

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

A24EU
BRITISH AEROSPACE
Revision 8
HS 748 Series
2A
2B
July 29, 2011

TYPE CERTIFICATE DATA SHEET NO. A24EU

This data sheet which is a part of type certificate No. A24EU 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 2RW

I - Model HS 748 Series 2A (Transport Category) Approved 7 April 1972

Engines 2 Rolls-Royce Dart MK 532-2L Turbo-Propeller.
Reduction gear ratio: 0.093 to 1.
or
2 Rolls-Royce Dart MK 535-2 Turbo Propeller.
Reduction gear ratio: 0.093 to 1.

Fuel Aviation Kerosene Specifications (as revised):

American MIL-T-5624 (Grade JP-5)
ASTM D.1655-68 Jet A or Jet A-1

I.A.T.A. Kerosene type fuel
Canadian 3-GP-23. Kerosene type.
British D.Eng.R.D. 2494, 2498 or 2453.

Note: The following departures from specification, D.Eng.R.D. 2494 are acceptable.

Flash Point - Minimum 70°F
Mercaptan sulphur percentage weight maximum 0.005% by weight.

Aviation wide-cut fuel specification (as revised):

American MIL-T-5624 (Grade JP-4)
ASTM D. 1655 Jet-B

I.A.T.A. Wide-cut (JP-4) Type fuel Canadian 3-GP-22.
wide-cut type. British D.Eng.R.D. 2486 or 2454.

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Engine Limits:

	Rating	Shaft HP	Jet Thrust	Engine r.p.m.	Propeller r.p.m.	Turbine Gas Temperature °C
Rolls Royce Dart MK 532- 2L	Max. Takeoff (WET)	2040	520	15000	1395	905
	(DRY)	1835	485	15000	1395	810
	Max. Continuous	1835	485	15000	1395	920
Rolls Royce Dart MK 535-2	Max. Takeoff (WET)	2040	520	15000	1395	920
	(DRY)	1835	485	15000	1395	810
	Max. Continuous	2030	485	15000	1395	920

Propeller and Limits: 2 Dowty Rotol Type CR.212/4-30-4/22 or CR 251/4-30-4/49, R.A.
25953-1 Blades
Diameter 12 feet
Pitch settings at 0.7 radius station
Ground Fine 0° Fine 18°, feathered 84°21', Low pitch warning 16°.
Restricted speed range: Continuous operation between 8500 and 9500 engine
r.p.m. is to be avoided during ground operations.

Airspeed limits:

Vmo (Maximum Operating)
From sea level to 15000 feet 225 kts.
Above 15000 feet 215 kts.

Va (Maneuvering) 155 kts.

Vfe (Flap Speeds)
Flap deflection 7 1/2° 180 kts.
Flap deflection 15° 180 kts.
Flap deflection 22 1/2° 140 kts.
Flap deflection 27 1/2° 120 kts.

Vlo (Landing Gear Operation)
Operation 160 kts.
Extended 160 kts.

Vllo (Landing Light Operation)
Operation 140 kts.
Extended 140 kts.

Vmc (Minimum Control Speed)
82 kts. (Flaps 0 < 22 1/2 °)
81 kts. (Flaps = or > 22 1/2 °)

C.G. range: Landing gear retraction moment - 68,564 lb. in. (Nose down)
(Landing gear extended)

Weight (lb.)	Forward		Aft	
	% S.M.C.	Aft of Datum (ins)	% S.M.C.	Aft of Datum (ins)
24,000	12.20	57.00	32.20	76.78
27,000	12.20	57.00	32.20	76.78
30,000	13.70	58.50	32.20	76.78
40,000	19.00	63.75	35.20	79.80
44,495	21.30	66.00	35.20	79.80

Straight line variation between weights

Maximum weights: Maximum Take-off weight 44,495 lb.
Maximum Landing Weight 43,000 lb.
Maximum Zero Fuel Weights 37,500 lb.
38,500 lb. (with Modification 4080)

Maximum baggage: Baggage holds located according to the passenger layout.

Between fuselage formers 252 in. forward and 126 in. forward of the fuselage datum the maximum permissible floor loading is 110 lb. per sq. ft. over full width of fuselage, or 155 lb. per sq. ft. with an unloaded 20 inch central aisle.

