ROLLING DOOR DIVISION
DASMA TECHNICAL DATA SHEET
#272
Door & Access Systems Manufacturers Association International

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Rolling Door Counterbalancing

Counterbalancing of the rolling door curtain is different from counterbalancing a sectional door. Although each manufacturer's spring design varies slightly, a rolling door will typically be out of balance during some portion of its travel. Therefore, tensioning of a door to a particular degree of balance is an issue of preference, as described in this Technical Data Sheet.

As a curtain rolls up on itself, the coil diameter increases with every revolution. As a result, the reduction in "hanging weight" (curtain plus bottom bar) changes with every revolution. Consequently, door torque is non-linear and increases or decreases at a variable rate. Meanwhile, spring torque is typically linear and increases or decreases at a uniform rate. Charting spring torque will generate a straight line. However, charting door torque will generate a curve. Charting these two torque functions on the same graph will show that a door will in most cases balance in two places (where the lines intersect).

Examples of balance preferences for a hypothetical door are illustrated in Figures 1, 2 and 3. The lower left side of each chart represents the door in the open position and the right side represents the closed position of the door. As the door closes, door and spring torque increase. When the door is in the open position, changing the number of initial turns of the spring will move the spring torque line. This changes how the door is balanced throughout its travel.

Below are three different balance preferences for a hypothetical door based on changing the number of initial turns.

- **Case 1 – Figure 1 (1 ¾ initial turns)**
  A door will be closer to being balanced in the open and closed position more so than when a door is in the halfway open position. It will take more effort to open a door throughout most of its travel.

- **Case 2 - Figure 2 (2 initial turns)**
  A door is equally close to being balanced throughout the travel of the door. This means it will take the same amount of effort to close the door as it does to open it.

- **Case 3 – Figure 3 (2 ¼ initial turns)**
  A door will be closer to being balanced at the halfway open position more so than at the open or closed position. It will take more effort to close the door from the open position and near the closed position.

In all cases, the two positions of travel where the spring and door torque line intersect are where the door would balance. Therefore, an otherwise out-of-balance door should be regarded as part of the normal design function of a spring balanced rolling door.

