U.S. Department
of Transportation
National Highway
Traffic Safety
Administration

NHTSA

DOT HS 813 700

April 2025

Evaluation of FMVSS No. 226: Curtain Air Bags and Ejection Mitigation in Rollover Events

This page is intentionally left blank.

DISCLAIMER

This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings, and conclusions expressed in this publication are those of the authors and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade names, manufacturers' names, or specific products are mentioned, it is because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Suggested APA Format Citation:

Acevedo Díaz, E. (2025, April). *Evaluation of FMVSS No. 226: Curtain air bags and ejection mitigation* (Report No. DOT HS 813 700). National Highway Traffic Safety Administration.

This page is intentionally left blank.

Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
DOT HS 813 700		

4. Title and Subtitle	5. Report Date
Evaluation of FMVSS No. 226: Curtain Air Bags and Ejection Mitigation in Rollover Events	April 2025
	6. Performing Organization Code NSA-310
7. Author Eliseo Acevedo Díaz	8. Performing Organization Report No.
9. Performing Organization Name Evaluation Division National Center for Statistics and Analysis National Highway Traffic Safety Administration 1200 New Jersey Avenue SE Washington, DC 20590	10. Work Unit No. (TRAIS)
	11. Contract or Grant No.
12. Sponsoring Agency Name and Address National Highway Traffic Safety Administration 1200 New Jersey Avenue SE Washington, DC 20590	13. Type of Report and Period Covered NHTSA Technical Report
	14. Sponsoring Agency Code

15. Supplementary Notes

16. Abstract

This study estimates the likelihood of occupant ejection in the presence of curtain air bags deployable during a rollover event, and how other factors can affect this outcome. The data used for this study was the Crash Report Sampling System for 2016 to 2021. Our data shows that about 27 percent of vehicles in rollover crashes from 2016 to 2021 had rollover deployable FMVSS No. 226-compliant curtain air bags. About 50,000 occupants were fully or partially ejected from vehicles during rollover events. The use of seat belts was the most significant factor in reducing the odds of occupant ejections in rollover vehicles. Rollover-activated curtain air bags were statistically significant in preventing occupant ejections when adjusting for other factors. The estimated effectiveness of curtain air bags in preventing occupant ejections by unrestrained occupants in rollover vehicles was 44.7 percent, adjusting for other factors. The combined effect of rollover-activated curtain air bags and seat belt use reduces the probability of occupant ejection by 99 percent in rollover events.

17. Key Words	18. Distribution Statement
regulatory evaluation, FMVSS No. 226, curtain air bag, ejection, rollover.	Document is available to the public from the DOT, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, https://crashstats.nhtsa.dot.gov.

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price
Unclassified	Unclassified	73	

Form DOT F 1700.7 (8-72) Reproduction of completed page authorize

This page is intentionally left blank.

Table of Contents

List of Figures

List of Tables

Acronyms and Abbreviations

CI	confidence interval
CRSS	Crash Reporting Sampling System
ESC	electronic stability control
FMVSS	Federal Motor Vehicle Safety Standard
LTV	light-truck vehicles
NCAP	New Car Assessment Program
OR	odds ratio
RR	risk ratio/relative risk
SE	standard error
vPIC	[NHTSA] Product Information Catalog and Vehicle Listing

Executive Summary

Seat belt use reduces the probability of occupant ejection in a crash (Kahane, 2015). The likelihood of a fatal injury among ejected occupants in all types of crashes is about three times greater than for a non-ejected (Burgess & Starnes, 2009) occupant. In 2022 some 83 percent of passenger vehicle occupants ejected from vehicles in fatal crashes were killed (NCSA, 2024a), compared to 4 percent for those who were not ejected (NCSA, 2024b). This is due to the increased risk of high-severity impacts that occur during ejections.

A rollover can shatter a vehicle's side glass, creating a portal for occupant ejection (Federal Motor Vehicle Safety Standards No. 226. 2011). Additionally, the occupant kinematics in a rollover vehicle with respect to an ejection portal can result in the occupant being partially or completely ejected if not restrained or contained inside the vehicle.[6]

In this report we found that aggregated data from the Crash Report Sampling System from 2016 to 2021 shows a mortality rate among partial and completely ejected[1] passengers of 22.6 percent and a suspected serious injury rate of 30.6 percent.

The national seat belt use estimates for drivers and front row passengers have remained around 90 percent since 2016 (Boyle, 2023b). Seat belt use among passengers involved in fatal crashes ranged from 91.9 percent to 89.4 percent among all crashes (Boyle, 2023a). Seat belt use among passengers who were fatally injured in crashes ranged from 41.8 percent to 45.8 percent in that period.

Analyzing CRSS data from 2016 to 2021 shows that among the fatally injured belted passengers, about 5.3 percent were at least partially ejected from the vehicles, whereas 43.3 percent of the fatally injured unbelted were ejected or partially ejected. The probability of ejection of unbelted occupants in rollover vehicles with curtain air bag compliant to Federal Vehicle Motor Safety Standard No. 226, *Ejection mitigation*, was 17.4 percent. Additionally, the effectiveness of this technology in preventing ejections in rollovers was estimated to be 44.7 percent (95% CI [24.6, 59.5]) when adjusting by seat belt use. These differences were statistically significant at an alpha level of .05.

Key Findings:

- There were more than 1 million passenger vehicle rollovers from 2016 to 2021.
- The effectiveness of curtain air bags deployable at rollover events, compliant with FMVSS No. 226, in preventing occupant ejection was 44.7 percent (95% CI [24.6, 59.5]) in preventing occupant ejection.
- The probability of ejection in unbelted occupant in rollover vehicles with curtain compliant with FMVSS 226 was 17.4 percent.
- Rollover passenger vehicles in crashes that occurred in rural areas had higher odds to have an occupant ejection when compared to rollover crashed passenger vehicles in urban areas (OR: 1.27; 95% CI [1.01 – 1.58]).
- About 5 percent of vehicles that rolled over from 2016 – 2021, had rollover-activated curtain air bags compliant with FMVSS No. 226.

[1] Unless otherwise stated, the term "ejected" refers to fully or partial occupant ejection.

- Occupants wearing a seat belt were 98 percent less likely to be ejected in rollover occurrences when compared to unbelted occupants, after adjusting for rollover-activated curtain air bags, vehicle type, and urbanicity.
- The combination of seat belt and curtain air bags reduces the probability of occupant ejections by 99 percent.

Introduction

Studies have shown that the risk of fatality for occupants ejected in rollover crashes is significantly higher than for occupants who are not ejected. In 2022 fatality rate for those ejected from the vehicle during a rollover has been estimated to be 95.5 percent, compared to 4.7 percent for those who were not ejected from the vehicle (NCSA, 2024).

Curtain air bags, also known as side-impact air bags or side curtain air bags, are installed in vehicles to provide protection during side-impact collisions and/or rollovers. They deploy rapidly from the roof lining or door panels and cover the windows or side areas of the vehicle (NHTSA, n.d.). When deployed, curtain air bags create a protective cushion between the occupants and the side structures, reducing the risk of head and neck injuries by minimizing the impact force on the occupant heads (Kahane, 2015).

The name "curtain air bag" derives from its appearance when deployed, resembling a curtain hanging from the roofline. The term "curtain air bag" was coined to distinguish this specific type of air bag from other types, such as front air bags or knee air bags (IIHS, 2021).

Curtain air bags are an essential component of a comprehensive passive safety system in modern vehicles, working in conjunction with other safety features like seat belts and front air bags.

Kahane (2014) found that curtain air bags can reduce fatalities in near-side crashes by about 16.4 percent. A combination of curtain and torso air bags can reduce this incidence by 31.3 percent (p-value < .05) (Federal Motor Vehicle Safety Standards No. 226. 2011). Seat belts are designed to reduce serious injury and prevent occupants from being ejected or partially ejected from their vehicles in the case of crashes. In 2003 to 2007, only 2 percent of belted passengers in fatal crashes were ejected, compared to 35.3 percent of unrestrained occupants who were ejected in the same period. Cummins et al. (2011) found that the combination of torso air bag and seat belt use, can reduce the fatality rate by 67 percent, and can reduce the likelihood of serious injury by 63 percent in all crash types. Newer technologies have significantly reduced the percentage of ejected occupants among newer model year (MY) vehicles (NCSA, 2024).

In 2002 curtain air bags were expanded to mitigate occupant ejections in rollover crashes, supplementing seat belts. To this end, manufacturers installed equipment in vehicles that would trigger the curtain air bags in a first-event rollover and even in a post-impact rollover if the vehicle's electrical system was still functional. Compared to curtain airbags deployable only in near-sided crashes, rollover-activated side curtain airbags are designed to stay inflated longer than 6 seconds to prevent ejection in rollover events, cases with complex trajectories, or multiple crash events. By 2011 about 45 percent of new passenger vehicles had curtain air bags that would deploy in rollover events. In February 2011 the National Highway Traffic Safety Administration published a final rule establishing FMVSS No. 226 that specifies requirements for ejection mitigation systems to reduce the likelihood of complete and partial occupants' ejections through side windows during rollovers or side impacts. For side window openings with movable glazing, the final rule specifications essentially require that multipurpose passenger vehicles, trucks, and buses with gross vehicle weight ratings of 4,536 kg or less, manufactured on or after September 1, 2017, have side air bags deployable in rollovers or side impacts, for the first three rows of seats, and to a portion of the cargo area behind the first or second row. The standards also required manufacturers to meet a phase-in schedule to include the curtain air bags in their vehicles: 25 percent for the MY 2014; 50 percent for the MY 2015; 75 percent for the

MY 2016; 100 percent minus advanced credits for MY 2017, and all their passenger cars for MYs 2018 and beyond.

Compared to curtain air bags deployable only in near-sided crashes, rollover-activated side curtain air bags compliant with FMVSS 226 are designed to stay inflated longer than 6 seconds to prevent ejection in rollover events, cases with complex trajectories, or multiple crash events.

Other conditions are also present in vehicle rollovers and ejections. For example, vehicle rollovers are a serious issue in rural areas, which tend to have dangerous roads and unsafe conditions. Studies have shown that vehicle rollovers occur at a higher rate on rural roads than on urban roads due to their narrower widths, uneven or broken road surfaces, and lack of guard rails. Factors such as speeding, alcohol use, and driver fatigue are also common contributing factors. Additionally, drivers and passengers in rural areas are less likely to use seat belts than occupants in urban areas (Beck et al., 2017).

In this report we estimate the likelihood of occupant ejection in the presence of curtain air bags deployable in a rollover compliant with FMVSS No. 226 and examine how other factors can potentially affect this outcome. Our data shows that about 46 percent of the vehicles involved in crashes from 2016 to 2021 had rollover deployable curtain air bags.

Analytical Software

Most of the computation, data manipulation, and analysis for this project was done using the SAS Studio Version Stable 2023.08, from the SAS Viya interface. For the log binomial regression analysis on complex survey sample, R version 4.3.1, and the *survey* (v 3.5-5) package. NHTSA's Product Information Catalog and Vehicle Listing data was pulled on September 27, 2023.

Methods

This study is focused on rollover vehicles in crashes sampled by the Crash Reporting Sampling System (CRSS),[2] a nationally representative complex survey sample of crashes in the United States that have a police crash report, from 2016 to 2021. The main outcome of interest is whether the occupant in the rollover vehicle was partially or totally ejected, and the factors that can be associated with the ejection.

Analytical Dataset

To obtain the specific make, model, MY, and trim of the vehicle, CRSS collects the first 11 digits in the VIN for each vehicle in the crash report, and vPIC obtained this information. After that information was mapped to the data, the rollover-deployed curtain air bag information for each vehicle was obtained from the New Car Assessment Program database for MYs 2002 to 2017. The curtain air bags for these vehicles were coded as being non-compliant, since FMVSS 226 took effect after 2017. Some manufactures could have produced vehicles with curtain air bags compliant with FMVSS 226 in this period; however, we could not identify them with our data systems. Vehicles manufactured after September 1, 2017, were required to be FMVSS No. 226-compliant, i.e., have curtain air bags deployable in a rollover. The vehicles were mapped using a "fuzzy merge" between the vPIC and NCAP vehicles using the make, model, and MYs variables. A 10-percent sample of the merged data was evaluated to capture the fuzzy merge errors. The vehicles without corresponding match were coded manually using the NCAP data.

Exclusions

Only vehicles that had rollovers in the CRSS dataset from 2016 to 2021 were included. For this analysis, rollover vehicles were those that rotated 90° or more about any true longitudinal or lateral axis during a crash. The vehicle types in the analysis included passenger cars and light trucks (pickups, SUVs, vans, etc.). Large trucks, motorcycles, and buses were excluded from this analysis. Convertibles were also excluded. Finally, only occupants 12 and older and seated in outboard positions were included.

Analytical Variables

For this study we are interested in the rollover variable obtained from the CRSS auxiliary files coded *A_VROLL*. Rollovers are vehicles whose rotation in any true longitudinal or lateral axis is more than 90° at any time during the crash. All vehicles that had rollovers were included in the analysis. The outcome variable that we were interested in was ejection. Total and partial ejections were coded as ejections. Ejections where the degree of ejection was unknown, were also coded as ejections. The ejection variable used in the analysis was the imputed ejected values from the data coded EJECT_IM (NCSA 2023). The study compares occupant ejection rates in rollover vehicles with curtain air bags deployable in rollover events, curtain air bags compliant with FMVSS 226, and vehicles without this safety feature. Due to the nature of the data set used, there is no way of knowing if the curtain air bag was, in fact, deployed. For this reason, we assume that if a vehicle is equipped with rollover-activated curtain air bags, these were activated and engaged in the rollover.

[2] Crash Investigation Sampling System (CISS) was considered, but not used due to small frequencies in rollover crashes.

For this study we used a logistic regression analysis to measure the magnitude, significance, and association that the curtain air bag has in potentially preventing occupant ejections in a rollover. A logistic regression analysis allows us to estimate this magnitude while adjusting for other factors that may confound this association. The literature shows that some factors are seat belt use (*a_restuse*), passenger vehicle type (*a_body*; passenger car, LTV), seating position (*seat_pos*; front or rear seat), and urbanicity (*urbanicity*; rural or urban) (Winnicki, 1997). With these variables, the logistic regression follows the form (Kutner et al., 2004):

$$P = \frac{e^{\beta_0+\beta_i X}}{1 + e^{\beta_0+\beta_i X}} \quad (1)$$

Where the α is the intercept of the logistic regression analysis, and β_i are the parameters of the model for the predictor variables of the rollover-activated air bag (FMVSS 226-compliant, rollover-activated curtain air bag, or no rollover-activated curtain air bag), occupant restraint use, occupant seating position, and urbanicity. This will be used to estimate the probability of ejection given the presence of the safety measures of interest.

To estimate the effectiveness, we will fit all the interest and statistically necessary safety measures in a log binomial regression, to calculate an adjusted risk ratio (Donohue, 2018) (RR_{airbag}) for occupant ejection in rollover crashes. The log binomial regression follows the form:

$$\ln p = \beta_0 + \beta_i X_i \quad (2)$$

Where the coefficients are like those in *Equation* (1). We will then define effectiveness as the percentage of reduction in occupant ejection in a group at risk compared to the group with the assumed protective factor. Our effectiveness estimate will be determined by exponentiating the corresponding regression coefficient in *Equation* (2) and taking the difference to 1:

$$Effectiveness = 1 - e^{\beta_{airbag}} = 1 - RR_{airbag} \quad (3)$$

Results

The CRSS data from 2016 – 2021 shows that approximately 2 percent of the vehicles involved in crashes resulted in partial or complete rollover. This accounted for more than 1 million rollover vehicles in crashes in the study years. There were almost 150,000 occupants fully or partially ejected from vehicles in from 2016 to 2021. These account for less than 1 percent of the occupants involved in police reported crashes in this period. However, 52 percent of ejected passengers were in vehicles that rolled over during the crash. About 27 percent of vehicles in our rollover data had types of curtain air bags deployable in rollovers.

Rollover-Activated Curtain Air Bag

Rollover-activated curtain air bags were first introduced in 2002. Since then, the number of vehicles with this system in the CRSS data has steadily grown until FMVSS No. 226 became mandatory for all outboard seating positions for vehicle MYs 2018 and newer. Figure 1 below shows the relationship between the increase in the percentage of vehicles with rollover-activated curtain systems in our data and the rollover rate by vehicle MYs. Our data showed a decrease in rollover rate for the more recent vehicle MYs, from 35 for every 1,000 passenger vehicles with a MY older than 2002 involved in crashes, to less than 10 for every 1,000 passenger vehicles with vehicle MYs from 2012 to 2019 involved in crashes. This reduction might be because of the introduction of safety features such as electronic stability control and antilock brake system (Pai, 2017). A slight increase is shown for vehicle MYs newer than 2019, up to 22 for every 1,000 passenger vehicles with the MY 2021.

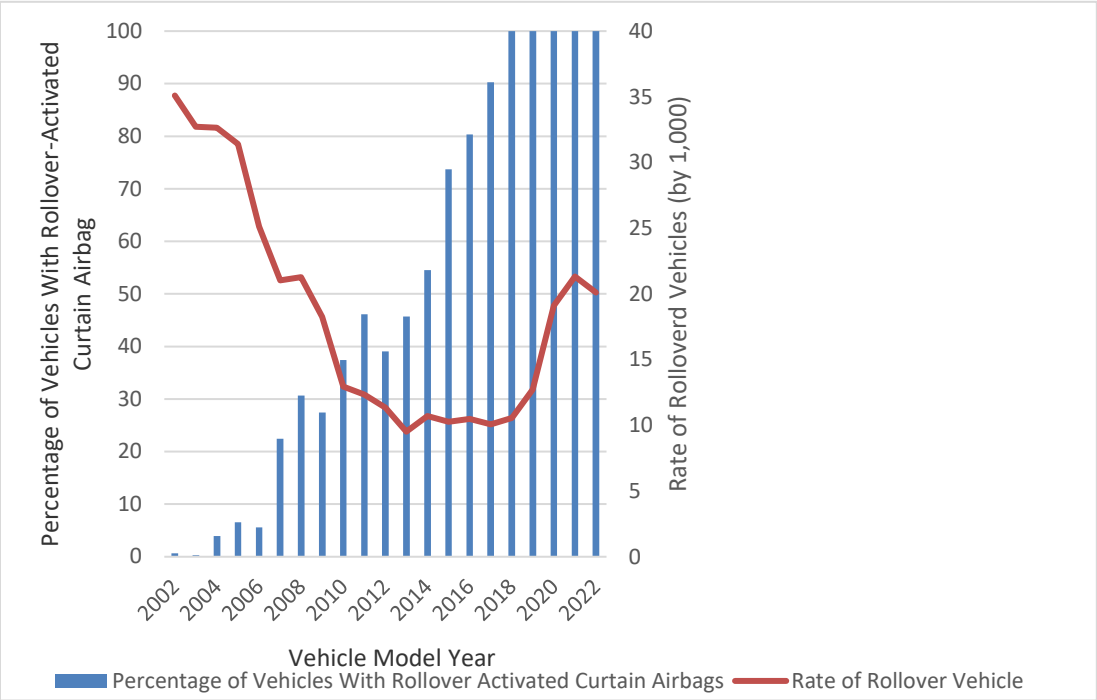

Figure 1. Percentage of Vehicles With Rollover-Activated Curtain Air Bag Versus Rate of Rolled Vehicles by Model Year*

Data sources: Rollover rate: CRSS 2016 – 2021.
* Vehicles with MY greater than 2018 are required to have rollover-activated curtain air bags.

