

DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
49 CFR Part 571
Docket No. NHTSA-2011-0174
RIN 2127-AK88
Federal Motor Vehicle Safety Standards;
Theft Protection and Rollaway Prevention

AGENCY: National Highway Traffic Safety Administration (NHTSA), Department of Transportation (DOT).

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: In this NPRM, we (NHTSA) address safety issues arising from increasing variations of keyless ignition controls, and the operation of those controls. At issue are drivers' inability to stop a moving vehicle in a panic situation, and drivers who unintentionally leave the vehicle without the vehicle transmission's being "locked in park," or with the engine still running, increasing the chances of vehicle rollaway or carbon monoxide poisoning in an enclosed area.

Therefore in this NPRM, among other matters, we propose to standardize the operation of controls that are used to stop the vehicle engine or other propulsion system and that do not involve the use of a physical key. We are also proposing to require that an audible warning be given to any driver who: attempts to shut down the propulsion system without first moving the gear selection control to the "park" position (for vehicles with a "park" position); exits a vehicle

without having first moved the gear selection control to “park” (for vehicles with a “park” position), or exits a vehicle without first turning off the propulsion system.

DATES: Comments must be received on or before **[INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

ADDRESSES: You may submit comments to the docket number identified in the heading of this document by any of the following methods:

- Federal eRulemaking Portal: go to <http://www.regulations.gov>. Follow the online instructions for submitting comments.
- Mail: Docket Management Facility, M-30, U.S. Department of Transportation, West Building, Ground Floor, Rm. W12-140, 1200 New Jersey Avenue, S.E., Washington, D.C. 20590.
- Hand Delivery or Courier: West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue, S.E., between 9 am and 5 pm Eastern Time, Monday through Friday, except Federal holidays.
- Fax: (202) 493-2251.

Regardless of how you submit your comments, you should mention the docket number of this document.

You may call the Docket at 202-366-9324.

Instructions: For detailed instructions on submitting comments and additional information on the rulemaking process, see the Public Participation heading of the Supplementary Information section of this document. Note that all comments received will be posted without change to <http://www.regulations.gov>, including any personal information provided.

Privacy Act: Please see the Privacy Act heading under Rulemaking Analyses and Notices.

FOR FURTHER INFORMATION CONTACT:

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SUPPLEMENTARY INFORMATION:

Table of Contents

- I. Executive Summary
- II. Background
- III. Safety Need for Proposed Changes to FMVSS No. 114
 - A. Inability to Stop a Moving Vehicle in a Panic Situation
 - B. Rollaway - Leaving a Vehicle Not in "Park"
 - C. Leaving the Vehicle with the Vehicle Propulsion System Unintentionally Left Active
- IV. Society of Automotive Engineers Effort in this Area
- V. NHTSA's Proposal
 - A. New Definitions
 - B. Standardizing Shutting Down a Moving Vehicle's Propulsion System
 - C. Audible Warning When Key is in the Starting System and the Driver Opens the Door
 - D. Audible Warning to Prevent Rollaways
 - E. Audible Warning to Reduce Chances of Drivers' Leaving a Vehicle with the Propulsion System Active
 - F. Owners' Manual Required Language
- VI. Other Issues Considered by NHTSA
 - A. Propulsion System Kill Switch in Plain View of the Driver
 - B. Stepping on Brake Before Starting the Propulsion System
 - C. Specified Actuation Time for the Propulsion System Start Control
 - D. Automatic Timed Shut-Off of Propulsion System for a Stationary Vehicle

E. Preventing Shut-Off of Propulsion System for a Stationary Vehicle not in “Park”

- VII. Additional Questions
- VIII. Benefits, Costs and Lead Time
- IX. Rulemaking Analyses and Notices
- X. Public Participation

I. Executive Summary

In this notice, the National Highway Traffic Safety Administration (NHTSA) addresses safety issues arising from increased availability of ignition systems that do not use physical keys to start and stop passenger motor vehicles’ engines or other propulsion systems. At issue are drivers’ inability to stop a moving vehicle in a panic situation, and drivers who unintentionally leave the vehicle without the vehicle transmission’s being locked in “park,” or with the engine still running, increasing the chances of vehicle rollaway or carbon monoxide poisoning in an enclosed area.

Therefore in this NPRM, among other matters, we propose to standardize the length of time it is necessary to push a control to stop the vehicle engine or other propulsion system. We are also proposing to require that an audible warning be given to any driver who: (1) attempts to shut down the propulsion system without first moving the gear selection control to the “park” position (for vehicles with a “park” position); (2) exits a vehicle without having first moved the gear selection control to “park” (for vehicles with a “park” position), or (3) exits a vehicle without first turning off the propulsion system.

This rulemaking action is undertaken in response to our review of complaints from consumers to our Office of Defects Investigation (ODI) reporting incidents such as those described above and investigations of crashes and complaints regarding unintended

acceleration.¹ While we recognize that this is not the traditional data base upon which our agency typically bases a rulemaking, we believe that, in this instance, we are addressing an emerging safety issue with non-standardized new technology in way that imposes minimal cost on vehicle manufacturers, especially given that the proposed two-year lead time of the new requirements, and that many vehicles already have some form of the features we are proposing today.

Today's proposal would, if finalized:

- Clarify that definitions for “key” and “starting system” currently in Federal Motor Vehicle Safety Standard (FMVSS) No. 114 apply to all propulsion systems.
- Propose a new definition for “key code carrying device.”
- Propose to revise the definition of “starting system.”
- Propose a new definition for “stop control.”
- Delete the door opening alert exclusion currently in FMVSS No. 114 for a running vehicle (only for vehicles equipped with keyless ignition).
- Add requirements for the operation of a pushed stop control: the driver must hold the control for a minimum of 500 milliseconds to shut down the propulsion system, whether the vehicle is moving or stationary, and the propulsion system must shut down within 1 second of the initial push of the stop control.
- Add a requirement for an internal alert to the driver when s/he requests propulsion system shut down without first placing the gear selection control in “park.”

¹ We also note the recommendation of the National Aeronautic and Space Administration's (NASA) Engineering and Safety Center (NESC) that NHTSA consider regulation of “controls for managing safety critical functions” and that we noted that “Keyless ignition systems can exacerbate UA incidents (particularly prolonged incidents involving a stuck accelerator pedal) if the driver cannot determine how to shut off the engine quickly.” “Technical Assessment of Toyota Electronic Throttle Control (ETC) Systems,” National Highway Traffic Safety Administration, February 2011, page 65.

- Add a requirement for an external alert that the driver and bystanders can hear when the vehicle is not in “park” and the driver exits the vehicle.
- Add a requirement for an external alert that sounds when the driver leaves a keyless ignition vehicle with the propulsion system active.
- Add new test procedures for the new requirements.

We believe that the benefits of the new requirements proposed today, while not yet quantifiable on a national level, will reduce the risk that drivers will misuse these new keyless ignition systems and therefore also reduce:

- crashes, injuries and deaths resulting from a driver’s inability to shut down a moving vehicle;
- rollaway incidents due to drivers failing to place the gear shift control in “park” before shutting down the propulsion system, and leaving the vehicle; and
- incidents of carbon monoxide poisoning due to drivers inadvertently leaving a vehicle running or with its propulsion system active in an enclosed space, such as a garage adjoining a home.

We believe that taking precautionary action now, before these non-standardized systems become more widely available, will be beneficial to highway safety. Production of vehicles with these systems has grown from about 5,000 vehicles in model year 2002 to over 1,2 million in model year 2008. We believe we will accrue benefits by establishing a consistent experience for the users across all vehicles and a consistent way to turn off the propulsion system whether the vehicle is moving or not. This not only simplifies training new drivers, but also training drivers new to keyless ignition vehicles, and reduces the stress and confusion relating to fundamental differences in how one operates a vehicle. This is especially important in vehicles that provide

less obvious cues as to the state of the engine and the starting system. If the measures we propose in this notice prevent just one serious injury over three years, the rule will be cost beneficial. We believe the countermeasures we have proposed can reasonably be expected to have their intended effect based on similar requirements already in place in FMVSS No. 114 and other standards and in common automotive practice. For example, the warning to drivers to take their keys with them when they leave their vehicles (currently in FMVSS No. 114) and the threshold warning device for platform lifts (currently in FMVSS No. 403) are effective alerts, and we see no reason the new alerts proposed here should be less effective. The common automotive practice of the rotating ignition switch, combined with a physical key, has standardized the engine shut down procedure before the advent of the new electronic convenience controls. We believe standardizing the operation of these new controls, combined with the new alerts, will have the same effect. We believe these new requirements are especially worthwhile considering what we believe to be minimal costs to implement them.

Today, in the vehicles with keyless ignition systems, the great majority use push-button type switches. Some require a momentary tap, some require longer hold times, and some use different hold times to affect different functions. The countermeasure for driver confusion over shutting down a moving vehicle is to require that the switch that turns off the propulsion system work consistently, whether the vehicle is moving or not. From our knowledge of the operation of current designs, we believe that our proposed 500 millisecond hold time is well within the functional range of the switches currently in use. The only change necessary, in most cases, will be in the additional software coding. Thus, we believe there will be little incremental cost for changing the behavior of the keyless ignition control. There will be costs associated with testing the new software for correct operation.

We are proposing to require one new internal driver alert and two new external driver alerts. Some models already use some version of these alerts and other alerts are already required by FMVSS No. 114. In most cases, manufacturers need only reconfigure existing sound generating systems to engage under the right circumstances. For this reason, we believe the warning cues proposed here have little cost associated with their implementation.

Because the incremental cost for equipping every vehicle in the fleet would be very small, it follows that regardless of the number of vehicles needing a countermeasure, the cost to equip the entire fleet of keyless ignition vehicles would be similarly small.

If the proposed changes in this NPRM are made final, NHTSA proposes a lead time of two years from the next September 1 after a final rule is published in the FEDERAL REGISTER. We believe that this lead time gives vehicle manufacturers ample time to implement the new requirements in the normal course of vehicle model updating at minimal cost.

II. Background

Under 49 U.S.C. Section 30111(a), NHTSA (by delegation from the Secretary of Transportation) is directed to prescribe Federal motor vehicle safety standards (FMVSSs). Section 30111(a) also states that “Each standard shall be practicable, meet the need for motor vehicle safety, and be stated in objective terms.” This subsection was the statutory basis for the original promulgation of FMVSS No. 114, Theft protection and rollaway prevention, (49 CFR Section 571.114) and is also the basis for this proposal.

Federal Motor Vehicle Safety Standard No. 114, specifies vehicle performance requirements intended to reduce the incidence of crashes, injuries and fatalities resulting from theft and accidental rollaway of motor vehicles. The purpose of this standard is to decrease the likelihood that a vehicle is in a crash as a result of theft, or accidentally set in motion. FMVSS No. 114 applies to all passenger cars, and to trucks and multipurpose passenger vehicles with a gross vehicle weight rating (GVWR) of 4,536 kilograms (10,000 pounds) or less. However, it does not apply to walk-in vans.²

To minimize crashes involving stolen vehicles, FMVSS No. 114 specifies at S5.1.1 that each vehicle must have a starting system which, whenever the key is removed from the starting system prevents: a) the normal activation of the vehicle's engine or motor and; b) either steering, or forward self-mobility, of the vehicle, or both. To deter theft, Section 5.1.3 requires an audible alert to the driver if the driver's door is opened and the key left in the starting system. This serves as a reminder to the driver to always take the key. It is further specified at S5.1.4 that if a vehicle is equipped with a transmission with a "park" position, the means for deactivating the vehicle's engine or motor must not activate any device installed to prevent steering or forward self-mobility, unless the transmission is locked in the "park" position.

To minimize rollaway in vehicles equipped with transmissions with a "park" position, the standard specifies in S5.2.1 that the starting system must prevent key removal unless the transmission or gear selection control is locked in "park" or becomes locked in "park" as a direct result of key removal. The standard further specifies at S5.2.2 that the vehicle must be designed

² In addition, FMVSS No. 114 specifies requirements for a brake transmission shift interlock (BTSI) at S5.3. S5.3 applies to all motor vehicles (except trailers and motorcycles) with a GVWR of 4,536 kilograms (10,000 pounds) or less.

such that the transmission or gear selection control cannot move from the “park” position, unless the key is in the starting system.³

FMVSS No. 114 includes a specific definition of “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.” For purposes of FMVSS No. 114, “key” means both the traditional physical key and codes that are electronically transmitted by a fob, plastic card, or a similar device. The electronic code also includes numeric codes entered onto a keypad inside the vehicle by the driver. The standard also includes a definition of “starting system”: “means the vehicle system used in conjunction with the key to activate the engine or motor.”

