### PA-28-180 OPERATING INFORMATION

#### Airspeed Limitations:

<table>
<thead>
<tr>
<th>Speed Name/Remarks</th>
<th>Calibrated Airspeed</th>
<th>Knots</th>
<th>MPH</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{NE}$</td>
<td>Never Exceed Speed</td>
<td>148</td>
<td>171</td>
</tr>
<tr>
<td></td>
<td>Do not exceed this speed in any operation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$V_{NO}$</td>
<td>Max structural cruising speed</td>
<td>121</td>
<td>140</td>
</tr>
<tr>
<td></td>
<td>Do not exceed this speed except in smooth air and then only with caution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$V_A$</td>
<td>Maneuvering speed at 2,400 Pounds</td>
<td>112</td>
<td>129</td>
</tr>
<tr>
<td>$V_{FE}$</td>
<td>Maximum flap extended speed</td>
<td>100</td>
<td>115</td>
</tr>
<tr>
<td>$V_S$</td>
<td>Stall speed (No Flaps)</td>
<td>58</td>
<td>67</td>
</tr>
<tr>
<td>$V_{SO}$</td>
<td>Stall speed in landing configuration (40° Flaps)</td>
<td>49</td>
<td>57</td>
</tr>
<tr>
<td></td>
<td>Demonstrated Crosswind capability</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Optimum/Recommended Speeds:

<table>
<thead>
<tr>
<th>Speed Name/Remarks</th>
<th>Indicated Airspeed</th>
<th>Knots</th>
<th>MPH</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_X$</td>
<td>Best angle of climb</td>
<td>64</td>
<td>74</td>
</tr>
<tr>
<td>$V_Y$</td>
<td>Best rate of climb</td>
<td>74</td>
<td>85</td>
</tr>
<tr>
<td>$V_R$</td>
<td>Normal rotation</td>
<td>53</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Normal climb</td>
<td>74</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td>Enroute climb</td>
<td>87</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Normal landing (no flaps)</td>
<td>74</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td>Normal landing (full flaps)</td>
<td>66</td>
<td>76</td>
</tr>
<tr>
<td></td>
<td>Powered landing (no flaps)</td>
<td>74</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td>Powered landing (full flaps)</td>
<td>66</td>
<td>76</td>
</tr>
<tr>
<td></td>
<td>Max performance approach</td>
<td>61</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>Optimum glide</td>
<td>71</td>
<td>82</td>
</tr>
</tbody>
</table>
### Maneuvering Limits:

<table>
<thead>
<tr>
<th>Speed Name/Remarks</th>
<th>Max Indicated Airspeed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Knots</td>
</tr>
<tr>
<td>Chandelles</td>
<td>Use $V_A$</td>
</tr>
<tr>
<td>Lazy Eights</td>
<td>Use $V_A$</td>
</tr>
<tr>
<td>Steep Turns</td>
<td>Use $V_A$</td>
</tr>
<tr>
<td>Spins</td>
<td>Not Authorized</td>
</tr>
<tr>
<td>Stalls (except whip stalls)</td>
<td></td>
</tr>
</tbody>
</table>
Engine Failure During Takeoff Run:

- Throttle: Idle
- Brakes: Apply
- Flaps: Retract
- Mixture: Idle Cutoff
- Ignition Switch: Off
- Master Switch: Off

Engine Failure Immediately After Takeoff:

1. If enough runway remaining to land:
   - Throttle: Idle
   - Land airplane
   - Brakes: Apply
   - Mixture: 40°
   - Ignition Switch: Off
   - Master Switch: Off

2. Not enough runway to land
   - Airspeed: 82 MPH IAS (71 Knots)
   - Fly runway heading to emergency landing site
   - Mixture: Idle cutoff
   - Fuel Selector: Off
   - Ignition switch: Off
   - Flaps: As required
   - Master switch: Off
   - Door: Ajar
PA-28-180 OPERATING INFORMATION

Engine Failure In Flight:

1. Gain all the altitude you can!
   Pull back (gently) to use the aircraft’s momentum to gain altitude until airspeed falls off to the optimum glide speed (82 MPH IAS; 71 Knots).

