

CENTER FOR AUTO SAFETY

2001 S STREET, NW SUITE 410 WASHINGTON, DC 20009-1160 (202) 318-7700

DEPT. OF TRANSPORTATION

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April 15, 1999

NHTSA-99-5482-7

Dr. Ricardo Martinez, Administrator
National Highway Traffic Safety Administration (NHTSA)
400 Seventh Street, S.W.
Washington, DC 20590

NHTSA-99-5098-18

EXECUTIVE SECRETARIAT
1999 APR 15 PM 3:17
NATIONAL HIGHWAY
TRAFFIC SAFETY ADMIN.

PETITION

Dear Dr. Martinez:

On February 11, 1999, GM released selective information concerning the potential dangers of some side impact **airbag** systems to children.¹ Whether GM's motivation was to promote the sale of GM vehicles with presumably better side air-bags or to ensure that side **airbags** do not injure out-of-position (OOP) occupants is unknown. The critical issue is whether the existence of any potential harm from side **airbags** can be mitigated through the use of proper engineering encouraged by effective rulemaking. The steadily increasing number of side impact **airbags** entering into the vehicle fleet merits increased scrutiny by NHTSA to prevent the introduction of systems that fail to adequately mitigate the risks to children. Without close NHTSA monitoring and rulemaking requiring an effective solution to the problem of OOP occupant interactions with side **airbag** systems, serious preventable consequences will likely follow as they did with **frontal airbags**. These consequences may include deaths and serious injuries of unsuspecting occupants.

As of this date, there is virtually a dearth of publicly available data detailing the extent of this potential problem with respect to existing systems. NHTSA itself is withholding **from** the public critical **information** on side **airbags** just like it did and continues to do with respect to frontal **airbag** systems. By letter of December 28, 1998, NHTSA requested that 20 manufacturers provide information on the side **airbags** installed in their **vehicles**.² Only a small fraction of the information received is available for public inspection.

The only documents NHTSA has elected to release concerning this issue are portions of

¹Specifically, GM released limited comparison data that showed the relative performances of side air-bag systems and their interactions with out-of-position (OOP) child passengers. The information included an analysis of neck-related injuries stemming from side **airbag** deployments. See Attachment A. CAS has asked GM to release all of its information and data on these tests to advance child safety. To date, GM has inexplicably refused to do so. See Attachment B.

²Letter from Dr. Ricardo Martinez, Administrator, *National Highway Traffic Safety Administration*, to Koichi Ameniya [sic], President and Chairman, *American Honda Motor Company* 1 (Dec. 28, 1998). Nineteen other vehicle manufacturers received identical letters. See Docket No. NHTSA- 1999-5098- 1, at 4 (revealing mailing list used to send NHTSA letter inquiring into manufacturer efforts in ensuring their products "do no harm"). In addition, NHTSA also explicitly asked each manufacturer to "personally confirm" that each of their "current and projected applications of advanced technologies do not pose safety risks, and to maintain or establish rigorous internal design protocols to address this possibility." *Id.* at 2. As of today's date, only seven manufacturers' replies have been entered into the docket. See Docket No. NHTSA- 1999-5098.

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R. Martinez

04/15/99

Page 2

presentations by GM and Honda.’ Both sets of these documents provide some detail into product plans and currently available side **airbag** systems. Other manufacturers who shared information with the Agency, however, have received blanket confidential treatment for their entire submissions. From the information already provided in the public docket addressing this issue, it is apparent that NHTSA possesses a considerable amount of information related to the possible risks involved with certain side **airbag** designs, as well as some of the methods available to mitigate those **risks**.⁴

If a certain engineering design is primarily responsible for the problems associated with the potential risks found in specific side **airbag** systems, it is crucial that the public be **fully** informed on this issue. Without releasing additional information to the public, one of two possible consequences will follow: **1)** The public may avoid side **airbags** because of perceived safety concerns, which could needlessly curtail the development, production and refinement of these potentially beneficial lifesaving devices; or **2)** The lack of information could allow overly aggressive systems to **further** penetrate into the market, resulting in fatalities and serious injuries.’ At this time, consumers simply do not have enough information available to them to appreciate whether these potential risks are associated with side **airbags** as a whole or whether they are restricted to certain designs.

If GM’s data reasonably reflect what is likely to occur in the field, NHTSA should take the

³See Docket No. NHTSA- 1999-5098.

