

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

A23WE
Revision 19
LOCKHEED
L-1011-385-1
L-1011-385-1-14
L-1011-385-1-15
L-1011-385-3

January 11, 2010

TYPE CERTIFICATE DATA SHEET A23WE

This data sheet which is part of the Type Certificate No. A23WE prescribes conditions and limitations under which the product for which the Type Certificate was issued meets the airworthiness requirements of the Federal Aviation Regulations.

Type Certificate Holder Lockheed Martin Corporation
Lockheed Martin Aeronautics Company
86 S. Cobb Drive
Marietta GA 30063

I - Model L-1011-385-1 (Transport Category Aircraft), Approved April 14, 1972

Engines 3 Rolls-Royce RB 211-22C-02 engines (see NOTE 25) or
3 Rolls-Royce RB 211-22B-02 engines (see NOTE 3 for Engine Life limitations.
Also see NOTES 10 and 12.)

Fuel See NOTE 4. (a).

Oil See NOTE 4.(b).

-22C Engine

Static thrust at sea level

Takeoff (5 min.) 41,030 lbs. (flat rated to ISA¹ + 3.8° C)

Maximum continuous 36,900 lbs. (flat rated to ISA + 10° C)

-22B Engine

Static thrust at sea level

Takeoff (5 min.) 41,030 lbs. (flat rated to ISA + 13.9° C)
42,670 lbs. (flat rated to ISA + 8.4° C to 5600 ft.
Thereafter, thrust reduces linearly to be
same as the -22B at ISA + 13.9° C and
10,000 ft.)²

Maximum continuous 40,140 lbs. (flat rated to ISA + 9.0° C to 25,000 ft. and
ISA + 13° C above 25,000 ft.)

¹ISA - International Standard Atmosphere

²With Rolls-Royce Mod 72-8700 or later FAA approved equivalent

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Rev. No.	18	18	18	18	18														

	-22C Engine Only			-22B Engine Only		
	N ₁ (%)	N ₂ (%)	N ₃ (%)	N ₁ (%)	N ₂ (%)	N ₃ (%)
Takeoff (5min.)	99.0	99.5	95.5	99.5	102.5	95.0
Maximum continuous	97.5	98.8	94.3	101.0	101.5	93.7 94.2 ³
Ground idle	19.3+4.00-0	--	--	21.0+2.3-0	--	--
Maximum reverse thrust (30 sec.)	90.0	--	--	101.3	--	--
Transient (20 sec.)	103.0	101.0	97.0	103.0	106.0	96.2
100% N ₁ (low pressure rotor) =		3,900 rpm				
100% N ₂ (intermediate pressure rotor) =		7,000 rpm				
100% N ₃ (high pressure rotor) =		10,611 rpm				
Maximum turbine temperature (measured at low pressure NGV ⁴):						
		<u>-22C Engine Only</u>		<u>-22B Engine Only</u>		
Takeoff (5 min.)		1328° F (720° C)		1342° F (728° C)		
Maximum continuous		1292° F (700° C)		1292° F (700° C)		
				1310° F (710° C) ⁴		
Starting (2 sec.)		1022° F (550° C)		1022° F (550° C)		
Reverse thrust (30 sec.)		1265° F (685° C)		1360° F (738° C)		
Maximum for acceleration (2 min.)		1337° F (725° C)		1360° F (738° C)		

APU Limits: See "Data Pertinent to All Models."

Airspeed Limits: Also see "Data Pertinent to All Models."

V _{fe} Load Relieving System Operative	Flap Angle Selected, in Degrees	Knots IAS/mach No.
	4°	250K M = 0.6
	10°	230K M = 0.5
	14°	215K M = 0.5
	18°	210K M = 0.5
	22°	205K M = 0.5
	27° ⁵	200K M = 0.5
	33°	170K M = 0.4
	42°	164K M = 0.4

If the landing flap extension speeds are inadvertently exceeded, the LRS will limit flap angle to 28° at airspeeds above 164 knots. When airspeed decreases to 164 knots, flaps will extend, as selected, to 33° or 42°. Limit speed with flaps at LRS position (28°) is 206 KIAS/0.4 mach.

V _{SLAT} (slat operation)	250k IAS (M = 0.6)
V _{LO} (landing gear)	
Retraction	230k not to exceed (M = 0.85)
Extension	300k not to exceed (M = 0.85)
V _{LE} (landing gear extended)	300k not to exceed (M = 0.85)

³DELETED.

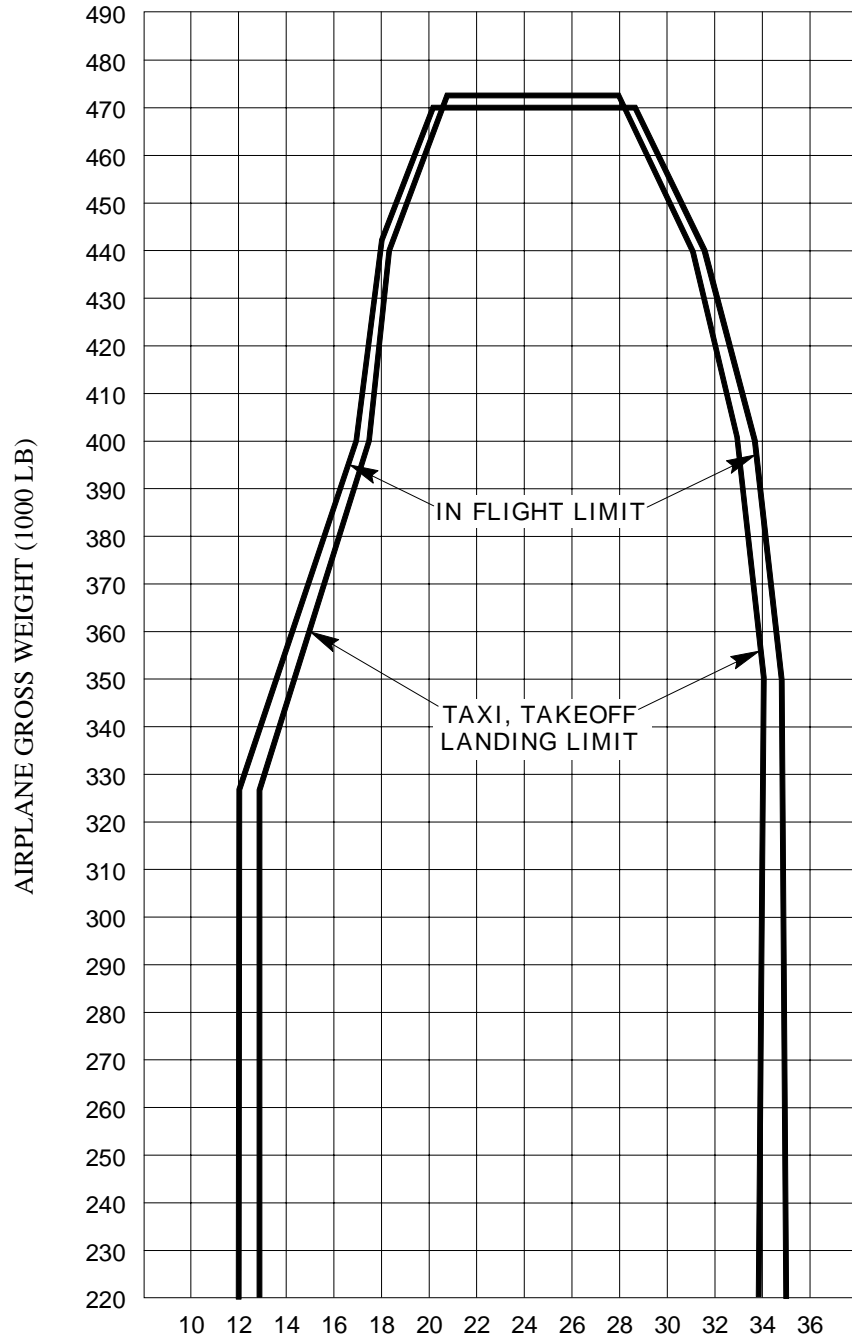
⁴NGV - Nozzle Guide Vanes

⁵Use of Flap 27 take-off is permitted only with aircraft equipped with flap quadrant 27 detent and which have incorporated S/B 093-27-098 or production equivalent which resets the take-off warning switch to accommodate Flap 27 take-off position.

