

EC120B

GAM/MBR/22/9/GAS

REVISION 0

MASS AND BALANCE REPORT

IMPORTANT NOTE

This report contains of Mass and Center of Gravity Schedule (MCGS), Weighing Record (WR), Equipment list and Aircraft Basic Mass and Balance Record.

This report shall be approved by qualified Weighing Engineer (WE) on MCGS and/or WR.

This Mass and Balance Report is approved under GAM privilege and can be used for flight operation.

The superseded report shall be removed from the flight manual prior to insert the latest Mass and Balance report.

The Mass and Balance report supersedes all earlier issues.

The effectivity of the report at the latest revision is specified on the Record of Revisions.

Doc. Ref. No.	GAM/MBR/22/9/GAS
Rev. Date	03/03/2022
Rev. No.	0

TABLE OF CONTENTS

RECORD OF REVISIONS 3

SECTION 1 – MASS AND CENTRE OF GRAVITY SCHEDULE (MCGS)..... 4

 PART B – VARIABLE LOAD 5

 PART C – LOADING INFORMATION (DISPOSABLE LOAD)..... 6

SECTION 2- MASS AND BALANCE RECORD..... 9

 PART 2A – WEIGHING RECORD (WR) 9

 PART 2B – EQUIPMENT LIST 14

APPENDIX – AIRCRAFT BASIC MASS AND BALANCE RECORD..... i

Doc. Ref. No.	GAM/MBR/22/9/GAS
Rev. Date	03/03/2022
Rev. No.	0

RECORD OF REVISIONS

Rev. No	Date	Affected Page(s)	Descriptions of Revision
0	03/03/2022	All	Initial issue

SECTION 1 – MASS AND CENTRE OF GRAVITY SCHEDULE (MCGS)

Aircraft designation	: EC120B		
Nationality	: Malaysia		
Registration number	: 9M-GAS		
Aircraft manufacturer/constructor	: Airbus Helicopters		
Aircraft serial number	: 1089		
Weight limitations – maximum authorized weight in flight	: 1,715 kg		
CENTRE OF GRAVITY LIMITATIONS			
For Longitudinal Forward and Aft CG Limit at various gross weight, refer EC120B approved flight manual, No. 1523, Sec 2- Limitation; Figure 2-1: Longitudinal CG Chart.			
For Lateral LH and RH Limit and Aft CG Limit at various gross weight, refer EC120B approved flight manual, No. 1523, Sec. 2- Limitations; Figure 2-2: Lateral CG Chart.			
DATUM REFERENCES			
Longitudinal datum line (Station 0) is located 4.00 m forward of the main rotor head centreline. Lateral datum is the aircraft symmetry plane			
PART A – BASIC WEIGHT			
The Basic Weight of the aircraft as calculated in Section 2 is	: 1102.58 kg		
The aircraft was weighed on (date)	: 02/03/2020		
The C.G of the aircraft in the same condition at this weight is	: LONGITUDINAL	4.156	
	: LATERAL	-0.014	
The total moment about the datum in this condition is	: LONGITUDINAL	4582.68	
	: LATERAL	-15.41	
The Basic Weight includes the weight of the total quantity of unusable fuel, oil & fluids in the normal condition and the list of equipment as specified in Section 3 – Basic Equipment List.			

Mass And Balance Report

Doc. Ref. No.	GAM/MBR/22/9/GAS
Rev. Date	03/03/2022
Rev. No.	0

PART B – VARIABLE LOAD

The Weights, Lever Arms (Measured Forward or Aft of the Datum defined in Part A) of the Variable Load, which includes the weight of the crew and those items of the equipment including usable fluids other than fuel, which do not form part of the Basic Equipment are shown below:

The Variable Load depends upon the equipment carried for the particular role.

