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Automobile Seat Failure

By Charles C. Roberts, Jr., Ph.D., P.E.

THE CLAIMS ANALYST IS SOME-

times faced with an unusual set of circumstances that may have caused an automobile accident. This somewhat unusual case study deals with a single automotive vehicle accident where the vehicle was a total loss and the insured driver was injured.

According to the insured, he was driving on a straight road during the day, with good weather conditions, when the driver's seat suddenly collapsed backward, causing him to lose control of the vehicle, which ended up in a ditch. Examination of the vehicle resulted in the photo in Figure 1 showing the driver's seat collapsed onto the back seat.

Figure 2 is a view of the driver's seat support bracket on the left side. The red

arrow points to a bolt that had failed, releasing the upper attachment to the seat frame from the seat recliner bracket. This will cause the seat to fall back until stopped by whatever is in the back seat. In this case, the seatback reclined all the way to the back seat cushion as shown in Figure 1.

Figure 3 is a microphotograph of the fracture surface of the remains of the bolt in the seat. Bending fatigue is evident (striations) with the origin being indicated by the red arrow and the direction of the crack advancement indicated by the blue arrow. There is no evidence of overloading or abuse. This crack developed over time and finally failed when a substantial area of the bolt cross-section had failed. It is easy to see how a driver could lose control when the seatback retracts suddenly.

This failure is addressed in a manufacturer's recall that required dealers to replace this system with a bolt and metal spacer. The metal spacer reduces the rocking motion of the bolt that would essentially eliminate the bending fatigue. It does not go unnoticed that this loss was caused by a design defect, which can be a basis for subrogation.

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