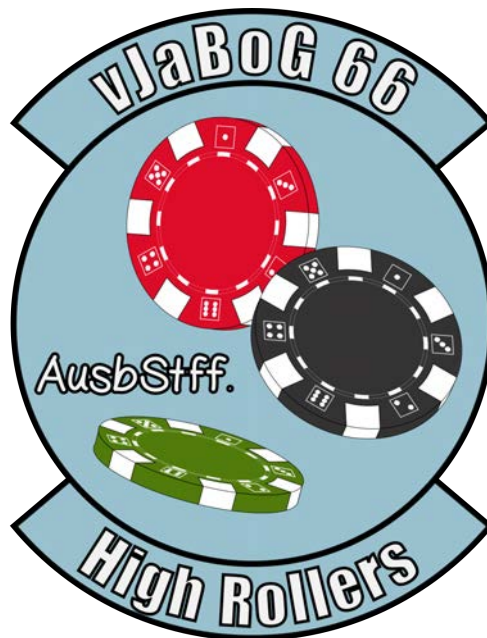


vJaBoG 66
"High Rollers"

C-101EB
EMERGENCY PROCEDURES



**PUBLIC RELEASE
APPROVED**



Revision 2
Letzte Änderung 29.05.2021

Änderungsübersicht

Rev 1	07.06.2020	-	Initiale Version
Rev 2	29.05.2021	-	FOR INTERNAL USE ONLY entfernt - PUBLIC RELEASE APPROVED hinzugefügt

Gültigkeitsbereich

Dieses Dokument ist für das Flugmuster C-101EB des vJaBoG 66 gültig.



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VORWORT

Die Notfall-Prozeduren für das Muster C-101EB des virtuellen Jagdbombergeschwaders 66 wurde nach bestem Wissen und Gewissen erstellt.

Die einzelnen Teilbereiche wurden, soweit möglich, anhand von realen Vorbildern und Dokumenten erstellt und niedergeschrieben. Wenn keine realen Dokumente zur Verfügung standen oder wenn der Geschwaderstab entschieden hat, Abstriche für die Praktikabilität oder das Gameplay zu machen, dann sind die hier dargestellten Prozeduren nach unserem besten Wissen über die militärische und zivile Luftfahrt ausgearbeitet worden.

Sollten Rechtschreibfehler oder Fehler inhaltlicher Natur gefunden werden, meldet diese bitte dem Geschwaderstab oder der Staffelführung.

vJaBoG 66, Geschwaderstab
Raku, Borin, Yurgon



TERMS

Die Phrasen "Land as soon as possible" und "Land as soon as practical" werden in diesem Dokument durchweg benutzt. Sie werden wie folgt unterschieden:

Land as soon as possible:

Ein Notfall wird gemeldet. Ein Landung sollte umgehend auf dem nächsten geeigneten Flugfeld durchgeführt werden, unter Beachtung der Schwere des Notfalls, Wetterkonditionen, Flugplatzeinrichtungen, Beleuchtung, Gesamtgewicht des Flugzeugs und Anweisungen der kommandierenden Stelle.

Land as soon as practical:

Der Notfall ist weniger dringend und, obwohl die Mission abgebrochen werden muss, nicht so schwerwiegend, dass eine sofortige Landung auf dem nächsten geeigneten Flugfeld notwendig ist.



GROUND EMERGENCIES

ENGINE FIRE OR OVERHEATING DURING START OR SHUTDOWN

NOTE

Experience has shown, that the most effective method to fight an internal fire in the engine is to ventilate the engine, if possible, to cool the location of the fire and to get rid of possible fuel accumulations.

1. Throttle - STOP
2. Fuel pump light - Check OFF visible
3. Starter switch - CRANK (Ventilation)

4. Fuel switch - CLOSE

Check OFF light illuminated in pushbutton and FUEL PRESS warning illuminated

5. Keep the engine turning until the fire is out

FIRE AFTER ENGINE SHUTDOWN

NOTE

The most probable cause of a fire after shutdown will be due to an oil leak. If this happens, monitor ITT during shutdown and inspect the exhaust area for evidence of fire.

1. Batteries - ON
2. L & R Battery Isolation - Check ON (pushbutton not illuminated)
3. Perform steps 1, 2, 3 and 4 of ENGINE FIRE OR OVERHEATING DURING START OR SHUTDOWN

ANTI-SKID FAILURE

NOTE

If the anti-skid system is operating below approximately 17 knots, this can either indicate failing of the anti-skid system or a brake failure, especially if the anti-skid button does not illuminate and thus indicate a failure of the anti-skid system. The priority is to restore full braking power as soon as possible.

1. Wheel brakes - Release

WARNING

Wheel brakes must be released before disconnecting the anti-skid system. Failure to do so will result in an immediate braking action with the braking force being proportional to the displacement of the brake pedals.

2. Anti-skid - OFF

Check OFF light illuminated in pushbutton

3. Wheel brakes - Apply

WARNING

When applying normal brake pressure without anti-skid, a wheel lock or even deflation may occur.

BRAKE FAILURE

NOTE

A total wheel brake failure normally only occurs with a total loss of hydraulic power. In these circumstances, only the parking / emergency brake may be available, powered by the pneumatic energy of the accumulator..

1. Emergency brake handle - PULL

WARNING

Braking action is not differential with the emergency brake handle pulled. The anti-skid system does not operate on the emergency brakes.



TAKEOFF EMERGENCIES

ABORT

1. Throttles - IDLE

NOTE

Stop the plane using normal wheel brakes.

If at any time the low hydraulic pressure warning light illuminates, switch to emergency brakes.

2. Canopies - CLOSED and LOCKED

3. Shoulder harness - LOCKED

4. Speed brake - IN

NOTE

If the speed brake is extended and a runway arresting gear is in place, the extended speed brake can deflect the cable from the plane and prevent arresting.

ENGINE FIRE OR OVERHEATING DURING TAKEOFF

If decision to abort is made:

1. See ABORT

If decision to continue the takeoff is made:

1. Maintain power

2. Search a clear area for an emergency landing

If fire is confirmed:

1. EJECT

If fire is not confirmed:

1. Reduce power to minimum

2. Land as soon as possible



ENGINE EMERGENCIES

LOSS OF CONTROLS

CAUTION

A loss of control must have been deliberately provoked, as the plane is very resistant to a loss of control. The recovery is easy, but without sufficient height for the recovery, ejecting is the only option.

