

**C.2. Excess Temperatures And Pressures.** Expansion joints should never be subject to operating conditions beyond the pressure and temperature limits recommended by the manufacturer.

**C.3. Care Of Outside Cover.** Any damage to the outside protective cover of an expansion joints should be repaired before placing the joint in service. This protective cover is designed to keep harmful materials from penetrating the carcass of the joint.

**C.4. Mating Flanges.** Be sure that the companion flange faces to be mated with the flanges of the rubber expansion joint are clean.

**C.5. Flange Face Lubricant.** Apply a thin film of graphite dispersed in glycerin or water to the face of the rubber flanges before installing the expansion joint. This is a type of lubricant that may be used on rubber flanges. Its purpose is to simplify installation and to permit easy removal at some future date.

**C. 6. Bolting.** Tighten bolts by alternating around the flange and tighten all bolts equally. The bolts are not considered tight until the edge of the expansion joint flange bulges slightly. Check bolt tightness at least one week after going on stream and periodically thereafter. As any rubber-like material takes a set after a period of compression, the bolts may loosen and result in a break in the seal. It is particularly important to check bolts in a hot and cold water system before changing over from one medium to the other.

**C.7. Insulation.** When insulation is used over the pipeline adjacent to a rubber expansion joint, the insulation of the expansion joint is not a recommended practice. However, if insulation is required, it should be made removable to permit easy access to the flanges. This facilitates periodic inspection of the tightness of joint bolting.

**C.8. Storage.** Expansion joints purchased as spares should be stored in a dry, fairly cool, dark place in a flat position, that is, not on the flange edges and with no weight whatsoever thereon.

**C.9. Care when Welding.** Welding operations should not be performed in the vicinity of a rubber expansion joint due to the possibility of damage to the joint.

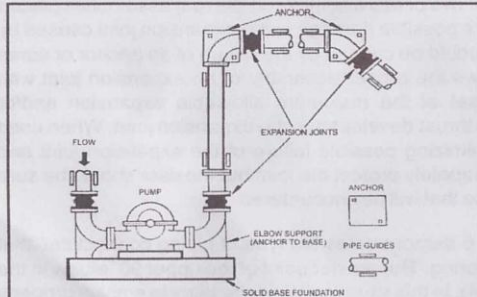


Figure 4 : Typical Piping Layout Utilizing Expansion Joints When Equipment and Piping are Properly Anchored

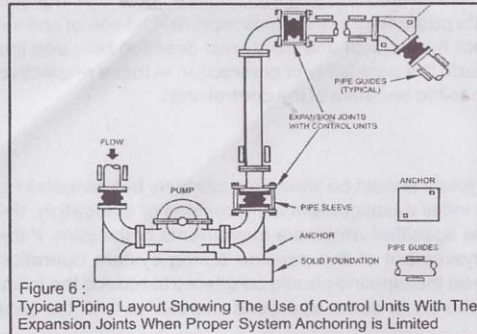


Figure 6 : Typical Piping Layout Showing The Use of Control Units With The Expansion Joints When Proper System Anchoring is Limited

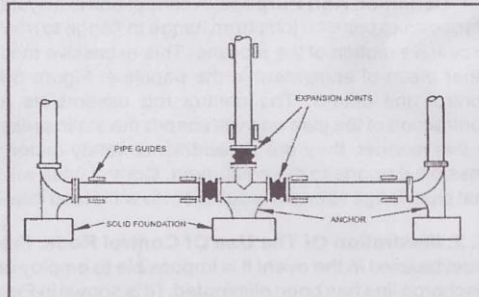
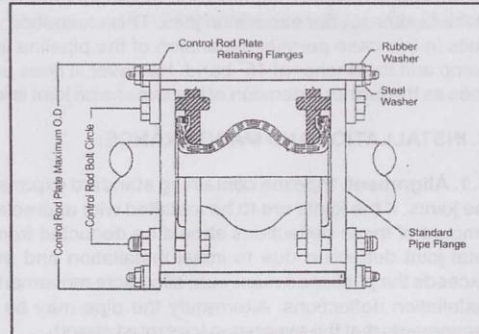
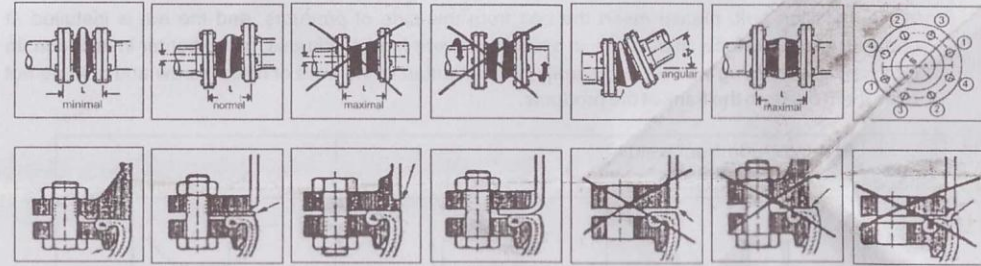


