

**Jerking the steering wheel when braking in an emergency in an ABS-equipped vehicle can get you in big trouble real quick!**

**Question & Answers**

Q: Where's the evidence that this is a safety problem?

A: Research by both the National Highway Traffic Safety Administration (NHTSA) and the Insurance Institute for Highway Safety (IIHS) reveal that drivers of ABS equipped cars seem to have trouble controlling their vehicles when braking in an emergency. For example, a December, 1994 report by NHTSA (1) found that, as compared to cars without anti-lock brakes, ABS-equipped cars had a statistically significant increase in the frequency of single-vehicle, run-off-the-road crashes.

"Fatal run-off-road crashes were up 28 percent, and nonfatal crashes by 19 percent." (2) The author of the NHTSA report offered the following hypothesis regarding why these crashes may be occurring:

A driver is exposed to a panic situation, such as a sudden realization that a slow vehicle or deer is in front of the car, or that the car is heading off the road. Some inexperienced drivers instinctively react to these situations by slamming on the brakes and abruptly turning the steering wheel. [emphasis in original] Without ABS, the front wheels lock and the car goes straight ahead, stopping in a reasonably short distance, essentially ignoring the steering input. With ABS, the vehicle responds to the abrupt, instinctive steering input, possibly running off the road and badly out of control. (3)

The AAA Foundation for Traffic Safety has produced a videotape which shows exactly how out of control an ABS-equipped car gets under these real-world circumstances.

Q: This crash risk occurs only at highway speeds, right?

A: Wrong. The Foundation's video shows an ABS-equipped car completely out of control when the driver violently jerks the steering wheel while braking on dry pavement at only 35 mph. The identical maneuver in a non-ABS equipped vehicle results in no loss of control.

Q: How were the tests shown in the Foundation's video conducted?

A: The Foundation's tests were conducted on August 26, 1997 at Transportation Research Center (TRC), East Liberty, Ohio (TRC is a nationally recognized vehicle safety research facility used by both NHTSA and motor vehicle manufacturers for vehicle testing, including braking tests). The braking sequences shown in the video were conducted on dry pavement at 35 mph. Test lanes were 11 feet wide. Braking commenced approximately 40 feet from the "target" (a line of cones across the lane). Initial runs were driven by a professional brake tester provided by TRC; subsequent runs with a non-professional driver produced identical results. The drivers were instructed to:

- 1) accelerate to 35 mph;
- 2) slam on the brakes at the braking point marked by cones at the side of

the lane; and

3) jerk the wheel sharply after initiating braking. The test vehicles were two identically equipped 1997 Ford Taurus models.

Each vehicle was equipped with ABS. For the non-ABS runs, ABS was disabled by removing the ABS system fuse from the vehicle. Both vehicles were tested with and without ABS and performed identically under both conditions.

Q: How realistic is the hypothesis that inexperienced drivers violently jerk the steering wheel when entering a panic stop?

A: In a presentation on January 25, 1996, Duane A. Perrin, Chief of NHTSA's Driver-Vehicle Interaction Division made the following remarks regarding driver behavior under these circumstances:

A simulator study is underway with ordinary drivers rather than drivers who are familiar with [ABS] and the physics of the situations. A simulator without ABS is being used to observe drivers' responses to emergency situations and to determine the role of feedback cues. We are finding that a driver tends to jam on the brakes and steer, and in many cases steer quite violently; the driver does not, as popularly believed, jam on the brakes and freeze. ... We hypothesize that in many cases the drivers with ABS would have steered right off the road and into the ditch.

Q: Are you saying that ABS is dangerous?

A: Only when used improperly. As was noted in a November, 1996 report by the Insurance Institute for Highway Safety:

In short, antilock brakes have had mixed effects on fatal crash involvement. The risk of colliding with and killing bicyclists, pedestrians, or other motorists is lower for ABS-equipped cars than for cars without ABS. This is in accord with the theoretical ability of drivers of ABS-equipped cars to steer around obstacles in the road during hard braking. However, there has been a corresponding increase in the risk of crashes fatal to the ABS vehicle occupants particularly rollover and run-off-the-road crashes but also some multiple-vehicle crashes).

While the authors of the IIHS report offer several hypotheses, including violent steering, as explanations for the anomalous performance of ABS, they also note that "None of these explanations can be verified using the data currently available...."

However, it is clear from the AAA Foundation's video that violent steering in a braking emergency in an ABS-equipped car leads to dangerous loss of control of the vehicle even at relatively low speed (35 mph).

Q: ABS system manufacturers recommend braking and steering to avoid an obstacle in an emergency. Do you endorse this recommendation?

A: Only if you know how to do so safely. That means if you drive an ABS-equipped car, van, light truck or sport utility vehicle you must understand that the vehicle will both brake and steer differently than a similar non-ABS-equipped vehicle. The one way to understand these differences is to experience them. The best way to gain this experience is to test the vehicle under non-emergency conditions. Take it to a large, unobstructed, paved area and practice panic stops, with and without steering, on both wet and dry

pavements. Violently jerk the wheel while braking hard on dry pavement to experience how truly dangerous this maneuver is.

While it is theoretically possible to brake and then steer your way out of trouble, we question whether many drivers will have the presence of mind and lightning fast reflexes needed to be able to do so in a real emergency -- even if they have been able to practice the maneuver successfully. Obviously, if braking and steering is your only option to avoid hitting a pedestrian or bicyclist, you need to try to do it -and maybe having practiced the maneuver will allow you to do so successfully.

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- (1) Charles J. Kahane, Ph.D., Preliminary Evaluation of the Effectiveness of Antilock Brake Systems for Passenger Cars, National Highway Traffic Safety Administration, Washington, DC, December, 1994 (Report No. DOT HS 808 206).
- (2) Ibid., "Technical Report Documentation Page."
- (3) Ibid., p. 70.
- (4) Duane A. Perrin, "Anti-lock Braking Systems," in Procedures of Highway Safety Forum on Technological Innovations in Vehicle and Highway Safety, Institute of Traffic Safety Management and Research, Albany, New York, 1996.
- (5) Charles M. Farmer, et al., "Fatal Crashes of Passenger Vehicles Before and After Adding Antilock Braking Systems," Insurance Institute for Highway Safety, Arlington, Virginia, November, 1996, pp. 21-22.
- (6) Ibid., p. 21

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