by removing the period at the end and inserting a semicolon.

15.509 [Corrected]

3. On page 233, first column, amendatory instruction 19 is corrected to read as follows: ''Section 15.509 is amended by revising paragraph (f)(4); at the end of paragraph (h)(1) by inserting the word and; in paragraph (h)(2) by removing '; and' and inserting a period in its place; and by removing paragraph (h)(3) to read as follows:''

37.103 [Amended]

4. On page 233, in the second column, the second line from the top should appear as set forth above.

52.203–8 [Corrected]

5. In that same column, under section 52.203–8, in the clause, paragraph (a) is corrected by removing ''1996'' the first time it appears; and in paragraph (a)(2)(ii), in the last line, ''subsections'' should be singular.

6. On the same page, in the third column, amendatory instruction 29 is corrected to read as follows:

52.203–13 [Removed]

29. Section 52.203–13 is removed.

9.507–1 [Corrected]

7. On page 235, third column, amendatory instruction 10 is corrected to read as follows: ''Section 9.507–1 is amended by removing the paragraph (a) designation; redesignating paragraphs (a)(1) through (a)(4) as (a) through (d), respectively; and removing paragraphs (b), (c), and (d).''

12.503 [Corrected]

8. On page 236, first column, in 12.503(b)(4), the word ''Requirements'' should read ''Requirement''.

19.303 [Corrected]

9. On page 236, first column, amendatory instruction 17 is corrected to read as follows: ''Section 19.303 is amended by revising the introductory text of paragraph (c)(2); at the end of paragraph (c)(2)(iv) by removing the word 'and'; in paragraph (c)(2)(vi) by removing 'certifying' and inserting 'acknowledging' in its place; and by revising the second sentence of paragraph (c)(3) to read as follows:''

42.703–2 [Corrected]

10. On page 237, in the second column, 42.703–2(f)(1) is corrected in the fourth line by inserting ''Final'' after ''Certification of''.

52.216–3 [Corrected]

11. On page 261, in the first column, in the second line of the clause title, the word ''STANDARD'' should read ''SEMISTANDARD''.

52.225–21 [Corrected]

12. On page 262, second column, amendatory instruction 5 is corrected to read as follows: ''Section 52.225–21 is amended by revising the dates of the clause and Alternate I to read '(JAN 1997)' and by removing the word 'specifying' from the fourth sentence of paragraph (c) of the clause and of Alternate I and inserting ''certifying''.''

5.203 [Corrected]

13. On page 263, in the second column, in 5.203, the fourth line of paragraph (a), the word ''when'' should be removed.

6.001 [Corrected]

14. On page 263, third column, amendatory instruction 4 is corrected to read as follows: ''Section 6.001 is amended by revising paragraph (a); in paragraph (d) by removing the word 'or'; and at the end of paragraph (e)(2) by removing the period and inserting '; or' in its place.''

15. On page 263, third column, the twenty-fifth line from the bottom, the heading of Part 11 should read ''PART 11—DESCRIBING AGENCY NEEDS''.

11.104 [Corrected]

16. On page 263, third column, amendatory instruction 6 is corrected to read as follows: ''Section 11.104 is amended by revising paragraph (a); and removing the period at the end of paragraph (b) and inserting '; and' in its place. The revised text reads as follows:''

17. Also in 11.104(a) on page 264, in the first column, on the eighth line, the word ''and'' should be removed.

13.106–2 [Corrected]

18. On page 265, second column, under section 13.106–2, in the tenth line of (a)(3), remove the word ''only'' the first time it is used.

19. In the same section, on the same page, in the third column, in the third line of paragraph (a)(5), ''Contracting'' should read ''contracting''.

20. Also on page 265, third column, in the seventeenth line of paragraph (b)(1), the word ''offices'' should read ''officers''.

21. On page 267, second column, fifth line from the bottom of the page, ''0174'' should read ''017''.

33.103 [Corrected]

22. In 33.103, on page 271, first column, in the sixth line of paragraph (f)(4), the word ''agencies'' should read ''agency''.

23. On page 271, second column, in the last line under **FOR FURTHER INFORMATION CONTACT**, ''FAC 90–5'' should read ''FAC 90–45''.

24. Also on page 271, second column, the last line under *Background* should read ''FAR 36.303–2(a)''.

36.303–1 [Corrected]

25. In 36.303–1, on page 273, first column, the second line of paragraph (a) in introductory text, the word ''include'' is misspelled.

Subpart 36.4 [Reserved]

26. Also on page 273, at the bottom of the first column, the subpart heading should appear as set forth above.

Dated: March 5, 1997.

Edward C. Loeb,

Director, Federal Acquisition Policy Division.

[FR Doc. 97–5842 Filed 3–7–97; 8:45 am]

BILLING CODE 6820–EP–P

DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

49 CFR Part 571

[Docket No. 95–28; Notice 10]

RIN 2127–AF73

Federal Motor Vehicle Safety Standards; Lamps, Reflective Devices and Associated Equipment

AGENCY: National Highway Traffic Safety Administration (NHTSA), DOT.

ACTION: Final rule.

SUMMARY: This document amends Standard No. 108, the Federal motor vehicle safety standard on lighting, to afford an option to existing headlamp aiming specifications which is intended to improve the objectivity and accuracy of motor vehicle headlamp aim when headlamps are aimed visually and/or optically. The rule reflects the consensus of NHTSA's Advisory Committee on Regulatory Negotiation concerning the improvement of headlamp aimability performance and visual/optical headlamp aiming. The Committee was composed of representatives of government, industry, and consumer interest groups.

DATES: The rule is effective May 1, 1997. Petitions for reconsideration must be filed not later than April 24, 1997.

ADDRESSES: Petitions for reconsideration should refer to Docket No. 95–28; Notice 10, and must be submitted to: Docket Section, Room 5109, 400 Seventh Street, SW., Washington, DC 20590. (Docket hours are from 9:30 a.m. to 4:00 p.m.).

FOR FURTHER INFORMATION CONTACT: (NHTSA Advisory Committee representative) Steve Kratzke, Office of Safety Performance Standards, NHTSA (Phone: 202–366–5203; FAX: 202–366–4329); (technical information) Rich Van Iderstine, Office of Safety Performance Standards, NHTSA (Phone: 202–366–5275; FAX: 202–366–4329); (legal information) Taylor Vinson, Office of Chief Counsel, NHTSA (Phone: 202–366–5263; FAX: 202–366–3820).

SUPPLEMENTARY INFORMATION:

I. Background

On June 9, 1995, at 60 FR 30506, the National Highway Traffic Safety Administration (NHTSA) published a notice of intent to establish an advisory committee (''the Committee'') for regulatory negotiation to develop recommended specifications for altering the lower beam patterns of Federal Motor Vehicle Safety Standard No. 108 *Lamps, Reflective Devices and Associated Equipment* to be more sharply defined. Such a pattern would facilitate visual/optical aimability of headlamps. During 1995–96, the Committee met at intervals to develop these specifications. On the basis of the Committee's recommendations, NHTSA published a notice of proposed rulemaking on July 10, 1996 at 61 FR 36334. This was followed by a correction notice published on August 20, 1996 (61 FR 43033). The reader is referred to these notices for further background information.

Because this was a negotiated rulemaking, NHTSA did not expect to receive many comments of a substantive nature. Comments were received from Valeo Vision, Hella KG Hueck & Co., Robert Bosch GmbH, Volkswagen, Stanley Electric Co. Ltd, Groupe de Travail ''Bruxelles 1952'' (GTB), Koito Manufacturing Co. Ltd., American Automobile Manufacturers Association (AAMA), Cooper Industries Wagner Lighting Division (Wagner), Advocates for Auto and Highway Safety (Advocates), Calcoast—ITL, and Volvo Cars of North America, Inc. As anticipated, all commenters supported the proposal, and the rule is adopted as proposed. However, some important points were raised in the comments, which will be discussed in the course of this notice.

II. Proposed Requirements and Their Rationales

The final rule will ensure that the visually/optically aimable lower beam of a headlamp meets the following criteria, as developed by the Committee:

A. Vertical Aim of Lower Beam

A visual cue (cutoff) is required in the lower beam pattern to permit accurate aiming. The cutoff marks a transition between the areas of higher and lower luminous intensities. The cutoff in the lower beam pattern is a horizontal line composed of maximum vertical logarithmic gradients of the screen illumination.

Vertical aim requires both a laboratory specification for headlamps before installation and a field specification for headlamps after installation. Under the final rule, the laboratory specifications are incorporated into Standard No. 108. The field specifications represent the Committee's recommendations to all persons who perform visual/optical headlamp aiming in the field and were set forth in the preamble to the NPRM.

1. Laboratory Specification for the Vertical Visual Aim of the Lower Beam

Several factors must be considered to ensure accurate and repeatable results that also relate to the requirements for field aimability. Accuracy for laboratory aim is specified to be within +/−0.1 degree. This is based on the test equipment positioning capability of +/−0.01 degree along with the associated lamp-to-lamp and laboratory-to-laboratory variances. The specification for the gradient is based on a required +/−0.1 degree laboratory aim accuracy and a 0.25 degree field aim accuracy with confidence limits of +/−2 sigma. A University of Michigan Transportation Research Institute (UMTRI) study titled ''Visual Aiming of European and U.S. Low-Beam Headlamps'' (Report No. UMTRI–91–34, by Sivak, Flannagan, Chandra, and Gellatly) provided the information needed to establish the necessary gradient within the confidence levels defined.

Measurement of the specific gradients may be carried out using traditional photometric measurement equipment; however, photometric distance may vary between companies. A procedure which has been developed by the Groupe de Travail ''Bruxelles 1952'' (GTB) Short-term Scientific Studies Working Group (SSST WG) provides a baseline system for this test. (This may be found in ''Draft Minutes of the Meeting held at Budapest 1995 October 3'' on file in the docket as attachment 3–9 to the Committee's minutes of Meeting No. 3.)

The cutoff can be on either the right or left side of the lower beam pattern. When so located, it provides the necessary reference for placing the beam in the appropriate vertical location for correct aim. In order to achieve a cutoff in a beam, there must be a distinct difference in illumination levels above and below the cutoff. This may be achieved by numerous methods in the design of a headlamp. For the purposes defined by the Committee, a horizontally oriented cutoff is necessary. Based on work done by the Society of Automotive Engineers'' (SAE) Beam Pattern Task Force (in developing SAE J1735 ''Harmonized Vehicle Headlamp Performance Requirements'), UMTRI, Commission Internationale de l'Eclairage Working Group on Vehicle Lighting (CIE TC4.10) (''Definition of the Vertical Cut-off of Vehicle Headlights'' draft 1993–3–15), and the GTB SSST WG, and reviewed by the Committee, the method for describing the cutoff is as follows.

