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Pictorial Index

PICTORIAL INDEX

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## Transmission Conductor Vibration Dampers Dissipator High-Efficiency Stockbridge Damper — 1700AA Series

### New Bell-shaped Weight Design

AFL’s new Dissipator high-efficiency stockbridge damper 1700AA series provides a significant performance improvement over our traditional damper due to its unique offset bell-shaped weight configuration. The new offset weight design basically doubles the number of resonant frequencies, thereby providing a more consistent efficiency performance over the aeolian frequency span. AFL combined the proven performance of our unique bell-shaped weights and incorporated them in a design using two different size weights on unequal messenger lengths. The end result produced a damper with optimum performance that will eliminate damage caused by aeolian vibration thereby extending the life of a transmission line.

### Applicable Conductor Types:

ACSR, ACSR-TW, ACSS (HiTemp), ACSS-TW, AAC, AAAC, ACAR

### Note:

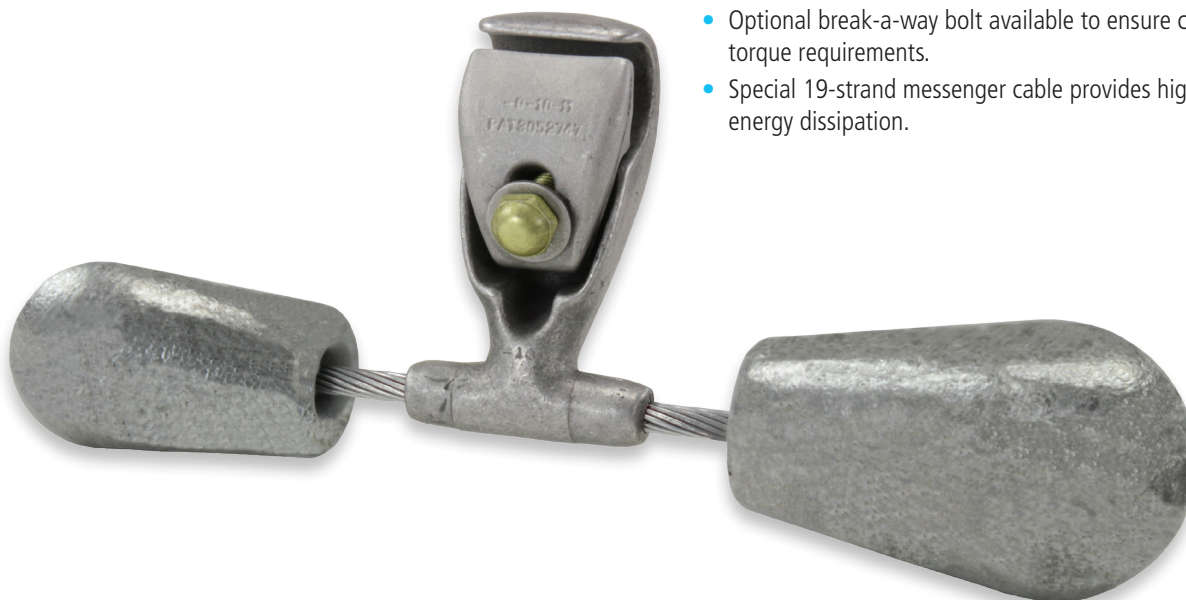
Please contact AFL for use.

### Vibrec® Damper Placement Software

AFL has the longest standing history in vibration analysis today. From the many years of testing and gathering of empirical data, AFL introduced Vibrec, an integrated Windows®-based vibration analysis program that is available as a “Free Download” on our website. This program allows users to perform analysis on transmission lines by inputting various mechanical and environmental parameters that can affect vibration. With this information, Vibrec determines how many AFL Stockbridge vibration dampers or Speed-Grip® Spacers will be required for each span and suggests the best location for these accessories. You can also contact our technical support team for a free analysis.

### Features

- Four natural frequency response modes and the unique weight shape provide one of the widest frequency ranges of coverage in the industry.
- Damper’s unique bell shaped weight with smooth contours throughout the entire damper design provides corona performance up to 500 kV.
- Unique conductor clamp design can be used on HiTemp® conductor applications up to 250°C without the need for armor rods.
- Optional break-a-way bolt available to ensure consistent torque requirements.
- Special 19-strand messenger cable provides highly efficient energy dissipation.



## Transmission Conductor Vibration Dampers Dissipator High-Efficiency Stockbridge Damper — 1700AA Series (cont.)

The AFL Stockbridge Damper is the most efficient way to extend the life of a transmission line. It is designed to eliminate the damage caused by aeolian vibration.

### What is Aeolian Vibration?

Aeolian vibration is a high frequency motion that can occur when a smooth, steady crosswind blows on aerial cables. This laminar wind creates vortices, which are detached at regular intervals on the leeward side, alternating from top and bottom of the cable. The detachments create vertical forces causing the cable to vibrate in standing waves. The primary factors effecting aeolian vibration are span length, tension and environmental factors. The amount of energy imparted to a cable varies directly with the span length. With increasing tension, the tendency of a cable to vibrate rises as its self dampening ability reduces.

The first aeolian vibration fatigue failures of stranded conductor were reported in 1917. George Stockbridge of Southern California Edison patented the stockbridge damper in 1928. During this same timeframe, an outdoor test span and indoor laboratory was erected for the study of vibration. These expanded facilities, along with more than 70 years of research and experience, have assisted AFL in understanding the theory of vibration and its control. Aeolian vibration still occurs and causes damage to conductors, hardware and towers. AFL Stockbridge Dampers dissipate this damaging force of nature.

### Dampers for T2 Conductors

AFL has developed a special clamp insert that allows the damper to be firmly secured to a T2 conductor. See page 394 for an illustration of the damper and the attachment. Please contact our engineering department for applications involving T2 Conductor.

Vibration Recommendation Form can be found on page 404.

# Vibration Dampers for Aluminum Type Conductor (ACSR, ACSR-TW, ACSS, ACSS-TW, AAC, AAAC, ACAR)

**Table 1: Weight Selection**

WEIGHT CATALOG NUMBER	BARE CONDUCTOR DIAMETER RANGE		WEIGHT <sup>1</sup>	
			STEEL	
	IN	MM	LBS	KG
<b>ALUMINUM CONDUCTOR</b>				
1703	0.361 - 0.570	9.2 - 14.4	2.9	1.32
1704	0.571 - 0.770	14.5 - 19.5	6.5	2.95
1705	0.771 - 0.970	19.6 - 24.6	9.9	4.49
1706AA	0.971 - 1.210	24.7 - 30.7	8.2	3.72
1707AA	1.211 - 1.382	30.8 - 35.1	8.4	3.81
1708AA	1.383 - 1.825	35.2 - 46.4	16.7	7.57

**Table 2: Clamp Selection**

CLAMP AFL NO.	OVERALL DIAMETER RANGE AT POINT OF INSTALLATION		CLAMP BOLT DIA <sup>4</sup>	WEIGHT <sup>2</sup>	
				ALUMINUM	
	IN	MM		LBS	KG
-2	0.270 - 0.360	6.9 - 9.1	7/16	0.3	0.15
-3	0.361 - 0.460	9.2 - 11.6	7/16	0.3	0.15
-4	0.461 - 0.570	11.7 - 14.4	7/16	0.3	0.15
-5	0.571 - 0.675	14.5 - 17.1	7/16	0.4	0.16
-6	0.676 - 0.770	17.2 - 19.8	7/16	0.4	0.15
-7	0.771 - 0.870	19.6 - 22.1	1/2	0.6	0.26
-8	0.871 - 0.970	22.2 - 24.6	1/2	0.6	0.26
-9 <sup>3</sup>	0.971 - 1.090	24.7 - 27.6	1/2	1.1	0.50
-10 <sup>3</sup>	1.091 - 1.210	27.7 - 30.7	1/2	1.1	0.50
-11 <sup>3</sup>	1.211 - 1.330	30.8 - 33.7	1/2	1.1	0.50
-13 <sup>3</sup>	1.331 - 1.486	33.8 - 37.7	5/8	1.6	0.73
-14 <sup>3</sup>	1.487 - 1.643	37.8 - 41.7	5/8	1.5	0.68
-15 <sup>3</sup>	1.644 - 1.780	41.8 - 45.2	5/8	1.5	0.68
-16 <sup>3</sup>	1.781 - 1.960	45.3 - 49.7	5/8	2.2	1.00
-17 <sup>3</sup>	1.961 - 2.157	49.8 - 54.7	5/8	2.2	1.00
-18 <sup>3</sup>	2.158 - 2.375	54.8 - 60.3	5/8	2.4	1.09
-19 <sup>3</sup>	2.376 - 2.614	60.4 - 66.4	5/8	2.4	1.09

**Notes:**

- Steel weight shown in Table 1 includes both damper weights and other steel parts used. For complete weight of damper assembly, add partial weights shown in Tables 1 and 2.
- Regular aluminum hexagon head bolts are standard on assemblies that have 1705 weights and smaller. Assemblies having 1706AA weights and larger have special Corona hexagon head bolts.
- For conductor sizes not covered in the table, consult AFL Technical Support Team at 1.800.866.7385.
- Installation instructions for dampers start on page 393.
- Weight combination sizes for cables smaller than 0.971" (1700 series) have identical weights on both sides.
- Weight size 1701 uses a 7-strand messenger cable.

**Ordering Instructions**
**Step 1: Determine Conductor Diameter**

All damper ordering is based on the diameter of the conductor being used.

**Step 2: Select Weight Catalog Number**

Use Table 1 to select the correct weight catalog number based on the diameter of the bare conductor being used.

**Step 3: Select Clamp Catalog Number**

Before selecting a Clamp, ask one question 'Does this application require placement of clamp over armor rods?'

If yes, select the correct clamp catalog number from Table 2 based on the total diameter of the conductor and the armor rods.

If no, select the correct clamp catalog number from Table 2 based on the diameter of the bare conductor being used.

**Step 4: Select Bolts**

For breakaway bolts, use 'BA'. For standard bolts, leave blank.

**NOTE:** Breakaway bolts may not be corona free at voltages 345kV and above.

**Step 5: Create Catalog Number**

Weight Catalog Number

 + 
 Clamp Catalog Number + 
 Bolts
**Example:**
**Without Armor Rods**

Conductor Diameter: 1.108" (28.1 mm)

Weight Size from Table 1: 1706AA

Clamp Size from Table 2: -10

Bolts: Breakaway

**Catalog Number: 1706AA-10BA**

**With Armor Rods**

Conductor Diameter: 1.108" (28.1 mm)

Weight Size from Table 1: 1706AA

Diameter of Conductor and Armor Rods: 1.728" (43.9 mm)

Clamp Size from table 2: -15

Bolts: Standard

**Catalog Number: 1706AA-15**

## Vibration Dampers for Galvanized Steel or Alumoweld® Strand

**Table 1: Weight Selection**

WEIGHT CATALOG NUMBER	BARE CONDUCTOR DIAMETER RANGE		WEIGHT <sup>2</sup>	
			STEEL	
	IN	MM	LBS	KG
<b>GALVANIZED STEEL, ALUMOWELD®</b>				
1701 <sup>1</sup>	0.270 - 0.430	6.9 - 10.9	2.6	1.18
1702 <sup>1</sup>	0.431 - 0.630	11.0 - 16.0	5.5	2.49

**Table 2: Clamp Selection**

CLAMP AFL NO.	OVERALL DIAMETER RANGE AT POINT OF INSTALLATION		CLAMP BOLT DIA. <sup>4</sup>	WEIGHT <sup>2</sup>	
				ALUMINUM	
	IN	MM		LBS	KG
-2	0.270 - 0.360	6.9 - 9.1	7/16	0.3	0.15
-3	0.361 - 0.460	9.2 - 11.6	7/16	0.3	0.15
-4	0.461 - 0.570	11.7 - 14.4	7/16	0.3	0.15
-5	0.571 - 0.675	14.5 - 17.1	7/16	0.4	0.16
-6	0.676 - 0.770	17.2 - 19.8	7/16	0.4	0.15
-7	0.771 - 0.870	19.6 - 22.1	1/2	0.6	0.26
-8	0.871 - 0.970	22.2 - 24.6	1/2	0.6	0.26

**Notes:**

- Steel weight shown in Table 1 includes both damper weights and other steel parts used. For complete weight of damper assembly, add partial weights shown in Tables 1 and 2.
- For conductor sizes not covered in the table, consult AFL Technical Support Team at 1.800.866.7385.
- Installation instructions for dampers start on page 393.

**Ordering Instructions**

**Step 1: Determine Conductor Diameter**

All damper ordering is based on the diameter of the conductor being used.

**Step 2: Select Weight Catalog Number**

Use Table 1 to select the correct weight catalog number based on the diameter of the bare conductor being used.

**Step 3: Select Clamp Catalog Number**

Before selecting a Clamp, ask one question 'Does this application require placement of clamp over armor rods?'

If yes, select the correct clamp catalog number from Table 2 based on the total diameter of the conductor and the armor rods.

If no, select the correct clamp catalog number from Table 2 based on the diameter of the bare conductor being used.

**Step 4: Select Bolts**

For breakaway bolts, use 'BA'. For standard bolts, leave blank.

**Step 5: Create Catalog Number**

$$\boxed{\text{Weight Catalog Number}} + \boxed{\text{Clamp Catalog Number}} + \boxed{\text{Bolts}}$$

# Transmission Conductor Vibration Dampers Dissipator High-Efficiency Stockbridge Damper

## Quick Reference Guide for ACSR Conductors

CODE WORD	CONDUCTOR			DAMPER CATALOG NUMBER*
	SIZE	STRANDING	DIAMETER	
	KCMIL	AL/ST	IN.	
Rook	636	24/7	0.977	1706AA-9
Grosbeak	636	26/7	0.990	1706AA-9
Teal	605	30/19	0.994	1706AA-9
Flamingo	666.6	24/7	1.000	1706AA-9
Egret	636	30/19	1.019	1706AA-9
Stilt	715.5	24/7	1.036	1706AA-9
Coot	795	36/1	1.040	1706AA-9
Starling	715.5	26/7	1.051	1706AA-9
Tern	795	45/7	1.063	1706AA-9
Redwing	715.5	30/19	1.081	1706AA-9
Cuckoo	795	24/7	1.092	1706AA-10
Condor	795	54/7	1.093	1706AA-10
Drake	795	26/7	1.108	1706AA-10
Ruddy	900	45/7	1.131	1706AA-10
Mallard	795	30/19	1.140	1706AA-10
Catbird	954	36/1	1.140	1706AA-10
Canary	900	54/7	1.162	1706AA-10
Rail	954	45/7	1.165	1706AA-10
Tanager	1033.5	36/1	1.186	1706AA-10
Cardinal	954	54/7	1.196	1706AA-10
Ortolan	1033.5	45/7	1.212	1707AA-11
Curlew	1033.5	54/7	1.244	1707AA-11
Bluejay	1113	45/7	1.259	1707AA-11
Bunting	1192.5	45/7	1.302	1707AA-11
Bittern	1272	45/7	1.345	1707AA-13
Pheasant	1272	54/19	1.382	1707AA-13

\* Add suffix "BA" to catalog number for break-a-way (shear-head) bolt option (i.e. 1708AA-14BA)

