

AEROSPACE RECOMMENDED PRACTICE

Submitted for recognition as an American National Standard

SAE ARP4087

REV.
A

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WING INSPECTION LIGHTS - DESIGN CRITERIA

1. SCOPE:

This SAE Aerospace Recommend Practice (ARP) is intended to cover the external lights on fixed wing aircraft for illuminating the wing leading edge and nacelles and the upper surfaces of the wing.

1.1 Purpose:

The purpose of this document is to set forth basic considerations and criteria which should be observed when designing wing inspection lights for all aircraft.

2. REFERENCES:

FAR PART 121.629 Operation in icing conditions
FAR PART 25.1403 Wing icing detection lights

3. GENERAL PROVISIONS:

3.1 Wing inspection lights are used to illuminate the wing leading edges, nacelles, upper wing surfaces, and any other external surfaces so that they may be visually inspected for ice accumulation or any other critical conditions at night.

3.2 When aircraft geometry permits, over wing inspection lights are recommended to illuminate the upper wing surfaces so that they may be visually inspected for snow/ice accumulation primarily during ground inspection.

3.3 On military aircraft the wing inspection lights may be used to provide visual reference for the boom operator in aerial refueling. In this case, it may be desirable to increase the illuminated areas on the inboard upper surface of the wings.

3.4 The lights shall be designed to provide proper illumination for the crew members, but care shall be taken in the design and installation location so that they will not cause objectionable glare or halation that might handicap crew members in the performance of their duties as required in FAR 121.629.

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3.5 Aircraft geometry shall dictate the size, number, and location of lights required to perform the intended function(s).

4. SPECIFIC DESIGN REQUIREMENTS:

4.1 Lighting Coverage:

4.1.1 The aircraft surfaces that require illumination vary among aircraft designs. The parameters are dictated by aircraft geometry, aircraft mission (commercial or military), and crew member visual accessibility.

4.1.1.1 Aircraft Geometry: For different aircraft configurations, the wing area coverage shall vary. Consideration shall be given to aircraft with supplementary wings, for example, canards, and the necessity for providing illumination on them.

4.1.1.2 Aircraft Mission: For aerial refueling, the wing inspection lights may provide significant additional reference information for the boom operator. In order to maximize this, additional factors shall be considered:

- a. Shield light sources from the direct vision of the boom operator.
- b. Provide continuous intensity control.

4.2 Illumination:

4.2.1 The recommended minimum level for wing leading edge illumination is 21.5 lux (2.0 ft-c) measured normal to the incident light. See Figure 1.

4.2.2 The recommended minimum illumination level for nacelles is 5.3 lux (0.5 ft-c). See Figure 1.

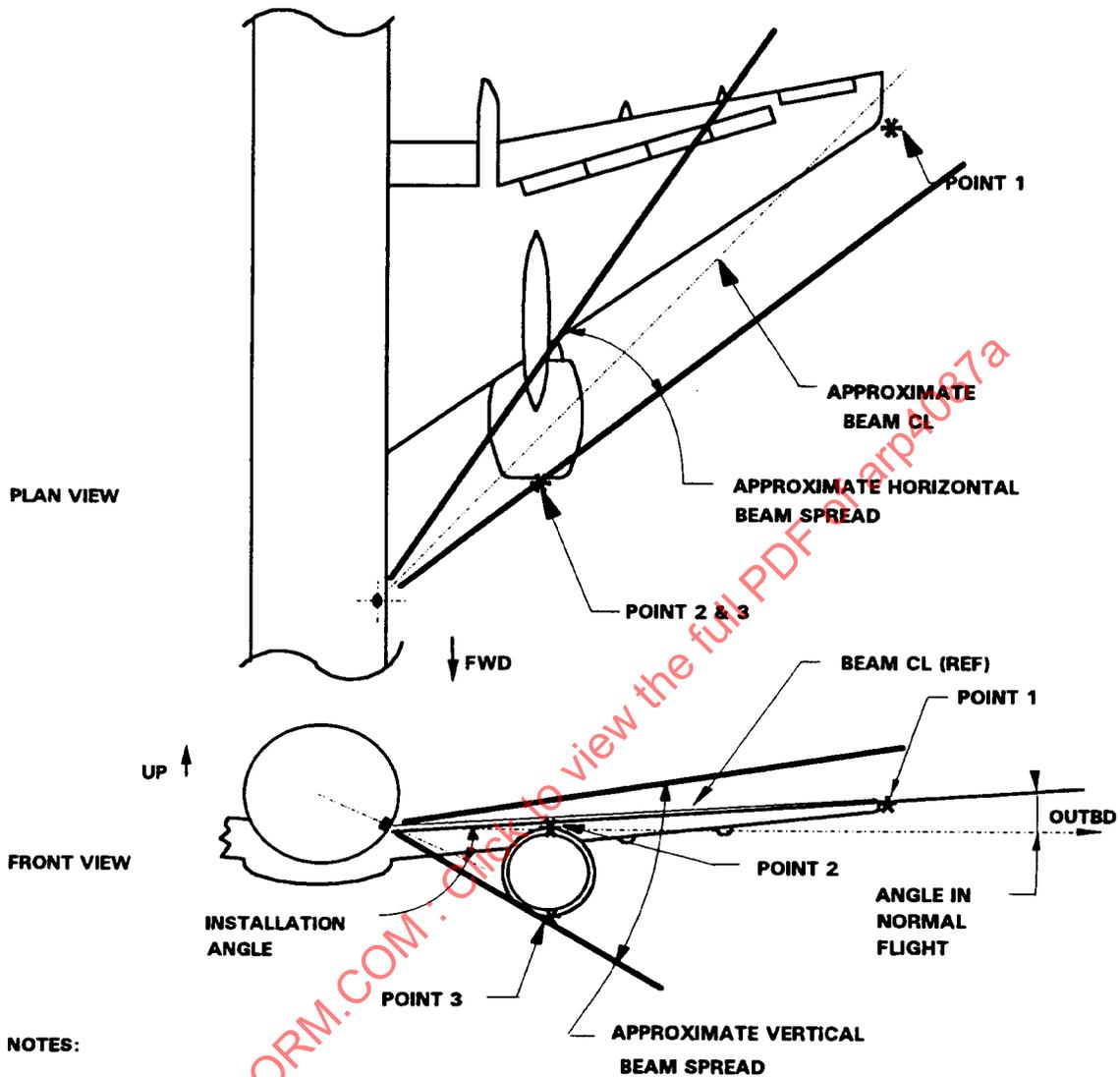
4.2.3 The recommended minimum level for wing upper surface illumination is 107.5 lux (10.0 ft-c) measured normal to the incident light. See Figure 2.

