

DEPARTMENT OF TRANSPORTATION**National Highway Traffic Safety Administration****49 CFR Part 571**

[DOT Docket No. NHTSA-01-9765]

RIN 2127-AE59

Federal Motor Vehicle Safety Standard; Radiator and Coolant Reservoir Caps, Venting of Motor Vehicle Coolant System**AGENCY:** National Highway Traffic Safety Administration (NHTSA), DOT.**ACTION:** Withdrawal of rulemaking.

SUMMARY: The purpose of this document is to announce the withdrawal of a rulemaking in which the agency had considered establishing a new Federal motor vehicle safety standard for radiator and coolant reservoir caps. After reviewing the available information and given the possible limited and uncertain safety benefits associated with the proposed requirement, the agency has decided to withdraw this rulemaking.

FOR FURTHER INFORMATION CONTACT: For non-legal issues: Mr. Kenneth O. Hardie, Office of Crash Avoidance Standards, National Highway Traffic Safety Administration, 400 Seventh Street, SW., Washington, DC 20590, Telephone No. (202) 366-6987. His FAX number is (202) 493-2739. For legal issues: Ms. Dorothy Nakama, Office of Chief Counsel (202) 366-2992. Her FAX number is (202) 366-3820. You may send mail to both of these officials at National Highway Traffic Safety Administration, 400 Seventh Street, SW, Washington, DC 20590.

SUPPLEMENTARY INFORMATION:**I. Background**

In April 1992, NHTSA received a petition for rulemaking submitted by Mr. John Giordano, recommending the establishment of a new safety standard that would require the use of thermal locking safety radiator caps. Mr. Giordano brought to our attention the RadLock thermal locking radiator cap. He contended that his suggested new safety standard would prevent the accidental scalding of persons who hastily open the cap of a hot motor vehicle radiator.

During operation, a motor vehicle engine becomes very hot. Motor vehicle engine cooling fluid (also known as coolant) can reach temperatures as high as 118 to 129 degrees Celsius (245 to 265 degrees Fahrenheit) and pressure levels as high as 110 to 117 kilopascals

(kPa) (16 to 17 pounds of pressure per square inch). Under such high temperature and pressure conditions, a person's removal of a standard radiator cap will allow hot fluid and steam to rush out of the neck of the radiator. When the system is under pressure, especially high pressure, removing a radiator cap can cause it to "explode," *i.e.*, the cap can be forcibly ejected or dislodged from the neck of the radiator in some way. A person close to the radiator may be sprayed with the hot fluid or steam that is ejected, and be scalded, possibly severely.

In support of his petition, Mr. Giordano asserted that over 100,000 radiator cap scald incidents occur annually in the U.S. resulting in over 20,000 victims requiring treatment at hospital emergency rooms and burn care facilities each year. [DOT Docket NHTSA 2001-9765-07 and (June 1, 2001 66 FR 29749)]. Mr. Giordano submitted four medical journal articles, and a letter from the Burn Special Projects Coordinator at the Washington Hospital Center, DC. The most relevant and informative article was authored by Dr. C.G. Ward and Dr. J.S. Hammond of the University of Miami School of Medicine. The article stated that during a three-year period from January 1979 through December 1981, a total of 86 patients (an average of 29 a year) with radiator-associated injuries required hospital admission to the University of Miami/Jackson Memorial Burn Center. The article stated that twice that number of patients (an average of 58 per year) were treated, but not hospitalized, during that three-year period for radiator-associated injuries. The article suggested a considerable number of the involved vehicles were manufactured between 1970 and 1975.

Mr. Giordano also provided a May 20, 1992 letter from Mr. Mark S. Lewis, MS, RRT, Burn Special Projects Coordinator at the Washington Hospital Center Burn Center, in Washington, DC. Mr. Lewis provided information that approximately 10 percent of scald injuries in the District of Columbia can be attributed to removing radiator caps.

