

In accordance with IMTAR – 21, Subpart P, 21.P.10

Note : Form 100 is a generic format for FCC. Applicable information from Form 100A & Form 100B for Aircraft and Helicopters respectively may also be supplemented to Form 100. FCC form is meant to serve as guidelines and can be adapted to suit the nature of the air system, emphasizing on the necessary information, that affects safety of flying.

FLIGHT CLEARANCE CERTIFICATE FOR

DEVELOPMENT TRIALS

Air System type : _____

Engine Type : _____

This is to certify that	is cleared for development flight trials within the conditions of
release and limitations specified in the following pages of	this document.

This certificate will be periodically amended depending on the changes to the standard of preparation of the Air System and flight test data obtained.

This certificate does not constitute any authority to fly unless accompanied by an individual or block Flight Program Clearance Memo (FPCM), as applicable, duly coordinated by CEMILAC & Airworthiness Group of Design Agency and a current certificate of safety for flight form 1090 coordinated by RDAQA (______).

Head of Design ()	
Design agency	CEMILAC
Date :	Date :
REF: CEMILAC/FCC/	
ISSUE: NIL	
DATED:	
X	
Version : 2.0	Date: August 2023



The incorporation of each amendment to this document is to be certified by entering below the amendment number, date and signature of the person responsible.

Amendment & Date	Document Number	Signature	Date

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1. INTRODUCTION

The systems are described briefly in the following paragraphs.

1.1 OBJECTIVE

The objective of the flight trials are:

- a. To assess the performance / behavior of the Air System and its systems, compare the same with analysis / Tests carried out.
- b. To validate the aero-data.
- c. To calibrate aero-data, systems and flow direction sensors.
- d. Others

2. STANDARD OF PREPARATION (SOP) OF AIR SYSTEM

The SOP of the Air System includes Equipment SOP and Drawing Applicability

2.1 EQUIPMENT SOP

 The Equipment Standard of Preparation for _______flight trials is given in document titled ______

 Issue: ________dated: _______, which is kept current by updating whenever any changes occurs

2.2 DRAWING APPLICABILITY

The drawing applicability for ______ is given in Ref. No. ______, Issue: Nil, Amd: dated ______ which is kept current by updating at regular intervals.

3. BASIS FOR CLEARANCE

The basis for clearance of ______ includes LRU level and System Level clearances and certificate of designs.

3.1 LRU LEVEL

The clearances of all LRUs are available in the document _____ Issue: Nil, Amd: Nil dated: ______ which lists out flight clearances of all LRUs by various RCMAs.

3.2 SYSTEM LEVEL

Each system clearance includes technical specification, design reports, failure modes and effects analyses, test schedules and associated reports, Air System level test schedules and test reports.

Sl. No.	System	No. of Reports	Certificate of Design Documents Reference
1	Aerodynamics Configuration		
2	Structures & Analysis		
3	Environmental Control System		
4	Life Support System		
5	Hydraulics		
6	Landing Gear& Brake System		
7	Escape System		
8	Flight Control System		
9	Power plant & Fuel System		
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10	Electrical Power Generation System	
11	Lighting System	
12	Avionics system (Including , Navigation & Communication)	
13	Engine	

4. **OPERATIONAL LIMITATIONS**

4.1 AIR FIELD OPERATIONS

4.1.1. Taxying Limitations:

• Speed not more than xx knot if canopy is partially open.

4.1.2. Emergency arrester system

• Cleared for emergency entry into arrester barrier system at speeds up to

Ground Speed	xx knot
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4.2 TAXY, TAKE-OFF AND LANDING LIMITATIONS – TYRES, WHEEL BRAKES

4.2.1. The tyres are cleared for rolling at the following ground speeds

Tyre ground speed limits (Knot)		
Main	Nose	
XXX	XXX	

4.2.2. Brake application speed limit:

Air System Configuration	Mass (kg)	Condition	Speed in TAS (knot)
Clean Configuration	VVV	Normal (xx MJ per Air System)	XX
Clean Conliguration	XXX	Emergency / RTO (xx MJ per Air System)	XX

4.3 <u>TAXY, TAKE-OFF AND LANDING LIMITATIONS - AIR SYSTEM WEIGHT AND CENTRE OF</u> <u>GRAVITY LIMITS</u>

4.3.1. Take-off weight limitations :

• Maximum take-off weight is xxx Kg.

