DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

4A21
Revision 8
BOEING
707-100 Long Body
707-200
707-100B Long Body
707-100B Short Body

May 1, 1973

TYPE CERTIFICATE DATA SHEET NO. 4A21

This data sheet which is a part of type certificate No. 4A21 prescribes conditions and limitations under which the product for which the type certificate was issued meets the airworthiness requirements of the Civil Air Regulations.

Type Certificate Holder — THE BOEING COMPANY
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I - Model 707-100 Long Body (Transport Aircraft), approved September 18, 1958

The Model 707-100 Long Body has several different versions due to different installations of fuel tankage, baggage compartment, equipment, interiors, airplane flight manuals, etc. These versions are as follows:

Version	Serial Nos. Eligible
707-124	17609 thru 17612 and 18012
707-131	17658 thru 17672

Engines — 4 Pratt and Whitney Turbo Wasp JT3C-6 Turbojet
Fuel — See NOTE 12

		Certification Limits 707-100 Long Body
Engine limits	Takeoff static net thrust (standard day), lb., at sea level	
	Dry (5 minutes)	11,200
	Water injection (2-1/2 minutes)	*13,000
	* See NOTE 7(c) for optional engine rating	
	Maximum continuous static thrust, (standard day), lb., at sea level)	10,000
	Maximum permissible engine rotors operating speeds:	
	Low pressure compressor (N_1), r.p.m.	7,000 (113%)
	High pressure compressor (N_2), r.p.m.	9,950 (99.7%)
	Maximum E.P.R. values shown in the Airplane Flight Manual shall not be exceeded	
	Maximum permissible turbine outlet gas temperatures:	
	Takeoff (5 minutes dry; 2-1/2 minutes wet)	(630°C) 1166°F
	Maximum continuous	(560°C) 1040°F
	Maximum for acceleration (2 minutes)	(650°C) 1202°F
	Starting maximum gas temperature (Ground)	(450°C) 842°F

Maximum permissible air bleed extractions of total engine air flow:

High pressure compressor	
From idle to maximum continuous	5.5%
At takeoff	2.0%
Low pressure compressor	
From idle to maximum continuous	1.0%
At takeoff	2.2%

Airspeed limits (IAS)

Case I is applicable to the 707-131 version.
Case II and Case III are applicable to the 707-124 version.
Case I covers normal operations up to a gross weight of 248,000 lb.
Case II covers normal operations up to a gross weight of 258,000 lb. with a restriction in forward C.G. limit of 17% up to 250,000 lb. and a linear increase to 18% at 258,000 lb.
Case III covers operations up to a gross weight of 258,000 lb. with restriction in airspeeds with the C.G. forward of the Case II limits.
Speed limitations for Case I and II are identical.

Case I and II Operations

Vmo (maximum Operating)

390 m.p.h. at sea level	(339 kt.)
398 m.p.h. at 5,000 ft.	(345 kt.)
406 m.p.h. at 10,000 ft.	(352 kt.)
415 m.p.h. at 15,000 ft.	(360 kt.)
425 m.p.h. at 20,000 ft.	(369 kt.)
434 m.p.h. at 24,900 ft.	(377 kt.)

Mmo = .884 at 24,900 ft. and above

Va (Maneuvering)

286 m.p.h. at sea level	(249 kt.)
292 m.p.h. at 20,000 ft.	(254 kt.)
314 m.p.h. at 39,500 ft.	(273 kt.)

Ma = .884 at 39,500 ft. and above

Vfe (Flap Speeds) (flaps not to be extended above 20,000 feet)

Max. Flap Deflection	(MPH)	(KT.)
20°	251	218
30°	239	208
50°	211	183

Vlo (Landing Gear Operation)

310 m.p.h. at sea level to 30,000 ft.	(269 kt.)
324 m.p.h. at 30,000 ft. to 35,000 ft.	(281 kt.)

Mlo = .825 Mach at 35,000 ft. and above

Vle (Landing Gear Extended)

367 m.p.h. to 29,300 ft.	(319 kt.)

Mle = .825 Mach at 29,300 ft and above

Landing Light Extended

439 m.p.h. at sea level to 24,200 ft.	(381 kt.)

M = .884 at 24,200 ft. and above

Maximum Dump Chute Extended and Extending Speed

Extending speed 275 m.p.h. to 41,700 ft. (239 kt.)
M = .825 above 41,700 ft.
Extended speed 315 m.p.h. to 36,200 ft. (274 kt.)
M - .825 at 36,200 ft. and above

Vmc (Minimum Control Speed) - One engine inoperative
For wet takeoff thrust
140 m.p.h. (122 kt.) sea level and standard day
For dry takeoff thrust
128 m.p.h. (111 kt.) sea level and standard day

Case III Operation
Vmo (Maximum Operating)
390 m.p.h. at sea level to 30,000 ft. (339 kt.)
to Mmo = .884 at 30,000 ft. and above

Other airspeed limitations are the same as Case I and II.

C.G. range and Datum

The nose gear retraction moment is 18,600 in.-lb. and moves C.G. forward. The main gear retracts parallel to the Wing Reference Axis; hence, has no effect on airplane C.G.

All stations noted in the Data Sheet are Body Stations unless identified specifically as moment arms. Dwg. 69-10819 defines Body Stations and moment arms. Datum is 50 in. forward of nose (moment arm = 0) for weight and balance purposes. Horizontal distance of datum to average wing jack point is 810.5 in.

