

# A.R.E.S. Safety Around Personal Vehicles

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As regular citizens, we are constantly surrounded by transportation vehicles of various types. As A.R.E.S. / R.A.C.E.S members deployed out, we encounter numerous vehicle types in emergency and disaster situations. This training file is intended to make our folks a bit more aware of some of the dangers present around some of the vehicles that could be encountered.

## Cars and Trucks

Today's cars and trucks (personal vehicles) have numerous safety items on an in them that can also present a dangerous hazard. Be aware of these hazards, they can severely injure or kill people. The following are excerpts from an online article:

### **Firefighters Fear Explosive Bumpers : Hazard: Some vehicles have a type of shock absorber that can burst during a blaze.**

Los Angeles firefighters say they have something to add to the list of potential disasters they face each time they approach a burning car: exploding bumpers.

But unlike the unseen threat of a burning battery producing a potentially lethal hydrogen vapor or that of melting seat cushions emitting a deadly cyanide-based gas, this hazard has firefighters reaching for their knees.

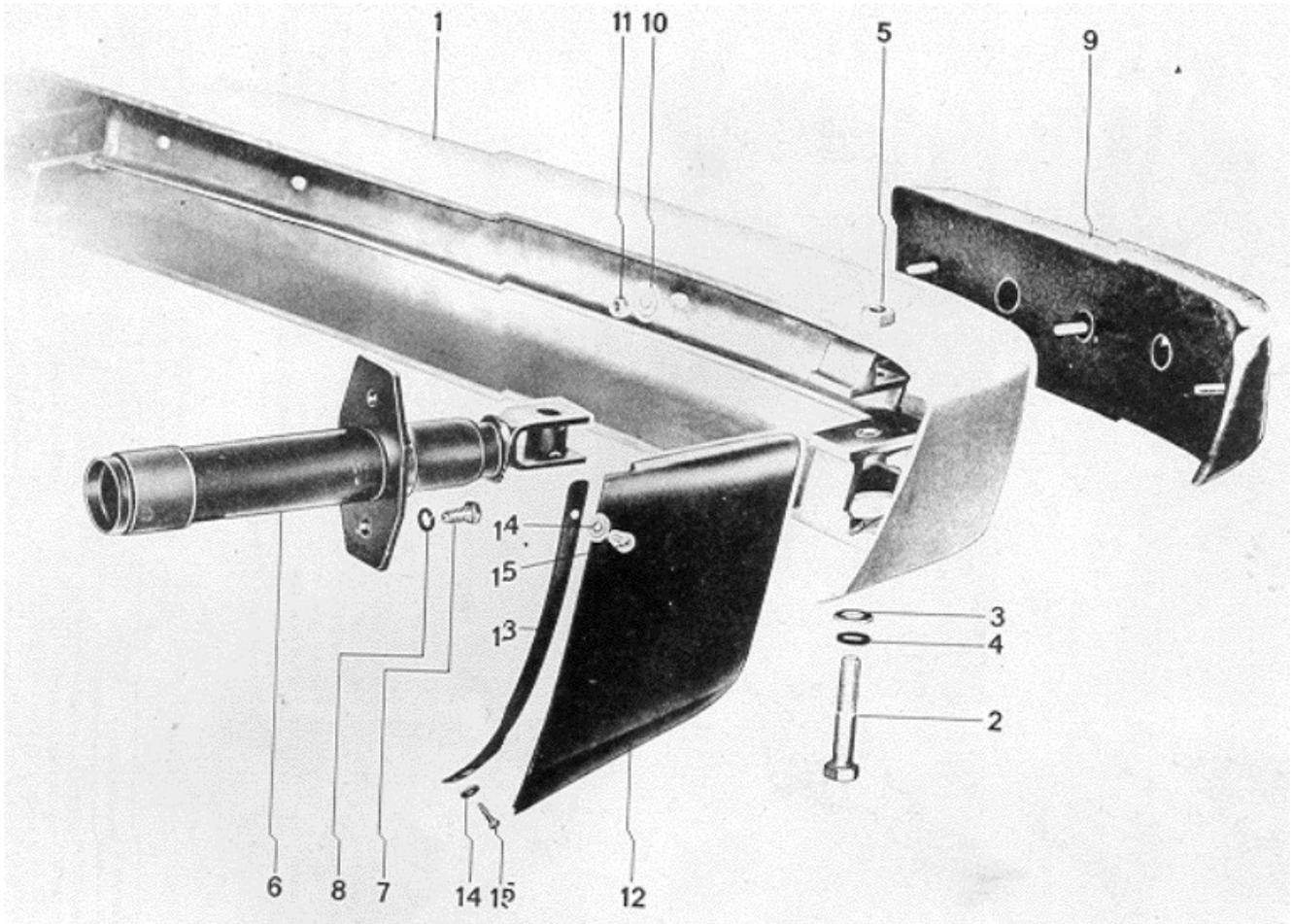
In response to new federal regulations, "safety bumpers" on many cars and trucks built beginning in the early 1980s contain a small gas or gel-filled shock absorber designed to minimize damage to vehicles in low-speed collisions.

But when these pressurized cylinders get too hot, such as during an engine compartment fire, they sometimes burst.

"It becomes a projectile--like a rocket," said George DeMott, a Los Angeles City Fire Department captain and 27-year veteran.

Though there are no statistics on the hazard, tales of exploding bumpers are regularly swapped among Los Angeles firefighters.

