

Aircraft Information Booklet



Cessna 210N

VH-ZIO

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NOTICE

The information and figures contained in this booklet are to be used for general purposes only. This document is not a substitute for the approved aeroplane flight manual.

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Aircraft Overview

The Cessna 210 is a great touring aircraft. With a six seat capability, along with high cruising speeds and good load capability, it is perfect for a flying holiday.

Equipment & Features

- Dual GNS 430 GPS/NAV/COM
- ADF
- DME
- Transponder
- JPI 450 Fuel Computer
- EDM 700 Engine Management Computer
- Digital Tachometer
- 6 Place Intercom
- WX-500 Stormscope

Recency & Restrictions

Private Hire: Company check flight and appropriate endorsements.
Dual training: With Company Approved Instructor.
Recency: Flown type (or similar) in last 45 days.

Panel Photo



Performance – Standard Specifications

SPEED

Maximum at Sea Level	170 KTAS
Cruise, 67% Power at 6500 Ft.....	159 KTAS

CRUISE

Using recommended lean mixture with fuel allowance for engine start, taxi, takeoff, climb and 45 minutes reserve.

75% Power at 8000 Ft	Range 760NM
87 Gallons Usable Fuel	Time 4.7 HRS

RATE OF CLIMB AT SEA LEVEL @ 4570LBS:

SERVICE CEILING:

TAKEOFF PERFORMANCE - MTOW @ Sea Level:

Ground Roll	1100 FT
Total Distance Over 50 Ft. Obstacle	1420 FT

LANDING PERFORMANCE:

Ground Roll	1400 FT
Total Distance Over 50 Ft. Obstacle	2620 FT

STALL SPEED:

Flaps Up, Gear Up, Power Off	69 KIAS
Flaps Down, Gear Down, Power Off.....	57 KIAS

MAXIMUM WEIGHT:

Takeoff.....	3800 LBS
Landing.....	3800 LBS

STANDARD EMPTY WEIGHT:

MAXIMUM USEFUL LOAD:.....

BAGGAGE ALLOWANCE:

*(120LBS Forward of Wheel Well, 200LBS Rear *240LBS TOTAL*)*

WING LOADING: Lbs/Sq Ft.....

POWER LOADING: Lbs/HP.....

FUEL CAPACITY:

OIL CAPACITY:

ENGINES: Continental

300 BHP / 5mins @ 2800RPM, then 285 BHP Continuous @ 2700RPM.

PROPELLER: Diameter – 3 -blade.....

Constant Speed, Hyraulically Actuated.

The above performance figures are based on the indicated weights, standard atmospheric conditions, level hard-surface dry runways and no wind. They are calculated values derived from flight tests conducted by the Cessna Aircraft Company under carefully documented conditions and will vary with individual airplanes and numerous other factors affecting flight performance.

Operating Information

AIRSPEEDS - NORMAL OPERATIONS

Takeoff:

Normal Climb Out	80-90 KIAS
Short Field Takeoff, Flaps 10°, Speed at 50 ft	74 KIAS

Enroute Climb, Flaps Up:

Normal, sea level.....	100-110 KIAS
Best Rate-of-Climb, Sea level.....	98 KIAS
Best Rate-of-Climb, 10,000 ft	92 KIAS
Best Angle-of-Climb, Sea level	81 KIAS
Best Angle-of-Climb, 10,000 ft	82 KIAS

Landing Approach (3800 Lbs):

Normal Approach Flaps Up.....	85-95 KIAS
Normal Approach, Flaps FULL.....	70-80 KIAS
Short Field Approach, Flaps FULL.....	75 KIAS

Balked Landing (3800 Lbs):

Maximum Power, Flaps 20°	70 KIAS
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V-Speeds:

Vne (never exceed)	200 KIAS
Vno (Maximum structural cruising speed)	165 KIAS
Vfe	160 KIAS
Vle (Maximum Landing Gear extended speed).....	200 KIAS
Vlo (Maximum Landing Gear operation speed)	165 KIAS

Maximum Recommended Turbulent Air Penetration Speed:

3800 Lbs	125 KIAS
3150 Lbs	113 KIAS
2500 Lbs	101 KIAS

Maximum Demonstrated Crosswind Velocity:

Takeoff or landing.....	21 KNOTS
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Stall Speed:

Flaps Up, Power Off	69 KIAS
Flaps Down, Power Off	57 KIAS

Unless otherwise noted, the speeds listed above are based on a maximum weight and may be used for any lesser weight. To achieve the performance specified in the performance section for take-off distance of the aircraft approved flight manual, the speed appropriate to the particular weight must be used.

POWER PLANT

Oil Type: W100 / 15W50

Oil Quantities

Maximum: (Company policy) 9 QTS

Minimum: (Company policy) 7 QTS

Engine operating limits including RPM, pressures, and temperatures, can be found by referring to the green arcs and red lines on applicable gauges.

Detailed information can also be found in the approved flight manual.

FUEL SYSTEM

Total Capacity: 90 gallons.

Total Usable: 87 gallons.

Fuel Consumption per hour: 65 litres / 17.1 gallons.

Approved Fuels:

Option A..... 100LL Grade Aviation Fuel (Blue)

Option B..... 100 Grade Aviation Fuel (Green)

TYRE PRESSURES

Nose wheel: 31 PSI

Main wheels: 51 PSI

MANOEUVRE / LOAD LIMITS

This aeroplane is certified in the normal category. The normal category is applicable to aircraft intended for non-aerobatic operations. These include any manoeuvres incidental to normal flying, stalls (except whip stalls). Aerobatic manoeuvres, including spins, are NOT approved.

Flight Load Factors:

Flaps Up..... +3.8g, -1.52g

Flaps Down..... +2.0g

The design load factors are 150% of the above, and in all cases, the structure meets or exceeds design loads.

