors.

Figure 24: Remove the optic fiber. Do not excessively bend the optic fiber.

Figure 23: Dismount the speed insert.

Figure 22 & 21: Remove the 2 temperature inserts.

Figure 20: Install the 3 caps with Allen key hexagon.

Figure 19: Remove the seal gas line (spanner size: 22).

Figure 18: Dismount the bearing high pressure line (Allen key hexagon 5).

Figure 17: Install the bearing high pressure cap (Allen key hexagon 5).

Figure 16: Dismount the bearing low pressure line (Allen key hexagon 5 & spanner size: 24).

Figure 15: Install the bearing low pressure cap (Allen key hexagon 5).

Figure 14: Secure the cartridge (Cartridge weigh = 180 kg) and then unscrew the cartridge flange (spanner size: 27).

Figure 13: Smoothly pull the cartridge and remove it from the 2 guides (always secure the cartridge).

Figure 10: Check that the plastic sheet is in his housing, and not on the cryogenic seal seat. If it is not the case push it in his housing.

Figure 12: View of the cartridge, check the presence of the 2 cryogenic seals.

Figure 11: Install the front protection tool with care (spanner size: 24), then, insert the cartridge in his transportation box.

Figure 10: View of the inner part of the casing, without the cartridge. In the case of an internal filter configuration:

- remove the inlet filter,
- remove the cryogenic seal of the inlet filter,
- inspect the cryogenic seal and clean it with a wiper,
- blow the filter, degrease it if necessary,
- remount the cryogenic seal of the inlet filter.

4.3 INSERTION OF A NEW CARTRIDGE

See §3.3.

5. EXCHANGE OF THE PROCESS FILTER (EXTERNAL FILTER CONFIGURATION)

5.1 EXPANDER STATUS

The procedure is to be used if there is a necessity to remove the filter.

The expander must imperatively been warmed up to room temperature, and all pipes vented with Nitrogen if the process gas is dangerous.

All the internal volumes must be depressurised.

5.2 REMOVAL OF THE FILTER

Figure 32: Unscrew the filter box flange (spanner size: 19).

Figure 33: View of the filter in the filter box.

Figure 34: Unscrew the filter flange (spanner size: 13).

Figure 35: Remove the filter with care. Blow the filter, degrease it if necessary.

5.3 INSERTION OF THE FILTER

Figure 35: Install the filter with care. Check that the axial gap between the filter flange and the casing is null. If it is not the case, the filter is not correctly installed.

Figure 34: Fully screw the filter flange (spanner size: 13).

Figure 33: View of the filter in the filter box.

Figure 32: Check the presence of the o-ring seal on the casing. Then, fully screw the filter box flange (spanner size: 19).

Figure 1:

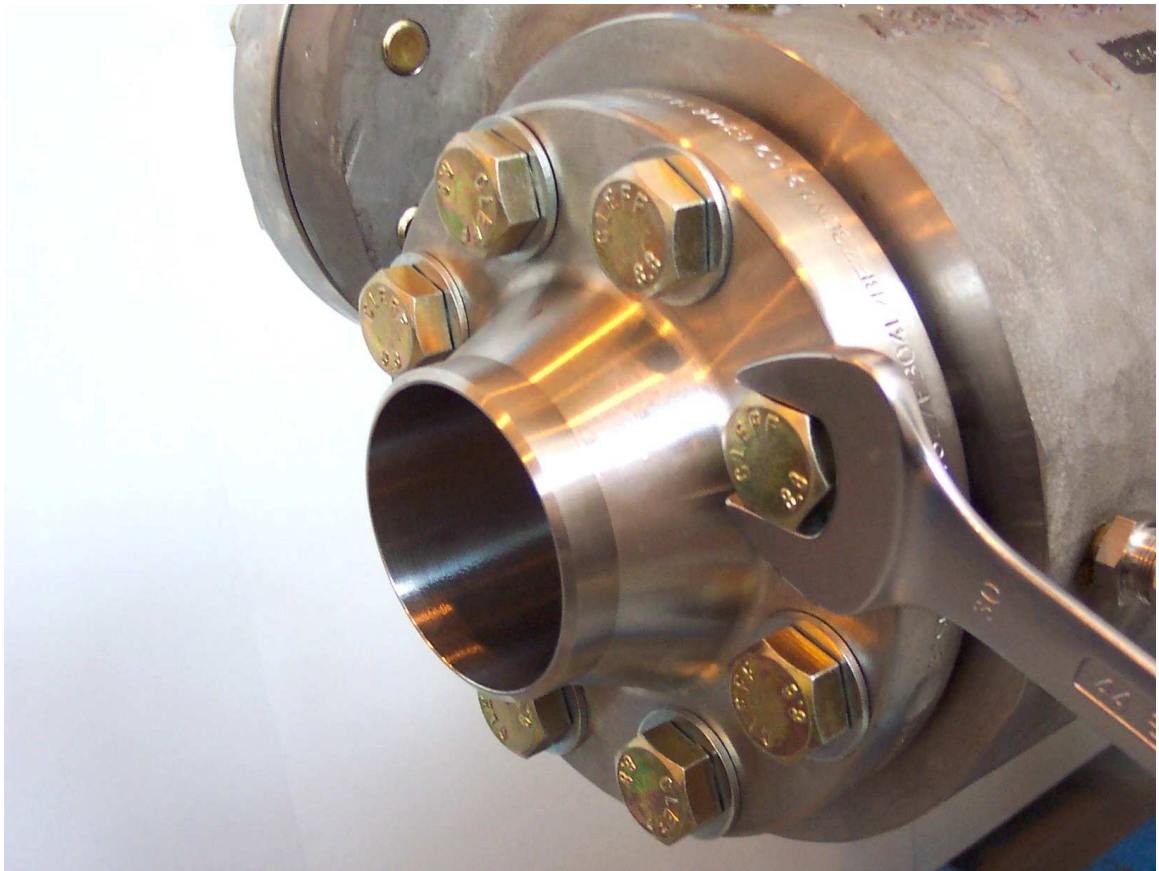


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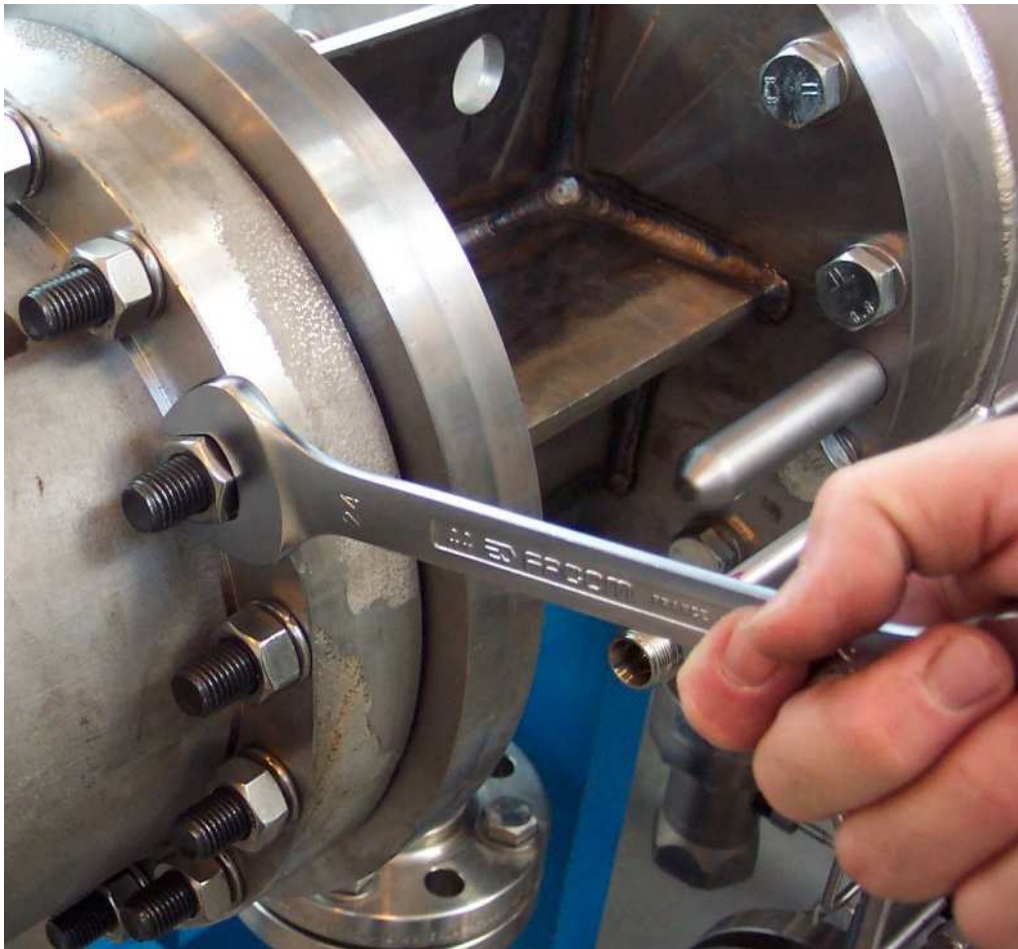