## Transmission Conductor Vibration Dampers Dissipator High-Efficiency Stockbridge Damper (cont.)

### Quick Reference Guide for ACSR Conductors (cont.)

CODE WORD	CONDUCTOR			DAMPER CATALOG NUMBER*
	SIZE	STRANDING	DIAMETER	
	KCMIL	AL/ST	IN.	
Dipper	1351.5	45/7	1.386	1708AA-13
Martin	1351.5	54/19	1.424	1708AA-13
Bobolink	1431	45/7	1.427	1708AA-13
Plover	1431	54/19	1.465	1708AA-13
Nuthatch	1510.5	45/7	1.466	1708AA-13
Lapwing	1590	45/7	1.504	1708AA-14
Parrot	1510.5	54/19	1.506	1708AA-14
Falcon	1590	54/19	1.545	1708AA-14
Chukar	1780	84/19	1.602	1708AA-14
-----	2034	72/7	1.681	1708AA-15
Kiwi	2167	72/7	1.737	1708AA-15
Bluebird	2156	84/19	1.762	1708AA-15
Thrasher	2312	76/19	1.802	1708AA-16

\* Add suffix "BA" to catalog number for break-a-way (shear-head) bolt option (i.e. 1708AA-14BA)



## Transmission Conductor Vibration Dampers Dissipator High-Efficiency Stockbridge Damper (cont.)

### Quick Reference Guide for AAC Conductors

CODE WORD	CONDUCTOR			DAMPER CATALOG NUMBER*
	SIZE	STRANDING	DIAMETER	
	KCMIL	ALUMINUM	IN.	
Violet	715.5	37	0.974	1706AA-9
Nasturtium	715.5	61	0.975	1706AA-9
Petunia	750	37	0.997	1706AA-9
Cattail	750	61	0.998	1706AA-9
Arbutus	795	37	1.026	1706AA-9
Lilac	795	61	1.028	1706AA-9
—	800	37	1.031	1706AA-9
Heliotrope	800	61	1.031	1706AA-9
Snapdragon	900	61	1.094	1706AA-10
Magnolia	954	37	1.124	1706AA-10
Goldenrod	954	61	1.126	1706AA-10
Camellia	1000	61	1.152	1706AA-10
Bluebell	1033.5	37	1.170	1706AA-10
Larkspur	1033.5	61	1.172	1706AA-10
Gladiolus	1510.5	61	1.187	1706AA-10
Marigold	1113	61	1.216	1707AA-11
Coreopsis	1590	61	1.250	1707AA-11
Hawthorn	1192.5	61	1.258	1707AA-11
Narcissus	1272	61	1.300	1707AA-11
Columbine	1351	61	1.340	1707AA-13
Carnation	1431	61	1.379	1707AA-13
—	1500	91	1.412	1708AA-13
Jessamine	1750	61	1.525	1708AA-14
Cowslip	2000	91	1.630	1708AA-14

\* Add suffix "BA" to catalog number for break-a-way (shear-head) bolt option (i.e. 1708AA-14BA)

## Transmission Conductor Vibration Dampers Dissipator High-Efficiency Stockbridge Damper (cont.)

### Quick Reference Guide for AAAC and ACAR Conductors

CODE WORD	CONDUCTOR			DAMPER CATALOG NUMBER*
	SIZE	STRAND	DIAMETER	
	KCMIL		IN.	
Flint	740.8	37	0.991	1706AA-9
—	853.7	18/19	1.063	1706AA-9
—	853.7	24/13	1.063	1706AA-9
—	853.7	30/7	1.063	1706AA-9
Greeley	927.2	37	1.108	1706AA-10
—	927.2	18/19	1.108	1706AA-10
—	927.2	24/13	1.108	1706AA-10
—	927.2	30/7	1.108	1706AA-10
—	1024.5	18/19	1.165	1706AA-10
—	1024.5	24/13	1.165	1706AA-10
—	1024.5	30/7	1.165	1706AA-10
—	1080.6	18/19	1.196	1706AA-10
—	1080.6	24/13	1.196	1706AA-10
—	1080.6	30/7	1.196	1706AA-10
—	1180.6	24/13	1.212	1707AA-11
—	1127	42/19	1.222	1707AA-11
—	1172.3	18/19	1.246	1707AA-11
—	1172.3	24/13	1.246	1707AA-11
—	1534	42/19	1.427	1708AA-13
—	1534	54/7	1.427	1708AA-13
—	1691	—	1.498	1708AA-14
—	1700	42/19	1.502	1708AA-14
—	1700	54/7	1.502	1708AA-14

\* Add suffix "BA" to catalog number for break-a-way (shear-head) bolt option (i.e. 1708AA-14BA)

## Transmission Conductor Vibration Dampers Dissipator High-Efficiency Stockbridge Damper (cont.)

### Quick Reference Guide for ACSS HiTemp® Conductor

CODE WORD	CONDUCTOR			DAMPER CATALOG NUMBER*
	SIZE	STRANDING	DIAMETER	
	KCMIL	AL/ST	IN.	
Rook/ACSS	636	24/7	0.977	1706AA-9
Grosbeak/ACSS	636	26/7	0.990	1706AA-9
Wood Duck/ACSS	605	30/7	0.994	1706AA-9
Teal/ACSS	605	30/19	0.994	1706AA-9
Flamingo/ACSS	666.6	24/7	1.000	1706AA-9
Gannet/ACSS	666.6	26/7	1.014	1706AA-9
Scoter/ACSS	636	30/7	1.019	1706AA-9
Egret/ACSS	636	30/19	1.019	1706AA-9
Stilt/ACSS	715.5	24/7	1.036	1706AA-9
Starling/ACSS	715.5	26/7	1.051	1706AA-9
Macaw/ACSS	795	42/7	1.055	1706AA-9
Tern/ACSS	795	45/7	1.063	1706AA-9
Redwing/ACSS	715.5	30/19	1.081	1706AA-9
Cuckoo/ACSS	795	24/7	1.092	1706AA-10
Condor/ACSS	795	54/7	1.092	1706AA-10
Drake/ACSS	795	26/7	1.108	1706AA-10
Ruddy/ACSS	900	45/7	1.131	1706AA-10
Mallard/ACSS	795	30/19	1.140	1706AA-10
Canary/ACSS	900	54/7	1.162	1706AA-10
Corncrake/ACSS	954	20/7	1.165	1706AA-10
Rail/ACSS	954	45/7	1.165	1706AA-10
Towhee/ACSS	954	48/7	1.175	1706AA-10
Redbird/ACSS	954	24/7	1.196	1706AA-10
Cardinal/ACSS	954	54/7	1.196	1706AA-10
Snowbird/ACSS	1033.5	42/7	1.203	1706AA-10
Ortolan/ACSS	1033.5	45/7	1.212	1707AA-11
Curlew/ACSS	1033.5	54/7	1.245	1707AA-11
Canvasback/ACSS	954	30/19	1.248	1707AA-11
Bluejay/ACSS	1113	45/7	1.259	1707AA-11
Finch/ACSS	1113	54/19	1.293	1707AA-11
Bunting/ACSS	1192.5	45/7	1.302	1707AA-11

\* Add suffix "BA" to catalog number for break-a-way (shear-head) bolt option (i.e. 1708AA-14BA)

## Transmission Conductor Vibration Dampers Dissipator High-Efficiency Stockbridge Damper (cont.)

### Quick Reference Guide for ACSS HiTemp® Conductor (cont.)

CODE WORD	CONDUCTOR			DAMPER CATALOG NUMBER*
	SIZE	STRANDING	DIAMETER	
	KCMIL	AL/ST	IN.	
Grackle/ACSS	1192.5	54/19	1.338	1707AA-13
Bittern/ACSS	1272	45/7	1.345	1707AA-13
Diver/ACSS	1272	48/7	1.357	1707AA-13
Pheasant/ACSS	1272	54/19	1.382	1707AA-13
Dipper/ACSS	1351.5	45/7	1.386	1708AA-13
Martin/ACSS	1351.5	54/19	1.424	1708AA-13
Bobolink/ACSS	1431	45/7	1.427	1708AA-13
Plover/ACSS	1431	54/19	1.465	1708AA-13
Nuthatch/ACSS	1510	45/7	1.466	1708AA-13
Ratite/ACSS	1590	42/7	1.492	1708AA-14
Lapwing/ACSS	1590	45/7	1.504	1708AA-14
Parrot/ACSS	1510	54/19	1.505	1708AA-14
Falcon/ACSS	1590	54/19	1.544	1708AA-14
Chukar/ACSS	1780	84/19	1.602	1708AA-14
Mockingbird/ACSS	2034.5	72/7	1.681	1708AA-15
Roadrunner/ACSS	2057	76/19	1.700	1708AA-15
Kiwi/ACSS	2167	72/7	1.737	1708AA-15
Bluebird/ACSS	2156	84/19	1.762	1708AA-15

\* Add suffix "BA" to catalog number for break-a-way (shear-head) bolt option (i.e. 1708AA-14BA)

## Transmission Conductor Vibration Dampers Dissipator High-Efficiency Stockbridge Damper (cont.)

### Quick Reference Guide for ACSS/TW HiTemp® Conductor

CODE WORD	CONDUCTOR			DAMPER CATALOG NUMBER*
	SIZE	TYPE	DIAMETER	
	KCMIL		IN.	
Maumee/ACSS/TW	768.2	13	0.977	1706AA-9
Puffin/ACSS/TW	795	10	0.980	1706AA-9
Wabash/ACSS/TW	762.8	16	0.990	1706AA-9
Condor/ACSS/TW	795	13	0.993	1706AA-9
Drake/ACSS/TW	795	16	1.010	1706AA-9
Phoenix/ACSS/TW	954	5	1.044	1706AA-9
Kettle/ACSS/TW	957.2	7	1.060	1706AA-9
Rail/ACSS/TW	954	7	1.061	1706AA-9
Fraser/ACSS/TW	946.7	10	1.077	1706AA-9
Canary/ACSS/TW	900	13	1.080	1706AA-9
Cardinal/ACSS/TW	954	13	1.084	1706AA-9
Snowbird/ACSS/TW	1033.5	5	1.089	1706AA-9
Columbia/ACSS/TW	966.2	13	1.092	1706AA-10
Ortolan/ACSS/TW	1033.5	7	1.102	1706AA-10
Suwannee/ACSS/TW	959.6	16	1.108	1706AA-10
Curlew/ACSS/TW	1033.5	13	1.128	1706AA-10
Avocet/ACSS/TW	1113	5	1.129	1706AA-10
—	1080	7	1.131	1706AA-10
Bluejay/ACSS/TW	1113	7	1.143	1706AA-10
Cheyenne/ACSS/TW	1168.1	5	1.155	1706AA-10
Genesee/ACSS/TW	1158	7	1.165	1706AA-10
Oxbird/ACSS/TW	1192.5	5	1.167	1706AA-10
Bunting/ACSS/TW	1192.5	7	1.181	1706AA-10
Finch/ACSS/TW	1113	13	1.185	1706AA-10
Hudson/ACSS/TW	1158.4	13	1.196	1706AA-10
Scissortail/ACSS/TW	1272	5	1.202	1706AA-10
Catawba/ACSS/TW	1272	5	1.203	1706AA-10
Nelson/ACSS/TW	1257.1	7	1.213	1707AA-11
Bittern/ACSS/TW	1272	7	1.220	1707AA-11
Grackle/ACSS/TW	1192.5	13	1.225	1707AA-11
Yukon/ACSS/TW	1233.6	13	1.245	1707AA-11

\* Add suffix "BA" to catalog number for break-a-way (shear-head) bolt option (i.e. 1708AA-14BA)

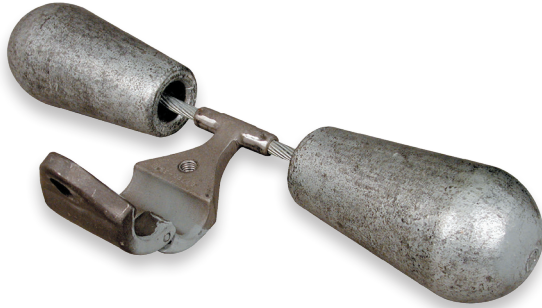
## Transmission Conductor Vibration Dampers Dissipator High-Efficiency Stockbridge Damper (cont.)

### Quick Reference Guide for ACSS/TW HiTemp® Conductor (cont.)

CODE WORD	CONDUCTOR			DAMPER CATALOG NUMBER*
	SIZE	TYPE	DIAMETER	
	KCMIL		IN.	
Truckee/ACSS/TW	1372.5	5	1.248	1707AA-11
Dipper/ACSS/TW	1351.5	7	1.256	1707AA-11
Mackenzie/ACSS/TW	1359.7	7	1.259	1707AA-11
Pheasant/ACSS/TW	1272	13	1.264	1707AA-11
Thames/ACSS/TW	1334.6	13	1.290	1707AA-11
Bobolink/ACSS/TW	1431	7	1.291	1707AA-11
St. Croix/ACSS/TW	1467.8	5	1.292	1707AA-11
Martin/ACSS/TW	1351.5	13	1.300	1707AA-11
Miramichi/ACSS/TW	1455.3	7	1.302	1707AA-11
Platte/ACSS/TW	1569	5	1.334	1707AA-13
Plover/ACSS/TW	1431	13	1.337	1707AA-13
Merrimack/ACSS/TW	1433.6	13	1.340	1707AA-13
Potomac/ACSS/TW	1557.4	7	1.345	1707AA-13
Lapwing/ACSS/TW	1590	7	1.358	1707AA-13
Rio Grande/ACSS/TW	1533.3	13	1.382	1707AA-13
Schuykill/ACSS/TW	1657.4	7	1.386	1708AA-13
Falcon/ACSS/TW	1590	13	1.408	1708AA-13
Pecos/ACSS/TW	1622	13	1.424	1708AA-13
Pee Dee/ACSS/TW	1758.6	7	1.427	1708AA-13
Chukar/ACSS/TW	1780	8	1.445	1708AA-13
James/ACSS/TW	1730.6	13	1.470	1708AA-13
Athabaska/ACSS/TW	1949.6	7	1.504	1708AA-14
Cumberland/ACSS/TW	1926.9	13	1.545	1708AA-14
Powder/ACSS/TW	2153.8	8	1.602	1708AA-14
Bluebird/ACSS/TW	2156	8	1.608	1708AA-14
Santee/ACSS/TW	2627.3	8	1.762	1708AA-15

\* Add suffix "BA" to catalog number for break-a-way (shear-head) bolt option (i.e. 1708AA-14BA)

## Guy Wire Vibration Dampers Stockbridge Type—2200 Series



The 2200 series guy wire dampers have been designed to dampen the wind-induced motion of guy wires. They were originally developed for the guy wires on United States Military navigation towers.

Aeolian vibration is a high frequency motion that can occur when a smooth, steady crosswind blows on aerial cables. Aeolian vibration can cause loosening of bolted connections and wear at the guy wire joints. With the proper placement of AFL guy wire dampers, aeolian vibration damage can be eliminated.

### Features

#### Engineered Performance

The guy wire damper features a specially designed hinged clamp with Belleville washers which provides maximum clamping area over the guy wire while maintaining a sufficient clamping force. The combination of these two features keeps the damper from "walking down" the wire.

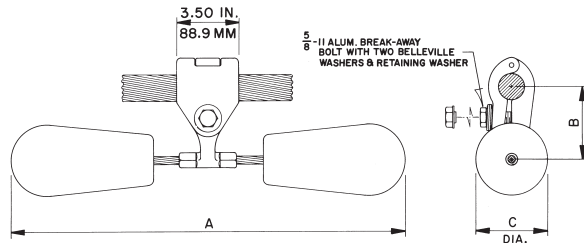
#### No Special Tools Needed with Breakaway Bolt Option

With the breakaway bolt, no special tools or torque wrench is needed. Simply tighten the bolt until the head shears off. This means proper torque has been achieved.

#### Damper Recommendations

For specific application requirements, contact the AFL Technical Support Team at 1.800.866.7385.

## Guy Wire Vibration Dampers Stockbridge Type—2200 Series (cont.)



### Ordering Instructions

#### Determine Conductor Diameter

Select guy wire damper catalog number based on the diameter of the conductor being used.

