

CHAPTER 4A

NORMAL OPERATING PROCEDURES

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4A.1 INTRODUCTION

Chapter 4A contains checklists and describes extended procedures for the normal operation of the airplane.

4A.2 AIRSPEEDS FOR NORMAL OPERATING PROCEDURES

Event	Flight Mass	850 kg 1874 lb	1000 kg 2205 lb	1150 kg 2535 lb	1200 kg 2646 lb
Airspeed for take-off climb (best rate-of-climb speed v_y) (Flaps T/O)		54 KIAS	60 KIAS	66 KIAS	67 KIAS
Airspeed for cruise climb (Flaps UP)		60 KIAS	68 KIAS	73 KIAS	76 KIAS
Approach speed for normal landing (Flaps LDG)		58 KIAS	63 KIAS	71 KIAS	73 KIAS
Minimum speed during touch & go (Flaps T/O)		54 KIAS	60 KIAS	66 KIAS	67 KIAS

4A.3 CHECKLISTS FOR NORMAL OPERATING PROCEDURES

4A.3.1 PRE-FLIGHT INSPECTION

(a) Cabin Check

- a) MET, NAV, mass & CG flight planning completed
- b) Airplane documents complete and up-to-date
- c) Ignition key pulled out
- d) Front canopy and rear door clean, undamaged, check locking
mechanism function
- e) All electrical equipment OFF

CONTINUED

- f) Circuit breakers set in (if one has been pulled,
check reason)
- g) Engine control levers check condition, freedom of
movement and full travel of throttle,
RPM and mixture levers
- h) Throttle IDLE
- i) Mixture control lever LEAN
- j) RPM lever HIGH RPM
- k) Master switch (BAT) ON
- l) Annunciator panel (if equipped) check function (see 7.11)
- m) PFD annunciations (if G1000 is installed) check
- n) Fuel quantity check

NOTE

Standard Tank (conventional instrument panel):

Depending on the type of fuel probes installed, the indicator can read a maximum of 15 US gal or 17 US gal (refer to Section 7.10 for details). When the fuel quantity indicator reads the maximum amount of fuel detectable, the correct fuel quantity must be determined with the fuel quantity measuring device. If this measurement is not carried out, the fuel quantity available for flight planning is the indicated amount.

Standard Tank (G1000 instrument panel):

When the fuel indicator reads 17 US gal, the correct fuel quantity must be determined with the fuel quantity measuring device. If this measurement is not carried out, the fuel quantity available for flight planning is 17 US gal.

CONTINUED

NOTE

Long Range Tank (conventional instrument panel):

At an indication of 16 US gal the quantity of auxiliary fuel can be determined by switching the AUX FUEL QTY switch to the respective position (LH or RH). The auxiliary fuel quantity is added to the 16 US gal.

An auxiliary fuel quantity of less than 3 US gal cannot be indicated by the system. In this case the quantity must be determined by means of the fuel quantity measuring device (see Section 7.10 - FUEL SYSTEM).

Long Range Tank (G1000 instrument panel):

When the fuel indicator reads 16 US gal the correct fuel quantity must be determined with the fuel quantity measuring device. There are 3 US gal of ungauged fuel from 16 to 19 US gal. If this measurement is not carried out, the fuel quantity available for flight is 16 US gal.

CAUTION

Long Range Tank (conventional instrument panel):

The correct indication of the fuel quantity takes 2 minutes after actuation of the switch.

- o) Position lights, strobe lights (ACLs) check
- p) Master switch (BAT) OFF
- q) Check for loose items complete
- r) Flight controls and trim free to move and correct
- s) Baggage stowed and secure
- t) Emergency axe (if OÄM 40-326 installed) . . . stowed and secure

CONTINUED

4A.3 CHECKLISTS FOR NORMAL OPERATING PROCEDURES

4A.3.1 PRE-FLIGHT INSPECTION

(a) Cabin check

Steps p) thru u) are amended to read, steps v) thru ac) are added:

- p) Check for loose items complete
- q) Flight controls and trim check free and correct movement
up to full deflection
- r) Baggage stowed and secure
- s) Emergency axe (if OÄM 40-326 installed). . . stowed and secure
- t) Emergency egress hammer stowed and secure
(if OÄM 40-401 installed)
- u) Fire extinguisher. charged and secure

DOOR OPEN (if G1000 is installed) or DOOR(S) warning check:

- v) All doors
(passenger door, canopy) close and latch
- w) DOOR OPEN or DOOR(S) warning check extinguished
- x) Passenger door unlatch
- y) DOOR OPEN or DOOR(S) warning check active
- z) Pull on outer passenger door handle the safety hook must hold the
passenger door in the closed
position

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- aa) Passenger door

check front and rear locking
bolt (firmly mounted and
undamaged)
- ab) Passenger door

check push-button
Push-button returns freely to the
fully extended position after
pressing and releasing
- ac) Master switch (BAT)

OFF

END OF CHECKLIST

- u) Emergency egress hammer stowed and secure
(if OÄM 40-401 installed)
- v) Fire extinguisher. charged and secure

END OF CHECKLIST

(b) Walk-Around Check, Visual Inspection

CAUTION

A visual inspection means: examination for damage, cracks, delamination, excessive play, load transmission, correct attachment and general condition. In addition control surfaces should be checked for freedom of movement.

CAUTION

In low ambient temperatures the airplane must be completely cleared of ice, snow and similar accumulations. For approved de-icing fluids refer to Section 8.6 - DE-ICING ON THE GROUND.

CAUTION

Prior to flight, remove such items as control surfaces gust lock, Pitot cover, tow bar, etc.