A North Hollywood captain said he's heard of one device blasting through a wooden garage door, and another flying more than 100 feet from a flaming car. And in March witnesses looked on as one of the projectiles was launched more than 30 feet from the front bumper of a burning car on the Golden State Freeway.



# 6 (gas/gel filled shock absorber)

While other auto makers began phasing out the pressurized mechanisms when federal bumper standards were relaxed to 2.5 m.p.h. in 1983, Ford continues to use the device in its Taurus, Crown Victoria and Tempo model cars.

Ford spokesman Mike Parris said that although they are more expensive to produce, the company continues to use this type of bumper because it meets the tougher 5 m.p.h. standards, something he said is difficult to accomplish with the newer plastic designs.

Parris said the company has received no reports of bumper mechanisms bursting on its cars or trucks.

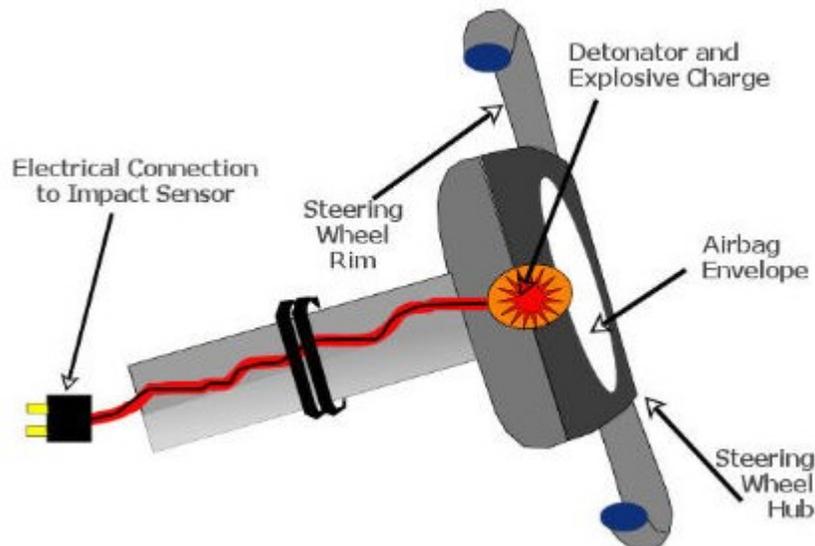
Another danger is that after being compressed in a collision, bumpers can release without warning, thrusting forward not only with pressure contained in the shock absorber, but also with the energy absorbed in the collision.

"If someone is standing in front of one of those, it'll break their legs," said Thomas Frank, also a captain with the Los Angeles City Fire Department. So seriously is the threat taken by the department that in 1987 a supplement was added to its training manual on how to avoid front and rear bumpers while fighting a car fire.

The rarity of the hazard was confirmed by John Ottoson, a senior analyst with the United States Fire Administration.

While the hazard may be "rare" it is still there and something to be aware of. For the full article, visit: [http://articles.latimes.com/1993-06-08/local/me-1042\\_1\\_shock-absorber](http://articles.latimes.com/1993-06-08/local/me-1042_1_shock-absorber)

Another hazard in today's vehicles, un-deployed airbags in a crashed vehicle. Many if not most of today's vehicles have airbags in them to help protect the vehicle occupants in the event of a crash. These airbags use a small explosive charge to rapidly inflate and deploy the airbag in the event of a crash.



It is important to realize that vehicle airbags do not always deploy. It is not uncommon at all to see a significant vehicle accident where airbags did not deploy. This does not necessarily mean there was a malfunction in the airbag system.



However, it should be understood that once a vehicle has suffered an impact, an airbag which did not go off or deploy DURING the accident, easily could go off AFTER the accident... when folks are not expecting it to. Always be aware and cautious of any airbag system that did not deploy if a vehicle has been damaged, it could go off and deploy unexpectedly.

With today's hybrid and electric vehicles, there are important hazards to be aware of. With hydrogen powered vehicles, you will not see a leaking hydrogen fire. Hydrogen can burn nearly invisible. If you suspect or know for sure that a vehicle is hydrogen powered, and has been damaged, be aware that there may be fire that you cannot see.



Hydrogen powered vehicle. Relief valve is venting and on fire.

Hydrogen is quick to burn in the presence of oxygen (O<sub>2</sub>) and can be very explosive. Used as the primary fuel for combustion when launching space shuttles, this is seriously powerful stuff. When hydrogen burns, large quantities of heat and light are given off. The light emitted from a pure hydrogen and oxygen reaction is mainly ultraviolet, making the flame almost invisible – however, in reality, there are often other materials present, creating a visible flame.

Vehicles powered by hydrogen or natural gas use compressed gas cylinders to store the hydrogen or natural gas. Be aware that while it may be a relatively remote chance, if the cylinder becomes compromised, an explosion is not out of the question.



Honda with CNG (compressed natural gas) cylinder system



Honda after CNG cylinder explosion and fire.

With today's electric vehicles and hybrid vehicles, it is important to realize that these vehicles have large battery banks. These battery banks not only contain hazardous and toxic chemicals, but also supply high voltage and amperage. While these systems are deemed safe under normal conditions, if damaged these systems present potential toxic exposure and electrical shock hazards. Even without any gasoline, diesel, natural gas, or hydrogen, electric vehicles still present significant hazards to be aware of. If these banks of batteries catch fire and burn, it is best to be well away from the vehicle as well as uphill and upwind of the vehicle and fire.



Damaged vehicles can also have broken glass, very sharp edges, leaking flammable liquids, and other hazards. Always keep well clear of damaged vehicles in emergency scenes or disaster areas whenever possible. 73