The main goal of this study was to estimate the effectiveness of curtain air bags compliant with FMVSS No. 226 in preventing ejections in rollover vehicles. For this purpose, it is important to first observe the relationship certain variables in our data may have in this outcome. Table 1 shows the result of the odds ratio taken from the regression analysis adjusted by all the variables mentioned in the *Analytical Variables* section. This analysis was performed using PROC SURVEYLOGISTIC in SAS. The variable *weight* was assigned to the WEIGHT option. Variables *psu* and *psustrata* were assigned to the CLUSTER and STRATA options, respectively. For the weighted frequencies, we used PROC SURVEYFREQ with the same variables. Out of the nearly 1.4 million occupants involved in rollover vehicles, 88.7 percent were using seat belts and were significantly less likely to be ejected than unrestrained occupants in those crashes (*p*-value < .05). Occupants in the back row were 5 percent less likely to be ejected from their vehicles, when compared to drivers and front row passengers when keeping the other factors constant (*p*-value > .05). However, there was no statistical difference in ejection odds between occupants in the front row and back row passengers. Occupants in rollover vehicles in urban areas were 21 percent less likely to be ejected than occupants in rollovers in rural areas (*p*-value < .05). Ejections were 10 percent more likely among LTV occupants when compared to occupants in passenger cars (*p*-value > 0.05). There was no statistical significance in the interaction term between rollover-activated curtain air bags and restraint use. Therefore, this interaction was not evaluated in the final regression analysis.

Table 1. Logistic Regression Coefficients and Weighted Frequencies of Occupants in Rollover Vehicles and the Associated Ejection Odds Ratio

	Weighted Frequency	**Ejection Percentage**	**Regression Coefficients**	***P*-Value**	**Odds Ratio**	**95% Confidence Interval**	
Rollover-Activated Air Bag						Lower	Upper
No	1,031,152	3.11	-	1.00	-	-	-
Not Compliant†	309,756	0.53	- 0.4515	**.0023**	**0.637**	**0.482**	**0.841**
Compliant	71,398	0.09	-0.7700	**< 0.0001**	**0.463**	**0.330**	**0.649**
Restraint Use							
No	160,266	3.72	-	1.00	-	-	-
Yes	1,252,040	0.43	- 4.3927	**< .0001**	**0.012**	**0.009**	**0.018**
Passenger Vehicle Type							
LTV	830,761	2.32	-	1.00	-	-	-
Passenger Car	581,545	1.40	-0.1042	.3281	0.901	0.728	1.115
Occupant Seating Position							
Front Row	1,342,974	3.44	-	1.00	-	-	-
Back Row	69,332	0.29	-0.0484	.7047	0.953	0.737	1.232
Urbanicity							
Rural	590,670	1.98	-	1.00	-	-	-
Urban	821,636	1.74	-0.2361	**.0382**	**0.789**	**0.631**	**0.986**

* Bold font indicates statistical significance at an α level of 0.05.
† Compliant to FMVSS 226.

Now that we established the effect and significance of the variables identified in the literature review in Table 1, we proceeded with the estimation of the probability of occupant ejection in the presence of a rollover-activated curtain air bag adjusting by those significant effects from the preliminary analysis. Although significant, we will not consider urbanicity a vehicle safety feature in the prevention of occupant ejection in rollover vehicles. The literature states that occupants in rural areas are less likely to use seat belts when compared with occupants in urban areas (Beck et al., 2017). However, we did not find a statistically significant difference in the logistic regression coefficient of the interaction between urbanicity and seat belt to predict occupant ejection (not included in this analysis). We will not consider urbanicity further in this analysis. We will re-fit the logistic regression model, with rollover-activated air bag and seat belt use as the only predictors for occupant ejections in rollover vehicles. This model will serve as a barometer to check if our variables are still significant, and to estimate the probability of ejection in rollover crashes with FMVSS No. 226-compliant curtain air bags. We get the following regression coefficient table:

Table 2. Re-Fitted Logistic Regression Coefficients for Significant Safety Features

	Regression Coefficient	***P*-Value**	**Odds Ratio**	**95% Confidence Interval**	
				Upper	Lower
Intercept	-0.7950	<.0001	-		
Rollover-Activated Air Bag					
No	-	-	1.00	-	-
Not Compliant†	- 0.4458	**.0029**	**0.640**	**0.467**	**0.849**
Compliant	-0.7598	**<.0001**	**0.468**	**0.333**	**0.657**
Seat Belt Use					
No	-	-	1.00	-	-
Yes	- 4.4093	**< .0001**	**0.012**	**0.009**	**0.017**

†Compliant to FMVSS 226.

After adjusting by just restraint use, both factors remain statistically significant. This suggest that the relationship between occupant ejection, a type of rollover-activated curtain air bag, and seat belt use, is not necessarily dependent on the variables removed from the model in Table 1. It is also worth noting that restraint use virtually eliminates the odds of occupant ejection in the event of rollover (OR 0.012; 95% CI [0.009, 0.017]). Using Equation (1) in the *Analytical Variable* section, substituting the β's for the logistic regression analysis in Table 2, removing the estimated effect that seat belt use has in ejection prevention according to the logistic regression model, and solving for the equation, we get the following estimate for rollover-activated curtain air bags compliant with FMVSS 226:

$$\hat{E} = \frac{e^{a+Xb_i}}{1+e^{a+Xb_i}} = \frac{1}{1+\exp(-[a+Xb_i])}$$
$$= \left[1+\exp\left(-\left(-0.7950(1)-0.4458(0)-0.7598(1)-4.4093(0)\right)\right)\right]^{-1}$$
$$= \frac{1}{5.73414} = 0.1744$$

Therefore, we conclude that the probability of ejection in rollover crashes among unbelted occupants in vehicles with rollover-activated curtain air bags compliant with FMVSS 226 is 17.4 percent. To establish the significance of this estimate we will introduce several concepts and notation. Consider the vector $\boldsymbol{b}$ as the vector containing all the coefficients of the logistic regression in Table 2:

$$\boldsymbol{b} = \begin{pmatrix} b_0 \\ b_1 \\ b_2 \\ b_3 \end{pmatrix} = \begin{pmatrix} -0.7950 \\ -0.4458 \\ -0.7598 \\ -4.4093 \end{pmatrix}.$$

Additionally, we introduce the vector $\boldsymbol{X_h}$ as the vector containing the values of the logit mean response to be evaluated in the logistic regression. For the scope of this project, this vector has the following form:

$$\boldsymbol{X_h} = \begin{pmatrix} 1 \\ 0 \\ 1 \\ 0 \end{pmatrix};$$

Last, we will define $\hat{E}_h$ as the fitted logit mean response. That is:

$$\hat{E}_h = \boldsymbol{X_h'b} = -1.5548$$

Note that Equation (1) can now be written as:

$$\hat{E} = \left[1+\exp\left(-\boldsymbol{X_h'b}\right)\right]^{-1} = \left[1+\exp\left(-\hat{E}_h\right)\right]^{-1};$$

Now that we have established these terms, we will now estimate a confidence interval for the point estimate of the probability. For this, we will use the following estimates for the lower and upper bound of the confidence interval:

$$L^* = [1+\mathrm{e}^{-\mathrm{L}}]^{-1}$$
$$U^* = [1+e^{-U}]^{-1}$$

where;

$$L = \hat{E}_h - z_{1-\frac{\alpha}{2}} \times s\{\hat{E}_h\}$$
$$U = \hat{E}_h + z_{1-\frac{\alpha}{2}} \times s\{\hat{E}_h\}$$

Where $z_{1-\frac{\alpha}{2}}$ is the z-score associated with the Z distribution for the cumulative probability of 1-$\alpha/2$, and $s\{\hat{E}_h\}$ is the standard error of the fitted logit mean response $\hat{E}_h$, and we approximate it with the following formula:

$$s^2\{\hat{E}_h\} = \boldsymbol{X}_h^{'}\boldsymbol{s}^2\{\boldsymbol{b}\}\boldsymbol{X}_h;$$

where $\boldsymbol{s}^2\{\boldsymbol{b}\}$ is the estimated approximate variance-covariance of the regression coefficients obtained using the COVB option from PROC SURVEYLOGISTIC:

$$\boldsymbol{s}^2\{\boldsymbol{b}\} = \begin{matrix} \\ b_0 \\ b_1 \\ b_2 \end{matrix}\begin{matrix} \begin{matrix} b_0 & b_1 & b_2 \end{matrix} \\ \begin{bmatrix} 0.003603 & -0.00279 & -0.00370 & -0.00324 \\ -0.00279 & 0.019364 & 0.010557 & 0.001935 \\ -0.00370 & 0.010557 & 0.027898 & 0.011393 \\ -0.00324 & 0.001935 & 0.011393 & 0.028559 \end{bmatrix} \end{matrix}$$

Therefore, the variance estimation for this probability is $s^2\{\hat{E}_h\} = 0.029492$. For an alpha level of 0.05 we get the following estimates for L and U:

$$L = -1.5548 - 1.96 \times 0.171732 = -1.89137$$
$$U = -1.5548 + 1.96 \times 0.171732 = -1.21818$$

Replacing these values for the upper and lower bounds, we get:

$$L^* = [1 + \exp(1.53067)]^{-1} = 0.1311$$
$$U^* = [1 + \exp(1.05335)]^{-1} = 0.2283$$

We therefore find with approximately 95 percent confidence, that the probability of unbelted occupant ejection in a rollover crash of a passenger vehicle with curtain air bags compliant with FMVSS 226 is from 0.131 to 0.228. We followed the same procedure to estimate the probability of occupant ejection in vehicles with curtain air bags not compliant with FMVSS 226 and without curtain air bags. These probabilities were found to be 0.224 and 0.3111. There was no statistical significance difference between the probability of occupant ejection in vehicles with rollover-activated curtain air bags compliant with FMVSS 226 and those not compliant with the standard (p-value < 0.05). Since the probability of occupant ejection for occupants in vehicles without any type of rollover-activated curtain air bag is not included in the 95 percent confidence interval above, we conclude that the rollover-activated curtain air bags compliant with FMVSS are statistically significant in preventing occupant ejections, when adjusting by seat belt use, with an alpha level of 0.05. Furthermore, using this same approximation and methodology, we will estimate the combined probability of occupant ejection for seat belt and rollover-activated curtain air bag compliant with FMVSS 226 protected passengers. Note that for this calculation we will need to slightly modify the previously presented $\boldsymbol{X_h}$ to be:

$$\boldsymbol{X_h} = \begin{pmatrix} 1 \\ 0 \\ 1 \\ 1 \end{pmatrix}$$

This will leave us with the estimated E_h as:

$$\hat{E}_h = \boldsymbol{X_h''b} = (1 \quad 0 \quad 1 \quad 1) \cdot \begin{pmatrix} -0.7950 \\ -0.4458 \\ -0.7598 \\ -4.4093 \end{pmatrix} = -5.96425$$

The calculation of the probability following Equation (1) will be:

$$\hat{E} = \left[1 + \exp\left(-\hat{E}_h\right)\right]^{-1} = [1 + \exp(5.7016)]^{-1} = 0.002562$$

The variance of the estimator was estimated as following:

$$s^2\{\widehat{E}\} = \boldsymbol{X_h'} s^2\{\boldsymbol{b}\} \boldsymbol{X}_h$$

$$= (1 \quad 0 \quad 1 \quad 1) \cdot \begin{pmatrix} 0.003603 & -0.00279 & -0.00370 & -0.00324 \\ -0.00279 & 0.019364 & 0.010557 & 0.001935 \\ -0.00370 & 0.010557 & 0.027898 & 0.011393 \\ -0.00324 & 0.001935 & 0.011393 & 0.028559 \end{pmatrix} \cdot \begin{pmatrix} 1 \\ 0 \\ 1 \\ 1 \end{pmatrix}$$

$$= 0.059089$$

Finally, using the upper and lower 95 percent confidence interval formulas for the estimated probabilities, we calculate those to be [0.00159, 0.00412]. Following the previous logic, this was statistically significant with an alpha level of 0.05.

Effectiveness

For the adjusted risk ratio estimation, we will fit the log binomial distribution with the predicted variables presented in from the result of the re fitted logistic regression analysis in Table 2.

Table 3. Log Binomial Regression Coefficients and Risk Ratios

	Regression Coefficient	***P*-Value**	**Risk Ratio**	**95% Confidence Interval**	
				Upper	**Lower**
Intercept	-1.16448	**<.0001**	**-**		
Rollover-Activated Air Bag					
No	-	-	1.00	-	-
Not Compliant†	- 0.34746	**.0013**	**0.7065**	**0.5750**	**0.8680**
Compliant	-0.59219	**.0003**	**0.5531**	**0.4055**	**0.7544**
Seat Belt Use					
No	-	-	1.00	-	-
Yes	- 4.06728	**< .0001**	**0.0171**	**0.0126**	**0.0234**

* Bold font indicates statistical significance at an α level of 0.05.

†Compliant to FMVSS 226.

Table 3 shows that the risk of occupant ejection in rollover crash when the occupant is in a seating position with curtain air bags compliant with FMVSS No. 226, is about 0.55 times the risk of ejection to those occupants without this protection, when adjusting by seat belt use (RR 0.553; 95% CI [0.406, 0.868]). Occupants in vehicles with rollover-activated curtain air bags not compliant with FMVSS 226 were about 30 percent less likely to be ejected from rollover vehicles when compared to those without the protection (RR 0.707; 95% CI [0.575, 0.868]). For belted occupants, the relative risk of ejection in rollover crashes was 0.017 times the risk ratio of those not using seat belts (RR 0.017; 95% CI [0.013, 0.023]). These differences were statistically significant.

To estimate the effectiveness of FMVSS No. 226-compliant curtain air bags, we now substitute the results in formula (3) presented on page 6, and we get:

$$effectivenes = 1 - RR_{airbags} = 1 - 0.5531 = 0.4469$$

Effectiveness upper and lower confidence interval bounds, can be calculated using the following formula (Link-Gelles et al., 2024):

$$Upper\ Bound = (1 - Lower\ RR\ 95\%\ CI) \times 100$$
$$Lower\ Bound = (1 - Upper\ RR\ 95\%\ CI) \times 100$$

Thus, substituting in these equations, we get that the effectiveness of FMVSS No. 226-compliant curtain air bags is 44.7 percent (95% CI [24.6, 59.5]) in preventing occupant ejection in rollover events, when controlling for the use of seat belt. This effectiveness is statistically significant.

This page is intentionally left blank.

Conclusions

Our analysis showed that in rollover crashes, occupants in vehicles with FMVSS No. 226-compliant curtain air bags were less likely to be ejected than occupants in vehicles without these curtain air bags, controlling for other factors. Our research has shown that seat belts significantly reduce the odds of ejection (OR 0.012; 95% CI [0.09, 0.017]) in rollover crashes, when adjusting for other factors. Seat belt use had the highest magnitude effect in preventing ejection in rollover crashes from 2016 to 2021. Occupants traveling in urban areas were less likely to be ejected in rollover vehicles than those traveling in rural areas, after adjusting by the other factors (OR 0.789; 95% CI [0.631, 0.986]). The interaction between seat belt use and urbanicity was not statistically significant in the prediction of occupant ejection and was not included in the final analysis. Rollover-activated curtain air bags significantly decrease the odds of occupant ejection when adjusting for seat belt use. Rollover-activated curtain air bags compliant with FMVSS 226 reduce the odds of occupant ejection by a factor of 0.532 (OR 0.468; 95% CI [0.333,0.657]), and rollover-activated curtain air bags not compliant with the standard had a odds ratio of 0.64 (95% CI [0.467, 0.849]). The probability of ejection in rollover crashes among unbelted occupants in vehicles with curtain air bags compliant with FMVSS 226 was 17.4 percent. This estimate was statistically significant with an alpha level of 0.05 (95% CI [13.1, 22.8]). The effectiveness of FMVSS No. 226-compliant curtain air bags in preventing occupant ejection in rollover crashes, was estimated to be 44.7 percent (95% CI [24.6, 59.5]), when adjusting by seat belt use. This is statistically significant with an alpha level of 0.05. Finally, the combination of seat belt and rollover-activated curtain air bags reduces the probability of occupant ejection by 99 percent (95% CI [99.6, 99.8]) in the event of a rollover. We conclude that FMVSS No. 226 was significantly effective in preventing occupant ejections in rollover crashes from 2016 to 2021.

