OPERATIONS MANUAL “B”

MULTI CREW COOPERATION – MCC

STANDARD OPERATING PROCEDURES

FNPT II MCC

ABNORMAL & EMERGENCIES

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2. ABNORMAL/EMERGENCY OPERATION

03.02.00 Contents

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02.01 INTRODUCTION

These procedures shall be used unless a deviation is necessary in the interest of safety. They are based on a well functioning Crew Resource Management with clear communication and a sound understanding of “Safety First”.

The following part of the SOP’s furthermore enhance checklist work by priorities and maximum use of the equipment down to a stabilized approach and landing.

Abnormal/Emergency situations require excellent crew coordination. A handover of controls from the Commander, if he is PF, to the PNF/PM may be considered to achieve a better overall understanding of the present situation.
In addition, the passengers shall be informed accordingly whenever possible. ☺

The emergency checklist (= QRH) shall be used when essential according to the emergency procedures below or whenever applicable (by CM 2 on the ground, PNF/PM in the air or as appropriate).

For certain situations memory items are prescribed (refer to the emergency procedures below or to the emergency checklist/QRH).

Be aware, that not all actions used in the MCC training will be the same during an actual type rating on Beech 200 or other turbo propeller aircraft due to the focus on multi crew cooperation training.
“There is no rule for everything!” Sometimes common sense and good airmanship are needed more than you would actually believe.

02.02 GENERAL OPERATING TECHNIQUES

For abnormal / emergency operation a guideline of priority for crew actions to handle the situation, beside the general rule: *AVIATE – NAVIGATE – COMMUNICATE*,
is:

- fly the aircraft
- warnings
- cautions
- others

For some Abnormal + Emergency (A&E) procedures specific actions have been defined to be performed as soon as the situation permits (by heart items).

A) Abnormal / emergency crew actions as a general guidance

1) Flying the AC is primary (no other action below 400 ft, unless necessary to regain control)
2) Notification is the first announcement of any malfunction
3) Verification is the analyses and confirmation of the malfunction by both Crew Members.
4) Identification of an applicable A + E procedure
5) Perform by heart items (might be needed immediately [e.g. no autofeather])
6) Initiation of procedure: When ready PF orders the procedure by announcing "My communication, your xxx checklist"
7) Reading of A + E checklists: The checklist items are read loud by PNF/PM starting with the procedure title of the checklist.

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B) Confirmed actions (means no handling before confirmation, on Be 200 MCC):

1) Power levers/Propeller levers/Condition levers (engine shut down):
PNF/PM: "Confirm Power (Propeller/Condition) lever number 1 / 2"
PF: "Power (Propeller/Condition) lever number 1 / 2 is confirmed"

2) Engine fire push button:
PNF/PM: "Confirm Engine fire push button No 1 / 2"
PF: "Engine fire push button No 1 / 2 is confirmed"

3) Generator switch:
PNF/PM: "Confirm LH/RH Generator"
PF: "LH/RH Generator is confirmed"

As a reminder:

MAYDAY CALL

MAYDAY, MAYDAY, MAYDAY
CALL SIGN OF ATC UNIT
OWN CALL SIGN
POSITION
KIND OF EMERGENCY
PILOT INTENTIONS

We like to provide you with some tools to easily handle all situations in the best available manner. These tools are used at major airlines with success and therefore they will work for us too.

In **performance critical situations**, where you don`t have an extended period of time for decision making, we suggest the following sequence:

P - P - A - A

Power: Check power set and available. Advance throttle to MCP or GA power, keep power as it is or even reduce power, whatever action is required, check time for maximum utilization when setting high power. Too low power (=energy) is dangerous, vice versa, to high power (e.g. when asymmetric) can be dangerous too. Situations can be engine failures, wind shear, …

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Performance: Check and announce configuration (Gear, flaps, spoilers) and minimum speed, if necessary also maximum speed permitted. Callout your target speed. If needed change configuration as deemed necessary to get rid of unwanted drag for example. You have two different ways to verify the configuration. Call out every point and verify, or go the direct way, like: “We are clean”. Know your target speed

Now the aircraft is set to fly (again)

Analysis: Minimum actions are to assess the situation, check time required and/or available and to set priorities (you may also continue with “FORDEC” below).

Action: Order correct checklist/QRH part and/or Procedures and consider available knowledge by crew. Inform ATC about your problem, intentions and required assistance (Priority/Emergency; Weather infos, RWYs [recheck info ASAP], NavAids, …).

P & P = first fly the aircraft
A & A = aircraft orientated handling

Some words about time:
Extreme situations can force you to an immediate relanding (e. g. severe engine troubles due to multiple bird strikes). In such a case the facts are clear, the options very limited, the risks obvious and the decision does not ask for an explanation. In other cases an initial action has to be chosen for immediate action, but FORDEC below may be used after the initial danger has vanished (e. g. rapid decompression and the level flight in safe altitudes thereafter).

Whenever your assessment of the available time permits and/or the need for an in-depth assessment of the situation requires a thorough investigation and decision making, we suggest the internationally used sequence, which resulted from various CRM studies, of:

F O R D E C

Facts: Gather all information to find the cause of a problem, its extent and all other information needed on the way to a safe landing. Modern aircraft provide lots of status information through the FMS status pages, on older aircraft a thorough cockpit scan, including circuit breakers, helps. External facts are the possible landing sites (Weather to and at, Approaches available and status, Runway dimensions, status and clearances before, aft and aside, traffic density, special use airspace, fire and rescue services, medical assistance…). The cabin crew puts forward their briefing on the situation in the cabin (any abnormal sounds, smells and any visual recognizable abnormalities, injuries among passengers and cabin crew, damage in cabin and what they see outside, general situation like level of fear, availability of assistance in form of deadheading crews, medical personnel, …

Define the problem!

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Options: All possible options for the solution of the problem have to be found and considered (Teamwork!). Checklists, manuals and pilots knowledge have to be assembled together.

Highest objective always is the safe termination of the flight!

When all considerations for the assurance of a safe landing, be it at the destination, departure aerodrome or any IA/EA/FEA, have been made, additional considerations about maintenance facilities, passenger transport, … may be included (time/workload permitting).

