



# THE SAFETY RECORD

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### Not So “Smart Key” Standard

Last month, the National Highway Traffic Safety Administration (NHTSA) Office of Defects Investigation opened a Preliminary Investigation into BMW 7-Series vehicles that roll away because the electronic ignition fails to shift the vehicle into Park when the driver leaves with the key fob. The agency had fielded two consumer complaints, and an unspecified number of Early Warning Reports on rollaway incidents before shipping off a Manufacturer’s Request for Information to BMW on Sept. 29.

If the 7-Series isn’t locking into Park, as consumers have alleged it should, BMW ought to be investigated. But the luxury carmaker should also be commended for designing an electronic key system which complies with the intent and letter of Federal Motor Vehicle Safety Standard 114 because many electronic key systems out there do neither. Starting with a 2002 interpretation letter to an unknown automaker permitting the electronic code to serve as the key to the vehicle, to the enshrinement of that view in a new FMVSS 114 Final Rule in 2006, NHTSA has permitted the introduction of millions of electronic key systems which allow rollaways, vehicle theft – both of which are addressed in FMVSS

114 – and, a new, deadly wrinkle that was not imagined by the standard: carbon monoxide poisonings.

In January, the Society for Automotive Engineers released a recommended practice for keyless ignitions that mostly codifies what automakers have already been doing for the last 20 years, while doing little to alleviate the hazards introduced by poor designs. More recently, NHTSA has indicated that it will re-visit the standard sometime in the near future with amendments designed to tighten the current regulation or maybe introduce standardization into electronic ignition systems.

These corrections would not be necessary if NHTSA had not allowed automakers to separate the electronic key code from its housing – the key fob, creating the two-part key. Under the current schema, the fob starts the vehicle by delivering the electronic code, but plays no role in turning it off. To do that, typically, the driver has to turn off the ignition (usually with a push-button on the dash or console), place the transmission into Park, and exit the vehicle through the driver’s door. Until that sequence is completed, your invisible key (the electronic code) is still (metaphorically) dangling in the ignition. Unfortunately, most consumers don’t know that – because

it defies the well-established relationship between the ignition and the key, and because many automakers call the fob the “key” in owner’s manuals and on dashboard messages to the driver.

### The Key You Can’t See

Originally, the “key” in Federal Motor Vehicle Safety Standard 114 Theft Protection was defined solely according to its security function. But in 2005, when the agency proposed amended FMVSS 114 to reflect the new, electronic systems, it redefined the key in relation to a different function. The key was now “a physical device or an electronic code which, when inserted into the starting system (by physical or electronic means), enables the vehicle operator to activate the engine or motor.” In other words, the key is what starts the vehicle.

In plain English, the fob must be considered the key, because without it, the driver cannot start the vehicle. The electronic code is more akin to the digital realization of indents on a metal key. Just as a driver could not start a vehicle using a traditional ignition system with just the bottom half of the key, a driver cannot start an electronic system without the fob. Drivers need the entire object – the traditional key’s head or the electronic (Cont. on p. 2)

### Manufacturer Takes Battle over CPSC Database to the Courts; GAO Finds Little to Complain About

WASHINGTON, D.C. – Unable to derail the consumer products database mandated by the 2008 Consumer Product Safety Improvement Act in Congress, one manufacturer has turned to the courts. Meanwhile, the Government Accounting Office’s first run at the publicly accessible complaints database shows that SaferProducts.gov works pretty much as advertised.

On October 17, “Company Doe” filed a motion in a U.S. District Court in Maryland to prevent the U.S. Consumer Product Safety Commission

from publishing a report alleging that a product caused an injury to a child. According to news accounts, the report emanated not from the alleged victim or his caregivers, but from another government agency, which could range from federal to a local entity, such as a fire or health department. The unnamed manufacturer characterized the report as “baseless” and sought anonymity for all filings, arguing that revealing its identity was tantamount to publishing the report in the database. The CPSC has said that it would be filing a motion

to unseal the claim, but declined to comment further.

The publicly accessible and searchable complaint database was a cornerstone of CPSIA, which was signed into law by President George W. Bush and passed with bi-partisan support and overwhelming majorities. (Only one representative and three senators voted against it.) Implementation, however, has been much less popular. Manufacturers, who have had near (Cont. on p. 7)

## Not So “Smart Key” Standard

(Cont. from p. 1)

key’s fob –to start the vehicle. But, not according to NHTSA and the automakers.

NHTSA has declined to enforce the regulation, as defined. In many real world instances, vehicles with electronically based systems have, in essence, two keys. One is the physical fob, which delivers the electronic code to the vehicle. You must use this key to start the vehicle. Once the fob delivers the code to the vehicle, its role as the “key” ends. To “remove” the second “key” (the electronic code), you must put the vehicle in Park, turn off the engine and open the driver’s door, or a similar sequence involving killing the engine and putting the vehicle transmission into Park.

In 1992, General Motors sought the agency’s guidance in developing an electronic lock/ignition system. In its reply, NHTSA opened the door to the two-part key. It agreed that “an electronic code which is entered into a locking ignition system by the vehicle operator to permit operation of the system comes within this definition.” The agency also affirmed that GM could re-engineer the locking function of the system to accommodate this new system, as long as the vehicle transmission was in the Park position or automatically locked in Park when the “key” was removed.

In a 2002 interpretation letter to unnamed automakers, the agency took its basic interpretation another step. Chief Counsel Jacqueline Glassman affirmed that a similar system complied with FMVSS 114 – even though, “the removal of the ‘Smart Key’ from the running vehicle would have no effect on the vehicle’s operation until the engine is stopped.”