Weight and Balance

SAMPLE LOADING PROBLEM	SAMPLE AIRPLANE		YOUR AIRPLANE	
	Weight (lbs.)	Moment (lb.-ins./1000)	Weight (lbs.)	Moment (lb.-ins./1000)
1. Basic Empty Weight (Use the data pertaining to your airplane as it is presently equipped. Includes unusable fuel and full oil)	2276	92.4	2343.8	95.72
2. Usable Fuel (At 6 Lbs./Gal.) Standard Tanks (87 Gal. Maximum)				
Reduced Fuel (64 Gal.)	384	16.5		
3. Pilot and Front Passenger (Station 34 to 46)	340	12.6		
4. Center Passengers (Station 61 to 77)	340	24.1		
5. Aft Passengers	340	34.3		
6. * Baggage - Forward of wheel well on folded down aft seat (Station 89 to 110) (120 lbs. max.)				
7. * Baggage - On wheel well (Station 110 to 124) (50 lbs. max.)				
8. * Baggage - Aft of wheel well (Station 124 to 152) (200 lbs. max.)	132	18.2		
9. RAMP WEIGHT AND MOMENT	3812	198.1		
10. Fuel allowance for engine start, taxi and runup	- 12	-.5		
11. TAKEOFF WEIGHT AND MOMENT (Subtract step 10 from step 9)	3800	197.6		
12. Locate this point (3800 at 197.6) on the Center of Gravity Moment Envelope. Since this loading falls within the shaded area of the moment envelope, proceed with steps 13, 14 and 15. If the computed loading point falls within the clear area of the moment envelope, no further steps are required and the loading is assumed satisfactory for takeoff and landing.				
13. Estimated Fuel Burn-Off (Climb and Cruise) (38 gallons at 6 lbs./gal.)	-228	-9.8		
14. Subtract step 13 from step 11 for estimated airplane landing weight	3572	187.8		
15. Locate this point (3572 at 187.8) on the Center of Gravity Moment Envelope. Since this point falls within the overall envelope, the loading may be assumed acceptable for landing. * The maximum allowable combined weight capacity for baggage on and aft of the wheel well is 200 lbs. The maximum allowable combined weight capacity for baggage forward, on and aft of the wheel well is 240 lbs.				

Loading Graph

LOADING ARRANGEMENTS

* Pilot or passenger center of gravity on adjustable seats positioned for average occupant. Numbers in parentheses indicate forward and aft limits of occupant center of gravity range.

** Baggage area center of gravity.

NOTES:

1. The usable fuel C.G. arm is located at station 43.0.
2. The aft baggage wall (approximate station 152) can be used as a convenient interior reference point for determining the location of baggage area fuse-lage station.

