NATIONAL TRANSPORTATION SAFETY BOARD
Investigative Hearing
UPS flight 2976
Boeing MD-11F, N259UP
Crash During Takeoff in Louisville, Kentucky
November 4, 2025

EXHIBIT

7B

Structures Group Chairman's Factual Report – Attachment 1 Type Certificate Data Sheet A22WE

(52 Pages)

National Transportation Safety Board
Office of Aviation Safety
Washington, DC 20594

DCA26MA024

STRUCTURES

Attachment 1
Type Certificate Data Sheet A22WE
April 16, 2026

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

A22WE
Revision 13
BOEING

DC-10-10
DC-10-40
DC-10-30
DC-10-30F (KC-10A, KDC-10)
DC-10-10F
DC-10-40F
DC-10-15
MD-11
MD-11F
MD-10-10F
MD-10-30F

April 30, 2018

TYPE CERTIFICATE DATA SHEET A22WE

This data sheet which is part of Type Certificate No. A22WE prescribes conditions and limitations under which the products for which the Type Certificate was issued meet the airworthiness requirements of the Federal Aviation Regulations.

Type Certificate Holder: The Boeing Company
4000 Lakewood Boulevard
Long Beach, California 90808

Type Certificate Ownership Record: McDonnell Douglas Corporation, Long Beach, California, merged with The Boeing Company effective January 1, 2010. Transferred type certificate A22WE to The Boeing Company on September 27, 2010.

I - Model DC-10-10 (Transport Aircraft), Approved July 29, 1971

Engines: 3 General Electric CF6-6D, CF6-6D1, CF6-6D1A, CF6-6K or CF6-6K2 Turbofan Engines. (CF6-6D and CF6-6K engines may be intermixed in accordance with Appendix XXII of the applicable FAA Approved Airplane Flight Manual. CF6-6D1 and CF6-6D1A engines may be intermixed in accordance with page 2.1 of Section IVB of applicable FAA Approved Airplane Flight Manual.)

Fuel: See NOTE 4.

Oil: See NOTE 5.

Engine Limits:	CF6-6D/-6K	CF6-6D1	CF6-6D1A/-6K2
Takeoff Thrust. Sea Level, Static (5 min) - flat to 88^{O}F (CF6-6D/-6K) and to 84^{O}F (CF6-6D1/-6D1A/-K2)	39,300 lb.	40,300 lb.	40,900 lb.
Maximum Continuous (flat to 77^{O}F)	37,500 lb.	37,500 lb.	37,500 lb.

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I - Model DC-10-10 (Transport Aircraft), Approved July 29, 1971 (cont'd)

Engine Limits: (cont'd)

Maximum permissible engine rotor operating speeds

N_1 (Low Compressor)	3810 rpm (111%)
N_2 (High Compressor)	9925 rpm (101%)

Maximum permissible engine temperature

Turbine exhaust gas temperatures at turbine outlet

Take off (5 min.)	1670°F (910°C)
Maximum Continuous	1616°F (880°C)
Maximum Acceleration (2 min.)	1697°F (925°C)
Starting (Max. Transient for 40 sec.)	1652°F (900°C)
(Max. No Time Limit)	1382°F (750°C)

Maximum permissible oil outlet temperature

Continuous operation	320°F (160°C)
Transient operation [1]	347°F (175°C)

APU Limits: (if installed)

AiResearch TSCP700-4B

Power Rating Maximum at sea level	189 hp

Rotor Speeds

Low pressure speed (N_1)	31,570 rpm (110%)
High pressure speed (N_2)	38,830 rpm (110%)
Exhaust Gas Temperature Maximum during operation	1085°F (585°C)
Maximum indicated temperature during each starting cycle	1085°F (585°C)

Airspeed Limits: (CAS)

V_{MO} / M_{MO} (Maximum Operating)	With SB 37-87	Without SB 37-87
At Sea Level	350K	350K
At 10,000 ft	350K	376K
At 24,820 ft	350K	376K (M=0.88)
At 28,310 ft	350K (M=0.88)	350K (M=0.88)
At 42,000 ft	258K (M=0.88)	258K (M=0.88)

V_A (Maneuvering) See FAA Approved Airplane Flight Manual

V_{FE} Flap Position (Inboard)	
5°	260K (M = 0.51)
15°	250K (M = 0.51)
20°	233K (M = 0.51)
25°	214K (M = 0.51)
35°	187K (M = 0.51)
50°	171K (M = 0.51)

[1] Transient operation above 320°F (160°C) is limited to 15 minutes.

I - Model DC-10-10 (Transport Aircraft), Approved July 29, 1971 (cont'd)

Airspeed Limits: (cont'd)
(CAS)

V_{SLAT} (Slat Operating)	
Takeoff and Approach:	
Flap Position (Inboard)	
5^o	260K (M = 0.51)
15^o	250K (M = 0.51)
25^o	214K (M = 0.51)
Landing	
Flap Position (Inboard)	
35^o	187K (M = 0.51)
50^o	171K (M = 0.51)
Autoslat	
Flaps retracted	260K (M = 0.51)
V_{LO} (Landing Gear)	
Retraction	230K (M = 0.70)
Extension	260K (M = 0.70)
V_{LE} (Landing Gear Extended)	300K (M = 0.70)
V (Landing light extension)	
Maximum speed extension retraction, or extended position	V_{MO}/M_{MO}
V (Fuel Dump)	325K up to 28,000 feet M = 0.82 above 28,000 feet

C.G. Range: See the appropriate FAA Approved Airplane Flight Manual and Weight and Balance Manual.

