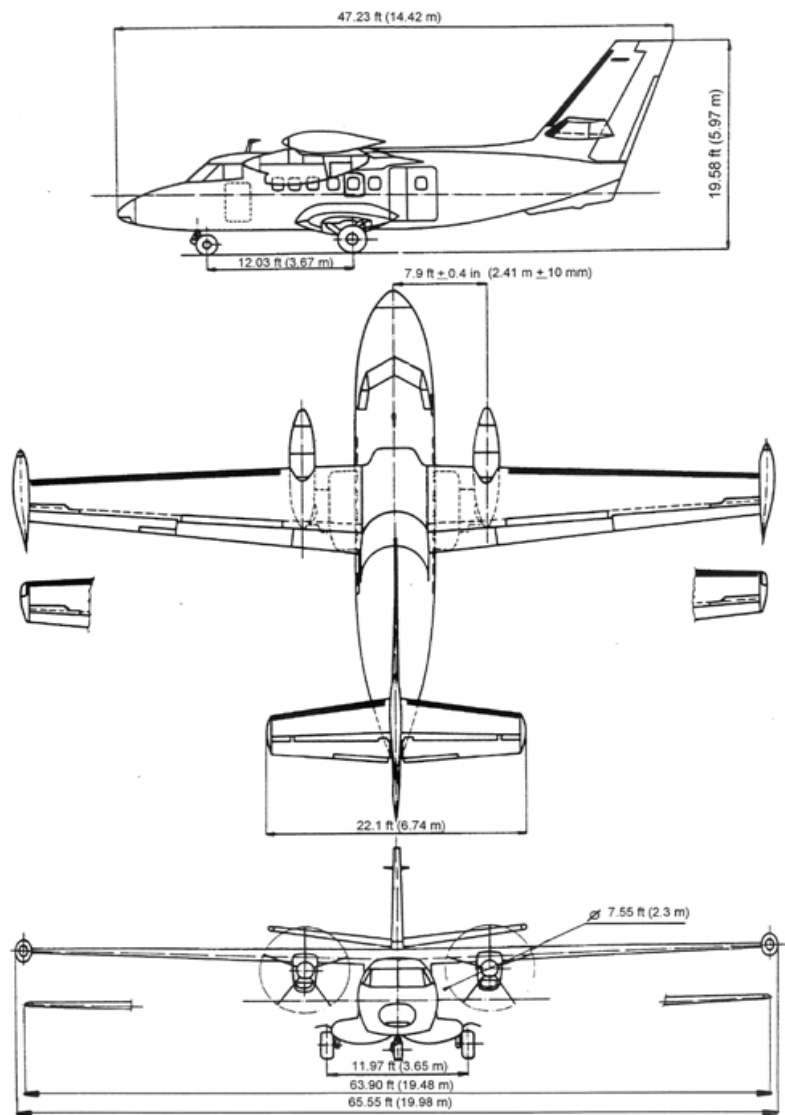
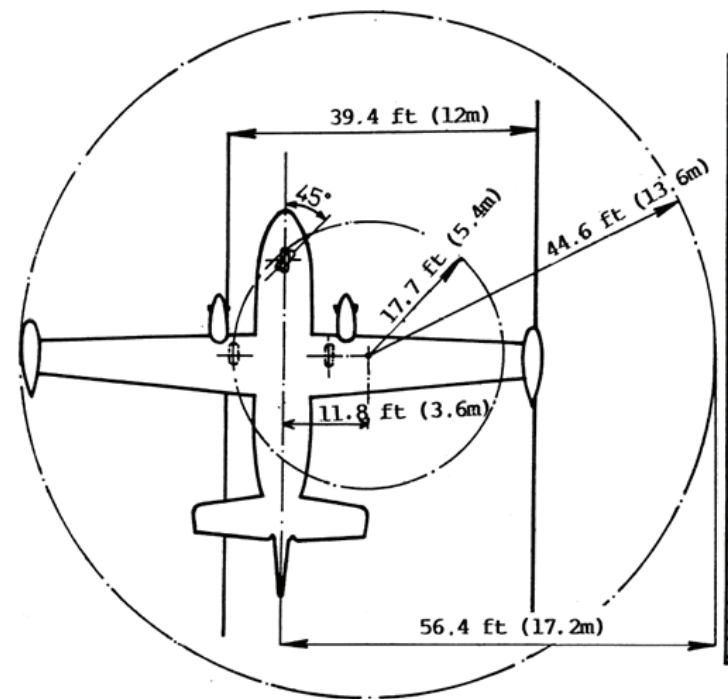


