



Safety Research & Strategies, Inc.
340 Anawan Street / Suite 200
Rehoboth, MA 02769
Ph. 508-252-2333, Fax 508-252-3137
www.safetyresearch.net

February 15, 2011

David Strickland
Administrator
National Highway Traffic Safety Administration
1200 New Jersey Avenue, SE, West Building
Washington, DC 20590

RE: Comments on Notice of Proposed Rulemaking; Anti-Theft and Rollaway Standard;
Docket 2011-0174

Dear Administrator Strickland:

We are pleased that the agency has recognized that today's keyless ignition systems have introduced a new set of hazards that require a regulatory response. As Safety Research & Strategies pointed out to the agency more than a year ago, keyless ignitions have introduced, for a small amount of customer convenience, a great deal of safety concern.

As the agency is aware, keyless ignitions or "smart keys" have upended the traditional interface between the driver the vehicle and eliminated the operation sequencing required before a occupant can exit the vehicle with a traditional key. The introduction of electronic keys in combination with push-button ignition systems has introduced new scenarios under which a driver can exit the vehicle, key fob in hand with the motor running, or with the engine off but the vehicle in a gear other than park. With today's quiet engines, lights that remain illuminated even when engines are off, and hybrids that temporarily shut off internal combustion engines, drivers can leave a vehicle, travel great distances from the vehicle with the key fob in their pockets while the engine is running or the transmission in neutral – all without being aware that they have done so.

Under the current scenarios, consumers may inadvertently leave an unattended vehicle running – vulnerable to theft, rollaway crashes and carbon monoxide poisoning – because they regard the fob as the key. Further, some manufacturers have created this confusion by referring to the devices in their owner's manuals as keys.

For example, throughout the 2009 Nissan Murano owner's manual, the fob is called the "Intelligent Key," and the manual does not distinguish or separate the code from the fob. Under the heading Key Reminder Chime, Nissan states: "A chime will sound if the driver side door is

opened while the ignition switch is pushed to the ACC position or pushed to the OFF or LOCK position with the key left in the key port. Make sure the ignition switch is pushed to the OFF position, and take the Intelligent Key with you when leaving the vehicle.”¹

Toyota calls its fob a Smart Key throughout the 2009 Venza owner’s manual. It includes an illustration of the fob under the heading: “The following keys are provided with the vehicle.”² Also, as noted above, Toyota’s dash warning on the 2010 RX indicates that “Key Not Detected” when the key fob is removed from the vehicle and the vehicle is running. There is nothing to prevent the vehicle from being operated when the key is not detected – and the dash indicator tells the operator that the key isn’t in the vehicle (which they are associating with the fob).

In the Genesis owner’s manual, Hyundai shows a picture of its fob, also dubbed a Smart Key and says: “With a smart key, you can lock or unlock a door and even start the engine without inserting the key. The functions of the buttons on a smart key are similar to the remote keyless entry.”³

In plain language to consumers, automakers consistently call these fobs, keys. Consumers, in turn, regard the fob as the key.

This conjoining of the fob and the code, however, disappears at the time of compliance. If a fob, or some other electronic device, starts the vehicle, it follows that the fob must have a role in turning off the vehicle and ensuring that it is locked in park, as required by the regulation. Allowing manufacturers an erroneous – and as far as the consumer is aware – secret definition of the key that allows drivers to mistakenly believe that when they exit the vehicle with the fob, the engine is off and the vehicle transmission locked in the Park position – is antithetical to the spirit and letter of FMVSS 114.

Our primary concerns with the agency’s Notice of Proposed Rulemaking, is that it proposes countermeasures that have no basis in human factors research; do not do enough to mitigate the safety problems; and defy the intent of Federal Motor Vehicle Safety Standard 114.

The current standard defines its purpose thus: *S.2. Purpose.* The purpose of this standard is to decrease the likelihood that a vehicle is stolen, or accidentally set in motion.”⁴ The agency, while re-asserting the regulation’s historic intent, and widening its scope, simultaneously proposes solutions that encourage driver behavior that the regulation was meant to discourage. FMVSS 114 was originally an anti-theft standard. The agency promulgated it to encourage drivers not to leave their keys in the vehicle. This NPRM, however, shifts the agency’s stance, in proposing solutions that permit drivers to leave their keys in the vehicle, and to leave the vehicle running with no occupant.