Even as Glassman stated that the system as described was compliant, she acknowledged the human factors problem:

“We observe that if the ‘Smart Key’ device remained in the car, e.g. in the pocket of a jacket lying on the seat, a person would need only turn the ignition switch knob to start the engine. It appears to us

that, with systems of this kind, there would be, in the absence of some kind of a warning, a greater likelihood of drivers inadvertently leaving a ‘Smart Key’ device in the car than with a traditional key. This is because the driver must physically touch a traditional key, unlike the ‘Smart Key’ device, as part of turning off the engine. You and/or the vehicle manufacturer may wish to consider whether there are any practicable means of reducing the possibility of drivers inadvertently leaving their ‘Smart Key’ devices in the car.”

### The Hazards of Today’s Electronic Key Systems

Glassman’s reasoning – that changing the traditional interface between the driver and the key would have negative consequences for drivers – was right. Her take on the consequences, however, was not – leaving the key fob in the vehicle was the least of it. Consider these incidents that are occurring in the real world because of a key you can’t see:

In 2010, Palm Beach police concluded that 29-year-old Chastity Glisson died of carbon monoxide poisoning after she inadvertently left her 2006 Lexus running in the garage attached to her Boca Raton town house. Her key fob was found in the house.

The Porsche Panamera’s keyless ignition system was blamed in a September heist from a dealership in Lawrence, New Jersey. Police speculated that the pair of thieves – two twenty-somethings who posed as potential buyers – made off with the \$148,000 vehicle by switching key fobs, and coming back for the sports car after the dealership closed.

In February, a Mercedes owner complained to NHTSA:

“I purchased a brand new 2011 Mercedes Benz gl450 4matic last night. The car has a keyless go system. When I was pulling into my driveway with my kids in the car this afternoon I accidentally turned the car off without putting the car in park and began to exit the

vehicle. I noticed the car started to roll back down my driveway. The car never went into park when I turned it off. Rather it went into neutral. I have never driven a car that didn’t go into a park mode when the engine was terminated. Thank goodness a child wasn’t playing in my driveway or my dog was there. A car of this sophistication, technology and price should have shifted into the park mode, not the neutral mode when the engine was turned off even if the car wasn’t put in park. Additionally, if that is how the car works, then I would think there would be a safety switch on the driver’s seat that would disengage the gear when I went to get out of the car. I am truly concerned for the safety of others as well as parked cars with what I believe to be a major design flaw.”

These incidents are not isolated. At least two other people have died in carbon monoxide poisoning incidents similar to Glisson’s; several others have been injured. Keyless ignition systems are presenting thieves new opportunities to nick high-end vehicles. Not only have academics demonstrated methodologies to start electronic key systems using cell phones, laptops and relay antennas, but real criminals have used them to steal David Beckham’s BMW X5 – twice. Rollaways, like the incident described by the Mercedes owner, are actually a new design feature of many electronic ignition systems.

SRS recently examined some 2012 models with smart keys, running 15 vehicles from major manufacturers through a series of scenarios designed to reveal their strategies for halting vehicle operations in the absence of a key fob and for alerting the driver that the vehicle was not in Park.

Most manufacturers do not have warnings when the key fob has left the vehicle and prevent restart when the key fob is removed and the driver exits through the driver’s door. Several vehicles included visual indicators that the “key” (meaning the fob) was no longer in the vehicle when it was driven and the key fob was not in

the vehicle, or that the “remote starter” was not detected or some similar language that avoided calling the fob a “key.” If a manufacturer used an audible telltale, it typically was neither distinct as a warning, nor heard from outside the vehicle. Once the driver closes the door and exits, an interior audible telltale no longer functions as an alert to the driver, because the sound is contained within the vehicle. SRS found no evidence of any automatic engine shutoff mechanisms when key fobs are removed from vehicles and the engines are left running; however, they may be embedded in software that would activate after a length of time. For the most part, the trigger for electronic code removal – which according to NHTSA and the manufacturers is the real “key” – is the driver’s door.

SRS has also examined other model year vehicles like the 2008 Toyota Highlander Hybrid and 2010 Lexus RX350 to determine whether the vehicles could be driven when the key fob was not present, whether the vehicle could be remotely started with the key and driven without the key fob present, and whether the vehicle could be left in Neutral once the key fob was physically removed from the vehicle. Our examinations demonstrated that these vehicles, like most other Smart Key-equipped models, once started, can be driven without the key fob, which most owners believe is the “key.” If the driver exits the vehicle with the vehicle running and removes the fob from the interior, reenters the vehicle without the key fob, the vehicle can be driven normally, but the Lexus dash indicator notes that the “key” is out of range (i.e., the fob is not in the vehicle). There is no consequence to mobility. The message to the driver reinforces the notion the key fob is the key. Once the vehicle is shut down, it cannot be restarted without the fob present in the vehicle.

In another scenario, if the driver remains in the vehicle without opening the driver’s door and the key fob is removed (i.e., a passenger removes the key fob in a

(Cont. on p. 6)

## Electromagnetic Interference Enables/Disables GM Airbags; GM Forgets to Inform Customers

What happens when you put your iPad on the front passenger seat of a 2012 Buick Enclave?

That depends on which General Motors source you consult. In May, the automaker sent out a Technical Service Bulletin warning that when “certain electronic devices” such as computers, MP3 players and cell phones are placed in the front passenger seat of a wide range of recent models, the front passenger airbag indicator may illuminate, enabling the airbag, and activating the seatbelt reminder light and warning chime – due to electromagnetic interference (EMI). Even though that iPad only weighs 1.5 pounds, the seat sensor suddenly thinks that this designated seating position is occupied.