2. Airspeed - Optimum glide speed 82 MPH IAS (71 Knots)
   Trim the airplane for optimum glide speed.

3. Find a suitable place to land and fly to it
   If altitude and distance to selected site permit, try to set up a normal landing pattern. If that’s not possible, take what you can get. Regardless of whether or not a full pattern can be set up, make sure the approach results in a landing parallel to any furrows in the selected field.

4. If time permits, try to correct the problem
   Fuel Selector.................................Fullest tank
   Electric Fuel Pump..........................On
   Mixture ......................................Rich (Forward)
   Carburetor Heat.............................On
   Throttle........................................1/4 Inch
   Primer..........................................In and Locked
   Master Switch ...............................On (Both sides)
   Ignition switch ..............................Both magnetos
   Start - if propeller is stopped.

5. If still have time communicate
   Transponder .................................7700
   Comm Radio .................................121.5

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Emergency Landing Without Engine Power:

1. Fly the airplane
   Airspeed ......................................82 MPH IAS / 71 Knots (flaps up)
   76 MPH IAS / 66 Knots (flaps down)

2. Prepare aircraft for landing
   Mixture ......................................Idle cutoff
   Fuel Selector .................................Off
   Electric Fuel Pump ..........................Off
   Ignition Switch .............................Off
   Flaps ..........................................As required (40° recommended)
   Master Switch ...............................Off
   Door ............................................Unlatch prior to touchdown

3. Landing
   Touchdown .................................Lowest possible speed
   Brakes .......................................Apply heavily
Precautionary Landing With Engine Power:

1. Fly the airplane
   - Airspeed: As appropriate
   - Flaps: 25°
   - Selected Field: Inspect
     Fly over field noting terrain and obstructions then retract flaps upon reaching a safe altitude and airspeed.

2. Prepare airplane for landing
   - Radios and Electrical: Off
   - Flaps: As required
   - Airspeed: 76 MPH IAS (66 Knots) on final
   - Master Switch: Off
   - Door: Unlatch prior to touchdown

3. Landing
   - Touchdown: As slow as possible
   - Ignition Switch: Off
   - Brakes: Apply heavily

Ditching:

1. Prepare for ditching
   - Radio: Transmit MAYDAY on 121.5
     Give location, situation and intentions.
     Note, if you were already communicating with ATC, report situation to controller, as opposed to using 121.5.
   - Transponder: 7700
   - Heavy Baggage: Secure or jettison

2. Fly the airplane
   - Approach
     - High wind / Heavy seas - Into the wind
     - Light winds / Heavy swells - Parallel to the swells
   - Flaps: 25° - 40°
   - Power: 300 ft./min. descent, 76 MPH IAS (66 Knots).
   - Cabin Doors: Unlatch prior to touchdown

3. Landing
   - Touchdown: Level attitude at 300 ft./min. descent
   - Face: Cushion with folded coat
   - Evacuate: Through door.
     If necessary, open window to allow cabin to flood to equalize pressure so door can be opened.
   - Life Vests and Raft: Inflate
Engine Fire During Start Up:

If Engine Has No Started
  Mixture ................................ Idle Cutoff
  Throttle ................................ Full Open
  Crank engine with starter to suck fire into the engine

If Engine Has Started
  Continue running to try to suck fire into the engine

In either case if fire is not out in a few seconds
  Fuel........................................ Off
  Mixture .................................... Idle Cutoff
  Use fire extinguisher

Engine Fire In Flight:

  Fuel Selector............................. Off
  Throttle.................................. Closed
  Mixture .................................... Idle Cutoff
  Heater ..................................... Off
  Defroster ................................ Off
  Landing .................................... Forced Landing Without Power

Cabin Fire:

  Master Switch ............................ Off
  Vents, Cabin Heat/Air .................... Closed
  Fire Extinguisher ........................ Activate
    After using fire extinguisher within a closed cabin ventilate the cabin.
  Landing ................................. As soon as possible

Wing Fire:

  Navigation lights ........................ Off
  Strobe Lights ............................ Off
  Pitot Heat ............................... Off

Attitude
  Perform side-slip to keep the flames away from the fuel tank and cabin.
  Land ................................. ASAP
    Do not use flaps.

