

# **CESSNA - 152 (172) [ 182 ]**

## **NORMAL OPERATING PROCEDURES**

prepared by Demetri Capetanopoulos

### **PREFLIGHT – MAINTENANCE RECORDS**

1. (IFR) Tested & inspected within prior 24 months:
  - a. Static pressure system
  - b. Altimeter instrument
  - c. Automatic pressure altitude reporting system
2. Tested & inspected within prior 12 calendar months:
  - a. ELT operation (batteries replaced at 50% life)
  - b. Annual inspection
3. (IFR) VOR operationally checked within prior 30 days
4. 100 hr inspection required if flight for hire

### **PREFLIGHT – COCKPIT**

1. Keys – IN PLAIN SIGHT
2. Aircraft Forms – CHECK & RECORD HOBBS / TACH
3. Required Documents – CHECK
  - a. Airworthiness Certificate
  - b. Registration
  - c. Airplane Flight Manual
  - d. Weight & Balance
4. Control Lock – REMOVE/STOWED
5. Throttle – IDLE
6. Mixture – FULL LEAN
7. Avionics Power Switch/All Switches – OFF
8. Master Switch – ON
9. Avionics Cooling Fan – CHECK AUDIBLY
10. Pitot Heat – ON/CHECKED
11. Strobe, Navigation Lights & Beacon – ON/CHECKED
12. Fuel Gauges – CHECK
13. Flaps – EXTEND FULL DOWN
14. Master Switch – OFF
15. Fuel Selector Valve – BOTH (LEFT)

## **PREFLIGHT – FUSELAGE, LEFT SIDE**

1. Door Hinges – CHECK PINS
2. Left Main Gear – CHECK
  - a. Strut
  - b. Brake and brake line
  - c. Tire condition and inflation = 30 (34) [ 42 ] PSI
  - d. Wheel pant / strut fairing (if installed)
  - e. Chocks -- REMOVE
3. Baggage Door – CLOSED/LOCKED
4. Fuselage – GENERAL CONDITION

## **PREFLIGHT – EMPENNAGE**

1. Horizontal Stabilizer – CHECK
2. Elevator – CHECK
3. Rudder – SECURITY/MOVEMENT/TRIM TAB
4. Tiedown Ring – REMOVE TIEDOWN
5. Navigation Light – CHECK
6. Fuselage – CHECK UNDERSIDE
7. VOR Antenna – CHECK

## **PREFLIGHT – FUSELAGE, RIGHT SIDE**

1. Fuselage – GENERAL CONDITION
2. ELT Antenna – CHECK
3. Right Main Gear – CHECK
  - a. Strut
  - b. Brake and brake line
  - c. Tire condition and inflation = 30 (34) [ 42 ] PSI
  - d. Wheel pant / strut fairing (if installed)
  - e. Chocks – REMOVE
4. Transponder Antenna – CHECK

## **PREFLIGHT – RIGHT WING**

1. Flaps – CHECK
2. Aileron – HINGES & BALANCE / MOVEMENT
3. Wing Tip/Nav Light/Strobe Light – CHECK
4. Leading Edge – CHECK
5. Wing Strut – CHECK/REMOVE TIEDOWN
6. Cabin Air Intake – CHECK CLEAR
7. Right Door Hinges – CHECK PINS
8. Wing Sump – CHECK GRADE / CONTAMINENTS
9. Fuel Tank – CHECK FUEL & SECURE CAP
10. Upper Wings – CHECK

## **PREFLIGHT – ENGINE**

1. Oil – CHECK LEVEL 4 -6 quarts [ 9-12 quarts ]  
– SECURE CAP
2. Fuel Strainer Drain Knob – DRAIN (at least 4 sec)
3. Cowl – CHECK SECURE
4. Carburetor Air Intake – CHECK CLEAN
5. Propeller – CHECK FOR NICKS [ and OIL LEAKS ]
6. Spinner – CHECK SECURE
7. Alternator Belt – CHECK
8. Inside Cowling – CHECK
9. Nose Gear – CHECK
  - a. Strut extended 2-3 inches, 20 (45) [ 55-60 ] PSI
  - b. Tire condition and inflation = 29 (28) [ 50 ] PSI
  - c. Chock – REMOVE
10. Landing Light – CHECK
11. Static Port – CHECK CLEAR [ both sides of aircraft ]

## **PREFLIGHT – LEFT WING**

1. Fuel Tank – CHECK FUEL/SECURE CAP
2. Upper Wings – CHECK
3. Cabin Air Intake – CHECK CLEAR
4. Wing Strut – CHECK/REMOVE TIEDOWN
5. Fuel Tank Vent – CHECK
6. Stall Warning – CHECK CLEAR
7. Pitot Tube – CHECK CLEAR / COVER REMOVED
8. Leading Edge – CHECK
9. Wing Tip/Nav Light/Strobe Light – CHECK
10. Aileron – HINGE/BALANCE/MOVEMENT
11. Flaps – CHECK
12. Wing Sump – CHECK GRADE / CONTAMINENTS
13. Chocks – REMOVE

## **FIRE: DURING START ON THE GROUND**

1. Cranking – CONTINUE, to get a start, which would suck the flames and accumulated fuel through the carburetor and into the engine.