More recently, an OnStar operator told a GM owner that if a passenger is seated in the right front seat with an electronic device in his or her lap, EMI may disable the airbag. In other words, if the sensor correctly perceives that an occupant is in the seat, then interference from the iPad tells the sensor to turn the airbag off. In complaints reported to SRS GM owners said electronic devices held by a front seat passenger turned off the passenger airbag.

“We called OnStar and spoke to a tech,” said one owner. “He confirmed that this can be caused by cell phones and cell towers.”

If one consults the owner’s manual of a 2012 Buick Enclave (which is among the models covered in the May 25 TSB), it warns: “The front passenger safety belt reminder light and chime may turn on if an object is put on the seat such as a briefcase, handbag, grocery bag, laptop, or other electronic device. To turn off the reminder light and/or chime, remove the object from the seat or buckle the safety belt.” Is this a warning about lightweight objects triggering a seatbelt sensor? Does the seat sensor confuse an iPhone with an occupant too small for safe protection from the airbag? Or, more likely, is this an obfuscated EMI warning? The owner’s manual is silent on this caution.

EMI is an old problem; automakers

have been designing to protect vehicle electronics from it for decades. For example, a Florida circuit judge’s scathing decision to set aside a civil jury verdict in favor of Ford Motor Company in a Unintended Acceleration case involving an Aerostar recounted evidence showing that as far back as 1976, Ford engineers obtained a patent describing a design for the cruise control system’s printed circuit board to reduce the risk of a sudden acceleration posed by EMI. The switches in the cruise control system Ford developed and installed in millions of vehicles were vulnerable at gear engagement to a current spike from electromagnetic interference that can bypass the control logic and induce the servo to pull the throttle wide open. (Ford went on to conceal this problem from the NHTSA and its own testifying experts in subsequent cases, for years.

See [How Ford Concealed Evidence of Electronically Caused UA](#))

More recently, EMI was theorized, and discarded, by NHTSA and its research contractor, NASA’s Engineering Safety Center, as a cause of Toyota UA – although NHTSA’s Vehicle Research and Test Center was able to produce a spike in RPMs in EMI tests on a 2007 Lexus. In a report that closed a 2007 Lexus floor mat interference investigation, ODI investigators said:

“Multiple electrical signals were introduced into the electrical system to test the robustness of the electronics against single point failures due to electrical interference. The system proved to have multiple redundancies and showed no vulnerabilities to electrical signal activities. Magnetic fields were introduced in proximity to the throttle body and accelerator pedal potentiometers and did result in an increase in engine revolutions per minute (RPM) of up to approximately 1,000 RPM, similar to a cold-idle engine RPM level.”

And in Dec. 2007, a 2006 Tundra owner filed this complaint with ODI:

“I am a [sic] ASE certified master tech and mechanic of 15 years. I owned a [sic] auto repair shop for 5 years and have since returned the vehicle to Toyota lease. My 2006 Toyota Tundra would accelerate on

its own at times. To stop it I would have to turn off the key, pull over and then restart it. Being a master technician I assure you it was electronic in nature. In no way was it a floor mat or accelerator pedal stuck. I did take it in for repair and was told there was no problem found. It did happen in the same location 3 times and could have been caused by EMI. Again, it was electrical in nature, there is no doubt of this.”

But, back to GM. The May 25 TSB covers 12 models over the 2009-2012 model years: the Buick Enclave; Cadillac CTS and SRX; Chevrolet Cobalt; Chevrolet HHR; Chevrolet Impala, Traverse; Chevrolet Equinox; Chevrolet Sonic; GMC Acadia; GMC Terrain; Saturn Outlook and Saturn Vue.

It warns “some electronic devices placed on the front passenger seat may interfere with the electric field generated by the PPS system, causing it to enable (turn ON) the passenger airbag and turn on the safety belt reminder light and chime – even though the seat is not occupied. The electronic device does not necessarily need to be turned on to cause this condition.”

It also cautions techs: “Never rest the diagnostic scan tool or components on the passenger front seat or touch the passenger front seat while the diagnostic scan tool is in contact with your body. This may cause the SIR lamp to illuminate while holding the diagnostic scan tool because your body can transfer the electronic ‘noise’ to the sensor mat in the passenger front seat.” (This may explain what happens when a right front seat passenger uses a cell phone.)

The fix was to simply clear the codes – which could relate to a variety of error messages involving the seat sensor or the ECU – and send the customer on his way.

If the GM owner lives in the Texas Panhandle, however, the problem is worse, and requires a more intensive fix. On May 25, the automaker issued a second and unusual warning for techs in Texas. This TSB warned that the airbag warning

light could behave erratically in the presence of EMI.

“This condition may be caused by possible electromagnetic interference in the Amarillo, Texas area from external sources such as aviation airspace traffic radar, creating erratic sensor information to the SDM,” the bulletin said.

This TSB covered 18 models in the 2010 and 2011 model years including 2010-2011 Cadillac Escalades; Chevrolet Avalanche, Silverado, Suburban, Tahoe, Yukon Denali; and GMC Sierra and Yukon Denali. In this case, the techs were required to amend the sensor by adding ferrite clamp beads on either side of the inflatable restraint sensor wire harness.

There are several international voluntary standards and vehicle manufacturers have set their own criteria governing EMI, but no Federal Motor Vehicle Safety Standard. But as the world goes ever more wireless, are automakers and NHTSA keeping up? According to EMI Expert Keith Armstrong, “some vehicle manufacturer’s standard tests only apply to the normal operating functions of the components and subsystems. For example, an airbag should not operate, a speedometer should show the correct speed within specified tolerances, etc., but they lack requirements to test the correct operation of safety systems, by stimulating them with a signal that should make them operate, and check that they always do operate as designed whilst exposed to EM disturbances.”

