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AEROSPACE STANDARD

AS 486B
Superseding AS 486A
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AIRCRAFT CIRCUIT BREAKER AND FUSE ARRANGEMENT

1. PURPOSE

The purpose of this standard is set forth the desired location, arrangement and general requirements of aircraft circuit breakers and fuses.

2. SCOPE

The recommendations of this standard apply to all civil type multi-engine transport aircraft.

3. DEFINITION

The definitions used herein are made as brief as possible and in familiar cockpit language. They are intended only to identify the devices mentioned rather than to prescribe their application.

3.1 Circuit Breakers: A circuit breaker is a resettable circuit-protective device. Circuit breakers can be divided by function into two classes:

3.1.1 Control Circuit Breakers: A control circuit breaker is one whose function is to protect the wiring used to operate control devices, such as relays.

3.1.2 Power Circuit Breakers: A power circuit breaker, as distinguished from a control circuit breaker, is one whose function is to protect the wiring carrying the power to using equipment.

Ø 3.1.3 Remote Circuit Breakers: A remote circuit breaker is one which is not accessible to the crew during flight.

3.2 Fuses: A fuse is a replaceable circuit protecting device depending on the melting of a conductor for circuit interruption.

3.3 Limiters: The term "limiter" is applied to certain types of fuses having higher melting points and longer inverse-time characteristics than the more common types of fuses.

4. LOCATION

4.1 Circuit breakers and fuses in electric systems essential to flight, navigation, communication, emergency systems, and in those circuits that require load monitoring, shall be selected, located, and installed so that open circuit breakers and open fuses will be readily discernible to a crew member. Supplemental indicating devices may be used. Accessiblity for opening and resetting of circuit breakers and fuse replacement shall be possible from crew operating position.

4.2 Circuit breakers and fuses of systems not essential in the operation of the aircraft may be located anywhere in the habitable portion of the aircraft provided that they can be readily inspected for open condition and are accessible for resetting or replacement in flight. Protective covers and placards discouraging unnecessary opening and closings of the circuits are desirable (examples: passenger reading lights, beverage heating, electric-shaver inverter). (Circuit breakers and fuses in systems not usable while the airplane is in self-powered operation need not comply.)

4.3 If remote circuit breakers are used as power circuit breakers to minimize runs of large wire and extended bus distribution systems, such circuit breakers shall include a reset control and indicating device located to conform to the requirements specified in 4.1 or 4.2, as applicable. Reset controls may be electrically operated, except in the case where tripping of the circuit breaker might leave the reset control without current supply (example: generator circuit breakers).

4.4 Limiters may be remotely located, provided that the limiter can be checked by noting the functioning of some usually operating device or equipment. In the event that only non-operating standby equipment (such as a spare inverter) is supplied through the limiter, a failure-indicating device shall be located to conform to the requirements specified in 4.1.

5. ORIENTATION

Ø 5.1 Circuit breakers, fuses and remote circuit breaker indicators and controls, shall be oriented from left to right, relative to the crew member when facing the circuit breaker, fuse or control panel, as numbers 1, 2, 3, 4 ... (Ref. ARP 268)

6. ACTUATION

Actuation of circuit breakers of the switch type shall be in conformity with the provisions in the latest issue of ARP 268, for actuation on controls ("forward", "upward", and "clockwise" designate "on"; "aft", "downward", and "counterclockwise" designate "off").

Actuation of circuit breaker of the "push-pull" type be "push-for-on" and "pull-for-off".

7. ARRANGEMENT

7.1 An area, or areas, consisting of one or more panels, shall be provided for location of circuit breakers and fuses in compliance with Section 4.

7.2 Ø Area Allocation: The area designated for circuit breakers and fuses, where practical, should be grouped by system sets; subsets of which should be in AC and DC groupings. Physical separation of groupings within a given system which may be required by bus isolation considerations should be minimized with respect to distance.

7.3 Ø Within the set and subset groupings (7.2), emergency and high priority circuit breakers and fuses shall be placed in the most conspicuous and accessible positions.

7.4 Ø Circuit Breaker Panels: Circuit breaker panels shall incorporate a grid system of marking to identify the physical location of each circuit breaker on a given panel. Horizontal rows are to be lettered A, B, C . . . from bottom to top. Vertical rows are to be numbered 1, 2, 3 . . . from left to right, see Figure 1.

8. GENERAL

8.1 Suitable lighting shall be provided for circuit breaker and fuse panels.

8.2 Marking: All marking, including abbreviations, used on the electrical devices described herein shall be in conformance with the latest issue of AS 425, Flight Control Compartment Nomenclature and Abbreviations, or MIL-STD-12C as appropriate.

8.3 Identifying placards shall be affixed above each circuit breaker or fuse in accordance with 8.2. Groups, sets, or subsets of related circuit breakers or fuses shall be further identified by a conspicuous white
Ø boundary enclosing each such group, and an appropriate placard - conforming to 8.2 - shall identify each such group. Color coding of the panel background or each such group can provide helpful supplementary identification. The following is suggested:

Engine systems and controls - Purple
Engine instruments - Purple/Black stripes
Fuel - Blue
Flight controls and hydraulics - Gray
Environmental - Green
Flight instruments - Gray/Black stripes
Electrical - Amber
Miscellaneous - Brown

8.4 In the event a circuit breaker or fuse is used for multiple circuits, a placard near the breaker or fuse and readily identified with it, must indicate all circuits affected.

8.5 All circuit breakers (except remote) shall be capable of being tripped and reset manually. A tripped circuit breaker must be unmistakably apparent. All circuit breakers subject to accidental actuation due to their location must be protected against inadvertent tripping.

8.6 Nomenclature published in airframe manufacturers' technical material shall agree with corresponding nomenclature used in the flight deck to identify circuit breakers and fuses.

9. NOTES

9.1 Marginal Indicia: The phi (Ø) symbol is used to indicate technical changes from the previous issue of this document.

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