If engine starts:

2. Power – 1700 RPM for a few minutes
3. Engine – SHUTDOWN and inspect for damage

If engine fails to start:

4. Cranking – CONTINUE, in an effort to obtain a start
5. Fire Extinguisher – OBTAIN
6. Engine – SECURE
  - a. Mixture – IDLE CUT OFF
  - b. Master Switch – OFF
  - c. Ignition Switch – OFF
  - d. Fuel Selector Valve – OFF
7. Fire – EXTINGUISH using fire extinguisher, wool blanket or dirt

## **BEFORE STARTING ENGINE**

1. All Items – SECURE
2. Passenger – BRIEFED ON Exits/Seat Belts/Stall Horn
3. Seats – ADJUSTED & LOCKED
4. Seat Belts – FASTENED
5. Avionics Power Switch/ALL Switches – OFF
6. Circuit Breakers – CHECKED IN
7. Fuel Selector Valve – BOTH
8. [ Cowl Flaps – OPEN ]
9. Brakes – TEST & HOLD
10. Ignition Key – INSERT

## **STARTING ENGINE**

1. Mixture – RICH
2. [ Propeller – HIGH RPM ]
3. Throttle – OPEN  $\frac{1}{4}$  [  $\frac{1}{2}$  ] INCH
4. Carburetor Heat – COLD
5. Prime – AS REQUIRED
6. Master Switch – ON
7. Rotating Beacon – ON
8. Instrument Lights – ON (night)
9. Brakes – HELD
10. Propeller Area – CLEAR
11. Starter – ENGAGE
12. Throttle – 800 – 1000 RPM
13. Oil Pressure – CHECK  
(10 PSI rise w/in 30 sec, 1 min cold wx)
14. Ammeter – CHECK

**\*\* CAUTION \*\***

**If ammeter indicates full scale charge at 1000 RPM, starter is not disengaged. Shut down engine and accomplish shut down checklist.**

## **BEFORE TAXI**







1. Throttle – 800 – 1000 RPM
2. Nav Lights – ON (night)
3. Landing Light – AS REQUIRED
4. Avionics Power Switch/ Radios – ON
5. Transponder – CODE SET/STANDBY MODE
6. Flaps – UP
7. Fuel Selector – BOTH
8. ATIS – MONITOR
9. Flight Instruments – CHECK/SET
  - a. Airspeed – CHECK
  - b. Attitude Indicator – SET
  - c. Altimeter – SET (indicates within 75ft for IFR)
  - d. Turn Coordinator – CHECK
  - e. Magnetic Compass – CHECK
  - f. Heading Indicator – SET
  - g. Vertical Speed Indicator – CHECK
10. Clearance Delivery – CONTACT
11. Ground Control – CALL FOR TAXI

## **TAXI**

1. Brakes – CHECK
2. Turn Coordinator – CHECK
3. Heading Indicator – CHECK
4. Attitude Indicator – CHECK
5. Control Surfaces – SET FOR WIND DIRECTION
  - Headwind – Bank Into
  - Tailwind – Dive Away

## ENGINE RUNUP

1. Throttle – 800 – 1000 RPM
2. Fuel Selector Valve – BOTH
3. Trim – SET
4. Flight Controls – CHECK FREEDOM & DIRECTION
5. Mixture – RICH (Below 3000 ft density alt)
6. Brakes – SET
7. Primer – IN & LOCKED
8. Throttle – 1700 RPM
9. Engine Instruments – CHECK
10. Suction Gauge – CHECK
11. Magnetos – CHECK  
(max drop 125 RPM, max diff 50 RPM)
12. [ Propeller – EXERCISE THEN FULL INCREASE ]  
(do not allow >500 RPM drop)
  - 1<sup>st</sup> – check RPM decrease
  - 2<sup>nd</sup> – check manifold pressure increase
  - 3<sup>rd</sup> – check oil pressure decrease
13. Carburetor Heat – CHECK
14. Ammeter – CHECK (Alt-OFF, low-volt light, Alt-ON)
15. Throttle – 800 – 1000 RPM
16. Throttle Friction – ADJUST

Steady Green		Cleared for takeoff
Flashing green		Cleared to Taxi
Steady Red		Stop
Flashing Red		Taxi clear of runway in use
Flashing White		Return to starting point
Alt Red/Green		Exercise extreme caution

## **BEFORE TAKEOFF**

1. Flaps – SET
2. Flight Instruments – CHECK
3. Fuel Selector Valve – BOTH
4. Trim – SET
5. Radio – FREQUENCIES SET
6. Carburetor heat – OFF/COLD
7. Brief – TAKEOFF/DEPARTURE EMERGENCY

Accomplish the following immediately before takeoff.

