

Hanscom Aero Club Safety Meeting

29 October 2021



- Departure Emergencies
- The Impossible Turn ASI Video
 - <u>https://www.aopa.org/training-and-safety/online-learning/safety-videos/the-</u> <u>runway-behind-you</u>



Power Loss During Departure Phases of Flight



"Takeoff Emergencies: Your 90 Second Survival Plan," Flying Magazine, Oct 2021

• What do you do if sudden loss of power during each phase?

• Options may be:

- Power off and land straight ahead
- Controlled crash straight-ahead
- Attempt to land on a runway



Runway 29 Landmarks





Some Numbers from the POH (PA-28-161)

- Takeoff roll requires approximately 700 ft to clear a 50ft obstacle
- Given perfect conditions
 - No wind
 - Experienced test pilot
 - Brand new airplane
 - No hesitation in transitioning to airspeed of 79 kts
 - No turns
 - No flaps
- Max glide is 1.875 nm/1000 ft
 - Reality will be much less
 - 1.25 nm/1000 ft more realistic





Options During Takeoff Roll

- This scenario is before rotation (wheels still on the ground)
- Hanscom's runway remaining past the 23/29 intersection is longer than some airfields have total

During takeoff roll, abort by throttle to idle, taxi (if able)

Options With Runway Remaining

- Altitude in this scenario is 0 to ~150 ft max
- Runway remaining very situational dependent, including altitude, headwinds, nature of power loss

With runway remaining, there may be enough runway left to just land This includes the over-run area or the fields along the runway

Options After Takeoff on Runway 29: 400 ft

- Not many good options if only 400 ft and past the pavement
- Establish best glide (73 in Warrior, 79 in Arrow)
- You won't have time to attempt a restart, focus on controlled crash landing

Straight ahead is the only option. Fly the plane through the crash. Survival of all aboard is the priority, not saving the airplane

Options After Takeoff on Runway 29: 1000 ft

- Our options get better, but a turnback still not recommended
- You might have time to run through your restart procedure quickly

Survival of all aboard is still the priority, perhaps can try a restart Some field options, but need to avoid houses and power lines

Restart Items Burned Into Your Memory

Warrior: 6 Items

- Fuel Selector switch tanks
- Ignition check "BOTH"
- Primer In and Locked
- Electric Fuel Pump ON
- Mixture Rich
- Carburetor Heat ON

• Arrow: 5 Items

- Fuel Selector switch tanks
- Ignition check "BOTH"
- Electric Fuel Pump ON
- Mixture Rich
- Alternate Air OPEN

PIPER AIRCRAFT CORPORATION PA-28-161, CHEROKEE WARRIOR II SECTION 3 EMERGENCY PROCEDURES

3.3 EMERGENCY PROCEDURES CHECK LIST

ENGINE FIRE DURING START

Starter .											•			С	Ta	in	k	eı	ngi	ine
Mixture															i	116		сu	ıt-0	off
Throttle																			ор	en
Electric f	ue	lŗ	pu	IUU	ıp														0]	FF
Fuel seled	cto)T																	0	FF
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ENGINE POWER LOSS DURING TAKEOFF

If sufficient runway remains for a normal landing, land straight ahead.

If insufficient runway remains: Maintain safe airspeed Make only shallow turn to avoid obstructions Flaps as situation requires

If sufficient altitude has been gained to attempt a
restart:
Maintain safe airspeed
Fuel selector switch to tank
containing fuel
Electric fuel pump
Mixture check RICH
Carburetor heat
Primerlocked
If power is not regained, proceed with power off
landing.

ENGINE POWER LOSS IN FLIGHT

Fuel selector
Electric fuel pump
of cause of power loss Primercheck locked If no fuel pressure is indicated, check tank selector position to be sure it is on a tank containing fuel.
When power is restored: Carburetor heat

ISSUED: DECEMBER 16, 1976 REVISED: JUNE 30, 1978 If power is not restored prepare for power off landing. Trim for 73 KIAS

POWER OFF LANDING

Locate suitable field. Establish spiral pattern. 1000 ft. above field at downwind position for normal landing approach. When field can easily be reached slow to 63 KIAS for shortest landing.

Touchdowns should normally be made at lowest possible airspeed with full flaps.

When committed to landing:									
IgnitionOFF									
Master switch OFF									
Fuel selectorOFF									
Mixture									
Seat belt and harness									

FIRE IN FLIGHT

Electrical fire (smoke in cabin):							
Master switch OFF							
Vents							
Cabin heat							
Land as soon as practicable.							

Engine fire:
Fuel selector
Throttle
Mixture
Electric fuel pump
Heater
Defroster
Proceed with POWER OFF LANDING procedure.

LOSS OF OIL PRESSURE

Land as soon as possible and investigate cause. Prepare for power off landing.

Options After Takeoff on Runway 29: 1000 ft (#2)

 In this scenario, being closer to the airfield can give you more options including *possibly* landing somewhere back at the airfield due to terrian

Landing on the airfield doesn't just mean the runway. Any landing in the grass or open taxiway at the airfield may be better than the trees

Recommendations and Takeaways

Departure Phase	Risk	Altitude (ft)	Emergency Action Plan
Takeoff Roll	Low	0	Power off, brake
Runway Remaining	Moderate	50 - 150	Land on runway remaining
Initial Climb	High	150 - 1200	Fly through the crash
Departure Climb	Moderate	>1200	Attempt restart, turn, land in clearings, turnback maybe possible

- Practice with an instructor and determine your personal limits
- Brief this plan during your passenger/takeoff brief
- Each turn equals lost altitude so keep turns shallow if possible
- A controlled crash is better than any uncontrolled spin
 - Stall speed increases with angle of bank
- Your goals (in priority order)
 - 1. Life safety of all aboard
 - 2. Life safety of anyone on the ground
 - 3. Minimize damage to property (including the airplane)