Between fuselage formers 126 in. forward of the fuselage datum to 306 in. aft of fuselage datum the maximum permissible floor loading is 100 lb. per sq. ft. over full width of fuselage, or 130 lb. per sq. ft. with an unloaded 20 inch central aisle.

Control surface movements: Elevator Up 22° Down 8.5°
Trim Tabs Up 7° Down 10°
Geared Tab Up 3.4° Down 8.8°
(0.4 Basic Gearing)

Rudder Right 20° Left 20°
Spring Tab Right 28° Left 28° (Rudder Locked)
Trim Tab Right 19.5° Left 13.5°

Ailerons Up 18.5° Down 18.5°
Trim Tabs Up 10° Down 10° (Starboard Aileron Only)
Geared Tabs Up 9° Down 9° (0.45 Basic Gearing)

Flaps 27.5° total angle of travel

The rigging instructions including tolerances are given in the CAA Approved Maintenance Manual.

II - Model HS 748 Series 2B (Transport Category) Approved December 19, 1980

Engines 2 Rolls-Royce Dart MK 535-2 Thru-Propeller.
Reduction gear ratio: 0.093 to 1.

Fuel See Section I.

Engine limits See Section I.

Propeller and Limits: See Section I.

Airspeed limits (I.A.S.) V_{mo} (Maximum Operating)
From sea level to 15,000 feet 220 kts .225 kts. (with Mod. 6751)
Above 15,000 feet 215 kts.

V_a (Maneuvering) 155 kts.

V_{fe} (Flap Speeds)

Flap deflection 7 1/2° 180 kts.

Flap deflection 15° 180 kts.

Flap deflection 22 1/2° 140 kts.

Flap deflection 27 1/2° 120 kts.

V_{lo} (Landing Gear Operation)

Operation 160 kts.

Extended 160 kts.

V_{llo} (Landing Light Operation)

Operation 140 kts.

Extended 140 kts.

V_{mc} (Minimum Control Speed)

82 kts. (Flaps 0 < 22 1/2°)

81 kts. (Flaps = or > 22 1/2°)

C.G. range Landing gear retraction moment - 68,564 lb. in. (Nose down)
(Landing gear extended)

Weight (lb.)	Forward		Aft	
	% S.M.C.	Aft of Datum (ins)	% S.M.C.	Aft of Datum (ins)
24,000	12.20	57.00	32.20	76.78
27,000	12.20	57.00	32.20	76.78
30,000	13.70	58.50	32.20	76.78
38,500	18.20	63.00	37.80	82.30
46,500	22.30	67.00	37.80	82.30

Straight line variation between weights

Maximum weights Maximum Takeoff weight 46,500 lb.
Maximum Landing Weight 43,000 lb.
Maximum Zero Fuel Weight 37,500 lb.
38,500 lb. (with Modification 4080)

Maximum baggage	Baggage holds located according to the passenger layout.			
	Between fuselage formers 252 in. forward and 198 in. aft of the fuselage datum, the maximum permissible floor loading is 200 lb. per sq. ft. over full width of fuselage except the areas between fuselage formers 162 in. forward and 180 in. aft outside a 34 in. center aisle where the maximum permissible floor loading is 150 lb. per sq. ft.			
	Between fuselage formers 198 in. aft and 306 in. aft of fuselage datum the maximum permissible floor loading is 100 lb. per sq. ft.			
Control surface movements	Elevator Up	22°	Down	8.5°
	Trim Tabs Up	7°	Down	10°
	Geared Tab Up	4.25°	Down	11°(0.4 Basic Gearing)
	Rudder	Right	20°	Left 20°
	Spring Tab	Right	28°	Left 28° (Rudder Locked)
	Trim Tab	Right	19.5°	Left 13.5°
	Ailerons Up	18.5°	Down	18.5°
	Trim Tabs Up	10°	Down	10° (Starboard Aileron Only)
	Geared Tabs Up	6.5°	Down	6.5° (0.35 Basic Gearing)
	Flaps 27.5° total angle of travel			
	The rigging instructions including tolerances are given in the CAA Approved Maintenance Manual.			