8. Transponder – ALTITUDE
9. D.G. & Compass – CHECK
10. Doors & Windows – CLOSED/LOCKED
11. Strobe Light – ON
12. Landing Light – ON
13. Contact Tower – READY FOR TAKEOFF
14. Time—RECORDED

## **ENGINE FAILURE: DURING TAKEOFF RUN**

1. Throttle – IDLE
2. Brakes – APPLY
3. Wing Flaps – RETRACT
4. Mixture – IDLE CUT OFF
5. Ignition Switch – OFF
6. Master Switch – OFF



## ENGINE FAILURE: IMMEDIATELY AFTER TAKEOFF

1. Glide – ESTABLISH
  - a. Flaps Up – 60 KIAS (65 KIAS) [ 75 KIAS ]
  - b. Flaps Down – 60 KIAS [ 70 KIAS ]
2. Mixture – IDLE CUT OFF
3. Fuel Selector Valve – OFF
4. Ignition Switch – OFF
5. Wing Flaps – AS REQUIRED
6. Master Switch – OFF

**NOTE** Absolutely no turn-back to runway below 600' AGL  
 All turns <45° (↑ bank = ↑ sink rate & stall speed)  
 Make turns into wind to extend glide

**TAKEOFF REJECTION** – max braking on dry, level pavement  
 (Add/subtract 10% for each 9kts head/tail wind, +15% on grass)

A/C Type	Press Alt	T/O Roll		5 sec reaction	LDG Roll		total dist req		
		0°C	30°C		0°C	30 °C	0°C	30 °C	
C-152	1000	640	628	+ 500	+ 465	605	=	<b>1605</b>	<b>1733</b>
	5000	1040	1315	+ 500	+ 540	600	=	<b>2080</b>	<b>2413</b>
C-172	1000	875	1090	+ 500	+ 530	590	=	<b>1905</b>	<b>2180</b>
	5000	1285	1620	+ 500	+ 615	685	=	<b>2400</b>	<b>2805</b>
C-182	1000	785	975	+ 500	+ 580	645	=	<b>1865</b>	<b>2120</b>
	5000	1125	1400	+ 500	+ 670	745	=	<b>2295</b>	<b>2645</b>

### NORMAL TAKEOFF

1. Wing Flaps – SET (0 or 10 Degrees)
2. Carburetor Heat -- COLD
3. Mixture – RICH (Below 3000 ft Density Alt)
4. Throttle – FULL
5. Engine Instruments – (2300-2400 RPM, Oil Pressure)
6. Rotate – 50 KIAS (55 KIAS) [ 50 KIAS ]
7. Climb – 65-75 KIAS (70-80 KIAS) [ 80 KIAS flaps up ]

## **SHORT FIELD TAKEOFF**

1. Flaps – 10 [ 20 ] DEGREES
2. Carburetor Heat -- COLD
3. Mixture – RICH (Below 3000 ft Density Alt)
4. Brakes – HELD
5. Throttle – FULL [ and 2400 RPM ]
6. Engine Instruments – CHECK  
(2300-2400 RPM, Oil Pressure)
7. Brakes – RELEASE (check airspeed moving)
8. Rotate – 50 KIAS (51 KIAS) [ 59 KIAS ]
9. Climb – 54 KIAS (59 KIAS @ 2300 lbs) [ 59 KIAS ]  
(56 KIAS @ 2100 lbs)  
(54 KIAS @ 1900 lbs)

## **SOFT FIELD TAKEOFF**

1. Flaps – 10 [ 20 ] DEGREES
2. Carburetor Heat -- COLD
3. Mixture – FULL RICH (Below 3000 ft Density Alt)
4. Control Wheel – MAINTAIN FULL AFT TO  
MINIMIZE WEIGHT ON  
NOSEWHEEL
5. Throttle – FULL [ and 2400 RPM ]
6. Engine Instruments – CHECK  
(2300-2400 RPM, Oil Pressure)
7. Control Wheel – AS NECESSARY TO LIFT NOSE  
WHEEL
8. Liftoff – AT MINIMUM SPEED
9. Control Wheel – FORWARD AS NEEDED TO KEEP  
AIRCRAFT IN GROUND EFFECT
10. Climb – AFTER AIRSPEED OF  $V_y$ :  
67 KIAS (76 KIAS) [ 81 KIAS ]
11. Flaps – UP, INCREMENTALLY

Flashing green (in air)  Return to land

## **ENROUTE CLIMB**

1. Airspeed – 70-80 KIAS (70-85 KIAS) [ 85-95 KIAS ]
2. Throttle – FULL OPEN [ 23 inches Hg & 2400 RPM ]
3. Mixture – FULL RICH (above 3000 ft lean as required)  
[ above 5000 ft lean as required ]
4. Engine Instruments – CHECK
5. [ Cowl Flaps – OPEN AS REQUIRED ]
6. Landing Light – AS REQUIRED

## **LEVEL OFF / CRUISE**

1. Throttle – POWER SET [ 55 - 75% ]
2. Mixture – SET AS REQUIRED
3. Fuel Selector Valve – BOTH
4. [ Cowl Flaps – AS REQUIRED to maintain cylinder  
head temperatures at 2/3 of normal operating range ]
5. Heading Indicator – SET
6. Engine Instruments – CHECKED
7. Fuel Gauges – CHECKED
8. Suction Gauges – CHECKED
9. Landing Light – AS REQUIRED

## **DESCENT**

1. Mixture – ENRICH
2. Fuel Selector Valve – BOTH
3. Carburetor Heat – AS REQUIRED
4. Throttle – AS REQUIRED
5. [ Cowl Flaps – CLOSED ]
6. Seat Belts & Harness – SECURE
7. Landing Light – ON

## **ENGINE FAILURE: DURING FLIGHT**

1. Airspeed – 60 KIAS (65 KIAS) [ 75 KIAS ]  
(into headwind ↑ IAS by ½ wind speed for max glide)
2. Carburetor Heat – ON
3. Fuel Selector Valve – BOTH
4. Mixture – FULL RICH
5. Ignition Switch – BOTH (START if propeller is stopped)
6. Primer – IN and LOCKED

