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4. On the next page, which contains Docket summary information for the Docket you selected, click on the desired comments. You may also download the comments.

Authority: 49 U.S.C. 30111, 30117, 30168; delegation of authority at 49 CFR 1.50 and 501.8.

Issued on: August 10, 2001.

Raymond P. Owings,

Associate Administrator for Research and Development.

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DEPARTMENT OF TRANSPORTATION**National Highway Traffic Safety Administration****49 CFR Part 571****Denial of Petition for Rulemaking; Federal Motor Vehicle Safety Standards**

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

ACTION: Denial of petition for rulemaking.

SUMMARY: This document denies the petition submitted by Federal-Mogul Lighting Products (Federal-Mogul) to amend Federal Motor Vehicle Safety Standard (FMVSS) No. 108, "Lamps, Reflective Devices, and Associated Equipment," to allow headlamps that are aimed visually or optically to have a horizontal adjuster system that does not have the required ± 2.5 degree horizontal adjustment range or the vehicle headlamp aiming device (VHAD) indicator required by the standard.

FOR FURTHER INFORMATION CONTACT: Mr. Chris Flanigan, Office of Safety Performance Standards, NHTSA, 400 Seventh Street, SW, Washington, DC 20590. Mr. Flanigan's telephone number is: (202) 366-4918. His facsimile number is (202) 366-4329.

SUPPLEMENTARY INFORMATION: By letter dated June 7, 1999, Federal-Mogul asked the agency for an interpretation on a new headlamp system design it was contemplating. It wanted to manufacture headlamps that have a ± 1 degree horizontal adjustment range, by means of an aiming screw, to accommodate the need to adjust the headlamp relative to the vehicle body so that it is in the design location. The horizontal aiming requirements, in paragraph S7.8.5.2(a)(2)(iv) of FMVSS No. 108, specify that "[t]he horizontal indicator shall perform through a minimum range of ± 0.76 degree (4 [inches (in.)] at 25 [feet (ft.)]); however, the indicator itself shall be capable of recalibration over a movement of ± 2.5 degrees relative to the longitudinal axis of the vehicle to accommodate any adjustment necessary for recalibrating the indicator after vehicle repair from accident damage."

If the horizontal aiming screw is included on the headlamp housing, the headlamp must also include a horizontal adjustment mechanism with a fiducial mark that indicates alignment of the headlamps relative to the vehicle's longitudinal axis. Specifically, paragraph S7.8.5.2(a)(2)(i) requires that the horizontal adjuster have a graduated scale not greater than 0.38 degree (2 in. at 25 ft.) to provide for variations in aim of at least 0.76 degree (4 in. at 25 ft.) to the left and the right of the longitudinal axis of the vehicle, and have an accuracy relative to the zero mark of less than 0.1 degree. Federal-Mogul asked that these requirements also be deleted.

In producing lamps in this manner, the photometry would be designed so the lamps could comply in any

horizontal location to which they could be adjusted in this limited range. Federal-Mogul states that this would resolve some manufacturing problems. It also stated that an anti-tampering feature would be included to assure that the aim could not be changed to be outside the horizontal range within which the headlamp achieved photometric compliance.

The agency's response was that the standard could not be interpreted in this manner. Federal-Mogul asked in its request for interpretation that, if the agency did not find that its headlamp system would be compliant, that the document be handled as a petition for rulemaking.

Background

Proper aim is required to ensure that headlamps installed on motor vehicles fulfill the safety functions required by Federal law. There are three principal methods of aiming headlamps. The first is visual and is done by projecting the beam onto a vertical surface and then adjusting the headlamp to an appropriate position. This position is determined by an observer. The second is optical and is done by projecting the beam into an optical device that is placed in front of the headlamp and then adjusting the headlamp until the beam conforms to the appropriate parameters. Lamps utilizing these two methods are termed visual/optical aim (VOA) headlamps.