1. Control stick - forward
2. Ailerons / Rudder - Center
3. Throttle - Idle

NOTE

Setting the throttle to idle will reduce the risk of engine extinction.

At low altitudes, power is needed for the recovery and can be applied. At low altitudes, the risk of an engine extinction is reduced.

If there is not enough height available for the recovery:

1. EJECT

ENGINE FAILURE

If suspected that the engine is internally damaged:

1. Throttle - Stop
 2. Fuel switch - OFF
- Check that the OFF light in pushbutton is illuminated

IMMEDIATE ENGINE RESTART

CAUTION

An in-air restart should not be attempted if it internal engine damage is suspected. An attempt to restart an internally damaged engine may result in an engine fire.

NOTE

It is extremely important to conserve battery power to operate the fuel pump, ignition, radios, etc. If time permits, disconnect all non-essential electric equipment.

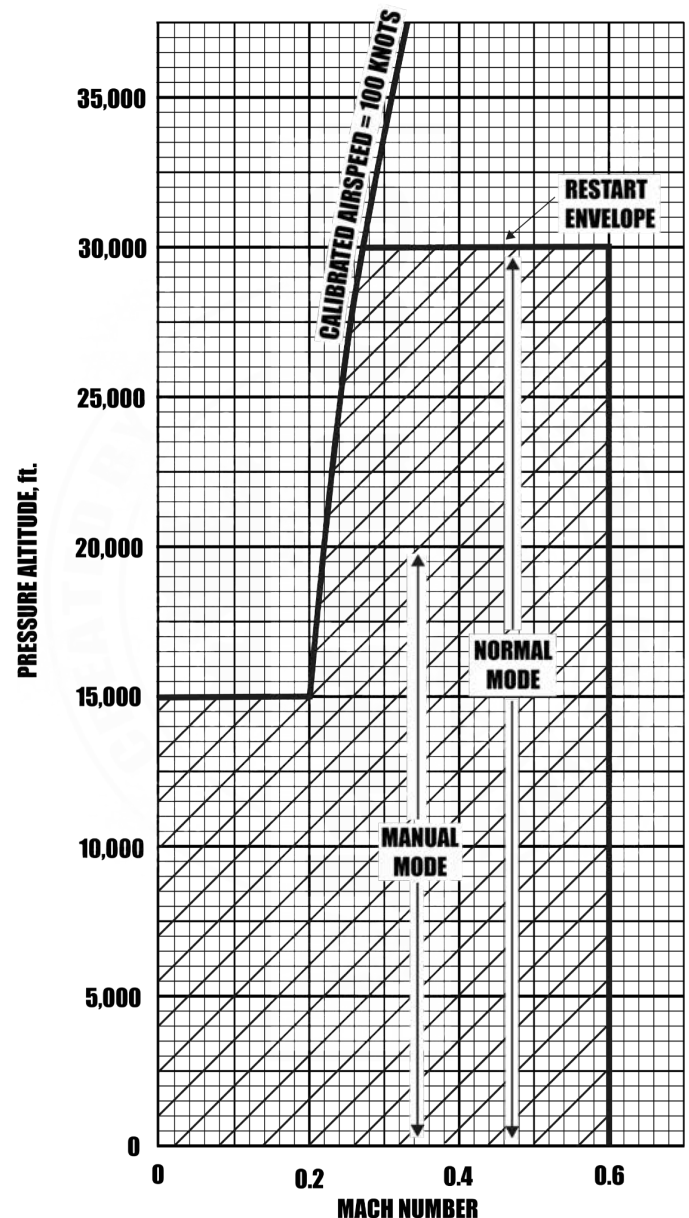


Figure 1: Engine Restart Envelope

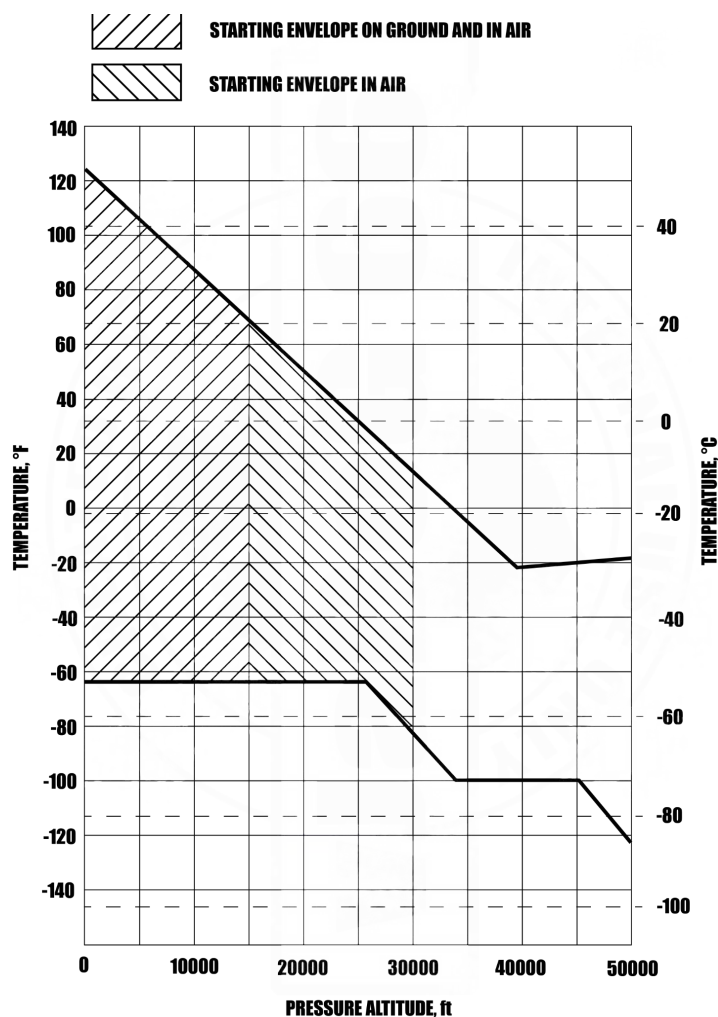


Figure 2: Starting Envelopes

NOTE

Immediate engine restarts may be attempted outside the restart envelope, above 30,000 ft.

