

INSTALLATION OF TRELLEBORG FF EXPANSION JOINTS – with full-faced flanges.

Key factors for installation

Trelleborg rubber expansion joints are supplied ready for installation. Following advices are however to be taken into consideration in order to obtain a good performance and prolonged service life of the expansion joint.

Fixed points

An expansion joint acts as a piston by the forces arising from the internal pressure. To prevent the pipes from damage they have to be properly anchored in order to take care of these reaction forces (Fr).

The reaction force of an expansion joint is calculated by the following formula:

$$Fr = A \times P \times 0,01$$

Fr = reaction force in kN.

A = effective cross sectional area in cm².

P = actual pressure in bar or kp/cm².

Checking

For optimum lifetime of expansion joints, make sure that the installed length and operating movements are compatible with their capabilities. (See our Technical Specifications for installation length and technical data).

Check that expansion joints working pressures and grades are compatible with the operating conditions.

Precautions prior to installation

- To avoid any damage, the expansion joints should be handled with great care, using a counter-flange lifting-ring.
- It is essential that the expansion joints are mounted on flat faced piping flanges that have been degreased and are clean and dry.
- No gasket must be mounted between the rubber expansion joint flanges and the mating pipe flanges.

Expansion Joint Positioning

- Position the expansion joint, making sure the holes of the expansion joint counter-flanges and flanges are in line with the holes of mating pipe flanges.

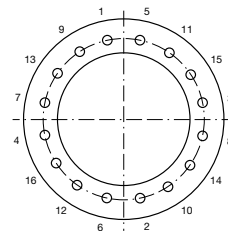
Installation

Trelleborg FF Expansion Joints

- When the expansion joint is in place, check the length of the bolts so that the arch will not be damaged during operation.
- Use a conical drive-in pin if necessary.
- Set bolts in place and tighten the nuts slightly on both flanges.
- Cut and remove webbing, taking care not to damage the cover.

Expansion Joint Installation:

- Tighten bolts on each flange moderately as in the sequence shown below:



- Bolts should be tightened in diametral crosswise order.
- Repeat tightening sequence several times.
- 1st pass: Tighten to approximately 10% of the maximum permissible torque for the bolting. Based on the class 6.8.
- 2nd pass: Tighten to approximately 30% of the maximum value.
- 3rd pass: After at least 2 hours, re-tighten to 30% of the maximum value to make up for the reduction in tightening after relaxation of tightening force in the 2nd pass.
- All bolts must be tightened to the same torque value.
- If necessary, re-tighten until there are no signs of leakage, see page or deformation of the top of the rubber flanges upon going on stream or during hydraulic pressure test.

Precaution

Do not paint or lubricate rubber parts of the expansion joints.

Installation of Trelleborg FF Expansion Joints

INSTALLATION OF THE TIE-ROD ASSEMBLY

- Arrangement of the various parts of a tie-rod unit is shown in the contractual drawings.
- The parts must be mounted in the right order.
- Spherical bearings, washers or spherical bearing nuts (if any) must be lubricated taking care not to foul the expansion joint.

Bolt tightening

- The bolts should be tightening when installing the expansion joint.
- Gradually tighten all bolts, including those of the tie-rod plates, in a diametrical crosswise order, in several passes.

Tie-rod adjustment

- Tie-rods should be adjusted to conform to the installed length of the expansion joint.
- The only play allowed (if any) after tightening is shown in contractual tie-rod drawings.

Tightening of locknuts on threaded rods

- Once the tie-rods have been adjusted and slightly tightened by fitting the nuts on either side of the fixing plates, tighten the counternuts.
- Lock the nut/counternut assembly by hand to state-of-art procedure.

Checking

After tightening, make sure the tie-rod play values (if any) are all identical so that reaction will be evenly distributed between each tie-rod.

MAINTENANCE AFTER INSTALLATION

Prior to starting up

- Remove any dust or foreign bodies which may have found their way inside the expansion joints.
- Make sure there is no possibility of accidental damage or sabotage. It is advisable to cover the expansion joints with light metal sheeting.
- Check that no lubricant can fall onto the expansion joints.

When starting up

- Check for leakage.
- If necessary, check efficiency of tie-rods.

When running

- The expansion joints must be easily accessible and never covered with insulating material or paint.
- They may only be protected with our fire-resistant covers, where these are specified.
- As soon as the expansion joints are working, make sure they are not subjected to movements exceeding their allowable limits.

Maintenance

It is advisable to inspect the expansion joints every **12 months**.

- Any changes in outer cover will be indicative of serious deterioration.
- Make sure the bolts are properly tightened.
- Check the extent of expansion joint movements, which must remain within their allowable limits.

It is advisable to make an in-depth inspection of expansion joints at least every **5 years**.

- Check each expansion joint carefully. For this, it must either be easily accessible for internal inspection or must be dismantled.



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