References

Beck, L., Downs, J., Stevens, M., & Sauber-Schatz, E. (2017, September 22). *Rural and urban differences in passenger-vehicle–occupant deaths and seat belt use among adults — United States, 2014*. Morbidity and Mortality Weekly Report Surveillance Summaries 2017, 66(17). http://dx.doi.org/10.15585/mmwr.ss6617a1

Boyle, L. (2023a, January). *Seat belt use in 2022 – Overall results*. (Traffic Safety Facts Research Note. Report No. DOT HS 813 407). National Highway Traffic Safety Administration. https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813407.pdf

Boyle, L. (2023b, November). *Occupant restraint use in 2022: Results from the NOPUS controlled intersection study* (Report No. DOT HS 813 523). National Highway Traffic Safety Administration. https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813523.pdf

Burgess, M., & Starnes, M. (2009, December). *Factors related to the likelihood of passenger vehicle occupant being ejected in a fatal crash* (Report No. DOT HS 811 209). National Highway Traffic Safety Administration. https://crashstats.nhtsa.dot.gov/Api/Public/Publication/811209

Cummins, J. S., Koval, K. J., Cantu, R. V., & Spratt, K. F. (2011). Do seat belts and air bags reduce mortality and injury severity after car accidents? *American Journal of Orthopedics, 40*(3).

Donohue, M, W. (2018, August). logbin: An R package for relative risk regression using the log-binomial model. *Journal of Statistical Software, 86*(9).

Federal Motor Vehicle Safety Standards No. 226, *Ejection mitigation; Phase-in reporting requirements; Incorporation by reference*, 49 CFR Part 571 and 585, January 19, 2011. [Docket Submission. Docket No. NHTSA-2011-0004 in Regulations.gov]. https://www.federalregister.gov/documents/2011/01/19/2011-547/federal-motor-vehicle-safety-standards-ejection-mitigation-phase-in-reporting-requirements. National Highway Traffic Safety Administration

Insurance Institute for Highway Safety. (2021). *Airbags* [sic]. [Web page]. https://www.iihs.org/topics/airbags#how-front-and-side-airbags-work

Kahane, C. J. (2014, January). *Updated estimates of fatality reduction by curtain and side air bags in side impacts and preliminary analyses of rollover curtains* (Report No. DOT HS 811 882). National Highway Traffic Safety Administration. https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/811882.pdf

Kahane, C.J., (2015, January). *Lives saved by vehicle safety technologies and associated Federal Motor Vehicle Safety Standards, 1960 to 2012 – Passenger cars and LTVs – With reviews of 26 FMVSS and the effectiveness of their associated safety technologies in reducing fatalities, injuries, and crashes*. (Report No. DOT HS 812 069). National Highway Traffic Safety Administration. https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812069.pdf

Kutner, M. H., Nachtsheim, C. J., & Neter, J. (2004) *Applied linear regression models*, 4th Ed. McGraw-Hill/Irwin.

Link-Gelles, R., Ciesla, A. A., Mak, J., Miller, J. D., Silk, B. J., Lambrou, A. S., Paden, C. R., Shirk, P., Britton, A., Smith, Z. R., & Fleming-Dutra, K. E. (2024, February). *Early estimates of updated 2023–2024 (Monovalent XBB.1.5) COVID-19 vaccine effectiveness against symptomatic SARS-CoV-2 infection attributable to co-circulating omicron variants among immunocompetent adults — Increasing community access to testing program, United States, September 2023–January 2024*. Morbidity and Mortality Weekly Report Surveillance Summaries, 73(4). doi: 10.15585/mmwr.mm7304a2

National Center for Statistics and Analysis. (2023, April). *Crash Report Sampling System analytical user's manual, 2016-2021* (Report No. DOT HS 813 436). National Highway Traffic Safety Administration. https://rosap.ntl.bts.gov/view/dot/78020/dot_78020_DS1.pdf

NCSA. (2024a, May). Occupant protection in passenger vehicles: 2022 data (Traffic Safety Facts. Report No. DOT HS 813 573). National Highway Traffic Safety Administration. https://crashstats.nhtsa.dot.gov/Api/Public/Publication/813573

NCSA. (2024b, July). *Passenger vehicles: 2022 data* (Traffic Safety Facts. Report No. DOT HS 813 592). National Highway Traffic Safety Administration. https://rosap.ntl.bts.gov/view/dot/77969

National Highway Traffic Safety Administration. (n.d.). *Air bags*. [Web page]. https://www.nhtsa.gov/equipment/air-bags

Pai, J. (2017, August). *Trends and rollover-reduction effectiveness of static stability factor in passenger vehicles* (Report No. DOT HS 812 444). National Highway Traffic Safety Administration. [Not available on the web].

Winnicki, J. (1997, November). *Analysis of ejection in fatal crashes* (Report No. DOT HS 808 643). National Highway Traffic Safety Administration. https://rosap.ntl.bts.gov/view/dot/12738

Appendix A: Rollover-Activated Curtain Air Bags Not Compliant With FMVSS 226

Make	Model	Year	Rollover Curtain Air Bag
ACURA	ILX	2013-2015	NO
ACURA	ILX	2016-2017	YES
ACURA	ILX HYBRID	2013-2014	NO
ACURA	MDX	2005	NO
ACURA	MDX	2008-2017	YES
ACURA	MDX E-AWD	2016	YES
ACURA	MDX SPORT HYBRID	2017	YES
ACURA	NSX	2016-2017	YES
ACURA	NSX-T	2005	NO
ACURA	RDX	2008-2017	YES
ACURA	RL	2005-2013	NO
ACURA	RLX	2014-2017	YES
ACURA	RLX SH-AWD	2014	YES
ACURA	RLX SPORT HYBRID	2016-2017	YES
ACURA	RSX	2005	NO
ACURA	TL	2005-2014	NO
ACURA	TLX	2015-2017	YES
ACURA	TSX	2005-2014	NO
ACURA	TSX SPORT WAGON	2011-2014	NO
ACURA	TSX V6	2009-2012	NO
ACURA	ZDX	2010	NO
ACURA	ZDX	2011-2013	YES
ALFA	4C	2015-2017	NO
ALFA ROMEO	GUILIA	2017	YES
AUDI	A3	2008-2015	NO
AUDI	A3	2016	YES
AUDI	A3 CABRIOLET	2016	NO
AUDI	A3 CABRIOLET	2017	NO
AUDI	A3 SEDAN	2017	YES
AUDI	A3 SPORTBACK	2013	NO
AUDI	A3 SPORTBACK E-TRON	2016	YES
AUDI	A3 SPORTBACK PHEV	2017	YES
AUDI	S3	2015	YES
AUDI	A4	2008-2016	NO
AUDI	A4	2017	YES
AUDI	A4 AVANT	2008-2012	NO
AUDI	A4 CABRIOLET	2008-2009	NO
AUDI	A4/S4	2010-2015	NO
AUDI	A4/S4 AVANT	2005-2011	NO
AUDI	A4/S4 CABRIOLET	2005	NO
AUDI	A4/S4 SEDAN	2005	NO
AUDI	A5 COUPE	2008-2017	NO
AUDI	A5, RS5, S5	2015	NO

Make	Model	Year	Rollover Curtain Air Bag
AUDI	A5, RS5, S5 COUPE	2015	NO
AUDI	A5/S5	2010-2014	NO
AUDI	A6	2008-2010	NO
AUDI	A6	2012-2017	YES
AUDI	A6 AVANT	2008-2009	NO
AUDI	A6/S6	2013-2015	YES
AUDI	A6/S6	2010-2011	NO
AUDI	A7	2012-2017	YES
AUDI	A8	2005-2010	NO
AUDI	A8	2011-2017	YES
AUDI	Q3	2015-2017	YES
AUDI	Q7	2008-2017	YES
AUDI	R8	2008-2015	NO
AUDI	R8 COUPE	2017	YES
AUDI	R8 SPYDER	2011-2015	NO
AUDI	RS 7	2016	YES
AUDI	RS4	2008	NO
AUDI	RS4 CABRIOLET	2008	NO
AUDI	RS7	2017	YES
AUDI	S3	2016-2017	YES
AUDI	S4	2008-2016	NO
AUDI	S5 CABRIOLET	2009-2017	NO
AUDI	S6	2008-2009	NO
AUDI	S6	2016-2017	YES
AUDI	S7	2016-2017	YES
AUDI	S8	2016-2017	YES
AUDI	SQ5	2016-2017	YES
AUDI	TT COUPE	2005-2012	NO
AUDI	TT COUPE	2016-2017	YES
AUDI	TT ROADSTER	2005-2017	NO
AUDI	TT, TTS COUPE	2015	NO
AUDI	TT, TTS ROADSTER	2015	NO
AUDI	TT/TTS COUPE	2014	NO
AUDI	TT/TTS ROADSTER	2013	NO
AUDI	TTS COUPE	2016-2017	YES
B250E	B-CLASS E-CELL	2017	NO
BENTLEY	ARNAGE R	2005-2009	NO
BENTLEY	ARNAGE RL	2005-2009	NO
BENTLEY	ARNAGE T	2005-2009	NO
BENTLEY	AZURE	2008-2009	NO
BENTLEY	BENTAYGA	2017	YES
BENTLEY	BROOKLANDS	2009	NO
BENTLEY	CONTENTAL GT CONVERTIBLE	2017	NO
BENTLEY	CONTINENTAL FLYING SPUR	2008-2013	NO
BENTLEY	CONTINENTAL GT	2005-2017	NO
BENTLEY	CONTINENTAL GT CONVERTIBLE	2015-2016	NO

Make	Model	Year	Rollover Curtain Air Bag
BENTLEY	CONTINENTAL GT SPEED	2014-2017	NO
BENTLEY	CONTINENTAL GTC	2008-2014	NO
BENTLEY	CONTINENTAL SUPERSPORTS	2011-2012	NO
BENTLEY	CONTINENTAL SUPERSPORTS CONVERTIBLE	2012-2013	NO
BENTLEY	FLYING SPUR V8	2014-2017	YES
BENTLEY	FLYING SPUR V8 S	2017	YES
BENTLEY	FLYING SPUR W12	2014-2017	YES
BENTLEY	MULSANNE	2011-2016	NO
BENTLEY	MULSANNE	2017	YES
BENTLEY	SUPERSPORTS CONVERTIBLE	2011	NO
BENTLEY	SUPERSPORTS CONVERTIBLE	2011	NO
BMW	1 SERIES CONVERTIBLE	2014	NO
BMW	128I	2008-2010	NO
BMW	128I CONVERTIBLE	2011-2013	YES
BMW	128I COUPE	2011-2013	NO
BMW	135I	2008-2010	NO
BMW	135I CONVERTIBLE	2008-2010	NO
BMW	135I CONVERTIBLE	2011-2012	YES
BMW	135I CONVERTIBLE	2013	NO
BMW	135I COUPE	2011-2013	NO
BMW	135IS CONVERTIBLE	2013	NO
BMW	2 SERIES CONVERTIBLE	2017	NO
BMW	2 SERIES COUPE	2017	YES
BMW	2 SERIES XDRIVE CONVERTIBLE	2017	NO
BMW	2 SERIES XDRIVE COUPE	2017	YES
BMW	220I ACTIVE TOURER	2015	YES
BMW	225I XDRIVE ACTIVE TOURER	2015	YES
BMW	228I CONVERTIBLE	2015-2016	YES
BMW	228I COUPE	2015-2016	YES
BMW	228I XDRIVE CONVERTIBLE	2015-2016	YES
BMW	228I XDRIVE COUPE	2015-2016	YES
BMW	3 SERIES SEDAN	2014-2017	YES
BMW	3 SERIES XDRIVE GT	2014	NO
BMW	3 SERIES XDRIVE GT	2017	YES
BMW	3 SERIES XDRIVE SEDAN	2014-2017	YES
BMW	3 SERIES XDRIVE SPORTS WAGON	2014	NO
BMW	320I SEDAN	2015-2016	YES
BMW	320I XDRIVE SEDAN	2015-2016	YES
BMW	325CI	2005	NO
BMW	325CI CONVERTIBLE	2005	NO
BMW	325I SPORT WAGON	2005	NO
BMW	325I, 325XI	2005	NO
BMW	325XI SPORT WAGON	2005	NO
BMW	328D SEDAN	2015-2016	YES
BMW	328D XDRIVE SEDAN	2015-2017	YES
BMW	328I	2009	NO

Make	Model	Year	Rollover Curtain Air Bag
BMW	328I CONVERTIBLE	2008-2012	YES
BMW	328I COUPE	2008-2013	NO
BMW	328I SEDAN	2008-2013	NO
BMW	328I SEDAN	2015-2016	YES
BMW	328I SPORTS WAGON	2008-2012	NO
BMW	328I XDRIVE COUPE	2011-2013	NO
BMW	328I XDRIVE GT	2015-2016	YES
BMW	328I XDRIVE GT	2016	YES
BMW	328I XDRIVE SEDAN	2011-2013	NO
BMW	328I XDRIVE SEDAN	2015-2016	YES
BMW	328I XDRIVE SPORTS WAGON	2011-2012	NO
BMW	328I XDRIVE SPORTS WAGON	2015-2017	YES
BMW	328XI	2008-2010	NO
BMW	330CI	2005	NO
BMW	330E SEDAN	2016-2017	YES
BMW	330I	2005	NO
BMW	330I, 330XI	2005	NO
BMW	335D SEDAN	2010-2011	NO
BMW	335I CONVERTIBLE	2008-2013	YES
BMW	335I COUPE	2008-2013	NO
BMW	335I SEDAN	2008-2013	NO
BMW	335I SEDAN	2015	YES
BMW	335I XDRIVE COUPE	2011-2013	NO
BMW	335I XDRIVE GT	2015-2016	YES
BMW	335I XDRIVE SEDAN	2011-2013	NO
BMW	335I XDRIVE SEDAN	2015	YES
BMW	335IS CONVERTIBLE HP	2011-2013	YES
BMW	335IS COUPE HP	2011-2013	NO
BMW	335XI	2009	NO
BMW	335XI COUPE	2008-2010	NO
BMW	335XI SEDAN	2008-2010	NO
BMW	340I SEDAN	2016	YES
BMW	340I XDRIVE SEDAN	2016	YES
BMW	4 SERIES COUPE	2017	YES
BMW	4 SERIES GRAN COUPE	2017	YES
BMW	4 SERIES XDRIVE COUPE	2017	YES
BMW	4 SERIES XDRIVE GRAN COUPE	2017	YES
BMW	428I CONVERTIBLE	2015-2016	NO
BMW	428I COUPE	2015-2016	YES
BMW	428I GRAN COUPE	2015-2016	YES
BMW	428I XDRIVE CONVERTIBLE	2015-2016	NO
BMW	428I XDRIVE COUPE	2015-2016	YES
BMW	428I XDRIVE GRAN COUPE	2015-2016	YES
BMW	435I CONVERTIBLE	2015-2016	NO
BMW	435I COUPE	2015-2016	YES
BMW	435I GRAN COUPE	2015-2016	YES

Make	Model	Year	Rollover Curtain Air Bag
BMW	435I XDRIVE CONVERTIBLE	2015-2016	NO
BMW	435I XDRIVE COUPE	2015-2016	YES
BMW	435I XDRIVE GRAN COUPE	2015-2016	YES
BMW	5 SERIES GT	2014-2017	YES
BMW	5 SERIES XDRIVE GT	2014-2017	YES
BMW	525I	2005-2010	NO
BMW	528I SEDAN	2011-2013	NO
BMW	528I SEDAN	2015-2016	YES
BMW	528I XDRIVE SEDAN	2015-2016	YES
BMW	528XI	2008-2010	NO
BMW	528XI SEDAN	2012-2013	YES
BMW	530I	2005	NO
BMW	530XI SPORT WAGON	2005	NO
BMW	535D SEDAN	2015-2016	YES
BMW	535D XDRIVE SEDAN	2015-2016	YES
BMW	535I	2008-2010	NO
BMW	535I GT	2010	NO
BMW	535I GT	2015-2016	YES
BMW	535I GT SEDAN	2011-2013	YES
BMW	535I SEDAN	2011-2013	NO
BMW	535I SEDAN	2015-2016	YES
BMW	535I XDRIVE GT	2015-2016	YES
BMW	535I XDRIVE GT SEDAN	2011-2013	YES
BMW	535I XDRIVE SEDAN	2011-2013	NO
BMW	535I XDRIVE SEDAN	2015-2016	YES
BMW	535XI	2008-2010	NO
BMW	535XI SPORTS WAGON	2008-2010	NO
BMW	545I	2005-2010	NO
BMW	550I	2008-2010	NO
BMW	550I GT	2010	NO
BMW	550I GT	2015	YES
BMW	550I GT SEDAN	2011-2013	YES
BMW	550I SEDAN	2011-2013	NO
BMW	550I SEDAN	2015-2016	YES
BMW	550I XDRIVE GT	2015-2016	YES
BMW	550I XDRIVE GT SEDAN	2011-2013	YES
BMW	550I XDRIVE SEDAN	2011-2013	NO
BMW	550I XDRIVE SEDAN	2015-2016	YES
BMW	550I XDRIVE SEDAN	2016	YES
BMW	6 SERIES CONVERTIBLE	2014	NO
BMW	6 SERIES CONVERTIBLE	2017	YES
BMW	6 SERIES COUPE	2014-2017	YES
BMW	6 SERIES GRAN COUPE	2014-2017	YES
BMW	6 SERIES XDRIVE CONVERTIBLE	2014	NO
BMW	6 SERIES XDRIVE CONVERTIBLE	2017	YES
BMW	6 SERIES XDRIVE COUPE	2014-2017	YES