⁴For its part, Volvo revealed limited information concerning its efforts to ensure that its side **airbags** did not pose a risk to OOP occupants. S. Pilhall, et al., *SIPSBAG -- The Seat-Mounted Side Impact Airbag System, in 14TH INTERNATIONAL TECHNICAL CONFERENCE ON ENHANCED SAFETY VEHICLES* 1026, 1032 (1994) (indicating that out of position occupants “will not cause the **Sipsbag** to **inflate** abnormally” and that “[a]n unrestrained child sitting or lying near the interior of the car will not have an increased injury risk compared to a system without [the] Sipsbag.”). While Volvo’s paper does not state explicitly that an OOP child passenger will not be injured by a deploying side **airbag**, it at least indicates that Volvo has taken steps to examine this issue.

⁵The case of the Chrysler Minivan’s passenger side air-bag interaction with children and short statured adults serves as a clear example of this type of scenario. CAS pointed to the problems that the **Minivan** vehicles (i.e. Dodge Caravan, Chrysler Town and **Country**, and Plymouth Voyager) were having in November 1996 when there were only eight recorded deaths. See Letter from Clarence Ditlow, Executive Director, *Center for Auto Safety*, to Dr. Ricardo Martinez, Administrator, *National Highway Traffic Safety Administration* (Nov. 8, 1996) (petition requesting defect investigation of Chrysler **Minivan**, 1991-92 Chevrolet Corsica, and 1990-92 Ford Taurus for “defective **airbag** crash sensor and/or deployment systems”). According to the latest available statistics from NHTSA’s Special Crash Investigation files, the passenger **airbags** in these vehicles have been linked to 13 deaths and 7 serious injuries. Special Crash Investigation Summary (March 1, 1999).

NHTSA itself seems to have arrived at a conclusion similar to what CAS stated over two years ago. As part of the Agency’s vehicle crash compatibility research program, researchers discovered the extremely aggressive nature of the passenger side air-bag used in the Dodge Caravan and noted in its March 1, 1999 press release that the forces from the **airbag** on a fifth-percentile female dummy showed “a high probability of a serious injury or death as a result of the interaction [between the **airbag** and dummy].” NHTSA Press Release (March 1, 1999). See also S. Summers, et al., *NHTSA’s Vehicle Compatibility Research Program*, Paper No. 1999-O 1-007 1 (1999).

necessary steps to ensure that side **airbag** systems installed in vehicles do not harm OOP occupants. At a minimum, the release of the GM information strongly suggests that the next logical step for NHTSA to take is to issue an Advanced Notice of Proposed Rulemaking to amend **FMVSS 214** to include an OOP test in order to assess the effectiveness and safety of side **airbag** designs. As with the case of **frontal airbags**, an OOP test is needed in order to prevent deployment related injuries?

At a minimum, some type of child OOP testing needs to be performed in order to avoid a repeat of problems similar to those encountered with frontal **airbags**. An OOP test, particularly with respect to a safety component like side **airbags**, will prove immensely beneficial since it will give conscientious manufacturers additional guidance to help them improve the side impact protection of the vehicles they produce and compel those manufacturers that are less conscientious to adhere to minimum **safety** levels in developing, equipping and marketing their side **airbag** systems. In this way, side **airbags** will be able to maintain a high level of safety in protecting occupants **from** potentially fatal crashes and inadvertent deaths.

As the manufacturers themselves have pointed out, the inclusion of additional testing measures to ensure occupant protection can be extremely helpful in improving FMVSS 214.' The

⁹In addition to the information already provided by manufacturers, outside research by independent engineers can also serve as a guide to NHTSA as to how to proceed on this issue. See A. **Khadilkar & L. Pauls**, *Assessment of Injury Protection Performance of Side Impact Airbags for Out-of-Position and Other than 50th Percentile Adult Male Occupants*, in **16TH INTERNATIONAL TECHNICAL CONFERENCE ON THE ENHANCED SAFETY OF VEHICLES 1858** (1998) (detailing procedures in **determining** likelihood of injury to OOP occupants with respect to side impact **airbag** deployments). Minor collisions may cause these devices to deploy **unnecessarily**, creating the potential for occupant injury, as well as increased repair costs, where these additional costs would not have occurred. The recent experience with frontal **airbag** systems makes it clear that ensuring the safety of these devices for occupants of a variety of sizes is a legitimate and paramount concern.

