



## Winter Flying Safety Seminar:

Req. for Flights Between Nov1st – Mar31st

October 23, 2021 – 9am

October 27, 2021 – 7pm

October 30, 2021 – 9am



# Winter Flying: Phases of Flight

- Pre-Flight (including Wx briefing)
- Taxi & Takeoff
- Enroute
- Approach & Landing
- Post-Flight
- Night Currency
  - Due to shorter days, many flights may be completed at night
  - Are you Night Current?

(1) Except as provided in paragraph (e) of this section, no person may act as pilot in command of an aircraft carrying passengers during the period beginning 1 hour after sunset and ending 1 hour before sunrise, unless within the preceding 90 days that person has made at least three takeoffs and three landings to a full stop during the period beginning 1 hour after sunset and ending 1 hour before sunrise, and—

(i) That person acted as sole manipulator of the flight controls; and

(ii) The required takeoffs and landings were performed in an aircraft of the same category, class, and type (if a type rating is required).



# 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, 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:**

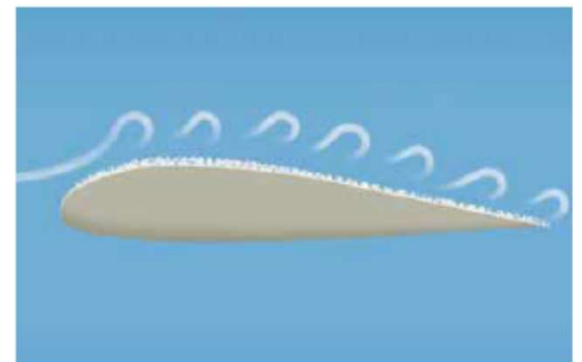
15/33 PTCHY THN SIR BA FAIR  
Runway 15/33 patchy thin snow or ice on runway.  
Braking action fair.

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



# Preflight Operations

- Cold weather preflight's tend to be abbreviated
  - Hurried due to cold weather
  - Insufficient time allowed for preheating, etc.
- Engine Preheat
  - Electric oil pan heaters work well to ~ 30° F
- 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
  - Winter Windshield Fluid or RV Antifreeze are solutions that can be used to remove frost if necessary.





# Preflight Operations (cont..)

- Fuel Contamination
  - Cold weather aggravates condensation of moisture in fuel tanks
- 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
- 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
- Lean the Mixture
  - This will help increase the oil temp while taxiing
- Taxi slower than normal & avoid hard braking, keep the nose up (full back pressure on the yoke)
- 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
- Video: <https://youtu.be/Mfn4w80MY0g>



# Cold Weather Starting

These procedures are not bullet proof, but should work almost all the time. If the engine doesn't start after four tries, let it sit for 10 minutes before reattempting starting. Continuous cranking is hard on the engine, battery, and starter.

If you smell fuel or notice a blue puddle (Avgas) under the engine, you have flooded the engine and there is a risk of fire. Either leave the plane sit, or refer to the flooded start procedures in the aircraft POH.

## **Aircraft with Lycoming Carbureted Engines - N89549, N96573, N62104, N2806M, N4335M**

1. Prime engine no more than (2) times with primer, make sure the primer fills with fuel before pushing it back in.
2. Advance throttle (2) times to the full open and back to closed position.
3. Leave throttle closed (idle)
4. Start engine, if fires but doesn't continue to run, pump throttle a couple times while cranking engine but only small pumps.

Note: Each time you pump the throttle, the accelerator pump in the carburetor pumps a large amount of fuel into the induction system. Pumping excessively will flood the engine.

## **Aircraft with Lycoming Fuel Injected Engines - N1963T, N684SP**

1. Advance the mixture full rich and throttle full open.
2. Run electric fuel pump no more than 5 seconds.
3. Close throttle (idle position)
4. Start engine, if it fires and then quits, prime as above no more than 3 seconds.



# 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



# Enroute (Cont..)

- Video: <https://youtu.be/eb2ll9uA9So>

- 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 (cont..)

- 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
    - NEVER turn it off if the engine starts to run rough!



# 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.
- 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



# Post Flight

- Return the plane to the hanger
- Sterilize Cockpit Area
- Clean Windshield and Leading Edges as necessary
- Plug in the block heater
  - Drape cord across the floor
  - Do NOT run the power cord thru the handle on the Cessna's





# Miscellaneous Items

- **Snow removal on apron**
  - Refrain from driving/walking on fresh snow as it gets compacted & forms ice.
  - New hangar items to aid in snow removal
    - Snow Shovel – located in each hanger
    - Bucket of Sand – located in each hanger
- **Battery Cart**
  - The battery cart has been “retired”.
  - If the battery is dead, please see Jason.
- **Refer to Cold Start procedures in the A/C POH**
  - “Expanded” procedures should be reviewed for cold weather start



# Miscellaneous Items

- Use of the Robo-Tow
  - C172 and Archer only
  - Position over the main
  - Tighten pins around nose wheel steering arm
  - Remove 'base-wheel' pin, raise the 'base-wheel' and reinsert the pin to hold it in place.
  - Operate the robo-tow
  - Once complete, follow steps above in reverse order to remove robo-tow for storage.







Cender Aero Club  
Zelienople, PA

# Recommended Videos

- Winter Flying Engine Operation in Cold Weather: <https://www.youtube.com/watch?v=Mfn4w80MY0g>
- Flying the Weather: Picking up Ice: <https://www.youtube.com/watch?v=eb2II9uA9So>
- Icing for General Aviation Pilots: [https://www.youtube.com/watch?v=fLIWf-Fk\\_YM](https://www.youtube.com/watch?v=fLIWf-Fk_YM)
- Ice Formation On Aircraft (1960): [https://youtu.be/9I40DQcK\\_6U](https://youtu.be/9I40DQcK_6U)
- Trapped Above the Ice: [https://youtu.be/yhC\\_M4N\\_p-E](https://youtu.be/yhC_M4N_p-E)
- Ice Induced Stall Pilot Training: <https://youtu.be/NBX84bF2d4U>
- Real Pilot Story: Icing Encounter: <https://youtu.be/jHm4itwpxVY>
- The "Joy" of Winter Flying - what it's really like: <https://youtu.be/rYGj42vcIVw>
- Flying in Freezing rain/ clear icing in an Eclipse Jet: <https://youtu.be/vnuxlCHi5VE>
- Severe Icing conditions and thunderstorms encounter during a summer flight: <https://youtu.be/12XcK1dzZF0>



Coudersport Aero Club  
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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 ?