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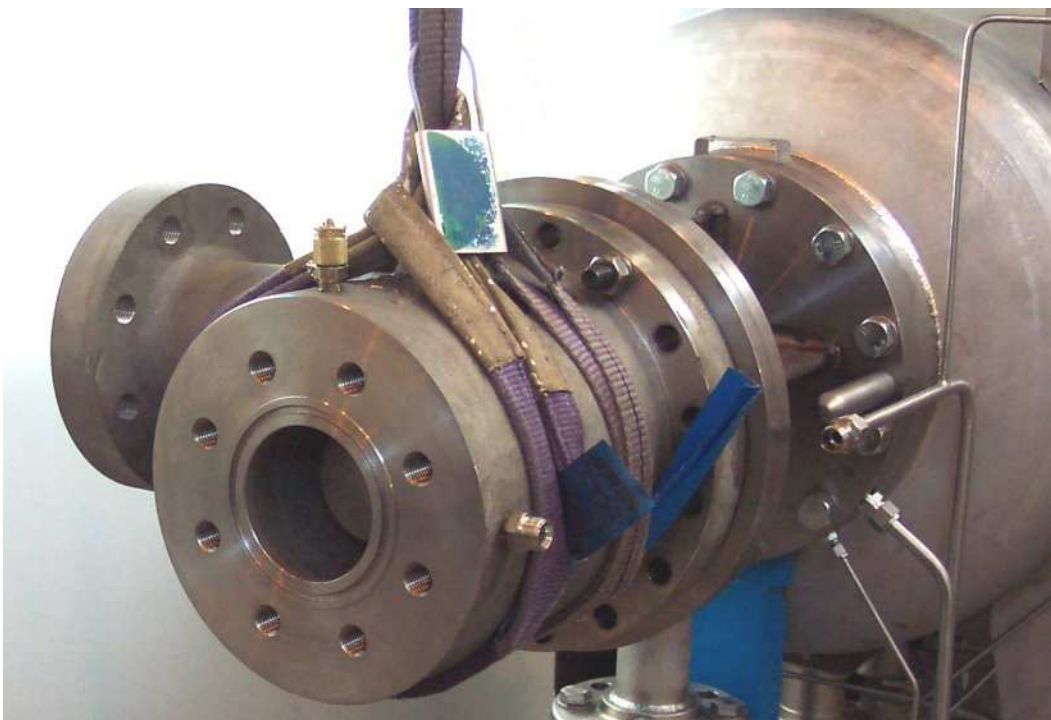


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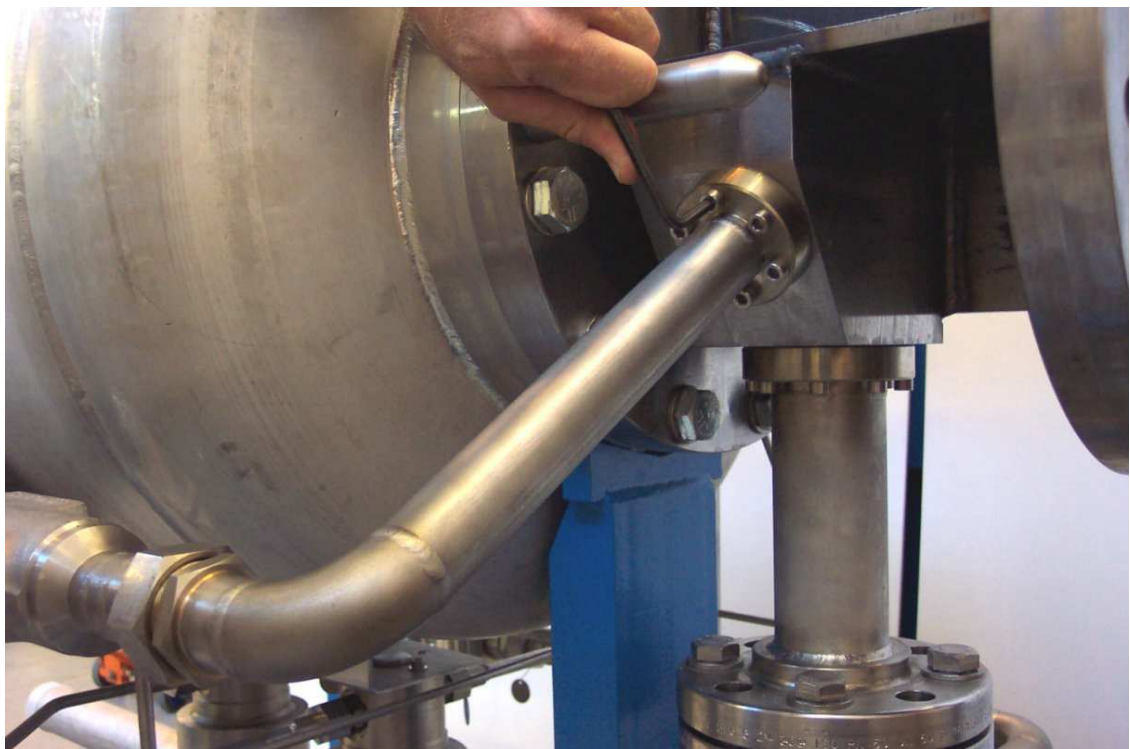


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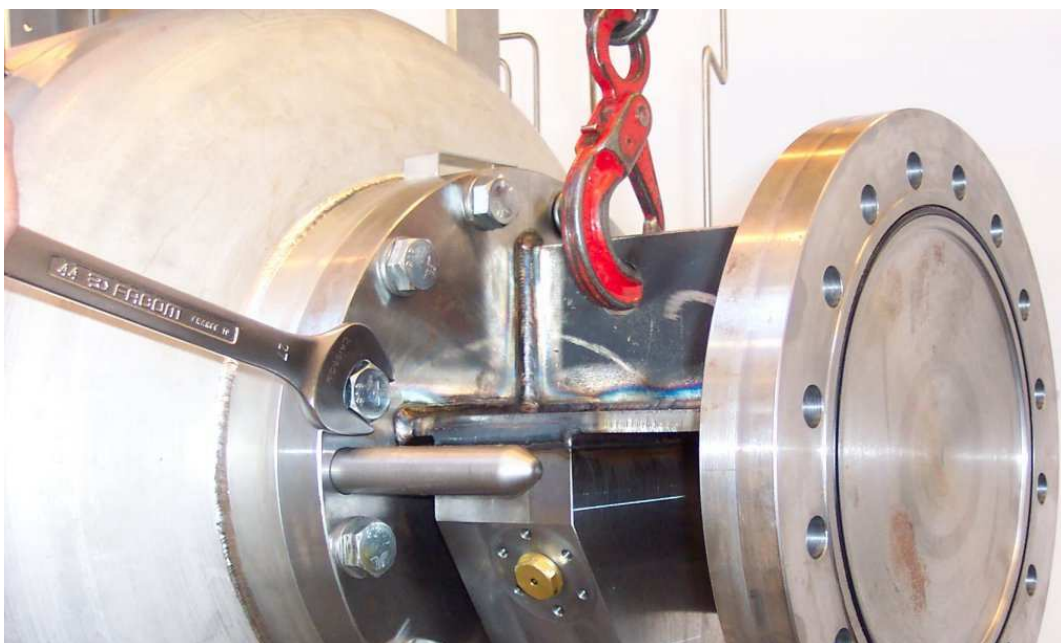