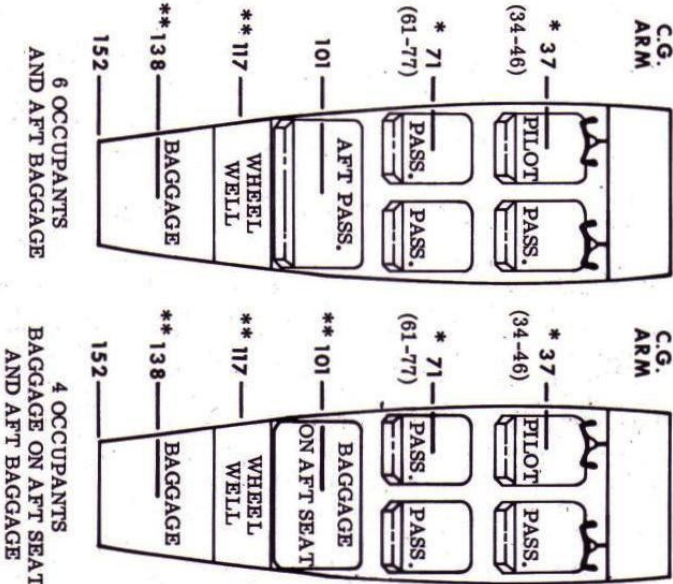


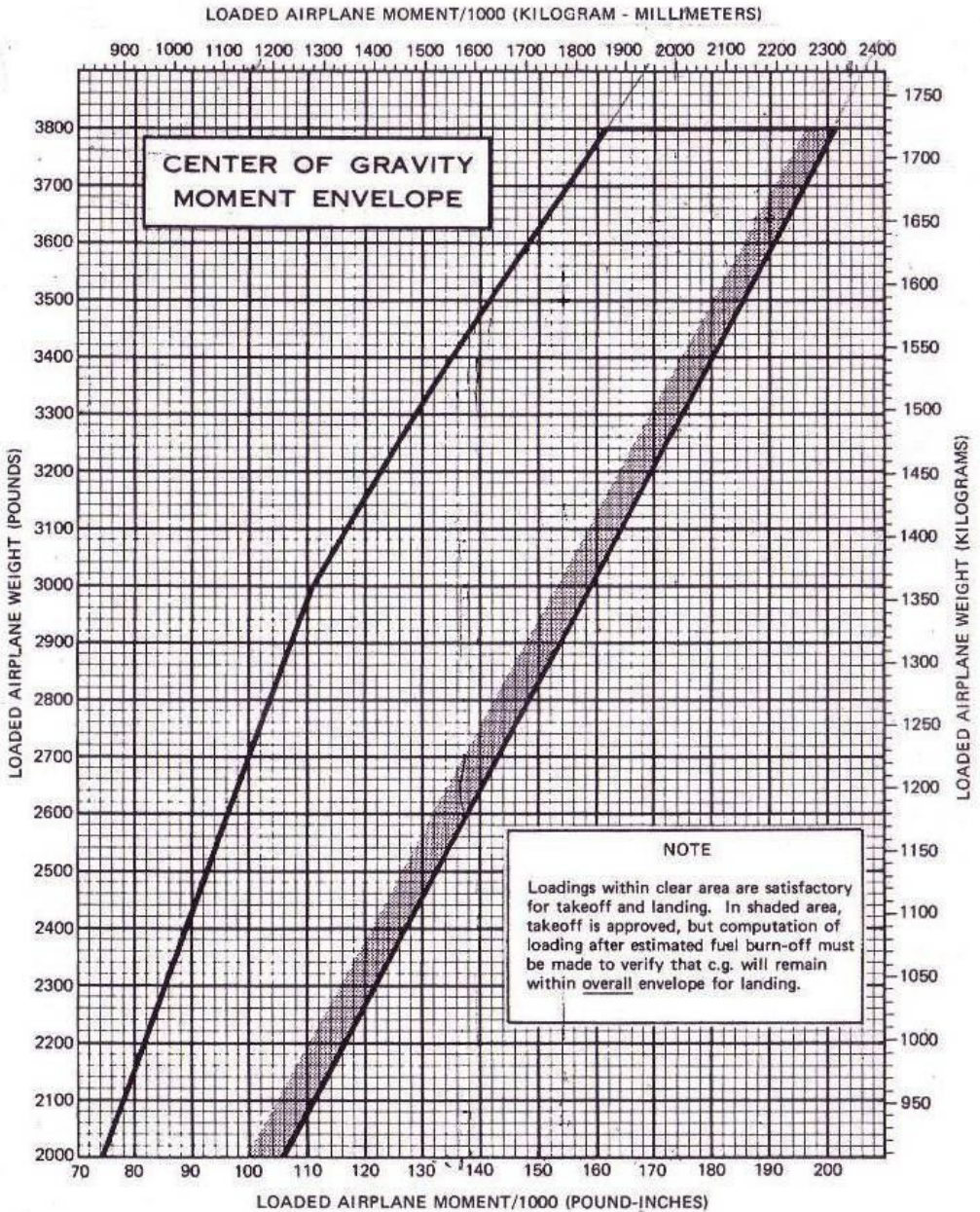
Figure 6-3. Loading Arrangements

CALCULATING THE MOMENT

The moment is the weight multiplied by the C.G. arm, divided by 1000.

Example: Pilot and front passenger weigh 340lbs, the arm is 85.5".
 Answer: $(340 \times 85.5) / 1000 = 29.07$

CENTRE OF GRAVITY ENVELOPE



Performance Charts

TAKEOFF DISTANCE MAXIMUM WEIGHT 3800 LBS

SHORT FIELD

CONDITIONS:

Flaps 10°
2850 RPM, Full Throttle and Mixture Set at Placard Fuel Flow Prior to Brake Release
Cowl Flaps Open
Paved, Level, Dry Runway
Zero Wind

MIXTURE SETTING	
PRESS ALT	PPH
S.L.	144
2000	138
4000	132
6000	126
8000	120

- NOTES:
1. Short field technique as specified in Section 4.
 2. Where distance value has been deleted, climb performance after lift-off is less than 150 fpm. Rate of climb is based on landing gear extended and flaps 10° at takeoff speed.
 3. Decrease distances 10% for each 10 knots headwind. For operation with tailwinds up to 10 knots, increase distances by 10% for each 2.5 knots.
 4. For operation on a dry, grass runway, increase distances by 15% of the "ground roll" figure.

WEIGHT LBS	TAKEOFF SPEED KIAS		PRESS ALT FT	0°C		10°C		20°C		30°C		40°C	
	LIFT OFF	AT 50 FT		GRND ROLL	TOTAL TO CLEAR 50 FT OBS	GRND ROLL	TOTAL TO CLEAR 50 FT OBS	GRND ROLL	TOTAL TO CLEAR 50 FT OBS	GRND ROLL	TOTAL TO CLEAR 50 FT OBS	GRND ROLL	TOTAL TO CLEAR 50 FT OBS
3800	68	74	S.L.	1120	1820	1205	1960	1295	2105	1390	2265	1495	2440
			1000	1225	2005	1320	2155	1420	2320	1525	2505	1640	2705
			2000	1345	2210	1445	2380	1555	2570	1675	2785	1800	3020
			3000	1475	2450	1585	2645	1710	2865	1840	3110	1980	3390
			4000	1620	2725	1745	2955	1880	3210	2025	3505	2180	3840
			5000	1785	3055	1925	3325	2075	3630	2235	3990	2410	4415
			6000	1970	3455	2125	3780	2290	4160	2470	4615	2665	5185
			7000	2180	3950	2350	4365	2540	4860	2740	5485	---	---
			8000	2415	4595	2610	5155	---	---	---	---	---	---

Note: Section 4 as mentioned above is making reference to the checklist section of this document.

LANDING DISTANCE

SHORT FIELD

CONDITIONS:

Flaps 30°
Power Off
Maximum Braking
Paved, Level, Dry Runway
Zero Wind

NOTES:

1. Short field technique as specified in Section 4.
2. Decrease distances 10% for each 10 knots headwind. For operation with tailwinds up to 10 knots, increase distances by 10% for each 2.5 knots.
3. For operation on a dry, grass runway, increase distances by 40% of the "ground roll" figure.
4. If a landing with flaps up is necessary, increase the approach speed by 13 KIAS and allow for 35% longer distances.

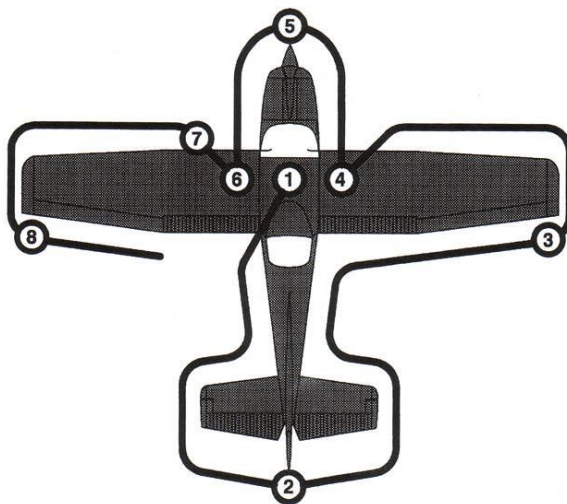
WEIGHT LBS	SPEED AT 50 FT KIAS	PRESS ALT FT	0°C		10°C		20°C		30°C		40°C	
			GRND ROLL	TOTAL TO CLEAR 50 FT OBS	GRND ROLL	TOTAL TO CLEAR 50 FT OBS	GRND ROLL	TOTAL TO CLEAR 50 FT OBS	GRND ROLL	TOTAL TO CLEAR 50 FT OBS	GRND ROLL	TOTAL TO CLEAR 50 FT OBS
3800	75	S.L.	725	1440	750	1480	780	1520	805	1560	830	1600
		1000	750	1480	780	1520	805	1560	835	1605	860	1645
		2000	780	1525	810	1565	835	1605	865	1650	895	1695
		3000	810	1565	840	1610	870	1660	900	1705	930	1750
		4000	840	1615	870	1660	900	1705	930	1750	965	1800
		5000	870	1660	905	1710	935	1755	965	1805	1000	1855
		6000	895	1680	940	1765	970	1810	1005	1860	1035	1910
		7000	940	1765	975	1815	1010	1870	1045	1920	1075	1970
		8000	975	1815	1010	1870	1050	1930	1085	1980	1120	2035

Note: Section 4 as mentioned above is making reference to the checklist section of this document.

