

**AIRSPPEED INDICATOR (PITOT STATIC)
(RECIPROCATING ENGINE POWERED AIRCRAFT)**Issued 1947-07
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1. **PURPOSE:** To establish the essential minimum safe performance standards for pitot static pressure type of airspeed indicators, primarily for use with reciprocating engine power transport aircraft, the operation of which may subject the instruments to the environmental conditions specified in Section 3.3.
2. **SCOPE:** This Aeronautical Standard covers five basic types of airspeed instruments as follows:
 - Type I - 1 revolution
 - Type II - 1 revolution (unequal scale)
 - Type III - 1 1/2 to 1 3/4 revolutions
 - Type IV - 7 revolutions
 - Type V - 1 3/4 to 2 revolutions
3. **GENERAL REQUIREMENTS:**
 - 3.1 **Material 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 **Identification:** The following information shall be legibly and permanently marked on the instrument or attached thereto:
 - (a) Name of instrument (Airspeed Indicators)
 - (b) SAE AS 391C
 - (c) Manufacturer's part number
 - (d) Manufacturer's serial number or date of manufacture
 - (e) Manufacturer's name and/or trademark
 - (f) Range
 - 3.3 **Environmental Conditions:** The following conditions have been established as minimum design requirements. Tests shall be conducted as specified in Sections 5, 6, and 7.
 - 3.3.1 **Temperature:** When installed in accordance with the instrument manufacturer's instructions, the instrument shall function over the range of ambient temperature of -30C to 50C and shall not be adversely affected by exposure to temperatures of -65C to 70C.

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3.3.2 Humidity: The instrument shall function and shall not be adversely affected following exposure to any relative humidity in the range from 0 to 95% at a temperature of approximately 70C.

3.3.3 Vibration: When installed in accordance with the instrument manufacturer's instructions, the instruments shall function and shall not be adversely affected when subjected to vibrations of the following characteristics:

<u>Instrument Location in Airframe</u>	<u>Cycles Per Second</u>	<u>Maximum Double Amplitude (In.)</u>	<u>Maximum Acceleration</u>
Panel or Rack (Vibration isolated)	5-50	0.020	1.5g

3.3.4 Altitude: The instrument shall function and shall not be adversely affected following exposure to a pressure and temperature range equivalent to -1000 to 40,000 feet standard altitude, per NACA Report 1235, except as limited by the application of Paragraph 3.3.1. The instrument shall not be adversely affected when subjected to an ambient pressure of 50 inches of mercury absolute.

3.4 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 electronic equipment installed in the same aircraft as the instrument.

3.5 Magnetic Effect: The magnetic effect of the indicator shall not adversely affect the performance of other instruments installed in the same aircraft.

4. DETAIL REQUIREMENTS:

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- 4.1 Pressure Equivalents: The instruments shall be calibrated to indicate airspeed in accordance with the following pressure equivalents. (Table I)

TABLE I
DIFFERENTIAL PRESSURE - KNOTS AND MPH
Mercury at 0°C
Water at 15.8°C

Differential Pressures for Knots				Differential Pressures MPH		
Pounds Per Square Inch	Inches of Water	Inches of Mercury	Calibrated Airspeed	Inches of Mercury	Inches of Water	Pounds/Sq. In.
.0094	.261	.0192	20	.0145	.197	.0071
.0377	1.05	.0768	40	.0579	.788	.0284
.0590	1.63	.120	50	.0905	1.23	.0444
.0850	2.35	.173	60	.130	1.77	.0640
.116	3.21	.236	70	.178	2.42	.0872
.151	4.19	.308	80	.232	3.16	.114
.192	5.31	.390	90	.294	4.00	.144
.237	6.56	.482	100	.363	4.94	.178
.342	9.47	.696	120	.524	7.13	.257
.467	12.9	.950	140	.715	9.73	.351
.612	17.0	1.25	160	.936	12.7	.460
.777	21.5	1.58	180	1.19	16.2	.583
.964	26.7	1.96	200	1.47	20.0	.723
1.17	32.5	2.39	220	1.79	24.3	.878
1.40	38.8	2.85	240	2.13	29.1	1.05
1.65	45.8	3.37	260	2.52	34.2	1.24
1.93	53.5	3.93	280	2.93	39.9	1.44
2.23	61.8	4.54	300	3.38	46.0	1.66
2.73	75.6	5.56	330	4.13	56.2	2.03
3.29	91.0	6.69	360	4.95	67.4	2.43
4.13	114.3	8.40	400	6.20	84.3	3.04
5.35	148.2	10.89	450	7.98	108.7	3.92
6.78	187.8	13.80	500	10.06	136.9	4.94
8.44	234.0	17.19	550	12.44	169.3	6.11
10.37	287.4	21.12	600	15.17	206.4	7.45
12.60	349.0	25.64	650	18.27	248.6	8.97
15.14		30.83	700	21.79	296.5	10.70

- 4.2 Indicating Method: The instruments shall indicate airspeed by means of a pointer moving over a fixed dial. Sensitive types shall have, in addition, an under-dial visible through an aperture in the fixed dial for indicating hundreds of miles per hour, or knots. Clockwise pointer motion shall indicate increasing airspeed.