While the new electronic keyless ignitions systems are currently subject to FMVSS No. 114, NHTSA is aware of emerging safety issues that we believe should be addressed by new requirements specific to these systems.

Keyless ignition systems, as they are commonly called, usually consist of a device carried by the driver, which contains an electronic code that grants access to the vehicle (allows the doors to unlock) and the ignition system. The electronic code is transmitted to the vehicle’s starting system without physical contact with the vehicle, other than its presence in the vehicle, and the driver is granted access to start the vehicle’s propulsion system, usually by pushing a button or turning a rotary switch. Keyless ignition systems first became available in luxury models but are now migrating to more popular vehicles (for example, the 2011 Kia Sedona minivan has keyless entry and ignition standard on the base model, with a manufacturer’s suggested retail price of \$24,595). Implementation of keyless ignition differs across models.

³ Exceptions (not relevant to this rulemaking) to these requirements are specified at S5.2.3 Key removal override option and S5.2.4 Gear selection control override option.

Circular push buttons are most common, but there are also rocker switches and rotary switches (similar to the familiar ignition switch that is turned with a key). Among the push button keyless ignition systems, there are differences in how these systems turn on and shut off the propulsion system, both while the vehicle is stationary (normal usage) and while moving (emergency situations). There are also differences in alerts given to the driver by different models if the driver does something unsafe while using the system, such as not putting the transmission in “park” before shutting down the engine, or leaving the vehicle while the propulsion system is still active.

III. Safety Need for Proposed Changes to FMVSS No. 114

In this section, we describe alleged incidents, and those that we have investigated, resulting in crashes, injuries and fatalities, involving vehicles with electronic keyless ignition systems. We also describe how we believe such incidents may have occurred.

The Office of Defects Investigation (ODI) is the office within NHTSA responsible for conducting defect investigations and administering safety recalls in support of NHTSA’s mission to improve safety on our nation’s roadways. One important means by which ODI discovers vehicle safety-related defects is self-reporting by vehicle owners. By relating the information over a toll-free hotline number (1-888-327-4236, TTY for the hearing impaired: 1-800-423-9153) or filling out an on-line or paper questionnaire, the Vehicle Owner’s Questionnaire (VOQ), vehicle owners can provide complaint information that is entered into NHTSA’s ODI vehicle owner’s complaint database. This information is used with other complaints and information to determine if a safety-related defect trend exists.

Traditionally, the data NHTSA uses for rulemakings are from data bases of police- or NHTSA-investigated crashes: the Fatality Analysis Reporting System (FARS), the National Automotive Sampling System Crashworthiness Data System (NASS-CDS) and the National Automotive Sampling System General Estimates System (NASS-GES). Today's discussion is based on driver complaints to ODI through the VOQ because in this case the crashes or incidents of interest either cannot be identified from data elements available in those data bases (crashes involving a vehicle speeding out of control, such as with a stuck accelerator pedal) or they will not be present in those data bases in the first place because they do not involve a motor vehicle in transport (rollaways and carbon monoxide poisoning). The relatively new "Not-In-Traffic Surveillance" (NiTS) data base was searched for these incidents, but no keyless ignition vehicles were found. Keyless ignition is an item of equipment that is still not widely used on vehicles, constituting less than 10 percent of vehicles sold, so it is not surprising that none of these vehicles are in the relatively new NiTS.

We recognize that there are many caveats to using VOQs as a data source, among them are:

- The crashes are not randomly selected.
- VOQs are self-reported and for most there is no follow up investigation as to what actually happened in the incident.
- There is no analysis of the root cause of the crash so we cannot confirm if the type of ignition switch contributed to crash causation.
- We have no information on other possible contributing factors in these crashes.

- There may be many more incidents that were not reported to NHTSA because the driver did not know how or where to make the complaint.⁴

However, an accumulation of VOQs from drivers stating a similar problem with a particular vehicle system points to emerging safety issues with new systems, which is what we are trying to document and correct with this precautionary proposal in a manner that has very little cost. We request comment on the use of vehicle owners complaints as a basis of this proposal.

A. Inability to Stop a Moving Vehicle in a Panic Situation

On August 28, 2009, there was a passenger car crash near San Diego, California that resulted in the deaths of four people. The vehicle at issue had a keyless electronic starting system, including a start/stop control (a push button) on the front dashboard. This control would stop the engine immediately when the vehicle was stationary, but the driver needed to depress the “stop” control for as long as three seconds to stop the engine when the vehicle was moving. NHTSA’s Office of Defects Investigation inspected this vehicle and crash site on September 3, 2009 and a report was filed on September 30, 2009.⁵ The investigator noted the following:

- The vehicle was a loaned Lexus ES-350 traveling at a very high rate of speed that did not stop at the end of Highway 125.
- The driver was a 19 year veteran of the California Highway Patrol.
- The cause of the crash was “very excessive speed.”

⁴ NASA ESC also observed this quality regarding the VOQ data, “The available incident reporting databases are valuable for identifying potential vehicle symptoms related to UA events. However, voluntary reporting systems may not allow for accurate quantitative estimates of incident rates or statistical trends. “Technical Assessment of Toyota Electronic Throttle Control (ETC) Systems,” National Highway Traffic Safety Administration, February 2011, page 61.

⁵ Memorandum from Bill Collins (Investigator and Interviewer, Vehicle Research and Test Center) to Kathleen DeMeter (Director, Office of Defects Investigation), September 30, 2009, available at <http://www-odi.nhtsa.dot.gov/acms/docServlet/Artemis/Public/Pursuits/2009/DP/INME-DP09001-37211P.pdf>

- The accelerator pedal had apparently been entrapped by the all-weather floor mat that was not the correct mat for the vehicle.
- Among the “other significant factors” was:

Push Button Ignition Start with no Emergency Instantaneous Shut off Device – In the event that this vehicle was producing unwanted power, there was no ignition key that could be mechanically actuated to instantaneously disconnect electrical power to the engine. In place of the key is a software push button that delays engine shutdown for three seconds once depressed. This instruction is not indicated on the dashboard.

In July of 2007, another fatal crash occurred in California involving a 2007 Toyota Camry equipped with keyless ignition experiencing an unwanted acceleration which hit a Honda Accord, killing its driver. This crash was investigated by Dynamic Science, Inc., under contract to NHTSA’s Special Crash Investigation Division. The report on this crash notes,

The driver reported that he attempted to turn off the vehicle by pushing the power button several times. The vehicle was equipped with a Smart Key system. In order to turn off the power while moving at speed requires the driver to press and hold the power button down for three seconds. The driver was unaware of this feature.^{6 7}

NHTSA’s Office of Defects Investigation has received complaints, through the submission of Vehicle Owner’s Questionnaires (VOQ)⁸ submitted to the agency, of similar situations in which the driver attempted to shut down the propulsion system in a runaway vehicle with keyless ignition. Two examples are:

While driving the car on the Falmouth connector with the toll booth in sight, I lifted my foot from the accelerator to decelerate and suddenly the accelerator just took off. I immediately applied the brake, but the car continued to

⁶ “ODI Unintended Acceleration Investigation/Vehicle to Vehicle”, Dynamic Science, Inc. Case Number:DS07035, 2007 Toyota Camry, California, July 2007 available at <http://www-nass.nhtsa.dot.gov/BIN/logon.exe/airmislogon> by entering case number DS07035.

⁷ Reviewers of UA complaints during NHTSA’s investigation of Toyota UA incidents also noted the necessity of learning this new procedure for shutting down the propulsion system with a keyless ignition system. “Technical Assessment of Toyota Electronic Throttle Control (ETC) Systems,” National Highway Traffic Safety Administration, February 2011, page 51, section 2.7.7.

⁸ To see the questionnaire form, go to <https://www-odi.nhtsa.dot.gov/ivoq/online.cfm>

try to accelerate, I then applied both feet to the brake as I tried desperately to stop the car while the front wheels were spinning and burning rubber. I tried to shut down the ignition with the pushbutton on the gear shifter and also desperately tried to move the gear shifter from drive but could not. Neither the ignition button nor the gear shifter would respond.

and

The critical safety concern is noted as follows: "..., I was traveling with the cruise control active at 55 miles per hour. Upon approaching a slower vehicle and checking traffic, I proceeded to accelerate the vehicle in an attempt to quickly pass the vehicle driving before me. Upon successful passage of the vehicle, I let off the accelerator and pressed the brakes several times, but the vehicle continued to accelerate under full power. Under the conditions, I tried to quickly disrupt this safety critical issue. To the best of my recollection I tried to slow the vehicle by pushing the power button, manipulating the cruise control lever, and putting the vehicle in neutral. All attempts were unsuccessful.

We can conclude from these VOQs and others like them that:

- Drivers will attempt to stop a vehicle in a wide open throttle event by using the engine stop control.
- Drivers expect the engine stop control to function the same way every time it is used, regardless of the vehicle state, stationary or moving.
- It is reasonable to link the driver's inability to shut down the moving vehicle to the difference between the expectation of how the control would work in this situation and the reality of how it actually does function.⁹

⁹ This difference in function was also noted by NASA NESC, "The keyless (push-button) ignition design can likewise have an unintended consequence. Here, the concern was that the driver (or passenger) might inadvertently turn off the vehicle when it is in motion. To prevent such an error, the safeguard was added that the button must be held for three seconds to turn off the vehicle when the vehicle is in motion. However, this procedure is certainly not well practiced by drivers. Indeed, many owners are not even aware of this 'hold the button' requirement. In any case, the most common behavior in an emergency situation is to revert to the well-learned, oft-practiced, always-successful procedure: push the button briefly to turn off the vehicle. However, this procedure fails in the off-nominal situation, no matter how many times the driver executes it in rapid succession." NASA Engineering and Safety Center Technical Assessment Report, "Technical Support to the National Highway Traffic Safety Administration (NHTSA) on the Reported Toyota Motor Corporation (TMC) Unintended Acceleration (UA) Investigation," page 44.

B. Rollaway - Leaving a Vehicle Not in “Park”

When shutting down a stationary vehicle (with a transmission with a “park” position) to leave it parked, the driver should first move the gear selection control to “park” and then request propulsion system shut down. Performing these actions in this order will ensure that the vehicle is in “park” before the driver leaves the vehicle. In a vehicle fitted with a traditional key and starting system, this involves moving to “park,” turning the ignition switch to “off” and removing the key. Due to a requirement in FMVSS No. 114, the driver will not be able to remove the key if the gear selection control is not in “park” unless it becomes locked in “park” as a direct result of key removal. To prevent rollaway in the keyless ignition vehicle, the gear selection control should be moved to “park” and then propulsion system shut down should be requested via whatever type of switch is used in the vehicle, most typically a push button. What we find drivers are reporting is that they occasionally (often while distracted) push the switch to shut down the engine without first moving the gear selection control into “park.”¹⁰ If they then leave the vehicle in this condition and it is on any kind of incline it can rollaway, possibly causing injury or fatality to the driver or bystanders or damage to surrounding property. In ODI’s VOQ data base, we found six complaints of rollaway and another three complaints in which the drivers realized that the vehicle could have rolled in this condition, but it did not.