Left Main Landing Gear:

- a) Landing gear strut visual inspection
- b) Strut fairing (if installed) visual inspection
- c) Wheel fairing visual inspection
- d) Tire inflation pressure (2.5 bar/36 PSI) check
- e) Wear, tread depth of tire check
- f) Tire, wheel, brake. visual inspection
- g) Brake line connection. check for leaks
- h) Slip marks visual inspection

CONTINUED

- i) Chocks. remove

| Left Wing:

- a) Entire wing surface visual inspection
- b) Step visual inspection
- c) Air intake on lower surface visual inspection
- d) Openings on lower surface check for traces of fuel (if tank is full, fuel may spill over through the tank vent)
- e) Tank drain drain off a small quantity, check for water and sediment
- f) Stall warning check (suck on opening)
- g) Tank filler visual inspection, fuel quantity must agree with indicator
- h) Tank air outlet in lower surface visual inspection
- i) 2 stall strips on wing visual inspection
- j) Pitot probe clean, orifices open
- k) Landing/taxi light visual inspection
- l) Wing tip visual inspection
- m) Position light, strobe light (ACL) visual inspection
- n) Mooring check, clear
- o) Aileron and linkage visual inspection
- p) Aileron hinges and safety pin. visual inspection
- q) Foreign objects in aileron paddle. visual inspection
- r) Flap and linkage visual inspection
- s) Flap hinges and safety pin. visual inspection

| Fuselage, Left Side:

- a) Canopy, left side visual inspection
- b) Rear cabin door & window. visual inspection

| CONTINUED

- c) Fuselage skin visual inspection
- d) Antennas visual inspection
- e) Autopilot static source check for blockage
(if OAM 40-267 installed)

Empennage:

- a) Stabilizers and control surfaces visual inspection
- b) Hinges visual inspection
- c) Elevator trim tab visual inspection, check locking
wire
- d) Rudder trim tab visual inspection
- e) Mooring on fin check, clear
- f) Tail skid and lower fin visual inspection
- g) Towing assembly, if fitted visual inspection

Fuselage, Right Side:

- a) Fuselage skin visual inspection
- b) Window visual inspection
- c) Canopy, right side visual inspection
- d) Autopilot static source check for blockage
(if OAM 40-267 installed)

Right Wing:

- a) Flap and linkage visual inspection
- b) Flap hinges and safety pin visual inspection
- c) Aileron and linkage visual inspection
- d) Aileron hinges and safety pin visual inspection
- e) Foreign objects in aileron paddle visual inspection
- f) Wing tip visual inspection

CONTINUED

- g) Position light, strobe light (ACL) visual inspection
- h) Mooring check, clear
- i) Entire wing surface visual inspection
- j) 2 stall strips on wing visual inspection
- k) Tank air outlet in lower surface visual inspection
- l) Tank filler visual check, fuel quantity must agree with indicator
- m) Openings on lower surface check for traces of fuel (if tank is full, fuel may spill over through the tank vent)
- n) Tank drain drain off a small quantity, check for water and sediment
- o) Step visual inspection

| Right Main Landing Gear:

- a) Landing gear strut visual inspection
- b) Strut fairing (if installed) visual inspection
- c) Wheel fairing visual inspection
- d) Tire inflation pressure (2.5 bar/36 PSI) check
- e) Wear, tread depth of tires check
- f) Tire, wheel, brake visual inspection
- g) Brake line connection check for leaks
- h) Slip marks visual inspection
- i) Chocks remove

| Front Fuselage:

- a) Oil level check dipstick,
min. 4 qts for VFR operation
min. 6 qts for IFR operation
- b) Cowling visual inspection

| CONTINUED

- c) 3 air intakes clear
- d) Propeller. visual inspection; blade shake:
max. 3 mm (1/8 in); angular play
of blade: max. 2°

WARNING

Never move the propeller by hand while the ignition is switched on,
as it may result in serious personal injury.

- e) Spinner including attachment screws. visual inspection
- f) Nose landing gear visual inspection
- g) Tire and wheel visual inspection
- h) Slip marks visual inspection
- i) Nose landing gear strut fairing (if installed) . . visual inspection
- j) Nose landing gear tie-down (if installed) . . . check, clear
- k) Wear, tread depth of tire check
- l) Wheel fairing visual inspection
- m) Tow bar removed
- n) Tire inflation pressure (2.0 bar/29 PSI) check
- o) Chocks remove
- p) Exhaust visual inspection
- q) Forward cabin air inlets (if installed). clear
- r) Winter baffle for fresh air inlet (if installed). . . visual inspection

WARNING

The exhaust can cause burns when it is hot.

Underside:

- s) Antennas (if fitted) visual inspection
- t) Gascolator drain off a small quantity of fuel,
check for water and sediment

CONTINUED

- u) Venting pipes check for blockage
- v) Fuselage underside check for excessive contamination
particularly by oil, fuel, and other fluids

END OF CHECKLIST**4A.3.2 BEFORE STARTING ENGINE****CAUTION**

For take-off the adjustable backrests (if installed) must be fixed in the upright position.

NOTE

The pilot must ensure that a passenger sitting on a front seat is instructed in the operation of the adjustable backrest (if installed).

- 1. Pre-flight inspection complete
- 2. Rudder pedals adjusted
- 3. Passengers instructed
- 4. Adjustable backrests (if installed) adjust to the upright position described
by a placard on the roll-over bar and
verify proper fixation
- 5. Safety harnesses all on and fastened
- 6. Baggage check, secured
- 7. Rear door closed and locked
- 8. Door lock (if installed) unblocked, key removed

CONTINUED

4A.3.2 BEFORE STARTING ENGINE

The note for step 3 and Caution for step 7 were added. Step 7 is amended to read:

3. Passengers instructed

NOTE

Ensure all the passengers have been fully briefed on the use of the seat belts, doors and emergency exits and the ban on smoking.