The weight and C.G. locations for Case I, II, and III operation are indicated in chart below:

Gross Weight	Forward Limit	Aft Limit
	Case I	
248,000 lb.	15.0% MAC (Sta. 822.5)	32.0% MAC (Sta. 863.6)
238,000 lb.	14.0% MAC (Sta. 820.1)	35.0% MAC (Sta. 870.9)
220,000 lb.	14.0% MAC (Sta. 820.1)	35.0% MAC (Sta. 870.9)
190,000 lb.	14.0% MAC (Sta. 820.1)	33.3% MAC (Sta. 866.8)
185,000 lb.	16.0% MAC (Sta. 824.9)	33.1% MAC (Sta. 866.3)
130,000 lb.	16.0% MAC (Sta. 824.9)	30.0% MAC (Sta. 858.8)
	Case II	
258,000 lb.	18.0% MAC (Sta. 829.7)	25.0% MAC (Sta. 846.7)
250,000 lb.	17.0% MAC (Sta. 827.3)	30.6% MAC (Sta. 860.2)
248,000 lb.	17.0% MAC (Sta. 827.3)	32.0% MAC (Sta. 863.6)
238,000 lb.	17.0% MAC (Sta. 827.3)	35.0% MAC (Sta. 870.9)
220,000 lb.	17.0% MAC (Sta. 827.3)	35.0% MAC (Sta. 870.9)
130,000 lb.	17.0% MAC (Sta. 827.3)	30.0% MAC (Sta. 858.9)
	Case III	
258,000 lb.	16.0% MAC (Sta. 824.9)	25.0% MAC (Sta. 846.7)
250,000 lb.	15.0% MAC (Sta. 822.5)	30.6% MAC (Sta. 860.2)
248,000 lb.	15.0% MAC (Sta. 822.5)	32.0% MAC (Sta. 863.6)
238,000 lb.	15.0% MAC (Sta. 822.5)	35.0% MAC (Sta. 870.9)
220,000 lb.	15.0% MAC (Sta. 822.5)	35.0% MAC (Sta. 870.9)
190,000 lb.	15.0% MAC (Sta. 822.5)	33.3% MAC (Sta. 866.8)
185,000 lb.	17.0% MAC (Sta. 827.3)	33.1% MAC (Sta. 866.3)
130,000 lb.	17.0% MAC (Sta. 827.3)	30.0% MAC (Sta. 858.8)

(1) Straight line variation between values.
(2) The aft C.G. limitation shown in the above table for gross weights below 220,000 lb. applies to takeoff conditions only. For airborne or landing conditions below 220,000 lb., the aft C.G. limitation is 35.0% MAC (BS 870.9).

Maximum weights

	707-131 (See NOTE 14) (lb.)	707-124 (See NOTE 8) (lb.)
Maximum ramp weight	248,000	258,000
Maximum flight weight, flaps 30°	246,000	256,000
Maximum flight weight, flaps up	243,000	253,000
Maximum flight weight at which the outboard auxiliary fuel tanks can be empty	233,000	233,000
Maximum landing weight	190,000	190,000
Maximum zero fuel weight	170,000	170,000

Maximum baggage

707-124, -131

Compt.	Body Station	Maximum Load (lb./sq.ft.)	Maximum Concentration (lb./sq.ft.)	Capacity (lb.)	Moment Arm
Fwd. Belly	400-600H+6	47	150	9000	+ 453
Aft Belly	960-1060	50	150	7000*	+1030
Aft Belly	1060-1200	35	150	4900*	+1170
Aft Belly	1200-1300	20	150	2000*	+1290

*Total aft compartment capacity should not exceed the following:

Version	Capacity, lb.
707-124	13,900
707-131	10,800

Fuel capacity

See NOTE 1(c) for information relative to unusable fuel; NOTE 1(d) for required fuel usage procedure; NOTE 1(e) for undumpable fuel.

The following data are given for full fuel tanks. See Boeing Documents indicted below for other fuel and water C.G. locations with partially filled tanks:

Version	Document
707-124	D6-1854
707-131	D6-1853

Tanks	Nominal Capacity (Usable fuel in tank) (U.S. Gal. per Tank)	Max. Capacity (lb. per Tank)	Moment Arm
707-124 (Serial Nos. 17609 thru 17612 only)			
No. 1 & No. 4 Reserve	434	2,995	1082.6
No. 1 & No. 4 Main	2,333	16,098	916.2
No. 2 & No. 3 Main	2,283	15,753	791.6
Center	3,386	23,363	740.0
Total	13,486	93,055	
707-131			
No. 1 & No. 4 Reserve	434	2,995	1082.6
No. 1 & No. 4 Main	2,333	16,098	916.6
No. 2 & No. 3 Main	2,283	15,753	791.2
Center	5,356	36,956	744.6
Total	15,456	106,648	

707-124 (Serial No. 18012 only)			
No. 1 & No. 4 Reserve	434	2,995	1082.6
No. 1 & No. 4 Main	2,333	16,098	916.6
No. 2 & No. 3 Main	2,283	15,753	791.2
Center	7,306	50,411	734.7
Total	17,406	120,103	

Oil tank capacity

Engine Oil Tank No.	Location	Volume Capacity	Moment Arm
1	Outboard Port	6.5 gal.	869
2	Inboard Port	6.5 gal.	686
3	Inboard Starboard	6.1 gal.	686
4	Outboard Starboard	6.1 gal.	869

The system oil capacities are given in Weight and Balance Control Manuals as noted under "Fuel Capacity".

Thrust Augmentation Water Capacity

Total	Usable	Moment Arm
(709 gal.) (5913 lb.)	*(709 gal.) (5913 lb.)	925.7

* 22.8 gal. is unusable but drainable; therefore, it will not be included in the airplane empty weight.

II - Model 707-200 (Transport Aircraft), approved November 5, 1959

(Same as Model 707-100 Long Body except for engines and associated changes and limitations)

Version	Serial Nos. Eligible
707-227	17691 thru 17695

Engines: 4 Pratt and Whitney Turbo Wasp JT4A-3/5 or JT4A-9/10 Turbojet
(See NOTE 5 for interchangeability of engines)
(Operation of the Pratt and Whitney JT4A-9/-10 Engines must be at JT4A-3/-5 Engine Thrust Settings and Ratings, with the exception stated in NOTE 13.)