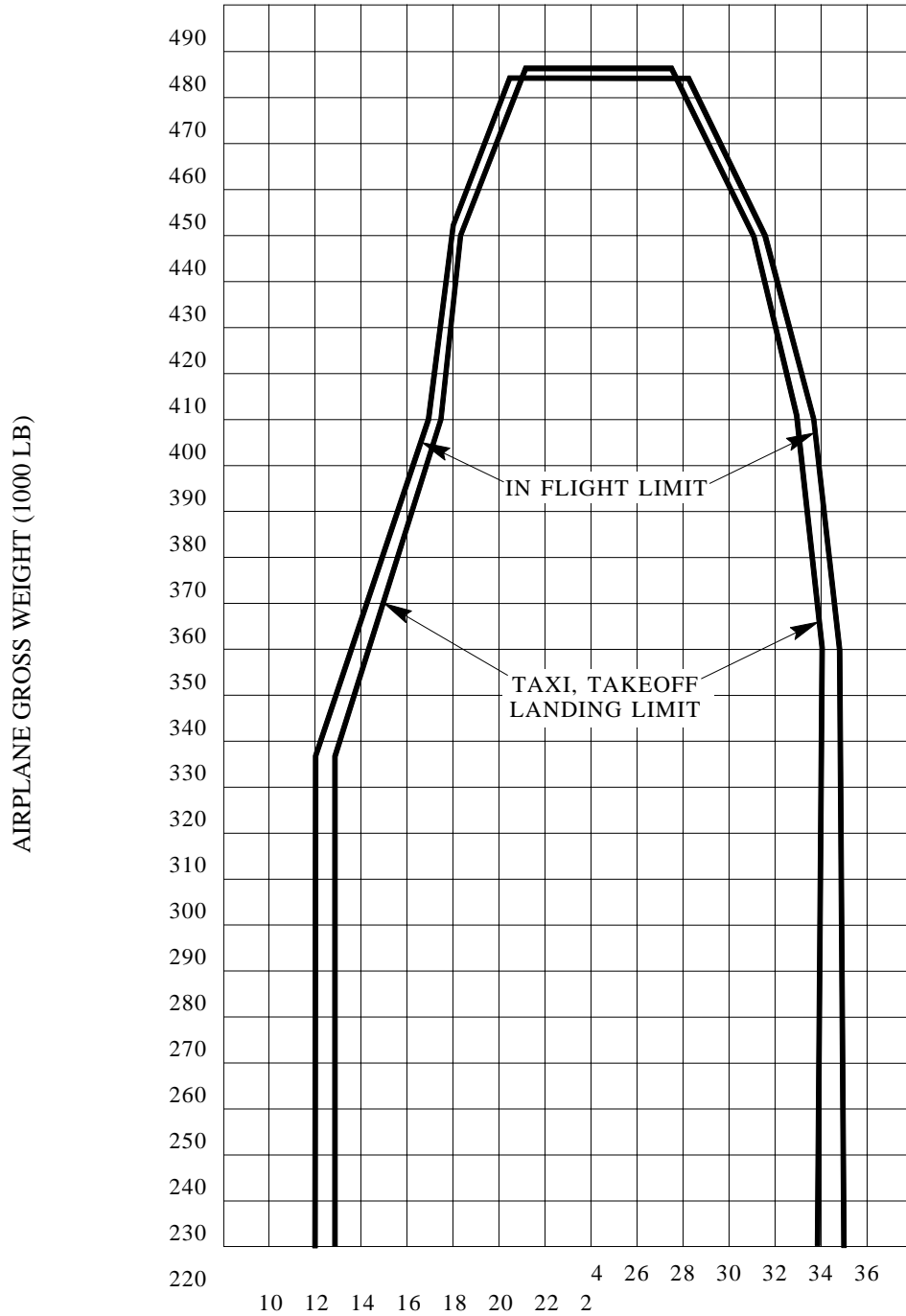
C.G. Range

L-1011-385-1
CENTER OF GRAVITY ENVELOPE

S/N 1004 - 1012



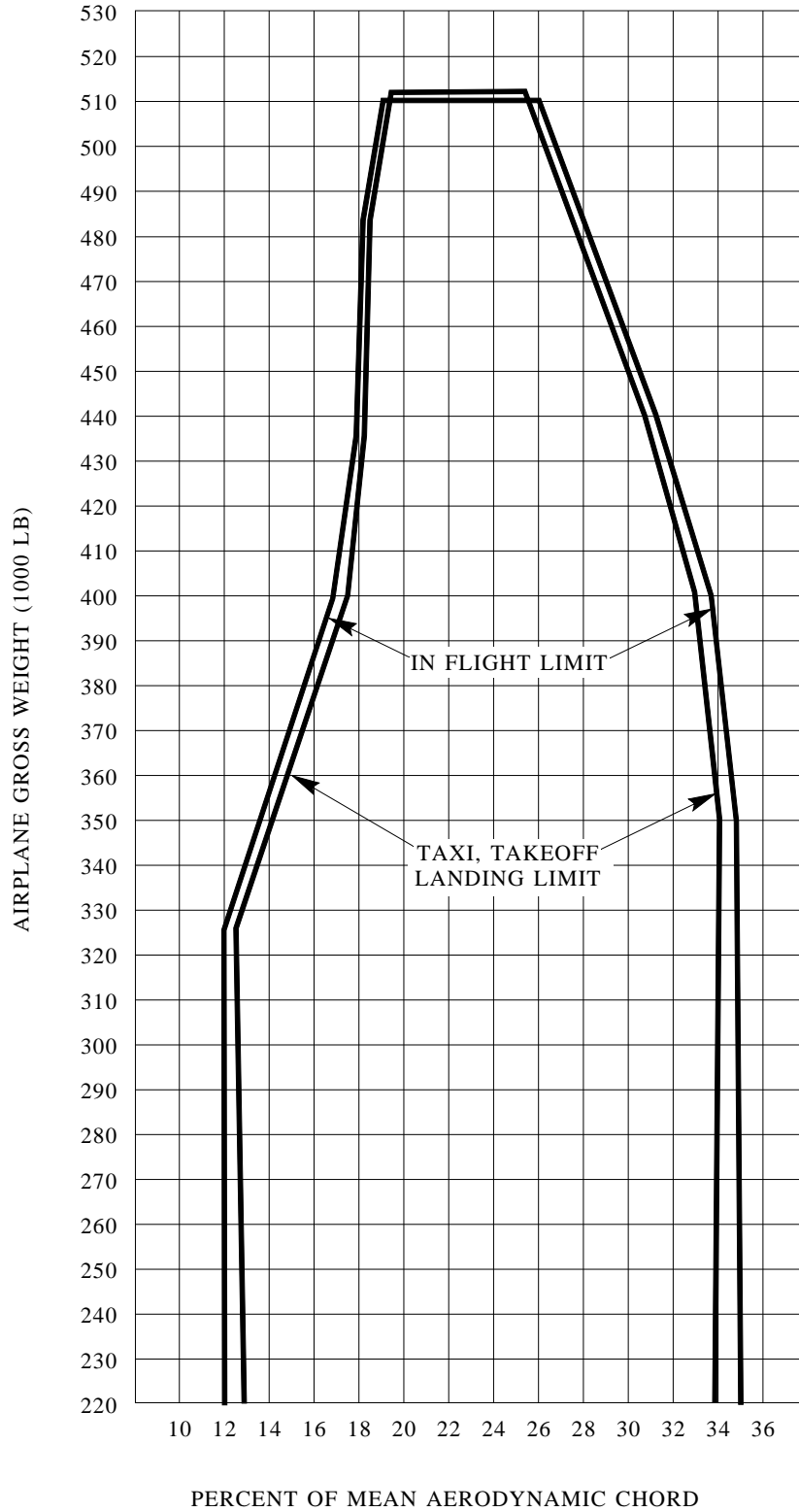
L-1011-385-1
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PERCENT OF MAXIMUM APPROVED GROSS WEIGHT

L-1011-385-1
CENTER OF GRAVITY ENVELOPE

S/N 1052 & UP



Maximum Weights^{6, 7}

	S/N 1004 thru 1012 ⁸	S/N 1013 thru 1051 ⁹	S/N 1052 & up ¹⁰	S/N 1052 & up ^{11,12}	S/N 1052 & up ¹³
Taxi and Ramp	472,000	476,000	468,000	476,000	512,000
Takeoff	470,000	474,000	466,000	474,000	510,000
Landing	368,000	368,000	368,000	368,000	368,000
Zero Fuel ¹⁴	338,000	338,000	320,000	338,000	338,000
Gear Jacking	472,000	472,000	468,000	468,000	512,000
Fuselage and Wing Jacking	340,000	340,000	340,000	340,000	340,000
Minimum Flight	233,700	233,700	233,000	233,700	233,000

The aircraft will remain within the above approved weight and C.G. limits when the aircraft is loaded within the zero fuel weight and C.G. limits and the effect of:

- (1) landing gear retraction, and
- (2) movement of crew and passengers from their assigned positions, is accounted for and the fuel is loaded (up to the maximum takeoff weight) and used in the approved sequence.

