

Rubber Expansion Joint Installation Instructions

Typical Tools required installing a rubber expansion joint

Appropriate Lifting gear; always lift on both flanges or with two slings each side of the sphere.

Centring Mandrels to help aligning the bolt holes, care should be taken not to damage the rubber.

Rubber hammer, do not use any sharp-edge tools.

Two correct size ring spanners and torque wrench.

Appropriate length bolts and washers.

Rulers and squares to check the piping alignment and installation gap.

Soapy water or green soap to lubricate the installation, if the operational conditions allow this.

(Note: rubber expansion joints seal on their rubber, they don't require gaskets to seal on unless it is to pack potential uneven sealing surfaces- see our technical literature)

Take note of your surroundings for any other environmental hazards.

UV, heat, spark or chemical exposure.

No welding should be performed near the rubber expansion joint without appropriate protection of the rubber joint externally and from stray currents.

CAUTION

Make sure the right rubber expansion joint selected for the application based on chemical compatibility, temperature rating, allowable movements, flange materials and are there control rods required consult our rubber expansion joint catalogue for all this information.

Visual inspection of the CT-REJ flanges and mating surfaces.

Prior to installing the rubber joint, visually check the condition of the rubber joint. Make sure the piping is aligned within 3 mm and the installation gap is within the allowable measurement without using excessive force. Review anchors support. Remove all foreign materials and debris. Examine the connecting pipe flanges according to the published requirements.

When control rods are required

Install the gusset plates on the outside of the mating flange. Insert the threaded rods through the outside hole in the plates. Pay attention if you need limit nuts.

Don't set the limit nuts in their final dimensions until the joint is fully installed, the control rod could be used to compress or extend the joint within its installation limits.

Bolts directions and torque settings

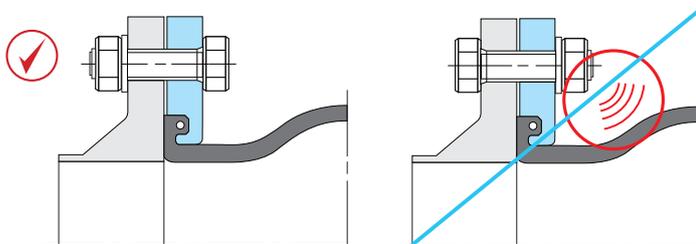
To prevent damage to the rubber membrane, it's important to take care on the installation direction of the bolts.

Where possible, we would always recommend the bolt head without a washer on the inside of the rubber expansion joint flange.

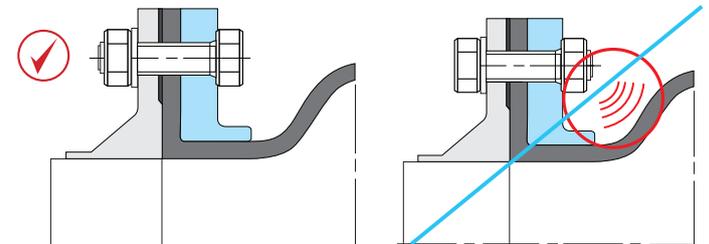
If this is impossible to do, you need to make sure the bolts are to a length so that they do not protrude more than 3 mm beyond the nut. Any packing washers should be placed on the pipe side.

Protruding bolts are a common cause of joint failure.

Standard spherical rubber expansion joints



Custom rubber expansion joints



Torque settings by joint design

Tighten the bolts in two to three successive steps with a cross-bolt tightening pattern to the torque setting below to assure leak free operation.

The bolted connections should always be made using two wrenches. Bolts should be done up so there is a close as possible equal gap between the mating flanges at all times.

(Never tighten to the point of metal to metal contact between the rubber joint flange and the mating flanges, overtightening will cause deformation of the rubber expansion joint sealing bead and premature failure.)

All rubber materials tend to relax over time. It is good practice to check the installation about two weeks after installation.

Always install a rubber expansion joint in an accessible spot for inspection and ease of inspection and maintenance.