None of the articles included extrapolation of these data to national estimates of the number of injuries associated with radiator cap removal. No similar attempt to extrapolate the data was made by the petitioner.

In order to obtain information to assess the validity of the assertions in Mr. Giordano's petition, we published a "Request for Comments" document in the **Federal Register**, requesting comments on the necessity and feasibility of rulemaking to prevent scald injuries by requiring thermal

locking radiator caps or other devices on motor vehicles with water-cooled engines. (June 10, 1993; 58 FR 32504.) NHTSA received 18 comments. The data in the public comments did not provide useful information on the total annual number of radiator cap-related scald incidents. In 1993, we changed the status of action on this petition from the "rulemaking phase" to the "research phase."

To gather more information on the extent of scalds resulting from radiator cap incidents, NHTSA entered into an interagency agreement with the Consumer Product Safety Commission (CPSC) in July 1993 to collect radiator cap-related injury data by using the CPSC's National Electronic Injury Surveillance System (NEISS). The NEISS data are collected from a sample of 91 hospitals of the 6,127 hospitals in the United States and its territories with at least six beds that provide emergency care on a 24-hour/day basis. These data are used to estimate the number of persons non-fatally injured and treated in hospital emergency rooms nationwide.

Injury data were collected by the CPSC from October 1, 1993 to September 30, 1994. The CPSC's data collection effort was completed and the resulting data were delivered to the NHTSA's National Center for Statistics and Analysis (NCSA). In November 1997, NCSA published a technical report, DOT HS 808 598, titled "Injuries Associated with Specific Motor Vehicle Hazards: Radiators, Batteries, Power Windows, and Power Roofs" that compiled the data from the CPSC's injury data collection effort. The technical report includes estimates of the number of persons injured as a result of incidents involving motor vehicle radiators.

The technical report estimated that during the period of study (October 1, 1993 through September 30, 1994), 19,638 persons received scald injuries nationwide in incidents involving motor vehicle radiators. Of the 19,638 persons, approximately 77 percent (15,118 out of 19,638) were injured during activities associated with the radiator cap.

Regarding the types of vehicles in which the radiator cap injuries were incurred, passenger cars represented 91 percent of the cases, pickup trucks approximately 7 percent of the cases and trucks and vans comprised the remaining cases. As for the model years of the vehicles involved, 65 percent of the motor vehicles were 1980-89 model years, with 52 percent of these being model years 1980-84. About 26 percent of the incidents involved 1975-79 models, about 8 percent involved

models older than 1975, and less than 1 percent involved newer vehicles, *i.e.*, model years 1990–1994. The report did not compare the absolute numbers of injuries for a given model year of vehicles to the number of those vehicles on the road to determine if there was any trend in the rate of occurrence of those injuries.

The small number of injuries (1 percent) for model years 1990–1994 vehicles appeared to be anomalous. NHTSA is not sure how to account for the small number for MY 1990–1994. One possible explanation is that these newer vehicles experienced fewer mechanical failures overall. Also, not all MY 1994 vehicles were taken into account because the CPSC data collection period ended in September 1994, by which time not all MY 1994 vehicles were sold and on the road.

During the 1993/1994 data collection effort, NHTSA and CPSC implemented a telephone callback questionnaire system that permitted NHTSA to authenticate cases for which information in the NEISS record of the case, particularly in the text field allowed for describing the incident involved, was not clear as to exactly what happened. The total number of radiator cap cases reflected in the 1993/1994 data includes a number of cases that are based on information gathered by telephone callback. Information on the model year of the involved vehicles was also obtained through telephone callback.

Based upon these estimates, NHTSA decided to further investigate the cost and feasibility of developing and implementing a new Federal motor vehicle safety standard to regulate radiator and coolant reservoir cap performance. Accordingly, NHTSA contracted with Ludtke & Associates in early 1997 to determine the variable manufacturing costs, weights, lead time, and capital investment associated with incorporating the use of temperature or pressure-locking radiator and coolant recovery tank caps as standard equipment in motor vehicles. Since no pressure-locking caps were found to exist, NHTSA requested that Ludtke & Associates design a prototype pressure-locking cap and provide an estimate of the expected increase in cost associated with requiring a pressure-locking cap for all motor vehicles under 10,000 lbs. Ludtke & Associates estimated the additional cost to consumers to be \$0.65 for a radiator cap and \$0.43 for a coolant reservoir cap.