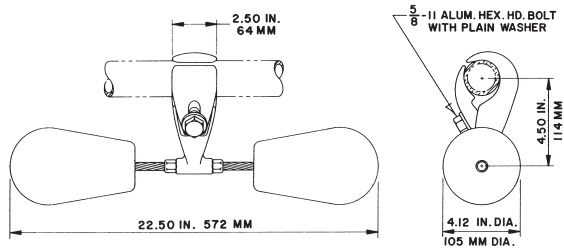
AFL NO.	CONDUCTOR DIAMETER RANGE				DAMPER WEIGHT NUMBER	DIMENSIONS						WEIGHT	
	MIN		MAX			A		B		C		LBS	KG
	IN	MM	IN	MM		IN	MM	IN	MM	IN	MM		
2202	0.438	11.1	0.500	12.7	1702	12.50	318	3.00	76	2.25	57	7.1	3.22
2203	0.562	14.3	0.625	15.9	1702	12.50	318	3.00	76	2.25	57	7.1	3.22
2204	0.688	17.5	0.750	19.1	1704	13.50	343	3.00	76	2.5	64	8.1	3.67
2205	0.812	20.6	0.875	22.2	1705	16.00	406	4.00	102	2.78	71	12.3	5.58
2206	0.938	23.8	0.970	24.6	1705	16.00	406	4.00	102	2.78	71	12.2	5.53
2207	0.971	24.7	1.000	25.4	1706	15.00	381	4.00	102	3.25	83	15.7	7.12
2208	1.062	27.0	1.125	28.6	1706	15.00	381	4.00	102	3.25	83	15.6	7.08
2209	1.188	30.2	1.210	30.7	1706	15.75	400	4.12	105	3.25	83	15.9	7.21
2210	1.211	30.8	1.250	31.8	1707	20.25	514	4.12	105	3.5	89	22.2	10.07
2211	1.312	33.3	1.375	34.9	1707	20.25	514	4.12	105	3.5	89	22.1	10.02
2212	1.438	36.5	1.500	38.1	1708	22.50	572	4.12	105	4.12	105	31.2	14.15
2213	1.562	39.7	1.625	41.3	1708	22.50	572	4.50	114	4.12	105	31.9	14.47
2214	1.688	42.9	1.750	44.5	1708	22.50	572	4.50	114	4.75	105	31.9	14.47
2215	1.812	46.0	1.875	47.6	1709	24.50	622	4.50	114	4.75	121	35.0	15.88
2216	1.938	49.2	2.000	50.8	1709	24.50	622	4.50	114	4.75	121	35.0	15.88
2217	2.062	52.4	2.125	54.0	1709	24.50	622	4.50	114	4.75	121	35.5	161.00
2218	2.188	55.6	2.250	57.2	1709	24.50	622	4.50	114	4.75	121	35.5	16.10
2219	2.312	58.7	2.375	60.3	1709	24.50	622	4.50	114	4.75	121	35.4	16.06
2220	2.438	61.9	2.500	63.5	1709	24.50	622	4.75	121	4.75	121	36.1	16.37
2221	2.562	65.1	2.625	66.7	1709	24.50	622	4.75	121	4.75	121	36.0	16.33
2222	2.688	68.3	2.750	69.9	1709	24.50	622	4.75	121	4.75	121	35.8	16.24
2223	2.812	71.4	2.875	73.0	1709	24.50	622	5.00	127	4.75	121	36.7	16.65
2224	2.938	74.6	3.000	76.2	1709	24.50	622	5.00	127	4.75	121	36.6	16.60
2225	3.062	77.8	3.125	79.4	1709	24.50	622	5.00	127	4.75	121	36.4	16.51
2226	3.188	81.0	3.250	82.6	1709	24.50	622	5.25	133	4.75	121	36.9	16.74
2227	3.312	84.1	3.375	85.7	1709	24.50	622	5.25	133	4.75	121	36.7	16.65
2228	3.438	87.3	3.500	88.9	1709	24.50	622	5.25	133	4.75	121	36.5	16.56
2229	3.562	90.5	3.625	92.1	1709	24.50	622	5.50	140	4.75	121	37.1	16.83
2230	3.688	93.7	3.750	95.3	1709	24.50	622	5.50	140	4.75	121	37.0	16.78
2231	3.812	96.8	3.875	98.4	1709	24.50	622	5.50	140	4.75	121	36.8	16.69

**Note:**

All guy wire dampers come standard with breakaway bolts.



## Highway Truss Vibration Dampers



AFL Highway Truss Dampers offer the most practical and economical solution for vibration problems normally encountered in highway sign trusses. The AFL 1708-17.1 damper, weighing 31 lbs. (14.06 kg), is the size most commonly used for highway truss applications. A single damper located at the mid-point of the truss will provide vibration protection for lengths between 60 and 140 ft (18.3-42.7 m). Special consideration should be given to longer spans or cantilever applications.

### Ordering Information

AFL NO.	TUBE O.D.		TOTAL WEIGHT			
	IN	MM	ALUM. LB.	KG	TOTAL LB.	KG
1708-17.1	2.00	50.8	2.2	1.00	31.0	14.06

#### Notes:

1. Truss damper comes standard with breakaway bolt.
2. The 1708-17.1 damper also fits 1-1/2" SPS tube.
3. For truss sizes not listed and recommended placement, contact the AFL Technical Support Team at 1.800.866.7385.

## Spacer Dampers with Elastomer Bushed Clamps—280000 Series



Spacer dampers were originally developed to suppress bundle conductor subspan oscillations that could cause damage to multi-conductor bundle systems. Later, it was determined that they could be used to control aeolian vibration as well as wake-induced oscillation. The spacer damper is designed to maintain the original geometry of the bundle system against loads. It must also restore the bundle to normal posture after experiencing severe loads due to short-circuit currents, ice and wind.

The AFL Spacer Damper combines the function of a spacer in maintaining conductor separation and the function of a damper in controlling aeolian vibration. The viscoelastic bushings firmly grip the conductor. AFL has developed spacer damper designs to meet various bundle configurations and installation requirements.

### Features

#### Controls Oscillation and Aeolian Vibration

The Spacer Damper is the most efficient way to extend the life span of the transmission line. It is designed to dissipate the damaging vibrations caused by wind.

#### No Special Tools Needed with Breakaway Bolt Option

With the breakaway bolt, no special tools nor torque wrench are needed. Simply tighten the bolt until the head shears off, indicating proper torque has been achieved.

#### Customized Designs

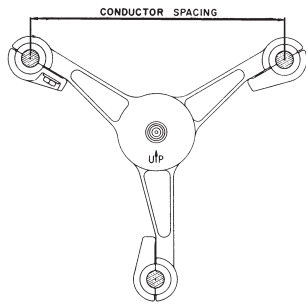
AFL can engineer a line protection system for any particular project. The Spacer Dampers are available for 3 and 4 conductor bundles. Standard spacing is 18 inches. For alternate spacing and bundle design, contact AFL Technical Support Team.

#### Vibrec® Damper Recommendation Program

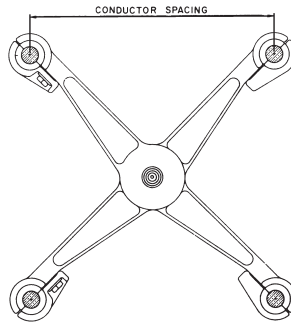
The Vibrec damper recommendation program assists in spacer damper requirements for transmission lines. For more information visit [www.Vibrec.com](http://www.Vibrec.com) or contact the AFL Technical Support Team at 1.800.866.7385.

Vibration Recommendation Form can be found on page 403.

## Spacer Dampers with Elastomer Bushed Clamps—280000 Series (cont.)



3 Conductor Bundle Bolted Type Clamp



4 Conductor Bundle Bolted Type Clamp

### Ordering Instructions

#### Step 1: Select Bundle and Clamp Type Catalog Number

Determine conductor bundle and clamp type to get first part of catalog number from Table 1.

#### Step 2: Select Clamp Size Catalog Number

Determine clamp size by diameter of conductor to get second part of catalog number from Table 2. For conductor diameter, see pages 387-392.

#### Step 3: Create Catalog Number

Clamp Type Number + Clamp Size Number

#### Example:

For a Spacer Damper with bolted clamps for 3 Conductor Bundle of 795 Drake ACSR conductor, the complete Catalog Number is:

**283457.287**

**Table 1: Bundle & Clamp Type Selection**

SYMMETRIC BUNDLE GEOMETRY			PARTIAL AFL NO. CLAMP TYPE
CONDUCTOR SPACING		NUMBER OF CONDUCTORS	
IN	MM		
18	457	3	283457
		4	284457

**Table 2: Clamp Size Selection**

PARTIAL AFL NO.	CONDUCTOR DIAMETER RANGE		DIMENSION		WEIGHT (BASED ON 18.00 IN (457 MM) CONDUCTOR SPACING)							
					3 CONDUCTOR				4 CONDUCTOR			
	IN	MM	IN	MM	ALUM	TOTAL	ALUM	TOTAL	ALUM	TOTAL	ALUM	TOTAL
.267	.976-1.051	24.79-26.71	2.00	51	8.1	3.67	9.1	4.13	9.7	4.40	11.7	5.31
.287	1.052-1.131	26.72-28.74	2.00	51	8.1	3.67	9.1	4.13	9.7	4.40	11.7	5.31
.310	1.132-1.220	28.75-31.00	2.00	51	8.1	3.67	9.0	4.08	9.7	4.40	11.7	5.31
.320	1.221-1.257	31.01-31.94	2.00	51	8.4	3.81	9.5	4.31	10.1	4.58	12.1	5.49
.342	1.258-1.345	31.95-34.17	2.00	51	8.4	3.81	9.5	4.31	10.1	4.58	12.1	5.49
.371	1.346-1.460	34.18-37.09	2.00	51	9.6	4.35	10.9	4.94	11.5	5.22	13.5	6.12
.394	1.461-1.550	37.10-39.38	2.00	51	9.6	4.35	10.8	4.90	11.5	5.22	13.5	6.12
.417	1.551-1.640	39.39-41.67	2.00	51	9.6	4.35	10.8	4.90	11.5	5.22	13.5	6.12
.437	1.641-1.720	41.68-43.70	2.20	56	10.2	4.63	11.3	5.13	12.2	5.53	14.2	6.44
.465	1.721-1.830	43.71-46.49	2.20	56	10.2	4.63	11.3	5.13	12.2	5.53	14.2	6.44
.488	1.831-1.920	46.50-48.78	2.20	56	10.2	4.63	11.2	5.08	12.2	5.53	14.2	6.44

**Note:**

Installation instructions for dampers start on page 393.

## Spacer Dampers Frame Style with Elastomer Bushed Clamps



Spacer dampers were originally developed to suppress bundle conductor subspan oscillations that could cause damage to multi-conductor bundle systems. Later, it was determined that they could be used to control aeolian vibration as well as wake-induced oscillation. The spacer damper is designed to maintain the original geometry of the bundle system against loads. It must also restore the bundle to normal posture after experiencing severe loads due to short-circuit currents, ice and wind.

The AFL Spacer Damper combines the function of a spacer in maintaining conductor separation and the function of a damper in controlling aeolian vibration. The viscoelastic bushings firmly grip the conductor. AFL has developed spacer damper designs to meet various bundle configurations and installation requirements.

### Features

#### High Temperature Application

The HiTemp® Speed-Grip® Spacer is specifically designed with elastomer bushed clamps that can withstand the rigors of increased temperatures (up to 250°C) of ACSS and ACSS/TW conductors. Two HiTemp bushings are available for 200°C and 250°C operation.

#### Controls Oscillation and Aeolian Vibration

The Spacer Damper is the most efficient way to extend the life span of the transmission line. It is designed to dissipate the damaging vibrations caused by wind.

#### No Special Tools Needed with Breakaway Bolt Option

With the breakaway bolt, no special tools or torque wrench is needed. Simply tighten the bolt until the head shears off, indicating proper torque has been achieved.

#### Customized Designs

AFL can engineer a line protection system for any particular project. The Spacer Dampers are available for 3 and 4 conductor bundles. Standard spacing is 18 inches. For alternate spacing and bundle design, contact AFL Technical Support Team.

#### Conductor Clamps

Clamps are constructed of high strength aluminum alloy with a hinged bolted rubber grommet configuration as the standard. Aluminum shear-head bolts are used to assure consistent torque is achieved during installation. A locking pin style is available on some sizes which requires a special tool for installation.

#### Corona and RIV

Spacer Dampers are designed to provide corona free performance on operating voltages up and including 500 kV. Special designs are available for 765 kV applications.

#### Vibrec® Damper Recommendation Program

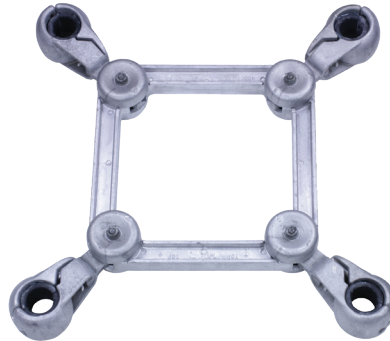
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Vibration Recommendation Form can be found on page 403.

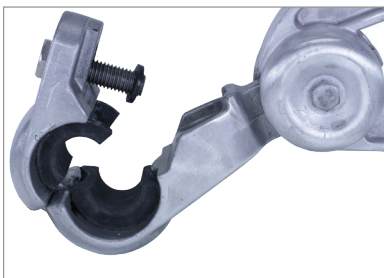
## Spacer Dampers Frame Style with Elastomer Bushed Clamps (cont.)



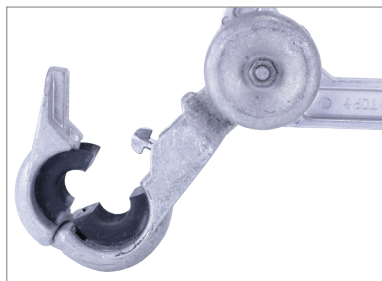
3-Conductor Bundle  
Locking Pin Type Clamp



4-Conductor Bundle  
Bolted Bushing Type Clamp



Bolted Bushing Type  
SDBB Type Clamp



Locking Pin Style  
SDL Type Clamp



Special Locking Pin Tool  
Order AFL No. SDL-INS-TOOL

### Ordering Instructions

**Step 1:** Select Clamp Type from above options.

**Step 2:** If high temperature bushings are required for rating up to 250°C conductor operation, add "HT." Otherwise, leave blank.

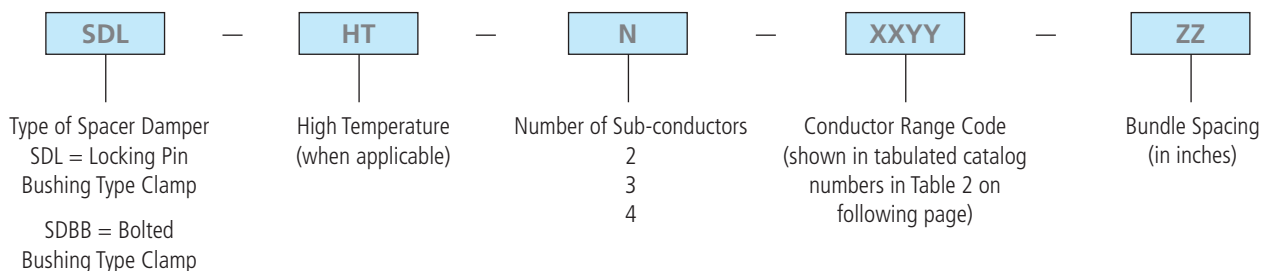
**Step 3:** Select number of sub-conductors in bundle. Bundle options are shown in Table 1 on the following page.