Risks/ Benefits: Analyze the benefits and risks and choose the best options together with the crew involved. Consider the additional time to distant airports against the benefits of larger runways, better ATC, airport, fire-fighting, medical and other services. Any complex situation is unique in itself and decision making always calls for balancing the risks and the benefits.

Decision: Make your decision. Use clear wording to communicate it to your crew. Optimize the distribution of the tasks.

Execution: **Carry out the decided action and check course of events for any deviations**

Inform ATC as early as possible about your decision thereby giving them the chance to provide the best service available.
Finish checklists items held, prepare the cockpit for the approach.
Brief cabin crew on what they have to expect and have them prepare the cabin for the landing/ditching.
The passengers expect the Captain to brief them on what is going on and planned to be done, do that whenever time permits, but early enough to have the cabin calm and listening to your flight attendants.

Check: Whenever circumstances change to an extent, where you need to adapt or even to develop a new plan, accept the challenge and the change, you even might have to restart at the beginning with the new added facts.

"The aim always is a safe approach and landing!"

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What to expect from ATC (in certain ATS-units)?
They use the tool **A S S I S T**

Acknowledge – understand and acknowledge the nature of the emergency

Separate – establish/maintain separation to other aircraft and terrain

Silence – get your frequency silent, don`t transmit unnecessarily (disturbing urgent pilot actions)

Inform – inform supervisors, other sectors, units and airports

Support – give maximum support to flight crew

Time – allow pilots sufficient time to work on their problem

Post flight debriefing

What has to be done after the successful landing with the mental stress in mind?
To overcome the actual stress and to reduce post flight stress symptoms an operational debriefing should be held whenever a non-standard situation occurred. This might be asked for by the flight attendants too.
Another tool, to remember what to do: "**APPROACH**"

As soon as possible

Participation of all involved personnel

Purpose has to be clarified in advance

Review of the incident and its outcome/handling

Operational facts

Ask the participants about their feelings and impressions

Check their understanding of the situation

Help can be provided within the team or by consulting professionals (e. g. peer support group)

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02.03 REJECTED TAKE OFF (RTO)

A rejected takeoff is a maneuver performed to safely and expeditiously stop the aircraft on the runway due to a serious problem
The decision to reject the takeoff in an actual emergency is the responsibility of the CM 1 and will occur at any speed below V_1.
Below 70 kts (low speed margin), the takeoff should also be discontinued for a master caution annunciation, loss of NAV-equipment or calls from C/A.
Above 70 kts (high speed margin) the T/O should be aborted only for serious malfunctions (red warnings).
Initially the procedures are the same as like for a normal T/O, when CM 2 is PNF/PM, he calls out any severe problem like engine failure, fire,… If **one** of the Crew members calls “STOP”, the CM1 will abort the T/O. If CM 2 is PNF/PM, he should call out the problem rather than calling “STOP”, but only short terms may be used (e.g. “engine fire”,…). After T/O abortion the CM 1 provides further instructions. He shall not forget to order the appropriate Checklist.

Note: The callout ”STOP” is an automatic control change if CM 2 is PF.

Examples for T/O abortion at high speed (>70 kts)
- Thrust loss
- Loss of directional control
- Fire warning
- Obvious incapacitation
- Runway incursion, multiple bird strikes

Phase	CM1	CM2
Initiation	**“STOP”** □ Power lever to beta / reverse □ apply brakes as required □ reverse as required to remain stable	monitor captain’s action and checks for abnormal indications
	□ keeps A/C on runway centerline and maintains max. braking until aircraft has actually stopped	□ monitors abnormal indications and engine instruments □ informs captain about any engine limit exceedance or abnormality
At 60 kts (decelerating)	**“CHECKED”**	**“60 KTS”**
Aircraft stopped	□ Parking brake .....ON □ evaluate the problem □ give orders for further intentions - taxi clear of runway, if safe - on ground emergency (checklist) - or taxi to ramp/GAC, if possible	□ informs ATC: “FLIGHT TRAINING 01D, takeoff abortion, runway 29 blocked” □ if ordered, perform ON GROUND EMERGENCY (even whole checklist including CM 1 items if ordered)

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If insufficient Runway remains for stopping:

ON GND EMERGENCY

(USE QRH)

NOTE:

- *The seat and rudder pedals must be adjusted in order to allow full brake pedal deflection with the rudder in either extreme position by both pilots.*
- *If an engine remains on high power, close respective condition lever immediately.*
- *Use On Ground Emergency checklist for fire or severe structural damage only.*

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02.04 ENGINE FAILURE/FIRE BEFORE V1

04.01 ENGINE FAILURE BEFORE V1

Abort take-off as described before

04.02 ENGINE FIRE BEFORE V1 (Procedure)

Phase	CM1	CM2
A/C has come to a complete stop and engines on fire	Reject the take off as described before **Perform On Ground Emergency Checklist** **"EVACUATE"**	**"Mayday call"** Call ATC for Fire Brigade & Assis-tance
Airplane evacua-tion		Inform ATC about evacuation. Assist evacuation of the cabin

04.03 ENGINE FIRE ON GROUND (taxi)

L ENG FIRE **or** **R ENG FIRE**

1. Aircraft ..... STOP
2. Parking brake ..... SET
3. Fire Extinguisher No 1 / 2 ..... ACTUATE (if required)

When deciding for evacuation:

ON GND EMERGENCY

(USE QRH)

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02.05 ENGINE FAILURE/FIRE AT OR AFTER V_1

The procedure outlined here and in the profile ENGINE FAILURE ON TAKEOFF will provide you with the information necessary to continue a takeoff at or after V_1 has been reached and an engine fails. Crew coordination and attention to the profile will result in a safe takeoff on the remaining engine.

First notice will be the yawing moment caused by the loss of forward thrust in combination with the retarding force of the windmilling propeller.

The PF will concentrate on maintaining speed and aircraft control. The PNF/PM will monitor and assist the PF and is prepared to complete the ordered engine failure checklists as directed by the PF upon reaching the acceleration height and climbing to a safe altitude, or after passing at least 400 ft. AGL in case of uncontrolled fire according to the judgment of the PIC.