On June 1, 2001, NHTSA published a NPRM (66 FR 29747) [DOT Docket No. NHTSA–2001–9765] proposing to regulate radiator and coolant reservoir

caps on new passenger cars, multi-purpose passenger vehicles and light trucks with such caps. To accompany this proposal, NHTSA also published a Preliminary Regulatory Evaluation titled “FMVSS No. 402 Radiator and Coolant Reservoir Caps Venting of Motor Vehicle Coolant Systems”. The purpose of the proposed rulemaking was to reduce the number of scald injuries that occur when people remove radiator caps or coolant reservoir caps from motor vehicle engines, and to reduce the likelihood that the discharge of hot fluids from a manually operated pressure venting system will scald persons removing the radiator cap. The proposed rulemaking contained three significant proposals:

(1) The cap removal must be accomplished with a combination of motions, including a downward force coupled with rotary movement,

(2) The radiator cap or pressurized reservoir cap must not be removable when the system pressures is at or exceeds 14 kPa (2 psi) and

(3) The venting path for hot fluids must be downward and toward the center of the vehicle.

NHTSA proposed a radiator cap safety standard based upon pressure, not temperature as suggested by Mr. Giordano. The agency tentatively concluded that the locking requirements for caps should be based upon pressure, instead of temperature. We took this approach because, although the temperature of the fluid in the radiator is related to the safety problems addressed by the proposal, we believed the most important safety consideration in providing a solution to radiator-related scalds was the pressure in the coolant system. If there were little pressure to force liquid or steam up when the cap is removed, the risk of hot scalding fluid or steam being ejected from the radiator filler neck or coolant system reservoir would be essentially eliminated. Also, ambient temperature under the hood of a vehicle without the engine running could approach 125 degrees Fahrenheit (51.6 degrees Celsius) during the hot part of a summer day in many States in the southern tier of the United States. Thus, Mr. Giordano’s suggestion might result in persons’ not being able to add radiator fluid (because of a locked cap) in circumstances in which there is no danger of hot liquid or steam being ejected from the coolant system during cap removal.

II. Comments on the NPRM

We received comments both supporting and opposing the proposed radiator safety cap standard. Advocates

for Highway and Auto Safety stated that it supports the main features of NHTSA’s proposed rule, and argued that substantial redesign of current radiator and coolant reservoir caps must be ensured by establishing performance requirements for preventing removal of the caps while the potential for effluent ejection is still high. Other commenters supporting the proposal included the Burn Foundation and Angela Rabbitts and Nicole E. Alden of the New York Presbyterian Hospital Burn Center.

While the auto industry, including members of the Alliance of Automobile Manufacturers, supported the intent of the proposal—to reduce the incidence and severity of burn and scald injuries associated with engine cooling systems—they argued that a radiator cap and coolant system reservoir standard is not necessary at this time for the following reasons:

(1) The data used to support the NPRM is based on vehicles that utilized older designs of engine coolant systems. Over the last ten years, there have been a large number of significant design changes and improvements in reliability that reduce the risk of vehicles overheating, and thus, the need to remove the radiator cap has been reduced. The Alliance stated these changes included:

a. Incorporation of a reservoir cap (the screw type) that requires more than one hand motion (turns) to allow pressure bleed down before complete removal.

b. Incorporation of caps that have brims, baffles, or other conveyances that direct escaping coolant/steam away from the hand of a person removing the cap.

c. Incorporation of de-gas reservoir (without separate radiator caps) that vent air first—not liquid and reduce entrained air in coolant, maintaining cooling capability.

d. Incorporation of a “limp-home” cooling function in engine electronics to keep customers from getting “stranded” by overheating or coolant loss (reduces need for customers to have to remove any pressurized caps).

e. Reduction in some vehicles of maximum cooling system operating temperatures under extreme conditions such as trailer towing, extended idling, and when traversing significant grades.

f. Changes in cooling system design and materials to reduce incidence of overheating (*e.g.*, long life coolants, long life hoses, corrosion resistant aluminum engine components and radiators, and translucent reservoirs to allow visual checking without opening system).