Bolt Torque Settings Rubber Expansion Joints			
Nominal Internal Diameter	Standard Special	Custom Build	
		Torque	Torque Nm
25-32	1 - 1 1/4	40	50
40-50	1 1/2 - 2	50	60
65	2 1/2	60	80
80-125	3	70	80
150-200	6-8	80	130
250-300	10-12	100	150
350-400	14-16	110	200
450-600	18-24	120	250

Field inspection guide of installed rubber expansion joints

After being fitted

After installation, the rubber expansion joint should be properly protected against damage. Nothing should be in contact with the rubber.

The rubber parts must not be painted or exposed to solvents or chemicals. The best performance is obtained when the expansion joint is able to function stress-free under normal operating conditions.

Pressure testing of rubber expansion joints.

A rubber expansion joint relies on its rubber sealing face pressure testing before supply can adversely influence the integrity of the sealing face.

Random batch pressure testing of the rubber expansion joint is performed by the manufacturer.

Pressure testing to 1.5 times the working pressure can be performed by Convuluted Technologies on special request by the customer, only if the customer takes note of the information stated above. Convuluted Technologies Pty Ltd will be recording our recommendations on the provided test certificates.

System pressure test should take place only after the rubber expansion joints have been fully installed in the piping system. If leaks should occur in the flange connection, the bolts can be retightened not exceeding the torque recommendations.

All rubber material tends to relax over a period of time. It is good practice to check the tightness of the bolts for 80% of the installation torque, about two weeks after the installation date.

If temperature cycling is part of the installation, it is recommended to check the above on an ongoing monthly basis, until such time that the last check shows no further tightening is required.

Field inspection guide of installed rubber expansion joints

The following guide is intended to assist in determining if an expansion joint should be replaced or repaired after extended service.

Replacement Criteria: If an expansion joint is in a critical service condition and is five or more years old, consideration should be given to maintaining a spare or replacing the unit at a scheduled outage. If the service is not of a critical nature, observe the expansion joint on a regular basis and plan to replace after 10 years' service. Applications vary and life can be as long as 30 years in some cases.

Cracking; Cracking or crazing may not be serious if only the outer cover is effected and the inner fabric is not exposed. If necessary, repair on site with rubber cement if the cracks are minor. Cracking where the fabric is exposed and torn, indicates the expansion joint should be replaced. Such cracking is usually the result of excess extension, angular or lateral movements. Such cracking can be identified by; flattening of the sphere, cracks at the base of the sphere, and/or cracks at the base of the flange. To avoid future problems, replacement expansion joints should be ordered with limit or control rods.

Blisters/Deformation and Ply Separation; Some blisters or deformations, when on the external portions of an expansion joint, may not affect the proper performance of the expansion joint. These blisters or deformations are cosmetic in nature and do not require repair. If major blisters, deformations and/or ply separations exist in the tube, the expansion joint should be replaced as soon as possible. Ply separation at the flange outside diameter can sometimes occur

and is not a cause for replacement of the expansion joint.

Metal Reinforcement; If the metal reinforcement of an expansion joint is visible through the cover, the expansion joint should be replaced as soon as possible. Additionally, if any external metal reinforcement is exhibiting signs of fatigue or wear, the expansion joint should be replaced as soon as possible.

Dimensions; Any inspections should verify that the installation is correct; that there is no excessive misalignment between the flanges; and, that the installed face-to-face dimension is correct. Check for over-elongation, over-compression, lateral or angular misalignment. If incorrect installation has caused the expansion joint to fail, consider ordering a new expansion joint sized to fit the existing piping dimensions. If neither option is available, adjust the piping and order a new expansion joint to fit the existing installation.

Rubber Deterioration; If the joint feels soft, gummy or too stiff to move, plan to replace the expansion joint as soon as possible.

Leakage; If leakage or weeping is occurring from any surface of the expansion joint, except where flanges meet, replace the joint immediately. If leakage occurs between the mating flange and expansion joint flange, tighten all bolts (note the recommended torque settings). If this is not successful, turn off the system pressure, loosen all flange bolts and then re-tighten bolts in stages by alternating around the flange. Remove the expansion joint and inspect both rubber flanges and pipe mating flange faces for damage and surface condition. Repair or replace as required. Also, make sure the expansion joint is not over elongated as this can tend to pull the joint flange away from the mating flange resulting in leakage. If leakage persists, consult the manufacturer for additional recommendations