Similarly, the very real possibility of sensor failure, causing inadvertent, late or no **airbag** deployment, raises the problem of how to develop the **necessary** procedures to test a system for these types of scenarios. NHTSA must investigate the **different** options that are beginning to emerge in evaluating side **airbags** with respect to occupants of **different** sizes. **See A. Khadilkar & L. Pauls**, *Application of a Computer-Model as an Engineering Tool for Evaluating Side Impact Design Requirements for Children and Small Adults*, in **16TH INTERNATIONAL TECHNICAL CONFERENCE ON THE ENHANCED SAFETY OF VEHICLES 1868** (1998) (describing software model used to assist in designing and engineering of side air-bags for occupants of various size).

¹⁰Manufacturers have expressed universal support for including new OOP dummy tests to reduce the risks to occupants from potentially fatal **airbag** deployments. See *generally*, NHTSA Docket No. NHTSA- 1998-4405. With this type of strong support for including explicit procedures geared to protect against the possibility of **airbag** deaths, it is inconceivable that manufacturers would have any reasonable opposition to the inclusion of similar types of OOP child test procedures.

R. Martinez
04/15/99
Page 4

“do no harm” philosophy is one that manufacturers have already adopted.* Incorporating child dummies will provide even more information that manufacturers and NHTSA can use to prevent injuries to child occupants and short adults.’ Without taking these types of passengers into account, it will be impossible for any manufacturer to validly claim that its side **airbag** systems provide adequate protection in side collisions and “do no harm” to vulnerable occupants.

Because of this apparent risk to OOP children from side impact **airbags**, CAS petitions NHTSA to include an OOP test procedure as part of FMVSS 2 14 in order to lower the probability of deaths and serious injuries **from** side **airbag** deployments. NHTSA should immediately initiate rulemaking that would add an OOP requirement for three-year-old and six-year-old children to **FMVSS 214**.¹⁰ As part of this effort, NHTSA should place all relevant documents and data in the public docket. NHTSA must not wait until the “real world” data include verified occupant deaths and serious injuries before substantive action is taken.

Respectfully submitted,



Michael **Kido**
Staff Attorney

Attachments: 3

⁸*See* Letter from Vann Wilber, Director of Vehicle Safety & International Department, *American Automobile Manufacturers Association*, et al., to Dr. Ricardo Martinez, Administrator, *National Highway Traffic Safety Administration* 4-6 (Dec. 22, 1997) (Petition for Rulemaking on FMVSS 2 14).

⁹**Similarly**, it may very well turn out that larger occupants face an increased risk **from** side **airbag** deployments. Especially obese occupants could have more of their own bodies exposed to the air-bag’s deployment path, leading of the increased risk of injury. Simply waiting for problems such as this one to occur before action is taken poses a significant philosophical dilemma with respect to the Agency’s role in promoting vehicle safety.

¹⁰**CAS’** inclusion of OOP test procedures for only these occupant sizes exhaustive should not be interpreted as an exhaustive list of problematic scenarios. It may very well be the case that NHTSA will have to investigate the possibility of adding occupants of other **sizes** in future amendments to FMVSS 2 14. At least one manufacturer has revealed that it **supports** the incorporation of an OOP requirement. In a letter to Administrator Martinez, GM indicated that it “has established risk criteria for various parameters and associated injury measures in a variety of test conditions intended to simulate potential locations near the side impact air bags where children could be seated or *out of position*.” Letter from Ronald Zarella, Executive Vice President, *General Motors North America*, to Dr. Ricardo Martinez, Administrator, *National Highway Traffic Safety Administration* 1 (Feb. 9, 1999). This letter is included as Attachment C.

ATTACHMENT A



General Motors Corporation

30001 Van Dyke Ave., Warren, Michigan 48090-6768

NEWS

for Release: February 11, 1999

Contact: Kyle Johnson
810.492.1920

REDUCING RISKS OF SIDE AIR BAGS A PRIORITY WITH GENERAL MOTORS

Warren, **Mich.** – Once limited to luxury cars, side air bags are now offered on a wide array of cars and minivans. And along with their availability in these other vehicles, comes heightened concern for small children who may be seated close to a side air bag.

The National Highway Traffic Safety Administration (NHTSA) recently contacted automakers emphasizing that it is extremely important to thoroughly test side impact air bags with both child and adult crash test dummies in a wide variety of positions to guard against the risk of serious injury to occupants who may be very close to a side impact air bag when it deploys.

