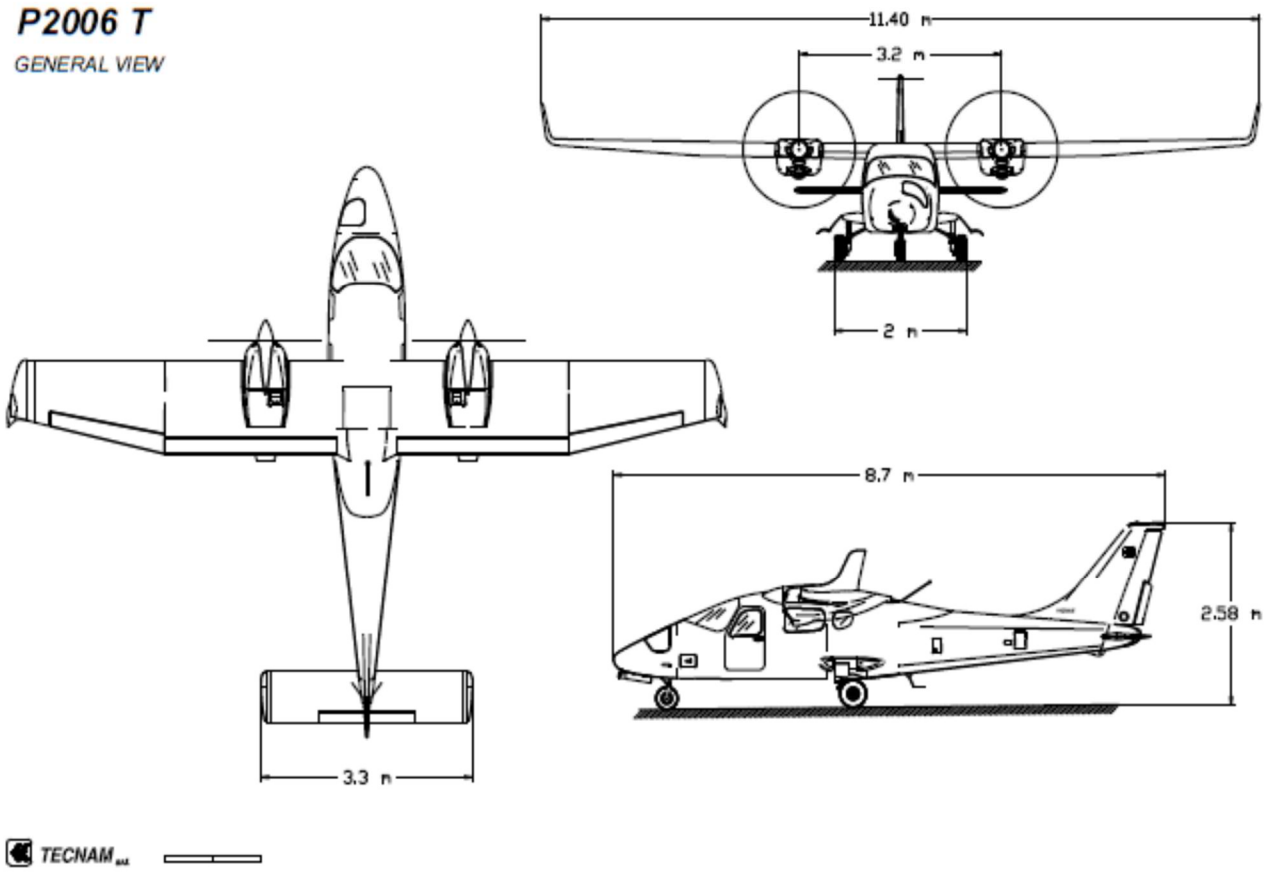
ADRIANA AVIATION



STANDARD OPERATING PROCEDURES

TECNAM P2006T

This Handbook was introduced for use in the ATO ADRIANA AVIATION by the order of Head of Training

Ordinance No. ……..,
dated ……
(HT Signature)

GENERAL INFORMATION

Tecnam P2006T is a twin-engine four-seat aircraft with high cantilevered wing and tricycle retractable landing gear.
Before using the airplane, you are recommended to read carefully manual:
a deep knowledge of airplane features and limitations will allow you for operating the airplane safely.

1 LIMITATION

1.1 SPEED LIMITATIONS

The following table addresses the airspeed limitations and their operational significance:

SPEED			KIAS	KCAS	REMARKS
V_{NE}	Never exceed speed		167	168	Do not exceed this speed in any operation.
V_{NO}	Maximum Structural Cruising Speed		135	133	Do not exceed this speed except in smooth air, and only with caution.
V_A	Design Manoeuvring speed		118	117	Do not make full or abrupt control movement above this speed, because under certain conditions the aircraft may be overstressed by full control movement.
V_O	Operating Manoeuvring speed				
V_{LE}	Maximum Landing Gear extended speed		93	92	Do not exceed this speed with the landing gear extended.
V_{LO}	Maximum Landing Gear operating speed		93	92	Do not exceed this speed when operating the landing gear.
V_{FE}	Maximum flaps extended speed	*FULL*	93	92	Do not exceed this speed for indicated flaps setting.
		T.O.	119	117	
V_{MC}	Aircraft minimum control speed with one engine inoperative		62	62	Do not reduce speed below this value in event of one engine inoperative condition.

1.2 AIRSPEED INDICATOR MARKINGS

The Airspeed Indicator displays airspeed on a rolling number gauge using a moving tape.
The airspeed is displayed inside the black pointer. The pointer remains black until reaching never-exceed speed (VNE), at which point it turns red.
Airspeed indicator markings and their colour code are explained in the following table.

MARKING	KIAS	EXPLANATION
White band	53-93	Lower limit is V_{SO}, upper limit is the maximum allowable speed with flaps extended in *FULL* position.
Red line	62	Minimum aircraft control speed with one engine inoperative and flaps set to T.O.
Green band	66-135	Normal aircraft operating range (lower limit is V_{S1}, stall speed in "clean" configuration, and upper limit is the maximum structural cruise speed V_{NO}).
Blue line	80	Best rate-of-climb speed with one engine inoperative.
Yellow band	135-167	Speed range where manoeuvres must be conducted with caution and only in smooth air.
Red line	167	Maximum speed for all operations.

1.3 NORMAL OPERATIONS

The following airspeeds are those which are significant for normal operations, with reference to both MTOW: 1180 kg and 1230 kg

		MTOW	
	FLAPS	1180kg	1230 kg
Rotation Speed (in takeoff, V_R)	T/O	64 KIAS	65 KIAS
Best Angle-of-Climb Speed (V_X)	0°	73 KIAS	72 KIAS
Best Rate-of-Climb speed (V_Y)	0°	80 KIAS	84 KIAS
Approach speed	T/O	90 KIAS	90 KIAS
Final Approach Speed	FULL	70 KIAS	71 KIAS
Manoeuvring speed (V_A)	0°	118 KIAS	122 KIAS
Never Exceed Speed (V_{NE})	0°	167 KIAS	171 KIAS

1.4 STALL SPEED

Weight: *1180 kg*
Throttle Levers: *IDLE*
Landing Gear: *Down*
CG: *Most Forward (16.5%)*
No ground effect

WEIGHT	BANK ANGLE	STALL SPEED					
		FLAPS 0°		FLAPS T/O		FLAPS FULL	
[kg]	*[deg]*	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
1230 *(FWD C.G.)*	0	66	64	56	56	53	54
	15	67	65	57	57	54	55
	30	70	69	60	60	58	58
	45	77	76	67	67	64	64
	60	93	90	81	79	78	76

1.5 KINDS OF OPERATIONS EQUIPMENT LIST

Equipment	VFR Day	VFR Night	IFR Day	IFR Night
Magnetic compass	•	•	•	•
GDU 1040 - Display Unit (2)	•	•	•	•
GIA 63W - Integrated Avionics Unit (2)	•	•	•	•
GDC 74A - Air Data Computer	•	•	•	•
GTP 59 - OAT sensor	•	•	•	•
GRS 77 - AHRS	•	•	•	•
GMU 44 - Magnetometer	•	•	•	•
GMA 1347 - Audio panel/Marker beacon	•	•	•	•
GTX 33 - Transponder	•	•	•	•
Standby Airspeed indicator	•	•	•	•
Standby Attitude indicator (electric)	•	•	•	•
StandbyAltimeter	•	•	•	•
Pitot heating system	•	•	•	•
Clock	•	•	•	•
Breakers panels	•	•	•	•
First Aid kit	•	•	•	•
Fire extinguisher	•	•	•	•
Fire detectors (2)	•	•	•	•
Instruments lights	•	•	•	•
Position lights	•	•	•	•
Landing light	•	•	•	•
Taxi light	•	•	•	•
Strobe lights	•	•	•	•
Torch		•	•	•
Cabin light		•	•	•
Cockpit lights		•	•	•
Emergency light	•	•	•	•
Volt-Ammeter	•	•	•	•
LG position and transition lights	•	•	•	•
ELT	•	•	•	•
Alternate static source	•	•	•	•
MAP indicator (dual)	•	•	•	•
RPM indicator (2)	•	•	•	•
Oil pressure indicator (2)	•	•	•	•
Oil temperature indicator (2)	•	•	•	•
CHT (2)	•	•	•	•
Fuel pressure indicator (2)	•	•	•	•
Fuel quantity indicator (2)	•	•	•	•
Longitudinal trim indicator	•	•	•	•
Rudder trim indicator	•	•	•	•
Flaps position indicator	•	•	•	•
Stall warning system	•	•	•	•
DME			•	•
ADF			•	•
	VFR Day	VFR Night	IFR Day	IFR Night

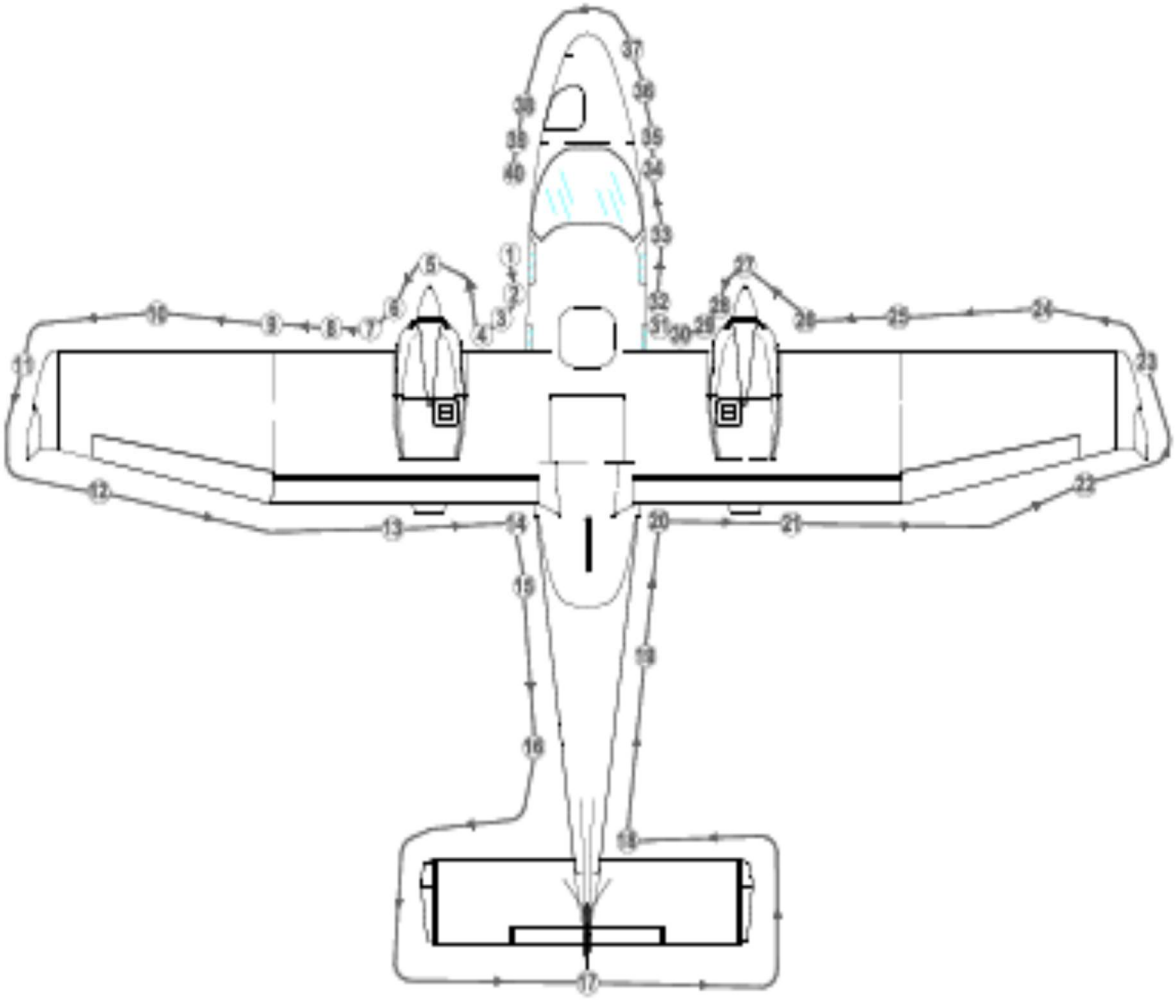
1.6 WARNING/CAUTION ALERTS AND SAFE OPERATING ANNUNCIATIONS