LIMITATIONS

GENERAL ARRANGEMENT DRAWING



MINIMUM RADIUS OF TURN ON THE GROUND



AIRCRAFT DIMENSIONAL DATA

GENERAL DATA			
1.	Length	–	14.42 m
2.	Height	–	5.97 m
3.	Wheel Track	–	3.65 m
4.	Wheel Base	–	3.67 m

WING			
1.	Area(wing tip not included)	–	34.86 m ²
2.	Span(wing tip tank included)	–	19.98 m
3.	Mean Aerodynamic Chord	–	1,918 mm
4.	Aspect ratio	–	10.45
5.	Quarter-chord Sweepback	–	0°
6.	Angle of Incidence at root	–	+2°
7.	Dihedral	–	1° 45'
8.	Aerodynamic twist	–	0°
9.	Geometric twist	–	-2.8°

AILERON			
1.	Length	–	2 X 3,822 mm
2.	Area	–	2 X 1.45 m ²
3.	Deflection	–	Up 27° ± 1°
			Down 14° ± 1°
4.	Area of left hand aileron trim tab	–	0.20 m ²
5.	Deflection of Trim Tab	–	Up 20° ± 2°
			Down 20° ± 2°

ELEVATOR			
1.	Area	–	2 X 1.58 m ²
2.	Deflection	–	Up 30° ± 1°
			Down 14° ± 1°
3.	Trim tab area	–	2 X 0.19 m ²
4.	Trim Tab Deflection	–	Up 10° ± 1°
			Down 16° ± 1°

HORIZONTAL TAIL			
1.	Span	–	6,736 mm
2.	Area (total)	–	9.56 m ²
3.	Quarter-chord sweep back	–	5°
4.	Aspect ratio	–	4.79
5.	Dihedral	–	7°
6.	Mean Aerodynamic Chord	–	1,469 mm
7.	Angle of Incidence	–	+2°

RUDDER			
1.	Area	–	2.92 m ²
2.	Deflection	–	25° ± 1°
3.	Trim tab area	–	0.43 m ²
4.	Trim deflection	–	28° + 0° / -1.5°

VERTICAL TAIL			
1.	Height	–	3,450 mm
2.	Area (total)	–	7.50 m ²
3.	Quarter-chord sweep back	–	35°
4.	Aspect Ratio	–	1.58
5.	Mean aerodynamic chord	–	2,263 mm

WING FLAPS			
1.	Length	–	2 X 4,830 mm
2.	Area	–	2 X 2.96 m ²
3.	Deflection of outer wing flap	–	T/O- 18° +/- 1°
		–	Ldg - 42° +/- 1°

GROUND SPOILERS			
1.	Length	–	2 X 2,695 mm
2.	Area	–	2 X 0.44 m ²
3.	Deflection	–	72°30' +/- 2°

AUTOMATIC BANK CONTROL TABS			
1.	Length	–	2 X 1,360 mm
2.	Area	–	2 X 0.245 m ²
3.	Deflection	–	55° +/- 2°

FUSELAGE				
1.	Entry door	Dimension	–	800 x 1460 mm
		Height	–	792 mm
2.	Cargo door	Dimension	–	1250 x 1460 mm
		Height	–	792 mm
3.	Emergency Exit Door (Front)	Dimension	–	665 x 970 mm
		Height	–	872 mm
4.	Emergency Exit Door (Under Wing)	Dimension	–	510 x 730 mm
		Height	–	1382 mm

LOAD LIMITATION

WEIGHTS LIMITATION			
1.	Maximum ramp weight	–	6620 Kg
2.	Maximum take-off weight	–	6600 Kg
3.	Maximum landing weight	–	6400 Kg
4.	Maximum zero fuel weight	–	6000 Kg (Without tip tank)
		–	6060 Kg (With tip tank)