As the transformation of an automobile continues from a collection of mechanical parts to a computer on wheels with communication interfaces to non-vehicle wireless devices from the driver and passengers inside, or from sources outside the vehicle, today’s vehicles are expected to function correctly in a very noisy electrical environment.

## DOT Inspector General Audit Finds NHTSA Defects Office Needs Improvement but Examination Falls Short

The DOT Office of Inspector General has found that NHTSA's Office of Defect Investigations followed its established procedures in conducting its inquiries into Toyota Sudden Acceleration for nearly a decade, but the OIG rapped the agency for its lack of transparency and documentation.

The new audit concluded NHTSA needs to make improvements in its handling of auto safety investigations, but offered no substantive evaluation of the agency's use of science in examining Toyota unintended acceleration. The OIG did not seek any independent source of technical knowledge, relying instead on a layman's understanding of easily observable phenomena: "Although we did not contract for any scientific or engineering expertise to assess independently any UA-related technical issues, we participated in and observed simulated pedal misapplication and pedal entrapment in Toyota vehicles with ODI officials. As the driver in the simulation depressed the gas pedal to accelerate, the floor mat trapped the pedal. The simulations clearly showed the potentially serious consequences that could result during pedal entrapment without the brake override system," the report stated.

The audit instead focused on improved training and better documentation on how complaints are addressed and investigations opened and closed.

The OIG initiated the audit in February to assess the effectiveness of

ODI's processes for identifying and addressing safety defects. It was later expanded at the request of Congress and the Secretary of Transportation to include: an analysis of ODI's industry-wide UA complaints and investigations; an evaluation of its resources to identify and address safety defects and of its compliance with government ethics rules; and a comparison of ODI's processes with other countries' defect investigation and recall programs.

While accelerator pedal entrapment is a cause of UA, OIG failed to address any of the issues dogging the NHTSA investigations. It made no comment on allegations that ODI ignored complaints that did not fit its theories, or mis-categorized complaints that could not be attributed to floor mat entrapment or driver errors. It did not investigate the numerous deficiencies in the NASA Engineering Safety Center evaluation of Toyota UA. The NASA study – led by NHTSA – for example, purported to draw conclusions about high-speed, long-duration events, but the researchers only examined vehicles that had experienced low-speed, short-duration events. The OIG was silent on NHTSA's failure to further investigate NASA findings related to sub-standard electronics and its reliance on Toyota and its litigation defense expert Exponent to dismiss important findings identified with electronic failures.

The report did note the lack of ODI staff training, but did not discuss the implications of the agency's technical ignorance in mounting an effective defect investigation. Nor did the OIG study show how ODI's lack of training in modern electronic engine management and controls affected their ability to investigate and question the manufacturer's representations of sophisticated and interconnected vehicle systems.

The OIG did find fault with ODI's lack of documentation and transparency:

"Without comprehensive documentation of pre-investigation activities, ODI's decisions are open to interpretation and questions after the fact, potentially undermining public confidence in its actions." Because NHTSA routinely fails to document meetings manufacturers, OIG recommended "a complete and transparent record system with documented support for decisions that significantly affect its investigations."

The audit was an opportunity to delve into the myriad inconsistencies and omissions outlined in e-mails and other documentation released as a result of Congressional investigations and FOIAs, and recounted in independent analyses of the agency's process, but if OIG investigators took it, the answers are missing from the final report. SRS has reported many of ODI's investigatory

abuses, the effect on Toyota investigations, and implications for future defect probes (see SRS web page [Toyota Unintended Acceleration](#)):

- NHTSA relied on Toyota's defense litigation expert Exponent for a warranty analysis used to dismiss the significance of physical evidence of an electronic cause of UA in some Toyotas. This conflict of interest was not disclosed.

- NHTSA and NASA based analyses on miscoded data and unsupported assumptions while failing to record and maintain the original data they on, preventing replication.

- NHTSA/NASA withheld from public view pieces of their latest report that are not related to Toyota's confidential business.

- NHTSA has continually misrepresented or ignored owners' complaints to buttress its belief that floor mat interference was to blame. (SRS online articles and reports on this issue include: [Exclusion of Early Camry Deaths Hamper Later Investigations](#); [Makin' it Fit so We Can Acquit](#); [Another Attack of the Killer Floor Mats: Sarasota Edition](#))

NHTSA's latest effort to prevent independent assessments of owners' complaints that don't match pedal interference or driver error is to keep the report and associated documents out of the public record. In some cases, the agency has claimed that photos and data are part of its "deliberative process" and exempt from public disclosure under the Freedom of Information Act.

### Study Shows Seat Belt Misuse Among 4-9 Year Olds

A new study shows that many parents know that adult seat belts do not fit their older children properly, but use them anyway.

Researchers from the University of Michigan's Child Health Evaluation and Research Unit and its Transportation Research Institute set out to determine the frequency with which drivers reported improper seat belt positioning among the Forgotten Child set – so named by the safety community, because these

children have outgrown five-point child safety restraints, yet are too small for seat belts. This group of children needs the aid of a booster seat to achieve a proper belt fit, with the lap portion of the belt extended low across the hips, and the shoulder belt resting over the shoulder, rather than on the child's neck.

The analysis, published in *Academic Pediatrics*, focused on caregiver responses to five questions in the phone-based 2007 Motor Vehicle Occupant Safety Survey regarding

children, 4-9 years of age, and problems attributed to the lap belt, the shoulder belt or both.

