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## **Do Automobiles Explode?**

By

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The controversy regarding accuracy of staged collisions between automotive vehicles has resulted in various television news magazine commentaries on vehicles exploding. It appears that the media and general public accept the premise that automotive vehicles explode as a result of an accident or fire. Many television shows and motion pictures incorporate automobile chase scenes where invariably a doomed motor vehicle is launched into the air, violently explodes while airborne, and lands in a heap of fiery rubble. Having reviewed statements from people attempting to rescue victims of automobile accidents it is interesting to note the degree of fear of an explosion that is often expressed. In some instances, bystanders have resisted approaching a vehicle to offer assistance to trapped victims because of a fear of an explosion. Spilled gasoline then ignites, and a fire engulfs the vehicle resulting in the death of the victims. Early assistance could have resulted in removal of the occupants of the vehicle prior to fire development. The promulgation of this fear has probably cost the lives of several crash victims. What drives this fear is the marrying of fact and fiction often called *faction*. Both the print and electronic media have played a significant role in the promulgation of *faction* amongst the general public. Several examples are readily available. The Audi 5000 was alleged to suddenly and uncontrollably accelerate. Both National Highway Traffic Safety Administration (NHTSA) and Transport Canada found this be a result of driver error and not a system malfunction. The

Chevrolet Corvair was alleged to have severe vehicle handling difficulty. NHTSA found this not to be the case. The GM pickup crash test illustrates how *faction* has arisen to new heights. The test vehicles were altered in order to induce a fiery and explosive looking incident, just the ingredients necessary for television ratings. The fact is that automobiles rarely explode. An explosion is usually a violent and sudden expansion of gases. Explosion of gasoline vapor requires a well mixed, nearly chemically correct, mixture of gasoline and air to result in an explosion. This condition rarely develops in an automobile.



Figure 1

Figure 1 is a view of an automobile after detonation of 1 lb of TNT in the occupant compartment. Severe upward deformation to the roof structure and torn sheet metal are characteristic of an explosion in the vehicle. Figure 2 is a view of a typical automobile that sustained a total burn encompassing the entire vehicle. Deformations to the metal structure are not indicative of an explosive

event when compared to the vehicle in Figure 1. Auto wrecking yards are full of totally



Figure 2

burned vehicles showing no evidence of an explosion and totally intact fuel tanks. There is often a fear of the vehicle fuel tank exploding during a fire. Typically, the gasoline vapor vents from the filler neck during a fire, thereby relieving pressure in the tank. There is insufficient oxygen in the fuel tank to allow the vapors to accelerate to an explosion. The explosions of vehicles seen in the movies or on TV are usually initiated by a point source charge such as C4 explosive. Witnesses to automobile fires have re-

counted what is perceived to be an explosion. The rapid deflagration of gasoline vapor near spilled gasoline from a ruptured fuel tank may appear to be explosive in nature. The rupturing of vehicle pneumatic tires results in a loud bang that may be interpreted as a gasoline explosion. Many witnesses at automobile accident scenes have an unfounded fear of gasoline explosions, probably in a large part due to violent adventure programs in the electronic

media. In certain instances, victims of automobile accidents have perished due to lack of assistance because of fear of a gasoline explosion. Caution should always be exercised when approaching an accident scene to render assistance. However, the propensity of an automobile to explode as a result of ignition of gasoline vapors is highly exaggerated.

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