**Step 4:** Select Range Code. Range codes are shown in the tabulated catalog numbers in Table 2 on the following page.

**Step 5:** Select the conductor bundle spacing. Options are shown in Table 1 on the following page.

#### Example:

For a 3-conductor bundle spacer damper for use with ACSS Drake (diameter 1.108"), rated for use at 250°C conductor operation, with 18" conductor spacing and bolted bushed clamps, the catalog number would be **SDBBHT3-2829-18**.



## Spacer Dampers Frame Style with Elastomer Bushed Clamps (cont.)

**Table 1: Bundle and Clamp Type Selection**

CONDUCTOR SPACING		NUMBER OF CONDUCTORS		
IN	MM			
16	400	2	3	4
18	457	2	3	4
20	500	2	3	4
25, 18, 18	635, 457, 457	—	3*	—

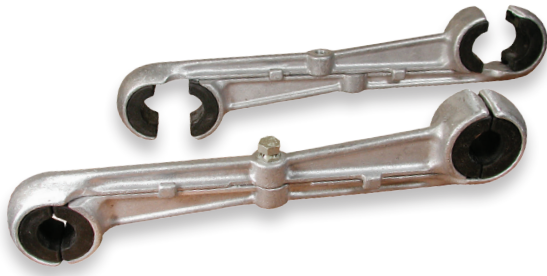
**Table 2: Clamp Size Selection**

ASSEMBLY CATALOG NUMBER *		CONDUCTOR DIAMETER RANGE				CLAMP WIDTH		WEIGHT FOR 18" CONDUCTOR SPACING			
LOCKING PIN CLAMP STYLE	BOLTED BUSHING CLAMP STYLE	IN		MM				3-CONDUCTOR BUNDLE		4-CONDUCTOR BUNDLE	
		MIN	MAX	MIN	MAX	IN	MM	LBS	KG	LBS	KG
SDLN-2021-ZZ	SDBBN-2021-ZZ	0.787	0.827	20.0	21.0	3	76	11.0	5.0	15.5	7.0
SDLN-2122-ZZ	SDBBN-2122-ZZ	0.827	0.866	21.0	22.0	3	76	11.0	5.0	15.5	7.0
SDLN-2223-ZZ	SDBBN-2223-ZZ	0.866	0.906	22.0	23.0	3	76	11.0	5.0	15.5	7.0
SDLN-2324-ZZ	SDBBN-2324-ZZ	0.906	0.945	23.0	24.0	3	76	11.0	5.0	15.5	7.0
SDLN-2425-ZZ	SDBBN-2425-ZZ	0.945	0.984	24.0	25.0	3	76	11.0	5.0	15.5	7.0
SDLN-2526-ZZ	SDBBN-2526-ZZ	0.984	1.024	25.0	26.0	3	76	11.0	5.0	15.5	7.0
SDLN-2627-ZZ	SDBBN-2627-ZZ	1.024	1.063	26.0	27.0	3	76	11.0	5.0	15.5	7.0
SDLN-2728-ZZ	SDBBN-2728-ZZ	1.063	1.102	27.0	28.0	3	76	11.0	5.0	15.5	7.0
SDLN-2829-ZZ	SDBBN-2829-ZZ	1.102	1.142	28.0	29.0	3	76	11.0	5.0	15.5	7.0
SDLN-2930-ZZ	SDBBN-2930-ZZ	1.142	1.181	29.0	30.0	3	76	11.0	5.0	15.5	7.0
SDLN-3031-ZZ	SDBBN-3031-ZZ	1.181	1.221	30.0	31.0	3	76	11.0	5.0	15.5	7.0
SDLN-3132-ZZ	SDBBN-3132-ZZ	1.221	1.260	31.0	32.0	3	76	11.0	5.0	15.5	7.0
SDLN-3233-ZZ	SDBBN-3233-ZZ	1.260	0.299	32.0	33.0	3	76	11.0	5.0	15.5	7.0
SDLN-3334-ZZ	SDBBN-3334-ZZ	1.299	1.339	33.0	34.0	3	76	11.0	5.0	15.5	7.0
SDLN-3435-ZZ	SDBBN-3435-ZZ	1.339	1.378	34.0	35.0	3	76	11.0	5.0	15.5	7.0
SDLN-3536-ZZ	SDBBN-3536-ZZ	1.378	1.417	35.0	36.0	3	76	11.0	5.0	15.5	7.0
SDLN-3637-ZZ	SDBBN-3637-ZZ	1.417	1.457	36.0	37.0	3	76	11.5	5.5	16.0	7.5
SDLN-3738-ZZ	SDBBN-3738-ZZ	1.457	1.496	37.0	38.0	3	76	11.5	5.5	16.0	7.5
SDLN-3839-ZZ	SDBBN-3839-ZZ	1.496	1.535	38.0	39.0	3	76	11.5	5.5	16.0	7.5
SDLN-3940-ZZ	SDBBN-3940-ZZ	1.535	1.575	39.0	40.0	3	76	11.5	5.5	16.0	7.5
SDLN-4041-ZZ	SDBBN-4041-ZZ	1.575	1.614	40.0	41.0	3	76	11.5	5.5	16.0	7.5
SDLN-4142-ZZ	SDBBN-4142-ZZ	1.614	1.654	41.0	42.0	3	76	11.5	5.5	16.0	7.5
SDLN-4243-ZZ	SDBBN-4243-ZZ	1.654	1.693	42.0	43.0	3	76	11.5	5.5	16.0	7.5
SDLN-4344-ZZ	SDBBN-4344-ZZ	1.693	1.732	43.0	44.0	3	76	11.5	5.5	16.0	7.5
SDLN-4445-ZZ	SDBBN-4445-ZZ	1.732	1.772	44.0	45.0	3	76	11.5	5.5	16.0	7.5
SDLN-4546-ZZ	SDBBN-4546-ZZ	1.772	1.811	45.0	46.0	3	76	11.5	5.5	16.0	7.5

**\* Notes:**

- The catalog numbers shown in Table 2 are applicable to equal subconductor spacings and 2-conductor spacer dampers. For unequal subconductor spacings, please contact AFL for ordering information.
- For high temperature applications up to 250°C, add "HT" to the clamp portion of the catalog number. Example: SDBBHT2-2021-18.

## Speed-Grip® Spacers for Two Bundle Conductors—3300 Series



Spacers are necessary on horizontal bundle construction to prevent damage from wake-induced oscillation, ice unloading and short circuit clashing. AFL's Speed-Grip Spacer employs elastomer bushed clamps to firmly grip the conductor. It is specially designed to allow rapid installation without special tools.

### What is wake-induced oscillation?

Wake-induced oscillation is a motion particular to bundled conductors experiencing moderate to high crosswinds. It takes various forms based on the bundle configuration and winds that occur. Damage can result due to conductor clashing or wear of attachment hardware, and thus it is important to protect against it. AFL has been researching oscillation to understand it and has developed improved accessories to control it.

### Features

#### Fully Assembled

The Speed-Grip Spacer is ready for immediate installation. The bushings are seated, frames interlocked and the wedge-lock bolt in place.

#### Quick Installation

With no loose parts, whether from a helicopter, spacer cart or bucket, the Speed-Grip spacer takes seconds to install.

#### No Special Tools

With the wedge-lock breakaway bolt, no special tool or torque wrench is needed. Simply tighten the bolt until the head shears off, indicating proper torque has been achieved.

#### Customized Design

The Speed-Grip Spacer is designed with a standard 18 inch spacing. For applications requiring other spacing dimensions, contact the AFL Technical Support Team.

#### Spacers for T2 Conductors

AFL has developed a special clamp insert that allows the speed grip spacer to be firmly secured to a T2 conductor. See page 394 for an illustration of the spacer and the attachment. Please contact our engineering department for applications involving T2 Conductor.

#### High Temperature Applications

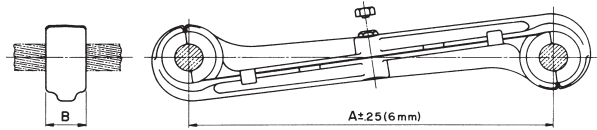
The Standard Bushings have a maximum temperature of 125°C. AFL has designed a special clamp insert to withstand the elevated temperatures of high temperature conductors. Two units are currently available for 200°C and 250°C. The 200°C unit is designated by adding the suffix "MT" to the part number. (i.e. 3326MT). The 250°C unit is designated by adding "HT" to the part number. (i.e. 3326HT). See page 337 for information on the HiTemp® Speed-Grip Spacers—3300HT Series. Please contact our engineering department for performance data on these two units.

#### Vibrec® Damper Recommendation Program

The Vibrec damper recommendation program assists in Speed-Grip Spacer requirements for transmission lines. For more information visit [www.Vibrec.com](http://www.Vibrec.com) or contact the AFL Technical Support Team at 1.800.866.7385.

Vibration Recommendation Form can be found on page 404.

## Speed-Grip® Spacers for Two Bundle Conductors—3300 Series (cont.)



The Speed-Grip Spacer comes fully assembled with no loose parts. The wedge lock break-away bolt requires no special tools to tighten. Unless otherwise requested, standard spacing is 18 inches.

### Ordering Information

Speed-Grip Spacers are ordered by catalog number corresponding to the conductor diameter.

#### Example:

For 795 Drake ACSS Conductor (1.108" diameter) operating at 250°C, the Speed-Grip Spacer catalog number would be:

#### 3310 HT

Range Code BLANK = Standard (125°C max.)  
MT = Medium Temperature (200°C max.)  
HT = High Temperature (250°C max.)

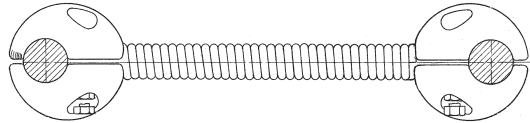
#### Note:

Installation instructions for Speed-Grip Spacers are on page 402.

AFL NO.	CONDUCTOR DIAMETER RANGE		DIMENSIONS				BOLT DIAMETER	WEIGHT				MAXIMUM VOLTAGE
			A		B			ALUMINUM		TOTAL		
	IN	MM	IN	MM	IN	MM	IN	LBS	KG	LBS	KG	KV
3300	0.776 - 0.808	19.7 - 20.4	18.0	457	2.0	51	5/8	3.1	1.41	3.5	1.56	345
3301	0.809 - 0.842	20.5 - 21.3	18.0	457	2.0	51	5/8	3.1	1.41	3.5	1.56	345
3302	0.843 - 0.875	21.4 - 22.1	18.0	457	2.0	51	5/8	3.1	1.41	3.5	1.56	345
3303	0.876 - 0.908	22.2 - 23.0	18.0	457	2.0	51	5/8	3.1	1.41	3.5	1.56	345
3304	0.909 - 0.942	23.1 - 23.8	18.0	457	2.0	51	5/8	3.1	1.41	3.5	1.56	345
3305	0.943 - 0.975	23.9 - 24.7	18.0	457	2.0	51	5/8	3.1	1.41	3.5	1.56	345
3306	0.976 - 1.000	24.8 - 25.4	18.0	457	2.0	51	5/8	3.1	1.41	3.5	1.59	345
3307	1.001 - 1.030	25.5 - 26.1	18.0	457	2.0	51	5/8	3.1	1.41	3.5	1.59	345
3308	1.031 - 1.051	26.2 - 26.6	18.0	457	2.0	51	5/8	3.1	1.41	3.5	1.59	345
3309	1.052 - 1.079	26.7 - 27.4	18.0	457	2.0	51	5/8	3.1	1.41	3.5	1.59	345
3310	1.080 - 1.110	27.5 - 28.1	18.0	457	2.0	51	5/8	3.1	1.41	3.5	1.59	345
3311	1.111 - 1.131	28.2 - 28.7	18.0	457	2.0	51	5/8	3.1	1.41	3.5	1.59	345
3312	1.140 - 1.170	29.0 - 29.7	18.0	457	2.0	51	5/8	3.1	1.41	3.5	1.59	345
3313	1.171 - 1.200	29.8 - 30.4	18.0	457	2.0	51	5/8	3.1	1.41	3.5	1.59	345
3314	1.201 - 1.220	30.5 - 30.9	18.0	457	2.0	51	5/8	3.1	1.41	3.5	1.59	345
3315	1.221 - 1.240	31.0 - 31.5	18.0	457	2.0	51	5/8	3.1	1.41	3.5	1.59	345
3316	1.241 - 1.257	31.6 - 31.9	18.0	457	2.0	51	5/8	3.1	1.41	3.5	1.59	345
3317	1.258 - 1.289	32.0 - 32.7	18.0	457	2.0	51	5/8	3.7	1.68	3.5	1.86	345
3318	1.290 - 1.320	32.8 - 33.5	18.0	457	2.0	51	5/8	3.7	1.68	3.5	1.86	345
3319	1.321 - 1.345	33.6 - 34.1	18.0	457	2.0	51	5/8	3.7	1.68	3.5	1.86	345
3321	1.380 - 1.405	35.1 - 35.6	18.0	457	2.0	51	3/4	3.7	1.68	4.2	1.91	345
3322	1.406 - 1.431	35.7 - 36.3	18.0	457	2.0	51	3/4	3.7	1.68	4.2	1.91	345
3323	1.432 - 1.460	36.4 - 37.0	18.0	457	2.0	51	3/4	3.7	1.68	4.2	1.91	345
3324	1.461 - 1.490	37.1 - 37.8	18.0	457	2.0	51	3/4	3.7	1.68	4.2	1.91	345
3325	1.491 - 1.520	37.9 - 38.6	18.0	457	2.0	51	3/4	3.7	1.68	4.2	1.91	345
3326	1.521 - 1.550	38.7 - 39.3	18.0	457	2.0	51	3/4	3.7	1.68	4.2	1.91	345
3327	1.551 - 1.580	39.4 - 40.1	18.0	457	2.0	51	3/4	3.7	1.68	4.2	1.91	345
3328	1.581 - 1.611	40.2 - 40.9	18.0	457	2.0	51	3/4	3.7	1.68	4.2	1.91	345
3330	1.612 - 1.640	40.7 - 41.6	18.0	457	2.2	56	3/4	4.2	1.91	5.2	2.36	500
3331	1.641 - 1.680	41.7 - 42.6	18.0	457	2.2	56	3/4	4.2	1.91	5.2	2.36	500
3332	1.681 - 1.720	42.7 - 43.6	18.0	457	2.2	56	3/4	4.2	1.91	5.2	2.36	500
3333	1.721 - 1.750	43.7 - 44.4	18.0	457	2.2	56	3/4	4.2	1.91	5.2	2.36	500
3334	1.751 - 1.790	44.5 - 45.4	18.0	457	2.2	56	3/4	4.2	1.91	5.2	2.36	500
3335	1.791 - 1.830	45.5 - 46.4	18.0	457	2.2	56	3/4	4.2	1.91	5.2	2.36	500
3336	1.831 - 1.860	46.5 - 47.2	18.0	457	2.2	56	3/4	4.2	1.91	5.2	2.36	500
3337	1.861 - 1.890	47.3 - 48.0	18.0	457	2.2	56	3/4	4.2	1.91	5.2	2.36	500
3338	1.891 - 1.920	48.1 - 48.7	18.0	457	2.2	56	3/4	4.2	1.91	5.2	2.36	500



## Spring-Type Conductor Spacers for Two Bundle Conductors—1790 and 1800 Series



### Ordering Instructions

#### Step 1: Select Base Catalog Number

Select catalog number based on the diameter of the conductor being used.

#### Step 2: Determine the Desired Spacing

Determine the desired spacing in whole inches and place after base catalog number. Standard spacing is 18 inches.

#### Step 3: Select the Type of Spring

Select "G" for a galvanized spring and "S" for a stainless steel spring. Place the spring letter at the end of the catalog number.