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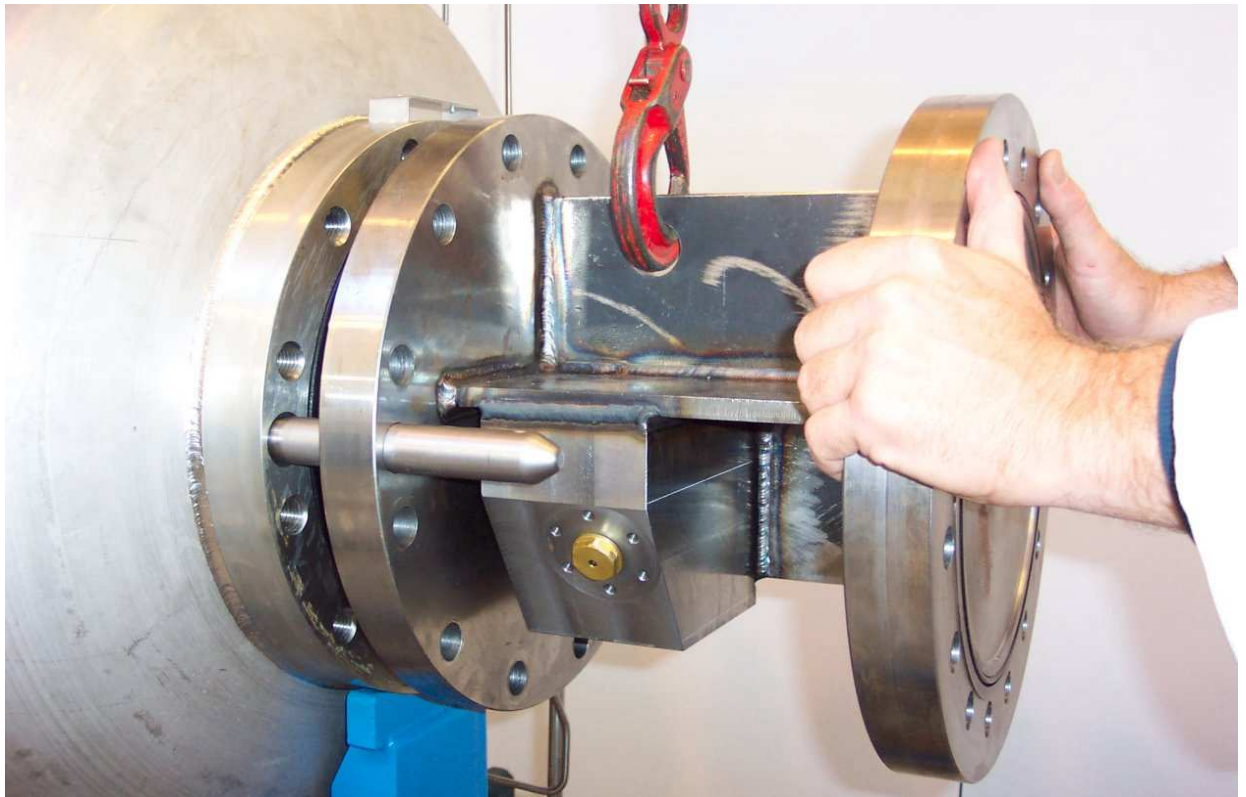


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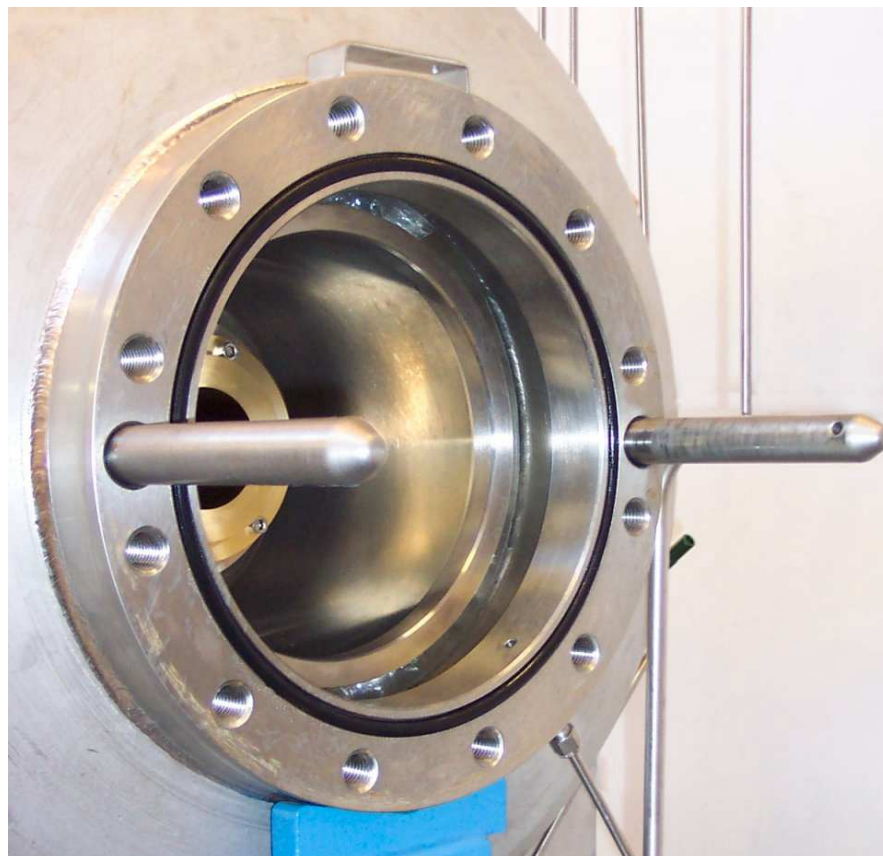


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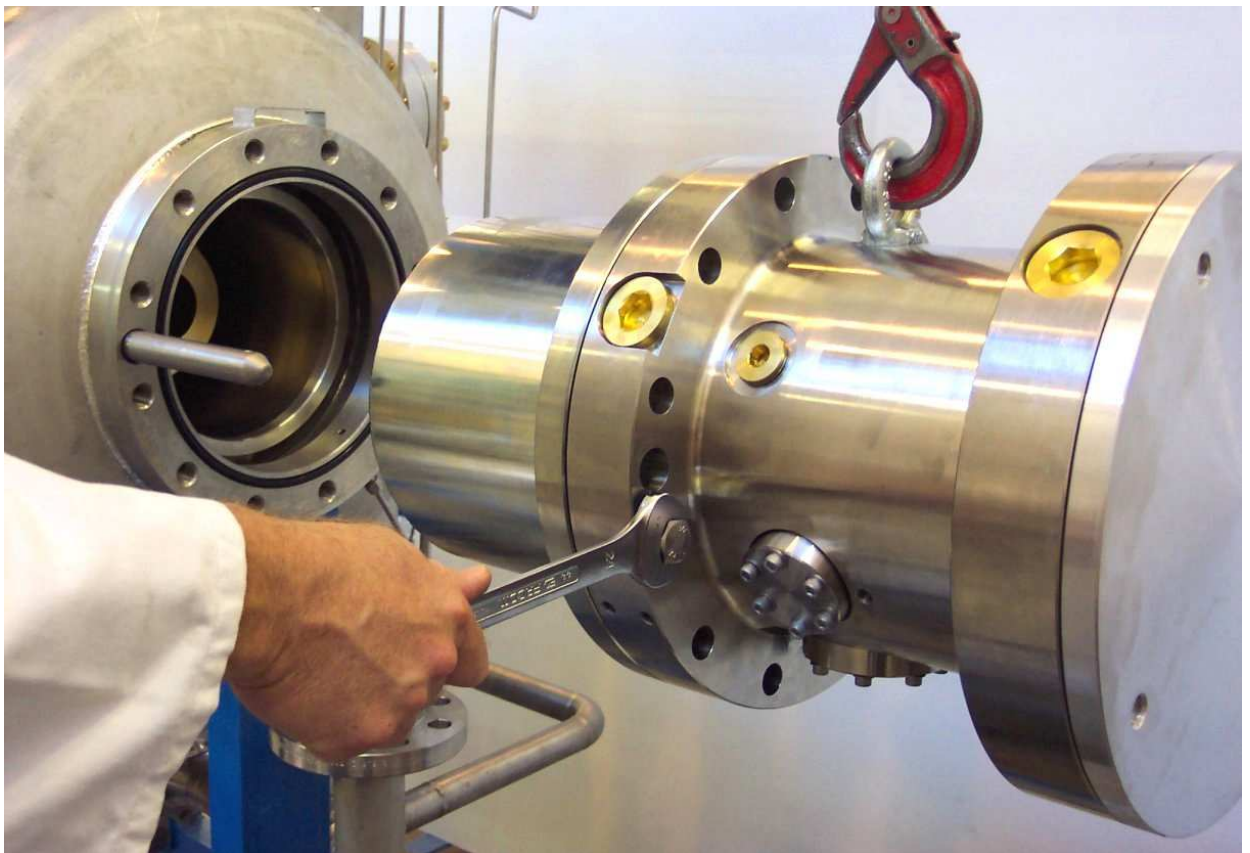