Scientific studies by Blackwell, Olson, Forbes, Sivak, Flannigan, et.al., have shown that the human eye responds to the logarithm (to base 10) of the gradient of screen luminance. This mathematical expression simulates in the laboratory where human vision perceives the cutoff on a screen during field aiming. A vertical scan of the lower beam pattern at a specified number of degrees to the right or left of the headlamp beam pattern's vertical axis, where the cutoff is located, is taken to gather data on the intensity values. This data is then analyzed using the mathematical expression to determine where the greatest rate of change of illumination occurs; the vertical location of the cutoff is thus defined. For example, a person could use a goniophotometer to record data in small vertical increments at the locations at 2.5 degree left or 2.0 degrees right in order to determine the cutoff location.

For effective field aiming, the cutoff needs to be finitely long so that the person looking at the cutoff has a sufficient cue to find it. This range should extend at least one degree on each side of the specified measurement point of the cutoff and should be approximately straight and horizontal.

The cutoff on the left side of the beam pattern can be achieved by putting more light below the horizontal on the left rather than reducing the intensity of light above the cutoff. This added light provides more illumination to detect objects on the left side of the beam pattern and more uniformity of the total light output from the vehicle. The light above the horizontal would not be decreased. The right side of the beam needs no such enhancement to achieve an adequate gradient for the cutoff. In addition to the above, these changes cause small effects in other areas of the beam that will be addressed below.

To accomplish these purposes, the Agency is adopting the changes to the existing photometric figures in Standard No. 108 for all headlamps designed for visual/optical aiming, as described below. In the final rule, existing photometric Figures 15A, 17A, 27, and 28, have been redesignated respectively Figures 15–1, 17–1, 27–1, and 28–1. Proposed Figures 15B, 17B, 27A and 28A have been adopted as Figures 15–2, 17–2, 27–2 and 28–2. The changes added to the ''-1'' Figures to achieve the ''-2'' Figures are:

(a) Elimination of the 0.5 deg. D–1.5 deg. L to L test points,

(b) Elimination of the 1.0 deg. D–6.0 deg. L test point,

(c) Addition of an 0.86 deg. D–3.5 deg. L test point with intensity requirements of 1800 cd. minimum, and 12000 cd. maximum, and

(d) Addition of an 0.86 deg D–V test point with intensity requirements of 4500cd. minimum,

(e) Addition of an 0.6 deg D–1.3 deg R test point replacing the current test point at 0.5 deg D–1.5 deg R with intensity requirements shown below:

New test point: 0.6 deg. D—1.3 deg. R		Replaced test point: 0.5 deg. D—1.5 deg. R		
Source:		Source:		
Cd minimum	Standard No. 108 figures	Cd minimum	Cd maximum	Standard No. 108 figures
10000	15–2 & 17–2	10000	20000	15–1 & 17–1.
10000	27–2 & 28–2	8000	20000	27–1 & 28–1.

(f) And modification of the 4 degree D–V test point in the Figure 15–2 lower beam maximum candela column from 7000 cd to 10000 cd.

In Figures 27–1 and 28–1, the maximum value at 0.5 degree D–1.5 degrees L is 2500 cd. In Figures 15–1 and 17–1 the maximum value at 0.5 degree D–1.5 degrees L is 3000 cd. The value of the 1.0 degree D–6.0 degrees L test point is 750 cd minimum, and it becomes superfluous because of the additional illumination provided by the new test point specified at 0.86 degree D–3.5 degrees L.

The three test points: 0.86 degree D–3.5 degrees L; 0.86 degree D–V; and 0.6 degree D–1.3 degree R being added have all been the subject of low beam headlamp harmonization activities with GTB, GRE, JASIC, and SAE. A research study, UMTRI 94–27 ''Evaluation of the SAE J1735 Draft Proposal for a Harmonized Low-Beam Headlighting Pattern'' reports that these three test points contribute to better performance of the lower beam headlamp. Incorporation of these test points also contributes to current worldwide harmonization for lower beam headlamps.

In the past there has been one ''seeing light'' test point at 0.5 degree D–1.5 degree R. This is being replaced by three new ''seeing light'' test points: 0.6 degree D–1.3 degrees R; 0.86 degree D–V; and 0.86 degree D–3.5 degree L. The new 0.86 degree D–V test point with the 4500 cd minimum will increase uniformity of the beam pattern below the horizontal line between the high intensity zones on the left and right. The new 0.6 degree D–1.3 degree R test point represents a relocation of a current test point by 0.1 degree D (from 0.5 degree D to 0.6 degree D) and 0.2 degree L (from 1.5 degree R to 1.3 degree R). These changes represent a significant improvement in providing more light to the left side of the beam pattern and will promote harmonization. There is a maximum (20000cd) requirement at the 0.5 degree D–1.5 degree R test point. Because of significantly greater control of minimum and maximum illumination above the horizontal axis, there is no continuing need for a maximum at this location.

The modification of the test point value at 4D–V in Fig. 15–2 from 7000 cd maximum to 10000 cd maximum is based on the substantial increase of light resulting from the test point modifications above which extend the high intensity zone on the right side of the beam pattern to the left side of the beam. The previous test point value at 0.5 degree D–1.5 degree L to L limited not only the light to the left region of the roadway, but also to the foreground area. Directing more light to the left will increase foreground light levels. Studies performed by UMTRI have shown that very high levels of foreground light can depreciate the driver's distance seeing performance. A modest increase in the maximum candela level at this test point from 7000 to 10000 will allow the additional left lane light yet not create undue foreground illumination.

As proposed, the cutoff location is positioned at 0.4 degree below the H–H line for headlamps designed to be aimed using the left side of the beam pattern. This causes the top edge of the main part of the beam pattern on the left to intersect the road surface at approximately 90 m. (300 feet) from the vehicle with headlamps mounted at 635 mm. (25 inches) above the road surface. This distance is increased from present headlamps that are limited by the 0.5 degree D–1.5 degrees L to L test point that exists today. The new test point is taken from SAE J1735.

The specific mathematical expression for identifying the cutoff is: $G = \log E(\alpha) - \log E(\alpha+0.1)$, where ''G'' is the gradient, ''E'' is illumination and ''α'' is the vertical angular position. The maximum value of the gradient ''G'' determines the angular location of the cutoff.

B. Horizontal Aim of Lower Beam

1. Eliminating Horizontal Aim Adjustability

Horizontal aimability is mandatory for mechanically-aimed headlamps under Standard No.108. Because the lower beam of a headlamp designed to conform to Standard No. 108 does not have any visual cues for achieving correct horizontal aim when aimed visually or optically, and because it is not possible to add such visual features without damaging the beam pattern, horizontal aim should be either fixed and nonadjustable, or have a horizontal VHAD.

When horizontal aim is nonadjustable, horizontal aim will not be compromised because most state laws require that headlamps be correctly aimed at the time of the first sale of the vehicle. Generally, the vehicle's manufacturer accepts the responsibility for assuring correct aim of new motor vehicles. Further, proper realignment of front-end components of collision-damaged vehicles will assure correct placement of headlamps and thus maintain proper horizontal aim. Thus, no further specifications are necessary for field use, except to note that horizontal aim may not be adjustable on some lamps marked ''VOR'' or ''VOL'' on the lens.

Standard No. 108 specifies for the lower beam, test points at 15 and 9 degrees left and right, with minimum candela of 850 and 1000 (test points 15 and 9 degrees, Figures 15–1 and 17–1) and 700 and 750 (test points 15 and 9

degrees, Figures 27–1 and 28–1). NHTSA's new Figures 15–2, 17–2, 27–2, and 28–2 increase these values. New test points added at 20 degrees left and right further widen the beam. In addition to the substitution of the above mentioned 0.86D–3.5L test point for the 0.5D–1.5L to L, to facilitate the cutoff, these changes make the new beam pattern less sensitive to horizontal positioning. The modifications and additions that have been adopted are:

9 deg L&R–2 deg D—1250 cd. min.
15 deg L&R–2 deg D—1000 cd. min.
20 deg L&R–4 deg D—300 cd. min.

These locations and values were taken from SAE J1735 which achieves a wider beam pattern as a result of these test points.

2. Horizontal Aim of Lower Beam for Laboratory Photometry tests.

The headlamp shall be mounted onto a fixture which simulates its actual design orientation on any vehicle for which the headlamp is intended. The fixture, with the headlamp installed, shall be attached to the goniometer table in such a way that the fixture alignment axes are coincident with the goniometer axes. Shimming or adjustment of the headlamp's attachment to the test fixture to comply with the photometric requirements is not allowed. If there is a VHAD, the aim of the headlamp shall be adjusted, using the headlamp's horizontal aiming adjusters so the VHAD reads zero. When the headlamp has been aimed vertically, the lamp is ready to be tested for photometric compliance.

C. Vertical Aim of Upper Beam

As with vertical aim of the lower beam, vertical aim of the upper beam requires both a laboratory specification for headlamps before installation and a field specification for headlamps after installation; however, the aim of the upper beam is not nearly as critical as it is for the lower beam. The laboratory specification is being incorporated into Standard No. 108 for visually/optically aimable headlamps. For a headlamp that incorporates both a lower beam and an upper beam, the laboratory procedure and the field procedure for upper beam are not applicable, because the headlamp must be aimed using the lower beam, and, by design, both beams are photometered in that position.

For a headlamp that has only an upper beam, the following apply:

1. Laboratory Specification for Vertical Visual Aim of Upper Beam

The vertical aim of the upper beam shall be adjusted so that the maximum beam intensity is located on the H–H axis.

2. Laboratory Specification for Horizontal Visual Aim of Upper Beam

The horizontal aim of the upper beam shall be adjusted so that the maximum beam intensity is located on the V–V axis unless the headlamp has fixed horizontal aim or a VHAD. In these cases, it shall be mounted onto a fixture which simulates its actual design orientation on any vehicle for which the headlamp is intended. The fixture, with the headlamp installed, shall be attached to the goniometer table in such a way that the fixture alignment axes are coincident with the goniometer axes. Shimming or adjustment of the headlamp's attachment to the test fixture to comply with the photometric requirements is not allowed. If there is a VHAD, the aim of the headlamp shall be adjusted, using the headlamp's horizontal aiming adjusters so that the VHAD reads zero. When the headlamp has been aimed vertically, the lamp is ready to be tested for photometric compliance.