¹ Murano Owner’s Manual, Nissan; 2009

² 2009 Venza Owner’s Manual, Toyota Motor Corporation

³ Genesis Coupe Owner’s Manual; Hyundai; 2008

⁴ Docket 2005-22093; 91 FR 17755; April 7, 2006

The most obvious solution is to treat the key fob as the key, rather than an electronic code that the driver cannot see, hold or manipulate. NHTSA decision to allow automakers to implement systems with, what is, essentially, an invisible key has set the stage for the current crop of hazards. This proposal does not attack this problem at its roots.

Instead, the agency is staking its strategy on the efficacy of auditory warnings. These *may* provide remediation. The agency, however, has provided no evidence or analysis to determine if NHTSA's confidence is warranted. There is no scientific basis for borrowing from the Platform lift Standard to propose warnings. The threshold warning alarm in that standard was, in turn, borrowed from SAE J2093 standard. The agency's sole testing for audibility levels consisted of the Vehicle Research and Test Center measuring sound levels at six different locations in an urban setting to determine ambient noise. VRTC found that the sound levels often exceeded 75 dBA, with the loudest location having an average of 79 dBA.⁵ Missing is the testing that was done to determine if this level of alert is sufficient to warn drivers and change their behavior. The agency has not collected any data in this regard, nor have the automakers. Given the seriousness of the harm, it is the agency's obligation to ensure that its new regulation is not experimental.

While effective warnings are certainly needed, they are only part of the design solution. The agency should reconsider the implementation of an automatic cut-off feature, and prohibiting the propulsion system from shutting down unless the gear selection control is in "Park."

In regards to the latter, the agency has argued that although it would address the rollaway problem, it might also contribute to the CO risk, because a driver might walk away from a vehicle in this condition. The latter part of NHTSA's argument makes no sense. Not allowing shutdown unless the transmission is in park lies at the heart FMVSS 114. As the agency notes, some manufacturers already offer this feature – for example, the MY 2008-2009 Dodge Challenger vehicles equipped with automatic transmissions and "Keyless Go" option. In 2008, Chrysler recalled the vehicle because a driver could depress the stop/start button and turn off the engine when the vehicle was not in park, take the fob and exit the vehicle. Chrysler recognized this sequence of events as a clear violation of the standard.⁶ We think the agency should consider this strategy, because that is what the standard demands: that the vehicle's transmission shifts into "Park" or automatically becomes shifted into Park when the key fob is removed. Even in the mechanical era, there were systems in which the transmission could be automatically shifted into park once the driver removed the key.

If the agency is not prepared to require this for all systems, it could require it for electronic transmission systems. There is ample precedent in NHTSA regulations for setting minimum requirements for optional designs. For example, the TPMS rule gives manufacturers two options for indicating a malfunction to the driver, a separate and continuously illuminated yellow telltale, or a flashing telltale.⁷ FMVSS 202 Head Restraints does not require automakers to install head

⁵ Supplemental Notice of Proposed Rulemaking; Docket NHTSA-98-4511, Notice 1; 65 FR 46228; July 27, 2001

⁶ Recall 08V458; Chrysler; September 4, 2008

⁷ Final Rule; Docket NHTSA 2005-20586; Federal Motor Vehicle Safety Standard 138; Tire Pressure Monitoring Systems; 67 FR 18136; April 8, 2005

restraints in the rear seating positions. It does, however, set minimum height, strength, position retention, and energy absorption requirements for manufacturers who choose this design.⁸

We also believe there should be an automatic cut-off feature. Allowing people to leave a vehicle running for purposes of pet safety and comfort is an individual choice. In that case, the fob would have to remain in the vehicle – just as a mechanical key must remain in the ignition if the driver wants to leave a vehicle running. The agency should not be writing rules that encourage behavior, i.e. leaving the keys in the ignition, which historically they attempted to discourage in the Anti-Theft standard.

If the agency is concerned that prohibiting propulsion shut-off unless the vehicle is in “Park,” might hamper drivers from making a panic stop, the agency could require this strategy when the vehicle is stationary.

One area that remains unaddressed is the language automakers use to refer to their keyless systems. Any monikers that associate the concept of the “key” with the fob continue to promote the idea among consumers that the fob is the key. Automakers should be required to explain exactly what the key is to consumers in the owner’s manual. Any in-board visual telltales should not refer to the fob in anyway as the key. In fact, the visual messages should say something along the lines of: “The ignition code is still in the vehicle.” Manufacturers should not be able to implement a system with an invisible key without explaining to the users exactly how it works. The fact that this is not included underscores the lack of research that went into crafting a solution to the problems created by keyless ignitions. Does the agency have any idea of what percentage of consumers understand what the “key” actually is?