## **FORCED LANDING WITHOUT POWER**

1. Airspeed – 65 KIAS [ 75 KIAS ] flaps up  
60 KIAS [ 70 KIAS ] flaps down
2. Mixture – IDLE CUT OFF
3. Fuel Selector Valve – OFF
4. Ignition Switch – OFF
5. Wing Flaps – AS REQUIRED
6. Master Switch – OFF
7. Doors – UNLATCH PRIOR TO TOUCHDOWN
8. Brakes – APPLY HEAVILY

Glide ratio ~ 1: 9  
Every 2000' AGL → 3nm

## **PRECAUTIONARY LANDING**

1. Airspeed – 60 KIAS [ 75 KIAS ]
2. Flaps – 20 DEGREES
3. Selected Field – FLY OVER (note terrain and obstacles  
then retract flaps upon reaching safe altitude / airspeed)
4. Avionics Power Switch/All Switches – OFF
5. Wing Flaps – 30 (40) [ 40 ] DEGREES
6. Airspeed – 55 KIAS (60 KIAS) [ 70 KIAS ]
7. Master Switch – OFF
8. Doors – UNLATCH PRIOR TO TOUCHDOWN
9. Touchdown – SLIGHTLY TAIL LOW
10. Ignition Switch – OFF
11. Brakes – APPLY HEAVILY

## **ENGINE FIRE IN FLIGHT**

1. Mixture – IDLE CUT OFF
2. Fuel Selector Valve – OFF
3. Master Switch – OFF
4. Cabin Heat and Air – OFF (except wing root vents)
5. Airspeed – 85 KIAS (100 KIAS) [ 100 KIAS ]  
(increase glide speed to extinguish the fire)
6. Forced Landing – EXECUTE EMERGENCY  
LANDING WITHOUT ENGINE POWER

## **ELECTRICAL FIRE IN FLIGHT**

1. Master Switch – OFF
2. Avionics Power Switch – OFF
3. All Other Switches (except ignition) – OFF
4. Vents/Cabin Air/Heat – CLOSED
5. Fire Extinguisher – ACTIVATE

**\*\* WARNING \*\***

**Ventilate the cabin after discharging fire extinguisher.**

If fire appears to be out and electrical power is necessary for flight:

6. Master Switch – ON
7. Circuit Breakers – CHECK for faulty circuit  
DO NOT RESET
8. Radio/Electrical Switches – ON ONE AT A TIME  
(until short is located)
9. Vents/Cabin Air/Heat – OPEN when fire extinguished

## WING FIRE IN FLIGHT






1. Navigation Light Switch – OFF
2. Strobe Light Switch – OFF
3. Pitot Heat Switch (if installed) – OFF
4. Airplane – SIDE SLIP to keep flames away from fuel tank & cabin. LAND AS SOON AS POSSIBLE with flaps retracted

## CABIN FIRE IN FLIGHT

1. Master Switch – OFF
2. Vents/Cabin Air/Heat – CLOSED
3. Fire Extinguisher – ACTIVATE
4. Airplane – LAND AS SOON AS POSSIBLE

## LANDING WITH A FLAT MAIN TIRE

1. Approach – NORMAL
2. Flaps - 30 DEGREES (preferred for slowest touchdown)  
Consider landing with crosswind coming from direction of the good tire
3. Touchdown – GOOD TIRE FIRST  
(hold airplane off flat tire as long as possible)

Steady Green		Cleared to land
Flashing green		Return to land
Steady Red		Stop / Give way
Flashing Red		Do not land
Alt Red/Green		Exercise extreme caution

## PILOT REPORT

Aircraft ID / Location / Time (Z) / Conditions

Icing: Intensity / Altitude / Aircraft Type / IAS / OAT

Turbulence: Intensity / In or near clouds / Altitude /  
Aircraft Type / Duration of turbulence

Wind Shear: Loss / gain of airspeed and altitude

## (IFR) POSITION REPORT

Aircraft ID / Position / Time / Altitude /  
ETA at next point / Next succeeding point

Time  
Turn  
Twist  
Throttle  
Talk

## (IFR) REQUIRED REPORTS

Vacating assigned alt	Change TAS 5% or 10 kts
Alt change-VFR on Top	TIME & ALT reaching fix
Missed approach	Unable climb/descend 500 fpm
NAVAID malfunctions	Hazardous weather conditions

## (IFR) APPROACH

1. **A** TIS – CHECK
2. **S** tack (radios / nav aids) – SET FREQ & ID
3. **A** pproach brief – PERFORM
  - M** arker beacon indicators tested & selected
  - I** dentify NAVAIDS used
  - C** ourse – Final approach course
  - E** ntry type – vectored or full
  - A** ltitudes – FAF, MDA or DH
  - T** ime – to reach missed approach point
  - M** issed approach procedure
4. **P** re-landing checklist - PERFORM

## **BEFORE LANDING**

1. Fuel Selector Valve – BOTH
2. Mixture – FULL RICH
3. Carburetor Heat – ON
4. Seat Belts & Harness – SECURE
5. Landing Light – ON
6. [Propeller – HIGH RPM ]

