Federal Communications Commission.
William F. Caton,
Acting Secretary.
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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 a petition for rulemaking.

SUMMARY: This document denies a petition from Robert Bosch GMBH (Bosch) to amend Federal Motor Vehicle Safety Standard (FMVSS) No. 108; Lamps, Reflective devices, and associated equipment to allow the intensity of upper beam headlamps to increase from 75,000 to 140,000 cd.

FOR FURTHER INFORMATION CONTACT: Mr. Jere Medlin, Office of Crash Avoidance Standards, NHTSA, 400 Seventh Street, SW, Washington, D.C. 20590. Mr. Medlin's telephone number is: (202) 366–5276. His facsimile number is (202) 366–4329.

SUPPLEMENTARY INFORMATION: By letter dated June 21, 1996, Bosch petitioned the agency to amend FMVSS No. 108 to allow upper beam headlamps with a maximum intensity at point H–V of 140,000 cd. or alternatively, the upper beam requirements in SAE J1735 JAN95 in place of the current Fig. 15 and Fig. 17 upper beam requirements. Bosch stated that present U. S. photometric requirements for upper beam headlamps allow a maximum candlepower of 60,000 and 75,000 cd. at 12.8 Volts. Bosch states that in Europe the maximum candlepower is limited to 112,500 cd. at approximately 12 Volts (which it claims is approximately 140,000 cd. at 12.8 Volts). Bosch claims that with today's technology and particularly in the future with the results of the Advisory Committee on Visual Aim, (a proposal to permit visual headlamp aim is pending) it will be possible to build a headlamp with the same lower beam pattern for the U. S. and Europe markets. Bosch claims that the different requirements for the upper beam in the U.S. and Europe ask either for a ''bad'' compromise in a headlamp, or the need for two different headlamp assemblies.

Bosch claims that full harmonization between U. S. and European-type headlamps will be possible, with implementation of its petition and the results of the visual aim rulemaking, and thus car manufacturers will be able to install the same type of headlamp on vehicles for both markets. Reduced tool and parts costs will be the result.

The agency has reviewed the claims associated with the petitioner's desired solution. It has found that full photometric harmonization of upper beam headlamp requirements already is possible without this requested action because headlamps designed above European minimum levels and below U.S. maximums are achievable. FMVSS No. 108 requires that upper beam headlamps have a minimum H–V axis intensity of 25,000 cd. to a maximum of 75,000 cd. for some lamps and 40,000 cd. to 75,000 cd. for others when measured at a test voltage of 12.8 Volts. The standard was last amended in 1978 when NHTSA increased the upper beam headlamp maximum allowed intensity from 37,500 cd. to 75,000 cd. NHTSA stated in that rulemaking action that its research has demonstrated that an increase in upper beam intensity to a maximum value of 75,000 cd. (150,000 cd. per vehicle) will enhance seeing ability without any significant increase in glare, but that photometric output exceeding 150,000 cd. results in only a marginal increase in visibility with an increase in glare. The agency has done no similar research work on upper beam headlamps since then nor is it aware of other safety research in this area. Bosch provided no such safety research data.

The agency did inquire as to how the Society of Automotive Engineers (SAE) justified the value it used in SAE J1735 JAN95 for maximum upper beam intensity. An obstacle detection rationale was used. The upper beam intensities which would be required to detect low (7%) luminance (reflectance) obstacles were defined by parametric extrapolations of data from different illumination studies. The light intensities calculated for alerting drivers to detect an obstacle within the potential stopping distance of their vehicle were found to be 243,000 to 284,000 cd. at 65 mph.

NHTSA observes, however, that there may be other criteria beside the ability to stop, for establishing requisite seeing distances, such as the ability to maneuver. The scope of the SAE investigation was limited only to stopping distance and glare was not studied. This justification is not comprehensive enough for NHTSA to reverse its previous decisions about the agency's upper beam intensity research.