DATA PERTINENT TO ALL MODELS

Minimum crew: 2 - (Pilot and Co-Pilot)

Maximum passengers: 50 with one (1) flight attendant 52 with two (2) flight attendants

Maximum operating altitude: 25,000 ft.

Fuel capacity: Two integral wing fuel tanks each 840 U.S. gallons. Moment arm plus 82.3 in. (i.e. aft of C.G. datum point). See NOTE 1(b) for data on system fuel and oil.

Oil capacity: Two oil tanks each 3.977 U.S. gallons capacity, including propeller feathering oil of 1.20 U.S. gallons. The oil tank is integral with the Rolls-Royce Dart Engines. Moment arm - 48.0 in. (i.e. forward of C.G. datum point). See NOTE 1 (b) for data on system fuel and oil.

Datum: Zero moment datum located on the center line of the aircraft 108.3 in. forward of the fuselage and datum (the datum face of the fuselage former at the rear spar). The C.G. datum point is a mushroom headed bolt marked C.G. origin on each side of the fuselage. The C.G. datum point is also 263.7 in. aft of the extreme forward tip of the fuselage and 108.3 inches forward of the fuselage datum.

Standard mean chord:	The standard mean chord is 98.77 in. and the leading edge of the standard mean chord (S.M.C.) is 43.15 in aft of the C.G. datum.
Leveling means:	The seat rail in the forward fuselage adjacent to the forward freight door.
Other operating limitations:	<p>Aircraft shall be operated in compliance with the operating limitations specified in the CAA Approved Flight Manual Document No. A01.10.</p> <ol style="list-style-type: none">1. Series 2A with Rolls Royce Dart MK 532-2L engines installed, Amendments G/5 and P/3 of AFM are required.2. Series 2A with Rolls Royce Dart MK 535-2 engines installed, Amendment G/5 of AFM are required.3. Series 2B with Rolls Royce Dart MK 535-2 engines installed, Amendments G/5 and P/4 are required.
Certification basis:	<p>FAR 21.19, FAR 25, effective 1 February 1965, including Amendments 25-1 through 25-20, Special Conditions No. 25-24-EU-4 dated 9 June 1970.</p> <p>Part 26 of the Federal Aviation Regulations: Per 21.29(a), applicable provision of part 26.</p> <p>FAR 36, effective 1 December 1969, including Amendments 36-1 through 36-9.</p> <p>Compliance with FAR 25, Amendments 25-7 through 25-20 which were not required based on the effective application date in accordance with FAR 21.17(c)(2) was elected by the manufacturer in accordance with FAR 21.17(d).</p> <p>Type Certificate No. A24EU, issued 7 April 1972. Effective Date of Application for Type Certificate per FAR 21.17(c)(2): 7 April 1967.</p> <p>Compliance with FAR 25.1419 has been shown.</p> <p>Exemption No. 9802 docket No FAA-2008-0738 concerning EAPAS 26.11, AASR 26.43, 26.45, and 26.49.</p> <p>Pursuant to FAR 21.29(a)(1)(ii), Type Certificate A24EU was issued in validation of the United Kingdom Civil Aviation Authority Certification of Compliance with the following standards which were found to provide a level of safety to the above "Certification Basis".</p> <ol style="list-style-type: none">1. BCAR Sections D and J in effect on 15 September 1966.2. FAA additional requirements listed in ARB Validation Arrangements (V.A. Note 1) Issue 2, dated 21 May 1967.3. Revised paragraphs of FAR 25 as amended by Amendments 25-7 through 25-20.4. Special Conditions No. 25-24-EU-4 dated 9 June 1970.5. FAR 36 effective 1 December 1969, including Amendments 36-1 through 36-9.

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.
Transition Statement:	<i>The United Kingdom Civil Aviation Authority originally type certificated this aircraft under its type certificate Number AAN10059 (HS 748 Series 2A) and ANN16479 (HS 748 Series 2B). The FAA validated this product under U.S. Type Certificate Number A24EU. Effective September 28, 2003, the European Aviation Safety Agency (EASA) began oversight of this product on behalf The United Kingdom.</i>
Import requirement	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 the 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. A24EU and to be in a condition for safe operation.'

