

MCE143-00

GROB 120A – F

CREW MEMENTO N° 1

**NORMAL
PROCEDURES
&**

**AIRCRAFT
LIMITATIONS**

PAGES INDEX

This memento includes **36** pages numbered and dated according to the following table.

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NORMAL PROCEDURES

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LIMITATIONS

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EMERGENCY PROCEDURES

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PRE-FLIGHT INSPECTION

PRE-FLIGHT
INSPECTION

IgnitionOFF
Emergency avionic..... OFF / GUARDED
All switchesOFF
Circuit breakers IN
ELT in position ARMED
Battery.....ON
Annunciator panelON / PRESS TEST BUTTON
Fuel quantity gauge..... CHECK
Voltage..... CHECK
Memory cardINSERTED
Engine fire extinguisher bottle.....PRESSURE: CORRECT
Hydraulic accumulator..... GAUGE IN GREEN RANGE
Battery.....OFF
Carbon monoxide detector.....CHECK (black = danger)

CAUTION

During acrobatic manoeuvres,
do not take the Control locks and the tow bar in plane,
NO BAGGAGE ALLOWED!

WALK-AROUND INSPECTION

RIGHT WING

Check panel for landing gear CHECK
Flaps and hinges CHECK
Ailerons and hinges CHECK
Tie-down and Control lock REMOVE (if necessary)
Position light CHECK
Anti-Collision light CHECK
Wing tip CHECK
Wing surface condition CHECK
Stall warning CHECK
Fuel filler cap CHECK TIGHT
Standing water in filler well REMOVE
Fuel quantity CHECK
Fuel vent CHECK
Fuel vent DRAIN
Fuel tank DRAIN (2x)
Collector tank DRAIN

RIGHT MAIN LANDING GEAR

Tire, wheel and brake VISUAL INSPECTION
Wheel chock REMOVE (only if no marshaller available)
Slip mark (red paint) VISUAL INSPECTION
Tire pressure CHECK

NOSE SECTION

Cowling properly attached CHECK
Air inlet FREE
Landing light CHECK
Propeller CHECK CONDITION
Spinner CHECK FOR CRACKS
Nose gear strut CHECK STROKE
Tire and wheel VISUAL INSPECTION
Tire pressure CHECK
Tow bar REMOVE (if necessary)
Oil quantity CHECK (only if no marshaller available)

LEFT MAIN LANDING GEAR

Tire, wheel and brake VISUAL INSPECTION
Slip mark (red paint) VISUAL INSPECTION
Wheel chock REMOVE (only if no marshaller available)
Tire pressure CHECK



LEFT WING

Fuel vent..... CHECK
Fuel vent.....DRAIN
Fuel tank.....DRAIN (2x)
Fuel quantity..... CHECK
Wing surface CHECK CONDITION
Fuel filler capCHECK TIGHT
Standing water in filler well REMOVE
Pitot tube cap..... REMOVE (only if no marshaller available)
Pitot - static tube CHECK CLEAN
Pitot heat CHECK
Wing tip..... CHECK
Tie-down and Control lock REMOVE (if necessary)
Position light CHECK
Anti-Collision light CHECK
Aileron and hinges CHECK
Flap and hinges CHECK
Wheel chock REMOVE (only if no marshaller available)

WALK AROUND
INSPECTION

FUSELAGE

Damage CHECK
All antennas CHECK

EMPENNAGE

Fins and control surfaces..... CHECK
Mass balances..... CHECK
Trim tab CHECK
Tie-down and Control lock REMOVE (if necessary)

EXTERNAL POWER (Only if required)

Battery and Avionic master OFF
Polarity of power supply plug..... CHECK
Power supply CONNECT

BEFORE ENGINE START

Seat and pedals ADJUSTED
Seat belts and harnesses APPLIED AND FASTENED
Parachute halyard HOOKED
Headset ADJUSTED AND CONNECTED
Canopy closed and locked CHECK
Parking brake SET
Battery ON
Bus tie MAN
Avionic master OFF
Volume and squelch ADJUSTED
Oil press warning lamp (check 3 sec after BATT: ON) CHECK ON
Engine instruments CHECK
Fuel quantity for the planned flight INIT
Mixture LEAN
Propeller lever FULL FORWARD
Throttle IDLE
Operating levers SET FRICTION
Trim NEUTRAL

WARNING

Always switch OFF the AVIONIC MASTER switch during start up for better service life of avionics equipment.

ENGINE START

Mixture level LEAN
Propeller lever FULL FORWARD
Throttle for fuel priming $\approx 30\%$
if CHT $< 65^{\circ}\text{C}$ & OAT $< 10^{\circ}\text{C}$ FULL POWER
Electrical Fuel pump ON
Mixture lever FULL RICH
if CHT $< 65^{\circ}\text{C}$ & OAT $< 10^{\circ}\text{C}$ during 10 sec.
if CHT $< 65^{\circ}\text{C}$ & OAT $\geq 10^{\circ}\text{C}$ during 5 – 10 sec.
if CHT $\geq 65^{\circ}\text{C}$ & OAT $< 30^{\circ}\text{C}$ during 2 – 5 sec.
if CHT $\geq 65^{\circ}\text{C}$ & OAT $\geq 30^{\circ}\text{C}$ during 2 sec.
Mixture lever LEAN
Electrical fuel pump OFF
if OAT $\geq 30^{\circ}\text{C}$ & CHT $\geq 65^{\circ}\text{C}$ KEEP ON (see note)
Throttle for starting $\approx 30\%$
if OAT $\geq 30^{\circ}\text{C}$ $\approx 50\%$
Brake pedals PRESSED
Propeller area CLEAR
Ignition START
(accord. to starter limitations) and set BOTH after engine fires
Mixture lever FULL RICH
Throttle $\approx 1200\text{ RPM}$
(max. 1500 RPM as long as oil temperature is below 40°C)
Starter warning light CHECK OFF
Oil pressure CHECK
Mixture lever LEAN to "M"