A national newspaper, USA Today, reported that some import auto manufacturers advise families with children to carefully consider whether to choose side air bags when they are offered as an option. One manufacturer warns that an unrestrained child that falls asleep next to a side air bag could be seriously injured if the device deployed.

According to Norm Pilcher, chief engineer for the Chevrolet Venture passenger van, laboratory results, such as the NHTSA's Side New Car Assessment Program (Side NCAP) tests, show side air bags can reduce the potential for injury to the head, chest and pelvis to properly seated adults. GM's tests of the side air bags with adult dummies in its minivans show reduction in rib, abdominal and pelvis loads, as well as rib deflection.

"GM shares the NHTSA's concern for thorough testing of side impact air bag systems," Pilcher says. "The industry's experience with frontal air bags provides us with an important background about out-of-position children and the potential risk for injury. Before introducing side air bags into our Chevrolet Venture van, we went to great lengths

- MORE -

to design the air bags for the many sizes and positions of front seat occupants. The engineering challenge of side air bags is to provide additional protection in a side impact crash while minimizing the potential risk of injury to the most vulnerable occupants -- children -- from the air bag deployment itself,"

GM has two goals in its side air bag programs; provide protection for occupants and minimize the risk of injury in the event of an air bag deployment. To meet the technical challenge, GM engineers carefully developed the air bag size, fold pattern, venting and inflator output to provide the proper design balance and minimize this injury risk to those who might be exposed to a deployment. GM's tests include placing three-year-old child crash dummies in vulnerable positions and deploying the side air bag. "One test is even designed to simulate a child sleeping with its head against the door when the air bag deploys," Pilcher says.

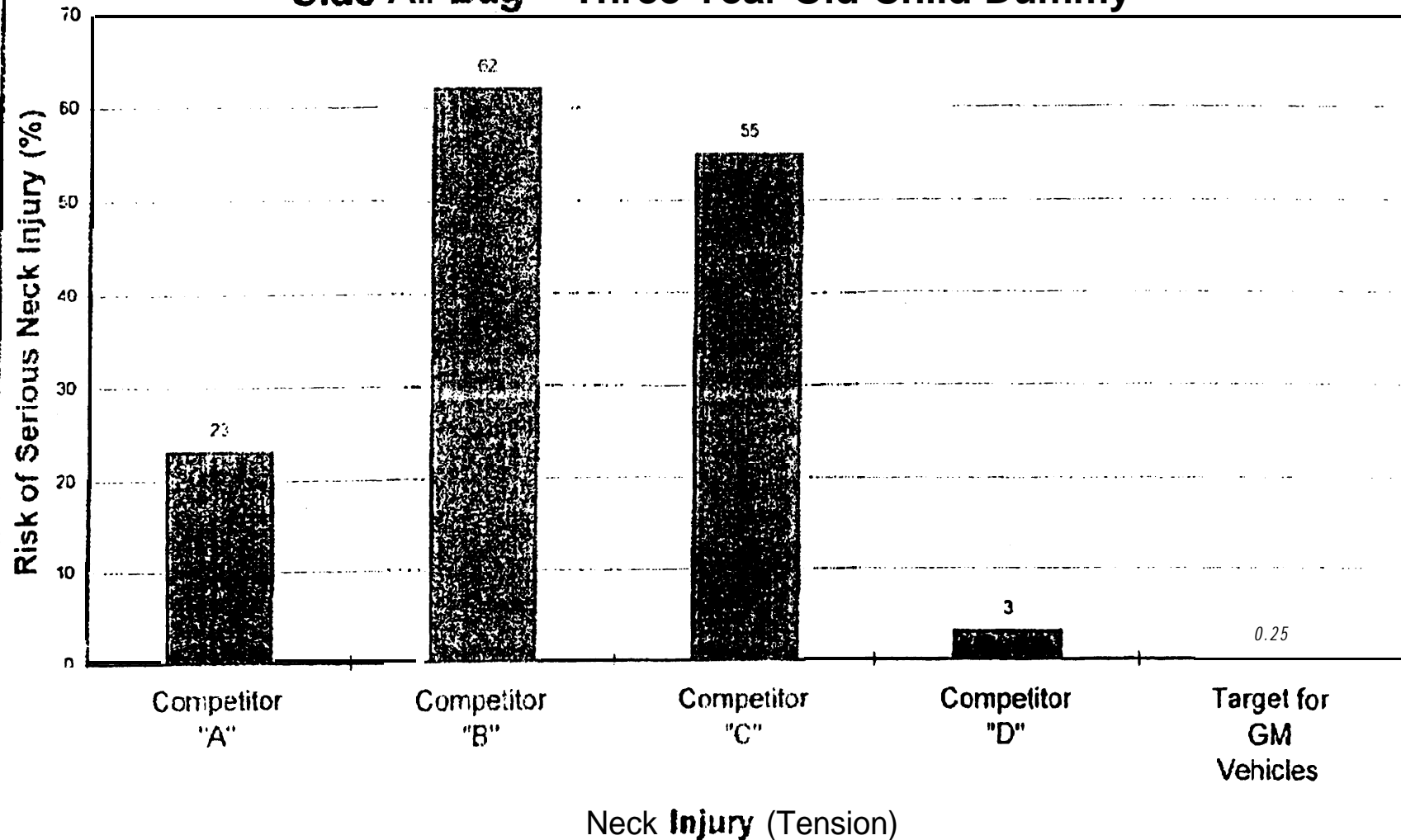
However, some competitive side air bag designs tested by GM are powerful enough to cause a significant risk of serious injury to out-of-position children. "There are no government regulations about the risk of injury to children from side air bags," says Pilcher. "And young children, with their less developed bones and muscles, are at a greater risk of injury from some competitors' side air bags than GM's. Based on testing using GM's procedures, serious neck injury is up to 50 times less likely and serious chest injury is up to 9 times less likely in the Chevrolet Venture than the competitive vehicles tested.