Electrical Fire In Flight:

  Master Switch ............................ Off
  Vents .................................... Open
  Cabin Heat/Defroster .................... Off
  Landing .................................... As soon as possible
Pre-Flight Inspection Checklist:

1. Wing Tops/Fuel Tanks
   - Fuel Level................................ Both Wings - Visual check
     If needed get gas (AVGAS 100) before proceeding with other
     fuel tank related items.
   - Filler caps ................................ Both Wings - Secure
   - Wing Tops................................... Inspect for loose screws,
     rivets and damage

2. Cockpit
   - Control wheel lock ..................... Remove
   - Ignition switch .......................... Off
   - Master switch ............................. On (both sides)
   - Fuel gauges ............................... Check quantity
   - Flaps ...................................... 10°
   - Pitot Heat ................................. On - observe Ammeter
     drop - then off
   - Strobe/Beacon ............................ On - visually check - off
   - Master Switch ............................. Off
   - Fuel tank selector ........................ On fullest tank

Paperwork:
   - Airworthiness certificate
   - Registration
   - Operating limitations (POH)
   - Weight/loading data

3. Cockpit - Night Flights
   - Nav Lights & Strobes .................... On
     Walk around plane and visually check to see that all are
     operating.
   - Landing Light ............................. On
     Visually check from outside if not dark enough to see that it's
     on from inside the cockpit.
   - Instrument Lights ........................ On
   - Light switches ............................ Off (except beacon)
   - Master switch ............................. Off

3. Right Wing
   - Flap ........................................ Check freedom of
     movement and security.
   - Aileron .................................... Check security and
     freedom of movement
   - Wing tip .................................... Check for cracks; Check
     light security.
   - Leading edge .............................. Look for dents
   - Fuel sump .................................. Check sample for color,
     water and dirt.
   - Main landing gear ........................ Check tire wear, brake
     pads, leaking brake fluid.
4. Nose
Cowling ......................... Check secured.
Oil .................................. 8 Quarts max; 6 Quarts minimum.
Nose gear ......................... Check tire wear; Strut inflation; security
Engine compartment ............ Check for bird’s nests
Propeller ......................... Check for nicks and security;
Spinner .......................... Check security
Landing light ..................... Check security
Air Filter .......................... Check clean and security
Fuel sump .......................... Check sample for color, water and dirt.

4. Left Wing
Leading edge ..................... Look for dents
Main landing gear ............... Check tire wear, brake pads, leaking brake fluid.
Fuel sump ......................... Check sample for color, water and dirt.
Pitot/Static ....................... Check cover off; Check holes not obstructed.
Wing tip .......................... Check for cracks; Check light security.
Aileron ............................ Check security and freedom of movement.
Flap .................................. Check freedom of movement and security.
Stall Warning Vane .............. Check for free operation

5. Fuselage – Left Side
Check for loose rivets, screws and damage.

6. Empenage
Stabilator .......................... Check security and freedom of movement.
Rudder ............................. Check security and freedom of movement.