Advise the passengers that after closing the passenger door, latching requires a separate action. Instruct the passengers not to latch an unlatched passenger door in flight. Instead inform the pilot.

7. Passenger door. closed and latched

CAUTION

When operating the canopy, pilots/operators must ensure that there are no obstructions between the canopy and the mating frame, for example seat belts, clothing, etc. When operating the canopy handle do NOT apply undue force.

A slight downward pressure on the canopy may be required to ease the canopy handle operation.



CAUTION

When operating the canopy, ensure that there are no obstructions between the canopy and the mating frame, for example seat belts, clothing, etc. When operating the locking handle do NOT apply undue force.

A slight downward pressure on the canopy may be required to ease handle operation.

- 9. Front canopy position 1 or 2 (cooling gap)
- 10. Canopy lock (if installed) unblocked, key removed
- 11. Parking brake set
- 12. Flight controls free movement
- 13. Trim wheel T/O
- 14. Throttle IDLE
- 15. RPM lever HIGH RPM
- 16. Mixture control lever LEAN
- 17. Friction device, throttle quadrant adjusted
- 18. Alternate air CLOSED
- 19. Alternate static valve CLOSED, if installed
- 20. Avionics Master switch OFF
- 21. Essential Bus switch OFF, if installed

CAUTION

When the essential bus is switched ON, the battery will not be charged unless the essential tie relay bypass (OÄM 40-126) is installed.

- 22. Master switch (BAT) ON (if G1000 is equipped, wait until power-up is complete, press ENT on MFD to acknowledge)

CONTINUED

23. Annunciator panel test (see Section 7.11)
24. Fuel tank selector on full tank

WARNING

Never move the propeller by hand while the ignition is switched on, as it may result in serious personal injury.

Never try to start the engine by hand.

END OF CHECKLIST

4A.3.3 STARTING ENGINE

(a) Cold Engine

1. Strobe light (ACL) ON
2. Electrical fuel pump ON, note pump noise (functional check of pump)
3. Throttle 3 cm (1.2 in) forward from IDLE (measured from rear of slot)
4. Mixture control lever RICH for 3 - 5 sec, then LEAN
5. Throttle 1 cm (0.4 in) forward from IDLE (measured from rear of slot)

WARNING

Before starting the engine the pilot must ensure that the propeller area is free, and no persons can be endangered.

CAUTION

Do not overheat the starter motor. Do not operate the starter motor for more than 10 seconds. After operating the starter motor, let it cool off for 20 seconds. After 6 attempts to start the engine, let the starter cool off for half an hour.

CONTINUED

CAUTION

Before starting the engine and until the engine is shut down, the canopy must be closed and latched in position 1 or 2 (cooling gap), and the door must be closed and latched.

During engine operation, it is prohibited to enter or exit the airplane.

CAUTION

The use of an external pre-heater and external power source is recommended whenever possible, in particular at ambient temperatures below 0 °C (32 °F), to reduce wear and abuse to the engine and electrical system. Refer to 4B.8 - STARTING THE ENGINE WITH EXTERNAL POWER. Pre-heat will thaw the oil trapped in the oil cooler, which can be congealed in extremely cold temperatures. After a warm-up period of approximately 2 to 5 minutes (depending on the ambient temperature) at 1500 RPM, the engine is ready for take-off if it accelerates smoothly and the oil pressure is normal and steady.

6. Ignition switch. START

When Engine Fires:

7. Mixture control lever. rapidly move to RICH
8. Oil pressure green sector within 15 sec
9. Electrical fuel pump OFF

WARNING

If the oil pressure has not moved into the green sector within 15 seconds after starting, SWITCH OFF ENGINE and investigate problem.

10. Master switch (ALT) ON

CONTINUED

11. Ammeter check
12. Fuel pressure. check (14 PSI to 35 PSI)
13. Annunciator panel check

END OF CHECKLIST

(b) Warm Engine

1. Strobe light (ACL) ON
2. Electrical fuel pump ON, note pump noise and fuel pressure increase
3. Throttle 3 cm (1.2 in) forward from IDLE (measured from rear of slot)
4. Mixture control lever RICH for 1 - 3 sec, then LEAN

WARNING

Before starting the engine the pilot must ensure that the propeller area is free and no persons can be endangered.

CAUTION

Do not overheat the starter motor. Do not operate the starter motor for more than 10 seconds. After operating the starter motor, let it cool off for 20 seconds. After 6 attempts to start the engine, let the starter cool off for half an hour.

CAUTION

Before starting the engine and until the engine is shut down, the canopy must be closed and latched in position 1 or 2 (cooling gap), and the door must be closed and latched.

During engine operation, it is prohibited to enter or exit the airplane.

5. Ignition switch START

CONTINUED

When Engine Fires:

6. Mixture control lever rapidly move to RICH
7. Oil pressure green sector within 15 sec

WARNING

If the oil pressure has not moved into the green sector within 15 seconds after starting, SWITCH OFF ENGINE and investigate problem.

8. Electrical fuel pump OFF
9. Master switch (ALT) ON
10. Ammeter check
11. Fuel pressure check (14 PSI to 35 PSI)
12. Annunciator panel check

END OF CHECKLIST**I** (c) Engine Will Not Start After Injection (Flooded Engine)

1. Strobe light (ACL) ON
2. Electrical fuel pump OFF
3. Mixture control lever LEAN, fully aft
4. Throttle at mid position

WARNING

Before starting the engine the pilot must ensure that the propeller area is free and no persons can be endangered.