Checklists – Normal Operations

PREFLIGHT INSPECTION

Visually check the aeroplane for general condition during walk-around inspection. Aeroplane should be parked in a level ground attitude to ensure that fuel drain valves allow for accurate sampling. Use of the refuelling steps and assist handles will simplify access to the upper wing surfaces for visual checks and refuelling operations. In cold weather, remove even small accumulations of frost, ice or snow from wing, tail and control surfaces. Also, make sure that control surfaces contain no internal accumulations of ice or debris. Prior to flight, check that pitot heater is warm to touch within 30 seconds with battery and pitot heat switches on. If a night flight is planned, check operation of all lights, and make sure a flashlight is available.



(1) CABIN

1. Pitot tube cover -- REMOVE. Check for pitot blockage.
2. Pilots Operating Handbook -- Available in aeroplane
3. Aeroplane weight and balance -- CHECKED.
4. Parking brake -- SET.
5. Control Wheel Lock -- REMOVE.
6. Landing Gear Lever -- DOWN
7. Ignition Switch -- OFF.
8. Avionics Master Switch -- OFF.

WARNING

WHEN TURNING ON THE MASTER SWITCH, USING AN EXTERNAL POWER SOURCE, OR PULLING THE PROPELLER THROUGH BY HAND, TREAT THE PROPELLER AS IF THE IGNITION SWITCH WERE ON. DO NOT STAND, NOR ALLOW ANYONE ELSE TO STAND, WITHIN THE ARC OF THE PROPELLER, SINCE A LOOSE OR BROKEN WIRE OR A COMPONENT MALFUNCTION COULD CAUSE THE PROPELLER TO ROTATE.

9. Master Switch -- ON.
10. Static Pressure Alternate Source Valve -- OFF.
11. Annunciator Panel Test Switch -- PLACE AND HOLD IN TST POSITION and ensure all amber and red annunciators illuminate.
12. Annunciator Panel Test Switch -- RELEASE. Check that appropriate annunciators remain on.

NOTE

When Master Switch is turned ON, some annunciators will flash for approximately 10 seconds before illuminating steadily. When panel TEST switch is toggled up and held in position, all remaining lights will flash until the switch is released

13. Fuel Selector Valve -- BOTH.
14. Flaps -- EXTEND.
15. Pitot Heat -- ON (Carefully check that pitot tube is warm to touch within 30 seconds.)
16. Pitot Heat -- OFF.
17. Master Switch -- OFF.
18. Baggage door -- CHECK, Lock with key.

(2) EMPENNAGE

1. Rudder Gust Lock -- REMOVE.
2. Tail Tie-down -- DISCONNECT.
3. Control Surfaces -- CHECK freedom of movement and security.
4. Trim Tab -- CHECK security.
5. Antennas -- CHECK for security of attachment and general condition.

(3) RIGHT WING Trailing Edge

1. Flap -- CHECK for security and condition.
2. Aileron -- CHECK freedom of movement and security.

(4) RIGHT WING

1. Wing Tie-down -- DISCONNECT.
2. Fuel Tank Vent Opening -- CHECK for stoppage.
3. Main Wheel Tire -- CHECK for proper inflation and general condition (weather checks, tread depth, and wear etc...).

WARNING

IF, AFTER REPEATED SAMPLING, EVIDENCE OF CONTAMINATION STILL EXISTS, THE AEROPLANE SHOULD NOT BE FLOWN. TANKS SHOULD BE DRAINED AND SYSTEM PURGED BY QUALIFIED MAINTENANCE PERSONNEL. ALL EVIDENCE OF CONTAMINATION MUST BE REMOVED BEFORE FURTHER FLIGHT.

4. Fuel Tank Sump Quick Drain Valves -- DRAIN at least a cupful of fuel (using sampler cup) from each sump location to check for water, sediment, and proper fuel grade before each flight and after each refuelling. If water is observed, take further samples until clear and then gently rock wings and lower tail to the ground to move any additional contaminants to the sampling points. Take repeated samples from all fuel drain points until all contamination has been removed. If contaminants are still present, refer to above WARNING and do not fly aeroplane.
5. Fuel quantity -- CHECK VISUALLY for desired level.
6. Fuel Filler Cap -- SECURE AND VENT UNOBSTRUCTED.

(5) NOSE

1. Right Static Source Opening -- CHECK for blockage.
2. Fuel Selector Quick Drain Valve (located on bottom of fuselage below the fuel selector valve) -- DRAIN at least a cupful of fuel (using sampler cup) from valve to check for water, sediment, and proper fuel grade before each flight and after each refuelling. If water is observed, take further samples until clear and then gently rock wings and lower tail to the ground to move any additional contaminants to the sampling points. Take repeated samples from all fuel drain points until all contamination has been removed. If contaminants are still present, refer to WARNING above and do not fly aeroplane.

3. Engine Oil Dipstick/Filler Cap -- CHECK oil level, than check dipstick/filler cap SECURE. Do not operate with less than seven quarts. Fill to nine quarts for extended flights.
4. Engine Cooling Air Inlets -- CLEAR of obstructions.
5. Propeller and spinner -- CHECK for nicks and security.
6. Air Filter -- CHECK for restrictions by dust or other foreign matter.
7. Nose Wheel Strut and Tyre -- CHECK for proper inflation of strut and general condition (weather checks, tread depth and wear) of tire.
8. Nose Gear Assembly and Gear Doors -- CHECK free of obstructions
9. Left Static Source Opening -- CHECK for blockage.

