

**DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION**

		A49EU
		Revision 19
BAE SYSTEMS (Operations) Limited		
BAe 146-Series	-100*	
	-200*	
	-300*	
Avro 146-RJ Series	70*	
	85*	
	100*	
		*See Note 19
		April 23, 2018

TYPE CERTIFICATE DATA SHEET NO. A49EU

This data sheet which is part of Type Certificate No. A49EU 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 BAE SYSTEMS (Operations) Limited
Prestwick International Airport
Ayrshire, Scotland KA9 2WR

I. Model BAe 146-100A (Transport Category) Approved June 13, 1983

Engines 4 Avco Lycoming Model ALF 502 R-3 Turbine engines
or
4 Avco Lycoming Model ALF 502 R-3A Turbine engines (See NOTE 7)
or
4 Avco Lycoming Model ALF 502 R-5 Turbine engines (See NOTE 7)

Fuel See Airplane Flight Manual for approved fuels and additives.

Engine Limits Model ALF 502 R-3 engine

Rating	Thrust lbs.	Engine N1	Engine N2	Turbine Gas Temperature *	
		% (RPM)	% (RPM)	°C	(°F)
Takeoff (5 minutes)	6700	96.0 (7300)	98.2 (19640)	882	(1620)
Max Continuous	6300	96.0 (7300)	96.9 (19380)	857	(1574)
<u>Model ALF 502 R-5 ALF 502 R-3A engines (See NOTE 9)</u>					
Rating	Thrust lbs.	Engine N1	Engine N2	Turbine Gas Temperature*	
		% (RPM)	% (RPM)	°C	(°F)
Takeoff (5 minutes)	6970	96.7 (7350)	98.2 (19640)	882	(1620)
Max. Continuous	6550	96.7 (7350)	96.9 (19380)	857	(1574)

*See Airplane Flight Manual for additional N2 speed, start and relight limits.

Page No.	1	2	3	4	5	6	7	8	9	10	11	12	13
Rev No.	18	18	18	18	18	18	18	18	18	19	19	18	18
Page No.	14	15	16	17	18	19	20	21	22	23	24	25	
Rev No.	18	18	18	18	18	19	19	18	18	18	18	18	

I. Model BAe 146-100A (Transport Category) Approved June 13, 1983 (continued)

Airspeed Limits	M _{MO} (Maximum Operating)	0.70	0.73 with BAe
			Mod HCM40241C
	V _{MO} (Maximum Operating to 8000 ft)		<u>kts. (IAS)</u>
	(8,000 to 22,950 ft.)	250	
	V _A (Maneuvering): Flaps Retracted	300	
	Flaps 18°	205	
	V _{FE} (Flap Speeds):	165	
	Flaps Deflected		
	<u>Degrees</u>		
	Enroute/Hold	0	V _{MO}
	T.O./ Approach	18	200
	T.O./Approach	24	170
	T.O.	30	160
	Landing	33	140

prior to embodiment of BAe
Modifications HCM00020P and U.
145 post BAe Modifications
HCM00020P and U.

V _{LO} (Landing Gear Operation)		
Operation		205
Extended		205
V _{LE} (Landing Gear)		
Extended		205
V _{MC} (Minimum Control Speed)		
VMCA		95
VMCG (up to 65,000 lbs takeoff weight)		87
(above 65,000 lbs takeoff weight)		84

C. G. Range (See Note 8)

Landing Gear retraction moment - 8,916 lb. in. (Nose down)

Maximum Taxi Weight 76500 lb.

GROSS WEIGHT LBS	FORWARD		AFT	
	Takeoff and Landing	Enroute	Takeoff and Landing	Enroute
76000	28.1% SMC (Arm -0.70 ft.)	All weights 27% SMC	43.5 SMC (Arm +0.78 ft.)	44.5% SMC (Arm +0.88 ft.)
76000 to 70000			Linear variation between 43.5% and 44% SMC	Linear variation between 44.5% and 45% SMC
70000 to 66000			44% SMC (Arm +0.83 ft.)	45% SMC (Arm +0.92 ft.)
66000 to 47000	28.0% SMC	(Arm -0.81 ft.)	Linear variation between 44% and 42.0% SMC	Linear variation between 45% and 43%
47000 to 44000	(Arm -0.71 ft.)			

I. Model BAe 146-100A (Transport Category) Approved June 13, 1983 (continued)**C.G. Range (cont'd)**Maximum taxi weight 82,750 lb.

This is achieved by the fitment of one of the following:

- i) Modification HCM 60015Q.
- ii) Modifications HCM 30071A and HCM 40225B or E (Steel brakes).
- iii) Modifications HCM 30071A and HCM 40225G (carbon brakes).
- iv) Modifications HCM 40046L and HCM 40225D (low pressure tires, wheels and steel brakes).
- v) Modifications HCM 40046L and HCM 40225F (low pressure tires, wheels and carbon brakes).

Maximum Taxi Weight with BAe Modifications HCM 30071A and HCM 40225B or HCM 40255G; HCM 40046L and HCM 40255D

FORWARD			AFT		
Gross Weight lbs.	Takeoff and Landing	Enroute	Takeoff and Landing	Enroute	Gross Weight lbs.
82250 to 66000	28.1% SMC (Arm -0.70 ft.)	All weights 27% SMC (Arm -0.81 ft.)	40.4% SMC (Arm +0.48 ft.)	40.4% SMC (Arm +0.48 ft.)	82250
			Linear variation between 40.4% and 40.9% SMC	Linear variation between 40.4% and 40.9% SMC	82250 to 82000
			Linear variation between 40.9% and 44% SMC	Linear variation between 40.9% and 42% SMC	82000 to 81350
				Linear variation between 42% and 45% SMC	81350 to 74000
66000 to 44000	28.0% SMC (Arm -0.71 ft.)	(Arm -0.81 ft.)	44% SMC (Arm +0.83 ft.)	45% SMC (Arm +0.92 ft.)	74000 to 47000
			Linear variation between 44% and 42.0% SMC	Linear variation between 45% and 43% SMC	47000 to 44000

Maximum taxi weight 84,500 lb with BAe Modification HCM 00020U

Gross Weight lbs.	Takeoff and Landing	Enroute	Takeoff and Landing	Enroute	Gross Weight lbs.
84000	All Weights 28.0% SMC (Arm -0.71 ft.)	All Weights 27.0% SMC (Arm -0.81 ft.)	43.0% SMC (Arm +0.73 ft.)	44.0% SMC (Arm +0.83 ft.)	84000
			Linear variation between 43.0% and 44.0% SMC	Linear variation between 44.0% and 45.0% SMC	84000 to 77500
			44.0% SMC (Arm +0.83 ft.)	45.0% SMC (Arm +0.92 ft.)	77500 to 47000
			Linear variation between 44.0% and 42.0% SMC	Linear variation between 45.0% and 43.0% SMC	47000 to 44000

Maximum Weights
(See NOTE 8)

Maximum Taxi Weight 76500 lb

	lbs	kg
Taxi	76,500	34,700
Takeoff Weight	76,000	34,473
Landing Weight	72,350	32,817
Zero Fuel Weight	65,000	29,483