Make	Model	Year	Rollover Curtain Air Bag
BMW	6 SERIES XDRIVE GRAN COUPE	2014-2017	YES
BMW	640I CONVERTIBLE	2013-2016	YES
BMW	640I COUPE	2013	NO
BMW	640I COUPE	2015-2016	YES
BMW	640I GRAN COUPE	2013-2016	YES
BMW	640I XDRIVE CONVERTIBLE	2015	NO
BMW	640I XDRIVE CONVERTIBLE	2016	YES
BMW	640I XDRIVE COUPE	2015-2016	YES
BMW	640I XDRIVE GRAN COUPE	2015-2016	YES
BMW	645CI	2005-2010	NO
BMW	650I CONVERTIBLE	2008-2010	NO
BMW	650I CONVERTIBLE	2012-2016	YES
BMW	650I COUPE	2009-2013	NO
BMW	650I COUPE	2015-2016	YES
BMW	650I GRAN COUPE	2013-2016	YES
BMW	650I XDRIVE GRAN COUPE	2013-2016	YES
BMW	650XI CONVERTIBLE	2013-2016	YES
BMW	650XI COUPE	2013	NO
BMW	650XI COUPE	2015-2016	YES
BMW	7 SERIES SEDAN	2014-2017	YES
BMW	7 SERIES XDRIVE SEDAN	2014-2017	YES
BMW	740E XDRIVE SEDAN	2017	YES
BMW	740I SEDAN	2011-2015	YES
BMW	740LD XDRIVE SEDAN	2015	YES
BMW	740LI SEDAN	2011-2015	YES
BMW	740LI SEDAN	2015	YES
BMW	740LI XDRIVE SEDAN	2015	YES
BMW	745I	2005	NO
BMW	745LI	2005	NO
BMW	750I	2008-2010	NO
BMW	750I SEDAN	2013	YES
BMW	750I SEDAN (INCL. ALPINA B7)	2011-2015	YES
BMW	750I XDRIVE SEDAN	2013	YES
BMW	750I XDRIVE SEDAN (INCL. ALPINA B7)	2011-2015	YES
BMW	750LI	2008-2010	NO
BMW	750LI SEDAN	2013	YES
BMW	750LI SEDAN (INCL. ALPINA B7)	2011-2015	YES
BMW	750LI XDRIVE SEDAN	2013	YES
BMW	750LI XDRIVE SEDAN (INCL. ALPINA B7	2011-2015	YES
BMW	750XI	2010	NO
BMW	750XLI	2010	NO
BMW	760I	2005-2010	NO
BMW	760LI	2011-2016	YES
BMW	760LI SEDAN	2013-2015	YES
BMW	ACTIVE HYBRID 5 SEDAN	2015-2016	YES
BMW	ACTIVE HYBRID 535I SEDAN	2012-2014	YES

Make	Model	Year	Rollover Curtain Air Bag
BMW	ACTIVEHYBRID 7 SEDAN	2014-2015	YES
BMW	ACTIVEHYBRID 740LI	2013	YES
BMW	ACTIVEHYBRID 750I	2011-2012	YES
BMW	ACTIVEHYBRID 750LI	2011-2012	YES
BMW	ACTIVEHYBRID X6	2011	YES
BMW	ACTIVEHYBRID3 SEDAN	2014-2015	YES
BMW	ALPINA B6 XDRIVE GRAN COUPE	2015-2017	YES
BMW	ALPINA B7 XDRIVE	2017	YES
BMW	I3	2015-2017	YES
BMW	I3 REX	2017	YES
BMW	I8	2015-2017	YES
BMW	M2 COUPE	2017	YES
BMW	M235I CONVERTIBLE	2015-2016	YES
BMW	M235I COUPE	2015-2016	YES
BMW	M235I XDRIVE CONVERTIBLE	2016	NO
BMW	M235I XDRIVE COUPE	2015-2016	YES
BMW	M3	2005-2009	NO
BMW	M3 CONVERTIBLE	2005-2009	NO
BMW	M3 CONVERTIBLE	2010-2013	YES
BMW	M3 COUPE	2008-2013	NO
BMW	M3 SEDAN	2008-2011	NO
BMW	M3 SEDAN	2015-2017	YES
BMW	M4 CONVERTIBLE	2015-2017	NO
BMW	M4 COUPE	2015-2017	YES
BMW	M5	2008-2010	NO
BMW	M5 SEDAN	2013-2016	YES
BMW	M6	2010	NO
BMW	M6 CONVERTIBLE	2008-2010	NO
BMW	M6 CONVERTIBLE	2013-2017	YES
BMW	M6 COUPE	2009-2013	NO
BMW	M6 COUPE	2014-2017	YES
BMW	M6 GRAN COUPE	2014-2017	YES
BMW	MINI CLUBMAN	2009	NO
BMW	MINI CLUBMAN S	2009	NO
BMW	MINI COOPER	2009	NO
BMW	MINI COOPER CONVERTIBLE	2009	NO
BMW	MINI COOPER S	2009	NO
BMW	MINI COOPER S CONVERTIBLE	2009	NO
BMW	X SPORT 3.0SI	2008-2009	YES
BMW	X SPORT 4.4SI	2008-2009	YES
BMW	X1	2014	YES
BMW	X1 SDRIVE	2017	YES
BMW	X1 SDRIVE28I	2013-2015	YES
BMW	X1 SDRIVE28I	2015	YES
BMW	X1 XDRIVE	2014-2017	YES
BMW	X1 XDRIVE28I	2013-2015	YES

Make	Model	Year	Rollover Curtain Air Bag
BMW	X1 XDRIVE35I	2013-2015	YES
BMW	X3	2014	YES
BMW	X3 2.5I	2005-2010	NO
BMW	X3 3.0I	2005-2010	NO
BMW	X3 3.0SI	2008-2009	NO
BMW	X3 SDRIVE	2017	YES
BMW	X3 SDRIVE28I	2015-2016	YES
BMW	X3 XDRIVE	2017	YES
BMW	X3 XDRIVE28D	2015-2016	YES
BMW	X3 XDRIVE28I	2011-2016	YES
BMW	X3 XDRIVE35I	2011-2017	YES
BMW	X4 XDRIVE	2017	YES
BMW	X4 XDRIVE28I	2015-2016	YES
BMW	X4 XDRIVE35I	2015-2016	YES
BMW	X5	2014	YES
BMW	X5 3.0I	2005	NO
BMW	X5 3.0I	2008-2009	YES
BMW	X5 3.0SD	2010	YES
BMW	X5 3.0SI	2010	YES
BMW	X5 4.4I	2005	NO
BMW	X5 4.8I	2008-2009	YES
BMW	X5 4.8I	2010	YES
BMW	X5 4.8IS	2005	NO
BMW	X5 M	2010-2017	YES
BMW	X5 SDRIVE	2017	YES
BMW	X5 SDRIVE35I	2015-2016	YES
BMW	X5 XDRIVE	2014-2017	YES
BMW	X5 XDRIVE35D	2011-2016	YES
BMW	X5 XDRIVE35I	2013	YES
BMW	X5 XDRIVE35I	2015-2016	YES
BMW	X5 XDRIVE35I (INCL. PREMIUM, SPORT	2011-2012	YES
BMW	X5 XDRIVE40E	2016-2017	YES
BMW	X5 XDRIVE50I	2011-2016	YES
BMW	X6	2014	YES
BMW	X6 3.5I	2010	YES
BMW	X6 5.0I	2010	YES
BMW	X6 5.0IH	2010	NO
BMW	X6 M	2010-2017	YES
BMW	X6 SDRIVE	2017	YES
BMW	X6 SDRIVE35I	2016	YES
BMW	X6 XDRIVE	2017	YES
BMW	X6 XDRIVE35I	2011-2016	YES
BMW	X6 XDRIVE50I	2011-2016	YES
BMW	Z4	2014	NO
BMW	Z4 COUPE 3.0SI	2008-2009	NO
BMW	Z4 M-COUPE	2008-2009	NO

Make	Model	Year	Rollover Curtain Air Bag
BMW	Z4 M-ROADSTER	2008-2009	NO
BMW	Z4 ROADSTER 2.5I	2005	NO
BMW	Z4 ROADSTER 3.0I	2005-2009	NO
BMW	Z4 ROADSTER 3.0SI	2008-2009	NO
BMW	Z4 ROADSTER S30I	2010	NO
BMW	Z4 ROADSTER S35I	2010	NO
BMW	Z4 SDRIVE28I	2012-2016	YES
BMW	Z4 SDRIVE30I	2011-2016	YES
BMW	Z4 SDRIVE35IS	2011-2016	YES
BUICK	CASCADA	2016-2017	YES
BUICK	CENTURY	2005	NO
BUICK	ENCLAVE	2008-2017	YES
BUICK	ENCORE	2013-2017	YES
BUICK	ENVISION	2015-2017	YES
BUICK	LACROSSE	2005-2009	NO
BUICK	LACROSSE	2010-2017	YES
BUICK	LESABRE	2005	NO
BUICK	LUCERNE	2008-2011	NO
BUICK	PARK AVE	2005	NO
BUICK	RAINIER	2005	NO
BUICK	REGAL	2011-2017	YES
BUICK	RENDEZVOUS	2005	NO
BUICK	TERRAZA	2005	NO
BUICK	VERANO	2012-2017	YES
CADILLAC	ATS	2013-2017	YES
CADILLAC	CT6	2016-2017	YES
CADILLAC	CTS	2005-2009	NO
CADILLAC	CTS	2010-2017	YES
CADILLAC	DEVILLE	2005	NO
CADILLAC	DTS	2008-2011	NO
CADILLAC	ELR	2014-2016	YES
CADILLAC	ESCALADE	2005	NO
CADILLAC	ESCALADE	2008-2017	YES
CADILLAC	ESV	2005	NO
CADILLAC	SRX	2005-2009	NO
CADILLAC	SRX	2010-2016	YES
CADILLAC	STS	2005-2011	NO
CADILLAC	XLR	2005-2009	NO
CADILLAC	XT5	2016-2017	YES
CADILLAC	XTS	2013-2017	YES
CHEVROLET	2013 MY MALIBU	2012	YES
CHEVROLET	ASTRO CARGO	2005	NO
CHEVROLET	ASTRO PASSENGER	2005	NO
CHEVROLET	AVALANCHE	2005	NO
CHEVROLET	AVALANCHE	2008-2013	YES
CHEVROLET	AVEO	2005	NO

Make	Model	Year	Rollover Curtain Air Bag
CHEVROLET	AVEO	2008-2011	NO
CHEVROLET	BLAZER	2005	NO
CHEVROLET	BOLT	2017	YES
CHEVROLET	CAMARO	2009-2013	NO
CHEVROLET	CAMARO	2014-2017	YES
CHEVROLET	CAPRICE PPV POLICE VEHICLE	2013-2017	YES
CHEVROLET	CAPTIVA	2011-2015	YES
CHEVROLET	CAVALIER	2005	NO
CHEVROLET	CHEVROLET CAPRICE PPV POLICE VEHICL	2011	NO
CHEVROLET	CHEVROLET CAPRICE PPV POLICE VEHICL	2012	YES
CHEVROLET	CITY EXPRESS	2016	YES
CHEVROLET	CITY EXPRESS CARGO VAN	2015-2017	NO
CHEVROLET	CLASSIC	2005	NO
CHEVROLET	COBALT	2005-2010	NO
CHEVROLET	COLORADO	2005-2012	NO
CHEVROLET	COLORADO	2015-2017	YES
CHEVROLET	CORVETTE	2005	NO
CHEVROLET	CORVETTE	2005-2014	NO
CHEVROLET	CORVETTE	2015-2017	YES
CHEVROLET	CRUZE	2011-2017	YES
CHEVROLET	EQUINOX	2005	NO
CHEVROLET	EQUINOX	2008-2017	YES
CHEVROLET	EXPRESS CARGO	2005	NO
CHEVROLET	EXPRESS CARGO G13405	2008-2017	YES
CHEVROLET	EXPRESS PASSENGER	2005	NO
CHEVROLET	EXPRESS PASSENGER G13406	2008-2017	YES
CHEVROLET	HHR	2008	NO
CHEVROLET	HHR	2009-2011	YES
CHEVROLET	IMPALA	2005-2012	NO
CHEVROLET	IMPALA	2013-2016	YES
CHEVROLET	MALIBU	2005-2012	NO
CHEVROLET	MALIBU	2013-2017	YES
CHEVROLET	MONTE CARLO	2005	NO
CHEVROLET	SILVERADO	2005	NO
CHEVROLET	SILVERADO 1500 SERIES	2008-2017	YES
CHEVROLET	SILVERADO 1500 SERIES HYBRID	2009-2017	YES
CHEVROLET	SILVERADO 2500 SERIES	2008-2010	NO
CHEVROLET	SILVERADO 2500 SERIES	2011-2017	YES
CHEVROLET	SILVERADO 3500 SERIES	2008-2011	NO
CHEVROLET	SILVERADO 3500 SERIES	2012-2017	YES
CHEVROLET	SONIC	2012-2017	YES
CHEVROLET	SPARK	2013-2017	YES
CHEVROLET	SS	2014-2017	YES
CHEVROLET	SSR	2005	NO
CHEVROLET	SUBURBAN	2005	NO
CHEVROLET	SUBURBAN 1500 SERIES	2008-2017	YES

Make	Model	Year	Rollover Curtain Air Bag
CHEVROLET	SUBURBAN 2500 SERIES	2008-2013	YES
CHEVROLET	TAHOE	2005	NO
CHEVROLET	TAHOE	2008-2017	YES
CHEVROLET	TAHOE HYBRID	2008-2013	YES
CHEVROLET	TRAILBLAZER	2005	NO
CHEVROLET	TRAILBLAZER	2008-2009	YES
CHEVROLET	TRAILBLAZER EXT	2005	NO
CHEVROLET	TRAVERSE	2009-2017	YES
CHEVROLET	TRAX	2015-2017	YES
CHEVROLET	UPLANDER	2005-2008	NO
CHEVROLET	VENTURE	2005	NO
CHEVROLET	VOLT	2011-2017	YES
CHRYLSER	PACIFICA	2017	YES
CHRYSLER	200	2011-2014	NO
CHRYSLER	200	2015-2017	YES
CHRYSLER	300	2005-2014	NO
CHRYSLER	300	2016-2017	YES
CHRYSLER	200 CONVERTIBLE	2012-2014	NO
CHRYSLER	ASPEN	2008-2009	YES
CHRYSLER	CROSSFIRE	2005	NO
CHRYSLER	CROSSFIRE COUPE	2008	NO
CHRYSLER	CROSSFIRE ROADSTER	2005-2008	NO
CHRYSLER	PACIFICA	2005-2008	NO
CHRYSLER	PACIFICA HYBRID	2017	YES
CHRYSLER	PT CRUISER	2005-2009	NO
CHRYSLER	PT CRUISER CONVERTIBLE	2005-2008	NO
CHRYSLER	SEBRING	2005-2010	NO
CHRYSLER	SEBRING CONVERTIBLE	2008-2010	NO
CHRYSLER	TOWN & COUNTRY	2008-2016	YES
CHRYSLER	TOWN & COUNTRY	2005	NO
CODA	CODA	2013	YES
DODGE	AVENGER	2008-2014	NO
DODGE	C/V CARGO VAN-LWB	2005	NO
DODGE	CALIBER	2008-2012	NO
DODGE	CARAVAN	2005	NO
DODGE	CARGO VAN	2011-2012	YES
DODGE	CHALLENGER	2009-2014	NO
DODGE	CHALLENGER	2015-2017	YES
DODGE	CHALLENGER AWD	2017	YES
DODGE	CHALLENGER SRT	2016-2017	YES
DODGE	CHARGER	2008-2014	NO
DODGE	CHARGER	2016-2017	YES
DODGE	CHARGER POLICE PACKAGE	2012	NO
DODGE	CHARGER PURSUIT	2013-2017	YES
DODGE	CHARGER SRT	2016-2017	YES
DODGE	DAKOTA CLUB CAB	2005	NO

Make	Model	Year	Rollover Curtain Air Bag
DODGE	DAKOTA CREW	2009-2011	NO
DODGE	DAKOTA EXTENDED	2009-2011	NO
DODGE	DAKOTA QUAD CAB	2005	NO
DODGE	DART	2013-2016	NO
DODGE	DURANGO	2005	NO
DODGE	DURANGO	2008-2017	YES
DODGE	GRAND CARAVAN	2005	NO
DODGE	GRAND CARAVAN	2008-2017	YES
DODGE	JOURNEY	2009	NO
DODGE	JOURNEY	2010-2017	YES
DODGE	MAGNUM	2005-2008	NO
DODGE	NEON	2005	NO
DODGE	NITRO	2008-2011	YES
DODGE	RAM 1500	2008-2010	NO
DODGE	RAM 1500 CREW	2009-2010	NO
DODGE	RAM 1500 MEGA	2008	NO
DODGE	RAM 1500 QUAD	2009-2010	NO
DODGE	RAM 1500 QUAD CAB	2005	NO
DODGE	RAM 1500 REG. CAB	2005	NO
DODGE	RAM 2500	2008-2010	NO
DODGE	RAM 2500 REG. CAB	2005	NO
DODGE	RAM 2500 CREW	2010	NO
DODGE	RAM 2500 MEGA	2009-2010	NO
DODGE	RAM 2500 QUAD	2009	NO
DODGE	RAM 2500 QUAD CAB	2005	NO
DODGE	RAM 3500 REG. CAB	2005	NO
DODGE	SPRINTER-2500	2008	NO
DODGE	SPRINTER-3500	2008	NO
DODGE	STRATUS	2005	NO
DODGE	VIPER	2016-2017	NO
DODGE	VIPER SRT-10	2005	NO
DODGE	VIPER SRT10 COUPE	2008-2010	NO
DODGE	VIPER SRT10 ROADSTER	2008-2010	NO
FIAT	500	2011-2015	NO
FIAT	124 SPIDER	2017	NO
FIAT	500 3 DR HB	2016	NO
FIAT	500 ABARTH	2014-2016	NO
FIAT	500 ABARTH CABRIO	2015	NO
FIAT	500 ABARTH CABRIO FF 27	2016	NO
FIAT	500 BEV	2016	NO
FIAT	500 CABRIO	2012-2016	NO
FIAT	500C	2013-2015	NO
FIAT	500E	2014-2015	NO
FIAT	500L	2014	NO
FIAT	500L	2016	YES
FIAT	500X	2016	YES