Among 891 adults who drove children 4 to 9 years of age, the vast majority, 534 (60 percent) reported they always used a child safety seat. The second largest group, 241 (27percent) reported that they always used the vehicle seat belt. The remainder reported that they sometimes used either, or used no restraints at all. But the rate of child seat use steadily dropped as the

children aged. By 9 years old, only 20 percent were always secured in child safety seats, compared to 61 percent of 4-6 year olds, according to parents' responses.

Parents reported using seat belts for 334 (37 percent) of 4- to 9-year-old child passengers. And, of those, 78 percent of the drivers reported improper belt fit, with improper shoulder belt position accounting for 44 percent and improper lap belt position for 62

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## Rulemaking Update

### New Child Dummies for Booster Seat Testing Offer Advancement – and Raise Significant Questions

Acknowledging concerns about the biofidelity of the new HIII 6-year-old dummy, the National Highway Traffic Safety Administration issued a Final Rule on Sept. 9 allowing manufacturers of child restraint systems to test for FMVSS 213 compliance with either the Hybrid II 6-year-old dummy (H2-6C) or the advanced Hybrid III 6-year-old dummy (HIII-6C).

Touted by NHTSA as the state-of-the-art, more biofidelic child dummy, the HIII 6C also has increased instrumentation allowing for better assessment of impact responses such as neck moments and chest deflections not measured by the HII 6C. However, the new dummy is also designed differently than the HII-6C – the neck and ribs are softer, and the thorax is stiffer, which can significantly alter the kinematics of the dummy during testing.

Outside testing entities, however, were not as impressed with the HIII-6C. TraumaLink test lab raised significant concerns with the performance of the dummy when their tests revealed extremely large neck elongation unlikely to be seen in children in real crashes, which resulted in high calculated injury values. TraumaLink suggested that this would predict a pattern of injuries not seen in the real world. They argued that the “softer neck” caused increased neck elongation and forward excursion resulting in higher Head Injury Criteria (HIC) from chin-to-chest contact and in some cases, head-to-knee contact.

SafetyBeltSafe concurred, documenting “unrealistic stretching and bending of this dummy’s neck while tightly restrained by a lap shoulder belt in a booster. The result was that the dummy’s face directly contacted the chest, generating an unrealistic and unacceptably high HIC.”

In fact, NHTSA’s Vehicle Research and Test Center (VRTC) tests with the dummy generated head excursion increases from 2 to 4.5 inches.

Researchers also expressed concern about the new HIII-6C dummies

permanently flexed hips which don’t allow for a slouched position and may inhibit submarining in non-optimal booster designs.

The real question is whether the dummy differences are more or less like what occurs in the real world. It is clear from a variety of recent testing of child dummies in child restraints, booster seats and vehicle seat belts, that there are significant concerns with the ability of child dummies to predict child occupant kinematics. NHTSA states that these issues are still under investigation as research and development of the HIII-6C dummy continues, but until they are resolved, the manufacturers will have the option of using the dummy of their choice.

### CPSC Addresses Table Saw Safety

This month, the U.S. Consumer Product Safety Commission issued an Advance Notice of Proposed Rulemaking to require performance standards for a system to reduce or prevent injuries from contact with the blade of a table saw. The Oct. 11 announcement, in response to a 2003 petition, requested comments about performance safety standards to address injury. The CPSC study documented more than 60,000 blade contact injuries annually at a cost of \$2.63 billion dollars each year, in 2007 and 2008.

Standard safety devices on table saws come in two forms: blade guards and kickback prevention devices. Traditional blade guards, however, can hinder table saw use, leading users to remove them. Blade guards can jam the work piece, block the user’s view and poorly align the splitter and the blade. In addition, difficult cuts actually require removal of the guard.

The initial voluntary standard published in 1971 by Underwriters Laboratories (UL987 Stationary and Fixed Electric Tools) has been revised many times, but essentially requires a guard that consists of a hood a spreader and a kickback device. The guard

must completely enclose the sides and top of the saw blade above the table and automatically adjust to the thickness of the work piece. Performance requirements were subsequently added, which required new table saws to have a permanent riving knife that was adjustable for all table saw operations. The CPSC is still concerned that the UL standard does not adequately address blade contact injuries or the potential for removal of the safety components from the saw. In its proposal, CPSC documents an innovative modular blade guard design, and a new blade contact detection and reaction system that stops and retracts below the table when it detects contact with skin.

The Occupational Safety and Health Administration (OSHA) also has a regulation on table saws in the workplace that requires a guarded hood, inspections and maintenance of wood working machinery. The OSHA standards are effective in the workplace, but CPSC determined that home use by consumers needed additional protection.

The Commission requested comments on whether it should issue a voluntary standard, a mandatory rule or a labeling requirement for warnings on the device. They specifically requested suggestions for potential requirements for such a standard and information on new technologies that make table saws safer.

### CPSC Proposes Mandatory Standard for Child Play Yard – Many Manufacturers’ Ignore Voluntary Standard

The CPSC has issued a Notice of Proposed Rulemaking to regulate children’s play yards. A “play yard” is a framed enclosure that has a floor and mesh or fabric-sided panels, primarily intended to provide a play or sleeping environment for children, that can fold for storage or travel. They are intended for children who are less than 35 inches tall who cannot climb out of the product.