7. Fuselage – Right Side
Check for loose rivets, screws and damage
Baggage Door ..................... Closed and locked
Normal Engine Starting Checklist:

1. Before Starting
   - Preflight Inspection: Completed
   - Seat position: Adjust & ensure locked
   - Seal belts/harness: Adjust and lock
     - Brief passengers on use of belts/harnesses and requirements for wearing them.
   - Fuel Selector: Fullest Tank
   - Radios/electrical: Off
   - Autopilot: Off
   - Brakes: Test and set
   - Circuit Breakers: Check all in

2. Starting Engine
   - Mixture: Rich (Forward)
   - Carburetor heat: Cold (up)
   - Primer: Prime if required
     - Make sure locked in
   - Throttle: 1/4 Inch
   - Key: In ignition
   - Master Switch: On (both sides)
   - Fuel Pump: On
   - Propeller Area: Call “Clear” & check prop area and behind plane
   - Ignition: Start - release on start
   - Throttle: 1,000 RPM
   - Oil Pressure: Check in green

3. Before Taxiing
   - Radios: On and set to appropriate frequency. Call for radio check
   - Transponder: Standby
   - Beacon/Strobe: On
   - Nav. Lights/Strobes: On if required
   - Flaps: Full up (normal takeoff)

4. Taxiing
   - Clearance: Check for things in way of wings
     - Check for people ahead of and behind plane
   - Flight Controls: Set for existing wind conditions
   - Brakes: Come to full stop immediately after starting taxi roll
5. IFR Instrument Checks
   Turn Coordinator.......................... Should indicate turn in proper direction while taxiing.
   Attitude Indicator ......................... Very little change due to turns; Slight pitch indications due to acceleration or deceleration.
   Heading Indicator......................... Should track headings.
   Altimeter.................................... When set to current altimeter setting should indicate within 75 ft. of airport elevation.
   VSI ........................................ Should indicate zero. If not, note indication and use for level indication in flight.
   VORs ....................................... Check at local ground check point or against each other based on some receivable signal.
Before Takeoff Checklist:

1. Final Cockpit Check
   - Cabin door: Closed and latched
   - Flight Controls: Free and correct
   - Elevator trim: Takeoff position
   - Rudder trim: Takeoff position

2. Flight Instruments: Check and set
   - Set attitude indicator to level flight position
   - Set altimeter to runway altitude or locally reported altimeter setting
   - Set heading indicator to magnetic compass

3. Comm Radio/VOR: Set to appropriate freqs
4. Beacon/Strobe: On
5. Nav Lights/Strobes: On if required
6. Autopilot: Off

2. Engine Run-up
   - Fuel Selector: Fullest Tank
   - Mixture: Rich (Forward)
   - Parking brake: Set or hold foot brakes
   - Throttle: 1,800 RPM

   On engine instruments:
   - Carburetor Heat: On
     - Check for RPM drop then back to off
   - Engine Instruments: Check
     - Oil pressure/temperature
     - Suction
     - Ammeter - Create electrical load with landing light.
       Make sure no more than needle width deflection.
   - Fuel Pump: Momentarily Off; Check for good fuel pressure; On
   - Throttle: 1,000 RPM
   - Throttle quadrant lock: Adjust
   - Transponder: Set to mode C/Altitude

   Check:
   - RPM drop should not exceed 125 RPM on either magneto.
   - RPM difference between magnetos should not exceed 50 RPM.
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Normal Takeoff and Climb Procedures

- Flaps: Full up
- Carburetor Heat: Cold (Up)
- Fuel Pump: On
- Elevator Trim: Takeoff position
- Rudder Trim: Takeoff position
- Heading indicator: Calibrate against compass
- Throttle: Full open (Forward)
- Engine Instruments: Check while starting roll
  - RPM: In the green arc
  - Oil Pressure: In the green
  - Oil Temperature: In the green
  - Suction: In the green
- Airspeed: Building
- Elevator: Lift nose wheel at 60 MPH (52 KIAS)
- Climb Speed: 85 MPH (74 KIAS)

Maximum Performance Takeoff (Short Field):