Phase	**PF**	**PNF/PM**
Engine Failure at or after V_1	□ rotate to ENG FAIL T/O-Attitude of abt. 7° ANU at approx. 3°/sec □ speed V_2 up to V_{2+15} (max 15° bank) **"Confirmed"**	Call out, e.g. **"V1", "ENGINE FAIL", "ROTATE", "V2"** at appropriate speeds and check Propeller autofeather (Prop RPM gauge). If autofeather system failed call: **"NO AUTOFEATHER"** and simultaneously grab the associated Power / Propeller / Condition lever calling: **"Confirm Propeller Lever No 1 / 2"** Immediately feather Propeller
At positive ROC	□ check positive ROC **""POSITIVE RATE, GEAR UP"**	□ check positive ROC □ selects gear up, when gear up is indicated: **"GEAR IS UP "**

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At acceleration height or briefed acceleration altitude (max. 10 min T/O-power OEI)	□ Accelerate to V_{YSE} □ On acceleration through V_2+15 : **„FLAPS ZERO“** **“SET MAX CONTINOUS POWER”**	□ check speed at/above V2+15kts □ select flaps up; when flaps up is indicated **“FLAPS ARE ZERO”** □ Perform power setting **“ MCP IS SET”**
Continue climb to MSA/MOCA/MORA	Continue Climb with V_{YSE} **“ENGAGE HDG, SELECT HDG xxx“** **“AUTO PILOT ON”**	- Select correct FD modes **“HDG xxx IS ENGAGED”** - Engage auto pilot and call out **„AUTO PILOT IS ON“**
Determine faulty engine and start procedure earliest 400 ft AGL if deemed necessary	**“ENGINE FAILURE NO 1 / 2 CONFIRMED, *P P A A,* PERFORM EMERGENCY CHECKLIST FOR ENGINE FAILURE/FIRE“** □ inform ATC about intentions	□ determine faulty engine **“ENGINE FAILURE NO 1 / 2** □ participate on decision making by use of “P P A A” Complete the **ENGINE FAILURE/FIRE** checklist

Determine the reason for engine failure before attempting any restart. Do not attempt to restart in case of fire or severe engine damage. Maintain 3°-5° bank to operative engine while maintaining a constant heading. Center the ball with use of rudder trim before engaging the autopilot.

Apply the abnormal procedure INFLIGHT ENGINE START only after flame-out and all considerations according PPAA/FORDEC.

NOTES: □ In no case rotate before V_R
□ *If you experience an engine failure during a go-around consider proceeding according* the procedure for engine failure at or after V_1.

ENGINE FAILURE AT OR AFTER V_1

Rotate to an attitude to ~ 7° ANU

T/O 70kts V_1 - Engine failure – V_R - V_2

Engine fail acceleration altitude
- decrease pitch
- min. speed V2+15
- Flaps up
- set MCP
- climb with V_{YSE}
- **PPAA/FORDEC**

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02.06 ENGINE FAILURE DURING CLIMB/CRUISE/DESCENT

Perform: **P P A A**

PF: Order checklist corresponding to problem, e.g.: Engine shutdown in flight, followed by Inflight engine start if advisable.

SINGLE ENGINE CRUISE (DRIFT DOWN)

If the engine failure occurs above the single-engine service ceiling a descent will be required. Set the operating engine to maximum continuous Power (MCP) and descend at drift down speed to the single-engine service ceiling. Maintain the MCP setting until the aircraft accelerates to the single-engine cruise speed, adjust power as necessary.

NOTE
- *Request ATC assistance (Priority, Emergency)*
- *Careful selection of landing airport with suitable weather conditions, RWY length, approach aids, etc. is essential.*

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02.07 APPROACH – ONE ENGINE INOPERATIVE OEI

In case of an engine failure during the approach the decision to continue the approach or to initiate a go-around is always left to the crew's best judgment.

Note: *Engine fire / failure on approach (If you decide to continue the approach - VMC only and when landing is assured) below 1.000 ft AGL no action in the air except for extinguishing an engine fire. But no checklist work below 300-500 ft AAL for monitoring a safe landing. Start checklist after stopping on RWY/TWY.*

ONE ENGINE INOPERATIVE APPROACH

NOTE: Normal Checklist is included

Plan a Flaps 1 landing
Maintain VREF F1+15 KTS minimum on final approach
Landing gear down within gliding distance of landing airport, but above 500 ft AGL

APPROACH

1. ATIS ..... RECEIVED
2. Altimeters ..... SET/COMPARED
3. Fuel Imbalance ..... CHECK
4. Pressurization ..... CHECK
5. OEI Go Around Procedure ..... REVIEW

FINAL

1. Flaps ..... 1 SET
2. Gear ..... DOWN/ 3 GREEN
3. Condition Lever ..... HIGH IDLE
4. Landing Light ..... ON
5. Rudder trim ..... 0 (consider on short final)
6. Propeller Control ..... FULL FORWARD
7. Airspeed ..... V_{APP} +10 KNOTS

Execute Normal Landing.

NOTE
Single-engine reverse may be used with caution after touch down on smooth, dry and paved surfaces.

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ONE-ENGINE-INOPERATIVE GO-AROUND

1. Power ..... Max certified (2.750 for 5")
2. Attitude ..... 5 – 8° ANU
3. Gear (positive rate) ..... UP
4. Speed (Blue line) ..... 121 KTS
5. Flaps ..... ZERO

02.08 EMERGENCY DESCENT

This maneuver is designed to bring the airplane down to a safe altitude in the minimum time. The procedure is intended to be used after an uncontrolled loss of cabin pressurization but can be utilized at any time an emergency descent is warranted.

Complete the emergency descent in accordance with the profile EMERGENCY DESCENT.

If structural integrity is in doubt, limit speed as much as possible, preferably to a speed at or below the existing speed at the time that the problem occurred and avoid high maneuvering loads.