The most appropriate technique is to try achieve engine restart with the immediate engine restart procedure directly after the engine failed.

1. Throttle - Idle (IMMEDIATELY)
2. Ignition - CONTINUOUS
3. Fuel enrichment - PUSH
Until reaching 300-400°C ITT

NOTE

Check ignition light illuminated and positive fuel flow.

4. ITT - Check for re-ignition

WARNING

- The maximum ignition time is 25 seconds.
- In-air restarts should not be attempted if the low pressure fan (N1) is not rotating.

Abort the in-air restart (throttle to STOP) if one of the following conditions becomes true:

- Engine ignition does not occur within 10 seconds of moving the throttles to idle and activating continuous ignition
- ITT approaches limit or exceeds it
- No indication of positive oil pressure within 10 seconds of restarting the engine

5. Throttle - As required
(as soon as engine has restarted)
6. Ignition - OFF
(as soon as engine instrument readouts have stabilized)
7. Ignition light - Check OFF
8. Engine instruments - Check for normal operation

NOTE

At high altitudes, you can take advantage of the high speeds of the compressors and attempt an immediate restart.

If the restart attempt fails you need to descend below 30,000 ft and restart the engine with one of the appropriate modes.

ENGINE RESTART (NORMAL MODE)**WARNING**

Engine restart attempts in normal mode should be carried out only when N2 is stabilized below 15%.

1. Fuel gauges - Check
2. Throttle - STOP
3. Fuel switch - OFF
4. Fuselage tank pump switch - OFF



5. Fuel transfer pumps - AUT (where applicable)

6. Air conditioning - OFF

WARNING

If the air conditioning is off, enable 100% oxygen.

7. Anti-ice - OFF

8. Speed and altitude - within normal mode envelope
(See figure 1)

9. Starter mode - NORMAL

10. Ignition - START (hold for 2 seconds)

Check ignition light illuminated

11. Throttle - IDLE, when reaching 10% N2 and positive
N1 rotation

Check FUEL PRESS warning light extinguishes

12. Fuel enrichment - PUSH
Until reaching 300-400°C ITT

NOTE

Check positive fuel flow.

13. ITT - Observe ITT rise within limits and disable fuel
enrichment when ITT reaches 300-400°C

WARNING

Abort the in-air restart (throttle to STOP, abort switch to
ABORT) if one of the following conditions becomes true:

- Engine ignition does not occur within 10 seconds of moving
the throttles to idle and activating continuous ignition

- ITT approaches limit or exceeds it

- No indication of positive oil pressure within 10 seconds of
restarting the engine

14. Ignition - OFF
(after stabilizing above 50% N2; only if flight
envelope does not dictate continuous ignition)

15. Ignition light - Check OFF (if ignition was switched
off)

16. Engine instruments - Check for normal operation

17. Air conditioning - ON

NOTE

The air conditioning was turned off during the restart
sequence. The pressure in the cabin may have reduced
greatly, thus it is recommended to descend below 10,000 ft of
altitude and operate the engine at the lowest feasible power
level before activating the air conditioning.

18. Anti-ice - As required

NOTE

In case of a failed engine restart attempt, wait 10 seconds to
allow the starter to cool and the drain of fuel accumulated in
the engine.

ENGINE RESTART (MANUAL MODE)**WARNING**

Do not attempt a manual engine restart in-air, if N2 is below
15%.

1. Fuel gauges - Check

2. Throttle - STOP

3. Fuel switch - OFF

4. Fuselage tank pump switch - OFF

5. Fuel transfer pumps - AUT (where applicable)

6. Air conditioning - OFF

WARNING

If the air conditioning is off, enable 100% oxygen.

7. Anti-ice - OFF

8. Speed and altitude - within manual mode envelope
(See figure 1)

9. Compressor fan speeds - N2 \geq 15%, N1 \geq 0

10. Ignition - CONTINUOUS
Check ignition light illuminates

11. Throttle - IDLE



Check FUEL PRESS warning light extinguishes

12. Fuel enrichment - PUSH
Until reaching 300-400°C ITT

NOTE

Check positive fuel flow.

13. ITT - Observe ITT rise within limits and disable fuel enrichment when ITT reaches 300-400°C

WARNING

Abort the in-air restart (throttle to STOP, abort switch to ABORT) if one of the following conditions becomes true:

- Engine ignition does not occur within 10 seconds of moving the throttles to idle and activating continuous ignition
- ITT approaches limit or exceeds it
- No indication of positive oil pressure within 10 seconds of restarting the engine

14. Ignition - OFF
(after stabilizing above 50% N2; only if flight envelope does not dictate continuous ignition)
15. Ignition light - Check OFF (if ignition was switched off)
16. Engine instruments - Check for normal operation
17. Air conditioning - ON

NOTE

The air conditioning was turned off during the restart sequence. The pressure in the cabin may have reduced greatly, thus it is recommended to descend below 10,000 ft of altitude and operate the engine at the lowest feasible power level before activating the air conditioning.

18. Anti-ice - As required

NOTE

In case of a failed engine restart attempt, wait 10 seconds to allow the starter to cool and the drain of fuel accumulated in the engine.

ENGINE RESTART, COMPUTER INACTIVE (MANUAL MODE)

WARNING

Do not attempt a manual engine restart in-air, if N2 is below 15%.

NOTE

If the amber COMPUTER caution light is illuminated, try disconnecting and connecting the computer. If the light stays illuminated, leave the computer disconnected.

1. Computer - OFF
2. Fuel gauges - Check
3. Throttle - STOP
4. Fuel switch - OFF
5. Fuselage tank pump switch - OFF
6. Fuel transfer pumps - AUT (where applicable)
7. Air conditioning - OFF

WARNING

If the air conditioning is off, enable 100% oxygen.

