Round Traveling Cable Installation

by Douglas Babcock and Dillard Green

Learning Objectives
After reading this article, you should have learned about:
- The proper inspection, storage and handling of traveling cable
- How to remove the jacket and braiding without damaging conductors
- Why pre-hanging a cable prior to installation is an important step
- Establishing the correct loop dimension below the elevator cab

Over the 30 years that it has been manufacturing elevator traveling cable, Draka Elevator Products has addressed many questions from the field related to the correct installation of round traveling cable. In an effort to reach the largest audience possible, your authors have compiled the most common oversights encountered during a typical installation and how they can be avoided.

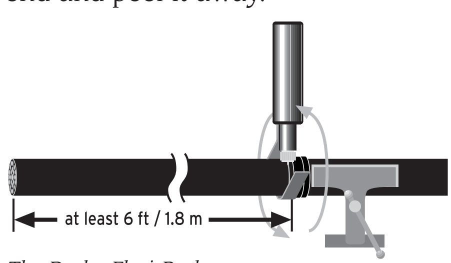
Inspection, Storage and Handling

Draka strongly suggests that as with any other type of elevator product, all traveling cable should be thoroughly inspected prior to installation to ensure that no damage has occurred during shipping. Damaged reels and containers are signs of rough handling and may indicate cable damage. Installation of cable with cuts or gouges in the outer jacket could lead to costly repairs and wasted time after the installation has been completed, so do not install potentially damaged cable.

Follow these tips when dealing with traveling cable prior to installation:
- Store cable in a clean, dry area and seal the cable end with electrical tape to keep moisture from entering it.
- When moving it with a forklift, be sure to lift the cable by the reel, rather than the cable.
- Alternatively, the cable reel may be rolled on a flat, firm surface.
- Finally, if the cable is being hoisted, be sure to place a strong rod through the reel as an anchor point for hoisting equipment. Never hoist by the cable.

Cable End Preparation

First, measure and mark the stripping point. While your requirements may vary, most installations require the removal of approximately 6 feet (1.8 meters) of cable jacket. Using a tool such as the Draka Flexi-Peeler™, score the full diameter of the traveling cable. Turn the handle of the tool 90°, then slit the jacket to the cable end and peel it away.



The Draka Flexi-Peeler

Next, remove the braid or "sock" to expose the conductors. Note: Never use a knife or scissors to complete this step of the process! Conductors may be easily damaged by doing so. Using a tool such as the Draka Sock Slicer™, remove the exposed braiding material. Separate the conductors by layer as required, and carefully cut away the jute fillers.

Continued

This article and **"Compensating Cable with a Wider Loop for Improved Balance"** on page 99 combined equal a continuing-education value of:

1 contact hour

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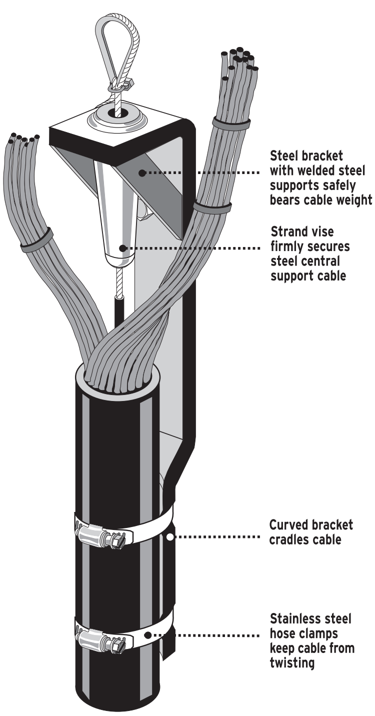
The Draka Sock Slicer

Pre-Hanging Cable

Pre-hanging cable is the most overlooked step (yet one of the most important parts) of the cable installation procedure. Pre-hanging traveling cable relieves the inner stresses that may have developed during re-reeling and handling.

