

Experts describe how SUV and train got snagged by rail

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Bad luck and unforgiving physics contributed to making the Metro-North collision with a car so deadly, experts say.

Metro-North trains are equipped with “contact shoes” that pick up electric power from the system’s third rail as the train moves. But at grade crossings, there is a gap in the third rail so vehicles can cross the tracks.

In Tuesday’s disaster, one end of that rail acted as a spear.

“When the train hit the SUV and was pushing it along, the SUV snagged that end of the third rail and pulled it off the insulators that hold it,” said Steve Ditmeyer, an adjunct professor of railway management at Michigan State University. “That caused it to come up through the SUV and into the lead car of the train.”

Because Metro-North uses an under-running third rail — meaning the shoes pick up power from the bottom of it — the rail ends at grade crossings have a slight upturn. Throughout the system, the third rail is slightly raised above the ground with a protective covering.

Ditmeyer said the rail design is not to blame for Tuesday’s tragedy.

“If the SUV had gone three or four feet less, the SUV would not have snagged on the third rail,” he said. “It was that sheer coincidence of timing that caused it be where it was with the train pushing it.” George Bibel, author of “Train Wreck: The Forensics of Rail Disasters,” said Tuesday’s high toll death is unusual for a car-train collision. “Normally you expect the train to sweep the car off the tracks,” he said.

But there have been cases like Tuesday’s and even more catastrophic. In 2005, in Glendale, Calif., a suicidal man drove his Jeep Cherokee onto the tracks, then changed his mind and abandoned his Jeep. A commuter train slammed into it, derailed, plowed into a freight train and then sideswiped

another commuter train. Eleven people were killed and more than 100 were injured.

The limits of strong steel

Experts say even though railroad steel is designed to be super strong, it can break in extreme situations and penetrate the train car. In many cases, running rails get destroyed when a train derailed. “The third rail is made up of sections that are bolted together,” said Conrad Ruppert, a senior research engineer at the Rail Transportation and Engineering Center at the University of Illinois at Urbana-Champaign. “The impact and force behind the train and the SUV would have a tendency to break these pieces apart where they are connected to one another. The weak point is where they are connected.”

It remains unclear how many people were killed or injured by sections of the rail that tore through the train car, but at least one person was reported to have lost his leg.

Christopher Barkan, executive director of the center, said ultimately the tragedy points to the need for better driver education. “If there is one message the public can learn from this is to never enter a grade crossing unless you can get all the way across.”



The third rail punctured the Metro-North train’s first car and ended up near the roof and between the first and second cars after the Tuesday evening crash. A portion of third rail is cut Wednesday as workers begin the process of removing the wreckage. (Photo: Seth Harrison/The Journal News)