Winter Flying Safety

October 7, 2025

Condor Aero Club
Zelienople, PA

Winter Flying: Phases of Flight

- Preflight (including Wx briefing)
- Taxi & Takeoff
- Enroute
- Initial Descent
- Approach & Landing
- Post-Flight

- Night Currency
  - Due to shorter days, many flights may be completed at night
  - Are you Night Current?

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Preflight Briefing / Planning

- Briefing should include the following:
  - Forecast freezing levels along your route of flight
  - Airmets for icing conditions (Airmet Zulu)
  - Cloud bases along your route of flight
  - Wx at destination airport including runway conditions
  - These are in addition to “normal” preflight items
    - PIREPs, TFRs, NOTAMS, significant weather, etc.
  - VFR flights should be planned clear of clouds
  - IFR flights should plan to avoid IMC when enroute altitude is at or below freezing
    - The MEA may make this impossible during winter months

Notam example:
15/33 PTCHY THN SIR BA FAIR
Runway 15/33 patchy thin snow or ice on runway.
Braking action fair.

GOOD:	No degradation of braking action.
FAIR:	Somewhat degraded braking conditions.
POOR:	Very degraded braking conditions.
NIL:	No braking action.

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Preflight Operations
(Snow Removal on the Apron)

- The Airport Authority plows Taxi Lanes to within (5) feet of the hangars
- The (5) feet closest to the hangar, as well as the sidewalks, are the Tenant's responsibility (That's US!)
- If you have the first flight following a snowfall, please clear snow from the first (5) feet from the hangar, as well as paths for the aircraft tires
  - You may shovel snow into a Taxi Lane before it is cleared
  - Please do NOT shovel snow into a previously-cleaned Taxi Lane
  - Hangar items to assist in snow removal: Snow Shovel, Bucket of Sand
- **Refrain from driving and/or walking on fresh snow as it gets compacted, which forms ice**
- Hangar items to aid in snow removal: Snow Shovel, Bucket of Sand

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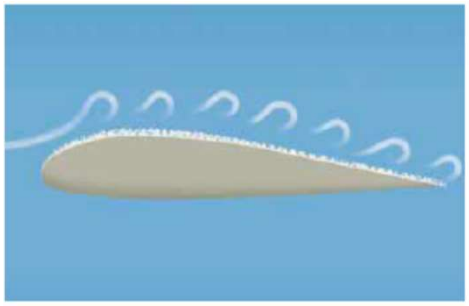
Preflight Operations
(Walk-Around)

- Cold weather pre-flights tend to be abbreviated (hurried) due to cold weather.
- Unplug Engine Heater
  (Heaters should be plugged in between Nov. 1st – Mar. 31st)
  - Electric oil pan heaters work well to ~ 20° F
  - Install cowl plugs (if available)
  - If the previous member forgot to plug in the Engine Heater, expect starting difficulty
- Remove Cowl Plugs
- Removal of snow, ice, and frost
  - Airfoil & control surfaces
    - A thin layer of frost (1-2 mm) can reduce lift by up to 33%
  - Air intakes, fuel vents, pitot tube & static ports



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Preflight Operations (Walk-Around)

- Gently rock wings before sumping fuel.
  - Cold weather aggravates condensation of moisture in fuel tanks

- Inspect Oil Breather for blockage due to frozen moisture.
  - A clogged Oil Breather causes the crankcase to pressurize, potentially causing engine failure.
  - Look for the “whistle slot” in the Breather pipe.

- Give the Exhaust Manifold a “good tug” to be sure it is secure.
  (Caution: it could be hot!)

  NOTE: Contrary to popular practice, the Exhaust Manifold is NOT the best place to attach the ground cable when fueling, as it is poorly bonded to the airframe ground (the fuel-filler necks). A tie-down ring is a much better choice.

YouTube Video – Grounding to Exhaust Manifold

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Preflight Operations
(Walk-Around)

- Inspect Pitot/Static system & Pitot Heat
  - Pitot Tube & Static Vents should be clear and unobstructed
  - Check Pitot Heat for proper operation
    (Careful: Will get HOT !!)
  - On Cessnas, check that the Pitot Cover moves freely

- When back in the airplane, check the Fuel Selector Valve for freedom of movement
  - It may be frozen in place

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Engine Start
(Lycoming Recommendations)

- Use of Primer:
  - 60° F Range: (1) stroke of Primer
  - 50° F Range: (2) strokes of Primer
  - 40° F Range: (3) strokes of Primer

- Starting Engine
  - Engage Starter for short periods (10 second), and then allow to cool.
  - If engine has not started after (3) such periods, a (5) minute cooling-off period is required to avoid overheating and/or damaging the Starter.

- Check Oil Pressure
  - After the engine has started, check for Oil Pressure.
  - If no oil pressure is indicated, immediately shut down to avoid damage to the engine.

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Engine Start
(Lycoming Recommendations)

- Use of Primer vs. Pumping the Throttle
  - The Primer injects fuel into the cylinder(s).
  - Pumping the Throttle uses the carburetor's Accelerator Pump to inject fuel into the carburetor (for acceleration).
    - Fuel injected into the carburetor without the engine cranking will "dribble down" the carburetor, and onto the air intake, lower cowling, and possibly, the ground.
    - **This causes a risk of fire**.