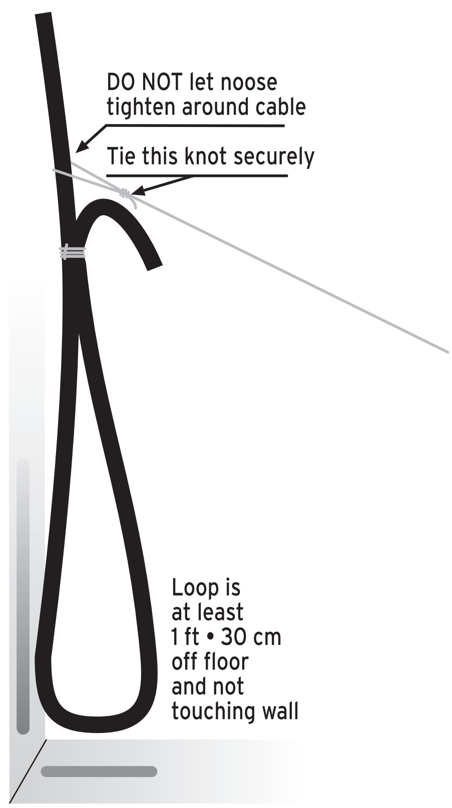
Draka recommends choosing a secure anchor point in the elevator hoistway that will permit the entire length of cable to hang freely. For steel-core cables, Draka provides the Universal Hanging System. Always secure the weight load in the strand vice portion of the hanger first. Then, tighten the hose clamps around the cable. This will prevent rotation of the cable or slippage of the conductor layers around the steel core.



Draka's Universal Hanging System

For jute-core cables, select the appropriately sized mesh grip based on the cable diameter. The lower end of the cable should clear the pit floor by approximately 1 foot (30 centimeters) to allow space for any straightening of the cable. The cable should be prevented from touching the hoistway walls or anything else in the hoistway. It should remain in this position for a minimum of 24 hours.

If the above pre-hanging procedure is not possible without the cable touching the pit floor, Draka recommends the following alternative method. Attach the cable at its permanent termination point using the proper hanging device as indicated above. Pull the cable away from the hoistway wall using a light rope. Finally, loop the cable back onto itself and secure it using a second piece of rope. Ensure that the bottom of the cable loop is approximately 1 foot (30 centimeters) from the pit floor. The cable should remain in this position for a minimum of 24 hours.

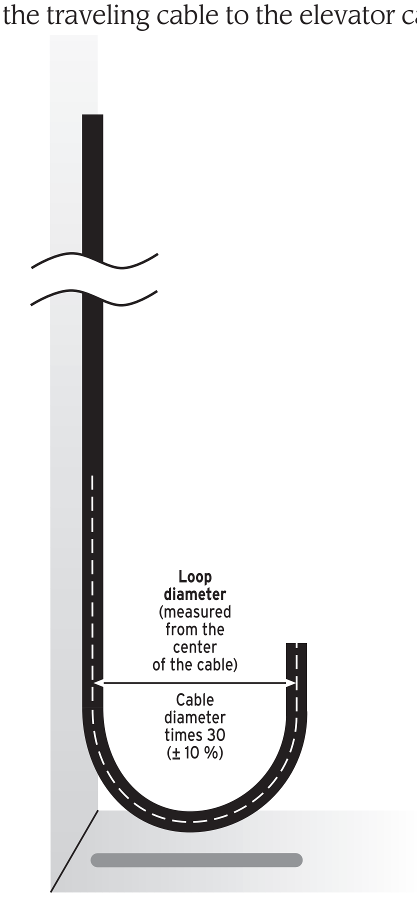


The alternative method of pre-hanging

Regardless of which pre-hanging method used, be careful not to twist or rotate the cable during the rest of the installation procedure. This will help ensure that the elevator operates smoothly and that the traveling cable does not twist upon itself during operation.

Establish the Correct Loop Dimension

The second most overlooked step during round traveling cable installation is setting the correct loop dimension below the elevator cab. The loop diameter is defined as the centerline distance between two parallel cable legs when the cable is suspended beneath the elevator cab. This distance determines the termination point of the traveling cable to the elevator cab.