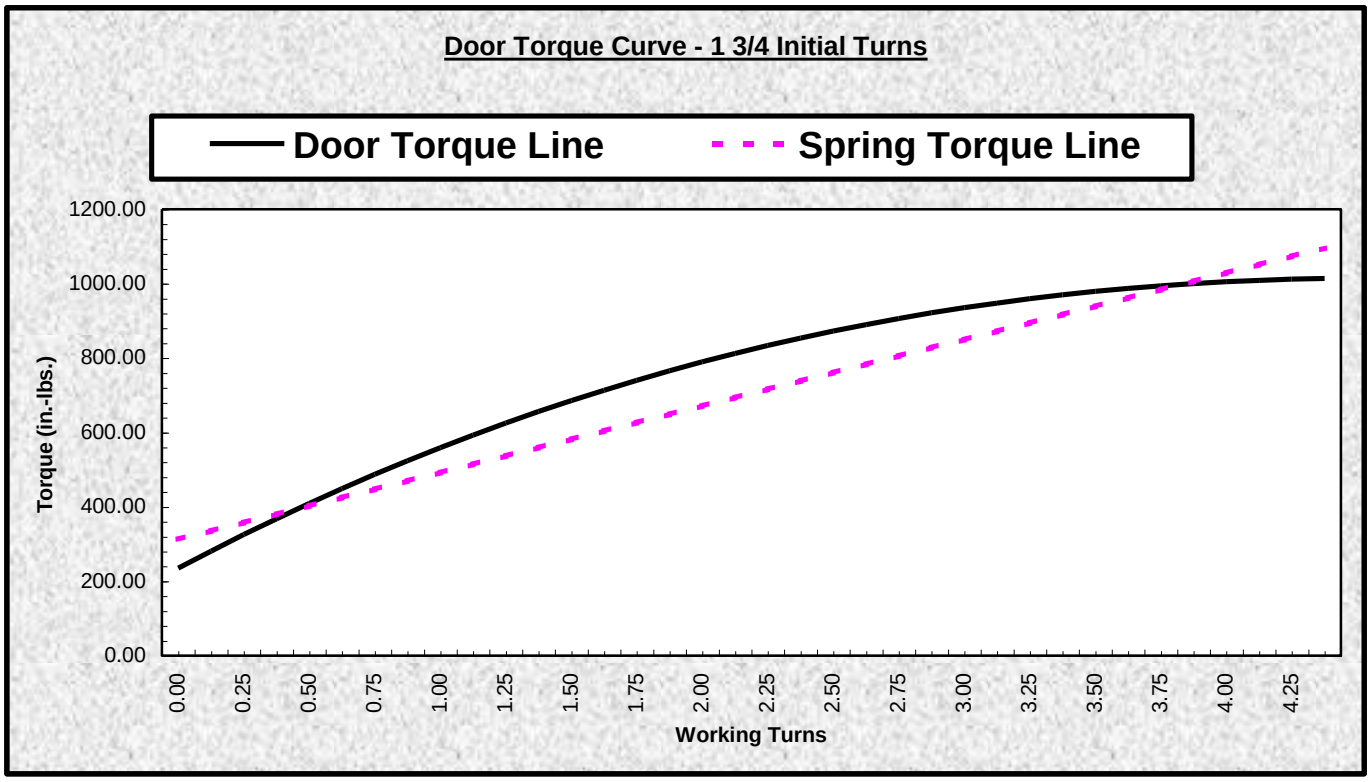

Figure 1

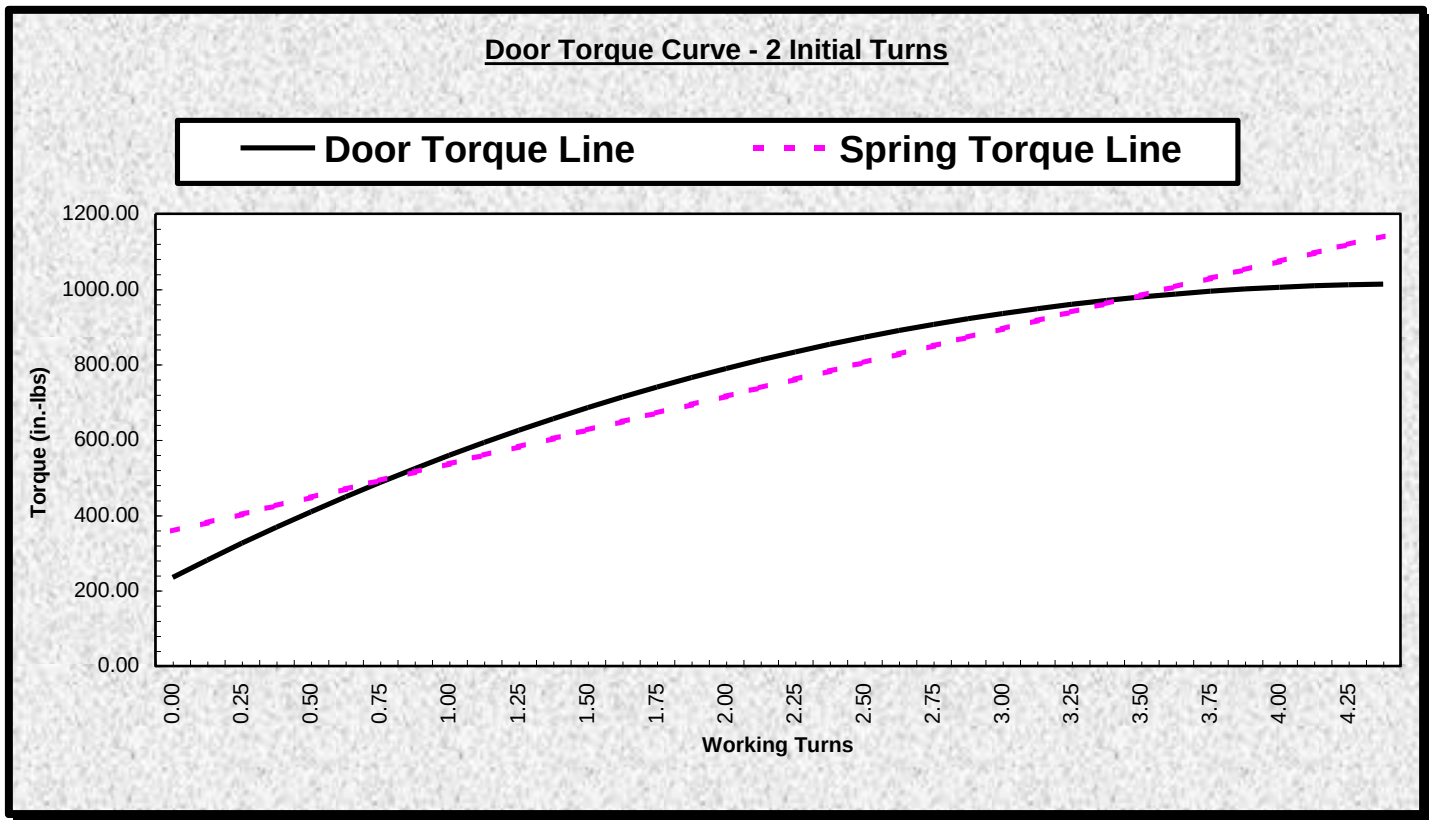