8. Anti-ice - OFF
9. Speed and altitude - within manual mode envelope
(See figure 1)
10. Starter switch - NORMAL
11. Ignition - START, hold for 2 seconds, then CONTINUOUS

Check ignition light illuminated
12. Compressor fan speeds - N2 \geq 10%, N1 \geq 0
13. Throttle - IDLE

NOTE

Fuel enrichment is inoperative in manual mode.
Check positive fuel flow.

14. ITT - Observe ITT rise within limits and disable fuel



enrichment when ITT reaches 300-400°C

WARNING

Abort the in-air restart (throttle to STOP, abort switch to ABORT) if one of the following conditions becomes true:

- Engine ignition does not occur within 10 seconds of moving the throttles to idle and activating continuous ignition
- ITT approaches limit or exceeds it
- No indication of positive oil pressure within 10 seconds of restarting the engine

15. Abort switch - ABORT, when reaching 50% N2

NOTE

In manual mode, there is no automatic starter disconnect

16. Ignition - OFF
(after stabilizing above 50% N2; only if flight envelope does not dictate continuous ignition)
17. Ignition light - Check OFF (if ignition was switched off)
18. Engine instruments - Check for normal operation
19. Air conditioning - ON

NOTE

The air conditioning was turned off during the restart sequence. The pressure in the cabin may have reduced greatly, thus it is recommended to descend below 10,000 ft of altitude and operate the engine at the lowest feasible power level before activating the air conditioning.

20. Anti-ice - As required

ENGINE FIRE

The red FIRE button on the central instrument panel and the red FIRE warning light on the caution and warning lights panel indicates that the sensor system in the engine has detected an overheating, with or without fire, in the engines or the surrounding areas.

NOTE

If the fire warning illuminates and then extinguishes, this may be due to a violent incident destroying the fire sensor system.

1. Throttle - Idle

If FIRE warning extinguishes and sensor system is operating normally:

1. Continue flight with minimum feasible throttle
2. Land as soon as possible

If FIRE warning stays illuminated:

1. Throttle - OFF
2. FUEL PRESS caution light - Check illuminated
3. Fuel switch - OFF
4. FUEL VALVE caution light - Check illuminated
5. Speed - Reduce
6. Fuel pumps - Off

If fire is confirmed:

1. EJECT

COMPRESSOR FAILURE

Except in the case of engine malfunctions, it is not characteristic for the turbofan engine that a compressor failure can be recognized by buffeting of the airframe, loss of thrust or speed fluctuations with a constant throttle position.

An indication of a compressor failure can be the lack of N1 response to throttle movements.

As a general rule, a compressor failure will be accompanied by an increase of ITT.

1. Throttle - Avoid fast / abrupt or abnormal movements

NOTE

- The throttle must be operated with smooth and continuous movements, which usually require two to



three seconds to move from IDLE to TAKEOFF

- Flying coordinate maneuvers increase the efficiency of the air intakes, reducing the risk of a compressor failure

If the compressor failed:

1. Throttle - IDLE

WARNING

In case of compressor failure, closely monitor ITT. Reducing throttle to idle will help in not exceeding limits.

2. Ignition - CONTINUOUS

NOTE

Setting the ignition to continuous reduces the risk to experience an engine failure.

3. Speed / AoA - Increase speed, decrease AoA
4. Altitude - Descent, if compressor failure happened at high altitude
5. Throttle - Advance slowly

If compressor is still failing:

1. Throttle - IDLE
2. Computer - OFF
3. Throttle - Advance slowly
4. Ignition - OFF (with N2 > 50%)

If compressor is still failing:

1. Engine - SHUTDOWN

WARNING

An attempt to restart the engine in-air, after suffering a compressor failure, is not recommended. If the flight conditions require it, an attempt can be made. If the compressor is still failing, shutdown the engine



