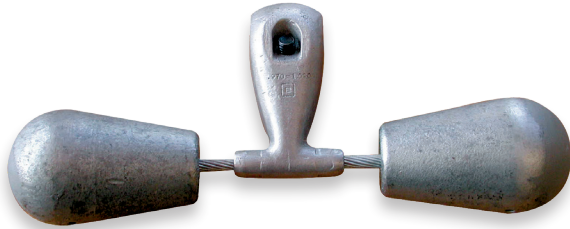


## Transmission Conductor Vibration Dampers Stockbridge Type—1700 Series



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 standing waves generally in high harmonic modes. The primary factors effecting aeolian vibration are span length, tension and impedance. 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 rapidly as its self dampening ability reduces. Impedance is determined by the mechanical and material properties of the cable.

The first aeolian vibration fatigue failures of stranded conductor were reported in 1917. George Stockbridge of Southern California Edison first developed dampers 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 dissipates this damaging force of nature.

### Features

#### Wide Vibration and Voltage Coverage

The AFL Stockbridge Damper has two natural frequency modes. These modes are commonly known as ‘flying’ and ‘wiggling’. AFL uses a specially designed 19 strand messenger wire allowing the

damper to dissipate vibration, or ‘wake up’, at lower energy inputs. These two modes combined with the 19 strand messenger wire give AFL’s Stockbridge Damper the widest range of vibration coverage in the industry. Damper assemblies with catalog weights of 1706 and larger can be used at 345 kV and above.

#### Pressed Clamp and Weights

AFL Stockbridge Damper clamp and weights are pressed onto the messenger wire, as opposed to being cast or welded. The pressing operation does not alter the physical or mechanical characteristics of the messenger wire. Casting or welding anneals the messenger, compromising its performance.

#### 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.

#### Proven Performance Year After Year

Comparative testing was conducted in 1993 at a private test site using AFL Stockbridge Dampers and those of two competitors. In this particular test, AFL dampers offered 40+ years of protection against fatigue, while the competitions’ dampers failed between 7 and 14 years.

#### 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.

#### High Temperature Application

The standard Stockbridge Damper is designed for 250°C high temperature applications without the need for Armor Rods.

#### Vibrec™ Damper Recommendation Program

The Vibrec damper recommendation program assists in damper requirements for transmission and distribution 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.

# Transmission Conductor Vibration Dampers Stockbridge Type—1700 Series (cont.)

**Table 1: Weight Selection**

WEIGHT CATALOG NUMBER	BARE CONDUCTOR DIAMETER RANGE		WEIGHT <sup>2</sup>	
			STEEL	
	IN	MM	LBS	KG
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
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
1706 <sup>3</sup>	0.971 - 1.210	24.7 - 30.7	13.3	6.03
1707 <sup>3</sup>	1.211 - 1.382	30.8 - 35.1	19.7	8.94
1708 <sup>3</sup>	1.383 - 1.825	35.2 - 46.4	28.8	13.06

**Table 2: Clamp Selection**

CLAMP CATALOG NUMBER	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 - 0.780	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.
- Damper assemblies with 1706, 1707, or 1708 weight catalog numbers and -9 clamp catalog numbers or larger can be used at 345 kV and above.
- Regular aluminum hexagon head bolts are standard on assemblies that have 1705 weights and smaller. Assemblies having 1706 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 vibration dampers, see page 354.

**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 use 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: 1706

Clamp Size from table 2: -10

Bolts: Breakaway

**Catalog Number: 1706-10BA**

**With Armor Rods**

Conductor Diameter: 1.108" (28.1 mm)

Weight Size from Table 1: 1706

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

Clamp Size from table 2: -15

Bolts: Standard

**Catalog Number: 1706-15**