DC-10-10 Maximum Weight: (See NOTE 10)	440, 000 pound Takeoff Weight See Serial Numbers Eligible	455,000 pound Takeoff Weight See Serial Numbers Eligible
Taxi and Ramp	443,000 lb.	458,000 lb.
Takeoff	440,000 lb.	455,000 lb.
Landing [2]	363,500 lb.	363,500 lb.
Zero Fuel [3]	335,000 lb.	335,000 lb.
Gear Jacking	443,000 lb.	443,000 lb.
Fuselage and Wing Jacking	388,000 lb.	388,000 lb.

Minimum Crew: For all flights: Pilot, Copilot, and Flight Engineer.
Maximum

Passengers: (See NOTE 6)

Maximum
Baggage: (See Weight and Balance Manual)

[2] Fuel dump valves required for operation in excess of maximum landing weight. See NOTE 1 (f).

[3] All weight in airplane above this weight must be fuel.

I - Model DC-10-10 (Transport Aircraft), Approved July 29, 1971 (cont'd)

Fuel Capacity:

Fuel Tank Capacity (pounds) Location	Structural	Usable (6.7 lb./gal)	Arm (Inches)
Main No. 1	42,579	40,116	1488
Main No. 2	68,998	64,969	1296
Main No. 3	42,579	40,116	1488
Center Wing Auxiliary (if installed)	36,849	32,727	1279
Crossfeed Manifold and Lines		609	1429

Oil Capacity: 24.3 lb./engine usable at 8.1 lb./gal. with wing engines moment arm at 1125 in. and tail engine moment arm at 2200 in.

Maximum Operating Altitude: 42,000 feet

MAC: 300.682 inches (Leading Edge of MAC Station 1299.83)

Service Life Limits: See NOTE 3

DC-10-10 Serial Numbers

Eligible: (See NOTE 10)

Maximum Takeoff Weight of 440,000 pounds

46500, 46502 - 46509, 46511 - 46520, 46522 – 46525, 46603, 46604, 46614, 46632, 46645, 46646, 46700 - 46703, 46706 - 46707, 46709, 46908, 46928, 46942, 46943, 46946, 46977, 46983, 47800, 47802, 47832, 47833, 47966 - 47969.

Maximum Takeoff Weight of 455,000 pounds

46501, 46727, 46905, 46906, , (46517, 46525, 46645, 46646, 46908, 46977, 46983, 47832, 47833). [4]

Other Information: See "Data Pertinent to All Models"

II - Model DC-10-40 (Transport Aircraft), Approved October 20, 1972

Engines: 3 Pratt and Whitney JT9D-20 Turbofan Engines with water injection, or 3 Pratt and Whitney JT9D-20J or JT9D-59A Turbofan Engines (JT9D-59A Engines are installed per Rohr STC SA3139WE) (See Serial Numbers Eligible).

Fuel: See NOTE 4.

Oil: See NOTE 5.

Engine Limits:

	JT9D-20	JT9D-20J	JT9D-59A
Static Thrust, Sea Level Takeoff, Dry [5]	44,500 lb.	48,050 lb.	51,720 lb.
Takeoff, Wet [6]	47,000 lb.		
Maximum Continuous	39,240 lb.	39,240 lb.	44,770 lb.

[4] When modified in accordance with McDonnell Douglas Service Bulletin 57-97.

[5] 5 minutes flat to 84°F for JT9D-20 and 86°F for JT9D-20J and JT9D-59A.

[6] 2 ½ minutes wet flat to 86°F.

II - Model DC-10-40 (Transport Aircraft), Approved October 20, 1972 (cont'd)

Engine Limits (cont'd):

Maximum permissible engine rotor speeds

N_1 (Low Compressor)	3650 rpm (101.4%)	3750 rpm (104.2%)	3780 rpm (105%)
N_2 (High Compressor)	8000 rpm (98.9%)	8000 rpm (98.9%)	8011 rpm (99%)

Maximum permissible engine temperature
Turbine exhaust gas temperature at turbine outlet
(Tt 6 for JT9D-20 & -20J and Tt 7 for JT9D-59A)

Takeoff, Wet or Dry (5 min)	1679°F (915°C)	1805°F (985°C)	1238°F (670°C)
Maximum Continuous	1607°F (875°C)	1697°F (925°C)	1202°F (650°C)
Maximum Acceleration (2 min)	1679°F (915°C)	1805°F (985°C)	1238°F (670°C)
Starting [7]	1202°F (650°C)	1202°F (650°C)	941°F (505°C)

Maximum permissible oil inlet temperature

Continuous Operation	275°F (135°C)	275°F (135°C)	275°F (135°C)
Transient Operation [8]	320°F (160°C)	320°F (160°C)	320°F (160°C)

APU Limits: (if installed)

AiResearch TSCP700-4

Power Rating Maximum at sea level 189 hp

Rotor Speeds

Low pressure rotor speed (N_1)	31,750 rpm (110%)
High pressure rotor speed (N_2)	38,830 rpm (110%)

Exhaust Gas Temperature

Maximum during operation	1085°F (585°C)
Maximum indicated temperature during each starting cycle	1085°F (585°C)

Airspeed Limits: (CAS)

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

At Sea Level	350K
At 10,000 ft.	376K
At 24,820 ft.	376K (M = 0.88)
At 42,000 ft.	258K (M = 0.88)

V_A (Maneuvering) See FAA Approved Airplane Flight Manual

V_{FE} Flap Position (Inboard)	With JT9D-20 or -20J Engines (See Serial Numbers Eligible)	With JT9D-59A Engines (See Serial Numbers Eligible)
5°	260K (M = 0.51)	270K (M = 0.55)
15°	255K (M = 0.51)	255K (M = 0.51)
20°	240K (M = 0.51)	240K (M = 0.51)
25°	221K (M = 0.51)	221K (M = 0.51)
35°	194K (M = 0.51)	194K (M = 0.51)
50°	178K (M = 0.51)	178K (M = 0.51)

[7] Maximum transient for 10 seconds.