  - Accelerator Pump Video (YouTube)

  - Accelerator Pump Video (Facebook)
    (Better: with voice-over. Requires a Facebook account, must maximize and unmute)

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Engine Start
(Condor-Recommended Cold-Weather Starting Procedures)

- Refer to:
  - "Amplified Procedures" in aircraft's POH
  - "Cold-Weather Starting Cheat Sheet" on the Condor website

- Avoid high-RPM start (shoot for 1000 RPM)
- Caution: STOP CRANKING if:

1. The engine doesn't start after (4) attempts
   - Let the engine "sit" for (10) minutes before re-attempting starting
   - Continuous cranking is very hard on the engine and starter, and will eventually run-down the battery requiring a jump start.
     (If a battery is dead, please follow maintenance reporting procedures)

2. If you smell fuel, or notice a blue puddle (Avgas) under the engine:
   - You have likely flooded the engine, and **there is a risk of fire**.
     This is an good time to know where to find a fire extinguisher
     (either in the aircraft or in the hangar)

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Engine Start
(Condor-Recommended Cold-Weather Starting Procedures)

- Condor Aircraft with Lycoming Carbureted Engines
  (N89549, N96573, N62104, N98887, N2806M, N4335M)

1. Prime the engine using the Primer, no more than (2) times
   (When pulling the primer knob out, listen for the primer filling with fuel before pushing it back in)
2. Advance the throttle to full-open and back to the closed position (2) times
   (This uses the carburetor's Accelerator Pump)
3. Leave the Throttle fulled-closed (idle)
4. Engage the Starter. If the engine fires, but does not continue to run, pump the throttle a couple times while cranking the engine – but only small pumps

- **NOTE**: Excessive pumping of the Throttle could **lead to an engine fire**.

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Taxiing

- Taxi slower than normal & avoid hard braking
- Avoid taxiing thru areas of snow & slush
  - Snow & slush can be thrown into wheel wells (or pants) which could freeze & lock wheels or brakes
- Attempt to keep the nose wheel on centerline to avoid wingtips striking snow drifts, plowed snow, or other objects

  Beware of KPJC taxiway centerlines at the north and sound ends of the runway. They are not centered.

Strong winds can cause weathervaning

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Run-up & Takeoff

- Run-Up
  - Select a dry area (if possible)
    - Plane will slide on snow/ice when run-up power applied
  - Keep tach below 1000 RPM until oil temp is in green
- Takeoff from snow-covered runway
  - Consider soft-field takeoff
  - Avoid braking – use rudder for steering
  - Exercise caution when turning onto runway
- On takeoff roll, note & call-out “Airspeed Alive” to ensure that Pitot Tube Cover is not stuck or frozen in place

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Effect of Slush/Snow on Runway

Slush Depth	Takeoff Distance Increase
½ Inch	15 percent
1 Inch	50 percent
1- ¼ Inch	100 percent
2 Inches	Takeoff not possible

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Rule of Thumb: If you can't walk without falling, don't take off

- Cabin Heat & Defroster
  - Be aware of the effects of Carbon Monoxide poisoning
    - Headache, increased respiration, drowsiness, blurred vision
  - If symptoms appear, discontinue use, open fresh air vents, and land as soon as possible

Percent CO in Blood	Typical Symptoms
<10	None
10-20	Slight headache
21-30	Headache, slight increase in respirations, drowsiness
31-40	Headache, impaired judgment, shortness of breath, increasing drowsiness, blurring of vision
41-50	Pounding headache, confusion, marked shortness of breath, marked drowsiness, increasing blurred vision
>51	Unconsciousness, eventual death if victim is not removed from source of CO

Enroute

- Pitot Heat
  - Use when in IMC or when flying in precipitation
  - Be aware of effects of iced up pitot tube or static ports
- Monitor Enroute & Destination Weather
  - Check ATIS/AWOS, HIWAS, etc. along route of flight
  - Utilize ADS-B METARS via aircraft GPS and/or Foreflight, etc.
- Monitor outside air temperature
- Monitor leading edges, OAT probe, etc. for ice accumulation

Instrument	Static Blockage	Pitot Blockage
Altimeter	"Freezes" at constant value	n/a
Vertical Speed Indicator	"Freezes" at zero	n/a
Airspeed Indicator	Under-reads in climb and over-reads in descent	Over-reads in climb and under-reads in descent

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Enroute

- Monitor enroute airspeed
  - A loss of airspeed is an indication of airframe icing
- Monitor engine power settings
  - A loss of RPM (fixed pitch prop) or manifold pressure (constant speed prop) is an indication of carburetor ice
  - Apply carb heat & leave on for 10-15 seconds or until engine roughness has ceased
    - Remember, the engine will run rougher before it gets better! This usually means additional power loss… leave the carb heat on until the roughness smooths out!
- Exercise Constant Speed Props every (30) minutes to help prevent oil congealing in the propeller hub.