D. Movable Reflector Headlamps

Movable reflector headlamps have a lens and headlamp housing that do not move with respect to the surrounding car structure when headlamps are aimed. Therefore, the range of headlamp aim limits does not need to be as large to cover repairs from vehicle collisions. Requirements for the aiming of movable reflector headlamps have been clarified and expanded to cover headlamps which are visually/optically aimable. The vertical aim range limits will now cover only the full range of pitch on the vehicle on which the headlamp system is installed (full range of pitch on the vehicle is defined in S7.8.3 of Standard No. 108). When horizontal aim is incorporated in a headlamp the horizontal aim range limits will remain 2.5 degrees. Photometry will then be done over the applicable aim limits used for the headlamp system.

E. Marking Requirements

1. Headlamp Optical Axis Mark

The accuracy and reliability of headlamp aim depends upon the correct placement of aiming equipment in front of the vehicle and its headlamps. To assure that this placement is correct and precise, it is necessary for the headlamps to have an indication of the optical axis to act as a geometric reference for measuring distances to the floor and between the headlamps and the vehicle's longitudinal axis. This may be done by a mark on the interior or exterior of the lens, or by a mark or central structure on the interior or exterior of the headlamp. Thus, Standard No. 108 is amended to require that a headlamp have this mark.

While the mark is necessary for visual/optical aim headlamps, it is also desirable for all headlamps because people who aim headlamps use visual/optical aim even though today's headlamps are not designed to be aimed by this method. In the interest of promoting correct aim, this optical axis mark is recommended for all future headlamp designs. This final rule may require changes in headlamps for existing production vehicles, however, it is not intended to be a retroactive requirement. Adequate leadtime is required for implementation, and commenters were invited to discuss leadtime concerns. These concerns and the effective date adopted for the optical axis mark requirement are discussed in the section of this notice called ''Effective Dates''

2. Visual/Optical Aimability Identification Mark

Marking of headlamps would indicate that the lamp is visually/optically aimable according to the means specified in the final rule. Thus, Standard No. 108 will require that the visible part of the lens of each original and replacement equipment headlamp and headlamp lens, and of each original equipment and replacement equipment beam contributor, designed to be visually/optically aimable, manufactured on or after March 1, 1997, the effective date of the final rule, be marked with the symbols ''VOL'', ''VOR'', or ''VO'' either horizontally or vertically. The Committee determined that ''VOR'' and ''VO'' respectively should be the only marking used for all lower beam and upper beam sealed beam and integral beam headlamp types existing before the effective date of the final rule if these types are ever redesigned to be visually/optically aimable. This will ensure that replacement headlamps are identically marked.

NHTSA proposed that manufacturers which introduce new visually/optically aimed headlamp types after the effective date be required to determine the aim method and apply the required marking. This aim method and marking must be followed by all subsequent manufacturers of this headlamp type.

Under the final rule, a lower beam headlamp will be marked ''VOL'' if the manufacturer designs it to be visually/optically aimed using the left side of the lower beam pattern, and ''VOR'' if using the right side. If a sealed beam or an

integral beam headlamp system is currently being produced, the lens of any lamp in such system that is manufactured on or after March 1, 1997, the effective date of the final rule, must be marked ''VOR'', and have the gradient on the right side, if the system is ever redesigned so that its lamps are visually/optically aimable. A headlamp will be marked ''VO'' if it is solely an upper beam headlamp and intended to be visually/optically aimed.

The discussion above relates to the proper marking of existing headlamp designs should their photometric performance be redesigned to be visually/optically aimable as described in this final rule. This does not mean that existing designs can be changed from being mechanically aimable to being visually/optically aimable. It means that existing designs, all of which are mechanically aimable, can be redesigned to include visual/optical aiming in addition to mechanical aim. Mechanical aim must be retained on existing designs to ensure that replacement equipment provide the same performance as original equipment. Thus, any current headlamp design that is modified to include visual/optical aimability must still provide mechanical aimability if that headlamp is intended to be a replacement in vehicles in which the lamp was used before its redesign.

Should a headlamp be redesigned without mechanical aiming features and replace an earlier version of the headlamp, one of two distinct safety consequences will occur, depending on whether the headlamp incorporated an external aiming system or an on-board one. If the headlamp incorporated an external aiming system and if one of the headlamps were replaced with a visual/optical aim only headlamp, the remaining headlamp would not be capable of being aimed with a mechanical aimer. This would occur because the external aimer must be attached to two headlamps, one on each side of the vehicle, in order to measure horizontal aim location. Additionally, the new visual/optical aim headlamp would be capable of being adjusted horizontally because there would be horizontal aiming screws. This is not permitted for visual/optical aim headlamps unless the headlamp has a horizontal VHAD. If the headlamp had an on-board mechanical aiming system, the safety consequence would be the inability to aim correctly a replacement headlamp offering visual/optical aimability only. In this case, the visual/optical headlamp would have horizontal aiming screws, but there would be no valid manner in which to aim the headlamp horizontally unless it continues to be equipped with a horizontal VHAD. For this headlamp, the presumed saving might be the deletion of the vertical VHAD. However, S5.8 *Replacement Equipment* prohibits replacement equipment that differs from original equipment.

In accordance with other marking requirements of Standard No. 108, the letters will be not less than 3 mm high.

III. Allowing Existing Headlamps to Use the New Photometrics

The Committee also decided that the improved photometrics represented by Figures 15–2, 17–2, 27–2, and 28–2 should be available to manufacturers of headlamps that are not visually/optically aimable within the meaning of this rulemaking action, but which presently are designed to meet the photometrics of Figures 15A, 17A, 27 or 28. This raises no safety issues regarding glare or compatibility of replacement equipment, and NHTSA is adopting appropriate amendments to implement the Committee's decision.

In commenting on the proposal for new photometrics, AAMA recommended that the definitions of ''integral beam headlamp'' and ''replaceable bulb headlamp'' be modified to assure that headlamps with removable lenses may be designed to have visual/optical aiming. In its view, visual/optical aiming of headlamps with replaceable lenses is an acceptable alternative to VHAD aiming. The agency concurs, and is amending the definitions in the manner suggested. Even though these specific changes were not proposed, the NPRM did cover integral beam headlamps and replaceable bulb headlamps with fixed lenses the agency sees no substantive distinction that would warrant a separate notice and an opportunity to comment on the inclusion of replaceable lens headlamps in this rulemaking action.

IV. Comments Relating to the NPRM

Stanley, Koito, AAMA, and Wagner called the agency's attention to the inconsistency between the proposed requirement that on-board vehicle headlamp horizontal aiming devices (VHADs) be permanently calibrated, and the lack of a proposal to amend the existing requirement that requires horizontal aiming VHADs to be capable of being recalibrated in the field (S7.8.5.2(a)(2)(iv)).

Permanent calibration was proposed to help prevent further misaim that can occur when vehicle repair technicians attempt to calibrate visually the VHADs of mechanically aimable headlamps that were never intended to be visually aimed. The Committee decided that recalibration should be prohibited because today's lower beam headlamps are not yet capable of being properly visually/optically aimed in the field due to the lack of visual cues in the beam pattern. Visual/optical aim is the only method available in the field today for VHAD calibration and it cannot be performed with any acceptable precision. Thus, there is no safety value from the current requirement for recalibration capability, whereas there would be one for permanent calibration. Permanent calibration retains the precision necessary for aiming; once calibration is lost it cannot be recovered. Maintaining calibration permits the vehicle repair technician to measure physically the mounting locations of the headlamp relative to the vehicle references so that the repaired substructure onto which the headlamp is mounted is restored to near its original alignment. Doing so permits the horizontal VHAD to establish horizontal aim location with reliability and accuracy. For these reasons, NHTSA is adopting S7.8.5.2(c) as proposed and eliminating the inconsistency by deleting the last part of the sentence of S7.8.5.2(a)(2)(iv).

In Stanley's opinion, the formula specified in SAE J1735 ''Harmonized Vehicle Headlamp Performance Requirements'' defining the cut-off of the beam is more practical than the formula that was proposed. This issue was thoroughly discussed by the Committee in its negotiating sessions.

The formula proposed represents the consensus of these meetings including the views of the Japanese Automobiles Standards Internationalization Center (JASIC), which represented the Japanese vehicle and lighting industries. NHTSA affirms its conclusion that the formula is practicable, for the reasons given in both the NPRM and this notice.

One issue for which NHTSA sought answers was whether the optional visual/optical headlamp aiming standard should become mandatory in due course, and, if so, on what date it should become effective. Three comments were received. Wagner believed that the standard should be mandatory, and asked for a 3-year leadtime. Volvo objected to a mandatory requirement. AAMA did not support a mandatory requirement until such time as data are available from field and use experience. On the basis of these comments, the agency concludes that resolution of the issue requires data that is not yet available and is not making the aiming standard mandatory. The

agency may revisit the issue at a later date.

AAMA also suggested minor wording and typographical changes to paragraphs S5.5.8, S7.3.8(b), S7.3.9, S7.4.2(a)(2(i), S10(a), and Figure 26 all of which are adopted.

Proposed paragraphs S7.8.1(b) and S7.8.5.3(f) would require fiduciary markings ''that are visible from the front of the headlamp * * *'' The final rule clarifies that the markings are ''visible from the front of the headlamp when installed on the vehicle,'' implementing a recommendation from AAMA.

V. Comments Not Relating to the NPRM

Several comments concerned issues beyond the scope of the NPRM and the issues that were part of the consensus achieved by the Committee, but NHTSA will comment briefly on them.

Valeo suggested permitting a visual horizontal aim adjustment feature in the beam for visually/optically aimable headlamps, and adding a definition of a ''kink'' in the cut off of the VOL lower beams. In Valeo's opinion, the prohibition of horizontal aim adjustment mechanisms will compel the manufacture of design-specific headlamps for the ECE and U.S. markets. Valeo deems the alternative permitted in the proposal of providing a horizontal VHAD to be considerably more expensive than basic aiming means, but without benefit to the user.

NHTSA notes that the Committee considered features for horizontal visual/optical aiming but none were deemed sufficiently developed and designed to be usable, hence none were included in the NPRM. The agency believes that Valeo's claims of a considerable cost increase are incorrect. Today, with two different beam patterns required for the ECE and U.S. markets, two different headlamp designs are often necessary to meet the needs of each market. With the issuance of this final rule and its visual/optical beam pattern, manufacturers have stated that a beam pattern may be possible that complies with the requirements of both markets. Because ECE headlamps at the current time are required to have both vertical and horizontal aiming screws, an ECE headlamp, to be sold as a visual/optical aim headlamp in the U.S., will need to have a horizontal VHAD. While this would mean a slight cost increase for the ECE headlamp, Valeo will realize overall a significant cost savings from not having to design a separate product for the U.S. market. On balance, the agency estimates that Valeo's cost savings are in the range of $10,000,000 per design for development and tooling costs. The incremental cost of adding a horizontal VHAD is small in comparison to the significant savings afforded by this rulemaking. Additionally, GTB indicates that it will petition NHTSA for rulemaking to include a horizontal aim feature after it has completed research on the nature of horizontal gradients necessary for horizontal visual/optical aim.