Following table addresses the warning and caution alerts and safe operating annunciations shown (unless differently specified) on the Annunciation Window:

Warning alert (RED)	Cause
L BUS VOLT HIGH	LH electric system overvoltage
R BUS VOLT HIGH	RH electric system overvoltage
L COOLANT LOW	Left engine - coolant liquid low level
L COOLANT LOW	Right engine - coolant liquid low level
PILOT DR OPEN	Main door open and/or unlocked
REAR DR OPEN	Rear door open and/or unlocked
LH ENGINE FIRE	Left engine compartment: fire detected
RH ENGINE FIRE	Right engine compartment: fire detected
LG TRANSITION (warning light installed near the landing gear control lever)	One or more legs are in transition phase and/or the selected retracted/extended position is not yet reached.
Caution alert (AMBER)	**Cause**
L ALT FAIL	LH generator failure
R ALT FAIL	RH generator failure
PITOT HEAT	Pitot heating system failure/not activated
EXT POWER ON	External electrical supply connected
GEAR PUMP ON	LG pump electrically supplied
Safe operating annunciation (GREEN)	**Indication**
L FUEL PUMP ON	Left engine - electrical fuel pump ON
R FUEL PUMP ON	Right engine - electrical fuel pump ON
PITOT HEAT ON	Pitot heating system ON
LG Down & Locked (3 advisory lights, one for each leg, installed near the landing gear control lever)	Landing gear extended and locked

2 NORMAL PROCEDURES

2.1 PRE-FLIGHT CHECK – AIRCRAFT WALK-AROUND



Before each flight, it is necessary to carry out a complete aircraft check comprising an external inspection followed by a cockpit inspection as below detailed.
Technical log book
Training of record keeping in the technical logbook

1 Pilot door and cabin

Check door for integrity. Turn ON the Master Switch and check Stall Warning switch for operation and condition; check lighting of landing/Taxi/Nav/Strobe lights, then turn OFF the Master Switch.

2 Left main landing gear

Check fuselage skin status, tire status (cuts, bruises, cracks and excessive wear), slippage markers integrity, gear structure and shock absorber, hoses, gear door attachments and gear micro-switches. There should be no sign of hydraulic fluid leakage.

3 Wheel chock

Remove if employed

4 Propeller and spinner

The propeller blades and spinner should be free of cracks, nicks, dents and other defects and should rotate freely. Check fixing and lack of play between blades and hub.

5 Left engine nacelle

Perform following inspections:

a) *Check the surface conditions.*

b) *Nacelle inlets and exhausts openings must be free of obstructions. If inlet and outlet plugs are installed, they should be removed.*

c) *Check radiators. There should be no indication of leakage of fluid and they have to be free of obstructions.*

d) *Only before the first flight of a day:*

(1) Verify coolant level in the expansion tank, replenish as required up to top (level must be at least 2/3 of the expansion tank).

(2) Verify coolant level in the overflow bottle through the slot under the nacelle: level must be between min. and max. mark. Replenish if required removing the upper cowling; after that, install upper cowling checking for interferences with radiators

(3) Turn the propeller by hand to and fro, feeling the free rotation of 15°or 30° before the crankshaft starts to rotate. If the propeller can be turned between the dogs with practically no friction at all further investigation is necessary. Turn propeller by hand in direction of engine rotation several times and observe engine for odd noises or excessive resistance and normal compression.

e) *Check oil level and replenish as required.*

Prior to oil check, switch off both ignitions circuits and turn the propeller by hand in direction of engine rotation several times to pump oil from the engine into the oil tank, or let the engine idle for 1 minute. This process is finished when air is returning back to the oil tank and can be noticed by a murmur from the open oil tank. Prior to long flights oil should be added so that the oil level reaches the "max" mark.

f) *Drain off Gascolator for water and sediment (drain until no water comes off). Then make sure drain valve is closed.*

g) *Check drainage hoses clamps*

h) *Verify all parts are fixed or locked.*

i) *Verify all inspection doors are closed.*

6 Air induction system

Check engine air inlet for integrity and correct fixing. The air intake filter must be free of obstructions.

7 Left fuel tank

Check that the refuelling port cap is properly secured, then perform the fuel tank sump drainage operating the related valve which, after operation, must be checked closed. Fuel must checked for water and sediment. Verify the tank vent outlet is clear.

8 Landing and taxi lights

Visual inspection

9 Left wing leading edge

Visual inspection. Check cabin ventilation inlet and carburettor heating inlet for condition and free of obstruction. Check stall strip

10 Left wing top and bottom panels

Visual inspection

11 Left winglet, nav and strobe lights, static discharge wick

Check for integrity and fixing

12 Left aileron and balance mass

Visual inspection, remove tie-down devices and control locks if employed.

13 Left Flap and hinges

Visual inspection

14 Left static port

Remove protective cap – Visual inspection

15 Antennas

Check for integrity

16 Gear pump, external power and battery compartment

Check emergency landing gear extension system pressure (low pressure limit: 20 bar), external power and battery compartments closure.

17 Horizontal and vertical empennage and tabs. Static discharge wicks.

Check the actuating mechanism of control surfaces and the connection with related tabs. Check wicks for integrity. Remove tiedown device if employed.

18 Stabiliser leading edge
Check for integrity

19 Fuselage top and bottom skin
Visual inspection

20 Right static port
Remove protective cap – Visual inspection

21 Right Flap and hinges
Visual inspection

22 Right aileron and balance weight
Visual inspection, remove tie-down devices and control locks if employed.

23 Right winglet, nav and strobe lights, static discharge wick
Check for integrity and fixing and lighting

24 Right wing top and bottom panels *V*
Visual inspection

25 Right wing leading edge
Visual inspection. Check cabin ventilation inlet and carburettor heating inlet for condition and free of obstruction. Check stall strip.

26 Right fuel tank
Check that the refuelling port cap is properly secured, then perform the fuel tank sump drainage operating the related valve which, after operation, must be checked closed. Fuel must checked for water and sediment. Verify the tank vent outlet is clear.

27 Propeller and spinner:
The propeller blades and spinner should be free of cracks, nicks, dents and otherdefects and should rotate freely. Check fixing and lack of play between blades and hub.

28 Right engine nacelle
Apply check procedure reported in the walk-around station 5 and 6

29 Passenger door and cabin
Check door for integrity. Check safety belts for integrity and baggage for correct positioning and fastening. Check ditching emergency exit safety lock. Check passengers ventilation ports for proper setting.

30 Right main landing gear
Apply check procedure reported in the walk-around Station 2

31 Wheel chock
Remove if employed

32 Bottom fuselage antennas
Check for integrity

33 Right cabin ram-air inlet
Visual inspection

34 Right Pitot tube
Remove protective cap and check for any obstruction

35 Nose landing gear
Check tire status (cuts, bruises, cracks and excessive wear),slippage markers integrity, gear structure and retraction mechanism, shock absorber and gear doors attachments. There should be no sign of hydraulic fluid leakage.

36 Radome
Check for integrity

37 Radome access door
Visual inspection

38 Left Pitot tube
Remove protective cap and check for any obstruction

39 Left cabin ram-air inlet
Visual inspection

2.2 COCKPIT INSPECTIONS

1. Parking brake — *CHECK ENGAGED*
2. AFM and Garmin Pilot's Guide — *CHECK on board*
3. Weight and balance — *CHECK if within the limits*
4. Flight controls — *Remove seat belt used as lock*
5. PFD and MFD — *CHECK clean*
6. Seat — *Adjust as required*
7. Seat belt — *Fastened*
8. Passenger briefing — *Completed*
9. Doors — *CLOSED AND LOCKED*
10. Landing gear control lever — *CHECK DOWN*
11. Breakers — *All IN*
12. MASTER SWITCH — *ON*
13. Fuel quantity — *CHECK*
14. RH fuel selector — *RIGHT*
15. LH fuel selector — *LEFT*
16. RH Electrical Fuel Pump — *ON, check fuel pressure gauge correct operation.*
17. RH Electrical Fuel pump — *OFF, check pressure decreased at zero*
18. LH Electrical Fuel Pump — *ON, check fuel pressure gauge correct operation.*
19. LH Electrical Fuel pump — *OFF, check pressure decreased at zero*
20. Strobe light — *ON*
21. Landing gear lights — *TEST*
22. ELT — *CHECK set to ARM*
23. Fire detector — *TEST*
24. Engine levers friction — *Adjust if required*
25. Flight controls — *CHECK free*
26. Alternate static port — *CHECK closed*
27. Cabin heat — *CLOSED*
28. Flaps — *Operate control to FULL position. Verify extension. Retract flaps*
29. Pitch trim control — *Set to neutral position.*
30. Rudder trim control — *Set to neutral position.*
31. Eng. Starting Battery Voltmeter (if installed) *Check 12 to 14 Volt*

2.3 ENGINE STARTING

Avionics switches must be set OFF during engine starting to prevent avionic equipment damage.

1 Start clearance — *Obtain if needed*

Right engine starting

1 RH Throttle lever — *IDLE*
2 RH Carburetor heat — *OFF*
3 RH Propeller Lever — *FULL FORWARD*
4 RH Choke — *ON if required*

Cold engine.

Throttles idle (fully closed), chokes fully opened. Soon after starting advance the throttle to ~800 RPM and slowly close the choke. Keep engine at ~900 RPM for warm up period.

Hot engine.

Park the aircraft with the nose pointing into wind in order to aid cooling.
Keep chokes closed and slowly open the throttles one inch while cranking.

"Flooded Engine" (after engine start failure).

Keep chokes closed, open throttle fully and start the engine, then quickly reduce throttles to idle

5 RH Electrical Fuel pump — *ON, check advisory light ON and positive fuel press build up*

6 RH engine propeller zone *CHECK free*
7 RH ignitions switches *BOTH ON*

WARNING

Ensure that the area around engine propeller disc is clear from people and obstacles. Call out for propeller free.

Standard call out >*RIGHT PROP CLEAR*<

8 RH start push button *PUSH*
9 RH engine oil gauge *CHECK if increasing within 10 sec. (max 7 bar in cold operation)*
10 RH propeller RPM *1200 RPM*
11 RH Choke *OFF*
12 RH Field *ON*
13 RH Avionics *ON*
14 RH Cross bus *ON*
15 RH Ammeter *CHECK Amps positive*
16 Voltmeter *CHECK 12 to 14 Volt*
17 Chronometer *Start*
18 RH Electrical Fuel pump *OFF*

Left engine starting

1 LH Throttle lever *IDLE*
2 LH Carburettor heat *OFF*
3 LH Propeller Lever *FULL FORWARD*
4 LH Choke *ON if required*
5 LH Electrical Fuel pump *ON, check advisory light ON and positive fuel press build up*
6 LH engine propeller zone *CHECK free*
7 LH ignitions switches *BOTH ON*

WARNING

Ensure that the area around engine propeller disc is clear from people and obstacles. Call out for propeller free.

Standard call out >*LEFT PROP CLEAR*<

8 LH start pushbutton *PUSH*
9 LH engine oil gauge *CHECK if increasing within 10 sec.(max 7 bar in cold operation)*
10 LH propeller RPM *12000 RPM*
11 LH Choke *OFF*
12 LH Field *ON*
13 LH Avionics *ON*
14 LH Cross bus *ON*
15 LH Ammeter *CHECK Amps positive*
16 LH Electrical Fuel pump *OFF*

2.4 BEFORE TAXIING

1 Let the engines warm up to a minimum oil temperature of 50°C at 1000 RPM
2 Nav, Taxi and Landing lights *ON*
3 Transponder *Stand-by*
4 Passengers and crews seat belts *Fastened*
5 Passengers and crews headphones *Set as required*

2.5 TAXIING

Ensure that the main and passengers' doors warning lights are turned off.