## **GO AROUND**

1. Throttle – FULL [ and 2400 RPM ]
2. Carburetor Heat – COLD
3. Flaps – REDUCE TO 20 DEGREES IMMEDIATELY
4. Climb Speed – 55 KIAS
5. Flaps – UP after safe altitude and 60 [ 70 ] KIAS
6. [ Cowl Flaps – OPEN ]

## **SHORT FIELD LANDING**

1. Flaps – FULL DOWN
2. Airspeed – 54 KIAS (60 KIAS) [ 61 KIAS ]
3. Touchdown – MAIN WHEEL FIRST
4. Brakes – APPLY HEAVILY (do not skid tires)
5. Wing Flaps – RETRACT







## **SOFT FIELD LANDING**

1. Flaps – FULL DOWN
2. Airspeed – 54 KIAS (60 KIAS) [ 61 KIAS ]
3. Touchdown – MINIMUM AIRSPEED / NOSE HIGH
4. Landing Roll – MAINTAIN NOSE HIGH ATTITUDE
5. Braking – MINIMUM REQUIRED



## AFTER LANDING & CLEAR OF RUNWAY

1. Carburetor Heat – COLD
2. Flaps – UP
3. [ Cowl Flaps – OPEN ]
4. Transponder – OFF
5. Strobe Light – OFF
6. Landing Light – AS REQUIRED
7. Ground Control – CONTACT FOR TAXI

Steady Green		Cleared for takeoff
Flashing green		Cleared to Taxi
Steady Red		Stop
Flashing Red		Taxi clear of runway in use
Flashing White		Return to starting point
Alt Red/Green		Exercise extreme caution

## SHUTDOWN

1. Throttle – 1000 RPM
2. Avionics Power Switch – OFF
3. Exterior Lights – OFF

Magneto Grounding check: Cycle magneto to OFF briefly  
If engine continues to run a grounding connection is broken

4. Mixture – IDLE CUT OFF  
Tachometer should rise ~25 rpm prior to engine quit  
>25 rpm rise → idle mixture too rich  
<25 rpm rise → idle mixture too lean
5. Interior Lights – OFF
6. Magnetos – OFF / KEY REMOVED
7. Master – OFF
8. Fuel Selector Valve – BOTH (LEFT or RIGHT)

## **POSTFLIGHT**

Consider leaving the Rotating Beacon switch ON as an external visual indication if the Master Switch is inadvertently left on

1. Control Lock – INSTALL
2. Aircraft Forms – COMPLETED
  - a. Fuel – Record Quantity
  - b. Oil –Record Quantity
  - c. Hobbs meter – Record Reading
  - d. Tachometer – Record Reading
  - e. Discrepancies – Entered
3. Pitot Cover – INSTALLED
4. Aircraft – SECURE
  - a. Towbar – STOW
  - b. Safety Belts – STOW
  - c. Sunscreens – INSTALL
  - d. Doors & Windows – LOCK
  - e. Chocks – INSTALL
  - f. Tiedowns – ATTACH
5. ***CLOSE FLIGHT PLAN***

**CESSNA 152 (172) [ 182 ]  
EMERGENCY PROCEDURES**

**Emergency Frequency  
121.5**

**Transponder Code  
7700**

**Loss of Comms  
7600**

# **ENGINE FAILURES**

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## **DURING TAKEOFF RUN**

1. Throttle – IDLE
2. Brakes – APPLY
3. Wing Flaps – RETRACT
4. Mixture – IDLE CUT OFF
5. Ignition Switch – OFF
6. Master Switch – OFF

## **IMMEDIATELY AFTER TAKEOFF**

1. Glide – ESTABLISH
  - c. Flaps Up – 60 KIAS (65 KIAS) [ 75 KIAS ]
  - d. Flaps Down – 60 KIAS [ 70 KIAS ]
2. Mixture – IDLE CUT OFF
3. Fuel Selector Valve – OFF
4. Ignition Switch – OFF
5. Wing Flaps – AS REQUIRED
6. Master Switch – OFF

## **DURING FLIGHT**

1. Airspeed – 60 KIAS (65 KIAS) [ 75 KIAS ]
2. Carburetor Heat – ON
3. Fuel Selector Valve – BOTH
4. Mixture – FULL RICH
5. Ignition Switch – BOTH  
(START if propeller is stopped)
6. Primer – IN and LOCKED

## **FORCED LANDINGS**

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### **WITHOUT ENGINE POWER**

1. Airspeed – 65 KIAS [ 75 KIAS ] flaps up  
60 KIAS [ 70 KIAS ] flaps down
2. Mixture – IDLE CUT OFF
3. Fuel Selector Valve – OFF
4. Ignition Switch – OFF
5. Wing Flaps – AS REQUIRED
6. Master Switch – OFF
7. Doors – UNLATCH PRIOR TO TOUCHDOWN
8. Brakes – APPLY HEAVILY

### **PRECAUTIONARY WITH POWER**

1. Airspeed – 60 KIAS [ 75 KIAS ]
2. Flaps – 20 DEGREES
3. Selected Field – FLY OVER (note terrain and obstacles  
then retract flaps upon reaching safe altitude / airspeed)
4. Avionics Power Switch/All Switches – OFF
5. Wing Flaps – 30 DEGREES (40 DEGREES)
6. Airspeed – 55 KIAS (60 KIAS) [ 70 KIAS ]
7. Master Switch – OFF
8. Doors – UNLATCH PRIOR TO TOUCHDOWN
9. Touchdown – SLIGHTLY TAIL LOW
10. Ignition Switch – OFF
11. Brakes – APPLY HEAVILY

