European Aviation Safety Agency

EASA

TYPE-CERTIFICATE DATA SHEET

CAMERON HOT AIR BALLOONS
-
Manned Free Hot Air Balloons

Type Certificate Holder: **CAMERON BALLOONS LTD.**
St Johns Street
Bedminster
Bristol BS3 4NH
UNITED KINGDOM

Manufacturer: **CAMERON BALLOONS LTD.**
St Johns Street
Bedminster
Bristol BS3 4NH
UNITED KINGDOM

For Variants: Cameron A Type, Cameron C Type, Cameron GP Type, Cameron H Type, Cameron N Type, Cameron O Type, Cameron TR Type, Cameron V Type, Cameron Z Type, Colt A Type, Colt "Bullet" Type, Thunder A Type, Thunder "Bolt" Type, Thunder AX-Series S1, Thunder AX-Series S2, Thunder Z Type.

Issue 10, 24 July 2009

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SECTION 1: GENERAL (ALL TYPES AND VARIANTS)

I. General

1. Data Sheet No: EASA.BA.013 Issue Date: 24 July 2009

2. Type / Variant or Model

   (a) Type: Cameron A Type, Cameron C Type, Cameron GP Type, Cameron H Type, Cameron N Type, Cameron O Type, Cameron TR Type, Cameron V Type, Cameron Z Type, Colt A Type, Colt "Bullet" Type, Thunder A Type, Thunder "Bolt" Type, Thunder AX-Series S1, Thunder AX-Series S2, Thunder Z Type.

   (b) Variant or Model: Refer to Sections 2 to 17

3. Airworthiness Category: Standard

4. Type Certificate Holder: **CAMERON BALLOONS LTD.**
   St Johns Street
   Bedminster
   Bristol BS3 4NH
   UNITED KINGDOM

5. Manufacturer: **CAMERON BALLOONS LTD.**
   St Johns Street
   Bedminster
   Bristol BS3 4NH
   UNITED KINGDOM

6. National certification date: Various, refer to Sections 2-17

7. CAA Application date: Various, refer to Sections 2-17

8. CAA Recommendation date: -

9. EASA Certification date: 2 August 2005

II. Certification Basis

1. Reference date for determining the applicable requirements: Various, refer to Sections 2-17

2. UKCAA Type Certificate Data Sheet No.: Various, refer to Sections 2-17

3. UKCAA Type Certification Basis: Various, refer to Sections 2-17

4. Airworthiness Requirements:

   British Airworthiness Requirements, Manned Free Balloons, Issue 1 dated March 1972 († in Tables 1-16).

   British Airworthiness Requirements, Manned Free Balloons, Draft Issue 2 dated May 1978 (‡ in Tables 1-16)

   British Airworthiness Requirements, Manned Free Balloons, Draft Issue 3 dated September 1979 (◊ in Tables 1-16)

   British Civil Airworthiness Requirements, Part 31, Issue 1, dated 31 August 1984

   EASA CS 31HB (final CG9 draft 27 February 2003) (§ in Tables 1-16).

   EASA CS 31HB Issue 1(€ in Tables 1-16).

5. Special Conditions: *For aircraft certified in accordance with the British Civil Airworthiness Requirements, Part 31, Issue 1 dated 31/8/84, Appendix 1 to CAA letter, ref. 9/30/IPA, and dated 27/02/1989 applies. Refer to Note 2.*

6. Reversion and Exemptions: *None*

7. Equivalent Safety Findings: *None*

III. Technical Characteristics and Operational Limitiations

1. Type Design Definition: Refer to Sections 2-17

2. Description: Manned Free Hot Air Balloons of conventional shape with natural, semi-bulbous or bulbous profiles. Volumes range from 17 000 to 600 000 ft^3 (498 to 16 992 m^3). Envelopes are fitted with rip panel, parachute, combination, Lock Top or rapid deflation systems. Envelope options include rotation vents (turning vents), pressure scoop, skirt, Turbulator and limited inflated artwork as required. The envelope is attached to the burner loadframe/basket using stainless steel flying cables.

   Burners (heaters) are specified in single, double, triple or quadruple configurations dependant on envelope size. Each unit incorporates a main burner, quiet burner and pilot light as a minimum.

   Baskets are generally of traditional woven cane construction in Open, Single Tee or Double Tee Partitions configurations. The stainless steel suspension cables of the basket attach to the burner load frame and envelope using Karabiners.