See NOTES 1.(a), 1.(b), and 1.(c).

For fuel dump valves operation, see NOTE 1.(d).

Minimum Flight Crew For all flights: Pilot, co-pilot, and flight engineer

Maximum Passengers See NOTE 5.

Cargo See NOTE 37.

Fuel Capacity

Tank	Full Tank Capacity (lbs.)		Arm (Inches)
	Structural Limits (7.1 lb/gallon)	Usable Fuel (6.7 lb/gallon)	
2L	27,181	25,650	1371.8
1	57,362	54,130	1157.2
3	57,362	54,130	1157.2
2R	<u>27,181</u>	<u>25,650</u>	1371.8
Total	169,086	159,560	

⁶Weights are in pounds.

⁷These weights vary as a function of modification standard and fuel management. See FAA Approved Flight Manual and Weight and Balance Manual.

⁸These weights are applicable to L-1011-385-1 configured aircraft modified in accordance with S/B 093-51-029 to provide increased gross weight capability (see NOTE 38).

⁹These weights are applicable to L-1011-385-1 configured aircraft modified in accordance with S/B 093-51-030 to provide increased gross weight capability (see NOTE 38).

¹⁰These weights are applicable to L-1011-385-1-193L configured aircraft modified in accordance with S/B 093-51-012 to provide increased gross weight capability.

¹¹These weights are applicable to L-1011-385-1 configured aircraft modified in accordance with S/B 093-51-010, 093-28-038, -03-51-022 and 093-51-023 to provide increased gross and zero fuel weights capability (see NOTE 23 and 24).

¹²S/B 093-51-034 provides modifications of L-1011 aircraft to permit operation at maximum zero fuel weight of 335,000 lbs. at GTOW of 430,000 lbs and MZFW of 325,000 lbs at GTOW of 450,000 lbs.

¹³These weights are applicable to L-1011-385-1 configured aircraft modified in accordance with S/B 093-51-023 to provide the increased gross weight capability.

¹⁴All weight in aircraft above this weight must be fuel. For fuel dump valves operation see NOTE 1.(d).

Oil Capacity 39 pounds/engine usable at 8.0 pounds/gallon with wing engines moment arm at 1050 inches and tail engine moment arm at 2041 inches.

Eligibility:

<u>Series</u>	<u>Date Approved</u>	<u>Serial Numbers Issued to Date</u>
193A	April 14, 1972	1004, 1005, 1006, 1009, 1012, 1022, 1038, 1040, 1043, 1050, 1051, 1055, 1123, 1126, 1141, 1142, 1143, 1152, 1153
193B	June 5, 1972	1013, 1015, 1017, 1018, 1028, 1035, 1060, 1066, 1072, 1076, 1080
193M	November 24, 1972	None. All serial numbers converted to L-1011-385-1-14.
193E	December 30, 1972	1021
193K	February 9, 1972	1024
193R	May 25, 1973	1033
193C	September 20, 1973	1052, 1057, 1071, 1074, 1077, 1078, 1081, 1084, 1086, 1088, 1089, 1090, 1095, 1096, 1097, 1135, 1136, 1139, 1147, 1150, 1162, 1167, 1173, 1180, 1199, 1200, 1213, 1224, 1225, 1226
193P	December 12, 1973	1062, 1070, 1082, 1100, 1105, 1112, 1113, 1127, 1129, 1134, 1155, 1156
193L	June 28, 1973	1064
193N	September 27, 1973	1094, 1145

II. - Model L-1011-385-1-14 (Transport Category Aircraft), Approved June 6, 1975

Engines 3 Rolls-Royce RB.211-22B-02 engines (See Section I)
or
3 Rolls-Royce RB.211-524B-02 engines (See Section IV)
or
3 Rolls-Royce RB.211-524B4-02 engines (See Section IV)
or
3 Rolls-Royce RB.211-524B3-02 engines (See Section IV)

(See NOTE 3 for Engine Component Life Limitations and NOTE 10 for Engine Intermix.)

Fuel See NOTE 4.(a).

Oil See NOTE 4.(b).

APU Limits See "Data Pertinent to All Models."

Airspeed Limits

(Also see "Data Pertinent to All Models.")

V_{fe}	Load Relieving System Operative <u>Flap Angle Selected, in Degrees</u>	<u>Knots IAS/mach No.</u>
	4°	250K M = 0.6
	10°	230K M = 0.5
	14°	215K M = 0.5
	18°	210K M = 0.5
	22°	205K M = 0.5
	27° ¹⁵	200K M = 0.5
	33°	170K M = 0.4
	42°	164K M = 0.4

If the landing flap extension speeds are inadvertently exceeded, the LRS will limit flap angle to 28° at airspeeds above 164 knots. When airspeed decreases to 164 knots, flaps will extend, as selected, to 33° or 42°. Limit speed with flaps at LRS position (28°) is 208 KIAS/0.4 mach.

V_{SLAT}	(slat operation)	250k IAS (M = 0.6)
V_{LO}	(landing gear)	
	Retraction	230k not to exceed (M = 0.85)
	Extension	300k not to exceed (M = 0.85)
V_{L3}	(landing gear extended)	300k not to exceed (M = 0.85)

C.G. Range

See Center of Gravity envelope page 9.

Maximum Weights¹⁶

Taxi and Ramp	468,000 lbs.
Takeoff	466,000 lbs. ^{17,18}
Landing	368,000 lbs.
Zero Fuel ¹⁹	320,000 lbs. ^{19, 20}
Gear Jacking	468,000 lbs.
Fuselage and Wing Jacking	340,000 lbs.
Minimum Flight	233,700 lbs.

Loadability²⁰ The aircraft will remain within the above approved weight and CG limits when the aircraft is loaded within the zero fuel weight and CG limits and the effect of:

- (1) landing gear retraction, and
- (2) movement of crew and passengers from their assigned positions, is accounted for and the fuel is loaded (up to the maximum takeoff weight) and used in the approved sequence.

For fuel dump valves operation, see NOTE 1.(d).

Minimum Flight Crew

For all flights: Pilot, co-pilot, and flight engineer

Maximum Passengers

See NOTE 5.

Cargo

See NOTE 37.

¹⁵Use of Flap 27 for take-off is permitted only with aircraft equipped with flap quadrant 27 detent and which have incorporated S/B 093-27-098 which resets the takeoff warning switch to accommodate Flap 27 take-off position.

¹⁶These weights vary as a function of modification standard and fuel management. See FAA Approved Flight Manual and Weight and Balance Manual.

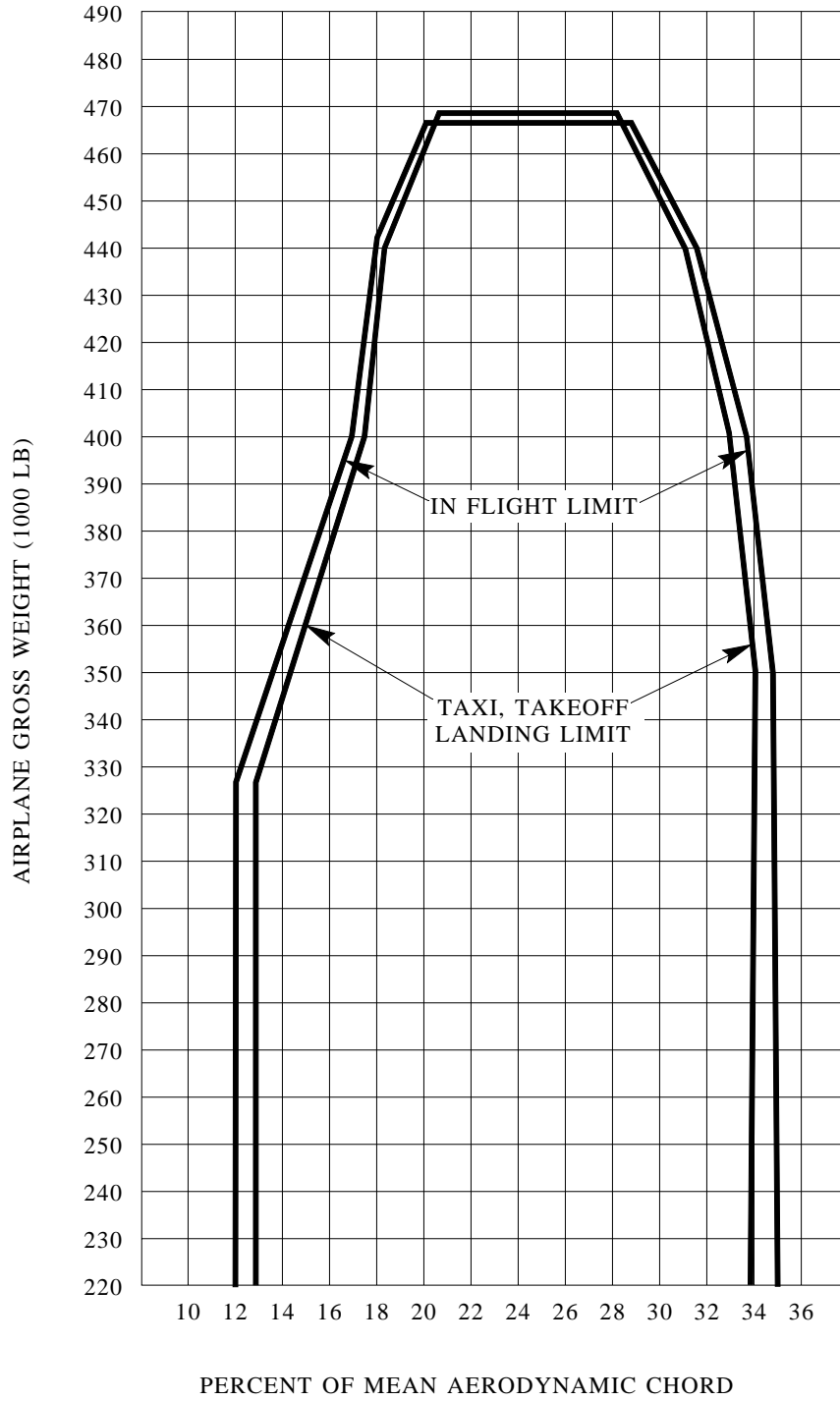
¹⁷At 450,000 lb. takeoff weight, the zero fuel weight is 330,000 lbs. and at 440,000 lbs. takeoff weight, the zero fuel weight is 338,000 lbs.

