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16. Abstract <p>This analytical study compared the median beam pattern of a sample of 19 HID low beams manufactured for the 2000 model year vehicles sold in the U.S. with a market-weighted median beam pattern of tungsten-halogen lamps for the same model year vehicles.</p> <p>The results indicate that the HID low beams provided a wider beam pattern, more foreground illumination, and more illumination at relatively large up angles. On the other hand, the HID lamps provided less light in the central part of the beam pattern near the horizontal.</p> <p>Functional analyses examined the effects of the different light distributions on the visibility of pedestrians and road delineation, glare towards oncoming drivers, and visibility of retroreflective traffic signs. Both straight roads and curves were considered.</p> <p>On both left and right curves, the wider beam pattern of the HID lamps delivered more light for the visibility of pedestrians and road delineation. On right curves, there was an increase in glare illumination towards oncoming drivers, while on left curves there was a decrease in glare illumination. On straight roads, the HID lamps produced more illumination for pedestrians and road delineation on the left side of the road, while producing less glare. However, the HID lamps provided less illumination for pedestrians and road delineation on the right side of straight roads. The results for the traffic signs varied with the location of the sign.</p> <p>It is recommended that future HID low beams provide more illumination in the area just to the right of the vertical and just below the horizontal.</p>					
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