Make	Model	Year	Rollover Curtain Air Bag
FIAT	ABARTH	2013	NO
FIAT	FIAT 500	2017	NO
FIAT	FIAT 500 ABARTH	2017	NO
FIAT	FIAT 500 ABARTH CABRIO	2017	NO
FIAT	FIAT 500 CABRIO	2017	NO
FIAT	FIAT 500E BEV	2017	NO
FIAT	FIAT 500L	2017	YES
FIAT	FIAT 500X	2017	YES
FIAT	500L	2015	YES
FORD	500	2005	YES
FORD	CMAX ENERGI	2013-2017	YES
FORD	CMAX HEV	2013-2017	YES
FORD	CROWN VICTORIA	2005-2011	NO
FORD	E-150 VAN	2008-2014	NO
FORD	E-150 WAGON	2009-2014	NO
FORD	E-350	2009-2014	NO
FORD	E-350/E-250	2008-2014	NO
FORD	ECONOLINE	2005	NO
FORD	EDGE	2008-2017	YES
FORD	ESCAPE	2012	YES
FORD	ESCAPE HEV	2008-2012	YES
FORD	ESCAPE HYBRID	2005	YES
FORD	EXCURSION	2005	NO
FORD	EXPEDITION	2005-2017	YES
FORD	EXPLORER	2005-2017	YES
FORD	F-150	2009-2017	YES
FORD	F-150	2005-2008	NO
FORD	F-250	2005-2010	NO
FORD	F-250	2011-2017	YES
FORD	F-350	2008-2010	NO
FORD	F-350	2011-2017	YES
FORD	FIESTA	2011-2016	NO
FORD	FIESTA	2017	YES
FORD	FLEX	2009-2017	YES
FORD	FOCUS	2005-2014	NO
FORD	FOCUS	2015-2017	YES
FORD	FREESTAR	2005	YES
FORD	FREESTYLE	2005	YES
FORD	FUSION	2008-2015	NO
FORD	FUSION	2016-2017	YES
FORD	FUSION ENERGI	2013-2015	NO
FORD	FUSION ENERGI	2016-2017	YES
FORD	FUSION HEV	2010-2015	NO
FORD	FUSION HEV	2016-2017	YES
FORD	GT	2005	NO
FORD	GT- NEW	2017	NO

Make	Model	Year	Rollover Curtain Air Bag
FORD	MKC	2016	YES
FORD	MUSTANG	2005-2014	NO
FORD	MUSTANG	2015-2017	YES
FORD	RANGER	2005-2011	NO
FORD	TAURUS	2005	NO
FORD	TAURUS	2008-2017	YES
FORD	THUNDERBIRD	2005	NO
FORD	TRANSIT	2015-2017	YES
FORD	TRANSIT CONNECT	2010-2013	NO
FORD	TRANSIT CONNECT	2014-2017	YES
FREIGHTLINER	SPRINTER 2500	2011-2015	NO
FREIGHTLINER	SPRINTER 2500 CARGO VAN	2011-2015	NO
FREIGHTLINER	SPRINTER 2500 PASSENGER VAN	2011-2015	NO
FREIGHTLINER	SPRINTER 3500 CAB CHASSIS	2011-2015	NO
FREIGHTLINER	SPRINTER 3500 CARGO VAN	2011-2015	NO
GENESIS	G80 IS A REBADGED HYUNDAI GENESIS	2017	YES
GENESIS	G90	2017	YES
GLE550E	GLE-CLASS HYBRID	2017	YES
GMC	ACADIA	2008-2017	YES
GMC	CANYON	2005-2012	NO
GMC	CANYON	2015-2017	YES
GMC	ENVOY	2005	NO
GMC	ENVOY DENALI	2005	NO
GMC	ENVOY XL	2005	NO
GMC	ENVOY XL DENALI	2005	NO
GMC	ENVOY XUV	2005	NO
GMC	ENVOY/ENVOY DENALI	2008-2009	YES
GMC	SAFARI CARGO	2005	NO
GMC	SAFARI PASSENGER	2005	NO
GMC	SAVANA CARGO G13405	2008-2014	YES
GMC	SAVANA CARGO G23405	2008-2017	YES
GMC	SAVANA CARGO G23705	2010-2017	YES
GMC	SAVANA CARGO G33405	2008-2017	YES
GMC	SAVANA CARGO G33705	2010-2017	YES
GMC	SAVANA CARGO H13405	2008-2014	YES
GMC	SAVANA PASSENGER	2005	NO
GMC	SAVANA PASSENGER G13406	2008-2014	YES
GMC	SAVANA PASSENGER G23406	2010-2017	YES
GMC	SAVANA PASSENGER G33406	2008-2017	YES
GMC	SAVANA PASSENGER G33706	2010-2017	YES
GMC	SAVANA PASSENGER H13406	2008-2014	YES
GMC	SIERRA	2005	NO
GMC	SIERRA 1500 SERIES	2008-2017	YES
GMC	SIERRA 1500 SERIES HYBRID	2009-2017	YES
GMC	SIERRA 2500 SERIES	2008-2010	NO
GMC	SIERRA 2500 SERIES	2011-2017	YES

Make	Model	Year	Rollover Curtain Air Bag
GMC	SIERRA 2500 SERIES	2011-2017	YES
GMC	SIERRA 3500 SERIES	2008-2011	NO
GMC	TERRAIN	2010-2017	YES
GMC	YUKON	2005	NO
GMC	YUKON DENALI	2005	NO
GMC	YUKON DENALI	2013-2016	YES
GMC	YUKON HYBRID	2008-2012	YES
GMC	YUKON XL	2005	NO
GMC	YUKON XL & YUKON DENALI XL 1500 SE	2008-2017	YES
GMC	YUKON XL & YUKON DENALI XL 2500 SE	2008-2013	YES
GMC	YUKON, YUKON DENALI	2008-2017	YES
HONDA	ACCORD	2005-2009	NO
HONDA	ACCORD	2015-2017	YES
HONDA	ACCORD COUPE	2008-2013	NO
HONDA	ACCORD COUPE	2014-2017	YES
HONDA	ACCORD COUPE V6	2008-2012	NO
HONDA	ACCORD CROSSOVER	2010	NO
HONDA	ACCORD CROSSTOUR	2011	YES
HONDA	ACCORD HYBRID	2005	NO
HONDA	ACCORD HYBRID	2014-2017	YES
HONDA	ACCORD PHEV	2013	NO
HONDA	ACCORD PLUG IN HYBRID	2014-2015	YES
HONDA	ACCORD SEDAN	2008-2013	NO
HONDA	ACCORD SEDAN	2014-2017	YES
HONDA	ACCORD SEDAN V6	2008-2012	NO
HONDA	ACCORD V6	2005	NO
HONDA	CIVIC	2005-2014	NO
HONDA	CIVIC	2015-2017	YES
HONDA	CIVIC CNG	2008-2014	NO
HONDA	CIVIC CNG	2015	YES
HONDA	CIVIC COUPE	2008-2014	NO
HONDA	CIVIC COUPE	2015-2017	YES
HONDA	CIVIC HATCH TYPE R	2017	YES
HONDA	CIVIC HATCHBACK	2005-2014	NO
HONDA	CIVIC HYBRID	2015	YES
HONDA	CIVIC IMA	2008-2012	NO
HONDA	CIVIC SEDAN	2008-2014	NO
HONDA	CIVIC SEDAN	2015-2017	YES
HONDA	CIVIC SI	2017	YES
HONDA	CLARITY ELECTRIC	2017	YES
HONDA	CLARITY FUEL CELL	2017	YES
HONDA	CROSSTOUR	2012-2015	YES
HONDA	CR-V	2005	NO
HONDA	CR-Z	2011-2016	NO
HONDA	ELEMENT	2005	NO
HONDA	ELEMENT	2008-2011	YES

Make	Model	Year	Rollover Curtain Air Bag
HONDA	FCX	2005-2014	NO
HONDA	FIT	2008-2013	NO
HONDA	FIT	2015-2017	YES
HONDA	FIT EV	2013-2014	NO
HONDA	HR-V	2015-2017	YES
HONDA	INSIGHT	2005-2014	NO
HONDA	ODYSSEY	2005	NO
HONDA	ODYSSEY	2008-2017	YES
HONDA	PILOT	2005	NO
HONDA	PILOT	2008-2017	YES
HONDA	RIDGELINE	2008-2017	YES
HONDA	S2000	2005-2009	NO
HUMMER	H2	2005	NO
HUMMER	H2	2008-2010	YES
HUMMER	H3	2005	NO
HUMMER	H3	2008-2010	YES
HYUNDAI	ACCENT	2005-2014	NO
HYUNDAI	ACCENT	2015-2017	YES
HYUNDAI	ACCENT 5	2013-2014	NO
HYUNDAI	ACCENT 5	2015-2017	YES
HYUNDAI	ACCENT 5DR (RB)	2012	NO
HYUNDAI	AZERA	2008-2014	NO
HYUNDAI	AZERA	2015-2017	YES
HYUNDAI	ELANTRA	2005-2015	NO
HYUNDAI	ELANTRA	2016-2017	YES
HYUNDAI	ENTOURAGE	2008-2010	NO
HYUNDAI	EQUUS	2013-2015	NO
HYUNDAI	GENESIS	2009-2014	NO
HYUNDAI	GENESIS	2015-2016	YES
HYUNDAI	GENESIS COUPE	2010-2016	NO
HYUNDAI	IONIQ ELECTRIC	2017	YES
HYUNDAI	IONIQ HYBRID	2017	YES
HYUNDAI	KOREA	2008	NO
HYUNDAI	SANTA FE	2005-2010	NO
HYUNDAI	SANTA FE	2013-2017	YES
HYUNDAI	SANTA FE SPORT	2013-2017	YES
HYUNDAI	SONATA	2005-2014	NO
HYUNDAI	SONATA	2015-2017	YES
HYUNDAI	SONATA HYBRID	2013-2015	NO
HYUNDAI	SONATA HYBRID	2015-2017	YES
HYUNDAI	SONATA PLUG-IN HYBRID	2016-2017	YES
HYUNDAI	TIBURON	2005-2008	NO
HYUNDAI	TUCSON	2005-2010	NO
HYUNDAI	TUCSON	2013-2017	YES
HYUNDAI	TUCSON FUEL CELL	2015-2017	YES
HYUNDAI	VELOSTER	2013-2015	NO

Make	Model	Year	Rollover Curtain Air Bag
HYUNDAI	VELOSTER	2015-2017	YES
HYUNDAI	VERACRUZ	2008-2010	NO
HYUNDAI	XG 350	2005	NO
INFINITI	EX35	2008-2013	NO
INFINITI	EX37	2013	NO
INFINITI	FX45	2008	YES
INFINITI	FX50	2009-2012	YES
INFINITI	G35 COUPE	2005	NO
INFINITI	G35 HEV	2013	NO
INFINITI	G35 SEDAN	2005-2008	NO
INFINITI	G37	2013	NO
INFINITI	G37 CONVERTIBLE	2009-2010	NO
INFINITI	G37 CONVERTIBLE	2011-2013	YES
INFINITI	G37 COUPE	2008-2013	NO
INFINITI	G37 SEDAN	2009-2011	NO
INFINITI	JX	2013	YES
INFINITI	M35 HEV	2012-2013	NO
INFINITI	M35, M45	2008-2010	NO
INFINITI	M37, M56	2011-2013	NO
INFINITI	Q30	2016	YES
INFINITI	Q40	2015	NO
INFINITI	Q45	2005	NO
INFINITI	Q50	2014-2016	NO
INFINITI	Q50	2017	YES
INFINITI	Q50 HEV	2015	NO
INFINITI	Q50 HYBRID	2014	NO
INFINITI	Q50 HYBRID	2017	YES
INFINITI	Q60 CNV (FORMERLY G CONV.)	2015	YES
INFINITI	Q60 CONVERTIBLE	2014	YES
INFINITI	Q60 COUPE	2014	NO
INFINITI	Q60 COUPE	2017	YES
INFINITI	Q60 CPE (FORMERLY G COUPE)	2015	NO
INFINITI	Q70	2014-2016	NO
INFINITI	Q70	2017	YES
INFINITI	Q70 HYBRID	2014	NO
INFINITI	Q70 HYBRID	2017	YES
INFINITI	Q70L	2016	NO
INFINITI	QX30	2016-2017	YES
INFINITI	QX50	2014-2017	NO
INFINITI	QX56	2005	NO
INFINITI	QX56	2008-2013	YES
INFINITI	QX60	2014-2017	YES
INFINITI	QX70	2014-2017	YES
INFINITI	QX80	2014-2017	YES
ISUZU	ASCENDER	2005	NO
ISUZU	ASCENDER	2008	YES

Make	Model	Year	Rollover Curtain Air Bag
ISUZU	I290	2008	NO
ISUZU	I-370	2008	NO
JAGUAR	F-PACE	2017	YES
JAGUAR	F-TYPE CONVERTIBLE	2014-2017	NO
JAGUAR	F-TYPE COUPE	2014-2016	YES
JAGUAR	S-TYPE	2005-2008	NO
JAGUAR	XE	2017	YES
JAGUAR	XF	2008-2015	NO
JAGUAR	XF	2016-2017	YES
JAGUAR	XJ	2005-2016	NO
JAGUAR	XK	2013	NO
JAGUAR	XK CONVERTIBLE	2008-2015	NO
JAGUAR	XK COUPE	2008-2015	NO
JAGUAR	XK8 CONVERTIBLE	2005	NO
JAGUAR	XK8 COUPE	2005	NO
JAGUAR	XKR CONVERTIBLE	2005	NO
JAGUAR	XKR COUPE	2005	NO
JAGUAR	X-TYPE	2005-2008	NO
JEEP	CHEROKEE	2014-2017	YES
JEEP	COMMANDER	2008-2010	YES
JEEP	COMPASS	2008-2017	YES
JEEP	GRAND CHEROKEE	2008-2017	YES
JEEP	GRAND CHEROKEE SRT	2017	YES
JEEP	LIBERTY	2008-2012	YES
JEEP	PATRIOT	2008-2017	YES
JEEP	RENEGADE	2016-2017	YES
JEEP	WRANGLER	2008-2017	NO
JEEP	WRANGLER UNLIMITED	2008-2017	NO
KIA	AMANTI	2005-2009	NO
KIA	BORREGO	2009-2010	YES
KIA	CADENZA	2014-2016	NO
KIA	CADENZA	2017	YES
KIA	FORTE	2010-2015	NO
KIA	FORTE	2016-2017	YES
KIA	K900	2015-2017	YES
KIA	NIRO	2017	YES
KIA	OPTIMA	2005-2015	NO
KIA	OPTIMA	2016-2017	YES
KIA	OPTIMA HYBRID	2013-2015	NO
KIA	QUORIS	2014	YES
KIA	RIO	2005-2017	NO
KIA	RONDO	2008-2010	NO
KIA	SEDONA	2005-2014	NO
KIA	SEDONA	2015-2017	YES
KIA	SORENTO	2005-2009	NO
KIA	SORENTO	2010-2017	YES

Make	Model	Year	Rollover Curtain Air Bag
KIA	SOUL	2009-2013	NO
KIA	SOUL	2014-2017	YES
KIA	SPECTRA	2005-2009	NO
KIA	SPORTAGE	2012-2017	YES
KIA	SPORTAGE (KM)	2008-2009	NO
KIA	UMA	2015	YES
KIA	VG	2013	NO
KIA	YD	2013-2014	NO
KIA	YP	2015	YES
LAND ROVER	DISCOVERY	2017	YES
LAND ROVER	DISCOVERY SPORT	2017	YES
LAND ROVER	FREELANDER	2005	NO
LAND ROVER	LR2	2008-2014	YES
LAND ROVER	LR3	2005	NO
LAND ROVER	LR3 (5 SEAT)	2008-2009	YES
LAND ROVER	LR4	2010-2014	YES
LAND ROVER	RANGE ROVER	2005-2009	NO
LAND ROVER	RANGE ROVER	2010-2017	YES
LEXUS	CT 200H	2011-2017	NO
LEXUS	ES 300H	2015	NO
LEXUS	ES 300H	2016-2017	YES
LEXUS	ES 350	2015	NO
LEXUS	ES 350	2016-2017	YES
LEXUS	ES300H	2013-2014	NO
LEXUS	ES330	2005-2014	NO
LEXUS	GS 350	2016-2017	YES
LEXUS	GS 450H	2015	NO
LEXUS	GS 450H	2016-2017	YES
LEXUS	GS F	2016-2017	YES
LEXUS	GS300/430	2005	NO
LEXUS	GS350	2013-2014	NO
LEXUS	GS350/460	2008-2011	NO
LEXUS	GS450H	2008-2014	NO
LEXUS	GX 460	2010-2017	YES
LEXUS	GX470	2005	NO
LEXUS	GX470	2008-2009	YES
LEXUS	HS250H	2010-2012	NO
LEXUS	IS F	2008-2014	NO
LEXUS	IS250/350	2008-2014	NO
LEXUS	IS250C/350C	2010-2014	NO
LEXUS	IS300	2005	NO
LEXUS	IS300 SPORTCROSS	2005	NO
LEXUS	LFA	2012	NO
LEXUS	LS 460	2015-2017	NO
LEXUS	LS 460 L	2015-2017	NO
LEXUS	LS 600H L	2015-2016	NO

Make	Model	Year	Rollover Curtain Air Bag
LEXUS	LS430	2005	NO
LEXUS	LS460	2008-2014	NO
LEXUS	LS600HL	2008-2014	NO
LEXUS	LX 570	2015-2017	YES
LEXUS	LX470	2005	NO
LEXUS	LX570	2008-2014	YES
LEXUS	NX 200T	2015-2017	YES
LEXUS	NX 300H	2015-2017	YES
LEXUS	RC 200T / 300 / 350	2016	NO
LEXUS	RC 200T / 300 / 350	2017	YES
LEXUS	RC F	2015-2016	NO
LEXUS	RC F	2017	YES
LEXUS	RX 350	2015-2017	YES
LEXUS	RX 450H	2015-2017	YES
LEXUS	RX330	2005	NO
LEXUS	RX350	2008-2014	YES
LEXUS	RX400H	2005	NO
LEXUS	RX400H	2008	YES
LEXUS	RX450H	2010-2014	YES
LEXUS	SC430	2005-2010	NO
LINCOLN	AVIATOR	2005	YES
LINCOLN	CONTINENTAL	2017	YES
LINCOLN	LINCOLN LS	2005	NO
LINCOLN	MARK LT	2008	NO
LINCOLN	MKC	2014-2017	YES
LINCOLN	MKS	2009-207	YES
LINCOLN	MKT	2010-2017	YES
LINCOLN	MKX	2008-2017	YES
LINCOLN	MKZ	2008-2017	NO
LINCOLN	MKZ HEV	2011-2015	NO
LINCOLN	MKZ HEV	2016-2017	YES
LINCOLN	NAVIGATOR	2005-2017	YES
LINCOLN	NAVIGATOR EL	2015-2017	YES
LINCOLN	NAVIGATOR EXTENDED	2010	YES
LINCOLN	TOWN TRUCK	2005	NO
MASERATI	GHIBLI	2015-2016	NO
MASERATI	GHIBLI	2017	YES
MASERATI	GRAN TURISMO	2015-2017	NO
MASERATI	LEVANTE	2017	YES
MASERATI	QUATTROPORTE	2015-2016	NO
MASERATI	QUATTROPORTE	2017	YES
MAYBACH	MAYBACH	2008-2012	YES
MAZDA	B-SERIES	2005-2011	NO
MAZDA	CX-3	2016-2017	YES
MAZDA	CX-5	2013-2017	YES
MAZDA	CX-7	2008-2012	YES

