

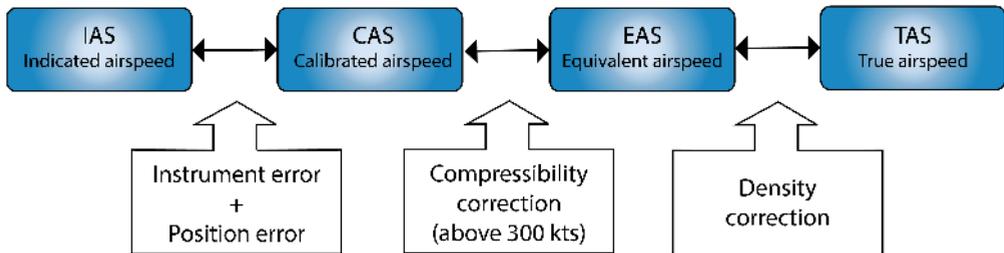
AIRSPEED INDICATOR ERRORS

True airspeed (TAS) is the airspeed that we would ideally read of the airspeed indicator. However there are errors introduced.

These errors are:

- Calibration error
- Compressibility error
- Density error

Applying these errors to true airspeed will result in indicated airspeed.



CALIBRATION ERROR (CAS)

Calibrated airspeed (CAS) is the indicated airspeed (IAS) of an aircraft, corrected for instrument and position error.

CAS is equal to true airspeed in standard atmosphere at sea level.

Position and placement of the static vent along with angle of attack and velocity of the aircraft will determine the pressure inside the airspeed indicator and thus the amount of calibration error of the airspeed indicator.

Calibration error is specific to a given aircraft design. A calibration table is usually given in the pilot operating handbook (POH). Using this calibration table, the indicated airspeed (IAS) is determined from calibrated airspeed by modifying it with calibration error of the airspeed indicator.

COMPRESSIBILITY ERROR

The airspeed indicator presumes that the air is incompressible. However, as air is compressible and the higher the speed, the higher pressure it will indicate (over-indicate). Therefore the compressibility correction is always negative.

If the true airspeed (TAS) is less than 300 knots, this effect is negligible.

A correction for compression must be *subtracted* from the CAS.

DENSITY ERROR

Equivalent airspeed (EAS) is true airspeed (TAS) modified with the changes in atmospheric density which affect the airspeed indicator.

If the air is less dense than in the standard atmosphere (1225 grammes per cubic meter), the airspeed indicator can not correctly indicate the true airspeed (TAS).

The ASI will *under-read* the true speed at altitude. This is due to lower air density at altitude.

If the density is greater than ISA at mean sea level (MSL), the ASI will *over-read* the true airspeed (e.g., cold air).