CAUTION

Do not overheat the starter motor. Do not operate the starter motor for more than 10 seconds. After operating the starter motor, let it cool off for 20 seconds. After 6 attempts to start the engine, let the starter cool off for half an hour.

CONTINUED

CAUTION

Before starting the engine, and until the engine is shut down, the canopy must be closed and latched in position 1 or 2 (cooling gap), and the door must be closed and latched.

During engine operation, it is prohibited to enter or exit the airplane.

5. Ignition switch START

When Engine Fires:

6. Throttle pull back towards IDLE
 7. Mixture control lever rapidly move to RICH
 8. Oil pressure green sector within 15 sec

WARNING

If the oil pressure has not moved into the green sector within 15 seconds after starting, SWITCH OFF ENGINE and investigate problem.

9. Master switch (ALT). ON
 10. Ammeter check
 11. Fuel pressure. check (14 PSI to 35 PSI)
 12. Annunciator panel check

END OF CHECKLIST**4A.3.4 BEFORE TAXIING**

1. Avionics Master switch ON
 2. Electrical equipment ON as required
 3. Flaps UP - T/O - LDG - T/O (indicator and visual check)
 4. Flight instruments and avionics set, test function, as required

CONTINUED

5. Flood light ON, test function, as required
6. Ammeter check, if required increase RPM
7. Fuel tank selector change tanks, confirm that engine
also runs on other tank (at least 1
minute at 1500 RPM)
8. Pitot heating ON, test function; ammeter must show
rise, and if G1000 is equipped, no
yellow PITOT FAIL annunciation
9. Pitot heating OFF if not required, check
annunciation, if G1000 is equipped,
yellow PITOT HT OFF annunciation
10. Strobe lights (ACLs) check ON, as required
11. Position lights, landing and taxi lights. ON, as required

CAUTION

When taxiing at close range to other aircraft, or during night flight in clouds, fog or haze, the strobe lights should be switched OFF. The position lights must always be switched ON during night flight.

12. Idle RPM check, 600 to 800 RPM

If G1000 is equipped:

NOTE

The GFC 700 AFCS system automatically conducts a preflight self-test upon initial power application. The preflight test is indicated by a white boxed PFT on the PFD. Upon successful completion of the preflight test, the PFT is removed, the red AFCS annunciation is removed, and the autopilot disconnect tone sounds.

13. Primary flight display NO AUTOPILOT ANNUNCIATIONS
(if autopilot GFC 700 is installed)

CONTINUED

14. Autopilot disconnect tone NOTE (if autopilot GFC 700 is installed)
15. MANUAL ELECTRIC TRIM - TEST as follows (if autopilot GFC 700 is installed):
Press the AP DISC button down, and hold while commanding trim. Manual electric trim should not operate either nose up or down.
16. AUTOPILOT (if installed). engage by pressing AP button
17. AP DISC switch press, verify that the autopilot disconnects, check tone (if GFC 700 is installed)
18. TRIM set to take-off position manually

END OF CHECKLIST**4A.3.5 TAXIING**

1. Parking brake release
2. Brakes test on moving off
3. Flight instrumentation and avionics check for correct indications (particularly directional gyro and turn and bank indicator)

CAUTION

When taxiing on a poor surface select the lowest possible RPM to avoid damage to the propeller from stones or similar items.

CONTINUED

CAUTION

Following extended operation on the ground, or at high ambient temperatures, the following indications of fuel vapor lock may appear:

- Arbitrary changes in idle RPM and fuel flow.
- Slow reaction of the engine to operation of throttle.
- Engine will not run with throttle in IDLE position.

Remedy:

1. For about 1 to 2 minutes, or until the engine settles, run at a speed of 1800 to 2000 RPM. Oil and cylinder head temperatures must stay within limits.
2. Pull throttle back to IDLE to confirm smooth running.
3. Set throttle to 1200 RPM and mixture for taxiing, i.e., use mixture control lever to set the maximum RPM attainable.
4. Immediately before the take-off run set the mixture for take-off, apply full throttle and hold this position for 10 seconds.

NOTE

Vapor lock can be avoided if the engine is run at speeds of 1800 RPM or more. This results in lower fuel temperatures.

END OF CHECKLIST

4A.3.6 BEFORE TAKE-OFF

CAUTION

Before take-off, the engine must run on each tank for at least 1 minute at 1500 RPM.

I CONTINUED

CAUTION

For take-off the adjustable backrests (if installed) must be fixed in the upright position.

- 1. Position airplane into wind if possible.
- 2. Parking brake set
- 3. Adjustable backrests (if installed) verify upright position and proper fixation
- 4. Safety harnesses on and fastened
- 5. Rear door check closed and locked
- 6. Front canopy closed and locked

CAUTION

When operating the canopy, ensure that there are no obstructions in between the canopy and the mating frame, for example seat belts, clothing, etc. When operating the locking handle do NOT apply undue force.

A slight downward pressure on the canopy may be required to ease handle operation.

- 7. Door warning light check OFF (DOOR, DOORS, or DOOR OPEN)
- 8. Fuel tank selector fullest tank
- 9. Engine instruments in green sector
- 10. Circuit breakers pressed in
- 11. Fuel pressure indicator check (approx. 14 - 35 PSI)
- 12. Electrical fuel pump ON
- 13. Mixture control lever RICH (below 5000 ft)

CONTINUED

4A.3.6 BEFORE TAKE-OFF

Step 5, step 6, the following caution and step 7 are amended to read:

- 5. Passenger door. check closed and latched
- 6. Canopy closed and latched

CAUTION

When operating the canopy, pilots/operators must ensure that there are no obstructions between the canopy and the mating frame, for example seat belts, clothing, etc. When operating the canopy handle do NOT apply undue force.