Of the 2.9 million play yards sold in the US each year, only about *half* of the manufacturers have certified them to the ASTM voluntary standard established by the Juvenile Products Manufacturers Association (ASTM F-406-11). This may explain the

numerous injuries and fatalities associated with play yards. The CPSC’s Directorate for Epidemiology reported 2,128 incidents from early November 2007 until early April 2011, including 49 fatalities and 165 nonfatal injuries. These incidents include suffocation from soft or extra bedding, and contusions and lacerations caused by the collapse of the side rail or sides of the structure, broken or detached component parts, and sharp surfaces.

The current ASTM standard for play yards is the basis for the proposed rule. This voluntary standard restricts sharp points and protrusions, lead paint and flammable solids and establishes requirements for stability, side height, floor strength, side deflection and corner bracket strength. The ASTM standard also contains requirements to protect children from entrapment and mattress displacement, and requirements that eliminate the risk that the outside rails collapse in a v-shape or result in a scissoring effect.

The new CPSC standard would incorporate the ASTM standard with a few changes intended to reduce the potential for improper testing, specifically related to the floor strength test and the corner bracket test.

### Vehicle Safety Information Resource Center

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(Cont. from p. 2)

Bag or jacket or is removed through a window or passenger door), in many vehicles there is no indication to the driver that the key fob is no longer in the vehicle. The RX 350 will alert the driver with an audible tone that the vehicle has not been put into Park. But there is no warning that the vehicle is in Park, but still running, when the key fob alone or the key fob and the driver exits the vehicle.

In the past, the driver had three cues that the key was still in the ignition and that the vehicle was running – the physical absence of the key in his possession, the sound of the engine, and the audible telltale. The latter is mandated by FMVSS 114 because, the agency has argued, drivers need a reminder that they have left the key in the vehicle. The electronic systems coupled with today’s quiet engines have removed two of these cues, and created a scenario that the originators of FMVSS 114 never anticipated. In addition, many lighting systems remain on for some period of time whether or not the vehicle is running or off, making it hard for drivers to discern what state the vehicle is in.

### How Did We Get Here? A Brief History of FMVSS 114

In 1967, the Federal Highway Administration first proposed adding a theft protection standard – FMVSS 114 – out of concern that stolen vehicles constituted a major safety hazard because unauthorized drivers were more likely to initiate crashes.

The agency’s first proposal would have required cars to be equipped with devices to remind drivers to remove keys when leaving their vehicles and require manufacturers to use a large number of locking system combinations to prevent use of master keys for theft. The rule was officially established on April 27, 1968, and became effective in January 1970. The rule remained substantially unchanged from the proposal and reiterated the safety concerns related to vehicle theft. By 1980, the anti-theft rule had been tweaked and expanded to

include light trucks and multipurpose passenger vehicles (MPV’s) whose GVWR of 10,000 pounds or less.

Eight years later, the agency proposed amending the rule to encompass the problem of roll-away vehicles. In 1988, the agency’s Notice of Proposed Rulemaking noted that it received complaints of accidents and injuries associated with steering wheel lock-up when a key is inadvertently removed, and inadvertent actuation of the transmission gear shift lever in vehicles with automatic transmissions. The latter, the agency said, “often results from children inadvertently moving the gear shift level [sic] from ‘park’ to ‘neutral’ in a stationary vehicle with the ignition turned off. The vehicle then rolls away. Most inadvertent gear shift accidents involve property damage only. However, there have been several reports of recent cases resulting in serious or fatal injuries. In these cases, a child inside the vehicle inadvertently moved the gear shift level [sic], and the vehicle rolled out of control injuring or killing a child inside or outside the vehicle.”

The proposed amendment would have required gear shift lever locks on automatic transmissions in place of the then-current requirement, which allowed for a steering column or gear shift lever lock, or both. The proposed requirement would have prevented shifting the transmission after the key was removed and locking the gearshift or steering column while the vehicle is in motion.

Two years later, the agency issued a Final Rule. FMVSS 114 now required vehicles with automatic transmissions that have a Park position to have a key-locking system that prevented removal of the key unless the transmission was locked in Park or became locked in Park as the direct result of removing the key. This requirement became effective for vehicles manufactured after September 1, 1992. The proposal to prevent steering lock-

up was not adopted in the final rule, but the agency noted that the amendment to prevent transmission lever shifting would also serve to prevent the removal of the key while the vehicle was in motion, because the amendment allowed key removal only when the transmission is in Park.

In the early 1990s, the agency began to field inquiries from manufacturers asking how FMVSS 114 would affect the development of keyless and electronic ignition systems.

In August 2005, NHTSA decided to address these new systems. It published a Notice of Proposed Rulemaking to amend the theft protection standard to reflect technological advances since the standard was last amended. After receiving several petitions from manufacturers requesting confirmation that their new systems were in compliance, NHTSA acknowledged that the regulatory language had become outdated and incompatible with key locking systems that employ electronic codes to lock and unlock the vehicle and to turn on the engine. The agency proposed to reorganize the regulation to separate the text related to theft protection from that intended to prevent unintended rollaway. It also wanted to simplify the language, redefine the word “key” to better reflect electronic codes and other locking devices and remove provisions that unnecessarily restrict design – such as the provision allowing only override systems that prevent steering before the key can be released or the transmission lever can be shifted.

On April 7, 2006, NHTSA issued a Final Rule to address comments and amend the theft protection standard as proposed in the August 2005 NPRM. NHTSA declined to drop the audible warning requirement, proposed by the Alliance of Automobile Manufacturers, because the current fleet uniformly already employed audible warnings and the agency said it was unaware of any vehicles in production using a non-audible notification method.

