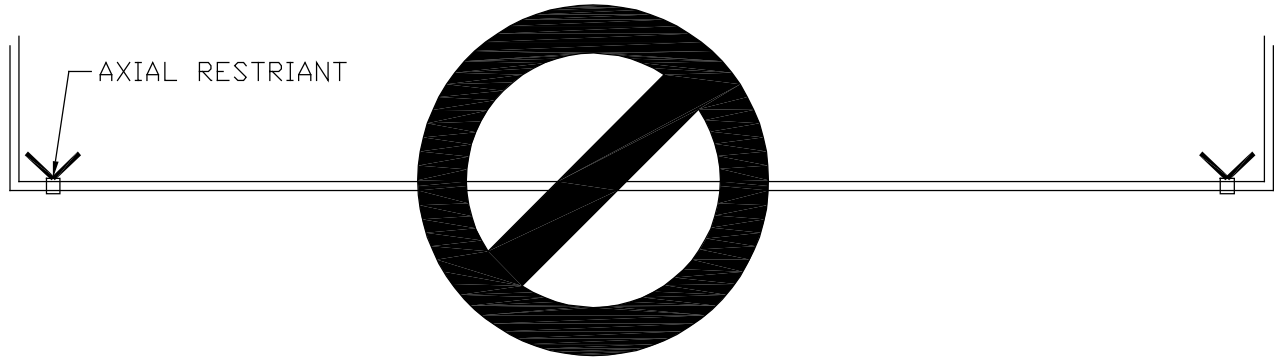
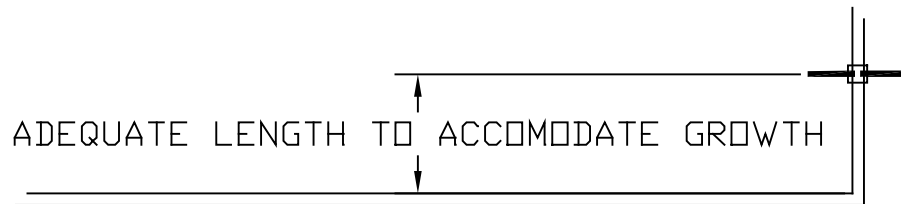


# AXIAL RESTRAINT OF STEAM PIPES

The Axial Restraint of Steam Piping raises important design configuration issues. As the pipe length grows with the temperature, the use of more than one restraint on any individual run will resist this growth and will either cause the pipe to buckle or will result in the failure of the restraint. This is unacceptable.



For short runs, a single axial restraint should be used and caution should be exercised to ensure that if restraints are fitted at the junction points of different runs, they do not fall at both ends of the same run. Caution should also be exercised to be sure that there is adequate length between corners and the first lateral restraint on a run to allow for the growth that can occur on the adjacent run.



For long runs that require more than 1 Axial Restraint, a device must be fitted into the run to absorb expansions and contractions between the restraint locations. This can take the form of an expansion loop or an expansion compensator as illustrated below.

If an expansion loop is fitted, the middle leg of the loop requires axial restraint as well. Because this restricts its movement, some caution must be used to ensure that the legs on each side of the loop are adequate to absorb the expansion for their respective runs. If the distance between the loop and the restraints on adjacent runs is approximately the same the system will be balanced and both legs will bend about the same. If the dimensions to the axial restraints vary significantly, the distortion of the two different legs will vary from one another in direct proportion and this should be addressed in design. Kinetics is not responsible for the design of these loops.

## AXIAL RESTRAINT OF STEAM PIPES

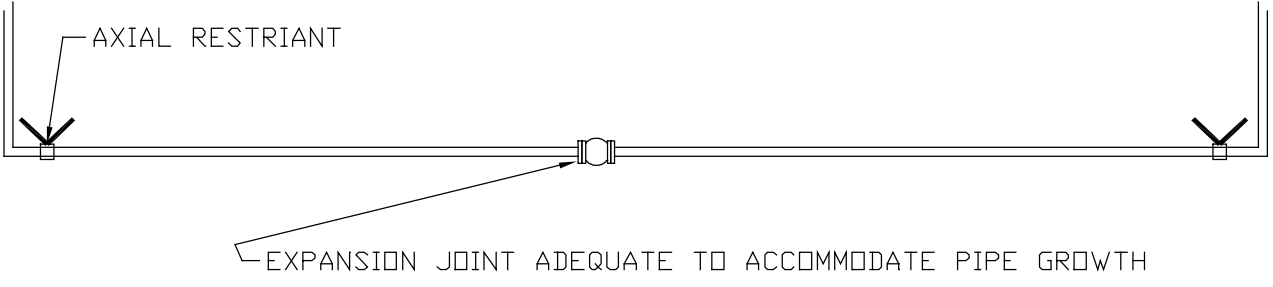
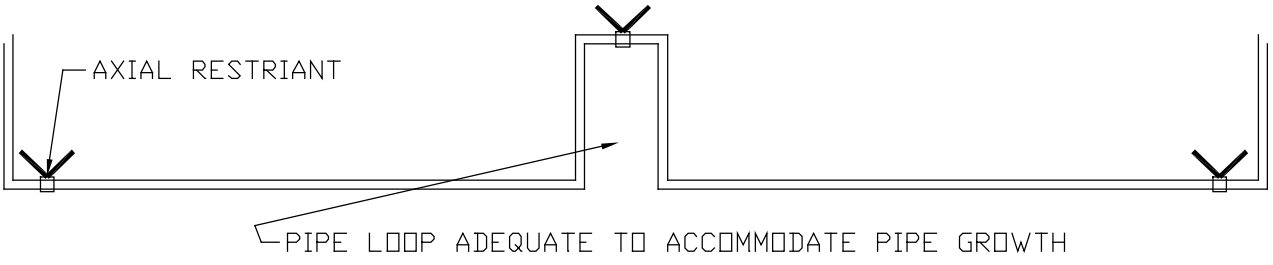
PAGE SERIES 1 OF 2

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**AXIAL RESTRAINT OF STEAM PIPES**

PAGE SERIES 2 OF 2

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