Valeo requested clarification of allowance of a re-aim of 0.25 degree in all directions around the test point being measured, even if the visually/optically aimable headlamp does not have a VHAD. Standard No. 108 has always allowed a re-aim of 0.25 degree in any direction for every test point during photometric testing, and will continue to do so. There is no reason not to allow visually/optically aimable headlamps to be similarly reaimable during compliance testing.

Hella and Bosch suggested further aspects to be considered that will be important to the future of harmonization. Both believe that future requirements should be added to permit a visual cue or vertical ''kink'' to be used for horizontal visual/optical aiming of the lower beam. However, as NHTSA has discussed above, this is not technically feasible at this point. Both also suggested that NHTSA allow an increased maximum intensity in upper beam headlamps. Recently NHTSA denied a petition for rulemaking on this subject (61 FR 45359) because of a lack of information supporting an increase beyond the maximum established by NHTSA in 1978. Finally, Hella believes that NHTSA should regulate fog lamps. NHTSA has already asked for comments on this issue (60 FR 54833) and intends to publish a further notice with its views on fog lamps in the near future.

Stanley asked whether the proposal applies to headlamps designed exclusively for motorcycle use. The answer is no; this rulemaking was not intended to address the amiability of motorcycle headlamps.

Calcoast offered a suggestion to improve proper horizontal positioning when photometering a visually/optically aimable headlamp: to add a lens marking identifying the horizontal angle at which the vertical scan is to be performed. NHTSA believes that this marking would add little to assist horizontal positioning, because the cut-off must occur in a 2-degree wide area either to the left or right of the vertical line so that field personnel can identify the cut-off and use it for aiming purposes. It is doubtful that service personnel could accurately and repeatably determine by observation where the cut-off is sharpest and use that as a horizontal aiming reference.

VI. Housekeeping Amendments

In reviewing the text of Standard No. 108 (49 CFR 571.108) as published in the Code of Federal Regulations, revised as of October 1, 1995, NHTSA has discovered several errors that it is taking this opportunity to correct.

The first is a clarification of S5.3.1.1.1 as it relates to the location of clearance lamps. The first sentence of the preceding paragraph, S5.3.1.1, requires, in part, that each lamp ''be located so that it meets the visibility requirements specified in any applicable SAE Standard.'' The second sentence of paragraph S5.3.1.1 states, in part and in essence, that ''no part of a vehicle shall * * * prevent [a clearance lamp] from meeting the photometric output specified in [the] applicable SAE Standard.''

Paragraph S5.3.1.1.1 allows an alternative location for clearance lamps under the conditions expressed in the paragraph and specifies that ''at such a location they need not be visible at 45 degrees inboard.'' The SAE Standard that applies to clearance lamps is J592e, ''Clearance, Side Marker, and Identification Lamps'', July 1972. SAE J592e does not contain installation requirements that specify inboard visibility performance for clearance lamps, within NHTSA's understanding of the first sentence of S5.3.1.1, unlike the standards for turn signal lamps which require ''signals from lamps on both sides of the vehicle [to] be visible through a horizontal angle from 45 deg. to the left for the left lamp to 45 deg to the right for the right lamp.'' (paragraph 5.4.1, SAE Standard J1395 APR85 ''Turn Signal Lamps for use on Motor Vehicles 2032 mm or More in Overall Width''). Instead, SAE J592e specifies photometric performance requirements to be met at test points 45 Left and 45 Right, within the meaning of the second sentence of S5.3.1.1. NHTSA does not wish to confuse the visibility of a lamp with maintenance of its photometric performance as mounted on a vehicle. For this reason, NHTSA believes that S5.3.1.1.1 would be more accurately expressed as specifying that clearance lamps alternatively located ''need not meet photometric requirements at 45 degrees inboard.'' Accordingly this change is made in paragraph S5.3.1.1.1.

In paragraph S5.5.4, the second sentence relating to activation of the high-mounted stop lamp is revised to substitute the word ''vehicle'' for ''passenger car''. This amendment should have been made when Standard No. 108 was amended to require center high-mounted stop lamps on vehicles other than passenger cars.

Paragraph S5.8.10 is revised by correcting its reference to ''S5.7.1'' to ''S5.8.1.'' NHTSA notes that Standard No. 108, as it appears in 49 CFR Parts 400 to 999, revised as of October 1, 1995, contains two paragraphs designated as S7.1 (page 231). The first that is printed specifies headlamp photometric requirements that apply on and after September 1, 1994, while the second contains requirements that apply both before and after that date. Only the first paragraph S7.1 will appear in 49 CFR Parts 400 to 999, revised as of October 1, 1996.

Paragraph S7.2(a) on headlamp lens marking explains that the DOT symbol is the certification required by ''15 U.S.C. 1403.'' This statutory requirement was recodified in 1994 as ''49 U.S.C. 30115'' and the paragraph is being revised to reflect the change. The effective date of December 1, 1989, is also being removed from this paragraph as it is superfluous.

Paragraphs S7.4(i) and S7.5(j) are added to clarify that integral beam headlamps and replaceable bulb headlamps may also incorporate replaceable light sources used for purposes other than headlighting.

Finally, in paragraph S10(a), ''SAE'' is inserted before ''Standard''.

VII. Effective Dates

The amendments that allow headlamps to be visually/optically aimable as an alternative to existing aimability requirements are effective April 1, 1997, approximately 60 days after publication of the final rule in the Federal Register. Because of the desire of all interests affected by the rule that it be issued as soon as practicable to permit an optional means of compliance, it is found for good cause shown that an effective date earlier than 180 days after issuance is in the public interest.

AAMA, Koito, and GTB asked for an additional year of leadtime to comply with requirements that are mandatory within the option, which are fixed calibration and optical axis marking. These requirements were proposed to become effective one year following the September 1 that follows publication of the final rule. Since this final rule is one that is published between September 1, 1996, and August 31, 1997, the effective date for the mandatory requirements is September 1, 1998. NHTSA confirmed in phone conversations that the concern of the commenters is that a late issuance date allowing a lead time of 13 months would be impracticable whereas as earlier one would not. Since this final rule is being published around March 1, the effective date of September 1, 1998, as discussed below for mandatory requirements affords a leadtime of approximately 18 months. NHTSA has concluded that this meets the needs of the commenters and therefore is taking no action on the request.

The amendments to S7.8.1(b) amending the fiducial marking to require an optical axis mark for headlamps that are not visually/optically aimable are effective September 1, 1998, which, as proposed, is September 1 of the year following one year after publication of the final rule. For the same reason, the amendments to S7.8.5.2(c) amending the calibration requirements for the VHAD are also effective September 1, 1998. On the basis of comments demonstrating that it is impracticable to comply with these requirements within 360 days after issuance of the rule, it is found for good cause shown that an effective date for these requirements that is later than 360 days after issuance of the rule is in the public interest.

There is no retroactive effect on existing headlamps or their replacements.

Rulemaking Analyses and Notices

Executive Order 12866 and DOT Regulatory Policies and Procedures.

This rulemaking action was not reviewed under Executive Order 12866. Further, it has been determined that the rulemaking action is not significant under Department of Transportation regulatory policies and procedures. The purpose of the rulemaking action is to provide an alternative and more objective means of determining the accuracy of headlamp aim. As an alternative, the provisions are not mandatory unless a manufacturer chooses to install visually/optically aimable headlamps on a motor vehicle that it intends to sell. Because of offsetting benefits to vehicle manufacturers when choosing this option, it is likely that greater benefits than costs will occur. The costs of the final rule are so minimal as not to warrant preparation of a full regulatory evaluation.

National Environmental Policy Act

NHTSA has analyzed this rulemaking action for the purposes of the National Environmental Policy Act. The final rule will not have a significant effect upon the environment. The composition of headlamps will not change from those presently in production.

Regulatory Flexibility Act

The agency has also considered the impacts of this rulemaking action in relation to the Regulatory Flexibility Act. For the reasons stated above and below, I certify that this rulemaking action will not have a significant economic impact upon a substantial number of small entities. Accordingly, no regulatory flexibility analysis has been prepared. Manufacturers of motor vehicles and motor vehicle equipment, those affected by the rulemaking action, are generally not small businesses within the meaning of the Regulatory Flexibility Act.

Executive Order 12612 (Federalism)

This rulemaking action has also been analyzed in accordance with the principles and criteria contained in Executive Order 12612, and NHTSA has determined that this rulemaking action does not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

Civil Justice

The final rule will not have any retroactive effect. Under 49 U.S.C. 30103, whenever a Federal motor vehicle safety standard is in effect, a state may not adopt or maintain a safety standard applicable to the same aspect of performance which is not identical to the Federal standard. 49 U.S.C. 30161 sets forth a procedure for judicial review of final rules establishing, amending or revoking Federal motor vehicle safety standards. That section does not require submission of a petition for reconsideration or other administrative proceedings before parties may file suit in court.

List of Subjects in 49 CFR Part 571

Imports, Motor vehicle safety, Motor vehicles, Tires.

In consideration of the foregoing, 49 CFR Part 571 is amended as follows:

PART 571—FEDERAL MOTOR VEHICLE SAFETY STANDARDS

1. The authority citation for part 571 continues to read as follows:

Authority: 49 U.S.C. 322, 30111, 30115, 30117 and 30166; delegation of authority at 49 CFR 1.50.