(6) LEFT WING

1. Fuel Quantity -- CHECK VISUALLY for desired level.
2. Fuel Filler Cap -- SECURE AND VENT UNOBSTRUCTED.
3. Fuel Tank Sump Quick Drain Valves -- DRAIN at least a cupful of fuel (using a sampler cup) from each sump location to check for water, sediment and proper fuel grade before each flight and after each refuelling. If water is observed, take further samples until clear and then gently rock wings and lower tail to the ground to move any additional contaminants to the sampling points. Take repeated samples from all fuel drain points until all contamination has been removed. If contaminants are still present do not fly aeroplane.
4. Main Wheel Tyre -- CHECK for proper inflation and general condition (weather checks, tread depth and wear, etc).

(7) LEFT WING Leading Edge

1. Pitot Tube Cover -- REMOVE and check opening for blockage.
2. Fuel Tank Vent Opening -- CHECK for blockage.
3. Stall Warning System -- CHECK vane for freedom of movement. To check the system, place the vane upward; a sound from the warning horn with the Master Switch ON will confirm system operation.
4. Wing Tie-Down -- DISCONNECT.
5. Landing/Taxi Lights -- CHECK for condition and cleanliness of cover.

(8) LEFT WING Trailing edge

1. Aileron -- CHECK for freedom of movement and security.
2. Flap -- CHECK for security and condition.

BEFORE STARTING ENGINE

1. Pre-flight Inspection -- COMPLETE
2. Passenger Briefing -- COMPLETE
3. Seats, Seatbelts, Shoulder Harnesses -- ADJUST and LOCK. Ensure inertia reel locking.
4. Brakes -- TEST and PARKING BRAKE SET
5. Circuit Breakers -- CHECK IN.
6. Electrical Equipment -- OFF.

WARNING

THE AVIONICS MASTER SWITCH MUST BE OFF DURING ENGINE START TO PREVENT POSSIBLE DAMAGE TO AVIONICS.

7. Avionics Master Switch -- OFF.
8. Autopilot (if installed) -- OFF.
9. Cowl Flaps -- OPEN.
10. Fuel Selector Valve -- BOTH.

STARTING ENGINE (With Battery)

1. Throttle -- OPEN 1 INCH (25mm).
2. Propeller -- HIGH RPM (Fully in).
3. Mixture -- FULL RICH.
4. Propeller Area -- CLEAR.
5. Master Switch -- ON

NOTE

If engine is warm omit priming procedure in steps 6, 7 & 8.

6. Auxiliary Fuel Pump Switch -- ON - Wait for Fuel Flow to Stabilise.
7. Auxiliary Fuel Pump -- OFF.
8. Confirm area around aircraft is clear -- call "CLEAR PROP!"
9. Ignition Switch -- START (release when engine starts).
10. Set throttle -- 1000 RPM.

NOTE

If engine floods, turn off auxiliary fuel pump, place mixture in idle cut off, open throttle ½ to full, and crank engine. When engine fires, advance mixture to full rich and retard throttle promptly

11. Oil Pressure -- CHECK. Confirm rising within 30 seconds or shut down.
12. AMPS/VOLTS -- Check for discharge.
13. Navigation lights and Flashing Beacon -- ON as required.
14. Avionics Master Switch -- ON
15. Radios/Nav aids -- ON. Set as required
16. Flaps -- RETRACT.

STARTING ENGINE (With External Power)

Procedures for starting the engine with external power are similar to starting with battery power.

Insert two additional steps to the STARTING ENGINE (with battery) checklist:

- 4.1 External Power -- CONNECT to Aeroplane receptacle.
- 13.1 External Power -- DISCONNECT from aeroplane receptacle.

TAXYING

1. Brakes -- CHECK.
2. Instruments -- CHECK indications in correct sense.

BEFORE TAKEOFF

1. Parking Brake -- SET.
2. Passenger Seat Backs -- MOST UPRIGHT POSITION.
3. Seats, Seatbelts and Shoulder Harnesses -- CHECK SECURE.
4. Cabin Doors -- CLOSED and LOCKED.
5. Flight Controls -- FULL FREE and CORRECT movement.
6. Flight Instruments -- CHECK and SET.
7. Fuel Quantity -- CHECK.
8. Mixture -- RICH.
9. Fuel Selector Valve -- RECHECK BOTH.
10. Elevator Trim and Rudder Trim -- SET for takeoff.
11. Throttle -- 1800 RPM.
 - a. Magnetos -- CHECK. RPM drop should not exceed 150 RPM on either magneto or 50 RPM differential between Magnetos. Confirm on BOTH.
 - b. Propeller -- CYCLE from high to low RPM; return to high RPM. Repeat. Confirm in high RPM.
 - c. Vacuum Gauge -- CHECK.
 - d. Engine Instruments and Ammeter -- CHECK.
12. Annunciator Panel -- Ensure no Annunciators are illuminated.
13. Throttle -- 800-1000 RPM.
14. Throttle Friction Lock -- ADJUST.
15. Strobe Lights -- AS DESIRED.
16. Radios and Avionics -- SET.
17. Autopilot -- OFF.
18. Wing Flaps -- SET for Takeoff (0° - 20°).
19. Cowl Flaps -- OPEN.
20. Brakes -- RELEASE.

HOLDING POINT CHECKS

1. LIGHTS -- Turn on as required.
2. TRANSPONDER -- 1200 ALT or as required.
3. RADIO -- Frequency set, volume tested, clearance.

