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Federal Motor Vehicle Safety Standards;
Theft Protection and Rollaway Prevention
76 FR 77183, December 12, 2011

Advocates for Highway and Auto Safety (Advocates) files these comments in response to the notice of proposed rulemaking (NPRM) issued by the National Highway Traffic Safety Administration (NHTSA) regarding proposed changes to Federal Motor Vehicle Safety Standard Number 114: Theft Protection and Rollaway Prevention (FMVSS 114). 76 FR 77183 (Dec. 12, 2011). The NPRM would amend FMVSS 114 by adding provisions to deal with safety-related and emergency situations to establish uniform operation of keyless ignition controls to stop a vehicle propulsion system, require an alert when a driver attempts to shut down a propulsion system, leave a vehicle when the transmission is not in park, or leave a vehicle while the propulsion system is still on, adopt test procedures to verify the operation of the required alerts, define necessary aspects of ignition operation that are unique to keyless ignitions, and prescribe language describing the operation of the keyless ignition system in the vehicle owner's manual.

Advocates supports the purpose of the NPRM and commends NHTSA on its effort to update FMVSS 114 to include new technologies and address the preventable injuries and fatalities associated with keyless ignitions. However, some of the details of the proposal fall short of the changes needed to provide a comprehensive safety regime for keyless ignition operations. News reports of fatalities, noted in the NPRM,[1] highlight the developing safety issue surrounding keyless ignitions. As NHTSA outlined in the NPRM, the proposed rulemaking will address a driver's inability to stop a moving vehicle in a panic situation and, at a basic level, drivers who unintentionally leave the vehicle without the vehicle's transmission being in park or with the engine still running. Advocates believes the standardization of the operation of the stop control will provide consumers with habit-forming repetition that will reduce the occurrences injury and death associated

[1] These include the inability of drivers to shut off the engine during episodes of uncontrolled acceleration as well as reports of carbon monoxide poisoning resulting from exhaust fumes in cases where the vehicle engine or propulsion system was inadvertently left in the on position. 76 FR 77186-77188.

with misuse of the stop control. However, reliance on single occurrence audible alerts to address the other situations noted in the NPRM is not likely to be sufficient.

Requests for Comments

Advocates responds to a number of requests for comments that are included throughout the text of the NPRM. Responses are generally presented in chorological order as set forth in the NPRM, with related responses grouped together as appropriate.

Use of vehicle owner's complaints as a basis for amending FMVSS 114.

Advocates supports the use of the consumer complaint form, called the vehicle owner's questionnaire (VOQ) as the basis of the proposed rulemaking. The VOQ system provides a direct line of communication between vehicle owners and the regulatory agency, allowing for trends in consumer complaints to be identified earlier than may be possible in more traditional safety databases such as the National Automotive Sampling System (NASS) or the Fatality Analysis Reporting System (FARS). The VOQs provide timely, if not immediate, information and feedback on safety issues and emerging trends that vehicle owners and operators are experiencing in the real world. The traditional safety databases may take years before collected data identify emerging issues and trends. More importantly, these databases suffer from a limited focus which may not have the capability to capture data on new issues until additional variables have been added. NHTSA recognized as much in stating in the NPRM:

> Today's discussion is based on driver complaints to ODI [Office of Defect Investigations] through the VOQ because in this case the crashes or incidents of interest either cannot be identified from data elements available in those [NASS and FARS] 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).

76 FR 77186.

In the case of keyless ignitions, the VOQ database has brought to light an emerging issue which can be addressed simply and cost effectively so as to prevent additional deaths which may take place before sufficient related cases appear in the traditional databases. All regulation should be based in sound science and VOQs are but an early warning tool to identify topics which warrant additional investigation. In the case at hand, when an issue is identified through such tools as the VOQ and a simple cost effective solution is proposed, such a process can limit the requirement for significant additional research which would delay resolution and possibly cost additional lives and injuries.

Technical specifications for audible warning alerts.

Advocates supports the agency's decision to set a uniform requirement for activation of the stop control, regardless of whether the vehicle is stopped or moving. With regard to

the requirement that the control be pushed for 500 milliseconds (ms), a study of driver behavior when operating vehicles should be conducted to calculate a reasonable but well established limit. Similarly, Advocates does not understand why establishing a routine limit for operation of the ignition during both startup and shutdown of the propulsion system would not be beneficial. Even if a uniform start-up or activation protocol is not itself essential, repetition is the hallmark of the learned behavior process and would limit conflicting behaviors associated with operating the same process but under different conditions (turning on vs. turning off). Using the identical protocol would have the benefit of reinforcing the learned behavior for when it might be needed in an emergency situation.