Below are two examples of rollaway incidents (quoted exactly from the VOQ statement):

I bought a used 2006 Audi A6 two months before the accident. I had been using the "keyless" option when starting and stopping the vehicle. I stopped at a library, pushed the button twice to turn off the ignition and the vehicle's electrical system. I got out of the vehicle and noticed that it was rolling forward. I attempted to stop it; I opened the driver's door and as I was getting in the door struck a trash can in the parking lot, knocking me down. The vehicle's rear wheel caught my left heel and drug me across a curb before stopping on my left foot. Several men in the parking lot lifted the vehicle off my foot. I was transported to

¹⁰ The vehicle complies with S5.2.1 of FMVSS No.114 because the key is the electronic code and that code can remain in the vehicle even if the physical device the driver carries is taken outside the vehicle.

the hospital and kept for injuries to my left leg. Evidently I failed to put the vehicle's transmission in "p" and had left it in "d". Cars that use a physical key to start and stop the vehicle will not allow a driver to remove the key unless the vehicle's transmission has been shifted to "park." A vehicle that does not utilize a physical key, does not have that built-in safety feature. Five weeks later I am in physical therapy and am grateful I did not sustain more serious injuries, or that an innocent bystander was not killed by a driverless car rolling through a parking lot at a library that is frequented by children. Now I am adamant about always setting the emergency brake. My concern is real: as more and more vehicles are manufactured with "keyless" ignition systems that contain no fail-safe feature to prevent "inadvertent rolling" as explained in the Audi's owner's manual, I believe more injuries and deaths will be realized. In speaking with the regional representative at Audi, he explained that Audi publishes a "book" explaining the vehicle and what happened was totally my fault. My Audi has a sensor in the passenger seat that prevents an expensive airbag from deploying unnecessarily; how about a sensor in the driver's seat that prevents a vehicle from rolling when there is no driver?

and

The contact owns a 2007 Toyota Avalon. The contact stated that when the vehicle is shut off, there is no way to determine if the vehicle is in park due to the keyless entry. She is able to exit the vehicle with the gear shift indicator in the drive position. This failure has caused the vehicle to roll away after she exits. The dealer stated that the failure was dangerous and was unable to perform the repair because the vehicle was designed in that manner. The manufacturer also stated that there was nothing they could do about the design.

C. Leaving the Vehicle with the Vehicle Propulsion System Unintentionally Left Active

There were four VOQs regarding carbon monoxide incidents with keyless ignition vehicles in the past 10 years. Reviewing complaints involving vehicles without a physical key for the propulsion system, we note that drivers occasionally do not turn off the propulsion systems on their vehicles after parking them. One possibility for this behavior is that the driver may not immediately know that the propulsion system has not been turned off. In the following self-reported cases (quoted directly from the VOQs), the drivers only found that they did not turn off the propulsion system because their in-house carbon monoxide detectors were activated after an extended period of the vehicle running in an attached garage:

I arrived home after dinner, drove my 2007 Lexus LS460 (equipped with keyless ignition) into my attached garage, closed the garage door and, leaving the key fob inside the vehicle, I entered my home and eventually went to sleep.

I was awoken at approx. 2:15 am by a carbon monoxide alarm located in the foyer inside my home adjacent to the entrance to the garage. I entered the garage to discover that the car's engine was still running, the garage filled with noxious fumes, and the entire vehicle extremely hot to touch, inside and out. I opened the garage door and was eventually able to shut down the engine and clear out the fumes. As I see it, the failure here was two-fold: (1) when I opened my door to exit the car, no alarm or other sound alerted me that the engine was still running, as is the case with ignitions requiring keys.¹¹ This is particularly problematic because the car's engine runs in virtual silence; and (2) even after the car was unwittingly left idling while in park, the engine did not cut off after some predetermined period of time.

The following incident was reported by the owner of another motor vehicle manufacturer's product which happens to have a hybrid propulsion system:

Our garage is attached to our house with our bedroom above the garage. With 3 kids, both my wife and I have been distracted leaving the car in the garage to unload groceries or help the children. When on electric power we have neglected to turn off the ignition since the car is silent. Only when the carbon-monoxide detector sounded in our garage did we realize the engine had started while we were in the house. We think this could be deadly to other families without carbon monoxide alarms who may also forget to turn off the engine when parked in an attached garage while on electric power.

Because the above two owners had carbon monoxide detectors in their homes, they were alerted of the problem in time to be able to shut down their vehicle propulsion systems. 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

¹¹ This statement by the vehicle owner is not correct for all vehicles. As previously discussed, FMVSS No. 114 excludes the situation of the running vehicle from the requirement to sound the alert to the driver when the door has opened and the key is in the ignition. However, some manufacturers do sound the alert when the engine is running, so this driver's experience may have been with those vehicles.

woman from carbon monoxide poisoning. (A copy of this article taken from www.sun-sentinel.com is placed in the docket cited in the heading of this notice.)

IV. Society of Automotive Engineers Effort in this Area

In response to the above areas of safety concern and concern regarding the myriad different ways manufacturers are implementing keyless ignition features, the Society of Automotive Engineers (SAE) created the Keyless Ignition Subcommittee as a subcommittee of the Controls and Displays Committee, which has worked since early 2009 to develop an SAE Recommended Practice (RP) to standardize the operation of keyless ignition systems.¹² The committee consisted of experts in the study of how humans interact with machines (human factors experts) and designers of keyless ignition systems from auto manufacturers and suppliers. A NHTSA staff person attended the subcommittee meetings, but did not participate in decision making. The resulting RP is based on the subcommittee members' experience with their company's vehicles and systems, knowledge of consumers' comments about the operation of the systems, knowledge of human factors engineering and, in some cases, knowledge of proprietary studies done during the development of their products (actual data was not shared with the group). The RP applies to all passenger cars, multipurpose passenger vehicles (MPVs), and trucks of 10,000 pounds GVWR and under, with automatic and manual transmissions (some provisions apply only to vehicles with automatic transmissions with a "park" position). The RP sets control actuation requirements for starting and stopping stationary and moving vehicles, and requirements in the form of visual or audible alerts to the driver to address leaving the vehicle without putting it in "park" and inadvertently leaving the engine running. NHTSA has used

¹² SAE J2948-201101 "Keyless Ignition Control Design," January 2011.

portions of the SAE RP as a foundation for the requirements proposed and explained in the next section.

In order to better address specific safety issues and to be more enforceable, our proposal today differs from the SAE RP on several points:

- The SAE RP has a range of 500msec-2sec for control actuation to stop a moving vehicle, while we propose a 500 millisecond control actuation for all stops regardless of whether the vehicle is moving or stationary.
- The SAE RP has requirements for control actuation to start the propulsion system, while we tentatively conclude that there is, at this time, no safety benefit upon which this agency can regulate propulsion system starting.
- The “Not in Park” alert required by the SAE RP sounds upon door opening, but has no measureable attributes. The internal audible alert we are proposing today sounds at 85dBA (500-3000 Hz) the instant the driver requests engine shut down (in a stationary vehicle) without the transmission in “park” and continues until the gear selection control is moved to “park”.
- The SAE RP requires an unspecified audible or visual external alert if the vehicle is not in “park” and the key code carrying device is not in the vehicle, while we are proposing an external audible alert that sounds at 85dBA, 1 meter from the vehicle, for 1 minute when the vehicle is stationary, the key code carrying device leaves the vehicle, and the vehicle is not in “park”.
- The SAE RP requires an unspecified audible alert if the propulsion system is active and the driver’s door is opened, while our proposal is for an external audible alert at 85dBA, 1 meter from the vehicle, for 1 second when the vehicle is stationary, the key code

carrying device leaves the vehicle, and the propulsion system is active (either an internal combustion engine is running, or in the case of a hybrid vehicle the propulsion system is in a state that the internal combustion engine could engage when the electric power became depleted over time).

We seek comment on whether our deviations from the SAE RP are appropriate for an FMVSS.

NHTSA requested that human factors experts at the John A. Volpe National Transportation Systems Center review the SAE RP to help us make our proposal more specific in addressing the safety issues we have noted in our VOQs. Their report has been placed in the docket for this notice.¹³

V. NHTSA Proposal

In this section, we will describe how we propose to amend FMVSS No. 114 so that the safety issues described in Section III. Safety Need for Proposed Changes to FMVSS No. 114 may be mitigated.

Based in part on NHTSA's ODI VOQ data, we are proposing regulatory text for addressing the following three types of safety related problems: 1) The driver's inability to shut down a moving vehicle in an emergency because the driver may be unfamiliar with the fact that the shut-down process is different in a moving vehicle than in a stopped vehicle. This situation may lead to a crash. 2) The possibility that the driver will walk away from a vehicle which is not locked in "park" because the driver is able to shut off the vehicle propulsion system without

¹³ "Review of SAE RP J2948 JAN2011: Keyless Ignition Control Design," John A. Volpe National Transportation Systems Center, March 2011.

first putting the transmission in “park.” This results in a greater likelihood that the vehicle will roll away on its own. 3) The possibility that the driver will walk away from a vehicle whose propulsion system has been unintentionally left active (even though the driver may have placed the transmission in “park.”). If the vehicle is in an enclosed garage connected to living quarters, this situation may result in carbon monoxide poisoning of persons in the dwelling; if outdoors, this increases the possibility of vehicle theft and a subsequent crash.

As the earlier incidents related from the VOQs have shown, in many ignition systems that don’t use physical keys, the driver may not know whether s/he has turned off the vehicle propulsion system.

In this NPRM, NHTSA proposes additional requirements for vehicles using keyless ignition systems because, unlike systems which use the traditional physical key, the start/stop process on vehicles that use electronic codes as keys are not standardized across manufacturers. In particular, if a push-button type control is used, the amount of time the start/stop control must be pressed differs not only among manufacturers, but also on the same vehicle, depending on whether the vehicle is started from a stopped position, stopped while the vehicle is in motion, or whether the vehicle propulsion system is being turned off while the vehicle is stopped. Standardization of controls teaches drivers how the controls will operate and ensures that drivers’ expectations about those operations are met.

The problem presented by the lack of standardization is exacerbated by the fact that electronic keys lack many of the visual and tactile cues about the status of the vehicle’s propulsion system that are available to drivers when using traditional physical keys. In a system using the physical key, the driver knows from the angle of the key in the ignition whether the vehicle is in “lock,” “accessory,” “start,” or “run.” Also, the key will not release from the

ignition switch unless the transmission is in “park.” The keyless ignition system provides no such physical cues to the driver.

The requirement for a visible indication of transmission position comes from FMVSS No. 102, Transmission shift position sequence, starter interlock, and transmission braking effect. S3.1.4.1 requires that if the transmission shift position sequence includes a “park” position, identification of shift positions, including the positions in relation to each other and the position selected, shall be displayed in view of the driver whenever: a) the ignition is in a position where transmission can be shifted; or b) the transmission is not in “park.” Despite this visual cue that the transmission is not in “park”, some drivers of vehicles equipped with keyless ignition systems, especially when distracted or unfamiliar with the operation of the vehicle they are driving, leave their vehicles without ensuring the transmission is in the “park” position. They do so because they do not have the tactile cue of being unable to remove the key unless the transmission or gear selection control is locked in “park.”¹⁴ Such actions result in a risk that the vehicle will roll away of its own accord.

We note that the current title of Standard No. 114, “Theft protection and rollaway prevention,” may be made outdated and not inclusive if the proposals described in this notice were made final. However, a title that is fully descriptive of all the purposes served by the standard may be unwieldy. We seek comment on the need to update the title and ask commenters to suggest a new title if they believe a change would be necessary or beneficial.

A. New Definitions

As mentioned in the Background section of this NPRM, FMVSS No. 114 already contains definitions for “key” and “starting system” which are inclusive of systems that use

¹⁴ In keyless ignition vehicles, the “key” is the electronic code transmitted from a device carried by the driver to the vehicle’s starting system. When the vehicle is not in “park,” this key code remains in the vehicle, thus the vehicle conforms to the requirement at 49 CFR 571.114 S5.2.1.

electronic codes without a physical key to allow the driver to start the vehicle. However, we are proposing the addition of one definition specific to keyless ignition systems:

Key code carrying device means a physical device which is capable of electronically transmitting a key code to the vehicle starting system without physical connection (other than its presence in the vehicle) between the device and the vehicle.

This key code carrying device is typically called a “key fob” by consumers. It carries and transmits the electronic code to the vehicle that gives the driver permission to start the vehicle. The electronic code carried in the device is the “key”. The device is not the “key”. This new definition for key code carrying device is based on that used in the SAE Recommended Practice discussed in Section IV above.¹⁵ We propose adding “without physical connection (other than its presence in the vehicle) between the device and the vehicle,” to SAE’s RP language to differentiate these devices from physical keys which also carry a chip containing an electronic code as part of a theft deterrent system. These physical keys must be inserted into the ignition switch of the vehicle and the key is used to turn the switch. Our proposed definition is intended to specifically exclude any key which must be physically inserted into any part of the vehicle each time the driver desires to start the propulsion system. If a key must be inserted into the vehicle we consider it to be a physical key, regardless of whether or not it also contains electronic components which communicate with the vehicle intended to identify this particular key as belonging to this particular vehicle (i.e., for theft prevention purposes). Further, our proposed definition of key code carrying device (KCCD) is not intended to exclude a device which otherwise would be a KCCD simply because it occasionally must have physical contact with the vehicle to recharge the battery in the KCCD or because the vehicle manufacturer provides a place where the driver may insert the KCCD if s/he chooses for the convenience of

¹⁵

SAE J2948-201101

providing a place to keep the device while driving. We note that the primary attraction of these keyless systems appears to be that the driver need not handle a key to access and start the vehicle. We seek comment on whether our proposed definition is specific enough to (a) exclude devices that we would consider physical keys – they must be inserted to start the vehicle, and (b) include devices which may be inserted to charge a battery or for driver convenience, but do not need to be inserted for normal vehicle operation. We request comment on how the definition of KCCD could be improved to clarify these points.