Figure 2

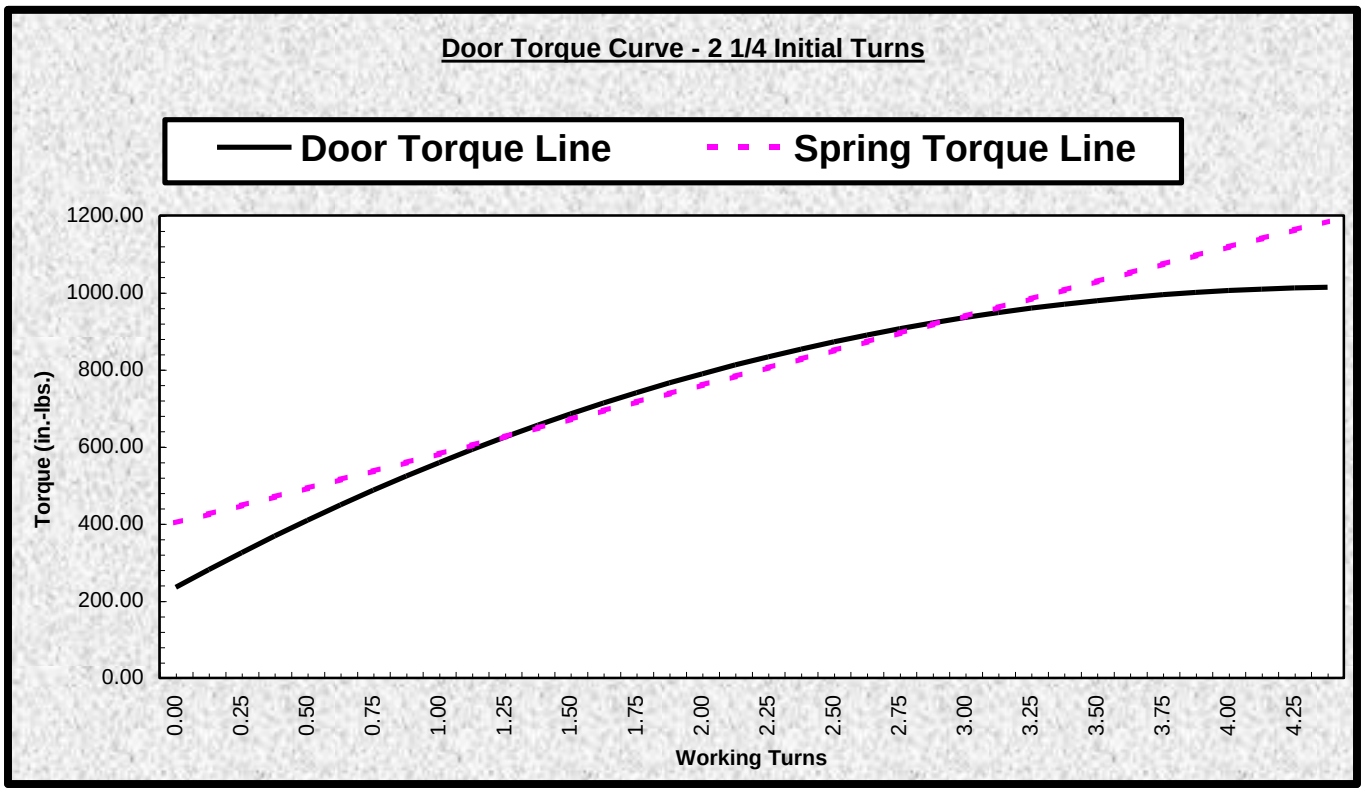

Figure 3