ENGINE OUT GLIDING DISTANCE

ENGINE WINDMILLING OR BLOCKED

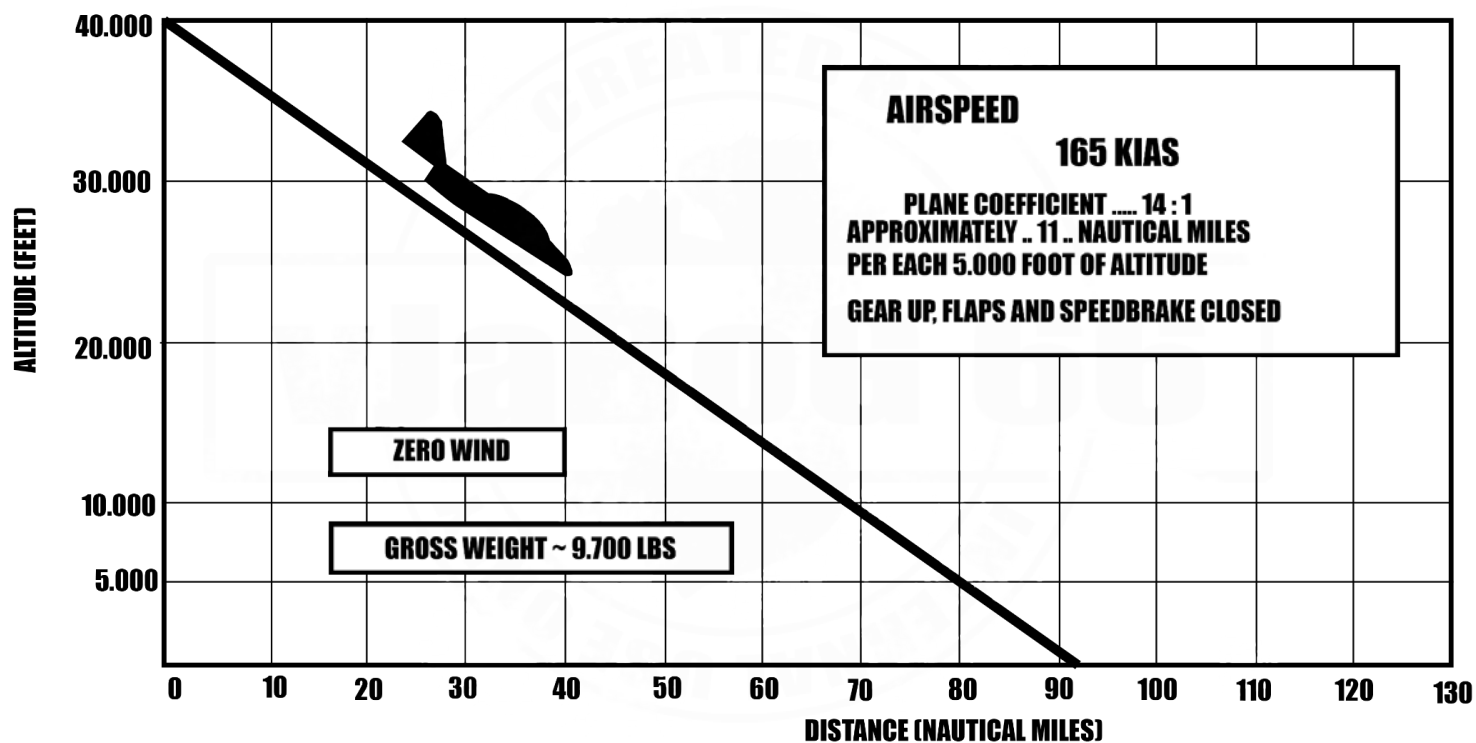


Figure 3: Engine Out Gliding Distance

CONFIGURATION	COEFFICIENT	DESCENT SPEED
GEAR UP FLAPS IN SPEED BRAKE ... CLOSED	14 : 1	2.100 fpm from 30.000 ft 1.600 fpm from 10.000 ft
GEAR DOWN FLAPS IN SPEED BRAKE ... CLOSED	11.7 : 1	1.900 fpm from 10.000 ft
GEAR DOWN FLAPS IN SPEED BRAKE ... OPEN	7.4 : 1	2.700 fpm from 10.000 ft

If the conditions are not favorable for a successful landing, consider ejection.



OIL EMERGENCIES

A failure in the engines oil system can be recognized by a fall, fluctuation or total loss of oil pressure.

This failure can be attenuated by vibrations that can increase progressively.

If the pressure drops down to 25 PSI, the red warning light OIL PRESS illuminates.

Excessively high pressure may be due to an obstruction or some kind of thick fluid.

Both may result in an engine seizure.

The experience on engine reactions shows that under abnormal oil pressures varying the throttle can aggravate lubrication conditions.

Therefore, the recommended procedure is:

1. Throttle - DO NOT TOUCH
2. Land as soon as possible

WARNING

With abnormally high or low pressure, the crew must prepare for an ENGINE OUT LANDING or for an EJECTION.



FUEL EMERGENCIES

COMPUTER FAILURE

A computer failure is indicated by an amber COMPUTER caution light.

WARNING

A failure of the engine computer means several protective automatisms are disabled, some of the affecting the fuel system.

1. Computer - OFF, then ON

If computer failure persists:

1. Continue flight with minimum feasible throttle setting
2. ITT - Monitor closely

FUSELAGE TANK PUMP FAILURE

A fuselage tank pump failure is indicated by an amber FUEL PRESS caution light.

NOTE

At altitudes below 25.000 feet, the engine pump is capable of sucking fuel from the fuselage tank without any operational anomalies.

WARNING

Sudden throttle movements with an inoperative fuselage tank pump above 25.000 feet may cause the engine to stop.

1. FUSELAGE BOOST PUMP circuit breaker - Check (last row, fifth from left)

If circuit breaker is OUT:

1. Fuselage Tank Pump - OFF

If circuit breaker is IN:

1. Fuselage Tank Pump - Cycle several times

If FUEL PRESS caution light is still illuminated:

1. Fuselage Tank Pump - OFF
2. Altitude - Descend below 25.000 ft, avoiding fast throttle movements

CENTRAL WING TRANSFER PUMP FAILURE

Simultaneous mechanical failure of both pumps that transfer fuel from the central wing tank to the fuselage tank is highly unlikely. However, it can occur as the result of an electrical malfunction.

If transfer is made with only one pump:

NOTE

If transfer from the central wing tank to the fuselage tank is made with one pump and this pump fails, the failure will be indicated by a red transfer pressure indicator on the fuel panel.

1. Failed central wing transfer pump - OFF
2. Remaining central wing transfer pump - AUT or MAN

If transfer is made with two pumps:

A failure of one central wing transfer pump can not be noticed by the pilot, if the transfer is being made with two pumps simultaneously.

If the CENTER indicator is red, this indicates failure of both pumps.

If both pumps fail:

NOTE

It will be impossible to use remaining fuel in the central wing tank.

1. Flightplan - Check and modify

EXTERNAL WING TRANSFER PUMP FAILURE

The external wing tanks are each fitted with a direct transfer pump to the fuselage tank. The external wing tanks are the first in the consumption sequence.



The failure of a external wing transfer pump can occur as the result of a mechanical or electrical failure.

NOTE

For transfer from the external wing tanks to the fuselage tank, both pumps will be connected simultaneously.

A failure of one of the pumps will not be noticed, since the other pump maintains the pressure in the transfer pipe.

The only way you will notice this is to observe a difference in heaviness between the two wings.

If, during transfer with external wing transfer pumps, the pilot notices a difference in heaviness between the two wings:

1. External wing transfer pump - Cycle both

Observe caution and warning light panel for illuminating FUEL PRESS light.

The pump operated when the light illuminates is the failed pump.

2. Failed transfer pump - Cycle several times

NOTE

If cycling the failed transfer pump does not resolve the failure, you can continue to consume fuel from the external wing tank with the operative external wing transfer pump.

Lateral compensation with an outer wing tank completely empty and the other completely full is always possible, even at approach and landing speeds.

However, for safety it is recommended to increase approach and landing speeds by 10 KIAS.



ELECTRICAL EMERGENCIES

GENERATOR FAILURE

A generator failure is indicated by a red GENERATOR warning light.

WARNING

With the generator inactive, the airplanes electrical systems are powered by batteries only. You should reduce electrical consumption to a minimum, turning off all non-essential and not needed devices.