WARNING

**If the oil pressure does not reach 25 psi (yellow arc)
within 30 sec, stop the engine.**

Do not restart until the cause has been rectified

NOTE

To start a warm engine or in high ambient temperatures,
switch ON the electrical fuel pump just before start
to prevent fuel vaporization in the fuel system

WARNING

**If the starter warning light remains ON after starter switch is
released, switch the Master OFF to prevent a cable fire
or starter damage and stop the engine.**

BEFORE ENGINE
START
ENGINE START
ENGINE START
WHEN FLOODED

WARNING

**If the engine dies after the electric FUEL PUMP is first
switched OFF, a technical defect of
the mechanical fuel pump is possible.
Do not fly the airplane until the fault has been rectified.**

ENGINE START WHEN FLOODED

Throttle FULL OPEN
Electrical fuel pump OFF
Mixture LEAN
Elevator PULL BACK
Brake pedals PRESS ON

WARNING

**Make sure the aircraft is secure
and that there are no obstacles in front of it!
The engine can develop full power immediately.**

Engine START

NOTE

Operate the starter (according to the starter limitations)
until the engine is running,
then set the mixture lever forwards and pull back the throttle.
If necessary, switch ON the electrical FUEL PUMP immediately!
(Precautionary to avoid formation of vapour bubbles).

AFTER START CHECKS

AlternatorON
Alternator warning lightCHECK "OFF"
AmmeterCHECK CHARGING

NOTE

With a negative ammeter value,
"PULL and PUSH" the circuit breaker "ALT FIELD" to "RESET"
the alternator and/or recycle the alternator ("OFF and ON")

CAUTION

If the red alternator warning light remains ON,
shut down the engine and have the fault investigated.

External power (if used) DISCONNECT
Bus Tie AUTO
Fuel pump OFF
Anti-collision lights ON
Avionic Master ON
Air conditioning / ventilation AS REQUIRED
Position lights ON
NDB ON
EDM CHECK
Annunciator panel CHECK
Avionic data, setting, freq., volumeCHECK / ADJUST
Transponder SBY/SET
Flight instrumentsCHECK / ADJUST
Electrical horizon CHECK UNCAGE
Flaps FULL CYCLE
Taxi / Landing lights CHECK



TAXI CHECKS

Taxi light..... AS REQUIRED
Taxi area..... CHECK
Parking brake..... RELEASE
Brake operation..... CHECK
Nose wheel steering..... CHECK USING RUDDER

NOTE

For tight turns during taxiing use the wheel brakes as necessary.

Compass..... CHECK
Gyroscopic instruments..... CHECK
Controls CHECK FOR FULL AND FREE MOVEMENT
Fuel supply..... CHECK LH / RH TANK
Squawk SET ALT

ENGINE CHECKS

Parking brake..... SET
Oil temperature CHECK ABOVE 40 °C
Fuel tank CHECK FULLEST
Propeller lever HIGH RPM
Power lever SET 2000 RPM
Check EGT ABOVE 700°C
(adjust mixture if necessary)

Ignition set to L.....RPM MUST DROP
Ignition set to BOTH.....CHECK 2000 RPM
Ignition set to R.....RPM MUST DROP

- Maximum RPM drop..... 175 RPM
- Minimum RPM drop..... 50 RPM
- Maximum RPM drop difference 50 RPM

Ignition set to BOTH.....CHECK 2000 RPM
Propeller lever CYCLE FULL RANGE
Propeller lever HIGH RPM
Alternate Air ON
CHECK RPM DROP 20 to 70 RPM

Alternate air knob FULLY IN AND LOCKED
Suction CHECK
Throttle SET TO IDLE / CHECK LEFT HANDLE POSITION
Taxi & landing light..... ON
Ps heat..... ON
Air conditioning / ventilation ON
Fuel Press..... CHECK 12 psi MIN
Electrical fuel pump..... ON
Fuel Press..... CHECK
RPM.....CHECK 700 – 800 RPM
Throttle..... SET 1000 TO 1500 RPM
P/S Heat..... AS REQUIRED

AFTER START
CHECKS
TAXI CHECKS
ENGINE CHECKS

CAUTION

During long engine runs on the ground,
do not run the engine below 1000 RPM.
Lean mixture for clean SMOOTH engine running.

During engine runs in excess of 20 minutes, reduce the electrical load on the alternator to avoid excessive heat built-up.

The following systems should be switched OFF on ground:

- TAXI / LANDING LIGHT
- P/S HEAT
- AIR CONDITION / VENT LOW

BEFORE TAKE OFF

Hydr accu emer ext..... CHECK 1250 – 2000 psi
Emergency gear valveNORMAL
Elevator trim.....SET TO TAKE OFF
Mixture lever ADJUST
Propeller..... HIGH
Flaps T/O
Electrical fuel pump.....ON
Ignition CHECK BOTH
Air conditioning & ventilation VENT / LOW
Fuel tank selector.....FULLEST TANK
P/S heat AS REQUIRED
Taxi & landing light.....ON
Engine instrumentsGREEN ARC
Oil temperature (minimum 40 °C) CHECK
Annunciator panel ONLY FUEL PUMP ON
AND P/S HEAT, IF SELECTED ON
Flight instruments..... CHECK
All control surfaces (full and free movement) CHECK
Seat beltsCHECK FASTEN / TIGHT
Parachute halyard.....CHECK HOOKED
Canopy.....CHECK CLOSED
Parking brake..... RELEASE

NOTE

If one wheel brake binds,
apply and release the parking brake again.



