

Area of Operation II. Preflight Procedures

Task A. Aircraft Systems Related to Instrument Flight Rules (IFR) Operations

• **References:** 14 CFR part 91; AC 91-74; FAA-H-8083-2, FAA-H-8083-3, FAA-H-8083-15, FAA-H-8083-25; POH/AFM

• **Objective:** To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with anti-icing or deicing systems, and other systems related to IFR flight. **1**

• **Knowledge:** The applicant demonstrates understanding of:

- **IR.II.A.K1** The general operational characteristics and limitations of applicable anti-icing and deicing systems, including airframe, propeller, intake, fuel, and pitot-static systems. **2**
- **IR.II.A.K2** Flight control systems.

HOW IS THIS TESTED? Systems knowledge will focus on the flight instruments and de-ice/anti-ice systems. (Even pitot heat and your defogger count for fighting icing.) Expect questions about how failure of one item, like your primary GPS navigator, affects other systems. Also know your electrical system cold, including how you'd shed electrical load if your alternator failed in flight.



Older Piper Autoflight, Cessna, Century, and STEC rate-based autopilots work best if the airplane is trimmed before you engage them. Some autopilots don't have automatic pitch trim, and require you manually trim in response to autopilot annunciations. If you ignore those trim indications and disconnect when the airplane is out of trim, the airplane may reward you with a sudden pitch up or down. This was the cause of a failure on a checkride when I had to take over to prevent an actual unusual attitude. — David G. (DPE)

1 | Ice Is Where You Expect to Find It

There's lots of specific guidance on icing theory and its effect on the airplane, along with mitigation action to take in the event of an icing encounter. This should be an easy question to answer. Make sure you can answer, "what constitutes known icing conditions?" (It's conditions in which a pilot would reasonably expect ice to form.)

Make sure you understand the specific limitations for the airplane you are flying, including all its anti-ice (prevents ice) and de-ice (removes ice) devices. Pitot heat should be used for anti-ice, but will also de-ice. Know if you're Flight Into Known Icing (FIKI) certified or not. — David G. (DPE)

2 | If You Have a Carb, Learn About Carb Heat

Fewer and fewer instructors have experience with carbureted engines, and thus the knowledge they pass on to their clients is only rote knowledge. Therefore, many applicants flying behind carbureted engines don't really understand what conditions could create carburetor ice, where carburetor heat comes from, or how that second item can combat the first one.

Carb heat should be used as an anti-ice system when flying in clouds and a power reduction is called for. Apply carb heat *prior* to reducing the power. That includes prior to any power reduction for a constant speed descent. If this happens on a flight test, I'll simulate a rough-running engine when they level off to see if they recognize the problem and use carb heat to fix it.

I may ask about a situation where flying through wet snow blocks an engine air intake, causing a loss of power. If the applicant doesn't understand that the carburetor heat system bypasses the air filter (that's blocked by snow) they won't know what to do and can't answer my question.

Also Learn How Your Static System Is Plumbed

Many applicants mistakenly tell me that they will turn on pitot heat to solve a frozen static system. That's not right.

Even on Pipers where the static source is located at the back of the pitot vane, ice can form in the line running through the wing. On airplanes with fuselage static ports, pitot heat obviously has no effect.

Related to this is that many pilots flying airplanes with a static drain inside the cockpit are unaware that the drain exists.

And the Basics for Ice Protection

Few applicants have experience with airframe de-ice or anti-ice systems. Just having the rote knowledge is expected here—but do have that. — Doug S. (DPE)