### FMVSS 114: Not Just for Theft Protection

For two decades, FMVSS 114 has clearly served a two-fold purpose: prevent auto theft and vehicle rollaways caused by the inadvertent actuation of the shift lever. The anti-theft purpose has been a part of the rule since 1970, and rollaway prevention became a feature of a 1988 Final Rule. The crux of those protections has been preventing drivers from leaving keys in their vehicles or in a state that rendered vehicles vulnerable to unintentional movement.

Both intentions were firmly rooted in safety concerns. From the rule’s inception, the agency argued that this rule would reduce injuries and deaths caused by auto theft. In establishing the standard, the agency cited a Department of Justice study that 94,000 stolen cars were in crashes in 1966, and more than 18,000 of these incidents resulted in injury to one or more people. According to the report, the accident rate for stolen cars was some 200 times greater than the normal accident rate for non-stolen vehicles. This standard would clearly benefit safety, by reducing the number of stolen vehicles, the agency argued.

The agency has reliably affirmed the rule’s intent every time it amended it, right through to the last Final Rule in 2006: “Our safety standard on theft protection specifies vehicle performance requirements intended to reduce the incidence of crashes resulting from theft and accidental rollaway of motor vehicles.”

Regardless of how the vehicle key is constructed – metal or digital – the operator must physically place the transmission into Park to remove the key, or the transmission must automatically lock the vehicle in Park, if the transmission is in any other position when the vehicle is turned off. As the agency noted in the 2006 Final Rule: “Systems using an electronic code instead of conventional key would satisfy

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## Not So “Smart Key” Standard

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the rollaway prevention provisions if the code remained in the vehicle until the transmission gear is locked in the ‘park’ position.”

In 2006, when the agency made the last round of amendments, it again rejected the Alliance of Automobile Manufacturers argument that an audible telltale was not necessary, based on human factors:

“A warning must be sufficient to catch a driver’s attention before he or she exits the vehicle without the keys. For example, a visual dashboard telltale might be insufficient to accomplish this goal. We believe that it is necessary to carefully examine the alternatives to audible warnings in order to make sure that they are effective in reducing likelihood of drivers leaving their keys in the vehicle.”

For these reasons, the rule makes two demands on key systems. One, the vehicle must be locked in park before the key is removed, or must automatically lock in place when the key is removed. Two, once the key is removed, normal activation of the vehicle’s engine or motor; and either steering or forward self-mobility of the vehicle, or both must be prevented.

### SAE: Late to Party, Came Without a Gift

In January, SAE issued an exceedingly weak keyless ignition sys-

tems standard. Issued about 20 years after manufacturers began offering the first keyless ignition systems, SAE J2948 does little to alter the status quo. Most manufacturers’ systems already meet the very generic recommendations, and many manufacturers already have developed their preferred stop/start sequences.

SAE’s J2948 does address the problem of shutting down a keyless ignition system in an open throttle situation – a problem that emerged during the Toyota Sudden Unintended Acceleration crisis. Consumers who experienced a long duration acceleration event often reported that they hit the ignition button multiple times, in an attempt to bring the vehicle to a stop – to no avail. These drivers did not know the Toyota system required the driver to hold the ignition button in for a full three seconds before it would shut down an engine that was racing at full throttle while the vehicle was underway. This was the manufacturer’s solution to prevent inadvertent shutdowns if the switch was bumped. In an emergency situation, drivers with few options to control a vehicle that is not responding to their brake commands naturally reacted by hitting the ignition button multiple times. This standard takes pains to define short and long actuations and recommends that systems undergo a stop when the ignition button is actuated for a long period of

time or is subject to a series of short actuations. BMW vehicles, for example, will shut down the engine after three short actuations.

However, SAE J2948 does nothing to ensure FMVSS 114’s rollaway and anti-theft protections – in fact, it’s weaker than the mandatory regulation. Today’s keyless entry systems – which already meet the provisions of J2948 – can be exited without the vehicle’s transmission being locked into Park, creating a rollaway hazard. They can also be driven away, under many conditions, when the fob is not present, rendering a vehicle susceptible to theft. Similarly, SAE J2948 does not address the problem of drivers leaving their vehicle engines on – sometimes until all the fuel is spent – with the key fob in their possession. This circumstance has already led to carbon monoxide poisoning deaths of at least three Toyota owners.

The SAE J standard does not define critical design concepts, such as “key” and “audible.” The audible telltale in many vehicles is often too soft, too similar to other auditory telltales, or confined to the interior of the vehicle, and thus completely inaudible to the driver, once he has exited and shut the door.

Finally, SAE J2948 does nothing to address the direct misinformation conveyed to the driver by the

manufacturer calling the fob a “key” or using marketing monikers such as “Smart Key” or “Intelligent Key,” or by semantically associating the fob in any way with vehicle propulsion. The term “key” is used to refer to the fob in owner’s manuals and visual telltales, leading the consumer to believe that the fob is the key. For example, in some vehicles, you can remove the fob, with the vehicle running, and the dash will illuminate a message to the driver: “Key Not Detected.” Nowhere are consumers informed that the key is an invisible electronic code.

The standard would be much more effective, and, ultimately, compliant with FMVSS 114, if it established the fob as the key and encouraged manufacturers to install systems that stop engine propulsion and lock the vehicle in Park when the fob is removed from the envelope of the vehicle. Making the “key” an invisible code has created problems that are not hypothetical. They are occurring – with extreme and harmful consequences for users.

SAE’s recommended practice does nothing to address the current crop of problems. It’s unlikely that NHTSA will be able to write more words that will correct the error of the two-part key. Enforcement of the standard, as written, is another avenue of redress – equally improbable.