[8] Transient operation above 275°F (135°C) is limited to 20 minutes.

II - Model DC-10-40 (Transport Aircraft), Approved October 20, 1972 (cont'd)

Airspeed Limits: (cont'd)

(CAS)	V_{SLAT} (Slat Operating)		
	Takeoff and Approach:	With JT9D-20 or 20J Engines (See Serial Numbers Eligible)	With JT9D-59A Engines (See Serial Numbers Eligible)
	Flap Position (Inboard)		
	5^o	260K (M = 0.51)	270K (M = 0.55)
	15^o	255K (M = 0.51)	255K (M = 0.51)
	20^o	221K (M = 0.51)	221K (M = 0.51)
	Landing		
	Flap Position (Inboard)		
	25^o	221K (M = 0.51)	221K (M = 0.51)
	35^o	194K (M = 0.51)	194K (M = 0.51)
	50^o	178K (M = 0.51)	178K (M = 0.51)
	Autoslat		
	Flaps retracted	260K (M = 0.51)	270K (M = 0.75)
	V_{LO} (Landing Gear)		
	Retraction	230K (M = 0.70)	230K (M = 0.70)
	Extension	260K (M = 0.70)	260K (M = 0.70)
	V_{LE} (Landing Gear Extended)	300K (M = 0.70)	300K (M = 0.70)
	V (Landing light extension)	V_{MO}/M_{MO}	V_{MO}/M_{MO}
	Maximum speed extension, retraction, or extended position.		
	V (Fuel Dump)	325K up to 28,000 feet M = 0.82 above 28,000 feet	

C.G. Range: See the appropriate FAA Approved Airplane Flight Manual and Weight and Balance Manual.

DC-10-40
Maximum Weight:
(See NOTE 10)

	With JT9D-20 or -20J Engines 565,000 pound Takeoff Weight (See Serial Numbers Eligible)		With JT9D-59A Engines 572,000 pound Takeoff Weight (See Serial Numbers Eligible)	
	Center Main Gear Extended	Center Main Gear Retracted	Center Main Gear Extended	Center Main Gear Retracted or Removed
Taxi and Ramp	568,000 lb.	443,000 lb.	575,000 lb.	478,000 lb.
Takeoff [9]	565,000 lb.	440,000 lb.	572,000 lb.	475,000 lb.
Landing [10]	421,000 lb.	363,500 lb.	421,000 lb.	400,000 lb.
Zero Fuel [11]	391,000 lb.	363,500 lb.	391,000 lb.	391,000 lb.
Gear Jacking Weight	568,000 lb.	443,000 lb.	575,000 lb.	478,000 lb.
Fuselage and Wing Jacking Weight	508,000 lb.	443,000 lb.	508,000 lb.	478,000 lb.

9 For takeoff above 555,000 pounds, 28 ply main landing gear tires and modification per Douglas Service Bulletin 57-28 or equivalent are required.

10 Fuel dump valves required for takeoff in excess of maximum landing weight. See NOTE 1 (f).

11 All weight in airplane above this weight must be fuel.

II - Model DC-10-40 (Transport Aircraft), Approved October 20, 1972 (cont'd)

Minimum Crew: For all Flights: Pilot, Copilot, and Flight Engineer.

Maximum Passengers: (See NOTE 6).

Maximum Baggage: (See Weight and Balance Manual).

Fuel Capacity: Fuel Tank Capacity (pounds)

Location	Structural	Usable (6.7 lb./gal.)	Usable [12] (6.7 lb./gal.)	Arm (inches)
Main No. 1	43,202	40,203	40,704	1492.6
Main No. 2	69,495	64,969	65,438	1296.0
Main No. 3	43,202	40,403	40,704	1492.6
Center Wing Auxiliary	104,141	97,409	98,111	1266.1
Crossfeed Manifold & Lines		622	622	1420.1

Oil Capacity: 77 lb./engine usable at 8.1 lb./gal. with wing engines moment arm at 1164.0 in. and tail moment area at 2239.0 in.

Maximum Operating Altitude: 42,000 feet

MAC: 295.78 inches (Leading Edge of MAC Station 1311.95)

Service Life Limits: See NOTE 3

DC-10-40 Serial Numbers Eligible: (See NOTE 10)

Maximum Takeoff Weight of 565,000 pounds
(with JT9D-20 or -20J Engines)
46750, 46752 – 46771.

Maximum Takeoff Weight of 572,000 pounds
(with JT9D-59A Engines installed per STC SA3139WE)
46660, 46662, 46913, 46923, 46967, 46974, 47822, 47824 - 47826, 47852, 47853, – 47856, 47857, 48301.

Spare Engine Transportation Pod - The Spare Engine Transportation Pod may be carried on models with JT9D-59A engines installed per STC SA3139WE in accordance with the limitations specified in the FAA approved Airplane Flight Manual.