Cabin high altitude warning (rapid/explosiv decompression)

Phase	PF	PNF/PM
Perform emergency descent items by heart	OXYGEN MASK.....ON SPEAKERS.....MASK CREW COMM.....ESTAB if cabin alt is above 14000 ft **"EMERGENCY DESCENT"** ALT PRESEL.....10.000ft or MOCA/MORA POWER LEVER.....IDLE PROP LEVER.....FULL FWD SPEED…….....VMO/MMO TURN 30-45° OFF ATS route or as instructed by ATC	OXYGEN MASK.....ON SPEAKERS.....MASK CREW COMM.....ESTABLISH required CHECKLIST.....PERFORM PAX OXYGEN.....ON LANDING LIGHTS.....ON Emergency Call to ATC.....PERFORM TRANSPONDER.....7700 or as instructed by ATC

NOTE:
If structural damage is suspected:
Reduce speed 180 kts
Below 200 kts Flaps 1
At 181 kts gear down
Descend with 180 kts and maintain

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02.09 WINDSHEAR RECOVERY

A dangerous speed loss below a safe margin can be caused by meteorological reasons, such as thunderstorm, wind shear, mountain wave, downburst or inversion. Also system failures or pilot errors can not be excluded.

The first indication of a low speed condition may be one or any combination of the following:

- Rapid decrease of airspeed below speed bug setting
- Rapid decrease of climb rate during take - off or go-around
- Rapid increase of sink rate during approach
- Initial stall buffet
- Unusual high pitch attitude

It is of vital importance to apply maximum available power. Keep wings level and adjust pitch according to the situation to regain a safe speed (minimize altitude loss). Safe speed has priority.
If the aircraft is approaching stall with AP engaged, the elevator will probably be trimmed to an extreme Aircraft Nose Up - Attitude. Be aware of this possible condition when switching off the AP.
In an emergency situation, positive climb performance and maneuver margins still exist at or near stall warning speed.
Pitch should never be increased so rapidly that speed decreases below onset of the stall warning.
 Do not change configuration (flaps, gear) until well clear of ground.
(Aircraft in take-off, approach or go-around configuration)

Phase	PF	PNF/PM
At first indication of stall (stick shaker)	**"WINDSHEAR, MAX POWER"** advance propeller levers, than power levers to approximate max Power rotate to ~12° - fly at V_2	 adjust levers for max power Announce **"MAX POWER SET"**
Up to safe altitude or 1500 ft AGL and positive out of wind shear	lower the nose and accelerate, continue with normal acceleration or go around procedure	

NOTE:
Maximum power means "maximum certified power". Over boost should only be considered during emergency situations when all other available actions have been taken and terrain contact is imminent, as last possibility to avoid a crash.

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02.10 GROUND PROXIMITY WARNING

(SYSTEM NOT YET INSTALLED)

In VMC: take appropriate action to correct the condition or initiate a go around!
In IMC:

- Whenever the "TERRAIN, TERRAIN", "DON'T SINK", "TOO LOW-FLAP", "TOO LOW-GEAR", "GLIDE SLOPE" or "SINK RATE" aural announcements are heard, take appropriate action to correct the unsafe condition.
- Whenever the "TOO LOW-TERRAIN" or "WHOOP WHOOP PULL UP" announcements are heard, establish the power setting and attitude which will produce the maximum climb gradient consistent with the aircraft configuration.

PF	PNF/PM
□ Disconnect auto pilot □ Aggressively apply maximum power. □ Call "PULL UP - Power". □ Roll wings level and rotate to an initial pitch of about 7-10°. ***NOTE:*** *If a turn is required according procedure in use, make sure the turn is completed.* □ Monitor radio altimeter for sustained or increasing terrain clearance. □ Do not change configuration (gear or flap) until terrain clearance is assured □ If terrain remains a threat, continue rotation up to stick shaker or initial buffet. □ Consider gear/flaps retraction for climb improvement with due regard to speed and the fact that no acceleration is possible. □ When clear of the terrain, slowly decrease pitch attitude and accelerate.	□ Assure maximum***** power □ Verify all required actions have been completed and call out any omissions. □ Call out any trend towards the terrain. ***NOTE ****Maximum power means "maximum certified power". Overboost or "firewalling the power levers" should only be considered during emergency situations when all other available actions have been taken and terrain contact is imminent.*

NOTE:

☞In certain circumstances the warning provided by the GPWS may be very late. Recovery action, therefore, should be both prompt and positive.

☞Notice the difference between "TERRAIN TERRAIN" and "TOO LOW - TERRAIN" and take the appropriate actions.

☞Do not use Flight Director command indication.

☞Aft control column force increases as the airspeed decreases. In all cases, the pitch attitude that results in (intermittent stick shaker or) initial buffet is the upper pitch limit. (Flight at intermittent stick shaker may be required to obtain positive terrain clearance). Smooth, steady control inputs will avoid a maximum pitch attitude overshoot resulting in a stall.

☞With standard technology GPWS the warning period is no more than 5 - 10 seconds till impact unless the warning is a false warning and can be confirmed as such.

☞EGPWS provides terrain awareness and therefore more time to react or avoid.

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02.11 TCAS

(SYSTEM NOT YET INSTALLED

In case of interest in this system, information will be provided during ground training, on request.

02.12 RECOVERY FROM UNUSUAL ATTITUDES

> 30° ANU unintentional, and /or
> 10° AND unintentional, and /or
> 45 ° bank, unintentional

Steep bank and/or nose high:

Start recovery with nose down and increase power, passing 0° ANU on attitude indicator level the wings and keep the altitude loss to a minimum, however, obtaining a safe speed is crucial.

Steep bank and/or nose low:

First level the wings and reduce power if required, than pull up to keep the altitude loss to a minimum and reduce to cruise speed or as appropriate. Consider using the speed brakes during recovery, to avoid overspeed.

SPINS

If a *spin is entered inadvertently:*
Immediately move the control column full forward, apply full rudder opposite to the direction of the spin, and reduce power on both engines to idle. These three actions should be done as nearly simultaneously as possible; then continue to hold this control position until rotation stops and then neutralize all controls and execute a smooth pullout. Ailerons should be neutral during recovery.

NOTE
US Federal Aviation Administration Regulations do not require spin demonstration of airplanes of this weight; therefore no spin tests have been conducted. The recovery technique is based on the best available information.