- Taxi: Maximum runway usage
  - Takeoff procedure should be started using ALL available runway. Taxi to end of runway and align with centerline.
- Brakes: Set and hold
- Flaps: 25°
- Carburetor Heat: Cold (Up)
- Fuel Pump: On
- Elevator Trim: Takeoff position
- Rudder Trim: Takeoff position
- Heading indicator: Calibrate against compass
- Throttle: Full open (in)
- Engine Instruments: Check before starting roll
  - RPM: In the green arc
  - Oil Pressure: In the green
  - Oil Temperature: In the green
  - Suction: In the green
- Brakes: Release
- Airspeed: Building
- Elevator: Slightly tail low
- Climb Speed: 74 MPH (65 KIAS) until obstacles are cleared, then 85 MPH (74 KIAS).
- Flaps: Retract at safe altitude with positive rate of climb.
PA-28-180 OPERATING INFORMATION

Soft Field Takeoff:

Taxi ............................................. Keep rolling to avoid bogging down

Flaps ............................................. 25°
  If 25° flaps are used, with obstacles ahead, leave them extended until the obstacle is cleared and at a safe altitude.

Carburetor Heat ......................... Cold (Up)

Fuel Pump .................................... On

Elevator Trim ............................ Takeoff position

Rudder Trim ............................. Takeoff position

Heading indicator ....................... Calibrate against compass or runway heading

Throttle ........................................ Full open (in)

Engine Instruments ........................ Check as starting roll
  RPM – In the green arc
  Oil Pressure - In the green
  Oil Temperature - In the green
  Suction - In the green

Airspeed ............................... Building

Elevator ................................. Slightly tail low
  Allow the airplane to lift off as soon as possible (before reaching safe climb speed). Level off at a few feet above the ground and fly in ground effect until reaching normal climb speed.

Climb Speed .......................... 74 MPH (65 KIAS) until obstacles are cleared, then 85 MPH (74 KIAS).

Flaps ........................................... Retract at safe altitude with positive rate of climb.

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After Takeoff Checklist

1. Climbout
   Airspeed .................................. 85 MPH (74 KIAS)
   Altitude .................................. Above 300 AGL
   Flaps ...................................... Up (one click at a time)
   Fuel Pump ................................ Off at 1,000 AGL; Check fuel pressure

2. At Cruise Altitude
   Attitude ................................. Level
   Airspeed .................................. Let build to desired cruise speed
   Throttle .................................. Reduce to desired cruise setting
   Heading Indicator .................... Calibrate against compass

3. Above 5,000 MSL
   Mixture .................................... Lean for maximum RPM

Enroute Climb:

Normal Airspeed ....................... 100 MPH (87 KIAS)
Max Performance ...................... See POH Climb Table in Section IV

Throttle .................................. Full Open (Forward)

Carburetor Heat ....................... Cold (Up)

Mixture .................................... Rich (Forward) below 5,000 ft. Leaned for maximum RPM above 5,000.
Normal Approach and Landing Procedures:

1. Pre-Landing (Downwind) check
   - Seat belts/Harnesses .................... Adjust and lock
   - Mixture .................................. Rich (Forward)
   - Fuel Selector ......................... Fullest Tank
   - Fuel Pump ............................... On; Check fuel pressure
   - Autopilot ................................ Off

2. Approach and Landing
   - Power .................................... Reduce to 1,300 to 1,500 RPM abeam approach end of runway
   - Airspeed ................................. Let bleed off to less than 115 MPH (100 KIAS)
   - Flaps ..................................... Use as desired
     - Under light (less than 10 Knots) wind conditions 10° descending on the end of the downwind leg, 25° on base, and full flaps over the threshold as required.
     - In heavier winds 25° or less is good flap setting for landing.
     - Use minimum flap setting possible for cross wind landing

Airspeeds
   - Downwind through base 90 MPH (78 KIAS)
   - Final approach 80 - 85 MPH (70 – 74 KIAS)
   - In gusty winds add 1/2 difference between gust and average wind speed to approach speed.

Touchdown
   - Just above stalling speed - main wheels first.

Landing Roll
   - Lower nose wheel gently

Braking
   - Minimum required.