(2) NHTSA cost estimate in the NPRM is too low: The Ludtke & Associates design of a prototype pressure-locking

radiator cap (used as the basis for NHTSA's cost estimate) is deficient because its design does not contain all the required functions necessary to operate with current coolant systems.

(3) NHTSA is unable to demonstrate in the field that the technology proposed in the NPRM will work in a real world environment since there are no commercially available pressure-locking caps.

(4) The proposal incorrectly assumes that a pressure-locking system is the only technology that will address this issue and, as such, is too design restrictive and will preclude other suitable technologies.

III. Decision To Withdraw Rulemaking

After carefully considering the comments, we have decided to withdraw this rulemaking. After reviewing the available information, we believe the potential safety benefits associated with the proposed requirement are limited and uncertain.

In July 2000, the CPSC began routinely to collect data on injuries involving motor vehicles and motor vehicle equipment and made this information available through its website. NHTSA was able to search the CPSC NEISS database for scald injuries associated with the removal of a radiator cap. NHTSA used the word "radiator" and other key words to search the text fields in NEISS for radiator cap related scald injuries that occurred between January 1, 2001 and December 31, 2001. This search produced a national

projection for the year 2001 of 4,949 persons injured in scalding incidents involving motor vehicle radiator caps. The vast majority of patients were treated and released.

The data were acquired from a representative sampling of scald injuries reported in emergency rooms monitored by NEISS. When the injury data were compared to the radiator cap related scald injuries estimated through the NHTSA/CPSC 1993/1994 data collection effort (15,118 injuries), the year 2001 injury data (4,949 injuries) suggest that the scald injury rate for a 12 month-period decreased by approximately 66% since September 1994.

The CPSC 2001 injury data do not include information on the make, year of manufacture, or model year of the motor vehicles involved or information on the type of cap involved. NHTSA is thus unable to analyze in detail whether this reduction in documented injuries resulted from changes made to motor vehicle cooling systems as suggested by the automobile manufacturers in their comments on this rulemaking. However, the agency would expect that the various changes cited by the manufacturers to provide benefits in this area.

NHTSA notes that the CPSC year 2001 data contained cases that were listed as a scald or burn injury, but the text field of the NEISS file does not contain enough information to determine whether the injury is associated with a radiator cap. It is possible that our year

2001 data underestimates the number of scald injuries related to radiator caps. It is clear, however, that vehicle manufacturers have made improvements in the design and reliability of motor vehicle cooling systems and, at the same time, the documented injuries associated with radiator caps have declined.

We also believe, based on our review of the comments, that the proposed rule may be unnecessarily design-restrictive, *i.e.*, there may be alternatives to pressure-locking caps that would meet the agency's safety objectives in this area but could not be used to comply with the proposed requirement. If we were planning to proceed further with this rulemaking, this is an issue that we would need to evaluate carefully.

Accordingly, in light of the substantial reduction in the number of cases of radiator cap related scald injuries, the resources that would be needed to further refine the requirements proposed in the NPRM, and limited and uncertain benefits, the agency has decided to withdraw this rulemaking. NHTSA can revisit the issue of radiator cap scalding, if sufficient grounds exist in the future.

Authority: 49 U.S.C. 322, 30111, 30115, 30117 and 30166; delegations of authority at 49 CFR 1.50 and 49 CFR 501.8(f).

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Stephen R. Kratzke,

Associate Administrator for Rulemaking.

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