Figure 5 : Typical Piping Layout Utilizing Expansion Joints and The Proper Use of Anchors in Branch Locations



# FLEXIBLE RUBBER JOINT

## INSTALLATION INSTRUCTIONS



### ※ NOTE FOR INSTALLING

PLEASE INSTALL PRODUCTS ACCORDING TO THE ORDER

①②③④ AND SCREW THE DIAGONAL BOLTS TIGHTLY.

## Installation

### of Rubber Expansion Joints

**DON'T USE RAISED FACE FLANGES !**

### Bolt Torque

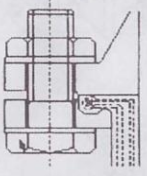
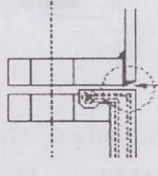
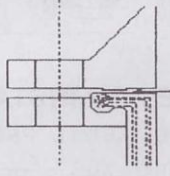
The tables below show the bolt torques, prevent overtightening

The torque figures for both types are based on using 8.8 galvanized bolts

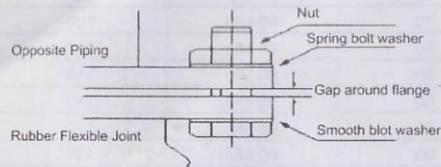
DN	Bolt - Torque				
	Step 1 (Nm)	Rest	Step 2 (Nm)	Rest	Step 3 (Nm)
25	25	30 Min	40	60 Min	60
32	25	30 Min	40	60 Min	60
40	25	30 Min	40	60 Min	60
50	25	30 Min	40	60 Min	60
65	25	30 Min	50	60 Min	70
80	35	30 min	60	60 min	80
100	35	30 Min	60	60 Min	80
125	35	30 Min	60	60 Min	80
150	40	30 Min	70	60 Min	90
200	40	30 Min	70	60 Min	90
250	40	30 Min	70	60 Min	100
300	40	30 Min	70	60 Min	100
350	40	30 Min	80	60 Min	110
400	40	30 Min	80	60 Min	110
450	40	30 Min	80	60 Min	120
500	40	30 Min	90	60 Min	130
600	40	30 Min	90	60 Min	130
650	40	30 Min	90	60 Min	130
700	40	30 Min	90	60 Min	130
750	40	30 Min	90	60 Min	130

## V. ATTENTION FOR CONNECTION

1. Based on the opposite flange shape of the products, it may damage sealed surface of the washer of the rubber itself. Please refer to the following table to ascertain the shape of flange.
2. While installing bolt, please insert the bolt from this side of products, and the nut is installed at opposite flange surface, in addition, in order to prevent from slackness, make tighter installation. In addition, install spring washer additionally, pay attention to the front of metal screw and bolt, do not raise them out from the flank of the products.

Shape	Pipe protrude from weld - type flange	Insert weld-type flange	Embedded flange
<b>Shape</b>			
<b>Assessment</b>	No problem, As the internal diameter of rubber itself is at the same position with the internal diameter of opposite flange, thus with sufficient strength to cover the washer, it is highly ideal.	Please assess whether washer is integrated for use. According to the fusing as shown in arrow 1, the sealed surface of washer may be damaged. Use the coarse file or sand paper to remove, if necessary, use together with washer.	No way to use. The raised part as shown in arrow 2 has a small contact area with the surface of washer external film of the rubber, therefore, the load of unit area becomes larger, thus bringing about the damage of surface of washer external film and the initial water leakage.

3. For installing the bolt, fix equally on both the diagonal line. Pay attention that if the abnormal installation is done in single fixation, it may cause the damage of the products. After fixation, determine at 90°C 4 direction using fine-tuning device for the gap of between the flange. Maintain the difference of gap's maximum value and minimum value within 0.5mm and fix equally. Gap around flange keeps within 2 mm.



