



# The Takata Airbag Recall: An Insurance Perspective

**Let's take a look at the Takata frontal airbag recall and the insurance implications.**

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Let's take a look at the issues involved with the Takata frontal airbag recall, and the implications, from an insurance perspective, when evaluating individual incidents in which a Takata frontal airbag was involved.

## **How Airbags Work**

The frontal airbag is a device that rapidly acts in front of the occupant to supplement the seat belt. The key feature of the typical automotive frontal airbag is that it is designed to deploy in crashes of sufficient severity within a cone of plus-or-minus 30 degrees from straight frontal (12:00). The threshold for firing is typically equivalent to a vehicle striking a wall at about 10 mph or greater.

In order to operate effectively, any airbag system requires two critical components: Sensors to detect a crash and provide a signal to the airbag that it is time to deploy; and a chemical compound to provide and generate the volume of inert gas needed to inflate the airbag in the extremely short time of a frontal crash. In general, a typical frontal crash lasts only about 100 milliseconds (a millisecond is one-one thousandth of a second). The sensors take approximately 20 to 25 milliseconds to detect a crash, determine that the crash is severe enough to warrant airbag deployment, and send a deployment signal to the airbag itself. The process of generating the inert gas and inflating the airbag takes another 20 to 25 milliseconds, for a total of less than 50 milliseconds, making it a very energetic and potentially explosive inflation process. Figure one shows a schematic of a typical driver's frontal airbag system.

## **The Takata Airbag Problem**

Takata has been manufacturing frontal airbag systems for many years. Along with other airbag manufacturers, Takata has been searching for a replacement for the sodium azide compound used to generate the inert nitrogen gas that inflates the airbag. The reason for this is that while sodium azide generates mostly inert nitrogen gas, it can sometimes also produce small amounts of the chemical "sodium hydroxide," which is slightly toxic and can cause minor irritation to the eyes and/or open wounds. Starting in the mid-1990s, the automotive airbag industry began to use "tetrazole" in place of sodium azide, but tetrazole, while less toxic than sodium azide, was significantly more expensive to use. Eventually, in the late 90s, Takata began to use a chemical propellant based on "ammonium nitrate" (NH<sub>4</sub>NO<sub>3</sub>), which more commonly is used as a fertilizer, as a cheaper alternative to tetrazole.

The problem with ammonium nitrate is its ability to transition through various solid crystalline states due to changes in temperature, pressure, and moisture as the airbag module sits in the car over the life of the vehicle. As the ammonium nitrate compound switches between these crystalline states, it breaks down and becomes unstable. When that happens, the ammonium nitrate in the airbag inflator unit can explode violently as the airbag deploys in an accident, over-inflating the airbag and, in many cases, sending metal debris from the airbag assembly flying into the occupant compartment. These uncontrolled explosions, and the resulting flying debris, have been responsible for numerous serious injuries and death.

Because of these very dangerous and deadly problems with Takata's frontal airbags, many cars with Takata airbags have been recalled. But many others have yet to be recalled, and there are millions of vehicles on the road with the dangerous airbags in them.

## **Insurance Considerations**

Automotive crashes involving the deployment of Takata frontal airbags require careful evaluation of the individual cases to establish that the known failure of the Takata airbag actually occurred during the crash. This evaluation requires an inspection of the vehicle to establish that the frontal airbag did, in fact, malfunction and cause an uncontrolled explosion, with the resulting excessive pressure and/or metal debris being sprayed into the occupant compartment. This is accomplished through visual examination of the vehicle and frontal airbag, and a download of the vehicle's ECM (black box). Lastly, the injuries suffered must be assessed to determine if they were caused by the explosive deployment of the airbags.

If these indicators are found, then it can be reasonably assumed that the Takata frontal airbag malfunctioned during the crash, as it is known to do. At that point, subrogation of the case against Takata and/or the vehicle manufacturer is something to consider.

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