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Initial Descent

- Prior to power reduction, check Carb Heat
  - If not checked, and Carburetor Ice is present, extreme engine roughness may occur once power is reduced

- Avoid power-off letdowns
  - This is especially applicable to cold-weather operations when shock-cooling of the engine is likely
  - If aircraft is equipped with an Engine Analyzer, it is recommended that CHTs to not change more than 50° F per minute
  - The Engine Analyzer may also display a “Shock Cooling” alarm

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Approach & Landing

- If airframe ice is suspected, do not extend flaps, and use higher than normal approach speeds
- Listen to ATIS/AWOS (or unicom) for runway information
  - If not available, visually examine runway while in traffic pattern – check for snow drifts, vehicles, etc.
  - Be familiar with runway condition reports (5/5/5)
- Plan for a soft/short-field landing
- Maintain directional control on snow covered runway
  - Avoid hard braking – use rudder for steering
  - Exercise caution when turning off runway or taxiways

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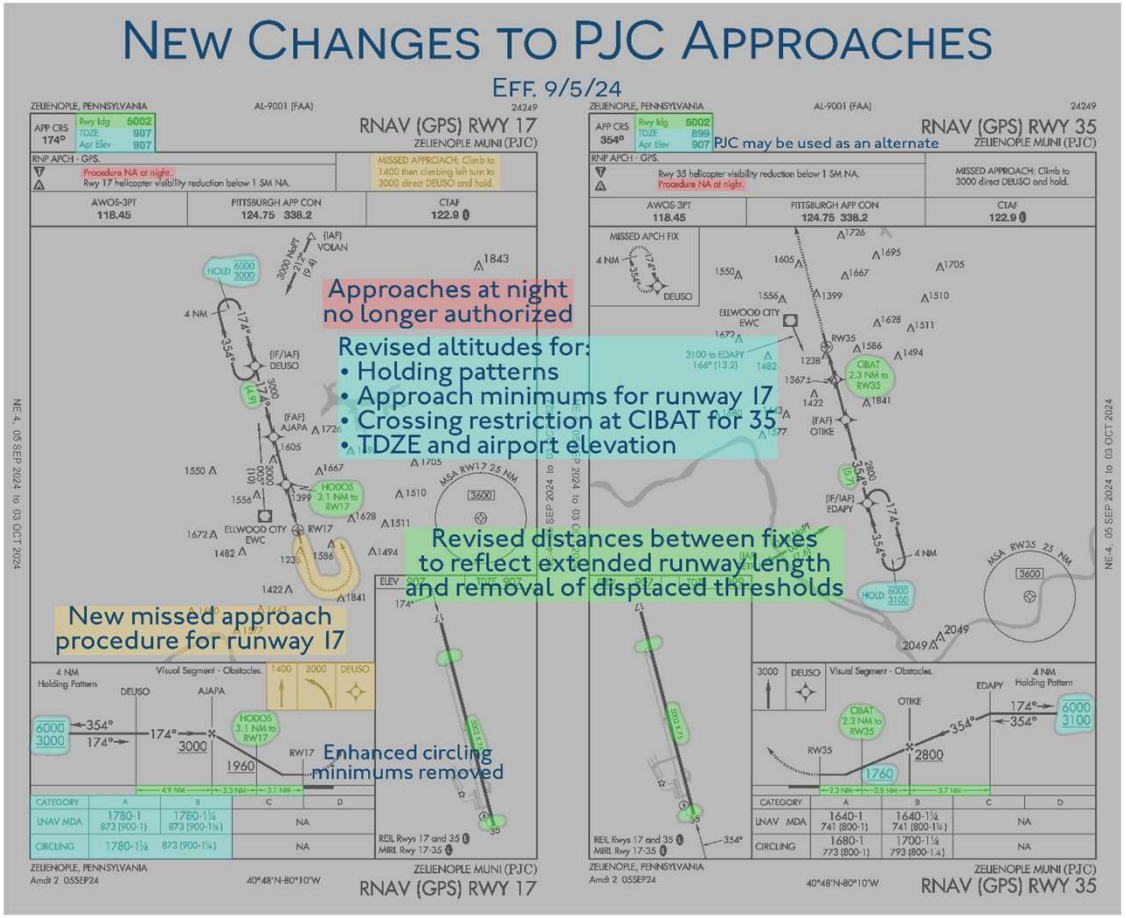
Approach & Landing

- Be familiar with the approach!
  - PJC approaches have been updated as of 9/5/24



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Miscellaneous Items

- Engine heaters
  - Engine heater plugs are accessed thru the engine cowling oil door
  - Heaters should be plugged in after each flight (November 1st to March 31st)
  - If parking off-field, take an orange extension cord with you, located in the Pilot's Lounge and/or the hangar.

- Fire Extinguishers are hanging on the wall in each hangar behind the aircraft's right wing

- Note: Instrument Approaches for BOTH runways (RNAV-35 and RNAV-17) are temporarily NOT APPROVED at night.

- Note: Runway 17 operations are now approved between sunset and sunrise (previous NOTAM has been lifted)

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Summary

- Winter provides spectacular scenery and great aircraft performance
- With attention to the elements, winter flying can be both safe & enjoyable
- Questions?

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