1. Generator - RESET, then ON

If the GENERATOR warning light remains illuminated:

2. Battery - ON
3. Generator - OFF
4. ESS Bus Transfer - OFF
5. Bus Tie - OFF

NOTE

With the secondary bus disconnected, the following systems will be inoperable:
Transfer from wing tanks, several gauges, DC equipment, UHF, TACAN.
If these systems are needed, turn the Bus Tie switch ON for the shortest duration possible.

6. Voltmeter - Frequently check voltage on primary bus

NOTE

If the remaining voltage gets low, you can disconnect the inverter. This limits the aircraft capabilities to VHF navigation.

7. Land as soon as practical

BATTERY OVERHEATING

Overheating of a battery is announced with a 600 Hz tone and a flashing red WARNING light.

1. Faulty battery isolation - PUSH (OFF light in pushbutton illuminated)

NOTE

A faulty battery can be identified by taking the generator offline (Generator - OFF) and disconnecting the primary from the secondary bus (Bus Tie - OFF). Subsequently you can observe the voltmeter while isolating the faulty battery.

GENERAL BATTERY FAILURE

1. Batteries - Off
2. ESS Bus Transfer - ON
3. Bus Tie - OFF

NOTE

The generator is now the only source of electrical power.

4. Land as soon as practical

INVERTER FAILURE

The normal inverter is powered by the primary bus, the standby inverter is powered by the secondary bus. In case the normal inverter fails, switchover to the standby inverter happens automatically. There is no automatic switchover from standby inverter to normal inverter.

NOTE

The amber caution light corresponding to the failed inverter will stay illuminated, even if the inverter is switched off.

NOTE

Failure of an inverter and automatic switchover can be noticed by momentary loss of all AC powered instruments.

If normal inverter fails and automatic switchover fails (loss of all AC powered instruments):

1. Inverter - Standby



HYDRAULIC EMERGENCIES

HYDRAULIC SYSTEM FAILURE

A failure of the hydraulic system occurs with the hydraulic pressure below 2.000 PSI. This will trigger a red HYD PRESS warning.

Consequences of hydraulic loss are:

- Loss of hydraulic assistance for the ailerons servoactuators (if the accumulator is empty)
- Speed brake is inoperative
- Landing gear extension only with emergency pneumatic energy
- Inability to raise the landing gear
- Flaps are inoperative
- Loss of normal wheel braking action, only emergency braking through the accumulator
- Anti-skid is inoperative

If a hydraulic system failure occurs:

1. Land as soon as practical
2. Prepare for approach without flaps
3. Landing gear - Emergency extend
4. Fly the final approach at a speed not lower than recommended for configuration without flaps (see table below)

RECOMMENDED SPEEDS FOR FINAL APPROACH WITHOUT FLAPS		
GROSS WEIGHT (lbs) (two pilots)	FUEL REMAINING (lbs)	APPROACH SPEED (KCAS)
8265	465	122
8819	1015	125
9480	1565	129
9921	2115	132
10362	2670	135
11023	3220	140

AILERON SERVO ACTUATOR FAILURE

An aileron servo actuator failure will only manifest with a loss of hydraulic pressure.

The hydraulic pressure to the servo actuator can be cancelled with the emergency aileron hydraulic override button. This is usually done for the purpose of manual command training.

CAUTION

With an inoperative servo actuator, avoid landing in conditions with strong gusty winds or crosswinds as much as possible.

NOTE

To have manual aileron control, press the emergency aileron hydraulic override button in any cockpit.

With the red HYD PRESS warning persistently lit on the caution and warning light panel, there is sufficient reserve of hydraulic power to carry out at least 10 actuations at maximum aileron deflection or for a duration of two minutes, that should be used to reduce flight speed, if necessary, to put the airframe into a condition where it can be maneuvered with the aileron system in manual control.

This is done automatically once the accumulator pressure drops to 400 ± 30 psi.

NOTE

At a speed of 150 KIAS the ailerons can be deflected to its maximum in the manual mode. An easy actuation is possible up to 250 KIAS.

**CAUTION**

On final approach with an inoperative servo actuator, it can be extremely dangerous to reactivate the servo actuator. Under these circumstances, the abrupt reduction of forces in the aileron control system could lead to an undesirable roll maneuver at low altitude, that can possibly not be corrected. For this reason it is advised to land in manual mode with the emergency aileron hydraulic override button illuminating MAN.

EMERGENCY SPEED BRAKE RETRACT

The speed brake may be inoperative due to electrical or hydraulic failure.

If the speed brake is retracted, and an electric or hydraulic failure prevents extending, the pilot has no option to extend it.

If the speed brake is extended, and an electric or hydraulic failure prevents closing, the pilot has the option to emergency retract it.

This action energizes the electronic emergency lock, opening the return hydraulic pressure line, that keeps the speed brake extended. Under the effect of the dynamic pressure the speed brake will be pushed in, but without closing completely.

1. Emergency speed brake retract - PUSH
2. Land as soon as practical

UNCONTROLLED DISPLACEMENT OF ELEVATOR TRIM

Usually, elevator trim is controlled with the trim hat on the control stick. In case of a failure of the elevator trim, the trim must be controlled from a toggle switch located on the emergency panel.

If the trim actuator is not de-energized when the trim hat is released, i.e. the trimming of the elevators continues to be out of control, a command from the switch on the emergency panel has to be sent immediately, to cancel the unwanted trim actuation.

WARNING

Even in case of a maximum elevator trim displacement, the elevator control has enough power to safely maneuver the plane. Although the required forces on the control stick can become high, they are within physical capabilities of the pilot. Speed should immediately be reduced and any aerobatic maneuvers should be avoided.

1. Emergency pitch trim guard - OPEN
2. Emergency pitch trim - UP or DOWN, as required
3. If trim actuator is not controllable: reduce speed until force is acceptable
4. Land as soon as possible

WARNING

Before approach and landing, If the elevator trim is excessively positive, fly at a sufficient altitude and with a speed below 140 KIAS, to test the effect of flap deflection (in TAKE-OFF position first) and with progressively extended speed brake.



LANDING EMERGENCIES

LANDING WITHOUT FLAPS

1. See HYDRAULIC EMERGENCIES, HYDRAULIC SYSTEM FAILURE

ENGINE OUT LANDING

Windmilling engine RPM during a descent with the engine off are not enough to keep sufficient hydraulic pressure. Therefore, flaps and speed brake will not be available. The aileron servo actuator as a reserve for approximately 2 minutes or 10 full deflections.