Standard call out >*LEFT FREE, RIGHT FREE*<

1 LH/RH Fuel Selector *As required*
2 LH and RH fuel pressure *Monitor*

3 Parking Brake *RELEASE*
4 Flight instruments *CHECK*
5 Engine instruments *CHECK*
6 Altimeter *SET both and crosscheck max difference 150 ft*

Standard call out >*CHECK BRAKES*<

7 Brakes *TEST*

2.6 PRIOR TO TAKEOFF / RUN UP

1 Parking Brake *ENGAGED*
2 RH Fuel Selector *RIGHT*
3 LH Fuel Selector *LEFT*
4 LH and RH fuel pressure *CHECK*
5 LH and RH Engine parameters checks:

- Oil temperature: *50-110 °*
- CHT: *Max 135°*
- Oil pressure: *2-5 bar (above 1400 RPM): 0.8 bar (below 1400 RPM)*
- Fuel pressure: *2.2 – 5.8 psi (0.15 - 0.40 bar)*

6 LH and RH Generator lights *CHECK BOTH OFF*
7 LH and RH Propeller Lever *FULL FORWARD*
8 LH and RH Throttle Lever *1650 RPM*
9 RH Ignitions switches Set L / R / BOTH *(RPM drop with single ignition circuit selected must not exceed 200 prop's RPM; maximum RPM difference by use of either circuits LEFT or RIGHT cannot overcome 50 RPM)*
10 LH Ignitions switches Set L / R / BOTH *(RPM drop with single ignition circuit selected must not exceed 200 prop's RPM; maximum RPM difference by use of either circuits LEFT or RIGHT cannot overcome 50 RPM)*
10 RH Propeller Lever *Governor check. Retard the prop lever until a RPM drop is observed. The purging cycle should be repeated up to 3 times, with the governor closely (firmly and positively) control the rpm. Verify 1650 prop RPM are restored with prop lever at full forward position.*
10 LH Propeller Lever *Governor check. Retard the prop lever until a RPM drop is observed. The purging cycle should be repeated up to 3 times, with the governor closely (firmly and positively) control the rpm. Verify 1650 prop RPM are restored with prop lever at full forward position.*
11 RH Carburettor heat *ON, verify propeller RPM decreasing about 100 RPM*
12 LH and RH Throttle Lever *BOTH IDLE*
13 RH Carburettor heat *OFF*
14 RH engine instruments *CHECK parameters if within green arcs*
15 LH and RH Fuel quantity indicator *CHECK consistent with fuel plan*
16 Flaps *T/O or as required*
17 Pitch trim and rudder trim *SET neutral position*
18 Flight controls *Check free*
19 Seat belts fastened and doors closed and locked *CHECK*

Standard call out >*TAKE-OFF BRIEFING*<

2.7 LINE-UP

Standard call out >*APPROACH SECTOR FREE*<

1 Parking Brake *RELEASE, check full in*
2 Annunciator window *CHECK cautions and warnings OFF*

3 RH Fuel Selector	*RIGHT*
4 LH Fuel Selector	*LEFT*
5 Pitot heat	*as required*
6 XPDR	*SET ALT*
7 Magnetic compass	*CHECK*
8 AHRS	*CROSS CHECK*
9 Strobes	*ON*

Standard call out >*RUNWAY IDENTIFIED*<

2.8 TAKEOFF

1 Landing light	*ON*
2 LH and RH Electrical Fuel pump	*BOTH ON*
3 Carburettors heat	*CHECK OFF*
4 LH and RH Propeller Lever	*FULL FORWARD*
5 LH and RH Throttle Lever	*FULL POWER*

Standard call out >*T/O POWER SET*>

6 Engines instruments	*Parameters within GREEN arcs*

Standard call out > *CHECKED*<
>*BRAKES RELEASED*<
>*SPEED RISING*<

7 Rotation speed	MTOW 1180kg *Vr = **64** KIAS*

Standard call out >*ROTATION*<

8 Apply brakes to stop wheel spinning

Standard call out >*POSITIVE CLIMB*<

9 Check	*Pitch 10° V>>70 RoC >500*

Standard call out >*GEAR UP*<

10 Landing gear control knob	*UP: check green lights and TRANS light turned OFF within about 20”*

2.9 CLIMB

Standard call out >*SAFE ALTITUDE*<

1 Flaps	*UP at safe altitude*
2 LH and RH Throttle Lever	*25 at safe altitude*
3 LH and RH Propeller Lever	*Set max cont power at safe altitude*
4 Landing and taxi lights	*OFF*
5 LH and RH Electrical Fuel pump	*BOTH OFF*

Standard call out >*AFTER T/O CHECKLIST COMPLITED*<

2.10 BEFORE LANDING

Standard call out >*SPEED CHECK – GEAR DOWN*<
> *APPROACH BRIEFING*<

1 Rear passengers seats	*Seats set at full aft and lower position*
2 Speed below applicable VLO/VLE	*Landing gear control knob DOWN Check green lights ON*
3 On base leg:	*Flaps T/O V=85*
4 On final leg: speed below 93 KIAS	*Flaps FULL*
	LH and RH Propeller Lever FULL FORWARD
5 Final Approach Speed	*VAPP= 75 KIAS*

6 Touchdown speed	*65 KIAS*
7 Landing and taxi light	*ON*
8 LH and RH Electrical Fuel pump	*BOTH ON*
9 Carburettors heat	*CHECK*

Standard call out >*BEFORE LANDING CHECKLIST COMPLETED*<

2.11 FINAL

1. Gear *check*	*DOWN 3 GREEN*
1. Flaps	*0/TO/FULL*
2 LH and RH Propeller Lever	*FULL FORWARD*
3. Landing Light: *check*	*ON*
4. Fuel pumps *check*	*ON*
5 Carburettor heat:	*as needed*

Standard call out >*FINAL CHECK*<

2.12 BALKED LANDING/MISSED APPROACH

Standard call out>*GO-AROUND*<

1 LH and RH Propeller Lever	*FULL FORWARD*
2 LH and RH Throttle Lever	*FULL POWER*
3 Carburettors heat	*CHECK OFF*
4 Flaps	*T/O*
5 Speed	*Keep over 62 KIAS, climb to VY or VX as applicable*
6 Landing gear	*UP as positive climb is achieved*
7 Flaps	*UP*

2.13 AFTER LANDING

1 LH and RH Electrical Fuel pump	*BOTH OFF*
2 Flaps	*0°*
3 Landing light	*OFF*
4 Strobes	*OFF*

Standard call out >*RUNWAY VACATED*<

2.14 PARKING/SHUT DOWN

1 Parking brake	*Engage*
2 Taxi light	*OFF*
3 Engines	*Allow for cooling down 1 minute at idle power*
4 LH and RH AVIONIC BUS	*OFF*
5 LH and RH CROSS BUS	*OFF*
6 Flaps	*Check in UP*
7 Trims	*Check neutrals*
8 Navigation lights	*OFF*

Ensure the engine is at its lowest possible idle speed before selecting ignitions off.

9 Ignitions	*Turn OFF one at time*
10 Doors safety locks	*Check OFF*
11 LH/RH Field	*OFF*
12 All external lights	*OFF*

13 Master Switch *OFF*
14 LH and RH Fuel Selector *BOTH OFF*
15 Emg Batt / Emg cockpit light *Check OFF*

2.15 POSTFLIGHT CHECKS

1 Pilot door and cabin
Check door for integrity.

2 Left main landing gear
Check fuselage skin status, tire status (cuts, bruises, cracks and excessive wear), slippage markers integrity, gear structure and shock absorber, hoses, gear door attachments and gear micro-switches. There should be no sign of hydraulic fluid leakage.

3 Wheel chocks
Use if needed

4 Aileron lock
The propeller blades and spinner should be free of cracks, nicks, dents and other defects and should rotate freely. Check fixing and lack of play between blades and hub.

5 Left engine nacelle
Perform following inspections:
a) Check the surface conditions.
b) Nacelle inlets and exhausts openings must be free of obstructions. If inlet and outlet plugs are installed, they should be removed.
c) Check radiators. There should be no indication of leakage of fluid and they have to be free of obstructions.
g) Check drainage hoses clamps
h) Verify all parts are fixed or locked.
i) Verify all inspection doors are closed.

6 Air induction system
Check engine air inlet for integrity and correct fixing. The air intake filter must be free of obstructions.

7 Landing and taxi lights
Visual inspection.

8 Left wing leading edge
Visual inspection. Check cabin ventilation inlet and carburettor heating inlet for condition and free of obstruction. Check stall strip.

9 Left wing top and bottom panels
Visual inspection

10 Left winglet, nav and strobe lights, static discharge wick
Check for integrity and fixing

11 Left aileron and balance mass
Visual inspection, remove tie-down devices and control locks if employed.

12 Left Flap and hinges
Visual inspection

13 Left static port
Visual inspectionand use protective cap

14 Antennas
Check for integrity

15 Gear pump, external power and battery compartment
Check emergency landing gear extension system pressure (low pressure limit: 20 bar), external power and battery compartments closure.

16 Horizontal and vertical empennage and tabs. Static discharge wicks.
Check the actuating mechanism of control surfaces and the connection with related tabs. Check wicks for integrity. Remove tiedown device if employed.

17 Stabilator leading Edge
Check for integrity

18 Fuselage top and bottom skin
Visual inspection

19 Right static port
Visual inspection and use protective cap

20 Right Flap and hinges
Visual inspection

21 Right aileron and balance weight
Visual inspection, remove tie-down devices and control locks if employed

22 Right winglet, nav and Strobe lights, static discharge wick
Check for integrity and fixing and lighting

23 Right wing top and bottom panels
Visual inspection

24 Right wing leading Edge
Visual inspection. Check cabin ventilation inlet and carburettor heating inlet for condition and free of obstruction. Check stall strip.

25 Propeller and spinner
The propeller blades and spinner should be free of cracks, nicks, dents and other defects and should rotate freely. Check fixing and lack of play between blades and hub.

26 Right engine nacelle
Apply check procedure reported in the walkaround station 5 and 6

27 Passenger door and cabin
Check door for integrity. Check safety belts for integrity and baggage for correct positioning and fastening. Check ditching emergency exit safety lock. Check passengers ventilation ports for proper setting.

28 Right main landing gear
Apply check procedure reported in the walkaround

29 Wheel chock
Use if needed

30 Bottom fuselage antennas
Check for integrity

31 Right cabin ram-air inlet
Visual inspection

32 Right Pitot tube
Check for any obstructionand use protective cap

33 Nose landing gear
Check tire status (cuts, bruises, cracks and excessive wear), slippage markers integrity, gear structure and retraction mechanism, shock absorber and gear doors attachments. There should be no sign of hydraulic fluid leakage

34 Radome
Check for integrity

35 Radome access door
Visual inspection

36 Left Pitot tube
Check for any obstruction and use protective cap

37 Left cabin ram-air inlet
Visual inspection

3 EMERGENCY PROCEDURES

Section includes checklists and detailed procedures for coping with various types of emergency conditions that could arise after a system failure. Before operating the aircraft, the pilot should become thoroughly familiar with this manual and, in particular, with this Section. Further on a continued and appropriate training and self study should be done.

In any case, as a failure or abnormal behaviour is detected pilots should act as follows:

1. *Keep self-control and maintain aircraft flight attitude and parameters*
2. *Analyse the situation identifying, if required, the area for a possible emergency landing*
3. *Apply the pertinent procedure*
4. *Inform the Air Traffic Control as applicable*

For the safe conduct of later flights, any anomaly and/or failure must be communicated to the National Authorities in charge, in order to put the aircraft in a fully operational and safe condition.

In this Chapter, following definitions apply:

Land as soon as possible*: land without delay at the nearest suitable area at which a safe approach and landing is assured.*

Land as soon as practical*: land at the nearest approved landing area where suitable repairs can be made.*

3.1 AIRPLANE ALERTS

3.1.1 SINGLE ALTERNATOR FAILURE / OVERVOLTAGE

1. FIELD LH (or RH) *OFF*
2. FIELD LH (or RH) *ON*

If the LH (or RH) ALT caution stays displayed

3. FIELD LH (or RH) *OFF*
4. Avionic LH *OFF*
5. ADF *OFF*

Switching OFF avionic LH and ADF will permit to shed nonessential electrical power.
The battery and a single generator are able to supply the electrical power necessary for flight, but redundancy is lost.

If conditions permit:

Switching CROSS BUS OFF will further reduce alternator load; the decision mainly depends on weather conditions.

6. CROSS BUS LH (or RH) OFF

LH Gen Bus	LH Avionic Bus	RH Avionic Bus	RH Gen Bus
Pitot Heat	DME	ADF	NAV Lights
Landing Light	Transponder	COM 2	Rudder Trim
Taxi Light	A/P	NAV 2	Stall Warning
	A/P Pitch Trim	MFD	
		AHRS/ADC*	

7. Land as soon as practicable

3.1.2 BOTH ALTERNATORS FAILURE

In event of both L and R ALT FAIL caution alerts displayed:

1. FIELD LH and RH *BOTH OFF*
2. FIELD LH and RH *BOTH ON*

If the LH (or RH) ALT caution stays displayed

1. Verify good ammeter indications on restored alternator
2. Refer to Single alternator failure / overvoltage drill

If both LH and RH ALT cautions stay displayed

3. FIELD LH and RH *BOTH OFF*
4. CROSS BUS LH and RH *BOTH OFF*

If engine starting battery modification is applied

5. EMERG BATT switch ON

6. Land as soon as possible**.**

If engine starting battery modification is not applied

5. Land as soon as possible**.**

The battery can supply electrical power for at least 30 minutes

3.1.3 BOTH ALTERNATORS OVERVOLTAGE

In event of both L and R BUS VOLT HIGH warning alerts displayed:

1. FIELD LH and RH *BOTH OFF*

2. FIELD LH and RH *BOTH ON (one at a time)*

If the LH (or RH) BUS VOLT HIGH warning is still displayed:

3. Verify good ammeter indications on restored alternator

4. Refer to Single alternator failure / overvoltage drill

If both LH and RH BUS VOLT HIGH warning are still displayed:

3. CROSS BUS LH and RH *BOTH OFF*

4. FIELD LH and RH *BOTH OFF*

5. FIELD LH and RH BOTH ON (one at a time)

If LH (or RH) BUS VOLT HIGH warning is still displayed:

6. Verify good ammeter indications on restored alternator

7. Switch CROSS BUS on the restored alternator side

8. Refer to Single alternator failure / overvoltage drill

If both LH and RH BUS VOLT HIGH warning are still displayed:

6. FIELD LH and RH *BOTH OFF*

If engine starting battery modification is applied

7. EMERG BATT switch ON

8. Land as soon as possible.

If engine starting battery modification is not applied

7. Land as soon as possibile

The battery can supply electrical power for at least 30 minutes

3.1.4 FAILED DOOR CLOSURE

In case of door opening / unlocking, related PILOT or REAR DR OPEN alert is displayed. In this case, apply following procedure:

ON THE GROUND

1. Passengers and crew seat belts *Fasten and tighten*

2. Affected door *Verify correctly closed*

If door is open

3. Relevant engine *Shut down*

4. Affected door *Close and check*

If door is closed

3. Locking device *Check*

If down in unlocked position

4. Abort mission.

IN FLIGHT

1. Passengers and crew seat belts *Fasten and tighten*

2. Affected door and locked device *Verify correctly closed*

If door is open or locking device is unlocked

3. Land as soon as possibile

3.1.5 PITOT HEATING SYSTEM FAILURE

When the Pitot Heating system is activated, the green PITOT HEAT advisory light is turned ON. If the amber PITOT HEAT caution light turns OFF, then the Pitot Heating system is functioning properly. Anytime the amber PITOT HEAT caution light is ON at the same time the green PITOT HEAT light is ON, then the Pitot Heating system is not functioning properly.