TAKE OFF

On runway axis, at 1200 RPM without braking:

Artificial horizon SET
Heading CHECK
P/S heat AS REQUIRED

Full throttle on brakes:

RPM 2550 – 2680 RPM
Fuel flow according to placard CHECK
Engine instruments CHECK

Brakes released:

10 seconds ≈ 45 KIAS (without wind)
Rotation 65 KIAS

NOTE

For better take-off and climb performance
air-conditioning can be switched OFF.

Z > 50 ft. GND and 80 KIAS GEAR UP
Z > 150 ft. GND and 87 KIAS FLAPS UP
Z > 300 ft. GND and 100 KIAS:

- Electrical fuel pump OFF
- Taxi & landing light OFF

Gear up, Flaps Up, squawk / ALT CHECK
Air conditioning & ventilation AS REQUIRED

CLIMB

Climb power SET
Mixture ADJUST
Engine instruments CHECK

NOTE

Check the cylinder head temperature (CHT).
Recommended is CHT ≤ 204°C for continuous operation.
In case of too high CHT, increase airspeed and/or fuel flow

Airspeed 102 KIAS
Altimeter setting CHECK

BEFORE TAKE OFF
TAKE OFF
CLIMB

CRUISE

RPM..... 1800 – 2700 RPM
Power.....45 % – 100 %

NOTE

Do not exceed the max. cont. manifold pressure – limit
(see placard).

Mixture setting according to engine power ADJUST
Trim SET

PERIODIC CHECKS DURING CRUISE

- F** FUEL..... Check quantity and balance using
cockpit gauges, fuel flow meter
- E** ELECTRIC Check volts in green, amps near zero
and annunciator panel clear
- E** ENGINE Check instruments for normal readings
- A** ANNUNCIATOR PANEL All alarms OFF

DESCENT

Altimeter SET
Power setting (avoid idle for long periods) AS REQUIRED
Mixture ADJUST
Fuel tank selector AS REQUIRED



LANDING PATTERN

DOWNWIND LEG

Propeller HIGH
Mixture setting for go-around FULL FORWARD
Electrical fuel pump ON
Taxi & landing light ON
Air conditioning & ventilation VENT / LOW

AT AIRSPEED $\leq$ 136 KIAS (VLO)

Throttle $\approx$ 18 in. Hg
Flaps T/O
Landing gear DOWN
Brakes CHECK
Airspeed 90 KIAS
Seat belts and harnesses CHECK FASTEN / TIGHT

TURNING FINAL

Landing gear CHECK DOWN AND LOCKED
Throttle $\approx$ 12 in. Hg
Airspeed 90 KIAS

FINAL

Flaps LAND
Airspeed 80 KIAS
Throttle AS REQUIRED

WARNING

Maximum speed with Flaps LDG extended: 114 KIAS.

WARNING

In strong crosswinds, gusty conditions or in strong turbulence, as well as in rain or icing conditions, increase the approach speed.

GO AROUND

Propeller CHECK HIGH RPM
Throttle FULL
Mixture setting CHECK
Flaps RETRACT TO TAKE-OFF
Climb speed with take-off flaps 87 KIAS
Landing gear UP
Flaps UP
Climb speed with flaps UP (above 150 ft. GND) 102 KIAS
Electrical fuel pump (above 300 ft. GND) OFF
Air conditioning & ventilation AS REQUIRED
Taxi & landing light OFF

CRUISE
PERIODIC CHECKS
DESCENT
LANDING PATTERN

LANDING

Threshold airspeed 70 KIAS
Touchdown 65 KIAS
Nose wheel LOWER GENTLY
Brake AS REQUIRED

NOTE

During touch and go, retract flaps to T/O position
before full throttle.

AFTER LANDING

Electrical fuel pump OFF
Air conditioning & ventilation AS REQUIRED
P/S heat OFF
Landing light OFF
Taxi light AS REQUIRED
Transponder STANDBY
Flaps UP
Trim NEUTRAL
Parachute halyard UNHOOKED

BEFORE LEAVING THE AIRPLANE

PARKING BRAKE SET
Air conditioning & ventilation OFF
Avionic equipment OFF
Avionic master OFF
Magnetos CHECK OFF AT ≈ 900 RPM
Throttle 1000 – 1200 RPM
Mixture LEAN CUT-OFF

When the engine has stopped:

All electrical systems OFF
Ignition OFF
Electrical horn CAGE

PARKING

Wheel chocks POSITION
Parking brake RELEASE
Tie-down (if required) INSTALL
Control locks INSTALL
Pitot tube cover INSTALL
Canopy CLOSED



AIRCRAFT LIMITATIONS

SPEEDS

Never exceed speed (VNE)	235 KIAS
Maximum structural cruising speed (VNO)	172 KIAS
Design manoeuvre speed (VA):	Acrobatic..... 165 KIAS
..... Utility.....	145 KIAS
Maximum landing gear extended (VLE).....	160 KIAS
Maximum landing gear operation (VLO)	136 KIAS
Maximum flaps extended speed (VFE)	114 KIAS
Maximum speed with flaps in T/O position (VFE-T/O) ...	150 KIAS
Best speed for operation of Fire Extinguisher	95 KIAS

FLAPS MANOEUVRE LOAD FACTORS

Flaps UP acrobatic	+6 g / -4 g
(training limitations	+5 g / -3 g)
Flaps UP utility	+4.4 g / -1.76 g
Flaps DOWN	+3.8 g / -0.0 g

MAXIMUM TAKE-OFF / LANDING WEIGHTS

Acrobatic.....	1440 / 1440 kg
Utility	1490 / 1440 kg
(maximum baggage weight)	50 kg

MAXIMUM ALTITUDE

Operating altitude	12 000 ft.
Take-off and landing altitude	8 000 ft.