   Pressurised fuel cylinders, manufactured from Titanium, Stainless Steel or Aluminium, are available in volumes of 47 to 90 litres. The cylinders have the facility to withdraw the fuel as liquid or vapour as required.

   Additional equipment is mounted in the basket as required.

3. Equipment: Equipment is listed in the Approved Cameron Balloons Flight Manual-Issue 9 or later approved EASA revision.

4. Envelope: Refer to Sections 2 to 17 and Cameron Balloons Flight Manual and Supplements-Issue 9 or later approved EASA revision.

5. Burner: Refer to Sections 2 to 17 and Cameron Balloons Flight Manual and Supplements-Issue 9 or later approved EASA revision.

6. Basket: Refer to Sections 2 to 17 and Cameron Balloons Flight Manual and Supplements-Issue 9 or later approved EASA revision.

7. Mass: Refer to Sections 2 to 17. Note: MTOM = Maximum Take-Off Mass, MLM =Minimum Landing Mass.

8. Envelope Temperature: The envelope temperature must not exceed 120°C (250°F).

9. Minimum Crew: One (Pilot).

10. Maximum Occupants: Not to exceed maximum take off mass and limitations. Refer to Approved Aircraft Flight Manual, Issue 9 or later approved EASA revision.

11. Fuel: Commercial Propane.

12. Other Limitations: With the exception of single occupancy balloons, a minimum of two independent cylinders with provision to supply pilot lights (double burner) are required, three such cylinders for a triple burner, four for a quadruple burner. Extra cylinders may be used.

IV. Operation and Service Instructions

1. Cameron Balloons Flight Manual and Supplements-Issue 9 or later approved EASA revision.

2. Cameron Balloons Maintenance Manual and Supplements-Issue 9 or later approved EASA revision.

3. Operation and Service Instructions specific to aircraft registration or constructors number with an issue date prior to 28 September 2003 may continue to be used. Inspection shall be in accordance with the latest issue of the inspection schedule - Cameron Balloons Maintenance Manual and Supplements-Issue 9 or later approved EASA revision refers.

V. Notes

Note 1) For the purpose of maintenance and inspection a log book must be maintained with each hot air balloon envelope. If the burner, basket, instruments and/or cylinders are interchanged, they must be listed in the log book of each envelope with which they are used.

Note 2) Special Conditions (Appendix 1 to CAA letter, ref. 9/30/IPA, dated 27/2/1989) only apply to balloons certified in the UK CAA Transport Category (Passenger):-

Airworthiness Requirements for the issue of Certificates of Airworthiness in the Transport Category for Hot Air Balloons.

Hot air balloons may be granted Certificates of Airworthiness in the Transport Category subject to compliance with the following airworthiness requirements and conditions:

1. The balloon must be a conventional shape hot air balloon.

2. Compliance must be established with the applicable requirements of BCAR 31 "Manned Free Balloons".

3. The heater system (including the burner unit, fuel lines, fuel cells, regulators, control valves and other related elements necessary for the correct functioning of a heater) shall be such that no single failure could prevent operation of at least one heater of adequate capacity to enable a safe landing to be made.

4. Those parts of the heater system mounted above the occupants must be rigidly and robustly supported so that they are unlikely to cause injury to the occupants during a rough landing.

5. The number of passengers that may be carried is limited to a maximum of 19.

6. When the basket is capable of carrying more than 6 persons it shall be divided into compartments, each containing not more than 6 persons.

7. Where the basket proportions and compartmentation are such that more than one person might fall on top of another during landing, there must be a means of preventing this. The means may be by basket orientation, where the balloon has this capability or by other effective means.

8. Certification in the Transport Category will be limited to free flight only.

SECTION 2: Cameron A Type (105 000 - 530 000 ft^3)

CAA UK Type Certificate Data Sheet reference: *BB12*

Manned free hot air balloon with twenty horizontally cut, semi-bulbous gores and twenty flying cables.The envelope general assembly is defined by drawing CB1359. The definition of all variants (models) is listed in Table1.