1. Pitot heat switch *OFF*
2. Verify Pitot Heating circuit breaker is *IN*
3. Pitot heat switch *ON*
4. Check PITOT HEAT caution light:

If the amber light stays ON, assume a failure in the pitot heating system.
Avoid visible moisture and OATs below 10 deg C.

3.1.6 COOLANT LIQUID LOW LEVEL

When the engine coolant liquid level goes under the lower limit, the related L or R COOLANT LOW warning alert is displayed. Low coolant level condition may lead to high CHT/CT. When the warning is displayed, apply following procedure:

1. Check affected engine CHT/CT

If CHT is above 135°C or CT is above 120°C

2. Affected engine *Reduce power setting to reduce CHT/CT up tothe minimum practical*
3. Land as soon as practical

If CH/CT continues to rise and engine shows roughness or power loss

4. Affected engine *SECURE*
5. Land as soon as possible applying ***ONE ENGINE INOPERATIVE LANDING*** procedure.

3.1.7 GEAR PUMP FAILURE

The GEAR PUMP ON caution light turns ON when the landing gear hydraulic pump is electrically supplied. After the landing gear retraction, if the red TRANS light turns OFF and the GEAR PUMP ON caution stays turned ON, this could indicate a gear pump relay failure to ON.

If TRANS light is OFF

1. Continue the mission monitoring the caution light.

If TRANS light is ON

2. Landing gear is not locked in UP position

The electrical gear pump, continuously supplied, causes a current absorption which does not affect the mission unless this failure is coupled with the overall electrical failure. In this case, the residual battery endurance may be consistently lower than 30 minutes.

3.1.8 ENGINE FIRE

LH ENGINE FIRE Left engine fire detected OR RH ENGINE FIRE Right engine fire detected
In event of engine fire, the LH or RH ENGINE FIRE warning alert is displayed.
Refer to following procedures:
FIRE ON THE GROUND
FIRE DURING TAKEOFF RUN
FIRE IN FLIGHT

3.1.9 LOSS OF INFORMATION DISPLAYED

When a LRU or a LRU function fails, a large red 'X' is typically displayed on the display field associated with the failed data.

In most of cases, the red "X" annunciation is accompanied by a message advisory alert issuing a flashing ADVISORY Softkey annunciation which, once selected, acknowledges the presence of the message advisory alert and displays the alert text message in the Alerts Window.

3.1.10 DISPLAY FAILURE

In the event of a display failure, the G950 System automatically switches to reversionary(backup) mode. In reversionary mode, all important flight information is presented on the remaining display in the same format as in normal operating mode. The change to backup paths is completely automated for all LRUs and no pilot action is required.

if the system fails to detect a display problem

1 DISPLAY BACKUP button *PUSH*

3.2 POWERPLANT EMERGENCIES

3.2.1 PROPELLER OVERSPEEDING

The aircraft is fitted with propeller/governor set by MT-Propeller such a way that the maximum propeller rpm exceedance is prevented. In case of propeller overspeeding in flight, apply following procedure:

1. Throttle Lever *REDUCE power to minimum practical*
2. Propeller Lever *REDUCE as practical (not in feathering)*
3. RPM indicator *CHECK*

If it is not possible to decrease propeller rpm, apply ***ENGINE SECURING PROCEDURE*** and land as soon as possible **a**pplying ***ONE ENGINE INOPERATIVE LANDING*** procedure .

CAUTION

Maximum propeller rpm exceedance may cause the engine components damage. Propeller and engine shall be inspected in accordance with related Operators Manuals.

3.2.2 CHT LIMIT EXCEEDANCE

If CHT/CT exceeds its limit, apply following procedure:

1. Check affected engine CHT/CT

If CHT is above 135°C or CT is above 120°C

2. Affected engine *Reduce power setting to reduce CHT/CT up to the minimum practical*
3. Land as soon as practical

If CHT/CT continues to rise and engine shows roughness or power loss

4. Affected engine *SECURE*
5. Land as soon as possible applying *one engine inoperative landing* procedure.

3.2.3 OIL TEMPERATURE LIMIT EXCEEDANCE

If oil temperature exceeds maximum limit (130°C):

1. OIL PRESS *CHECK*

If oil pressure is within limits

2. Affected engine *Reduce power setting to minimum applicable*
3. Affected engine *Keep propeller speed higher than 2000 RPM*

If oil pressure does not decrease

4. Airspeed *INCREASE*

If oil temperature does not come back within limits, the thermostatic valve, regulating the oil flow to the heat exchangers, could be damaged or an oil leakage can be present in the oil supply line.

5. Land as soon as practical keeping the affected engine to the minimum necessary power
6. Monitor OIL PRESS and CHT/CT

if engine roughness / vibrations or erratic behaviour is detected:

7. Affected engine *SECURE*
8. **Land as soon as possible** applying *one engine inoperative landing* procedure.

WARNING

Excessive oil pressure drop leads to a high pitch propeller configuration with consequent propeller feathering and engine stopping.

3.2.4 OIL PRESSURE LIMITS EXCEEDANCE

If oil pressure exceeds its lower or upper limit (0.8 – 7 bar), apply following procedure:

WARNING

Excessive oil pressure drop leads to a high pitch propeller configuration with consequent propeller feathering and engine stopping. An excessive oil pressure value can be counteracted by decreasing propeller rpm.

1. OIL PRESS *CHECK*

If oil pressure exceeds upper limit (7 bar)

2. Throttle Lever *first REDUCE affected engine power by 10%*
3. Propeller Lever *Keep low rpm*
4. OIL PRESS *CHECK (verify if came back within the limits)*
5. Land as soon as practical

If oil pressure is under the lower limit (0.8 bar)

2. Land as soon as practical

If oil pressure is continuously decreasing

3. Affected engine *SECURE*
4. Land as soon as possible applying *one engine inoperative landing* procedure.

3.2.5 LOW FUEL PRESSURE

If fuel pressure decreases below the lower limit (2.2 psi), apply following procedure:

1. Fuel press *CHECK*
2. Fuel quantity *CHECK*
3. Fuel consumption *MONITOR*

If a fuel leakage is deemed likely

5. Land as soon as possible.

If a fuel leakage can be excluded:

4. Electrical fuel pump *ON*
5. Feed the affected engine by means of opposite side fuel tank

If pressure does not come back within the limits

6. Land as soon as practical

3.3 OTHER EMERGENCIES

3.3.1 EMERGENCY DESCENT

Descent with airspeed at VLE, idle power and gear down will provide high descent rates and pitch attitudes up to -15°. Anticipate altitude capture and return to level flight during emergency descent in order to assure a safe and smooth recovery from maneuver.

1. Power levers *IDLE*
2. Flaps *UP*
3. IAS *below VLO/VLE*
4. Landing gear *DOWN*
5. Airspeed *Up to VLE*

3.3.2 TOTAL ELECTRICAL FAILURE

In case of electrical system overall failure, apply following procedure:

1. Emergency light *ON if necessary*
2. MASTER SWITCH *OFF*

3. FIELD LH and RH *BOTH OFF*
4. MASTER SWITCH *ON*
5. FIELD LH and RH *BOTH ON*

If failure persists

6. EMERG BATT switch *ON (if engine starting battery installed)*
7. Land as soon as possible applying *emergency landing gear extension* procedure

WARNING

An electrical system overall failure prevents flaps operation: landing distance without flaps increases of about 25%.

CAUTION

A fully charged battery can supply electrical power for at least 30 minutes.

3.3.3 STATIC PORTS FAILURE

In case of static ports failure, the alternate static port in the cabin (shown below) must be activated.

1. Cabin ventilation *OFF (hot and cold air)*
2. ALTERNATE STATIC PORT VALVE *OPEN*
3. Continue the mission

3.3.4 UNINTENTIONAL FLIGHT INTO ICING CONDITIONS

1. Carburettor heat *BOTH ON*
2. Pitot heat *ON*
3. Fly as soon as practical toward a zone clear of visible moisture, precipitation and with higher temperature, changing altitude and/or direction.
4. Control surfaces *Move continuously to avoid locking*
5. Propellers rpm *INCREASE to prevent ice build-up on the blades*

WARNING

In event of ice build-up in correspondence of wing leading edges, stall speed increases.
Ice build-up on wing, tail fin or flight control surfaces unexpected sudden roll and/or pitch tendencies can be experienced and may lead to unusual attitude and loss of aircraft control.
Do not use Autopilot when icing formation is suspected or detected.

3.3.5 CARBURETTOR ICING

DURING TAKEOFF

The carburettor icing in “full throttle” mode is unlikely. Take off in known or suspected icing formation is forbidden; in order to dispose of full engine take off power, take-off must be performed with carburettor heating OFF.

IN FLIGHT

Carburettor icing is considered probable when external air temperature is below 15° C and visible air moisture (clouds, mist, haze or fog) or atmospheric precipitation are present.
Generally, an OAT-to-dew point temperature spread lower than 10°C and OAT less than 15°C with visibility lower than 5 km is a positive indication of likely icing formation condition.
Should an inadvertent flight into known or forecast icing condition happen carburettor heating should be selected “ON” as soon as possible: the greater the advance carburettors are warmed the better the chances not to form ice and avoid engine power loss or reduction.
Keep Carb Heating “ON” until engine power is restored and area of possible icing condition is exited.

CAUTION

Carburettor Heating selected to “ON” will cause engine RPM reduction of about 100 RPM causing a sensible available engine power decrease.

3.3.6 FLAPS CONTROL FAILURE

DURING TAKEOFF

CAUTION

Flap UP take off, requires a T/O distance (50 ft height obstacle distance) increased by about 20%.

1. Airspeed *Keep below 93 KIAS*

2. Land as soon as practical

DURING APPROACH/LANDING

CAUTION

If the flaps control fails, consider the higher stall speed and an increased landing distanceof about 25%.

1. Airspeed *Keep over 75 KIAS*

2. Land as soon as practical on a runway of appropriate length

DURING APPROACH/LANDING

CAUTION

If the flaps control fails, consider the higher stall speed and an increased landing distance of about 25%.

1. Airspeed *Keep over 75 KIAS*

2. Land as soon as practical on a runway of appropriate length

3.4 ONE ENGINE INOPERATIVE PROCEDURES

CAUTION

The ineffectiveness of one engine results in asymmetric traction which tends to yaw and bank the aircraft towards the inoperative engine. In this condition it is essential to maintain the direction of flight compensating the lower traction and counteracting the yawing effects by mean of rudder pedals.

To improve directional control, it is advisable to bank the aircraft of about 5° to the side of the operating engine. In addition, reduced available overall power and extended control surfaces will lead to a performances drop: a quick pitch attitude reduction will allow to keep a minimum safety airspeed. The higher is the airspeed the better will be lateral and directional control efficiency: never allow airspeed to drop below VMCA.

CAUTION

Best residual climb performances in OEI (One Engine Inoperative) condition have been recorded in Flap Up configuration and at VYSE, which is marked as a Blue Line on the Airspeed indicator (calculated for maximum Take Off Weight and Sea, Level ISA condition) For actual condition VYSE refer to Section 5 Para. 13, "One engine rate of climb". VXSE is actually very close to VYSE in any condition, thus best climb performance will also be associated with best climb angle (gradient) performance. .

3.4.1 ENGINE SECURING

Following procedure is applicable to shut-down one engine in flight:

1. Throttle Lever *IDLE*
2. Ignition *BOTH OFF*
3. Propeller Lever *FEATHER*
4. Fuel Selector *OFF*
5. Electrical fuel pump *OFF*

After securing engine(s), after analysing situation, refer immediately to following procedures:

ENGINE FAILURE IN FLIGHT
SINGLE GENERATOR FAILURE
BOTH GENERATOR FAILURE
INFLIGHT ENGINE RESTART
ONE ENGINE INOPERATIVE LANDING
LANDING WITHOUT ENGINE POWER

3.4.2 INFLIGHT ENGINE RESTART

WARNING

After: - mechanical engine seizure; - fire; - major propeller damage engine restart is not recommended.

