



Door & Access Systems
Manufacturers Association
International

COMMERCIAL & RESIDENTIAL GARAGE DOOR DIVISION

DASMA TECHNICAL DATA SHEET

#192

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Securing Garage Doors During High Wind Events

This DASMA Technical Data Sheet provides information about securing a garage door to prevent the door from opening in a high wind event. High wind events can include hurricanes, tornados, and straight line winds from thunderstorms or cold fronts.

Background

Hurricane Andrew hit South Florida in 1992. Until Hurricane Katrina in 2005, Hurricane Andrew was the costliest natural disaster to hit the United States. With Hurricane Katrina the majority of the destruction was caused by water storm surges and flooding; whereas the damage caused by Hurricane Andrew was almost entirely wind related.

In the aftermath of Hurricane Andrew, post-disaster studies of building design noted that many garage doors in the path of the storm had been opened, allowing hurricane force winds into homes. When a garage door opening is breached, for whatever reason, wind pressures build up in the garage, possibly blowing off the roof or causing other catastrophic damage to the home.

Original investigators assumed that homeowners had opened their garage doors before the storm; however, further investigation revealed that this was not the case in many instances. So why were these garage doors opened during the hurricane? The hurricane itself opened these garage doors through the action of hurricane force winds.

Why Can a Garage Door Open During a High Wind Event?

Garage doors consist of multiple door sections, connected by hinges that run the width of the door opening. Rollers inserted in the hinges at the ends of the section fit into tracks on either side of the door opening. The door sections "catch" the wind and "push" the door against the vertical track; however, the vertical track is not perfectly straight up and down. The vertical track is tilted back, such that the door does not rub against the opening in normal operation.

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.

In addition, the top rollers typically rest in the curved portion of the track when the door is closed. This position of the top rollers when combined with the slight track tilt allows a small portion of the wind force that pushes against the face of the door to impart an upward force that drives the door open. The greater the force exerted by the wind, the more upward acting force that lifts the door. (See Figure 1.)

Do Garage Doors with Operators Respond to High Wind Events Differently?

Each configuration of operator and door will react differently in response to loads imparted by high wind events. It is important to consider how the entire door system will oppose both upward forces and direct loads. Resistance to a garage door's tendency to rise or fall depends in part upon the actual mechanical connection of the garage door to the operator and the status of the counterbalance system. Contact a trained door systems technician to ensure not only the safe "entrapment protection" function of the door system and the proper door counterbalance, but also to verify that the door will remain closed while withstanding the loads imparted by high wind for the duration of a design level wind event as dictated by the authority having jurisdiction.

Another point relevant to the subject: when a garage door is automated through the installation of a garage door operator, manual locks are typically disengaged, disabled, or removed. However, garage doors designed for higher wind resistance may employ manual locks to be engaged prior to a high wind event.

Recommendations

- In all cases, your safety is important. Be sure to follow all safety precautions in any high wind event.
- See TDS-167 (*Residential Sectional Garage Door and Electric Operator Checklist for Home Inspectors and Consumers*), TDS-168 (*Wind on Garage Doors: Frequently Asked Questions*), and TDS-174 (*Building Occupant – Checking a Garage Door for Damage*).
- Prior to a high wind event, and if at all possible during a high wind event, it is a good practice to:
 - a. Close the door and leave it closed.
 - b. Mechanically lock the door via a manual locking device, when such device is provided with a higher wind resistant garage door.
 - c. Disconnect the operator, when the door is manually locked.
 - d. Unlock the door prior to normal operation, especially if you use an automatic operator.

Note: Using an automatic operator to open a door while manually locked can cause damage to both the door and operator.

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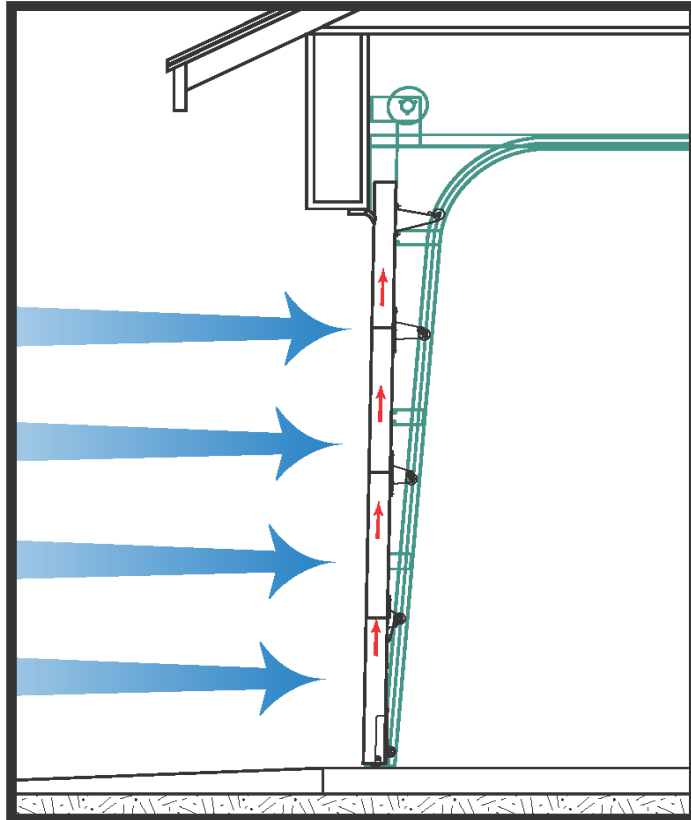


Figure 1

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