We agree with the agency’s position that the shutdown sequence should be standardized, so that drivers can shut the vehicle off in an emergency. But, again, the agency has produced no human factors-testing that provides a basis for choosing 500 milliseconds as the optimum time.

Below we are providing additional background on FMVSS 114.

A Brief History of the Rule

The Federal Highway Administration first proposed adding a theft protection standard—FMVSS 114—in December 1967.⁹ The proposal emanated from concerns 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 vehicle and require manufactures 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

⁸ Final Rule; Docket NHTSA 2004-19807; FMVSS 202 Head Restraints; 69 FR 74848; December 14, 2004

⁹ December 28, 1967; 32 FR 20866; Docket 1-21

vehicle theft.¹⁰ By 1980, the anti-theft rule had been tweaked and expanded to include light trucks and multipurpose passenger vehicles (MPV's) whose GVWR is 10,000 pounds or less.¹¹

Eight years later, the agency proposed amending the rule to encompass the problem of rollaway 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 as well as inadvertent actuation of the transmission gear shift lever in vehicles with automatic transmissions.¹² 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."¹³

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.¹⁴

Two years later, the agency issued a Final Rule.¹⁵ 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.¹⁶ 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/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.¹⁷ 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

¹⁰ April 27, 1968; 33 FR 6471; Docket 1-21-No.1

¹¹ December 29, 1980; 45 FR 85450; Docket 1-21-No. 5

¹² April 5, 1988; 53 FR 11105; Docket 1-21-No. 7

¹³ April 5, 1988; 53 FR 11105; Docket 1-21-No. 7

¹⁴ April 5, 1988; 53 FR 11105; Docket 1-21-No. 7

¹⁵ May 30,1990; 55 FR 21868; Docket 1-21-No.-9

¹⁶ May 30,1990; 55 FR 21868; Docket 1-21-No.-9

¹⁷ August 17, 2005; 70 FR 48362; Docket 2005-22093

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 involving theft protection from those 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.¹⁸ 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.

Intent of FMVSS 114

For two decades, FMVSS 114 has clearly served a two-fold purpose: to prevent auto theft and to prevent 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 and theft.

Today the scope and purpose of the standard is codified thus: “This standard specifies vehicle performance requirements intended to reduce the incidence of crashes resulting from theft and accidental rollaway of motor vehicles. S2. *Purpose*. The purpose of this standard is to decrease the likelihood that a vehicle is stolen, or accidentally set in motion.”¹⁹

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 accidents in 1966 and more than 18,000 of these incidents resulted in injury to one or more people. According to the report, the crash rate for stolen cars was some 200 times greater than the normal crash rate for non-stolen vehicles.²⁰ This standard would clearly benefit safety, by reducing the number of stolen vehicles, the agency argued.

Again, in 1988, when the agency sought to broaden the standard to include a countermeasure to vehicle rollaway, the agency produced statistical evidence that such incidents were compromising auto safety.

That final rule discussed the safety need for transmission shift locks and noted that the agency calculated that there are “roughly 400 to 800 relevant injury producing transmission lever shifting accidents each year (based on the Agran study).” NHTSA also noted that transmission

¹⁸ April 7, 2006; 91 FR 17755; Docket 2005-22093

¹⁹ April 7, 2006; 91 FR 17755; Docket 2005-22093

²⁰ April 27, 1968; 33 FR 6471; Docket 1-21-No.1

lever inadvertent actuation presents a significant safety risk and the agency has a “special obligation to reduce injuries involving children.”²¹

In a subsequent 1994 FMVSS 114 rulemaking, in which NHTSA proposed to amend the regulation to prevent key removal only when the shift lever or other shifting mechanism is fully placed in any designated shift position other than "park." the agency explained:

“In adopting the amendment, the agency explained that a study focusing on child-injuring rollaway accidents in Orange County, California demonstrated that injuries caused by rolling vehicles posed a significant safety problem. That study uncovered nine cases of children releasing the brake or moving the transmission shift lever, or both, causing a parked vehicle to roll and injure the child operating the controls or children near the vehicle.”²²