¹⁸The Zero Fuel Weight/Takeoff Gross Weight combinations are a linear function. See FAA Approved Airplane Flight Manual and Weight and Balance Manual.

¹⁹All weight in aircraft above this weight must be fuel. For fuel dump valves operation see NOTE 1.(d).

²⁰See NOTE 1.(a), 1.(b), and 1.(c).

L-1011-385-1-14
CENTER OF GRAVITY ENVELOPE



<u>Fuel Capacity</u>	<u>Full Tank Capacity (lbs.)</u>		
	Tank	Structural Limits (7.1 lb/gallon)	Usable Fuel (6.7 lb/gallon)
2L	27,181	25,650	1371.8
1	57,362	54,130	1157.2
3	57,362	54,130	1157.2
2R	<u>27,181</u>	<u>25,650</u>	1371.8
Total	169,086	159,560	

Oil Capacity

For -22B engines: 39 pounds/engine usable at 8.0 pounds/gallon with wing engines moment arm at 1050 inches and tail engine moment arm at 2041 inches.
For -524 engines: 33 pounds/engine usable at 8.0 pounds/gallon with wing engines moment arm at 1050 inches and tail engine moment arm at 2041 inches.

Eligibility²¹

Series	Date	Serial Numbers Issued to Date
<u>Eligible</u>	<u>Approved</u>	
193S	June 6, 1975	None. All serial numbers converted to L-1011-385-1-15.
193A		1010, 1158
193M		1019, 1023
193E		1048, 1049
193C		1041
193P		1103
193N		1083, 1093, 1101, 1106

III. - Model L-1011-385-1-15 (Transport Category Aircraft). Approved July 25, 1975

<u>Engines</u>	3 Rolls-Royce RB.211-22B-02 engines (See Section I) or 3 Rolls-Royce RB.211-524B-02 engines (see Section IV) or 3 Rolls-Royce RB.211-524B3-02 engines (see Section IV) or 3 Rolls-Royce RB.211-524B4-02 engines (see Section IV) or 3 Rolls-Royce RB.211-524B4-D-02 engines (see Section IV) (See NOTE 3 for Engine Component Life Limitations and NOTE 10 for Engine Intermix.)
<u>Fuel</u>	See NOTE 4.(a).
<u>Oil</u>	See NOTE 4.(b).
<u>APU Limits</u>	See "Data Pertinent to All Models."

²¹See NOTE 23.

Airspeed Limits

(Also see "Data Pertinent to All Models.")

V_{fe} Load Relieving System Operative	<u>Flap Angle Selected, in Degrees</u>	<u>Knots IAS/mach No.</u>
	4°	250K M = 0.6
	10°	230K M = 0.5
	14°	215K M = 0.5
	18°	210K M = 0.5
	22°	205K M = 0.5
	27° ²²	200K M = 0.5
	33°	170K M = 0.4
	42°	164K M = 0.4

If the landing flap extension speeds are inadvertently exceeded, the LRS will limit flap angle to 28° at airspeeds above 164 knots. When airspeed decreases to 164 knots, flaps will extend, as selected, to 33° or 42°. Limit speed with flaps at LRS position (28°) is 206 KIAS/0.4 mach.

V_{SLAT} (slat operation)	250k IAS (M = 0.6)
V_{LO} (landing gear)	
Retraction	230k not to exceed (M = 0.85)
Extension	300k not to exceed (M = 0.85)
V_{LE} (landing gear extended)	300k not to exceed (M = 0.85)

C.G. Range

See center of gravity envelope page 12.

Maximum Weights^{23, 24}

Taxi and Ramp	468,000 lbs.	512,000 lbs.
Takeoff	466,000 lbs.	510,000 lbs. ²⁵
Landing	368,000 lbs.	368,000 lbs. ²⁶
Zero Fuel ²⁷		320,000 lbs. ^{26, 28}
		338,000 lbs. ²⁷
Gear Jacking	468,000 lbs.	512,000 lbs.
Fuselage and Wing Jacking	340,000 lbs.	340,000 lbs.
Minimum Flight	233,700 lbs.	233,700 lbs.

²²Use of Flap 27 for take-off is permitted only with aircraft equipped with flap quadrant 27 detent and which have incorporated S/B 093-27-098 which resets the take-off warning switch to accommodate Flap 27 take-off position.

²³These weights vary as a function of modification standard and fuel management. See FAA Approved Flight Manual and Weight and Balance Manual.

²⁴These weights are applicable to L-1011-385-1-15 configured aircraft modified in accordance with S/B 093-51-023 to provide the increased gross weight capability to 510,000 lbs. GTOW.

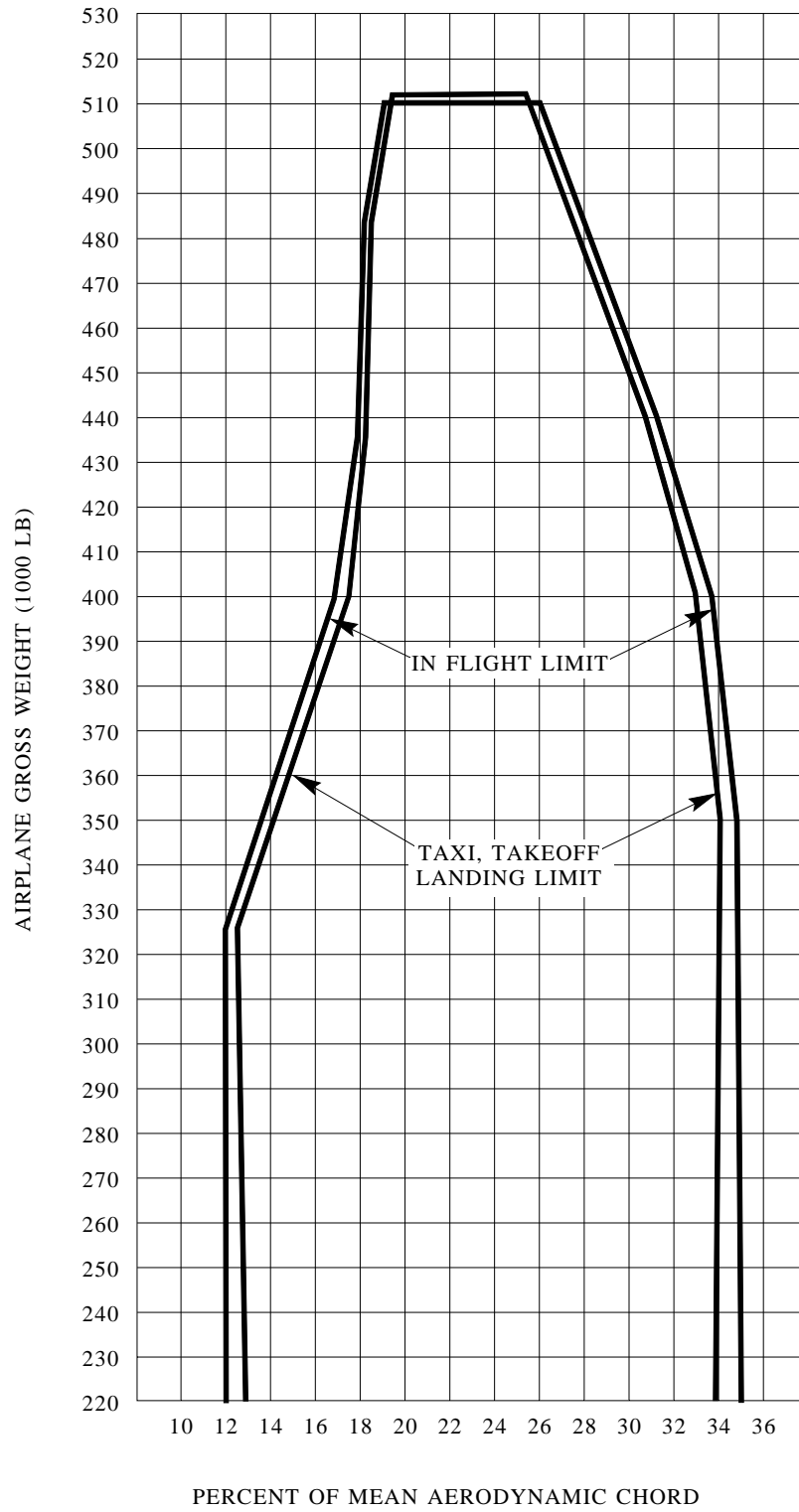
²⁵The Zero Fuel Weight/Takeoff Gross Weight combinations are a linear function. See FAA Approved Airplane Flight Manual and Weight and Balance Manual.