2. Section 571.108 is amended by:

a. Amending Section S4 to add new definitions: ''Cutoff'' and ''Visually/optically aimable headlamp'' in alphabetical order to read as set forth below;

b. revising the definition in S4 of ''Integral beam headlamp'', ''Replaceable bulb headlamp'', and ''Vehicle headlamp aiming device'', to read as set forth below;

c. revising paragraph S5.3.1.1.1 to read as set forth below;

d. revising paragraph S5.5.4 to read as set forth below;

e. revising paragraph S5.5.8 to read as set forth below;

f. revising paragraph S5.8.10 to read as set forth below;

g. revising paragraph S7.2(a) to read as set forth below;

h. revising paragraphs S7.3.2(a)(3); 7.3.3(a); S7.3.4; S7.3.5(a); S7.3.6(a); the first sentence of S7.3.7(b); S7.3.7(d); S7.3.7(h)(1); the last sentence of S7.3.8(b); S7.3.9(a); S7.4(a)(1)(i); S7.4(a)(1)(ii); S7.4(a)(1)(iii); S7.4(a)(2)(i); S7.4(a)(2)(ii); and the first sentence of S7.4 (a)(3) to read as set forth below;

i. adding new paragraph S7.4(i) to read as set forth below:

j. revising paragraphs S7.5(d)(2)(i)(A)(*1*); S7.5(d)(2)(i)(A)(*2*), S7.5(d)(2)(ii)(A)(*1*), S7.5(d)(2)(ii)(A)(*2*), S7.5(d)(3)(i)(A), S7.5(d)(3)(i)(B); S7.5(d)(3)(ii)(A); S7.5(d)(3)(ii)(B); S7.5(e)(2)(i)(A); S7.5(e)(2)(i)(B); S7.5(e)(2)(ii)(A); S7.5(e)(2)(ii)(B); S7.5(e)(3)(i) and S7.5(e)(3)(ii) to read as set forth below;

k. adding new paragraph S7.5(j) to read as set forth below;

l. revising paragraphs; S7.6.2; S7.6.3, S7.8.1; and S7.8.2 to read as set forth below;

m. adding new paragraph S7.8.2.1(c) to read as set forth below;

n. redesignating existing paragraph S7.8.2.2 as S7.8.2.3;

o. adding new paragraph S7.8.2.2 to read as set forth below;

p. revising paragraphs S7.8.4 and S7.8.5 to read as set forth below;

q. redesignating existing paragraph S7.8.5.2(c) as S7.8.5.2(d);

r. adding new paragraphs S7.8.5.2(c) and S7.8.5.3 to read as set forth below;

s. revising the fourth sentence of paragraph S10 (a) and the third sentence of paragraph S10(b) to read as set forth below;

t. redesignating Figures 15A, 17A, 27 and 28, as Figures 15–1, 17–1, 27–1, and 28–1, revising their titles, and republishing them as set forth below;

u. adding new Figures 15–2, 17–2, 27–2, and 28–2, to read as set forth below: and

v. revising Figure 26 to read as set forth below:

§ 571.108 Standard No. 108; Lamps, reflective devices, and associated equipment.

* * * * *

S4 *Definitions.*

* * * * *

Cutoff means a generally horizontal, visual/optical aiming cue in the lower beam that marks a separation between areas of higher and lower luminance.

* * * * *

Integral beam headlamp means a headlamp (other than a standardized sealed beam headlamp designed to conform to paragraph S7.3 or a replaceable bulb headlamp designed to conform to paragraph S7.5) comprising an integral and indivisible optical assembly including lens, reflector, and light source, except that a headlamp conforming to paragraph S7.8.5.2 or paragraph S7.8.5.3 may have a lens designed to be replaceable.

* * * * *

Replaceable bulb headlamp means a headlamp comprising a bonded lens and reflector assembly and one or two replaceable headlamp light sources, except that a headlamp conforming to paragraph S7.8.5.2 or paragraph S7.8.5.3 may have a lens designed to be replaceable.

* * * * *

Vehicle headlamp aiming device or VHAD means motor vehicle equipment, installed either on a vehicle or headlamp, which is used for determining the horizontal or vertical aim, or both the vertical and horizontal aim of the headlamp.

* * * * *

Visually/optically aimable headlamp means a headlamp which is designed to be visually/optically aimable in accordance with the requirements of paragraph S7.8.5.3 of this standard.

* * * * *

S5 *Requirements.*

* * * * *

S5.3.1.1.1 Clearance lamps may be located at a location other than on the front and rear if necessary to indicate the overall width of a vehicle, or for protection from damage during normal operation of the vehicle, and at such a location they need not meet the photometric output at any test point that is 45 degrees inboard.

* * * * *

S5.5.4 The stop lamps on each vehicle shall be activated upon application of the service brakes. The high-mounted stop lamp on each vehicle shall be activated only upon application of the service brakes.

* * * * *

S5.5.8 On a motor vehicle equipped with a headlighting system designed to conform to the photometric requirements of Figure 15–1 or Figure 15–2, the lamps marked ''L'' or ''LF'' may be wired to remain permanently activated when the lamps marked ''U'' or ''UF'' are activated. On a motor vehicle equipped with an Integral Beam headlighting system meeting the photometric requirements of paragraph S7.4(a)(1)(ii), the lower beam headlamps shall be wired to remain permanently activated when the upper beam headlamps are activated. On a motor vehicle equipped with a headlighting system designed to conform to the requirements of Figure 17–1 or Figure 17–2, a lower beam light source may be wired to remain activated when an upper beam light source is activated if the lower beam light source contributes to compliance of the headlighting system with the upper beam requirements of Figure 17–1 or Figure 17–2.

* * * * *

S5.8.10 Unless otherwise specified in this standard, each lamp, reflective device, or item of associated equipment to which paragraph S5.8.1 applies may be labeled with the symbol DOT, which shall constitute a certification that it conforms to applicable Federal motor vehicle safety standards.

* * * * *

S7 *Headlighting requirements.*

* * * * *

S7.2(a) The lens of each original and replacement equipment headlamp, and of each original equipment and replacement equipment beam contributor shall be marked with the symbol ''DOT'' either horizontally or vertically which shall constitute the certification required by 49 U.S.C. 30115.

* * * * *

S7.3.2 *Type A headlighting system.*

* * *

(a) * * *

(3) In paragraphs 4.5.2 and 5.1.6, the words ''Figure 28–1 or 28–2 of Motor Vehicle Safety Standard No. 108'' are substituted for ''Table 3.''

* * * * *

S7.3.3 *Type B headlighting system.*

* * *

(a) The requirements of paragraph S7.3.2 (a) through (c), except that the words ''Figure 27–1 or Figure 27–2'' are substituted for ''Table 3'' in paragraph S7.3.2(a)(3).

* * * * *

S7.3.4 *Type C headlighting system.* A Type C headlighting system consists of two Type 1C1 and two Type 2C1 headlamps and associated hardware, which are designed to conform to the requirements of paragraph S7.3.2 (a) through (d), except that the words ''Figure 28–1 or Figure 28–2'' are substituted for ''Table 3'' in paragraph S7.3.2(a)(3).

S7.3.5 *Type D headlighting system.* (a) A Type D headlighting system consists of two Type 2D1 headlamps and associated hardware, which are designed to conform to the requirements

of paragraph S7.3.2 (a) through (c), except that the words ''Figure 27–1 or Figure 27–1'' are substituted for ''Table 3'' in paragraph S7.3.2(a)(3).

* * * * *

S7.3.6 *Type E headlighting system.* (a) A Type E headlighting system consists of two Type 2E1 headlamps and associated hardware, which are designed to conform to the requirements of paragraph S7.3.2 (a) through (c), except that the words ''Figure 27–1 or Figure 27–1'' are substituted for ''Table 3'' in paragraph S7.3.2(a)(3).

* * * * *

S7.3.7 *Type F headlighting system.* * * *

(b) The photometric requirements of Figure 15–1 or Figure 15–2 of this standard. * * *

* * * * *

(d) When tested in accordance with section (c), the mounted assembly (either Type UF or Type LF headlamps, respective mounting ring, aiming ring, and aim adjustment mechanism) shall be designed to conform to the requirements of Figure 15–1 or Figure 15–2 for upper or lower beams respectively without reaim when any conforming Type UF or LF headlamp is tested and replaced by another conforming headlamp of the same Type.

* * * * *

(h) * * *

(1) The assembly (consisting of the Type UF and LF headlamps, mounting rings, the aiming/seating rings, and aim adjustment mechanism) shall be designed to conform to the test points of Figure 15–1 or Figure 15–2.

* * * * *

S7.3.8 *Type G headlighting system.* * * *

* * * * *

(b) * * * In paragraph 4.5.2, the words ''either Figure 28–1, or Figure 28–2'' are substituted for ''Table 3''.

* * * * *

S7.3.9 *Type H headlighting system.* * * *

(a) Paragraphs S7.3.8 (a) through (d) except that in paragraph S7.3.8(b), the words ''Figure 27–1 or Figure 27–2'' are substituted for ''Table 3.''

* * * * *

S7.4 *Integral beam headlighting systems.* * * *

(a) * * *

(1) * * *

(i) Figure 15–1 or Figure 15–2; or

(ii) Figure 15–1 or Figure 15–2, except that the upper beam test value at 2.5 D–V and 2.5D–12R and 12L, shall apply to the lower beam headlamp and not to the upper beam headlamp, and the upper beam test point value at 1.5D–9R and 9L shall be 1000; or

(iii) Figure 28–1 or Figure 28–2.

(2) * * *

(i) Figure 17–1 or Figure 17–2; or

(ii) Figure 27–1 or Figure 27–2.

(3) In a system in which there is more than one beam contributor providing a lower beam, and/or more than one beam contributor providing an upper beam, each beam contributor in the system shall be designed to meet only the photometric performance requirements of Figure 15–1 or Figure 15–2 based upon the following mathematical expression: conforming test point value = 2 (Figure 15–1 or Figure15–2 test point value)/total number of lower or upper beam contributors for the vehicle, as appropriate. * * *

* * * * *

(i) An integral beam headlamp may incorporate replaceable light sources that are used for purposes other than headlighting.

S7.5 *Replaceable bulb headlamp systems.* * * *

* * * * *

(d) * * *

* * * * *

(2) * * *

(i) * * *

(A) * * *

(*1*) The lower beam requirements of Figure 27–1 or Figure 27–2, or Figure 17–1 or Figure 17–2, if the light sources in the headlamp system are any combination of dual filament replaceable light sources other than Type HB2; or

(*2*) The lower beam requirements of Figure 17–1 or Figure17–2 if the light sources are Type HB2, or any dual filament replaceable light sources that include Type HB2; or

* * * * *

(ii) * * *

(A) * * *

(*1*) The upper beam requirements of Figure 27–1 or Figure 27–2, or Figure 17–1 or Figure 17–2 if the light sources in the headlamp system are any combination of dual filament replaceable light sources that include Type HB2, or

(*2*) The upper beam requirements of figure 17–1 or Figure 17–2 if the light sources are type HB2, or any combination of replaceable light sources that include Type HB2; or

* * * * *

(3) * * *

(i) * * *

(A) The lower beam requirements of Figure 27–1 or Figure 27–2, or Figure 15–1 or Figure 15–2 if the light sources in the headlamp system are any combination of dual filament light sources other than Type HB2; or

(B) The lower beam requirements of Figure 15–1 or Figure 15–2 if the light sources are Type HB2, or dual filament light sources other than Type HB1 and HB5. The lens of each such headlamp shall be marked with the letter ''L''.