A slight downward pressure on the canopy may be required to ease the canopy handle operation.

- 7. DOOR OPEN (if G1000 is installed) or DOOR(S) warning. check no indication

NOTE

At a density altitude of 5000 ft or above or at high ambient temperatures a fully rich mixture can cause rough running of the engine or a loss of performance. The mixture should be set for smooth running of the engine.

14. Flaps check T/O
15. Trim check T/O
16. Flight controls free movement, correct sense
17. Throttle 2000 RPM
18. RPM lever pull back until a drop of 250 to 500 RPM is reached - HIGH RPM; cycle 3 times
19. Magneto check L - BOTH - R - BOTH
 Max. RPM drop: 175 RPM
 Max. difference: 50 RPM
 If the electronic ignition control unit is installed, the ignition status light must illuminate and extinguish after approximately 20 to 30 sec

CAUTION

The lack of an RPM drop suggests a faulty grounding or incorrect ignition timing. In case of doubt the magneto check can be repeated with a leaner mixture, in order to confirm a problem. Even when running on only one magneto the engine should not run unduly roughly.

20. Circuit breaker check in
21. Voltmeter check in green range
22. Throttle IDLE

CONTINUED

If G1000 is installed:

- a) Flight plan entered
 - b) Altimeter setting (G1000 NXi and standby) . . checked and set
 - c) Altitude preselector set
 - d) Radios set and checked
 - e) Transponder code set
- 23. Parking brake release
 - 24. Alternate air check CLOSED
 - 25. Landing light ON as required
 - 26. Pitot heating ON as required

END OF CHECKLIST

4A.3.7 TAKE-OFF

(a) Normal Take-Off Procedure

- 1. Transponder ON/ALT
- 2. RPM lever check HIGH RPM
- 3. Throttle MAX PWR (not abruptly)

WARNING

The proper performance of the engine at full throttle should be checked early in the take-off procedure, so that the take-off can be aborted if necessary.

A rough engine, sluggish RPM increase, or failure to reach take-off RPM (2680 ± 20 RPM) are reasons for aborting the take-off. If the engine oil is cold, an oil pressure in the yellow sector is permissible.

- 4. Elevator neutral
- 5. Rudder maintain direction

CONTINUED

NOTE

In strong crosswinds steering can be augmented by use of the toe brakes. It should be noted, however, that this method increases the take-off roll, and should not generally be used.

- 6. Nose wheel lift-off at v_R = 59 KIAS
- 7. Airspeed 67 KIAS (1200 kg, 2646 lb)
66 KIAS (1150 kg, 2535 lb)
60 KIAS (below 1000 kg, 2205 lb)

Above a Safe Height:

- 8. RPM lever 2400 RPM
- 9. Electrical fuel pump OFF
- 10. Landing light. OFF

END OF CHECKLIST**4A.3.8 CLIMB****(a) Procedure for Best Rate of Climb**

- 1. Flaps T/O
- 2. Airspeed 67 KIAS (1200 kg, 2646 lb)
66 KIAS (1150 kg, 2535 lb)
60 KIAS (1000 kg, 2205 lb)
54 KIAS (850 kg, 1874 lb)
- 3. RPM lever 2400 RPM
- 4. Throttle MAX PWR
- 5. Mixture control lever RICH, above 5000 ft hold EGT
constant
- 6. Engine instruments in green sector
- 7. Trim as required
- 8. Electrical fuel pump ON at high altitudes

CONTINUED

CAUTION

Operation at high altitudes with the electrical fuel pump OFF may cause vapor bubbles, resulting in intermittent low fuel pressure indications, sometimes followed by high fuel flow indications.

END OF CHECKLIST**I (b) Cruise Climb**

1. Flaps UP
2. Airspeed 76 KIAS (1200 kg, 2646 lb)
73 KIAS (1150 kg, 2535 lb)
68 KIAS (1000 kg, 2205 lb)
60 KIAS (850 kg, 1874 lb)
3. RPM lever 2400 RPM
4. Throttle MAX PWR
5. Mixture control lever RICH, above 5000 ft hold EGT
constant
6. Engine instruments in green sector
7. Trim as required
8. Electrical fuel pump ON at high altitudes

CAUTION

Operation at high altitudes with the electrical fuel pump OFF may cause vapor bubbles, resulting in intermittent low fuel pressure indications, sometimes followed by high fuel flow indications.

END OF CHECKLIST

4A.3.9 CRUISE

1. Flaps UP
2. Throttle set performance according to table
3. RPM lever 1800 - 2400 RPM

NOTE

Favorable combinations of manifold pressure and RPM are given in Chapter 5.

NOTE

To optimize engine life the cylinder head temperature (CHT) should lie between 150 °F (66 °C) and 400 °F (204 °C) in continuous operation, and not rise above 435 °F (224 °C) in fast cruise.

NOTE

The oil temperature in continuous operation should lie between 165 °F (74 °C) and 220 °F (104 °C). If possible, the oil temperature should not remain under 180 °F (82 °C) for long periods, so as to avoid accumulation of condensation.

4. Mixture set in accordance with 4A.3.10 -
MIXTURE ADJUSTMENT
5. Trim as required
6. Fuel tank selector as required
(max. difference 10 US gal with
Standard Tank, 8 US gal with Long
Range Tank)
7. Electrical fuel pump ON at high altitudes

CONTINUED

CAUTION

Operation at high altitudes with the electrical fuel pump OFF may cause vapor bubbles, resulting in intermittent low fuel pressure indications, sometimes followed by high fuel flow indications.

