

## JAR 25.1303 Flight and navigation instruments

All flight and navigation instruments must have characteristics suitable for use in the particular aeroplane considered. The presentation must be clear and unambiguous

(a) The following flight and navigation instruments must be installed so that the instrument is visible from each pilot station:

- (1) A free-air temperature indicator or an air temperature indicator which provides indications that are convertible to free-air temperature.
- (2) A clock displaying hours, minutes, and seconds with a sweep-second pointer or digital presentation.
- (3) A direction indicator (nonstabilised magnetic compass).

(b) The following flight and navigation instruments must be installed at each pilot station:

- (1) An airspeed indicator. If airspeed limitations vary with altitude, the indicator must have a maximum allowable airspeed indicator showing the variation of VMO with altitude.
- (2) An altimeter (sensitive).
- (3) A rate-of-climb indicator (vertical speed).
- (4) A gyroscopic rate of turn indicator combined with an integral slip-skid indicator (turn-and-bank indicator) except that only a slip-skid indicator is required on aeroplanes with a third attitude instrument system which is powered from a source independent of the electrical generating system and continues reliable operation for a minimum of 30 minutes after total failure of the electrical generating system.

*(F) (4) (France) A gyroscopic rate of turn indicator combined with an integral slip-skid indicator (turn-and-bank indicator) except that only a slip-skid indicator is required on aeroplanes fitted with a third attitude instrument system usable through flight attitudes of 360° of pitch and roll, which is powered from a source independent of the electrical generating system and continues reliable operation for a minimum of 30 minutes after total failure of the electrical generating system, and is installed in accordance with JAR 25.1321 (a).*

- (5) A bank and pitch indicator (gyroscopically stabilised). (See ACJ 25.1303 (b) (5).)
- (6) A direction indicator (gyroscopically stabilised, magnetic or non-magnetic).

(c) The following flight and navigation instruments are required as prescribed in this paragraph:

1[(1) A speed warning device which must give] effective aural warning (differing distinctively from aural warnings used for other purposes) to the pilots whenever the speed exceeds VMO by 6 knots  $\pm 4.5$  knots or MMO by  $0.01 \pm 0.0075$ . (See ACJ 25.1303(c)(1).)

1[(F) (1) (France) *A speed warning device which must give effective aural warning (differing distinctively from aural warnings used for other purposes) to the pilots, whenever the speed exceeds VMO plus 6 knots or MMO + 0.01. The upper limit of the production tolerance for the warning device may not exceed the prescribed warning speed and the lower limit shall be such that nuisance warnings are avoided. (See ACJ 25.1303 (c) (1).)*

(2) A machmeter is required at each pilot station for aeroplanes with compressibility limitations not otherwise indicated to the pilot by the airspeed indicating system required under subparagraph (b) (1) of this paragraph.