The U.S. airworthiness certification basis for aircraft type certificated under FAR Section 21.29 and exported by the country of manufacture is FAR Sections 21.183(c) or 21.185(c). The U.S. airworthiness certification basis for aircraft type certificated under FAR Section 21.29 but exported from countries other than the country of manufacture (e.g., third party country) is FAR Sections 21.183(d) or 21.183(b). These sections provide that U.S. airworthiness certification are issued only if the Administrator finds, "that the aircraft conforms to the type design and is in a condition for safe operation."

In order for the FAA to make the finding that an HS 748 aircraft is in a condition for safe operation, the FAA certificating inspector or other authorized person must contact the Manager, International Branch, ANM-116, FAA Transport Airplane Directorate; 1601 Lind Avenue Southwest; Renton, Washington 98055; telephone (425) 227-1263; fax (425) 227-1149, prior to issuance of the U.S. airworthiness certificate to obtain the FAA Required Modification List (RML) for the HS 748. Prior to issuance of a Standard Airworthiness Certificate on any HS 748 model aircraft, all modifications shown in the model HS 748 RML must be accomplished in the interest of safety before the aircraft can be found to be in a condition for safe operation.

Authority for these required modifications is given per the airworthiness certification provisions of 49 U.S.C. 44704 (c), which states "the Administrator may include in an airworthiness certificate terms required in the interest of safety". "Terms required in the interest of safety" include actions to correct unsafe conditions issued by the foreign authority of the state of design that also meet FAA criteria for corrective action. This law also gives the FAA the authority to adopt FAR § 21.183(c) and (d), which form the regulatory basis for the issue of standard U.S. airworthiness certificates on imported products. 14 CFR §21.183(c) and (d) provide that airworthiness certificates are issued only if the Administrator finds "that the aircraft conforms to the type design and is in a condition for safe operation." The modifications identified in the Model HS 748 RML are required in the interest of safety and are necessary for this airplane to be in a condition for safe operation.

A Notice of policy Statement announcing the FAA's policy with respect to foreign mandatory continued airworthiness information, when no aircraft of the affected design are currently operating in the U.S. was published in the Federal Register on May 1, 1998. Additional guidance is contained in the FAA advisory Circular 21-23, Airworthiness Certification of Civil Aircraft, Engines, Propellers, and Related Products Imported into the United States.

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 United Kingdom Civil Aviation Authority or JAA Design Organization Approval No. CAA.JA.02034 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 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 Civil Aviation Authority 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 Schedule of Equipment Drawing No. A 3767.

In addition, the following items of equipment are required.

Control Column stick shaker	Safe Flight - Pt. No. C74002
Lift Transducer	Safe Flight - Pt. No. C74007 (2 required).

NOTES:

NOTE 1. (a) Current weight and balance report, including list of equipment included in the certificated empty weight and loading instructions when necessary, must be in each aircraft at the time of original certification.

(b) "Unusable Fuel and System Oil" and all hydraulic fluid must be included with certificated empty weight.

Unusable fuel is that quantity of fuel in the system and in the tanks which is unavailable to the engine under critical flight conditions as defined in FAR 25.959. This unusable fuel includes "system fuel" which is defined as the quantity required to fill the system and tanks outlet level when the airplane is in the ground level attitude. The fuel gauges are calibrated to read zero during level flight with the unusable fuel in the tanks.

The total amount of fuel is as follows:

<u>Usable Fuel</u>	<u>Unusable Fuel</u>
<u>@ 6.75 lb./gal.</u>	<u>@ 6.75 lb./gal.</u>
1680 U.S. gallons	3.6 U.S. gallons

System Oil is that amount of oil required to fill the oil system and tanks which is not available for normal engine lubrication. The propeller feathering oil is not considered usable oil and is included in "System Oil". System oil weight is 37 lb. The oil tank capacity shown in this specification is the total oil for which the tanks are placarded. Dipstick readings indicate the amount of oil required to fill the tank.

NOTE 2. All placards required in the Approved Airplane Flight Manual must be installed in the appropriate location.

NOTE 3. The service life for aircraft structural parts which are fatigue critical are listed in the HS 748 Recommended Maintenance Schedule, pages 12 to 18 inclusive, and may not be changed without FAA approval.

NOTE 4. The approval fuel additives are listed in the CAA Approved Flight Manual Document A01.10.

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