NOTE

While switching from one tank to the other, the electrical fuel pump should be switched ON.

END OF CHECKLIST**4A.3.10 MIXTURE ADJUSTMENT****CAUTION**

1. The maximum permissible cylinder head temperature (500 °F (260 °C)) must never be exceeded.
2. The mixture control lever should always be moved slowly.
3. Before selecting a higher power setting the mixture control lever should, on each occasion, be moved slowly to fully RICH.
4. Care should always be taken that the cylinders do not cool down too quickly. The cooling rate should not exceed 50 °F (22.8 °C) per minute.

I (a) Best Economy Mixture

The best economy mixture setting may only be used up to a power setting of 75 %. In order to obtain the lowest specific fuel consumption at a particular power setting proceed as follows: Slowly pull the mixture control lever back towards LEAN until the engine starts to run roughly. Then push the mixture control lever forward just far enough to restore smooth running. At the same time the exhaust gas temperature (EGT) should reach a maximum.

The exact value of EGT can be obtained by pressing the far left button on the engine instrument unit VM 1000. In the Lean mode one bar represents 10 °F (4.6 °C).

CONTINUED

(b) Best Power Mixture

The mixture can be set for maximum performance at all power settings. The mixture should first be set as for “best economy.” The mixture should then be enriched until the exhaust gas temperature is approximately 100 °F (55 °C) lower.

This mixture setting produces the maximum performance for a given manifold pressure and is mainly used for high power settings (approximately 75 %).

END OF CHECKLIST**4A.3.11 DESCENT**

1. Mixture control lever adjust as required for the altitude,
operate slowly
2. RPM lever 1800 - 2400 RPM
3. Throttle as required
4. Electrical fuel pump ON at high altitudes

CAUTION

When reducing power, the change in cylinder head temperature should not exceed 50 °F (22.8 °C) per minute. This is normally guaranteed by the “self-adapting inlet.” An excessive cooling rate may occur however, when the engine is very hot and the throttle is reduced abruptly in a fast descent. This will be indicated by a flashing cylinder head temperature indication.

CAUTION

Operation at high altitudes with the electrical fuel pump OFF may cause vapor bubbles, resulting in intermittent low fuel pressure indications, sometimes followed by high fuel flow indications.

END OF CHECKLIST

4A.3.12 LANDING APPROACH**CAUTION**

For landing the adjustable backrests (if installed) must be fixed in the upright position.

1. Adjustable backrests (if installed) adjust to the upright position described by a placard on the roll-over bar and verify proper fixation.
2. Fuel selector fullest tank
3. Electrical fuel pump ON
4. Safety harnesses fastened
5. Airspeed reduce to operate flaps (108 KIAS)
6. Flaps T/O
7. Trim as required
8. Landing light as required

(a) Before Landing

9. Mixture control lever RICH
10. RPM lever HIGH RPM
11. Throttle as required
12. Airspeed reduce to operate flaps (91 KIAS)
13. Flaps LDG
14. Approach speed 73 KIAS (1200 kg, 2646 lb)
71 KIAS (1150 kg, 2535 lb)
67 KIAS (1092 kg, 2407 lb)
63 KIAS (1000 kg, 2205 lb)
58 KIAS (850 kg, 1874 lb)

CAUTION

In conditions such as strong winds, wind shear, or turbulence, a higher approach speed should be selected.

CONTINUED

NOTE

In case of airplanes with a maximum landing mass less than the maximum permitted flight mass, a landing with a higher mass constitutes an abnormal operating procedure. Refer to Sections 2.7 - MASS (WEIGHT) and 4B.7 - LANDING WITH HIGH LANDING MASS.

END OF CHECKLIST**4A.3.13 GO-AROUND**

1. Throttle MAX PWR
2. Airspeed 67 KIAS (1200 kg, 2646 lb)
66 KIAS (1150 kg, 2535 lb)
60 KIAS (1000 kg, 2205 lb)
54 KIAS (850 kg, 1874 lb)
3. Flaps T/O

(a) Above a Safe Height

4. RPM lever 2400 RPM
5. Airspeed 76 KIAS (1200 kg, 2646 lb)
73 KIAS (1150 kg, 2535 lb)
68 KIAS (1000 kg, 2205 lb)
60 KIAS (850 kg, 1874 lb)
6. Flaps UP
7. Electrical fuel pump OFF

END OF CHECKLIST**4A.3.14 AFTER LANDING**

1. Throttle IDLE
2. Brakes as required
3. Electrical fuel pump OFF

CONTINUED

4. Transponder OFF / STBY
5. Pitot heating OFF
6. Avionics as required
7. Lights as required
8. Flaps UP

END OF CHECKLIST**4A.3.15 ENGINE SHUT-DOWN**

1. Parking brake set
2. Engine instruments check
3. Avionics Master switch OFF
4. All electrical equipment OFF
5. Throttle 1000 RPM
6. Ignition check OFF until RPM drops noticeably,
then immediately BOTH again
7. Mixture control lever LEAN - shut engine off
8. Ignition switch OFF

CAUTION

If the G1000 NXi is installed, wait until the engine indications on the MFD are red X'd or yellow X'd prior to switching the Master switch off. This ensures that the engine and flight data can be written to non-volatile memory before removing electrical power.