FLOOR LOADING

PASSENGER VERSION				
1.	Maximum load on baggage compartments	Front	-	100 Kg
		Rear (19 passenger)	-	0 Kg
		Rear (17 passenger)	-	150 Kg
		Rear (15 passenger)	-	300 Kg
2.	Maximum specific load on floors	Baggage Compartment	-	400 Kg/m ²
		Passenger cabin	-	400 Kg/m ²
3.	Maximum passenger		-	19

CARGO VERSION				
1.	Maximum load in baggage compartment	Rear	-	150 Kg
		Front	-	100 Kg
2.	Maximum weight of the cargo in the container		-	1000 Kg
3.	Maximum weight of the cargo without separator installed		-	500 Kg
4.	Maximum weight of the cargo in one section with separator installed		-	500 Kg
5.	Maximum specific floor loading of the container		-	400 Kg/m ²
6.	Maximum cargo dimension height		-	1m
7.	Cargo dimensions length and width (with the separator installed)		-	1.14 X 1.1 m
8.	Cargo dimensions length and width (without the separator installed)		-	2.28 X 1.1 m

CG LIMITATION

1.	Maximum take-off weight	-	26%-30%
2.	Maximum fwd CG (L/G Ext)	-	19%
3.	Maximum aft CG (L/G Ext)	-	30%
4.	Empty aircraft CG	-	19%

SPEEDS

AIR SPEEDS				
1.	Maximum operating limit speed, V _{MO}	-		181 KIAS
2.	Operating maneuvering speed, V _o	-		143 KIAS
3.	Design speed for maximum gust intensity, V _B	-		143 KIAS
4.	Maximum landing gear operating and extended speed, V _{LO} and V _{LE}	-		135 KIAS
5.	Maximum flaps extended & operating speed (V _{FE} & V _{FO})	-		135 KIAS (Flaps 18°)
		-		119 KIAS (Flaps 42°)
6.	Max permissible spoiler extension speed (V _{SPOIL})	-		102 Kts
7.	Minimum control speed	Take off run	-	60 KIAS
		Take off	-	65 KIAS (Flaps 18°)
			-	77 KIAS (Flaps 0°)
		Landing	-	65 KIAS

MISCELLANEOUS SPEEDS			
1.	Anti-blocking speed range	-	11 – 85 KIAS
2.	Flaps 42° lowering speed	-	≤ 111 KIAS
3.	Taxiing speed on unpaved strips	-	≤ 27 KIAS
4.	Both engines best angle of climb airspeed (flaps 18°) V_x	-	86 KIAS
5.	Both engines best rate of climb airspeed (flaps 18°) V_Y	-	105 KIAS
6.	Both engines best angle of climb airspeed (flaps 0°) V_x	-	100 KIAS
7.	Both engines best rate of climb airspeed (flaps 0°) V_Y	-	110 KIAS

POWER RATING

INTER-TURBINE TEMPERATURE			
1.	Continuous OEI	–	780 ⁰ C
2.	Take-off	–	780 ⁰ C
3.	Maximum Continuous	–	720 ⁰ C
4.	Idle	–	550 ⁰ C
5.	Acceleration	–	810 ⁰ C (Max 5 Sec)
6.	Reverse	–	710 ⁰ C
7.	Emergency circuit	–	780 ⁰ C
8.	Starting	–	Ground sources 700 ⁰ C
		–	On-board sources 730 ⁰ C

GAS GENERATOR SPEED			
1.	At Idle	–	57 + 3%
2.	Max Continuous	–	98.4%
3.	Continuous OEI	–	101.5%
4.	Take Off	–	101.5%
5.	Max Overshoot (During Acceleration)	–	103%
6.	During Reverse Ops	–	96%
7.	Emergency Circuit Ops	–	101.5%

TORQUE LIMITATION			
1.	Max Continuous	–	100%
2.	Continuous OEI	–	100%
3.	Take Off	–	100% (106% short time)
4.	Max overshoot during acceleration	–	106%
5.	Emergency Circuit Ops	–	100%

PROPELLER DATA			
1.	Idle RPM	–	920 ± 60
2.	Speed Control Range RPM	–	1700 to 2080
3.	Propeller Diameter	–	90.5"
4.	No of Blades	–	05
5.	Rotation(viewed from rear)	–	Clockwise
6.	Beta Range	–	1700 to 1900