I. Model BAe 146-100A (Transport Category) Approved June 13, 1983 (continued)

Maximum Weights (cont'd)	<u>Maximum Taxi Weight 82,750 lb</u>		
		<u>lbs</u>	<u>kg</u>
	Taxi	82,750	37,535
	Takeoff Weight	82,250	37,308
	Landing Weight	72,350	32,817
	Zero Fuel Weight	66,000	29,937
	<u>Maximum Taxi Weight 84,500 lb</u>		
	84,500	38,328	
	84,000	38,101	
	77,500	35,153	
	68,500	31,070	
Maximum Baggage	Forward Hold	2580 lbs (Arm -12.7 ft.)	
	Rear Hold	2420 lbs (Arm +11.78 ft.)	
	The maximum floor loading in the baggage compartment is 75 lbs./sq. ft.		
Control Surface Movements	The specific procedures for rigging each of the aircraft movable surfaces are defined in the documents listed below. Correct application of these procedures will ensure movement and travel of each surface is as required.		
	HC271H0001	Aileron Rigging	
	HC272H0001	Rudder Rigging	
	HC273H0001	Elevator Rigging	
	HC275H0001	Flap Rigging	
	HC276H0001	Airbrake and Lift Spoiler Rigging	
	Maximum Passengers	94 maximum, in accordance with approved only setting configuration.	
BAe modification HCM 60014M provides a 76 seat layout that complies with the Type Certificate Standard. See drawing HC250H0154.			
Engine Oil Capacity	Four oil tanks each 3.02 U.S. gallons capacity. Moment arm - 8.5 ft. See Airplane Flight Manual for Approved Oils.		
C.G. Datum	Fuselage station AX 448.13 inches. This is 4 feet forward of the reference point which is indicated by two plates at the rear end of the landing wheel well.		
Other Operating Limitations	Aircraft shall be operated in compliance with the operating limitations specified in the EASA Approved Flight Manual (AFM) Document No. BAE 5.1 dated August 15, 2007 or later approved revisions. AFM BAE 5.1 supersedes CAA Approved Flight Manual Document No. BAe 3.3 dated June 13, 1983, or later approved revisions.		
	When fitted with BAe modifications HCM 00209A, HCM 40046A, HCM 40046L, together with HCM 40046Z or HCM 40046B, HCM 40046D and HCM 40046M, and operated in accordance with the Approved Flight Manual, Document No. BAe 5. 1 Appendix No. 29 the aircraft can be operated on unpaved runways up to a maximum takeoff of 76000 lbs.		
	When fitted with BAe modifications HCM 60014G, HCM 60014H, HCM 60014J, HCM 60014Q, and HCM 60014R, the aircraft may be operated in a mixed passenger/cargo layout. See BAe report number HTD.R.461-00.DC0097, Issue 3.		

II. Model BAe 146 200A (Transport Category) Approved June 13, 1983

(Same as 100A except increased gross weight and passenger seating.)

Engines	4 Avco Lycoming Model ALF 502 R-3 Turbine Engines or 4 Avco Lycoming Model ALF 502 R-3A Turbine Engines (See NOTE 7) or 4 Avco Lycoming Model ALF 502 R-5 Turbine Engines (See NOTE 7)			
Fuel	See Airplane Flight Manual for approved fuels and additives.			
Engine Limits (Standard Day)	<u>Model ALF 502 R-3 engine</u>			
	<u>Rating</u>	Thrust	Engine	Engine
		<u>lbs.</u>	N1	N2*
			<u>% (RPM)</u>	<u>% (RPM)</u>
	Takeoff	6700	96.0 (7300)	98.2 (19640)
	(5 minutes)			
	Max. Continuous	6300	96.0 (7300)	96.1 (19380)
				857 (1574)
	<u>Model ALF 502 R-3A and ALF 502 R-5 engines</u> (See NOTE 9)			
	<u>Rating</u>	Thrust	Engine	Engine
		<u>lbs.</u>	N1	N2*
			<u>% (RPM)</u>	<u>% (RPM)</u>
	Takeoff	6970	96.7 (7350)	98.2 (19640)
	(5 minutes)			
	Max. Continuous	6550	96.7 (7350)	96.9 (19380)
				857 (1574)
	*See Airplane Flight Manual for additional N2 speed, start and relight limits			
Airspeed Limits	M _{MO} (Maximum Operating)		0.70	0.73 with BAe Mod HCM40241D
				<u>kts. (IAS)</u>
	V _{MO} (Maximum Operating to 8000 ft)		250	
	(8000 to 23,900 ft)		295	
	V _A (Maneuvering)			
	Flaps Retracted		225 with BAe Mod. HCM00021B	
			230 with BAe Mod. HCM00021U	
	Flaps 18°		175	
	V _{FE} (Flap Speeds)			
		Flaps Deflected		
		Degrees		
	Enroute/Hold	0	V _{MO}	
	T.O./Approach	18	205 prior to embodiment of BAe modifications HCM 00021M and U.	
			210 post BAe modifications HCM 00021M and U.	

II. Model BAe 146 200A (Transport Category) Approved June 13, 1983 (continued)

T.O./Approach/Climb	24	180
Approach	30	170
Landing	33	145
V _{LO} (Landing Gear Operation)		
Operation		205
Extended		205
V _{LE} (Landing Gear)		
Extended		205
V _{MC} (Minimum Control Speed)		
V _{MCA}		95
V _{MCG} (up to 65,000 lbs takeoff weight)		86
(above 65,000 lbs takeoff weight)		82

C.G. Range
(See NOTE 8)

Landing gear retraction moment - 8,916 lb in (Nose down)

Maximum Taxi Weight 90,000 lbs.

FORWARD			AFT	
Gross Weight lbs	Takeoff and Landing	Enroute	Takeoff and Landing	Enroute
89500	28.1% SMC (Arm -0.70 ft.)	All Weights 27% SMC (Arm -0.81 ft.)	44.0% SMC (Arm +0.83 ft.)	45.0% SMC (Arm +0.92 ft.)
89500 to 85000			Linear variation between 44% and 46% SMC	Linear variation between 45% and 47% SMC
85000 to 71000			46% SMC (Arm +1.02 ft.)	47% SMC (Arm +1.12 ft.)
71000 to 48500	28.0% SMC		Linear variation between 46% and 44% SMC	Linear variation between 47% and 45.2% SMC
48500 to 46000	(Arm -0.71 ft)			

Maximum taxi weight 90,000 lbs. with Bae modifications HCM 00296A & HCM 45018A

FORWARD			AFT	
Gross Weight lb	Takeoff and Landing	Enroute	Takeoff and Landing	Enroute
89500	28.0% SMC (Arm -0.71 ft)	26.0% SMC (Arm -0.90 ft.)	42.5% SMC (Arm +0.70 ft.)	44.0% SMC (Arm +0.81 ft.)
89500 to 78000	Linear variation between 28.0% and 27.0% SMC	Linear variation between 26.0% and 25.0% SMC	Linear variation between 42.5% and 47.0% SMC	Linear variation between 44.0% and 48.0% SMC
78000 to 76250				
76250 to 72000				
72000 to 48500	27.0% SMC	25.0% SMC	47.0% SMC (Arm +1.12 ft.)	48.0% SMC (Arm +1.22 ft.)
48500 to 46000	(Arm -0.80 ft.)	(Arm -1.00 ft.)	Linear variation between 47.0% and 45.5% SMC	Linear variation between 48.0% and 46.5% SMC

II. Model BAe 146 200A (Transport Category) Approved June 13, 1983 (continued)

Maximum taxi weight 93,500 lb with BAe Modification HCM00021U

Gross Weight lbs	FORWARD		AFT	
	Takeoff and Landing	Enroute	Takeoff and Landing	Enroute
93000	28.0% SMC (Arm -0.71 ft.)	26.0% SMC (Arm -0.90 ft.)	42.0% SMC (Arm +0.46 ft.)	42.0% SMC (Arm +0.64 ft.)
93000 to 86000	Linear variation between 28.0% and 27.0% SMC	Linear variation between 26.0% and 25.0% SMC	Linear variation between 42.0% and 47.0% SMC	Linear variation between 42.0% and 48.0% SMC
86000 to 84600			47.0% SMC (Arm -1.12 ft.)	
84600 to 73500				
73500 to 48500	27.0% SMC (Arm 0.80 ft.)	25.0% SMC (Arm -1.00 ft.)	Linear variation between 47.0% and 45.5% SMC	48.0% SMC (Arm +1.22 ft.)
48500 to 46000				Linear variation between 48.0% and 46.5% SMC

Maximum Weights
(See NOTE 8)Maximum Taxi Weight 90,000 lbs.

	lbs.	kg.
Taxi	90,000	40,824
Takeoff Weight	89,500	40,597
Landing Weight	77,500	35,154
Zero Fuel Weight	71,000	32,206

Maximum Taxi Weight 93,500 lbs.

Taxi	93,500	42,410
Takeoff Weight	93,000	42,184
Landing Weight	81,000	36,740
Zero Fuel Weight	75,000	34,019

Maximum Baggage

Forward Hold 3350 lbs. (Arm -14.76 ft.)
 Reverse Hold 3320 lbs. (Arm +13.68 ft.)
 The maximum floor loading in the baggage compartment is 75 lbs./sq. ft.

Control Surface Movements

The specific procedures for rigging each of the aircraft moveable surfaces are defined in the documents listed below. Correct application of these procedures will ensure moment and travel of each surface as required.

