SUPPORTS, GUIDES and ANCHORS

Installation, Operating and Maintenance Instructions

GENERAL

1. The placement of guides, supports and anchors is essential to the proper functioning of any expansion joint. Correct installations will prevent the pipe from sagging and provide for proper alignment. Improper installations could result in pipe displacements in excess of the selected expansion joints capability.
2. All expansion joints must be bound by two anchors that have been designed to resist the forces and moments imposed by the system.
3. Low friction graphite slides, Fig. 201, provide support for pipe weight while allowing both axial and lateral pipe movements.
4. Low friction graphite guides, Fig. 101, provide support for pipe weight, allow axial pipe movements but restrict lateral movements.
5. Radial Guides, GA Type, provide for proper pipe alignment. These guides **CANNOT** act as supports for pipe weight as they will buckle causing misalignment at slip type expansion joints in turn resulting in system leakage.
6. When a slip type expansion joint without base is installed in the center of a pipe run it is recommended that Low Friction Graphite Guides be used as the primary guide. These guides will provide pipe support and proper alignment.
7. For buried conduit systems with slip type expansion joints installed in manholes or vaults, a guide should be installed at the termination of the conduit pipe at the manhole wall (i.e. gland or link seal). In addition consideration should be given to providing a "Moment" guide within 10 feet of the manhole wall.
8. Anchors, Fig. 701 and Fig. 702, are designed to rigidly secure the pipe from any movement (axial, lateral and vertical).

INSTALLATION

1. The location of an expansion joint determines the required locations for supports, guides and anchors.

Slides/Guides

2. Always refer to the Project drawings for locations of supports and guides.
3. Table 1 (page 2) provides recommendations for guide and support spacing to be used for above ground or tunnel installations. The table applies to the following situations:
   a. Single slip type expansion joints with an integral anchor or installed immediately adjacent to a pipeline anchor.
   b. Double slip type expansion joints
   c. Intermediate guide and support spacing recommendations apply to Ball Joints as well.

Installation continued on page 2.

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Installation continued:

Table 1

Nominal Pipe Size (Inches)	Primary (1st) Guide from end(s) of Slip (Feet)	Intermediate Guide Spacing (Feet) Pressure (PSIG)				Pipe Support Spacing	
		100	150	300	400	Water	Steam
1-1/2	1-1/2	8	8	7	7	8	10
2	2	9	9	8	8	10	13
2-1/2	2	12	12	11	11	11	15
3	3	15	15	12	12	12	15
4	4	20	20	18	16	14	17
5	6	28	27	25	22	16	18
6	6	35	33	30	27	17	21
8	8	48	45	40	35	19	24
10	8	57	60	55	50	22	27
12	12	75	70	60	55	23	30
14	12	80	75	65	60	25	32
16	16	90	85	75	70	27	35
18	20	100	95	85	80	28	37
20	20	110	105	95	90	30	39
24	25	130	125	110	100	32	42

4. Table 1 is based on ASME Power Piping Code B31.1 and is applicable for horizontal straight runs of pipe, without concentrated loads such as heavy valves or fittings between supports. The spans apply to standard weight or heavier pipe operating at a maximum temperature of 750 °F (400 °C).

5. The installation of a support and/or guide is not dependent on flow direction but is dependent on anticipated pipe movement. Figures 1, 2 and 3 on page 3 depict the proper installation for the low friction graphite slides and guides as well as radial alignment guides.

6. All supports and guides should be properly welded to the outside diameter of the pipe as shown.

7. Three (3) 1-1/2” length welds are typical for 8” traverse. For traverses greater than 8”, add an additional 1-1/2” length weld for each additional 4” of traverse.

8. Radial alignment guides should have the spider portion of the guide installed at the housing centerline at ambient temperature.

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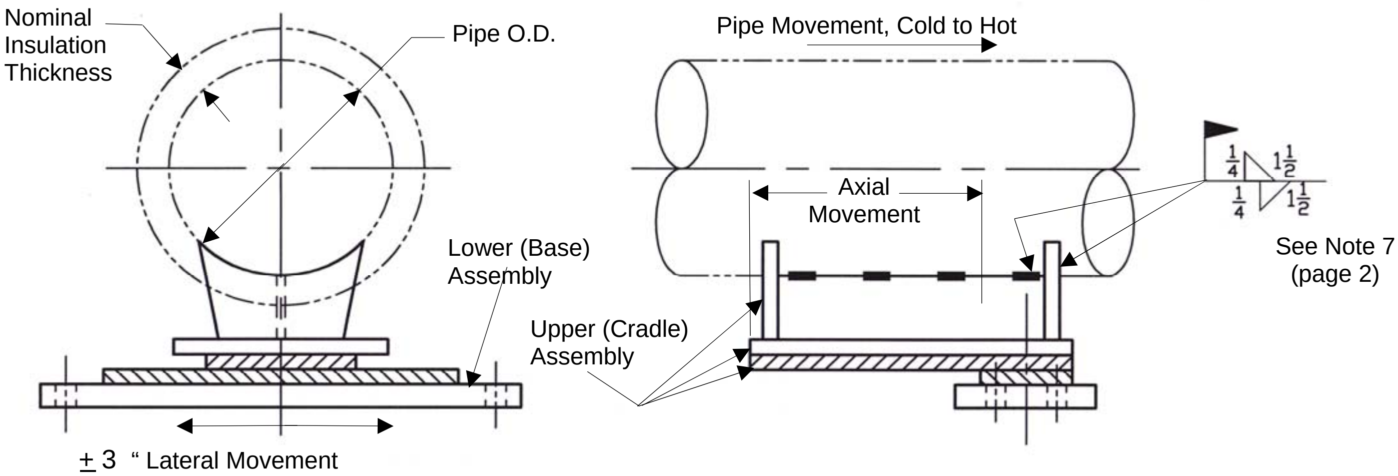