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02.13 ABNORMAL APPROACH AND LANDING

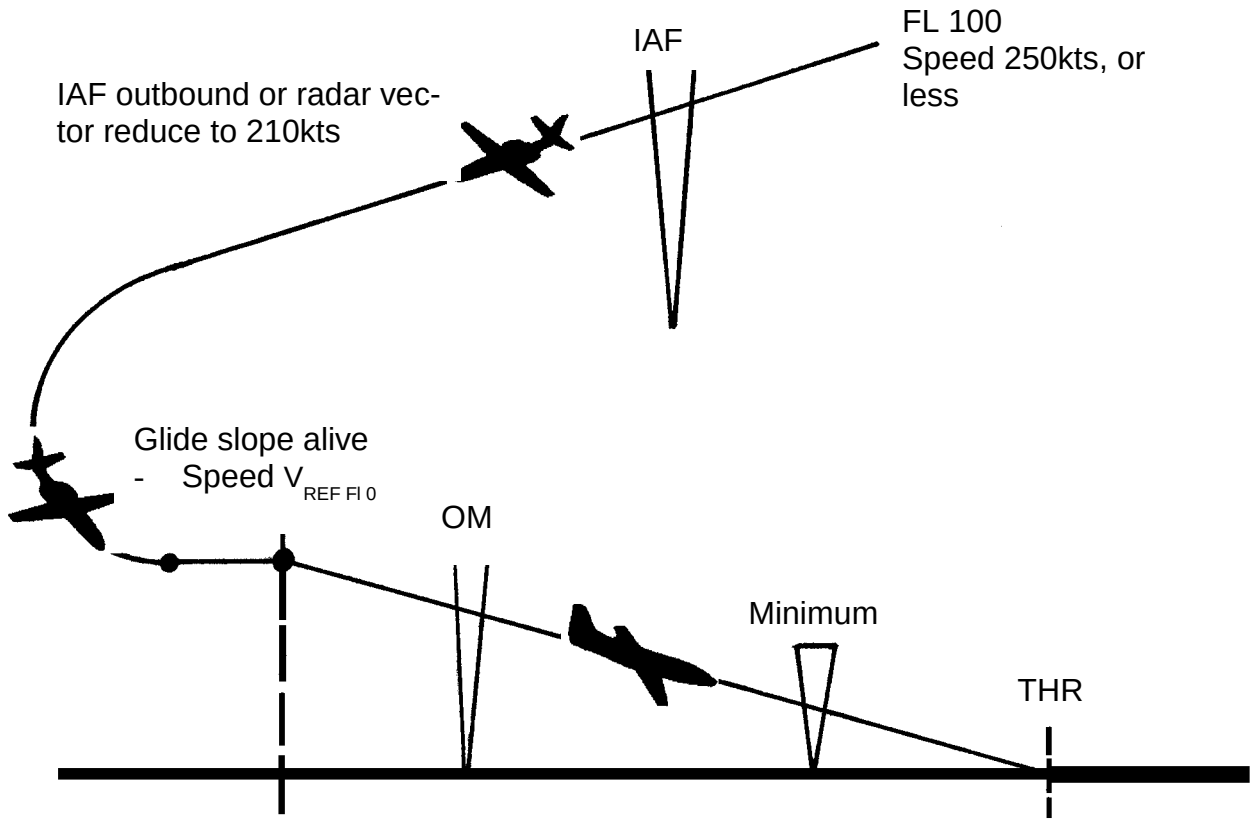
13.01 ABNORMAL LANDING

For any abnormal landings, do not hurry with procedures or checklist action, land at a suitable airport if possible. Advice ATC of your specific situation and ask for ground assistance if necessary.

13.02 FLAPS ZERO LANDING

When planning a no flaps landing, the landing weight of the aircraft must be considered. An attempt should be made to reduce this weight if possible, especially if runway length is marginal due to higher approach and landing speeds required for a no flaps configuration.

Compute the normal V_{REF} and add 15 kts. Set the speed bug on the new „$V_{REF\ Fl\ 0}$“ , fly the final approach at the adjusted $V_{REF\ Fl\ 0\ +\ 10\ kts}$ and reduce to the adjusted V_{REF} prior crossing the threshold.



Note: To preclude excessive float during landing, allow the airplane to touch down in a slightly flatter attitude than on a normal landing.

Use chart provided within performance section for speed and landing distance

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02.14 ON GROUND EMERGENCY

If the **CM 1** decides to evacuate the aircraft, he commands “EVACUATE – EVACUATE”.
Thereafter he continues with the On Ground Emergency Checklist, coordinates the evacuation from inside and makes sure before leaving the aircraft that nobody is left on board.
The **CM 2** is released to help evacuating the passengers immediately after informing ATC. Moving the passengers at least 150 m away from the aircraft into the wind by making clear signals and giving firm orders.

ON GND EMERGENCY

(USE QRH)

02.22 AUTO FLIGHT

22.01 FD fail see AP fail

22.02 AP fail

AP do not use
Check TRIM available
Try switching on electrical trim system
If successful, try switching on FD/AP

02.23 COMMUNICATION

No EMERGENCY/ABNORMAL Procedure available

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02.24 ELECTRIC SYSTEM MALFUNCTIONS

24.01 INVERTER INOPERATIVE INVERTER

1. Inverter switch ..... 2 / 1 (as appropriate)

24.02 GENERATOR INOPERATIVE (DC GEN Annunciator ON)

1. Loadmeter — **Verify no load**
2. Generator Switch — **OFF/RESET**

If unsuccessful:
3. Generator Switch — **OFF**
4. Operating Generator — **MAX LOAD 1.0 to FL 310**

EXCESSIVE LOADMETER INDICATION (OVER*1.0)*

1. Battery Switch — **OFF**

If loadmeter still indicates above 1.0:
2. Nonessential Electrical Equipment — **OFF**

If loadmeter indicates 1.0 or below:
3. Battery Switch — **ON**

CIRCUIT BREAKER TRIPPED
1. Nonessential Circuit — **DO NOT RESET IN FLIGHT**
2. Essential Circuit:
- **a. Circuit Breaker** — **PUSH TO RESET**
- **b. If Circuit Breaker Trips Again** — **DO NOT RESET**

24.0 BOTH GENERATORS INOPERATIVE

1. Battery Switch — **check ON**
2. Generator Switches — **OFF/RESET once at a time**

If unsuccessful:
3. Generator Switch — **OFF**
4. Nonessential Electrical Equipment — **OFF**

LAND ASAP!