Other Information: See "Data Pertinent to All Models"

III - Model DC-10-30 (Transport Aircraft), Approved November 21, 1972

Engines: 3 General Electric CF6-50A, CF6-50C, CF6-50CA, CF6-50C1, CF6-50C2, CF6-50C2B or CF6-50C2-R Turbofan Engines. (Engines may be intermixed in accordance with Appendix XXII of applicable FAA Approved Airplane Flight Manual).

Fuel: See NOTE 4.

[12] When modified per Douglas Service Bulletin 28-27 and 28-32 or equivalents.

III - Model DC-10-30 (Transport Aircraft), Approved November 21, 1972 (cont'd)

Oil: See NOTE 5.

Engine Limits:

	CF6-50A	CF6-50C/-50CA/ -50C2-R	CF6-50C1	CF6-50C2	CF6-50C2B
Static Thrust, Sea Level Takeoff [13]	48,400 lb.	50,400 lb.	51,800 lb.	51,800 lb.	53,200 lb.
Maximum Continuous (flat to 86°F)	46,300 lb.	46,300 lb.	46,300 lb.	46,300 lb.	46,300 lb.
Maximum permissible engine rotor operating speeds					
N_1 (Low Compressor) [14]	3982 rpm (116%)		3982 rpm (116%)	4068 rpm	4068 rpm
	4068 rpm (118.5%)[15]		4068 rpm (118.5%)[15]	(118.5%)	(118.5%)
N_2 (High Compressor)	10613 rpm (108%)		10613 rpm (108%)	10761 rpm	10761 rpm
	10761 rpm (109.5%)[16]		10761 rpm (109.5%)[16]	(109.5%)	(109.5%)

	CF6-50A	CF6-50C/-50CA/ -50C1	CF6-50C2/-50C2B/ -50C2-R
Maximum permissible engine temperature Turbine exhaust gas temperature at turbine outlet			
Takeoff (5 min.)	1679°F (915°C)	1715°F (935°C) 1733°F (945°C)[17]	1733°F (945°C)
Maximum Continuous	1607°F (875°C)	1607°F (875°C) 1670°F (910°C)[17]	1670°F (910°C)
Maximum for Acceleration (2 min.)	1706°F (930°C)	1742°F (950°C) 1760°F (960°C)[17]	1760°F (960°C)
Starting (Max. Transient for 40 sec.)	1652°F (900°C)	1652°F (900°C)	1652°F (900°C)
(Max. no time limit)	1382°F (750°C)	1382°F (750°C)	1382°F (750°C)
Maximum permissible oil outlet temperature Continuous Operation	320°F (160°C)	320°F (160°C)	320°F (160°C)

[13] 5 minutes flat to 87°F for -50A; 5 minutes flat to 86°F for -50C, -50CA, -50C1, -50C2, and -50C2-R; 5 minutes flat to 79°F for -50C2B.

[14] The CF6-50C N_1 value of 116% is used for the preparation of the Airplane Flight Manual in lieu of the CF6-50C1 N_1 value of 116½% noted in the engine data sheet.

[15] When modified per Douglas Service Bulletin 77-46 or production equivalent, for CF6-50A/-50C/-50CA/-50C1.

[16] When modified per Douglas Service Bulletin 77-44 or production equivalent, for CF6-50A/-50C/-50CA/-50C1.

[17] When modified per Douglas Service Bulletin 77-47 or production equivalent, for CF6-50C/-50CA/-50C1.

III - Model DC-10-30 (Transport Aircraft), Approved November 21, 1972 (cont'd)

Engine Limits (cont'd)

	CF6-50A	CF6-50C/-50CA/ -50C1	CF6-50C2/-50C2B/ -50C2-R
Transient Operation [18]	347°F (175°C)	347°F (175°C)	347°F (175°C)

APU Limits: (if installed)

AiResearch TSCP700-4

Power Rating Maximum at sea level	189 hp
Rotor Speeds	
Low pressure rotor speed (N_1)	31,750 rpm (110%)
High pressure rotor speed (N_2)	38,830 rpm (110%)
Exhaust Gas Temperature	
Maximum during operation	1085°F (585°C)
Maximum indicated temperature each starting cycle	1085°F (585°C)

Airspeed Limits: (CAS)

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

At Sea Level	350K
At 10,000 ft	376K
At 24,820 ft	376K (M = 0.88)
At 42,000 ft	258K (M = 0.88)

V_A (Maneuvering) See FAA Approved Airplane Flight Manual

V_{FE} Flap Position (Inboard)	572,000 lb./580,000 lb. Takeoff Weight (See Serial Numbers Eligible)	565,000 lb. Takeoff Weight (See Serial Numbers Eligible)
5°	270K (M = 0.55)	260K (M = 0.51)
15°	255K (M = 0.51)	255K (M = 0.51)
20°	240K (M = 0.51)	240K (M = 0.51)
25°	221K (M = 0.51)	221K (M = 0.51)
35°	194K (M = 0.51)	194K (M = 0.51)
50°	178K (M = 0.51)	178K (M = 0.51)

V_{SLAT} (Slat Operating)

Takeoff and Approach

Flap Position		
5°	270K (M = 0.55)	260K (M = 0.51)
15°	255K (M = 0.51)	255K (M = 0.51)
25°	221K (M = 0.51)	221K (M = 0.51)

Landing

Flap Position		
35°	194K (M = 0.51)	194K (M = 0.51)
50°	178K (M = 0.51)	178K (M = 0.51)

[18] Transient operation above 320°F (160°C) is limited to 15 minutes.