Make	Model	Year	Rollover Curtain Air Bag
MAZDA	CX-9	2008-2017	YES
MAZDA	MAZDA 2	2011-214	NO
MAZDA	MAZDA2	2016-2017	YES
MAZDA	MAZDA3	2005-2013	NO
MAZDA	MAZDA3	2014-2017	YES
MAZDA	MAZDA5	2008-2015	NO
MAZDA	MAZDA6	2005-2015	NO
MAZDA	MAZDA6	2016-2017	YES
MAZDA	MPV	2005	NO
MAZDA	MX-5	2008-2017	NO
MAZDA	RX-8	2005-2011	NO
MAZDA	TRIBUTE	2005-2011	YES
MAZDA	TRIBUTE HEV	2010-2011	YES
MAZDA	TRIBUTE HYBRID	2009	NO
MERCEDES-BENZ	AMG GT S	2016-2017	NO
MERCEDES-BENZ	B-CLASS FUEL CELL	2011-2016	NO
MERCEDES-BENZ	C230K SPORT COUPE	2005	NO
MERCEDES-BENZ	C240 LUXURY SEDAN	2005	NO
MERCEDES-BENZ	C240 LUXURY WAGON	2005	NO
MERCEDES-BENZ	C300	2008-2009	NO
MERCEDES-BENZ	C300 4MATIC	2008	NO
MERCEDES-BENZ	C320 LUXURY SEDAN	2005	NO
MERCEDES-BENZ	C320 SPORT COUPE	2005	NO
MERCEDES-BENZ	C320 SPORT SEDAN	2005	NO
MERCEDES-BENZ	C350	2008-2009	NO
MERCEDES-BENZ	C350E	2017	YES
MERCEDES-BENZ	C55 AMG	2005	NO
MERCEDES-BENZ	C63 AMG	2009	NO
MERCEDES-BENZ	C-CLASS	2010-2013	NO
MERCEDES-BENZ	C-CLASS	2016-2017	YES
MERCEDES-BENZ	C-CLASS COUPE	2013-2017	NO
MERCEDES-BENZ	C-CLASS SEDAN	2014	NO
MERCEDES-BENZ	CL500	2005	NO
MERCEDES-BENZ	CL550	2008-2009	YES
MERCEDES-BENZ	CL600	2005	NO
MERCEDES-BENZ	CL600	2008	YES
MERCEDES-BENZ	CL600 BI-T	2009	YES
MERCEDES-BENZ	CL63 AMG	2008-2009	YES
MERCEDES-BENZ	CL65 AMG	2005	NO
MERCEDES-BENZ	CL65 AMG	2008-2009	YES
MERCEDES-BENZ	CLA-CLASS	2015-2017	YES
MERCEDES-BENZ	CL-CLASS	2010-2017	YES
MERCEDES-BENZ	CLK320	2005	NO
MERCEDES-BENZ	CLK320A	2005	NO
MERCEDES-BENZ	CLK350	2008-2009	NO
MERCEDES-BENZ	CLK500	2005	NO

Make	Model	Year	Rollover Curtain Air Bag
MERCEDES-BENZ	CLK500A	2005	NO
MERCEDES-BENZ	CLK550	2008-2009	YES
MERCEDES-BENZ	CLK55A AMG	2005	NO
MERCEDES-BENZ	CLK63 AMG	2008-2009	YES
MERCEDES-BENZ	CLS500	2005	NO
MERCEDES-BENZ	CLS55 AMG	2005	NO
MERCEDES-BENZ	CLS550	2008-2009	YES
MERCEDES-BENZ	CLS63 AMG	2008-2009	YES
MERCEDES-BENZ	CLS-CLASS	2010-2017	YES
MERCEDES-BENZ	E320	2005	NO
MERCEDES-BENZ	E320 BLUETEC	2008-2009	YES
MERCEDES-BENZ	E320-4MATIC	2005	NO
MERCEDES-BENZ	E350	2008-2009	YES
MERCEDES-BENZ	E350	2009	YES
MERCEDES-BENZ	E500	2005	NO
MERCEDES-BENZ	E55 AMG	2005	NO
MERCEDES-BENZ	E550	2009	YES
MERCEDES-BENZ	E550 4MATIC	2008-2009	YES
MERCEDES-BENZ	E63 AMG	2008-2009	YES
MERCEDES-BENZ	E-CLASS	2017	YES
MERCEDES-BENZ	E-CLASS CABRIO	2016	NO
MERCEDES-BENZ	E-CLASS CABRIOLET	2011	NO
MERCEDES-BENZ	E-CLASS CABRIOLET	2012-2013	YES
MERCEDES-BENZ	E-CLASS COUPE	2010-2017	NO
MERCEDES-BENZ	E-CLASS SEDAN	2010-2016	YES
MERCEDES-BENZ	E-CLASS STATION WAGON	2017	YES
MERCEDES-BENZ	E-CLASS WAGON	2013-2016	YES
MERCEDES-BENZ	G500	2005-2008	NO
MERCEDES-BENZ	G55 AMG	2008-2009	NO
MERCEDES-BENZ	G-CLASS	2010-2017	NO
MERCEDES-BENZ	GL320 BLUETEC	2009	YES
MERCEDES-BENZ	GL320 CDI	2008	YES
MERCEDES-BENZ	GL450 4MATIC	2008-2009	YES
MERCEDES-BENZ	GLA-CLASS	2015-2017	YES
MERCEDES-BENZ	GL-CLASS	2010-2016	YES
MERCEDES-BENZ	GLE-CLASS	2017	YES
MERCEDES-BENZ	GLE-CLASS COUPE	2016-2017	YES
MERCEDES-BENZ	GLK-CLASS	2010-2013	YES
MERCEDES-BENZ	GLS-CLASS	2017	YES
MERCEDES-BENZ	MAYBACH 57	2005	NO
MERCEDES-BENZ	MAYBACH 62	2005	NO
MERCEDES-BENZ	ML320 BLUETEC 4MATIC	2009	YES
MERCEDES-BENZ	ML320 CDI 4MATIC	2008	YES
MERCEDES-BENZ	ML350	2005	NO
MERCEDES-BENZ	ML350	2009	YES
MERCEDES-BENZ	ML350 4MATIC	2008-2009	YES

Make	Model	Year	Rollover Curtain Air Bag
MERCEDES-BENZ	ML500	2005	NO
MERCEDES-BENZ	ML550 4MATIC	2008-2009	YES
MERCEDES-BENZ	ML63 AMG	2008-2009	YES
MERCEDES-BENZ	ML-CLASS	2010-2013	YES
MERCEDES-BENZ	R320 BLUETEC 4MATIC	2009	YES
MERCEDES-BENZ	R320 CDI 4MATIC	2008	YES
MERCEDES-BENZ	R350	2008	YES
MERCEDES-BENZ	R350 4MATIC	2008-2009	YES
MERCEDES-BENZ	R-CLASS	2010-2012	YES
MERCEDES-BENZ	S430	2005	NO
MERCEDES-BENZ	S430-4MATIC	2005	NO
MERCEDES-BENZ	S500	2005	NO
MERCEDES-BENZ	S500-4MATIC	2005	NO
MERCEDES-BENZ	S55 AMG	2005	NO
MERCEDES-BENZ	S550	2008-2009	YES
MERCEDES-BENZ	S550 4MATIC	2008-2009	YES
MERCEDES-BENZ	S600 BI-T	2008-2009	YES
MERCEDES-BENZ	S63 AMG	2008-2009	YES
MERCEDES-BENZ	S65 AMG	2008-2009	YES
MERCEDES-BENZ	S-CLASS	2010-2017	YES
MERCEDES-BENZ	SL500	2005	NO
MERCEDES-BENZ	SL55 AMG	2005	NO
MERCEDES-BENZ	SL55 AMG	2008	NO
MERCEDES-BENZ	SL550	2008	NO
MERCEDES-BENZ	SL550	2009	NO
MERCEDES-BENZ	SL600	2005	NO
MERCEDES-BENZ	SL600 BI-T	2008-2009	NO
MERCEDES-BENZ	SL600 BI-T	2009	NO
MERCEDES-BENZ	SL63 AMG	2009	NO
MERCEDES-BENZ	SL65 AMG	2005-2009	NO
MERCEDES-BENZ	SLC-CLASS	2017	NO
MERCEDES-BENZ	SL-CLASS	2010-2017	NO
MERCEDES-BENZ	SLK280	2008	YES
MERCEDES-BENZ	SLK300	2009	YES
MERCEDES-BENZ	SLK350	2005	NO
MERCEDES-BENZ	SLK350	2008-2009	YES
MERCEDES-BENZ	SLK55 AMG	2005	NO
MERCEDES-BENZ	SLK55 AMG	2008-2009	YES
MERCEDES-BENZ	SLK-CLASS	2010-2012	NO
MERCEDES-BENZ	SLK-CLASS	2012-2016	YES
MERCEDES-BENZ	SLR	2005-2008	NO
MERCEDES-BENZ	SLS AMG	2011-20013	YES
MERCEDES-BENZ	SPRINTER 2500	2011	NO
MERCEDES-BENZ	SPRINTER 2500 MIXTO	2012-2015	NO
MERCEDES-BENZ	SPRINTER 2500 CARGO VAN	2011-2015	NO
MERCEDES-BENZ	SPRINTER 2500 PASSENGER VAN	2011-2015	NO

Make	Model	Year	Rollover Curtain Air Bag
MERCEDES-BENZ	SPRINTER 3500 CAB CHASSIS	2011-2015	NO
MERCEDES-BENZ	SPRINTER 3500 CARGO VAN	2011-2015	NO
MERCEDES-MAYB	S-CLASS	2016-2017	YES
MERCURY	GRAND MARQUIS	2005-2011	NO
MERCURY	MARINER	2008-2011	YES
MERCURY	MARINER HEV	2008-2011	YES
MERCURY	MERCURY MARINER	2005	YES
MERCURY	MILAN	2008-2011	NO
MERCURY	MILAN HEV	2010-2011	NO
MERCURY	MONTEGO	2005	YES
MERCURY	MONTEREY	2005	YES
MERCURY	MOUNTAINEER	2005-2010	YES
MERCURY	SABLE	2005	NO
MERCURY	SABLE	2008	YES
MINI	CLUBMAN	2008-2014	NO
MINI	CLUBMAN	2017	YES
MINI	CLUBMAN ALL4	2017	YES
MINI	CLUBMAN S	2008-2012	NO
MINI	CLUBMAN S JCW	2010-2012	NO
MINI	CONVERTIBLE	2014-2017	NO
MINI	COOPER	2005-2012	NO
MINI	COOPER	2014	YES
MINI	COOPER CONVERTIBLE	2005-2010	NO
MINI	COOPER CONVERTIBLE	2011-2015	YES
MINI	COOPER COUNTRYMAN	2011-2016	NO
MINI	COOPER COUPE	2013-2015	NO
MINI	COOPER HARDTOP	2015-2016	YES
MINI	COOPER JCW HARDTOP	2016	YES
MINI	COOPER PACEMAN	2015-2016	YES
MINI	COOPER ROADSTER	2013-2015	NO
MINI	COOPER S	2005-2012	NO
MINI	COOPER S CONVERTIBLE	2005-2010	NO
MINI	COOPER S CONVERTIBLE	2011-2015	YES
MINI	COOPER S COUNTRYMAN	2011-2013	NO
MINI	COOPER S COUNTRYMAN	2015-2016	YES
MINI	COOPER S COUPE	2013-2015	NO
MINI	COOPER S HARDTOP	2015-2016	YES
MINI	COOPER S JCW	2010-2012	NO
MINI	COOPER S JCW CONVERTIBLE	2010	NO
MINI	COOPER S JCW CONVERTIBLE	2011-2012	YES
MINI	COOPER S PACEMAN	2015-2016	YES
MINI	COOPER S ROADSTER	2013-2015	NO
MINI	COUNTRYMAN	2014	NO
MINI	COUPE	2014	NO
MINI	HARDTOP	2017	YES
MINI	JCW CONVERTIBLE	2015	NO

Make	Model	Year	Rollover Curtain Air Bag
MINI	JCW COUNTRYMAN	2015-2016	YES
MINI	JCW COUPE	2013-2015	NO
MINI	JCW PACEMAN	2013	NO
MINI	JCW PACEMAN	2015-2016	YES
MINI	JCW ROADSTER	2013-2015	NO
MINI	MINI CLUBMAN	2013	NO
MINI	MINI CLUBMAN S	2013	NO
MINI	MINI CLUBMAN S JCW	2013	NO
MINI	MINI COOPER	2013	NO
MINI	MINI COOPER CONVERTIBLE	2013	NO
MINI	MINI COOPER PACEMAN	2013	NO
MINI	MINI COOPER S	2013	NO
MINI	MINI COOPER S CONVERTIBLE	2013	NO
MINI	MINI COOPER S CONVERTIBLE JCW	2013	NO
MINI	MINI COOPER S JCW	2013	NO
MINI	MINI COOPER S PACEMAN	2013	NO
MINI	MINI COOPER S PACEMAN ALL4	2013	NO
MINI	PACEMAN	2014	NO
MITSUBISHI	ECLIPSE	2005-2012	NO
MITSUBISHI	ECLIPSE SPYDER	2005-2012	NO
MITSUBISHI	ENDEAVOR	2005	NO
MITSUBISHI	ENDEAVOR	2010-2011	YES
MITSUBISHI	GALANT	2005-2010	NO
MITSUBISHI	GALANT (08MY)	2008-2012	NO
MITSUBISHI	I-MIEV	2013-2017	NO
MITSUBISHI	LANCER	2005-2017	NO
MITSUBISHI	LANCER EVOLUTION	2005-2012	NO
MITSUBISHI	LANCER SPORTBACK	2005-2014	NO
MITSUBISHI	MIRAGE	2014-2015	NO
MITSUBISHI	MIRAGE	2016-2017	YES
MITSUBISHI	MONTERO	2005	NO
MITSUBISHI	OUTLANDER	2005	NO
MITSUBISHI	OUTLANDER	2010-2017	YES
MITSUBISHI	OUTLANDER SPORT	2011-2017	YES
MITSUBISHI	RAIDER CLUB CAB	2009-2010	NO
NISSAN	350Z	2005-2008	NO
NISSAN	350Z ROADSTER	2005-2009	NO
NISSAN	370Z	2009-2013	NO
NISSAN	370Z COUPE	2012-2017	NO
NISSAN	370Z ROADSTER	2010-2017	NO
NISSAN	ALTIMA	2005-2014	NO
NISSAN	ALTIMA	2015-2017	YES
NISSAN	ALTIMA COUPE	2008-2012	NO
NISSAN	ALTIMA HEV	2010-2011	NO
NISSAN	ARMADA	2005	NO
NISSAN	ARMADA	2008-2017	YES

Make	Model	Year	Rollover Curtain Air Bag
NISSAN	CHEVROLET CITY EXPRESS	2015	YES
NISSAN	CITY EXPRESS	2017	YES
NISSAN	CUBE	2009-2014	NO
NISSAN	FRONTIER	2008-2013	YES
NISSAN	FRONTIER CREW CAB	2005	NO
NISSAN	FRONTIER CREW CAB	2010-2017	YES
NISSAN	FRONTIER KING CAB	2015-2017	YES
NISSAN	GTR	2009-2017	NO
NISSAN	JUKE	2011-2016	NO
NISSAN	JUKE	2017	YES
NISSAN	JX	2013	YES
NISSAN	LEAF	2011-2016	NO
NISSAN	LEAF	2017	YES
NISSAN	MAXIMA	2005-2014	NO
NISSAN	MAXIMA	2015-2017	YES
NISSAN	MURANO CROSS CABRIOLET	2012-2014	YES
NISSAN	NV200	2013-2017	YES
NISSAN	NV3500	2013-2017	YES
NISSAN	PATHFINDER	2005	NO
NISSAN	PATHFINDER	2008-2017	YES
NISSAN	PATHFINDER HYBRID	2014	YES
NISSAN	QUEST	2005-2017	NO
NISSAN	QX56	2011	YES
NISSAN	ROGUE	2008-2017	YES
NISSAN	ROGUE HYBRID	2017	NO
NISSAN	ROUGE SELECT	2014-2015	YES
NISSAN	SENTRA	2005-2017	NO
NISSAN	SENTRA SR TURBO	2017	NO
NISSAN	TITAN	2008-2013	YES
NISSAN	TITAN CREW CAB	2005	NO
NISSAN	TITAN CREW CAB	2010-2017	YES
NISSAN	TITAN KING CAB	2005	NO
NISSAN	TITAN KING CAB	2010-2015	YES
NISSAN	TITAN SINGLE CAB	2017	YES
NISSAN	TITAN XD CREW CAB	2016-2017	YES
NISSAN	TITAN XD SINGLE CAB	2017	YES
NISSAN	VERSA	2008-2013	NO
NISSAN	VERSA HATCHBACK	2012	NO
NISSAN	VERSA NOTE	2014-2016	NO
NISSAN	VERSA NOTE	2017	YES
NISSAN	VERSA SEDAN	2012-2016	NO
NISSAN	VERSA SEDAN	2017	YES
NISSAN	XTERRA	2005	NO
NISSAN	XTERRA	2008-2015	YES
PONTIAC	AZTEC	2005	NO
PONTIAC	BONNEVILLE	2005	NO