HC271H0001	Aileron Rigging
HC272H0001	Rudder Rigging
HC273H0002	Elevator Rigging
HC274H0001	Flap Rigging
HC275H0001	Airbrake and Lift Spoiler Rigging

Engine Oil Capacity

Four oil tanks each 3.02 U.S. gallons capacity. Moment arm - 8.5 ft.
 See Airplane Flight Manual for Approved Oils.

II. Model BAe 146 200A (Transport Category) Approved June 13, 1983 (continued)

C.G. Datum	Fuselage station AX491.81 inches. This is 4 feet forward of the reference point which is indicated by two plates at the rear end of the landing wheel well pressure floor.
Maximum Passengers	108 Maximum. Compliance with FAR 25.803 has been shown by demonstration and analysis with an aircraft having an interior configuration in accordance with British Aerospace document no. HAW.R.460.AW.0506 or any approved seating configuration.
Other Operating Limitations	Aircraft shall be operated in compliance with the operating limitations specified in the EASA Approved Flight Manual Document No. BAE 5.1.dated August 15, 2007 or later approved revisions. AFM BAE 5.1 Supersedes CAA approved Flight Manual
Document	No. BAe 3.6 dated June 13, 1983 or later approved revisions.

III. Model BAe 146 300A (Transport Category) Approved October 28, 1988

(Same as 100A except increased gross weight and passenger seating)

Engines	4 Avco Lycoming Model ALF R-3A Turbine Engines (See NOTE 7) or 4 Avco Lycoming Model ALF 502 R-5 Turbine Engines (See NOTE 7)			
Fuel	See Airplane Flight Manual for approved fuels and additives.			
Engine Limits	<u>MODEL ALF 502 R-3A and ALF 502 R-5 engines (See NOTE 9)</u>			
		Engine	Engine	Turbine Gas
	Thrust	N1	N2	Temperature*
<u>Rating</u>	<u>lbs.</u>	<u>% (RPM)</u>	<u>% (RPM)</u>	<u>°C (°F)</u>
Takeoff	6970	96.7 (7350)	98.2 (19640)	882 (1620)
(5 minutes)				
Max. Continuous	6550	96.7 (7350)	96.9 (19380)	857 (1574)
* See Airplane Flight Manual for additional N2 speed, start and relight limits.				
Airspeed Limits	M _{MO} (Maximum Operating) 0.73			
			<u>Kts. (IAS)</u>	
	V _{MO} (Maximum Operating to 8000 ft.)		250	
	(8000 to 23,900 ft)		295	305 with BAe Mod. HCM36049A
	V _A (Maneuvering)			
	Flaps Retracted		235	
	Flaps 18°		180	

III. Model BAe 146 300A (Transport Category) Approved October 28, 1988 (continued)**V_{FE} (Flap Speeds)**

	<u>Flaps Deflected Degrees</u>	
Enroute/Hold	0	V _{MO}
T.O./ Approach	18	210
T.O./Approach/Climb	24	180
Approach	30	170
Landing	33	150

V_{LO} (Landing Gear Operation)

Operation	205
Extended	205

V_{LE} (Landing Gear)

Extended	205
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V_{MC} (Minimum Control Speed)

V _{MCA}	97
V _{MCG}	82

C.G. Range
(See NOTE 8)

Landing Gear retraction moment - 8,916 lb. in. (Nose down)

Maximum Taxi Weight 95,500 lbs.

Gross Weight lbs	FORWARD		AFT	
	Takeoff and Landing	Enroute	Takeoff and Landing	Enroute
95000	24.5% SMC (Arm -1.05 ft.)	22.5% SMC (Arm -1.23 ft.)	44.0% SMC (Arm 0.81 ft.)	45.6% SMC (Arm 0.99 ft.)
95000 to 83000	Linear variation between 24.5% and 22.5% SMC	Linear variation between 22.5% and 20.5% SMC	Linear variation between 44.6% and 48.5% SMC	Linear variation between 45.6% and 50.0% SMC
83000 to 77500				
77500 to 58000	Linear variation between 22.5% and 23.0% SMC	20.5% SMC (Arm -1.42 ft.)	48.5% SMC (Arm +1.24 ft.)	50.0% SMC (Arm +1.41 ft.)
58000 to 47000			Linear variation between 48.5% and 44.0% SMC	Linear variation between 50.0% and 45.4% SMC

Maximum Weights**Maximum Taxi Weight 95500 lb**

	<u>lbs</u>	<u>kg</u>
Taxi	95,500	43,318
Takeoff Weight	95,000	43,091
Landing Weight	83,000	37,648
Zero Fuel Weight	77,500	35,153

Maximum Baggage

Forward Hold 4215 lbs (Arm -16.93 ft.)
 Rear Hold 4033 lbs.(Arm +14.20 ft.)
 The maximum floor loading in the baggage compartment is 75 lbs/sq. ft.

III. Model BAe 146 300A (Transport Category) Approved October 28, 1988 (continued)

Control Surface Movements	<p>The specific procedures for rigging each of the aircraft moveable surfaces are defined in the documents listed below. Correct application of these procedures will ensure movement and travel of each surface is as required.</p> <p>HC271H0001 Aileron Rigging HC272H0001 Rudder Rigging HC273H0567 Elevator Rigging HC274H0001 Flap Rigging HC275H0002 Airbrake and Lift Spoiler Rigging</p>
Engine Oil Capacity	Four oil tanks each 3.02 U.S. gallons capacity. Movement arm -8.5 ft. See Airplane Flight Manual for Approved Oils.
C.G. Datum	Fuselage station AX 544.81 inches. This is 4 feet forward of the reference point which is indicated by two plates at the rear end of the landing wheel well pressure floor.
Maximum Passengers	108 maximum. Compliance with FAR 25.803 has been shown by demonstration and analysis with an aircraft having an interior configuration in accordance with any British Aerospace approved seating configuration.
Other Operating Limitations	Aircraft shall be operated in compliance with the operating limitations specified in the EASA Approved Flight Manual Document No. BAE 5.1 dated August 15, 2007 or later approved revisions. AFM BAE 5.1 supersedes CAA approved Flight Manual Document No. BAe 3.11 dated June 1988 or later approved revisions.

DATA PERTINENT TO ALL MODELS

Auxiliary Power Unit	1 AiResearch GTCP 36-100 (M) or 1 AiResearch GTCP 36-150(M) or 1 Sundstrand APS1000 T-62T-46C
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** Limits	*GTCP 36-100(M)	GTCP 36-150(M)	APS1000 T-62T-46C
Rated shp, maximum for Standard Day, Sea Level conditions	45 shp	50 shp	53.5 shp
Shaft Speed: Maximum (at rated power)	100.5% (59034 RPM)	103% (60499 RPM)	108% (69286 RPM)
Maximum Exhaust Temperature:	732°C	746°C	718°C
Continuous Operation:	974°C	974°C	-°C
Starting: (Up to 10 seconds)	870°C	870°C	1032°C

*See Note 5

**See Airplane Flight Manual for additional limitations and Approved Oils.

Minimum Crew	2 - Pilot and Co-Pilot
Maximum Operating Altitude	30,000 ft. (See NOTE 12)

Usable Fuel Capacity

	100A	200A	300A
Wing Tanks (Right & Left)	16,240 lbs (Arm +0.008 ft)		
Center Tank	4,400 lbs (Arm -3.243 ft)		
Auxiliary Tanks (Right & Left)	2,064 lbs (Arm +4.230 ft)		

Fuel must be loaded symmetrically into the wing tanks.
The maximum allowable wing tank fuel asymmetry is 1,500 lbs.
See NOTE 1 for information on unusable and undrainable fuel.

Standard Mean Chord (SMC)	The Standard Mean Chord is 9.62 ft. The leading edge of the Standard Mean Chord is 3.405 ft. forward of the C.G. datum.
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Leveling Means Clinometer on cabin seat rails.

Certification Basis for the 100A & 200A

FAR 21.29, FAR 25, effective February 1, 1965, including Amendment 25-1 through 25-43. In addition the applicant voluntarily complied with the following later requirements.