III - Model DC-10-30 (Transport Aircraft), Approved November 21, 1972 (cont'd)

Airspeed Limits: (cont'd)
(CAS)

	572,000 lb./580,000 lb. Takeoff Weight (See Serial Numbers Eligible)	565,000 lb. Takeoff Weight (See Serial Numbers Eligible)
Autoslat Flaps retracted	270K (M = 0.55)	260K (M = 0.51)
V_{LO} Landing Gear		
Retraction	230K (M = 0.70)	230K (M = 0.70)
Extension	260K (M = 0.70)	260K (M = 0.70)
V_{LE} (Landing Gear Extended)	300K (M = 0.70)	300K (M = 0.70)
V (Landing light extension) - Maximum Speed in extension, retraction, or extended position		V_{MO}/M_{MO}
V (Fuel Dump)	325K up to 28,000 feet M=0.82 above 28,000 feet	

C.G. Range: See the appropriate FAA Approved Airplane Flight Manual and Weight and Balance Manual.

DC-10-30
Maximum Weight:
(See NOTE 10)

	565,000 pound Takeoff Weight (See Serial Numbers Eligible)		572,000 pound Takeoff Weight (See Serial Numbers Eligible)	
	Center Main Gear Extended	Center Main Gear Retracted	Center Main Gear Extended	Center Main Gear Retracted
Taxi and Ramp	568,000 lb.	463,000 lb.	575,000 lb.	478,000 lb.
Takeoff [19]	565,000 lb.	460,000 lb.	572,000 lb.	475,000 lb.
Landing [20]	424,000 lb.	400,000 lb.	424,000 lb.	400,000 lb.
Zero Fuel [21]	401,000 lb.	391,000 lb.	401,000 lb.	401,000 lb.
Gear Jacking	568,000 lb.	463,000 lb.	575,000 lb.	478,000 lb.
Fuselage and Wing Jacking	508,000 lb.	463,000 lb.	508,000 lb.	478,000 lb.

	580,000 pound Takeoff Weight (See Serial Numbers Eligible)		590,000 pound Takeoff Weight [24A, 24B] (See Serial Numbers Eligible)	
	Center Main Gear Extended	Center Main Gear Retracted	Center Main Gear Extended	Center Main Gear Retracted
Taxi and Ramp	583,000 lb.	478,000 lb.	593,000 lb.	478,000 lb.
Takeoff [22]	580,000 lb.	475,000 lb.	590,000 lb.	475,000 lb.

[19] For takeoff weights above 555,000 pounds, 28 ply main landing gear tires and modification per Douglas Service Bulletin 57-28 or equivalents are required.

[20] Fuel dump valves required for operation in excess of maximum landing weight. See NOTE 1(f).

[21] All weight in airplane above this weight must be fuel.

[22] For takeoff weights above 555,000 pounds, 28 ply main landing gear tires and modification per Douglas Service Bulletin 57-28 or equivalents are required.

III - Model DC-10-30 (Transport Aircraft), Approved November 21, 1972 (cont'd)

Maximum Weight: (cont'd)
(See NOTE 10)

	580,000 pound Takeoff Weight (See Serial Numbers Eligible)		590,000 pound Takeoff Weight (See Serial Numbers Eligible)	
Landing [23]	446,000 lb.	400,000 lb.	411,000 lb.	400,000 lb.
Zero Fuel [24]	424,000 lb.	391,000 lb.	368,000 lb.	368,000 lb.
Gear Jacking	583,000 lb.	478,000 lb.	593,000 lb.	478,000 lb.
Fuselage and Wing Jacking	508,000 lb.	478,000 lb.	508,000 lb.	478,000 lb.

Minimum Crew: For all Flights: Pilot, Copilot, and Flight Engineer.

Maximum Passenger: (See NOTE 6).

Maximum Baggage: (See Weight and Balance Manual).

Fuel Capacity: Fuel Tank Capacity (pounds)

Location	Usable Structural	Usable [25] (6.7 lb./gal.)	(6.7 lb./gal.)	Arm (inches)
Main No. 1.	43,202	40,203	40,704	1492.6
Main No. 2.	69,495	64,969	65,438	1296.0
Main No. 3.	43,202	40,203	40,704	1492.6
Center Wing Auxiliary	104,141	97,409	98,111	1266.1
Aft Aux.[26]	11,028	N/A	10,280	1819.5
Aft Aux.[27]	23,052	N/A	21,618	1850.0
Aft Aux.[28]	24,018	N/A	3,317	
Crossfeed Manifold & Lines		609	609	1420.5

NOTE: The integrity of the transfer system must be demonstrated per Maintenance Manual, Chapter 28-21-100, section titled "Manifold Integrity Check" whenever the system is disturbed for maintenance. Also, if the tank overfilled light is illuminated any time during fueling, comply with the caution note in Chapter 12-11-04, section titled "Safety and Operating Precautions", item pertaining to tank overfilled condition.

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[23] Fuel dump valves required for operation in excess of maximum landing weight. See NOTE 1(f).

[24] All weight in airplane above this weight must be fuel.

[24A] Serial numbers 48265, 48267, 48290, 48315, 48316, and 48319 have a maximum zero fuel weight of 391,000 lb.