Make	Model	Year	Rollover Curtain Air Bag
PONTIAC	G3	2009-2010	NO
PONTIAC	G5	2008-2010	NO
PONTIAC	G6	2005-2010	NO
PONTIAC	G8	2008-2010	NO
PONTIAC	GRAND AM	2005	NO
PONTIAC	GRAND PRIX	2005-2008	NO
PONTIAC	GTO	2005	NO
PONTIAC	MONTANA	2005	NO
PONTIAC	SOLSTICE	2005-2010	NO
PONTIAC	SUNFIRE	2005	NO
PONTIAC	TORRENT	2008-2009	YES
PONTIAC	VIBE	2005-2010	NO
PORSCHE	718 BOXSTER	2017	NO
PORSCHE	718 BOXSTER S	2017	NO
PORSCHE	718 CAYMAN	2017	NO
PORSCHE	718 CAYMAN S	2017	NO
PORSCHE	911 CARRERA	2005-2017	NO
PORSCHE	911 CARRERA 4	2008-2017	NO
PORSCHE	911 CARRERA 4 CABRIOLET	2008-2017	NO
PORSCHE	911 CARRERA 4 GTS	2015-2016	NO
PORSCHE	911 CARRERA 4 GTS CABRIOLET	2015-2016	NO
PORSCHE	911 CARRERA 4S	2005-2017	NO
PORSCHE	911 CARRERA 4S CABRIOLET	2005-2017	NO
PORSCHE	911 CARRERA BLACK EDITION	2012	NO
PORSCHE	911 CARRERA BLACK EDITION CABRIOLET	2012	NO
PORSCHE	911 CARRERA CABRIOLET	2005-2017	NO
PORSCHE	911 CARRERA CABRIOLET	2008	NO
PORSCHE	911 CARRERA CABRIOLET S	2005	NO
PORSCHE	911 CARRERA GTS	2011-2016	NO
PORSCHE	911 CARRERA GTS CABRIOLET	2015-2016	NO
PORSCHE	911 CARRERA S	2005-2017	NO
PORSCHE	911 CARRERA S CABRIOLET	2008-2017	NO
PORSCHE	911 GT2	2005-2011	NO
PORSCHE	911 GT3	2005-2016	NO
PORSCHE	911 GT3 RS	2008-2016	NO
PORSCHE	911 GTS	2012	NO
PORSCHE	911 GTS 4	2012	NO
PORSCHE	911 GTS 4 CABRIOLET	2012	NO
PORSCHE	911 GTS CABRIOLET	2012	NO
PORSCHE	911 SPEEDSTER	2011	NO
PORSCHE	911 TARGA 4	2009-2017	NO
PORSCHE	911 TARGA 4S	2008-2017	NO
PORSCHE	911 TURBO	2005-2017	NO
PORSCHE	911 TURBO CABRIOLET	2005-2017	NO
PORSCHE	911 TURBO S	2005-2017	NO
PORSCHE	911 TURBO S CABRIOLET	2011-2017	NO

Make	Model	Year	Rollover Curtain Air Bag
PORSCHE	911 TURBO S SPECIAL EDITION	2012	NO
PORSCHE	911 TURBO S SPECIAL EDITION CABRIOL	2012	NO
PORSCHE	918 CABRIOLET	2014	NO
PORSCHE	918 SPYDER	2015	NO
PORSCHE	BOXSTER	2005-2016	NO
PORSCHE	BOXSTER GTS	2015-2016	NO
PORSCHE	BOXSTER S	2005-2016	NO
PORSCHE	BOXSTER S BLACK EDITION	2012	NO
PORSCHE	BOXSTER SPYDER	2011-2016	NO
PORSCHE	CARMAN R	2012	NO
PORSCHE	CARRERA GT	2005	NO
PORSCHE	CAYENEE S	2015	YES
PORSCHE	CAYENNE	2005-2017	NO
PORSCHE	CAYENNE DIESEL	2013-2017	YES
PORSCHE	CAYENNE GTS	2009-2017	YES
PORSCHE	CAYENNE S	2005	NO
PORSCHE	CAYENNE S	2008-2017	YES
PORSCHE	CAYENNE S E-HYBRID	2013-2017	YES
PORSCHE	CAYENNE TRANSSYBERIA	2010	YES
PORSCHE	CAYENNE TURBO	2005	NO
PORSCHE	CAYENNE TURBO	2008-2017	YES
PORSCHE	CAYENNE TURBO S	2009-2017	YES
PORSCHE	CAYMAN	2008-2016	NO
PORSCHE	CAYMAN GT4	2015-2016	NO
PORSCHE	CAYMAN GTS	2015-2016	NO
PORSCHE	CAYMAN S	2008-2016	NO
PORSCHE	MACAN	2015-2017	YES
PORSCHE	MACAN S	2014-2017	YES
PORSCHE	MACAN S DIESEL	2014-2016	YES
PORSCHE	MACAN TURBO	2014-2017	YES
PORSCHE	PANAMERA	2011-2017	YES
PORSCHE	PANAMERA 4	2011-2017	YES
PORSCHE	PANAMERA 4 EDITION	2016	YES
PORSCHE	PANAMERA 4 E-HYBRID	2017	YES
PORSCHE	PANAMERA 4 E-HYBRID EXECUTIVE	2017	YES
PORSCHE	PANAMERA 4 EXCECUTIVE	2017	YES
PORSCHE	PANAMERA 4S	2010-2017	YES
PORSCHE	PANAMERA 4S EXECUTIVE	2015-2017	YES
PORSCHE	PANAMERA EDITION	2016	YES
PORSCHE	PANAMERA E-HYBIRD	2015	YES
PORSCHE	PANAMERA EXCLUSIVE SERIES	2016	YES
PORSCHE	PANAMERA GTS	2013-2016	YES
PORSCHE	PANAMERA S	2010-2016	YES
PORSCHE	PANAMERA S E-HYBRID	2016	YES
PORSCHE	PANAMERA S HYBRID	2012-2013	YES
PORSCHE	PANAMERA TURBO	2010-2017	YES

Make	Model	Year	Rollover Curtain Air Bag
PORSCHE	PANAMERA TURBO EXECUTIVE	2014-2017	YES
PORSCHE	PANAMERA TURBO S	2012-2016	YES
RAM	1500	2011	NO
RAM	1500	2013	YES
RAM	2500	2011	NO
RAM	2500	2016	YES
RAM	1500 CREW	2011-2012	NO
RAM	1500 CREW	2014	YES
RAM	1500 CREW CAB	2015-2016	YES
RAM	1500 QUAD	2011	NO
RAM	1500 QUAD	2014	YES
RAM	1500 QUAD CAB	2012	NO
RAM	1500 QUAD CAB	2013-2016	YES
RAM	1500 REGULAR	2014	YES
RAM	1500 REGULAR CAB	2012	NO
RAM	1500 REGULAR CAB	2015-2016	YES
RAM	2500 CREW	2011	NO
RAM	2500 CREW	2014	YES
RAM	2500 CREW CAB	2012	NO
RAM	2500 CREW CAB	2015-2016	YES
RAM	2500 MEGA	2011	NO
RAM	2500 MEGA	2014	YES
RAM	2500 MEGA CAB	2012	NO
RAM	2500 MEGA CAB	2015-2016	YES
RAM	2500 REGULAR	2012	NO
RAM	2500 REGULAR	2014	YES
RAM	2500 REGULAR CAB	2015	YES
RAM	CARGO VAN	2013-2015	YES
RAM	PROMASTER	2014-2016	NO
RAM	PROMASTER CITY	2016	YES
RAM	RAM 1500 CREW CAB	2017	YES
RAM	RAM 1500 QUAD CAB	2017	YES
RAM	RAM 1500 REGULAR CAB	2017	YES
RAM	RAM 2500	2017	YES
RAM	RAM 2500 CREW CAB	2017	YES
RAM	RAM 2500 MEGA CAB	2017	YES
RAM	RAM PROMASTER CITY	2017	YES
ROLLS-ROYCE	DAWN	2017	NO
ROLLS-ROYCE	GHOST	2010	NO
ROLLS-ROYCE	GHOST	2011-2017	YES
ROLLS-ROYCE	GHOST EWB	2012-2017	YES
ROLLS-ROYCE	PHANTOM	2005-2017	NO
ROLLS-ROYCE	PHANTOM CONVERTIBLE	2008-2010	NO
ROLLS-ROYCE	PHANTOM CONVERTIBLE	2011-2017	YES
ROLLS-ROYCE	PHANTOM COUPE	2010-2017	NO
ROLLS-ROYCE	PHANTOM EWB	2008-2017	NO

Make	Model	Year	Rollover Curtain Air Bag
ROLLS-ROYCE	ROLLS-ROYCE GHOST	2013	YES
ROLLS-ROYCE	ROLLS-ROYCE GHOST EWB	2013	YES
ROLLS-ROYCE	ROLLS-ROYCE PHANTOM	2013	NO
ROLLS-ROYCE	ROLLS-ROYCE PHANTOM CONVERTIBLE	2013	NO
ROLLS-ROYCE	ROLLS-ROYCE PHANTOM COUPE	2013	NO
ROLLS-ROYCE	ROLLS-ROYCE PHANTOM EWB	2013	NO
ROLLS-ROYCE	WRAITH	2014-2017	YES
S550E	S-CLASS	2017	YES
SAAB	3-Sep	2005-2012	NO
SAAB	5-Sep	2005-2012	NO
SAAB	9-2X	2005	NO
SAAB	9-4X	2011-2012	YES
SAAB	9-7X	2005	NO
SAAB	9-7X	2008-2009	YES
SATURN	ASTRA	2008-2009	NO
SATURN	AURA	2008-2010	NO
SATURN	AURA GREEN LINE HYBRID	2008-2009	NO
SATURN	ION	2005	NO
SATURN	OUTLOOK	2008-2010	YES
SATURN	RELAY	2005	NO
SATURN	SKY	2008-2010	NO
SATURN	VUE	2005-2010	NO
SATURN	VUE HYBRID	2008-2009	YES
SCION	IA	2016	YES
SCION	SCION TC	2008	NO
SCION	SCION XB	2008	NO
SCION	SCION XD	2008	NO
SLR	SLR	2009	NO
SMART	ELECTRIC CABRIO	2017	NO
SMART	ELECTRIC COUPE	2017	NO
SMART	FORTWO CABRIOLET	2009-2012	NO
SMART	FORTWO COUPE	2009-2012	NO
SRT	300	2014	NO
SRT	CHALLENGER	2014	NO
SRT	CHALLENGER	2015	YES
SRT	CHARGER	2014	NO
SRT	GRAND CHEROKEE	2014-2015	YES
SRT	VIPER	2013-2015	NO
SUBARU	B9 TRIBECA	2008	YES
SUBARU	BAJA	2005	NO
SUBARU	BRZ	2013-2016	NO
SUBARU	BRZ	2017	YES
SUBARU	CROSSTREK	2016-2017	YES
SUBARU	FORESTER	2005-2008	NO
SUBARU	FORESTER	2009-2017	YES
SUBARU	IMPREZA	2005-2016	NO

Make	Model	Year	Rollover Curtain Air Bag
SUBARU	IMPREZA	2017	YES
SUBARU	IMPREZA 4DR	2011	NO
SUBARU	IMPREZA 5DR	2011	NO
SUBARU	IMPREZA WRX	2014	NO
SUBARU	IMPREZA WRX/STI	2012-2013	NO
SUBARU	IMPREZA WRX/WRX STI	2014	NO
SUBARU	LEGACY	2005-2014	NO
SUBARU	LEGACY	2015-2017	YES
SUBARU	OUTBACK	2005-2009	NO
SUBARU	OUTBACK	2010-2017	YES
SUBARU	TRIBECA	2009-2014	YES
SUBARU	WRX	2015-2016	NO
SUBARU	WRX	2017	YES
SUBARU	XV CROSSTREK	2013-2015	YES
SUBARU	XV CROSSTREK HYBRID	2014-2015	YES
SUZUKI	AERIO GX 2.3L	2005	NO
SUZUKI	AERIO SX 2.3L	2005	NO
SUZUKI	EQUATOR	2013	YES
SUZUKI	EQUATOR CREW CAB	2010-2012	YES
SUZUKI	EQUATOR EXTENDED CAB	2011-2012	YES
SUZUKI	EQUATOR KING CAB	2010	YES
SUZUKI	FORENZA	2005-2008	NO
SUZUKI	GRAND VITARA	2005-2008	NO
SUZUKI	GRAND VITARA	2009-2014	YES
SUZUKI	GRAND VITARA XL7	2005	NO
SUZUKI	KIZASHI	2010-2014	NO
SUZUKI	RENO	2005-2008	NO
SUZUKI	SX4	2008-2014	NO
SUZUKI	SX4 HATCHBACK	2009	NO
SUZUKI	SX4 SEDAN	2009-2014	NO
SUZUKI	VERONA	2005	NO
SUZUKI	XL7	2008-2009	YES
TESLA	MODEL S	2017	YES
TESLA	MODEL S 60	2016-2017	YES
TESLA	MODEL S 60D	2016-2017	YES
TESLA	MODEL S 60KWH	2015	YES
TESLA	MODEL S 70	2016	YES
TESLA	MODEL S 70D	2016	YES
TESLA	MODEL S 75	2016-2017	YES
TESLA	MODEL S 75D	2016-2017	YES
TESLA	MODEL S 85	2016	YES
TESLA	MODEL S 85D	2015-2016	YES
TESLA	MODEL S 85KWH	2015	YES
TESLA	MODEL S 90	2016	YES
TESLA	MODEL S 90D	2016-2017	YES
TESLA	MODEL S P100D	2016-2017	YES

Make	Model	Year	Rollover Curtain Air Bag
TESLA	MODEL S P85D	2015-2016	YES
TESLA	MODEL S P90D	2016-2017	YES
TESLA	MODEL X	2015-2017	YES
TESLA	MODEL X 60D	2016-2017	YES
TESLA	MODEL X 75D	2016-2017	YES
TESLA	MODEL X 90D	2016-2017	YES
TESLA	MODEL X P100D	2016-2017	YES
TESLA	MODEL X P90D	2016-2017	YES
TOYOTA	4RUNNER	2005	NO
TOYOTA	4RUNNER	2008-2017	YES
TOYOTA	AVALON	2005-2015	NO
TOYOTA	AVALON	2016-2017	YES
TOYOTA	AVALON HYBRID	2013-2015	NO
TOYOTA	AVALON HYBRID	2016-2017	YES
TOYOTA	CAMRY	2005-2014	NO
TOYOTA	CAMRY	2015-2017	YES
TOYOTA	CAMRY HYBRID	2008-2014	NO
TOYOTA	CAMRY HYBRID	2015-2017	YES
TOYOTA	CAMRY SOLARA	2005-2008	NO
TOYOTA	CELICA	2005	NO
TOYOTA	COROLLA	2005-2016	NO
TOYOTA	COROLLA	2017	YES
TOYOTA	COROLLA MATRIX	2005	NO
TOYOTA	ECHO	2005	NO
TOYOTA	FJ CRUISER	2008	NO
TOYOTA	FJ CRUISER	2009-2014	YES
TOYOTA	HIGHLANDER	2005	NO
TOYOTA	HIGHLANDER	2008-2017	YES
TOYOTA	HIGHLANDER HYBRID	2008-2017	YES
TOYOTA	HIGHLANER HV	2005	NO
TOYOTA	LAND CRUISER	2015-2017	YES
TOYOTA	LANDCRUISER	2005	NO
TOYOTA	LANDCRUISER	2008-2014	YES
TOYOTA	MATRIX	2008-2013	NO
TOYOTA	MIRAI	2016-2017	YES
TOYOTA	MR2	2005	NO
TOYOTA	PRIUS	2005-2015	NO
TOYOTA	PRIUS	2016-2017	YES
TOYOTA	PRIUS C	2013-2017	NO
TOYOTA	PRIUS PLUG-IN HYBRID	2012-2014	NO
TOYOTA	PRIUS PRIME	2017	YES
TOYOTA	PRIUS V	2012-2015	NO
TOYOTA	PRIUS V	2016-2017	YES
TOYOTA	RAV4	2005	NO
TOYOTA	RAV4	2008-2017	YES
TOYOTA	RAV4 HYBRID	2016-2017	YES

Make	Model	Year	Rollover Curtain Air Bag
TOYOTA	RAV4 HYBRID	2017	YES
TOYOTA	SCION FR-S	2013-2016	NO
TOYOTA	SCION IA	2016	NO
TOYOTA	SCION IM	2016-2017	YES
TOYOTA	SCION IQ	2011-2015	NO
TOYOTA	SCION IQ EV	2013	NO
TOYOTA	SCION TC	2005-2016	NO
TOYOTA	SCION XA	2005	NO
TOYOTA	SCION XB	2005-2015	NO
TOYOTA	SCION XD	2010-2014	NO
TOYOTA	SEQUOIA	2005	NO
TOYOTA	SEQUOIA	2008-2017	YES
TOYOTA	SIENNA	2005-2014	NO
TOYOTA	SIENNA	2015-2017	YES
TOYOTA	TACOMA	2005	NO
TOYOTA	TACOMA	2008-2017	YES
TOYOTA	TUNDRA	2005	NO
TOYOTA	TUNDRA	2008-2017	YES
TOYOTA	VENZA	2009-2015	NO
TOYOTA	YARIS	2008-2015	NO
TOYOTA	YARIS	2016-2017	YES
TOYOTA	YARIS LIFTBACK	2008-2016	NO
TOYOTA	YARIS SEDAN	2010-2012	NO
TOYOTA *	SCION TC	2009	NO
TOYOTA *	SCION XB	2009	NO
TOYOTA *	SCION XD	2009	NO
VOLKSWAGEN	ALLTRACK	2017	YES
VOLKSWAGEN	BEETLE	2012-2017	NO
VOLKSWAGEN	BEETLE CONVERTIBLE	2013-2017	NO
VOLKSWAGEN	CC	2010-2017	NO
VOLKSWAGEN	EGOLF	2016	NO
VOLKSWAGEN	EGOLF	2017	YES
VOLKSWAGEN	EOS	2008-2016	NO
VOLKSWAGEN	GLI	2008-2009	NO
VOLKSWAGEN	GOLF	2005-2016	NO
VOLKSWAGEN	GOLF	2017	YES
VOLKSWAGEN	GOLF GTI	2015-2016	NO
VOLKSWAGEN	GOLF GTI	2017	YES
VOLKSWAGEN	GOLF R	2013-2016	NO
VOLKSWAGEN	GOLF R	2017	YES
VOLKSWAGEN	GOLF SPORTWAGEN	2015	NO
VOLKSWAGEN	GOLF SPORTWAGEN	2016-2017	YES
VOLKSWAGEN	GOLF/GTI	2005-2012	NO
VOLKSWAGEN	GTI	2008-2014	NO
VOLKSWAGEN	JETTA	2005-2014	NO
VOLKSWAGEN	JETTA	2015-2017	YES