ITEM	DESCRIPTION	WEIGHT (KG)	ARM (M)	
			LONG.	LAT.
1	PILOT	+Actual	2.35	0.36

Doc. Ref. No.	GAM/MBR/22/9/GAS
Rev. Date	03/03/2022
Rev. No.	0

PART C – LOADING INFORMATION (DISPOSABLE LOAD)

It is a requirement of the MCAR that the pilot-in-command satisfies himself before take-off that the load is of such mass, and is so distributed and secured, that it may safely be carried on the intended flight.

Information below is given to enable Disposable Load (Fuel and Pay-Load) to be distributed so that the Maximum Weight and Centre of Gravity Limitations given in the Flight Manual are NOT exceeded.

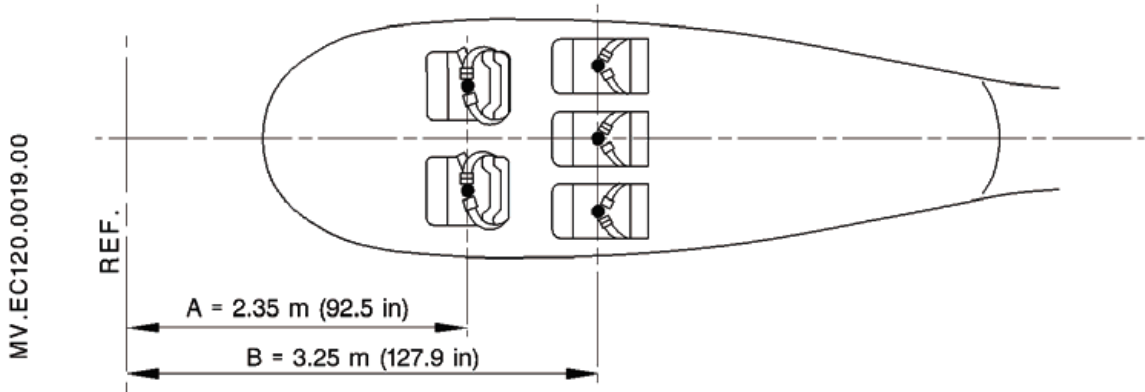
The appropriate Lever Arms of the Disposable Loads are:-

ITEM	MISCELLANEOUS LOADING DATA	ARM (M)	
		LONG.	LAT.
1	<u>FUEL IN TANKS</u> Fuel tank capacity..... 410.50 litres/ 326.35 kg Usable fuel.....406 litres/ 322.77 kg Unusable fuel..... 4.50 litres/ 3.58 kg Weight of this quantity of fuel at 0.795 kg/litres is 322.77 kg	4.09	0.00

ITEM	MISCELLANEOUS LOADING DATA (IF REQUIRED)	MAXIMUM WEIGHT (LB)	ARM (M)	
			LONG.	LATERAL
2	<u>CABIN FLOOR LOADING</u>			
A	On left hand forward cabin floor, Maximum distributed load (Co-pilot seat is removed)	150.0	2.35	-0.36
B	On rear cabin floor, Maximum distributed load (Passenger seats all removed)	320.0	3.10	0.00
3	<u>BAGGAGE COMPARTMENT LOADING</u> Cargo compartment Maximum Load...300 kg/m2 (62.5 pounds/sq. feet)	441.00	4.10	0.00

Doc. Ref. No.	GAM/MBR/22/9/GAS
Rev. Date	03/03/2022
Rev. No.	0

3 **SEATING CONFIGURATION – 4 PASSENGER SEATERS**






ITEM	WEIGHT (KG)	ARM (M)	
		LONG.	LAT.
3.1. Copilot/One place passenger seat – LH Front	+Actual	2.35	-0.36
3.2. One place passenger seat - LH Rear	+Actual	3.25	-0.50
3.3. One place passenger seat – Middle Rear	+Actual	3.25	0.00
3.4. One place passenger seat – RH Rear	+Actual	3.25	0.50

Doc. Ref. No.	GAM/MBR/22/9/GAS
Rev. Date	03/03/2022
Rev. No.	0

NOTE

1. To obtain the total loaded weight of aircraft, add to the BASIC Weight the weights of the items of variable and disposable load (if not included during weighing - see equipment list) to be carried for the particular role.
2. Loading information (disposable load) and CG envelope chart is available in Approved Flight Manual.
3. It is a requirement of the MCAR 2016 that the pilot-in-command satisfies himself before take-off that the load is of such mass, and is so distributed and secured, that it may safely be carried on the intended flight.
4. CAAM APPROVAL REFERENCE NUMBER: CAMO/2016/03
5. This MCGS was prepared on 03/03/2022 and supersedes all previous issues.

