UNITED KINGDOM
CIVIL AVIATION AUTHORITY

FA69
Issue 1
MAY 1999
McDONNELL DOUGLAS
MD-11
MD-11F

TYPE CERTIFICATE DATA SHEET NO. FA 69

This data sheet which is part of CAA Type Certificate No. FA69, prescribes conditions and limitations under which the product, for which the type certificate was issued, meets the airworthiness requirements of the Civil Aviation Authority.

TYPE CERTIFICATE HOLDER:	**McDONNELL DOUGLAS CORPORATION** **3855 LAKEWOOD BOULEVARD** **LONG BEACH** **CALIFORNIA 90846-0001** **USA**
MANUFACTURER:	**McDONNELL DOUGLAS**
AIRCRAFT TYPE/ **MODEL NUMBER(S):**	**MD-11** **MD-11F**

In this case, the CAA Type Certification has been granted on the basis of a recommendation from the Joint Airworthiness Authorities (JAA) following an investigation carried out in accordance with the JAA Joint Certification Procedures. Accordingly, the attached JAA Data Sheet No. JAA/25/91-001 Issue 6 dated 28 May 1998 has been accepted by the CAA for the McDonnell Douglas MD11 Series.

- END -

JOINT AVIATION AUTHORITIES
JAA DATA SHEET FOR NATIONAL TYPE CERTIFICATES
McDONNELL DOUGLAS MD-11

The MD-11 is a derivative of the DC-10, the information below should be used by in conjunction with the data contained in CAA TCDS FA 10 applicable to the DC-10 Series aircraft.

Type Certificate Holder	McDonnell Douglas Corporation, Long Beach, California, United States of America.

Model MD-11 (Transport Aircraft), Approved 2nd October, 1991

and

Model MD-11F (Transport Aircraft), Approved 20th December, 1994

Type Design Standard	Report MDC 91K0526		
Dimensions	Span	51.66 m	(169 ft 6 ins)
	Length	61.21 m	(200 ft 10 ins)
	Height	17.60 m	(57 ft 9 ins)
	Wing Area	338.9 m^2	(3648 ft^2)

Engines

3 General Electric CF6-80C2D1F high-bypass turbofan engines.

or

3 Pratt & Whitney PW4460 high-bypass turbofan engines.

or

3 Pratt & Whitney PW4462 high-bypass turbofan engines.

APU 1 Garret Airesearch TSCP 700-4E

Fuel

a) The following fuels are eligible:

Kerosene type fuels MIL-T-5624H (JP-5) and ASTM D 1655-657 (Jet A and A1), as specified in engine Type Certification Data Sheet E13NE as revised and E24NE.

b) To use MIL-T-5624 (JP-4) or Jet B fuels in MD-11 and MD-11F airplanes, McDonnell Douglas Drawing PZV0007 or production equivalent must be installed.

c) Additives that may be used (in addition to those authorized by GE specification D50TF2 or by P&WA Specification 522, for the respective engines) in the approved fuel are listed below. These additives may be used in combination.

1) Philips PFA-55MB or anti-icing additive to Specifications MIL-I-27686E at a concentration not in excess of 0.15 percent by volume.

2) Sohio Biobor JF biocide additive at a concentration not in excess of 20 ppm elemental boron (270 ppm total additive).

3) Shell ASA-3 anti-static additive at a concentration that will provide not in excess of 3000 conductivity units, which is approximately equivalent to one ppm.

d) NALCO 5403 corrosion inhibitor fuel additive may be used if concentration delivered to airplane does not exceed 23 mg/litre of turbine fuel.

e) Fuel capacities:

FUEL TANK CAPACITY (kg)

CAPACITY	1 MAIN	2 MAIN	3 MAIN	AUX	TAIL
MAX	18,564	29,244	18,564	44,764	5,953
0.803 KG/LITRE					

Oil

The following oils are eligible for all CF6 engines:

Synthetic type conforming to GE Specification D50TF1, classes A or B. GE Service Bulletin No. 79-1 lists approved brand oils.

The following oils are eligible for all P&W engines:

Oil specified in P&WA Specification 521 (P&WA Service Bulletin 238).

The oil system capacity of each engine tank is 26.5 litres approx.