At this time, we are not proposing to change our definition of “key”, which provides that for keyless ignition systems, the electronic code, not the physical device carried by the driver, is the key. We note that NHTSA’s definition of the code as the key is long-standing. It was first articulated in a letter to Mr. Stephen Selander of General Motors in May of 1992.¹⁶ Further, in August of 2005 we published a Notice of Proposed Rulemaking which, among other things, proposed the current definition of “key.” There were no comments which disagreed with our definition of “key” with regard to keyless ignition systems at that time and we finalized that rulemaking in April of 2006.¹⁷ However, we acknowledge that consumers may think of the key code carrying device as the key and that some manufacturers do refer to this device as a key in their consumer literature, so there may be some confusion on the part of consumers as to what is actually the key. Therefore, we seek comment on whether we should revise our definition of “key” and if so, what that definition should be and how we should differentiate between the device the driver carries and the code that actually allows the vehicle to start. Changing the definition of “key” may change the interpretation of what it means for the key to be removed from (S5.1.1) or inserted into the starting system (S5.1.3).

¹⁶ Letter from Paul Jackson Rice, Chief Counsel to Stephen E. Selander, General Motors Corp, May 22, 1992.
¹⁷ 71 FR 17752, April 7, 2006

In addition, we are proposing to amend the definition of “starting system.” At present, “starting system” is defined as: “means the vehicle system used in conjunction with the key to activate the engine or motor.” In this NPRM, we propose to amend the end of the “starting system” definition to state: “... activate the engine, motor, or other system which provides propulsion to the motor vehicle.” We are proposing this clarification so that it is explicit that FMVSS No. 114 applies to any propulsion “starting system” available in motor vehicles today, or at some point in the future.

We are proposing to add a second definition, “stop control means the device used by the driver to deactivate the engine, motor, or other system which provides propulsion to the motor vehicle.” In most vehicles available today, this control is a push button switch, but this definition is not limited to push button switches.

B. Standardizing Shutting Down a Moving Vehicle’s Propulsion System

As we have seen in the quoted VOQs, drivers recognize the need and desirability of shutting down the engine in a moving vehicle when they experience an event in which the acceleration of the vehicle does not seem to be under their control. The VOQs also point out that drivers are stymied in their efforts to shut down the engine in a moving vehicle by the fact that when the vehicle is moving the shut down procedure they are used to in every day operation does not work. To remedy this safety issue, NHTSA proposes to standardize the length of time the driver must press on a “stop” control in order to stop a vehicle, whether moving or stationary. At S5.4.2.1(a), we propose that for vehicles equipped with propulsion system stop controls that are activated by the driver pressing on the control, the vehicle’s propulsion system must stop only after the control has been depressed for more than 500 milliseconds. The 500 milliseconds time

is based on SAE Recommended Practice J2948 Keyless Ignition Control Design (January 2011). Five hundred milliseconds is the lowest time specified by the Recommended Practice for engine shut down in a moving vehicle (the RP has a range of 500 milliseconds to 2 seconds, NHTSA believes that standardization is not achieved by allowing a window of operation).

We are proposing to regulate only the operation of controls that are pushed because we believe that this covers the great majority of stop controls manufactured today (a circular push button) or contemplated for the future (pressing or touching a portion of a display screen). However, we note that other controls, such as rotary knobs and rocker switches¹⁸ have been used in keyless ignition systems in the past. We seek comment on what other controls are used or contemplated and whether there is a safety need to regulate the actuation of all types of stop controls (not just those that are pushed) and how that might be accomplished. NHTSA seeks comment on whether the language of S5.4 needs to be more specific as to the point at which the 500 msec time begins and what that more specific language would be. When offering suggestions, commenters should keep in mind that there are several different types of switch designs currently available and that could become available that would be subject to this standard.

NHTSA understands manufacturers implemented the practice of designing keyless ignition systems to shut down differently while the vehicle is moving than while stationary to help prevent inadvertent propulsion system shut down, i.e. a situation in which the driver reaches for a different control, accidentally bumps the engine off control and as a result experiences an unintended, unexpected engine shut down, which can create a hazardous situation. However, different times for different modes of operation (for example, a light tap to start or stop a parked

¹⁸ We noted that a rocker switch must be pressed and therefore would be subject to the regulatory text proposed in this notice.

vehicle and several seconds to turn the propulsion system off while the vehicle is in motion) result in the driver experiencing an unexpected result when using his accustomed tap motion to request engine shut off (in a stationary vehicle). The drivers' accustomed tap motion does not have the expected effect in a moving vehicle in a panic situation. As previously discussed, this safety issue was identified in the VOQs by and NASA NESC in its review of UA incidents. NHTSA believes that requiring the driver to use the same action to request engine shut down in all cases should result in the safety benefit of drivers' ability to shut down a moving vehicle without the necessity of knowing or remembering a separate motion. We have chosen to propose the 500 millisecond control actuation time believing it will be long enough to guard against inadvertent shut down, while also short enough for drivers to tolerate for everyday normal stationary shut down. We ask for comment on whether this time is too long or too short and whether the danger of inadvertent shut down is that much greater than that of an inability to shut the propulsion system off in the event of a stuck throttle, engine fire, or other emergency situation. Please provide data on this risk comparison. We also believe that the instances of inadvertent shut down can be mitigated by other means, such as better control or switch location, which will not inadvertently get in the way of the driver's wrist, arm, bracelet, or other foreseeable obstruction and ask for comment on this facet of vehicle design.

In our proposal, the time between when the control actuation starts the shut down process (500 milliseconds) and the time the engine must be stopped (1 second) allows for the signals to be sent and acted upon by the vehicle to bring the engine to a stop. We seek comment on this length of time and the problem of engine inertia working to keep the engine running when the vehicle is moving. We propose that the test procedures for compliance with this standard will be conducted on a level surface.

We have proposed a requirement that once the propulsion system of a moving vehicle is shut down, any restart of the system must be initiated by the driver by actuation of the engine start control. This is to prevent automatic restart by any vehicle system, such as idle-stop technology, when the driver has shut down the engine in an emergency situation.

In developing this NPRM, we considered whether to make all control actuations the same, 500 millisecond hold for starting and stopping the engine under any condition, to emphasize to the driver that this control functions the same under all conditions. However, we understand that drivers are so anxious to get started as soon as possible that they would not tolerate a wait time as long as 500 milliseconds to start the engine. We have seen examples of vehicles in which the manufacturers have designed their systems such that if the driver “taps” the start control (as little as 60 milliseconds) the vehicle will start. After careful consideration, we have tentatively decided that requiring all stops to be the same accomplishes the goal of standardizing the propulsion stop function without inconveniencing drivers in the start mode and that there is little additional safety benefit to be gained by regulating the starting of the propulsion system. However we note that more time spent in the starting up process would provide more time for systems like a rearview camera system to boot up and begin functioning before rearward movement begins. We ask for comment on this tentative decision.

In S5.4.1.2(b), we are not proposing to allow auto-shift to “neutral” in lieu of engine shut down because we believe, based on the VOQ data, that when drivers actuate the engine “off” control or switch, they expect the engine to shut off. An engine which continues to run could confuse the driver and cause unwanted actions by the driver. We are aware that some manufacturers currently do shift the transmission to “neutral” when the driver requests engine shut down while the vehicle is moving. These manufacturers believe that if the engine is shut

down while the vehicle is moving, the driver's ability to control the vehicle will be hampered by the resulting loss of power steering and power braking. In the same vein, we are not requiring auto-shift to "neutral" because, in addition to the issue of driver expectation, we know requiring this feature would require all vehicles to be fitted with electronic transmissions and this would be extremely costly. We note that drivers have dealt with this loss of control when shutting down conventionally keyed vehicles for many years. If we were to determine that loss of power control when shutting down the propulsion system of a moving vehicle is a safety concern, we believe we would need to address that safety issue for all vehicles, not just those fitted with keyless ignitions.

We ask for comment on whether the safety problem associated with loss of power assist to braking and steering is greater than the safety risk of the driver believing that s/he has requested the engine to shut down and has instead experienced an unexpected action by the vehicle. If we were persuaded by comments to the NPRM on this issue that allowing auto-shift to "neutral" is a countermeasure that meets the need for safety, the regulatory language proposed today would be altered so that S5.4.1.1(b) would read "The propulsion system must shut off, or remove motive power from the drive wheels, within 1 second after the control has been depressed for more than 500 milliseconds." The phrase "or remove motive power from the drive wheels," is not part of the current proposal. We also note that we have seen examples where the manufacturer has chosen not to allow the vehicle's propulsion system to shut down at all while the vehicle is moving. If today's proposal is made final, these systems would not be allowed. We note that as early as 1997 we voiced our concern about the fact that such systems would not meet driver's expectations.¹⁹

¹⁹ Letter to a redacted party from John Womack, Acting Chief Counsel, January 30, 1997.

We have also considered allowing a vehicle to enter a “limp home” mode instead of shutting down the propulsion system when shut down is requested in a moving vehicle. Such an operating mode would allow the driver to finish his or her trip at some reduced maximum allowable throttle output, rather than requiring the driver to pull over to the side of the road (encumbered with the loss of power assist to braking and steering) as would be the case with full engine shut down. While this mode has the advantage of allowing the driver to continue his or her trip, it has all the disadvantages of the auto-shift to neutral listed above. It is also uncertain whether whatever vehicle malfunction was causing the excessive throttle condition to which the driver was initially responding (by requesting shut down) would also affect the “limp home” mode. For these reasons, we have tentatively decided not to allow this mode of operation, but we ask for comment on whether any manufacturer is currently using such a “limp home” mode when propulsion shut down is requested in a moving vehicle and what are the possible advantages and disadvantages of such an operating mode.

Finally, we note that SAE J2948 specifies stop conditions at S4.3.2.1., “ Stop Conditions Met.” Among other matters, S4.3.2.1 states that the vehicle shall also exit the run mode after multiple actuations (defined at S3.7.3 as two or three actuations in a row) of the keyless ignition control system. We do not believe that NHTSA needs to include this requirement in our proposal since we believe that standardizing propulsion control shut down to a 500 msec hold obviates the likelihood that the driver will attempt to shut down the propulsion system using multiple short presses. We believe this has happened in current vehicles because the “everyday” shut down procedure is a momentary press of the control and the driver uses that momentary press in the moving condition also. When it does not work, s/he tries it again. S/he is not intentionally pressing multiple times because s/he knows the shut down procedure is different

while the vehicle is moving, s/he's just repeating what s/he thought should work.²⁰ If today's proposal were made final, the driver will experience no need for multiple control actuations; the propulsion system will have deactivated within the time period that the driver expects from normal use.

C. Audible Warning When Key is in the Starting System and Driver Opens the Door

At present, S5.1.3 of FMVSS No. 114 specifies that an audible warning must be activated when the key is in the ignition system and the door closest to the driver's designated seating position is opened. There are three exceptions to this requirement: a) after the key has been inserted into the starting system, and before the driver takes further action; b) if the key is in the starting system in a manner or position that allows the engine or motor to be started or to continue operating; or c) for mechanical keys and starting systems, after the key has been withdrawn to a position from which it may not be turned.

In this NPRM, we propose to limit the exclusion at S5.1.3(b) to vehicles with mechanical keys and starting systems. The original logic of S5.1.3(b) (i.e., applying to motor vehicles with all types of keys and starting systems) was that if the engine were running, then the driver must have intentionally left the key behind. However, with keyless ignition systems, it is not obvious to the driver that s/he has left the "key" (the electronic code) behind and also it may not be obvious that the engine or other propulsion system is running.

Therefore, if this NPRM were made final, on vehicles with electronic keyless ignition systems, when the "key" is left in the starting system in a manner or position that allows the engine, motor or other propulsion system to be started or to continue operating, the audible warning currently excluded by S5.1.3(b) must be activated when the driver's door is opened.

²⁰ See footnote 8.