The agency reiterated this intent in the June 1995 Final Rule: “The purpose of this requirement is to prevent rollaway crashes caused by unattended children pulling the transmission lever out of park.”²³

In 2006, when the agency modified the rule again to accommodate the introduction of various electronic key systems, it again affirmed the rule’s intent: “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.”²⁴

Regardless of how the vehicle key is constructed – be it 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 2005 Final Rule:

“Systems using an electronic code instead of conventional key would satisfy the rollaway prevention provisions if the code remained in the vehicle until the transmission gear is locked in the ”park” position.”²⁵

Explicit in those safety-based arguments was an acknowledgement of the human factors that helped to create those hazards. In promulgating FMVSS 114, the agency dismissed manufacturers’ suggestions that a device to warn the driver that the key was still in the vehicle was unnecessary thus:

“It is, of course, the operator's responsibility to remove the key when the car is left unattended, and drivers should continue to be exhorted to take this elementary precaution. Nevertheless, many do not, and the interest of safety would be promoted by the existence

²¹ April 5, 1988; 53 FR 11105; Docket 1-21-No. 7

²² Docket 1-21, Notice 12; May 14, 1994

²³ Docket 1-21-Notice 13; June 7, 1995

²⁴ Docket 2005-22093; April 7, 2006

²⁵ Docket 2005-22093; April 7, 2006

of a visible or audible warning device on the car, reminding the driver when he has neglected his responsibility. This is an instance in which engineering of vehicles is more likely to have an immediate beneficial impact than a long-range process of mass education.”²⁶

In 2005, 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.

Definition of Key

Originally, the key was defined solely according to its security function: “‘Key’ includes any other device designed and constructed to provide a method for operating a locking system which is designed and constructed to be operated by that device.”²⁷

This definition remained in place until 2005, when the agency amended FMVSS 114 to reflect the new, electronic systems. In its Final Rule, the agency clearly defined the key simply, and, again only in relation to one function. Under the current FMVSS 114 S4 definition:

“Key means 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.

Under the S4 definition, the fob – which is the physical manifestation of electronically-based ignition/locking systems – constitutes the key, because without it, you cannot start the vehicle. The code may be the digital realization of indents on a metal key, but it is housed in that fob. And, to extend the comparison, you cannot start a vehicle with a metal key by the indents alone, you need the entire device to make the key work. The fob delivers the code that is specific to a particular vehicle. You cannot use your fob to open or operate any vehicle other than your own.

²⁶ April 27, 1968; 33 FR 6471; Docket 1-21-No.1

²⁷ April 27, 1968; 33 FR 6471; Docket 1-21-No.1

You cannot start the vehicle by whispering the computer code into the ignition slot. You must deliver it via the fob. It is, therefore, the vehicle key.

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. (And thus, by regulation, is the actual key.) 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 in park. The fob, which must be used to start the vehicle, has no role in turning off the vehicle.

The plain meaning of the text does not allow a two-part key. The key is simply what starts the vehicle and you cannot separate the code from its physical housing and start a vehicle.

Interpretation Letters

The interpretation letters sketch the evolution of electronic keys and FMVSS 114 compliance. From 1992 to 2005, the agency provided guidance on several occasions on electronic key systems.

General Motors appears to be the first manufacturer to seek the agency guidance in developing an electronic lock/ignition system. In 1992, it wrote to the agency describing its new system:²⁸

“This electronic key locking system would be operated by a key (an electronic code) entered and removed by the operator. When the key is entered into the locking system by the operator, a match is made with an electronic code stored in the system's memory. This match is analogous to the tumblers of a conventional lock cylinder matching the cut of a conventional key.

When a correct key match occurs, the person could then move the locking system out of the lock position to other positions such as accessory, off, on, or start, in order to activate the vehicle's engine, motor, or accessories.

With the locking system out of the lock position, the transmission can be shifted out of the "PARK" position in order to operate the vehicle. The transmission shift lever must be returned to the "PARK" position in order to place the locking system back into the lock position.

Placement of the locking system back into the lock position by the operator would automatically cause removal of the key from the system. At that time, re-entry of the correct key (electronic code) would be necessary to operate the vehicle.”²⁹

²⁸ Re: General Motors Corporation; FMVSS 114; Request for Interpretation; Stephen E. Selander -- Attorney, GM Legal Staff; February 28, 1992

²⁹ Letter to General Motors; Paul Jackson; NHTSA; May 22, 1992

In its reply to GM in May of that year, 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 engineer the backend of the system, as described (“Removal of the key would occur when the locking system is placed back into the "lock" position by the operator, since the electronic code is automatically removed from the system at that time and the vehicle will not operate unless the code is reentered.”) – as long as the vehicle transmission was in the Park position or automatically locked in Park when the “key” was removed.