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4.3.2. Landing weight Vs Sink rate :

Air System Configuration	Max Landing Mass (Kg)	Max Sink rate (m/sec)
Clean Configuration	XXX	XXX

4.3.3. Cross winds during landing and take-off :

Air System is cleared to operate within the following crosswind limitations.

Runway condition		Cross wind Speed (Knots)
Duri	Take off	XX
Dry	Landing	XX
Fl	ooded	Not Cleared

4.3.4. Centre of gravity limits before Take-off:

Allowable centre of gravity range is **xx% to xx% MAC** for the following pilot weight configuration. **Solo Pilot Configuration:**

- Front cockpit: xxx Kg to xxx Kg
- Rear cockpit: Nil

Two pilot Configuration:

- Front cockpit: **xxx** Kg to **xx** Kg
- Rear cockpit: xx Kg to **xx** Kg

4.4 ENGINE OPERATING LIMITATIONS:

The xxxx engine is cleared for operation subjected to following Limitations:

4.4.1. Operating conditions:

Maximum absolute flying altitude, ft	XXX
Maximum air starting altitude, ft	XXX
Maximum indicated airspeed, Mach	XX
Maximum ambient temperature at sea level, °C	XX
Minimum Ambient temperature range for ground starting, $^{\circ}C$	XXX
Minimum oil temperature range for air starting, °C	XX

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4.4.2. Operating Limits on Engine Parameters and Actions:

Sl. No.	Parameters	Normal range	Action if exceed the limit
1	Torque		
2	Rotor speed		
3	EGT During Start		
4	Fuel Flow		
4	Fuel Flow		
5	Oil Pressure		
6	Oil Temperature		
7	Starting Time		

4.4.3. Wind Milling Limit:

Wind Milling Rpm	Operating Limits	Action If Exceeded
28 to 100 %		
18 to 28 %		
10 to 18 %		
5 to 10 %		
0 to 5 %		

4.4.4. Warnings and cautions:

4.4.5. Conditions of release:

This clearance is contingent upon the following:

- This clearance is valid for xxxx hours of flight (inclusive of Ground run, LSTT, HSTT)
- All the maintenance / installation procedures are to be followed as stipulated in the respective OEM manuals.
- This clearance stands invalid if any changes are made from the present Configuration / SOP for the flight tests without the concurrence of CEMILAC (______).

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4.4.6. Technical parameters:

Terre	
Туре	
Compressor	
Turbine	
Direction of rotation	
SHP	
Max Torque	
100 % rpm of Ng	
Specific Fuel Consumption, kg / (hr.kgf)	
Prop rpm	
Max allowable Exhaust Temp during starting	
Bleed Extraction	
OIL SYS	ГЕМ
Туре	
Oil specification	
Oil tank capacity, quartz	
Oil consumption rate, gallon / hour	
Oil pressure in pressure line, psi	
Inverted flying, sec	
Fuel Specification	

ENGINE FLIGHT ENVELOPE

Mach No. Vs Altitude & CAS

4.5 GENERAL FLIGHT LIMITATIONS

4.5.1. Speed limitations:

Flight speed limitation (Level Flight) (CAS in knot)

Minimum groad (least) Company and a to	Clean configuration (Flap Level)	XX
xx° AOA for xx Kg AUW	Take-off & Landing configuration (30 deg Flap)	xx
Max speed / Mach with UC up		XXX
Max speed with UC down and locked		XX

Note: 1'g' stall speeds at Sea level (CAS in knot) for various Air System configuration and AUW are as follows:

Clean configuration	:	xx Knots
With UC and Takeoff flap	:	xx Knots

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Take off speed limitations (CAS in knot):

Recommended take off rotation speed with deg Flap	XX
Unstick speed with max power	XX
Decision speed for RTO	XX

Approach speed limitations (CAS in knot):

Mass (kg)	Approach speed	
XXX	XX	

4.5.2. Altitude limitations

Maximum pressure altitude with U/C up	xxx ft
Maximum pressure altitude with U/C down	xxxx ft

4.5.3. AOA Limitations

AOA range for Wings-level operations	Max	Min
As indicated on PFD	vv ⁰	vv ⁰
• xx ^o (Never Exceed)	XX*	~~~
AOA range for maneuvering operations	0	9
• As indicated on PFD	XX	XX

4.5.4. Fuselage scrape attitude:

• With Oleo collapsed and Tyres flat = xxx deg.