S5.1.3 does not specify the volume or duration of this audible warning. Many manufacturers currently choose to sound this alarm regardless of whether they use a physical or electronic key in the vehicle.

D. Audible Warning to Prevent Rollaway

In this NPRM at S5.4.2 Warnings to driver exiting a vehicle with the gear selection control not in “park” for vehicles equipped with a “park” position, we propose two new audible alerts of no less than 85 dBA between 500-3000 Hz. The first, S5.4.2.2, must sound if propulsion shut down is requested, the gear selection control is not in “park,” and the vehicle is moving at less than 15 km/h (9.3 miles per hour). We propose that the alert must continue until the gear selection control is placed in “park.” The gear selection control must be able to be moved to the “park” position without having to restart the propulsion system.

We are proposing a loud audible warning as opposed to allowing the manufacturer a choice between an audible or visual warning (as allowed by the SAE RP) for two reasons. First, FMVSS No. 114 currently requires an audible warning as discussed above, so drivers are accustomed to this type of warning. Secondly, we believe that a visual alert, such as a written or pictographic message to the driver in the message center of the dashboard (currently used in some vehicles), is too easily ignored by the driver. The alert must be loud to guarantee a driver’s response to this very dangerous situation. The sound level proposed, 85 dBA between 500-3000 Hz, comes from the threshold- warning alert required in FMVSS No. 403, Platform lift systems for motor vehicles. We seek comment on whether the test method proposed today in S6.3.1 is the best method to measure the sound level and whether the sound level is too loud or not loud enough (for this requirement and all other sound levels proposed in this NPRM).

The test procedure proposed at S6.3.1 uses the height of a seated 50th percentile male dummy to establish the height at which sound levels are measured. The proposal is that the sound be measured 740 mm above the driver's seat. This height was derived from the fact that the seated height of the 50th percentile male dummy (to the top of the head) is 909mm and the shoulder height is 565mm above the seat. The midpoint of the difference between those two distances is 740mm.²¹

An alternative to this loud warning sound could be an audible voice command telling the driver exactly what is wrong (for example, "Danger. Not in 'park'.") and how to remedy the situation ("Move gear selection control to 'park'"). This solution may be more helpful to the driver, but we do not know if most vehicles currently have the capability for voice commands or if such capability could be added at very low cost. We know that such artificial human voice alerts have been used in some vehicles in the past to alert drivers and passengers to potentially harmful conditions, e.g. "door ajar" or "turn off headlights." We have the following questions regarding this alternative form of alert:

- Is a voice command preferable to an unspecified loud audible warning?
- How loud should such a voice alert be?
- Should a voice alert be required to be in English?
- Should it be required to be able to be programmed to the driver's choice of language?
- Should NHTSA specify the exact words to be used and if so what should those words be?
- Are most vehicle manufacturers capable of providing such a voice alert and at what cost?

²¹ $909 - [(909 - 565)/2] = 737\text{mm}$, rounded up is 740mm

We propose to use the phrase “the vehicle is moving at less than 15 km/h” in lieu of “the vehicle is stationary.” We believe that most currently available wheel speed sensors are not capable of determining speeds of 0. The 15 km/h figure is also that referenced in the final rule establishing the electronic stability control system.²²

The second alert, at S5.4.2.3, must sound outside the vehicle if the driver does not respond to the internal alarm and continues to exit the vehicle without placing the transmission in “park.” We propose to determine that the driver has left the vehicle by requiring the vehicle to sense the absence of the KCCD. The proposed regulatory text is:

When tested in accordance with S6.3.2, an audible alert of no less than 85dBA between 500-3000 Hz, measured outside the vehicle, must sound when the door located closest to the driver’s designated seating position is opened while the gear selection control is not in “park”, the vehicle is moving at less than 15 km/h (9.3 mph), and the key code carrying device is not present in the vehicle. This alert must sound for 1 minute or until the gear selection control is moved to “park,” whichever occurs first. This alert is not required to sound if the transmission becomes locked in “park” as a direct result of key removal upon door opening, or upon removal of the key code carrying device from the vehicle.

We seek comment on the ways in which vehicles manufactured today sense the absence of the key code carrying device. If the system does not already incorporate such a sensor, what would be the cost to add it? We realize that sensing the presence or absence of the KCCD is not an ideal substitute for sensing the presence or absence of the driver, for a number of reasons, primarily that the driver may not take the KCCD with him or her, in which case the warning will not sound and the vehicle will be left in an unsafe condition – vulnerable to rollaway and theft. (Sensing the absence of the KCCD is the approach used in SAE J2948.) The driver may be especially likely to leave the KCCD in the vehicle when the vehicle is in his or her own garage or driveway. As explained in the next section, we also seek comment on whether a one-second audible

²² See 66 FR 17236, at 17264, April 6, 2007.

warning to the driver leaving a vehicle with the propulsion system operating sufficiently reduces this risk.

One way of sensing the driver's presence is to do it directly, such as is done for the right front passenger for the purpose of determining whether or not to deploy an air bag in a crash. However, we do not believe that most, if any, manufacturers currently have such sensors in the driver's position. We estimate that adding some sort of sensor to indicate the driver has left the vehicle would cost between \$4 per vehicle for a seat belt sensor, and \$12 per vehicle for a weight sensor in the driver's seat. We request comment on how such sensors might be used to indicate the presence or absence of the driver, the accuracy of our cost estimate, and whether this cost is commensurate with the safety risk we are attempting to reduce.

The sound level required, again 85 dBA between 500-3000 Hz, is measured at 1580mm²³ above the ground, one meter from the vehicle (S6.3.3). We also propose that the alarm discontinue after one minute (or until the gear selection control has been moved to "park"), as after that time, we believe the alarm has been ignored by the driver and will be ignored by any bystanders. We seek comment on the duration of the alarm, on whether the alarm should be continuous, and on the test method proposed at S6.3.2. We also seek comment on whether such an alarm requirement can be readily confused with the antitheft alarm system that is already standard on many passenger motor vehicles.

E. Audible Warning to Reduce Chances of Drivers' Leaving a Vehicle with the Propulsion System Active

²³ As with the previous discussion this height is based on the height of the 50th percentile male dummy. The height to the top of the standing dummy's head is 1750mm. Subtracting the same 172mm as above leaves 1578mm which we round up to 1580mm.

In S5.5 Warning to driver exiting a vehicle with the propulsion system operating, we propose to require an audible alert to sound outside the vehicle if the propulsion system is running, or is capable of starting without reintroduction of the electronic key code into the starting system, the door closest to the driver's designated seating position is opened, and the KCCD is not in the vehicle.

This is a proposed countermeasure for those cases in which a driver is unaware that s/he has inadvertently left the vehicle running. We are proposing an alert time of one second because a person walking at an average pace of three miles per hour will cover three feet in less than one second. After that time and distance, we assume that the driver has left the vehicle running intentionally, either because someone else is in the vehicle, to facilitate vehicle repair, or for some other reason. The alert would sound for one second (rather than one minute, as the alert for leaving the vehicle not in "park" would sound), because leaving the vehicle with the propulsion system on is more commonly intentional on the part of the driver, and less immediately risky to bystanders. If it sounds for longer than a second, the alert would also tend to annoy bystanders and serve no purpose. However, we seek comment on whether one second is long enough for an alert that the driver has left the vehicle with the propulsion system active.

We recognize that there is a competition between our desire to alert the driver to the fact that s/he has inadvertently left the vehicle with the propulsion system active and the potential to create a nuisance alert when the driver has left the vehicle running intentionally. Most of these potential nuisance situations will be alleviated if the driver takes the KCCD with him or her. We also recognize that there are occasions when a driver may leave the vehicle running while a passenger remains in the vehicle. The required alert then becomes a nuisance to the passenger, but this is very brief – one second. We seek comment on whether this warning would be

necessary if the manufacturer could determine that seating positions other than the driver's are occupied. We know that most vehicles are capable of determining if the right front passenger position is occupied for purposes of complying with FMVSS No. 208, Occupant protection. Would manufacturers value the ability to reduce passenger annoyance equal to the cost of adding software to prevent this alarm if the seat were occupied, if given the option?

As with the above section on the "not in park" alerts we seek comment on whether simulated voice alerts containing a warning (such as "Propulsion system active") and how to remedy the situation (e.g. "Turn off propulsion system") would be an effective alternative to the proposed alert and if manufacturers are capable of installing this type of alert and at what cost.

We also recognize that this requirement will not have the intended result of preventing vehicle theft or death due to carbon monoxide poisoning if the driver does not take the KCCD from the vehicle. A driver may be especially prone to leave the KCCD in the vehicle when the vehicle is locked in the garage at home. This is another reason that we are seeking comment on the availability and cost of sensors that would indicate the presence or absence of the driver as discussed in the last section.

As will be explained later, we considered requiring the engine to shut down after a specified period of time, however, there are many situations in which a driver intends to leave some electrical system or the engine in the vehicle running without his or her presence. An example is leaving a passenger with heat or air conditioning on while the driver runs an errand, or keeping the engine running to prevent the inability to restart the engine in a very cold climate. After reviewing many possible scenarios and careful consideration, we decided we could not propose a time period for shut down that would cover all possible reasons consumers would want to leave the propulsion system running in their absence from the vehicle.

F. Owner's Manual Required Language

In order to ensure that drivers who are so inclined have access to information on how the propulsion system in their vehicles operates, normally, and in the event of an emergency, in this NPRM at S5.6, we are proposing to require that manufacturers place in the vehicle's owner's manual, instructions regarding the operation of the control(s) that stops and starts the propulsion system. This proposed language would provide a warning that power assist to steering and braking will be lost in the event the propulsion system is shut down while the vehicle is in motion. We are also proposing that there must be an explanation of how to handle the vehicle safely in the event power assist to steering and braking is lost.

NHTSA has reviewed the available owner's manuals for many manufacturers. As a practical matter, we are not aware of any manufacturer whose manual does not already address this critical safety situation. The proposed language at S5.6 will ensure that this language will continue to be maintained. Nothing in this proposed language should dissuade a manufacturer from adding additional information, if it believes the information would help a driver safely handle the vehicle in the event of an emergency.

We note that NHTSA's proposed language in the owner's manual, if made final, would be a "collection of information" as defined by the Office of Management and Budget at 5 CFR 1320 Controlling Paperwork Burdens on the Public. In this NPRM, we seek public comment on this proposed collection of information. A full description of this proposed collection of information is provided in Section IX Rulemaking Analyses and Notices.

Since we believe that very few drivers actually read the owner's manual, we request comment on whether this proposed requirement (and hence the collection of information) is

actually necessary and if manufacturers will continue to provide the instructions for these controls regardless of any requirement by NHTSA to do so.

VI. Other Issues Considered by NHTSA

In the following sections, we will discuss additional measures, other than those mentioned above that we have taken under consideration to address the safety issues raised in this NPRM. We have considered whether each of these measures would meet the need for safety in both keyless ignition systems and systems using the traditional physical key. We are not proposing regulatory text for the following measures and explain why we are not doing so. However, we seek comment on each of them and may adopt provisions relating to one or more of them in the final rule, if it can be demonstrated that they can be incorporated by manufacturers at little cost. Further, nothing in this rulemaking should be construed as prohibitions against manufacturers from voluntarily incorporating these systems in the passenger motor vehicles they manufacture.

A. Propulsion System Kill Switch in Plain View of the Driver

NHTSA considered whether to require a kill switch in plain view of the driver that would stop the propulsion system in the event of an emergency. Preferably, this switch would be an eye-catching color, such as red, and would be readily accessible on the instrument panel or other obvious location. Such a switch would, ideally, be used for all stops, not just emergency stops, so that drivers would learn the function and correct use of the switch. For example NHTSA

requires such a switch for motorcycles.²⁴ Boats, personal water craft, and construction equipment and power tools also have such switches.

NHTSA has not proposed regulatory text that would require this kill switch in passenger motor vehicles. Requiring the separate switch would mean adding new equipment to the passenger motor vehicle at issue, thus adding expense to the vehicle and possibly requiring a significant amount of lead time to implement. We cannot at this time determine whether such a switch would be easier for drivers to understand and use in an emergency than a stop control that meets the requirements we are proposing today. We seek comment and data on whether a stand alone stop control would be safer than the combined start/stop control in use now, if the stop control function complied with our proposal.