Make	Model	Year	Rollover Curtain Air Bag
VOLKSWAGEN	JETTA GLI	2017	YES
VOLKSWAGEN	JETTA HYBRID	2014	NO
VOLKSWAGEN	JETTA HYBRID	2015-2016	YES
VOLKSWAGEN	JETTA SPORTWAGEN	2008-2014	NO
VOLKSWAGEN	JETTA SPORTWAGEN TDI	2009	NO
VOLKSWAGEN	JETTA TDI	2009	NO
VOLKSWAGEN	NEW BEETLE	2005-2010	NO
VOLKSWAGEN	NEW BEETLE CONVERTIBLE	2008-2009	NO
VOLKSWAGEN	PASSAT	2005-2015	NO
VOLKSWAGEN	PASSAT	2016-2017	YES
VOLKSWAGEN	PASSAT CC COUPE	2009	NO
VOLKSWAGEN	PASSAT WAGON	2008-2009	NO
VOLKSWAGEN	PHAETON	2005	NO
VOLKSWAGEN	R32	2008	NO
VOLKSWAGEN	RABBIT	2008-2009	NO
VOLKSWAGEN	ROUTAN	2010-2014	YES
VOLKSWAGEN	TIGUAN	2009-2017	YES
VOLKSWAGEN	TOUAREG	2005	NO
VOLKSWAGEN	TOUAREG	2012-2017	YES
VOLKSWAGEN	TOUAREG 2	2008-2010	YES
VOLKSWAGEN	TOUAREG HYBRID	2014-2015	YES
VOLKSWAGEN	TOUAREG/TOUAREG 2	2011	YES
VOLKWAGEN	ROUTAN	2009	NO
VOLVO	2017 S90 T5	2016	NO
VOLVO	C30	2008-2013	NO
VOLVO	C70	2005	NO
VOLVO	C70	2008-2013	YES
VOLVO	S40	2005-2011	NO
VOLVO	S60	2005-2009	NO
VOLVO	S60	2011-2017	YES
VOLVO	S60I	2016-2017	YES
VOLVO	S80	2005-2016	NO
VOLVO	S90	2017	YES
VOLVO	V50	2005-2011	NO
VOLVO	V60	2014-2017	YES
VOLVO	V60 CC	2015-2017	YES
VOLVO	V70	2005	NO
VOLVO	V70	2008-2010	NO
VOLVO	V90CC	2017	YES
VOLVO	XC60	2009-2017	YES
VOLVO	XC70	2005-2016	NO
VOLVO	XC90	2005	NO
VOLVO	XC90	2008-2017	YES

Appendix B: SAS Code

```
options nodate nonumber nocenter nofmterr;

%LOADCRSS; /* LOAD CRSS FROM AUTO EXC FILE */

/* CREATE LIBRARIES TO STORE DATA GENERATED THROUGH THE DOCUMENT */

libname NCAP "/data/homes/eliseo.acevedo/ORAE_EVALS/FMVSS_226/NCAP_Data/";
libname DATA "/data/homes/eliseo.acevedo/ORAE_EVALS/FMVSS_226/DATA/";

/***********************************************/

/* IMPORT THE NEW CAR ASSESMENT PROGRAM (NCAP) DATA SETS */
PROC IMPORT
      DATAFILE="/data/homes/eliseo.acevedo/ORAE_EVALS/FMVSS_226/NCAP_Data/2005
Combined BSC Spreadsheet-CONFIDENTIAL DATA3.xlsx"
      OUT=NCAP.NCAP2005
      DBMS=XLSX
            REPLACE;
RUN;

DATA NCAP.NCAP2005 (DROP=D);
      SET NCAP.NCAP2005;
      YEAR = 2005;
      test = INDEX(UPCASE(QUESTION28),'ROLLOVER');

/* MANUALLY CODED THE EXCEL FILE SO THAT QUESTION28 IS THE NAME OF THE VARIABLE IN
THE NCAP DATA THAT IDENTIFIES ROLLOVER ACTIVATED CURTAIN AIRBAG */

      IF TEST GT 0 THEN ROS = "YES";
      IF TEST EQ 0 THEN ROS = "NO";
RUN;

/* NO NCAP DATA FOR 2006-2007 */

%MACRO A;
      %DO Y=2008 %TO 2017;

            PROC IMPORT

      DATAFILE="/data/homes/eliseo.acevedo/ORAE_EVALS/FMVSS_226/NCAP_Data/&Y.
Combined BSC Spreadsheet-CONFIDENTIAL DATA3.xlsx"
                  OUT=NCAP.NCAP&Y.
                  DBMS=XLSX
                        REPLACE;
            RUN;

            DATA NCAP.NCAP&Y. (DROP=D);
                  SET NCAP.NCAP&Y.;
                  YEAR = &Y.;
                  test = INDEX(UPCASE(QUESTION28),'YES');
                  IF TEST GT 0 THEN ROS = "YES";
                  IF TEST EQ 0 THEN ROS = "NO";
            RUN;

            PROC FREQ;
                  table test ros;
            RUN;
      %END;
%MEND;
```

```
%A;

DATA NCAP.NCAP (DROP=D);
      SET NCAP.NCAP2005 NCAP.NCAP2008 - NCAP.NCAP2017;
RUN;

proc datasets library=NCAP nolist;
      delete NCAP2005 NCAP2008-NCAP2017;
quit;

PROC SORT DATA = NCAP.NCAP;
      BY YEAR;
RUN;

/* LOAD AND MERGE DATA FILES */

/* ACCIDENT FILES */

proc sql;
      create table DATA.ACCCRSS
      like CRSS2016.ACCIDENT;
quit;

%MACRO A;
      %DO Y=2016 %TO 2021;

            PROC SQL;
                  CREATE TABLE DATA.ACCCRSS&Y. AS SELECT
                        *
                  FROM CRSS&Y..ACCIDENT A
                  LEFT JOIN CRSS&Y..ACC_AUX B
                        ON (A.CASENUM = B.CASENUM);
            QUIT;

            PROC SQL;
                  CREATE TABLE DATA.ACCCRSS AS SELECT
                        *
                  FROM DATA.ACCCRSS
                  OUTER UNION CORRESPONDING
                  SELECT *,
                  &Y. AS CY
                  FROM DATA.ACCCRSS&Y.;
            QUIT;

            proc datasets LIBRARY= DATA nolist;
                  delete ACCCRSS&Y. ;
            quit;
      %END;
%MEND A;
%A;

/* VEHICLE FILES */

proc sql;
      create table DATA.VEHCRSS
      like CRSS2016.VEHICLE;
quit;

%MACRO B;
      %DO Y=2016 %TO 2021;
```

```
            PROC SQL;
                  CREATE TABLE DATA.VEHCRSS&Y. AS SELECT
                        *,
                        C.MAKE AS VPCMAKE,
                        C.MODEL AS VPCMODEL,
                        C.MODELYEAR AS VPCMODYR
                  FROM CRSS&Y..VEHICLE  A
                  LEFT JOIN CRSS&Y..VEH_AUX B
                        ON (A.CASENUM = B.CASENUM AND A.VEH_NO = B.VEH_NO)
                  LEFT JOIN CRSS&Y..VPICDECODE (KEEP=MAKE MODEL MODELYEAR CASENUM
VEH_NO) C
                        ON (A.CASENUM = C.CASENUM AND A.VEH_NO = C.VEH_NO);
            QUIT;

            PROC SQL;
                  CREATE TABLE DATA.VEHCRSS AS SELECT
                        *
                  FROM DATA.VEHCRSS
                  OUTER UNION CORRESPONDING
                  SELECT *,
                  &Y. AS CY
                  FROM DATA.VEHCRSS&Y.;
            QUIT;

            proc datasets LIBRARY= DATA nolist;
                  delete VEHCRSS&Y. ;
            quit;
      %END;
%MEND B;
%B;

/* INCLUDE ONLY PASSENGER CARS AND LIGHT TRUCK */

data VEHCRSS;
      set DATA.VEHCRSS;
      if A_BODY IN (1:5);
run;

/* COMBINE CRSS VEHICLE DATA WITH NCAP DATA BY MAKE, MODEL, AND MY */

proc sql;
      create table CRSSNCAP as select DISTINCT
            a.*,
            b.ROS,
            B.YEAR
      FROM VEHCRSS A
      LEFT JOIN NCAP.NCAP B
            ON (compged(upcase(A.VPCMAKE),upcase(B.MAKE)) le 100 AND
compged(upcase(A.VPCMODEL), upcase(B.MODEL)) le 100 AND A.VPCMODYR = B.YEAR);
QUIT;

DATA CRSSNCAP1;
      SET CRSSNCAP;
      IF VPCMODYR ^=.;
      IF VPCMAKE ^='';
      IF VPCMODEL ^= '';

      IF VPCMODYR LE 2001 THEN ROS = "NO"; /* Rollover curtain airbags were
introduced on MY 2002 */
```

```
      IF VPCMODYR GE 2018 THEN ROS = "YES"; /* FMVSS 226 took place for MY 2018 and
newer */
RUN;

PROC FREQ DATA=CRSSNCAP1;
      TABLE ros;
RUN;

DATA COMPLETE;
      SET CRSSNCAP1;
      if ROS IN ("YES", "NO");
RUN;

/* VEHICLES THAT WERE NOT ASSIGNED A CURTAIN AIR BAG IN BY NCAP DATA, HAD THEIR
CURTAIN AIR BAG ASSIGNED MANUALLY (SEE APPENDIX A) */

%INCLUDE "/data/homes/eliseo.acevedo/ORAE_EVALS/FMVSS_226/PROG_CODE/Curtain airbag
assignment.sas";

DATA DATA.ROSVEH;
      SET COMPLETE ROSCHECK;
RUN;

/* MERGE PASSENGER TO VEHICLE DATA */

%MACRO C;
      %DO Y=2016 %TO 2021;

            PROC SQL;
                  CREATE TABLE DATA.PASS&Y. AS SELECT
                        *
                  FROM CRSS&Y..PERSON A
                  LEFT JOIN CRSS&Y..PER_AUX B
                        ON (A.CASENUM = B.CASENUM AND A.VEH_NO = B.VEH_NO AND
A.PER_NO = B.PER_NO);
            QUIT;
      %END;
%MEND C;
%C;

DATA DATA.PASS;
      SET DATA.PASS2016 - DATA.PASS2021;
RUN;

PROC SORT data=DATA.PASS;
      BY CASENUM VEH_NO;
RUN;

PROC SORT DATA=DATA.ROSVEH;
      BY CASENUM VEH_NO;
RUN;


PROC SQL;
      CREATE TABLE DATA.VEHPAS AS SELECT DISTINCT
            A.*,
            B.*
      FROM DATA.ROSVEH A
      LEFT JOIN DATA.PASS B
            ON (A.CASENUM = B.CASENUM AND A.VEH_NO = B.VEH_NO);
```

```
QUIT;

DATA DATA.VEHPAS;
      SET DATA.VEHPAS;
      IF EJECT_IM IN (1,2,3) THEN EJECT_IM = 1;
      IF EJECT_IM = 0 THEN EJECT = 0;
      IF EJECT_IM = 1 THEN EJECT = 1;
      IF ROS = "YES" THEN ROS_NUM = 0;
      IF ROS = "NO" THEN ROS_NUM = 1;
RUN;

DATA DATA.VEHPAS;
      SET DATA.VEHPAS;
      PVTYPE = "CAR";
      IF A_BODY = 1 THEN PVTYPE = "CAR";
      IF A_BODY IN (2:5) THEN PVTYPE = "LTV";
RUN;

PROC SORT DATA=DATA.VEHPAS;
      BY A_VROLL;RUN;

DATA DATA.VEHPAS;
      SET DATA.VEHPAS;
      PVTYPE = "CAR";
      IF A_BODY = 1 THEN PVTYPE = "CAR";
      IF A_BODY IN (2:5) THEN PVTYPE = "LTV";
RUN;

DATA DATA.VEHPAS;
      SET DATA.VEHPAS;
      seatpos = "FRONT ROW";
      IF SEAT_POS IN (11:19) THEN SEATPOS = "FRONT ROW";
      IF SEAT_POS IN (21:43) THEN SEATPOS = "BACK ROW";
RUN;

data DATA.VEHPAS;
      set DATA.VEHPAS;
      fmvss226 = "YES";
      if MOD_YEAR le 2017 then fmvss226 = "NO";
      fmvss226_2 = "YES";
      if MOD_YEAR LE 2013 THEN FMVSS226_2 = "NO";
      IF MOD_YEAR IN (2014:2017) AND ROS IN ("NO","NOT") THEN FMVSS226_2 = "NO";

      FMVSS226_3 = "NO";
      if MOD_YEAR LE 2017 AND ROS EQ "YES" THEN FMVSS226_3 = "NC";
      if ROS EQ "NOT" THEN FMVSS226_3 = "NO";
      IF MOD_YEAR GE 2018 THEN FMVSS226_3 = "YES";
run;

/* REGRESSION MODEL AND FREQUENCIES PRESENTED IN TABLE 1 */

PROC SURVEYLOGISTIC DATA=DATA.VEHPAS;
      CLASS FMVSS226_3(ref='NO') A_RESTUSE(REF="2") PVTYPE SEATPOS URBANICITY A_PTYPE
/  param = ref;
      MODEL EJECT_IM (EVENT='1') = FMVSS226_3 A_RESTUSE PVTYPE SEATPOS URBANICITY/;
      WEIGHT WEIGHT;
      CLUSTER PSU;
      STRATA PSUSTRAT;
      WHERE ROS in ("YES","NO") AND A_VROLL = 1 AND A_RESTUSE ^= 3 AND A_PTYPE IN
(1,2) and seat_pos in (11,13,21,23) and AGE_IM ge 13;
```

```
RUN;

PROC SURVEYFREQ DATA=DATA.VEHPAS;
      TABLE EJECT_IM * (FMVSS226_3 A_RESTUSE PVTYPE SEATPOS URBANICITY);
      WEIGHT WEIGHT;
      CLUSTER PSU;
      STRATA PSUSTRAT;
      WHERE ROS in ("YES","NO") AND A_VROLL = 1 AND A_RESTUSE ^= 3 AND A_PTYPE IN
(1,2) and seat_pos in (11,13,21,23) and AGE_IM ge 13;
RUN;

/* LOGISTIC REGRESSION ANALYSIS PRESENTED IN TABLE 2 AND VAR-COV MATRIX FOR
SIGNIFICANCE CALCULATION*/


PROC SURVEYLOGISTIC DATA=DATA.VEHPAS;
      CLASS FMVSS226_3(ref='NO') A_RESTUSE(REF="2") PVTYPE SEATPOS URBANICITY A_PTYPE
/  param = ref;
      MODEL EJECT_IM (EVENT='1') =  FMVSS226_3 A_RESTUSE / COVB;
      WEIGHT WEIGHT;
      CLUSTER PSU;
      STRATA PSUSTRAT;
      WHERE ROS in ("YES","NO") AND A_VROLL = 1 AND A_RESTUSE ^= 3 AND A_PTYPE IN
(1,2) and seat_pos in (11,13,21,23) and AGE_IM ge 13;
RUN;
```

Appendix C: R Code

```r
# LOAD NECESSARY R LIBRARIES FOR ANALYSIS #

library(Matrix)
library(survey)
library(data.table)

# LOAD DATA SET AFTER NCAP CLASSIFICATION FROM SAS #

vehpas <-
read.csv("//nhtazelas004vg/sasviyadata/homes/eliseo.acevedo/ORAE_EVALS/FMVSS_226/DATA/VEHPASEXP.csv")

# PREPARE DATA FOR R ANALYSIS #

vehpas2 <- vehpas
rm(vehpas);gc()
vehpas2 <- subset(vehpas2, A_RESTUSE != 3)
vehpas2 <- subset(vehpas2, ROS %in% c("YES","NO"))

vehpas2$ROS2 <- replace(vehpas2$ROS2, vehpas2$ROS == "YES", 1)
vehpas2$ROS2 <- replace(vehpas2$ROS2, vehpas2$ROS == "NO", 0)
vehpas2$ROS2 <- as.factor(vehpas2$ROS2)

vehpas2$ROS <- as.factor(vehpas2$ROS)
vehpas2$A_RESTUSE <- as.factor(vehpas2$A_RESTUSE)
vehpas2$EJECT_IM <- as.factor(vehpas2$EJECT_IM)

vehpas2 <- within(vehpas2, A_RESTUSE <- relevel(A_RESTUSE, ref = 1))
vehpas2 <- within(vehpas2, EJECT_IM <- relevel(EJECT_IM, ref = 1))

vehpas2 <- subset(vehpas2, A_VROLL == 1)
vehpas2 <- subset(vehpas2, A_PTYPE %in% c(1,2))
vehpas2 <- subset(vehpas2, SEAT_POS %in% c(11,13,21,23))
vehpas2 <- subset(vehpas2, AGE_IM >= 13)
vehpas2 <- subset(vehpas2, EJECT_IM != 8)
vehpas2 <- subset(vehpas2, ROS %in% c("YES","NO"))
vehpas2 <- subset(vehpas2, A_RESTUSE != 3)

# CREATE SURVEY DESIGN FOR SURVEY ANALYSIS IN R #
design <- svydesign(id = ~PSU,
                    weights = ~WEIGHT,
                    cluster = ~PSUSTRAT,
                    nest = F,
                    data = vehpas2)
summary(design)
```

```
# LOG-BINOMIAL REGRESSION PRESENTED IN TABLE 3 #

fit2 <- svyglm(factor(EJECT_IM,levels = c(0,1)) ~ factor(ROS2,levels = c(0,1))
+
                  factor(A_RESTUSE, levels = c(2,1)),
                design = design, family = quasibinomial(link="log"))

summary(fit2)
```

DOT HS 813 700
April 2025

U.S. Department
of Transportation

**National Highway
Traffic Safety
Administration**

16559-030325-v1b