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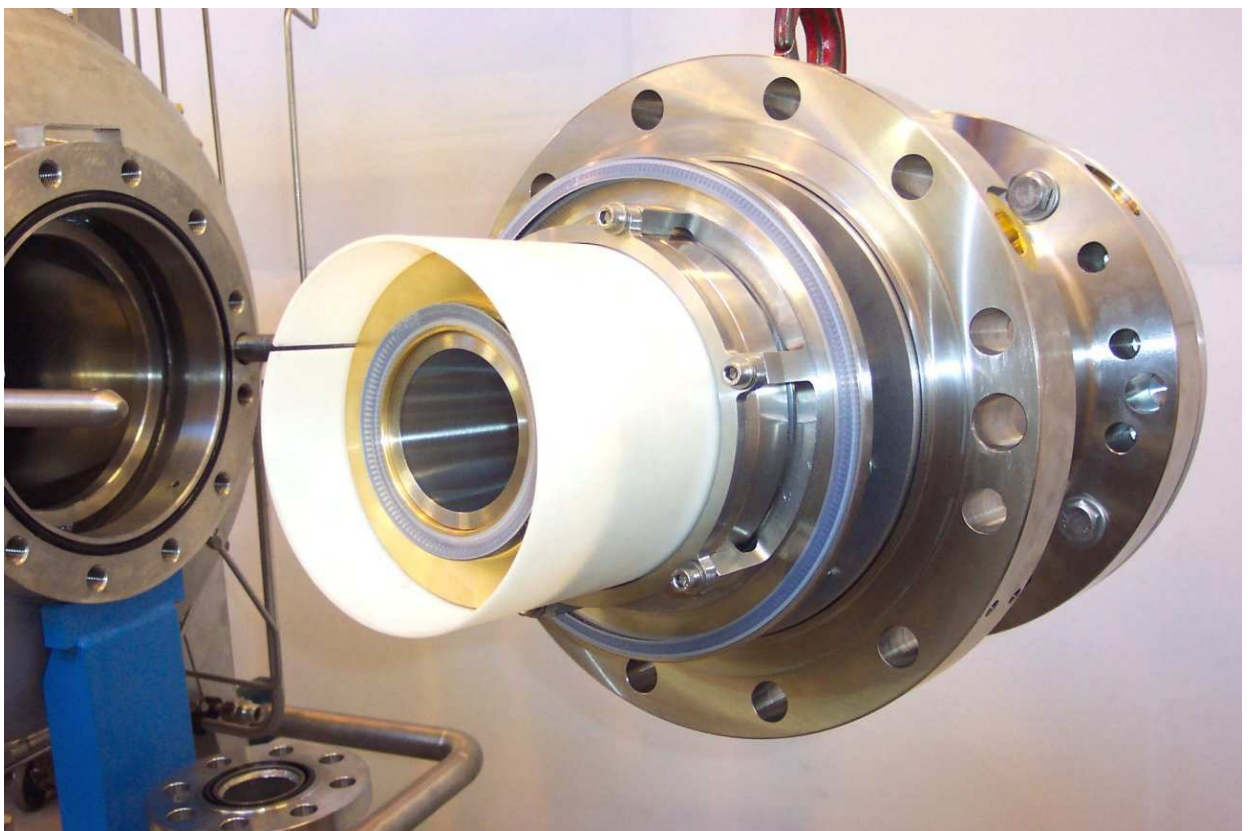


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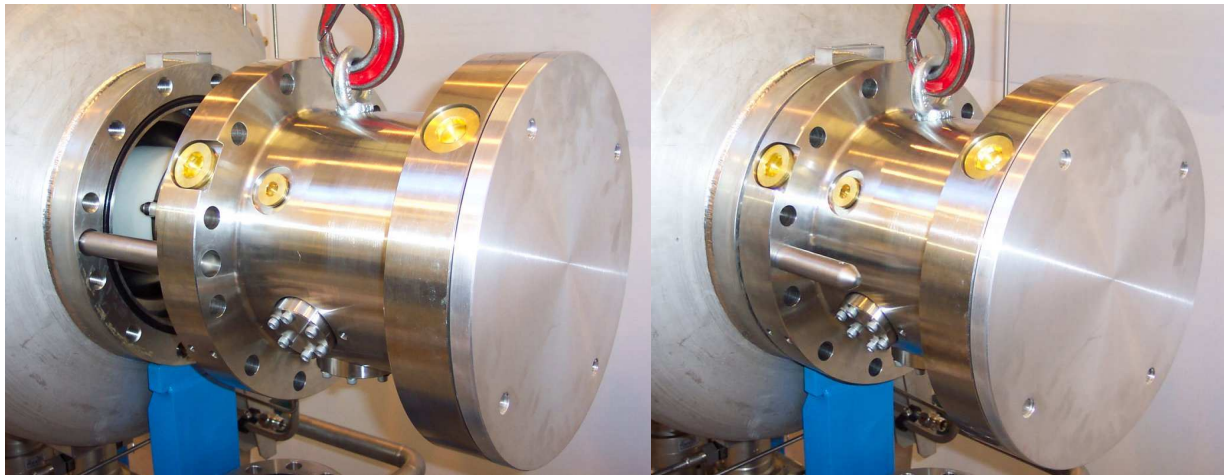


Figure 14:



Figure 15:



Figure 16:



Figure 17:

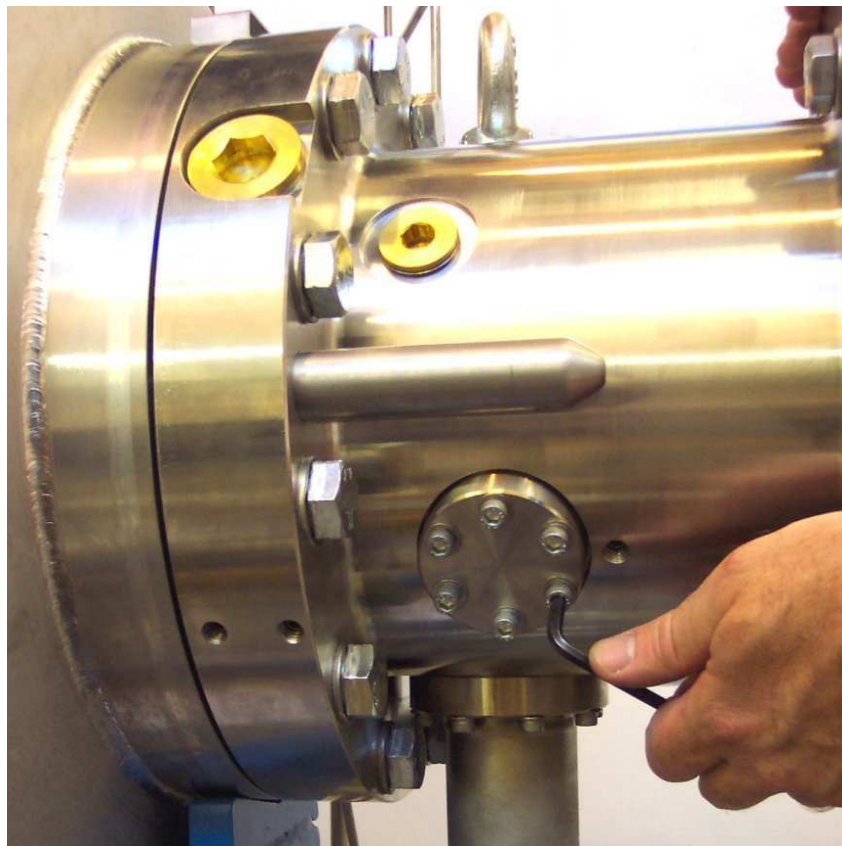


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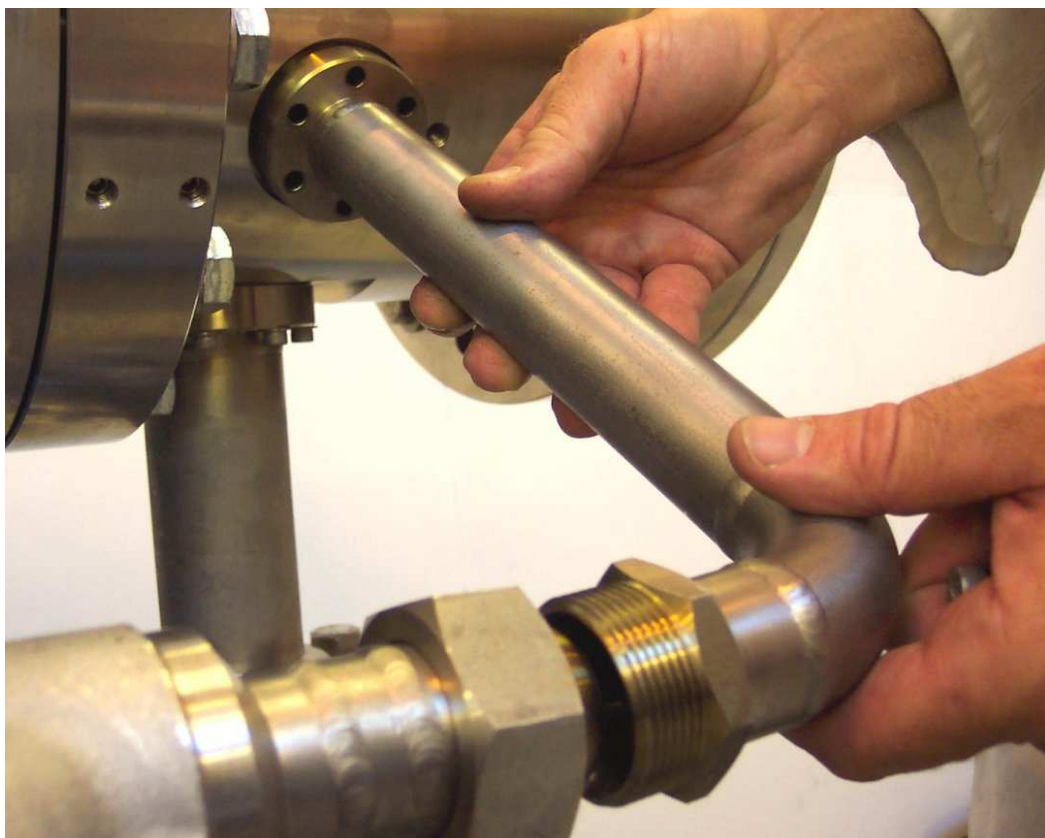


Figure 19:



Figure 20:



Figure 21:



Figure 22:



Figure 23:



Figure 24:

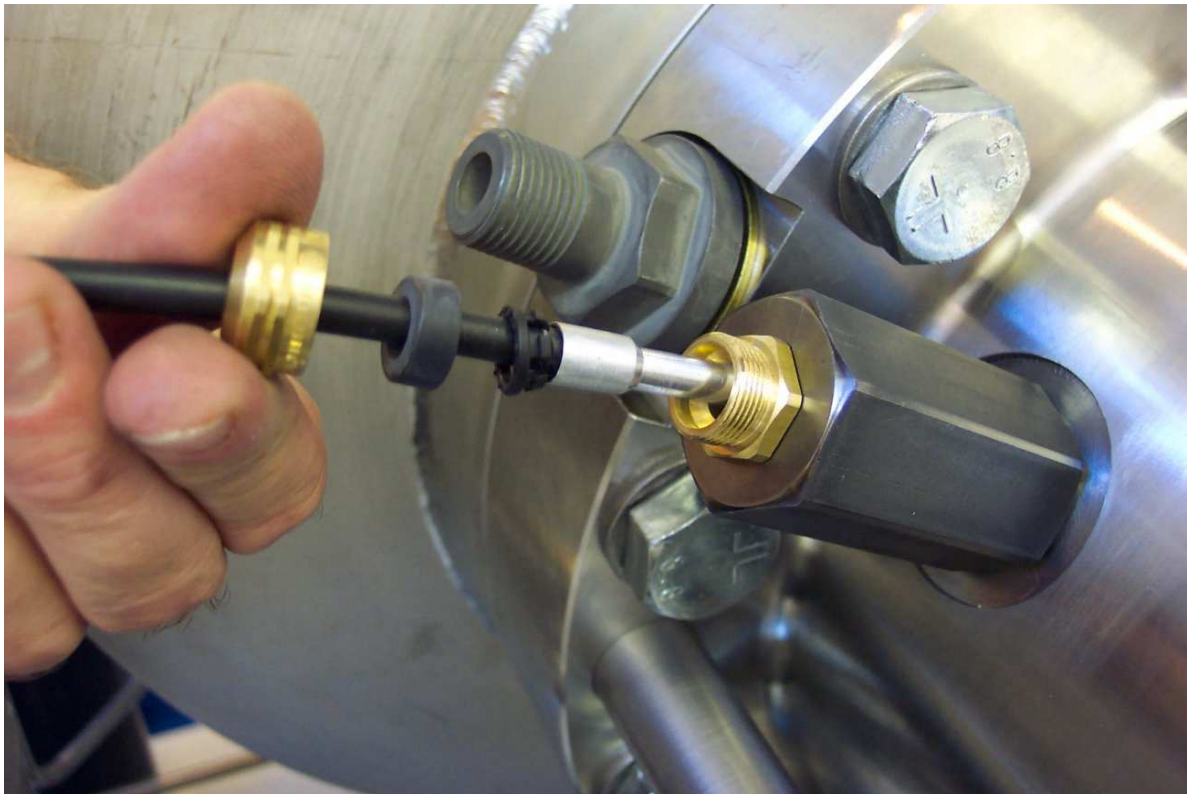


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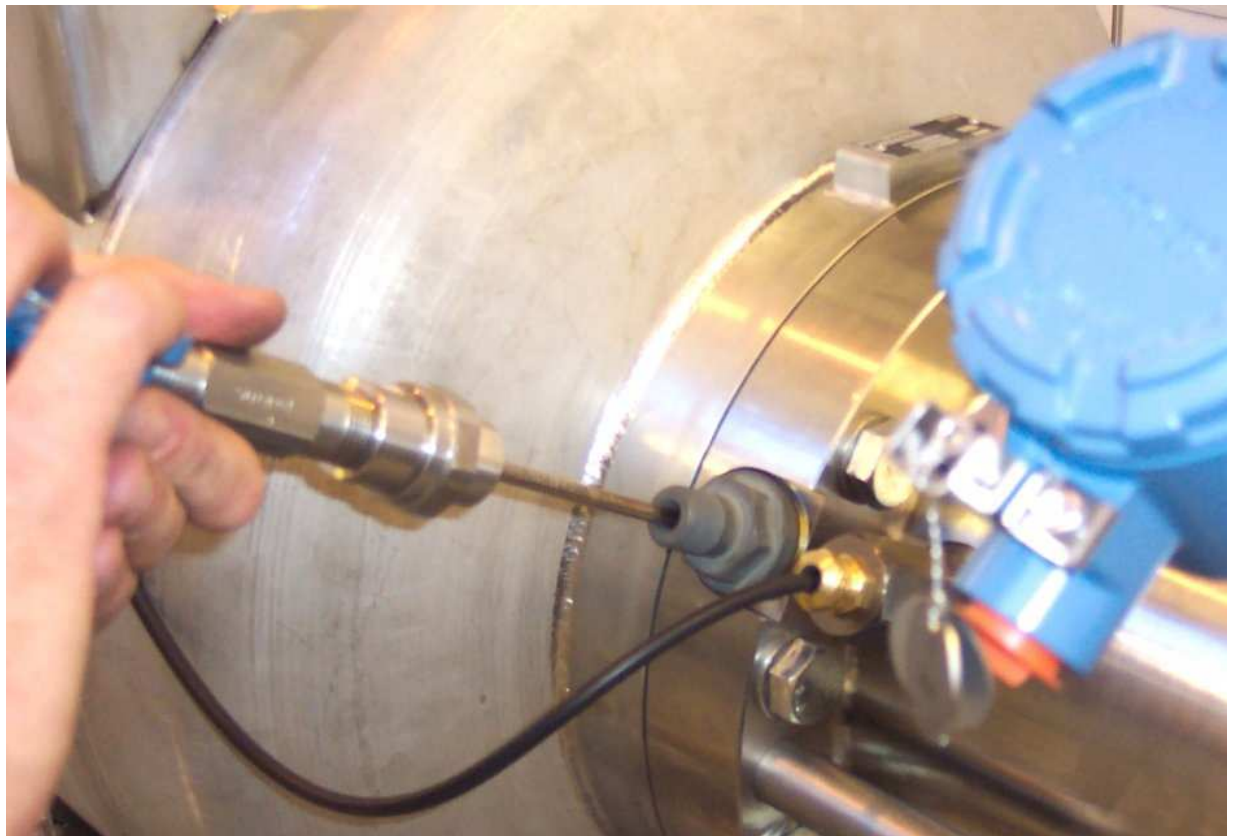


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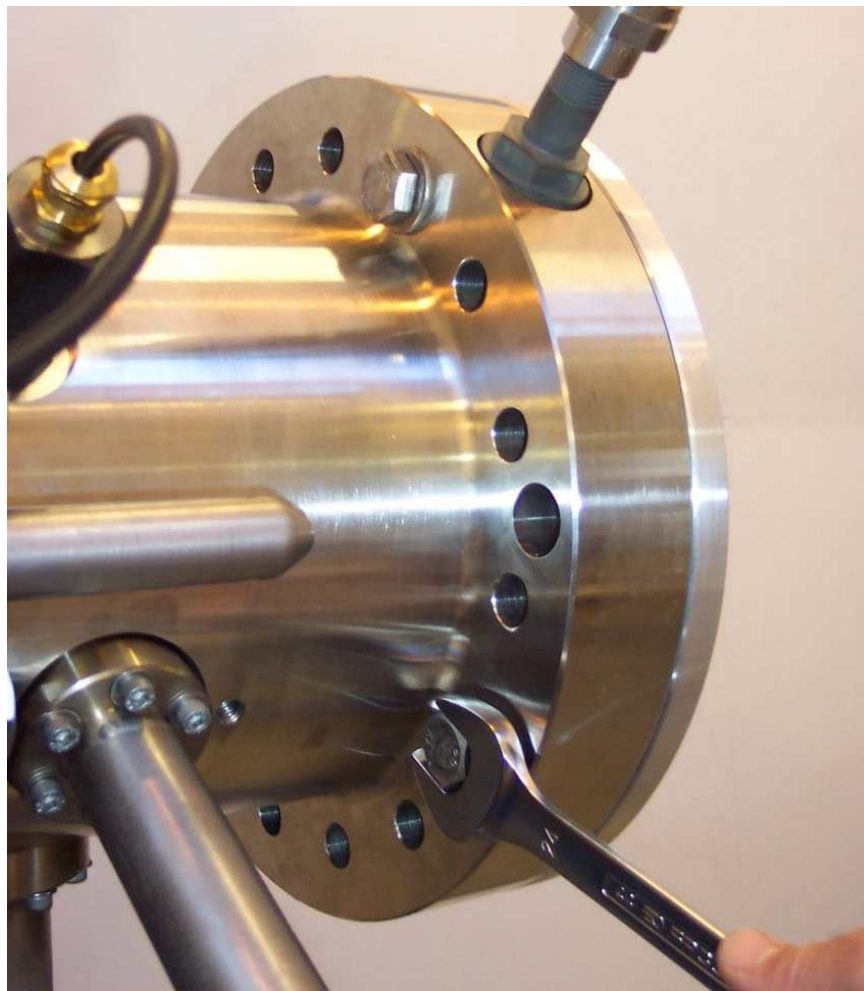


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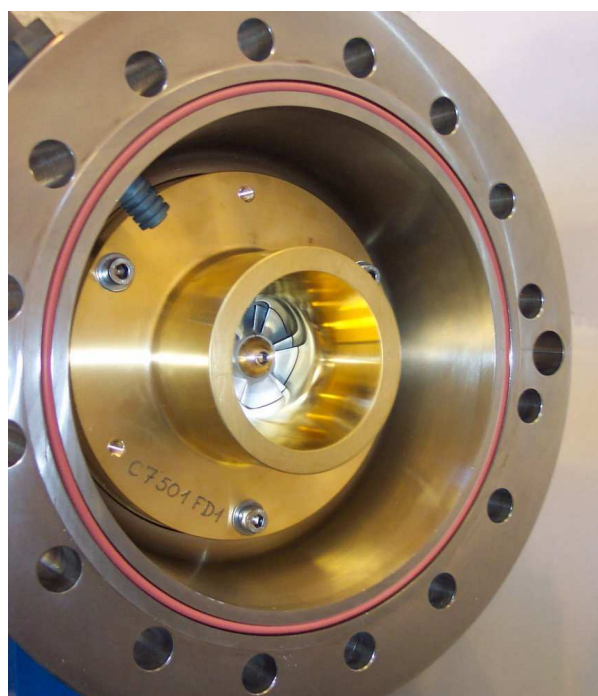


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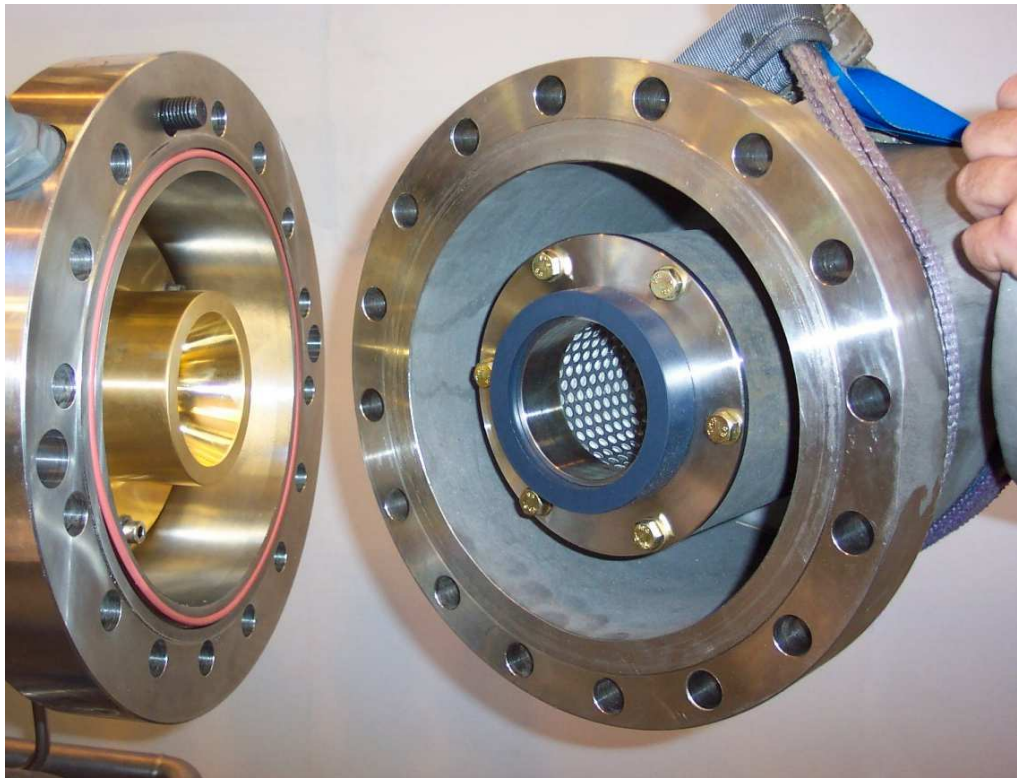