B. Stepping on Brake Before Starting the Propulsion System

In thinking about the risks associated with today's keyless ignition systems, NHTSA considered whether we should propose requiring that the driver must first step on the service brake before the propulsion system can be started. This feature is currently available in some vehicles. It addresses the situation in which an unattended child left in a vehicle could play with power windows or other electrical system features to which s/he could have access by actuating a control that works with a simple touch, even in the absence of the KCCD. NHTSA has not proposed regulatory text for this requirement because we cannot estimate this risk at this time.

We also note that on September 1, 2010, the requirement in FMVSS No. 114 for a brake transmission shift interlock (BTSI) took effect. The requirement was mandated by Congress and

²⁴ FMVSS No. 123 Motorcycle controls and displays, at S5.1. states: "Each motorcycle shall be equipped with a supplemental engine stop control, located and operable as specified in Table 1." Table 1 specifies that this control must be located on the right handlebar.

implemented into FMVSS No. 114 by rulemaking.²⁵ The new S5.3 Brake transmission shift interlock states as follows:

Each motor vehicle manufactured on or after September 1, 2010 with a GVWR of 4,536 kilograms (10,000 pounds) or less with an automatic transmission that includes a “park” position shall be equipped with a system that requires the service brake to be depressed before the transmission can be shifted out of “park.” This system shall function in any starting system key position in which the transmission can be shifted out of “park.” This section does not apply to trailers or motorcycles.

This S5.3 requirement is intended to prevent children from being able to shift the transmission out of “park” even if the physical key is in the ignition. We believe it also will minimize sudden acceleration by brake/accelerator misapplication because the driver must have his foot on the brake before the vehicle can be shifted out of “park.” It would then take a conscious decision to remove the foot from the brake, and then onto the accelerator, before the vehicle can be set in motion.

A new requirement that the driver must step on the service brake before the propulsion system can be started would extend the length of time the driver’s foot must be on the brake (i.e., because the foot must be on the brake before the propulsion system can be started and then when the driver takes the vehicle out of “park.”) S5.1.4 specifies that the vehicle must be in “park” before the key can be removed, so the stopped vehicle should always begin in the “park” position. The vehicle can only move when the vehicle is taken out of “park.” This is when the driver must step on the brake, before s/he makes a conscious decision to move, forward or in reverse.

C. Specified Actuation Time for the Propulsion System Start Control

As mentioned above, we considered whether to propose specifying, for electronic key systems, the amount of time that the driver must press on the “start” control in order to start the

²⁵ 75 FR 15621, March 30, 2010.

vehicle. We were considering a 500 millisecond time period (the same as the time period we are proposing to shut down the propulsion system). This would indicate to the driver that pushing the control for the same period of time (500 milliseconds) would actuate both stopping and starting, i.e., that the control works the same way at all times. However, NHTSA understands that some manufacturers have received complaints from their customers regarding a perceived lengthy start time (such as 500 milliseconds). To satisfy such drivers, some vehicle manufacturers have designed their vehicles to start at a mere tap on the “start” control, which could be as little as 60 milliseconds.

After carefully considering this issue and the safety issue that would be addressed by such a requirement, NHTSA has decided not to propose regulatory text to specify the length of time the “start” control must be depressed to start the vehicle. We are not aware of any safety issues resulting from a “start” control that has to be pushed for either a too short (e.g., less than 60 millisecond) or a too long (e.g., more than two second) period of time.

We have also considered the fact that when the vehicle is started, the transmission position should presumably still be in “park.” Therefore, even if a sudden start of the vehicle propulsion system should startle the driver, the vehicle should not move. Due to the brake transmission shift interlock requirement specified at S5.3, the driver would then need to depress the service brake in order to shift the transmission out of the “park” position to commence driving. The driver decides when to commence driving.

D. Automatic Shut-Off of Propulsion System for a Stationary Vehicle

When examining possible countermeasures for the situation in which a driver walks away from a vehicle with its propulsion system active, thereby increasing the risk of theft or carbon monoxide poisoning, NHTSA considered a requirement for an automatic shut-off feature applied

to vehicles fitted with electronic key code systems. We are aware that some manufacturers already provide this feature on their passenger motor vehicles. Such manufacturers have determined on their own the appropriate range of time (15 minutes to half an hour or longer) after which the vehicle propulsion system is automatically shut off. We are also aware that some systems that allow the vehicle to be started from a remote location rather than from inside the vehicle (“remote start”) have this feature as well – if the driver does not enter the vehicle after a certain amount of time after having remotely started the vehicle, the propulsion system will shut off.

NHTSA is not proposing regulatory text to require these automatic shut off systems. We have been unable to conclude that there is a specified period of time after which the propulsion system should be shut down to effectively address various scenarios mentioned in VOQs submitted to the agency. There are scenarios, such as leaving pets in the vehicle with the air conditioning or heating system on while the driver shops or is at a restaurant, where an automatic shut off of the propulsion system would have adverse results. It is our understanding that some drivers may stay in their vehicles for hours, for example, to sleep, with the air conditioning or heating system on. For the pet owner or the person staying in the vehicle for an extended period, it would be inconvenient if the propulsion system had to be restarted every 15 minutes or so.

As earlier noted, a consumer submitted a VOQ reporting a carbon monoxide build up situation where the driver parked the vehicle in the garage without turning off the engine, and locked the garage, but left the key fob, or key code carrying device, in the vehicle. Some propulsion systems that automatically shut off do so after they sense that the KCCD has been removed from the interior of the vehicle. In the situation reported in the VOQ, the automatic

system would not have shut off the propulsion system because it continued to sense the presence of the KCCD in the vehicle interior.

We believe that the new alert that we are proposing would refocus the driver's attention on the vehicle when s/he is leaving if s/he has inadvertently left the propulsion system active. For these reasons, we tentatively conclude that we do not need to regulate vehicle propulsion automatic shut off systems at this time, however, we request comment on this issue.

E. Preventing Shut-Off of Propulsion System for a Stationary Vehicle not in "Park"

We have reviewed vehicles with keyless ignition systems in situations where the driver has forgotten to place the gear selection control in "park" before shutting down the propulsion system and leaving the vehicle. As a countermeasure to rollaway incidents in such situations, we have considered whether preventing the propulsion system from shutting down unless the gear selection control is in "park" would meet the need for safety. Some manufacturers already provide this feature on their passenger motor vehicles. We considered requiring this feature, but have tentatively decided that the internal and external alerts that we are proposing are more appropriate because they alert the driver to the situation rather than masking it (i.e. not only may the driver not realize the gear selection control is not in "park", s/he may not realize that the propulsion system has not shut down). This proposed remedy is simpler and more direct and reinforces the message that a driver must put the gear selection control in "park" before requesting propulsion system shut down, just as the inability to remove a traditional key from the ignition if the gear selection control was not in "park" does. We also believe that a strategy of not shutting down a vehicle that is not in "park" may contribute to an increased risk of carbon monoxide poisoning if a driver walks away from a vehicle in this condition. We seek comment

on why manufacturers who choose to implement this strategy have done so and what are the perceived benefits. What would be the cost to implement such a strategy? If we were to require such a strategy, should it be instead of, or in addition to, the proposed internal and external alarms?

VII. Additional Questions

NHTSA requests comment on the following questions:

1. Is there any safety benefit to keyless ignition (separate from keyless entry) systems over the traditional physical key that is used to turn a rotary switch? Are there cost or weight savings? If there are no safety benefits to these new systems over the traditional key, do their convenience advantages outweigh the new safety risks we are seeing in VOQ submissions?
2. What would be the effects – safety or otherwise – of requiring vehicles to have an ignition system that uses a physical key inserted by the driver, in other words, doing away with current ignition systems that are activated by electronic key codes and touching some sort of switch?
3. Will vehicles with propulsion stop systems that meet the new FMVSS No. 114 requirements proposed in this notice somehow interfere with the functioning of anti-theft systems (immobilizers) that are part of vehicle antitheft systems available today?²⁶

VIII. Benefits, Costs and Proposed Lead Time

²⁶ We are aware that Canadian Motor Vehicle Safety Standard No. 114 requires the use of immobilizers and that many manufacturers equip some or all of the U.S. market vehicles with immobilizers that meet the requirements of CMVSS 114 to sell the same vehicles in both the U.S. and Canada. We do not want to add requirements to FMVSS No. 114 that would prevent this practice unnecessarily.

Benefits

We believe that the benefits of the new requirements proposed today, while not yet quantifiable, would be a reduction in the risk that drivers will misuse these new keyless ignition systems and therefore a reduction in:

- crashes, injuries and deaths resulting from a driver's inability to shut down a moving vehicle,
- rollaway incidents and their accompanying crashes, injuries, and deaths, and
- incidents of carbon monoxide poisoning due to drivers inadvertently leaving a vehicle running or with its propulsion system active in an enclosed space, such as a garage underneath or adjoining a home.

Although the current information indicates a clear safety problem, it is difficult to quantify the benefits. However, we believe the potential risks justify the costs of this rule. Given that we believe the total costs of this proposal would be relatively small, certainly less than \$500,000 a year, for the entire industry, preventing even one serious injury over three years would make the proposed rule cost-beneficial.

We believe that taking precautionary steps now, before these non-standardized systems become more widely available, would be beneficial to vehicle safety. The availability of these systems increases every model year. For example, for the 11 manufacturers for which we have data, production of models with any type of keyless ignition (as standard or optional equipment) increased from 5,000 vehicles in model year 2002 to over 1.2 million vehicles in model year 2008. For models equipped with push button controls as standard or optional equipment, production increased from 5,000 vehicles in model year 2002 to over 1.1 million vehicles in model year 2008. We believe a benefit would accrue from establishing consistent experience for

the users across all vehicles. This simplifies the operation of these systems for drivers, reducing the stress and confusion relating to fundamental differences in how one operates a vehicle. This is especially important in vehicles that provide less obvious cues as to the state of the engine and the starting system. We believe the countermeasures we have proposed can reasonably be expected to have their intended effect based on similar requirements already in place in FMVSS No. 114 and other standards and in common automotive practice. For example, the warning to drivers to take their key with them when they leave the vehicle (currently in FMVSS No. 114) and the threshold warning device for platform lifts (currently in FMVSS No. 403) are effective alerts. We see no reason why the new alerts proposed here should be less effective. The common automotive practice of the rotating ignition switch combined with a physical key has standardized engine shut down procedure before the advent of the new electronic convenience controls. We believe standardizing the operation of these new controls, combined with the new alerts, will have the same effect. We believe these new requirements are especially worthwhile considering what we believe to be minimal costs to implement them. We seek comments on this understanding of the benefit of the proposed changes to FMVSS No. 114.

Costs

The countermeasure for driver confusion over how to shut down a moving vehicle is to require that the switch that turns off the propulsion system work consistently, whether the vehicle is moving or not. In the vehicles that are in production today and are fitted with keyless ignition systems, the great majority have push-button type switches. Some require a momentary tap, some require longer hold times, and some use different times to affect different functions. From our knowledge of the operation of current designs, we believe that our proposed 500 millisecond hold time is well within the functional range of the switches currently in use. The

only change necessary, in most cases, would be in the lines of software coding for the system operated by button. Thus, we believe there would be little incremental cost for changing the behavior of the keyless ignition control. There would be costs associated with testing the new software for correct operation. Those costs would be minimized by the lead time we are proposing below. This lead time would allow changes to be made between and not during model years.

We are proposing to require one new internal driver alert and two new external driver alerts. Some models already use some version of these alerts and other alerts are already required by FMVSS No. 114. In most cases, manufacturers need only reconfigure existing sound generating systems to engage under the right circumstances. For this reason, we believe the warning cues proposed here have very little cost associated with their implementation.

Because the incremental cost for equipping every vehicle in the fleet would be very small, it follows that regardless of the number of vehicles needing a countermeasure, the cost to equip the entire fleet would be similarly small.

We seek comment on our tentative conclusions regarding the costs to manufacturers to implement the changes proposed today.

Proposed Lead Time

If the proposed changes in this NPRM are made final, NHTSA proposes a lead time of two years from the next September 1 after a final rule is published in the FEDERAL REGISTER. This means, for example, if a final rule were published on September 2, 2012, the final rule would take effect on September 1, 2015. We believe that this lead time gives vehicle manufacturers ample time to implement the new requirements at minimal cost, especially given that we believe the required changes would be minimal. Manufacturers are already making

changes to accommodate the SAE RP. The changes we are proposing today would be minimal changes from that RP. Comments are requested on this proposed lead time.