Short Field Landing:

1. Pre-Landing (Downwind) check
   - Seat belts/Harnesses .................... Adjust and lock

Mixture ........................................ Rich (Forward)
Fuel Selector ............................... Fullest Tank
Fuel Pump .................................... On; Check fuel pressure
Autopilot .................................... Off

2. Approach and Landing
   - Power .................................... Reduce to 1,300 to 1,500 RPM abeam approach end of runway
   - Airspeed ................................. Let bleed off to less than 115 MPH (100 KIAS)
   - Flaps
     - Under light (less than 10 Knots) wind conditions 10° descending on the end of the downwind leg, 25° on base, and full flaps on final.
   - Airspeeds
     - Downwind through base 90 MPH (78 KIAS)
     - Final approach 70 - 75 MPH (61 – 65 KIAS)
     - In gusty winds add 1/2 difference between gust and average wind speed to approach speed.

Touchdown
   - Roundout must be done much faster than usual due to low airspeed.

Landing Roll ................................. Hold Nose off as long as possible.

Braking ........................................ Maximum possible without sliding tires; Hold full up elevator

Flaps ......................................... Retract
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**Soft Field Landing:**

1. **Pre-Landing (Downwind) check**
   - Seat belts/Harnesses .................. Adjust and lock
   - Mixture .................................. Rich (Forward)
   - Fuel Selector .......................... Fullest Tank
   - Fuel Pump ............................. On; Check fuel pressure
   - Autopilot ................................ Off

2. **Approach and Landing**
   - Power .................................. Reduce to 1,300 to 1,500 RPM abeam approach end of runway
   - Airspeed ............................... Let bleed off to less than 115 MPH (100 KIAS)
   - Flaps .................................. Use as desired
     - Under light (less than 10 Knots) wind conditions 10° descending on the end of the downwind leg, 25° on base, and full flaps over the threshold as required.
     - In heavier winds 25° or less is good flap setting for landing.
     - Use minimum flap setting possible for cross wind landing
   - Airspeeds
     - Downwind through base 90 MPH (78 KIAS)
     - Final approach 80 - 85 MPH (70 – 74 KIAS)
     - In gusty winds add 1/2 difference between gust and average wind speed to approach speed.
   - Touchdown
     - Just above stalling speed - main wheels first.
   - Landing Roll
     - Hold nose wheel off as long as possible
   - Braking
     - Minimum required.
   - Flight Controls .......................... Full up elevator

**Balked Landing (Go Around):**

- Throttle .................................. Full Open (in)
Post-Landing Checklists:

1. After Landing - Clear of Runway
   - Flaps ........................................ Full Up
   - Carburetor Heat .......................... Off (Up
   - Fuel Pump ................................. Off
   - Elevator Trim .............................. Takeoff position
   - Rudder Trim ............................... Takeoff position

2. If Hard Landing
   - ELT ........................................... Listen for on 121.5 on communications radio

3. Engine Shutdown
   - Radios/Electrical .......................... All off
   - Throttle .................................... 1,000 RPM
   - Master Switch ............................. Off
   - Mixture ..................................... Idle cutoff
   - Ignition .................................... Off

4. Securing the Airplane
   - Control Lock .............................. Install
   - Tiedown .................................... Wings and Tail
   - Pitot Cover ................................ Install
   - Double Check
     - All electrical equipment - Off
     - Master Switch - Off

5. Close your Flight Plan

Before Leaving Home

1. Self Check
   - Feeling ok ................................ Yes
   - Under any stress ......................... No more than usual
   - Taking any medication .................. No
   - Alcohol in last 12 Hrs ................... No

2. Flight Planning/Navigation Equipment
   - Current Charts
   - A/FD
   - POH
   - Airport Guide
   - E6-B
   - Plotter
   - Calculator
   - Timer
   - Custom Checklists
   - Flight Plans
   - Weather Reports
   - Pensils
   - Clipboards

3. Emergency Items
   - Hand Compass
   - Knife
   - Flashlights
   - Batteries
   - Bulbs
   - Cell Phone (Charged)
   - Spare Glasses
   - Sun Glasses