Engine Limits,
General Electric
CF6-80C2D1F

Take-off thrust, sea level, static (5 min: See NOTE 3), kg	27,529	(60,690 lb)
Maximum continuous thrust, sea level, static thrust, kg	25,497	(56,730 lb)

Flat rating ambient temperature:

Take-off	30°C
Maximum continuous	25°C

Maximum permissible engine rotor speeds:

Low pressure rotor (N_1)	3,854 rpm (117.5%)
High pressure rotor (N_2)	11,055 rpm (112.5%)

Maximum permissible exhaust gas temperatures:

Take-off (5 min: See NOTE 3)	960°C
Maximum continuous	925°C
Starting (Max. transient for 40 sec)	870°C
Starting (Max. with no time limit)	750°C

Maximum permissible oil outlet temperatures:

Continuous operation	160°C
Transient operation	175°C

(Transient operation is limited to 15 minutes).

Fuel and Oil Pressure Limits:

Fuel pressure limits apply at the engine fuel pump inlet.

Ground Starting Air Starting and Operation.

This limit is from a minimum fuel pressure of not less than 5.0 psia (34.46 kPa, absolute) above the true fuel vapour pressure to a maximum of 70 psig (482.6 kPa gauge) (relative to atmosphere) with vapour/liquid ratio of zero at all conditions.

Oil: Pressure Limit at Idle.

Engine Limits, General Electric CF6-80C2D1F (Cont'd)

The pressure limit at idle is 9.5 psid (65.5 kPa diff) minimum; varying from 26 to 120 psid (179.4 to 827.6 kPa diff) in the normal operating range.

Engine Limits, Pratt & Whitney PW4460

Take-off thrust, sea level, static (5 min: See NOTE 3), kg	27,216	(60,000 lb)
Maximum continuous thrust, sea level, static thrust, kg	22,816	(50,300 lb)
Flat rating ambient temperature take-off	30°C	
Maximum continuous	30°C	
Maximum permissible engine rotor speeds:		
Low pressure rotor (N_1)	4,012 rpm (111.4%)	
High pressure rotor (N_2)	10,450 rpm (100.0%)	
Maximum permissible exhaust temperatures:		
Take-off (5 min: See NOTE 3)	650°C	
Maximum continuous	625°C	
Starting on ground	535°C	
Starting in flight	650°C	
Maximum permissible oil outlet temperatures:		
Continuous operation	163°C	
Transient operation	177°C	

(Transient operation is limited to 20 minutes)

Fuel and Oil Pressure Limits:

Fuel pressure limits apply at the engine fuel pump inlet:

Minimum fuel pressure must be not less than 5 psig (34.46 kPa, gauge) above the true vapour pressure of the fuel.

Maximum fuel pressure must be not greater than 70 psig (482.6 kPa gauge) with a vapour-to-liquid ratio of zero.

Oil pressure, minimum 70 psid (482.6 kPa diff).

Engine Limits, (Cont'd)
Pratt & Whitney
PW4460

(However, temporary interruption of oil pressure associated with negative "g" operation is limited to 30 seconds maximum. Normal oil pressure will be restored rapidly once the negative "g" effect has been eliminated).

Engine Limits,
Pratt & Whitney
PW4462

Take-off thrust, sea level, static (5 min: See NOTE 3), kg	28,123	(62,000 lb)
Maximum continuous thrust, sea level, static thrust, kg	22,816	(50,300 lb)
Flat rating ambient temperature take-off	30°C	
Maximum continuous	30°C	

Maximum permissible engine rotor speeds:

Low pressure rotor (N_1)	4,012 rpm (111.4%)
High pressure rotor (N_2)	10,450 rpm (100.0%)

Maximum permissible exhaust temperatures:

Take-off (5 min: See NOTE 3)	650°C
Maximum continuous	625°C
Starting on ground	535°C
Starting in flight	650°C

Maximum permissible oil outlet temperatures:

Continuous operation	163°C
Transient operation	177°C

(Transient operation is limited to 20 minutes)

Fuel and Oil Pressure Limits:

Fuel pressure limits apply at the engine fuel pump inlet:

Minimum fuel pressure must be not less than 5 psig (34.46 kPa, gauge) above the true vapour pressure of the fuel.

Engine Limits, (Cont'd)
Pratt & Whitney
PW4462

Maximum fuel pressure must be not greater than 70 psig (482.6 kPa gauge) with a vapour-to-liquid ratio of zero.