1. Carburettor heat	*ON if required*
2. Electrical fuel pump	*ON*
3. Fuel quantity indicator	*CHECK*
4. Fuel Selector	*CHECK (Crossfeed if required)*
5. Field	*OFF*
6. Ignition	*BOTH ON*
7. Operating engine Throttle Lever	*SET as practical*
8. Stopped engine Throttle Lever	*IDLE*
9. Stopped engine Propeller Lever	*FULL FORWARD*
10. Start push-button	*PUSH*
11. Propeller Lever	*SET at desired rpm*
12. Field	*ON (check for positive ammeter)*
13. Engine throttle levers	*SET as required*

If engine restart is unsuccessful

14. EMERG BATT switch	*ON (if starting battery installed)*
15. Repeat engine restart procedure	

CAUTION

After engine restart, if practical, moderate propeller rpm and throttle increase to allow OIL and CHT/CT temperatures for stabilizing in the green arcs.
If the fuel quantity in the tank which feeds the stopped engine is low, select the opposite side fuel tank by means of the fuel selector.

If engine restart is still unsuccessful:

16. Affected engine	*SECURE*

17. Land as soon as possible applying *one engine inoperative landing* procedure

3.4.3 ENGINE FAILURE DURING TAKEOFF RUN

Before rotation: abort take off

1. Throttle Lever	*BOTH IDLE*
2. Rudder	*Keep heading control*
3. Brakes	*As required*

When safely stopped:

4. Failed Engine Ignition	*BOTH OFF*
5. Failed Engine Field	*OFF*
6. Failed Engine Electrical fuel pump	*OFF*

if the decision is taken to continue the takeoff:

WARNING

A take-off abort should always be preferred if a safe stop can be performed on ground.
A suggested "GO-NO-GO" criteria is: abort take-off until LG is still down and locked.
Once airborne accelerate to Blue Line Speed (VYSE) before commanding LG retraction.
Take-off planning should take into account that high density altitude and aircraft mass may result in OEI negative climb rate. VYSE with flap up shall be flown in order to achieve best possible rate of climb after landing gear retraction and engine feathering.

1. Operating engine Throttle Lever	*FULL POWER*
2. Operating engine Propeller Lever	*FULL FORWARD*
3. Heading	*Keep control using rudder and ailerons*
4. Attitude	*Reduce as appropriate to keep airspeed over 62 KIAS*
5. Inoperative engine Propeller Lever	*FEATHER*

6. Landing gear control lever — *UP*
7. Airspeed — *VXSE/VYSE as required*
8. Flaps — *0°*

At safe altitude

9. Inoperative engine — *Confirm and SECURE*
10. Operative engine Electrical fuel pump — *Check ON*
11. Operating engine — *Check engine instruments*
12. Operating engine Fuel Selector — *Check correct feeding (crossfeed if needed)*

If engine restart is recommended:

13. Apply **INFLIGHT ENGINE RESTART** procedure

If engine restart is unsuccessful or it is not recommended:

13. Land as soon as possible
14. One engine inoperative landing procedure

Following:
- mechanical engine seizure; - fire; - major propeller damage engine restart is not recommended.

3.4.4 ENGINE FAILURE DURING CLIMB

1. Autopilot — OFF
2. Heading — *Keep control using rudder and ailerons*
3. Attitude — *Reduce as appropriate to keep airspeed over 62 KIAS*
4. Operating engine Throttle Lever — *FULL THROTTLE*
5. Operating engine Propeller Lever — *FULL FORWARD*
6. Operative engine Electrical fuel pump — *Check ON*
7. Inoperative engine Propeller Lever — *FEATHER*
8. Inoperative engine — *Confirm and SECURE*

If engine restart is possible:

9. Apply **INFLIGHT ENGINE RESTART**

If engine restart is unsuccessful or it is not recommended:

9. Land as soon as possible
10. One engine inoperative landing procedure.

Following a mechanical engine seizure, fire or a major propeller damage engine restart is not recommended.
Continuation of flight to a safe landing runway must be planned taking into account maximum operating ceiling in OEI condition. Refer to "One-engine rate of climb".

3.4.5 ENGINE FAILURE IN FLIGHT

1. Autopilot — *OFF*
2. Heading — *Keep control using rudder and ailerons*
3. Attitude — *Adjust as appropriate to keep airspeed over 62 KIAS*
4. Operating engine — *Monitor engine instruments*
5. Operative engine Electrical fuel pump — *Check ON*
6. Operating engine Fuel Selector — *Check correct feeding (crossfeed if needed)*

If engine restart is possible:

7. Apply **INFLIGHT ENGINE RESTART** procedure

If engine restart is unsuccessful or it is not recommended:

8. Land as soon as possible
9. One engine inoperative landing procedure.

Following a mechanical engine seizure, fire or a major propeller damage engine restart is not recommended.

WARNING

Continuation of flight to a safe landing runway must be planned taking into account maximum operating ceiling in OEI condition. Refer to Rate of climb with One Engine Inoperative.

3.4.6 ONE ENGINE INOPERATIVE LANDING

WARNING

Thoroughly evaluate residual Single Engine Go-Around capabilities and expected climb gradient should a Missed Approach / balked landing be executed.
Autopilot must be kept OFF

1. Seat belts	*Tightly fastened*
2. Landing lights	*As required*
3. Operating engine Fuel Selector	*Check correct feeding/crossfeed if needed*
4. Inoperative engine Propeller Lever	*CHECK FEATHER*
5. Inoperative engine	*CHECK SECURED*
6. Operative engine Electrical fuel pump	*ON*

When on final leg:

7. Flap	*T/O*
8. Landing gear	*Select DOWN and check three green lights on*
9. Approach Airspeed	*VYSE*
10. Touchdown speed	*70 KIAS*

3.5 LANDING GEAR SYSTEM FAILURES

3.5.1 EMERGENCY LANDING GEAR EXTENSION

Landing gear extension failure is identified by means of the green lights not illuminated: relevant gear leg may not be fully extended and/or locked. Light bulb operating status can be verified by pressing the LDG push-to-test button. Additionally, the red light TRANS indicates that one or more legs are moving and the PUMP ON amber light on the annunciator panel indicates the hydraulic gear pump is operating.

1. Airspeed	*applicable VLO/VLE*
2. Landing gear control lever	*DOWN*
Landing gear breaker	*OFF*
3. Emergency gear extension access door	*REMOVE*
4. RH control lever	*90° counterclockwise*

5. Wait at least 20 seconds

Main Landing Gear legs green lights may be turned on, thus indicating effective main gear legs blocked in down position by mere effect of gravity force.

6. LH control lever *ROTATE*	*180° counterclockwise*

7. Land as soon as practical

The emergency landing gear extension operation takes about 20- sec.

3.5.2 COMPLETE GEAR UP OR NOSE GEAR UP LANDING

CAUTION

The following procedure applies if Nose Landing Gear is not extended and locked even after emergency extension procedure.

WARNING

A Nose Landing Gear up leg not down and locked might lead to a hazardous situation, especially on uneven runways.
If landing gear position is not known, perform a tower fly-by at safe speed and altitude to have confirmation about its situation.
If possible coordinate fire brigade intervention along runway and report number of persons on board and remaining fuel type and quantity.

If a complete Landing Gear up or a Nose Landing Gear up position is reported:

Preparation

1. Reduce fuel load if time and conditions permit
2. Crew and passengers safety belts — *Tightly fastened*
3. Landing gear control lever — *UP*
4. Green lights and TRANS light — *CHECK OFF*
5. Flap setting — *plan approach with Flap Land*

Before ground contact:

6. LH and RH Fuel Selector — *BOTH OFF*
7. LH and RH Electrical fuel pump — *BOTH OFF*
8. Ignitions — *ALL OFF*

On touch down:

9. Landing attitude — *slight nose-up and wings levelled*,
10. Touchdown speed — *as low as 50 KIAS with flap*
11. Aircraft nose — *gently lower as speed bleeds off*

After aircraft stops:

12. FIELD LH and RH — *BOTH OFF*
13. MASTER SWITCH — *OFF*

CAUTION

Master switch to OFF impairs radio communication and outside aircraft lighting.
Consider use of ditching emergency exit to escape in case pilot or passenger doors are blocked, watch for engine hot parts, fuel, hydraulic fluid or oil spills. Leave aircraft in upwind direction.

3.5.3 PARTIAL MAIN LG EXTENSION

CAUTION

The following procedure applies if one or both Main Landing Gear legs are not completely extended and locked even after emergency extension procedure.

WARNING

A partial gear landing (RH and/or LH leg not down and locked) might turn into a hazardous situation, especially on uneven runways. If possible try to obtain a symmetric gear extension (e.g. by trying further landing gear retraction) in order to avoid swerving after touchdown.
A gear up landing is generally considered safer.
If landing gear position is not known, perform a tower fly-by at safe speed and altitude to have confirmation about its situation.
If possible coordinate fire brigade intervention along runway and report number of persons on board and remaining fuel type and quantity.

Preparation

1. Reduce fuel load if time and conditions permit
2. Crew and passengers safety belts — *Tightly fastened*
3. Landing gear control lever — *UP*
4. Green lights and TRANS light — *CHECK OFF*
5. Flap setting — *plan approach with Flap Land*

If partially extended landing gear is confirmed:

Before ground contact:

6. LH and RH Fuel Selector — *BOTH OFF*
7. LH and RH Electrical fuel pump — *BOTH OFF*
8. Ignitions — *ALL OFF*

On touch down:

9. Align for approach — *on the runway centreline*
10. Touchdown speed — *as low as 50 KIAS*
11. Touchdown — *on the extended gear only*
12. Heading and direction — *maintain applying appropriate aileron and rudder/steering control*
13. Retracted leg — *keep off the ground as long as possible*

After aircraft stops:

14. FIELD LH and RH — *BOTH OFF*

15. MASTER SWITCH *OFF*

CAUTION

Master switch to OFF impairs radio communication and outside aircraft lighting.

16. Aircraft Evacuation *carry out if necessary*

WARNING

Consider use of ditching emergency exit to escape in case pilot or passenger doors are blocked, watch for engine hot parts, fuel, hydraulic fluid or oil spills. Leave aircraft in upwind direction.

3.5.4 FAILED RETRACTION

1. Airspeed *Keep below applicable VLO/VLE*

2. Landing gear control lever *DOWN*

WARNING

A Landing Gear lever recycle (further retraction attempt) may result in a final partial Landing Gear Extension, which may then compromise safe landing aircraft capability.

3. Landing Gear lights *Check*

If a safe landing configuration is obtained (3 greens)

4. Land normally

If a safe landing gear configuration is not obtained:

4. Emergency LG extension procedure

5. Land as soon as practical

3.5.5 UNINTENTIONAL LANDING GEAR EXTENSION

CAUTION

An unwanted landing gear extension, with at least one leg moving downward, may be caused by hydraulic fluid loss and it is signaled by

- significant aerodynamic noise increase;

- light and counteractable nose down pitch moment;

- red TRANS light turned on.

1. Airspeed *Keep below applicable VLO/VLE*

2. Landing gear control lever *DOWN*

3. Landing Gear lights *Check*

If a safe landing configuration is obtained (3 greens)

4. Land normally

If a safe landing gear configuration is not obtained:

4. Emergency LG extension procedure

5. Land as soon as practical

3.6 SMOKE AND FIRE OCCURRENCE

3.6.1 ENGINE FIRE ON THE GROUND

1. Fuel Selectors *BOTH OFF*

2. Ignitions *ALL OFF*

3. Electrical fuel pumps *BOTH OFF*

4. Cabin heat and defrost *OFF*

5. MASTER SWITCH *OFF*

6. Parking Brake *ENGAGED*

7. Aircraft Evacuation carry out immediately

WARNING

Consider use of ditching emergency exit to escape in case pilot or passenger doors are blocked, watch for engine hot parts, fuel, hydraulic fluid or oil spills. Leave aircraft in upwind direction.

3.6.2 ENGINE FIRE DURING TAKEOFF RUN

Before rotation: abort take off

1. Throttle Lever	*BOTH IDLE*
2. Rudder	*Keep heading control*
3. Brakes	*As required*

With aircraft under control

4. Fuel Selector	*BOTH OFF*
5. Ignitions	*ALL OFF*
6. Electrical fuel pump	*BOTH OFF*
7. Cabin heat and defrost	*OFF*
8. MASTER SWITCH	*OFF*
9. Parking Brake	*ENGAGED*
10. Aircraft Evacuation	*carry out immediately*

WARNING

Consider use of ditching emergency exit to escape in case pilot or passenger doors are blocked, watch for engine hot parts, fuel, hydraulic fluid or oil spills. Leave aircraft in upwind direction.

if the decision is taken to continue the takeoff:

WARNING

A take-off abort should always be preferred if a safe stop can be performed on ground. A suggested "GO-NO-GO" criteria is: abort take-off until LG is still down and locked. Once airborne accelerate to Blue Line Speed (VYSE) before commanding LG retraction. Take-off planning should take into account that high density altitude and aircraft mass may result in OEI negative climb rate. VYSE with flap up shall be flown in order to achieve best possible rate of climb after landing gear retraction and engine feathering.