<u>FAR Section</u>	<u>Amdt.</u>	<u>FAR Section</u>	<u>Amdt.</u>
25.305 (d)	54	25.809 (f) (iii, iv, v)	47
25.345 (d)	46	25.851 (a) (5)	54
25.351 (a)	46	25.853 (c), (d), (e)	51
25.365 (e)(1), (e)(2)	54	25.1103(a), (b)(2), (d), (e), (f)	46
25.571	45	25.1142	46
25.605 (a), (b)	46	25.1207(d)	46
25.629 (d)(1), (d)(4) (v & vi)	46	25.1305 (d)	54
25.697 (b)	46	25.1329 (h)	46
25.701 (a)	46	25.1522	46
25.733 (a), (b), (c)	49	25.1561 (c)	46
25.735 (b), (f)(2), (g)	48	25.773(b)(2)(ii)	72
25.793	51	25.775(e)	72
25.803 (c), (d)	46		

Certification Basis (cont'd)

Compliance with FAR 25.803 and 25.1419 has been established.

Compliance with FAR 25.801 has been established for the structure of the aircraft fitted with BAe modifications HCM 00100A or HCM 00166A, plus HCM 00100B for BAe 146-100A or HCM 00100C for BAe 146-200A. Full compliance will be achieved when survival equipment is installed in accordance with FAR's 25.1411 through 25.1415 and the appropriate operating equipment.

FAR 36, effective December 1, 1969, including Amendments 36-1 through 36-13. SFAR 27, 27-1 through 27-4 (see NOTE 4).

For the 300A

In addition to the 100A and 200A certification requirements, the following later requirements apply to the 300A certification:
FAR 25 Subpart C, Amendments 44 to 54 inclusive.

<u>FAR Section</u>	<u>Amdt.</u>	<u>FAR Section</u>	<u>Amdt.</u>
25.629	46	25.811	46
25.783	54	25.812	46
25.787	51	25.853	51
25.789	46	25.858	54
25.803	46	25.863	46

FAR Part 36 effective December 1, 1969, including Amendments 36-1 through 36-15. Special Federal Aviation Regulation No. 27 effective February 1, 1974, including amendments 27-1 through 27-5.

For All Bae 146

Equivalent Safety
FAR 25.613 (a) - Design Values
FAR 25.615 (a) - Design Properties
FAR 25.773 (b)(2) - Pilot's Window(see note 18)
FAR 25.1091 (e) - Foreign Object Ingestion

Exemption No. 3639 regarding FAR 25.807(c)(1)

Type Certificate No. A49EU, issued June 13, 1983.
Effective Date of Application for Type Certificate August 4, 1978.

The applicable later requirements for the installation of the LF507-1H engine are defined

within FAA issue paper G-1 dated January 26, 1993 detailing:
FAR 25.903 (a) Amendment 57
FAR 25.1091 (e) Amendment 57

FAR 25.1093 (b) (2)	Amendment 57
FAR 25.1163 (a) (3)	Amendment 57
FAR 25.1305 (d) (1)	Amendment 54

Historical Transition	The United Kingdom Civil Aviation Authority originally type certificated this aircraft under its type certificate Number BA16. The FAA validated this product under U.S. Type Certificate Number A49EU. Effective September 28, 2003, the European Aviation Safety Agency (EASA) began oversight of this product on behalf of the United Kingdom.
Serial Nos. Eligible	The United Kingdom Certificate of Airworthiness for Export endorsed as noted under "Import Requirements" must be submitted for each individual aircraft for which application of certification is made.
Import Requirements	The FAA can issue a U.S. airworthiness certificate based on an NAA Export Certificate of Airworthiness (Export C of A) signed by a representative of United Kingdom Civil Aviation Authority on behalf of the European Community. The Export C of A should contain the following statement: 'The aircraft covered by this certificate has been examined, tested, and found to conform with Type Design approved under U.S. Type Certificate No. A49EU and to be in a condition for safe operation.'
Service Information	<p>Each of the documents listed below that contain a statement that it is approved by the European Aviation Safety Agency (EASA) - or for approvals made before September 28, 2003 - by the United Kingdom Civil Aviation Authority, are accepted by the FAA and are considered FAA approved. Additionally, approvals issued by BAE Systems (Operations) Limited under the authority of EASA approved Design Organization EASA.21J.047 - or for approvals made before September 28, 2003 under the authority of JAA Design Organization Approval No. CAA.JA.02034 or Manufacturers CAA Approval Ref. DAI/1011/55 - are considered FAA approved. These approvals pertain to the type design only.</p> <ul style="list-style-type: none"> • BAE Systems (Operations) Limited service bulletins, except as noted below, • Structural repair manuals, • Vendor manuals referenced in BAE Systems (Operations) Limited service bulletins, • Aircraft flight manuals, • Repair Instructions. <p>Note: Design changes that are contained in BAE Systems (Operations) Limited Service Bulletins and that are classified as Level 1 Major in accordance with either the US/United Kingdom or US/EASA Bilateral Aviation Safety Agreement Implementation Procedures for Airworthiness must be approved by the FAA.</p>
Equipment	<p>The basic required equipment as prescribed in the applicable airworthiness regulations (See Certification Basis) must be installed in the aircraft for certification.</p> <p>Approved equipment is included in the document: ADE-CES-D-460-00-0011</p>

IV. Model AVRO 146-RJ70A (Transport Category), Approved September 3, 1993

C.G. Range

Maximum Taxi Weight 84,500 lbs

Gross Weight lbs	FORWARD		AFT	
	Takeoff and Landing	Enroute	Takeoff and Landing	Enroute
84000			43.9% SMC (Arm +0.82 ft.)	44.9% SMC (Arm +0.91 ft.)
84000 to			Linear variation between 43.9%	Linear variation between 44.9%

83500	28.1% SMC	27.0% SMC	and 44.0% SMC (Arm +0.83 ft.)	and 45.0% SMC (Arm +0.92 ft.)
83500 to 47000	(Arm - 0.70 ft.)	(Arm - 0.81 ft.)	44.0% SMC (Arm +0.83 ft.)	45.0% SMC (Arm +0.92 ft.)
47000 to 44000			Linear to 42.0% SMC (Arm +0.64 ft.)	Linear to 43.0% SMC (Arm +0.73 ft.)

IV. Model AVRO 146-RJ70A (Transport Category), Approved September 3, 1993 (continued)

Maximum Taxi Weight 90,500 lbs with Bae modifications HCM00020Z or HCM40373C

Gross Weight lbs	FORWARD		AFT	
	Takeoff and Landing	Enroute	Takeoff and Landing	Enroute
90000	28.0% SMC (Arm -0.71ft)	27.0% SMC (Arm -0.81 ft.)	43.0% SMC (Arm +0.73 ft)	44.0% SMC (Arm +0.83 ft)
90000 to 83500			Linear variation between 43.0% and 44.0% SMC (Arm +0.83 ft)	Linear variation between 44.0% and 45.0% SMC (Arm +0.92 ft.)
83500 to 47000			44.0% SMC (Arm +0.83 ft.)	45.0% SMC (Arm +0.92 ft)
47000 to 44000			Linear variation between 44.0% and 42.0% SMC (Arm +0.64 ft.)	Linear variation between 45.0% and 43.0% SMC (Arm +0.73 ft.)

Maximum Taxi Weight 95,500 lbs with BAe modification HCM40373A

Gross Weight lbs	FORWARD		AFT	
	Takeoff & Landing	Enroute	Takeoff & Landing	Enroute
95000	28.0% SMC (Arm -0.71 ft)	27.0% SMC (Arm -0.81 ft)	40.2% SMC (Arm +0.45 ft)	41.2% SMC (Arm + 0.55 ft)
95000 to 90000			Linear variation between 43.0% and 44.0% SMC (Arm +0.83 ft)	Linear Variation between 44.0% and 45.0% SMC (Arm +0.92 ft)
90000 to 83500			Linear variation between 43.0% and 44.0% SMC (Arm +0.83 ft)	Linear variation between 44.0% and 45.0% SMC (Arm +0.92 ft)
83500 to 47000			44.0% SMC (Arm +0.83 ft)	45.0% SMC (Arm +0.92 ft)
47000 to 44000			Linear variation between 44.0% and 42.0% SMC (Arm +0.64 ft)	Linear variation between 45.0% and 43.0% SMC (Arm +0.73 ft)

Maximum Weights

Maximum Taxi Weight 84,500 lbs

	<u>lbs</u>	<u>kgs</u>
Taxi Weight	84,500	38,328

Takeoff Weight	84,000	38,101
Landing Weight	83,500	37,874
Zero Fuel Weight	71,500	32,431
Zero Fuel Weight	74,500	33,792 (with Modification HCM00020X or HCM40373B)

IV. Model AVRO 146-RJ70A (Transport Category), Approved September 3, 1993 (continued)

Maximum Taxi Weight 90,500 lbs. with BAe modifications HCM00020X and HCM00020Z or HCM40373B and HCM40373C

	<u>lbs</u>	<u>kgs</u>
Taxi Weight	90,500	41,050
Takeoff Weight	90,000	40,823
Landing Weight	83,500	37,874
Zero Fuel Weight	74,500	33,792

Maximum Taxi Weight 95,500 lbs. with BAe modification HCM40373A

	<u>lbs</u>	<u>kgs</u>
Taxi Weight	95,500	43,318
Takeoff Weight	95,000	43,091
Landing Weight	83,500	37,874
Zero Fuel Weight	74,500	33,792

V. Model AVRO 146-RJ85A (Transport Category) Approved December 1, 1993

C.G. Range

Maximum Taxi Weight 93,500 lbs.