Oil pressure, minimum 70 psid (482.6 kPa diff).

(However, temporary interruption of oil pressure associated with negative "g" operation is limited to 30 seconds maximum. Normal oil pressure will be restored rapidly once the negative "g" effect has been eliminated).

APU Limits

AIResearch TSCP700-4E

Power Rating Maximum at sea level	189 hp
Rotor Speeds	
Low pressure speed (N_1)	31,570 rpm (110%)
High pressure speed (N_2)	38,880 rpm (110%)
Exhaust Gas Temperature -	
Starting	872°C
Continuous	585°C

Airspeed Limits

V_{mo}/M_{mo} (MAXIMUM OPERATING)

ALTITUDE (feet)	KEAS	KCAS
At sea level	350	350
10,000	359.6	365
25,670	345.54	365
above 25,670	0.87 Mach	0.87 Mach

For additional airspeed limits below 90% wing tip fuel, see FAA Approved JAA Airplane Flight Manual (K0031J or K0051J as applicable).

V_a (maneuvering) See Approved Airplane Flight Manual

FLAP AND SLAT SPEEDS:

FLAP	SLAT	SPEED (KCAS)	MACH	GROSS WEIGHT
0	ext	280	0.55	MTOGW
15	ext	255	0.51	MTOGW
22	ext	240	0.51	MTOGW
25	ext	229	0.51	MTOGW
28	ext	219	0.51	MLW+1361 kg
35	ext	198	0.51	MLW+1361 kg
50	ext	178	0.51	MLW+1361 kg

V_{lo} (LANDING GEAR SPEEDS:)

Gear Extension = 260 KCAS
Gear Retraction = 230 KCAS to 0.7 MACH
V_{le} Landing Gear Extended = 300 KCAS

V (Landing Light Extension) - Maximum Speed in Extension, Retraction, or Extended Position: V_{mo}/M_{mo}

V (FUEL DUMP SPEED)

No additional speed restriction is imposed upon the aeroplane during the time period in which fuel is being dumped.

Model MD-11 Transport Aircraft

C.G Range See MD-11 Weight and Balance Manual Report No. MDC-K0032.

Maximum Weight
(see NOTE 1)

	Without SB 103-1 or production equivalent	With SB 103-1 or production equivalent	With SB 57-20 or production equivalent	With SB * or production equivalent	Center Main Gear Retracted
Taxi and Ramp	278,052 kg	281,680 kg	284,856 kg	287,124 kg	203,209 kg
Take-off	276,691 kg	280,320 kg	283,722 kg	285,990 kg	201,849 kg
Landing	207,745 kg	207,745 kg	207,745 kg	218,405 kg	181,437 kg
Zero Fuel	195,045 kg	195,045 kg	195,045 kg	209,242 kg	167,829 kg
Gear Jacking Weight	278,052kg	281,680 kg	284,856 kg	287,124 kg	
Fuselage and Wing Jack Weight	230,425 kg	230,425 kg	230,425 kg	230,425 kg	

Model MD-11F Transport Aircraft

C.G Range See MD-11F Weight and Balance Manual Report No. MDC-K5542.

Maximum Weight
(see NOTE 1)

	Without SB 103-1 or production equivalent	With SB 103-1 or production equivalent	With SB 57-20 or production equivalent	With SB * or production equivalent	Center Main Gear Retracted	Production Airplanes **
Taxi and Ramp	278,052 kg	281,680 kg	284,856 kg	287,124 kg	203,209 kg	287,124 kg
Take-off	276,691 kg	280,320 kg	283,722 kg	285,990 kg	201,849 kg	285,990 kg
Landing	207,745 kg	207,745 kg	218,405 kg	218,405 kg	181,437 kg	222,941 kg
Zero Fuel	195,045 kg	195,045 kg	204,706 kg	209,242 kg	167,829 kg	209,242 kg
Gear Jacking Weight	278,052 kg	281,680 kg	284,856 kg	287,124 kg		287,124 kg
Fuselage & Wing Jack Wt.	230,425 kg	230,425 kg	230,425 kg	230,425 kg		230,425 kg

*Douglas Service Bulletins: MD11-28-079, MD11-31-073, MD11-32-057, & MD11-57-032.
**Aircraft serial No. 48781 thru 48785 are eligible for MLW of 222,941 kg, until 31 October 1999. Approval beyond this date is contingent upon safe life limit compliance data.