1. Operating engine Throttle Lever	*FULL POWER*
2. Operating engine Propeller Lever	*FULL FORWARD*
3. Heading	*Keep control using rudder and ailerons*
4. Attitude	*Reduce as appropriate to keep airspeed over 62 KIAS*
5. Fire affected engine Propeller Lever	*FEATHER*
6. Landing gear control lever	*UP*
7. Airspeed	*VXSE/VYSE as required*
8. Flaps	*0°*

At safe altitude

9. Cabin heat and defrost	*BOTH OFF*
10. Fire affected engine Fuel Selector	*Confirm and OFF*
11. Fire affected engine Ignitions	*Confirm and BOTH OFF*
12. Fire affected engine Electrical fuel pump	*Confirm and OFF*
13. Fire affected engine FIELD	*OFF*

14. Land as soon as possible applying *one engine inoperative landing* procedure.

3.6.3 ENGINE FIRE IN FLIGHT

1. Cabin heat and defrost	*BOTH OFF*
2. Autopilot	*OFF*
3. Fire affected engine Fuel Selector	*Confirm and OFF*
4. Fire affected engine Ignition	*Confirm and BOTH OFF*
5. Fire affected engine Throttle Lever	*Confirm and FULL FORWARD*
6. Fire affected engine Propeller Lever	*Confirm and FEATHER*
7. Fire affected engine Electrical fuel pump	*OFF*
8. Heading	*Keep control using rudder and ailerons*

9. Attitude — *Adjust as appropriate to keep airspeed over 62 KIAS*
10. Fire affected engine Field — *OFF*
11. Cabin ventilation — *OPEN*
12. Land as soon as possible applying *one engine inoperative landing* procedure.

3.6.4 ELECTRICAL SMOKE IN CABIN ON THE GROUND

1. MASTER SWITCH — *OFF*
2. Cabin heat and defrost — *OFF*
3. Throttle Lever — *BOTH IDLE*
4. Ignitions — *ALL OFF*
5. Fuel Selector — *BOTH OFF*
6. Parking Brake — *ENGAGED*
7. Aircraft Evacuation carry out immediately

WARNING

Consider use of ditching emergency exit to escape in case pilot or passenger doors are blocked, watch for engine hot parts, fuel, hydraulic fluid or oil spills. Leave aircraft in upwind direction.

3.6.5 ELECTRICAL SMOKE IN CABIN DURING FLIGHT

1. Cabin ventilation — *OPEN*
2. Emergency light — *ON*
3. Standby attitude indicator switch — *ON*
4. Gain VMC conditions as soon as possible

In case of cockpit fire:

5. Fire extinguisher — *use toward base of flames*

CAUTION

A tripped circuit breaker should not be reset.

If smoke persists, shed electrical supply in order to isolate faulty source by:

6. FIELD LH and RH — *OFF*
7. AVIONICS LH and RH — *OFF*
8. CROSS BUS LH and RH — *BOTH OFF*

CAUTION

A fully charged battery can supply electrical power for at least 30 minutes.

If faulty source is found:

9. It may be possible to restore non faulty power sources (one at a time)

If smoke persists:

WARNING

Before total electrical system shutdown consider gaining VMC condition, at night set personal emergency light on. Only emergency light and emergency ADI will be electrically powered. All radio COM and NAV, Landing Gear lever (normal mode) and indication lights, electrical trims and flaps will be unserviceable.

10.MASTER SWITCH *OFF*
11.Land as soon as possibile

When on ground:

12. Aircraft Evacuation — *carry out as necessary*

WARNING

Consider use of ditching emergency exit to escape in case pilot or passenger doors are blocked, watch for engine hot parts, fuel, hydraulic fluid or oil spills. Leave aircraft in upwind direction.

3.7 UNINTENTIONAL SPIN RECOVERY

WARNING

Spin behaviour has not been demonstrated since certification process does not required it for this aircraft category. Intentional spin is forbidden.

Stall with one engine inoperative is forbidden.
Should an unintentional spin occur, the classic recovery manoeuvre is deemed as being the best action to undertake:

1. Both engines throttles	*IDLE*
2. Flight Controls	*Centralize*
3. Rudder	*Fully Against Rotation Until It Stops*

3.8 LANDING EMERGENCIE

3.8.1 LANDING WITHOUT ENGINE POWER

CAUTION

In case of double engine failure both propellers should be feathered to achieve maximum efficiency.
Best glide speed is attained with flap UP and equals VY for current aircraft mass and air density altitude.
Normal landing gear extension requires MASTER switch ON, an efficient battery and takes around 20 seconds.
LG selection should be appropriately anticipated when sure on final.
Flap can be set to T/O or LAND when sure on final to reduce landing ground roll on short field.
Touchdown speed can be as low as 50 kt with flap down.

1. Airspeed	*MTOW 1180kg VY = 83 KIAS*
2. Flaps	*UP*
3. Emergency landing field	*Select*

WARNING

Emergency landing strip should be chosen considering surface condition, length and obstacles.
Wind can be guessed by smoke plumes direction and tree tops or grass bending.
Select touchdown direction according to the furrows of a plowed field, not across.

4. Safety belts	*FASTEN and tighten*
5. Flaps	*Set when landing is assured*
6. Landing gear control lever	*DOWN when landing is assured*

CAUTION

To reduce landing gear extension time, evaluate use of emergency control system which requires about 12 sec.

Before touch down

7. Fuel Selector	*BOTH OFF*
8. Electrical fuel pump	*BOTH OFF*
9. Ignitions	*ALL OFF*
10. MASTER SWITCH	*OFF*

When stopped

11. Aircraft Evacuation	*carry out if necessary*

WARNING

Consider use of ditching emergency exit to escape in case pilot or passenger doors are blocked, watch for engine hot parts, fuel, hydraulic fluid or oil spills. Leave aircraft in upwind direction.

3.8.2 LANDING WITH NOSE LANDING GEAR TIRE DEFLATED

WARNING

If possible, as a nose landing gear flat tire condition is known, coordinate fire brigade intervention along runway and report number of persons on board and remaining fuel type and quantity.

If Nose Landing Gear flat tire is confirmed:

Preparation

1. Crew and passengers safety belts	*Tightly fastened*
2. If time permits	*Burn fuel to lower landing weight*
3. Flap setting	*plan approach with Flap Land*

Before ground contact:

4. Fuel Selector	*BOTH OFF*

5. Electrical fuel pump *BOTH OFF*
6. Ignitions *ALL OFF*

On touch down:

7. Landing attitude *slight nose-up and wings levelled*,
8. Touchdown speed *as low as 50 KIAS with flap*
9. Aircraft nose *gently lower as speed bleeds off*

After aircraft stops:

10. FIELD LH and RH *BOTH OFF*
11. MASTER SWITCH *OFF*

CAUTION

Master switch to OFF impairs radio communication and outside aircraft lighting.

12. Aircraft Evacuation *carry out if necessary*

WARNING

Consider use of ditching emergency exit to escape in case pilot or passenger doors are blocked, watch for engine hot parts, fuel, hydraulic fluid or oil spills. Leave aircraft in upwind direction.

3.8.3 LANDING WITH A KNOWN MAIN LANDING GEAR TIRE DEFLATED

WARNING

An asymmetrical landing gear tire condition (RH and/or LH tires deflated)might turn into a hazardous situation, especially on uneven runways.
If possible, as a landing gear tires condition is known, coordinate fire brigade intervention along runway and report number of persons on board and remaining fuel type and quantity.

If a main Landing Gear flat tire is confirmed:

Preparation

1. Crew and passengers safety belts *Tightly fastened*
2. Flap setting *plan approach with Flap Land*

Before ground contact:

3. Ignitions *ALL OFF*
4. LH and RH Fuel Selector *BOTH OFF*
5. LH and RH Electrical fuel pump *BOTH OFF*

On touch down:

6. Align for approach *on the runway centreline*
7. Touchdown speed *as low as 50 KIAS*
8. Touchdown *on the good tire gear only*
9. Heading and direction *maintain applying appropriate aileron and rudder/steering control*
10. Flattened tire *keep off the ground as long as possible*

After aircraft stops (or if runway departure is imminent):

11. FIELD LH and RH *BOTH OFF*
12. MASTER SWITCH *OFF*

CAUTION

Master switch to OFF impairs radio communication and outside aircraft lighting.

13. Aircraft Evacuation *carry out if necessary*

WARNING

Consider use of ditching emergency exit to escape in case pilot or passenger doors are blocked, watch for engine hot parts, fuel, hydraulic fluid or oil spills. Leave aircraft in upwind direction.

3.8.4 LANDING WITHOUT BRAKES

CAUTION

If possible, select an airport with suitable runway length. Otherwise, evaluate the possibility to perform a gear up landing. In the latter case consider the increasing hazard of an uneven pavement.

1. Safety belts *FASTEN*

After touch down if runway is deemed insufficient to decelerate:

2. Fuel Selector — *BOTH OFF*
3. Electrical fuel pumps — *BOTH OFF*
4. Ignitions — *ALL OFF*
5. FIELD LH and RH — *BOTH OFF*
6. MASTER SWITCH — *OFF*

CAUTION

Master switch to OFF impairs radio communication and outside aircraft lighting.

Before end of runway or if runway departure is imminent:

7. Landing gear control lever — *UP*

After aircraft stops:

8. Aircraft Evacuation — *carry out if necessary*

WARNING

Consider use of ditching emergency exit to escape in case pilot or passenger doors are blocked, watch for engine hot parts, fuel, hydraulic fluid or oil spills. Leave aircraft in upwind direction.

3.9 AIRCRAFT EVACUATION

WARNING

Leave the aircraft when engines are fully stopped. Watch for engine hot parts and fuel, hydraulic fluid or oil spills when using fuselage doors. If fuselage doors are unserviceable escape through the ditching emergency exit. In case of engine fire escape from opposite or upwind aircraft side.

Verify (if not yet performed):

1. Fuel Selectors — *BOTH OFF*
2. Ignitions — *ALL OFF*
3. Electrical fuel pumps — *BOTH OFF*
4. MASTER SWITCH — *OFF*
5. Parking Brake — *ENGAGED*
6. Leave the aircraft using emergency exits

3.10 DITCHING

WARNING

Contact with water shall happen with aircraft longitudinal axis and direction of motion parallel to the wave at the minimum possible speed. Keep the nose up as long as possible.
Once in the water, the aircraft shall be evacuated through the ditching emergency exit, if available put life vest on and set dinghy out first. Inflate them only outside the aircraft.
If available, try to approach any existing ship in the vicinity in order to be rapidly located and rescued right after ditching.

1. Landing gear — *UP*
2. Safety belts — *Tighten and fastened*
3. Flaps — *FULL*

Before water impact

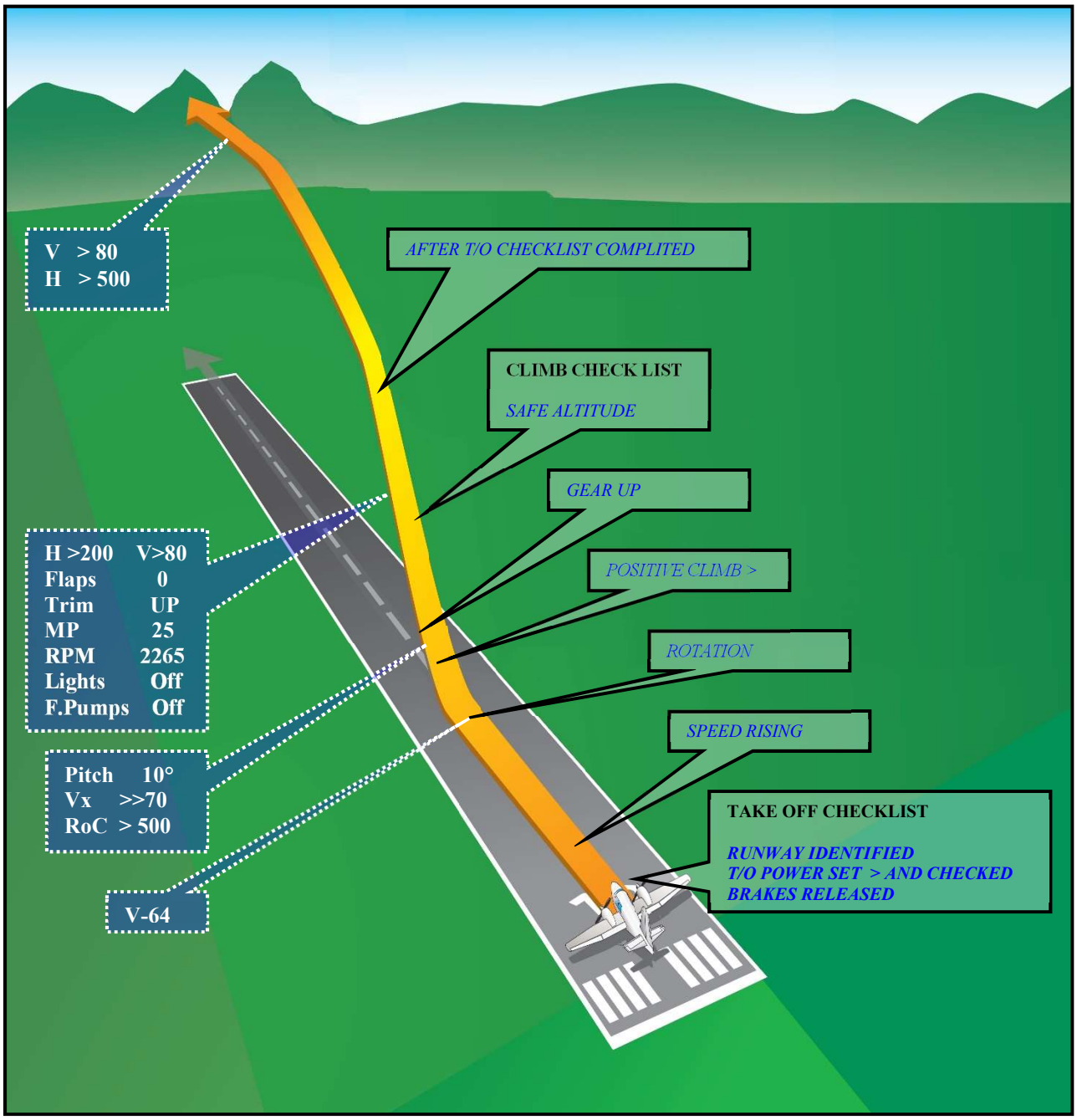
4. Fuel Selector — *BOTH OFF*
5. Electrical fuel pump — *BOTH OFF*
6. Ignitions — *ALL OFF*
7. MASTER SWITCH — *OFF*
8. FIELD LH and RH — *BOTH OFF*
9. Impact speed — *50 KIAS*