The required loop diameter

The correct loop diameter may be determined by multiplying the cable diameter by 30. For example, if you are installing 1.5-inch traveling cable, the loop diameter should be set to 45 inches (1.5 inches X 30). The size of the loop diameter should be set to ±10%.

Headquartered in Rocky Mount, North Carolina, Draka designs and manufactures steel-core and jute-core round traveling cables, as well as a variety of flat traveling cables. More detailed information related to traveling cable installation procedures may be obtained at website: www.draka-ep.com.

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Learning-Reinforcement Questions

Use the below learning-reinforcement questions to study for the Continuing Education Assessment Exam available online at www.elevatorbooks.com or on page 141 of this issue.

- Why is it important to conduct a thorough inspection of traveling cable prior to installation?
- What specialized tools are available for cable preparation?
- What is the most overlooked step during a typical round traveling cable installation, and why is it important?
- How is the correct loop diameter determined? How is the loop diameter defined?

Compensating Cable with a Wider Loop for Improved Balance

Learning Objectives
After reading this article, you should have learned about:
- ◆ How the loop in compensation cable affects elevator performance
- ◆ The benefits of installing compensation cable with a wider loop
- ◆ Some of the drawbacks to using traveling cable for compensation

The Question

How does a compensating-cable loop width affect elevator performance?

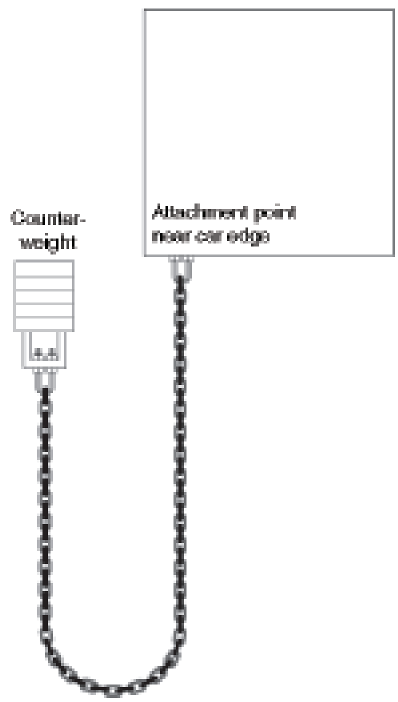
The compensating cable gets its name for compensating for the weight of suspension ropes to balance (dynamically and mechanically) the elevator system. Specifically, it compensates for the weight of the suspension means as it is played out to move the car up and down the hoistway. This article addresses issues about compensating cable that have become more common as elevators go higher and faster.

The Situation

Originally, compensation was provided by lengths of bare chain or sash cord chain. These were cheaper alternatives to wire rope. While chain and sash cord were inexpensive, they were also quite noisy.

Compensating cable came about as a way to make chain quieter. Most compensating cables are some version of a coated chain, and are about as flexible as chain. This was intentional; since compensation cable often replaced chain, it needed to form the same narrow loop as chain to connect to the same support points underneath the car and counterweight.

The Narrow Loop and the Attachment Points



Compensation rope forms a loop as it hangs from its attachment points. The width of that loop depends on the flexibility of the compensation. Like the material it replaces, compensating cable forms a fairly narrow natural loop. Note that because of this narrow loop, the compensation is attached near the edge of the car.

Maintaining this natural loop is essential to safe operation of the elevator. A wider-than-specified loop width can cause the cable to swing around excessively in the pit. This can be dangerous and damaging; excessive cable sway allows the cable to potentially grab or entangle with buffers, buffer switches, mounting brackets and other pit equipment.