9. Master switch (ALT/BAT) OFF

END OF CHECKLIST**4A.3.16 POST-FLIGHT INSPECTION**

1. Ignition switch OFF, remove key
2. Master switch (BAT) ON

CONTINUED

3. Avionics Master switch ON
4. ELT check inactive: listen on 121.5 MHz
5. Avionics Master switch OFF
6. Master switch (BAT) OFF
7. Parking brake release, use chocks
8. Airplane moor, if unsupervised for extended
period

NOTE

If the airplane is not operated for more than 5 days, the long-term parking procedure should be applied. If the airplane is not operated for more than 30 days, the storage procedure should be applied. Both procedures are described in the Airplane Maintenance Manual (Doc. No. 6.02.01) in Chapter 10.

END OF CHECKLIST

4A.3.17 FLIGHT IN RAIN

NOTE

Performance deteriorates in rain; this applies particularly to the take-off distance and to the maximum horizontal speed. The effect on the flight characteristics is minimal. Flight through very heavy rain should be avoided because of the associated visibility problems.

4A.3.18 REFUELING

CAUTION

Before refueling, the airplane must be connected to electrical ground. Grounding points: unpainted areas (latches) on steps, left and right.

4A.3.19 FLIGHT AT HIGH ALTITUDE

At high altitudes the provision of oxygen for the occupants is necessary. Legal requirements for the provision of oxygen should be adhered to.

Also see Section 2.11 - OPERATING ALTITUDE.

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CHAPTER 4B

ABNORMAL OPERATING PROCEDURES

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4B.1 PRECAUTIONARY LANDING

NOTE

A landing of this type is only necessary when there is a reasonable suspicion that due to fuel shortage, weather conditions, or at nightfall the possibility of endangering the airplane and its occupants by continuing the flight cannot be excluded. The pilot is required to decide whether or not a controlled landing in a field represents a lower risk than the attempt to reach the target airfield under all circumstances.

NOTE

If no level landing area is available, a landing on an upward slope should be sought.

1. Select appropriate landing area.
2. Consider wind.
3. Approach: If possible, the landing area should be overflown at a suitable height in order to recognize obstacles. The degree of offset at each part of the circuit will allow the wind speed and direction to be assessed.
4. Airspeed 76 KIAS (1200 kg, 2646 lb)
73 KIAS (1150 kg, 2535 lb)
68 KIAS (1000 kg, 2205 lb)
60 KIAS (850 kg, 1874 lb)
5. ATC advise

On Final Approach:

6. Flaps LDG
7. Safety harnesses tighten
8. Touchdown with the lowest possible airspeed

CONTINUED

CAUTION

If sufficient time is remaining, the risk of fire in the event of a collision with obstacles can be reduced as follows:

- Fuel tank selector OFF
- Ignition switch OFF
- Master switch (ALT/BAT) OFF

END OF CHECKLIST**4B.2 INSTRUMENT INDICATIONS OUTSIDE OF GREEN RANGE****4B.2.1 HIGH OIL PRESSURE WHEN STARTING IN LOW AMBIENT TEMPERATURES**

- Reduce RPM and re-check oil pressure at a higher oil temperature.
- If on reducing the RPM the indicated oil pressure does not change, it is probable that the fault lies in the oil pressure indication. Terminate flight preparation.

4B.2.2 HIGH MANIFOLD PRESSURE

If the manifold pressure indicator is clearly above the green range, the reading is faulty. In this case the performance settings should be undertaken by means of the lever settings. The airplane should be serviced.

4B.2.3 OIL TEMPERATURE

A constant reading of the oil temperature of 26 °F (-3 °C) or 317 °F (158 °C) suggests a faulty oil temperature sensor. The airplane should be serviced.

4B.2.4 CYLINDER HEAD TEMPERATURE AND EXHAUST GAS TEMPERATURE

A very low reading of CHT or EGT for a single cylinder may be the result of a loose sensor. In this case the reading will indicate the temperature of the engine compartment. The airplane should be serviced.

END OF CHECKLIST

4B.3 FAILURES IN THE ELECTRICAL SYSTEM

4B.3.1 LOW VOLTAGE CAUTION

This caution is indicated when the normal on-board voltage (28 V) drops below 24 V.

Possible reasons are:

- A fault in the power supply.
- RPM too low.

(a) "Low Voltage" Caution on the Ground

1. Engine speed 1200 RPM
2. Electrical equipment OFF
3. Ammeter check

If the caution light does not go out, and the ammeter flashes and reads zero:

- Terminate flight preparation.

(b) "Low Voltage" Caution During Flight

1. Electrical equipment OFF if not needed
2. Ammeter check

If the caution light does not go out, and the ammeter flashes and reads zero:

- Follow procedure in 3.7.2 (b) - ALTERNATOR FAILURE.

(c) "Low Voltage" Caution During Landing

- Follow (a) after landing.

END OF CHECKLIST

4B.3.2 ELECTRONIC IGNITION CONTROL UNIT

If the electronic ignition control unit is installed but inoperative, the white status light for the ignition (IGN or IGNITION) will be illuminated, and the conventional magneto ignition will take over the ignition control.

The flight can be continued normally. However, fuel consumption will slightly increase, and engine starting will become difficult.

END OF CHECKLIST**4B.4 TAKE-OFF FROM A SHORT GRASS STRIP**

1. Brakes apply
2. Flaps T/O
3. Throttle MAX PWR
4. Elevator (control stick) fully aft
5. Brakes release
6. Hold direction using rudder

NOTE

In strong crosswinds steering can be augmented by use of the toe brakes. It should be noted, however, that this method increases the take-off roll, and should not generally be used.

