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February 24, 2024

BY MAIL

Sophie Shulman, Acting Director
National Highway Traffic Safety Administration
1200 New Jersey Avenue, SE
Washington, DC 20590

Re: Petition to Set Overall Limit on Headlight Intensity

Dear Sophie Shulman,

Pursuant to CFR Title 49, Subtitle B, Chapter V, Part 552, Subpart A Petitions for Rulemaking, Defect, and Non-Compliance Orders, the Soft Lights Foundation hereby submits this petition requesting that NHTSA update FMVSS-108 to set an overall limit on low beam headlight intensity. The petition is contained in the following pages.

Sincerely,

A handwritten signature in black ink that reads "Mark Baker". The signature is written in a cursive, slightly slanted style.

Mark Baker
President
Soft Lights Foundation
mbaker@softlights.org

cc:
Representative Mike Thompson
Representative Mark Pocan
Representative John Garamendi

Petition to Limit Overall Low Beam Headlight Intensity

I. FMVSS-108 Table XIX-a.

NHTSA sets the standards for vehicle lighting in the Federal Motor Vehicle Safety Standard Section 108. The limits for lower beam headlight intensity are specified in Table XIX-a as shown in Figure 1.

TABLE XIX-a: HEADLAMP LOWER BEAM PHOTOMETRY REQUIREMENTS									
TEST POINT (degrees)		LOWER BEAM # 1M (LB1M)		LOWER BEAM # 1V (LB1V)		LOWER BEAM # 2M (LB2M)		LOWER BEAM # 2V (LB2V)	
		MAXIMUM PHOTOMETRIC INTENSITY (cd)	MINIMUM PHOTOMETRIC INTENSITY (cd)	MAXIMUM PHOTOMETRIC INTENSITY (cd)	MINIMUM PHOTOMETRIC INTENSITY (cd)	MAXIMUM PHOTOMETRIC INTENSITY (cd)	MINIMUM PHOTOMETRIC INTENSITY (cd)	MAXIMUM PHOTOMETRIC INTENSITY (cd)	MINIMUM PHOTOMETRIC INTENSITY (cd)
⁽¹⁾ 10U to 90U	⁽¹⁾ 90L to 90R	125	-	125	-	125	-	125	-
4U	8L & 8R	-	64	-	64	-	64	--	64
2U	4L	-	135	-	135	-	135	-	135
1.5U	1R to 3R	-	200	-	200	-	200	-	200
1.5U	1R to R	1,400	-	1,400	-	1,400	-	1,400	-
1U	1.5L to L	700	-	700	-	700	-	700	-
0.5U	1.5L to L	1,000	-	1,000	-	1,000	-	1,000	-
0.5U	1R to 3R	2,700	500	2,700	500	2,700	500	2,700	500
H	V	5,000	-	5,000	-	-	-	-	-
H	4L	-	135	-	135	-	135	-	135
H	8L	-	64	-	64	-	64	-	64
0.5D	1.5L to L	3,000	-	-	-	3,000	-	-	-
0.5D	1.5R	20,000	10,000	-	-	20,000	10,000	-	-
0.6D	1.3R	-	-	-	10,000	-	-	-	10,000
0.86D	V	-	-	-	4,500	-	-	-	4,500
0.86D	3.5L	-	-	12,000	1,800	-	-	12,000	1,800
1D	6L	-	1,000	-	-	-	1,000	-	-
1.5D	2R	-	15,000	-	15,000	-	15,000	-	15,000
1.5D	9L & 9R	-	1,000	-	-	-	1,000	-	-
2D	9L & 9R	-	-	-	1,250	-	-	-	1,250
2D	15L & 15R	-	850	-	1,000	-	850	-	1,000
2.5D	V	-	-	-	-	-	-	-	-
2.5D	12L & 12R	-	-	-	-	-	-	-	-
4D	V	7,000	-	10,000	-	-	-	-	-
4D	4R	12,500	-	12,500	-	12,500	-	12,500	-
4D	20L & 20R	-	-	-	300	-	-	-	300

⁽¹⁾ These test points are boundaries, intensity values within this boundary must meet the listed photometry requirement.

Figure 1 - Table XIX-a Headlight Intensity for LB2V

The second to last column labeled Lower Beam #2B (LB2V) is for modern headlights. The sub column header reads, "MAXIMUM PHOTOMETRIC INTENSITY (cd)". This column thus sets the maximum intensity limits for headlights using luminous intensity measured in candela. As can be seen in the table, there are numerous test points that have no limit. NHTSA has confirmed in writing that the dashes mean the intensity limit is infinity.

The first two columns in Table XIX-a set the measurement test points for compliance testing. The letters H and V represent the Horizontal and Vertical

midpoint of the headlight. The remaining test points are degrees to the left, right, up, or down from the H,V test point.