## **DITCHING**

1. Radio – TRANSMIT MAYDAY on 121.5 MHz
2. Transponder – SQUAWK 7700
3. Heavy Objects (baggage area) – SECURE/JETTISON
4. Approach:
  - High Winds, Heavy Seas – INTO THE WIND
  - Light Winds, Heavy Swells – PARALLEL TO SWELL
5. Wing Flaps – 30 DEGREES [ 20 – 40 DEGREES ]
6. Power – EST 300 FT/MIN DESCENT @ 55 [ 65 ] KIAS

[ NOTE: if no power is available approach at 75 KIAS  
with flaps up or 70 KIAS with 10 degrees of flaps ]

7. Cabin Doors – UNLATCH
8. Touchdown – LEVEL ATTITUDE AT 300 FT/MIN  
DESCENT
9. Face – CUSHION at touchdown with folded coat
10. Airplane – EVACUATE through doors. If necessary,  
open windows and flood cabin to equalize pressure.
11. Life Vests and Raft – INFLATE outside the aircraft.

# **FIRES**

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## **DURING START ON THE GROUND**

1. Cranking – CONTINUE, to get a start, which would suck the flames and accumulated fuel through the carburetor and into the engine.

If engine starts:

2. Power – 1700 RPM for a few minutes
3. Engine – SHUTDOWN and inspect for damage

If engine fails to start:

4. Cranking – CONTINUE, in an effort to obtain a start
5. Fire Extinguisher – OBTAIN
6. Engine – SECURE
  - a. Mixture – IDLE CUT OFF
  - b. Master Switch – OFF
  - c. Ignition Switch – OFF
  - d. Fuel Selector Valve – OFF
7. Fire – EXTINGUISH using fire extinguisher, wool blanket or dirt

## **ENGINE FIRE IN FLIGHT**

1. Mixture – IDLE CUT OFF
2. Fuel Selector Valve – OFF
3. Master Switch – OFF
4. Cabin Heat and Air – OFF (except wing root vents)
5. Airspeed – 85 KIAS (100 KIAS) [ 100 KIAS ]  
(increase glide speed to extinguish the fire)
6. Forced Landing – EXECUTE EMERGENCY  
LANDING WITHOUT ENGINE POWER

## **ELECTRICAL FIRE IN FLIGHT**

1. Master Switch – OFF
2. Avionics Power Switch – OFF
3. All Other Switches (except ignition) – OFF
4. Vents/Cabin Air/Heat – CLOSED
5. Fire Extinguisher – ACTIVATE

**\*\* WARNING \*\***

**Ventilate the cabin after discharging fire extinguisher.**

If fire appears to be out and electrical power is necessary for flight:

6. Master Switch – ON
7. Circuit Breakers – CHECK for faulty circuit  
DO NOT RESET
8. Radio/Electrical Switches – ON ONE AT A TIME  
(until short is located)
9. Vents/Cabin Air/Heat – OPEN when fire extinguished

## **CABIN FIRE IN FLIGHT**

1. Master Switch – OFF
2. Vents/Cabin Air/Heat – CLOSED
3. Fire Extinguisher – ACTIVATE
4. Airplane – LAND AS SOON AS POSSIBLE

## **WING FIRE IN FLIGHT**

1. Navigation Light Switch – OFF
2. Strobe Light Switch – OFF
3. Pitot Heat Switch (if installed) – OFF
4. Airplane – SIDE SLIP to keep flames away from fuel tank & cabin. LAND AS SOON AS POSSIBLE with flaps retracted



# **ELECTRICAL POWER SUPPLY SYSTEM MALFUNCTION**

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## **AMMETER SHOWS EXCESSIVE RATE OF CHARGE**

1. Alternator – OFF
2. Alternator Circuit Breaker – PULL
3. Nonessential Electrical Equipment – OFF
4. Flight – TERMINATE as soon as practical

## **LOW VOLTAGE LIGHT ILLUMINATES DURING FLIGHT**

### **NOTE**

Illumination of the low voltage light may occur during low RPM conditions with an electrical load on the system such as during a low RPM taxi. Under these conditions, the light will go out at higher RPM. The master switch need not be recycled since an over-voltage condition has not occurred to de-activate the alternator system.

1. Avionics Power Switch – OFF
2. Alternator Circuit Breaker – CHECK IN
3. Master Switch – OFF both sides
4. Master Switch – ON
5. Low – Voltage Light – CHECK OFF
6. Avionics Power Switch – ON

If Low-Voltage light illuminates again:

7. Alternator – OFF
8. Nonessential Radio and Electrical Equipment – OFF
9. Flight – TERMINATE as soon as practical

# ICING

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## INADVERTENT ICING ENCOUNTER