MAXIMUM CROSSWIND

For take-off and landing	25 Kts
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ENGINE LIMITATIONS

ENGINE OPERATING LIMITS / RATED OUTPUT ROTATION SPEED

During take-off and climb	MAX. 2700 RPM
MAX. continuous rotation speed	2700 RPM

MAX. CONT. MANIFOLD PRESSURE

1800 RPM.....	23.8 in. Hg
1900 RPM.....	24.6 in. Hg
2000 RPM.....	25.6 in. Hg
2100 RPM.....	27.1 in. Hg
2200 RPM and +.....	FULL THROTTLE

AFTER LANDING
BEFORE LEAVING
THE AIRPLANE
PARKING

AIRCRAFT
+
ENGINE
LIMITATIONS

CYLINDER HEAT TEMPERATURE

Minimum 66 °C
Normal (green arc)..... 66 – 260 °C
Maximum 260 °C

OIL PRESS

Minimum (idle) 25 psi
Normal (green arc)..... 60 – 90 psi
Maximum 115 psi

OIL TEMPERATURE

Minimum (not for continuous operation) 40 – 60 °C
Normal (green arc)..... 60 – 118 °C
Maximum 118 °C

OIL CAPACITY

Minimum (7.6 litres) 8 US Qt
Recommended (9.6 litres) 10 US Qt
Maximum (11.4 litres) 12 US Qt

FUEL PRESS

Minimum (idle) 12 psi
Normal 14 – 45 psi
Maximum 45 psi

FUEL FLOW (OCTANE GRADE MIN. AVGAS 100LL)

Minimum
Normal 34 – 83 l/hr
Maximum 102 l/hr

FUEL CAPACITY

Total 262 litres
Unusable (each) 10 litres
Collector tank (each)..... 8 litres
Tank asymmetry MAX 25 litres

STARTER LIMITATIONS

START – SEQUENCE	STARTER ON	COOLING DOWN
1	10 sec	1 min
2	10 sec	1 min
3	10 sec	15 min



GROB 120A – F
CREW MEMENTO N° 1

EMERGENCY PROCEDURES

ENGINE FAILURE
TAKE OFF
And FLIGHT

ENGINE FAILURE

DURING TAKE-OFF (on ground)

Throttle IDLE
Brakes AS REQUIRED

Actions in case the aircraft is departing from the runway:

Mixture LEAN CUT-OFF
Fuel tank selector OFF
Ignition OFF
BATTERY & ALTERNATOR OFF
Parachute halyard UNHOOKED
Radio cord DISCONNECTED
Safety harness RELEASE
Evacuate the aircraft backwards

DURING TAKE-OFF (airborne) AND FLIGHT

Engine power insufficient to continue flight:

Airspeed TRIM FOR BEST GLIDE
Electrical FUEL PUMP ON
Fuel tank selector CHECK
Ignition BOTH
Fuel pressure CHECK
Alternate air ON
(if no improvement) OFF
Mixture CHECK
Propeller HIGH RPM
Throttle CYCLE

If there is no improvement:

Mixture LEAN CUT-OFF
Fuel tank selector OFF
Ignition OFF
Electrical FUEL PUMP OFF
ELT ON

When landing is assured:

Landing gear AS REQUIRED
Flaps LAND OR FULL
Emergency radio call IF POSSIBLE
Seats belts TIGHT AND LOCKED
BATTERY & ALTERNATOR OFF

WARNING

Land as straight ahead as possible.
Make only small directional changes to avoid obstacles.
Make a normal or belly landing as decided due to situation.

ENGINE RESTART

Fuel tank selectorFULLEST TANK
Propeller HIGH
Throttle 1/4 OPEN
BATTERY & ALTERNATOR.....ON
Ignition..... BOTH
Electrical FUEL PUMPON

If propeller is windmilling:

Mixture..... RICH

If propeller is not windmilling:

Ignition START
Mixture.....OPEN UNTIL ENGINE RUNS SMOOTHLY
Electrical FUEL PUMP OFF

NOTE

Expect a short delay until full power is available
if the engine has failed because of an empty fuel tank.

ENGINE SHUT-DOWN DURING FLIGHT

After all actions to regain normal engine operation are unsuccessful:

AirspeedTRIM FOR BEST GLIDE
Fuel tank selectorOFF
Mixture..... LEAN CUT-OFF
Ignition..... OFF
"POWER-OFF LANDING"EXECUTE or BAILOUT



ABANDONING THE AIRCRAFT BY PARACHUTE CANOPY EMERGENCY JETTISON

Engine SHUT DOWN
Squawk & ELT EMERG MODE / ON
Helmet visors DOWN
Red locking lever PULL
Open canopy handle and push backwards and up through the
90° position until it releases (approx. 170° position).
Push the canopy simultaneously backwards and upwards.
Radio cord DISCONNECTED
Safety harness RELEASE
Cockpit ABANDON
Parachute CHECK OPENING
Red Emergency Handle ACTUATE IF NECESSARY

ENGINE RESTART
ENGINE
SHUT-DOWN
ABANDONING
AIRCRAFT
EMERGENCY
LANDINGS

EMERGENCY LANDINGS

POWER OFF LANDING

According to actual situation select most suitable emergency
landing area.

