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**National Highway  
Traffic Safety  
Administration**



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# Evaluation Note

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## **PRELIMINARY RESULTS OF THE SURVEY ON THE USE OF PASSENGER AIR BAG ON-OFF SWITCHES**

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Even though passenger side air bags have saved over 1,000 lives, there are some people who should not be exposed to an air bag deployment. In May 1995, the National Highway Traffic Safety Administration (NHTSA) issued a final rule allowing manufacturers to install an on-off switch for the passenger air bag in vehicles that cannot accommodate a rear-facing child seat anywhere except in the front seat: e.g., pickup trucks and cars either with no rear seat or with small rear seats.

In November 1997, NHTSA issued another final rule defining high-risk groups that should not be exposed to passenger air bags: infants, children 12 years old and younger, and adults with certain medical conditions. The rule enables owners of any passenger car, pickup truck, van, or sport utility vehicle to obtain an on-off switch for their passenger air bag if they transport people in one of these high-risk groups. The benefits of these regulations are contingent on the correct use of the switches: that the air bag is turned off when a high-risk individual is seated behind it, and turned on at other times.

NHTSA conducted a survey to investigate how pickup truck drivers are using and misusing the switches. The main question that the study sought to answer was how often the switches were off when they should be off and on when they should be on. The switches are primarily found in newer model year pickup trucks. Passenger vehicles with after-market air bag on-off switches, plus other vehicles with original equipment on-off switches (such as Dodge Vipers and Dodge Cargo Ram vans), were not included in the survey because there were so few with on-off switches.

**Methodology and Scope** Since the correctness of the switch setting depends on who is in the seat at the moment, the survey was performed while the vehicles were occupied. Unlike shoulder belt use surveys, the setting of the on-off switch cannot be observed from a distance; it was necessary to talk to people in stopped vehicles.

The survey was conducted in four States—California, Georgia, Michigan, and Texas—because they have the nation’s highest rates of newer light truck registrations and because they represent diverse geographic locations. Data collection occurred in a mix of metropolitan and non-metropolitan counties.

The study was limited to late model pickup trucks equipped with a passenger-side air bag and, in most cases, an on-off switch to allow deactivation of the passenger-side air bag. Some vehicles included in the survey (but excluded from the analyses) may have had no switch because the vehicle has a full back seat. Table 1 lists the manufacturer, model, and the first model year of the vehicles targeted in the study that had on-off switches. All subsequent model years were included in the study.

**Table 1: Truck Models With On-off Switches**

Manufacturer	Model	Year Air Bag On-off Switch Became:		Manufacturer	Model	Year Air Bag On-off Switch Became:	
		Optional	Standard			Optional	Standard
Chevrolet	S-10		1998	GMC	Sonoma		1998
	C/K Pickup		1997		Sierra		1997
	Silverado		1999	Isuzu	Hombre		1998
Ford	Ranger	1996**	1998	Mazda	B-Series		1998
	F-150/250*		1997	Nissan	Frontier		1998
	F-350	1998		Toyota	Tacoma		1998
Dodge	Dakota		1998		Tundra		2000
	Ram		1998				

\* Depending on the cab type, some heavy duty F-250’s may not have passenger side air bag on-off switches.

\*\*Passenger-side air bags were optional, but the switch was standard on all trucks with passenger-side air bags.

The sample was designed to ensure that three groups defined by different driver and right front passenger seat combinations were included in the study. These three groups and their target representation in the study are:

- 25 Drivers and right front infant passengers, less than a year old,
- 700 Drivers and right front children passengers, age 1-12 years old, and
- 1,000 Drivers and right front adult passengers, older than 12 years old.

Two-person data collection teams surveyed the pickup truck occupants. One team member interviewed the drivers about the status of the on-off switch, their reasons for turning the switch on or off, and their opinions on the risks and benefits of air bags, and the age, height and weight of any the passengers. The other team member observed the make and model of the vehicle, number of seating positions and placement of occupants, availability and status of the on-off switch, and the restraint use, sex and race of any occupant. The survey was conducted in parking lots of retail stores, community facilities, recreational/entertainment facilities, and vehicle maintenance facilities. Data collection began on July 1, 2000, and ended on November 22, 2000. A total of 1,637 interviews were conducted where the status of the on-off switch was observed. Table 2 shows the number of completed observations/interviews for each of the three groups.

**Table 2: Number of Completed Observations by the Three Driver and Front Passenger Seat Combinations**

Target Group	Target Sample	Completed Observations
Driver + Adult	1,000	1,117
Driver + Child	700	497
Driver + Infant	25	23
<b>TOTAL</b>	<b>1,725</b>	<b>1,637</b>

**Results** This study asks how often the passenger air bag on-off switches are off when they should be off and on when they should be on. The passenger side airbag should be activated for the adult passengers and deactivated when there is a child or infant seated in the right front passenger seat.