Prepared by:		Date:	03/03/2022
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SECTION 2- MASS AND BALANCE RECORD

PART 2A – WEIGHING RECORD (WR)

Location	MIAT HANGAR, SUBANG
Equipment	JACKSON AIRCRAFT WEIGHING SYSTEM
Model / Part number	M2400-4-25CS WIRELESS LAPTOP SCALE SYSTEM
Serial number	632100-25K (RED), 583831-25K (BLUE), 582255-25K (YELLOW)
Calibration due date	18/05/2022

MEASUREMENT

All station arms measured from datum, located 4.0m forward of the main rotor centreline.
 Distance from datum point to forward jack point is 3.048m (0.376m LH & RH).
 Distance from datum point to LH & RH aft jack points station is 6.1475m.
 In lateral calculations: Left is negative (-), Right is positive (+).
 Weight of fuel: 1 litre @ 0.795 kg.

FIRST WEIGHING (All Units in KG)

JACK POINT			CELL READING	ZERO RTN.	CALIBRATION	ACTUAL WEIGHT
LHD	FWD	RED	376.00	0	0	376.00
RHD	FWD	YELLOW	331.00	0	0	331.00
AFT	AFT	BLUE	392.00	0	0	392.00
					TOTAL	1099.00

SECOND WEIGHING (All Units in KG)

JACK POINT			CELL READING	ZERO RTN.	CALIBRATION	ACTUAL WEIGHT
LHD	FWD	BLUE	371.00	0	0	371.00
RHD	FWD	RED	334.00	0	0	334.00
AFT	AFT	YELLOW	394.00	0	0	394.00
					TOTAL	1099.00

AVERAGE AIRCRAFT WEIGHT

JACK POINT		AVERAGE CELL READING (KG)	ARM (M)		MOMENT (KG.M)	
			LONG.	LAT.	LONG.	LAT.
LHD	FWD	373.50	3.048	-0.376	1138.42	-140.43
RHD	FWD	332.50	3.048	0.376	1013.46	125.02
AFT	AFT	393.00	6.148	0.000	2416.16	0.00
TOTAL		1099.00	4.156	-0.014	4568.04	-15.41

APPENDIX A – ADD THE FOLLOWING ITEM

ITEM	DESCRIPTION OF ITEM	WEIGHT (KG)	ARM (M)		MOMENT (KG.M)	
			LONG.	LAT.	LONG.	LAT.
1	UNUSABLE FUEL	3.58	4.09	0.00	14.64	0.00
TOTAL		3.58	4.09	0.00	14.64	0.00

APPENDIX B – SUBSTRACT THE FOLLOWING ITEM

ITEM	DESCRIPTION OF ITEM	WEIGHT (KG)	ARM (M)		MOMENT (KG.M)	
			LONG.	LAT.	LONG.	LAT.
1	NIL	0.00	0.00	0.00	0.00	0.00
TOTAL		0.00	0.00	0.00	0.00	0.00

CORRECTED CG LOCATION WITH RESPECT TO DATUM LINE

ITEM ADDED AND SUBTRACTED	WEIGHT (KG)	ARM (M)		MOMENT (KG.M)	
		LONG.	LAT.	LONG.	LAT.
AIRCRAFT BASIC WEIGHT	1099.00	4.156	-0.014	4568.04	-15.41
PLUS – APPENDIX A	3.58	4.09	0.00	14.64	0.00
MINUS – APPENDIX B	0.00	0.00	0.00	0.00	0.00
CORRECTED BASIC WEIGHT	1102.58	4.156	-0.014	4582.68	-15.41