Continued

This article and **"Round Traveling Cable Installation"** on page 95 combined equal a continuing-education value of:

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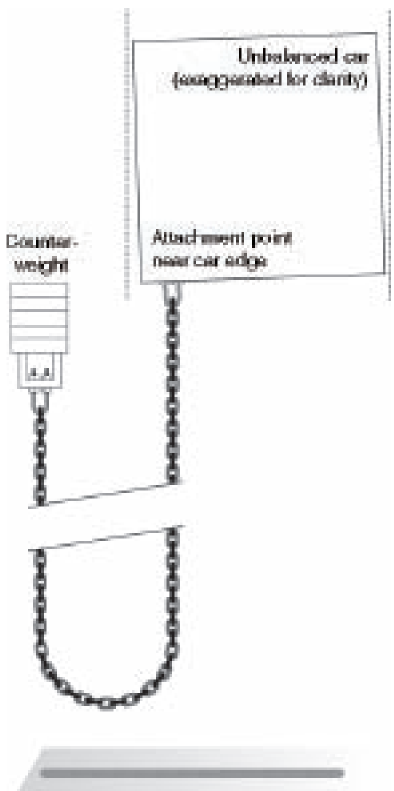
If a cable entanglement occurs, there is risk to public safety and of damage to pit and/or hoistway equipment. Therefore, the attachment point must be aligned with the cable's natural loop.

How an Off-Center Attachment Point Limits Performance



Elevator manufacturers determined that a hang length of approximately 400 feet (122 meters) for bare-chain compensation was about the maximum length for balance if the chain's support point was near the edge of the car. (Note: Maximum hang length for modern compensating cable is based on the strength of its support member and not the balance of the elevator.)

However, the issue is not so much as the length as it is the weight; 400 or more feet of compensation can unbalance the car and degrade its performance, especially in side-counterweight configurations.

There are a couple of methods in use to counterbalance long lengths of compensation. Some companies actually supply static weights that hang from the car opposite the compensation attachment point. While this does counterbalance the compensation, it lowers the capacity and overall performance of the car by making it heavier.

Another method is to install additional compensating cable like a traveling cable opposite the primary compensation attachment point. This dynamically counterbalances the compensating cable(s) and is a more suitable solution than static weights. However, this method adds the costs of cable, support hardware and installation time while continuing to reduce or lower the car's capacity because of the extra weight.

Traveling Cable as Compensation Cable

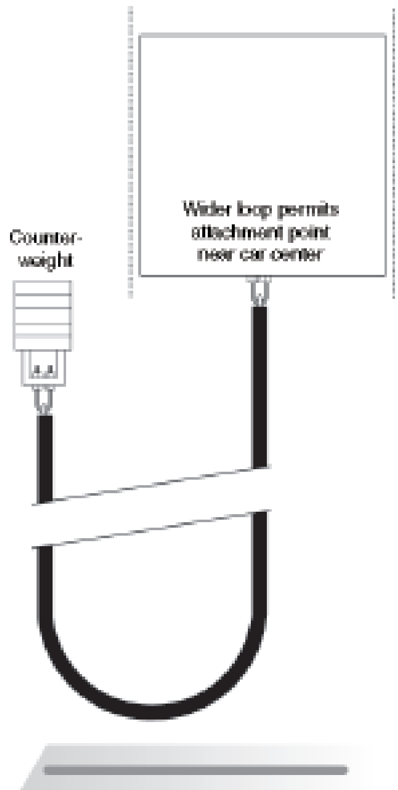
It seems that the answer is to use compensation that has a wider natural loop to permit center attachment.

Traveling cable has been used as compensating cable for many years. It meets the requirement for a wider loop, and its stable tracking during operation usually requires only a single sway-reduction roller or device.

However, it is not the ideal solution. Traveling cable costs roughly four times as much as the compensation cable it replaces. Traveling cable also has to be securely supported at both ends in order to prevent premature breakdown of the conductors that can cause twisting and poor tracking.

Another Problem

When traveling cable is used as compensation, the cable must be occasionally shortened as the suspension ropes stretch over time. (It is much more difficult to shorten traveling cable than compensation cable.)



The Answer – Compensation Cable with a Wider Loop

The main problem with the current generation of compensation cable is its small loop width of about 2 feet (60 centimeters). It would seem that the best answer would be to produce a chain-based compensation cable with a wider natural loop that matched up to the size of a standard elevator car, more like 4 feet (1.2 meters).