Re-ignition of the engine, if a possibility, is a high priority, but should not distract from the needed concentration on approach and landing. Therefore, re-ignition attempts should be made before reaching high key.

The 360-degree-approach-pattern is depicted on the next page.

SIMULATED ENGINE OUT LANDING

Simulated engine out landings are normally conducted with the throttle in idle.

In this setting, the engine still provides a little amount of thrust (approximately 100 lb below 3,000 ft), instead of the resistance caused by turning the engine off.

Also, because the engine needs spool up time in order to accelerate quickly when needed, it is advisable to maintain a higher RPM than idle. When counteracting the thrust with the speed brake, a 20% higher speed than the in a real forced landing is to be flown (with the same gross weight in both cases).

LANDING WITH STRUCTURAL DAMAGES

If structural damages occur during flight, the pilot has to decide between leaving the plane or attempting to land.

If satisfactory control performance can be maintained, the maneuvers during an approach should be simulated at a safe altitude, to determine if the aircraft is controllable at approach speeds.

1. Climb to 15,000 ft AGL and simulate an approach
2. Know the minimum speed at which control difficulties may arise

CAUTION

Do not let the aircraft stall!

As soon as you encounter signs of a stall, recover immediately.

If control of the aircraft can not be maintained below 140 KIAS in landing configuration, eject.

3. Speed brake, gear and flaps - EXTEND for descent
4. Speed - 20 knots above minimum controllable speed (from 2) during descent and approach
5. Fly a straight-in approach

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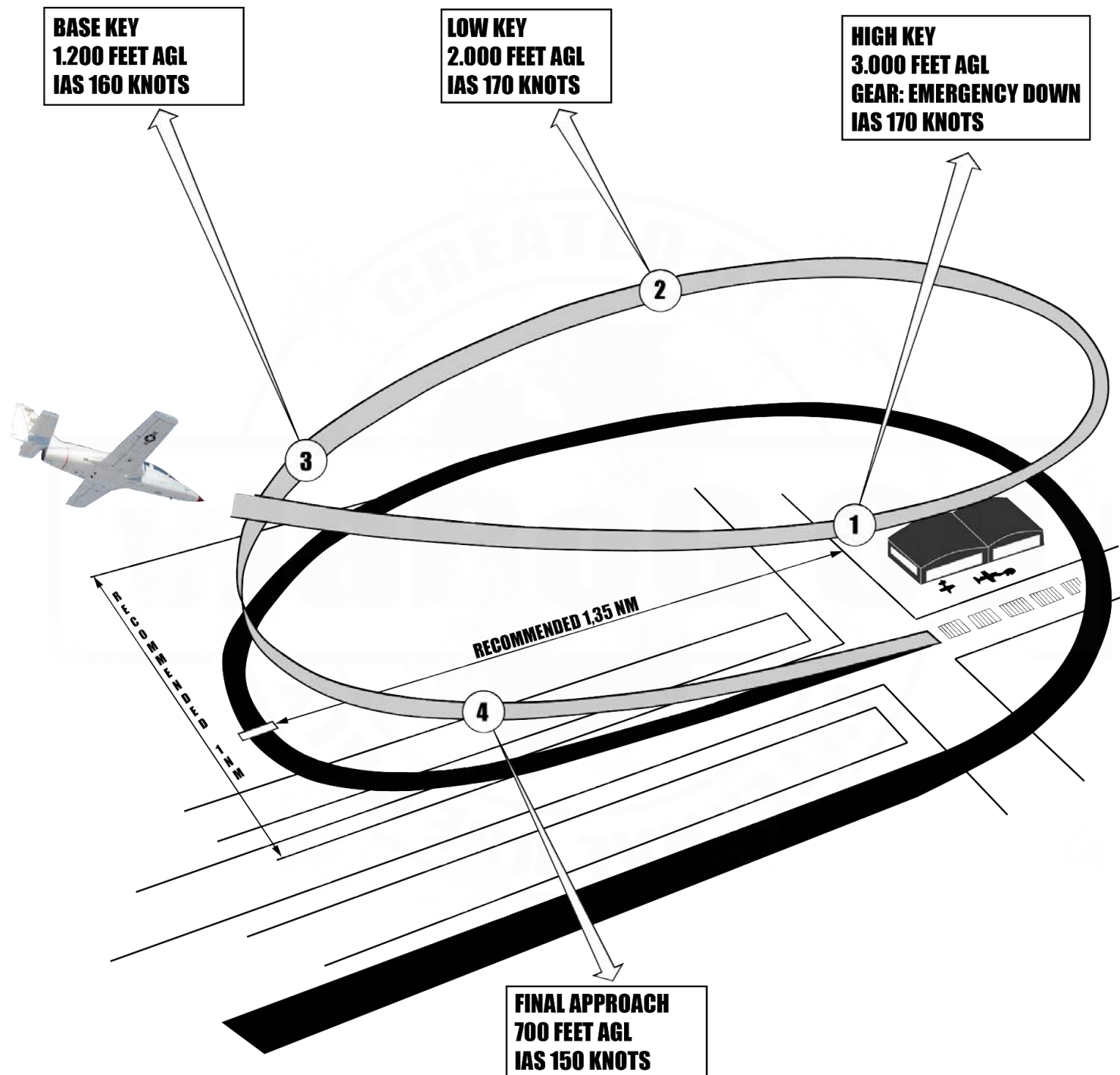


Figure 4: Flameout Landing Pattern



LANDING FROM THE REAR COCKPIT

In case of incapacitation of front cockpit crewmember, there is no problem in landing the aircraft from the rear cockpit.

If the front cockpit crewmember has ejected alone, the rear cockpit crewmember is presented with the following conditions:

- Due to the reaction to the ejection seat and the rear of the aircraft will instantly rise, while the center of gravity also shifts to the rear

WARNING

The rear cockpit crewmember has to quickly react to counter the experienced forces on the airframe to prevent loss of control.