Aircraft evacuation

10. Emergency exit handle — *rotate clockwise*
11. Latch door — *push outward*
12. Life vests
13. Evacuate the aircraft

4 TRAFFIC PATTERN PROCEDURES

4.1 DEPARTURE

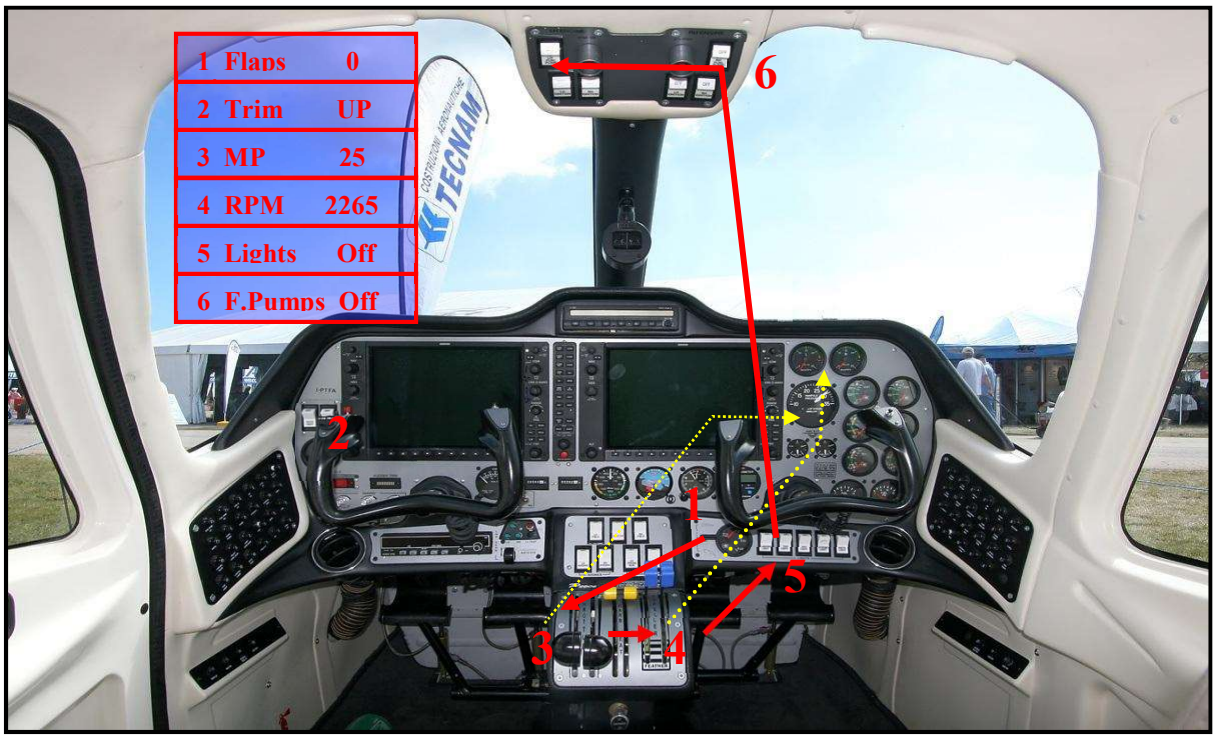


4.1.1 TAKE-OFF BRIEFING:

I'm the pilot flying, you are the pilot in command.
Runway in use ….. concrete/grass… dry/wet.
Wind …. from ….
Flaps TO…Vr …..climb speed V …..
After departure …. left hand pattern climb …..

Emergency briefing
Any failure before Vr…abort take-off, breaks apply, vacate runway notify ATC.
Any failure after Vr ..gear down and sufficient runway ahead land vacate runway notify ATC.
Any failure after Vr ..gear up or no sufficient runway ahead start OEI procedure notify ATC.
In case of engine fire apply emergency checklist and land asap
Briefing completed any questions

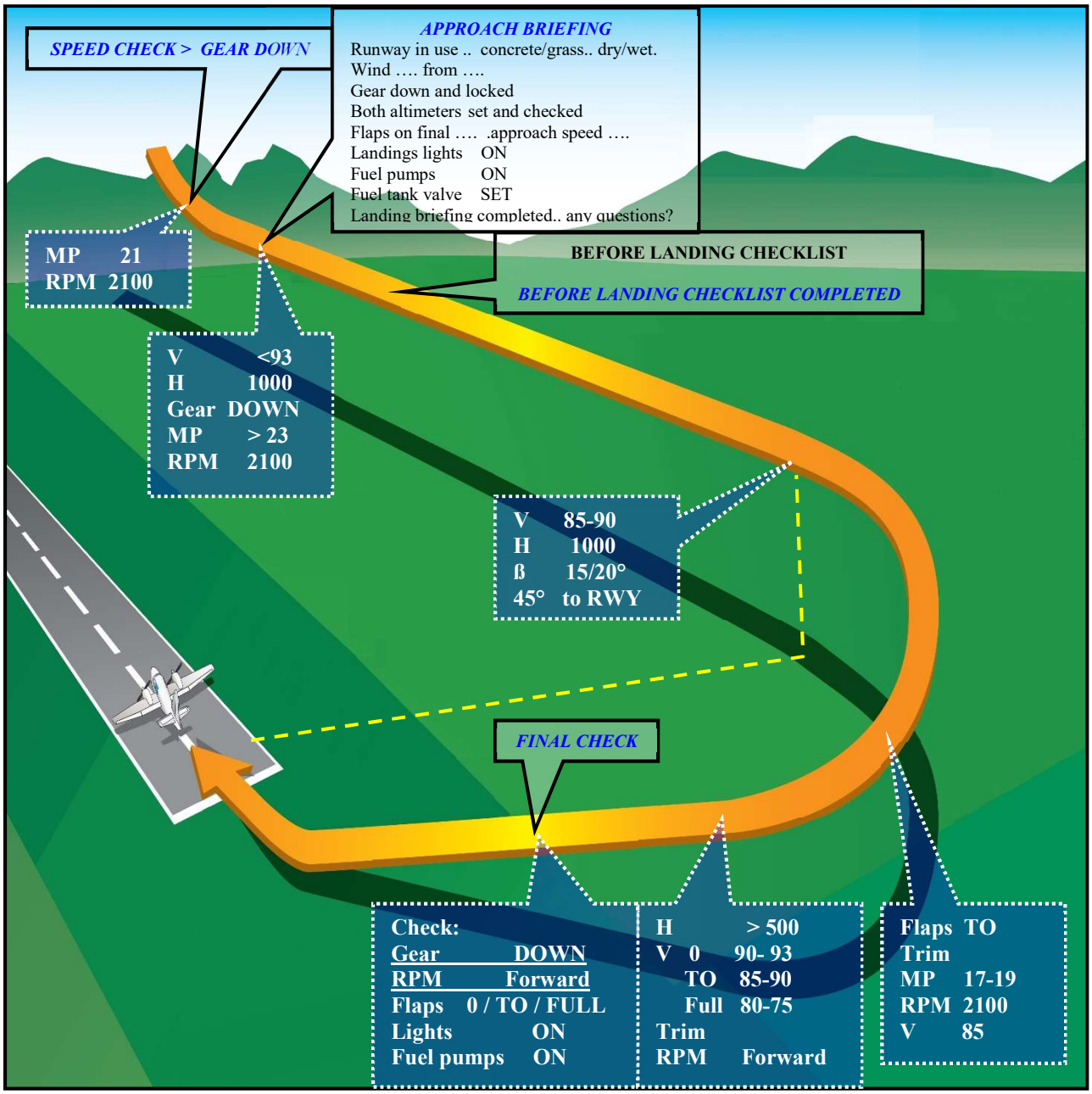
4.1.2 ACTIONS ON CLIMB CHECKLIST



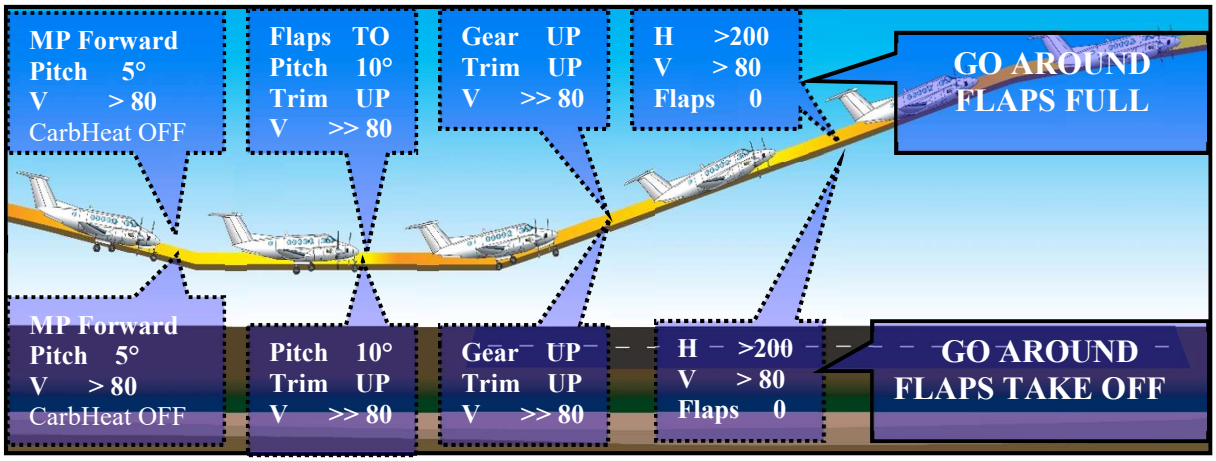
4.2 LANDING

4.2.1 APPROACH BRIEFING

Runway in use XX concrete/grass… dry/wet.
Wind …. from ….
Gear down and locked
Both altimeters set and checked
Flaps on final …..approach speed …..
Landings lights on
Fuel pumps on
Fuel tank valve set
Landing briefing completed.. any questions?