Gross Weight lbs	FORWARD		AFT	
	Takeoff and Landing	Enroute	Takeoff and Landing	Enroute
93000	27.8% SMC (Arm -0.73 ft)	25.8% SMC (Arm -0.92 ft)	44.8% SMC (Arm +0.90 ft)	44.8% SMC (Arm +0.90 ft)
93000 to 90000	Linear variation between 27.8% and 27.0% SMC (Arm -0.81 ft)	Linear variation between 25.8% and 25.0% SMC (Arm -1.00 ft)	Linear variation between 44.8% and 47.0% SMC (Arm +1.12 ft)	Linear variation between 44.8% and 47.0% SMC (Arm +1.12 ft)
90000 to 88600			Constant 47.0% SMC (Arm +1.12 ft)	Linear variation between 47.0% and 48.0% SMC (Arm +1.21 ft.)
88600 to 79000				Constant 48.0% SMC (Arm +1.21 ft)
79000 to 48500	27.0% SMC (Arm -0.81 ft)	27.0% SMC (Arm -1.00 ft)		
48500 to 46000			Linear variation between 47.0% and 45.5% SMC (Arm +0.97 ft)	Linear variation between 48.0% and 46.5% SMC (Arm +1.07 ft)

V. Model AVRO 146-RJ85A (Transport Category) Approved December 1, 1993 (continued)

C.G. Range

Maximum Taxi Weight 93,500 lbs. with BAe modification HCM20203B, E2208 only
(See Note 15)

(See Note 13)

Gross Weight lbs	FORWARD		AFT	
	Takeoff and Landing	Enroute	Takeoff and Landing	Enroute
93000	28.0% SMC (Arm -0.71 ft)	26.0% SMC (Arm -0.90 ft)	42.0% SMC (Arm +0.64 ft)	42.0% SMC (Arm +0.64 ft)
93000 to 86000	Linear variation between 28.0% and 27.0% SMC (Arm -0.81 ft)	Linear variation between 26.0% and 25.0% SMC (Arm -1.00 ft)	Linear variation between 42.0% and 47.0% SMC (Arm +1.12 ft)	Linear variation between 42.0% and 47.0% SMC (Arm +1.12 ft)
86000 to 84600			Constant 47.0% SMC (Arm +1.12 ft)	Linear variation between 47.0% and 48.0% SMC (Arm +1.21 ft.)
84600 to 84600				Constant 48.0% SMC (Arm +1.21 ft)
84600 to 75000				
75000 to 48500	Constant 27.0% SMC (Arm -0.81 ft)	Constant 27.0% SMC (Arm -1.00 ft)		
48500 to 46000			Linear variation between 47.0% and 45.5% SMC (Arm +0.97 ft)	Linear variation between 48.0% and 46.5% SMC (Arm +1.07 ft)

C.G. Range

Maximum Taxi Weight 97,500 lbs with Modification HCM00021X

Gross Weight lbs	FORWARD		AFT	
	Takeoff and Landing	Enroute	Takeoff and Landing	Enroute
97000	28.0% SMC (Arm -0.71 ft)	26.0% SMC (Arm -0.90 ft)	42.0% SMC (Arm +0.64 ft)	42.0% SMC (Arm +0.64 ft)
97000 to 90000	Linear variation between 28.0% and 27.0% SMC (Arm -0.81 ft.)	Linear variation between 26.0% and 25.0% SMC (Arm -1.00 ft)	Linear variation between 42.0% and 47.0% SMC (Arm +1.12 ft)	Linear variation between 42.0% and 47.0% SMC (Arm +1.12 ft)
90000 to 88600			Constant 47.0% SMC (Arm +1.12 ft)	Linear variation between 47.0% and 48.0% SMC (Arm +1.21 ft)
88600 to 79000				Constant 48.0% SMC (Arm +1.21 ft)
79000				

to 48500	Constant	Constant		
48500 to 46000	27.0% SMC (Arm -0.81 ft)	25.0% SMC (Arm -1.00 ft)	Linear variation between 47.0% and 45.5% SMC (Arm +0.97 ft.)	Linear variation between 48.0% and 46.5% SMC (Arm +1.07 ft)

Maximum Weights

Maximum Taxi Weight 93,500 lbs

	lbs	kgs
Taxi Weight	93,500	42,410
Takeoff Weight	93,000	42,184
Landing Weight	85,000	38,555
Zero Fuel Weight	79,000	35,833

V. Model AVRO 146-RJ85A (Transport Category) Approved December 1, 1993 (continued)

Maximum Taxi Weight 93,500 lbs with BAe Modification HCM20203B (see Note 15)

Taxi Weight	93,500	42,410
Takeoff Weight	93,000	42,184
Landing Weight	81,000	36,740
Zero Fuel Weight	75,000	34,019

Maximum Taxi Weight 97,500 lbs. with Bae Modification (HCM00021X)

Taxi Weight	97,500	44,225
Takeoff Weight	97,000	43,998
Landing Weight	85,000	38,555
Zero Fuel Weight	79,000	35,833

VI. Model AVRO 146-RJ100A (Transport Category) Approved June 10, 1994

C.G. Range

Maximum Taxi Weight 98,000 lbs.

Gross Weight lbs	FORWARD		AFT	
	Takeoff and Landing	Enroute	Takeoff and Landing	Enroute
97500	23.9% SMC (Arm -1.11 ft)	21.9% SMC (Arm -1.30 ft)	46.2% SMC (Arm +1.04 ft)	47.4% SMC (Arm +1.15 ft)
97500 to 90000	Linear variation between 23.9% and 22.5% SMC (Arm -1.24 ft.)	Linear variation between 21.9% and 20.5% SMC (Arm -1.43 ft)	Linear variation between 46.2% and 48.5% SMC (Arm +1.26 ft)	Linear variation between 47.4% and 50.0% SMC (Arm +1.41 ft)
90000 to 82500			Constant 48.5% SMC (Arm +1.26 ft)	Constant 50.0% SMC (Arm +1.41 ft)
82500 to 58000	Linear variation between 22.5% and 23.0% SMC (Arm -1.19 ft)	Constant 20.5% SMC (Arm -1.43 ft)		
58000 to 47000		Linear variation between 48.5% and 44.0% SMC (Arm +0.83 ft)	Linear variation between 50.0% and 45.5% SMC (Arm +0.97 ft)	

Maximum Taxi Weight 98,000 lbs with Bae Modification HCM60346N, E3221 Only (see Note 14)

Gross Weight lbs	FORWARD		AFT	
	Takeoff and Landing	Enroute	Takeoff and Landing	Enroute
97,500	24.4% SMC (Arm -1.06 ft)	22.4% SMC (Arm -1.24 ft)	44.0% SMC (Arm +0.83 ft)	45.3% SMC (Arm +0.92 ft)
97,500 to 86,500	Linear variation between 24.4% and 22.5% SMC	Linear variation between 22.4% and	Linear variation between 44.0% and 48.5% SMC (Arm +1.26 ft)	Linear variation between 46.0% and 50.0% SMC (Arm +1.41 ft)