In 2002, in interpretation letter to unnamed automakers, the agency took its basic interpretation another step.³⁰ 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.”

Further, even as Glassman stated that the system as described was compliant, she acknowledged the human factors problem associated with such systems:

“We observe that if the ‘Smart Key’ device remained in the car. e.g. in the pocket of a jacket laying 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.”³¹

When narrowly construed, these interpretations make some sense. After all, a driver cannot remove a conventional key without turning off the engine and placing the vehicle in park. However, these interpretations have also allowed automakers to create a virtual key for the purposes of compliance, while telling the consumer that the key was the physical fob.

These interpretations, however, were rendered moot after April 7, 2006, when NHTSA passed a Final Rule redefining the key as that which starts the vehicle.

Testing

At least five FMVSS 114 compliance tests have been conducted since 2000 in which the vehicle used an electronic key fob. Four were conducted by General Testing Labs (2009 Hyundai Genesis; a 2009 Cadillac CTS; 2009 Lexus ES 350; and the 2009 Nissan Altima). One was

³⁰ Case 4:09-cv-03660-SBA Document15-2; Letter to Unnamed Manufacturer; NHTSA; Jacqueline Glassman; August 15, 2002

³¹ Case 4:09-cv-03660-SBA Document15-2; Letter to Unnamed Manufacturer; NHTSA; Jacqueline Glassman; August 15, 2002

conducted by Calspan (2008 Toyota Hybrid Highlander). Using the interpretations, instead of the plain text of the regulation, all of the vehicles were judged as compliant. Some of the vehicles have an immobilizer that allegedly prevents the vehicle from moving if the fob is removed from the interior of the vehicle or a short distance from the exterior of the vehicle (Hyundai and Cadillac). But two of the tested vehicles have “two-part” keys, in which the fob is used to start the vehicle, but plays no role in turning the vehicle off.

Of the five tests, the Altima is the only one to include the language: “The physical key device can be removed from vehicle, but the stored key code stays in memory until vehicle is in park, turned off, and the door is opened.”³²

As noted in the GTL report of the 2009 Altima:

“The physical key device can be removed from vehicle, but the stored key code stays in memory until vehicle is in park, turned off, and the door is opened.”³³

The Hyundai Genesis is said to have a similar system:

“The electronic key is inserted into the starting system when (1) The key device is inside the vehicle and (2) The operator pushes the start/stop button.³⁴ The key is removed from the starting system the transmission is in “park” position; the engine is shut off; and a door is opened (in that order). In fact, the testers took special note that the fob was not used to turn off the vehicle.: “If key device is removed from vehicle while engine is running, steering and driving are unaffected until the first time the engine is turned off, at which time the engine cannot be re-started and steering locks.”³⁵

We examined a 2006 Murano with a CVT, a 2009 Murano and a 2010 Lexus RX350. And we demonstrated to our satisfaction that one can put these vehicles in neutral, turn off the engine, exit the vehicle with the fob and move a significant distance without the vehicle’s automatically locking the transmission into Park. In some scenarios, the vehicle emitted an audio telltale to alert the driver when the key was not in the vehicle and the transmission was not in Park. Nonetheless, the driver was able to remove the key with the vehicle in neutral and it did not automatically lock in Park. The driver could start the vehicle, and hand the key to someone else, who could move a considerable distance from the vehicle, without it detecting the absence of the key.

We believe that these are clear violations of S5.2.1, which states:

³² Nissan Motor Co. Ltd. 2009 Nissan Altima, Passenger Car NHTSA No. C95202; FMVSS 114 Compliance Test; General Testing Laboratories; July 20, 2009

³³ Nissan Motor Co. Ltd. 2009 Nissan Altima, Passenger Car NHTSA No. C95202; FMVSS 114 Compliance Test; General Testing Laboratories; July 20, 2009

³⁴ Safety Compliance Testing For FMVSS No. 114 Theft Protection Hyundai Motor Company; 2009 Hyundai Genesis, General Testing Laboratories; July 7, 2009

³⁵ Safety Compliance Testing For FMVSS No. 114 Theft Protection Hyundai Motor Company; 2009 Hyundai Genesis, General Testing Laboratories; July 7, 2009

“Except as specified in S5.2.3, the starting system required by S5.1 must prevent key removal when tested according to the procedures in S6, unless the transmission or gear selection control is locked in ‘park’ or becomes locked in ‘park’ as a direct result of key removal.”