## Manufacturer Takes Battle over CPSC Database to the Courts; GAO Finds Little to Complain About

(Cont. from p. 1)

total control of the flow of public information since the CPSC was established in 1972, have fought it every step of the way. While consumers routinely file complaints against automakers in the National Highway Traffic Safety Administration’s Vehicle Owner Questionnaire database without controversy or discernible effect on the vehicle manufacturers, other industries that have enjoyed the privilege of shielding complaints about their products from public view have reacted with great alarm. They have complained endlessly that the database would publish inaccurate information about their products

and serve as a breeding ground for lawsuits. The Commission’s two Republican appointees Anne Northup and Nancy Nord have taken up industry’s cause, voting against it.

Republicans now serving in Congress have re-thought the GOP’s support. Last summer freshman Rep. Mike Pompeo (R-KS) introduced a measure prohibiting funds for a publicly available and searchable consumer database, even though the CPSC had already invested \$3 million to complete it. On the Senate side, Senator Rand Paul (R-KY) proposed a Senate amendment that would have elimi-

nated the CPSC altogether. This session, Pompeo has re-introduced his bill, and the Republican-dominated U.S. House is likely to approve it again, predicts Rachel Weintraub, Consumer Federation of America’s Director of Product Safety and Senior Counsel. But, the rock-solid support of Senators Rockefeller (D-WV), Durbin (D-IL) and Pryor (D-AR) ensured the viability of the database last session, and Weintraub expects they will protect it in the future.

The impact of the lawsuit is harder to assess: “Certainly what the lawsuit shows is the extent to which certain entities will go to keep in-

formation from consumers,” Weintraub says.

The GAO’s analysis of SaferProducts.gov, also released this month, found little to criticize in the database’s first six months of operation. The GAO’s only conclusion and related recommendation was for the commission to better analyze each report for evidence of a product number or serial number.

The CPSC actually puts each complaint through one of the most rigorous vetting of any federal agency. It reviews each report to determine if the submitter has in

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### Manufacturer Takes Battle over CPSC Database to the Courts

(*Cont. from p. 7*) -cluded all the required information. (Those that don't meet the minimum criteria are saved for internal use.) The CPSC then transmits a copy to the manufacturer, importer, or private labeler, allowing the company the opportunity to comment. Qualifying reports and manufacturer comments are posted.

CPSCIA requires, at a minimum, that the submitter include eight pieces of information, including a description of the consumer product sufficient to distinguish it as something regulated by the CPSC; the identity of the manufacturer or private labeler by name; a description of the harm related to use of that product; and contact information and consent to publish the complaint. Many reports of harm submitted to CPSC as of July 7, 2011, were missing information required for publication on the web site. The GAO's analysis of CPSC data showed that as of July 7, 2011, 5,464 reports of harm were received; 2,084 (38 percent) contained the minimum; and 1,847 (34 percent) were published. Consumers submitted 97 percent (1,786) of the published reports. 61 percent (1,128) of submitters reported that the harm or risk of harm occurred to themselves or a family member; 72 percent of reports contained numeric identifiers, such as a serial number or product number.

The GAO criticized the agency for failing to adequately identify all reports in need of a serial number or photograph of the product, a new requirement that was signed

into law on August 12:

"While the model and/or serial numbers remain optional information for the submitter to include, under the recent amendments to CPSIA, CPSC now must contact submitters who did not report a model number or serial number to attempt to obtain this information, or a photograph of the product, before sending the report of harm to the manufacturer for comment. Unless CPSC strengthens the analytic methods used to identify reports with missing model numbers or serial numbers, it will not be able to identify all reports that require the agency to contact the submitter for more product information because it currently does not track all reports of harm missing such information. To effectively implement the recent amendments to CPSIA, we recommend that CPSC enhance the analytic methods it uses to identify product information in a report of harm, such as by verifying whether the model field in its data contains a number (versus a text response, which would not meet the statutory requirement) or by searching for model numbers or serial numbers that may be listed in other fields."

In a response from the Democratic majority, three commissioners Robert Adler, Inez Tenenbaum and Thomas Moore agreed with the GAO's analysis and said that they were already working on ways to address the Accounting Office's recommendation.

### Study Shows Seat Belt Misuse

(*Cont. from p. 4*)

percent. At least one improper belt position was reported by about 78 percent of drivers, which, the researchers concluded, is the most important finding of the analysis: "Children who are prematurely restrained in an adult seat belt that does not fit properly are at increased risk of injury to the head, spine, and abdomen. Although improper lap belt positioning was more common, of greater clinical concern is that almost one-half of children were reported to have improper shoulder belt positioning. Our findings are consistent with laboratory evidence that demonstrates incorrect belt positioning is commonly the result of a mismatch between child body proportions and rear seat belt geometry. Even at age 9, most children's thighs are too short to sit in most vehicle rear seats without slumping. The slumped postures invariably lead to poor lap belt fit. In regard to shoulder belt positioning, the discomfort associated with having the belt against the face or neck can trigger the child to put the belt under their arm or behind their back. Putting the belt under the arm or behind the back is a much more serious belt fit problem than a belt that rides close to the face or neck because these positions result in greater travel of the torso, compression of the abdomen, and stress on the spine as the body comes to a stop in a crash."

The researchers surmised caregivers "may not be aware of proper seat belt positioning for the lap and shoulder belts or may not understand the serious and potentially permanent injuries that result from improper seat belt fit." That confusion likely stems, at least in part, from state seat belt laws that do not address older children and "may indicate to parents that their child is ready to be transitioned from a belt-positioning booster seat to an adult seat belt before reaching the stature and maturity to ensure proper seat belt fit on every trip." The researchers recommended that pediatricians inform their patients about the importance of seat belt fit.