

could have been eliminated by paving the spaces between the structure.

Mr. STONEX. [Narrating film:] At General Motors, we think that our circular track is one of the safest high speed roads in the world. One of the problems involved was the illumination of the track entrance and the exit. The commercially available lamp poles were rigid and would have been hazardous. These scenes of impacted lamp poles were obtained on a day's drive through the city of Detroit. The city officials indicate that there are about 300 of these poles knocked down during a year's time, or about one a day. Here is a scene that you have seen before.

Here is the tripod-type lamp pole which is not practical particularly; however, it was very effective, damage to the car very slight.

This will be a test of a standard steel lamp pole of standard installation. You get some impression of the severity of the impact and the damage to the vehicle which is caused by this pole.

Through our mutual interest in highway safety, Texas A. & M. University disclosed to us a design of a breakaway slip base for sign posts that they were testing in conjunction with the Texas Highway Department and the Bureau of Public Roads. Taking the lead from them, they had a bidirectional slip base and we arrived at this one which is omnidirectional. The top of the mounting plate is attached to the base of the pole. This is attached to the ground anchor by four bolts and spacers.

And this will be a test of the pole of the omnidirectional breakaway.

This is an aluminum pole. The State of Michigan requested that we evaluate steel posts with the omnidirectional breakaway because of some difference in the initial cost. This is a steel pole with the rigid base, the standard installation at the moment throughout much of the country. They figure in serious and costly accidents, as you can see.

Here is an installation with the breakaway base, slip base. The damage to the pole and to the automobile are minimal.

I might say that this standard is approved by the Michigan State Highway Department presently.

On our test track, we elected to keep the poles 30 feet from the edge of the pavement, so that we get the double safety of remoteness from the edge of the pavement and the slipaway bases.

Mr. CONSTANDY. We have approximately 5 more minutes. I think you have one more film, do you not?

Mr. LUNDSTROM. No; we would like to not show the other film of the bridge parapet. I would like to call your attention to the rigid parapet though, that was shown in the guardrail film.

There are many features that are not obvious to you on initial viewing. First of all, vehicles that strike this new bridge parapet, vehicles that strike at rather flat angles, are redirected by tire contact and there is no sheet metal damage at all. For sharper angles of impact or for higher speeds, the tire climbs the bridge rail and the car banks into a turn. It is this fine turn and bank that gives this quadrail advantages over other structures. This performs so well that we now are driving these tests, rather than running the cars by remote control.

If your committee is able to come to Detroit at any time, you can personally ride in cars being driven into these bridge rails about 40