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7. Author(s) Carol A.C. Flannagan and Michael J. Flannagan				8. Performing Organization Report No. UMTRI-98-45	
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16. Abstract Although the question of how large a driver's outside rearview mirror must be in order to see a specified target has been addressed in other publications, the related problem of required adjustment range has not. In this paper, we present a series of equations that predict, for a given vehicle, the size and location of the mirror adjustment range needed in order to accommodate some percentage of the driver population (e.g., 96%). To complete the calculations for 96% accommodations, eye locations in the vehicle are represented by the 99% SAE J941 eyellipse. Because the transformation from eye location to target location in the mirror will not preserve the tangent properties of the eyellipse, we propose a method in which the side and plan views of the eyellipse are treated separately. Eye location in plan view affects only horizontal adjustment of the mirror, and eye location in side view affects only vertical adjustment of the mirror. In each view, there are two points that lie on lines that are tangent to the eyellipse and pass through the mirror center. These two points are used to represent two extremes of mirror adjustment. Thus, we exclude the 2% of driver eye locations that lie outside either of the tangent lines (no cases lie outside both, so each tangent excludes 1%). In plan view, eye locations must first be adjusted for head turn. We also present equations to calculate mirror adjustment, referenced to an arbitrary line, for each of the four tangent points, given a specified target. We discuss various choices of target location and type, including centered point targets, centered extended targets, and targets that are located at the edge of the field of view. For the latter target type, the calculation of head turn is somewhat different than for centered targets, but the rest of the calculations are the same. The end result of these equations is a rectangle in two-dimensional mirror-adjustment space such that 96% of drivers can find a suitable mirror position within those bounds. An example is carried out using dimensions from a specific vehicle and a target located at the inner edge of the field of view, in order to illustrate the procedure.					
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