"We could engineer GM vehicles with side impact air bags to receive better scores on the NHTSA's Side NCAP test, but only with an air bag design that poses additional risks to children," adds Pilcher. "GM does not accept that trade-off."

GM continues to recommend that the safest place for children traveling in a car is to be properly restrained in a rear seat, and the proper restraint for a three-year-old is a forward facing child seat.

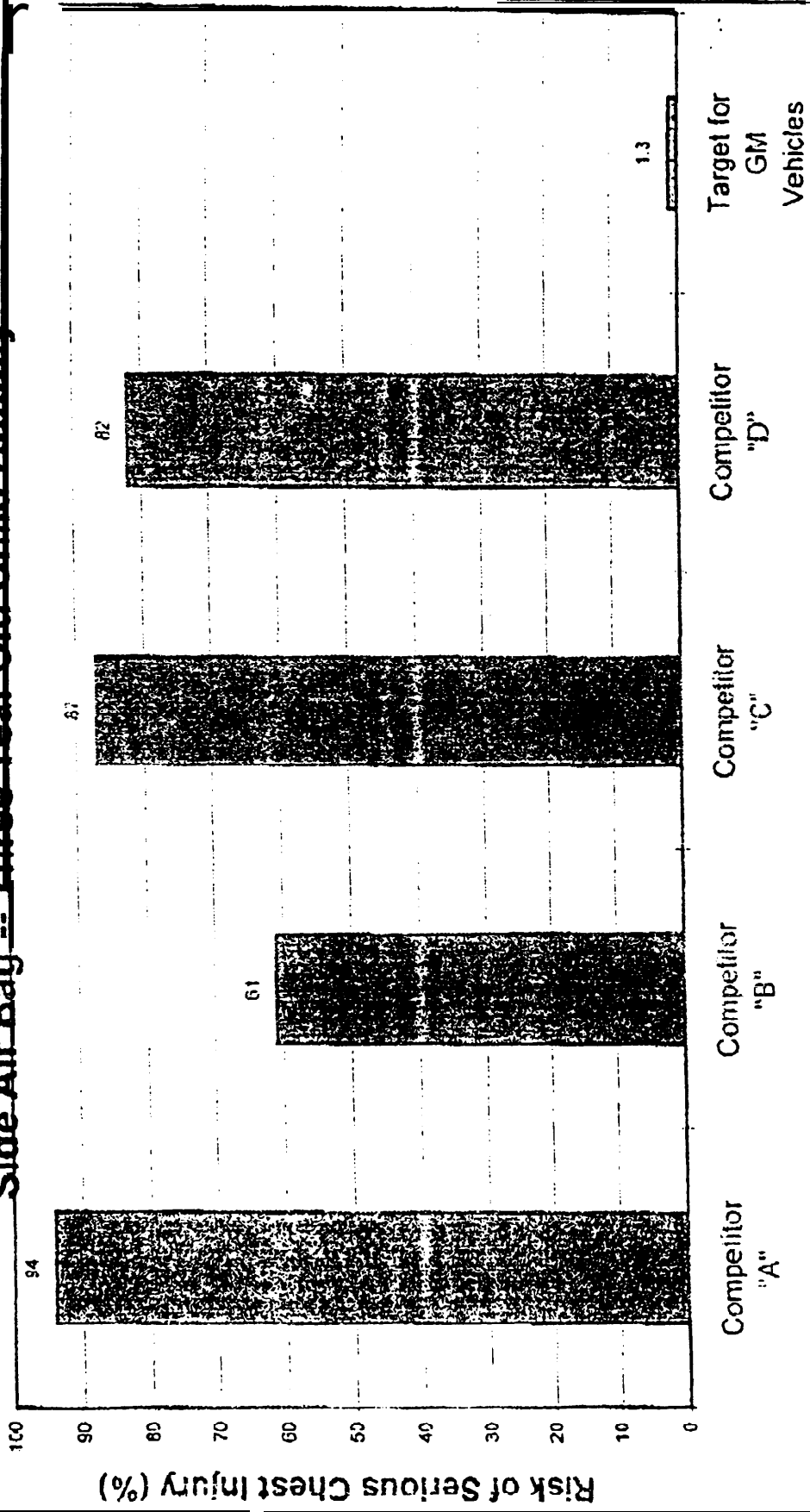
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Risk of Serious Injury (AIS >3) from Statically Deployed Side Air Bag -- Three Year Old Child Dummy