Other Factors

In addition, other factors are present in the 18 years that have passed since NHTSA's statements on increased intensity upper beam headlamps. These factors influencing our decision for denial are:

1. State laws specify the distances from other vehicles when upper beam headlamps must be dimmed. These were set at a time when upper beam headlamps had 37,500 cd. maximums. With the doubling in 1978 of upper beam intensity and a redoubling that would result from this petition, the dimming distances to prevent blinding oncoming motorists may have to increase dramatically. Most states have 500 foot approaching, 200 foot following dimming distances. Because the illumination at the eye is proportional to the lamp's intensity and inversely proportional to the square of the distance, an estimate can be made for how dimming laws should be changed. If 500/200 feet were deemed to be acceptable for 37,500 cd. headlamps, then for the 75,000 cd. headlamps, the dimming distance should have been changed to 700/280 feet and for 140,000 cd. lamps the dimming distance should be changed to be 970/390 feet. Drivers of the new cars with such headlamps would have to be reeducated on this or states would have to change their laws. Either is problematic for NHTSA because we cannot compel states to change their laws.

2. The number of aging, glare sensitive U.S. drivers is at an all time high and increasing. This population complains that glare from existing headlamps and auxiliary lamps already is too high. This population is the most sensitive to glare and roadway illumination effects. Glare resistance reduces markedly as drivers age. According to research, the glare resistance of the human eye at age 72 is half as good as it is for age 20. Contrast sensitivity, an important factor in night vision, decreases markedly with age making targets more difficult to perceive. While having more intense upper beams may help older drivers see better, they will be blinded more often by other drivers who choose to use upper beams and do not dim them at greater distances.

3. The window of harmonization for upper beam headlamp intensity appears to be adequate. The European specification for upper beam intensity at the H–V point is 30,000 cd. minimum to 150,000 cd. maximum at 12.0 volts. When converted to testing at 12.8 volts

this is a range from 37,800 to 189,000 cd. Compared to the specification that has been proposed to be changed (40,000 to 75,000), the European specification has a much wider allowable range, yet is harmonious with the current U.S. specification. That is, a headlamp that complies with the 40K to 75K cd. U.S. performance is completely acceptable for European regulations having a range of 37.8K to 189K cd. The only difference is that it may not be as intense as some manufacturers might think that their customers might desire.

What Advantages Are There From Adopting the Higher Intensity?

1. The claimed advantage is the achievement of harmonization. As explained above, there is already substantial harmonization between the U.S. and European standards for upper beams. Thus NHTSA does not find the claimed harmonization advantage persuasive.

2. The higher output would offer a seeing advantage to those drivers that use upper beam headlamps, particularly at higher speeds that may be permissible on autobahns in Europe. While the agency is not aware of any quantitative information on the upper beams that contributed to prevention or causation of crashes, one can imagine that in the less populated areas of the United States where lower density traffic often exists (with limited opposing traffic-and hence no glare problems) and higher nighttime speeds are likely because of the greater distances necessary for travel, upper beam headlamps are likely used for considerably more miles than on the east or west coasts. Thus, there is likely a sizeable population that could benefit from better nighttime vision from more intense upper beams.

What Disadvantages Are There From Adopting the Higher Intensity?

1. As stated above, the changes that have occurred in upper beam performance have the effect of increasing glare when approaching other vehicles; this change would make this situation worse unless dimming distances could be increased.

2. While not an actual disadvantage of increasing the upper beam intensity, NHTSA itself has no research to explain why it was once unsafe to significantly increase the intensity and why today it would be acceptable. We are aware of no new data, only modeling and calculations that say that intensity increases could offer seeing distance improvements.

Since there is no new safety research that is more compelling than the research considered in establishing the present limits, for the maximum intensity of upper beams, NHTSA is denying this petition. 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 specific requirement requested by the petitioner would be issued at the conclusion of a rulemaking proceeding.

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

Issued on: October 17, 1996.

L. Robert Shelton,

Associate Administrator for Safety Performance Standards.

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