TAKEOFF

NORMAL TAKEOFF

1. Wing Flaps -- 10°.
2. Power -- FULL THROTTLE and 2800 RPM.
3. Mixture -- RICH (mixture may be leaned to Maximum Power Fuel Flow placard value).
4. Checks -- REVS/MAP achieved, AIRSPEED rising, GUAGES in the green.
5. Elevator Control -- LIFT NOSE WHEEL at 60-70 KIAS.
6. Climb Speed -- 80-90 KIAS.
7. Wing Flaps -- RETRACT.
8. Passing 500'AGL, Reduce to CLIMB POWER 25in Hg and 2500RPM

SHORT FIELD TAKEOFF

1. Wing Flaps -- 20° degrees.
2. Foot Brakes -- APPLY.
3. Power -- FULL THROTTLE and 2800RPM.
4. Mixture -- Lean to obtain Maximum Power Fuel Flow placard value.
5. Brakes -- RELEASE.
6. Checks -- REVS/MAP achieved, AIRSPEED rising, GUAGES in the green.
7. Elevator Control -- MAINTAIN SLIGHTLY TAIL LOW ATTITUDE.
8. Climb Speed -- 74 KIAS (Until all obstacles are cleared).
9. Wing Flaps -- RETRACT slowly after reaching 80 KIAS.

ENROUTE CLIMB

NORMAL CLIMB

1. Airspeed -- 100-110 KIAS.
2. Power -- 25in Hg or FULL THROTTLE, whichever is less, 2500 RPM.
3. Mixture -- 20 GPH or FULL RICH (whichever is less). Observe EGT/CHT
4. Cowl Flaps -- OPEN as required. Observe EGT/CHT
5. Fuel Selector Valve -- BOTH.

MAXIMUM PERFORMANCE CLIMB

1. Airspeed -- 98 KIAS at sea level to 92 KIAS at 10000 feet.
2. Power -- 25in Hg and 2550 RPM
3. Mixture -- lean in accordance with Maximum Power Fuel Flow placard.
4. Cowl Flaps -- OPEN as required.

CRUISE

1. Power -- 15-23 in. Hg, 2000 - 2400 RPM (No more than 80%).
2. CRUISE POWER TYPICALLY 23in Hg / 2400RPM
3. Rudder and Elevator Trim -- ADJUST.
4. Mixture -- LEAN.
5. Cowl Flaps -- CLOSE.

DESCENT

1. Power -- AS DESIRED.
2. Mixture -- ENRICHEN as required.
3. Cowl Flaps -- CLOSED.
4. Fuel Selector Valve -- BOTH.
5. Wing Flaps -- AS DESIRED (0° - 10° below 160 KIAS; 10° - 20° below 130 KIAS; 20° - FULL below 115 KIAS).

BEFORE LANDING

1. Brakes -- Checked and OFF.
2. **Undercarriage -- DOWN and locked.**
3. Mixture -- RICH.
4. Propeller -- HIGH RPM.
5. Fuel -- Check quantity, pressure and selection.
6. Auxiliary Fuel Pump -- OFF.
7. Landing/Taxi Lights -- ON.
8. Autopilot -- OFF.
9. Seat Backs -- MOST UPRIGHT POSITION.
10. Windows, Seats and Seatbelts -- SECURED and LOCKED.

LANDING

NORMAL LANDING

1. Airspeed -- 85-95 KIAS (Flaps UP).
2. Wing Flaps -- AS DESIRED (0°-10° below 160 KIAS; 10°-20° below 130 KIAS; 20°-FULL below 115 KIAS)
3. Airspeed -- 75-85 KIAS (Flaps FULL).
4. Power -- REDUCE smoothly to idle as obstacle is cleared.
5. Trim -- ADJUST as desired.
6. Touchdown -- MAIN WHEELS FIRST
7. Landing Roll -- LOWER NOSE WHEEL GENTLY.
8. Braking -- MINIMUM REQUIRED.

SHORT FIELD LANDING

1. Airspeed -- 85-95 KIAS (Flaps UP).
2. Wing Flaps -- FULL (below 115 KIAS).
3. Airspeed -- 75 KIAS (Until flare).
4. Trim -- ADJUST as desired.
5. Touchdown -- MAIN WHEELS FIRST.
6. Brakes -- APPLY HEAVILY.
7. Wing Flaps -- **IDENTIFIED and RETRACT** for maximum brake effectiveness.

BALKED LANDING

1. Power -- FULL THROTTLE and 2800 RPM.
2. Wing Flaps -- RETRACT to 20°.
3. Climb Speed -- 70 KIAS
4. Wing Flaps -- RETRACT slowly after reaching a safe altitude and 80 KIAS.
5. Cowl Flaps -- OPEN

AFTER LANDING

1. Wing Flaps -- **"Identified", then RETRACT.**
2. Cowl Flaps -- OPEN.
3. Pitot Heat -- OFF.
4. Radios/Nav aids -- AS REQUIRED.
5. Landing/Taxi/Strobe Lights -- OFF/AS REQUIRED.

SHUT DOWN/SECURING AEROPLANE

1. Parking Brake -- SET (if required).
2. Throttle -- 1000 RPM.
3. Ignition Switches -- CHECK L, R, then ON BOTH.
4. Electrical equipment, Avionics Master Switch, Autopilot – OFF.
5. Mixture -- IDLE CUT OFF (pulled fully out).
6. Throttle -- CLOSED (Once propeller has stopped).
7. Ignition Switches -- OFF.
8. Master Switch -- OFF .
9. Control Lock -- INSTALL.
10. Fuel Selector Valve -- BOTH.
11. Tidy aeroplane interior.
12. Pitot Cover -- INSTALL.

Checklists – Emergency Procedures

INTRODUCTION

Emergencies caused by aeroplane or engine malfunctions are extremely rare if proper pre-flight inspections and maintenance are performed.

Section 3 of the approved flight manual provides amplified procedures for coping with emergencies that may occur.

Should an emergency arise the basic guidelines described in this section and the approved flight manual should be considered and applied as necessary to correct the problem.

Procedures in this section shown in **bold faced** type are immediate action items that should be committed to memory.