SYSTEM AND EQUIPMENT LIMITATION

HYDRAULIC SYSTEM

Pressure			
1.	Main sys press	–	150 kg/cm ²
2.	Emergency sys press	–	100 kg/cm ²
1.	Main hyd accum press	–	150 kg/cm ²
2.	Main brake press	–	45+3 kg/cm ²
3.	Emergency brake press	–	45+3 kg/cm ²
4.	Parking brake press	–	25 kg/cm ²
5.	Hand pump press	–	100 kg/cm ²
6.	HYDRAUL cell light on	–	90°C

OIL SYSTEM

Quantity			
1.	Capacity in each engine	–	11 liters
2.	Min permissible in one tank	–	5.5 liters
3.	Max permissible in one tank	–	7 liters
Pressure			
4.	Min	–	1.2 kg/cm ²
5.	Normal	–	1.8 to 2.7 kg/cm ²
6.	Max	–	3.5 kg/cm ²
Temperature			
1.	Min (For Starting)	–	-20 ⁰ C
2.	Normal	–	+20 ⁰ C to 85 ⁰ C
3.	OEI	–	+20 ⁰ C to +95 ⁰ C
4.	Min Oil Temp (For Acceleration)	–	20 ⁰ C
5.	Max Working Oil Temp	–	85 ⁰ C

FUEL SYSTEM

1.	Tank Capacity (Without Tip Tank)	–	1000 Kg
2.	Tank Capacity (With Tip Tank)	–	1300 Kg
3.	Unusable Fuel	–	12.8 Kg
4.	LH Main Tank	–	500 Kg
5.	RH Main Tank	–	500 Kg
6.	Each Wing Tip Tank	–	156.9 Kg
7.	Max Fuel Unbalance For T/O	–	60 Kg
Pressure			
8.	Max pressure at T/O rating	–	0.5 to 12 kg/cm ²

Oxygen System

1.	Pilot's cylinder pressure	–	1800 psi ± 50 psi
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Wheel Data

Main Ldg Gear			
1.	Tyre Size	–	720 X 32 mm
2.	Tyre Press	–	4.2 kp/cm ²
Nose Ldg Gear			
1.	Tyre Size	–	550 X 325 mm
2.	Tyre Press	–	4.2 kp/cm ²
3.	Nose Wheel Strg (Manual)	–	±50 ⁰
4.	Nose Wheel Strg (Taxi)	–	±4.5 ⁰

Brake Operation			
1.	Max Parking Brake Press	–	25 + 5 kg/cm ²
2.	Max Emerg Brake Press	–	45 + 3 kg/cm ²
3.	Max Press During Eng Test	–	50 ± 5 kg/cm ²
Speed For Brake Application			
1.	During Flaps 42° Ldg	–	85 KIAS
2.	During Flaps 0° Ldg	–	89 KIAS
3.	During Flaps 18° Abort	–	89 KIAS

SPOILERS			
1.	Ht for Spoiler Use	–	1.6 ft

ELECTRIC SYSTEM			
1.	Max Grd Load (One Gen, 30 Min)	–	100 A
2.	Max In Flt Load (One Gen)	–	200 A
3.	Max In Flt Load (One Gen, 30 Mins, Temp Below +5° C)	–	250 A

ICE PROTECTION SYSTEM			
1.	Heating Time Windshield (From I to II Posn)	–	7 Mins (Min)
2.	Pitot-Static & Stall Probe Heating Sys Op (On Grd)	–	1 Min (Max) Above 0° C
3.	Pitot-Static & Stall Probe Heating Sys Op (On Grd)	–	2 Min (Max) Below 0° C
4.	Pitot-Static & Stall Probe Heating Sys Op (After Ldg)	–	2 Min (Max)
5.	Pneumatic Airframe Deicing Sys Op (Min Ambient Temp)	–	30° C
6.	Pneumatic Deicing Out of Op Cycle	–	1.2 Kg/Cm ² (Min Press)