86,500 to 80,500	(Arm -1.24 ft)	20.5% SMC (Arm -1.43 ft)	Constant 48.5% SMC (Arm +1.26 ft)	Constant 50.0% SMC (Arm +1.41 ft)
80,500 to 58,000	Linear variation between	Constant 20.5% SMC (Arm -1.43 ft.)	Linear variation between 48.5% and 44.0% SMC (Arm +0.83 ft.)	Linear variation between 50.0% and 45.4% SMC (Arm +0.98 ft)
58,000 to 47,000	22.5% and 23.0% SMC (Arm -1.19 ft)			

VI. Model AVRO 146-RJ100A (Transport Category) Approved June 10, 1994 (continued)

Maximum Taxi Weight 102,000 lbs with BAe Modification HCM01000L

Gross Weight lbs	FORWARD		AFT	
	Takeoff and Landing	Enroute	Takeoff and Landing	Enroute
101500	24.3% SMC (Arm -1.07 ft)	22.3% SMC (Arm -1.26 ft)	45.0% SMC (Arm +0.92 ft)	46.0% SMC (Arm +1.02 ft)
101500 to 90000	Linear variation between 24.3% and	Linear variation between 22.3% and	Linear variation between 45.0% and 48.5% SMC (Arm +1.26 ft)	Linear variation between 46.0% and 50.0% SMC (Arm +1.41 ft)
90000 to 82500	22.5% SMC (Arm -1.24 ft)	20.5% SMC (Arm -1.43 ft)	Constant 48.5% SMC (Arm +1.26 ft)	Constant 50.0% SMC (Arm +1.41 ft)
82500 to 58000	Linear variation between	Constant	Linear variation between 48.5% and 44.0% SMC (Arm +0.83 ft.)	Linear variation between 50.0% and 45.5% SMC (Arm +0.97 ft)
58000 to 47000	22.5% and 23.0% SMC (Arm -1.19 ft)			

Maximum Weight

Maximum Taxi Weight 98,000 lbs

	<u>lbs</u>	<u>kgs</u>
Taxi Weight	98,000	44,452
Takeoff Weight	97,500	44,225
Landing Weight	88,500	40,142
Zero Fuel Weight	82,500	37,421

Maximum Taxi Weight 98,000 (with Bae Modification HCM60346N (see Note 14)

	<u>lbs</u>	<u>kgs</u>
Taxi Weight	98,000	44,452
Takeoff Weight	97,500	44,225
Landing Weight	86,500	39,235
Zero Fuel Weight	80,500	36,514

Maximum Taxi weight 102,000 lbs. with Bae Modification HCM01000L

	<u>lbs</u>	<u>kgs</u>
Taxi Weight	102,000	46,266
Takeoff Weight	101,500	46,039
Landing Weight	88,500	40,142
Zero Fuel Weight	82,500	37,421

DATA PERTINENT TO ALL AVRO 146 MODELS

Engines

4 Avco Lycoming Model LF507-1F Turbine engines

Fuel

See Airplane Flight Manual for approved fuels and additives.

Engine Limits (See NOTE 13)

Model LF507-1F Engine (Standard day Sea Level Conditions)				
Rating	Thrust lbs	Engine N1 % (RPM)	Engine N2* % (RPM)	Exhaust Gas Temperature °C (°F)
Takeoff (5 minutes)	7000	97.0 (7374)	98.8 (19760)	632 (1170)
Max Continuous	6550	97.0 (7374)	96.9 (19380)	613 (1136)

*See Airplane Flight Manual for additional N2 speed, start and relight limits

Auxiliary Power Unit.

1 AiResearch GTCP 36-150(M) or 1 Sundstrand APS1000 T-62T-46C

** Limits	GTCP 36-150(M)	APS1000 T-62T-46C
Rated shp, maximum for Standard Day, Sea level conditions	50 shp	53.5 shp.
Shaft Speed: Maximum (at rated power)	103% (60499 RPM)	108% (69286 RPM)
Maximum Exhaust Temperature: Continuous Operation Starting: (Up to 10 seconds) (More than 10 seconds)	746°C 974°C 870°C	718°C - 1032°C

** See Airplane Flight Manual for additional limitations and Approved Oils.

Airspeed Limits.

Limit	Aircraft type [speeds in Kts (IAS)]		
	RJ70A	RJ85A	RJ100A
MMO (Maximum Operating) [Indicated Mach No]	0.73	0.73	0.73
VMO (up to 8000 ft)	250	250	250
(8,000 to 22,950 ft)	300	300	-
(8,000 to TBA)	-	-	305
VA (Maneuvering): Flaps Retracted	205	235 #	245 *
Flaps 18°	165	175	175
VFE (Flap speeds):			
Enroute/Hold Flaps 0°	VMO	VMO	VMO
Takeoff/Approach Flaps 18°	205	215	220
Takeoff/Approach Flaps 24°	170	180	180
Takeoff Flaps 30°	160	170	170
Landing + Flaps 33°	150	150	155
VLO (Landing Gear Operations): Operation	210	210	210
Extended	210	210	210
VLE (Landing Gear): Extended	210	210	210
VMC (Minimum Control Speed):			
VMCA Flaps 0°	132	132	132
Flaps 18°	97	97	97
Flaps 24°	91	91	91
Flaps 30°	89	89	89

VMCG (up to 65,000 lbs)	85	84	81
(at and above 65,000 lbs)	83	81	81

* For construction number E3221 with Modification HCM60346N, Flaps Retracted VA is 240 Kts (IAS)
- See Note 14.

For construction number E2208 with Modification HCM20203B, Flaps Retracted VA is 230 Kts (IAS)
- See Note 15.

+ Flaps 33° is available as a Take-off setting for aircraft fitted with modification HCM30370A or HCM40391A.

C.G. Range.

Landing Gear retraction moment - 8,916 lb. in. (Nose down)

Control Surface Movements.

The specific procedures for rigging each of the aircraft movable surfaces are defined in the documents listed below. Correct application of these procedures will ensure movement and travel of each surface is as required.

Rigging	RJ70A	RJ85A	RJ100A
Aileron	HC271H0001	HC271H0001	HC271H0001
Rudder	HC272H0001	HC272H0001	HC272H0001
Elevator	HC273H0001	HC273H0002	HC273H0567
Flap	HC275H0001	HC275H0001	HC275H0001
Airbrake & Lift Spoiler	HC276H0001	HC276H0001	HC276H0001

Maximum Underfloor Baggage.

	RJ70A	RJ85A	RJ100A
Forward Hold	2580 lbs (Arm -12.73 ft)	3350 lbs (Arm -14.76 ft)	4125 lbs (Arm -16.93 ft)
Rear Hold	2420 lbs (Arm +11.78 ft)	3320 lbs (Arm +13.68 ft)	4033 lbs (Arm +15.33 ft)
Maximum Floor Loading	75 lbs/sq.ft		

Maximum Passengers.

Model	RJ70A	RJ85A	RJ100A
Maximum Passengers	94	108	108

Engine Oil Capacity.

Four oil tanks each 3.02 U.S. gallons capacity. Moment arm - 8.5 ft.
See Airplane Flight Manual for Approved Oils.

Weight and Balance Datum.

Model	RJ70A	RJ85A	RJ100A
Fuselage Station AXO (inches)	448.13	491.81	544.81

This is 4 feet forward of the reference point which is indicated by two plates at the rear end of the main landing gear bay.

Aircraft Flight Manual.

Aircraft shall be operated in compliance with the operating limitations specified in the EASA Approved Flight Manual Document BAE 5.1 dated August 15, 2007 or later approved revisions. AFM BAE No. 5.1 supersedes CAA approved Flight Manual Document No. BAe No. 4.1, dated April 08, 1993 or later approved revisions.

Minimum Crew.

2 - (Pilot and Co-Pilot)

Maximum Operating Altitude.

31,000 ft (See Notes 16 and 17.)

Usable Fuel Capacity.

	RJ70A	RJ85A	RJ100A
--	-------	-------	--------

Wing Tanks (Right & Left)	16,160 lbs (Arm +0.008 ft)
Center Tank	4,160 lbs (Arm -3.24 ft)
Auxiliary Tanks (Right & Left)	2,064 lbs (Arm +4.230 ft)

Fuel must be loaded symmetrically into the wing tanks. The maximum allowable wing tank fuel asymmetry is 1,500 lbs. See Note 1 for information on unusable and undrainable fuel.

Standard Mean Chord.
(SMC).

The Standard Mean Chord is 9.62 ft. The leading edge of the Standard Mean Chord is 3,405 ft forward of the C.G. datum.

