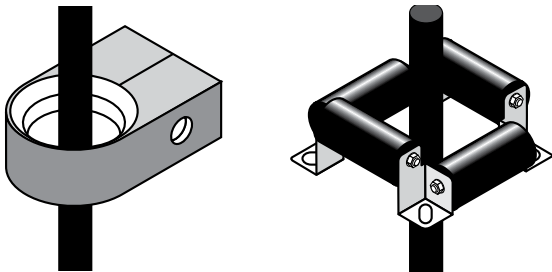


Damping devices for compensation cable

TECH TIP 12

Damping devices were created to keep free-hanging compensating chain or cable away from contacting pit equipment such as buffers, guide rails, limit switches and their mounting or support brackets. While there have been many different designs, the two most popular have been the 'static' type and the 'roller' type (Figure 1).

Figure 1: Static and roller type dampeners



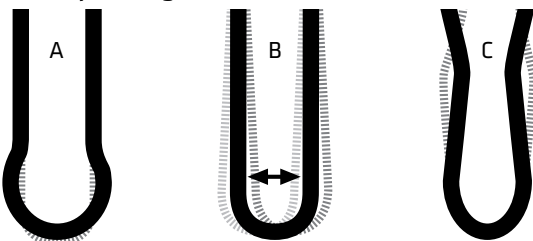
Static versions have no moving parts and are used for lower speeds; roller types have rollers that work better for higher speeds.

What does a damping device do?

Damping devices decrease, or dampen, the movement of a compensating cable loop. Compensating cables are free-hanging and are supported under the elevator car and its counterweight. This creates a loop in the elevator pit that is relatively stationary when the cable moves through the loop at the same speed as the elevator.

The compensating cable loop moves in several ways during operation. The loop widens during the elevator's acceleration (Figure 2A); the loop swings back and forth during stops and starts (Figure 2B); oscillations can develop in the cables moving downward into the loop if the car bounces slightly during loading and unloading (Figure 2C).

Figure 2: Compensating cable movement



Damping devices minimize these types of movements and keep compensating cables tracking in their proper position and away from other pit equipment.

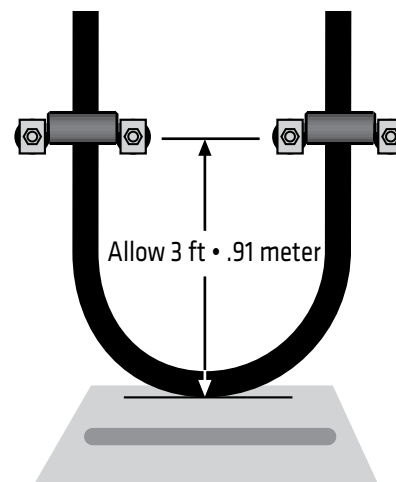
When to use damping devices

Damping devices should be used when the movement of compensating cables causes them to come close to touching pit equipment. Because the elevator's speed affects the sway of compensating cables, most elevator manufacturers require damping devices to be used when the car moves at 350 ft/min • 1.78 m/sec or faster. Damping devices should also be used at lower speeds if there is a concern about compensating cable coming in contact with pit equipment.

Where should damping devices be installed?

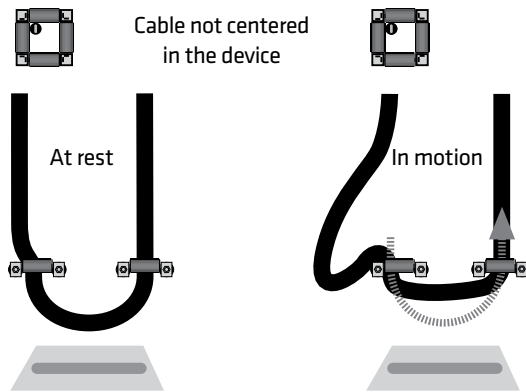
For maximum effectiveness, damping devices need to be installed 3 feet • .91 meters above the bottom of the cable loop on both the car and counterweight legs of the cable (Figure 3). Note that the distance is measured from the bottom of the cable loop because the cable clearance from the pit floor varies. This recommended three-foot height maximizes performance by maintaining proper compensating cable tracking while preventing the compensating cable from falling outside the influence of damping devices.

Figure 3: Damping device installation



A common misconception about roller-type damping devices is that they pinch the compensating cable and cause it to pass outside the damping device when in motion (Figure 4). However, the cable loop can fall outside the rollers if the devices are installed within the curvature of the cable loop (less than the recommended 3 feet • 0.91 meters distance) and if the cable is not centered within the rollers.

Figure 4: Cable loop falling out



Which device is better, static or roller type?

Static devices (like the SwayLess damping device - Figure 1 on the left) generally cost less and are recommended for car speeds of up to 500 ft/min • 2.54 m/sec and for compensating cables with an outer diameter of no more than of 1.8 inches • 46 mm. The SwayLess device uses a brass ring insert (which causes less cable wear than other devices that have a polyurethane body) but the ring has to be maintained. Static devices with only a polyurethane body can cause excessive jacket wear that will shorten the life of the compensating cable. Polyurethane devices can also cause noise due to vibration.

Roller-type devices (like the Super SwayLess damping device - Figure 1B) have smooth, free-spinning nylon rollers that offer the lowest possible jacket wear, and can be used at any car speed up to 700 ft/min • 3.5 m/sec. These devices typically cost more but require no maintenance.

What about shallow pit applications?

Some installations may not have enough room to permit the damping devices to be placed at the recommended 3 feet • .91 m above the bottom of the cable loop; in some cases, there is not enough room to permit the use of two damping devices.

In these cases, the Shallow SwayLess damping device is recommended. It can be used up to 33 inches • .83 m above the pit floor and at any car speed up to 700 ft/min • 3.5 m/sec

Figure 5: ShallowSwayless