Engine limits

	JT4A-3/5	JT4A-9/10
Takeoff static net thrust (standard day), lb., at sea level, Dry (5 minutes)	15,800	16,800
Maximum continuous static thrust, (standard day), lb., at sea level)	12,500	13,500
Maximum permissible engine rotors operating speeds:		
Low pressure compressor (N_1), r.p.m.	6,950	7,060
High pressure compressor (N_2), r.p.m.	9,050	9,135

Maximum E.P.R. values shown in the Airplane Flight Manual shall not be exceeded

Maximum permissible turbine outlet gas temperatures:

Takeoff (5 min.)	(607°C) 1125°F	(635°C) 1175°F
Maximum continuous	(500°C) 932°F	(516°C) 960°F
Maximum for acceleration (2 min.)	(607°C) 1125°F	(635°C) 1175°F
Starting maximum gas temperature		
Ground	(450°C) 842°F	(450°C) 842°F
In flight	(475°C) 887°F	(475°C) 887°F

Maximum permissible air bleed extractions of total engine air flow:

High pressure compressor		
At takeoff	1.5%	1.5%
All other running	5.5%	5.5%
Low pressure compressor		
At takeoff	1.6%	1.65%
All other running	2.0%	2.0%

For 3-engine takeoff, N_1 bleed 1.9%, N_2 bleed 2.2%

Airspeed limits (IAS)

Vmo (Maximum Operating Speed)

390 m.p.h. at sea level	(339 kt.)
398 m.p.h. at 5,000 ft.	(345 kt.)
406 m.p.h. at 10,000 ft.	(352 kt.)
415 m.p.h. at 15,000 ft.	(360 kt.)
425 m.p.h. at 20,000 ft.	(369 kt.)
434 m.p.h. at 24,900 ft.	(377 kt.)

Mmo = .884 at 24,900 ft. and above

Va (Maneuvering)

286 m.p.h. at sea level	(249 kt.)
292 m.p.h. at 20,000 ft.	(254 kt.)
314 m.p.h. at 39,500 ft.	(273 kt.)

Ma = .884 at 39,500 ft. and above

Vfe (Flap Speeds) (flaps not to be extended above 20,000 feet)

Max. Flap Deflection	(MPH)	(KT.)
20°	251	218
30°	240	208
50°	211	183

Vlo (Landing Gear Operation)

310 m.p.h. at sea level to 30,000 ft. (269 kt.)
324 m.p.h. at 30,000 ft. to 35,000 ft. (281 kt.)
Mlo = .825 Mach at 35,000 ft. and above

Vle (Landing Gear Extended)

367 m.p.h. to 29,300 ft. (319 kt.)
Mle = .825 Mach at 29,300 ft. and above

Landing Light Extended

439 m.p.h. at sea level to 24,200 ft. (381 kt.)
M = .884 at 24,200 ft. and above

Maximum Dump Chute Extended and Extending Speed
Extending speed 275 m.p.h. to 41,700 ft. (239 kt.)
M = .825 above 41,700 ft.
Extended speed 315 m.p.h. to 36,200 ft. (274 kt.)
M - .825 at 36,200 ft. and above

Vmc (Minimum Control Speed) - One engine inoperative
For takeoff thrust
126 m.p.h. (109 kt.) sea level and standard day

C.G. range and Datum

The nose gear retraction moment is 18,600 in.-lb. and moves C.G. forward. The main gear retracts parallel to the Wing Reference Axis; hence, has no effect on airplane C.G.

All stations noted in the Data Sheet are Body Stations unless identified specifically as moment arms. Dwg. 69-10819 defines Body Stations and moment arms. Datum is 50 in. forward of nose (moment arm = 0) for weight and balance purposes. Horizontal distance of datum to average wing jack point is 810.5 in.

The weight and C.G. locations are indicated in chart below:

Gross Weight	Forward Limit		Aft Limit
258,000 lb.	16.0% MAC (Sta. 824.9)	18.0% MAC (Sta. 829.7)	25.0% MAC (Sta. 847.7)
250,000 lb.	15.0% MAC (Sta. 822.5)	17.0% MAC (Sta. 827.3)	32.0% MAC (Sta. 863.6)
248,000 lb.	15.0% MAC (Sta. 822.5)	17.0% MAC (Sta. 827.3)	35.0% MAC (Sta. 870.9)
235,000 lb.	15.0% MAC (Sta. 822.5)	17.0% MAC (Sta. 827.3)	35.0% MAC (Sta. 870.9)
195,000 lb.	15.0% MAC (Sta. 822.5)	17.0% MAC (Sta. 827.3)	32.7% MAC (Sta. 865.3)
190,000 lb.	17.0% MAC (Sta. 827.3)	17.0% MAC (Sta. 827.3)	32.4% MAC (Sta. 864.7)
130,000 lb.	17.0% MAC (Sta. 827.3)	17.0% MAC (Sta. 827.3)	29.0% MAC (Sta. 857.6)

(1) Straight line variation between values.

(2) The aft C.G. limitation shown in the above table for gross weights below 235,000 lb. applies to takeoff conditions only. For airborne or landing conditions below 235,000 lb., the aft C.G. limitation is 35.0% MAC (BS 870.9).

(3) A restricted speed zone exists between the forward limits listed above. Aircraft loaded to initial gross weights greater than 248,000 pounds must observe reduced Vmo of 339 knots IAS when operating in this zone.

Maximum weights

	707-227
Maximum ramp weight	258,000 lb. (See NOTE 8)
Maximum flight weight, flaps 30°	257,000 lb.
Maximum flight weight, flaps up	256,500 lb.
Maximum flight weight at which the outboard auxiliary fuel tanks can be empty	233,000
Maximum landing weight	190,000
Maximum zero fuel weight	170,000

Maximum baggage

707-227,

Compt.	Body Station	Maximum Load (lb./in.)	Maximum Concentration (lb./sq.ft.)	Capacity (lb.)	Moment Arm
Fwd. Belly	400-600H+6	47	150	9000	+ 453
Aft Belly	960-1060	50	150	7000	+1030
Aft Belly	1060-1200	35	150	4900	+1170
Aft Belly	1200-1300	20	150	2000	+1290

Fuel capacity

See NOTE 1(c) for information relative to unusable fuel; NOTE 1(d) for required fuel usage procedure; NOTE 1(e) for undumpable fuel.