Test Conditions: Side of Head Against Vehicle Door or Facing the Deployment

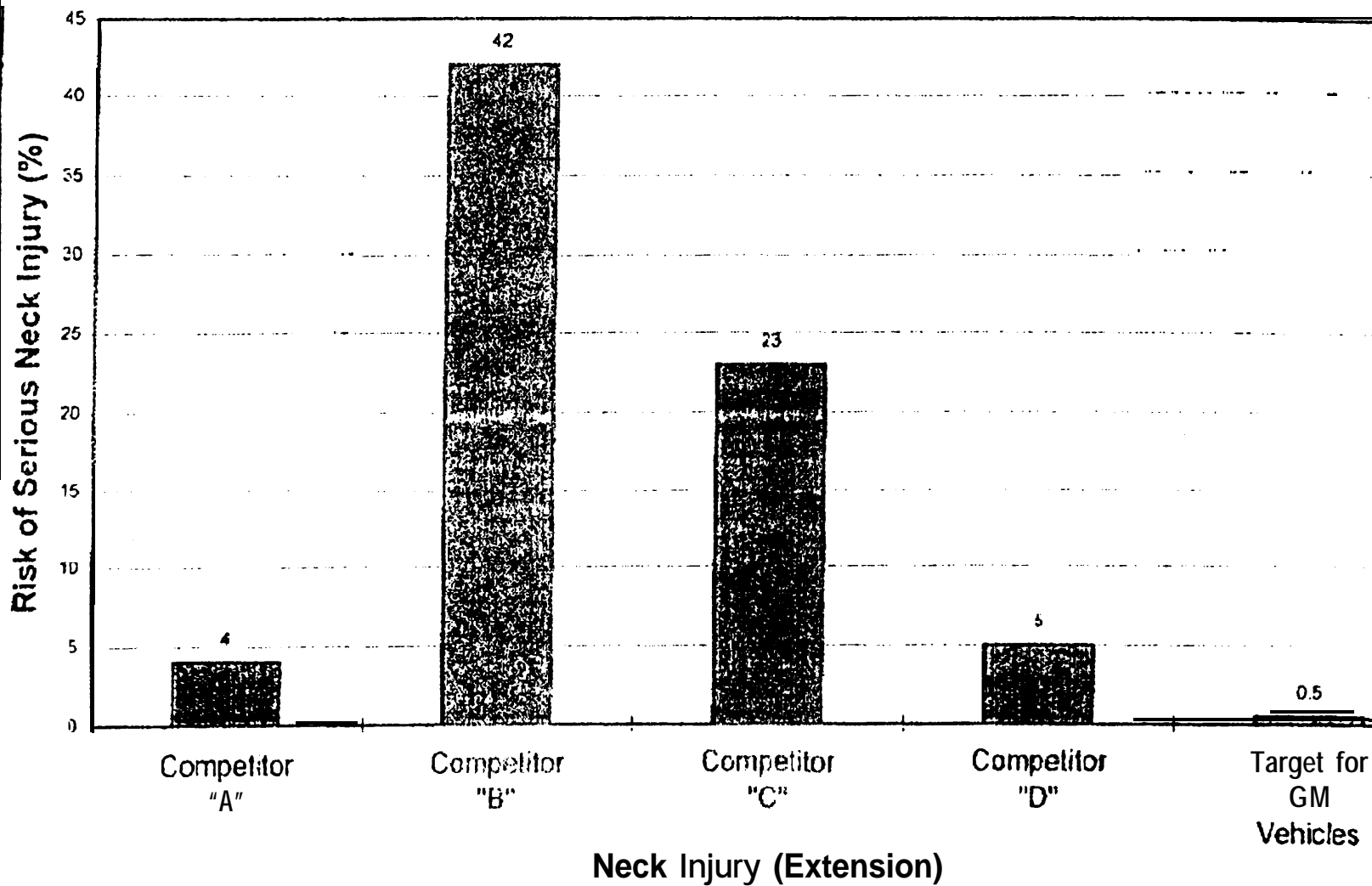
Risk of Serious Injury (AIS > 3) from Statically Deployed Side Air Bag -- Three Year Old Child Dummy