Wide-loop compensating cable is now commercially available with a loop width of approximately 4 feet. A 4-foot loop width allows the cable to be supported or terminated near the center of the car for improved balance and ride quality. This provides the best solution for elevators with side-counterweight configurations, or with hang lengths over 400 feet that have balancing issues. Elevators currently using traveling cable as compensation now have a low-cost solution for replacement that includes stable tracking performance. Little or no sway reduction is needed.

Conclusion

Wide-loop compensating cables will offer the best combination of price and performance for long hang lengths and for elevators with balance/performance issues such as side counterweight configurations.

Reprinted from ***Draka Elevator Products' Tech Tip #8.***

Earn Your Credit!

See page 141 of this issue for the ELEVATOR WORLD Continuing Education Assessment Examination Questions.

Learning-Reinforcement Questions

Use the below learning-reinforcement questions to study for the Continuing Education Assessment Exam available online at www.elevatorbooks.com or on page 141 of this issue.

- What are some of the drawbacks to using compensation cable with a naturally narrow loop?
- What are the benefits of installing compensation cable with a wider loop?
- Traveling cable has been used as compensation cable for many years. Why is this not the ideal solution?

ELEVATOR WORLD Continuing Education Assessment Examination Questions

Instructions:

- Read the articles **"Round Traveling Cable Installation"** and **"Compensating Cable with a Wider Loop for Improved Balance"** (pages 95 and 99) and study the learning-reinforcement questions at the end of the article.
- To receive **one hour** of continuing-education credit, answer the assessment examination questions found online at www.elevatorbooks.com or fill out the ELEVATOR WORLD Continuing Education Reporting Form found overleaf and submit by mail with payment.
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Questions from "Round Traveling Cable Installation"

1. Most traveling cable installations require the removal of approximately:
   a. 1.8 feet of cable jacket.
   b. 4 feet of cable jacket.
   c. 6 feet of cable jacket.
   d. None of the above.

2. What is the most overlooked step of most cable installations?
   a. Inspection for cuts and gouges in the outer jacket.
   b. Removing the cable braiding.
   c. Pre-hanging the cable.
   d. Determining the correct loop diameter.

3. The main benefit to pre-hanging traveling cable is:
   a. The cable is stretched to the correct length.
   b. Relief of the inner stresses that may have developed during re-reeling and handling.
   c. Verifying that the cable is the correct length.
   d. All of the above.

4. Traveling cable should remain in the pre-hanging position for a minimum of:
   a. 12 hours.
   b. 18 hours.
   c. 24 hours.
   d. 36 hours.

5. The correct loop diameter is determined by multiplying the cable diameter by:
   a. 30.
   b. 60.
   c. 75.
   d. 90.

Questions from "Compensating Cable with a Wider Loop for Improved Balance"

6. Wide-loop compensation cable is commercially available with a natural loop width of approximately ___ feet.
   a. 3
   b. 3.5
   c. 4
   d. 5

7. One of the drawbacks to using traveling cable as compensation cable is:
   a. Traveling cable costs roughly four times as much as the compensation cable it replaces.
   b. Traveling cable must be securely supported at both ends to prevent premature breakdown of the conductors.
   c. Traveling cable must be occasionally shortened to compensate for the stretching of suspension ropes.
   d. All of the above.

8. The main benefit of the mid-car attachment point of wider-loop compensation cable is:
   a. Smaller counterweights are required.
   b. Improved balance and performance.
   c. Higher passenger capacity.
   d. Increased need for static weights.

9. The maximum hang length for bare-chain compensation supported near the edge of a car is:
   a. 122 feet.
   b. 300 feet.
   c. 375 feet.
   d. 400 feet.

10. One of the methods for counterbalancing long lengths of compensation cable supported near the edge of a car is:
    a. Adding weights to the inside of the car.
    b. Adding static weights which hang from the car opposite the compensation attachment point.
    c. Limiting the number of passengers permitted inside the cab.
    d. Both B and C.

ELEVATOR WORLD Continuing Education Reporting Form

Article titles: **"Round Traveling Cable Installation"** and **"Compensating Cable with a Wider Loop for Improved Balance"** (EW, June 2008 pages 95 and 99).

Continuing-education credit: These articles will earn you **one contact hour** of elevator-industry continuing-education credit.

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