



MEMORANDUM FOR RECORD Polit Operating Handbook

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The following are Excerpts from the Piper PA-34 Pilot Operating Handbook.

SENECA		
GENERAL SPECIFICATIONS		
PERFORMANCE		
Published figures are for Standard PA-34* airplanes flown at gross weight under standard condition at sea level unless otherwise stated. Performance for a specific airplane may vary from published figures depending upon the equipment installed, the condition of engines, airplane and equipment, atmospheric conditions and piloting technique.		
Gross Weight (pounds)	4000	4200
Take-off Run (ft) (short field effort, flaps 25)	750	800
Take-off Distance Over 50 ft Barrier (ft) (short field effort, flaps 25)	1140	1235
Minimum Controllable Single Engine Speed (mph)	80	80
Best Rate of Climb Speed (mph) (knots)	105 (91.5)	105 (91.5)
Best Rate of Climb (ft per min)	1460	1360
Best Angle of Climb Speed (mph) (knots)	90 (78)	90 (78)
Best Single Engine Rate of Climb Speed (mph) (knots)	105 (91.5)	105 (91.5)
Single Engine Rate of Climb @ S.L. (ft per min)	230	190
Service Ceiling (ft)	18,800	17,900
Absolute Ceiling (ft)	20,000	19,400
Single Engine Service Ceiling (50 fpm) (left engine out) (ft)**	5200	3650
Single Engine Absolute Ceiling (left engine out) (ft)	6600	5000
Top Speed (mph) (knots)	196 (170)	195.3 (169.8)
Cruising Speed (75% power at sea level) (mph) (knots)	173 (150)	171.6 (149.2)
Cruising Speed (75% power at 6000) (mph) (knots)	187 (162)	186.3 (162)
Optimum Cruising Speed (65% power at 9000) (mph) (knots)	185 (160)	183.4 (159.5)
Stalling Speed (gear and flaps down) (power off) (mph) (knots)	67 (58)	69 (60)
Stalling Speed (gear down and flaps up) (power off) (mph) (knots)	73 (63.5)	76 (66)
Landing Roll (flaps down) (ft) (short field)	705***	
Landing Over 50 ft Barrier (flaps down) (ft) (short field)	1335***	
Fuel Consumption (75% power) (gph) (both engines)	20.6	20.6
Fuel Consumption (65% power) (gph) (both engines)	18.3	18.3
Cruising Range (75% power at 6000 ft) (mi)	804	804
Cruising Range (65% power at 9000 ft) (mi)	885	885
*200 BHP, Counter-Rotating Engines, 4200 lb. G.W., Maximum Take-off Weight 4000 lb. G.W., Maximum Landing Weight		
**5000 Ft. Single Engine Service Ceiling Occurs at 4030 Pounds Gross Weight.		
***This value applies only for the conditions stated on the Landing Distance vs Density Altitude Chart.		
GENERAL SPECIFICATIONS REVISED: May 30, 1975		
		1-1

E. AIRSPEED LIMITATIONS AND INDICATOR MARKINGS (Calibrated Airspeed)

NEVER EXCEED SPEED	217 MPH
MAXIMUM STRUCTURAL CRUISING SPEED	190 MPH
DESIGN MANEUVERING SPEEDS	
Minimum Weight (2743 lbs.)	133 MPH
Maximum Weight (4200 lbs.)	146 MPH
MAXIMUM FLAPS EXTENDED SPEED	125 MPH
MAXIMUM GEAR EXTENDED SPEED	150 MPH
MAXIMUM GEAR RETRACT SPEED	125 MPH
MINIMUM CONTROL SPEED (Single Engine)	80 MPH
AIRSPEED INDICATOR MARKINGS	
Green Arc (Normal Operating Range)	76 MPH to 190 MPH
Yellow Arc (Caution Range - Smooth Air)	190 MPH to 217 MPH
White Arc (Flaps Extended Range)	69 MPH to 125 MPH
Radial Red Line (Never Exceed - Smooth Air)	217 MPH
Radial Red Line (Minimum Control Speed - Single Engine)	80 MPH
Radial Blue Line (Best R/C Speed Single Engine)	105 MPH

V_{mc} - MINIMUM SINGLE-ENGINE CONTROL SPEED

V_{mc} is the calibrated airspeed below which a twin-engine aircraft cannot be controlled in flight with one engine operating at take-off power at sea level density altitude and the other engine windmilling. V_{mc} for the Seneca has been determined to be 80 MPH. Under no circumstances should an attempt be made to fly at a speed below this V_{mc} with only one engine operating. As a safety precaution, when operating under single-engine flight conditions either in training or in emergency situations, maintain an indicated airspeed above 90 MPH.

The V_{mc} demonstration required for the FAA flight test for the multi-engine rating approaches an uncontrolled flight condition with power reduced on one engine. The demonstration should not be performed at an altitude of less than 3500 feet above the ground. Initiate recovery during the demonstration by immediately reducing power on the operating engine and promptly lowering the nose of the airplane.

More power is available on the operating engine at lower altitudes and hence there can be more asymmetric thrust. The V_{mc} is highest at low altitudes. Since V_{mc} decreases with altitude, at higher altitudes the airplane will approach a stall before reaching V_{mc}. The most critical situation occurs at the altitude where the stall speed and V_{mc} speed coincide. Care should be taken to avoid this flight condition because at this point loss of directional control occurs at the same time the airplane stalls and a spin could result.

C. EMERGENCY PROCEDURES

1. DETECTING A DEAD ENGINE

- a. Loss of Thrust
- b. Nose of aircraft will yaw in direction of dead engine (with coordinated controls)

2. FEATHERING PROCEDURE

The propellers can be feathered only while the engine is rotating above 800 RPM. Loss of centrifugal force due to slowing RPM will actuate a stop pin that keeps the propeller from feathering each time the engine is stopped on the ground. Single engine performance will decrease if the propeller of the inoperative engine is not feathered.

NOTE

If circumstances permit, in the event of an actual engine failure, the pilot may elect to attempt to restore power prior to feathering. The following actions are suggested:

- (1) Mixture - As Required
- (2) Fuel Boost Pump - On
- (3) Fuel Selector - Crossfeed
- (4) Magnetos - Select L or R only
- (5) Alternate Air - On

- a. Minimum Control Speed - 80 MPH.
- b. Best R/C Speed Single Engine - 105 MPH.
- c. Maintain Direction and Airspeed above 90 MPH.
- d. Mixture Controls - forward.
- e. Propeller Controls - forward.
- f. Throttle Controls - forward.
- g. Flaps - retract.
- h. Gear - retract.
- i. Electric Fuel Pumps - "ON."
- j. Identify inoperative engine.
- k. Throttle of inoperative engine - retard to verify.
- l. Propeller of inoperative engine - feather.
- m. Mixture of inoperative engine - idle cut off.
- n. Trim - as required.
- o. Maintain 5° bank toward operating engine.
- p. Electric Fuel Pump of inoperative engine - "OFF."
- q. Magnetos of inoperative engine - "OFF."
- r. Cowl Flaps - close on inoperative engine, use as required on operative engine.
- s. Alternator of inoperative engine - "OFF."
- t. Electrical Load - reduce to prevent battery depletion.
- u. Fuel Management - fuel "OFF" inoperative engine; consider crossfeed use.
- v. Electric fuel pump operative engine - "OFF."