Battery will last around 30 minutes, at minimum power consumption

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02.26 FIRE PROTECTION

Attempt to identify the source of smoke or fumes. Smoke associated with electrical failures is usually gray or tan in colour, and irritating to the nose and eyes. Smoke produced by environmental system failures is generally white in colour, and much less irritating to the nose and eyes. If smoke is prevalent in the cabin, cabin oxygen masks should not be intentionally deployed. If masks are automatically deployed due to an increase in cabin altitude, passengers should be instructed not to use them unless the cabin altitude exceeds 15,000 feet.

Dissipation of smoke is not sufficient evidence that a fire has been extinguished. If it cannot be visually confirmed that no fire exists, land at the nearest suitable airport. Opening a storm window (after depressurizing) will facilitate smoke/fume removal.

26.01 ELECTRICAL SMOKE OR FIRE

1. Oxygen — USE
2. Cabin Temp Mode — OFF
3. Avionics Master — OFF
4. Nonessential Electrical Equipment — OFF

If Fire or Smoke *Ceases:*
5. Individually restore avionics and equipment previously turned off.
6. Isolate defective equipment.

If Smoke *Persists:*
7. Cabin Pressure Switch — DUMP

26.02 ENVIRONMENTAL SYSTEM SMOKE OR FUMES

1. Oxygen — USE
2. Cabin Temp Mode — OFF
3. Vent Blower — HI
4. Left Bleed Air Valve — ENVIR OFF

If Smoke d*ecreases:*
5. Continue operation with left bleed air off.

If Smoke d*oes not decrease:*

5. Left Bleed Air Valve - OPEN
6. Right Bleed Air Valve - ENVIR OFF
7. If Smoke decreases, continue operation with right bleed air off.

NOTE: Each bleed air valve must remain closed long enough to allow time for smoke purging to positively identify the smoke source.

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02.27 FLIGHT CONTROLS

27.01 UNSCHEDULED ELECTRIC ELEVATOR TRIM

1. Airplane Attitude	MAINTAIN
2. Control Wheel Trim Switch	DEPRESS TO TURNOFF TRIM
3. Retrim Airplane	MANUAL
4. ELEV TRIM Switch	OFF

DO NOT reactivate electric trim system until cause of malfunction has been determined.

27.02 UNSCHEDULED RUDDER BOOST ACTIVATION

System is not implemented

02.28 FUEL SYSTEM

28.01 CROSSFEED (ONE-ENGINE-INOPERATIVE OPERATION)

1. Standby Boost Pumps (feeded side) ..... ON
2. Crossfeed Flow Switch- LEFT/RIGHT ..... CHECK
   a. FUEL CROSSFEED Annunciator ..... ON
   b. Both FUEL PRESS Annunciators ..... OUT

TO DISCONTINUE CROSSFEED:

3. Crossfeed Flow Switch ..... OFF

28.02 ENGINE DRIVEN BOOST PUMP FAILURE

1. Standby Boost Pump (Failed Side) ..... ON
2. FUEL PRESS Annunciator ..... OFF

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02.30 ICE AND RAIN PROTECTION

30.01 PILOT'S ALTERNATE STATIC AIR SOURCE

THE PILOT'S ALTERNATE STATIC AIR SOURCE SHOULD BE USED FOR CONDITIONS WHERE THE NORMAL STATIC SOURCE HAS BEEN OBSTRUCTED. When the airplane has been exposed to moisture and/or icing conditions (especially on the ground), the possibility of obstructed static ports should be considered.
Partial obstructions will result in the rate of climb indication being sluggish during a climb or descent.
Verification of suspected obstruction is possible by switching to the alternate system and noting a sudden sustained change in rate of climb. This may be accompanied by abnormal indicated airspeed and altitude changes beyond normal calibrated differences.

Whenever any obstruction exists in the Normal Static Air System, or when the Alternate Static Air System is desired for use:

1. Pilot's Static Air Source (right side panel) ..... ALTERNATE
   a. For Airspeed Calibration and Altimeter Correction, refer to the PERFORMANCE Section.

NOTE
Be certain the static air valve is in the NORMAL position when the alternate system is not needed.

30.02 ELECTROTHERMAL PROPELLER.DEICE (MANUAL SYSTEM)

1. To use manual system, hold manual propeller deice switch in MANUAL position for approximately 90 seconds, or until ice is dislodged from blades.

2. Monitor manual system current requirement with the airplane's loadmeters when the manual deice switch is in the MANUAL position. A small needle deflection (approximately 5%) indicates the system is functioning.

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30.03 PROCEDURES FOR EXITING THE SEVERE ICING ENVIRONMENT:

These procedures are applicable to all flight phases from takeoff to landing. Monitor the ambient air temperature.
While severe icing may form at temperatures as cold as -18 degrees Celsius, increased vigilance is warranted at temperatures around freezing with visible moisture present. If the visual cues specified in the Limitations Section for identifying severe icing conditions are observed, accomplish the following:

1. Immediately request priority handling from Air Traffic Control to facilitate a route or an altitude change to exit the severe icing conditions in order to avoid extended exposure to flight conditions more severe than those for which the airplane has been certificated.
2. If the autopilot is engaged, hold the control wheel firmly and disengage the autopilot.
3. If an unusual roll response or un-commanded roll control movement is observed, reduce the angle-of attack.
4. Do not extend flaps during extended operation in icing conditions. Operation with flaps extended can result in a reduced wing angle-of-attack with the possibility of ice forming on the upper surface further aft on the wing than normal, possibly aft of the protected area.
5. If the flaps are extended, do not retract them until the airframe is clear of ice.
6. Report these weather conditions to Air Traffic Control.

