



**Conder Aero Club
Zelienople, PA
Founded 1957**

Winter Flying Safety

October 3, 2023



Winter Flying: Phases of Flight

- Preflight (including Wx briefing)
- Taxi & Takeoff
- Enroute
- Approach & Landing

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



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:

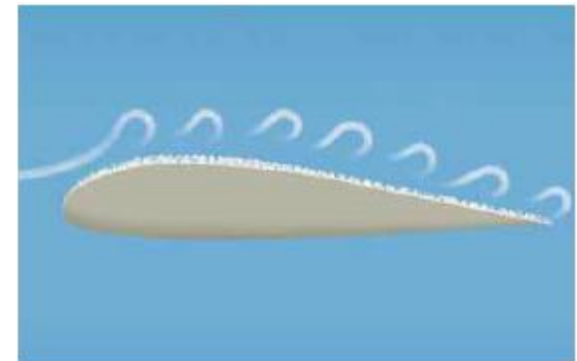
15/33 PTCHY THN SIR BA FAIR
Runway 15/33 patchy thin snow or ice on runway.
Braking action fair.

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



Preflight Operations

- Cold weather preflights tend to be abbreviated
 - Hurried due to cold weather
- Engine Heaters
 - Electric oil pan heaters work well to $\sim 20^{\circ}$ F
 - Install Cowl Plugs (if available)
 - Plug Engine Heaters in after each flight
- 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





Preflight Operations (con't.)

■ Fuel Contamination

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

■ Oil & Breather Line

- Inspect breather for blockage due to frozen moisture

■ Exhaust System

- Give the manifold a “good tug” to be sure it is secure (could be hot!)

■ Pitot Static System & Heat

- Be sure pitot tube & static vents are clear, and pitot cover is not frozen in place
- Check pitot heat for proper operation (Careful: HOT !!)



Engine Start & Taxi

- When starting engine, avoid tendency to over-prime and/or to pump throttle
 - Can cause engine fire
 - Refer to “Expanded” starting procedures in the POH
 - Avoid High RPM start, try to keep under 1000 RPM
- 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 nose wheel on centerline
 - Wingtips may strike snow drifts or other objects
- Strong wind can cause weathervaning



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, check “Airspeed Alive” to ensure that pitot tube cover is not frozen



Effect of Slush/Snow on Runway

<u>Slush Depth</u>	<u>Takeoff Distance Increase</u>
1/2 Inch	15 percent
1 Inch	50 percent
1- 1/4 Inch	100 percent
2 Inches	Takeoff not possible

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



Enroute

- **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



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Enroute (Con't.)

■ Pitot Heat

- Use when in IMC or when flying in precipitation
- Be aware of effects of iced up pitot tube or static ports

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

■ Monitor Enroute & Destination Weather

- Check ATIS/AWOS, HIWAS, etc. along route of flight
- Get an updated briefing from Flight Service

■ Monitor outside air temperature

■ Monitor leading edges, OAT probe, etc. for ice accumulation



Enroute (con't.)

- 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. Note that engine roughness can initially get worse before it gets better with the application of carb heat to carb ice.



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.
 - At a towered airport, you may also be given a runway condition report. The scale is 0 to 6 with 0 being extreme ice/snow conditions and 6 being a dry runway, given for each 1/3 of the runway, e.g. 5/4/4.
- 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



Miscellaneous Items

- **Snow removal on apron**
 - Refrain from driving/walking on fresh snow as it gets compacted & forms ice.
 - Hangar items to aid in snow removal
 - Snow Shovel
 - Bucket of Sand
- **Engine Heaters**
 - All club aircraft have electric heaters
 - Plug accessed via cowling oil door
 - Pre-heaters should be plugged in after flight
 - If staying off-field over night, take the orange extension cord with you



Miscellaneous Items

- Refer to Cold Start procedure in the A/C POH
 - *“Expanded” procedures should be reviews for cold weather start*
 - *“Cheat Sheet” is available on the Condor web site and is posted on the wall in the Pilot Lounge*
- Over-Cranking will result in a dead battery and possibly damage the starter
 - If a battery is dead, please see Jason.
- Fire Extinguishers are on wall in each hanger



Summary

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