Table 1 Cameron A Type Definitions, Limitations and Eligible Equipment

Model	Vol. (ft^3)	Vol. (m^3)	Dwg.	MTOM (kg)	MLM (kg)	Burner Cat.	Basket Cat.	Date
A-105	105 000	2974	CB115	952	476	B	B, C, D, E, F, G, H, I, J, K	16-05-73
A-120	120 000	3398	CB617	1088	545	B	C, D, E, F, G, H, I, J, K, L	24-06-88
A-140	140 000	3965	CB105	1270	635	B	D, E, F, G, H, I, J, K, L, M	14-09-72
A-160	160 000	4531	CB653	1451	726	B,C	D, E, F, G, H, I, J, K, L, M, N	07-11-88
A-180	180 000	5098	CB692	1633	817	B,C,D	E, F, G, H, I, J, K, L, M, N, O	18-08-89
A-200	200 000	5664	CB1199	1814	909	B,C,D	G, H, I, J, K, L, M, N, O, P, Q	10-04-97
A-210	210 000	5947	CB199	1905	952	B,C,D	G, H, I, J, K, L, M, N, O, P, Q	25-01-84
A-250	250 000	7080	CB463	2268	1134	C,D	H, I, J, K, L, M, N, O, P, Q	14-05-86
A-275	275 000	7788	CB1147	2494	1248	C,D	I, J, K, L, M, N, O, P, Q	19-04-96
A-300	300 000	8496	CB603	2721	1361	C,D	K, L, M, N, O, P, Q	11-08-88
A-315	315 000	8920	CB1028	2857	1429	C,D	K, L, M, N, O, P, Q	12-08-93
A-340	340 000	9629	CB1166	2857	1429	D	L, M, N, O, P, Q	19-05-96
A-340HL	340 000	9629	CB1148	3084	1542	D	L, M, N, O, P, Q	08-04-98
A-375	375 000	10620	CB761	3402	1701	D	M, N, O, P, Q	08-06-90
A-400	400 000	11328	CB1248	3628	1815	D	N, O, P, Q	23-10-97
A-415	415 000	11753	CB1311	3764	1882	D	N, O, P, Q	25-01-99
A-530	530 000	15010	CB197	4807	2404	D	N, O, P, Q	16-04-02

SECTION 3: Cameron C Type (60 000 - 100 000 ft^3)

CAA UK Type Certificate Data Sheet reference: *BB2*

Manned free hot air balloon with twelve vertically cut gores and twelve flying cables. The envelope general assembly is defined by drawing CB 1363. The definition of all models is listed in Table 2.

Table 2 Cameron C Type Definitions, Limitations and Eligible Equipment

Model	Vol. (ft^3)	Vol. (m^3)	Dwg.	MTOM (kg)	MLM (kg)	Burner Cat.	Basket Cat.	Date
C-60	60 000	1700	CB996	544	-	A, B	A, B, C, D, E, F, G	26-02-92
C-70	70 000	1982	CB1256	635	-	A, B	A, B, C, D, E, F, G, H	23-10-97
C-80	80 000	2266	CB1025	726	-	A, B	A, B, C, D, E, F, G, H, I	19-05-93
C-90	90 000	2549	CB1460	816	-	A, B	A, B, C, D, E, F, G, H, I, J	30-04-02
C-100	100 000	2832	CB1048	907	-	A, B	A, B, C, D, E, F, G, H, I, J,K	23-04-98

SECTION 4: Cameron GP Type (65 000 - 70 000 ft^3)

CAA UK Type Certificate Data Sheet reference: *BB22*

Manned free hot air balloon with twenty four vertically cut gores and twelve flying cables. The envelope may be fitted with an optional "Turbulator" inflated appendage to improve stability in rapid ascents and descents. The envelope general assembly is defined by drawing CB 1539. The definition of all models is listed in Table 3.

Table 3 Cameron GP Type Definitions, Limitations and Eligible Equipment

Model	Vol. (ft^3)	Vol. (m^3)	Dwg.	MTOM (kg)	MLM (kg)	Burner Cat.	Basket Cat.	Date
GP-65	65 000	1841	CB1397	590	-	A, B	A, B, C, D, E, F, G, H	13-06-00
GP-70	70 000	1982	CB1498	635	-	A, B	A, B, C, D, E, F, G, H	02-06-03

SECTION 5: Cameron H Type (20,000-34,000 ft^3)

CAA UK Type Certificate Data Sheet reference: *Not Issued*

Manned free hot air balloon with fifteen vertically cut gores and fifteen flying cables. The envelope general assembly is defined by drawing CB 1365. The definition of all models is listed in Table 4.

