

TURN AND BANK INDICATOR

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Revised

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1. **PURPOSE:** To specify minimum requirements for Turn and Bank Indicators for use in aircraft, the operation of which may subject the instruments to the environmental conditions specified in Section 3.4.

2. **SCOPE:** This specification covers three basic types of instruments as follows:

TYPE I - Air Driven

TYPE II - D-C Operated

TYPE III - A-C Operated

3. **GENERAL REQUIREMENTS:**

3.1 **Materials and Workmanship:**

3.1.1 **Materials:** Materials shall be of a quality which experience and/or tests have demonstrated to be suitable and dependable for use in aircraft instruments.

3.1.2 **Workmanship:** Workmanship shall be consistent with high grade aircraft instrument manufacturing practice.

3.2 **Radio Interference:** The instrument shall not be the source of objectionable interference, under operating conditions at any frequencies used on aircraft, either by radiation or feed back, in radio sets installed in the same aircraft as the instrument.

3.3 **Identification:** The following information shall be legibly and permanently marked on the instrument or attached thereto:

- (a) Name of instrument (Turn and Bank Indicator)
- (b) SAE Specification, AS-395
- (c) Rating (Nominal electric or vacuum etc.)
- (d) Manufacturer's part number
- (e) Manufacturer's serial number or date of manufacture
- (f) Manufacturer's name or trademark

3.4 **Environmental Conditions:** The following are established design criteria only. All tests shall be run as per Sections 5, 6 and 7.

3.4.1 **Temperature:** When installed in accordance with the instrument manufacturer's instructions the instrument shall function over the range of ambient temperature from -30C to 50C and shall not be adversely affected by exposure to temperatures in the range of -65C to 70C.

3.4.2 **Humidity:** The instrument shall function and shall not be adversely affected when exposed to a relative humidity of up to and including 95% at a temperature of approximately 32C.

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3.4.3 Altitude: The instrument shall function and shall not be adversely affected when subjected to a pressure and temperature range equivalent to -1000 to 40,000 feet standard altitude except that the instrument temperature shall not be lower than -30C.

3.4.4 Vibration: When installed in accordance with the instrument manufacturer's instructions the instruments shall function and not be adversely affected when subjected to vibrations of not more than .010 inch at a frequency from 500 to 3000 cycles per minute or of not more than 1.3 g. When specified by the purchaser for use in rotary wing aircraft, the frequency range shall be 150-3000 cycles per minute.

NOTE: It is understood that the unit shall withstand vibration at higher frequencies, but the acceleration values need not exceed those shown above.

4. DETAIL REQUIREMENTS

4.1 Indicating Method: Turns shall be indicated by means of a pointer, deflecting in direction of turn. Banks shall be indicated by means of a black ball, free to move in a curved transparent tube.

4.2 Visibility: Both bank and turn indications shall be visible from any point within the frustum of a cone whose side makes an angle of not less than 30 degrees with the perpendicular to the dial and whose small diameter is the aperture of the instrument case. The distance between the dial and the cover glass shall be a practical minimum and shall not exceed 0.187 inch.

4.3 Dial Markings:

4.3.1 Finish: Unless otherwise specified, luminescent (self-activating) material shall be applied to all markings, pointer and the inclinometer backing.

4.3.2 Letters: Letters "L" and "R" shall be legibly marked on the dial.

4.3.3 Instrument Name: The word "Turn and Bank" shall be marked and may be indicated in the same finish as the letters.

4.4 Power Variations: The instrument shall properly function with a voltage and frequency variation of $\pm 10\%$ of the rated value (provided the A-C voltage and frequency vary in the same direction) and/or $\pm 30\%$ of the rated vacuum pressure.

5. TEST CONDITIONS

5.1 Atmospheric Conditions: Unless otherwise specified, all tests required by this specification shall be made at an atmospheric pressure of approximately 29.92 inches of mercury and at an ambient temperature of approximately 22C. When tests are made with atmospheric pressure or temperature substantially different from these values allowance shall be made for the variation from the specified conditions.