

Pitot-Static System Preflight

The walkaround inspection should assure removal of the pitot tube cover if you use one. Also check the pitot tube, drain, and static ports for blockage, general condition, and alignment. Especially check the static ports for tape or other protection after the aircraft has been washed or painted. For flight into instrument conditions, turn on the pitot heat and feel the tube with your hand. Be brief, both to save the heater element and your skin; they heat up fairly quickly.

The old axiom “What you don’t know can’t hurt you” seldom holds true in aviation. Vents and openings—especially the pitot tube and static port—should be checked for foreign objects that might be lodged inside. A former flight instructor I knew used to have a pet preflight trick. He would put a toothpick in the pitot tube of his Piper Cherokee to see if his students actually got down on all fours and checked it. One day a lesson was canceled at the last minute and another student took the airplane up solo, toothpick and all; it was quite a ride for the novice. There are far too many stories about blockages caused by dirt, ice, snow, and other foreign objects to bypass a thorough look.

The cabin check should include the current local altimeter setting, which should cause the altimeter to read the airport elevation. An error in excess of 75 feet should be cause for grounding the aircraft. Both the airspeed indicator and VVI should read zero prior to engine start. During normal taxi all three instruments should remain fairly constant, aside from a little jiggling of the needles as the airplane bounces along. If there are noticeable changes in airspeed, altitude, or vertical velocity during taxi, there is a problem with the instrument.

During takeoff the airspeed indicator should “come alive” fairly early in the run. If the aircraft has two airspeed indicators, cross-check them when yours reaches the bottom of the white arc, which is nothing more than a fairly easy-to-recognize position when you glance across the instrument panel to the other one. If they are not in agreement, something is wrong. The vertical velocity should reflect a climb promptly after leaving the runway, but there always will be a slight inherent delay. The altimeter should show upward movement within a couple of feet.

Questions of accuracy regarding pitot-static instruments are best resolved on the ground, so the sooner you admit there might be a problem, the faster you can abort a takeoff or avoid flying into IFR conditions and find a place to land.

GYRO INSTRUMENTS

There are three gyroscopic flight instruments: the attitude indicator, heading indicator, and turn indicator. The attitude indicator, often referred to as an artificial horizon, is the most extensively used of the three.

Attitude Indicator

The purpose of the attitude indicator is to provide the pilot with a stable reference to the earth’s horizon, depicting both pitch about the lateral axis and roll about the longitudinal axis of the aircraft. The heart of the attitude indicator is a gyroscope.