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ISSN 0148-7191

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1. ABSTRACT

With the increased use of wraparound lamps in automotive design, the problem of how to illuminate the lateral section which is blocked from the light source by the chassis has become a point of concern. This report describes the development of an optical system which makes use of a photoconductive panel in order to resolve this problem.

INTRODUCTION

Automobile signalling lamps play an important role in ensuring safety during night driving by indicating one's presence and intentions to not only oncoming and following vehicles, but also to adjacent vehicles and pedestrians. Recent automotive design has favored curved, uniform lines to permit increased streamlining. These designs preclude the protruding lamp

systems which formerly served the purpose of lateral signalling. Instead, wraparound units, particularly for the rear combination and front turn signal lamps, have become the norm (fig. 1).

The demands for increased trunk space and engine room have also had a significant effect on today's lamps, and current specifications require ultra-slim, space-saving designs. However, as lamps have become ever slimmer and the wraparound portion more pronounced, the range of direct illumination from the light source has become reduced. In particular, the lateral wraparound portion of lamps has remained largely unilluminated up to now. Consequently this portion fails to serve its function as a lateral indicator, and the overall appearance of the lamp also suffers (figs. 2 & 3).

The goal of our research was to overcome these drawbacks of wraparound lamp designs, and to provide overall illumination.