Airspeed TRIM FOR BEST GLIDE
Seat belts and harness TIGHT
Emergency radio call ANNOUNCE
XPDR & ELT EMERG MODE / ON
Fuel tank selector OFF
Mixture LEAN CUT-OFF
Ignition OFF
Electrical FUEL PUMP OFF
Flaps AS REQUIRED
Landing gear AS REQUIRED
BATTERY & ALTERNATOR OFF

POWER ON LANDING

Emergency landing area SELECT
Emergency radio call ANNOUNCE
XPDR & ELT AS REQUIRED
Fly over selected area to check condition IF POSSIBLE
Seat belts and harness TIGHT
Flaps AS REQUIRED
Landing gear AS DECIDED
BATTERY & ALTERNATOR OFF
Mixture (if off-field-landing, before touch-down) .. LEAN CUT-OFF
Brakes AS REQUIRED
Fuel tank selector OFF
Engine IGNITION OFF

EMERGENCY GEAR UP LANDING

Cockpit..... SECURE LOOSE ITEMS
Seat belts..... TIGHT AND LOCKED
Flaps..... LAND
Approach speed..... 80 KIAS

If landing is assured:

Electrical FUEL PUMP OFF
Fuel tank selector OFF
Mixture LEAN CUT-OFF
Ignition OFF
BATTERY & ALTERNATOR OFF

DITCHING

Radio MAYDAY
XPDR & ELT EMERG MODE / ON
Heavy objects SECURE
Landing gear UP
Flaps AS REQUIRED
Seat belts and harness tight CHECK
Approach in prevailing:

- Strong wind and high seas AGAINST THE WIND
- Gentle wind and strong swell PARALLEL TO SWELL

Touch down AT MIN. SPEED
Canopy OPEN
Seat belts and harness RELEASE
Airplane ABANDON
Life jackets and dinghy INFLATE

CAUTION

Do not operate over water and outside gliding range of land able terrain unless wearing life jackets on board for each crew member.

AIRSPEEDS FOR EMERGENCY OPERATIONS AT 1440 KG

Engine failure after take-off (Landing gear ext.):

MAX. performance gliding speed (flaps UP) 90 KIAS
MAX. performance gliding speed (flaps T/O) 80 KIAS
Recommended speed for emergency gear lowering 85 KIAS
Recommended min. approach speeds (power OFF):

- Flaps retracted 85 KIAS
- Flaps extended (TAKE-OFF – LAND – FULL) 80 KIAS



STARTER WARNING

STRTR

Red warning light ON + voice warning **"CHECK ELECTRIC"**

The starter is still engaged while the engine is running or supplied by current; this may overheat the starter.

On ground:

EngineSHUT-DOWN

During flight:

Land as soon as possible

Engine SHUT-DOWN AS SOON AS POSSIBLE

EMER GEAR UP
LANDING
DITCHING
STRTR
OIL PRESS

CAUTION

It is possible that the starter may cause mechanical damage if it is engaged with the engine running. If warning light comes on during flight, consider an emergency landing.

LOW OIL PRESSURE WARNING

OIL PRESS

Red warning light ON + voice warning **"CHECK OIL"**

Oil press..... CHECK

Oil temperature CHECK

If oil pressure is low (out of green arc) and oil temperature

NORMAL:

- Land at the nearest airfield.

If a complete loss of oil pressure with increasing oil temperature is observed:

- Reduce engine power to minimum,
- Look for an emergency landing field,
- Use minimum power to attain the emergency landing field,
- Expect higher propeller drag.

NOTE

In some cases (failure of aerobatic oil system) it is possible to recover oil system by roll into inverted flight and back to normal flight.

WARNING

Expect engine failure any time with LOW OIL PRESSURE.

ROUGH ENGINE OR POWER LOSS

Alternate air..... ON (PULL)
Mixture FULL RICH
Propeller..... HIGH RPM
Electrical FUEL PUMPON
Ignition CHECK BOTH, SELECT "GOOD" MAGNETO
Fuel selector CHECK
If roughness not curedLAND AS SOON AS POSSIBLE

The cause of engine roughness is not normally obvious.

The following list of possibilities should be checked in the order listed:

ICED AIR INTAKE FILTER

Indications: RPM drop at constant power setting

Alternate air ON (PULL)
Mixture..... ADJUST

FOULED IGNITION PLUGS

Indication: regular misfiring, power loss

Engine power..... 75 % BHP
Mixture..... BEST POWER RANGE
Cylinder head temperature CHECK WITHIN LIMITS
Continue flight, if the engine is running smooth.
Land at the nearest airfield, if the engine is running rough.

MAGNETO FAILURE

Indications: rough running, misfiring, RPM drop

Mixture..... RICH
Throttle CYCLE
Ignition..... CHECK BOTH, SELECT "GOOD" MAGNETO
Mixture..... ADJUST
Power setting.....AVOID POWER ABOVE 65 %
FOR LONG PERIODS
CHT and EGT MONITOR
Land at the nearest airfield.

CAUTION

If one MAG is U/S,
there will be a DEAD-CUT during MAG-CHECK.

NOTE

With only one MAG SYSTEM in operation, higher EGT is normal.

BLOCKED FUEL-INJECTION-NOZZLE

Indications: rough running, power loss, backfiring

Mixture..... ENRICH
Throttle ADJUST
Land at the nearest airfield.



FAILURE OF THE PROPELLER GOVERNOR

The result is loss of control over the RPM by the RPM lever and constant speed operation.

Indications: the most likely result is RPM overspeed.

Throttle IDLE
Airspeed LOW

Continue flight with partial throttle for landing at the nearest airfield.

FUEL PRESS WARNING

FUEL PRESS

Red warning light ON + voice warning "CHECK FUEL"

Electrical FUEL PUMP CHECK
Attitude STRAIGHT AND LEVEL
Fuel tank selector SELECT OTHER TANK
Fuel quantity and balance CHECK
Fuel pressure CHECK
Fuel flow CHECK

If warning persists, prepare for EMERGENCY LANDING.

Fuel pressure downstream of the engine-driven fuel pump is below 14.5 psi.

FUEL LH/RH LEVEL CAUTION

FUEL LH LVL or FUEL RH LVL

Amber caution light ON + voice warning "CHECK FUEL"
(Fuel quantity in LH or RH collector tank below 5 litres)

Attitude STRAIGHT AND LEVEL
Fuel tank selector OTHER TANK
Fuel quantity and balance CHECK

ROUGH ENGINE
POWER LOSS
PROPELLER
GOVERNOR

FUEL PRESS

FUEL LH/RH LVL

FIRE WARNING

ENGINE FIRE DURING START (not airborne)

Indications: FIRE warning light, flames in the engine compartment.