Regarding horizontal aim adjustment required for VOA headlamps, paragraph S7.8.5.3(b) of FMVSS No. 108 states that "[t]here shall be no adjustment of the horizontal aim unless the headlamp is equipped with a horizontal VHAD." A VHAD is an item of equipment installed on the vehicle and headlamp which is used for determining headlamp aim mechanically in much the same manner as described above. In its most common form, there is a bubble vial on the headlamp housing which has a closely specified geometric relationship to the headlamp beam's vertical location. When the bubble is within a specific area indicated on its vial, the headlamp's vertical aim is correct. A similar mechanical reference marking system is used for correct horizontal aim, essentially aligning the optical axis of the headlamp housing or reflector to the vehicle's longitudinal axis. One attractive feature of VHADs is that they provide a simple way to determine a headlamp's proper aim. However, VHADs add to vehicle cost. Some vehicle manufacturers choose to use them for the additional styling freedom they provide, but other manufacturers

choose not to use them because of the added cost.

The third method of aim is mechanical and is done without activation of the headlamp. In this case the proper aim is determined through the use of mechanical equipment, either external to the headlamp housing or provided as part of the headlamp. External mechanical aim was introduced in 1955 by the automotive industry in response to aiming concerns expressed by the States. These concerns were related to the inability of the first two methods to provide accurate and repeatably correct aim at that time.

The ability of motor vehicle headlamps to be mechanically aimed has been a requirement of FMVSS No. 108 from its effective date of January 1, 1968. Mechanical aiming was necessary because accurate and reliable visual or optical aim of the lower beam pattern in use in the United States at that time was difficult to achieve. Sealed beam headlamps, the only type permitted until 1983, are required to have one of four aiming pad patterns on the lens for mechanical aiming. These patterns consist of three raised aiming pads arranged as a triangle at specified points on the lens which create a precise interface between the headlamp and a mechanical aiming device attached to the headlamp during the aiming verification process. The mechanical aiming device provides information so that the aiming planes of the headlamps on each side of the vehicle can be adjusted to be parallel with each other and perpendicular to the road surface. Because a headlamp's beam pattern is designed to be correctly aimed when the aiming plane is oriented as stated, the beam pattern can be accurately and repeatably aimed without the need for illuminating the headlamp.

With the advent of replaceable bulb headlamps in 1983, restrictions on the size and shape of headlamps were no longer required. While two additional configurations of mechanical aiming pads were permitted, not all headlamp designs could accommodate them. In response to this problem, the agency has allowed VHAD since June 8, 1989. VHAD is an alternative method of mechanical aim which is not dependent upon an externally applied mechanical device. It is accomplished by mechanical aiming equipment on the vehicle itself.

As a consequence, the vehicle industry requested that the agency allow VOA headlamps, provided that significant visual cues in the beam pattern were added to assure accuracy. Subsequently, VOA headlamps became part of FMVSS No. 108 and headlamps

meeting new beam pattern photometric requirements were developed. These headlamps have a beam pattern that is relatively insensitive to modest horizontal misaim. VOA headlamps were allowed based on comments to the agency that vehicles could be built with such close tolerances that no horizontal aim adjustment was necessary. Additionally, to date, no useful visual cue for horizontal aiming exists. Consequently, because no visual cue was available for the purpose of horizontal aiming, the agency did not permit any horizontal movement of VOA headlamps. The lamp is essentially correctly aimed as installed. As an alternative, horizontal-aiming VHADs were permitted on VOA headlamps as a means for manufacturers to meet European requirements which require both a horizontal and vertical aim adjustment. Thus, to be sold in both the European and U.S. markets, a headlamp needs both a horizontal and vertical aiming screw. A VOA headlamp intended for use only in the U.S. market need only have the vertical one.