(ii) * * *

(A) The upper beam requirements of Figure 27–1 or Figure 27–2, of Figure 15–1 or Figure 15–2 if the light sources in the headlamp system are any combination of dual filament light sources other than Type HB2; or

(B) The upper beam requirements of Figure 15–1 or Figure 15–2 if the light sources are Type HB2, or dual filament light sources other tha Type HB1 and Type HB5. The lens of each such headlamp shall be marked with the letter ''u''.

(e) * * *

* * * * *

(2) * * *

(i) * * *

(A) By the outboard light source (or the uppermost if arranged vertically) designed to conform to the lower beam requirements of Figure 17–1 or Figure 17–2; or

(B) By both light sources, designed to conform to the lower beam requirements of Figure 17–1 or Figure 17–2.

(ii) * * *

(A) By the inboard light source (or the lower one if arranged vertically) designed to conform to the upper beam requirements of Figure 17–1 or Figure 17–2; or

(B) By both light sources, designed to conform to the upper beam requirements of Figure 17–1 or Figure 17–2.

(3) * * *

(i) The lower beam shall be produced by the outboard lamp (or upper one if arranged vertically), designed to conform to the lower beam requirements of Figure 15–1 or Figure 15–2. The lens of each headlamp shall be permanently marked with the letter ''L''.

(ii) The upper beam shall be produced by the inboard lamp (or lower one of arranged vertically), designed to conform to the upper beam requirements of Figure 15–1 or Figure 15–2. The lens of each headlamp shall be permanently marked with the letter ''U''.

* * * * *

(j) A replaceable bulb headlighting system may incorporate replaceable light sources that are used for purposes other than headlighting.

* * * * *

S7.6.2 In a combination headlighting system consisting of two headlamps, each headlamp shall be designed to conform to Figure 17–1 or Figure 17–2 and shall be a combination of two different headlamps chosen from the

following types: a Type F headlamp, an integral beam headlamp, and a replaceable bulb headlamp.

* * * * *

S7.6.3 In a combination headlighting system consisting of four headlamps, each headlamp shall be designed to conform to Figure 15–1 or Figure 15–2, or if an integral beam headlamp in which there is more than one beam contributor, designed to conform to Figure 15–1 or Figure 15–2 in the manner required by S7.4(a)(3) of this standard.

* * * * *

S7.8.1 (a) Each headlamp or beam contributor that is not visually/optically aimable in accordance with S7.8.5.3 of this standard shall be equipped with fiducial marks, aiming pads, or similar references of sufficient detail and accuracy, for determination of an appropriate vehicle plane to be used with the photometric procedures of SAE J1383 APR85 for correct alignment with the photometer axis when being tested for photometric compliance, and to serve for the aiming reference when the headlamp or beam contributor is installed on a motor vehicle. The fiducial marks, aiming pads, or similar references are protrusions, bubble vials, holes, indentations, ridges, scribed lines, or other readily identifiable marks established and described by the vehicle or headlamp manufacturer.

(b) Each motor vehicle manufactured on and after September 1, 1998, shall be equipped with headlamps or beam contributors which have a mark or markings that are visible from the front of the headlamp when installed on the vehicle to identify the optical axis of the headlamp to assure proper horizontal and vertical alignment of the aiming screen or optical aiming equipment. The manufacturer is free to choose the design of the mark or markings. The mark or markings may be on the interior or exterior of the lens or indicated by a mark or central structure on the interior or exterior of the headlamp.

(c) Each headlamp that is visually/optically aimable in accordance with S7.8.5.3 of this standard shall be marked in accordance with S7.8.5.3(f).

S7.8.2 Except as provided in this paragraph, each headlamp shall be installed on a motor vehicle with a mounting and aiming mechanism that allows aim inspection and adjustment of both vertical and horizontal aim, and is accessible for those purposes without removal of any vehicle parts, except for protective covers removable without the use of tools.

S7.8.2.1

* * * * *

(c) A visually/optically aimable headlamp that has a lower beam shall not have a horizontal adjustment mechanism unless such mechanism meets the requirements of paragraph S7.8.5.2 of this standard.

S7.8.2.2 If the headlamp is aimed by moving the reflector relative to the lens and headlamp housing, or vice versa, it shall:

(a) allow movement of the headlamp system, when tested in the laboratory, to be not less than the full range of pitch on the vehicle on which the headlamp system is installed and for the horizontal aim range limits of S7.8.4,

(b) Conform with the photometrics applicable to it with the lens at any position relative to the reflector within the range limits as specified in S7.8.2.2(a),

(c) Be exempted from the aim range limits for testing in a laboratory in S7.8.3, and

(d) Be exempted from S7.8.4 if it is visually/optically aimable and has fixed horizontal aim.

* * * * *

S7.8.4 When a headlamp system is tested in a laboratory, the range of its horizontal aim shall be not less that +/-2.5 degrees from the nominal correct aim position for the intended vehicle application.

S7.8.5 When activated in a steady-burning state, headlamps shall not have any styling ornament or other feature, such as a translucent cover or grill, in front of the lens. Headlamp wipers may be used in front of the lens provided that the headlamp system is designed to conform with all applicable photometric requirements with the wiper stopped in any position in front of the lens. When a headlamp system is installed on a motor vehicle, it shall be aimable with at least one of the following: An externally applied aiming device, as specified in S7.8.5.1; an on-vehicle headlamp aiming device installed by the vehicle or lamp manufacturer, as specified in S7.8.5.2; or by visual/optical means, as specified in S7.8.5.3.

* * * * *

S7.8.5.2

* * * * *

(c) Each headlamp equipped with a VHAD that is manufactured for use on motor vehicles manufactured on or after September 1,1998, shall be manufactured with its calibration permanently fixed by its manufacturer. Calibration in this case means the process of accurately aligning the geometry of the VHAD devices with the beam pattern for the purposes of compliance with the standard.

* * * * *

S7.8.5.3 *Visual/optical aiming.* Each visually/optically aimable headlamp shall be designed to conform to the following requirements:

(a) *Vertical aim, lower beam.* Each lower beam headlamp shall have a cutoff in the beam pattern. It may be either on the left side or the right side of the optical axis, but once chosen for a particular headlamp system's design, the side chosen for the cutoff shall not be changed for any headlamps intended to be used as replacements for those system's headlamps.

(1) *Vertical position of cutoff.* The headlamp shall be aimed vertically so that the cutoff is on the left side, at 0.4 degree down from the H–H line, or on the right side, at the H–H line.

(2) *Vertical gradient.* The gradient of the cutoff measured at either 2.5 degrees L or 2.0 degrees R shall be not less than 0.13 based on the procedure of S7.8.5.3, paragraph (a)(5).

(3) *Horizontal position of the cutoff.* The width shall be not less than two degrees, with not less than two degrees of its actual width centered at either 2.5 degrees L, or 2.0 degrees R.

(4) *Maximum inclination of cutoff.* The vertical location of the highest gradient at the ends of the minimum width shall be within +/-0.2 degree of the vertical location of the maximum gradient measured at the appropriate vertical line (at either 2.5 degrees L for a left side cutoff, or 2.0 degrees R for a right side cutoff.)

(5) *Measuring the cutoff parameter.* (i) The headlamp shall be mounted on a fixture which simulates its actual design location on any vehicle for which the headlamp is intended. The fixture, with the headlamp installed shall be attached to the goniometer table in such a way that the fixture alignment axes are coincident with the goniometer axes. The headlamp shall be energized at the specified test voltage.

(ii) The headlamp beam pattern shall be aimed with the cutoff at the H-H axis. There shall be no adjustment, shimming, or modification of the horizontal axis of the headlamp or test fixture, unless the headlamp is equipped with a VHAD. In this case the VHAD shall be adjusted to zero.

(iii) A vertical scan of the beam pattern shall be conducted for a headlamp with a left side gradient by aligning the goniometer on a vertical line at 2.5 degrees L and scanning from 1.5 degrees U to 1.5 degrees D. For a headlamp with a right side gradient, a vertical scan of the beam pattern shall be conducted by aligning the goniometer on a vertical line at 2.0 degrees R and scanning from 1.5 degrees U to 1.5 degrees D.

(iv) Determine the maximum gradient within the range of the scan by using the formula: G = log E(*a*)-*log E(a*+0.1), where ''G'' is the gradient, ''E'' is illumination and ''*a*'' is vertical angular position. The maximum value of the gradient ''G'' determines the vertical angular location of the cutoff. Perform vertical scans at 1.0 degree L and R of the measurement point of the maximum gradient to determine the inclination.

(b) *Horizontal aim, lower beam.* There shall be no adjustment of horizontal aim unless the headlamp is equipped with a horizontal VHAD. If the headlamp has a VHAD, it shall be set to zero.

(c) *Vertical aim, upper beam.* (1) If the upper beam is combined in a headlamp with a lower beam, the vertical aim of the upper beam shall not be changed from the aim set using the procedures of paragraphs S7.8.5.3(a) and (b) used for the lower beam.

(2) If the upper beam is not combined in a headlamp with a lower beam, the vertical aim of the upper beam shall be adjusted so that the maximum beam intensity is located on the H-H axis.

(d) *Horizontal aim, upper beam.* (1) If the upper beam is combined in a headlamp with a lower beam, the horizontal aim of the upper beam shall not be changed from the aim set using the procedures of paragraphs S7.8.5.3 (a) and (b) used for the lower beam.

(2) If the upper beam is not combined in a headlamp with the lower beam and has fixed horizontal aim or has a horizontal VHAD, then the headlamp shall be mounted on a fixture which simulates its actual design location on any vehicle for which the headlamp is intended. The fixture, with the headlamp installed shall be attached to the goniometer table in such a way that the fixture alignment axes are coincident with the goniometer axes. The headlamp shall be energized at 12.8 ± 0.20 mV. There shall be no adjustment, shimming, or modification of the horizontal axis of the headlamp or test fixture, unless the headlamp is equipped with a VHAD. In this case the VHAD shall be adjusted to zero.

(3) If the upper beam is not combined in a headlamp with a lower beam, and it does not have a VHAD, the horizontal aim of the upper beam shall be adjusted so that the maximium beam intensity is located on the V-V axis.

(e) *Photometric Requirements and Measurement.* (1) Instead of being designed to conform to the photometric requirements of Figures 15–1, 17–1, 27–1 or 28–1, a visually/optically aimable headlamp shall be designed to conform to the requirements of Figures 15–2, 17–2, 27–2 or 28–2 when tested in accordance with paragraph (2) and SAE J575 DEC88, with the distance from the photometer to the headlamp no less than 18.3 m.