Table 4 Cameron H Type Definitions, Limitations and Eligible Equipment

Model	Vol. (ft^3)	Vol. (m^3)	Dwg.	MTOM (kg)	MLM (kg)	Burner Cat.	Basket Cat.	Date
H-20	20 000	566	CB683	181	-	A1	A1	09-11-89
H-24	24 000	680	CB729	218	-	A1	A1	09-11-89
H-34	34 000	963	CB730	308	-	A1	A1	09-11-89

SECTION 6: Cameron N Type (31 450 - 210 000 ft^3)

CAA UK Type Certificate Data Sheet reference: *BB4*

Manned free hot air balloon with twenty four or thirty two vertically cut, smooth gores and twelve or sixteen flying cables. The envelope general assembly is defined by drawing CB 1361. The definition of all models is listed in Table 5.

Table 5: Cameron N Type; Definitions, Limitations and Eligible Equipment

Model	Vol. (ft^3)	Vol. (m^3)	Dwg.	MTOM (kg)	MLM (kg)	Burner Cat.	Basket Cat.	Date
N-31	31 450	890	CB476	285	-	A,	A, B, C, D	30-05-78
N-42	42 000	1190	CB476	381	-	A,	A, B, C, D, E	27-04-83
N-56	56 000	1586	CB476	508	-	A, B	A, B, C, D, E, F, G	21-04-77◊
N-65	65 000	1841	CB476	590	-	A, B	A, B, C, D, E, F, G, H	17-01-80◊
N-70	70 000	1982	CB476	635	-	A, B	A, B, C, D, E, F, G, H	04-08-94
N-77	77 500	2195	CB476	703	-	A, B	A, B, C, D, E, F, G, H, I	24-05-77
N-90	90 000	2549	CB476	816	-	A, B	A, B, C, D, E, F, G, H, I, J	09-06-83
N-100	100 000	2832	CB476	907	-	A, B	B, C, D, E, F, G, H, I, J, K	08-01-88
N-105	105 000	2974	CB476	952	476	B	B, C, D, E, F, G, H, I, J, K	01-08-79
N-120	120 000	3398	CB476	1088	544	B	C, D, E, F, G, H, I, J, K, L	06-05-88
N-133	133 000	3767	CB476	1206	603	B	C, D, E, F, G, H, I, J, K, L	04-08-88
N-145	145 000	4106	CB476	1315	657	B, C	D, E, F, G, H, I, J, K, L, M	21-06-88
N-160	160 000	4531	CB476	1451	725	B, C	E, F, G, H, I, J, K, L, M, N	08-04-86
N-180	180 000	5098	CB476	1633	816	B, C, D	E, F, G, H, I, J, K, L, M, N, O	04-01-85
N-210	210 000	5947	CB476	1905	952	B, C, D	G, H, I, J, K, L, M, N, O, P, Q	01-06-94

SECTION 7: Cameron O Type (31 450 - 160 000 ft^3)

CAA UK Type Certificate Data Sheet reference: *BB1*

Manned free hot air balloon with twelve horizontally cut, bulbous gores and twelve flying cables. The envelope general assembly is defined by drawing CB 1360. The definition of all models is listed in Table 6.

Table 6: Cameron O Type; Definitions, Limitations and Eligible Equipment

Model	Vol. (ft^3)	Vol. (m^3)	Dwg.	MTOM (kg)	MLM (kg)	Burner Cat.	Basket Cat.	Date
O-31	31 450	890	CB110	285	-	A	A, B, C, D	31-01-73
O-42	42 000	1190	CB101	381	-	A,	A, B, C, D, E	04-08-72◊
O-56	56 000	1586	CB45	508	-	A, B	A, B, C, D, E, F, G	21-04-77†
O-65	65 000	1841	CB54	590	-	A, B	A, B, C, D, E, F, G, H	18-01-80◊
O-77	77 500	2195	CB112	703	-	A, B	A, B, C, D, E, F, G, H, I	10-04-73
O-84	84 000	2379	CB49	762	-	A, B	A, B, C, D, E, F, G, H, I	20-07-71
O-90	90 000	2549	CB658	816	-	A, B	A, B, C, D, E, F, G, H, I, J	19-12-88
O-105	105 000	2974	CB167	952	477	B	B, C, D, E, F, G, H, I, J, K	31-05-79
O-120	120 000	3398	CB505	1088	545	B	C, D, E, F, G, H, I, J, K, L	28-08-87
O-140	140 000	3965	CB772	1270	635	B, C	D, E, F, G, H, I, J, K, L, M	28-03-90
O-160	160 000	4531	CB368	1451	726	B, C	D, E, F, G, H, I, J, K, L, M, N	09-06-83

SECTION 8: Cameron TR Type (60 000 – 84 000 ft^3)

CAA UK Type Certificate Data Sheet reference: *BB22*

Manned free hot air balloon with twenty four vertically cut gores and twelve flying cables. The envelope may be fitted with an optional “Turbulator” inflated appendage to improve stability in rapid ascents and descents. The envelope general assembly is defined by drawing CB 1523. The definition of all models is listed in Table 7.