#### Step 4: Create Catalog Number

Base Catalog Number + Desired Spacing + Spring Type

#### Example:

Conductor Diameter: 1.108" (28.1mm)

Base Catalog Number: 1794

Spacing: 18 inches

Spring Type: G

Complete Catalog Number: 1794.18G

### 1790 Series Recommended for Voltages up to 345 kV

BASE AFL NO.	CONDUCTOR DIAMETER RANGE				WEIGHT			
	MIN		MAX		ALUMINUM		TOTAL	
	IN	MM	IN	MM	LBS	KG	LBS	KG
1790.xxx	0.813	20.7	0.875	22.2	2.3	1.04	4.5	2.04
1791.xxx	0.876	22.3	0.937	23.6	2.5	1.13	4.7	2.13
1792.xxx	0.938	23.9	1.000	25.4	2.1	0.95	4.3	1.95
1793.xxx	1.001	25.5	1.062	26.9	2.3	1.04	4.5	2.04
1794.xxx	1.063	27.0	1.130	28.7	2.2	1.00	4.5	2.04
1795.xxx	1.131	28.8	1.196	30.4	2.1	0.95	4.4	2.00
1796.xxx	1.197	30.5	1.252	31.8	2.8	1.27	4.9	2.22
1797.xxx	1.253	31.9	1.312	33.3	2.9	1.32	5.0	2.27
1798.xxx	1.313	33.4	1.375	34.9	2.7	1.22	4.9	2.22
1799.xxx	1.376	35.0	1.437	36.5	2.7	1.22	4.9	2.22

### 1800 Series Recommended for Voltages up to 500 kV

BASE AFL NO.	CONDUCTOR DIAMETER RANGE				WEIGHT			
	MIN		MAX		ALUMINUM		TOTAL	
	IN	MM	IN	MM	LBS	KG	LBS	KG
1800.xxx	1.438	36.5	1.518	38.5	4.3	1.95	6.2	2.81
1801.xxx	1.519	38.6	1.599	38.6	4.2	1.91	6.1	2.77
1802.xxx	1.600	40.7	1.680	40.7	4.0	1.81	5.9	2.68
1803.xxx	1.681	42.7	1.762	42.7	4.0	1.81	5.9	2.68
1804.xxx	1.763	44.8	1.843	44.8	3.9	1.77	5.8	2.63

#### Notes:

1. Installation instructions for Spring-Type Spacers are on page 402.
2. Weights are based on spacing of 18 inches.



## Conductor Information for ACSR Conductors

CODE NAME	SIZE	STRANDING	DIAMETER (INCHES)				WEIGHT PER 1000 FT	RATED STRENGTH	RESISTANCE OHMS PER 1000 FT		ALLOWABLE AMPACITY <sup>1</sup>
			INDIVIDUAL WIRES		STEEL CORE	COMPLETE CABLE			DC @ 20°C	AC @ 75°C	
	KCMIL OR AWG	AL/ST	AL	ST			LBS	LBS			AMPS
Turkey	6	6/1	0.066	0.066	0.066	0.198	36	1,190	0.641	0.806	105
Swan	4	6/1	0.083	0.083	0.083	0.250	57	1,860	0.403	0.515	140
Swanate	4	7/1	0.077	0.103	0.103	0.257	67	2,360	0.399	0.519	140
Sparrow	2	6/1	0.105	0.105	0.105	0.316	91	2,850	0.254	0.332	184
Sparate	2	7/1	0.097	0.130	0.130	0.325	107	3,460	0.251	0.338	184
Robin	1	6/1	0.118	0.118	0.118	0.354	115	3,550	0.201	0.268	212
Raven	1/0	6/1	0.133	0.133	0.133	0.398	145	4,380	0.159	0.217	242
Quail	2/0	6/1	0.149	0.149	0.149	0.447	183	5,310	0.126	0.176	276
Pigeon	3/0	6/1	0.167	0.167	0.167	0.502	231	6,620	0.100	0.144	315
Penguin	4/0	6/1	0.188	0.188	0.188	0.563	291	8,350	0.080	0.119	357
Waxwing	266.8	18/1	0.122	0.122	0.122	0.609	289	6,880	0.064	0.079	449
Partridge	266.8	26/7	0.101	0.079	0.236	0.642	367	11,300	0.064	0.078	475
Ostrich	300	26/7	0.107	0.084	0.251	0.680	412	12,700	0.057	0.069	492
Merlin	336.4	18/1	0.137	0.137	0.137	0.684	365	8,680	0.051	0.063	519
Linnet	336.4	26/7	0.114	0.089	0.265	0.720	462	14,100	0.051	0.062	529
Oriole	336.4	30/7	0.106	0.106	0.318	0.741	526	17,300	0.050	0.061	535
Chickadee	397.5	18/1	0.149	0.149	0.149	0.743	431	9,940	0.043	0.053	576
Brant	397.5	24/7	0.129	0.086	0.257	0.772	511	14,600	0.043	0.053	584
Ibis	397.5	26/7	0.124	0.096	0.289	0.783	546	16,300	0.043	0.052	587
Lark	397.5	30/7	0.115	0.115	0.345	0.806	622	20,300	0.043	0.052	594
Pelican	477	18/1	0.163	0.163	0.163	0.814	517	11,800	0.036	0.044	646
Flicker	477	24/7	0.141	0.094	0.282	0.846	614	17,200	0.036	0.044	655
Hawk	477	26/7	0.135	0.105	0.316	0.858	656	19,500	0.036	0.044	659
Hen	477	30/7	0.126	0.126	0.378	0.883	746	23,800	0.035	0.043	666
Osprey	556.5	18/1	0.176	0.176	0.176	0.879	603	13,700	0.031	0.038	711
Parakeet	556.5	24/7	0.152	0.102	0.305	0.914	716	19,800	0.031	0.038	721
Dove	556.5	26/7	0.146	0.114	0.341	0.927	765	22,600	0.031	0.038	726
Eagle	556.5	30/7	0.136	0.136	0.409	0.953	871	27,800	0.030	0.037	734
Peacock	605	24/7	0.159	0.106	0.318	0.953	779	21,600	0.028	0.035	760
Squab	605	26/7	0.153	0.119	0.356	0.966	832	24,300	0.028	0.035	765
Wood Duck	605	30/7	0.142	0.142	0.426	0.994	946	28,900	0.028	0.034	774
Teal	605	30/19	0.142	0.085	0.426	0.994	939	30,000	0.028	0.034	773
Kingbird	636	18/1	0.188	0.188	0.188	0.940	690	15,700	0.027	0.033	773
Swift	636	36/1	0.133	0.133	0.133	0.930	643	13,690	0.027	0.033	769
Rook	636	24/7	0.163	0.109	0.326	0.977	818	22,000	0.027	0.033	784

## Conductor Information for ACSR Conductors (cont.)

REFERENCE

CODE NAME	SIZE	STRANDING	DIAMETER (INCHES)				WEIGHT PER 1000 FT	RATED STRENGTH	RESISTANCE OHMS PER 1000 FT		ALLOWABLE AMPACITY <sup>1</sup>
			INDIVIDUAL WIRES		STEEL CORE	COMPLETE CABLE			DC @ 20°C	AC @ 75°C	
	KCMIL OR AWG	AL/ST	AL	ST			LBS	LBS			AMPS
Grosbeak	636	26/7	0.156	0.122	0.365	0.991	874	25,200	0.027	0.033	789
Scoter	636	30/7	0.146	0.146	0.437	1.019	995	30,400	0.026	0.033	798
Egret	636	30/19	0.146	0.087	0.437	1.019	987	31,500	0.027	0.033	798
Flamingo	666.6	24/7	0.167	0.111	0.333	1.000	858	23,700	0.026	0.032	807
Gannet	666.6	26/7	0.160	0.125	0.374	1.014	916	26,400	0.026	0.031	812
Stilt	715.5	24/7	0.173	0.115	0.345	1.036	920	25,500	0.024	0.029	844
Starling	715.5	26/7	0.166	0.129	0.387	1.051	984	28,400	0.024	0.029	849
Redwing	715.5	30/19	0.154	0.093	0.463	1.081	1,110	34,600	0.024	0.029	859
Coot	795	36/1	0.149	0.149	0.149	1.040	804	16,710	0.022	0.027	884
Drake	795	26/7	0.175	0.136	0.408	1.107	1,093	31,500	0.021	0.026	907
Tern	795	45/7	0.133	0.089	0.266	1.063	895	22,100	0.022	0.027	887
Condor	795	54/7	0.121	0.121	0.364	1.092	1,023	28,200	0.022	0.027	889
Mallard	795	30/19	0.163	0.098	0.488	1.140	1,233	38,400	0.021	0.026	918
Ruddy	900	45/7	0.141	0.094	0.283	1.131	1,013	24,400	0.019	0.024	958
Canary	900	54/7	0.129	0.129	0.387	1.162	1,158	31,900	0.019	0.024	961
Rail	954	45/7	0.146	0.097	0.291	1.165	1,074	25,900	0.018	0.023	993
Cardinal	954	54/7	0.133	0.133	0.399	1.196	1,227	33,800	0.018	0.023	996
Ortolan	1033.5	45/7	0.152	0.101	0.303	1.212	1,163	27,700	0.017	0.021	1043
Curlew	1033.5	54/7	0.138	0.138	0.415	1.245	1,330	36,600	0.017	0.021	1047
Bluejay	1113	45/7	0.157	0.105	0.315	1.258	1,253	29,800	0.016	0.019	1092
Finch	1113	54/19	0.144	0.086	0.431	1.292	1,429	39,100	0.015	0.020	1093
Bunting	1192.5	45/7	0.163	0.109	0.326	1.302	1,342	32,000	0.014	0.018	1139
Grackle	1192.5	54/19	0.149	0.089	0.446	1.337	1,531	41,900	0.014	0.018	1140
Bittern	1272	45/7	0.168	0.112	0.336	1.345	1,432	34,100	0.014	0.017	1184
Pheasant	1272	54/19	0.154	0.092	0.461	1.381	1,633	34,600	0.014	0.017	1187
Dipper	1351.5	45/7	0.173	0.116	0.347	1.386	1,521	36,200	0.013	0.016	1229
Martin	1351.5	54/19	0.158	0.095	0.475	1.424	1,735	46,300	0.013	0.016	1232
Bobolink	1431	45/7	0.178	0.119	0.357	1.427	1,611	38,300	0.012	0.015	1272
Lapwing	1590	45/7	0.188	0.125	0.376	1.504	1,790	42,200	0.011	0.014	1354
Falcon	1590	54/19	0.172	0.103	0.515	1.544	2,041	54,500	0.011	0.014	1359
Chukar	1780	84/19	0.146	0.087	0.437	1.602	2,071	51,000	0.010	0.013	1453
Bluebird	2156	84/19	0.160	0.096	0.481	1.762	2,509	60,300	0.008	0.011	1623
Kiwi	2167	72/7	0.174	0.116	0.347	1.735	2,300	49,800	0.008	0.011	1607

**Note:**

1. Conductor temperature at 75°, ambient temperature 25° C, emissivity 0.5, wind 2 ft/sec, in sun.

## Conductor Information for AAC Conductors

CODE NAME	SIZE	STRANDING	DIAMETER (INCHES)	WEIGHT PER 1000 FT	RATED STRENGTH	RESISTANCE OHMS PER 1000 FT		ALLOWABLE AMPACITY <sup>1</sup>
	KCMIL OR AWG	AL	COMPLETE CABLE	LBS	LBS	DC @ 20°C	AC @ 75°C	AMPS
Peachbell	6	7	0.184	25	563	0.658	0.805	103
Rose	4	7	0.232	39	881	0.414	0.506	138
Iris	2	7	0.292	62	1,350	0.260	0.318	185
Pansy	1	7	0.328	78	1,640	0.207	0.252	214
Poppy	1/0	7	0.368	99	1,990	0.164	0.200	247
Aster	2/0	7	0.414	125	2,510	0.130	0.159	286
Phlox	3/0	7	0.464	157	3,040	0.103	0.126	331
Oxlip	4/0	7	0.522	198	3,830	0.082	0.100	383
Sneezewort	250.0	7	0.567	234	4,520	0.069	0.085	425
Valerian	250.0	19	0.574	234	4,660	0.069	0.085	426
Daisy	266.8	7	0.586	250	4,830	0.065	0.079	443
Laurel	266.8	19	0.592	250	4,970	0.065	0.079	444
Peony	300.0	19	0.628	281	5,480	0.058	0.071	478
Tulip	336.4	19	0.665	315	6,150	0.051	0.063	513
Daffodil	350.0	19	0.679	328	6,390	0.049	0.061	526
Canna	397.5	19	0.723	373	7,110	0.044	0.053	570
Goldentuft	450.0	19	0.769	422	7,890	0.038	0.043	616
Cosmos	477.0	19	0.792	447	8,360	0.036	0.045	639
Syringa	477.0	37	0.795	447	8,690	0.036	0.045	639
Zinnia	500.0	19	0.811	469	8,760	0.035	0.043	658
Hyacinth	500.0	37	0.814	469	9,110	0.035	0.043	658
Dahlia	556.5	19	0.856	522	9,750	0.031	0.038	703
Mistletoe	556.5	37	0.858	522	9,940	0.031	0.038	704
Meadowsweet	600.0	37	0.891	562	10,700	0.023	0.036	738
Orchid	636.0	37	0.918	596	11,400	0.027	0.036	765
Heuchera	650.0	37	0.928	609	11,600	0.027	0.033	775
Verbena	700.0	37	0.963	656	12,500	0.025	0.031	812
Flag	700.0	61	0.964	656	12,900	0.025	0.031	812
Violet	715.5	37	0.973	671	12,800	0.024	0.030	823
Nasturtium	715.5	61	0.975	671	13,100	0.024	0.030	823
Petunia	750.0	37	0.997	703	13,100	0.023	0.029	847
Cattail	750.0	61	0.998	703	13,500	0.023	0.029	847
Arbutus	795.0	37	1.026	745	13,900	0.022	0.027	878
Lilac	795.0	61	1.027	745	14,300	0.022	0.027	879
Cockscomb	900.0	37	1.092	844	15,400	0.019	0.024	948
Snapdragon	900.0	61	1.093	844	15,900	0.019	0.024	948
Magnolia	954.0	37	1.124	894	16,400	0.018	0.023	982
Goldenrod	954.0	61	1.125	894	16,900	0.018	0.023	983

## Conductor Information for AAC Conductors (cont.)

REFERENCE

CODE NAME	SIZE	STRANDING	DIAMETER (INCHES)	WEIGHT PER 1000 FT	RATED STRENGTH	RESISTANCE OHMS PER 1000 FT		ALLOWABLE AMPACITY <sup>1</sup>
	KCMIL OR AWG	AL	COMPLETE CABLE	LBS	LBS	DC @ 20°C	AC @ 75°C	AMPS
Hawkweed	1000.0	37	1.151	937	17,200	0.017	0.022	1,010
Camellia	1000.0	61	1.152	937	17,700	0.071	0.022	1,011
Bluebell	1033.5	37	1.170	969	17,700	0.017	0.021	1,031
Larkspur	1033.5	61	1.171	969	18,300	0.017	0.021	1,032
Marigold	1113.0	61	1.216	1,043	19,700	0.016	0.020	1,079
Hawthorn	1192.5	61	1.258	1,118	21,100	0.015	0.018	1,124
Narcissus	1272.0	61	1.300	1,192	22,000	0.014	0.017	1,169
Columbine	1351.5	61	1.340	1,267	23,400	0.013	0.016	1,212
Carnation	1431.0	61	1.378	1,341	24,300	0.012	0.016	1,253
Gladiolus	1510.5	61	1.416	1,416	25,600	0.014	0.015	1,294
Coreopsis	1590.0	61	1.453	1,490	27,000	0.011	0.014	1,333
Jessamine	1750.0	61	1.524	1,640	29,700	0.010	0.013	1,408
Cowslip	2000.0	91	1.631	1,875	34,200	0.009	0.012	1,518
Sagebrush	2250.0	91	1.730	2,130	37,500	0.008	0.011	1,612
Lupine	2500.0	91	1.823	2,366	41,900	0.007	0.010	1,706
Bitterroot	2750.0	91	1.912	2,603	46,100	0.006	0.009	1,793
Trillium	3000.0	127	1.998	2,839	50,300	0.006	0.008	1,874
Bluebonnet	3500.0	127	2.158	3,345	58,700	0.005	0.008	2,024