We are not proposing a phased-in lead time because we believe that the changes we propose today are relatively minor and can be implemented in a two-year period. We tentatively conclude that a phased-in lead time would be an unnecessary complication that would increase cost to the manufacturers and to the agency due to the need to keep track of which vehicle lines are subject to compliance in a given model year. The percentage of vehicles now using keyless ignition and the number of model lines is so small that we believe the proposed changes can be made in the proposed two year lead time without phase in.²⁷ We seek comment on our tentative conclusion that a phased-in lead time is not necessary.

IX. Rulemaking Analyses and Notices

Executive Orders 12866 and DOT Regulatory Policies and Procedures

The agency has considered the impacts of this rulemaking action under Executive Orders 12866 and 13563 and the Department of Transportation's regulatory policies and procedures (44 FR 11034; February 26, 1979). This proposal has been deemed “non-significant” by the Office of Management and Budget. This NPRM includes the following proposed changes to FMVSS No. 114: establishing a standardized time for pushing a control to stop the vehicle propulsion system and several new warnings to the driver; requesting propulsion system shut down without first moving the gear selection control to the “park” position (for vehicles with a “park”

²⁷ The most recent information we have for a full year of production and sales indicates that the 2008 model year production of vehicles with keyless ignition standard or optional was 1,212,355 vehicles while the 2008 calendar year sales of all vehicles was 13,194,741 vehicles. Therefore, we believe the current sales level of keyless ignition vehicles is less than ten percent of the total U.S. sales.

position), exiting a vehicle with the gear selection control not in “park” (for vehicles with a “park” position), and exiting a vehicle with the propulsion system operating.

None of these proposed changes would require the addition of new systems or equipment on existing vehicles. The first proposed change, standardizing the time to push a control to stop the vehicle propulsion system, could be accomplished by reconfiguring lines of software coding for the system operated by the control. The costs involved in reconfiguring the software are minimal. For the proposed driver alerts (one new internal driver alert and two new external alerts), in most cases, manufacturers need only reconfigure existing sound generating systems to engage under the right circumstances. For these reasons, we have tentatively concluded that the warning cues proposed in this NPRM have little cost associated with their implementation.

Regulatory Flexibility Act

Pursuant to the Regulatory Flexibility Act (5 U.S.C. 601 et seq., as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996), whenever an agency is required to publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small governmental jurisdictions). The Small Business Administration’s regulations at 13 CFR Part 121 define a small business, in part, as a business entity “which operates primarily within the United States.” (13 CFR §121.105(a)). No regulatory flexibility analysis is required if the head of an agency certifies that the rule would not have a significant economic impact on a substantial number of small entities. The SBREFA amended the Regulatory Flexibility Act to require Federal agencies to provide a statement of the factual basis for certifying that a rule will not have a significant economic impact on a substantial number of small entities.

NHTSA has considered the effects of this rulemaking action under the Regulatory Flexibility Act. According to 13 CFR § 121.201, the Small Business Administration's size standards regulations used to define small business concerns, manufacturers of passenger vehicles would fall under North American Industry Classification System (NAICS) No. 336111, Automobile Manufacturing, which has a size standard of 1,000 employees or fewer. Using the size standard of 1,000 employees or fewer, NHTSA estimates that there are a limited number of small business manufacturers of passenger vehicles subject to the proposed requirements. These small U.S. businesses, which include Tesla, manufacture specialty passenger cars which serve niche markets.

I hereby certify that this proposed rule would not have a significant economic impact on a substantial number of small entities. The basis for this certification is that as earlier stated, if made final, none of these proposed changes would require the addition of new systems or equipment on existing vehicles, and would result in minimal costs to all businesses, small and large. The first proposed change, standardizing the time to push a control to stop the vehicle propulsion system, would incur minimal costs resulting from reconfiguring lines of software coding for the system operated by the control. All the proposed driver alerts can rely on the existing systems that are already required by FMVSS No. 114 or used for other purposes. In most cases, manufacturers need only reconfigure existing sound generating systems to engage under the right circumstances.

Executive Order 13132 (Federalism)

NHTSA has examined today's NPRM pursuant to Executive Order 13132 (64 FR 43255, August 10, 1999) and concluded that no additional consultation with States, local governments or their representatives is mandated beyond the rulemaking process. The agency has concluded

that the rulemaking would not have sufficient federalism implications to warrant consultation with State and local officials or the preparation of a federalism summary impact statement. The final rule would not have “substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.”

NHTSA rules can preempt in two ways. First, the National Traffic and Motor Vehicle Safety Act contains an express preemption provision:

When a motor vehicle safety standard is in effect under this chapter, a State or a political subdivision of a State may prescribe or continue in effect a standard applicable to the same aspect of performance of a motor vehicle or motor vehicle equipment only if the standard is identical to the standard prescribed under this chapter.

49 U.S.C. 30103(b)(1).

It is this statutory command by Congress that preempts any non-identical State legislative and administrative law addressing the same aspect of performance.

The express preemption provision described above is subject to a savings clause under which “[c]ompliance with a motor vehicle safety standard prescribed under this chapter does not exempt a person from liability at common law.” 49 U.S.C. 30103(e) Pursuant to this provision, State common law tort causes of action against motor vehicle manufacturers that might otherwise be preempted by the express preemption provision are generally preserved. However, the Supreme Court has recognized the possibility, in some instances, of implied preemption of such State common law tort causes of action by virtue of NHTSA's rules, even if not expressly preempted. This second way that NHTSA rules can preempt is dependent upon there being an actual conflict between an FMVSS and the higher standard that would effectively be imposed on motor vehicle manufacturers if someone obtained a State common law tort judgment against the

manufacturer, notwithstanding the manufacturer's compliance with the NHTSA standard. Because most NHTSA standards established by an FMVSS are minimum standards, a State common law tort cause of action that seeks to impose a higher standard on motor vehicle manufacturers will generally not be preempted. However, if and when such a conflict does exist—for example, when the standard at issue is both a minimum and a maximum standard—the State common law tort cause of action is impliedly preempted. See *Geier v. American Honda Motor Co.*, 529 U.S. 861 (2000).

Pursuant to Executive Order 13132 and 12988, NHTSA has considered whether this rule could or should preempt State common law causes of action. The agency's ability to announce its conclusion regarding the preemptive effect of one of its rules reduces the likelihood that preemption will be an issue in any subsequent tort litigation.

To this end, the agency has examined the nature (e.g., the language and structure of the regulatory text) and objectives of today's rule and finds that this rule, like many NHTSA rules, prescribes only a minimum safety standard. As such, NHTSA does not intend that this rule preempt state tort law that would effectively impose a higher standard on motor vehicle manufacturers than that established by today's rule. Establishment of a higher standard by means of State tort law would not conflict with the minimum standard announced here. Without any conflict, there could not be any implied preemption of a State common law tort cause of action. Nevertheless, we solicit the comments of the States and other interested parties on this assessment of issues relevant to E.O. 13132.

National Environmental Policy Act

NHTSA has analyzed this NPRM for the purposes of the National Environmental Policy Act. The agency has determined that implementation of this action would not have any significant impact on the quality of the human environment.

Paperwork Reduction Act

Before a Federal agency can collect certain information from the public, it must receive approval from the Office of Management and Budget (OMB). Under the Paperwork Reduction Act of 1995, a person is not required to respond to a collection of information by a Federal agency unless the collection displays a valid OMB control number. Before seeking OMB approval, Federal agencies must publish a document in the FEDERAL REGISTER providing a 60-day public comment period and otherwise consult with members of the public and affected agencies concerning each proposed collection of information. In this NPRM, we are proposing a revision to an existing OMB approved collection, OMB Clearance No. 2127-0541, Consolidated Justification of Owner's Manual Requirements for Motor Vehicles and Equipment, for which we are soliciting public comment.

Title: Consolidated Justification of Owner's Manual Requirements for Motor Vehicles and Equipment.

OMB Control Number and Expiration Date: OMB Control No. 2127-0541, approved through May 31, 2012.

Type of Request: Revision of a currently approved collection.

Abstract: In this NPRM, at S5.6 Owner's manual required language, we are proposing that manufacturers must place in the vehicle owner's manual, instructions regarding the operation of the control(s) that stops and starts the propulsion system. This language (which the manufactures would provide) must contain a warning that power assist to steering and braking

will be lost in the event the propulsion system is shut down while the vehicle is in motion. There must also be an explanation of how to handle the vehicle safely in the event power assist to steering and braking is lost.

If this proposed S5.6 language (in FMVSS No. 114) is made final, we will submit a request for OMB clearance of the proposed collection of information in time to obtain clearance prior to the effective date of the final rule.

Description of the likely respondents - Manufacturers of passenger cars, multipurpose passenger vehicles, trucks, and multipurpose passenger vehicles with a GVWR of 4,536 kg or less. NHTSA estimates that there are a total of 21 such manufacturers.

Estimated total annual reporting and recordkeeping burden of the proposed collection of information – The total estimated annual burden (counting all respondents) is estimated at 21 hours. This breaks down to an estimated one hour per manufacturer to write the information to be provided in the owner's manual. 21 times one hour each results in 21 estimated burden hours for report preparation. Because the information to be provided is of a very general nature, NHTSA does not believe that manufacturers must provide separate explanations for each vehicle line or model they produce regarding how to handle a vehicle in the event of an emergency.

There are no proposed recordkeeping requirements associated with this collection of information.

Estimated total annual costs of the proposed collection of information – NHTSA believes all manufacturers already have the engineering staff on hand needed to write the description, which they will accomplish in the regular performance of their duties. The additional few pages in an owner's manual (or, especially, information on a CD ROM) will result in minimal additional costs. NHTSA notes that it is not aware of any manufacturer that is not already

providing this information in the vehicle owner's manuals. Therefore, NHTSA believes the cost of complying would be \$0.

Comments are invited on: (i) Whether the proposed collection of information is necessary for the proper performance of the functions of the agency, including whether the information will have practical utility; (ii) The accuracy of the agency's estimate of the burden of the proposed collection of information, including the validity of the methodology and assumptions; (iii) How to enhance the quality, utility, and clarity of the information to be collected; and (iv) How to minimize the burden of the collection of information on those who are to respond, including the use of appropriate automated, electronic, mechanical, or other technological collection techniques or other forms of information technology, e.g., permitting electronic submission of responses.

Please provide comments on this proposed collection of information by the comment due date cited in the DATES: section of this NPRM, and please reference the docket number cited in the heading of this notice in your comments. Any of the means of comment described in the ADDRESSES: section of this NPRM may be used.

National Technology Transfer and Advancement Act

Under the National Technology Transfer and Advancement Act of 1995 (NTTAA) (Public Law 104-113), "all Federal agencies and departments shall use technical standards that are developed or adopted by voluntary consensus standards bodies, using such technical standards as a means to carry out policy objectives or activities determined by the agencies and departments." For today's NPRM, NHTSA has relied on an SAE Recommended Practice, J2948 Keyless Ignition Control Design (January 2011) for guidance.

Executive Order 12988

With respect to the review of the promulgation of a new regulation, section 3(b) of Executive Order 12988, “Civil Justice Reform” (61 FR 4729, February 7, 1996) requires that Executive agencies make every reasonable effort to ensure that the regulation: (1) Clearly specifies the preemptive effect; (2) clearly specifies the effect on existing Federal law or regulation; (3) provides a clear legal standard for affected conduct, while promoting simplification and burden reduction; (4) clearly specifies the retroactive effect, if any; (5) adequately defines key terms; and (6) addresses other important issues affecting clarity and general draftsmanship under any guidelines issued by the Attorney General. This document is consistent with that requirement.

Pursuant to this Order, NHTSA notes as follows.

The issue of preemption is discussed above in connection with E.O. 13132. NHTSA notes further that there is no requirement that individuals submit a petition for reconsideration or pursue other administrative proceeding before they may file suit in court.

Unfunded Mandates Reform Act

The Unfunded Mandates Reform Act of 1995 requires agencies to prepare a written assessment of the costs, benefits and other effects of proposed or final rules that include a Federal mandate likely to result in the expenditure by State, local or tribal governments, in the aggregate, or by the private sector, of more than \$100 million annually (adjusted for inflation with base year of 1995 this is \$141.23 million in 2009 dollars). This NPRM, if made final, would not result in expenditures by State, local or tribal governments, in the aggregate, or by the private sector in excess of \$141.23 million annually.