1. Pitot Heat (if installed) – ON
2. Turn back or change altitude to obtain an outside air temperature that is less conducive to icing.
3. Pull cabin heat control full out to obtain maximum defroster air temperature. For greater airflow at reduced temperatures, adjust the cabin air control as required.
4. Open the throttle to increase engine speed and minimize ice build-up on propeller blades
5. Watch for signs of carburetor air filter ice and apply carburetor heat as required. An unexpected loss in engine speed could be caused by carburetor ice or air intake filter ice. Lean the mixture for maximum RPM, if carburetor heat is used continuously.
6. Plan a landing at the nearest airport. With an extremely rapid ice build-up, select a suitable “off-airport” landing site.
7. With an ice accumulation of ¼ inch or more on the wind leading edges, be prepared for significantly higher stall speed.
8. Leave wing flaps retracted. With a severe ice build-up on the horizontal tail, the change in wing wake airflow direction caused by wing flap extension could result in a loss of elevator effectiveness.
9. Open left window and, if practical, scrape ice from a portion of the windshield for visibility in the landing approach.
10. Perform a landing approach using a forward slip, if necessary, for improved visibility.
11. Approach at 65 to 75 KIAS [ 80 to 90 KIAS ] depending upon the amount of ice accumulation.
12. Perform a landing in level attitude.

## **(IFR) LOSS OF COMMUNICATIONS**

1. Transponder – SQUAWK 7600
2. If VFR conditions – LAND AS SOON AS PRACTICAL
3. If IFR conditions exist – CONTINUE ACCORDING TO

### Route:

**A**ssigned – by route assigned in last ATC clearance

**V**ectored – go direct to the fix, route, or airway in vectored clearance

**E**xpected – by route ATC advised may be expected

**F**iled – by route in flight plan

### Altitude:

**M**inimum – use minimum altitude for IFR ops

**E**xpected – altitude ATC advised may be expected

**A**ssigned – altitude assigned in last ATC clearance

### Leave clearance limit:

When limit is approach fix – commence descent at expected-further-clearance time or, if none, as close to estimated arrival time as calculated from filed or amended ATC clearance.

When limit is not an approach fix – leave limit fix at expected-further-clearance time, if none, proceed to approach fix and commence descent at estimated time as calculated from filed or amended ATC clearance.

## **LANDING WITH A FLAT MAIN TIRE**

1. Approach – NORMAL  
(consider crosswind from side of good tire)
2. Touchdown – GOOD TIRE FIRST
3. (hold airplane off flat tire as long as possible)

## STALL SERIES

### ENTRY CONDITIONS:

1. Altitude > 2000 AGL
2. Normal Cruise
3. Two 90° clearing turns (30° bank)
4. During second clearing turn
  - Carburetor heat – ON
  - Mixture – FULL RICH
  - Throttle – IDLE
5. Maintain altitude with elevator until airspeed dissipates to approach glide speed

### TAKEOFF / DEPARTURE (POWER ON) STALL:

6. Carburetor heat – OFF
7. Throttle – FULL
8. Smoothly increase pitch to an attitude well in excess of normal climb  
(For turning departure stall initiate 30° bank with pitch)

### APPROACH / LANDING (POWER OFF) STALL:

6. Flaps - 30° DEGREES
7. Carburetor heat – OFF
8. Maintain pitch until stall occurs

### RECOVERY

9. Release yoke back pressure to break stall
10. Power – UP (full throttle)
11. Pitch – UP (to normal climb attitude)
12. Flaps – UP (20° then slowly with airspeed)

## **Intentional spins are prohibited in C-182**

### **PRECISION MANEUVERS**

#### ENTRY CONDITIONS:

1. Altitude – 800 AGL
2. Normal Cruise
3. Enter maneuver on the DOWNWIND
4. Steepest angle of bank required on downwind
5. Shallowest angle of bank required on upwind

S-TURNS ALONG A ROAD: 30° bank

URNS ABOUT A POINT: 45° bank

SHALLOW EIGHTS AROUND PYLONS: 30° bank

STEEP EIGHTS AROUND PYLONS: 45° bank

### **PRECISION MANEUVERS**

Angle of bank required in a turn is directly proportional to speed over ground

Downwind = Steep bank angles

**CESSNA 152 (172) [ 182 ]  
REFERENCE INFORMATION**

Stall with flaps ( $V_{SO}$ ) =	35	(33)	[ 40 ]	KIAS
Stall without flaps ( $V_S$ ) =	40	(44)	[ 50 ]	KIAS
Takeoff rotation ( $V_R$ ) =	50	(55)	[ 55 ]	KIAS
Best Angle of Climb ( $V_X$ ) =	55	(60)	[ 59 ]	KIAS
Best Rate of Climb ( $V_Y$ ) =	67	(76)	[ 81 ]	KIAS
Maneuvering Speed ( $V_A$ ) =	104	(99)	[ 111 ]	KIAS
Max structural cruise ( $V_{NO}$ ) =	111	(127)	[ 143 ]	KIAS
Never Exceed speed ( $V_{NE}$ ) =	149	(158)	[ 179 ]	KIAS
Max Flap Speed ( $V_{FE}$ ) =	85	(85)	[ 95 ]	KIAS
First 10° flaps =	85	(110)	[ 140 ]	KIAS
Final Approach Speed =	60-65	(65-70)	[ 60-80 ]	KIAS

Max Demonstrated Crosswind Velocity = 12 (15) [15] KTS

**C-182 CRUISE SETTINGS:**

max weight, standard conditions, pressure altitude = 2000 ft

<b>KTS</b>	<b>MP</b>	<b>RPM</b>	<b>GPH</b>	<b>%</b>
115	20.0"	2100	9.5	55
127	21.0"	2300	11.3	65
133	22.0"	2400	12.6	75