SPEED CHECK > GEAR DOWN
APPROACH BRIEFING
Runway in use .. concrete/grass.. dry/wet.
Wind …. from ….
Gear down and locked
Both altimeters set and checked
Flaps on final …. .approach speed ….
Landings lights ON
Fuel pumps ON
Fuel tank valve SET
Landing briefing completed.. any questions?
MP 21
RPM 2100
BEFORE LANDING CHECKLIST
BEFORE LANDING CHECKLIST COMPLETED
V <93
H 1000
Gear DOWN
MP > 23
RPM 2100
V 85-90
H 1000
ß 15/20°
45° to RWY
FINAL CHECK
Check:
Gear DOWN
RPM Forward
Flaps 0 / TO / FULL
Lights ON
Fuel pumps ON
H > 500
V 0 90- 93
TO 85-90
Full 80-75
Trim
RPM Forward
Flaps TO
Trim
MP 17-19
RPM 2100
V 85

4.3 GO AROUND


MP Forward
Pitch 5°
V > 80
CarbHeat OFF
Flaps TO
Pitch 10°
Trim UP
V >> 80
Gear UP
Trim UP
V >> 80
H >200
V > 80
Flaps 0
GO AROUND
FLAPS FULL
MP Forward
Pitch 5°
V > 80
CarbHeat OFF
Pitch 10°
Trim UP
V >> 80
Gear UP
Trim UP
V >> 80
H >200
V > 80
Flaps 0
GO AROUND
FLAPS TAKE OFF

5 SINGLE ENGINE TRAINING

5.1 CHARACTERISTIC AIRSPEEDS WITH ONE ENGINE INOPERATIVE

In case of one engine inoperative condition (OEI), pilot shall take into account the airspeeds shown below:

Minimum aircraft control speed with one engine inoperative and flaps set to T.O. (*VMC*)
62 KIAS

	MTOW 1180 kg	MTOW 1230 kg
Best rate-of-climb speed OEI (*VYSE*)	**80**	84
Best gradient speed OEI (VXSE)	**79**	83

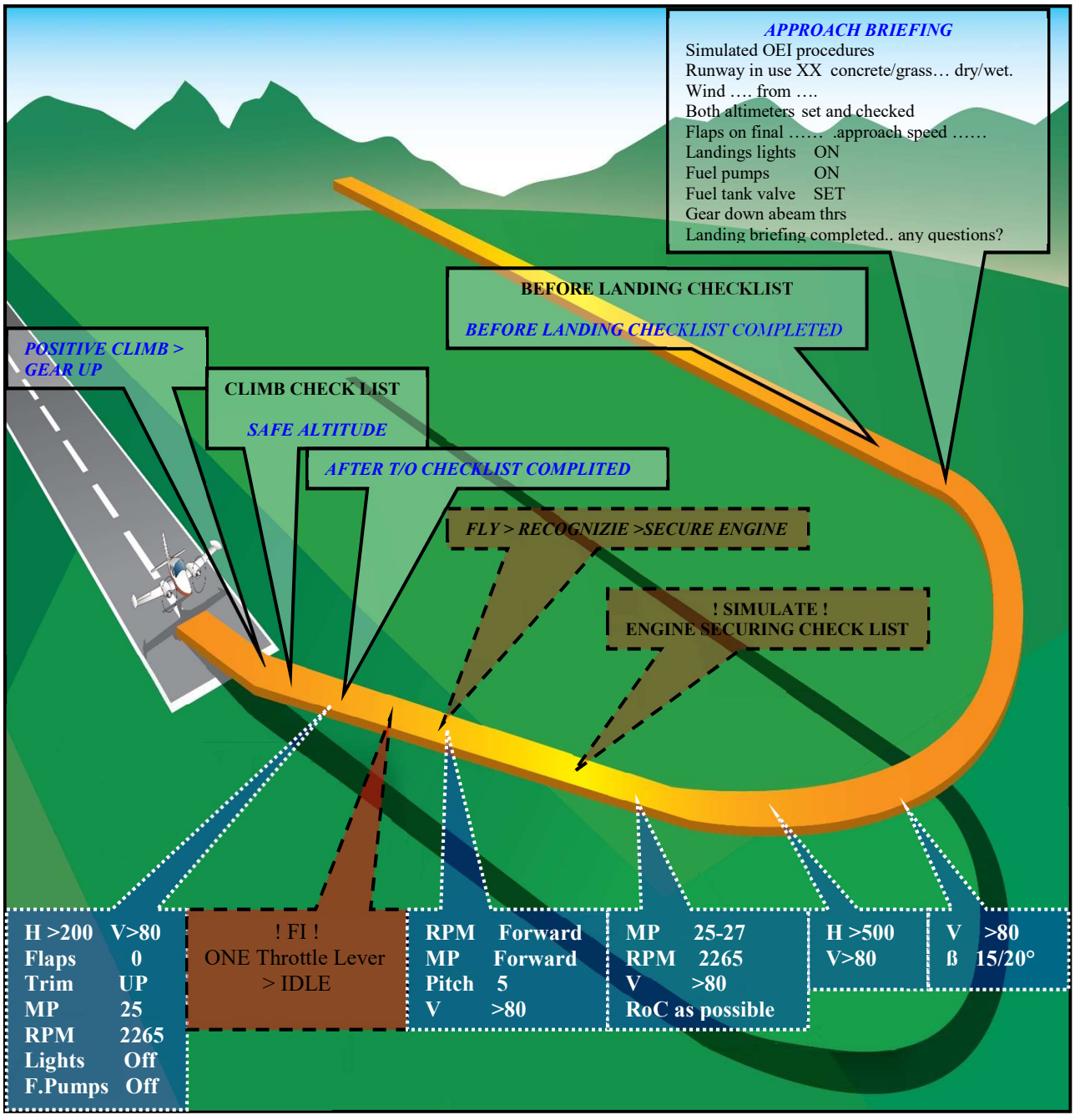
VSSE is a speed selected as training aid for pilots in the handling of multi-engine aircraft. It is the minimum speed for intentionally rendering on engine inoperative in flight. This minimum speed provides the margin the manufacturer recommends for us when intentionally performing engine inoperative maneuvers during training.
Shutting down an engine for training shall not become a habit; for safety purpose, and in order to optimize training, engine shutdown to perform OEI shall be executed only when necessary and required by regulations.

Recommended safe simulated OEI speed (*VSSE*) **70 KIAS**

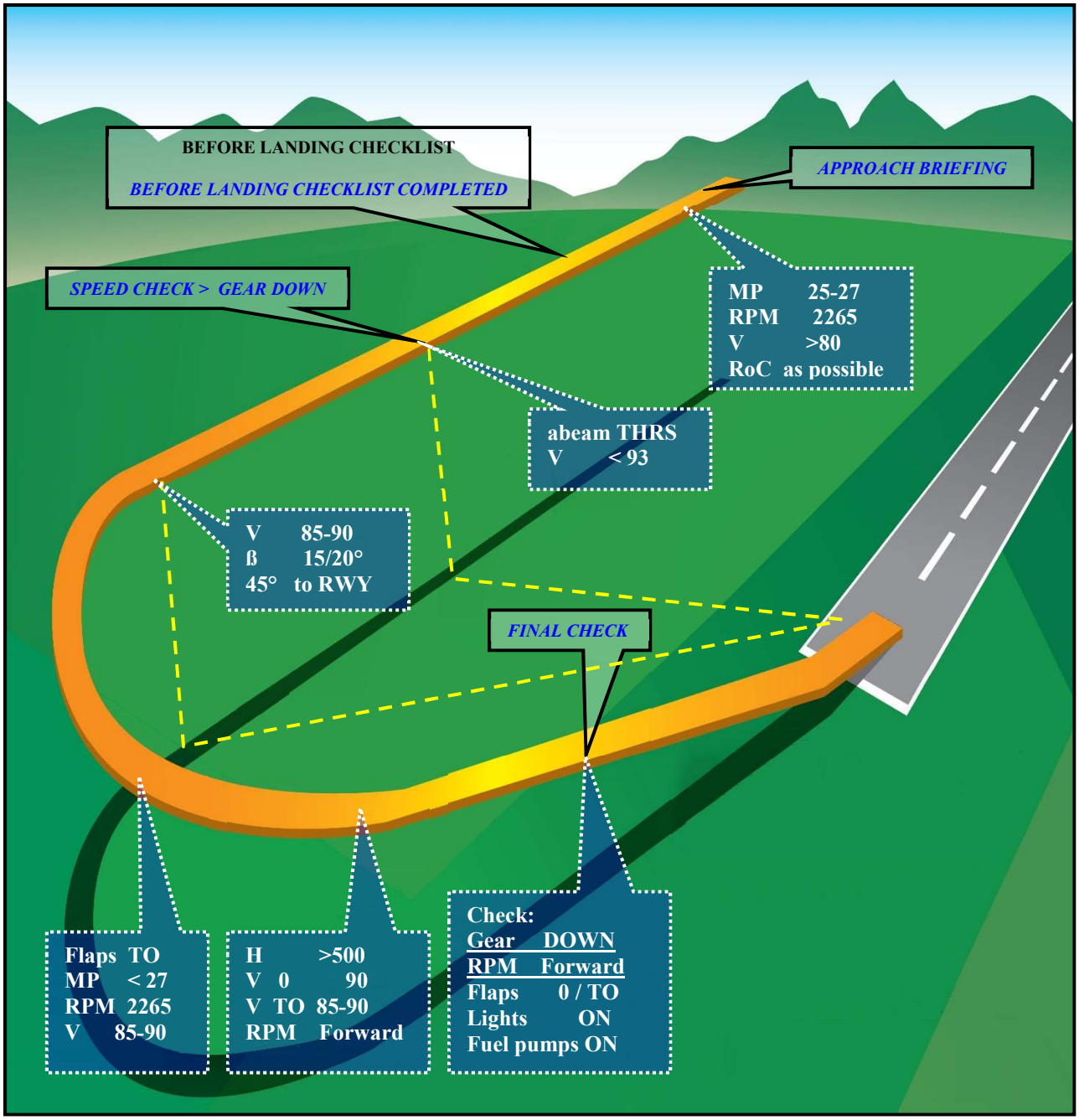
In normal operations, shutting down an engine for training shall not become a habit, in particular for safety reasons and in order to optimise training; engine shutdown to perform OEI shall be executed only when required by regulations.
The continuous operation of engine securing for training may indeed cause long term damages to the engine itself due to the high load coming from propeller (which is in feathering angle during the engine re-starting).

5.2 TRAFFIC PATTERN PROCEDURES - SINGLE ENGINE TRAINING

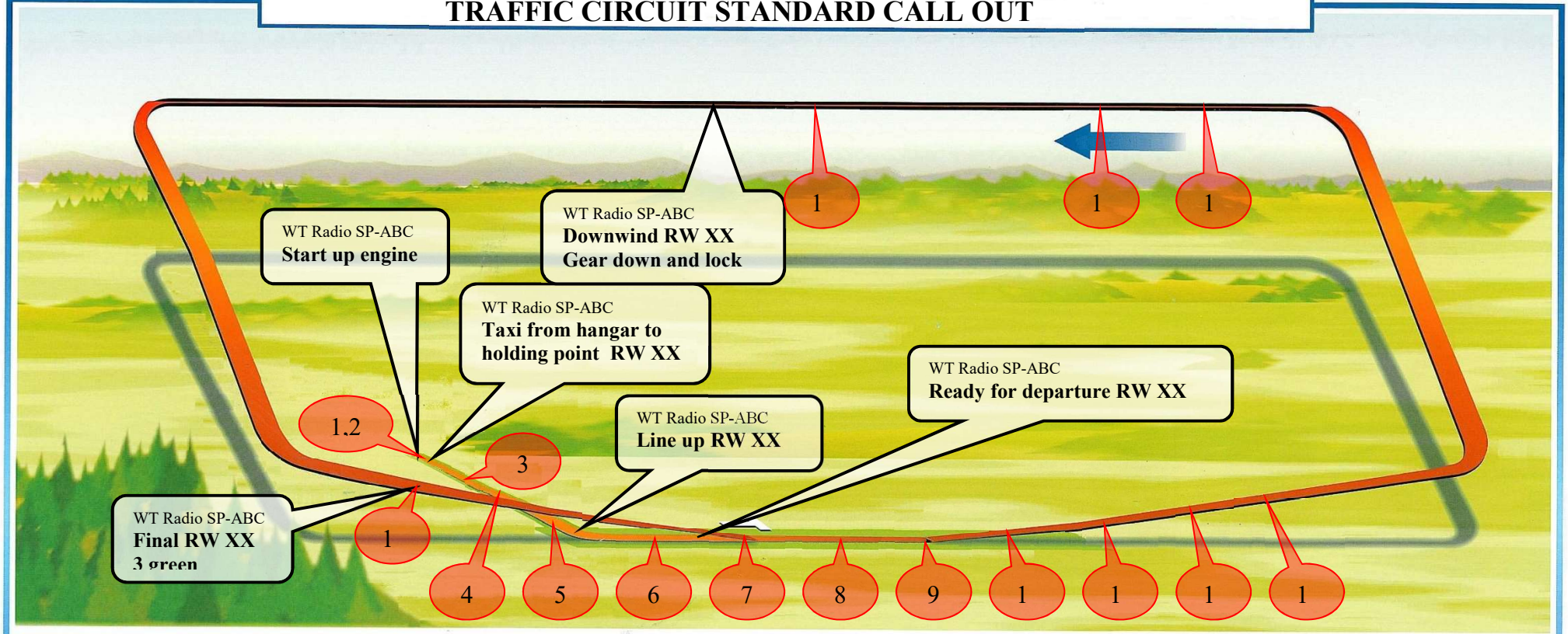
5.2.1 DEPARTURE - SINGLE ENGINE TRAINING.



5.2.2 LANDING - SINGLE ENGINE TRAINING.



TRAFFIC CIRCUIT STANDARD CALL OUT



ENGINE STARTING
1 *RIGHT/ LEFT PROP CLEAR*

TAXIING
2 *LEFT FREE, RIGHT FREE*
3 *CHECK BRAKES*

PRIOR TO TAKEOFF
4 *TAKE-OFF BRIEFING*

LINE-UP
5 *APPROACH SECTOR FREE*
6 *RUNWAY IDENTIFIED*

TAKEOFF
7 *T/O POWER SET*
CHECKED
BRAKES RELEASED
8 *SPEED RISING*
9 *ROTATION*
10 *POSITIVE CLIMB*
11 *GEAR UP*

CLIMB
12 *SAFE ALTITUDE*
13 *AFTER T/O CHECKLIST COMPLITED*

BEFORE LANDING
14 *SPEED CHECK – GEAR DOWN*
15 *APPROACH BRIEFING*
16 *BEFORE LANDING CHECKLIST COMPLETED*

FINAL
17 *FINAL CHECK*

AFTER LANDING
18 *RUNWAY VACATED*

TECNAM P2006 COCKPIT LAYOUT