The following data are given for full fuel tanks. See Boeing Documents D6-3352 for other fuel and water C.G. locations with partially filled tanks:

Tanks	Nominal Capacity (Usable fuel in tank) (U.S. Gal. per Tank)	Max. Capacity (lb. per Tank)	Moment Arm
No. 1 & No. 4 Reserve	434	2,995	1082.6
No. 1 & No. 4 Main	2,333	16,098	916.6
No. 2 & No. 3 Main	2,283	15,753	791.2
Center	7,306	50,411	744.6
Total	17,406	120,103	

Oil tank capacity

The system oil capacities are given in Weight and Balance Control Manual D6-3352.

Engine Oil Tank No.	Location	Volume Capacity	Moment Arm
1	Outboard Port	8.33 gal.	868.5
2	Inboard Port	8.33 gal.	685.8
3	Starboard Port	8.34 gal.	685.8
4	Outboard Port	8.34 gal.	868.5

III - Model 707-100B Long Body (Transport Aircraft), approved March 1, 1961

(Same as Model 707-100 Long Body except for engines, wing changes and other associated changes and limitations)

Version	Serial Nos. Eligible
707-121B	17586; 17587; and 17589 thru 17591
707-123B	17628; 17630 thru 17640; 17642 thru 17652; and 19185 thru 19188; 18882 thru 18885; 18054; 19323 thru 19341.
707-131B	18385 thru 18397; 18400 thru 18404; 18758 thru 18762; 18986 thru 18989; 19215 thru 19223; 19436, 19568 and 19569.
707-139B	17903
707-153B	17925 thru 17927

Engines: 4 Pratt and Whitney Turbo Wasp JT3D-1, JT3D-1MC6, JT3D-3, JT3D-3B, or JT3D-1MC7, Turbofan (See also NOTE 10)

Fuel: See NOTE 12

Engine limits	707-123B	Certification Limits 707-121B, -131B, -139B, & -153B
Takeoff static net thrust (standard day), lb., at sea level Dry (5 minutes)	17,000	18,000
Maximum continuous static thrust (standard day), lb., at sea level	14,500	16,400
Maximum permissible engine rotors operating speeds:		
Low pressure compressor (N_1), r.p.m.	6,800	6,800
High pressure compressor (N_2), r.p.m.	10,200	10,250
Maximum E.P.R. values shown in the Airplane Flight Manual shall not be exceeded		

Engine limits (cont'd)

Maximum permissible turbine outlet gas temps:

Takeoff (5 minutes)	(530°C) 985°F	(555°C) 1031°F)
Maximum continuous	(460°C) 860°F	(490°C) 914°F)
Maximum for acceleration (2 minutes)	(530°C) 985°F	(555°C) 1031°F)
Starting	(450°C) 842°F	(450°C) 842°F)

Maximum permissible air bleed extractions of total engine air flow:

High pressure compressor		
From idle to maximum continuous	5.5%	5.5%
At takeoff	2.0%	2.0%
Low pressure compressor		
From idle to maximum continuous	2.0%	2.0%
At takeoff	2.2%	2.2%

Airspeed limits (IAS)

Vmo (maximum Operating)

436 m.p.h. at sea level	(379 kt.)	(379 kt.)
441 m.p.h. at 10,000 ft.		(384 kt.)
454 m.p.h. at 20,000 ft.		(395 kt.)
459 m.p.h. at 23,000 ft.		(399 kt.)

Mmo = .90 at 23,000 ft. and above

Va (Maneuvering)

290 m.p.h. at sea level	(252 kt.)
290 m.p.h. at 5,000 ft	(252 kt.)
292 m.p.h. at 10,000 ft.	(253 kt.)
294 m.p.h. at 15,000 ft.	(255 kt.)
296 m.p.h. at 20,000 ft.	(257 kt.)
300 m.p.h. at 25,000 ft.	(261 kt.)
307 m.p.h. at 30,000 ft.	(267 kt.)
314 m.p.h. at 35,000 ft.	(273 kt.)
321 m.p.h. at 39,600 ft.	(279 kt.)

Ma = .90 at 39,600 ft. and above

Vfe (Flaps speeds)

Max. Flap Deflection	(MPH)	(KT.)
20°	253	220
30°	242	210
50°	213	185

Vlo (Landing Gear Operation)

Sea Level to 30,000 ft.	(311 m.p.h.)	(270 kt.)
30,000 ft. to 35,800 ft.	(322 m.p.h.)	(280 kt.)
Mlo = .83 Mach at 35,800 ft. and above		

Vle (Landing Gear Extended)

Sea Level to 30,000 ft.	(320 kt.)
Mle = .83 at 30,000 ft. and above	

Dump Chute Operation

276 m.p.h. at Sea Level to 42,000 ft.	(240 kt.)

Dump Chute Extended

317 m.p.h. at Sea Level to 36,700 ft.	(275 kt.)
M = .83 at 36,700 ft. and above	

Vmc (Minimum Control Speed)

Minimum control speed (Air) Vmca Maximum takeoff thrust	125.3 m.p.h.	(109 kt.)
Minimum control speed (Ground) Vmcg	119 m.p.h.	(103.5 kt.)

C.G. range and Datum

The nose gear retraction moment is 18,600 in.-lb. and moves C.G. forward. The main gear retracts parallel to the Wing Reference Axis; hence, has no effect on airplane C.G.

All stations noted in the Data Sheet are Body Stations unless identified specifically as moment arms. For weight and balance purposes, datum is 50 in. forward of nose (moment arm - 0) Horizontal distance of datum to average wing jack point is 810.5 in.