²⁶Aircraft modified by Lockheed Martin Service Bulletin No. 093-51-018 have Maximum Landing Weight of 380,000 lbs.

²⁷All weight in aircraft above this weight must be fuel. For fuel dump valves operation see NOTE 1.(d).

²⁸At 450,000 lbs. Takeoff Weight, the Zero Fuel Weight is 330,000 lbs. and at 440,000 lbs. Takeoff Weight, the Zero Fuel Weight is 338,000 lbs.

L-1011-385-1-15
CENTER OF GRAVITY ENVELOPE



Loadability²⁹ The aircraft will remain within the above approved weight and C.G. limits when the aircraft is loaded within the zero fuel weight and C.G. limits and the effect of:

- (1) landing gear retraction, and
- (2) movement of crew and passengers from their assigned positions, is accounted for and the fuel is loaded (up to the maximum takeoff weight) and used in the approved sequence.

For fuel dump valves, see NOTE 1.(d).

Minimum Flight Crew For all flights: Pilot, co-pilot, and flight engineer

Maximum Passengers See NOTE 5.

Cargo See NOTE 37.

Tank	Full Tank Capacity (lbs.)		Arm (Inches)
	Structural Limits (7.1 lb/gallon)	Usable Fuel (6.7 lb/gallon)	
2L	27,181	25,650	1371.8
1	57,192	53,970	1157.2
1A	10,131	9,560	1132.6
3	57,192	53,970	1157.2
3A	10,313	9,560	1132.6
2R	<u>27,181</u>	<u>25,650</u>	1371.8
Total	189,008	178,360	

Oil Capacity For -22B engines 39 pounds/engine usable at 8.0 pounds/gallon with wing engine moment arm at 1050 inches and tail engine moment arm at 2041 inches.

For -524 engines 33 pounds/engine usable at 8.0 pounds/gallon with wing engine moment arm at 1050 inches and tail engine moment arm at 2041 inches.

Eligibility

Series	Date	Serial Numbers Issued to Date
<u>Eligible</u>	<u>Approved</u>	
193T	July 25, 1975	1118, 1122
193U	December 18, 1975	1131, 1133, 1138, 1201, 1203, 1223
193S	May 29, 1976	1110, 1116, 1137, 1144, 1148, 1149, 1160, 1161, 1170, 1171, 1175, 1187, 1190, 1192, 1214
193N	February 29, 1980	1178, 1182, 1193, 1198, 1204, 1205
293C	May 12, 1981	1211, 1212
193B	September 29, 1981	1109, 1111, 1115, 1124, 1130, 1215, 1221, 1230, 1231, 1232
193E		1058, 1067, 1069, 1073
193C		1151, 1227, 1228, 1234, 1237, 1244, 1245
193P		1053

IV. Model L-1011-385-3 (Transport Category Aircraft). Approved April 13, 1979

Engines 3 Rolls-Royce RB.211-524B-02 engines
or
3 Rolls-Royce RB.211-524B3-02 engines
or
3 Rolls-Royce RB.211-524B4-02 engines
or
3 Rolls-Royce RB.211-524B4-D-02 engines
(See NOTE 3 for Engine Component Life Limitations and NOTE 10 for Engine Intermix.)

Fuel See NOTE 4.(a).

²⁹See NOTE 1.(a), 1.(b), and 1.(c).

Oil

See NOTE 4.(b).

Engine Limits

Rolls-Royce RB.211-524B-02, -524B3-02, -524B4-02, -524B4-D-02 Engines

Static Thrust at Sea Level

Takeoff (5 min.) 49,120 lbs. (-524B4-D-02: Flat Rated to ISA +17.8° C up to 5000 ft.³⁰; -524B-02, -524B3-02 and -524B4-02: Flat rated to ISA +13.9° C)

Maximum continuous 44,780 lbs. (Flat rated to ISA + 9.0° C to 25,000 ft., ISA + 10° C above 25,000 ft.)

	<u>N₁ (%)</u>	<u>N₂ (%)</u>	<u>N₃ (%)</u>	
Takeoff (5 min.)	103.0	106.0	107.0 ³¹	97.0 97.5 ³²
Maximum continuous	103.0	102.0	103.5 ³⁵	94.5 95.3 ³²
Ground Idle	22.5 + 1.0-0	-	-	
Maximum Overspeed (20 sec.)	104.0	107.0	108.0 ³⁵	98.3 98.5 ³²
Maximum for Reverse (60 sec.)	90.0	-	-	

100% N₁ (low pressure rotor) = 3900 rpm

100% N₂ (intermediate pressure rotor) = 7000 rpm

100% N₃ (high pressure rotor) = 10,611 rpm

Maximum turbine temperature (measured at low pressure NGV)

Takeoff (5 min.) 1444° F (785° C)

Maximum continuous 1350° F (732° C)

Starting 1022° F (550° C) in flight

1112° F (600° C) on ground

APU Limits

See "Data Pertinent to All Models."

Airspeed Limits

Also, see "Data Pertinent to all Models."

V_{fe} Load Relieving System OperativeFlap Angle Selected, in DegreesKnots IAS/mach No.

4°	250K M = 0.6
10°	230K M = 0.5
14°	225K M = 0.5
18°	220K M = 0.5
22°	215K M = 0.5
33°	210K M = 0.4

V_{SLAT} (slat operation)

250k IAS (M = 0.6)

V_{LO} (landing gear)

Retraction

230k not to exceed (M = 0.85)

Extension

300k not to exceed (M = 0.85)

V_{L3} (landing gear extended)