(2) If the lower beam has a left side cutoff, reaim the headlamp vertically to place the maximum gradient found in paragraph S7.8.5.3 at 0.4 degree below the H-H line. For a headlamp with a lower beam right side cutoff, place the maximum gradient found in paragraph S7.8.5.3 at the H–H line. For an upper beam, the headlamp would already be aimed at the end of the procedure found in paragraph S7.8.5.3. A 0.25 degree reaim is permitted in any direction at any test point.

(f) *Marking*—(1) *Headlamp optical axis mark.* There shall be a mark or markings identifying the optical axis of the headlamp visible from the front of the headlamp when installed on the vehicle, to assure proper horizontal and vertical alignment of the aiming screen or optical aiming equipment with the headlamp being aimed. The manufacturer is free to choose the design of the mark or markings. The mark or markings may be on the interior or exterior of the lens or indicated by a mark or central structure on the interior or exterior of the headlamp.

(2) *Visual/optical aimability identification marks.* (i) The lens of a lower beam headlamp shall be marked ''VOL'' if the headlamp is intended to be visually/optically aimed using the left side of the lower beam pattern.

(ii) The lens of a lower beam headlamp shall be marked ''VOR'' if the headlamp is intended to be visually/optically aimed using the right side of the lower beam pattern.

(iii) The lens of each sealed beam or integral beam headlamp shall be marked ''VOR'' if the headlamp is of a type that was manufactured before May 1, 1997, and if such headlamp type has been redesigned since then to be visually/optically aimable.

(iv) The lens of a headlamp that is solely an upper beam headlamp and intended to be visually/optically aimed using the upper beam shall be marked ''VO''.

(v) Each letter used in marking according to this paragraph shall be not less than 3 mm. high.

* * * * *

S10. *Simultaneous aim photometry tests.*

(a) *Type F headlamp systems.* * * * Photometry measurements of the UF photometry unit shall be completed using the aiming plane so established, and the procedures of section 4.1 and 4.1.4 Standard J1383 APR85, and Figure 15–1 or Figure 15–2. * * *

(b) Integral beam headlamp systems. * * * Photometric compliance of the lower beam shall be determined with all lower beam contributors illuminated and in accordance with sections 4.1 and 4.1.6 of SAE Standard J1383 APR85, and Figure 15–1 or Figure 15–2. * * *

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FIGURE 15-1

PHOTOMETRIC TEST POINT VALUES

FOR MECHANICAL AIM HEADLIGHTING SYSTEMS

UPPER BEAM

Test Points (degrees)	Candela maximum	Candela minimum
2U-V	--	1,500
1U-3L and 3R	--	5,000
H-V	70,000	40,000
H-3L and 3R	--	15,000
H-6L and 6R	--	5,000
H-9L and 9R	--	3,000
H-12L and 12R	--	1,500
1.5D-V	--	5,000
1.5D-9L and 9R	--	2,000
2.5D-V	--	2,500
2.5D-12L and 12R	--	1,000
4D-V	5,000	--

LOWER BEAM

Test Points (degrees)	Candela maximum	Candela minimum
10U-90U	125	--
4U-8L and 8R	--	64
2U-4L	--	135
1.5U-1R to 3R	--	200
1.5U-1R to R	1,400	--
1U-1.5L to L	700	--
0.5U-1.5L to L	1,000	--
0.5U-1R to 3R	2,700	500
H-4L	--	135
H-8L	--	64
0.5D-1.5L to L	3,000	--
0.5D-1.5R	20,000	10,000
1D-6L	--	1,000
1.5D-2R	--	15,000
1.5D-9L and 9R	--	1,000
2D-15L and 15R	--	850
4D-4R	12,500	--
4D-V	7,000	--
H-V	5,000	--

FIGURE 15-2

PHOTOMETRIC TEST POINT VALUES

FOR VISUAL/OPTICAL AIM HEADLIGHTING SYSTEMS

UPPER BEAM

Test Points (degrees)	Candela maximum	Candela minimum
2U-V	--	1,500
1U-3L and 3R	--	5,000
H-V	70,000	40,000
H-3L and 3R	--	15,000
H-6L and 6R	--	5,000
H-9L and 9R	--	3,000
H-12L and 12R	--	1,500
1.5D-V	--	5,000
1.5D-9L and 9R	--	2,000
2.5D-V	--	2,500
2.5D-12L and 12R	--	1,000
4D-V	5,000	--

LOWER BEAM

Test Points (degrees)	Candela maximum	Candela minimum
10U-90U	125	--
4U-8L and 8R	--	64
2U-4L	--	135
1.5U-1R to 3R	--	200
1.5U-1R to R	1,400	--
1U-1.5L to L	700	--
0.5U-1.5L to L	1,000	--
0.5U-1R to 3R	2,700	500
H-V	5,000	--
H-4L	--	135
H-8L	--	64
0.6D-1.3R	--	10,000
0.86D-V	--	4,500
0.86D-3.5L	12,000	1,800
1.5D-2R	--	15,000
2D-9L and 9R	--	1,250
2D-15L and 15R	--	1,000
4D-V	10,000	--
4D-4R	12,500	--
4D-20L and 20R	--	300

FIGURE 17-1

PHOTOMETRIC TEST POINT VALUES

FOR MECHANICAL AIM HEADLIGHTING SYSTEMS

UPPER BEAM

Test Points (degrees)	Candela maximum	Candela minimum
2U-V	--	1,500
1U-3L and 3R	--	5,000
H-V	75,000	40,000
H-3L and 3R	--	15,000
H-6L and 6R	--	5,000
H-9L and 9R	--	3,000
H-12L and 12R	--	1,500
1.5D-V	--	5,000
1.5D-9L and 9R	--	2,000
2.5D-V	--	2,500
2.5D-12L and 12R	--	1,000
4D-V	12,000	--

LOWER BEAM

Test Points (degrees)	Candela maximum	Candela minimum
10U-90U	125	--
4U-8L and 8R	--	64
2U-4L	--	135
1.5U-1R to 3R	--	200
1.5U-1R to R	1,400	--
1U-1.5L to L	700	--
0.5U-1.5L to L	1,000	--
0.5U-1R to 3R	2,700	500
H-4L	--	135
H-8L	--	64
0.5D-10.5L to L	3,000	--
0.5D-1.5R	20,000	10,000
1D-6L	--	1,000
1.5D-2R	--	15,000
1.5D-9L and 9R	--	1,000
2D-15L and 15R	--	850
4D-4R	12,500	--

FIGURE 17-2

PHOTOMETRIC TEST POINT VALUES

FOR VISUAL/OPTICAL AIM HEADLIGHTING SYSTEMS

UPPER BEAM

Test Points (degrees)	Candela maximum	Candela minimum
2U-V	--	1,500
1U-3L and 3R	--	5,000
H-V	75,000	40,000
H-3L and 3R	--	15,000
H-6L and 6R	--	5,000
H-9L and 9R	--	3,000
H-12L and 12R	--	1,500
1.5D-V	--	5,000
1.5D-9L and 9R	--	2,000
2.5D-V	--	2,500
2.5D-12L and 12R	--	1,000
4D-V	12,000	--

LOWER BEAM

Test Points (degrees)	Candela maximum	Candela minimum
10U-90U	125	--
4U-8L and 8R	--	64
2U-4L	--	135
1.5U-1R to 3R	--	200
1.5U-1R to R	1,400	--
1U-1.5L to L	700	--
0.5U-1.5L to L	1,000	--
0.5U-1R to 3R	2,700	500
H-4L	--	135
H-8L	--	64
0.6D-1.3R	--	10,000
0.86D-V	--	4,500
0.86D-3.5L	12,000	1800
1.5D-2R	--	15,000
2D-9L and 9R	--	1,250
2D-15L and 15R	--	1,000
4D-4R	12,500	--
4D-20L and 20R	--	300

FIGURE 26

TABLE FOR DETERMINING THE PHOTOMETRIC REQUIREMENTS OF REPLACEABLE BULB HEADLAMP SYSTEMS

	Any dual filament type other than HB2 used alone or with another dual filament type other than HB2, filed in Docket No. 93-11	HB2 or any single filament type used alone or with any other single or dual filament type, filed in Docket No. 93-11
Four-Headlamp Systems	Fig. 27-1 or 27-2 Fig. 15-1 or 15-2	Fig. 15-1 or 15-2
Two-Headlamp Systems	Fig. 27-1 or 27-2 Fig. 17-1 or 17-2	Fig. 17-1 or 17-2

FIGURE 27-1

PHOTOMETRIC TEST POINT VALUES

FOR MECHANICAL AIM HEADLIGHTING SYSTEMS

UPPER BEAM

Test Points (degrees)	Candela maximum	Candela minimum
2U-V	--	1,000
1U-3L and 3R	--	2,000
H-V	75,000	20,000
H-3L and 3R	--	10,000
H-6L and 6R	--	3,250
H-9L and 9R	--	1,500
H-12L and 12R	--	750
1.5D-V	--	5,000
1.5D-9L and 9R	--	1,500
2.5D-V	--	2,500
2.5D-12L and 12R	--	750
4D-V	5,000	--

LOWER BEAM

Test Points (degrees)	Candela maximum	Candela minimum
10U-90U	125	--
4U-8L and 8R	--	64
2U-4L	--	135
1.5U-1R to 3R	--	200
1.5U-1R to R	1,400	--
1U-1.5L to L	700	--
0.5U-1.5L to L	1,000	--
0.5U-1R to 3R	2,700	500
H-4L	--	135
H-8L	--	64
0.5D-1.5L toL	2,500	--
0.5D-1.5R	20,000	8,000
1D-6L	--	750
1.5D-2R	--	15,000
1.5D-9L and 9R	--	750
2D-15L and 15R	--	700
4D-4R	12,500	--

FIGURE 27-2

PHOTOMETRIC TEST POINT VALUES

FOR VISUAL/OPTICAL AIM HEADLIGHTING SYSTEMS

UPPER BEAM

Test Points (degrees)	Candela maximum	Candela minimum
2U-V	--	1,000
1U-3L and 3R	--	2,000
H-V	75,000	20,000
H-3L and 3R	--	10,000
H-6L and 6R	--	3,250
H-9L and 9R	--	1,500
H-12L and 12R	--	750
1.5D-V	--	5,000
1.5D-9L and 9R	--	1,500
2.5D-V	--	2,500
2.5D-12L and 12R	--	750
4D-V	5,000	--