Gross Weight	Forward Limit	Aft Limit
	TAKEOFF	
258,000 lb.	15.0% MAC (Sta. 822.3)	25.0% MAC (Sta. 846.7)
249,400 lb.	14.1% MAC (Sta. 820.3)	31.0% MAC (Sta. 861.2)
238,000 lb.	13.0% MAC (Sta. 817.6)	31.0% MAC (Sta. 861.2)
195,000 lb.	13.0% MAC (Sta. 817.6)	31.0% MAC (Sta. 861.2)
190,000 lb.	14.0% MAC (Sta. 820.1)	31.0% MAC (Sta. 861.2)
179,000 lb.	14.0% MAC (Sta. 820.1)	31.0% MAC (Sta. 861.2)
175,000 lb.	14.0% MAC (Sta. 820.1)	30.7% MAC (Sta. 860.5)
135,000 lb.	14.0% MAC (Sta. 820.1)	28.0% MAC (Sta. 853.9)
	FLIGHT	
258,000 lb.	15.0% MAC (Sta. 822.3)	25.0% MAC (Sta. 846.7)
249,000 lb.	13.7% MAC (Sta. 819.3)	31.0% MAC (Sta. 861.2)
238,000 lb.	12.0% MAC (Sta. 815.2)	31.0% MAC (Sta. 861.2)
200,000 lb.	12.0% MAC (Sta. 815.2)	31.0% MAC (Sta. 861.2)
190,000 lb.	14.0% MAC (Sta. 820.1)	31.0% MAC (Sta. 861.2)
175,000 lb.	14.0% MAC (Sta. 820.1)	31.0% MAC (Sta. 861.2)
	LANDING	
190,000 lb.	16.0% MAC (Sta. 824.5)	35.0% MAC (Sta. 870.9)
185,000 lb.	15.0% MAC (Sta. 822.3)	35.0% MAC (Sta. 870.9)
175,000 lb.	14.0% MAC (Sta. 820.1)	35.0% MAC (Sta. 870.9)

Straight line variation between values.

Maximum weights

(See NOTE 8)

Maximum ramp weight	258,000 lb.
Maximum flight weight	258,000 lb.
Maximum flight weight at start of outboard reserve fuel transfer	248,000 lb.
Maximum flight weight at which the outboard reserve tanks can be empty	243,000 lb.
Maximum landing weight	190,000 lb.
Maximum zero fuel weight	170,000 lb.
Maximum effective structural design zero fuel weight	185,000 lb.

Maximum baggage

Compt.	Body Station	Maximum Load (lb./in.)	Maximum Concentration (lb./sq.ft.)	Capacity (lb.)	Moment Arm
Fwd. Belly	400-600H+6	47	150	9000*	453
Aft Belly	960-1060	50	150	7000	1030
Aft Belly	1060-1200	35	150	4900	1170
Aft Belly	1200-1300	20	150	2000	1290

*Fwd. cargo compartment weight limitation is 5000 lb. when ballast is installed on Bulkhead Station 178. (See NOTE 11)

Fuel capacity

(See NOTE 1(c) for information relative to unusable fuel; NOTE 1(d) for required fuel usage procedure; NOTE 1(e) for undumpable fuel.)
Maximum fuel capacity in pounds listed below must not be exceeded. See Boeing Documents below for other fuel and C.G. locations with partially filled tanks.

707-121B D6-2884 707-131B D6-1853 707-153B D6-3022
707-123B D6-1840 707-139B D6-5345

Tanks	Nominal Capacity (Usable fuel in tank) (U.S. Gal. per Tank) Overwing Fueling	Underwing Fueling	Max. Capacity (lb. per Tank)	Moment Arm
No. 1 & No. 4 Reserve	434	434	3,081	1082.6
No. 1 & No. 4 Main	2,326	2,326	16,592	914.3
No. 2 & No. 3 Main	2,228	2,228	16,152	791.6
Center	5,432	5,451	51,874	744.2
Total	15,408	15,427	123,524	

Oil tank capacity

The system oil capacities are given in Weight and Balance Control Manual D6-1840.

Engine Oil Tank No.	Location	Volume Capacity	Moment Arm
1	Outboard Port	6.0 gal.	866.9
2	Inboard Port	6.0 gal.	684.1
3	Inboard Starboard	6.1 gal.	684.1
4	Outboard Starboard	6.1 gal.	866.9

IV - Model 707-100B Short Body (Transport Aircraft), approved July 24, 1961

(Same as Model 707-100 Short Body except for engines, wing changes and other associated changes and limitations.)

Version: 707-138B

Serial Nos. Eligible: 17696 thru 17702, 18067 thru 18069, 18334, 18739, and 18740

Engines: 4 Pratt and Whitney Turbo Wasp JT3D-1, JT3D-1MC6, or JT3D-1MC7, Turbofan (See also NOTE 10)

Fuel: See NOTE 12

Engine limits

Same as noted in Section III, Model 707-100B Long Body, except that 707-100B Short Body is approved for water augmentation; hence, the following static net thrust is valid:

	Certification Limits 707-138B
Takeoff static net thrust (standard day), lb., at sea level wet (2 1/2 minutes)	17,000

Airspeed limits (IAS)

Vmo (maximum Operating) (Basic)

434 m.p.h. at sea level	(378 kt.)
443 m.p.h. at 10,000 ft.	(384 kt.)
454 m.p.h. at 20,000 ft.	(395 kt.)
459 m.p.h. at 25,300 ft.	(399 kt.)

Airspeed limits (IAS) (cont'd)

Mmo = .91 at 23,500 ft. and above

Va (Maneuvering)

290 m.p.h. at sea level	(252 kt.)
292 m.p.h. at 5,000 ft	(253 kt.)
293 m.p.h. at 10,000 ft.	(255 kt.)
295 m.p.h. at 15,000 ft.	(256 kt.)
296 m.p.h. at 20,000 ft.	(256 kt.)
302 m.p.h. at 25,000 ft.	(263 kt.)
308 m.p.h. at 30,000 ft.	(268 kt.)
314 m.p.h. at 35,000 ft.	(273 kt.)
320 m.p.h. at 39,600 ft.	(278 kt.)

Ma = .91 at 39,600 ft. and above

Vfe (Flaps Speeds)

Max. Flap Deflection	(MPH)	(KT.)
20°	253	220
30°	242	210
50°	213	185

Vlo (Landing Gear Operation)

311 m.p.h. at sea level to 30,000 ft.	(270 kt.)
322 m.p.h. at 30,000 ft. to 35,800 ft.	(280 kt.)

Mlo = .83 Mach at 35,800 ft. and above

Vle (Landing Gear Extended)

368 m.p.h. at sea level to 29,000 ft.	(320 kt.)