Fuel tank selectorOFF
Electrical FUEL PUMPOFF
Mixture LEAN CUT-OFF
ThrottleFULL FORWARD
IgnitionOFF
Engine fire extinguisher push-button (Lighted) PUSH
All electrical switchesOFF
Leave a/c and combat fire.

ENGINE FIRE IN FLIGHT

Indications: FIRE warning light, flames, smoke, smell or external signal or call.

Consider immediate **"POWER ON LANDING"**, if appropriate.

Fuel tank selectorOFF
Propeller lever FULL BACK
Airspeed95 KIAS
Electrical FUEL PUMPOFF
Mixture LEAN CUT-OFF
ThrottleFULL FORWARD
Cabin heating: Distribution Control LeverOFF
Cabin heating: Temperature Control LeverFULLY COLD

If FIRE warning persists for 30 sec:

Engine fire extinguisher push-button (Lighted) PUSH
IgnitionOFF

NOTE

After Engine Fire, do not attempt an air restart.

If after operating the fire extinguisher there is a smell or visible smoke in the cockpit, open the canopy for additional ventilation.

Continue with **"POWER OFF EMERGENCY LANDING"**.

According to actual situation select most suitable emergency landing area.

AirspeedTRIM FOR BEST GLIDE
Seat belts and harness TIGHT
Emergency radio call ANNOUNCE
XPDR & ELT EMERG MODE / ON
Fuel tank selectorOFF
Mixture LEAN CUT-OFF
IgnitionOFF
Electrical FUEL PUMPOFF
Flaps AS REQUIRED
Landing gear AS REQUIRED
BATTERY & ALTERNATOROFF



ELECTRICAL FIRE IN FLIGHT

ALTERNATOR.....OFF
BATTERYOFF
Vents CLOSED
Cockpit fire extinguisherOPERATE

NOTE

Ventilate cabin after using fire extinguisher in closed cabin.
The canopy can be easily opened below 95 KIAS.

AVIONIC MASTER.....OFF
All other switches, including all avionics switches.....OFF
(except ignition switch)

If fire is extinguished and electric power is required to continue flight:

BATTERYON
ALTERNATOR.....ON
Turn on all other switches as well as all circuit breakers in slow sequence until the short circuit is identified.
Deselect the failed system and land as soon as practical.

CABIN FIRE IN FLIGHT

BATTERY & ALTERNATOR.....OFF
Vents CLOSED
Cabin heating OFF
Fire extinguisherOPERATE

NOTE

Ventilate cabin after using extinguisher in closed cabin.

Land as soon as possible

WING FIRE IN FLIGHT

POSITION LIGHTS.....OFF
ANTI-COLL LIGHTSOFF
Perform side slip to keep flames away from cabin
Other fuel tankCHECK OR CHANGE
Emergency landing PERFORM

FIRE FAULT

Amber caution light ON

Fault in the fire detection system.
The fire detection system is not available.

ENGINE FIRE
ELECTRICAL FIRE
CABIN FIRE
WING FIRE
FIRE FAULT

ICING

INADVERTENT FLIGHT INTO ICING CONDITIONS

P/S HEATON

Propeller leverFULL FORWARD

Alternate air (observe manifold pressure!)ON

Cabin heating to windshield onlyON

Alternate StaticON

Reverse heading and/or altitude to leave icing conditions.

Prepare for landing at nearest airfield if ice cannot be removed.

If there is fast ice build-up, search for emergency landing location.

In case of icing on wing leading edges, expect higher stall speeds. The stall warning may give no or incorrect warning.

- In case of an incorrect stall warning PULL STALL WARNING CB

NOTE

Warning on annunciator panel and voice warning remain active.

WARNING

Leave area with icing conditions immediately after first signs of icing. Expect higher stall speeds.

Stall warning may be incorrect or absent.

Add 5-10 Kts to approach and landing speed.

P/S HEAT CAUTION

P/S HEAT

Amber caution light ON + voice warning "**CHECK HEAT**"

P/S HEAT switch.....CYCLE TO ON

P/S HEAT circuit breakerCHECK IN

If the CB pops out again or the annunciator panel caution remains, assume a failed P/S heating system. Land as soon as possible or fly to an area or altitude without icing conditions.



SPIN RECOVERY

SIMPLE PROCEDURE FOR USE AFTER LESS THAN 1.5 TURN SPINNING ONLY

Throttle CLOSED
Rudder FULLY OPPOSITE TO SPIN DIRECTION
Pause
Elevator SLOWLY RELEASE
Aileron NEUTRAL
Rudder when spin stops NEUTRAL
Recover from dive.

NOTE

To recover from all types of spins (except inverted),
use the procedure described on placard and below.

CAUTION

Altitude loss for recovery after spinning stops will be about 1000 ft.

Identified direction of spin TURN INDICATOR OR VISUAL
Throttle CLOSED
Rudder FULLY OPPOSITE TO SPIN DIRECTION
Aileron IN SPIN DIRECTION
Elevator FAST FORWARD TO STOP

If spin does not stop:

Elevator PULL BACK TO STOP

Keep rudder opposite to spin direction, aileron in spin direction
and hold the full pulled stick for 2 sec.

Elevator PUSH FAST FORWARD TO STOP
When spin stops CONTROLS NEUTRAL
Recover from dive.

