

MIL-L-5667B (USAF)
 4 February 1964
 Superseding
 MIL-L-5667A (ASG)
 16 January 1953

MILITARY SPECIFICATION

LIGHTING EQUIPMENT, AIRCRAFT INSTRUMENT PANEL, GENERAL SPECIFICATION FOR INSTALLATION OF

1. SCOPE

1.1 This specification covers the general requirements for the installation of aircraft instrument panel lighting equipment.

2. APPLICABLE DOCUMENTS

2.1 The following documents, of the issue in effect on date of invitation for bids or request for approval, form a part of this specification to the extent specified herein:

SPECIFICATIONS

Military

MIL-L-5057	Light, Panel, Aircraft, Individual Instrument
MIL-B-5087	Bonding, Electrical (For Aircraft)
MIL-W-5088	Wiring, Aircraft, Installation Of
MIL-E-7080	Electric Equipment, Aircraft, Selection and Installation Of
MIL-C-25050	Colors, Aeronautical Lights and Lighting Equipment, General Requirements For
MIL-L-25467	Lighting, Integral, Aircraft Instrument, General Specification For
MIL-L-27160	Lighting, Instrument, Integral, White General Specification For

STANDARDS

Military

MIL-STD-143	Specifications and Standards, Order of Precedence for the Selection of
MS9006	Recesses - Cross, Low Torque Drive, Dimensions and Gage Dimensions for
MS25027	Light Assembly, Cockpit, Fixed

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(Copies of documents required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

3. REQUIREMENTS

3.1 MATERIALS.- Materials used in the installation of instrument panel lighting equipment shall be such as to withstand the service, functional, and environmental conditions specified by the applicable instrument specification.

3.2 SELECTION OF SPECIFICATIONS AND STANDARDS.- Specifications and standards for necessary commodities and services not specified herein shall be selected in accordance with MIL-STD-143.

3.3 DESIGN AND CONSTRUCTION

3.3.1 Instrument lighting installations shall be in accordance with MIL-B-5087, MIL-W-5088, and MIL-E-7080.

3.3.2 All items of lighting equipment specified for installation shall conform to their respective drawings or specifications, or both, and shall be installed without modification, except for electrical leads. The required types and quantity of aircraft lighting equipment shall be listed in the aircraft model specification.

3.3.3 SELECTION OF INSTRUMENT LIGHTS.- When so specified by the procuring activity, as soon as possible after each instrument panel design or design change has been determined, the contractor shall furnish to the procuring activity one sample of each instrument panel or the instrument panel drawings involved, or both. These panels and drawings are for use by the procuring activity for lighting studies prior to making recommendations relative to the types of lights to be used. The drawings shall show the layout of each instrument panel and the relative position of the crew member's normal eye level with respect to the instrument panel under his observation.

3.3.3.1 MOCKUP.- In order to predetermine the adequacy of the instrument lighting system for each new model aircraft, or modification thereof, which would affect the design of the instrument panel layout or of the lighting system, a complete mockup of the instrument lighting system involved shall be prepared by the aircraft contractor for inspection and approval by the procuring activity.

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3.3.3.1.1 **EQUIPMENT.**- Insofar as practicable, the mockup shall include such actual lighting equipment and instruments for models of instruments to be illuminated as to afford a reasonable indication of the effectiveness of the lighting involved. Cardboard templates of instrument dials will not be satisfactory. The location of floodlighting fixtures shall be given careful consideration in order to provide satisfactory even illumination, prevent undesirable reflections in the windshields, instrument faces, and other cockpit enclosures, and prevent glare from a direct or reflected view of the lamps and cover glasses or lenses. If instrument are not sufficiently recessed under the fuselage cowling to prevent reflection of the instruments in the windshields, windows, or other highly reflective enclosures, a suitable light shield or visor shall be provided around the panel to prevent these reflections.

3.3.4 **COLOR.**- All red lighting on externally lighted instruments shall conform to identification red as described in MIL-C-25050, except that the minimum transmission of the filters shall be 0.07 when tested with a light source having a color temperature of 2,355° K. The color of white and red lighted integral instrument lighting shall be in accordance with MIL-L-27160 and MIL-L-25467, respectively.

3.3.5 **GLARE.**- The location of lights shall be given careful consideration in order to provide satisfactory illumination, prevent undesirable reflections in windshields, canopies, and other enclosures, and prevent glare from a direct or reflected view of lamps, lenses, or surfaces.

3.3.6 **FLIGHT COMPARTMENT INSTRUMENT PANELS.**- The instruments in the flight compartment shall be provided with a primary and a secondary lighting system.

3.3.6.1 PRIMARY LIGHTING SYSTEM

3.3.6.1.1 **FLANGE- OR CLAMP-MOUNTED INSTRUMENTS.**- The primary instrument lighting system for flange- or clamp-mounted instruments shall be either white or red integral lighting as specified in MIL-L-27160 or MIL-L-25467. If post lighting is used, it shall conform to MIL-L-5057. The procuring activity shall determine the type and color of lighting to be used.