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02.31 INDICATING & RECORDING (IRS)

Warning annunciator panel:

L ENG FIRE	INVERTER	----------	ALT WARN	R ENG FIRE
L FL PRESS	---------	----------	----------	R FL PRESS
L OIL PRESS	L GEN OVHT	----------	R GEN OVHT	R OIL PRESS
----------	L BL AIR FL	----------	R BL AIR FL	----------

Caution and Advisory annunciator panel:

L DC GEN	----------	PROP SYNC ON	----------	----------	R DC GEN
----------	----------	----------	----------	----------	
L ICE VANE	----------	BATTERY CHARGE	EXT PWR	----------	R ICE VANE
----------	----------	ELEC TRIM OFF	----------	----------	----------
L ICE VANE EXT	----------	LDG TAXI LIGHT	PASS OXY ON	----------	R ICE VANE EXT
L IGNITION ON	L BL AIR OFF	----------	FUEL X-FEED	R BL AIR OFF	R IGNITION ON

02.32 Landing gear

LANDING GEAR MANUAL EXTENSION

1. Landing Gear Relay Circuit Breaker ..... **PULL**
2. Landing Gear Switch ..... **DOWN**
3. Extension Lever Securing Clip ..... **PULL OPEN**
4. Extension Lever ..... **PUMP till 3 GREEN**

WARNING
After a manual (emergency) landing gear extension has been made, do not move any landing gear controls, or reset any switches or circuit breakers until the airplane is on jacks, since the failure may be in the gear-up circuit and the gear might retract on the ground.

NOTE
Ensure the extension lever is in the full down position prior to placing the pump handle back in the securing clip.

02.33 LIGHTS

No EMERGENCY/ABNORMAL Procedure available

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02.34 NAVIGATION

NO EMERGENCY/ABNORMAL Procedure available yet, use common sense for mode failures

02.35 OXYGEN

LOSS* OF *PRESSURIZATION

1. Oxygen (crew and passengers) - AS REQUIRED
2. Descend - AS REQUIRED

NOTE
The following table sets forth the average time of useful consciousness (time from onset of hypoxia until loss of effective performance) at various altitudes.

35,000 feet	1/2 to 1 minute, thereafter it is a lethal experience
30,000 feet	1 to 2 minutes, -"-
28,000 feet	2 1/2 to 3 minutes, -"-
25,000 feet	3 to 5 minutes, -"-
22,000 feet	5 to 10 minutes, blood saturation down to 66%
18,000 feet	20 - 30 minutes, blood saturation down to 71%

A blood saturation level of 93% oxygen is considered to be the lower limit for normal functioning body. At ISA it is about 97%

AUTO-DEPLOYMENT OXYGEN SYSTEM

1. In the event the PASS OXY ON annunciator does not illuminate following illumination of the ALT WARN annunciator, pull PASSENGER MANUAL O'RIDE valve to deploy passenger masks. First aid masks are provided manually.

2. If oxygen quantity is insufficient to sustain both passengers and crew, the supply can be isolated to the crew and First Aid outlets by pulling the OXYGEN CONTROL circuit breaker located in the environmental selection of the circuit breaker panel.
PASSENGER MANUAL O'RIDE must be in the OFF position.

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02.36 BLEED AIR SYSTEM MALFUNCTIONS

36.01 PRESSURIZATION SYSTEM

Anytime the differential pressure indicates in the Red Arc:

1. Cabin Altitude Controller ..... HIGHER SETTING

If condition persists:
2. Oxygen (crew and passengers) ..... AS REQUIRED
3. Bleed Air Valves ..... ENVIR OFF
4. Cabin Pressure Switch ..... DUMP (after cabin is depressurized)
5. Descend ..... AS REQUIRED
6. Bleed Air Valves ..... OPEN

36.02 BLEED AIR - LINE FAILURE WARNING SYSTEM

Warning annunciators should be monitored during engine start procedure. Either engine will extinguish both annunciators upon starting.
Illumination of a warning annunciator in flight indicates a possible rupture of a bleed air line aft of the engine firewall.

1. Bleed Air Valve (affected engine) ..... INSTR & ENVIR OFF
2. Engine Instruments ..... MONITOR

NOTE
The bleed air warning annunciator will not extinguish after closing the Bleed Air Valve.

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02.52 DOORS

52.01 ILLUMINATION OF CABIN DOOR WARNING ANNUNCIATOR

WARNING
Do not attempt to check the security of the airstair door in flight. Remain as far from the door as possible with seatbelts securely fastened until the airplane has landed.
The airstair door locking mechanism must be in the over-centered position (indicated by positioning of safety arm around the diaphragm plunger) in order to provide complete positive locking of the airstair door.

If cabin is pressurized and door is not completely locked, any movement of the door handle toward the unlocked position may cause rapid, complete unlocking and opening of the door.

1. If the red CABIN DOOR warning annunciator illuminates, depressurize cabin (consider altitude first) by activating cabin pressurization dump switch on pedestal.
2. Do not attempt to check the airstair door for security until the cabin is depressurized and the airplane is on the ground.
3. Check security of the airstair door (on the ground)by lifting airstair door step and checking position of arm and plunger. If unlocked position of arm is indicated, turn door handle toward locked position until arm and plunger are in position.

52.02 EMERGENCY EXIT

- Emergency Exit Handle - PULL (This is a plug-type door and opens into the cabin.)

The outside handle may be locked from the inside with the EXIT LOCK lever. The inside EXIT-PULL handle will unlatch the door regardless of the position of the EXIT LOCK lever. Before flight, make certain the lock lever is in the unlocked position.

02.56 WINDOWS

56.01 CRACK IN ANY SIDE WINDOW OR IN WINDSHIELD

If it has been determined that a crack has developed in any side window or windshield:
1. Altitude- Maintain25,000 Ft or less
2. Pressurization Controller-Reset to maintain 4.0 PSI or less as required.

Prior to next flight, maintenance actions are required. Refer to the Airworthiness Limitations in Chapter 4 of the Maintenance Manual.

NOTES (WINDSHIELD)
A. Visibility through the windshield may be significantly impaired.
B. Windshield wipers may be damaged if used on cracked surface.
C. Heating elements may be inoperative in the area of the crack.

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02.70 ENGINE MALFUNCTIONS (other than 02.80)

70.01 ENGINE SHUT DOWN IN FLIGHT

The abnormal procedure ENGINE SHUT DOWN IN FLIGHT will be used when the crew decides that an engine needs to be shut down. This decision can only be made after the specific situation has been evaluated, which means no time critical situation can predominate. (Examples for such situations may be: oil pressure too low, engine roughness.) This Procedure will be used even a RESTORE POWER PROCEDURE before was not successful.

In the *Multi Crew Concept* the A&E-list requested by the PF will be processed by the PNF/PM following the Read-and-Do method.