Minimum Crew — For all flights: pilot, copilot.

Maximum Passengers — See NOTE 2 The maximum number of passengers approved for emergency evacuation is 410. See interior schematic drawing for the maximum passenger capacities approved for each aircraft when delivered.

MD-11 Passenger Emergency Exits	No.	Type
	2	Type 1 (oversize)
	6	Type A

MD-11F Emergency Exits	No.	Type
Passenger Configuration Only	2	Type 1 (oversize)
	6	Type A
Freighter Configuration Only	2	Type 1 (oversize)
	0	Type A

Maximum Baggage/Cargo
MD-11: (See MD-11 Weight and Balance Manual Report No. MDC-K0032).
MD-11F: (See MD-11F Weight and Balance Manual Report No. MDC-K5542).

Maximum Operating Altitude — 43,200 feet

Datum — 139 inches forward of fuselage nose (Sta. 0)

MAC — 295.8 inches (Leading Edge of MAC Station 1312)

Leveling Means — One of the following three systems:

a) Two sets of lugs in nose wheel well

1) Lateral on centerline 2 inches forward of station 495.

2) Longitudinal 24 inches left of centreline, 20 inches and 40 inches forward of station 495.

b) Plumb bob and grid plate at station 1516 aft bulkhead, right hand main gear wheel well, if installed per Service Bulletin 53-52.

c) Set of lugs at sta. 1521 in right hand main gear wheel well. Lay flat plate on which to put level for either lateral or longitudinal.

Control Surface — To insure proper operation of the airplane, the movement of the various control surfaces must be carefully controlled by proper rigging of the Flight Control Systems. The airplane must therefore be rigged in accordance with Douglas Drawing NXH 7604, "Rigging Procedures", and NXH-6705, "Throws - Flight Controls".

Wheels and Tyres

Number of wheels in nosewheel unit:	2
Number of wheels in each mainwheel unit:	10
Maximum tyre pressures (unloaded):	
nosewheel tyres	13.1 bar
mainwheel tyres	14.7 bar
Runway load classification LCN number (rigid)	105.9
(flex)	96.5

Certification Basis
(See NOTE 4)

Date of application for JAA type certification: 12 Dec 1988
Date of application for FAA type certification: 9 Oct 1985
Date used by FAA and JAA for determining applicable requirements: 25 Sept 1987

1) JAA Mandatory Airworthiness Standards

JAR 25 Change 12* (See 2 below) except for:

JAR 25.109 replaced by JAA Special Condition JAA/MD-11/10

JAR 25.307 replaced by FAR 25.307 Amendment 53 for structure unchanged from DC-10

JAR 25.963(d) replaced by FAR 25.963(d) Amendment 61 for the inertia fuel loads in the unchanged wing fuel tanks

JAR 25.1309 replaced by FAR 25.1309 Amendment 22 for parts unchanged in both design and usage from DC-10 and which have demonstrated satisfactory service experience

JAR 25.1401(b) & (f) replaced by JAR 25.1401(b) & (f) Change 10

JAR 25.1457(c)(2) need not be applied to the continuous recording of hand held microphones

JAR AWO Change 1

Special Conditions

JAA/MD-11/01	Artificial Static Longitudinal Stability	30 Oct 1990
JAA/MD-11/03	Discrete Gust Loads	26 April 1989
JAA/MD-11/04	Gust Requirements for Winglets	26 April 1989
JAA/MD-11/05	Lightning Strike Indirect Effects and External Radiation Protection	20 Nov 1989
JAA/MD-11/06	Engine Full Authority Digital Electric Control Systems	2 May 1989
JAA/MD-11/07	Operation without Normal Electrical Power	May 1989
JAA/MD-11/08	Miscellaneous Electrical Requirements	May 1989
JAA/MD-11/09	Aeroplane Wheels and Wheel Brake Assemblies: Minimum Performance Standards	Aug 1990
JAA/MD-11/10	Rejected Take-off	Sept 1991

2) MDC Elect to Comply Airworthiness Standards

*MDC elected to comply with JAR NPAs 25B-158, 25B-183 and 25CDEF-185 which were introduced into Change 12 by Amendment 87/2.