AIRSPEEDS

AIRSPEEDS FOR EMERGENCY OPERATION

Engine Failure After Takeoff:

Wing Flaps Up	85 KIAS
Wing Flaps Down	80 KIAS

Manoeuvring Speed:

3800 Lbs	125 KIAS
3150 Lbs	113 KIAS
2500 Lbs	101 KIAS

Maximum Glide:

3800 Lbs	85 KIAS
3150 Lbs	80 KIAS
2500 Lbs	75 KIAS

Precautionary Landing With Engine Power

75 KIAS

Landing Without Engine Power:

Wing Flaps Up	90 KIAS
Wing Flaps Down	80 KIAS

ENGINE FAILURES

ENGINE FAILURE DURING TAKEOFF ROLL

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. **Airspeed -- 85 KIAS Flaps Up, 80 KIAS Flaps Down.**
2. Mixture -- IDLE CUT OFF.
3. Fuel Shutoff Valve -- PULL OFF.
4. Ignition Switch -- OFF.
5. Wing Flaps -- AS REQUIRED (FULL recommended).
6. Master Switch -- OFF.
7. Cabin Door -- UNLATCH.
8. Land -- STRAIGHT AHEAD.

ENGINE FAILURE DURING FLIGHT (Restart Procedures)

1. **Airspeed -- 55 KIAS (Best glide speed).**
2. **Fuel Selector Valve -- BOTH.**
3. **Auxiliary Fuel Pump Switch -- ON.**
4. **Mixture -- RICH (if restart has not occurred).**
5. Ignition Switch -- BOTH (or START if propeller is stopped).

FORCED LANDINGS

EMERGENCY LANDING WITHOUT ENGINE POWER

1. Passenger Seat Backs -- MOST UPRIGHT POSITION.
2. Seats and Seat Belts -- SECURE.
3. Airspeed -- 85 KIAS Flaps Up, 80 KIAS Flaps Down.
4. Mixture -- IDLE CUT OFF.
5. Fuel Shutoff Valve -- PULL OFF.
6. Ignition Switch -- OFF.
7. Landing Gear -- DOWN (Up if terrain is rough or soft)
8. Wing Flaps -- AS REQUIRED (FULL recommended).
9. Master Switch -- OFF (when landing is assured).
10. Doors -- UNLATCH PRIOR TO TOUCHDOWN.
11. Touchdown -- SLIGHTLY TAIL LOW.
12. Brakes -- APPLY HEAVILY.

PRECAUTIONARY LANDING WITH ENGINE POWER

1. Passenger Seat Backs -- MOST UPRIGHT POSITION.
2. Seats and Seat Belts -- SECURE.
3. Airspeed -- 85 KIAS.
4. Wing Flaps -- 10°.
5. Selected Field -- FLY OVER, noting terrain and obstructions, then retract flaps upon reaching a safe altitude and airspeed.
6. Avionics Master Switch and Electrical Switches -- OFF.
7. Landing Gear -- DOWN
8. Wing Flaps -- FULL (on final approach).
9. Airspeed -- 75 KIAS.
10. Master Switch -- OFF.
11. Doors -- UNLATCH PRIOR TO TOUCHDOWN.
12. Touchdown -- SLIGHTLY TAIL LOW.
13. Ignition Switch -- OFF.
14. Brakes -- APPLY HEAVILY.

DITCHING

1. Radio -- TRANSMIT MAYDAY on 121.5 MHz or appropriate frequency, giving location and intentions and SQUAWK 7700.
2. Heavy Objects in baggage area -- SECURE OR JETTISON (if possible).
3. Landing Gear -- UP
4. Passenger Seat Backs -- MOST UPRIGHT POSITION.
5. Seats and Seat Belts -- SECURE.
6. Wing Flaps -- 20° to FULL.
7. Power -- ESTABLISH 300FT/MIN DESCENT AT 75 KIAS.

NOTE

If no power is available, approach at 80 KIAS
with flaps up or at 65 KIAS with 10° flaps.

8. Approach -- High Winds, Heavy Seas -- INTO THE WIND.
Light Winds, Heavy Swells -- PARALLEL TO SWELLS.
9. Cabin Doors -- UNLATCH.
10. Touchdown -- LEVEL ATTITUDE AT ESTABLISHED RATE OF DESCENT.
11. Face -- CUSHION at touchdown with folded coat.
12. ELT -- Activate.
13. Aeroplane -- EVACUATE through cabin doors. If necessary open window and flood cabin to equalize pressure so doors can be opened.
14. Life Vests and Raft -- INFLATE WHEN CLEAR OF AEROPLANE.

FIRES

DURING START ON GROUND

1. **Cracking -- CONTINUE** to get a start which would suck the flames and accumulated fuel 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. **Throttle -- FULL OPEN.**
5. **Mixture -- IDLE CUT OFF.**
6. **Cranking -- CONTINUE.**
7. **Fuel Shutoff Valve -- PULL OFF.**
8. **Auxiliary Fuel Pump -- OFF.**
9. Fire Extinguisher -- OBTAIN.
10. Engine -- Master Switch OFF, Ignition Switch OFF.
11. Parking Brake -- RELEASE.
12. Aeroplane -- EVACUATE.
13. Fire -- EXTINGUISH using fire extinguisher, wool blanket or dirt.
14. Fire Damage -- INSPECT, repair damage or replace damaged components or wiring before conducting another flight.

ENGINE FIRE IN FLIGHT

1. **Mixture -- IDLE CUT OFF.**
2. **Fuel Shutoff Valve -- PULL OFF.**
3. **Auxiliary Fuel Pump Switch -- OFF.**
4. **Master Switch -- OFF.**
5. Cabin Heat and Air -- OFF (except overhead vents).
6. Airspeed -- 120 KIAS (If fire is not extinguished, increase glide speed to find an airspeed – within airspeed limitations – which will provide an incombustible mixture).
7. Forced Landing -- EXECUTE (as described in Emergency Landing Without Engine Power).

ELECTRICAL FIRE IN FLIGHT

- 1. Master Switch -- OFF.**
- 2. Vents, Cabin Air, Heat -- CLOSED.**
- 3. Fire Extinguisher -- ACTIVATE.**
- Avionics Master Switch -- OFF.
- All other Switches (except ignition switch) -- OFF.