REMARKS:

Reason for weighing	: Aircraft painting
Weighing condition	: Inside hangar
Hangar doors	: N/A
Main rotor blades	: One blade aftwards on the aircraft center line
Aircraft doors	: Closed
Aircraft attitude	: Level longitudinally & laterally
Fuel tanks	: Drained
Fluids	: Serviced to normal flight condition
Rotor Brake	: Rotor brake was applied
Configuration	: 4 passenger seaters

Doc. Ref. No.	GAM/MBR/22/9/GAS
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BASIC AIRCRAFT WEIGHING DIMENSIONS

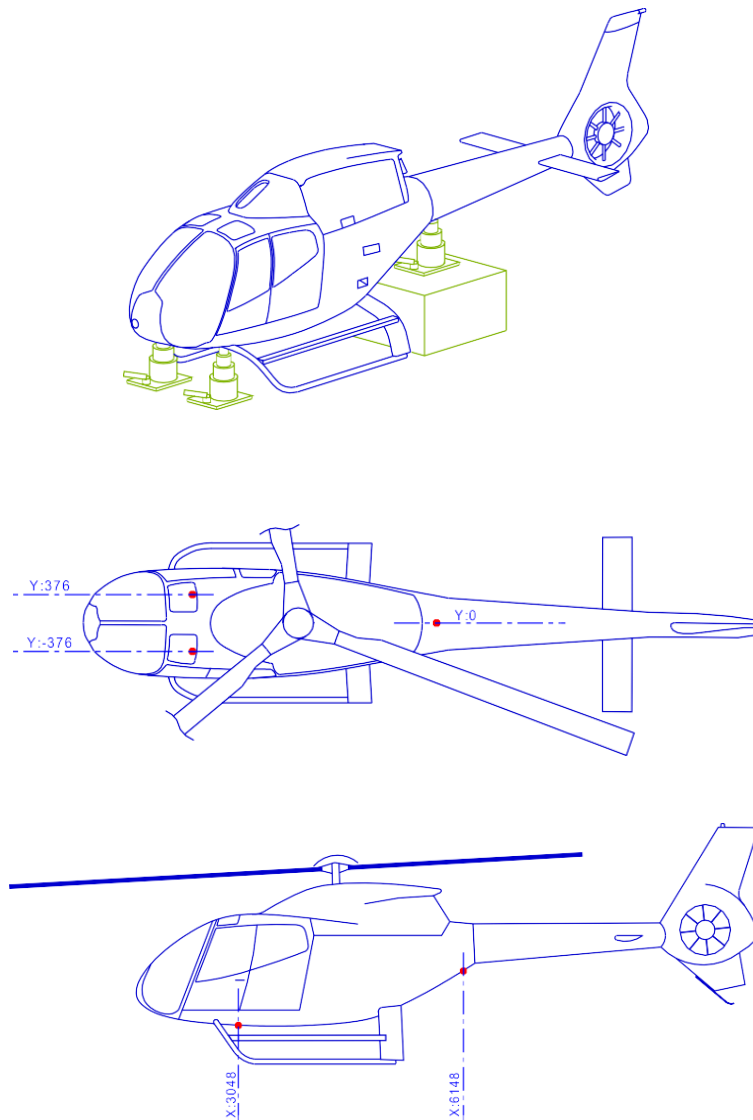
Longitudinal datum line (Station 0) is located 4.00 m forward of the main rotor head center line. Therefore, the Buttock Line are positive on the RH side and negative on the LH side.

1. Distance from the reference datum to the RH jackpoint station of 0.376 m.
2. Distance from the reference datum to the LH jackpoint station of 0.376 m.

Note 2

Arm is distance in m from datum.