**Note:**

1. Conductor temperature at 75°, ambient temperature 25° C, emissivity 0.5, wind 2 ft/sec, in sun.

## Conductor Information for AAAC Conductors

CODE NAME	SIZE	STRANDING	DIAMETER	WEIGHT PER 1000 FT	RATED STRENGTH	RESISTANCE OHMS PER 1000 FT		ALLOWABLE AMPACITY <sup>1</sup>
	KCMIL	AL	IN	LBS	LBS	DC @ 20°C	AC @ 75°C	AMPS
Akron	30.58	7	0.198	29	1,110	0.659	0.785	107
Alton	48.69	7	0.250	45	1,760	0.414	0.493	143
Ames	77.47	7	0.316	72.	2,800	0.260	0.310	191
Azusa	123.3	7	0.398	115	4,460	0.163	0.195	256
Anaheim	155.4	7	0.447	145	5,390	0.130	0.154	296
Amherst	195.7	7	0.502	183	6,790	0.103	0.123	342
Alliance	246.9	7	0.563	230	8,560	0.082	0.097	395
Butte	312.8	19	0.642	292	11,000	0.064	0.077	460
Canton	394.5	19	0.720	368	13,300	0.051	0.061	532
Cairo	465.4	19	0.783	434	15,600	0.043	0.052	590
Darien	559.5	19	0.858	522	18,800	0.036	0.043	663
Elgin	652.4	19	0.927	608	21,900	0.031	0.037	729
Flint	740.8	37	0.990	691	24,400	0.027	0.033	790
Greeley	927.2	37	1.108	865	30,500	0.022	0.026	908

**Note:**

1. Conductor temperature at 75°, ambient temperature 25° C, emissivity 0.5, wind 2 ft/sec, in sun.

## Conductor Information for ACAR Conductors

REFERENCE

SIZE	STRANDING	DIAMETER	WEIGHT PER 1000 FT	RATED STRENGTH	RESISTANCE OHMS PER 1000 FT		ALLOWABLE AMPACITY <sup>1</sup>
					DC @ 20°C	AC @ 75°C	
KCMIL	AAC/AAAC	IN	LBS	LBS			AMPS
355.0	12/7	0.683	332	8,500	0.051	0.062	519
465.9	12/7	0.783	436	11,000	0.039	0.048	616
503.6	12/7	0.814	471	11,900	0.036	0.044	646
653.1	12/7	0.927	611	15,400	0.028	0.034	760
739.8	30/7	0.990	693	15,300	0.024	0.030	831
739.8	18/19	0.990	692	18,800	0.025	0.031	814
853.7	30/7	1.063	799	17,500	0.021	0.026	907
853.7	18/19	1.063	798	21,500	0.022	0.027	890
927.2	30/7	1.108	868	19,000	0.019	0.024	955
927.2	18/19	1.108	867	23,400	0.020	0.025	936
1024.5	30/7	1.165	959	20,900	0.017	0.022	1,015
1024.5	18/19	1.165	958	25,800	0.018	0.023	995
1081.0	30/7	1.196	1,012	22,100	0.016	0.021	1,048
1081.0	18/19	1.196	1,011	27,200	0.017	0.021	1,028
1109.0	30/7	1.212	1,038	22,700	0.016	0.020	1,065
1109.0	18/19	1.212	1,037	27,900	0.017	0.021	1,044
1172.0	30/7	1.246	1,097	24,000	0.015	0.019	1,101
1172.0	18/19	1.246	1,096	29,500	0.016	0.020	1,080
1197.0	30/7	1.259	1,121	24,500	0.015	0.019	1,115
1197.0	18/19	1.259	1,119	30,200	0.016	0.019	1,094
1280.0	30/7	1.302	1,199	26,200	0.014	0.018	1,160
1280.0	18/19	1.302	1,197	32,200	0.015	0.018	1,139
1361.0	42/19	1.344	1,274	30,300	0.013	0.017	1,196
1527.0	42/19	1.424	1,429	33,600	0.012	0.015	1,314
1703.0	42/19	1.504	1,594	37,500	0.011	0.014	1,363
1933.0	42/19	1.602	1,809	42,500	0.009	0.012	1,465
2267.0	42/19	1.735	2,142	49,900	0.008	0.011	1,594
2339.0	42/19	1.762	2,210	51,500	0.008	0.011	1,622
2493.0	72/19	1.821	2,357	50,400	0.007	0.010	1,687
2493.0	54/37	1.821	2,355	57,600	0.007	0.010	1,670

**Note:**

1. Conductor temperature at 75°, ambient temperature 25° C, emissivity 0.5, wind 2 ft/sec, in sun.



## Installation Instructions

### 1700-T2 SERIES VIBRATION DAMPER

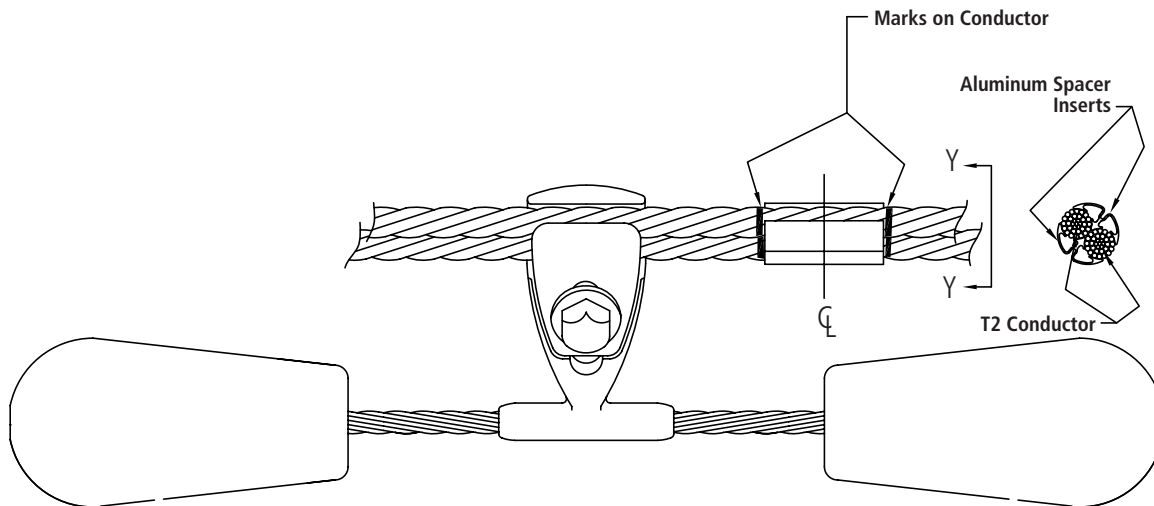
#### General

AFL vibration dampers are produced with carefully designed and controlled surface finishes for High Voltage use. To maintain this quality, the dampers should be protected, preferably in their shipping containers, from dirt and foreign material prior to installation. Handling in the field should be with care to avoid mechanical damage. AFL Vibration dampers may be installed without disassembly of the clamp parts.

**NOTE: DO NOT WRAP TAPE OVER THE INSERTS TO HOLD THEM TO THE CONDUCTORS, THIS WILL REDUCE THE DAMPERS SLIP STRENGTH AT THE CLAMP/INSERT INTERFACE**

#### Procedure

- Step 1** Obtain the damper placement location from AFL Damper Recommendation Form.
- Step 2** Loosen the bolt to open clamp sufficiently to permit cable entry into the clamp groove. Note: The bolt need not be removed.
- Step 3** Hang the damper around the conductor near the final installation location. For a horizontal two-conductor bundle, the bolt head should be toward the center of the bundle.
- Step 4** Hold the two spacer inserts at the proper spacing as specified in Step 1 and mark the conductor on each side as illustrated.



**NOTE: 1700-T2 Dampers are only for use on overhead transmission line twisted pair cables.**

**CAUTION:** Follow installation instructions carefully. Improper installation can result in mechanical failure of the cable system and possible injury to persons handling or in the vicinity of the cable systems.

# Installation Instructions

## 1700-T2 SERIES VIBRATION DAMPER

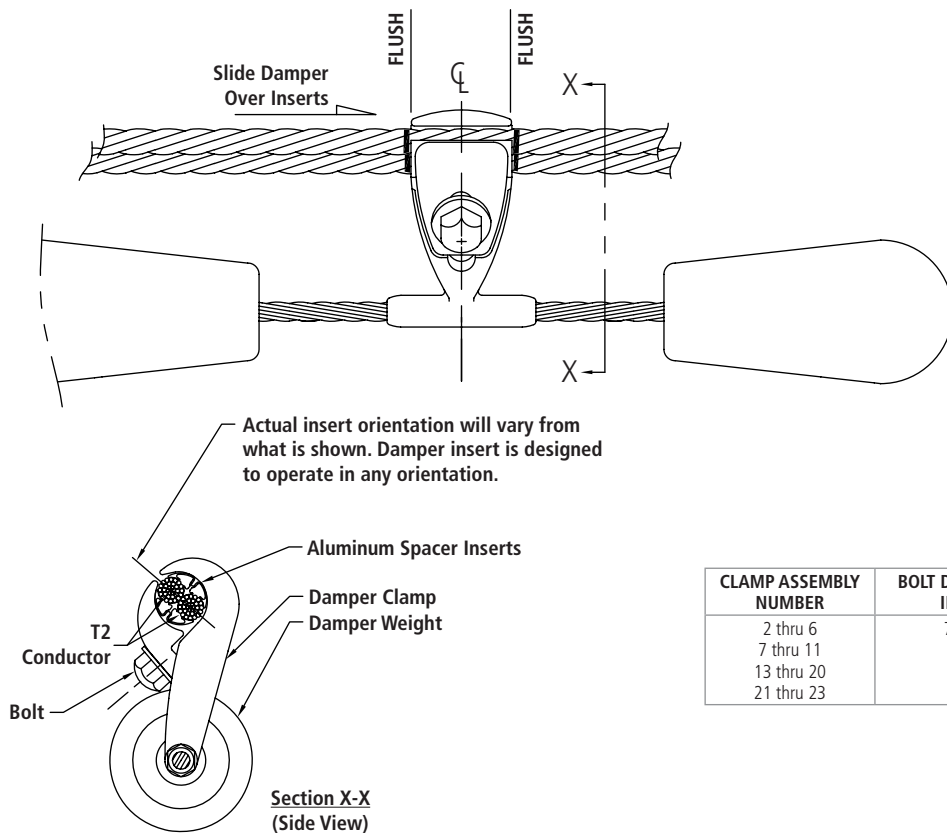
**NOTE: DO NOT WRAP TAPE OVER THE INSERTS TO HOLD THEM TO THE CONDUCTORS, THIS WILL REDUCE THE DAMPERS SLIP STRENGTH AT THE CLAMP/INSERT INTERFACE**

### Procedure

**Step 5** Slide the damper over the spacer inserts and tighten bolt finger tight. The spacers should align flush with the edge of the clamp as shown  
NOTE: Damper weights should be located directly below the conductor as shown.

**Step 6** Tighten the bolt with a torque wrench to the recommended value for the bolt size tabulated below. If the bolt has breakaway outer head, tighten the bolt until breakaway head shears off.

INSTALLATION INSTRUCTIONS



CLAMP ASSEMBLY NUMBER	BOLT DIAMETER INCH	TORQUE LBF-FT (N-M)
2 thru 6	7/16	20 (27)
7 thru 11	1/2	25 (34)
13 thru 20	5/8	40 (54)
21 thru 23	3/4	60 (81)

**NOTE: Insert orientation may be different from illustration.**

**CAUTION:** Follow installation instructions carefully. Improper installation can result in mechanical failure of the cable system and possible injury to persons handling or in the vicinity of the cable systems.

# Installation Instructions

## Vibration Dampers 1700, 1700AA Series

### GENERAL INFORMATION

AFL vibration dampers are produced with carefully designed and controlled surface finishes for High Voltage use. To maintain this quality, the dampers should be protected, preferably in their shipping containers, from dirt and foreign material prior to installation. Handling in the field should be with care to avoid mechanical damage. AFL Vibration dampers may be installed without disassembly of the clamp parts.

### VIBREC® DAMPER RECOMMENDATION PROGRAM

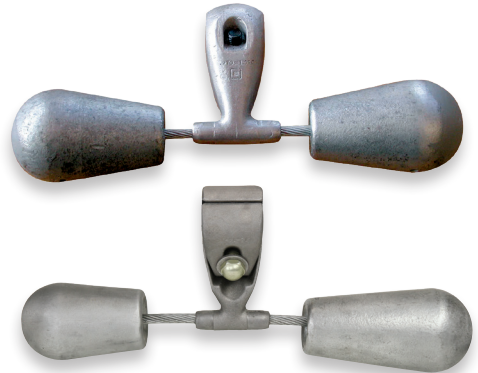
The Vibrec damper recommendation program assists in damper requirements for transmission and distribution lines. For more information contact the AFL Technical Support Team at 1.800.866.7385.

### INSTALLATION PROCEDURE

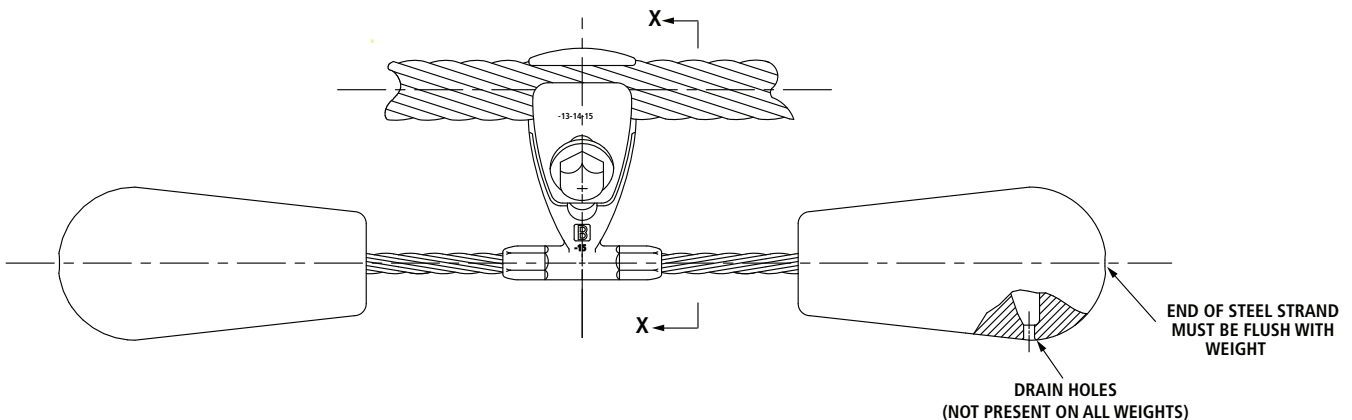
- Step 1:
- (a) Obtain the damper spacing from AFL.
  - (b) At the tangent tower, the centerline of the damper should be the specified distance from the center of the suspension clamp.
  - (c) At the dead end location, the centerline of the damper should be the specified distance from the mouth of the dead end. Normally, for a phase conductor, a second damper is required at the dead end location; on a static wire, a second damper is usually not required at the dead end location. The centerline distance between the two dampers should be as specified.