STALL

Red warning light ON + aural warning

The MAX. safe angle-of-attack is exceeded, decrease AOA by:

Attitude REDUCE
Airspeed INCREASE
Normal acceleration REDUCE
Engine power INCREASE

ICING

P/S HEAT

SPIN RECOVERY

STALL

ALTERNATOR FAILURE

ALT OFF

Red warning light ON + voice warning **"CHECK ELECTRIC"**

Indication: voltmeter reading < 24.5 V DC

Alternator OFF

Electrical systems.. REDUCE TO MINIMUM FOR SAFE FLIGHT

- BUS TIE AS REQUIRED
- AIR CONDITION OFF
- GEAR EXTENSION..... BY EMERGENCY

Land as soon as practical

ALT RCCB is OPEN, eng-driven ALT is not connected to the DC-system.

VOLTAGE WARNING

VOLT

Red warning light ON + voice warning **"CHECK ELECTRIC"**

Ammeter CHECK

If ammeter reading negative:

ALTERNATOR..... RESET
by "PULL and PUSH" the circuit breaker "ALT FIELD"
and/or by recycling the alternator ("OFF and ON")

If unsuccessful:

ALTERNATOR..... OFF

Electrical systems.. REDUCE TO MINIMUM FOR SAFE FLIGHT

- BUS TIE AS REQUIRED
- AIR CONDITION OFF
- GEAR EXTENSION..... BY EMERGENCY

Land as soon as practical

ELECTRIC FAILURE PATTERN

Same as **"LANDING PATTERN"** except:

"EMERGENCY LANDING GEAR EXTENSION"

Recommended airspeed..... 85 KIAS

Flaps..... T/O if possible

Engine POWER FOR LEVEL FLIGHT

Bottle pressure..... CHECK (1250 up to 2000 psi)

HYDR circuit breaker PULL

LDG GEAR lever DN

EMERG LDG GEAR valve..... LIFT KNOB
& SWIFTLY TURN LEVER ONTO EMERGENCY

Gear locked CHECK 3 GREEN

Airspeed 100 KIAS

If no flaps:

- Airspeed in turning final 100 KIAS
- Airspeed in final 90 KIAS



BUS TIE CAUTION

BUS TIE

Amber caution light ON + voice warning **"CHECK ELECTRIC"**

BUS TIE caution light ON means, main bus and avionics bus 2 are supplied by alternator, battery bus and avionics 1 by battery. The battery is not charged!

BUS TIE.....MAN
Voltmeter CHECK

If BUS TIE caution light is still ON, voltmeter reading is 24.5 - 29 V DC and the ammeter has a normal indication on the + side:

Land as soon as practical

If BUS TIE caution light is still ON, voltmeter reading is < 24.5 V DC and the ammeter shows a discharge (- side):

Electrical systems.. REDUCE TO MINIMUM FOR SAFE FLIGHT

- AIR CONDITIONOFF
- GEAR EXTENSION..... BY EMERGENCY

Land as soon as practical

CAUTION

With BUS TIE switch in MAN and "ALT OFF" light ON, main bus and avionic bus 2 are supplied by battery. If ammeter shows high current, select BUS TIE switch to OFF.

BATTERY OFF CAUTION

BATT OFF

Amber caution light ON + voice warning **"CHECK ELECTRIC"**

BATTERY CHECK ON

If caution light remains ON:

BATTERYOFF

Land as soon as practical

Batt. RCCB is OPEN, battery not connected to BATT BUS.

ALT OFF
VOLT
ELECTRIC
FAILURE PATTERN
BUS TIE
BATT OFF

OTHER ELECTRICAL SYSTEM FAILURES

AMMETER INDICATION HIGH

Indication: ammeter reading > 10 Amp. for a relatively long period of time

Voltmeter CHECK

If voltage 24 - 29 V DC:

BATTERY OFF
(Alternator remains active)

Nevertheless land as soon as possible

If voltage > 29 V DC: Alternator OFF

Electrical systems.. REDUCE TO MINIMUM FOR SAFE FLIGHT

- BUS TIE AS REQUIRED
- AIR CONDITION OFF
- GEAR EXTENSION..... BY EMERGENCY

Land as soon as possible.

CAUTION

With BUS TIE in AUTO, deselecting the alternator will automatically disconnect main bus and avionic bus 2 from the battery.

Battery will be discharged at high rate.

Lower the landing gear and reduce electrical systems to those required for safe flight.

AMMETER READING NEGATIVE

ALTERNATOR RESET
by "PULL and PUSH" the circuit breaker "ALT FIELD"
and/or recycling the alternator ("OFF and ON")

If unsuccessful:

ALTERNATOR OFF

Electrical systems.. REDUCE TO MINIMUM FOR SAFE FLIGHT

- BUS TIE AS REQUIRED
- AIR CONDITION OFF
- GEAR EXTENSION..... BY EMERGENCY

Land as soon as practical



BATTERY CB POPPED

BATTERY OFF
ALTERNATOR OFF
BUS TIE OFF
BATT circuit breaker PUSH IN
BATTERY ON
ALTERNATOR ON

If BATT CB pops again:

BATTERY OFF
ALTERNATOR ON
Land as soon as possible

ALTERNATOR CB POPPED

BATTERY OFF
ALTERNATOR OFF
BUS TIE OFF
Alternator circuit breaker PUSH IN
ALTERNATOR ON

If Alternator CB pops again:

ALTERNATOR OFF
BATTERY ON
Land as soon as practical

AVIONIC BUS FAILURE / USE OF EMER AVIONIC SWITCH

NOTE

Failed avionic bus CB not popped.

CAUTION

DO NOT OPERATE THE EMER AVIONIC SWITCH BEFORE
YOU HAVE PULLED THE FAILED AVIONIC BUS CB
(YOU MAY BLOW THE EMERGENCY BUS FUSE)

FAILED AVIONIC BUS CB PULL
AVIONIC MASTER switch CHECK ON
EMER AVIONIC switch ON
FUNCTIONING AVIONIC BUS CB PULL

NOTE

With the EMER AVIONIC switch ON:

- Avionic Bus 1 is supplied direct from the Battery RCCB,
- Avionic Bus 2 is supplied direct from the Alternator RCCB.