[24B] Serial numbers 48267, 48290, 48315, 48316, and 48319 have a maximum landing weight of 436,000 lb.

[25] When modified per Douglas Service Bulletins 28-27 and 28-32 or equivalents.

[26] When modified per Douglas Service Bulletins 28-67, 28-111 and 28-114 or equivalents.

[27] When modified per Douglas Service Bulletin 28-79 or equivalent.

[28] When modified in accordance with Service Bulletin 28-79 and 28-137 or production equivalent.

III - Model DC-10-30 (Transport Aircraft), Approved November 21, 1972 (cont'd)

Oil Capacity: 24.3 lb./engine usable at 8.1 lb./gal. with wing engines moment arm at 1125 in. and tail engine moment arm at 2200 in.

Maximum Operating Altitude: 42,000 feet

MAC: 295.78 inches (Leading Edge of MAC Station 1311.95)

Service Life Limits: See NOTE 3

DC-10-30 Serial Numbers Eligible: (See NOTE 10)

Maximum Takeoff Weight of 565,000 pounds

46550 - 46557, 46575 - 46582, 46640, 46685, 46686, 46711 - 46714, 46850 - 46854, 46868, 46870, 46872, 46892, 46911, 46912, 46914 –46416, 46418 - 46919, 46922, 46926, 46927, 46933, 46934, 46940, 46941, 46944, 46945, 46950 - 46954, 46957, 46958, 46963, 46964, 46969, 46971, 46972, 46981, 46982, 46997, 47834, 47837, 47846 - 47849, 47861 - 47867, 47886, 47926, 47927, 47980, 47982, 47981, 48283, 48286.

Maximum Takeoff Weight of 572,000 pounds

46542, 46591, 46959, 46961, 46981, 46988, 46990, 46991, 46993, 46995, 47817, 47838, 47956, 47957, 48266, 48317, 48318.

Maximum Takeoff Weight of 580,000 pounds

46583, 46584, 46869.

Maximum Takeoff Weight of 590,000 pounds

46543, 46595, 46596, 47814, 47815, 47844, 47845, 47850, 47851, 48252, 48265, 48267, 48282, 48285, 48288, 48290, 48292, 48293, 48296, 48315, 48316, 48319.

Other Information: See "Data Pertinent to All Models"

IV - Model DC-10-30F (Transport Aircraft), Approved March 30, 1973

(KC-10A See NOTE 11 regarding certification)
(KDC-10 See NOTE 19 regarding certification)

Engines: 3 General Electric CF6-50A, CF6-50C, CF6-50CA, CF6-50C1, CF6-50C2, CF6-50C2B or CF6-50C2-R Turbofan Engines. (Engines may be intermixed in accordance with Appendix XXII of applicable FAA Approved Airplane Flight Manual).

Fuel: See NOTE 4

Oil: See NOTE 5

Engine Limits: (See Section III)

APU Limits: (if installed) AiResearch TSCP700-4 (See Section III)

IV - Model DC-10-30F (Transport Aircraft), Approved March 30, 1973 (cont'd)

(KC-10A See NOTE 11 regarding certification)
(KDC-10 See NOTE 19 regarding certification)

Airspeed Limits: (CAS)

V_{MO}/M_{MO} (Maximum Operating)
(KC-10A with Aerial Refueling Boom and Drogue Stowed)
(KDC-10 with Aerial Refueling Boom stowed)

At Sea Level	350K
At 10,000 ft	376K
At 24,820 ft	376K (M = 0.88)
At 42,000 ft	258K (M = 0.88)

V_{MO}/M_{MO} (Maximum Operating)
(KC-10A/KDC-10 with Aerial Refueling Boom Deployed)

At Sea Level	350K
At 10,000 ft	355K
At 25,600 ft	370K (M = 0.88)
At 37,000 ft	289K (M = 0.88)

V_{MO}/M_{MO} (Maximum Operating)
(KC-10A with Drogue Deployed)

At Sea Level	325K
At 10,000 ft	329K
At 28,930 ft	345K (M = 0.88)
At 37,000 ft	289K (M = 0.88)

V_A (Maneuvering) See FAA Approved Airplane Flight Manual

V_{FE} Flap Position Inboard

5^o	270K (M = 0.55)
15^o	255K (M = 0.51)
20^o	240K (M = 0.51)
25^o	221K (M = 0.51)
35^o	194K (M = 0.51)
50^o	178K (M = 0.51)

V_{SLAT} (Slat Operating)

Takeoff and Approach
Flap Position (Inboard)

5^o	270K (M = 0.55)
15^o	255K (M = 0.51)
25^o	221K (M = 0.51)

Landing
Flap Position (Inboard)

25^o	221K (M = 0.51)
35^o	194K (M = 0.51)
50^o	178K (M = 0.51)

Autoslat
Flaps retracted 270K (M = 0.75)

V_{LO} Landing Gear

Retraction	230K (M = 0.70)
Extension	260K (M = 0.70)

V_{LE} (Landing Gear Extended) 300K (M = 0.70)

IV - Model DC-10-30F (Transport Aircraft), Approved March 30, 1973 (cont'd)

(KC-10A See NOTE 11 regarding certification)
(KDC-10 See NOTE 19 regarding certification)

Airspeed Limits: (cont'd)
(CAS)

V (Landing light extension) - Maximum speed in extension, retraction, or extended position	V_{MO}/M_{MO}
V (Fuel Dump)	325K up to 28,000 feet M = 0.82 above 28,000 feet

NOTE - The airspeed limits for DC-10-30F with CF6-50C1 engines are the same as those for DC-10-40 airplanes with JT9D-59A engines. (See Section II).