## **ALTIMETER THUMBRULES**

High to Low Pressure → Altimeter reads HIGH

Low to High Pressure → Altimeter reads LOW

Set altimeter to reporting station within 100nm of position

Pressure drop in Atmosphere = 1" Hg / 1000 ft up to 10K ft

Winds aloft given in TRUE direction

Dry Lapse Rate = 5.5°F per 1000 ft

Normal Temperature Lapse Rate = 3.5°F (2°C) per 1000 ft

Sea Level Standard Temp = 59°F or 15°C

Each 15°F (8.5°C) above "normal" = 1000 ft of density alt

Dew Point drop = 1°F per 1000 ft

Cumulus cloud base calculation use 4.5°F per 1000 ft

## **COMPASS THUMBRULES**

True course (plotted) ± variation = magnetic course

Magnetic course ± deviation = compass course

EAST ⇒ Least

WEST ⇒ Best

Head Ind creep → set against mag compass every 15 min

On an East/West heading: (ANDS)

Acceleration → Indicates more northerly heading

Deceleration → Indicates more southerly heading

On a North/South heading and a turn is initiated: (NOSE)

Heading North → Compass initially rolls opposite

Heading South → Compass initially exceeds turn

Standard rate turn = 360° in 2 min = 3° per second

## **AIRSPEED THUMBRULES**

Aircraft with a static port on only one side:

Slipping towards the static port → Airspeed reads HIGH

Slipping away from the static port → Airspeed reads LOW

True airspeed ↑ at higher altitudes due to lower density

True airspeed = Calibrated airspeed + 2% per 1000 ft

The angle of attack at the stall is always the same for a given flap setting but the airspeed at which the stall occurs varies with the weight of the aircraft

More flaps → lower stall speed → lower AOA at the stall

Higher weight → higher stall speed

Stall speed goes up in a turn

→ the steeper the bank the faster the stall speed increases

$$V_{\text{stall in turn}} = V_{\text{stall (level)}} \times \sqrt{\text{load factor}}$$

$$60^\circ \text{ bank} = \text{load factor } 2 \quad (2g \text{ turn})$$

## **WEIGHT AND BALANCE THUMBRULES**

Fuel weight = 6 lbs/gal      Oil weight = 7.5 lbs/gal ~ 2 lbs/qt

Position of CG has an effect on stall speed for a given weight:

- Fwd CG requires greater opposing tail-down force which requires greater overall wing lift and stall speed increases as square root of weight supported
- Aft CG requires less or no opposing tail-down force and the nose can be displaced from equilibrium and not tend to return

Allow 15 minutes per 1 foot of fuel tank depth for water to settle before sumping



## **PERFORMANCE THUMBRULES**

For airplanes having RPM settings for cruise at sea level of 2300-2500 rpm add 25 rpm per 1000 ft to maintain sea level percentage of power

The maneuvering speed divides the stall area from an area of possible overstress during conditions of turbulence.  
Typically 1.5→2.0 times the stall speed

For max range → use an indicated airspeed 1.5 times the power-off, flaps-up stall speed (bottom of green arc)

Amount of bank required for standard rate turn depends upon airspeed:

$$\begin{aligned} \text{airspeed (mph)} / 10 + 5 &= \text{bank angle required} \\ \text{airspeed (kts)} / 10 * 1.5 &= \text{bank angle required} \end{aligned}$$

## **COLD WEATHER OPS GUIDANCE**

Prior to starting when temperatures below freezing, pull the propeller through by hand several times to “limber” the oil

Preheat is generally required when OAT < -18°C (0°F)  
Preheat is recommended when OAT < -7°C (20°F)

1. Brakes - SET
2. Ignition Switch – OFF
3. Throttle – CLOSED [ OPEN 1/2 INCH ]
4. Mixture – IDLE CUT-OFF [ RICH ]  
Prime – while propeller is being turned by hand
  - with preheat use 2-4 (4-8) [ 4-8 ] full strokes
  - without preheat use 2-4 (6-10) [ 6-8 ] strokes
5. Mixture – RICH
6. Master Switch – ON
7. Throttle – with preheat OPEN 1/2–3/4 (1/8) [ 1/2 ] inch
  - without preheat pump full twice then open
8. Ignition Switch – START
9. Prime – AS REQUIRED until engine running smoothly

## **VFR Minimum Equipment List**

Airspeed Indicator

Altimeter

Magnetic direction indicator

Tachometer for each engine

Oil pressure gauge for each engine using pressure system

Temperature gauge for each liquid-cooled engine

Oil temperature gauge for each air-cooled engine

Manifold pressure gauge for each altitude engine

Fuel gauge indicating the quantity of fuel in each tank

Landing gear position indicator (if retractable)

Red or White Anti-collision light

Seat belt for each occupant over 2 years of age

Shoulder harness for each front seat

Emergency locator transmitter

### **At night**

Approved position lights

Electric landing light (if operated for hire)

Adequate source of electrical energy

One spare set of fuses or 3 of each kind

## **IFR Minimum Equipment List**

All VFR minimum equipment plus:

2-way radios and navigation system

Gyroscopic rate of turn indicator

Slip-skid indicator

Sensitive altimeter adjustable for barometric pressure

Clock (with second hand)

Generator or alternator

Gyroscopic pitch & bank indicator (artificial horizon)

Gyroscopic direction indicator