Executive Order 13045

Executive Order 13045 (62 FR 19885, April 23, 1997) applies to any rule that: (1) is determined to be “economically significant” as defined under E.O. 12866, and (2) concerns an environmental, health, or safety risk that NHTSA has reason to believe may have a disproportionate effect on children. This rulemaking is not subject to the Executive Order because it is not economically significant as defined in E.O. 12866. However, since this NPRM, if made final, would make more explicit how the stop control on electronic keyless coded vehicles are to be actuated, and would provide warnings to the driver, it should have a beneficial safety effect on children riding in such vehicles.

Executive Order 13211

Executive Order 13211 (66 FR 28355, May 18, 2001) applies to any rulemaking that: (1) is determined to be economically significant as defined under E.O. 12866, and is likely to have a significantly adverse effect on the supply of, distribution of, or use of energy; or (2) that is designated by the Administrator of the Office of Information and Regulatory Affairs as a significant energy action. This rulemaking is not subject to E.O. 13211.

Plain Language

Executive Order 12866 requires each agency to write all rules in plain language.

Application of the principles of plain language includes consideration of the following questions:

- Have we organized the material to suit the public's needs?
- Are the requirements in the rule clearly stated?
- Does the rule contain technical language or jargon that isn't clear?
- Would a different format (grouping and order of sections, use of headings, paragraphing) make the rule easier to understand?
- Would more (but shorter) sections be better?

- Could we improve clarity by adding tables, lists, or diagrams?
- What else could we do to make the rule easier to understand?

If you have any responses to these questions, please include them in your comments on this proposal.

Regulation Identifier Number (RIN)

The Department of Transportation assigns a regulation identifier number (RIN) to each regulatory action listed in the Unified Agenda of Federal Regulations. The Regulatory Information Service Center publishes the Unified Agenda in April and October of each year. You may use the RIN contained in the heading at the beginning of this document to find this action in the Unified Agenda.

Privacy Act

Anyone is able to search the electronic form of all comments received into any of our dockets by the name of the individual submitting the comment (or signing the comment, if submitted on behalf of an association, business, labor union, etc.). You may review DOT's complete Privacy Act Statement in the Federal Register published on April 11, 2000 (Volume 65, Number 70; Pages 19477-78).

X. Public Participation

How do I prepare and submit comments?

Your comments must be written and in English. To ensure that your comments are correctly filed in the Docket, please include the docket number of this document in your comments.

Your comments must not be more than 15 pages long. (49 CFR 553.21). We established this limit to encourage you to write your primary comments in a concise fashion. However, you may attach necessary additional documents to your comments. There is no limit on the length of the attachments.

Comments may also be submitted to the docket electronically by logging onto the Federal Docket Management System website at <http://www.regulations.gov>. Follow the online instructions for submitting comments.

Please note that pursuant to the Data Quality Act, in order for substantive data to be relied upon and used by the agency, it must meet the information quality standards set forth in the OMB and DOT Data Quality Act guidelines. Accordingly, we encourage you to consult the guidelines in preparing your comments. OMB's guidelines may be accessed at <http://www.whitehouse.gov/omb/fedreg/reproducible.html>. DOT's guidelines may be accessed at http://www.bts.gov/programs/statistical_policy_and_research/data_quality_guidelines/html/introduction.html.

How can I be sure that my comments were received?

If you wish Docket Management to notify you upon its receipt of your comments, enclose a self-addressed, stamped postcard in the envelope containing your comments. Upon receiving your comments, Docket Management will return the postcard by mail.

How do I submit confidential business information?

If you wish to submit any information under a claim of confidentiality, you should submit three copies of your complete submission, including the information you claim to be confidential

business information, to the Chief Counsel, NHTSA, at the address given above under FOR FURTHER INFORMATION CONTACT. In addition, you should submit a copy, from which you have deleted the claimed confidential business information, to the docket at the address given above under ADDRESSES. When you send a comment containing information claimed to be confidential business information, you should include a cover letter setting forth the information specified in our confidential business information regulation. (49 CFR Part 512.)

Will the agency consider late comments?

We will consider all comments received before the close of business on the comment closing date indicated above under DATES. To the extent possible, we will also consider comments that the docket receives after that date. If the docket receives a comment too late for us to consider in developing a final rule (assuming that one is issued), we will consider that comment as an informal suggestion for future rulemaking action.

How can I read the comments submitted by other people?

You may read the comments received by the docket at the address given above under ADDRESSES. The hours of the docket are indicated above in the same location. You may also see the comments on the Internet. To read the comments on the Internet, go to <http://www.regulations.gov>. Follow the online instructions for accessing the dockets.

Please note that even after the comment closing date, we will continue to file relevant information in the docket as it becomes available. Further, some people may submit late comments. Accordingly, we recommend that you periodically check the Docket for new material. You can arrange with the docket to be notified when others file comments in the docket. See www.regulations.gov for more information.

List of Subjects in 49 CFR Part 571

Imports, Motor vehicle safety, Motor vehicles, and Tires.

In consideration of the foregoing, NHTSA proposes to amend 49 CFR Part 571 as set forth below.

PART 571 - - FEDERAL MOTOR VEHICLE SAFETY STANDARDS

1. The authority citation for Part 571 continues to read as follows:

Authority: 49 U.S.C. 322, 30111, 30115, 30117 and 30166; delegation of authority at 49 CFR 1.50.

2. Section 571.114 is amended by:

- a. revising S1.;
- b. revising S2.;
- c. revising in S4, the definition of “Key”;
- d. adding, in S4, in alphabetical order, the definitions of “Key code carrying device”, “Starting system” and “Stop control”;
- e. revising in S5, the first sentence;
- f. revising in S5.1.3, paragraph (b);
- g. adding S5.4;
- h. adding S5.4.1;
- i. adding S5.4.1.1, and paragraphs (a) through (c);
- j. adding S5.4.2;
- k. adding S5.4.2.1;
- l. adding S5.4.2.2;
- m. adding S5.4.2.3;
- n. adding S5.5;

- o. adding S5.6;
- p. revising S6.;
- q. revising S6.2;
- r. adding S6.3
- s. adding S6.3.1 paragraphs (a) through (i) ;
- t. adding S6.3.2 paragraphs (a) through (i); and
- u. adding S6.3.3 paragraphs (a) through (g).

The revisions and additions read as follows:

§571.114 Standard No. 114; Theft protection and rollaway prevention.

S1. Scope. This standard specifies vehicle performance requirements intended to reduce the incidence of crashes and injuries resulting from theft, accidental rollaway of motor vehicles, inability to deactivate the vehicle propulsion system and inadvertently leaving the system activated.

S2. Purpose. The purpose of this standard is to decrease the likelihood that a vehicle is stolen, is accidentally set in motion, cannot be stopped during a panic situation, or is shut down without the gear in the “park” position or without deactivating the vehicle propulsion system.

* * * * *

S4. Definitions.

* * * * *

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, motor or other system that provides propulsion to the motor vehicle.

Key code carrying device means a physical device which is capable of electronically transmitting

the key code to the vehicle starting system without physical connection (other than its presence in the vehicle) between the device and the vehicle.

* * * * *

Starting system means the vehicle system used in conjunction with the key to activate the engine, motor or other system which provides propulsion to the motor vehicle.

Stop control means the device used by the driver to deactivate the engine, motor or other system which provides propulsion to the motor vehicle.

* * * * *

S5. Requirements. Each vehicle subject to this standard must meet the requirements of S5.1 through S5.5. * * *

* * * * *

S5.1.3 * * *

(b) For mechanical keys and starting systems, if the key is in the starting system in a manner or position that allows the engine or motor to be started or to continue operating; or

* * * * *

S5.4 Requirements for vehicles using electronic codes to access the starting system without physical connection between the key and the vehicle.

S5.4.1 Propulsion system deactivation

S5.4.1.1. For a vehicle equipped with a propulsion system stop control that is activated by the driver pressing on the control—

(a) The vehicle's propulsion system must not stop until the control has been depressed for more than 500 milliseconds.

(b) The propulsion system must shut off within 1 second after the control is first pressed.

(c) Restarting the propulsion system after it has been stopped, but the vehicle is still moving at more than 15 km/h (9.3 mph), is permitted only by means of actuating the control used by the driver to start the propulsion system.

S5.4.2 Warnings to driver exiting a vehicle with the gear selection control not in “park,” for vehicles equipped with a “park” position.

S5.4.2.1. Motor vehicles whose transmissions have a “park” position and whose starting system is accessed by electronic key codes without any physical connection between the key and the vehicle shall meet the requirements of S5.4.2.2 and S5.4.2.3.

S5.4.2.2 When tested in accordance with S6.3.1, an audible alert of no less than 85dBA between 500-3000 Hz must sound when the driver actuates the stop control while the gear selection control is not in “park” and the vehicle is moving at less than 15 km/h (9.3 mph). This alert must continue until the gear selection control is placed in “park”. The gear selection control must be movable to the “park” position without the restarting of the propulsion system.

S5.4.2.3. When tested in accordance with S6.3.2, an audible alert of no less than 85dBA between 500-3000 Hz, measured outside the vehicle, must sound when the door located closest to the driver’s designated seating position is opened while the gear selection control is not in “park”, the vehicle is moving at less than 15 km/h (9.3 mph), and the key code carrying device is not present in the vehicle. This alert must sound for 1 minute or until the gear selection control is moved to “park,” whichever occurs first. This alert is not required to sound if the transmission becomes locked in “park” as a direct result of key removal upon door opening, or upon removal of the key code carrying device from the vehicle.

S5.5 Warning to driver exiting a vehicle while propulsion system is operating. When tested in accordance with section S6.3.3, an audible alert of no less than 85dBA between 500-3000 Hz, measured outside the vehicle, must sound if, the propulsion system is actuated, or capable of actuating without reintroduction of the electronic key code into the starting system, the door located closest to the driver's designated seating position is opened, and the key code carrying device is not present in the vehicle. This alert must sound for no less than 1 second.

S5.6 Owner's manual required language. In the vehicle's owner's manual, the manufacturer must place instructions regarding the operation of the control(s) that starts and stops the propulsion system. This language must contain a warning that power assist to steering and braking will be lost in the event the propulsion system is shut down while the vehicle is in motion. There must be an explanation of how to handle the vehicle safely in the event power assist to steering and braking is lost.

S6. Compliance test procedure.

* * * * *

S6.2 Test procedure for vehicles with transmissions with a "park" position.

* * * * *

S6.3 Test procedures for vehicles using electronic key codes with their starting systems.

S6.3.1 (a) Enter the vehicle with the key code carrying device.

(b) Actuate the propulsion system start control.

(c) Place the gear selection control in any position except "park"

(d) Activate the propulsion system stop control.

(e) Verify that an alert sounds.

(f) Measure the sound level of this alert at 740 mm above the driver's seat.

(g) Verify that the sound level is no less than 85dBA between 500-3000Hz.

(h) Move the gear selection control to the “park” position.

(i) Verify that the alert stops.

S6.3.2 (a) Enter the vehicle with the key code carrying device and sit in the driver’s seat.

(b) Actuate the propulsion system start control.

(c) Place the gear selection control in any position except “park”.

(d) Actuate the propulsion system stop control.

(e) Open the driver’s door, exit the vehicle with the key code carrying device and close the driver’s door.

(f) Verify that an alert can be heard exterior to the vehicle.

(g) Verify the sound level of the alert is no less than 85 dBA at 500-3000 Hz measured 1 meter perpendicular to the driver’s door and 1580 mm above the ground.

(h) Without moving the gear selection control to the “park” position, verify that the alert continues to sound for 1 minute.

(i) Verify that the alert sounds until the gear selection control is moved to the “park” position.

S6.3.3 (a) Enter the vehicle with the key code carrying device and sit in the driver’s seat.

(b) Actuate the propulsion system start control.

(c) Do not actuate the propulsion system stop control.

(d) Open the driver’s door, exit the vehicle with the key code carrying device and close the driver’s door.

(e) Verify that an alert can be heard exterior to the vehicle.

(f) Verify the sound level of the alert is no less than 85 dBA at 500-3000 Hz measured 1

meter perpendicular to the driver's door and 1580mm above the ground.

(g) Verify that the alert continues to sound for no less than 1 sec.

Issued on: December 1, 2011

Christopher J. Bonanti
Associate Administrator
for Rulemaking

Billing Code: 4910-59-P

[FR Doc. 2011-31441 Filed 12/09/2011 at 8:45 am; Publication Date: 12/12/2011]