MDC also elected to comply with the "Deletion of National Variants from JAR 25 Change 12 Introduced by Amendment 88/1 dated 18 October 1988".

Compliance with the following optional requirements has been establishes:-

- Ditching Provisions 25.801
- Ice Protection Provisions 25.1419

3) Environmental Standards

ICAO Annex 16 Volume 1 and Volume 2

4) Equivalent Safety Findings

ES/MD-11/01	Rating of oversize Type 1 Exits (JAR 25.807(a)(2))
ES/MD-11/02	Provision of Oxygen in Galley Work Areas (JAR 25.1447(c)(3))
ES/MD-11/03	Engine Low Pressure Warning (JAR 25.1305(a)(1))
ES/MD-11/04	Fire Zones (PW 4000 Fan Zone) (JAR 25.1181(a)(6))

Certification Maintenance Requirements

MD-11 Certification Maintenance Requirements (CMR's) are listed in FAA approved MDC Report No. MDC-K4174, Revision J or later FAA approved revision supplemented by the JAA additional items in Report 91K0836 and the engine Type Certificate Data Sheet. The more restrictive requirement from these documents shall be in force.

Production Basis

FAA Production Certificate No. 27, which transferred to FAA Production Certificate No. 700, on 30 January 1998.

Required Equipment

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 JAA are contained in the following:

- JAA Type Design Standard Definition Report MDC 91K0526

See also NOTE 5

Automatic Landing System Limitations

MD-11 airplanes which meet the following are eligible for autolanding:

(a) The Certification Maintenance Requirements (CMR) listed in FAA approved report MDC-K4174 revision K or later approved revision must be complied with;
(b) MD-11 EWO 22002 or SB 22-4 must be incorporated.

Service Information

McDonnell Douglas Model DC-10 and MD-11 Structural Repair Manual, Volume 1 is FAA approved.

McDonnell Douglas Model MD-11 Maintenance Manual

McDonnell Douglas Model MD-11 On Aircraft Maintenance Planning

McDonnell Douglas Model MD-11 Wiring Diagram

McDonnell Douglas Model MD-11 Illustrated Parts Catalogue

McDonnell Douglas Model MD-11 Components Maintenance Manual

McDonnell Douglas Model MD-11 LAMM Schematics Manual

McDonnell Douglas Model MD-11 Airworthiness Limitations Instructions

All McDonnell Douglas Service Bulletins and other service information, when FAA approved, will carry a statement to that effect.

NOTES

NOTE 1: The maximum weights specified do not apply to all aircraft associated with this Type Certification Data Sheet. Maximum weights and associated required items for an individual aircraft must be determined by reference to the FAA approved JAA Airplane Flight Manual applicable to that aircraft.

Fuel dump valves are required for operation in excess of maximum landing weight (See fuel capacity data).

NOTE 2: All replacement seats (crew, passenger and lounge), although they may comply with TSO-C39b, must also be demonstrated to comply with JAR 25.785 and other relevant specified requirements. 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 same requirements.

NOTE 3: When approved for use of 10 minute Take-off rating in accordance with Appendix 4 to the AFM then the revised limits in Section 4A of Appendix 4 will apply.

NOTE 4: For French DGAC certification, parts 1) and 2) are amended as follows:

1) Replace JAR 25 Change 12 with: JAR 25 Change 10 plus Amendments 84/1, 84/2, 84/3 and 85/1, (See 2) below) except for:

Replace exception relating to JAR 25.109 with:
JAR 25.109 replaced by JAA NPA 25B,D,G-244

Delete exception relating to 25.1401(b) & (f)

Add: Qualification Aviation Civile (QAC)

2) *MDC elected to comply with Change 12.

The elect to comply with the "Deletion of National Variants" and the compliance with optioned requirement statements are unchanged.

For German LBA certification add the following items:-

1A)	4 DV Luft Bau 0-LFKH	Hand Held Fire Extinguishers for use in Personnel Compartments.

NOTE 5: Radio/Nav equipments is subject to specific approval by individual JAA Authorities.

The radio/nav equipment approved by each JAA Authority is listed in the applicable Appendix to Report MDC91K0526.

NOTE 6: The MD-11 aircraft is qualified for operations within Reduced Vertical Separation Minimum (RVSM) airspace. See McDonnell Douglas Service Bulletin MD11-34-065 for establishing the basis for operational approval.

… END …