**\*\*\*Note: For the 1700AA series dampers, the damper is approved to be installed with either the large weight toward the structure or the small weight toward the structure.\*\*\***

- Step 2: Loosen the bolt so that the clamp may be opened sufficiently to permit cable entry into the clamp groove.  
**Note:** The bolt need not be removed.
- Step 3: Hang the damper on the conductor at the proper spacing specified in Step 1 and tighten the bolt finger tight.
- Step 4: Tighten the bolt with a torque wrench to the recommended value for the bolt size in the table below. If the bolt has a breakaway outer head, tighten the bolt until the breakaway head shears off.

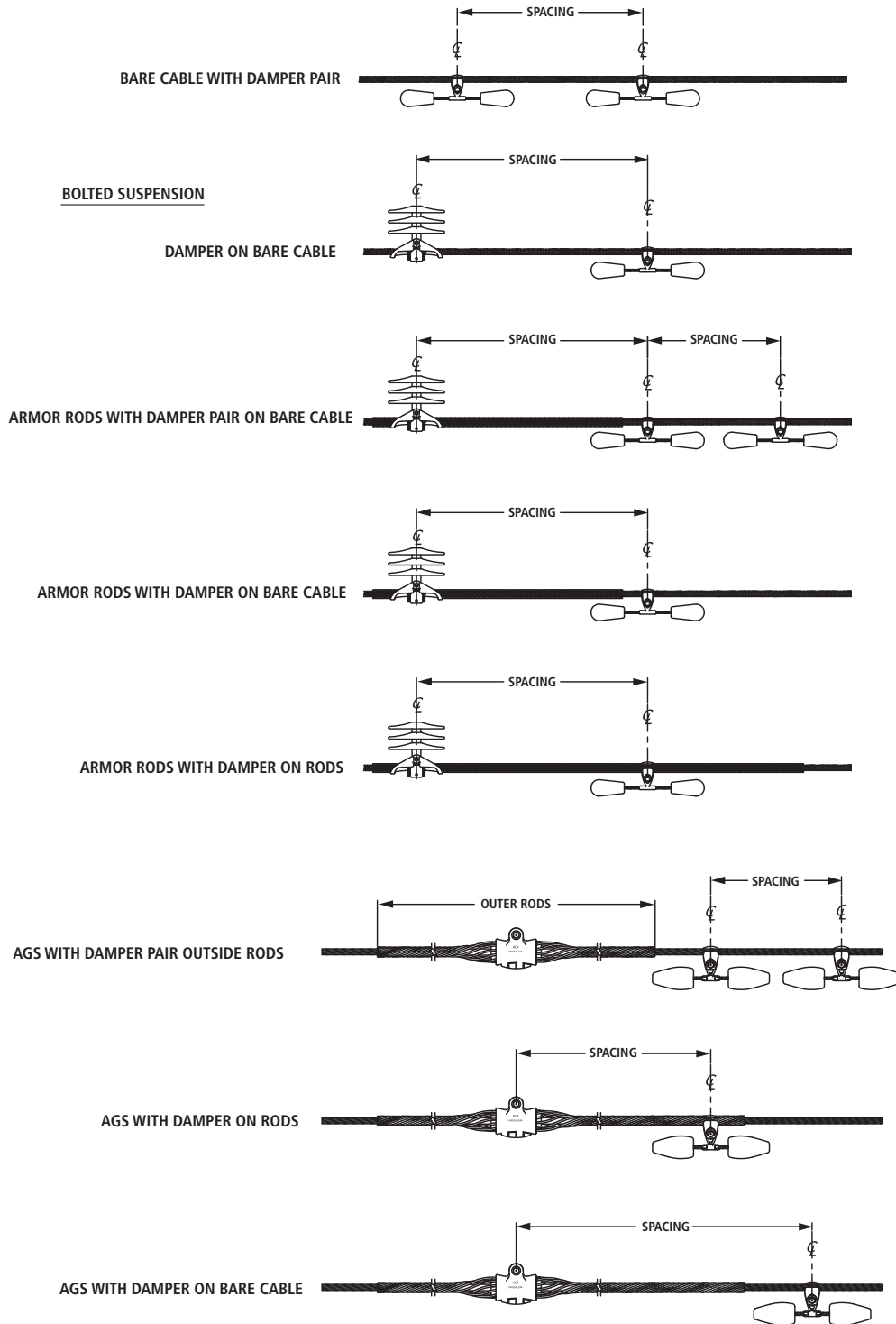


CLAMP ASSEMBLY NUMBER	BOLT DIAMETER INCH	TORQUE LBF. FT (N.M)
2 thru 6	7/16	20 (27)
7 thru 11	1/2	25 (34)
13 thru 20	5/8	40 (54)
21 thru 23	3/4	60 (81)

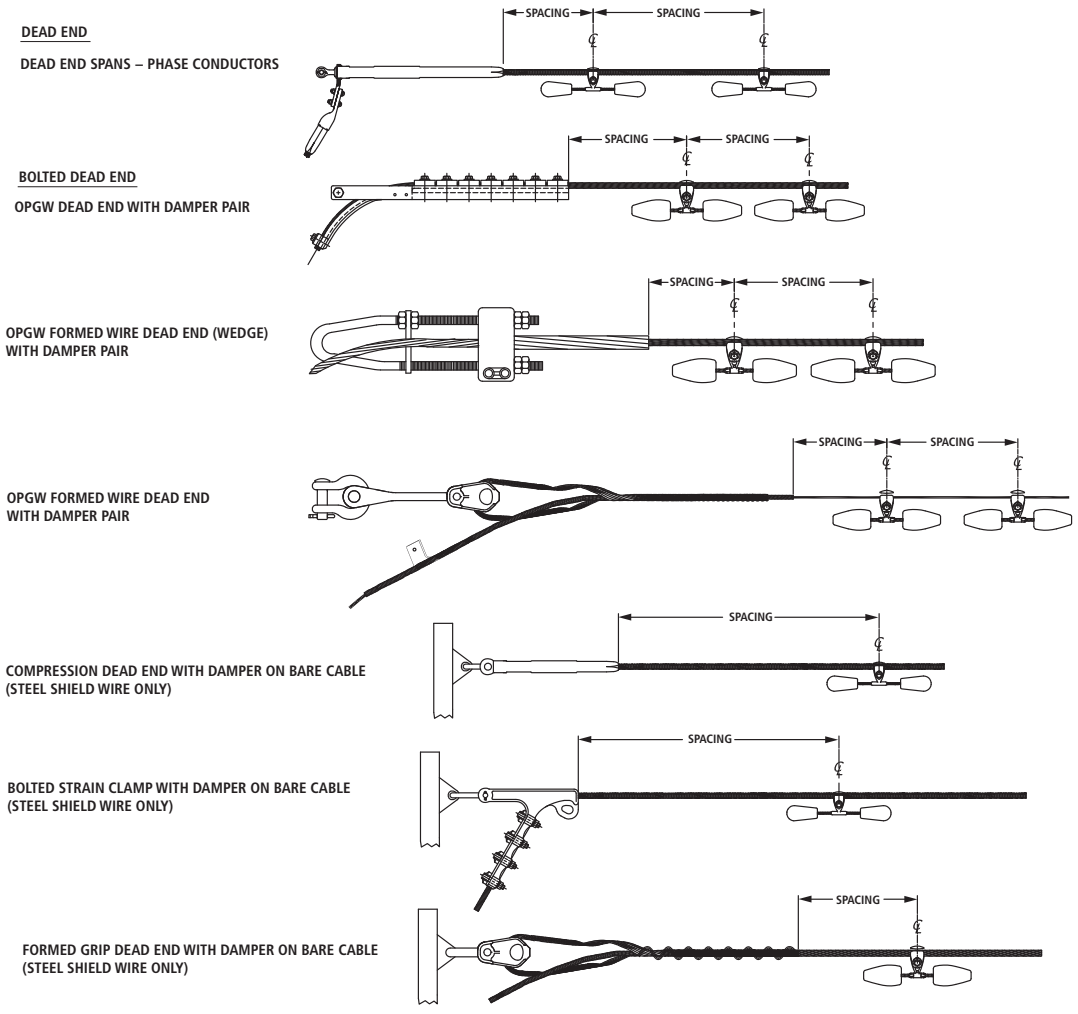


## Installation Instructions (cont.)

### Vibration Dampers 1700,1700AA Series



**Installation Instructions (cont.)**  
**Vibration Dampers 1700,1700AA Series**



## Installation Instructions (cont.)

### Vibration Dampers 1700,1700AA Series

#### VIBRATION PROTECTION RECOMMENDATIONS – SPACING NOTES

##### Notes:

- Tangent Spans – Phase Conductor and Overhead Ground Wire (OHGW)  
"Level One Damping" means one damper placement per conductor at one end of the span only. "Two dampers per conductor" means two damper placements (one damper placement at each end of the span).
- Tangent Spans – Dead End at One End – Phase Conductor  
In spans dead ended at one end only, and requiring only one damper per conductor, the damper should be placed at the tangent structure, spaced in accordance with Dimension A or B. If the span requires three dampers per conductor, then one damper should be placed at the tangent structure, spaced in accordance with Dimension A or B, and two dampers should be placed at the deadended structure, spaced in accordance with Dimensions C and D. Normally, two dampers are recommended at conductor dead ends with insulator strings, as it is impossible to accurately predict the location of vibration node points relative to the conductor dead end. With just one damper at a dead end, the damper could, under certain wind conditions, be at a node point. The effectiveness of two dampers, spaced as recommended, assures that at least one of the two dampers will be effective at all times.
- Tangent Spans – Dead Ended at One End – Overhead Ground Wire  
In spans deadended at one end only, and requiring only one damper per wire, the damper should be placed at the tangent structure, spaced in accordance with Dimension A or B. If the span requires two dampers per wire, then one damper should be placed at the tangent structure, in accordance with Dimension A or B, and one damper should be placed at the dead end, spaced in accordance with Dimension C.
- Spans Dead Ended at Both Ends – Phase Conductor  
"Two dampers per conductor" means two dampers at one end of the span only, spaced in accordance with Dimensions C and D. "Four dampers per conductor" means two dampers at each end of the span, spaced in accordance with Dimensions C and D. Normally, two dampers are recommended at conductor dead ends with insulator strings, as it is impossible to accurately predict the location of vibration node points relative to the conductor dead end. With just one damper at a dead end, the damper could, under certain wind conditions, be at a node point. The effectiveness of a damper on a node is significantly reduced. The use of two dampers, spaced as recommended, assures that at least one of the two dampers will be effective at all times.
- Spans Dead Ended at Both Ends – Overhead Ground Wire  
"One damper per conductor" means one damper at one end of the span, spaced in accordance with Dimension C. "Two dampers per conductor" means one damper located at each end of the span, spaced in accordance with Dimension C.
- Spans Dead Ended at Both Ends, or Tangent Spans of Dead Ended at One End, For OHGW Utilizing a Formed Guy Grip Dead End  
We do not recommend the installation of damper clamps over formed-guy-grip type dead ends. Therefore, where vibration protection is required for spans using the formed type dead ends, two dampers will be required at each dead end location, with the first damper spaced at the end of the rods and the second damper located in accordance with Dimension D.
- Dampers Over Armor Rods  
Dampers with the clamps placed over armor rods are not as effective as dampers with the clamp placed directly on the conductor. Therefore, if armor rods are used, the rods should be short enough as to permit installation of the damper clamp over the bare conductor, using the recommended Dimension B spacing. The Dimension B is used whenever armor rods, line guards or AGS units are specified. In the event the rod lengths are too long to permit installation directly on the conductor, the damper clamp must be selected to fit over the installed rods.
- Selective Damping  
The ability of a damper to protect a given span may be hindered by vibration in adjacent undamped spans even though the vibration in the undamped spans is not at a damaging level for the undamped span. Therefore, damping of adjacent spans is suggested at times. For simplicity, the Vibrec® program recommends that spans adjacent to a span requiring dampers also be damped. AFL will, however, approve omission of dampers in spans shorter than the level zero limit when the adjacent damped spans are less than 50% of the one-damper limit.
- If there are any questions with respect to the damper recommendations or placement, contact your local representative.

## Installation Instructions

### Spacer Dampers, Bolted Type

1. Check assembly to make sure all bushings are seated and that all bolts and washers are in position.
2. Loosen all 5/8"-11 spacer clamp break-away bolts to permit the clamp caps (Figure 1) to be rotated so that they will clear the conductor during installation.
3. Position the spacer damper on the two upper conductors. The top two clamp arms will rest on the conductors.
4. Rotate the two top caps so that they center on the conductor. Finger tighten each break-away bolt by first placing the hand over each clamp so that the edges of the clamp mouth close evenly and then finger tighten the bolt in each clamp.
5. Repeat step 4 for the bottom cap.

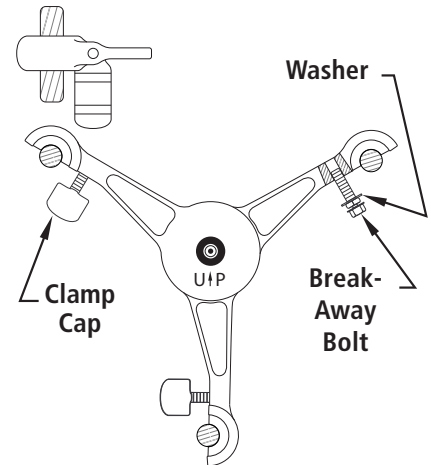


Figure 1

6. Position the spacer damper assembly perpendicular to the conductor centerline within tolerances shown in Figure 2.
7. Secure the spacer damper clamps to the conductor by tightening the 5/8" break-away bolt with a 15/16" hex socket wrench. Tighten each bolt until the upper bolt head shears off. (Note: A washer head on the break-away bolt will position the socket wrench on the bolt head and prevent wrench engagement with the lower bolt head during tightening.)
8. Make a final inspection checking for clamp fit and alignment and to see that all break-away bolts have the upper heads sheared off.