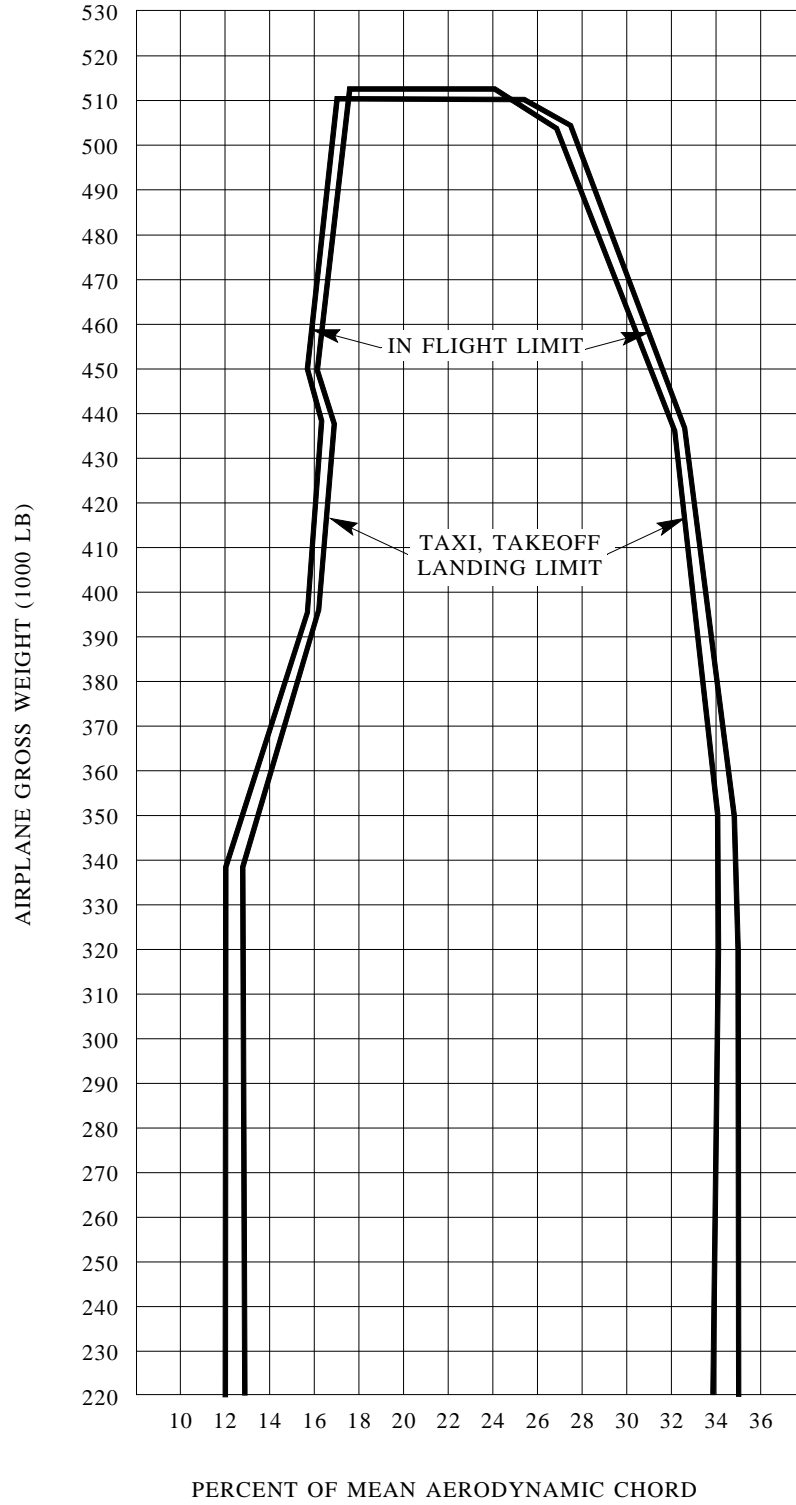
300k not to exceed (M = 0.85)

³⁰Also -524B4-02 engines with Rolls-Royce MOD 72-8516 Rev. 3.

³¹With Rolls-Royce MOD 72-7730 on -524B4-02 and -524B4-D-02 engines.

C.G. Range

L-1011-385-3
CENTER OF GRAVITY ENVELOPE



Maximum Weights^{32, 33}

Taxi and Ramp	498,000 lbs.	506,000 lbs. ³⁴	512,000 lbs. ³⁵
Take Off	496,000 lbs.	504,000 lbs.	510,000 lbs.
Landing	368,000 lbs.	368,000 lbs.	368,000 lbs.
Zero Fuel ³⁶	338,000 lbs.	338,000 lbs.	338,000 lbs.
Gear Jacking	498,000 lbs.	506,000 lbs.	512,000 lbs.
Fuselage and Wing Jacking	340,000 lbs.	340,000 lbs.	340,000 lbs.
Minimum Flight	233,700 lbs.	233,700 lbs.	233,700 lbs.

Loadability³⁷

The aircraft will remain within the above approved weight and C.G. limits when the aircraft is loaded within the zero fuel weight and C.G. limits and the effect of:

- (1) landing gear retraction and
- (2) movement of crew and passengers from their assigned positions, is accounted for and the fuel is loaded (up to the maximum takeoff weight) and used in the approved sequence.

For fuel dump valves operation, see NOTE 1.(d).

Minimum Flight Crew

For all flights: Pilot, Co-Pilot, and Flight Engineer

Maximum Passengers

See NOTE 5.

Cargo

See NOTE 37.

Fuel Capacity

Tank	Full Tank Capacity (lbs.)		Arm (Inches)
	Structural Limits (7.1 lb/gallon)	Usable Fuel (6.7 lb/gallon)	
2L	27,181	25,650	1371.8
1	57,192	53,970	1157.2
1A	28,824	27,200	1122.6
3	57,192	53,970	1157.2
3A	28,824	27,200	1122.6
2R	<u>27,181</u>	<u>25,650</u>	1371.8
Total	226,395	213,640	

Oil Capacity

For -524 engines- 33 pounds/engine usable at 8.0 pounds/gallon with wing engines moment arm at 1050 inches and tail engine moment arm at 1979 inches.

³²See NOTE 35.

³³These weights vary as a function of modification standard and fuel management. See FAA Approved Flight Manual and Weight and Balance Manual.

³⁴The weights listed in this column are applicable to L-1011-385-3 configured aircraft modified in accordance with S/B 093-51-016 to provide increased gross weight capability to 504,000 lbs. GTOW.

³⁵The weights listed in this column are applicable to L-1011-385-3 configured modified in accordance with S/B 093-57-169 to provide increased gross weight capability to 510,000 GTOW.

³⁶All weight in aircraft above this weight must fuel. For fuel dump valves operation see Note 1.(d).

³⁷See NOTE 1.(a), 1.(b), and 1.(c).

<u>Series Eligible</u>	<u>Date Approved</u>	<u>Eligibility</u> ³⁸ <u>Serial Numbers Issued to Date</u>
193V ³⁹	April 16, 1979	1157, 1159, 1164, 1165, 1168, 1174
193G ⁴⁰	January 17, 1980	1179, 1191
193J ⁴⁰	April 14, 1980	1183
193Y ⁴⁰	April 15, 1980	1176, 1177, 1181, 1184, 1185, 1186, 1188, 1194, 1195, 1197, 1208, 1210
193W ⁴¹	July 26, 1980	1189
193J ⁴¹	October 29, 1980	1196
193H ⁴¹	February 20, 1981	1202, 1206, 1207, 1209, 1216, 1218, 1246, 1247, 1248
293A ⁴¹	September 9, 1981	1217, 1219, 1220, 1229, 1238, 1249
193G ⁴¹	October 28, 1981	1222, 1233, 1250
293F ⁴¹	July 28, 1982	1235, 1236
293B ⁴¹	November 19, 1982	1239, 1240, 1241, 1242, 1243

DATA PERTINENT TO ALL MODELS (Except As Noted)

APU Limits

United Aircraft of Canada ST6L-73

Rotor Speeds (Ng) maximum

Steady state	38,100 rpm (101.6%)
Transient	38,500 rpm (102.6%)

Turbine Gas Temperature

Maximum during operation	1066° C (1950° F)
During start for 2 seconds	760° C (1400° F)

Lubricating Oil - PWA Specification No. 521. See P&WC Service Bulletin No. 9001.

Airspeed Limits

V_{mo}/M_{mo} (Maximum Operating)

	<u>IAS</u>	
At Sea Level	350K	
At 10,000 feet	375K	
At 26,200 feet	375K	(M = 0.9)
At 42,000 feet	264K	(M = 0.9)
At 43,000 feet	256K	(M = 0.9)

V_a (Maneuvering)

See FAA Approved Airplane Flight Manual.

Maximum Operating Altitude

42,000 ft.	Models L-1011-385-1 and -1-14
43,000 ft.	Models L-1011-385-1-15 and -3.

Fuselage Datum

83 inches forward of fuselage nose Models L-1011-385-1, -1-14 and -1-15.

183 inches forward of fuselage nose Models L-1011-385-3.

MAC

293.5 inches (Leading edge of MAC - Arm 1143.0)

³⁸See NOTE 35.

³⁹Without extended wings and active controls system.

⁴⁰With extended wings and active controls system.

Leveling Means

One of two systems in each airplane:

- (1) Spirit level and leveling pads at Sta. 1355.0 (left main landing gear wheel well).
- (2) Plumb bob and grid plate at Sta. 1341.5 (left main landing gear wheel well).

To ensure proper operation of the airplane, the movement of the control surface must be carefully controlled by proper rigging of the Flight Control Systems. The airplane must therefore be rigged in accordance with the following:

Lockheed Martin Report LR-25234 dated 14 April 1972, "L-1011 Primary and Secondary Controls Rigging Procedure Drawings," and applicable revisions.