4.5.5. Side slip limitations:

Maximum side slip with U/C up	xx deg
Maximum side slip with U/C down	xx deg

4.5.6. Maneuver limitations:

Maneuver limits are permitted within the following:

Inverted flying	xx sec max
360 deg roll (Recommended)	Left and Right

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4.5.7. Normal Acceleration limitation:

Normal Acceleration limitation for various Air System AUW weight.		xxx Kg
LIC	Minimum permitted	xx g
OC up	Max permitted	xx g
UC down	Minimum permitted	xx g
	Max permitted	xx g

4.5.8. Roll rate limitation:

Maximum Roll rate with U/C up	xxx deg/sec
Maximum Roll rate with U/C down	xxx deg/sec

4.5.9. Roll acceleration limit:

Maximum Roll acceleration with U/C up	xx rad/sec ²
Maximum Roll acceleration with U/C down	xx rad/sec ²

4.5.10. Yaw rate limitation:

Maximum Yaw rate permitted with U/C up	xx rad/sec ²
Maximum Yaw rate permitted with U/C down	xx rad/sec ²

4.5.11. Yaw acceleration limits:

Maximum Yaw acceleration permitted with U/C up	xx rad/ sec ²
Maximum Yaw acceleration permitted with U/C down	xx rad/ sec ²

4.5.12. Pitch acceleration limits

Maximum Pitch acceleration permitted with U/C up	xx deg/sec ²
Maximum Pitch acceleration permitted with U/C down	xx deg/sec ²

4.5.13. Stalling and spinning:

• Air System is not cleared for intentional stalling and spinning.

4.5.14. Weather related limitations:

• The Air System is cleared to fly in fair weather and day light conditions only.

The minimum visibility shall be xx km for demonstration flights

4.6 OTHER SYSTEM LIMITATIONS

4.6.1. AERODYNAMICS

• Angle of Attack limitation for the first block of flights are ______ and Angle of side slip limitations are.

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FLIGHT CLEARANCE CERTIFICATE
FOR AIR SYSTEM

- 4.6.2. STRUCTURE AND ANALYSIS
- 4.6.3. ENVIRONMENTAL CONTROL SYSTEM (ECS)
- 4.6.4. LIFE SUPPORT SYSTEM (LSS)
- 4.6.5. HYDRAULIC
- 4.6.6. LANDING GEAR AND BRAKE SYSTEM
- 4.6.7. ESCAPE SYSTEM

4.6.8. FCS

4.6.9. FUEL

4.6.10. ELECTRICAL AND POWER GENERATION

4.6.11. LIGHTING

4.6.12. AVIONICS

5. <u>FLIGHT ENVELOPES</u>

a) The flight envelopes for the development flights are :

2. Altitude – Mach No. Envelope Ref: Fig. 2	1.	Load Factor – Mach No. Envelope	Ref: Fig. 1
	2.	Altitude – Mach No. Envelope	Ref: Fig. 2

- b) Operating Envelopes of ______ Air System AUW xxx Kg, ______, Issue: Nil, Amendment: Nil, dated: ______
- c) Aerodynamic operating limitations for ______ Air System AUW xx Kg, vide Technical Memo ______ dated _____.
- d) Computation of Mass and CG data for ______ Air System for xxx kg take-off weight (Computed based on ______) on this weighing vide report No. ______) on this weighing vide report No. _______
 ________, Issue: Nil Amendment: Nil dated _______

Fig 1: V-n diagram (wt =xxxx) kg

Fig 2: Flight Envelope for xxxx kg

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6. <u>CONDITIONS OF RELEASE</u>

- xxxx is cleared for operations in ______ airfields. It is also cleared for outstation trials and demonstration flights (Air Shows) at other airfields, with prior concurrence of CEMILAC.
- The Air System is cleared to fly in fair weather and day light conditions. The minimum visibility shall be xx km for demonstration flights during Air shows.
- The Air System will not carry any Stores.
- Arrester barrier system shall be made available for all flights.

IMAP-2023 Part II, Chapter 5 & IMTAR 21 Subpart P

Persons authorised for undertaking flight tests:

Only test pilots / test engineers, who have successfully undergone a course in experimental flight testing are authorized to undertake flight testing of experimental, prototype or technology demonstrator Air System under development as a flight crew member. Similarly, persons who have successfully undergone the production test pilots course are authorized to flight-test production Air System of _______, BRDs / NAY or any other main contractor. Non qualified persons are not authorized to be crew members in any developmental flight testing or even as passengers in multi crew Air System during such developmental flight testing. In exceptional cases, however, the CTP / Head of flight testing can authorize in writing specific individuals (non flight test crew) on specific flights.

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