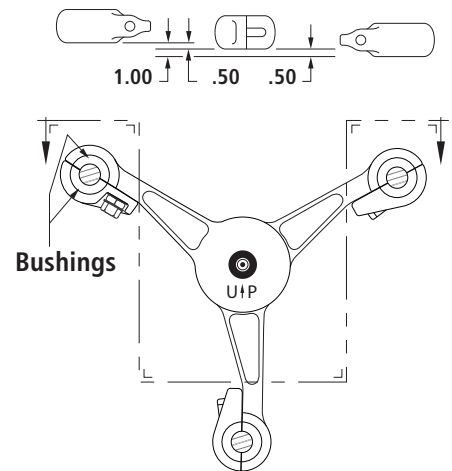


Figure 2

## Installation Instructions

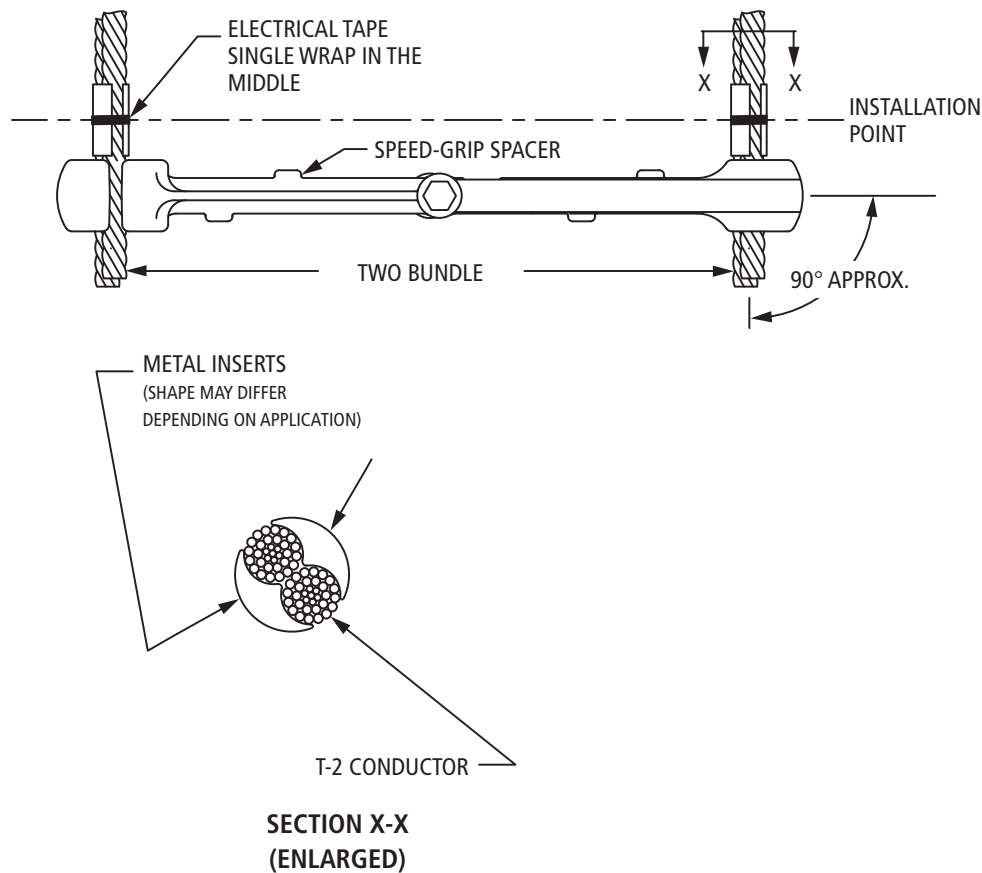
### T2 Speed-Grip® Spacer

1. Obtain the spacer location from the AFL Spacer Spacing Report. Mark the installation point on one T-2 conductor in the bundle.
2. Position two (2) metal inserts on the marked location as shown in Fig. 1. Wrap one (1) layer of electrical tape around the inserts to keep them in place during installation.

**CAUTION: Do not cover over half of the metal insert surface with tape and do not wrap more than one-and-a-half (1½) times around as it may affect the electrical and mechanical properties of the speed grip.**

3. Loosen the speed-grip assembly casting by opening the clamp enough to clear the conductors and insert on each end. Assembly will be held in this position by hand tightening the wedge-lock pin tight enough to hold spacer halves in position when placed over conductor.
4. Position the speed-grip spacer on the conductor adjacent to the installed set of inserts as shown in Fig. 1. Using the spacer as a guide, locate where the second set of inserts must be positioned to make the speed grip perpendicular to both conductors.

**Fig. 1**



5. Install the second set of inserts using one (1) layer of electrical tape to keep them in place.

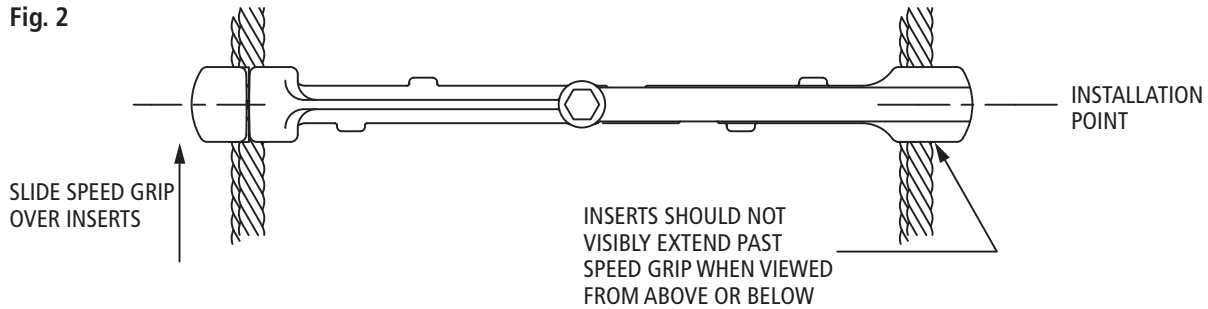


## Installation Instructions (cont.)

### T2 Speed-Grip® Spacer

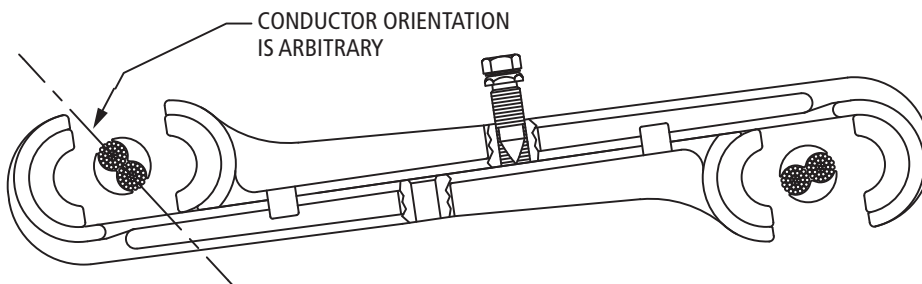
- Slide the speed grip over the spacers such that they are fully surrounded by the speed-grip bushings (see Fig. 2), while retaining the perpendicular stance against the conductors.

**Fig. 2**

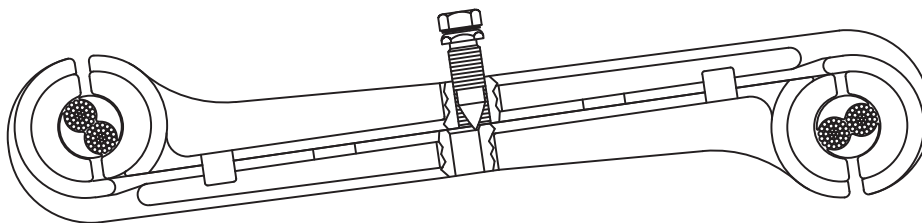


- Loosen wedge-lock pin and close the spacer halves on the conductors. At this position, the point of the pin will be in a position to permit engagement with the lower spacer half lock hole. Hand tighten pin to engage pin with lower spacer half lock hole (see Fig. 4).

**Fig. 3**

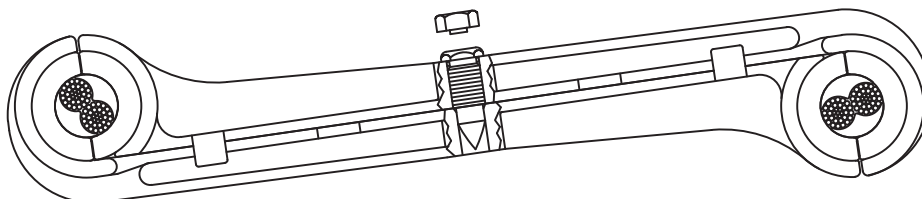


**Fig. 4**



- Using a socket wrench, tighten wedge-lock pin until break-away head shears off. It is recommended that a 12" ratchet wrench with a 6-point deep socket be used. Nominal break-away torque is 40 lbf-ft for the 5/8 aluminum break-away wedge-lock pin and 47 lbf-ft for the 3/4 (see Fig. 5).

**Fig. 5**

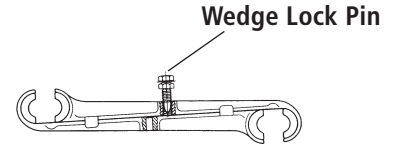


- Make final visual inspection to ensure that spacer is properly seated on conductors, wedge-lock pin head bottomed, and if pin head is free from burrs which might have occurred during installation.

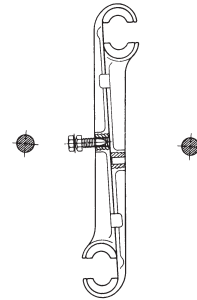
## Installation Instructions

### Speed-Grip® Spacers

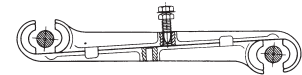
1. Prior to installation, slide open the spacer assembly giving a clamp opening of approximately 1½ times the conductor diameter. Finger-tighten the wedge-lock pin enough to hold the spacer assembly in the open position.



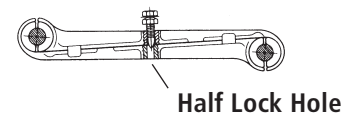
2. Position spacer assembly between the two conductors, so that it is perpendicular to the conductors.



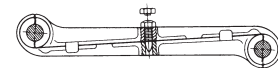
3. Rotate the spacer assembly until the conductors rest in the open clamps.



4. Loosen the wedge-lock pin and slide the spacer assembly closed. Finger-tighten the wedge-lock pin to engage the pin with lower spacer half lock hole.



5. Using a 12" (30 cm) ratchet wrench with a 6-point deep socket, tighten the wedge-lock pin until breakaway head shears off.



6. Make final visual inspection to ensure that the spacer is properly seated on the conductor, shear head is missing and the wedge-lock pin head is free of burrs.

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## Installation Instructions

### Spring-Type Spacers

1. Loosen bolts so that the clamp may be opened sufficiently to permit cable entry into the cable groove.
2. Align the clamps on the conductors. The spring should be straight and perpendicular to both conductors.
3. Tighten bolts with a socket wrench (thin wall recommended). Bolts of each clamp should be tightened in sequence for best results. Tighten one bolt to approximately 15 lb-ft (20N.m), then tighten the second bolt until torque control head shears off. First bolt should then be tightened until the torque control head shears off.

### Request for Vibration Information for Line/Stockbridge Dampers

Originator: \_\_\_\_\_ Tel/Fax: \_\_\_\_\_  
 Utility/Consultant: \_\_\_\_\_ Date: \_\_\_\_\_  
 Project Name: \_\_\_\_\_ Number of Phases/Span: \_\_\_\_\_  
 Line Voltage: \_\_\_\_\_ Number of Conductors/Phase: \_\_\_\_\_

**For each ruling or deadend span, provide the following information:**

1. Conductor Designation: \_\_\_\_\_
2. Average Annual Minimum Temperature (AAMT) for Line: \_\_\_\_\_  
(select from attached map)
3. Average Annual Temperature (AAT) for Line (usually 60°F) : \_\_\_\_\_
4. Terrain or Wind Speed (mph): \_\_\_\_\_ River/Water Crossing?  Yes  No  
(select Normal [15mph], Flat [20mph] or Water Crossing [25mph])

5. Loading Zone:

Check one	Zone	Ice (inches)	Wind (#/ft <sup>2</sup> )	K (#/ft)	Temp. (°F)
<input type="checkbox"/>	NESC Heavy	0.50	4.00	0.30	0
<input type="checkbox"/>	NESC Medium	0.25	4.00	0.20	15
<input type="checkbox"/>	NESC Light	0.00	9.00	0.05	30
<input type="checkbox"/>	CALIF. Heavy	0.50	6.00	0.00	0
<input type="checkbox"/>	CALIF. Light	0.00	8.00	0.00	25
<input type="checkbox"/>	<b>Other:</b>				

6. Guards: \_\_\_\_\_ Specify Guard Length if Not Standard (inches): \_\_\_\_\_  
No Guards = None    Line Guards = LG    Armor Rods = AR    Suspension = AGS

Specify Rod Diameter: \_\_\_\_\_  
 Maximum Design Tension (lbs.) \_\_\_\_\_

7. Spans (\*):

Ruling Span (ft)	Deadend to Deadend?	Max. Span (ft)	Initial Tension @ AAMT bare (lbs)	Final Tension @ AAT (lbs)	*OPTIONAL* Span List (Comma Separated) EXAMPLE: 700,750,450,950,...

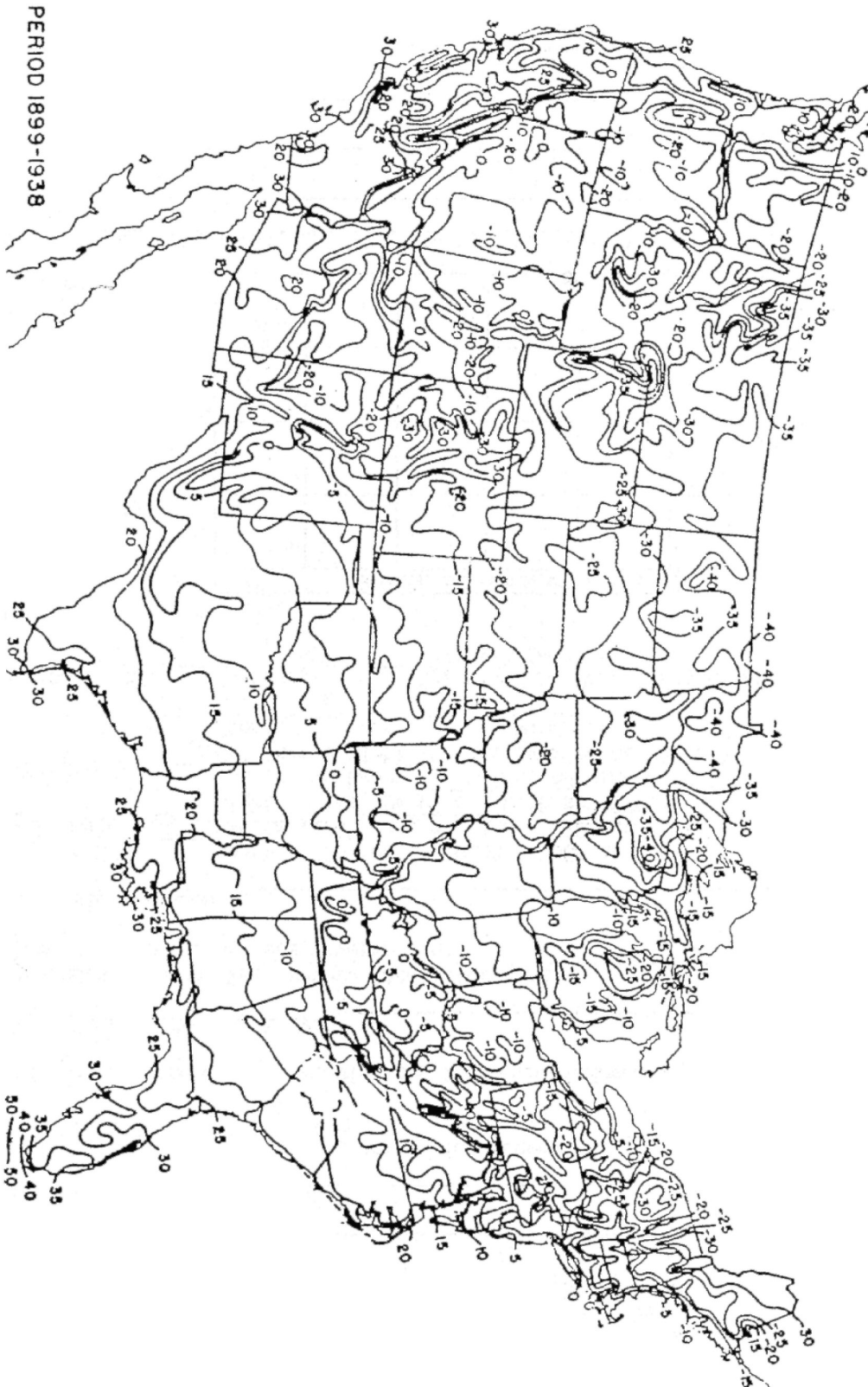
(\*) If more spans are needed please attach a spreadsheet with the above information (ruling span, tensions & span list) to get damper quantities with the recommendation.

8. Additional Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**Submit to:    spbacatechnical@AFLglobal.com or Fax: 864.433.5419**

REFERENCE MATERIAL

AVERAGE ANNUAL MINIMUM TEMPERATURE (°F)  
(AAMT)



PERIOD 1899-1938

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