LOWER BEAM

Test Points (degrees)	Candela maximum	Candela minimum
10U-90U	125	--
4U-8L and 8R	--	64
2U-4L	--	135
1.5U-1R to 3R	--	200
1.5U-1R to R	1,400	--
1U-1.5L to L	700	--
0.5U-1.5L to L	1,000	--
0.5U-1R to 3R	2,700	500
H-4L	--	135
H-8L	--	64
0.6D-1.3R	--	10,000
0.86D-V	--	4,500
0.86D-3.5L	12,000	1,800
1.5D-2R	--	15,000
2D-9L and 9R	--	1,250
2D-15L and 15R	--	1,000
4D-4R	12,500	--
4D-20L and 20R	--	300

FIGURE 28-1

PHOTOMETRIC TEST POINT VALUES

FOR MECHANICAL AIM HEADLIGHTING SYSTEMS

UPPER BEAM

Headlamp Type	1A1, 1C1, and	1G1	2A1, 2C1, and	2G1
Test Points (degrees)	Candela maximum	Candela minimum	Candela maximum	Candela minimum
2U-V	--	750	--	750
1U-3L and 3R	--	3,000	--	2,000
H-V	60,000	18,000	15,000	7,000
H-3L and 3R	--	12,000	--	3,000
H-6L and 6R	--	3,000	--	2,000
H-9L and 9R	--	2,000	--	1,000
H-12L and 12R	--	750	--	750
1.5D-V	--	3,000	--	2,000
1.5D-9L and 9R	--	1,250	--	750
2.5D-V	--	1,500	--	1,000
2.5D-12L and 12R	--	600	--	400
4D-V	5,000	--	2,500	--

LOWER BEAM

Headlamp Type	2A1, 2C1, and 2G1	
Test Points (degrees)	Candela maximum	Candela minimum
10U-90U	125	--
4U-8L and 8R	--	64
2U-4L	--	135
1.5U-1R to 3R	--	200
1.5U-1R to R	1,400	--
1U-1.5L to L	700	--
0.5U-1.5L to L	1,000	--
0.5U-1R to 3R	2,700	500
H-4L	--	135
H-8L	--	64
0.5D-1.5L to L	2,500	--
0.5D-1.5R	20,000	8,000
1D-6L	--	750
1.5D-2R	--	15,000
1.5D-9L and 9R	--	750
2D-15L and 15R	--	700
4D-4R	12,500	--

FIGURE 28-2

PHOTOMETRIC TEST POINT VALUES

FOR VISUAL/OPTICAL AIM HEADLIGHTING SYSTEMS

UPPER BEAM

Headlamp Type	1A1, 1C1, and	1G1	2A1, 2C1, and	2G1
Test Points (degrees)	Candela maximum	Candela minimum	Candela maximum	Candela minimum
2U-V	–	750	–	750
1U-3L and 3R	–	3,000	–	2,000
H-V	60,000	18,000	15,000	7,000
H-3L and 3R	–	12,000	–	3,000
H-6L and 6R	–	3,000	–	2,000
H-9L and 9R	–	2,000	–	1,000
H-12L and 12R	–	750	–	750
1.5D-V	–	3,000	–	2,000
1.5D-9L and 9R	–	1,250	–	750
2.5D-V	–	1,500	–	1,000
2.5D-12L and 12R	–	600	–	400
4D-V	5,000	–	2,500	–

LOWER BEAM

Headlamp Type	2A1, 2C1, and	2G1
Test Points (degrees)	Candela maximum	Candela minimum
10U-90U	125	–
4U-8L and 8R	–	64
2U-4L	–	135
1.5U-1R to 3R	–	200
1.5U-1R to R	1,400	–
1U-1.5L to L	700	–
0.5U-1.5L to L	1,000	–
0.5U-1R to 3R	2,700	500
H-4L	–	135
H-8L	–	64
0.6D-1.3R	–	10,000
0.86D-V	–	4,500
0.86D-3.5L	12,000	1,800
1.5D-2R	–	15,000
2D-9L and 9R	–	1250
2D-15L and 15R	–	1000
4D-4R	12,500	–
4D-20L and 20R	–	300

Issued on March 4, 1997.

Ricardo Martinez,

Administrator.

[FR Doc. 97–5723 Filed 3–7–97; 8:45 am]

BILLING CODE 4910–59–C

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN 1018–AC85

Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for the Cactus Ferruginous Pygmy-Owl in Arizona

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: The Fish and Wildlife Service (Service) determines endangered status for the cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*) in Arizona, pursuant to the Endangered Species Act of 1973, as amended (Act). The Service also determines that the cactus ferruginous pygmy-owl population in Texas does not warrant listing as a threatened species and is not finalizing that portion of the proposal. The Service originally proposed to list the cactus ferruginous pygmy-owl as endangered in Arizona with critical habitat, and threatened in Texas without critical habitat.

New information was received during comment periods indicating that population levels are higher in Arizona and Texas than was known at the time of the proposed rule. This information has been considered in making this final determination. However, the Service still determines that the Arizona population warrants endangered status. Conversely, the new information indicates that listing the species as threatened in Texas is not warranted. This rule implements the Federal protection and recovery provisions afforded by the Act for the Arizona population of this subspecies.

EFFECTIVE DATE: April 9, 1997.

ADDRESSES: The complete file for this rule is available for public inspection, by appointment, during normal business hours at the U.S. Fish and Wildlife Service, Arizona Ecological Services Field Office, 2321 West Royal Palm Road, Suite 103, Phoenix, Arizona, 85021–4951.

FOR FURTHER INFORMATION CONTACT: For Arizona, Mary E. Richardson, Arizona Ecological Services Field Office (see **ADDRESSES** section) (telephone 602/640–2720; facsimile 602/640–2730). For Texas, William Seawell, U.S. Fish and Wildlife Service, (telephone 512/994–9005; facsimile 512/994–8262).

SUPPLEMENTARY INFORMATION:

Background

The cactus ferruginous pygmy-owl (Order Strigiformes—Family Strigidae) is a small bird, approximately 17 centimeters (cm) (6¾ inches (in)) long. Males average 62 grams (g) (2.2 ounces (oz)), and females average 75 g (2.6 oz). The cactus ferruginous pygmy-owl is reddish-brown overall, with a cream-colored belly streaked with reddish-brown. Some individuals are grayish, rather than reddish-brown. The crown is lightly streaked, and paired black-and-white spots on the nape suggest eyes. There are no ear tufts, and the eyes are yellow. The tail is relatively long for an owl and is colored reddish-brown with darker brown bars. The call of this diurnal owl, heard primarily near dawn and dusk, is a monotonous series of short notes.

The cactus ferruginous pygmy-owl is one of four subspecies of the ferruginous pygmy-owl. It occurs from lowland central Arizona south through western Mexico, to the States of Colima and Michoacan, and from southern Texas south through the Mexican States of Tamaulipas and Nuevo Leon. South of these regions and through Central America, *G. b. ridgwayi* replaces *G. b. cactorum*.

Throughout South America, *G. b. brasilianum* is the resident subspecies (Fisher 1893, van Rossem 1937, Friedmann *et al.* 1950, Schaldach 1963, Phillips *et al.* 1964, de Schauensee 1966, Karalus and Eckert 1974, Oberholser 1974, Johnsgard 1988). Additionally, Konig and Wink (1995) have identified a fourth subspecies of pygmy-owl from central Argentina (*G.b. stranecki*).

The cactus ferruginous pygmy-owl (hereafter ''pygmy-owl'' unless otherwise noted) was described by van Rossem (1937), based on specimens from Arizona and Sonora. It is distinguished from *G. b. ridgwayi* and *G. b. brasilianum* by its shorter wings and longer tail, and by generally lighter coloration (van Rossem 1937, Phillips *et al.* 1964). *G. b. cactorum* occurs in several color phases, with distinct differences between regional populations (Sprunt 1955, Burton 1973, Tyler and Phillips 1978, Hilty and Brown 1986, Johnsgard 1988). Some investigators (e.g., van Rossem 1937, Tewes 1993) have suggested that further taxonomic investigation may be needed, however, *G. b. cactorum* is widely recognized as a valid subspecies (e.g., Friedmann *et al.* 1950, Blake 1953, Sprunt 1955, Phillips *et al.* 1964, Monson and Phillips 1981, Millsap and Johnson 1988, Binford 1989). The American Ornithologists' Union (AOU) recognized *G. b. cactorum* in its 1957 Checklist of North American Birds (AOU 1957), but subsequent lists did not include subspecies (AOU 1983). Based on these authorities, the Service accepted *G. b. cactorum* as a subspecies in 1991 (56 FR 58804), and again in 1993 (58 FR 13045). The Service accepts that there is only one subspecies (*G. b. cactorum*) of cactus ferruginous pygmy-owl in Arizona.

The pygmy-owl nests in a cavity in a tree or large columnar cactus. Cavities may be naturally formed (e.g., knotholes) or excavated by woodpeckers. No nest lining material is used. The pygmy-owl also has nested in fabricated nest boxes (Proudfoot *et al.* 1994a, Proudfoot 1996). Three, four, five, and occasionally six eggs are laid (Bent 1938, Heintzelman 1979, Glenn Proudfoot, Texas A&M University at Caesar Kleberg Wildlife Research Institute, unpubl. data 1996) and incubated for approximately 28 days. The young fledge about 28 days after hatching. The pygmy-owl begins nesting activities in late winter to early spring. It is nonmigratory throughout its range (Bendire 1888, Griscom and Crosby 1926, Oberholser 1974, Johnson et al. 1979). The pygmy-owl's diverse diet includes birds, lizards, insects, small mammals (Bendire 1888, Sutton 1951, Sprunt 1955, Earhart and Johnson 1970, Oberholser 1974), and frogs (Proudfoot *et al.* 1994b).

The pygmy-owl occurs in a variety of subtropical, scrub, and woodland communities, including riverbottom woodlands, woody thickets (''bosques''), coastal plain oak associations, thornscrub, and desertscrub. Unifying habitat characteristics among these communities are fairly dense woody thickets or woodlands, with trees and/or cacti large enough to provide nesting cavities. Throughout its range, the pygmy-owl occurs at low elevations, generally below 1,200 meters (m) (4,000 feet (ft)) (Swarth 1914, Karalus and Eckert 1974, Monson and Phillips 1981, Johnsgard 1988, Enriquez-Rocha *et al.* 1993).

In southern Texas, the pygmy-owl's habitat includes coastal plain oak associations as well as the Tamaulipan thornscrub of the lower Rio Grande Valley region, which consists of mesquite (*Prosopis glandulosa*), hackberry (*Celtis* spp.), oak (*Quercus* spp.), and Texas ebony (*Pithecellobium ebano*) (Griscom and Crosby 1926, Bent