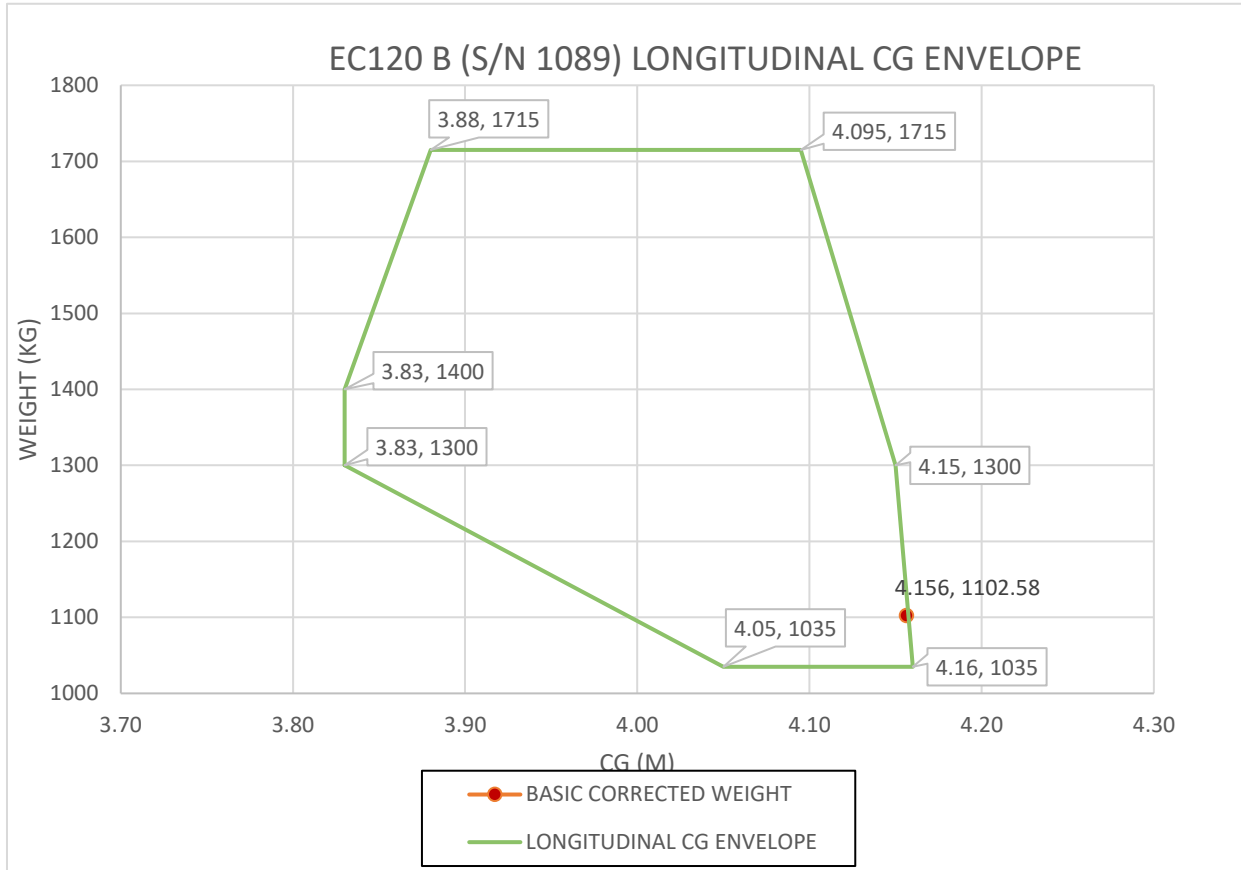
1. Distance from the reference datum to the Forward jackpoint station of 3.048 m.
2. Distance from the reference datum to the RH and LH jackpoint station of 6.148 m



[AIRCRAFT & JACK STATION FIGURE]