AMMETER
FAILURES
BATTERY CB
ALTERNATOR CB
EMER AVIONIC

HYDRAULIC SYSTEM PRESSURE CAUTION

HYDR PRESS

Amber caution light ON

On ground:

Delay take-off until bottle pressure is within 1250 to 2000 psi and caution light is OFF.

In flight:

HYDR circuit breaker CHECK IN
GEAR CTRL circuit breaker..... CHECK IN
Hydraulic pump..... CHECK RUNNING

If amber caution light is not OFF within 25 sec., assume leakage in emergency landing gear extension system and proceed as follows:

HYDR Ctrl circuit breaker PULL

Prior to landing:

HYDR Ctrl circuit breaker PUSH IN
Proceed immediately with normal landing gear extension.

HYDRAULIC PUMP CAUTION

HYDR PUMP

Amber caution light ON

Result: possible overheating of hydraulic pump.

HYDR circuit breaker PULL
BE PREPARED FOR "EMERGENCY GEAR EXTENSION".

FLAP ASYMMETRY CAUTION

FLAPS

Amber caution light ON

Flaps asymmetry

Flaps position CHECK

FLAPS UP PATTERN

Same as "LANDING PATTERN" except:

Airspeed in turning final 100 KIAS

Airspeed in final 90 KIAS



LANDING GEAR PROBLEMS

EMERGENCY LANDING GEAR EXTENSION

Recommended airspeed.....85 KIAS
Flaps.....T/O IF POSSIBLE
Engine POWER FOR LEVEL FLIGHT
Bottle pressure.....CHECK (1250 up to 2000 psi)
HYDR circuit breaker PULL
LDG GEAR lever DN
EMERG LDG GEAR valve..... LIFT KNOB
& SWIFTLY SET LEVER ONTO EMERGENCY
Gear lockedCHECK 3 GREEN

It will take about 13 seconds until gear is DN and locked.

If unsuccessful, repeat manoeuvres as specified for:

"LANDING GEAR EXTENSION FAILURE / Nose gear unsafe"

or

"LANDING GEAR EXTENSION FAILURE / One or both main gear unsafe", respectively.

CAUTION

If bottle pressure is below 1250 psi,
do not use Emergency System!
When emergency extension system has been used,
it has to be checked after landing prior to next flight.

LANDING GEAR RETRACTION FAILURE

Indication: red gear unsafe light on or no landing gear operation.

GEAR CTRL circuit breaker..... CHECK
GEAR IND circuit breaker CHECK
GEAR EMERGENCY handle at "NORMAL" CHECK

If red gear unsafe light still ON:

LDG GEAR leverDN
GEAR down and locked..... CHECK
(confirmed by external observer, if unsure)

Land as soon as practical on a suitable airfield.

CAUTION

EXPECT SHORTER RANGE WITH GEAR DOWN.

HYDR PRESS

HYDR PUMP

FLAPS

+ PATTERN

EMERG L/G EXT
L/G RETRACTION
FAILURE

LANDING GEAR EXTENSION FAILURE / Nose Gear Unsafe

Indication: no Green light

HYDR circuit breaker PULL during preparation of manoeuvres

HYDR circuit breaker PUSH IN

Normal acceleration... APPLY MODERATE NEGATIVE G-LOAD

If unsuccessful:

Throttle + Propeller IDLE + LOW

Flaps T/O

Airspeed REDUCE TO STALL WARNING

Low airspeed and low propeller stream will allow the nose-gear to lock in DN position.

If unsuccessful:

Continue with **"EMERGENCY LANDING GEAR EXTENSION"**.

LANDING GEAR EXTENSION FAILURE / One or Both Main Gear Unsafe

Indication: no Green light, one or both

HYDR circuit breaker PULL during preparation of manoeuvres

HYDR circuit breaker PUSH IN

Normal acceleration... APPLY MODERATE NEGATIVE G-LOAD

If unsuccessful:

Limited airspeed 160 KIAS

Normal acceleration..... APPLY MODERATE POSITIVE G-LOAD

If unsuccessful:

Yaw the airplane FIRST INTO THE UNLOCKED GEAR,
THEN INDUCE OSCILLATION.

SIMULTANEOUS NORMAL ACCELERATION MAY HELP.

If unsuccessful:

Continue with **"EMERGENCY LANDING GEAR EXTENSION"**.



LANDING WITH FLAT NOSE GEAR TIRE

or NOSE GEAR UNSAFE

ApproachNORMAL
Seat belts..... TIGHT AND LOCKED
Flaps..... T/O

CAUTION

A smooth flare and smooth nose up touch down followed by a controlled delay of the nose drop during roll should be attempted, which is facilitated with flaps T/O.

Touch-downMAIN WHEELS FIRST
Mixture LEAN CUT-OFF
ElevatorPULL to keep nose up
Electrical FUEL PUMP OFF
Ignition OFF
Fuel tank selector OFF
BATTERY & ALTERNATOR OFF

NOTE

Do not retract the gear if there is an indication of a blown tire.

LANDING WITH FLAT MAIN LANDING GEAR TIRE

or ONE OR BOTH MAIN GEAR UNSAFE

ApproachNORMAL
Seat belts..... TIGHT AND LOCKED
Flaps..... T/O

CAUTION

A smooth flare and smooth nose up touch down followed by a controlled delay of wing and tail drop during roll should be attempted, which is facilitated with flaps T/O.

Touch down on good wheel first and keep bad wheel from ground contact as long as possible.

Use good wheel brake to maintain direction and to delay tail drop.

Mixture LEAN CUT-OFF
Electrical FUEL PUMP OFF
Ignition OFF
Fuel tank selector OFF
BATTERY & ALTERNATOR OFF

