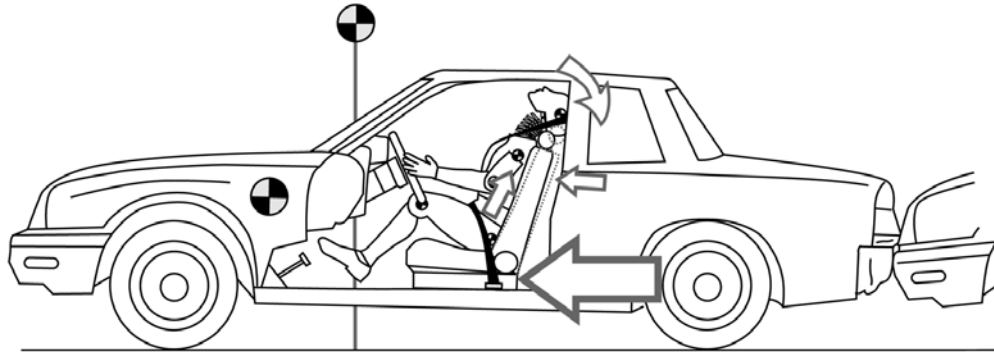


HOLST CHIROPRACTIC OFFICE

BACKSAFE® & SITTINGSAFE® Home & Industry Injury Prevention

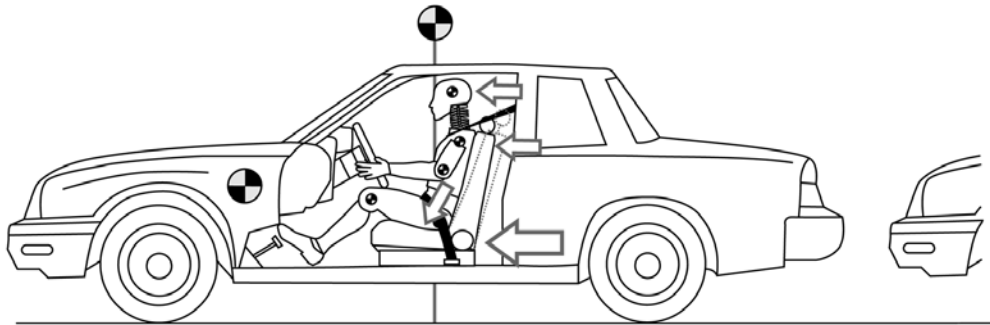
Scoliosis – Non-Surgical Correction • Whiplash Certification • Golf Injury & Performance Programs

A question frequently asked by insurance carriers is, “How is it that the occupant(s) are claiming (serious) injury when there is little or no (visible) damage to the vehicle?”



In a low speed rear impact collision (losric), the shock attenuating rear bumper is compressed and the target vehicle is propelled forward. The applied forces causes the following reaction:

1. The torso is thrust back into the seat, compressing, deflecting, and loading the seatback.
2. The torso and head rises up in the seat (Ramping Effect).
3. The head and neck come into contact with the headrest.
4. A hyperextension of the neck occurs, and depending on the height of the headrest, head and neck extension can push down on the headrest (Hammer and Nail Effect), thereby accentuating cervical hyperextension.
5. The hands can come free from the steering wheel, accentuating the rearward force into the seatback.
6. Due to the forward forces and occupant inertia, the foot comes off the brake pedal, accentuating the forward thrust.



Within milliseconds, the following sequence occurs:

1. The stored energy in the seatback is released, causing forward propulsion of the torso.
2. The forward thrust of the torso and the lag time of the head causes a shearing in the joints in the neck.
3. With the torso restrained by the seatbelts, the head then whips forward, causing a hyperflexion of the head and neck.
4. The forward forces applied to the driver then cause a forceful reapplication of the brakes, which accentuates the deceleration and forward momentum of the occupants.
5. Due to the elastic makeup of the bumper, the vehicle will have little or no visible damage at impacts of less than 8-12 mph. Threshold for occupant injury is 5 mph.