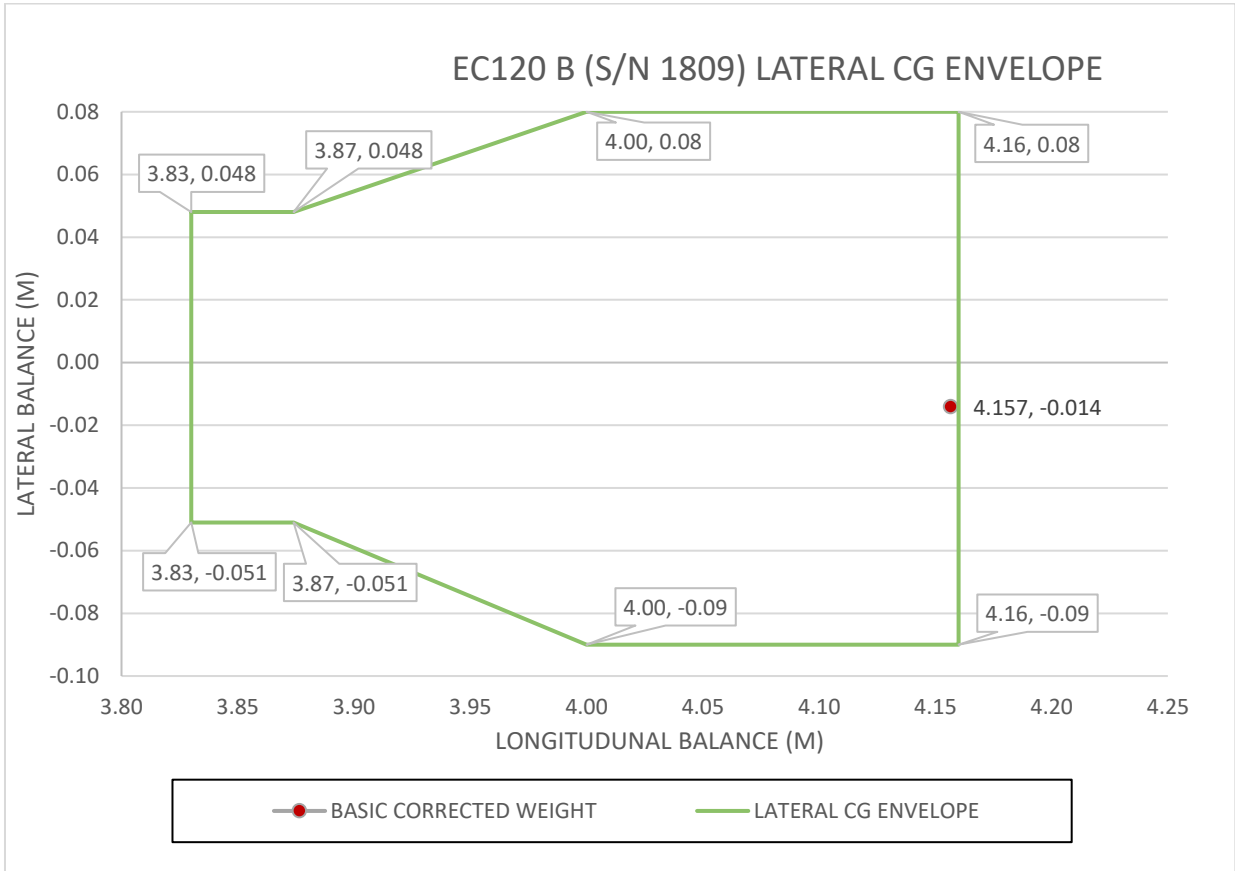
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LONGITUDINAL AND LATERAL CG ENVELOPE CHART



[LONGITUDINAL CG ENVELOPE CHART]

Doc. Ref. No.	GAM/MBR/22/9/GAS
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[LATERAL CG ENVELOPE CHART]