Agency Analysis

As part of the justification for the agency's allowing VOA headlamps in 1996, vehicle manufacturers indicated that they needed no horizontal aim adjustment because of the present accuracy of vehicle assembly and headlamp positioning on the assembly line. Because of this, and the fact that no reliable scientific method of achieving horizontal VOA has been determined, two major changes were made to FMVSS No. 108 for VOA headlamps. These were: (1) the beam was made to be much wider and much less sensitive to horizontal misaim and, (2) no horizontal aiming screws or mechanisms other than a horizontal VHAD were permitted. Federal-Mogul apparently does not want to bear the costs of adding a VHAD to its VOA headlamps, but does need some horizontal aim adjustment to be incorporated. As a consequence, it has petitioned to allow horizontal aim adjustability, but without a horizontal VHAD, as described above.

In 1996, an internationally-comprised Regulatory Negotiation Committee worked with the agency over many months to achieve a consensus on all issues and the specific text of the amendment to allow VOA headlamps. Because the present VHAD horizontal aim requirements, as applied to VOA, were part of that consensus agreement, the agency is reluctant to change these requirements, absent a compelling demonstration of a need to do so.

Currently, manufacturers can only use a VHAD for providing horizontal aim adjustment if they want that feature on a VOA headlamp. Federal-Mogul's petition appears to be based on a desire to have a small horizontal adjustment without a VHAD for the purpose of overcoming inaccuracies in the design and assembly of motor vehicles such that the headlamp housing may be purposefully misaimed, within a certain range, to help assure the desired visually symmetric size of the gap between the vehicle body and the headlamp or between the headlamp reflector and the surrounding headlamp housing while simultaneously achieving correct horizontal aim because of the design of the headlamp's lower beam. The agency is also aware of other lighting manufacturers who are contemplating methods of overcoming manufacturing inaccuracies with methods similar to Federal-Mogul's.

During the negotiated rulemaking, all of the vehicle manufacturers represented on the committee stated that they were capable of building vehicles as accurately as needed to install VOA headlamps. However, this degree of precision in assembly adds cost. This is also the case for including a VHAD. Federal-Mogul's petition requests a less expensive third alternative. That is, it requests that a small horizontal aim range be permitted to allow manufacturers to make the fit of the headlamp to their vehicle to appear more precise than would otherwise be the case. The requested horizontal aim would only be large enough "to ensure the headlamp will stay in compliance when installed on a vehicle."

Federal-Mogul's petition overlooks the fact that, aside from a VHAD, VOA headlamps do not currently have any feature that allows anyone other than the headlamp's manufacturer to objectively assess the accuracy of horizontal aim. Hence, a vehicle manufacturer seeking to adjust the horizontal aim of these lamps on a new vehicle would have no objective, repeatable way to assess the impact of its horizontal aim adjustments on real world lighting performance. Because of this limitation, neither the agency nor anyone else, including vehicle dealers and state safety inspectors, would have any way of knowing whether the "minor" horizontal aim adjustments vehicle manufacturers could make pursuant to this request would produce acceptable or "complying" horizontal aim on headlamps on vehicles on the road.

One promising near-term means of addressing the inability to provide

horizontal aim is to find a solution for a visual horizontal fiducial mark or reference similar to the cutoff in the beam pattern that permits vertical visual aiming. The vertical aim cutoff allows inspectors, service shops, and others to reliably and accurately vertically aim these headlamps. Informal discussions about developing a horizontal fiducial feature in the lower beam pattern have been held at recent meetings of the Society of Automotive Engineers (SAE) Lighting Committee. There have also been similar discussions at international meetings of automotive lighting experts.

Given Federal-Mogul's, as well as other manufacturers', desire for horizontal aiming features other than VHADs, the agency believes it is incumbent on Federal-Mogul and the industry to develop a single method for horizontal aiming which could be incorporated into FMVSS No. 108. The agency does not intend to assess individual manufacturer's petitions for alternatives to install a VHAD.

In accordance with 49 CFR part 552, this completes the agency's review of the petition. The agency has concluded that there is no reasonable possibility

that the amendment requested by the petitioner would be issued at the conclusion of a rulemaking proceeding. Accordingly, it denies Federal-Mogul's petition.

Authority: 49 U.S.C. 30103, 30162; delegation of authority at 49 CFR 1.50 and 501.8.

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Stephen R. Kratzke,

Associate Administrator for Safety Performance Standards.

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