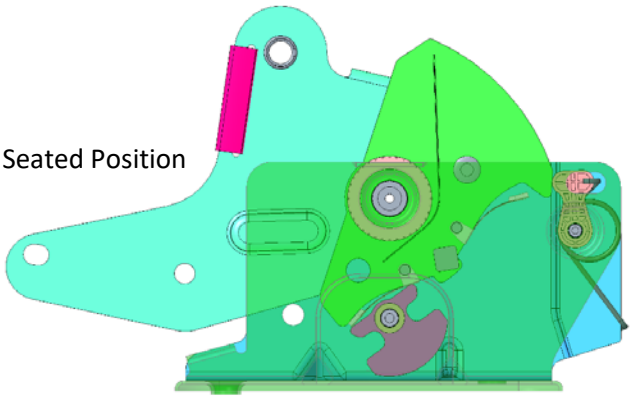
Virtual Engineering, Inc.

Engineering Your Competitive Edge…

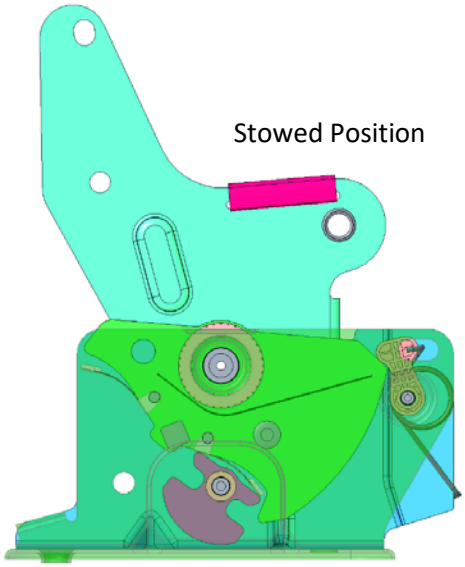
Inertia Latch Design for Pickup Truck Second Row Split Seat

- **Objective:**
  - Engineer Inertia Latches for 60/40 rear seats in an extended cab truck
- **Constraints:**
  - ***Zero*** BSR allowed
  - Inertia Latch is to lock up when the vehicle is subject to specified impact conditions; Seated position in rear impacts; Stowed position in frontal impacts
  - Seat articulates like a “stadium seat”
  - Stowed Position downward stop is the cushion bottom contact with carpeted floor pan

Seated Position



Stowed Position



Virtual Engineering

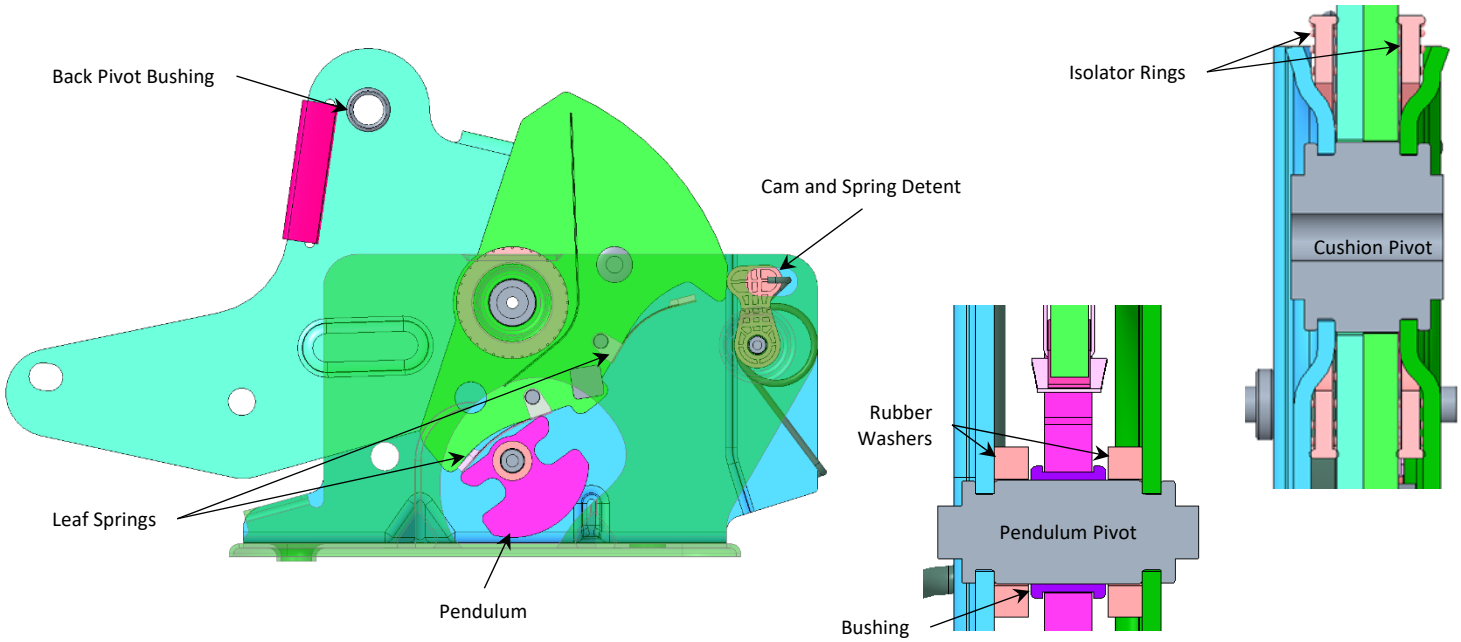
info@veng.com

Virtual Engineering, Inc.

Engineering Your Competitive Edge…

Inertia Latch Design for Pickup Truck Second Row Split Seat

- **Process:**
  - Designed one Pendulum to provide inertia locking against upward travel when seat is in the Seated Position and downward travel when in the Stowed Position
  - Designed a Leaf Spring keeping the Pendulum from rattling against the Sector: Considering the significant variations in the system tolerance stack-up, the Pendulum could not be included in the mechanism down stop; which meant that the Pendulum, needing to freely rotate to properly function, should be in contact with a biasing spring element in the Seated Position to keep it firmly pushed against the Locking Plate
  - Also Included a Leaf Spring for the Stowed Position due to similar conditions
  - The steel Pendulum is isolated from contact with other steel components by a plastic bushing at the pivot and flanking rubber washers
  - The Leaf Spring is isolated from the Locking Plate by a plastic Leaf Shim
  - Ring Isolators were designed at the Main Pivot to eliminate lateral looseness, provide resistance against rotation, improve the feel of rotation
  - A Cam is forced against the trim line of the Locking Plate to dampen cushion vibrations, provide a tactile detent in both seated and folded positions, and improve feel of rotation
  - Included a bushing in the Seat Back Pivot hole
- **Results:**
  - ***BSR were not an issue***
  - Excellent quality feel perceived by customer while folding seat up or down



Virtual Engineering

info@veng.com