Leveling Means.

Clinometer on cabin seat rails.

Certification Basis AVRO RJ

FAR 21.29

FAR 25 effective 1 February 1965, including Amendments 25-1 through 25-43, FAR 25 Subpart C, Amendments 44 through 54 inclusive.

In addition the following later requirements apply:

<u>FAR Section</u>	<u>Amdt.</u>
25.605(a),(b)	46
25.629	46
25.697(b)	46
25.701(b)	46
25.733(a), (b), (c)	49
25.735(b), (f)(2), (g)	48
25.783	54
25.787	51
25.789	46
25.793	51
25.803	46
25.809(f) (iii, iv, v)	47

<u>FAR Section</u>	<u>Amdt.</u>
25.811	46
25.812	46
25.851(a) (5)	54
25.853	51
25.858	54
25.863	46
25.1103(a), (b)(2), (d), (e), (f)	46
25.1142	46
25.1207(d)	46
25.1305(d)	54
25.1329(h)	46
25.1522	46
25.1561(c)	46
25.773(b)(2)(ii)	72
25.775(e)	72

Equivalent Safety:

FAR 25.613(a)	- Design Values
FAR 25.615(a)	- Design Properties
FAR 25.773(b)(2)	- Pilot's Window(see note 18)
FAR 25.1091(e)	- Foreign Object Ingestion

Exemption No. 3639 regarding FAR 25.807(c)(1).

FAR Part 36 effective December 1, 1969, including Amendments 36-1 through 36-20.
Special Federal Aviation Regulation No. 27 effective February 1, 1974 including Amendments 27-1 through 27-5.

FAA Advisory Circular AC120-28C (criteria for Approval of Category III Landing Weather Minima, dated March 1984).

The applicable later requirements for the installation of the LF507-1H and -1F engines are:

FAR 25.903(a)	Amendment 57
FAR 25.1091(e)	Amendment 57
FAR 25.1093(b)(2)	Amendment 57
FAR 25.1163(a)(3)	Amendment 57
FAR 25.1305(d)(1)	Amendment 54

The applicable later requirements for the installation of phase II avionics are, FAR Part 25 effective 1 February 1965 including Amendments 25-1 through 25-66 and Special Conditions as published in the Federal Register October 18, 1991 covering:

- 1) Lightning Protection
- 2) Protection from Unwanted Effects of High Intensity Radiated Field (HIRF)

Historical Transition.

The United Kingdom Civil Aviation Authority originally type certificated this aircraft under its type certificate Number BA16. The FAA validated this product under U.S. Type Certificate Number A49EU. Effective September 28, 2003, the European Aviation Safety Agency (EASA) began oversight of this product on behalf of the United Kingdom.

Type Certificate.

Type Certificate No. A49EU, issued June 13, 1983.
Effective Date of Application for Type Certificate August 4, 1978.

Serial Nos. Eligible.

The United Kingdom Certificate of Airworthiness for Export issued to aircraft manufactured at Woodford in the United Kingdom and endorsed as noted under "Import Requirements" must be submitted for each individual aircraft for which application of certification is made.

AVRO 146 aircraft Models will be the following construction numbers:

RJ70A:	E1223 and subsequent.
RJ85A:	E2226 and subsequent, less E2227 and including E2208.
RJ100A:	E3221 and subsequent, less E3222.

AVRO 146 aircraft minimum type design build standards for certification are defined by the following modifications:

RJ70A:	HCM60401Z	Part Number HC000H1401-002 at Issue 1 and subsequent.
RJ85A:	HCM60402Z	Part Number HC000H1402-002 at Issue 1 and subsequent.
RJ100A:	HCM60403Z	Part Number HC000H1403-002 at Issue 1 and subsequent.

Import Requirements.

The FAA can issue a U.S. airworthiness certificate based on an NAA Export Certificate of Airworthiness (Export C of A) signed by a representative of United Kingdom Civil Aviation Authority on behalf of the European Community. The Export C of A should contain the following statement: 'The aircraft covered by this certificate has been examined, tested, and found to conform with Type Design approved under U.S. Type Certificate No. A49EU and to be in a condition for safe operation.'

Service Information.

Each of the documents listed below that contain a statement that it is approved by the European Aviation Safety Agency (EASA) - or for approvals made before September 28, 2003 - by the United Kingdom Civil Aviation Authority, are accepted by the FAA and are considered FAA approved. Additionally, approvals issued by BAE Systems (Operations) Limited under the authority of EASA approved Design Organization EASA.21J.047 - or for approvals made before September 28, 2003 under the authority of JAA Design Organization Approval No. CAA.JA.02034 or Manufacturers CAA Approval Ref. DAI/1011/55 - are considered FAA approved. These approvals pertain to the type design only.

- BAE Systems (Operations) Limited service bulletins, except as noted below,

- Structural repair manuals,
- Vendor manuals referenced in BAE Systems (Operations) Limited service bulletins,
- Aircraft flight manuals,
- Repair Instructions.

Note: Design changes that are contained in BAE Systems (Operations) Limited Service Bulletins and that are classified as Level 1 Major in accordance with either the US/United Kingdom or US/EASA Bilateral Aviation Safety Agreement Implementation Procedures for Airworthiness must be approved by the FAA.

Equipment.

The basic required equipment as prescribed in the applicable airworthiness regulations (See Certification Basis) must be installed in the aircraft for certification.

Approved equipment is included in the following document:

ADE-CES-D-460-00-0011

NOTES: (Applicable to both BAe 146 and AVRO 146 Models unless indicated otherwise)

NOTE 1.

Weight and Balance.

(a) Current Weight and Balance Manual including list of equipment included in certificated empty weight and loading instructions must be provided for each aircraft at the time of original certification and at all times subsequently. "Weight and Balance Manual" No. WBM 146 contains all the loading information required for each aircraft in its delivery configuration.

(b) The airplane must be loaded so that the C.G. is within the specified limits at all times when all influences on C.G. position have been considered.

(c) The Weight and Balance Manual defined in (a) above quotes the quantities of unusable fuel as determined by the critical conditions of FAR 25.959. Undrainable fuel, being that remaining in the aircraft when all fuel drain valves are opened on the ground, is also quoted in the Weight and Balance Manual.

NOTE 2.

All placards required in the Approved Airplane Flight Manual must be installed in the appropriate location.

NOTE 3.

- (a) Airframe Component Life Limitations, required Certification Maintenance Requirements (CMR's) and required Structural Inspections are listed in the FAA Approved Airworthiness Limitations Section (Chapter 5) of the BAe 146/AVRO 146 Aircraft Maintenance Manual.
- (b) Engine life limited components are contained in Avro Lycoming Service Bulletin No. ALF 502-72-0002, Revision 6, dated January 10, 1983 or later, approved revision.

NOTE 4.

Compliance with the fuel venting provisions of SFAR 27 is achieved by incorporation of the components listed in Document Number HTD-N-46071SC0071.

NOTE 5. (BAe 146 only with GTCP 36-100(M))

Without Modifications HCM35040M and X the Auxiliary Power Unit has not been shown to fully comply with FAR 25.1093(b)(1) and therefore cannot be considered essential for dispatch purposes when falling snow or freezing rain conditions exist.

With Modification HCM35040M and X embodied the Auxiliary Power Unit can be operated as an essential power source for dispatch purposes in falling snow or freezing rain when the relevant information is incorporated in the approved Airplane Flight Manual, Document No. BAE 5.1.

NOTE 6.

NOTE 7. (BAe 146 only)

The Model ALF 502 R3A and ALF 502 R-5 engine are physically identical to the Model ALF 502 R-3 engine and is eligible without additional installation instructions. However, the following conditions must be observed:

(a) Any combinations of ALF 502 R-3 and R-5 model engines may be fitted to the aircraft provided they are all operated at the model ALF 502 R-3 thrust settings and limitations. Any combination of ALF 502 R-3A and R-5 model engines may be fitted to the aircraft and may be operated at the model ALF 502 R-5 thrust setting and limitations.

(b) When four ALF 502 R-5 engines are fitted, they may be operated at Model ALF 502 R-5 thrust settings and limitations when BAE Systems modifications HCM0020B for BAe 146-100A, or HCM00021B for BAe 146-100A, or HCM0021B for BAe 146-200A, or HCM00083A, HCM00083C and HCM00083D for BAe 146-100A and 200A, are incorporated.