Mle = .83 at 29,000 ft. and above

Dump Chute Operation

276 m.p.h. at Sea Level to 42,000 ft.	(240 kt.)

Dump Chute Extended

317 m.p.h. at Sea Level to 36,700 ft.	(275 kt.)

M = .83 at 36,700 ft. and above

Vmc (Minimum Control Speed)

Minimum control speed (Air) Vmca 135 m.p.h. Maximum takeoff thrust	(117 kt.)
Minimum control speed (Ground) Vmcg 129 m.p.h.	(112 kt.)

C.G. range and Datum

The nose gear retraction moment is 18,600 in.-lb. and moves C.G. forward. The main gear retracts parallel to the wing reference axis; hence, has no effect on airplane C.G.

All stations noted in the Data Sheet are Body Stations unless identified specifically as moment arms. For weight and balance purposes, datum is 110 in. forward of nose (moment arm = 0) Horizontal distance of datum to average wing jack point is 810.5 in.

Gross Weight	Forward Limit	Aft Limit
	TAKEOFF	
258,000 lb.	15.5% MAC (Sta. 823.7)	25.0% MAC (Sta. 846.7)
248,400 lb.	14.4% MAC (Sta. 821.1)	32.0% MAC (Sta. 863.7)
244,650 lb.	14.0% MAC (Sta. 820.1)	33.0% MAC (Sta. 866.0)
235,850 lb.	13.0% MAC (Sta. 817.6)	33.0% MAC (Sta. 866.0)
214,000 lb.	13.0% MAC (Sta. 817.6)	33.0% MAC (Sta. 866.0)
210,000 lb.	13.0% MAC (Sta. 817.6)	32.8% MAC (Sta. 865.6)

C.G. range and Datum (cont'd)

Gross Weight	Forward Limit	Aft Limit
	TAKEOFF	
205,000 lb.	13.0% MAC (Sta. 817.6)	32.6% MAC (Sta. 865.1)
200,000 lb.	13.0% MAC (Sta. 817.6)	32.4% MAC (Sta. 864.6)
195,000 lb.	13.0% MAC (Sta. 817.6)	32.2% MAC (Sta. 864.1)
190,000 lb.	13.0% MAC (Sta. 817.6)	32.0% MAC (Sta. 863.7)
185,000 lb.	13.0% MAC (Sta. 817.6)	31.8% MAC (Sta. 863.1)
176,000 lb.	13.0% MAC (Sta. 817.6)	31.4% MAC (Sta. 862.1)
170,000 lb.	15.0% MAC (Sta. 822.5)	31.1% MAC (Sta. 861.4)
155,000 lb.	15.0% MAC (Sta. 822.5)	30.2% MAC (Sta. 859.2)
135,000 lb.	15.0% MAC (Sta. 822.5)	28.8% MAC (Sta. 855.9)
	FLIGHT	
258,000 lb.	15.5% MAC (Sta. 823.7)	25.0% MAC (Sta. 846.7)
248,000 lb.	14.4% MAC (Sta. 821.1)	32.0% MAC (Sta. 863.7)
244,650 lb.	14.0% MAC (Sta. 820.1)	33.0% MAC (Sta. 866.0)
227,000 lb.	12.0% MAC (Sta. 815.2)	33.0% MAC (Sta. 866.0)
179,000 lb.	12.0% MAC (Sta. 815.2)	33.0% MAC (Sta. 866.0)
170,000 lb.	15.0% MAC (Sta. 822.5)	33.0% MAC (Sta. 866.0)
155,000 lb.	15.0% MAC (Sta. 822.5)	33.0% MAC (Sta. 866.0)
	LANDING	
190,000 lb.	18.3% MAC (Sta. 830.5)	33.0% MAC (Sta. 866.0)
185,000 lb.	17.5% MAC (Sta. 828.5)	33.0% MAC (Sta. 866.0)
170,000 lb.	15.0% MAC (Sta. 822.5)	33.0% MAC (Sta. 866.0)

Straight line variation between values shown.

Maximum weights

(See NOTE 8)	707-138B
Maximum ramp weight	258,000 lb.
Maximum flight weight	258,000 lb.
Maximum flight weight at start of outboard reserve fuel transfer	248,000 lb.
Maximum flight weight at which the outboard reserve tanks can be empty	243,000 lb.
Maximum landing weight	190,000 lb.
Maximum zero fuel weight	170,000 lb.
Maximum effective structural design zero fuel weight	185,000 lb.

Maximum baggage

Compt.	Body Station	Maximum Load (lb./in.)	Maximum Concentration (lb./sq.ft.)	Capacity (lb.)	Moment Arm
Fwd. Belly	400-600H+6	47	150	9650	483
Aft Belly	960-1060	50	150	3000	990
Aft Belly	1060-1200	35	150	4900	1110
Aft Belly	1200-1300	20	150	2000	1230

Fuel capacity

(See NOTE 1(c) for information relative to unusable fuel; NOTE 1(d) for required fuel usage procedure; NOTE 1(e) for undumpable fuel.)

The maximum fuel capacity in pounds listed below must not be exceeded. For other fuel C.G. locations with partially filled tanks, see Boeing Manual D6-3021.

Tanks	Nominal Capacity (Usable fuel in tank) (U.S. Gal. per Tank)		Max. Capacity (lb. per Tank)	Moment Arm
	Overwing Fueling	Underwing Fueling		
No. 1 & No. 4 Reserve	437	437	3,081	1082.6
No. 1 & No. 4 Main	2320	2320	16,592	913.2
No. 2 & No. 3 Main	2242	2242	16,152	791.6
Center (Six Cell)	7370	7342	51,874	734.4
Total	17,362	17,334	123,524	

Oil tank capacity

The system oil capacities are given in Weight and Balance Control Manual D6-3021.

Engine Oil Tank No.	Location	Volume Capacity	Moment Arm
1	Outboard Port	6.0 gal.	866.9
2	Inboard Port	6.0 gal.	684.1
3	Inboard Starboard	6.1 gal.	684.1
4	Outboard Starboard	6.1 gal.	866.9

Data Pertinent to All Models

MAC: 241.9 in. (L.E. of MAC is Body Station 786.2)

Leveling means: A plumb-bob attachment and leveling provision scale are provided in left wheel well.