Advocates does not support the elimination of the multiple short actuation process. In addition to the uniform process, a steady push for 500 ms, to shut down the propulsion system, the agency should require that repeated short actuations also be used for engine shut-down. In panic situations, which this rulemaking is designed to address, it is unreasonable to assume a driver would always rationally evaluate their behavior and comply with the usual procedure of a steady push of the actuation button for 500 ms required under normal circumstances. It is foreseeable that in an emergency situation, a percentage of the driving public will panic and depress the button repeatedly despite prior experience in shutting down the engine. In many non-emergency situations, especially when impatient, people engage in rapid, repeated efforts to change conditions, such as pressing an elevator button or a traffic control device walk signal button. It is likely that in an emergency situation some portion of drivers will react in a panic and revert to multiple short actuations.

Advocates supports the specification of the properties of any alerts required by the proposed rulemaking. However, research supporting the effectiveness of the alerts specified should be conducted. Advocates would like to offer the following recommendations regarding each of the alerts addressed in the rulemaking:

a) “Internal, not in park” warning for a stationary (travelling less than 15 km/h) vehicle when shut down is requested without the vehicle transmission being in park:

A vehicle equipped with an electronic transmission should, in addition to the audible alert, automatically shift the transmission to park. In the case of a vehicle without an electronic transmission, in addition to the alert during shut off, should prevent the vehicle from subsequently being turned on again until the transmission is first shifted to park in addition to initializing the audible alert once more during the turn-on process. Such a requirement would prevent the starting of a vehicle with the transmission in gear which could lead to unexpected movement.

b) “External, vehicle left running” warning for a stationary vehicle when the propulsion system is running and the key code carrying device (KCCD) leaves the vehicle:

Advocates is particularly concerned about the short duration of this alert and linking the alert to the location of the KCCD. A vehicle left running when the driver exits the vehicle should have a sufficiently assertive audible alert that will draw the driver's attention to the situation immediately. Testing should be used to specify an alert that will capture the attention of a driver who has unintentionally forgotten to shut off the vehicle engine. It should be kept in mind that preventing the unintentional situation, where a driver does not realize that the engine is still on, is the primary goal of the audible warning. Therefore, the duration and decibel level of the audible alert should be set at a level necessary to get the attention of drivers who may have inadvertently left the vehicle engine on, even if that tone may result in some degree of annoyance to operators who intend to leave their vehicles running.

Additionally, this alert should repeat at specified intervals until the vehicle engine is shut off, in order to draw continued attention to the fact that the engine was left in running. For example, individuals who inadvertently leave their vehicle running in a garage attached to their house, but ignored or failed to respond to the initial audible warning, might well hear a subsequent audible alert when in their home even when the vehicle is not in sight. In a number of instances, people have succumbed to carbon monoxide (CO) poisoning while sleeping because they unintentionally left their vehicles in the garage with the engine running. Alternatively, the agency could require a carbon monoxide sensor on each vehicle to provide a specific alert should a dangerous concentration of CO build up in the vicinity of the vehicle.

Finally, Advocates is concerned that linking the alert with the removal of the KCCD does not address those cases where an individual might leave the KCCD in their vehicle, specifically when parking their vehicle in their garage.

c) "External not in park" warning for a stationary vehicle when the driver exits the vehicle and the KCCD is not present in the vehicle:

As with the other alerts, Advocates recommends that the specifications of the alert be based upon examination of driver behavior to ensure effectiveness. Similar to the "still running" alert, Advocates is concerned about linking the alert to the location of the KCCD rather than connecting the alert to the action of the driver exiting the vehicle. This alert could be optional if, as specified in Advocates recommendation for the "internal not in park warning", the vehicle is equipped with an electronic transmission which automatically shifts the transmission into park. Where, however, a vehicle is not equipped with an electronic transmission, the internal alert would sound when the vehicle engine is turned off, followed by an appropriately specified external alert when the driver exits the vehicle. As previously recommended, the internal audible alert would need to sound again when the driver re-enters the vehicle and attempts to start the vehicle while the transmission is not in the park position.

Foreseeable Risk from Carbon Monoxide.