Similarly, an examination of the Lexus RX identified scenarios that appear to violate FMVSS 114. First, the engine can be shut off and the vehicle can be exited, the key removed, and the transmission can be left in a gear other than Park. This vehicle can also be driven without obstacle when the key is not in the vehicle. A dash warning – “Key Not Detected” – illuminates when the vehicle is being driven and the key is not present in the vehicle. It is also interesting to note that the key can be removed from the vehicle and the “Key Not Detected” telltale will NOT illuminate if the driver remains in the vehicle and the driver’s door is not opened. Thus, if the key were removed by a passenger or handed out through a window (intentionally or inadvertently) and the driver remains in place, the driver will have no indication that the key has been removed until he or she exits the vehicle. It appears that Toyota’s design for the electronic two-part key removes the “key” based on the driver’s door opening rather than the actual removal of the key.

CO Poisoning

In discussing the carbon monoxide hazard, the agency cited the August 26, 2010 death of Chastity Glisson, owner of a 2006 Lexus IS250:

“Others, not as fortunate, may have died because of carbon monoxide poisoning from their vehicles. For example, a September 1, 2010 article in the South Florida Sun-Sentinel.com, reported that Palm Beach County detectives were investigating whether a keyless ignition system on a vehicle that was left running in a garage attached to a house could have led to the death of a 29 year-old woman from carbon monoxide poisoning.”³⁶

We would like to update the record regarding this case. On October 29, 2010, the Palm Beach County Sheriff’s County concluded: “Chasity Glisson, a 29 year old woman, died from carbon monoxide poisoning after she left the car running in the garage of her townhouse. Based on my investigation, including the autopsy findings by Chief Medical Examiner Michael Bell’s, I conclude that the death of Chasity Sunshine Lee Glisson and the injury to Timothy Maddock were the result of the carbon monoxide poisoning caused by Glisson accidentally failing to shut the engine of her vehicle off after driving it into the ground floor single car garage. There is no evidence to suggest that the vehicle was left on intentionally. This case is now closed.”³⁷

In addition, on February 28, 2009, Ernest Codelia Jr. of Queens, New York died in a nearly identical scenario. Mr. Codelia’s companion, Mary Rivera, inadvertently left her Lexus running in an attached garage. Her home filled with carbon monoxide, even though Ms. Rivera had taken

³⁶ Notice of Proposed Rulemaking; Docket 2011-174; FMVSS 114 Theft Protection and Rollaway Prevention; 76 FR 77183; December 12, 2011

³⁷ Palm Beach Country Sheriff Offense Report; Pg. 15; C. Karpinski; October 29, 2010

her fob with her. Ms. Rivera was left with brain damage; Mr. Codelia died of carbon monoxide poisoning.³⁸ The record ought to reflect that the CO risk is not hypothetical.

These hazards are increasingly documented in news accounts, autopsies, police reports and the agency's own Vehicle Questionnaire database. On December 17, the problems caused by keyless ignitions entered the mainstream. National Public Radio weekly news quiz "Wait, Wait Don't Tell Me" captured the frustration of drivers with keyless ignition systems, in a spontaneous commentary by comedienne Paula Poundstone:

"You know what my car has that is the worst feature I've ever had in a car? Is this damn thing where you don't put the key in!" she fumes about the systems which allow a driver to exit the vehicle with the key fob and the engine running. "And it's so frustrating! I can't tell you how many times I've gotten back to the car – oh, Geez, I left it running again! You have no way of knowing that the car's running!"³⁹

In conclusion, the Notice of Proposed Rulemaking proposes countermeasures that have no basis in human factors research; do not do enough to mitigate the safety problems; and defy the intent of Federal Motor Vehicle Safety Standard 114.

³⁸ Remote Possibility: Keyless Ignitions Eyed in Three Deaths; Lisa Parker, NBC Chicago; February 3, 2011

³⁹ Wait, Wait, Don't Tell Me; transcript; Paula Poundstone; December 17, 2011