Minimum crew: 3 persons for all flights: Pilot, Copilot, Flight Engineer

Maximum passengers: 179 limited by emergency exit requirements. Approved for 189 when equipped with four (4) inflatable escape chutes installed in accordance with FAA approved type design data.

Maximum operating altitude: The maximum operating altitude for all models is 42,000 feet.

Other operating limitations: See FAA Approved Airplane Manuals and Supplements.

Control surface movements

To insure proper operation of the airplane, the movement of the various control surfaces must be carefully controlled by proper rigging of the flight control systems. The airplane must, therefore, be rigged in accordance with the following FAA approved data:

Surfaces	Installation Dwg.
Aileron and Spoiler	50-8701
Aileron Trim	50-8705
Inboard Aileron Balance Panel Tolerances	50-73133
Outboard Aileron Balance Panel Tolerances	50-73134
Speed Brakes (Spoilers)	50-8716
Elevator	50-8702
Elevator Balance Panel Tolerances	65-8424
Stabilizer Trim	50-8704
Rudder	50-8703
Rudder Trim	50-8706
Rudder Balance Panel Tolerances	65-14035
Wing Flap	50-8707

Service information	Boeing Document D6-1649, Structural Repair Manual, is FAA approved. Service Bulletins, D6-1647, and other service information, when FAA approved, will carry a statement to that effect.
Certification basis	CAR 4b dated December 1953, Amendments 4b-1, 4b-2 and 4b-3 thereto; the Special Conditions and the provisions of Amendments listed in Attachment A of CAA letter to Boeing dated October 30, 1957; and the provisions of Item 2 of Special Civil Air Regulation No. SR- 422. 707-100B Long Body and 707-100B Short Body comply with all of the above except that Boeing chose to comply with Item 2 of Special Civil Air Regulation No. SR-422B in lieu of SR-422. Type Certificate No. 4A21 issued September 18, 1958. Date of Application for Type Certificate July 19, 1955; amended March 12, 1959, for Model 707-100B Long Body and 707-100B Short Body. Compliance with the following optional requirements has been established: Ditching Provisions of 4b.361 Ice Protection Provisions of 4b.640
Production basis	Production Certificate No. 700
Equipment	The basic required equipment as prescribed in the applicable airworthiness regulations (see Certification Basis) must be installed in the aircraft for certification. Boeing Airplane Company Document D6-5694 contains lists of all required equipment for Model 707-100 Long Body, and 707-200. The required equipment that must be installed as well as optional equipment approved for 707-100B Long Body and 707-100B Short Body are listed in Boeing Documents D6-1840 and D6-3021 respectively. The Weight and Balance Manual Documents indicated for each model under "Fuel Capacity" contain lists of equipment as well as optional installations approved by the FAA.

NOTE 1. (a) Current weight and balance report including list of equipment included in certificated empty weight, and loading instructions must be in each aircraft at the time of original certification and at all times thereafter except in the case of the operators having an approved weight control system.

(b) The airplane must be loaded so the C.G. is within the specified limits at all times, with the effects of fuel and water use, the movement of crew and passengers from their assigned positions being considered.

(c) The "drainable unusable fuel" is that amount of fuel in the tanks which is unavailable to the engines under critical flight conditions as defined in CAR 4b.416. This drainable unusable fuel does not include the "tank trapped fuel" or "line unusable fuel", which is the unusable fuel retrained in the fuel feed and fuel dump lines. The "total unusable fuel", which includes the drainable unusable fuel, tank trapped fuel and line unusable fuel, must be included in the airplane empty weight or be suitably accounted for in the airplane weight and balance report. The total amount of fuel is as follows:

<u>For Model 707-100 Long Body except for the 707-124 version</u>:

Tank Trapped fuel	10.71 gal
Drainable unusable fuel	37.90 gal.
Line unusable fuel	7.85 gal.
Total unusable fuel	56.46 gal.

<u>For the 707-124 only:</u>

Tank trapped fuel	8.04 gal.
Drainable unusable fuel	29.17 gal.
Line unusable fuel	7.85 gal.
Total unusable fuel	45.06 gal.

<u>For Model 707-200 only</u>:

Tank Trapped fuel	10.71 gal
Drainable unusable fuel	109.82 gal.
Line unusable fuel	7.85 gal.
Total unusable fuel	128.38 gal.

For Model 707-100B Long Body and 707-100B Short Body:

Tank Trapped fuel	10.71 gal
Drainable unusable fuel	109.82 gal.
Line unusable fuel	7.85 gal.
Total unusable fuel	128.38 gal.

(d) I. Model 707-100 Long Body and Model 707-200

Fuel capacity and usage procedure are dictated by structural design. To preserve favorable wing bending moments, the following limitations shall apply:

All center section fuel in excess of any included in the zero fuel weight must be used before the transfer of outboard reserve fuel.

The airplane gross weight must not exceed 233,000 lb. if the reserve tanks are empty.

A. Fuel Loading Limitations

1. Load main tanks 1, 2, 3, and 4 equally.
2. If main tanks are full, load reserve tanks.
3. If all main and reserve tanks are full and additional fuel is required, load center tank to required fuel quantity.

NOTE: Center tank fuel may be substituted for payload in any quantity up to the maximum allowable payload* or to the center wing tank capacity, whichever is lower, provided the difference in effect on balance is also accounted for.

NOTE: Tanks selected for fuel may be loaded simultaneously.

*Maximum Zero Fuel Weight less airplane basic operating weight.

B. Fuel Usage Limitations

Use tank to engine combination during all takeoffs and landings, except as noted under Minimum Fuel Go-Around. (See Airplane Flight Manual)

Center tank fuel in excess of any included in the Zero Fuel Weight must be used after a minimum of 5,000 lb. up to a maximum of 10,000 lb. (total) of main tank fuel has been expended for takeoff and climb to altitude.

Do not initiate the transfer of reserve tank fuel until the fuel quantity in each outboard main tank is less than 12,000 lb.