Certification Basis

Issuance of a Type Certification for Model L-1011-385-1, and amended Type Certificates for Models L-1011-385-1-14, L-1011-385-1-15 and L-1011-385-3 are based upon compliance with the following:

- (1) FAR Part 25 dated February 1, 1965, "Airworthiness Standards: Transport Category Airplanes" including Amendments 25-1 through 25-18, and 25-20; FAR Parts 25.145(c), 25.683, 25.1331, and 25.1333 of Amendment 25.23; FAR Part 25.1459⁴¹ of Amendment 25-25.
- (2) FAR 36, "Noise Standard: Aircraft Type Certification," dated December 1, 1969.
- (3) Based on 14 CFR § 21.17(a) for new type certificates (TCs), (or 14 CFR § 21.101(g) for changes to TCs), applicable provisions of 14 CFR part 26 are included in the certification basis. For any future 14 CFR part 26 amendments, the holder of this TC must demonstrate compliance with the applicable sections.
- (4) Special Conditions #25-17-WE-6 Amendment #1 dated December 3, 1971, and Amendment #2 dated April 13, 1979, as applicable.⁴²
- (5) Lockheed Martin Corporation L-1011-385-1, 193L aircraft series has demonstrated compliance with the requirements of "Special Conditions for Lockheed Martin Corporation Model L-1011-385-1, 193L Airplane," No. 25-55-WE-16, dated June 21, 1974.
- (6) Lockheed Martin Corporation L-1011-385-1, 193N, L-1011-385-1-15, 193T and L-1011-385-1-15, 193U Aircraft Series have demonstrated compliance with the requirements of "Special Condition for Lockheed Martin Corporation Model L-1011-385-1 Airplane," No. 25-58-WE-17, dated September 26, 1974. Model L-1011-385-3 has complied with Amendment #1 dated April 13, 1979.
- (7) The Lockheed Martin Corporation L-1011-385-1, 193N and L-1011-385-1-15, 193T and L-1011-385-1-15, 193U aircraft series have demonstrated compliance with the requirements of U.K. Special Conditions of Issue 3 dated August 30, 1974. L-1011-385-3, 193V and L-1011-385-3, 193G aircraft series have demonstrated compliance with the requirements of U.K. Special Conditions Issue 4 dated April 16, 1979.
- (8) Compliance has been found for the following regulations: 14 CFR §26.11, 26.43 and 26.45, (Amdt. No. 26-0 through 26-3).

Production Basis

Production Certificate No. 600.

⁴¹Compliance with FAR Part 25.1459(a)(7) requires incorporation of LAC Service Bulletin 093-31-012 "Instruments - Digital Flight Data Recorder and Underwater Locating Device - Replacement Of."

⁴²For purposes of administration Special Airframe Conditions Nos. 4-15 contained in Special Conditions No. 25-17-WE-6, Amendment No. 1 dated 3 December 1971 (Docket No. 1005, Amendment No. 1) have been retitled and renumbered. These conditions are contained in the document entitled "SPECIAL CONDITIONS RETITLED AND RENUMBERED BY THE WESTERN REGION" dated 17 December 1971.

<u>Required Equipment</u>	The basic required equipment as prescribed in the applicable airworthiness regulations (see Certification Basis) must be installed in the aircraft for certification. All of the required equipment that must be installed as well as optional equipment installations approved by the FAA are contained in Chapter 2, "Weight and Balance Manual."
<u>Service Information</u>	Lockheed Martin Model L-1011-385-1, L-1011-385-1-14, L-1011-385-1-15 and L-1011-385-3 Structural Repair Manuals are FAA approved. All Lockheed Martin Service Bulletins and other service information, when FAA approved, will carry a statement to that effect. Lockheed Martin L-1011 Maintenance Review Board Report dated June 20, 1986, or later FAA approved revisions contains the basic minimum requirements for a maintenance program for continued airworthiness.

NOTES:

NOTE 1. (a) The weight of system unusable fuel and oil, as defined below, must be accounted for in the airplane operational empty weight, and is listed in the FAA Approved Lockheed Martin Weight and Balance Manual specified for each airplane.

System Fuel

The weight of all fuel required to fill lines and tanks up to the zero fuel on the quantity gages in the most critical flight attitude. This includes the unusable tank and plumbing fuel as defined by FAR Part 25.959, and the usable but ungageable fuel in the tanks and plumbing. The L-1011-385-1 and L-1011-385-1-14 airplanes have 206 pounds (based on 6.7 pounds per gallon) of unusable fuel in the tanks and plumbing (see NOTE 1.(e)) and 569 pounds of usable but ungageable fuel in the plumbing (see NOTE 1.(e)). This 569 pounds of fuel must be included in the total unusable fuel to obtain the correct weight and C.G. for takeoff (see FAA Approved Weight and Balance Manual). The L-1011-385-1-15 airplane has 240 pounds (based on 6.7 pounds per gallon) of unusable fuel in the tanks and plumbing, and 609 pounds of usable but ungageable fuel in the tanks and plumbing. This 609 pounds of fuel must be included in the total usable fuel to obtain the correct weight and C.G. for take-off. (See FAA Approved Weight and Balance Manual). The L-1011-385-3 airplane has 238 pounds of (based on 6.7 pounds per gallon) of unusable fuel in the tanks and plumbing and 774 pounds of usable but ungageable fuel in the plumbing. This 774 pounds of fuel must be included in the total usable fuel to obtain the correct weight and C.G. for takeoff. (See FAA Approved Weight and Balance Manual.)

There are 570 pounds (based on 6.7 pounds per gallon) of ungageable but usable fuel in the L-1011-385-1 and -1-14 tanks, 720 pounds of ungageable but usable fuel in the L-1011-385-1-15 tanks and 607 pounds of ungageable but usable fuel in the L-1011-385-3 tanks. This fuel is included in the tank fuel listed in this data sheet.

System Oil

The weight of oil remaining in the engine, accessories, lines and tanks after subtracting the oil in the tanks which is above zero gage levels. The engine oil tank capacities shown elsewhere in this data sheet include only the usable oil for which the tanks must be placarded.

- NOTE 1. (b) The "unusable" fuel is that amount of fuel in the tanks and plumbing which is unavailable to the engines under critical flight conditions as defined in FAR Part 25.959. This "unusable" fuel quantity of 206 pounds in the L-1011-385-1 and -1-14 airplanes (see NOTE 1.(e)), 240 pounds in the L-1011-385-1-15 airplanes and 238 pounds in the L-1011-385-3 airplanes is included in the System Fuel as indicated in NOTE 1.(c) and need not be accounted for separately.
- NOTE 1. (c) Fuel capacities shown in this data sheet as well as fuel loading fuel and usage procedures are dictated by structural design criteria, and to maintain airplane C.G. within approved limits at completion of fuel uplift. Fuel must be loaded symmetrically about the airplane lateral C.G. within approved limits and in accordance with the Approved Airplane Flight Manual.

- NOTE 1. (d) Fuel Jettison - The L-1011-385-1, -1-14 and -1-15 and -3 airplanes have been certificated for operation at maximum takeoff gross weight with and without the fuel jettison system. Refer to the FAA Approved Airplane Flight Manual for limitations to be observed during operation without the fuel jettison system. Refer to the FAA Approved Airplane Flight Manual for limitations to be observed during operation without the jettison system and when dumping fuel with the jettison system. Fuel jettisoning may be terminated by the Flight Crew at any time during the operation, and the total quantity of fuel not jettisoned must be included in the landing weight. The quantity of unjettisonable fuel remaining in the tanks at automatic cutoff is as follows for fuel weight based on 6.7 pounds per gallon:

<u>Tank No.</u>	<u>Fuel Quantity (lb.)</u>
2L	3,900
1	7,600
3	7,600
2R	3,900
Manifold	300

In L-1011-385-15 and -3 airplanes, fuel cannot be jettisoned from tanks 1A and 3A. Some fuel may remain in these tanks after termination of the jettison operation.

- NOTE 1. (e) Until service kits 093/SK28001 and 093/SK28002 are installed in S/Ns 1013, the unusable fuel in the tanks and plumbing is 506 pounds, and the usable but ungageable fuel in the plumbing is 269 pounds.

NOTE 2. Reserved.

NOTE 3. Life Limitations.

- (a) All life limited components with the exception of engine and APU components (see NOTE 3.(b) and Note 3(c)) are listed in FAA Approved Lockheed Martin Report LR-27324 and must be replaced as indicated therein. FAA Approved Lockheed Martin Report LR-27324, and FAA approved revisions thereto, are hereby incorporated as part of this Type Certificate Data Sheet A23WE. Copies of the above LR-27324 report may be obtained from the manufacturer:

Lockheed Martin Aircraft & Logistics Centers
 Out of Production Support
 120 Orion Street
 Greenville, South Carolina 29605

- (b) Engine life limited parts are identified in RB211-22B and RB211-524 series Time Limits Manual T-211(22B)-1RR and T-211(524)-3RR, respectively. For RB211-22B Fan Disc Life Limits see Rolls Royce ALERT Service Bulletin 72-A2655.
- (c) APU life limited parts are identified in "United Technologies Hamilton Maintenance and Overhaul Recommendations for the Hamilton Standard L-1011 Air Conditioning, Starting, and APU Systems" R4137.