Table 3 shows that 48 percent of the air bags were left on for child passengers 1-12 years old, potentially exposing these children to a deployment<sup>1</sup>. In most of these cases, the drivers said air bags only needed to be turned off for babies, or for children younger than their passenger – or they left the switch on all the time, thinking air bags were safe for all of their passengers.

Drivers transporting infants achieved the highest, although still not perfect success: 91 percent turned off the passenger air bags and only 9 percent left them on (two drivers – and both of them were driving somebody else’s truck, an unfamiliar vehicle).

There is also a problem when drivers ride with adult passengers. While 82 percent of the switches were on, as they should be, 18 percent were switched off. Many of these trucks often transport children, and owners kept the switch turned off permanently to guarantee their child would not be exposed to deployments. However, this deprived the adult passengers of any potential benefits of air bags. When the three passenger age groups are combined, the on-off switch was misused 27 percent of the time.

**Table 3: Observed On-off Switch Use by Driver and Passenger Group**

	Driver & Adult		Driver & Child		Driver & Infant		Total	
<b>Correct Use</b>	<b>911</b>	<b>82%</b>	<b>259</b>	<b>52%</b>	<b>21</b>	<b>91%</b>	<b>1,191</b>	<b>73%</b>
Airbag on when should be on	911	82%	0	0%	0	0%	911	56%
Airbag off when should be off	0	0%	259	52%	21	91%	280	17%
<b>Misuse</b>	<b>206</b>	<b>18%</b>	<b>238</b>	<b>48%</b>	<b>2</b>	<b>9%</b>	<b>446</b>	<b>27%</b>
Airbag off when should be on	206	18%	0	0%	0	0%	206	12%
Airbag on when should be off	0	0%	238	48%	2	9%	240	15%
<b>Total</b>	<b>1,117</b>	<b>100%</b>	<b>497</b>	<b>100%</b>	<b>23</b>	<b>100%</b>	<b>1,637</b>	<b>100%</b>

<sup>1</sup> 90 percent confidence bounds for the misuse rates: infants, 1-28 percent; children age 1-12, 40-52 percent; children age 1-6, 20-34 percent; children age 7-12, 51-61 percent; adult passengers, 16-20 percent; and all passengers, 25-29 percent.

Table 4 shows that the misuse of the switches increased as children grew up, among child passengers age 1-12. Air bags were left on for 25 percent of children aged 1-2 and 23 percent at age 3-4, already a substantial deterioration from the 9 percent misuse for infants. This increased to 30 percent at age 5-6, 42 percent at age 7-8, and averaged to 61 percent at ages 9-12.

**Table 4: Observed On-off Switch Use by Age for Right Front Child Passengers**

	Correct Use:		Misuse:		Total
	Airbag off when should be off		Airbag on when should be off		
<b>1-6 years old</b>	<b>105</b>	<b>73%</b>	<b>39</b>	<b>27%</b>	<b>144</b>
1-2 years old	25	74%	9	25%	34
3-4 years old	30	77%	9	23%	39
5-6 years old	50	70%	21	30%	71
<b>7-12 years old</b>	<b>154</b>	<b>44%</b>	<b>195</b>	<b>56%</b>	<b>349</b>
7-8 years old	52	58%	38	42%	90
9-10 years old	60	44%	77	56%	137
11-12 years old	42	34%	80	66%	122

The preliminary results of the survey show that too many motorists do not know, or are not properly acting on, NHTSA guidelines on the benefits and the risks of air bags. We have made a substantial effort (including requirements for guidance in owner's manuals) to alert the public of the danger of air bags to infants, and 91 percent of these air bags are switched off. The dangers of air bags to toddlers and small pre-teens have been less publicized, and a much higher percentage of those switches are misused. The 18 percent of air bags switched off with adult passengers are an additional safety problem.

In conclusion, the on-off switch was misused 48 percent of the time when a child 1-12 years old was seated behind the passenger air bag. This result shows that on-off switches are not currently accomplishing all of their potential to eliminate the risk of air bags to children. NHTSA and its partners must increase efforts to educate the public on the dangers of air bags to toddlers and pre-teens, and their benefits for adults. This needs to be a continuing effort, because as of July 1, 2001 there were approximately 10.2 million pickup trucks on the road with the switches, and pickup trucks are durable. At the same time, these results suggest that, even with improved public education, the switches are not likely to be an effective long-term solution. NHTSA and the industry must press ahead with advanced air bags that minimize dangers to children automatically, without requiring action by motorists.

*For more information about this study, please contact Charles J. Kahane at 202-366-2560, FAX: 202-366-2559. The full report is not currently available. NHTSA plans to issue a more detailed report in 2002, with additional analyses of why people are turning the switches on or off. This note and other NHTSA evaluations may be viewed at [www.nhtsa.dot.gov/cars/rules/regrev/evaluate](http://www.nhtsa.dot.gov/cars/rules/regrev/evaluate).*