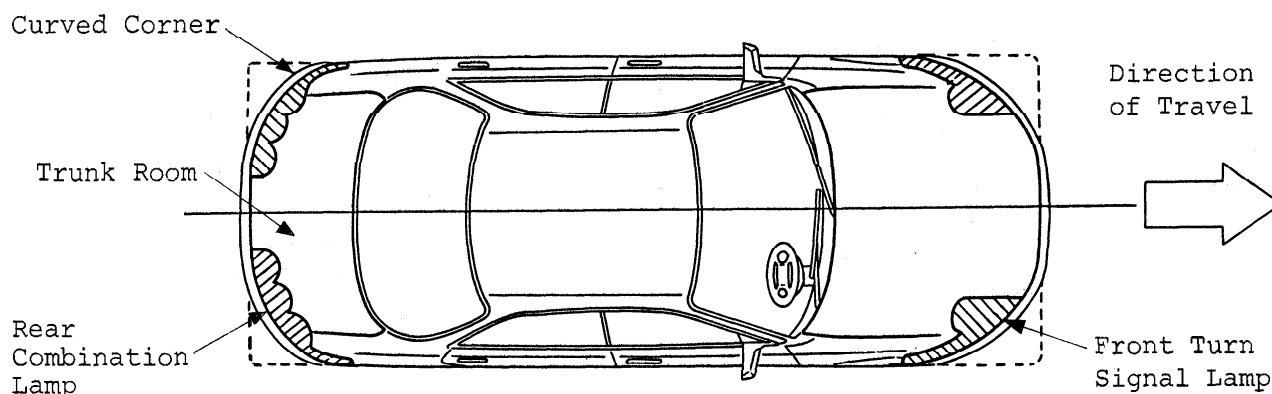


Fig.1 Trends in Recent Auto Designs

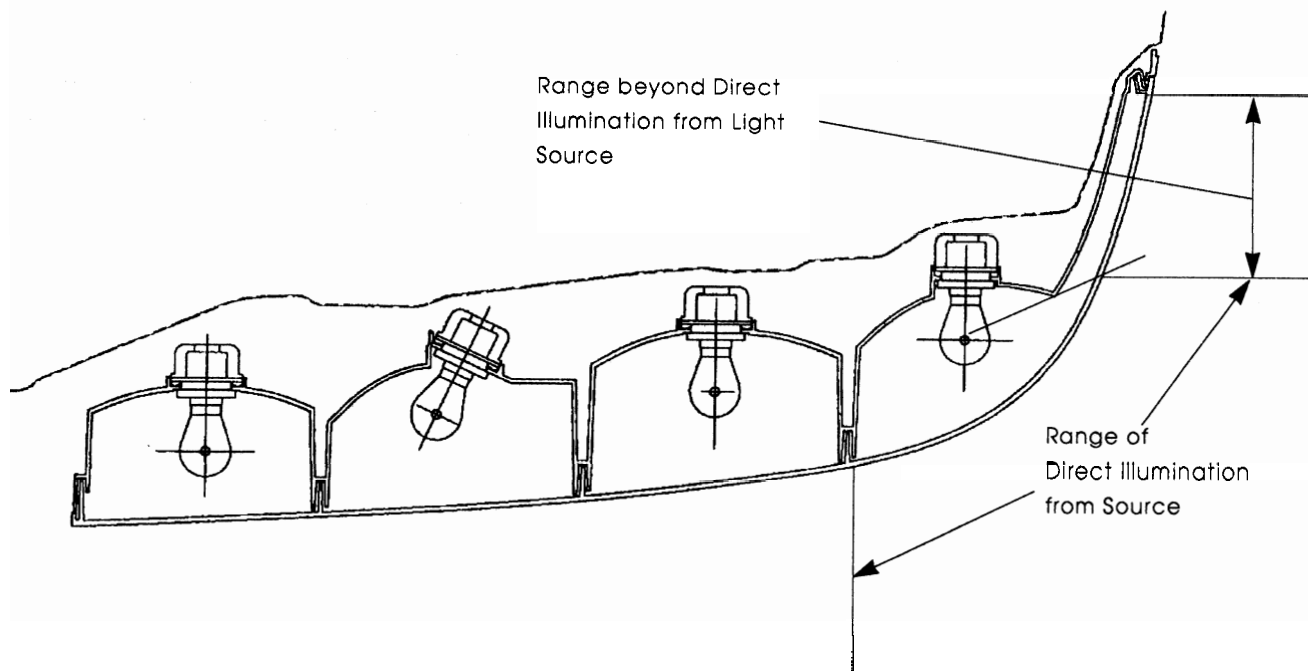


Fig.2 A Typical Large Size Wraparound Rear Combination Lamp

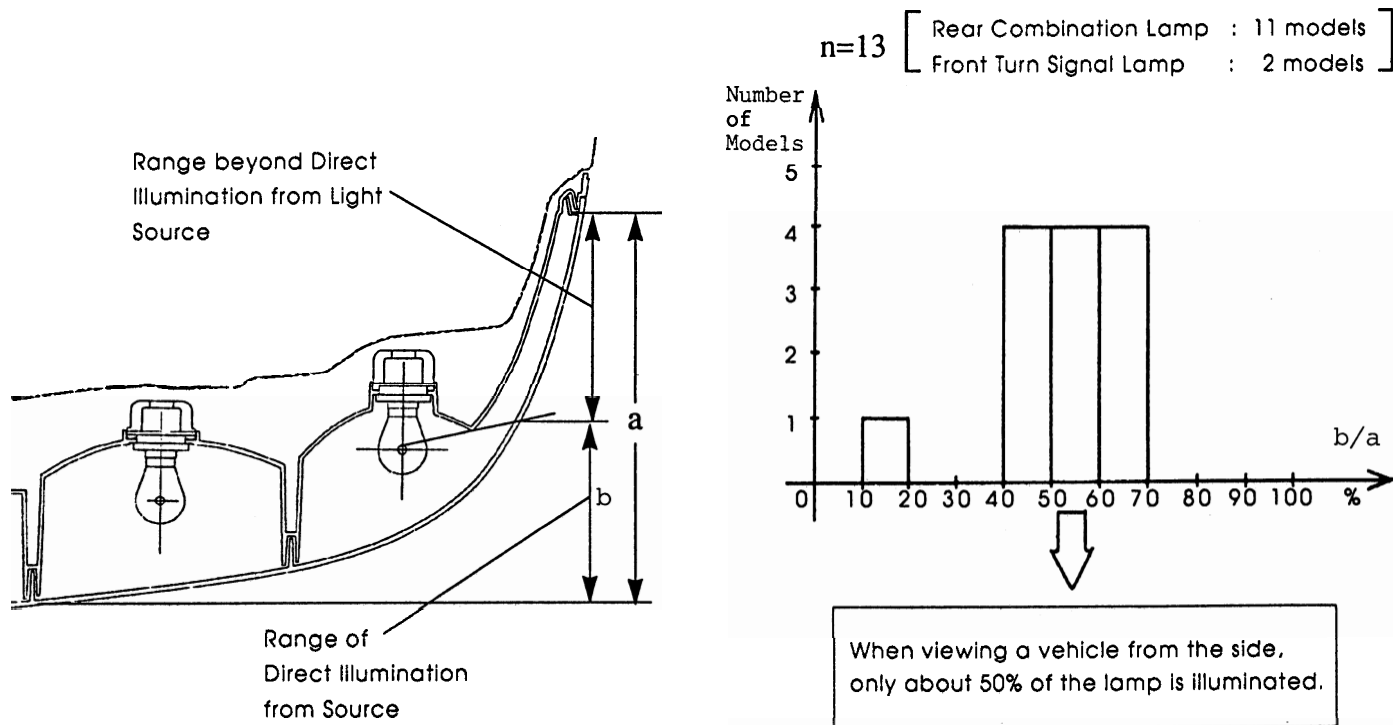


Fig.3 Percentage of Illumination of Lateral Portion of Wraparound Lamps

3. CHOOSING A SOLUTION

In the first step of our research, various possible methods of illuminating the lateral wraparound portion were examined and evaluated by their comparative merits.

Considering the relative merits of each of these five methods, it was clear that the photoconductive panel with conical dots held the greatest promise, and from this point we began working on the development of such a system.

NO.	METHOD	ABILITY TO ILLUMINATE	DEPTH OF LAMP BODY	COST	GENERAL EVAL.
1	<u>Photoconductive Panel with Conical Dot Reflectors.</u> A light-conducting acrylic panel is used to bend light from the light source to the wraparound portion (fig.4).	⊙	○	⊙	⊙
2	<u>Multiple Miniature Bulbs.</u> An array of miniature white bulbs are distributed within the wraparound portion to provide illumination(fig.5).	△	△	△	△
3	<u>LED.</u> LED's are distributed within the wraparound portion to provide illumination(fig.6).	△	○	△	△
4	<u>Electro Luminescence (EL).</u> An EL system is installed within the lateral wraparound portion(fig.7).	△	⊙	×	×
5	<u>Fiber Optics.</u> Light is conducted from the light source to the wrap-around portion through the use of a network of optical fibers(fig.8).	△	△	×	×

⊙ : Excellent

○ : Good

△ : Poor

× : Bad

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