

To: Interested Parties

From: Elliott H. Berger

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Re: Airbags: Auditory Risk and Issues of General Effectiveness

I continue to hear from many motorists and researchers who share stories about the failure of airbags to protect occupants, and the auditory and other injuries they cause. Unfortunately in a country that is quick to react to apparent corporate malfeasance, such as the case of the 100 lives lost due to Firestone tire failures, for some reason the airbag situation which has cost equally as many lives and even more hearing accidents fails to make the radar screens. Here are some of the facts and resources I have been able to assemble.

Fact 1

In February 1997 the American Academy of Otolaryngology – Head and Neck Surgery (AAO/HNS) wrote to the National Highway Traffic Safety Administration (NHTSA) urging NHTSA to “consider the health aspects of hearing damage from the noise and pressure of airbag deployment.” They recommended:

- Warning labels in automobiles about the loudness of the blast of deployment
- Consumer education
- On/off switches on all driver and passenger airbags

Fact 2

In March 1997 the National Hearing Conservation Association (NHCA) wrote to NHTSA urging them to consider the auditory risks of airbag deployment. They recommended:

- Allowing deactivation of both driver and passenger airbags
- Requiring the installation of on/off switches for both driver and passenger airbags
- Warning labels in automobiles about the loudness of the blast of deployment
- Designing airbags that deploy with less force and noise

Fact 3

NHTSA ignored the information (cited above) which was provided by two leading professional organizations involved in hearing conservation. In the final report of the NHTSA-sponsored “National Conference on Medical Indications for Air Bag Disconnection” (July, 1997) their medical panel concluded:

“... the phenomenon of hearing loss has not been noted to occur due to air bags. The specific conditions of hyperacusis and tinnitus are not associated with hearing loss, and persons with these conditions would have no greater likelihood of hearing loss from air bag deployment than any other persons.”

Fact 4

In 1998, a special session was organized for the October meeting of the Acoustical Society of America with five invited papers on the topic *Acoustical Effects of Airbag Deployment*. The salient issues reported in that session were:

- More than 100 cases of individuals suffering permanent hearing loss, hyperacusis (painful over sensitivity to noise), tinnitus, and disequilibrium (balance disorders) are published in the literature in spite of the fact that there is no means of formally reporting auditory injuries from airbag deployments and no concerted research efforts.
- Theoretical predictions based on a mathematical model of auditory hazard, confirmed by comparison with both animal and human experiments, show that under certain conditions it is likely that >90% of individuals will be at risk for hearing disorders when exposed to current airbags (open windows, unanticipated deployments, head turned so that ear is facing the airbag). Under the best case conditions the risk will range from <1% to a few percent. The theory also suggested that the auditory hazard could be materially reduced while maintaining other dimensions of airbag performance. [Dick Price, auditory psychophysicist, US Army.]
- NHTSA's panel is categorically incorrect in stating that hearing loss has not been noted to occur due to airbags, that tinnitus is not associated with hearing loss, and that those with hyperacusis or tinnitus are not at greater risk.

Fact 5

As a result, in part, of the above mentioned session, in September 1999 the Acoustical Society of America (ASA) wrote to NHTSA urging them to amend their current position regarding airbags. They recommended:

- Acknowledging that airbag deployment can cause hearing loss, tinnitus, hyperacusis and balance disorders
- Developing a data collection system to properly quantify the risks vs. benefit of airbag deployment
- Educating the public about the potential damage to hearing and balance from a 160- to 170-dB airbag impulse
- Studying criteria for deactivation options
- Including warning labels to accurately indicate the risks of airbags

Fact 6

Many are concerned that deactivating the airbag to avoid auditory risk is too hazardous because airbags "are so effective." The actual facts, according to Leonard Evans, an internationally recognized traffic safety research, previously employed by GM and currently the President of the International Traffic Medicine Association:

"The three best technical studies consistently find that airbags reduce the risk of death in a crash by 9% for belted drivers."

Evans goes on to state that the current claim by NHTSA is that airbags have saved about 1,700 lives, but this is only an inference calculated from estimated effectiveness. Balance this against the 62 individuals who were killed by airbags in crashes that, without the airbag, were unlikely to injure (Note that number as of 2004 is over 200 cases). Some of those were accidental deployments in which the airbag should not have inflated at all, such as 28 reported cases wherein the airbag discharged while the car was stationary. Furthermore, in his analysis of a large-scale 1996 Canadian study he concluded "all 12 comparisons show females with airbags at substantially higher risk than those without airbags." It is clear from Evans' research that the overall effectiveness of airbags in doing their assigned task is questionable; this makes their potential for inflicting injuries, including auditory injuries, and death, all the more problematical.

References

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2. Evans, L. (1997). "Offering Motorists the Airbag Option," The Washington Times Jun. 8, p. B4.
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11. Yaremchuk, K. and Dobie, R. A. (1999a). "The Otologic Effects of Airbag Deployment," J. Occup. Hear. Loss 2(2)(3), 67-73.
12. Yaremchuk, K. and Dobie, R. A. (1999b). "The Otologic Effects of Airbag Deployment," Spectrum Suppl. 1, 16, p.23.

Attachments

1. Letters to NHTSA from AAO, NHCA, and ASA
2. Price and Kalb "Auditory hazard from airbag noise exposure"
3. Yaremchuk, "The otologic effects of airbag deployment"
4. Garman "The auditory effects of an airbag deployment – an individual's experience"
5. Evans, L. "Offering motorists the airbag option"
6. Kazman, S. "Punish Ford-Firestone, but don't reward NHTSA"
7. Web page shots from the CBC and Toronto Star on airbag safety

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