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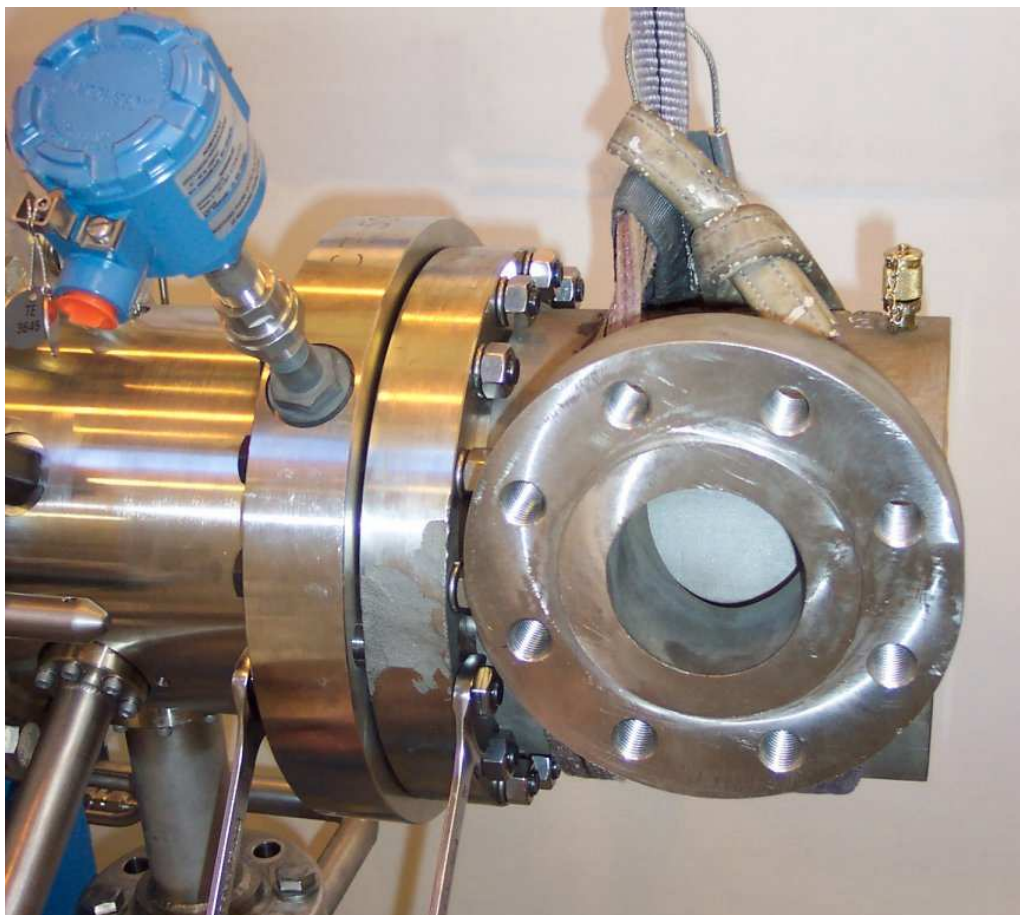


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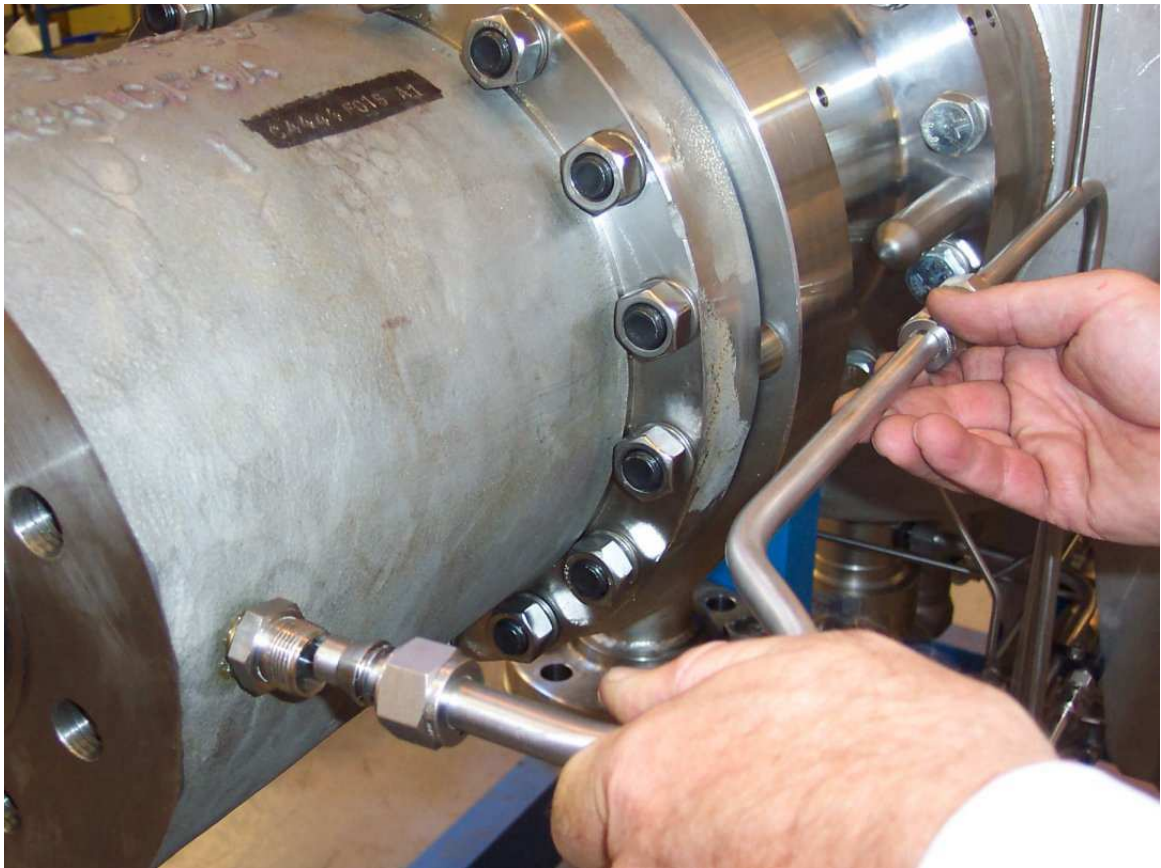