- NOTE 4. (a) Approved fuels and fuel additives are listed in the approved Rolls Royce Operating Instructions, Publication Reference F-RB211-T and F-211(524B)-T.
- (b) Approved oils are listed in the approved Rolls Royce Operating Instructions, Publication Reference F-RB211-T and F-211(524B)-T. Alternate brand oils are permitted when authorized by CAA approved Rolls Royce Service Bulletin.

- NOTE 5. (a) All replacement seats (crew, passenger and lounge), although they may comply with TSO-C39, must also be demonstrated to comply with FAR Part 25.785. Other installations, such as berths, compartments or items of mass which could create a hazard to the safety of passengers and crew must also be demonstrated to meet the applicable requirements of FAR Part 25.785.

- (b) L-1011-385-1, -1-14 and -1-15 airplanes. With three Type A passenger doors and one Type 1

passenger door per side of aircraft, the maximum eligible number of passengers is 345 demonstrated for emergency evacuation and 362 by analysis. With four Type A passenger doors per side of aircraft, the maximum eligible number is 400 demonstrated for emergency evacuation. See FAA approved interior arrangement drawings for maximum passenger capacities approved for each series eligible aircraft when delivered. These drawings are contained in the FAA Approved Lockheed Martin Report LR-25097.

- (c) L-1011-385-3 airplanes. Maximum eligible number of passengers is 315 with three Type A passenger doors per side of the aircraft. See FAA approved interior arrangement drawings for maximum passenger capacities approved for each series eligible aircraft when delivered. These drawings are contained in the FAA Approved Lockheed Martin Report LR-25097.

NOTE 6. DELETED.

NOTE 7. Deleted on June 20, 1974, when S/N 1006 aircraft was added to 193A series eligible.

NOTE 8. Cockpit Voice Recorder (CVR) operates only after engine start, and the ground cart disconnected, on the L1011-385-1, 193K, S/Ns 1024 and 1032 aircraft only.

NOTE 9. The L-1011-385-1, 193K, S/Ns 1024 and 1032 aircraft have been accepted for export to the United Kingdom with Digital Flight Data Recorder (DFDR) which has not demonstrated compliance with the requirements of FAR Part 25.1309(a).

NOTE 10. Engine Installation "Intermix" configurations may be utilized in accordance with Lockheed Martin Report LR-28617, applicable FAA approved Service Bulletins, and Appendices of FAA Approved Airplane Flight Manuals.

NOTE 11. DELETED.

NOTE 12. Rolls Royce RB211-22B engines must be installed during production or in accordance with Lockheed Martin Service Bulletin No. 093-71-009.

NOTE 13. DELETED.

NOTE 14. DELETED.

NOTE 15. Automatic Pilot-Flight Director System including approach and automatic landing to Category I, Category II, Category IIIA Weather Minima in accordance with FAR Part 25.1329, Advisory Circulars AC 25.1329-1A dated October 1, 1965, AC-20-57A dated January 12, 1971, AC 120-28A dated December 14, 1971, and AC 120-29 dated September 25, 1970.

Automated Navigation in Three Systems configurations:

- (a) Dual area navigation systems (ARINC 582) (Advisory Circular AC 90-45A dated September 15, 1975).
- (b) Dual area navigation systems (ARINC 582) with dual inertial reference systems (ARINC 571) (Advisory Circulars AC 90-45A dated September 15, 1975, and AC 25-4 dated February 18, 1966).
- (c) Dual area navigation system (ARINC 582) with triple inertial reference systems (ARINC 571) (Advisory Circulars 90-45A dated September 15, 1975, AC 25-4 dated February 18, 1966).

NOTE 16. DELETED.

NOTE 17. DELETED.

- NOTE 18. These Lockheed Martin Corporation L-1011 series airplanes with serial number 1052 and above (with exception of airplanes in the 193L series) which incorporated the FAA Approved Type Design modifications specified in the FAA Sealed L-1011-385-1 Drawing List Supplement titled "FAA List for Spare Engine Pod (SEP) and Spare Engine Pod (SEP) Pylon Only Peculiar - Type Design" are eligible to include the Spare Engine Pod (SEP) or the Spare Engine Pod (SEP) Pylon Only installation and must be operated in accordance with the FAA Approved Airplane Flight Manual LR-25925, Appendix 9, and FAA Approved Lockheed Martin Weight and Balance Manual.
- NOTE 19. The glide slope deviation warning (part of the ground proximity warning system, Sundstrand P/N 965-0376-070), was evaluated to the standard set forth in TSO-C92b and FAR Part 121.360(f).
- NOTE 20. DELETED.
- NOTE 21. (a) Lockheed Martin Corporation L-1011-385-1 aircraft with improved aircraft loadability with respect to the forward center of gravity limit must be equipped with 36 X 11-16 22 ply; rating nose landing gear tires.
- (b) Lockheed Martin Corporation L-1011-385-1, -1-14 and -1-15 aircraft must be equipped with main landing gear wheels, brakes and tires, and nose landing gear wheels and tires as identified in the latest revisions of Service Bulletins 093-51-010, 093-51-014, 093-51-015, 093-51-016, 093-51-022, 093-51-033, 093-51-029 and 093-51-031 for their applicable and listed brake release maximum gross takeoff weight.
- NOTE 22. DELETED.
- NOTE 23. Modifications in accordance with FAA approved Lockheed Martin Corporation Service Bulletin 093-51-010 constitutes an FAA approved conversion of the Model L-1011-385-1 aircraft to Model L-1011-385-1-14 aircraft.
- NOTE 24. Modifications in accordance with FAA approved Lockheed Martin Corporation Service Bulletin 093-28-038 constitutes an FAA approved conversion of the Model L-1011-385-1-14 aircraft to Model L-1011-385-1-15 aircraft.
- NOTE 25. There are no RB.211-22C engines in existence; however, -22C ratings and limits are retained on this TCDS to permit operational use of FAA certified takeoff performance based on -22C takeoff ratings as shown in the FAA Approved L-1011 Airplane Flight Manual (Appendix 8 to Lockheed Martin Report LR-25925) for aircraft equipped with -22B engines.
- The FAA approved Flight Manual for -22C engine (Lockheed Martin Report LR-25225) is discontinued.
- NOTE 26. DELETED.
- NOTE 27. The APU is approved for use as an alternate in-flight source of electric and pneumatic power.
- NOTE 28. DELETED.
- NOTE 29. DELETED.
- NOTE 30. The FAA approved Airplane Flight Manual for Lockheed Martin Corporation Model L-1011-385-3 (193V series airplanes) is Lockheed Martin Report L-25925; Log of Pages DL5. There is no revision service for this Airplane Flight Manual and, therefore, in the event of the return to the U.S. of the L-1011-385-3 (193V series airplanes), Lockheed Martin Corporation should be contacted for an appropriate current FAA Approved Airplane Flight Manual.
- NOTE 31. A functional inspection at intervals not to exceed 5000 hours time in service must be conducted on those airplanes configured with the Rolls Royce RB.211-524 series engines utilizing the bleed air minimum pressure control ejector system.
- NOTE 32. DELETED.

- NOTE 33. Applicable to those aircraft which comply with FAA approved February 9, 1981, Drawing List L-1011-385-3 and derivatives dated January 15, 1981, with RB.211-524B4-02 Engines, Ground Proximity Warning System, Auto Braking System, Extended Wings, Active Control System and Digital Horizontal Situation Indicator.
- NOTE 34. DELETED.
- NOTE 35. Those L-1011-385-3 aircraft manufactured without extended wings and active control system may be modified to this configuration by incorporation of FAA approved Lockheed Martin Service Bulletins 093-57-140 and 093-22-122, and are FAA approved to the higher maximum weights as noted on this type certificate data sheet.
- NOTE 36. DELETED.
- NOTE 37. Cargo compartment loading limitations are as specified by the appropriate FAA Approved Airplane Flight Manuals and FAA approved Weight and Balance Manuals.
- NOTE 38. Modification in accordance with FAA approved Lockheed Martin Corporation Service Bulletins 093-51-029, and 093-51-030 R1 constitute FAA approved conversions of Model L-1011-385-1 aircraft Serial Numbers 1004 to 1012 and 1013 to 1051 respectively, to Model L-1011-385-1-14 aircraft.
- NOTE 39. DELETED.

....END....