PART 2B – EQUIPMENT LIST

NO	EQUIPMENT	QTY	WEIGHT (KG)	ARM (M)
1.	FLIGHT STEPS	2	-	-
2.	SLIDING DOOR	1	-	-
3.	MAGNETIC COMPASES	1	-	-
4.	REMOTE INDICATING SN3308	1	-	-
5.	OIL TEMP	1	-	-
6.	OUTSIDE AIR TEMP	1	-	-
7.	TURBINE TEMP (T4)	1	-	-
8.	BATT TEMP	1	-	-
9.	AIRSPEED INDICATOR	1	-	-
10.	DIRECTIONAL GYRO.	1	-	-
11.	FLIGHT HOUR INDICATOR	1	-	-
12.	VEMD	1	-	-
13.	GYRO HORIZON	1	-	-
14.	TACHOMETER INDICATOR	1	-	-
15.	TURN & BANK INDICATOR	1	-	-
16.	ADF KING KR87	1	-	-
17.	HEADSETS	2	-	-
18.	GPS/COMM GARMIN GNC420	1	-	-
19.	VHF COMM KING KY196A	1	-	-
20.	TRANSPONDER GTX320	1	-	-
21.	ENCODER AK350	1	-	-
22.	AUDIO GARMIN GMA340	1	-	-
23.	RADALT KING KRA10A	1	-	-
24.	CD PLAYER PIONEER	1	-	-
25.	ALTIMETER	1	-	-
26.	AMMETERS	1	-	-
27.	CLOCKS	1	-	-
28.	ENGINE OIL PRESSURE GAUGE	1	-	-
29.	FUEL CONTENT GAUGE	1	-	-
30.	ANTICOLLISION LIGHT	1	-	-
31.	LANDING/TAXI LIGHT	1	-	-
32.	MAP READING LIGHTS	2	-	-
33.	NAVIGATION LIGHTS	3	-	-
34.	DUAL CONTROLS	1	-	1.99
35.	FIRE EXT (PORTABLE)	1	2.01	2.40
36.	FLIGHT MANUAL	1	-	-
37.	FIRST AID KIT	1	1.74	2.64

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Mass And Balance Report


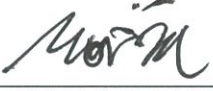


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NO	EQUIPMENT	QTY	WEIGHT (KG)	ARM (M)
38.	TECH LOG FILE	1	-	-
39.	PASSENGER LIGHT	1	-	-
40.	EMERGENCY LOCATOR TRANSMITTER	1	-	-
41.	MAIN FUNCTION DISPLAY GMX 200	1	-	-
42.	INSTRUMENT LIGHT	1	-	-

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NOTE

1. CAAM APPROVAL REFERENCE NUMBER: CAMO/2016/03
2. This WR and Equipment List were prepared on 03 / 03 / 2022 and supersedes all previous issues.

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APPENDIX – AIRCRAFT BASIC MASS AND BALANCE RECORD

(CONTINUOUS HISTORY OF CHANGES IN STRUCTURE OR EQUIPMENT AFFECTING MASS AND BALANCE)

AIRCRAFT TYPE	EC120B	SERIAL NUMBER	1089						REGISTRATION	9M-GAS		
DATE	DESCRIPTION OF ARTICLE OR MODIFICATION		WEIGHT CHANGE						RUNNING TOTAL BASIC AIRCRAFT			SIGN & STAMP
			ADDED (+)			REMOVED (-)			WEIGHT (KG)	ARM (M)	MOMENT (KG.M)	
			WEIGHT (KG)	ARM (M)	MOMENT (KG.M)	WEIGHT (KG)	ARM (M)	MOMENT (KG.M)				
03/03/2022	BASIC WEIGHT (AS WEIGHED ON 02/03/2022)	LONGITUDINAL	-	-	-	-	-	-	1102.58	4.156	4582.68	
		LATERAL	-	-	-	-	-	-	1102.58	-0.014	-15.41	
		LONGITUDINAL										
		LATERAL										
		LONGITUDINAL										
		LATERAL										
		LONGITUDINAL										
		LATERAL										