II. Model 707-100B Long Body and 707-100B Short Body:

To preserve favorable wing bending moments, the following limitations shall apply:

All center section fuel in excess of any included in the effective structural design zero fuel weight must be used before the transfer of outboard fuel.

The airplane gross weight must not exceed 243,000 lb. if the reserve tanks are empty.

A. Fuel Loading Limitations

1. (Applicable to 707-100B Short Body; 707-131B; 707-121B; and 707-139B) Load center tank fuel to 10,000 lb. This limitation is applicable only when the total fuel load is less than 80,000 lb. and the reserve tanks are loaded and the zero fuel weight C.G. is aft of 27% MAC.

2. Load Main tanks 1, 2, 3, and 4 equally.

3. If main tanks are full, load reserve tanks.

4. If all main and reserve tanks are full and additional fuel is required, load center tank to required fuel quantity.

NOTE: Center tank may be substituted for payload in any quantity up to the maximum allowable payload* and 10,000 lb. or to the center wing tank capacity, whichever is lower, provided the difference in effect on balance is also accounted for. When the takeoff C.G. is expected to be in the aft takeoff restricted zone, load up to 15,000 lbs. of center tank fuel before loading main tanks to achieve a more forward C.G.

NOTE: Tanks selected for fuel may be loaded simultaneously.

*Maximum Zero Fuel Weight less airplane basic operating weight.

B. Fuel Usage Limitations

Use tank to engine combination during all takeoffs and landings, except as noted under Minimum Fuel Go-Around. (See Airplane Flight Manual)

Center tank fuel in excess of any included in the effective structural design zero fuel weight must be used after a minimum of 5,000 lb. up to a maximum of 10,000 lb. (total) of main tank fuel has been expended for takeoff and climb to altitude.

Do not initiate the transfer of reserve tank fuel until the fuel quantity in each outboard main tank is less than 12,000 lb.

Fuel reserves must be retained in main tanks only.

(e) Fuel Dumping	Undumpable Fuel
For Model 707-100 Long Body and Short Body:	
2 outboard main tanks	907 gal.
2 inboard main tanks	640 gal.
Center wing tank	160 gal.
TOTAL	1707 gal.
For Model 707-200 & 707-100B Short Body:	
2 outboard main tanks	845 gal.
2 inboard main tanks	986 gal.
Center wing tank	141 gal.
TOTAL	1972 gal.
For Model 707-100B Long Body:	
2 outboard main tanks	903 gal.
2 inboard main tanks	1012 gal.
Center wing tank	141 gal.
TOTAL	2056 gal.

NOTE 2. Reserved

NOTE 3. Replacement Brake Lining must meet Boeing Specification D10-3072, "Specification for Wheel and Brake Assembly".

NOTE 4. Aft of Fuselage Station 850, the airplane design vertical load factors exceed TSO C-39 specifications; therefore, replacement passenger seats aft of Fuselage Station 850 must be evaluated for compliance with 4b.358(c).

NOTE 5. For Model 707-200 only: It is permissible to interchange the JT4A-3, -5, -9, and -10 engines in any combination, see appropriate FAA Approved Airplane Flight Manual for limitations.

NOTE 6. Whenever fuel is loaded into the center section fuel tanks, drain the sump of water prior to flight.

NOTE 7. (a) and (b) below apply to Model 707-200 only; (c) applies to Model 707-100 Long Body:

(a) The oil tank capacity (8.3 gal.) as required per CAR 4b.440(b), is based on a maximum engine oil consumption of 0.4 gal. per hour. Any increase in engine oil consumption above this rate will reduce the operating range of the airplane.

(b) Using the Bullseye or Sight Gage as a level for servicing the oil tank will result in a lesser oil quantity and will reduce the operating range of the airplane.

(c) The takeoff thrust rating for this engine may be increased to 13,500 lb. when Boeing Service Bulletin No. 538 has been complied with and the appropriate Airplane Flight Manual information is provided.

NOTE 8. The Model 707-100 Long Body, 707-100B Long Body and 707-200 airplanes must use 24-ply main landing gear tires when operated at weights of 255,000 lb. and above.

NOTE 9. Special fatigue or retirement considerations applicable to the Model 707-100B Long Body and 707-100B Short Body aircraft:

(a) The turbo compressor duct must be inspected, maintained and/or retired in accordance with Boeing Service Bulletin No. 1221 dated February 23, 1961, or later FAA approved revisions.

NOTE 10. The Models 707-100B Long Body and 707-100B Short Body may intermix the following engines in combinations and with the appropriate limitations noted in the FAA Approved Airplane Flight Manual:

JT3D-1, JT3D-1MC6, JT3D-1MC7, JT3D-3, and JT3D-3B

NOTE 11. Provisions have been made for installation of ballast on the version 707-123B (not to exceed 1460 lb.) per Boeing Dwg. 65-19695.

NOTE 12. JP-1, JP-4 and JP-5 fuels conforming to P&WA Specification No. 522 and later revisions may be used separately or mixed in any proportions without adversely affecting the engine operation or power output. No fuel control adjustment is required when switching fuel types.

Phillips anti-icing fuel additive PFA-55MB (MIL-I-27686 USAF) may be used if concentration delivered to airplane does not exceed 0.1% by volume. No fuel system anti-icing credit is allowed.

Anti-static fuel additive (Shell ASA-3) may be mixed with the fuel (recommended quantity 0.5 to 1.0 ppm) provided the effective conductivity of the mixture does not exceed 300 picomhos per meter.

NOTE 13. Model 707-227 airplane has been approved for operation with P & W JT4A-9/-10 engines at JT4A-9/-10 engine thrust settings and ratings, Appendix I (La Paz, Bolivia) and Supplement IV to the FAA Approved Airplane Flight Manual, D6-1567.

NOTE 14. Model 707-131 may operate at the weights shown for the 707-124 providing NOTE 8 (24 ply tires) and Boeing Service Bulletin 538 (JF3C-6 engine thrust increase) have been incorporated as stipulated in the 707-131 Flight Manual Supplement.

.....END.....