C.G. Range:
DC-10-30F: See the appropriate FAA Approved Airplane Flight Manual and Weight and Balance Manual.
KC-10A: See the appropriate FAA Approved Airplane Flight Manual and "Basic Weight Checklist and Loading Data", Report No. T.O. 1C-10(K) A-5, Chg. 1, dated 15 March 1981.
KDC-10: See the appropriate FAA Approved Airplane Flight Manual and Weight and Balance Manual.

DC-10-30F
Maximum Weight: (See NOTE 10)

	565,000 pound Takeoff Weight (See Serial Numbers Eligible)		572,000 pound Takeoff Weight (See Serial Numbers Eligible)	
	Center Main Gear Extended	Center Main Gear Retracted	Center Main Gear Extended	Center Main Gear Retracted or Removed
Taxi and Ramp	568,000 lb.	463,000 lb.	575,000lb.	478,000lb.
Takeoff [29]	565,000 lb.	460,000 lb.	572,000lb.	475,000lb.
Landing [30]	424,000 lb.	400,000 lb.	424,000lb.	400,000lb.
Zero Fuel [31]	401,000 lb.	391,000 lb.	401,000lb.	391,000lb.
Gear Jacking Wt.	568,000 lb.	463,000 lb.	575,000lb.	478,000lb.
Fuselage & Wing Jack Weight	508,000 lb.	463,000 lb.	508,000lb.	478,000lb.

	580,000 pounds Takeoff Weight (See Serial Numbers Eligible)		590,000 pounds Takeoff Weight (See Serial Numbers Eligible)	
	Center Main Gear Extended	Center Main Gear Retracted or Removed	Center Main Gear Extended	Center Main Gear Retracted or Removed
Taxi and Ramp	583,000 lb.	478,000 lb.	593,000 lb.	478,000 lb.
Takeoff [29]	580,000 lb.	475,000 lb.	590,000 lb.	475,000 lb.
Landing [30]	446,000 lb.	400,000 lb.	436,000 lb.	400,000 lb.
Zero Fuel [31]	424000 lb.	391,000 lb.	414,000 lb.	400,000 lb.
Gear Jacking Wt.	583,000 lb.	478,000 lb.	593,000 lb.	478,000 lb.
Fuselage & Wing Jack Weight	508,000 lb.	478,000 lb.	508,000 lb.	478,000 lb.

[29] For takeoff weights above 555,000 pounds, 28 ply main landing gear tires and modification per Douglas Service Bulletin 57-28 or equivalents are required.

[30] Fuel dump valves required for operation in excess of maximum landing weight. See NOTE 1 (f).

[31] All weight in airplane above this weight must be fuel.

IV - Model DC-10-30F (Transport Aircraft), Approved March 30, 1973 (cont'd)

(KC-10A See NOTE 11 regarding certification)
(KDC-10 See NOTE 19 regarding certification)

Minimum Crew: For all Flights: Pilot, Copilot, and Flight Engineer.

Maximum Passengers: For DC-10-30F: See FAA approved exemption 6752 for the accommodation of up to four supernumeraries immediately aft of the cockpit on freighter aircraft equipped with a Class E cargo compartment.

For KC-10A: The KC-10A is approved to operate in the "all cargo" or "combi" (combination passenger and cargo) configuration. For the "combi" configuration, a total of up to 75 passengers are allowed per FAA approved MDC interior schematic drawing number J015113, Revision V, or later FAA approved revisions.

Maximum Baggage: (See Weight and Balance Manual).

Fuel Capacity: Fuel Tank Capacity (pounds)

Location	Usable Structural	Usable [32] (6.7 lb./gal.)	(6.7 lb./gal.)	Arm (inches)
Main No. 1	43,202	40,203	40,704	1492.6
Main No. 2	69,495	64,969	65,438	1296.0
Main No. 3	43,202	40,203	40,704	1492.6
Center Wing Auxiliary	104,141	97,409	98,111	1266.1
Aft Aux.[33]	10,884	N/A	10,280	1819.5
Aft Aux.[34]	22,670	N/A	21,618	1850.0
Crossfeed Manifold & Lines		609	609	1420.5
Fwd. Body (KC-10A ***only***)	59,171	55,308	N/A	959
Aft. Body (KC-10A ***only***)	70,294	66,149	N/A	1641

NOTE: The integrity of the transfer system must be demonstrated per Maintenance Manual, Chapter 28-21-100, section titled "Manifold Integrity Check" whenever the system is disturbed for maintenance. Also, if the tank overfilled light is illuminated any time during fueling, comply with the caution note in Chapter 12-11-04, section titled "Safety and Operating Precautions", item pertaining to tank overfilled condition.

Oil Capacity: 24.3 lb./engine usable at 8.1 lb./gal. with wing engines moment arm at 1125 in. and tail engine moment arm at 2200 in.

Maximum Operating Altitude: 42,000 feet

MAC: 295.78 inches (Leading Edge of MAC St. 1311.95)

Service Life Limits: See NOTE 3.

[32] When modified per Douglas Service Bulletins 28-27 and 28-32 or equivalents.

[33] When modified per Douglas Service Bulletins 28-67, 28-111 and 28-114 or equivalent.

[34] When modified per Douglas Service Bulletin 28-79 or equivalent.