Apply Abnormal Procedure: ONE ENGINE INOPERATIVE LANDING

REASONS FOR ENGINE SHUTDOWN
- *UNSCHEDULED ENGINE TORQUE INCREASE - (Ground or Flight)*
(Not Responsive to *Power Lever Movement)*
-ENGINE FIRE IN FLIGHT
- *ENGINE FAILURE IN FLIGHT*

1. Condition Lever ..... CUT-OFF
2. Propeller Lever ..... FEATHER
3. Fire Extinguisher ..... ACTUATE (if required)
4. Engine Auto Ignition ..... OFF
7. Generator ..... OFF
8. Propeller Synchrophaser ..... OFF
9. Electrical Load ..... MONITOR

70.02 ENGINE FAILURE AT/AFTER V1

Use 02.05 Engine failure/fire at or after V1

70.03 ENGINE FAILURE IN FLIGHT BELOW AIR MINIMUM CONTROL SPEED (VMCA)

1. Reduce power on operative engine as required to maintain control.
2. Lower nose to accelerate above VMCA.
3. Adjust power as required.
4. Secure affected engine as in ENGINE SHUTDOWN IN FLIGHT

70.04 ENGINE FLAMEOUT (2nd Engine)

1. Power Lever ..... IDLE
2. Propeller ..... DO NOT FEATHER
3. Condition Lever ..... CUT-OFF
4. Inflight Engine Start Procedure ..... Perform

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70.05 ENGINE START INFLIGHT

IF FLIGHT CONDITIONS DO NOT PERMIT THE TEMPORARY LOSS OF ATTITUDE REFERENCE, CONDUCT AIRSTART USING THE NO STARTER ASSIST PROCEDURES.

The pilot should determine the reason for engine failure before attempting an air start. Do not attempt an air start if N1 indicates zero.
Above 20,000 feet, starts tend to be hotter. During engine acceleration to idle speed, it may become necessary to move the condition lever periodically to CUT-OFF in order to avoid an over temperature condition.

NOTE
The propeller will not un-feather without engine operating.

05.01 NO STARTER ASSIST (PROPELLER FEATHERED OR WINDMILLING)

1. Power Lever ..... IDLE
2. Propeller Lever ..... FULL FORWARD
3. Condition Lever ..... CUT-OFF
4. Firewall Fuel Valve ..... OPEN
5. Generator (inoperative engine) ..... OFF
6. Airspeed ..... 140 KNOTS MINIMUM
7. Altitude ..... BELOW 20,000 FEET
8. Eng Auto Ignition ..... ARM
9. Condition Lever ..... LOW IDLE
10. Power ..... AS REQUIRED (after ITT has peaked)
11. Generator ..... ON
12. Electrical Equipment ..... AS REQUIRED

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05.02 STARTER ASSIST

Standby Attitude and Air Data displays must be monitored during STARTER ASSIST air starts.

1. Power Lever ..... IDLE
2. Condition Lever ..... CUT-OFF

NOTE
If conditions permit, retard operative engine ITT to 700°C or less to reduce the possibility of exceeding ITT limit. Reduce electrical load to minimum consistent with flight conditions.

3. Ignition and Start Switch ..... ON
4. IGNITION annunciator ..... ON (check)
5. Condition Lever ..... LOW IDLE
6. Ignition and Start Switch ..... OFF (N1 above 50%)
7. Propeller Lever ..... AS REQUIRED
8. Power Lever ..... AS REQUIRED
9. Generator ..... ON
10. Electrical Equipment ..... AS REQUIRED

70.06 GLIDE

Determine that procedures for re-starting first and second failed engines are ineffective before feathering second engine propeller.

1. Gear ..... UP
2. Flaps ..... ZERO
3. Propeller ..... FEATHER
4. Speed ..... 135 KIAS

Note: In zero wind condition, the gliding capability is about 2 NM per 1.000 ft of altitude. Any HW/TW will account for minus/plus 0,2 NM per 10 kts HW/TW.

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02.79 Oil system

79.01 LOW OIL PRESSURE **L OIL PRESS** **or** **R OIL PRESS**

1. Oil pressure ..... 60 - 85 psi (undesirable)
2. Power setting ..... not exceeding 1100 ft-lbs torque.

To be tolerated only for the completion of the flight.

1. Oil pressure ..... < 60 psi (unsafe)
2. Engine ..... Shut down or minimum power required for immediate landing

79.02 HIGH OIL TEMPERATURE

Oil temperature ..... 80 – 99° C
Engine parameters ..... check for abnormalities

Oil temperature ..... > 99° C
Throttle 1 / 2 ..... retard
Oil temperature above 99° C ..... max. 5 min

CHIP DETECT LIGHT **L CHIP DET** or **R CHIP DET**

System not implemented

02.80 ENGINE START MALFUNCTIONS

80.01 No ignition:

Recognition: IGNITION ON light missing when start switch is selected ON

Action: Start switch to OFF, call Maintenance after checking C/Bs

80.02 No N 1 indication:

Recognition: No rise of N 1 after IGNITION ON annunciation

Action: Start switch to OFF, call Maintenance

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80.03 No start:

Recognition: No ITT rise after condition lever set to low idle

Action: Condition lever to FUEL CUT OFF
Start switch to STARTER ONLY
Time check 60 sec (dry motoring, fuel clearing)
Start switch to OFF
Consider new start attempt or ABORTED ENGINE START CHECKLIST
Call for maintenance if desired

80.04 Hot start:

Recognition: Fast increase in ITT (i.e. ITT faster than N 1 increase)

Action: At ~900° C condition lever to FUEL CUT OFF
Start switch to STARTER ONLY
Time check 60 sec (dry motoring, fuel clearing)
Start switch to OFF
Consider new start attempt or ABORTED ENGINE START CHECKLIST
Call for maintenance if desired

80.05 Hung start:

Recognition: No or almost no increase in N 1/ N 2, idle values not to be reached

Action: Condition lever to FUEL CUT OFF
Start switch to STARTER ONLY
Time check 60 sec (dry motoring, fuel clearing)
Start switch to OFF
Consider new start attempt
Call for maintenance if desired

- End of Chapter -

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