(c) The appropriately revised approved Airplane Flight Manual, Document No. BAE 5.1 is required for operation when BAE Systems modifications HCM50033A, HCM50033B, HCM50033C; or HCM00101A, HCM00101B; or HCM00336A, HCM00336B, HCM00336C, HCM 00336D; or HCM50046A, HCM50046B, HCM50046C, HCM50046D are incorporated.

(d) Deleted.

NOTE 8. (BAe 146 only) Maximum Weight Increase

(a) The maximum weights all BAe 146 Models may be increased as shown in the following tables when the BAE Systems modification listed against each weight increase is fitted and the aircraft is operated in accordance with the FAA Approved Flight manual, Document No. BAE 5.1, revised to reflect the associated modification standard.

(b) 100A

	Maximum Weight Permitted	BAe Modification No.
Maximum Zero fuel weight	66,000 lb	No modification to aircraft
	67,000 lb	HCM 00020G or HCM60015Q
	67,500 lb	HCM 00020H
	68,500 lb	HCM 00020J
Maximum landing weight	73,350 lb	HCM 00020N or HCM 60015Q
	77,500 lb	HCM 00020P
Maximum take-off weight	82,250 lb	i) HCM 60015Q or ii) HCM 30071A with HCM 40225B, E or G or iii) HCM 40046L with HCM 40225D or F
	84,000 lb.	HCM 00020U

(c) 200A.

	Maximum Weight Permitted	BAe Modification No.
Maximum zero fuel weight	73,500 lb	HCM 00021G
Maximum zero fuel weight	75,000 lb	HCM 00021J
Maximum Landing weight	78,900 lb	HCM 40420B
	81,000 lb	HCM 00021N
Maximum takeoff weight	91,200 lb	HCM 40420A
	93,000 lb	HCM 00021U

(d) 300A.

	Maximum Weight Permitted	BAe Modification No.
Maximum zero fuel weight	78,500 lb * 79,000 lb	HCM 01000B HCM 01000G
Maximum landing weight	84,500 lb	HCM 01000B
Maximum take-off weight	97,500 lb	HCM 01000B

*Applicable to freighter aircraft only. HCM 01000G can only be embodied on aircraft which incorporate HCM 01000B.

NOTE 9. (BAe 146 only)

The maximum take-off N2 rating is 98.0% (19760 rpm) for aircraft fitted with BAE Systems modification HCM35051B and operated in accordance with the Approved Flight Manual, Document No. BAE 5.1.

The maximum take-off N2 rating is 98.8% (19760 rpm) with transient overshoots not to exceed 10 seconds or 100%, for aircraft fitted with BAE Systems modifications:

- (i) HCM35051D and HCM70080A
- or (ii) HCM01054B

and operated in accordance with the Approved Flight Manual, Document No. BAE 5.1.

For aircraft fitted with BAE Systems modification HCM 60020B, the maximum take-off N2 limits of 98.8% (19760 rpm) and the maximum take-off TGT limit of 904°C are authorized, provided the aircraft is operated in accordance with the limitations and procedures given in the Approved Flight Manual, Document No. BAE 5.1.

NOTE 10.

Category II & III Operation

BAe 146 Models: (Category II Operation only)

Automatic Pilot/Flight Director System including approach and landing to Category II Weather Minimum is authorized for the BAe 146 Models when the following BAE Systems modifications are embodied and operated in accordance with the appropriately revised approved Airplane Flight Manual, Document No. BAE 5.1.

Model	Modification
100A	HCM40350B
200A	HCM40350C
300A	HCM40354A

AVRO 146 Models: (Category III and II Operation)

Automatic Pilot/Flight Director System including approach and landing to Category II Weather Minimum is authorized for the AVRO 146 Models by virtue of the fitment of the Category III Modifications as detailed below:

Model	Modification
RJ70A	HCM40356A
RJ85A:	HCM40355A
RJ100A	HCM40354A

Operation for Category III and II is detailed within the appropriately revised approved Aircraft Flight Manual Document No. BAE 5.1.

NOTE 11. (BAe 146 only)

Aircraft for Freighter Conversion

A BAe 146 200A/300A fitted with the BAe modification(s) noted below provides provision for converting the basic BAe 146 200A/300A into the freighter configuration.

For 200A:	HCM 50200A	- Deletion of type certification basic features not required on conversion to a freighter aircraft.
	HCM 50200B	- Basic airframe changes.
	HCM 50200C	- Dedicated freighter features.
For 300A:	HCM 50213C	- To prepare basic 300A airframe for conversion to freighter role.

Freighter Aircraft

The BAe 146 300A fitted with the BAe Modification noted below provides full conversion to an operational freighter aircraft.

HCM 50214S	- To introduce minimum standard for dedicated freighter aircraft.
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Modification HCM 50214S has associated content within approved Airplane Flight Manual Document No. BAE 5.1.

NOTE 12. (BAe 146 only)	<u>Aircraft for operation to 31,000 ft:</u> For aircraft fitted with BAe modification HCM 50043A and HCM 50043B, or E or F or for aircraft fitted with HCM 50043C, operation to a maximum altitude to 31,000 ft in accordance with the Approved Flight Manual is authorized.
NOTE 13. (AVRO 146-RJ only)	On all AVRO 146-RJ Models, the engine is controlled by a fanspeed (N ₁) Schedule in the Digital Flight Guidance Computer or the Aircraft Flight Manual. When Modification HCM00020S is fitted to the RJ70A aircraft, the Schedule produces a thrust of 6,130 lbs at sea level (static) and ISA +17.5°C, (compared to 7,000 lbs without the modification and HCM00020R fitted) which is the basis for the performance data in the Aircraft Flight Manual.
NOTE 14. (E3221 only)	Construction number E3221 is fitted with Modification HCM60346N which introduces reduced Max. Zero Fuel and Max. Landing Weights and a reduction in speed VA to 240 kts (IAS) with flaps retracted.
NOTE 15. (E2208 only)	Construction number E2208 is fitted with Modification HCM20203B which introduces reduced Max. Zero Fuel and Max. Landing Weights and a reduction in speed VA to 230 kts (IAS) with flaps retracted.
NOTE 16. (AVRO 146-RJ only) and	<u>Aircraft for operation to 33,000 ft:</u> For aircraft fitted with BAe modification HCM 50070F HCM 50258A, operation to a maximum altitude to 33,000 ft in accordance with the Approved Flight Manual is authorized.
NOTE 17. (AVRO 146-RJ only)	Aircraft for operation to 35,000 ft For aircraft fitted with BAe modification HCM 50259A, operation to a maximum altitude to 35,000 ft in accordance with the Approved Flight Manuals is authorized.
NOTE 18	In the original certification basis an equivalent safety finding (ESF) to FAR 25.773(b)(2) amendment 25-23 was granted to allow for a non-openable first pilot window based on certain compensating design features. FAR 25.773 (b)(2) was later amended by amendment 25-72 to delete the need for an ESF for a non-openable first pilot window provided certain criteria are met (the criteria and BAe compliance with it are contained in FAA issue paper F-1 dated July 8, 1998). Satisfying these criteria also establishes compliance with FAR 25.773(b)(2)(ii) and 25.775(e) as amended by amendment 25-72 and the certification basis for the BAe/Avro 146 has been amended accordingly.
NOTE 19	The certification differences between aircraft that meet the FAA certification basis (FAA TCDS A49EU) and those aircraft that meet the European Aviation Safety Agency (EASA) certification basis (EASA TCDS EASA.A.182) are limited to cabin pressure controllers, fuel contents indicators, a change of MMO, associated placards and gauges and constructors

nameplates and flight manual. BAE Systems (Operations) Ltd Service Bulletins are available to facilitate conversion of an EASA standard aircraft to an FAA standard aircraft and vice versa. (SB01-07-20004A; SB01-37-20004B; SB01-35-20004C) Aircraft converted from the EASA standard to the FAA standard must have an “A” suffix, in the aircraft model designation, see table below and on the applicable placards and or nameplates to indicate that the converted aircraft meets the FAA certification basis

BAE 146 Series		Avro 146 RJ Series	
FAA	EASA	FAA	EASA
146-100A	146-100	146-RJ70A	146-RJ70
146-200A	146-200	146-RJ85A	146-RJ85
146-300A	146-300	146-RJ100A	146-RJ100

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