U.S. DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration

# VFR PILOT EXAM-O-GRAM* NO. 17

POOR GUY...

## COMMON MISCONCEPTIONS (Series #1)


The following remarks are actual excerpts from a pilot's written report of an accident in which he was involved.

"I was climbing at an airspeed of 60 mph. I started a climbing turn to the right. The wind now became a cross wind instead of a head wind. This (lack of head wind) caused the airplane to stall -- to recover from the stall I turned the airplane back into the wind . . . (Later) I was in a quartering tailwind from the right. . . Went into a second stall. . . This is all I remember."

This pilot had over 100 hours, yet stalled and crashed due to an apparent misuse of controls at a slow airspeed (high angle of attack). The inspector who took this pilot's statement decided to pursue this theory with a group of student pilots. He posed this question to them.

"If the aircraft's stalling speed was 60 mph and you were flying at an airspeed of 70 mph into a 30 mph wind, what would happen if you maintained this airspeed of 70 mph but turned downwind?" Five of the six students said the airplane would stall.

IS THIS ANSWER CORRECT? No.

DOES THE STALLING SPEED OF AN AIRPLANE DEPEND UPON THE AIRSPEED OR THE GROUNDSPEED? The airspeed.

DOES THE DIRECTION OF THE WIND HAVE ANY EFFECT ON THE AIRSPEED OF AN AIRCRAFT IN FLIGHT? No.

Now to summarize our point, airspeed is the only speed which holds any significance for an airplane. Once it is off the ground, an airplane feels nothing but its own speed through the air. It makes absolutely no difference what its speed happens to be in relation to the ground. The aircraft in flight feels no wind. It simply proceeds, operating with the same mechanical efficiency, upwind, downwind, crosswind, or in no wind at all. (NOTE: We are referring here to a steady wind. Turbulence, gusts, or wind shears can lead to stalls even though airspeed is being maintained above the normal stalling speed. In such conditions it is wise to add a safe margin to normal climbout or approach speeds.)

* Exam-O-Grams are non-directive in nature and are issued solely as an information service to individuals interested in Airman Written Examinations.

Rev. 1/77

Based on the performance of many applicants on the Private Pilot Written Test, here are some of the other more common misconceptions.

IF IT IS NECESSARY TO CLEAR OBSTRUCTIONS IMMEDIATELY AFTER TAKEOFF, SHOULD YOU USE BEST ANGLE-OF-CLIMB SPEED OR BEST RATE-OF-CLIMB SPEED? Best angle-of-climb speed. Simply stated, the difference is this. The best angle-of-climb speed produces the greatest climb in a given distance; the best rate-of-climb speed produces the greatest climb in a given time. Distance, of course, is the determining factor for takeoff obstruction clearance.

DO ALL WIND REPORTS INDICATE A TRUE DIRECTION? No. The wind direction, as reported by a control tower in pilot instructions, is magnetic. All other wind directions (Sequence Reports, Terminal Forecasts, Winds Aloft Forecasts, etc.) are true.

WHAT IS THE HEIGHT OF A CLOUD CEILING BASED ON? The height of the clouds above the ground, not the height above sea level (MSL). For example, let's examine the following weather report: ABQ M3Ø OVC. The station is Albuquerque, N.M., which has an elevation of 5,352 feet above sea level. The ceiling is reported as a 3,000-foot overcast. Using the current Albuquerque altimeter setting, your altimeter would indicate approximately 8,352 feet at the base of the clouds when over the airport, but your height above the ground would be 3,000 feet. As a word of caution, the 10,000-foot-plus mountains a few miles east of the city would probably extend up into the clouds since this ceiling report is based on an observation taken over the airport.

WHICH IS THE MORE DENSE -- MOIST AIR OR DRY AIR? Dry air. It is generally understood that high temperatures and high elevations result in a higher density altitude, but there seems to be a general impression that moist air has the reverse effect. The common misconception is that moist air is heavier than dry air. This is not true! Water vapor weighs less than an equal amount of dry air. A dry parcel is therefore denser and heavier than a moist parcel. Since both engine and aircraft performance decrease with an increase in density altitude, you should remember that high relative humidities (small spreads between temperature and dew point), especially on hot summer days, will result in longer takeoff runs.

IS AN AIRCRAFT CRUISING VFR AT 5,500 FEET MSL ALWAYS GOVERNED BY THE VFR CRUISING ALTITUDES REQUIREMENTS? Not necessarily. The rule pertains to aircraft operated in level cruising flight at more than 3,000 feet above the surface. The aircraft in this case (5,500 feet MSL) might be operating above a surface elevation of 3,500 feet and this rule would not apply.

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These are, by no means, all of the common misconceptions that prevail among student pilots, but as we stated earlier, a trend has become apparent in the Private Pilot Written Examination results which highlights these that are discussed. Additional misconceptions are discussed in Exam-O-Gram No. 26.



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1/77