As mentioned above, the prospect of carbon monoxide poisoning is an unintended consequence of keyless ignitions that, while infrequent, is nevertheless, foreseeable. In a

number of incidents, carbon monoxide poisoning has been reported where vehicle owners have inadvertently left the vehicle engine on and running in an enclosed garage attached to the vehicle owner's home. Silent or near silent operation of the vehicle propulsion system, combined with the manner in which keyless ignition separates the electronic key code from the physical KCCD can result, in some circumstances, in the endangerment of vehicle owners who may for any number of reasons fail to focus on the specific manner in which a keyless ignition system must be shut off. For this reason, any warning system directed to ensuring that vehicle owners do not inadvertently leave the vehicle propulsion system on when they leave the vehicle must take into account that some vehicle owners may not heed and properly react to the initial short alert on exiting the vehicle. Since such incidents have been reported a number of times over several years, it is necessary to ensure that the proposed alert will either repeat at specified intervals while the propulsion system remains on after the driver has left the vehicle, in order to draw continued attention, or to require a separate CO sensor and alarm system on each vehicle equipped with a keyless ignition which can sound a sufficiently loud audible alert should a dangerous concentration of CO build up in the vicinity of the vehicle. Advocates is concerned that limiting the alert only to the initial removal of the KCCD does not address those cases where an individual might leave the KCCD in their vehicle when parking their vehicle in their attached garage and may still be in ear-shot of a recurrent alert even if the vehicle is not directly visible.

Definition of the term "key".

Advocates recommends that the agency incorporate the caveats presented in the comment request into the definition of the term "key" to directly address any ambiguity as follows:

> *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. (76 FR 77189). This definition excludes devices which *must* be inserted to start a vehicle and includes devices which *may* be inserted to charge a battery or for driver convenience, but do not need to be inserted for normal operation of the vehicle.

It should be kept in mind that despite the electronic nature of the KCCD, many consumers consider a "key code carrying device" as the equivalent of a physical key and will likely continue to understand and treat KCDCDs as literal keys. There is a necessary transition between mechanical keys and electronic key codes and a potential lag in consumer comprehension as to the fundamental difference in operation that the agency must take into account. Therefore, care should be given to reducing confusion by creating additional terms only as necessary.

The agency should consider that not all consumers will understand how to apply the definition of the term "key" to the "key code carrying device" as discussed in response to the previous comment request. As mentioned in other comments submitted to this docket, a key code cannot reach a vehicle to permit ignition unless the KCCD is used to bring it to the vehicle, thus, the differentiation between a key and a key code carrying device does

not seem necessary. Rather, it may be easier to differentiate rules under FMVSS 114, and elsewhere as necessary, by the function of the key itself. For a simplified example, if a key *must* be physically inserted into a vehicle to start the ignition, it may not be released from the vehicle unless the transmission is placed into "park", if a key *is not required* to be physically inserted into a vehicle it must follow the alert and transmission shift rules suggested above, i.e., that there be an audible alert and that the vehicle engine cannot subsequently be started until the transmission has been placed in the park position.

As mentioned, confusion can be created for consumers by differentiating between a key and a KCCD. Few consumers understand that the "key" (key code) in a keyless ignition system can be separated from the KCCD. For example, when a vehicle is able to be started in the presence of a KCCD and can then continue to be operated without the KCCD being present in the vehicle. Of course, once the vehicle is shut down and the KCCD is not in the vicinity of the vehicle, the operator will not be able to restart the engine. This illustrates the problems which can arise by allowing a technical differentiation between a KCCD and a traditional key without clearly and affirmatively communicating this distinction to consumers. The agency should consider requiring vehicles with keyless ignitions to provide a warning to drivers that the vehicle can be started if the key (KCCD as opposed to the electronic key code) is near, but not in, the vehicle, and that the vehicle can be operated once started even if the KCCD is removed from the vehicle. In certain situations, the separation of the vehicle starting code from the KCCD can result in drivers being stranded when the KCCD has been left at home or at another location (for instance, when the vehicle is started and the KCCD is hanging nearby in a garage or at a valet parking stand). While largely an inconvenience, vehicle owners and renters should be advised to keep the KCCD with them or in the vehicle at all times in order to start the vehicle engine.

Uniformity of "activation" and emergency shut-down requirements.

Advocates recommends that the agency consider generalizing the uniformity requirement to apply to all types of controls apart from the traditional key turning mechanism. For example, using a term such as "activated" to describe any functioning of a non-traditional stop control be it pulled, pushed, flicked, twisted, swiped or activated by any other type of motion. Any activation should be maintained for a specified duration. While this generalization may limit controls to those actions which can be maintained for the minimum period specified, this would ensure that controls which permit instantaneous start/shut off of the propulsion system would be discouraged, if not prohibited, thus guaranteeing uniformity and consistency in behavior while reducing the possibility of inadvertent shut-off.