Table 7: Cameron TR Type; Definitions, Limitations and Eligible Equipment

Model	Vol. (ft^3)	Vol. (m^3)	Dwg.	MTOM (kg)	MLM (kg)	Burner Cat.	Basket Cat.	Date
TR-60	60 000	1 700	CB1520	544	-	A, B	A, B, C, D, E, F	19-09-05§
TR-70	70 000	1 982	CB1519	635	-	A, B	A, B, C, D, E, F	14-05-04§
TR-77	77 500	2 195	CB1591	703	-	A, B	A, B, C, D, E, F	03-03-08§
TR-84	84 000	2 379	CB1612	762	-	A, B	A, B, C, D, E, F	30-06-09 €

SECTION 9: Cameron V Type (31 450 - 90 000 ft^3)

CAA UK Type Certificate Data Sheet reference: *BB13*

Manned free hot air balloon with eight horizontally cut, bulbous gores and eight flying cables. The envelope general assembly is defined by drawing CB1362. The definition of all models is listed in Table 8.

Table 8: Cameron V Type; Definitions, Limitations and Eligible Equipment

Model	Vol. (ft^3)	Vol. (m^3)	Dwg.	MTOM (kg)	MLM (kg)	Burner Cat.	Basket Cat.	Date
V-31	31 450	890	CB149	285	-	A,	A, B, C, D	17-01-78
V-42	42 000	1190	CB369	381	-	A,	A, B, C, D, E	27-04-83◊
V-56	56 000	1586	CB134	508	-	A, B	A, B, C, D, E, F, G	12-04-76◊
V-65	65 000	1841	CB166	590	-	A, B	A, B, C, D, E, F, G, H	23-03-79◊
V-77	77 500	2195	CB170	703	-	A, B	A, B, C, D, E, F, G, H, I	30-05-78
V-90	90 000	2549	CB817	816	-	A, B	A, B, C, D, E, F, G, H, I, J	07-12-90

SECTION 10: Cameron Z Type (31 450 - 600 000 ft^3)

CAA UK Type Certificate Data Sheet reference: *BB21*

Manned free hot air balloon with twenty four, twenty eight or thirty two horizontally cut, smooth gores and twelve, twenty four or twenty eight flying cables. The envelope general assembly is defined by drawing CB 1364. The definition of all models is listed in Table 9.