As can be seen in the table, there is no intensity limit for many locations. For example, there is no limit for the middle of the headlight, there is no intensity for 4 degrees left of the H,V point, and there is no limit on intensity from 4 degrees down and from 20 degrees left to 20 degrees right. There is no overall limit on intensity.

Due to the lack of an overall intensity limit, the extreme intensity plus the blue wavelength light used in most LED headlights is causing drivers and pedestrians to be blinded by excessive glare, putting public safety at risk. The petitioner therefore requests that NHTSA establish an overall LB2V limit on intensity.

II. Public Comments


The public has serious concerns about the safety of LED headlights. Nearly 60,000 people have signed a petition demanding the LED headlights be banned.¹ The petition contains thousands of comments describing the blinding glare, eye pain, and fear for their safety due to the use of LED headlights. The thousands of comments from this petition have been submitted to NHTSA on multiple occasions. Below are a few of the most recent safety comments about LED headlights.


¹ <https://www.change.org/p/u-s-dot-ban-blinding-headlights-and-save-lives>


 **John Arndt**
14 hours ago

It is atrocious that some people think they need excessively bright Headlights, also the lights were never approved or tested.

♡ 2


 · [Report](#)


 Write a reply... [Reply](#)


 **Robert Heimowitz**
18 hours ago

LED headlights are causing problems.

♡ 2


 · [Report](#)

 Write a reply... [Reply](#)

 **Jeremy Nyberg**
19 hours ago

Yes please. I have been in a few near-misses while being blinded by oncoming traffic.

♡ 2

 · [Report](#)

III. Glare

In the rejection letter for petition NHTSA-2022-0109, Ann Collins wrote, "NHTSA believes the current research supports that FMVSS No. 108 contains the appropriate requirements to address these areas. NHTSA agrees that glare can have a negative safety impact and believes FMVSS No. 108 addresses that issue." As shown in Figure 1, FMVSS-108 contains no overall limit on intensity, and thus Ann Collins' claim that FMVSS-108 contains appropriate requirements to address glare caused by the use of LED technology is not justified.

Ann Collins also wrote, "While LED integral beam headlamps can be made to have a smaller footprint compared to lamps that use halogen or high-

*intensity discharge (HID) light sources, which can be perceived to be more uncomfortable at closer distances, an agency report to Congress, "Nighttime Glare and Driving Performance," stated that when viewed from more than approximately 100 feet, the size of a headlamp has little impact on discomfort and that no research has identified any impact of oncoming headlamp size on the visibility of the person experiencing glare."*²

The above statement is based on a report that was delivered to Congress in 2007, prior to the widespread introduction of LED headlights. In that glare report to Congress, NHTSA writes, "New headlamp technologies (e.g., light emitting diodes), even newer than HID and projector headlamps, are beginning to be introduced on vehicles in the United States." and "Indeed, new headlamp systems may aid in reducing the tradeoff between visibility and glare by allowing systems to respond dynamically to the driving situation. At the same time, these dynamic headlamp systems will present new challenges for regulation of vehicle lighting."

Thus, at least as far back as 2007, NHTSA was aware that the impacts of LED headlights needed study and that regulation of LED technology was a requirement. Yet rather than notify the automakers that they were required to comply with 5 U.S.C. 551-559 and petition NHTSA for authorization to sell vehicles with LED headlights and provide proof to NHTSA that LED headlights were safe, NHTSA took no action. Previous petitions by the automakers for modifications to FMVSS-108 required approximately a decade for NHTSA to study the new technology and eventually grant approval of the petition. In the case of LED headlights, the entire regulatory process was skipped, with LED headlights simply appearing on roadways with no regulation at all, putting public safety at risk.

LEDs emit extremely intense light from a tiny flat surface area. Ann Collins wrote that the size of the headlamp has little impact on discomfort and that no research has identified any impact of oncoming headlamp size on the visibility of the person experiencing glare. This statement is based on the 2007 report that NHTSA acknowledges does not include LED headlights. Given that LEDs have drastically different spatial, spectral, and temporal characteristics as compared to a tungsten filament, it is inappropriate for NHTSA to claim that the size of the emitter has little impact on discomfort or disability glare, and it is inappropriate to claim that no research has identified issues with glare from LED headlamps because the studies have not yet been performed. NHTSA has not studied the impacts of glare from LED headlights and has not published the required performance standards for LED headlights which would place a limit on intensity and blue wavelength light.

² https://www.nhtsa.gov/sites/nhtsa.gov/files/glare_congressional_report.pdf

IV. Requested Action

1. Update FMVSS-108 Table XIX-a LB2V to set an overall maximum limit for intensity for any point in space at 100 feet from the source. The overall maximum should be 20,000 candelas, or another value that NHTSA determines ensures the comfort, health, safety, and civil rights of any oncoming driver, pedestrian, bicyclist, wheelchair user, child, and all others, and which meets US Food and Drug Administration requirements for protection of photobiological, neurological, psychological, and hormonal safety for Visible Light radiation emitted by an electronic product.