3.3.6.1.1.1 **MOUNTING SCREWS.**- The mounting screws shall have cross-recessed heads in accordance with MS9006.

3.3.6.1.2 **INSTALLATION.**- The instrument light shall be mounted on or adjacent to the individual instrument, according to the location for which the light is designed. The following provisions shall be made on the initial installation to permit simplified maintenance methods.

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a. For flange-mounted instruments, a 1/4-inch hole shall be drilled through the instrument panel or a suitable slot on the periphery of the instrument hole shall be provided for the electrical lead of each light. These holes or slots shall be located in an appropriate place adjacent to the instrument involved.

b. Extra slack in the electrical lead of each instrument light shall be provided so that between 3-1/2 to 4 inches of the lead can be readily pulled through the instrument panel upon removal of the light from the instrument or panel.

c. After installation of the light, the contact assemblies shall be checked for proper operation and adjusted if necessary.

The above is applicable to external post lighting fixtures but not applicable to integral-lighted instruments which simply receive their electrical power through the electrical connector in the back of the instrument.

3.3.6.2 SECONDARY LIGHTING SYSTEM.- The secondary lighting system shall be either white or red floodlighting provided by lights designed in accordance with MS25027 or other lights approved by the procuring activity.

3.3.6.2.1 INSTALLATION.- Sufficient lights shall be employed to provide adequate illumination subject to the mockup approval. Where practicable, these lights shall be installed under the glare shield of the instrument panel, as far away from the instrument panel as practicable.

3.3.6.3 THUNDERSTORM LIGHTS.- When specified by the procuring activity, cockpits shall be equipped with white thunderstorm lights, so located as to provide an intensity of at least 100 foot-candles on the instrument panel. The thunderstorm lights shall flood the instrument panel, controls, and floor of the cockpit. The type of light used shall be as specified by the procuring activity. When integral instrument lighting is specified, a control, preferably a variable transformer or a rheostat, shall be used to maintain a range of 0 to 5V to the instrument panel. All lamps shall be connected in parallel and to the common supply so that only one dimming control will be required for primary lighting.

3.3.7 NONFLIGHT COMPARTMENT INSTRUMENT PANELS.- In compartments where dark adaptation is not required, or from which stray white light will not affect personnel requiring dark adaptation, instrument lighting shall be provided by a white floodlighting system and by either red floodlighting or individual instrument lights installed as specified above. Separate dimming controls shall be provided for each lighting system at each crew station. Red floodlighting shall be provided by lights in accordance with MS25027, or other lights approved by the procuring activity.

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3.3.8 INSTRUMENT INSTALLATION.- Instrument dial markings shall be visible to the operator from the normal eye position. Where the instrument primary lighting system is installed and the dial markings are obscured due to instrument position, the panel may be tilted, bent, or arranged in step installations. These variations from normal instrument installation shall be approved by the procuring activity.

3.4 INTENSITY CONTROLS.- Controls for intensity of instrument lighting shall be in accordance with the applicable lighting specification.

4. QUALITY ASSURANCE PROVISIONS

4.1 RESPONSIBILITY FOR INSPECTION.- Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.2 EXAMINATION OF PRODUCT.- Each instrument lighting installation shall be carefully examined to determine compliance with the requirements specified herein.

5. NOTES

5.1 SPACE REQUIREMENTS.- The space requirements of the light employed with clamp-mounted instruments are approximately 3/8-inch diameter by 11/16 inch in front of the panel and 9/16 inch behind the panel. One mounting hole within the tolerance of 0.250 to 0.255 inch in diameter is required. No additional hole is required for the electrical lead.

5.2 INTERNATIONAL STANDARDIZATION.- Certain provisions, paragraph 3.3.6.2, of this specification are the subject of international standardization agreement ABC AIR STD 10/19. When amendment, revision, or cancellation of this specification is proposed, the departmental custodians will inform their respective Departmental Standardization Offices so that appropriate action may be taken respecting the international agreement concerned.

International Interest (see section 5).

PAS/blh
SEMS

SPECIFICATION ANALYSIS SHEET

Form Approved
Budget Bureau No. 119-R004INSTRUCTIONS

This sheet is to be filled out by personnel either Government or contractor, involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity (as indicated on reverse hereof).

SPECIFICATION

ORGANIZATION (Of submitter)

CITY AND STATE

CONTRACT NO.

QUANTITY OF ITEMS PROCURED

DOLLAR AMOUNT

\$

MATERIAL PROCURED UNDER A

 DIRECT GOVERNMENT CONTRACT SUBCONTRACT

HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?

A. GIVE PARAGRAPH NUMBER AND WORDING.

B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES.

COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID

IS THE SPECIFICATION RESTRICTIVE?

 YES NO IF "YES", IN WHAT WAY?

REMARKS (Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity)

PREPARED BY (Printed or typed name and activity)

DATE

FOLD

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