Figure 1 - "201-B" Low Friction Graphite Support

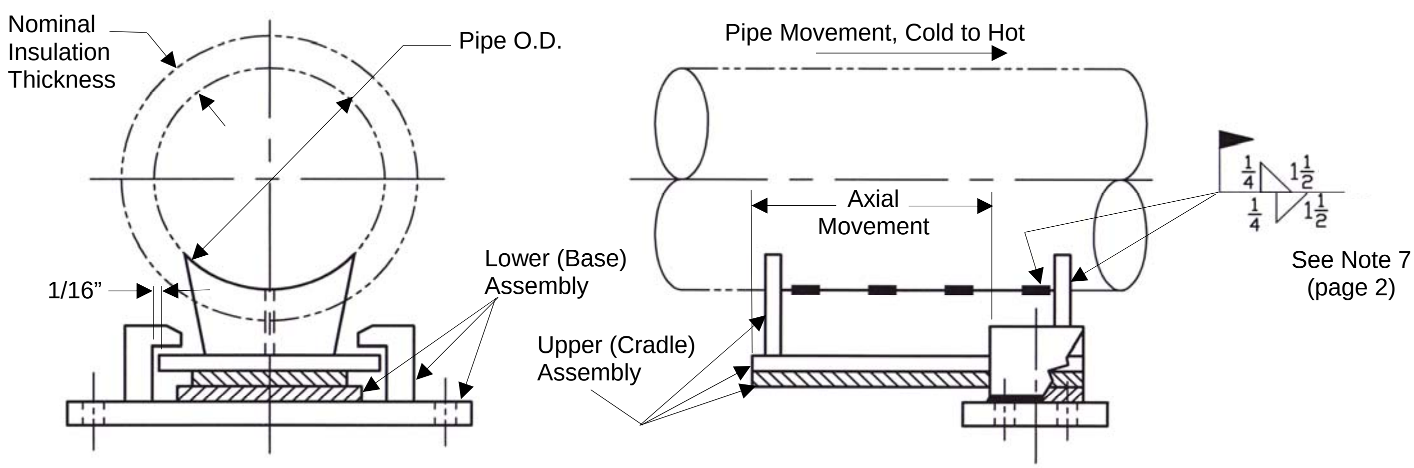

Figure 2 - "101-B" Low Friction Graphite Guide

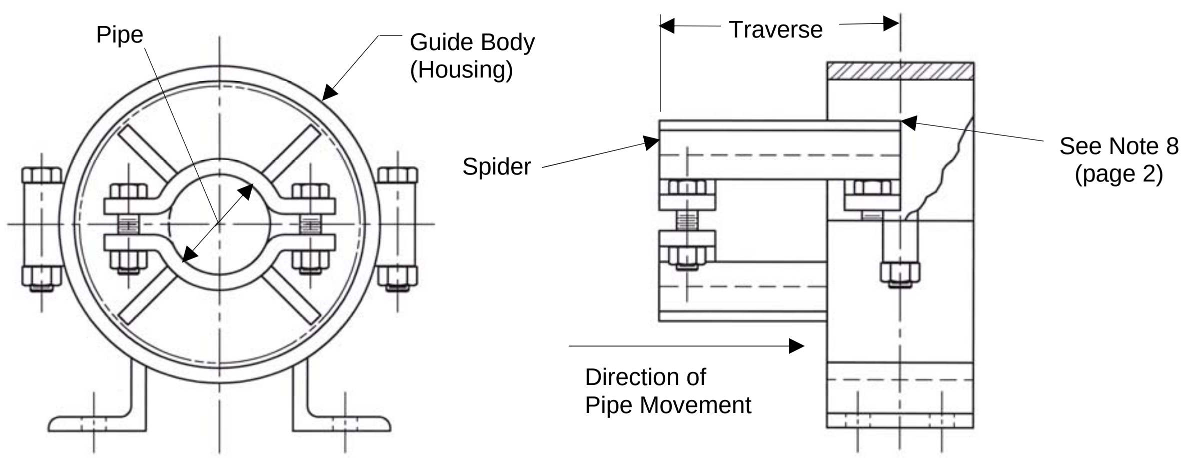

Figure 3 - Radial Alignment Guide

Anchors

9. Anchor installation should be according to Project Drawings.
10. ATS standard anchor designs have bolt holes drilled 1/8” larger than the intended bolt diameter.
11. Table 2 identifies the maximum load ratings for ATS standard Channel Riser designed anchors. The ratings were based on the use of heavy hex bolting per ASTM A-325 tensile properties.

Table 2

PIPE SIZE (Inches)	F (LBS.)
1-1/2	2,500
2	3,500
2-1/2	4,500
3	5,700
4	8,500
5	11,500
6	15,000
8	22,000
10	32,000
12	40,000
14	45,000
16	55,000
18	79,000
20	89,000
24	120,000

12. Anchors should be properly welded to the outside diameter of the pipe and rigidly secured to mating structure.

ROUTINE MAINTENANCE

1. All slides and guides should be periodically inspected in ensure that the graphite plates are intact and that the lower assemblies/base plates are securely fastened.
2. All anchors should be periodically inspected to ensure that they are rigidly mounted and that shearing or bending has not occurred.

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