



DASMA
Door & Access Systems
Manufacturers Association
International

COMMERCIAL & RESIDENTIAL GARAGE DOOR DIVISION

TECHNICAL DATA SHEET

#190

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Factors Affecting Spring Cycle Life

Introduction

The objective of garage door spring manufacturers is to provide a product within industry tolerances and standards; however, once a spring leaves the location where it was manufactured, the manufacturer no longer has control over how the spring is handled, how the spring is installed, or how the spring is affected by door users. This Technical Data Sheet describes how handling, installation, and door usage can affect both torsion and extension spring cycle life and gives recommendations to help maximize spring performance.

Important Note

Spring cycle life may not necessarily coincide with door cycle life. ANSI/DASMA 109 is a test to determine door cycle life. When a door is tested to the standard, failure includes, among other factors, "any component of the door system causing the door to cease operation".

Handling Factors

- **Dropping a Spring.** Regardless of whether or not it is packaged, care must be taken when transporting a spring from the manufacturer through the supply chain. Even a seemingly minor nick or notch could provide a weak point in a spring, compromising its intended performance. Control should be exercised where possible. Dropping a torsion spring on a hard surface could also result in cracked or broken cast spring fittings, and this could cause possible spring failure and injury to the installer during installation.
- **Throwing a Spring.** Under no circumstances should anyone throw a spring. As with dropping a spring, a nick or notch could result, but a thrown spring may also strike onto a hard surface, possibly resulting in deformity. Because of tolerances observed by the manufacturer, a spring slightly out of round could compromise its intended performance. For a torsion spring, impact on a hard surface could also result in cracked or broken cast spring fittings, and this could cause possible spring failure and injury to the installer during installation.

Note: Technical Data Sheets are information tools only and should not be used as substitutes for instructions from individual manufacturers. Always consult with individual manufacturers for specific recommendations for their products and check the applicable local regulations.

This Technical Data Sheet was prepared by the members of DASMA's Commercial & Residential Garage Door Division Technical Committee. DASMA is a trade association comprising manufacturers of rolling doors, fire doors, grilles, counter shutters, sheet doors, and related products; upward-acting residential and commercial garage doors; operating devices for garage doors and gates, sensing devices, and electronic remote controls for garage doors and gate operators; as well as companies that manufacture or supply either raw materials or significant components used in the manufacture and installation of the Active Members' products.

- **Storing a Spring.** Springs should be kept dry to prevent surface rust development. Rust reduces the effective area of spring wire, which in turn reduces its overall strength. Rust can also cause corrosion pits from which fatigue cracks can accelerate and reduce cycle life.
- **Cutting a Spring to Length.** If using a spring out of stock and torch-cutting to length, avoid overheating adjacent coils. It is also important to shield adjacent coils from molten splatter during torch-cutting, which can create brittle spots possibly causing premature failure.
- **Threading a Torsion Spring onto a Cone.** Avoid letting the active coils turn.

Installation Factors

- **Applying a Spring to the Wrong Door.** Not knowing whether or not a spring meets a door's counterbalance requirement can not only reduce the cycle life of a door assembly and/or a garage door motor, but it could also result in a safety issue regarding manual operation of the door. The installer should always double check spring identification and parameters to verify adherence to the garage door manufacturer's installation instructions.
- **Applying an Incorrect Number of Turns to a Torsion Spring.** Excessive torque applied to a torsion spring could not only put excessive force on other counterbalance components, but could also be a safety issue for the installer applying such torque. Insufficient torque can present problems, as well, resulting in a door drifting down from its open position over time. The number of turns should always be in accordance with the garage door manufacturer's installation instructions.
- **Applying a Spring to a Door Weighing More Than the Manufacturer's Specifications.** Actions taken by building occupants, such as applying paint to the door or adding components to the door, may cause the door weight to surpass the manufacturer's specifications. If it appears that paint is affecting the door weight, a trained door systems technician may measure this effect with a scale after the door counterbalance system has been disabled. DASMA TDS-176 provides strong advice regarding attaching materials to or hanging materials from any part of a garage door assembly.
- **Winding a Torsion Spring Backwards.** This is another potential safety issue for the installer. The turns should always be applied in the direction specified in the manufacturer's installation instructions.
- **Improper Stretch.** For a torsion spring, insufficient stretch can place the coils in constant, scraping contact with each other during door operation. Too much stretch can cause the springs to “snake,” which can lead to

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- coil rubbing as well. These stretch problems can be caused either during initial spring winding or afterwards due to side-to-side shaft movement.

Door Usage Factors

- **Extreme Climatic Conditions.** Doors left open for extended periods of time on a regular basis allow springs to face increased temperature, moisture, and air quality variations. Doors installed in climates such as those subject to extreme heat or cold, frequent precipitation, and/or proximity to a saline coastal location should be kept closed where possible.
- **Corrosive Environment.** Certain chemicals, such as acids containing chlorine, can cause spring corrosion, leading to premature failure. Applications such as wash bays should be reviewed for possible corrosive effects.
- **Lack of Counterbalance Assembly Maintenance.** The counterbalance assembly should be maintained in accordance with the door manufacturer's written instructions. Regular greasing or lubrication of springs, as required in the manufacturer's instructions, will help to maximize spring cycle life.

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