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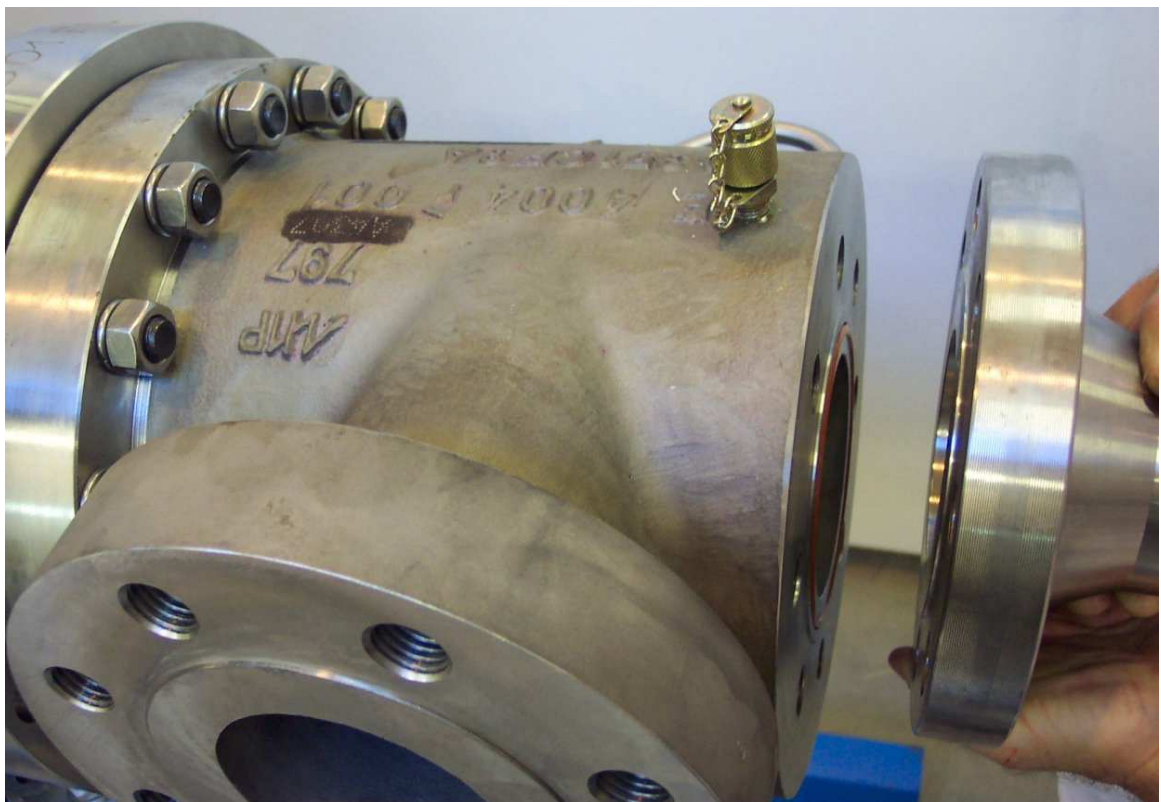


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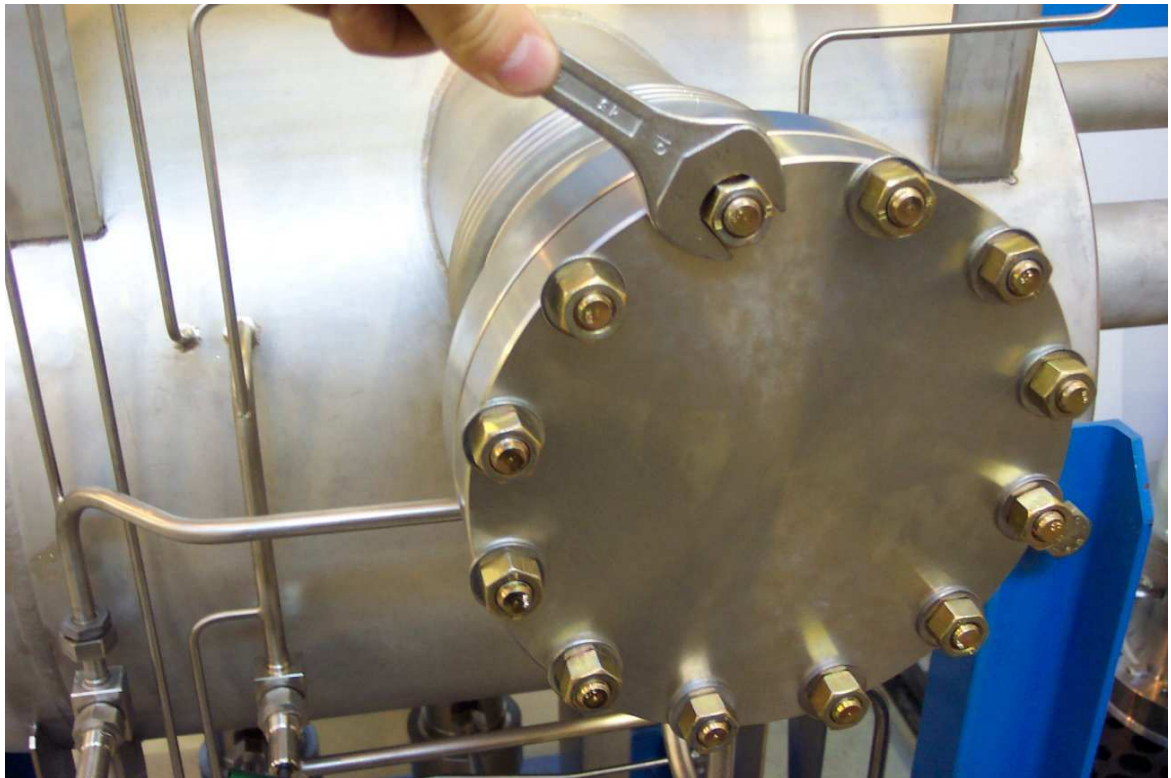


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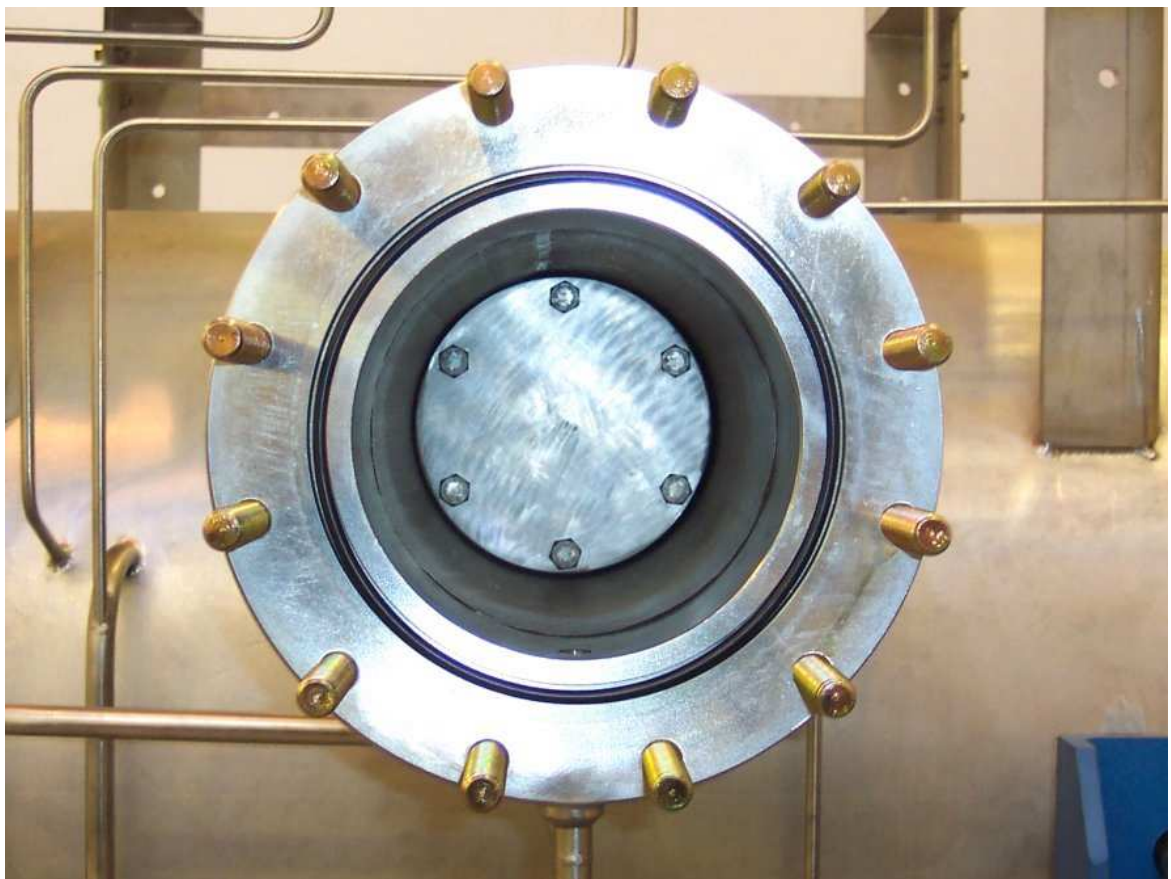


Figure 34 :



Figure 35 :