MISC LIMITATION

1.	Max Pressure Altitude For Starting The Engine	–	13,000 ft (4000 m)
2.	Max Press Alt for T/O & Ldg	–	13,120 ft (4000 m)
3.	Max Pressure Flight Altitude with Auto Feather Sw On	–	10,000 ft (3050 m)
4.	Max Permissible Op Alt	–	14,000 ft (4200 m)
5.	Max Permissible Op Alt with Fuel Pump Inoperative	–	13,120 ft (4000 m)
6.	AC Op Temp	–	- 50° C to + 50° C
7.	Maximum Number of Subsequent Starting (2 min Interval)	–	5
8.	Min Volt of Ext Power Supply During Starting	–	20 V
9.	Min Bat Volt Drop During Starting	–	14 V
10.	Heating System On ITT Temp Increment	–	30° C
11.	Op Time For Ldg Lt	–	5 Min (Max)
12.	Time Req'd For Auto/Manual Feathering	–	5 Sec
13.	Time Req'd For Emerg Feathering	–	20 Sec
14.	Emerg Ldg Gear Ext	–	60 Sec
15.	Max Turning Angle During Towing	–	30°
16.	Max Towing Spd	–	10-15 Kph

MANOEUVRE LIMITATION			
1.	Positive (Flap Extended)	–	2.0
2.	Positive (Flaps Retracted)	–	3.0
3.	Negative	–	-1.24

COLOR CODE			
1.	RED RADIAL LINE	–	Maximum and/or minimum permissible value of the measured parameter
2.	RED TRIANGLE (engine and propeller instruments)	–	Max Overshoot value
3.	GREEN ARC	–	Normal operating range
4.	YELLOW ARC	–	Permissible for short duration (caution range)

CHECK LIST STUDY GUIDE

Introduction

1. The Check list Study Guide provides you with requirements for accomplishing check list tasks. It describes how to use the guide and run check lists as well as what is expected of you at the beginning. Please read it to reinforce the requirements. This guide is intended to assist preparation for flight in L 410 UVP-E 20 ac and to provide check list standardization and callouts within aircrew. The check list procedures outlined in this guide are to be used in every flight.

Concept of Crew Resource Management (CRM)

2. The challenge and response format within this guide is widely used in the aviation industry and is primarily designed to increase CRM between the UTP and IP as well as ensure each step of the check list is completed by both crewmembers. Not every step requires a dual response however each pilot, regardless of which seat they occupy, must ensure each step of the check list has been accomplished. All phrases and terms are to be verbalized exactly by the crewmember running the check list. When dual concurrence is required, items are shown as (P) (CP) within the check list. When concurrence of either crew is required, items are shown as (P / CP) within the check list.

3. Although it is ultimately the PIC's responsibility to ensure all check list items are properly completed, this does not take any responsibility away from the UTP. UTPs must demonstrate good CRM when challenging their IP if a check list step has been executed improperly or inadvertently skipped. When a check list item requires both crewmembers to respond, the UTP will not proceed to the next item until the IP responds. This will ensure items are being checked properly by both crewmembers. The challenges appear just as they are listed within the Check list. There are many acronyms used within the check list. Acronyms are to be verbalized with the actual name while calling out the challenge. For example, BATT switch as Battery, GEN switch as Generator, EMER LDG GR as Emergency Landing Gear, etc.

Memorization

4. Most check lists are not performed from memory; however, the following checklist performed during critical phases of flight should be performed from memory: Lineup Check list, Takeoff Check list, After Takeoff Checklist, Ops Normal Check list, Before Landing check list, Touch and Go Landing Check list and Finals Check list. The check list is to be always kept ready by P/CP over side table in cockpit and to be utilized for the entire flight.

Flow Management

5. After completing strap-in (this includes oxygen check, fastening seat belt and shoulder harness, wearing sunglass and headset, kneeboard attachment etc), conduct an ICS check prior to beginning the cockpit checklist, as below:

- a. PIC/IP/Capt: "Intercom Check"
- b. CP/UTP: "Loud and clear, how do you read me?"
- c. PIC/IP/Capt: "Read you Loud and Clear", "Commence COCKPIT CHECKLIST"

6. It is the responsibility of UTP, CP or IP to read out the check list once on ground. From 'After Takeoff Check list' until 'Finals Check list', it is the responsibility of PM for verbalizing all check list except for 'Ops Normal Check list'; which should be verbalized by PF. It is important that both crewmembers remain cognizant of the check list status as the check lists are being completed. The Check list commencement after seating in the cockpit is to be done by PIC, IP or Capt by saying "Commence COCKPIT CHECKLIST". The commencement of all other check list are announced and done by UTP/CP by saying "Commencing TAXI CHECKLIST". If a check list is interrupted, that interruption is announced, (i.e. "Holding TAXI CHECK LIST") and resumed by declaring "Resuming TAXI CHECK LIST". Completion of a check list is announced (i.e. "TAXI CHECK LIST Complete").