WARNING

AFTER DISCHARGING FIRE EXTINGUISHER AND ASCERTAINING THAT THE FIRE HAS BEEN EXTINGUISHED, VENTILATE CABIN.

- Vents, Cabin Air, Heat -- OPEN when it is ascertained that fire is completely extinguished.

If fire has been extinguished and electrical power is necessary for continuance of flight to the nearest suitable airport or landing area:

- Master Switch -- ON.
- Circuit Breakers -- CHECK for faulty circuit, do not reset.
- Radio Switches -- OFF.
- Avionics Master Switch -- ON.
- Radio/Electrical Switches -- ON one at a time, with delay after each until short circuit is localised.

CABIN FIRE

- 1. Master Switch -- OFF.**
- 2. Vents, Cabin Air, Heat -- CLOSED (to avoid drafts).**
- 3. Fire Extinguisher -- ACTIVATE.**

WARNING

AFTER DISCHARGING FIRE EXTINGUISHER AND ASCERTAINING THAT THE FIRE HAS BEEN EXTINGUISHED, VENTILATE CABIN.

- Vents, Cabin Air, Heat -- OPEN when it is ascertained that fire is completely extinguished.
- Land the aeroplane as soon as possible to inspect for damage.

WING FIRE

- 1. Landing/Taxi/Strobe/Navigation Light Switches -- OFF.**
- 2. Pitot Heat Switch -- OFF.**
- Sideslip to keep flames away from cabin and fuel tank.
- Land as soon as possible using flaps only on final approach.

ICING

INADVERTENT ICING ENCOUNTER

1. **Turn pitot heat switch ON.**
2. **Turn back or change altitude** to obtain an outside air temperature that is less conducive to icing.
3. **Pull cabin heat full out and rotate defroster control clockwise** to obtain maximum defroster airflow.
4. Increase engine speed to minimize ice build-up on propeller blades.
5. Watch for signs of induction air filter icing. An unexplained loss of manifold pressure could be caused by ice blocking the air intake filter. Adjust the throttle as desired to set manifold pressure. Adjust mixture, as required for any change in power settings.
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 wing 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 80 to 90 KIAS depending upon the amount of the accumulation.
12. Perform a landing in a level attitude.

STATIC SOURCE BLOCKAGE (Erroneous Instrument Readings Suspected)

1. **Static Pressure Alternate Source Valve -- PULL ON.**
2. Airspeed/Altitude -- See Flight Manual (Section 5) for correction table.

VACUUM SYSTEM FAILURE

Left or Right Vacuum Annunciator Light illuminates.

1. **Vacuum Gauge -- CHECK** to ensure vacuum within green arc.

If vacuum is not within normal operating limits a failure has occurred in the vacuum system and partial panel procedures may be required for continued flight.

LANDING WITH A FLAT MAIN TIRE

1. Approach -- NORMAL.
2. Wing Flaps -- FULL DOWN.
3. Touchdown -- GOOD MAIN TIRE FIRST, hold aeroplane off flat tire as long as possible with aileron control.
4. Directional Control -- MAINTAIN using brake on good wheel as required.

LANDING WITH A FLAT NOSE TIRE

1. Approach -- NORMAL.
2. Wing Flaps -- As required.
3. Touchdown -- ON MAINS, hold nose wheel off the ground as long as possible.
4. When nose wheel touches down, maintain full up elevator as aeroplane slows to stop.

LANDING GEAR MALFUNCTION PROCEDURES

1. Master Switch -- ON
2. Landing Gear Lever -- CHECK (full up).
3. Landing Gear and Gear Pump Circuit Breakers -- IN
4. Gear Up Light -- CHECK
5. Landing Gear Lever -- RECYCLE
6. Gear Motor -- CHECK Operation (Ammeter and Noise)

LANDING GEAR FAILS TO EXTEND

1. Landing Gear Lever -- DOWN
2. Emergency Hand Pump -- EXTEND HANDEL and PUMP (approx 35 cycles)
3. Gear Down Light -- ON (Master on)
4. Pump Handle -- STOW

GEAR UP LANDING

1. Landing Gear Lever -- UP
2. Landing Gear and Gear Pump Circuit Breakers -- IN
3. Runway -- SELECT longest hard surface or smooth runway
4. Wing Flaps -- 30° on Final Approach
5. Airspeed -- 75 KIAS
6. Doors -- UNLATCH prior to touchdown
7. Avionics Master and Master Switch -- OFF when landing is assured
8. Touchdown -- SLIGHTLY TAIL LOW
9. Mixture -- IDLE CUT OFF
10. Ignition -- OFF
11. Fuel Shutoff Valve -- PULL OFF
12. Aeroplane -- EVACUATE

LANDING WITHOUT A "GEAR LOCKED" INDICATION

1. Before Landing Check -- COMPLETE
2. Approach -- NORMAL
3. Landing Gear and Gear Pump Circuit Breakers -- IN
4. Landing -- TAIL LOW as smoothly as possible
5. Braking -- MINIMUM necessary
6. Taxi -- SLOWLY
7. Engine -- SHUTDOWN prior to inspection of gear

LANDING WITH A DEFECTIVE NOSE GEAR

1. Moveable Load -- REARWARD
2. Passenger -- Move REARWARD
3. Before Landing Check -- COMPLETE
4. Runway -- HARD SURFACE or SMOOTH GRASS
5. Wing Flaps -- 30°
6. Landing -- AS PER GEAR UP PROCEDURE

ELECTRICAL POWER SUPPLY SYSTEM MALFUNCTIONS

AMMETER SHOWS EXCESSIVE RATE OF CHARGE (Full Scale Deflection)

1. Alternator -- OFF.
2. Nonessential Electrical Equipment -- OFF.
3. Flight -- TERMINATE as soon as practical.

LOW VOLTAGE ANNUNCIATOR ILLUMINATES DURING FLIGHT (Ammeter Indicates Discharge)

1. Avionics Master Switch -- OFF
2. Alternator Circuit Breaker -- CHECK IN.
3. Master Switch -- OFF (both sides)
4. Master Switch -- ON.
5. Low Voltage Annunciator -- CHECK OFF.
6. Avionics Master 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.