4.2.4 The light beam shall be shaped and directed to provide uniform illumination of the wing surfaces.

4.3 Color:

The color of light as produced by the lamps should not be modified.

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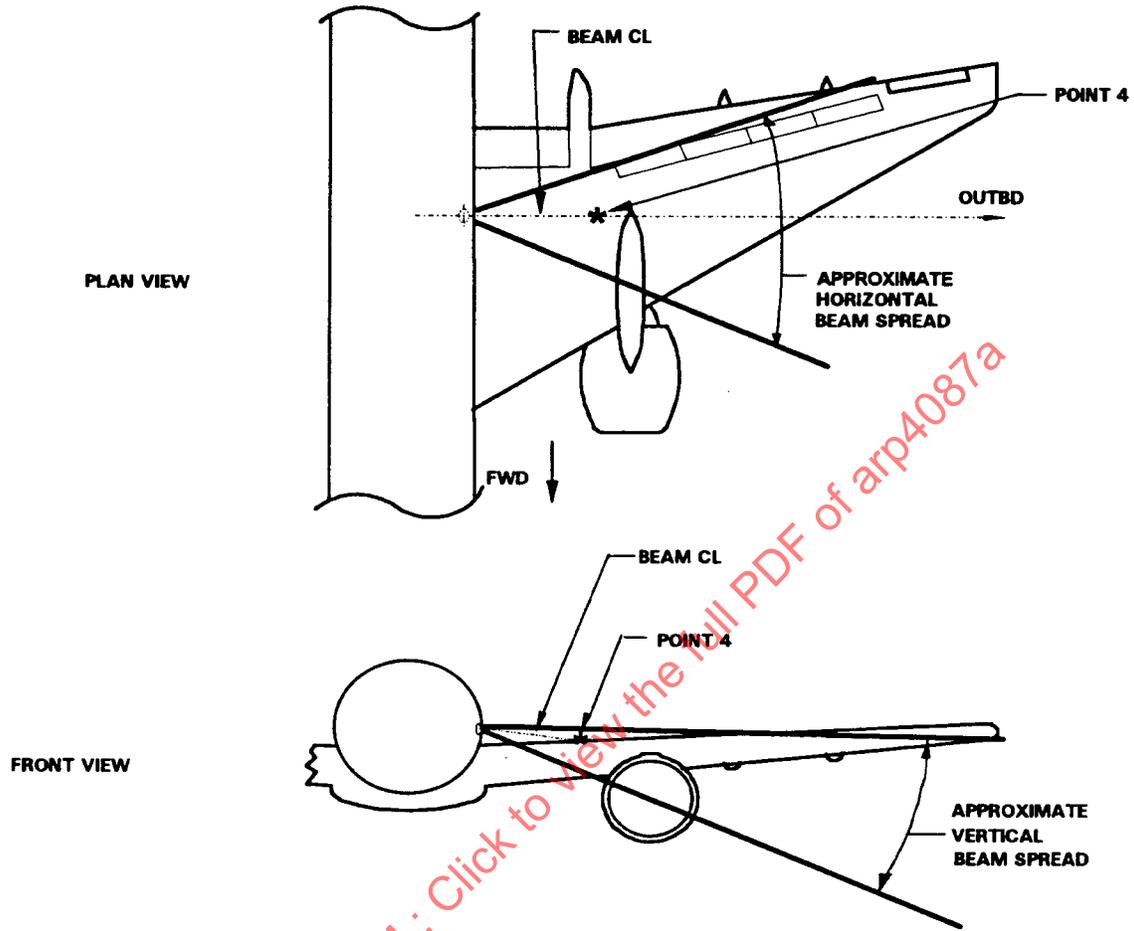
NOTES:

WITH FULL RATED VOLTAGE APPLIED TO THE LAMP
ILLUMINATION LEVEL MEASURED NORMAL TO THE
LIGHT SOURCE SHALL BE AS FOLLOWS:

- POINTS 1 = 21.5 LUX (2.0 FT-C) MINIMUM
- POINTS 2 & 3 = 5.3 LUX (0.5 FT-C) MINIMUM

FIGURE 1 - Wing Illumination Pattern Wing Leading Edge

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NOTES:

**WITH FULL RATED VOLTAGE APPLIED TO THE LAMP
THE ILLUMINATION LEVEL MEASURED NORMAL TO
THE LIGHT SOURCE SHALL BE AS FOLLOWS:**

POINT 4 = 107.5 LUX (10.0 FT-C) MINIMUM

FIGURE 2 - Wing Illumination Pattern Wing Upper Surface