Table 9: Cameron Z Type; Definitions, Limitations and Eligible Equipment

Model	Vol. (ft^3)	Vol. (m^3)	Dwg.	MTOM (kg)	MLM (kg)	Burner Cat.	Basket Cat.	Date
Z-31	31 450	890	CB1462	285	-	A, A1	A, B, C, D	07/05/02
Z-42	42 000	1190	CB1463	381	-	A, A1	A, B, C, D, E	05/03/03
Z-56	56 000	1586	CB1464	508	-	A, B	A, B, C, D, E, F, G	24/07/09€
Z-65	65 000	1841	CB1346	590	-	A, B	A, B, C, D, E, F, G, H	16/04/99
Z-69	69 000	1954	CB1465	626	-	A, B	A, B, C, D, E, F, G, H	04/08/04§
Z-77	77 500	2195	CB1342	703	-	A, B	A, B, C, D, E, F, G, H, I	24/05/99
Z-90	90 000	2549	CB1340	816		A, B	A, B, C, D, E, F, G, H, I, J	16/04/99
Z-105	105 000	2974	CB1345	952	476	B	B, C, D, E, F, G, H, I, J, K	14/07/99
Z-120	120 000	3398	CB1348	1088	544	B	C, D, E, F, G, H, I, J, K, L	12/04/02
Z-133	133 000	3767	CB1349	1206	603	B	C, D, E, F, G, H, I, J, K, L	02/06/00
Z-140	140 000	3965	CB1477	1270	635	B, C	D, E, F, G, H, I, J, K, L, M	21/02/02
Z-145	145 000	4106	CB1350	1315	658	B, C	D, E, F, G, H, I, J, K, L, M	06/04/00
Z-150	150 000	4248	CB1473	1361	681	B, C	D, E, F, G, H, I, J, K, L, M	15/11/01
Z-160	160 000	4531	CB1351	1451	726	B, C	D, E, F, G, H, I, J, K, L, M, N	07/08/00
Z-180	180 000	5098	CB1352	1633	817	B, C, D	E, F, G, H, I, J, K, L, M, N, O	31/01/02
Z-210	210 000	5947	CB1353	1905	952	B, C, D	G, H, I, J, K, L, M, N, O, P, Q	23/04/01
Z-225	225 000	6372	CB1466	2041	1021	C, D	G, H, I, J, K, L, M, N, O, P, Q	29/07/02
Z-250	250 000	7080	CB1459	2268	1134	C, D	H, I, J, K, L, M, N, O, P, Q	02/04/02
Z-275	275 000	7788	CB1467	2494	1247	C, D	I, J, K, L, M, N, O, P, Q	24/02/03
Z-315	315 000	8920	CB1468	2857	1429	C, D	K, L, M, N, O, P, Q	19/04/02
Z-350	350 000	9912	CB1469	3175	1588	D	L, M, N, O, P, Q	04/03/03
Z-375	375 000	10620	CB1470	3401	1700	D	M, N, O, P, Q	16/09/05§
Z-400	400 000	11328	CB1471	3628	1814	D	N, O, P, Q	18/03/04§
Z-425LW	425 000	12036	CB1502	3662	1831	D	N, O, P, Q	25/06/03§
Z-450	450 000	12744	CB1472	4082	2041	D	N, O, P, Q	27/11/06§
Z-600	600 000	16992	CB1565	5089	2545	D	N, O, P, Q ,R	06/04/06§

SECTION 11: Colt A Type (17 000 - 450 000 ft^3)

CAA UK Type Certificate Data Sheet reference: *BB17*

Manned free hot air balloon with twenty four, twenty eight or thirty two horizontally cut, smooth gores and twelve, twenty four or twenty eight flying cables. The envelope general assembly is defined by drawing CB 1368. The definition of all models is listed in Table 10.

Table 10: Colt A Type; Definitions, Limitations and Eligible Equipment

Model	Vol. (ft^3)	Vol. (m^3)	Dwg.	MTOM (kg)	MLM (kg)	Burner Cat.	Basket Cat.	Date
17A	17 600	498	CB1122	160		A	A	01-09-81◊
21A	21 000	595	CB1090	191		A	A	01-11-81◊
25A	25 000	708	CB1461	227		A	A, B	01-09-91
31A	31 450	890	CB1462	285	-	A	A, B, C, D	01-01-80◊
42A	42 000	1190	CB1463	381	-	A	A, B, C, D, E	01-10-83
56A	56 000	1586	CB1464	508	-	A, B	A, B, C, D, E, F, G	13-11-78‡
69A	69 000	1954	CB1465	626	-	A, B	A, B, C, D, E, F, G, H	01-10-81
77A	77 500	2195	CB1342	703	-	A, B	A, B, C, D, E, F, G, H, I	07-06-78
90A	90 000	2549	CB1340	816		A, B	A, B, C, D, E, F, G, H, I, J	08-02-85
105A	105 000	2974	CB1345	952	476	B	B, C, D, E, F, G, H, I, J, K	01-10-79
120A	120 000	3398	CB1348	1088	544	B	C, D, E, F, G, H, I, J, K, L	20-10-86
140A	140 000	3965	CB1477	1270	635	B, C	C, D, E, F, G, H, I, J, K, L	10-05-94
150A	150 000	4248	CB1473	1361	681	B, C	D, E, F, G, H, I, J, K, L, M	25-03-02
160A	160 000	4531	CB1351	1451	726	B, C	D, E, F, G, H, I, J, K, L, M	01-04-80
180A	180 000	5098	CB1352	1633	817	B, C, D	D, E, F, G, H, I, J, K, L, M	16-12-85
210A	210 000	5947	CB1353	1905	952	B, C, D	D, E, F, G, H, I, J, K, L, M, N	17-07-91
240A	240 000	6797	CB1128	2177	1088	C, D	G, H, I, J, K, L, M, N, O, P, Q	15-04-82
260A	260 000	7363	CB1129	2358	1179	C, D	H, I, J, K, L, M, N, O, P, Q	01-06-92
300A	300 000	8496	CB1130	2721	1360	C, D	K, L, M, N, O, P, Q	01-07-86
315A	315 000	8920	CB1468	2857	1429	C, D	K, L, M, N, O, P, Q	27-05-92
400A	400 000	11328	CB1471	3628	1814	D	N, O, P, Q	05-10-98