Chest Injury (Compression)

Test Conditions: Side of Head Against Vehicle Door or Facing the Deployment

Risk of Serious Injury (AIS > 3) from Statically Deployed Side Air Bag -- Three Year Old Child Dummy



Test Conditions: Side of Head Against Vehicle Door or Facing the Deployment

ATTACHMENTB

CENTER FOR AUTO SAFETY

2001 S STREET, NW SUITE 410 WASHINGTON, DC 20003-1160 (202) 328-7000

March 25, 1999

Richard Humphrey
General Motors North America
1660 L street, NW
Suite 400
Washington, DC 20036

Dear Mr. Humphrey:

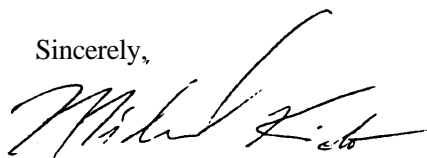
Thanks very much for taking the time with me the other day to clarify GM's position regarding the release of its recently publicized side impact **airbag** comparison research test data and videos. The Center for Auto **Safety** (CAS) believes it is extremely important that technical information be made public on any risks that may accompany the various types of side impact **airbag** systems. Release of such information serves two purposes. First, the information can be used to help establish an out-of-position occupant requirement as part of FMVSS 201 and 214 similar to what is proposed for FMVSS 208. Second, such information will help consumers to make better informed decisions when purchasing a vehicle.

While the February 11, 1999 press release is a step in the right direction, CAS calls on GM to release the test data and videos to further the goals stated above. This information will prove invaluable in informing the public about the performances of different side **airbag** systems, and clarify any potential misunderstandings about the effectiveness of these systems. Moreover, this information can help develop regulatory requirements to protect out-of-position occupants in side impact crashes. The existence of such requirements will be crucial in ensuring that potentially unsafe systems do not enter and penetrate the marketplace.

CAS is aware of two public disseminations of side impact **airbag** information by GM. First, GM presented NHTSA with information in a detailed briefing on October 20, 1998. May we have copies of the materials **from** that briefing? Second, GM issued the abovementioned February 11th press release and distributed video clips of side impact **airbag** tests run by GM.

CAS encourages GM to seriously reconsider its current ban on the further dissemination of its side impact **airbag** research data and videos. It would be unfortunate if the lifesaving potential of these devices were marred by the occurrence of preventable deaths. GM's knowledge of the risks involved with certain systems places a moral obligation squarely on the shoulders of the company to disseminate those risks to the public as thoroughly as possible. We sincerely hope that GM will make the right decision to release this information in its entirety to the public.

Sincerely,



Michael Kido
Staff Attorney

ATTACHMENT C

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NHTSA-99-5098-2

RONALD L. ZARRELLA
Executive Vice President
President, GM North America

General Motors

99 MAR -2 AM 11:49

DOCUMENTARY SERVICES DIV
RECEIVED FEB 9, 1999

EXECUTIVE SECRETARIAT
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NATIONAL HIGHWAY
TRAFFIC SAFETY ADMIN.

The Honorable Ricardo Martinez
Administrator
National Highway Traffic Safety Administration
400 7th Street S. W., Room 5220
Washington, D.C. 20590

Dear Dr. Martinez:

Thank you for your letter to Jack Smith of December 28, 1998 concerning child safety and side impact air bags.