7. Elevator (control stick) release slowly, when nose wheel has lifted allow airplane to lift off as soon as possible and increase speed at low level

CONTINUED

- | | |
|--------------------------------|-------------------------------|
| 8. Airspeed | 67 KIAS (1200 kg, 2646 lb) |
| | 66 KIAS (1150 kg, 2535 lb) |
| | 60 KIAS (1000 kg, 2205 lb) |
| | 54 KIAS (850 kg, 1874 lb) |
| 9. RPM lever | 2400 RPM, above safe altitude |
| 10. Flaps | UP, above safe altitude |
| 11. Electrical fuel pump | OFF, above safe altitude |
| 12. Landing light | as required |

END OF CHECKLIST**4B.5 FAILURES IN FLAP OPERATING SYSTEM****4B.5.1 FAILURE IN POSITION INDICATION OR FUNCTION**

- Check flap position visually.
- Keep airspeed in white sector.
- Re-check all positions of the flap switch.

4B.5.2 MODIFIED APPROACH PROCEDURE DEPENDING ON THE AVAILABLE FLAP SETTING**(a) Only UP or T/O Available**

- | | |
|----------------|----------------------------|
| Airspeed | 76 KIAS (1200 kg, 2646 lb) |
| | 73 KIAS (1150 kg, 2535 lb) |
| | 68 KIAS (1000 kg, 2205 lb) |
| | 60 KIAS (850 kg, 1874 lb) |

Land at a flat approach angle, use throttle to control airplane speed and rate of descent.

(b) Only LDG Available

Perform normal landing.

END OF CHECKLIST

4B.6 FAILURES IN ELECTRICAL RUDDER PEDAL ADJUSTMENT

(a) Runaway of Electrical Rudder Pedal Adjustment (Optional Equipment, OÄM 40-251)

NOTE

The circuit breaker for the rudder pedal adjustment is located below the related switch, on the rear wall of the leg room.

1. Circuit breaker pull

END OF CHECKLIST

4B.7 LANDING WITH HIGH LANDING MASS

NOTE

This Section only applies to airplanes with a maximum landing mass less than the maximum flight mass. All landings with a current flight mass not exceeding the maximum permissible landing mass constitutes a normal operating procedure. Refer to Sections 2.7 - MASS (WEIGHT) and 4A.3.12 - LANDING APPROACH.

NOTE

The maximum landing mass given in Chapter 2 is the highest mass for landing conditions at the maximum descent velocity. This velocity was used in the strength calculations to determine the landing gear loads during a particularly hard landing.

Perform landing approach and landing according to Chapter 4A, but maintain an increased airspeed during landing approach.

Approach speed 73 KIAS (1200 kg, 2646 lb)
71 KIAS (1150 kg, 2535 lb)

CONTINUED

WARNING

Damage to the landing gear can result from a hard landing with a flight mass above the maximum landing mass.

END OF CHECKLIST**4B.8 STARTING THE ENGINE WITH EXTERNAL POWER****WARNING**

The use of an external power supply for engine starting with an empty airplane battery is not permitted if the subsequent flight is intended to be an IFR flight. In this case the airplane battery must be charged first.

WARNING

The external power supply must be operated by a person made aware of the associated procedures. Special care is required due to the proximity of the propeller area.

NOTE

Starting the engine with external power is recommended in particular at ambient temperatures below 0 °C (32 °F), to reduce wear and abuse to the engine and electrical system.

1. Pre-flight inspection complete
2. Rudder pedals adjusted
3. Passengers instructed
4. Safety harnesses all on and fastened
5. Baggage check, secured
6. Rear door closed and locked
7. Door lock (if installed) unblocked, key removed

CONTINUED

4B.8 STARTING ENGINE WITH EXTERNAL POWER

4B.8.1 BEFORE STARTING ENGINE

Step 6 is amended to read:

6. Passenger door..... closed and latched

CAUTION

When operating the canopy, ensure that there are no obstructions between the canopy and the mating frame, for example seat belts, clothing, etc. When operating the locking handle do NOT apply undue force.

A slight downward pressure on the canopy may be required to ease handle operation.

- 8. Front canopy position 1 or 2 (cooling gap)
- 9. Canopy lock (if installed) unblocked, key removed
- 10. Parking brake set
- 11. Flight controls free movement
- 12. Trim wheel T/O
- 13. Throttle IDLE
- 14. RPM lever HIGH RPM
- 15. Mixture control lever LEAN
- 16. Friction device, throttle quadrant adjusted
- 17. Alternate air CLOSED
- 18. Alternate static valve CLOSED, if installed
- 19. Avionics Master switch OFF
- 20. Essential Bus switch OFF, if installed

CAUTION

When the essential bus is switched ON, the battery will not be charged unless the essential tie relay bypass (OÄM 40-126) is installed.

- 21. External power connect
- 22. Master switch (BAT) ON

CONTINUED

- 23. Annunciator panel test (see Section 7.11)
- 24. Fuel tank selector on full tank

WARNING

Never move the propeller by hand while the ignition is switched on,
as it may result in serious personal injury.

Never try to start the engine by hand.

- 25. Starting engine procedure execute (see Section 4A.3.3 -
STARTING ENGINE)
- 26. External power disconnect, close access panel
- 27. Ammeter check
- 28. Master switch (ALT) OFF, note decrease of ammeter
reading
- 29. Master switch (ALT) ON

END OF CHECKLIST

4B.9 ERRONEOUS INDICATIONS OF AIRSPEED OR ALTITUDE

Erroneous indications on the airspeed indicator, altimeter, vertical speed indicator, or erroneous behavior of the autopilot (if equipped) may be the result of a static source blockage.

- 1. Alternate static source OPEN
- 2. Pitot heat ON
- 3. Emergency window(s) CLOSE

END OF CHECKLIST