SECTION 12: Colt 'Bullet' Type (56 000 - 90 000 ft^3)

CAA UK Type Certificate Data Sheet reference: *BB18*

Manned free hot air balloon with sixteen alternately horizontally and vertically cut smooth gores and eight flying cables. The envelope general assembly is defined by drawing CB 1369. The definition of all models is listed in Table 11.

Table 11: Colt Bullet Type; Definitions, Limitations and Eligible Equipment

Model	Vol. (ft^3)	Vol. (m^3)	Dwg.	MTOM (kg)	MLM (kg)	Burner Cat.	Basket Cat.	Date
56B	56 000	1586	CB1132	508	-	A, B	A, B, C, D, E, F, G	03-07-81◊
77B	77 000	2190	CB1133	697	-	A, B	A, B, C, D, E, F, G, H, I	07-02-80◊
90B	90 000	2549	CB1143	816	-	A, B	A, B, C, D, E, F, G, H, I, J	24-04-01

SECTION 13: Thunder A Type (Series 3) (56 000 - 77 000 ft^3)

CAA UK Type Certificate Data Sheet reference: *Not Issued*

Manned free hot air balloon with twenty four or thirty two vertically cut, smooth gores and twelve, twenty four or thirty two flying cables. The envelope general assembly is defined by drawing CB 1540. The definition of all models is listed in Table 12.

Table 12: Thunder A Type; Definitions, Limitations and Eligible Equipment

Model	Vol. (ft^3)	Vol. (m^3)	Dwg.	MTOM (kg)	MLM (kg)	Burner Cat.	Basket Cat.	Date
AX6-56A	56 000	1586	CB1541	508	-	A, B	A, B, C, D, E, F, G	01-01-74†
AX7-77A	77 000	2190	CB1542	697	-	A, B	A, B, C, D, E, F, G, H, I	13-09-74†

SECTION 14: Thunder "Bolt" Type (Series 5) (42 000 - 77 000 ft^3)

CAA UK Type Certificate Data Sheet reference: *Not Issued*

Manned free hot air balloon with eight vertically cut, bulbous gores and eight flying cables. The envelope general assembly is defined by drawing CB 1543. The definition of all models is listed in Table 13.

Table 13: Thunder A Type; Definitions, Limitations and Eligible Equipment

Model	Vol. (ft^3)	Vol. (m^3)	Dwg.	MTOM (kg)	MLM (kg)	Burner Cat.	Basket Cat.	Date
AX5-42Bolt	42 000	1190	CB1544	381		A	A, B, C, D, E	01-03-79
AX6-56Bolt	56 000	1586	CB1545	508	-	A, B	A, B, C, D, E, F, G	08-12-78
AX7-65Bolt	65 000	1841	CB1546	590		A, B	A, B, C, D, E, F, G,H	01-03-79
AX7-77Bolt	77 000	2190	CB1547	697	-	A, B	A, B, C, D, E, F, G, H, I	17-11-78

SECTION 15: Thunder AX-Series S1 (Series 1) (42 000 - 180 000 ft^3)

CAA UK Type Certificate Data Sheet reference: *BB15*

Manned free hot air balloon with twelve horizontally cut, bulbous gores and twelve flying cables. The envelope general assembly is defined by drawing CB 1366. The definition of all models is listed in Table 14.

Table 14: Thunder AX-Series S1 Type; Definitions, Limitations and Eligible Equipment