As you know GM shares NHTSA's view that safety features and devices integrated into new motor vehicle products should be designed to provide crash protection for occupants and also to minimize the likelihood of injury due to the deployment itself. It is this approach that led to GM's proposal (later adopted in the AAMA rulemaking petition of August 1996 and NHTSA's rule of March 1997) for depowering air bags. GM has also applied this approach to its side impact air bag designs.

GM recommends that all child passengers be properly restrained (belted or appropriate child safety seat) and that those under the age of 12 be seated in a rear seat. Unfortunately, some drivers will ignore our warnings and occasionally will transport children in the front seat. Therefore, GM's side impact air bag designs have been developed to minimize the injury risk to children who could be exposed to the inflation insult of a deploying side air bag. GM has established risk criteria for various parameters and associated injury measures in a variety of test conditions intended to simulate potential locations near the side impact air bags where children could be seated or out of position. GM's tests place these dummies immaliately adjacent to an inflating side air bag. As examples, one GM test places a 3 year old dummy's head against the vehicle door to simulate a child who has fallen asleep. Another test places the 3 year old child dummy's chest against the door as though the child was looking through the window. GM attempts to configure these test conditions in the "worst case" for potential injury to a child from a deploying side

General Motors Corporation

400 Renaissance Center
Mail Code 482-D20-D21

P.O. Box 400
Detroit, Michigan 48265-4000

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February 9, 1999

Page 2

impact air bag. As you know, such efforts are never "perfect" due to the biomechanical limitations of the test devices, but nevertheless they provide a reasonable assurance that GM's side impact air bags will provide protective capacity to adults and simultaneously minimize the risk of serious injury to children.

I have been told that GM's technical staff has discussed its side impact air bag development procedures and test criteria with NHTSA's staff, and I have directed GM's continued cooperation with NHTSA on all research issues, including side impact air bags and test dummies.

In that regard, I know my staff is somewhat concerned about the potential impact test devices. GM strongly urges NHTSA to take a leadership role in consolidating the multiple ongoing research efforts into a single one and to produce a resultant single test device. Given the opportunity, GM will work closely with NHTSA to help achieve this result.

As always, we at GM appreciate your comments and insight into matters of automotive safety, one of GM's top priorities.

Best regards,



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CENTER FOR AUTO SAFETY

2001 S STREET, NW SUITE 410 WASHINGTON, DC 20009-1160 (202) 3287700

BY FIRST CLASS MAIL

April 19, 1999

Dr. **Ricardo** Martinez, Administrator
National Highway **Traffic** Safety Administration (NHTSA)
400 Seventh Street, **S.W.**
Washington, DC 20590

Dear Dr. Martinez:

On April 15, 1999, the Center for Auto Safety (CAS) submitted a petition for rulemaking asking the Agency to initiate an Advanced Notice of Proposed Rulemaking concerning the inclusion of an out-of-position test for child occupants. As part of that petition, a number of articles were cited for support. In footnote four, we mistakenly identified the Volvo article used for support. The correct citation should read as follows:

B. Lundell, *et al.*, ***SIPSBAG -- The Seat-Mounted Side Impact Airbag System***, in **ADVANCES IN OCCUPANT PROTECTION TECHNOLOGIES FOR THE MID-NINETIES** 141, 147 (1995).

An error was left in footnote nine's second sentence last part, which should read "leading to the increased risk of injury."

Please include these corrections with the petition. If you have any questions, please do not hesitate to have a member of your **staff** contact me at (202) 328-7700. We regret any inconvenience that this matter may have caused.

Sincerely,



Michael **Kido**
Staff Attorney

EXECUTIVE SECRETARIAT
1999 APR 22 AM 8:08
NATIONAL HIGHWAY
TRAFFIC SAFETY ADMIN.

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Michael Kido, Staff Attorney
Center for Auto Safety
2001 s street, NW
Suite 410
Washington, DC 20009-1 160

APR 26 1999

Dear Mr. **Kido**:

This will acknowledge receipt of your petition dated April **15, 1999**, submitted on behalf of the Center for Auto Safety requesting the agency to include an out-of-position (OOP) test procedure as part of FMVSS No. 214 in order to lower the probability of deaths and serious injuries **from** side air **bag** deployments

You will be notified of our decision to grant or deny your petition.

Sincerely,



L. Robert Shelton
Associate Administrator
for Safety **Performance** Standards