- The cabin will be abruptly depressurized
- The now open front cabin can cause a turbulence that may result in directional instability of the aircraft
- The center of gravity can be shifted behind the normal margin, with low or no longitudinal stability

Before ejection:

1. Speed - reduce to 170 KIAS
2. Altitude - Descend to 15.000 ft or lower
3. Oxygen - 100%
4. Compensate for the sudden movement of the airframe

After ejection:

1. Continue to compensate for the c.g. shift
2. Land as soon as possible

LANDING WITH HYDRAULIC FAILURE

See HYDRAULIC EMERGENCIES.

After touchdown:

1. Use emergency brake

WARNING

The emergency wheel brakes do not provide differential braking and applies brakes equally to both wheels.

LANDING GEAR NOT LOCKED

An unlocked landing gear is not an emergency. It may be a fault in the signaling system.

If hydraulic pressure is within operating limits and the gear lever is down, try to obtain a visual check from the outside from other aircraft or a tower.

In any case a gear does not signal locked:

1. Speed - reduce to below 150 KIAS
2. Circuit breakers GEAR and SPD BRK / GEAR / TRIM IND - OUT, then wait a few seconds, then IN
(first row, fourth from right and second row, fourth from right)
3. Gear lever - UP, then DOWN

If gear still indicates stuck:

1. Apply negative g load, to help the gear get unstuck.
2. If gear got unstuck and indicates down, apply positive g load to help lock the gear

If gear still indicates not locked, a decision must be made to use the emergency gear extension.

NOTE

The emergency gear extension uses pneumatic pressure instead of hydraulic pressure. Thus, the pneumatic emergency extension is irreversible and once down, the gear can not be raised anymore.

With normal hydraulic pressure (2.850 - 3.050 psi):

- a) If none of the three gears is properly locked, or both main gears are locked, or one main gear and the nose gear is locked, **DO NOT USE THE EMERGENCY GEAR EXTENSION.** Instead, land according to the proper LANDING WITH GEAR NOT DOWN procedure.



- b) If only one main gear or only the nose gear is locked, **USE THE EMERGENCY GEAR EXTENSION** and land according to the proper **LANDING WITH GEAR NOT DOWN** procedure.

With low hydraulic pressure (lower than 1.800 psi):

Use the emergency gear extension and land according to the proper **LANDING WITH GEAR NOT DOWN** procedure.

EMERGENCY GEAR EXTENSION

1. Speed - 150 KIAS
2. Circuit breaker GEAR - PULL
(first row, fourth from right)
3. Emergency gear extension lever - PULL and keep pulled until three green

LANDING WITH BRAKE FAILURE

In the event one or both brakes fail, land with the lowest possible safe speed, to aim for a minimum ground roll. Use the longest available runway and land as close into the wind as possible.

Use aerodynamic braking to the maximum extent possible. After touchdown, hold the control stick in the most backward position.

LANDING ON UNPREPARED SURFACES

If it becomes necessary to land on an unprepared surface, it is advised to lower the gear, as even with poor underground conditions, the gear will help to slow down the plane with a less catastrophic risk.

DITCHING

Ditching is not recommended.

The deceleration forces on splash down will be extremely high and the floating time of the aircraft can be very short.

There is no advantage in ditching instead of ejecting.

However, if ejection is not practicable and ditching is the only option:

1. IFF - EMERGENCY
2. Oxygen - 100%
3. Gear - UP

CAUTION

Do not splash down with the landing gear extended!

4. Flaps - DOWN
5. Speed brake - CLOSED

LANDING WITHOUT CANOPY OR WITH BROKEN CANOPY

When landing without canopy or with a broken canopy (cracks in the glass), there is no need for a special landing technique. However, it is recommended to fly the approach with additional 5 - 10 KIAS, than landing with an intact canopy.



LANDING WITH GEAR NOT DOWN

WARNING

When attempting to land with one or more gears not safe, keep in mind:

- Crosswind
- Runway condition
- Available space in case of inadvertent runway excursion

CAUTION

If the conditions are not favorable:

EJECT

ONE MAIN SAFE, NOSE UNSAFE



Landing with only one main gear safe and nose unsafe is not advisable.

It is recommended to raise the gear, check if it is completely raised and follow the ALL GEAR UP procedure.

If the pneumatic emergency gear extension was activated and the above condition remains, IT IS RECOMMENDED TO EJECT!

ALL GEAR UP



1. Consume at least all fuel in central wing tank
2. Shoulder harness - Checked
3. Speed brake - IN
4. Flaps - DOWN
5. Fly straight-in approach with 110 KIAS

After touchdown:

6. Throttle - STOP
7. Fuel switch - OFF
8. Oxygen - CLOSED
9. Generator - OFF
10. Batteries - OFF

BOTH MAIN SAFE, NOSE UNSAFE



1. Consume the maximum possible amount of oxygen
2. Shoulder harness - Checked



3. Speed brake - IN
4. Flaps - DOWN
5. Fly straight-in approach with 110 KIAS

After touchdown:

6. Throttle - STOP
7. Fuel switch - OFF
8. Oxygen - CLOSED
9. Generator - OFF
10. Batteries - OFF

ONE MAIN SAFE, NOSE SAFE



1. Shoulder harness - Checked
2. Speed brake - IN
3. Flaps - DOWN
4. Fly a straight-in approach at 120 KIAS.

Try to touch down at the beginning of the runway, on the side of the safe main gear.

After touchdown:

5. Throttle - IDLE
6. Lower the nose and maintain directional control by raising the wing of the unsafe main gear
7. Use all available braking power of both wheels on the ground to decelerate the aircraft and to help maintain directional control

8. When it is no longer possible to keep the wing raised:

- a. Throttle - STOP
- b. Fuel switch - OFF
- c. Oxygen - OFF
- d. Generator - OFF
- e. Batteries - OFF

10. Use the emergency brake for the maximum possible braking effect

- 11.

BOTH MAINS UNSAFE, NOSE SAFE



Landing with only nose gear safe and both main gears unsafe is not advisable.

It is recommended to raise the gear, check if it is completely raised and follow the ALL GEAR UP procedure.

If the pneumatic emergency gear extension was activated and the above condition remains, IT IS RECOMMENDED TO EJECT!