Model	Vol. (ft^3)	Vol. (m^3)	Dwg.	MTOM (kg)	MLM (kg)	Burner Cat.	Basket Cat.	Date
AX5-42 S1	42 000	1190	CB1134	381	-	A	A, B, C, D, E	01-11-86
AX6-56 S1	56 000	1586	CB1135	508	-	A, B	A, B, C, D, E, F, G	01-01-73†
AX7-65 S1	65 000	1841	CB1136	590	-	A, B	A, B, C, D, E, F, G,H	01-05-74
AX7-77 S1	77 500	2195	CB1080	703	-	A, B	A, B, C, D, E, F, G,H,I	01-01-73
AX8-84 S1	84 000	2379	CB1125	762		A, B	A, B, C, D, E, F, G,H,I	01-04-79‡
AX8-90 S1	90 000	2549	CB1199	816	-	B	B, C, D, E, F, G, H,I,J	09-05-85
AX8-105 S1	105 000	2974	CB1107	952	476	B	C, D, E, F, G, H,I,J,K,L	04-03-86
AX9-120 S1	120 000	3398	CB1137	1088	544	B, C	C, D, E, F, G, H, I,J,K,L	23-01-92
AX10-160 S1	160 000	4531	CB1138	1451	726	B, C	D, E, F, G, H, I, J,K,L,M,N	01-04-84
AX10-180 S1	180 000	5098	CB1139	1633	817	B, C, D	E, F, G, H, I, J, K,L,M,N,O	01-02-85

SECTION 16: Thunder AX-Series S2 (Series 2) (90 000 - 250 000 ft^3)

CAA UK Type Certificate Data Sheet reference: *BB12*

Manned free hot air balloon with twenty horizontally cut, semi-bulbous gores and twenty flying cables. The envelope general assembly is defined by drawing CB1367. The definition of all models is listed in Table 15.

Table 15: Thunder AX-Series S2 Type; Definitions, Limitations and Eligible Equipment

Model	Vol. (ft^3)	Vol. (m^3)	Dwg.	MTOM (kg)	MLM (kg)	Burner Cat.	Basket Cat.	Date
AX8-90 S2	90 000	2549	CB1082	816	-	A, B	A, B, C, D, E, F, G,H,I,J	01-01-77
AX8-105 S2	105 000	2974	CB1088	952	476	B	B, C, D, E, F, G, H,I,J,K	05-03-74
AX9-120 S2	120 000	3398	CB1105	1088	545	B	C, D, E, F, G, H,I,J,K,L	01-09-91
AX9-140 S2	140 000	3965	CB1079	1270	635	B, C	C, D, E, F, G, H, I,J,K,L,M	01-12-78
AX10-150 S2	150 000	4248	CB1344	1361	680	B, C	C, D, E, F, G, H, I,J,K,L,M	04-03-99
AX10-160 S2	160 000	4531	CB1140	1451	726	B, C	D, E, F, G, H, I, J,K,L,M,N	01-04-91
AX10-180 S2	180 000	5098	CB1141	1633	817	B, C, D	E, F, G, H, I, J, K, L, M, N, O	01-07-91
AX10-210 S2	210 000	5947	CB1142	1905	952	B, C, D	G, H, I, J, K,L,M,N,O,P,Q	02-03-95
AX11-225 S2	225 000	6372	CB1200	2041	1020	C, D	G, H, I, J, K,L,M,N,O,P,Q	10-03-97
AX11-250 S2	250 000	7080	CB1194	2268	1134	C, D	H, I, J, K,L,M,N,O,P,Q	27-02-97

SECTION 17: Thunder Z Type (Series 4) (31 000 - 160 000 ft^3)

CAA UK Type Certificate Data Sheet reference: *Not Issued*

Manned free hot air balloon with sixteen, twenty, twenty four or twenty eight horizontally cut, bulbous gores and sixteen, twenty, twenty four or twenty eight flying cables. The envelope general assembly is defined by drawing CB 1548. The definition of all models is listed in Table 16.

Table 16: Thunder Z Type; Definitions, Limitations and Eligible Equipment

Model	Vol. (ft^3)	Vol. (m^3)	Dwg.	MTOM (kg)	MLM (kg)	Burner Cat.	Basket Cat.	Date
AX4-31Z	31 000	878	CB1549	285	-	A	A, B, C, D	26-03-84◊
AX6-56Z	56 000	1586	CB1550	508	-	A, B	A, B, C, D, E, F, G	11-01-78†
AX7-65Z	65 000	1841	CB1551	590	-	A, B	A, B, C, D, E, F, G,H	18-01-82◊
AX7-77Z	77 500	2195	CB1552	703	-	A, B	A, B, C, D, E, F, G,H,I	01-09-77†
AX8-105Z	105 000	2974	CB1573	952	476	B	C, D, E, F, G, H,I,J,K,L	30-05-82◊
AX10-160Z	160 000	4531	CB1553	1451	726	B, C	D, E, F, G, H, I, J,K,L,M	01-05-83◊

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