GAP AROUND FLANGE

SIZE	SINGLE SPHERE (mm)		DOUBLE SPHERE (mm)	
	mm	mm	mm	mm
3/4"	20	2	-	-
1"	25	2	-	-
1 1/4"	32	2	2.5	-
1 1/2"	40	2	2.5	-
2"	50	2	2.5	-
2 1/2"	65	2	2.5	-
3"	80	2	3	-
4"	100	2	3	-
5"	125	2.5	3.5	-
6"	150	2.5	3.5	-
8"	200	3	4	-
10"	250	4	5	-
12"	300	4	5	-
14"	350	4	5	-
16"	400	4	4	-
18"	450	3	3	-
20"	500	5	3	-
24"	600	2	4	-
28"	700	3	4	-
30"	750	5	4	-

1. After installation and before pressure test, the expansion joint must be restrained by tie rods. Check that length of rods. Check that the length of rods between the flanges are the same and the nuts are properly locked in position.
2. The pipework to which the expansion joint is connected, must be properly anchored and guided. If there is any doubt, the expansion joints must be restrained by tie rods.
3. Don't use raised face flanges!

## INTRODUCTION

It can be stated generally that the proper location of rubber expansion joints is close to a main anchoring point. Following the joint in the line, a pipe guide or guides, should be installed to keep the pipe in line and prevent undue displacement of this line. This the simplest application of a joint, namely, to absorb the expansion and contraction of a pipeline between fixed anchor points.

### A. ANCHORING AND GUIDING THE PIPING SYSTEM:

**A.1. Anchor are required.** Figure 4 on illustrates a simple piping system. You will notice that in all cases, solid anchoring is provided wherever the pipeline changes direction and that the expansion joints in that line are located as close as possible to those anchor points. In addition, following the expansion joints, and again as close as is practical, pipe guides are employed to prevent displacement of the pipeline. It should be pointed out that the elbows adjacent to the pump are securely supported by the pump base so that no piping forces are transmitted to the flanges of the pump itself. Anchors shown at the 90° and the 45° bend in the pipeline must be solid anchors designed to withstand the thrust developed in the line together with any other forces imposed on the system at this point.

**A.2. Branch Connection Anchors.** Figure 5 is another illustration of the proper anchoring that should be provided in a line with a branch connection. The anchor shown at the Tee and elbow connections must be designed to withstand both the thrust and any other forces imposed on the system at these points. Again, emphasis is placed on the relative location of the joints, their anchoring points and the pipe guides.

### B. CONTROL UNITS:

**B.1. Definition And Purpose.** A control unit is a system of two or more control rod (tie rod) assemblies placed across an expansion joint from flange to flange to minimize possible damage to the expansion joint caused by excessive motion of the pipeline. This excessive motion could be caused by the failure of an anchor or some other piece of equipment in the pipeline. Figure 8 shows the proper assembly of an expansion joint with control unit details. The control rod assemblies are set at the maximum allowable expansion and/or contraction of the joint and will absorb the static pressure thrust developed at the expansion joint. When used in this manner, they are an additional safety factor, minimizing possible failure of the expansion joint and possible damage to the equipment. Control units will adequately protect the joint but the user should be sure that pipe flange strength is sufficient to withstand total force that will be encountered.

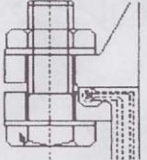
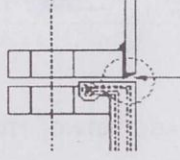
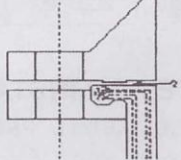
**B. 2. Illustration Of The Use Of Control Rods.** Figure 6 demonstrates the type of piping connections that must be used in the event it is impossible to employ anchoring. The anchor point at the upper 90° elbow in the discharge line has been eliminated. (It is shown in Figure 4). In this situation, it is necessary to employ properly designed control units with the joints located in this non-anchored line. Without the use of these control units, the pipeline between the pump and the anchor at the 45° bend would be severely displaced due to elongation in the flexible rubber expansion joint. This elongation would proceed until the joints rupture. The use of control units in this case permits expansion of the pipeline in both the vertical and horizontal direction between the pump and the anchor at 45° bend. However, it does preclude the possibility of contraction in these respective lines as the further extension of the expansion joint is impossible because of the control units.

### C. INSTALLATION AND MAINTENANCE:

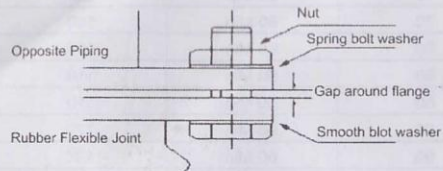
**C.1. Alignment.** Pipeline containing standard expansion joints should be lined up accurately before installing the joints. If the joints are to be installed with appreciable initial misalignment compression or elongation, the amount of these deflections should be deducted from the specified allowable movements of the joint. If the total joint deflection due to initial installation and the movement of the pipeline during system operation exceeds the published maximum allowable movement, then the pipeline should be altered to reduce the initial installation deflections. Alternately the pipe may be anchored in some approved manner to limit the pipe movements that the expansion joint must absorb.

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