7. Check list error prevention tips:

- a. Always carry out checks by using the check list, except memory items.

- b. Check every item, every time; do not fall into trap of familiarity for habitual influence.
- c. Slow down and confirm significant items.
- d. Deliberately read the checklist.
- e. If interrupted, restart from the beginning.

Checklist Learning Process

8. To learn the check list, one need to run an individual check list several times before moving on. For example, begin by running the Cockpit Check list five or six times. The first couple of times would be with the Check list Study Guide so you understand what you are doing/looking for and how you respond. It will also help you see that there is a "flow" to the checklist as you move through the cockpit accomplishing items. After you feel confident with the Cockpit Check list items, move on to do it and add the Engine Start Check list. Do this several times and then add the next check list to the sequence.

9. You need to practice checklist simply by learning the steps and what you should do in each step. Then repeat it until you are smooth, efficient, and timely. As a guide to measure your timeliness, you should be able to run the Cockpit Checklist thru the Lineup Checklist in 20 minutes (15 minutes is optimal). You will need to be able to run checklist smoothly.

10. When executing check lists, the UTP/CP will state the CHALLENGE exact read out from Check list. The crew complying the CHALLENGE will perform the ACTION, then state the RESPONSE. When an ACTION involves a "Check" of the position, instrument status or setting of an adjustable control or switch, the pilot is expected to touch or look at that item to aid in verification of its position or setting, and if necessary, change its setting or position to make it consistent with the prescribed RESPONSE. The ACTION AND RESPONSE are interlinked and responsible crew should execute the task and then verbalize whatever checked or parameters found.

	Challenge		Action and Response	Crew
1.	FDR-'FDR ON' It	–	Check on	(CP)
2.	iPad	–	Off	(P) (CP)
3.	Flight control	–	Check, (except rudder)	(P / CP)

11. During the learning process, IP will watch you to see if you accomplish what is demanded. He may ask you what the check list step entails for emulating physical movement (looking right, looking up or etc). For example, when you read out FDR-'FDR ON' It, you are required to look at appropriate location of central pedestal to simulate the check of "Check on". If your head never moves down to view the FDR It, the instructor will probably interrupt you since the checklist item you performed was not expressed with your physical action. Additionally, you will find a tendency to mumble the required action while accomplishing it. This is mainly from the human trait of walking yourself through steps and processes. While most Instructors understand that you will do this in the beginning, they will push you away from saying things as you improve because it slows down the checklist process.

Challenge Column

12. The UTP, CP or IP will read out the check list CHALLENGE exactly as it appears. You will not say "switch"/"button" or non-bold action items throughout the check list (except STARTER button). Additionally, abbreviated items on the Checklist (BATT, GEN, FDR etc.) are called out fully in the CHALLENGE (Battery, Generator, Flight Data Recorder etc.).

Action and Response

13. This column shows you what you must accomplish after the challenge or what you look for prior to giving a response. You will need to know these with no excuses! This is the cornerstone of accomplishing a check list. If you do not know what to do or look for, the check list is useless. Spend time understanding what each step requires. Some steps will not require an explanation of the action because of obviousness.

Example :

Battery/External Power	–	Checked/On; 20 V min	(CP)
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With the battery step example above, the ACTION & RESPONSE shows you to respond with "Checked/ON; 20 V min" but the actual response after checking voltage you will give is "ON, xx.x volts". This is where the repetition of practice helps solidify these differences. Remember that if ACTION & RESPONSE indicates both crew to take action and respond, then you are required to get a response from the other crew before moving on. If he/she does not respond, just repeat the challenge callout. Also, do not to use the word "is" with your response. For example, "Generator...is OFF" should just be "Generator OFF".