Advocates suggests that, similar to the basis for the regulation itself, NHTSA review VOQs to determine the relative occurrence of inadvertent shut down. Advocates concurs with the agency's belief that many of the instances of inadvertent shut downs could be addressed by control design and location and is likely already incorporated into the manufacturer design process, whether the vehicle uses traditional or keyless ignition systems. Furthermore, the agency could require that an audible alert, similar to that proposed for the "internal, not in park" warning, be used to alert the driver that the

vehicle operation will be changing. In emergency situations, when the shut down is intentionally activated, such an audible alert would provide feedback to the driver that the shut down process is occurring. In the case of a moving vehicle (travelling more than 15 km/h), the requirements for shift to park for electronic transmission would not be applied until the vehicle has decelerated to 15 km/h.

Any procedure which shuts down the propulsion system should cut off the energy supply to the system, be it fuel, electric or some other propulsion source. In those cases, the continued motion of the engine would be limited to expenditure of only the fuel / energy supply contained within the propulsion system at the moment of shut down. The greatest concern is that the engine should be unable to continue to supply a motive force to the vehicle for any significant amount of time past the time a request of shutdown is initiated. Advocates cautions that considering any system which locks the engine immediately upon shut down could lead to loss of control. The agency should investigate this situation to determine the duration which a vehicle engine should continue to supply motive power after a shut down request in order to allow for safe operation out of a highway right-of-way, intersection, or other dangerous location.

As mentioned previously, standardizing all operations of the engine control would be beneficial in terms of creating a repetitive process for training drivers. If a single control is used for both starting and stopping the propulsion system, the process for activating that control in either process, start up or shut down, should be identical. Furthermore, this would establish a set time period in which additional safety systems would have time to perform necessary checks and, if necessary, illuminate warning lamps prior to a vehicle being operated.

Safety and Cost Issues.

Advocates does not have information on sensor cost, however, should the agency consider requiring solutions which would make sensors necessary, any benefits calculated should include some estimate of the possible use of these sensors to enhance occupant protection systems both now and in the future. We would note that the cost of electronic sensors has been reduced in recent years as electronic sensors replaced mechanical sensors, as sensor technology has advanced, and efficiencies of mass production have been applied. We would also point out that sensors are used for many non-safety related convenience functions such as headlamp reminders.

We point out that NHTSA has, in the past, asserted its authority to regulate in areas where safety data and benefits may not be fully quantified. In the context of light transmittance of glazing materials the agency stated that "[a]lthough NHTSA attempts, within its capabilities, to quantify the benefits of its actions, is still has a duty to vehicle safety, even in areas with inherent uncertainty." 63 FR 37820, 37826 (July 14, 1998).

Advocates supports the agency's reasoning that, while it is difficult to quantify the benefits, at an estimated total cost of less than $500,000 per year, regulating keyless ignitions will be cost beneficial with the prevention of even one fatality per year. A simple search of headline news over the past several years quickly turns up a number of

publicized cases of CO poisoning related to keyless ignition vehicles, with the latest case occurring as recently as March 1, 2012 claiming the lives of Adele Ridless and Mort Victor.[2] Many of the benefits of preventing theft and rollaway established for traditional mechanical keyed systems will be carried over to keyless ignitions. Furthermore, with the continued concerns surrounding recent investigations of sudden acceleration, the proposed standardized shutdown process will accrue additional benefits. Regardless of the current costs / benefits associated specifically with keyless ignitions, the proposed regulation simply carries the intent of the original FMVSS 114 into the current century in terms of technology. Regulation must adapt with technology or it may be possible that safety concerns previously addressed by older regulations will pop up again and again.

Conclusion

Advocates commends the agency for making an effort to update FMVSS 214 to address technological advance such as keyless ignitions. While Advocates agrees with the intent, and is supportive of the effort, there are a number of changes that should be made in line with the recommendations in these comments regarding the details of the regulation. This regulation is necessary for public safety and will be cost effective to implement. Advocates does not oppose keyless ignitions, however, NHTSA has a duty to ensure that not a single person is injured or killed as a result of the adoption of this electronic convenience.

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[2] http://www.sun-sentinel.com/news/palm-beach/west-boca/fl-west-boca-monoxide-folo-20120303,0,5998182.story