IV - Model DC-10-30F (Transport Aircraft), Approved March 30, 1973 (cont'd)

(KC-10A See NOTE 11 regarding certification)
(KDC-10 See NOTE 19 regarding certification)

DC-10-30F Serial Numbers Eligible: (See NOTE 10)

Maximum Takeoff Weight of 565,000 pounds

46891, 46917, 46955, 46956, 46965, 46985, 47868, 47889, 47906 - 47908, 47921 - 47925, 47928, 47929.

Maximum Takeoff Weight of 572,000 pounds

46540, 46541, 46590, 46836, 46921, 46931, 46932, 46936, 46937, 46949, 46975, 46976, 46978, 46986, 46987, 46998, 46999, 47816, 47818, 47819 47831, 47840, 47888.

Maximum Takeoff Weight of 580,000 pounds

47811, 47813, 47841, 47842.

Maximum Takeoff Weight of 590,000 pounds

47843, 47870, 48200, 48211, 48213 – 48251, 48298, 48299, 48303 – 48310.

Other Information: See "Data Pertinent to All Models"

V - Model DC-10-10F (Transport Aircraft), Approved February 1, 1974

Engines: 3 General Electric CF6-6D, CF6-6D1, CF6-6D1A, CF6-6K or CF6-6K2 Turbofan Engines. (CF6-6D and CF6-6K engines may be intermixed in accordance with Appendix XXII of applicable FAA Approved Airplane Flight Manual. CF6-6D1 and CF6-6D1A may be intermixed in accordance with page 2.1 of Section IV-B of applicable FAA Approved Airplane Flight Manual.)

Fuel: See NOTE 4.

Oil: See NOTE 5.

Engine Limits: Refer to Section I

APU Limit: (if installed) Refer to Section I

Airspeed Limits: (CAS) Refer to Section I

C.G. Range: See the appropriate FAA Approved Airplane Flight Manual and Weight and Balance Manual.

V - Model DC-10-10F (Transport Aircraft), Approved February 1, 1974 (cont'd)

DC-10-10F

Maximum Weight: (See NOTE 10)	440,000 pound Takeoff Weight (See Serial Numbers Eligible)	446,000 pound Takeoff Weight (See Serial Numbers Eligible)
Taxi and Ramp	443,000 lb.	449,000 lb.
Takeoff	440,000 lb.	446,000 lb.
Landing [35]	370,000 lb. [36]	375,000 lb.
Zero Fuel [37]	350,000 lb. [38]	355,000 lb.
Gear Jacking Weight	443,000 lb.	449,000 lb.
Fuselage and Wing Jack Weight	388,000 lb.	388,000 lb.

	455,000 pound Takeoff Weight (See Serial Numbers Eligible)
Taxi and Ramp	458,000 lb.
Takeoff	455,000 lb.
Landing [35]	375,000 lb.
Zero Fuel [37]	355,000 lb.
Gear Jacking Weight	449,000 lb.
Fuselage and Wing Jack Weight	388,000 lb.

Minimum Crew: For all flights: Pilot, Copilot, and Flight Engineer.

Maximum Passengers: See FAA approved exemption number 6752 for the accommodation of up to four supernumeraries immediately aft of the cockpit on freighter aircraft equipped with a Class E cargo compartment.

Maximum Baggage: (See Weight and Balance Manual).

Fuel Capacity: Fuel Tank Capacity (pounds)

Location	Structural	Usable (6.7 lb./gal.)	Arm (inches)
Main No. 1	42,579	40,116	1488
Main No. 2	68,998	64,969	1296
Main No. 3	42,579	40,116	1488
Crossfeed Manifold & Lines		609	1429
Center Wing Auxiliary (if installed)	36,849	32,727	1279

Oil Capacity: 24.3 lb./engine usable at 8.1 lb./gal. with wing engines moment arm at 1125 in. and tail engine moment arm at 2200 in.

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[35] Fuel dump valves required for operation in excess of maximum landing weight. See NOTE 1(f).

[36] 370,000 pound landing weight is approved in freighter mode only, when Douglas Drawing SM10000001 and Douglas Service Bulletin 27-156 are incorporated and main landing gear Goodyear brakes 5000709-7 or later are installed, or production equivalent.

[37] All weight in airplanes above this weight must be fuel.

[38] 350,000 pound zero fuel weight is approved in freighter mode only, when Douglas drawing SM10000001 and Douglas Service Bulletin 27-156 are incorporated and main landing gear Goodyear brakes 5000709-7 or later are installed, or production equivalent.

V - Model DC-10-10F (Transport Aircraft), Approved February 1, 1974 (cont'd)

Maximum Operating Altitude: 42,000 feet

MAC: 300.682 inches (Leading Edge of MAC Station 1299.83)

Service Life Limits: See NOTE 3

DC-10-10F Serial Numbers Eligible: (See NOTE 10)

Maximum Takeoff Weight of 440,000 pounds

None

Maximum Takeoff Weight of 446,000 pounds

46705, 46900 - 46903, 47801.

Maximum Takeoff Weight of 455,000 pounds

None

Other Information: See "Data Pertinent to All Models"

VI - Model DC-10-40F (Transport Aircraft, Approved November 5, 1976

Engines: 3 Pratt and Whitney Turbofan JT9D-59A Engines installed per Rohr STC SA3139WE.

Fuel: See Note 4

Oil: See NOTE 5

Engine Limits: (See Section II)

APU Limits: (See Section II)

Airspeed Limits: (See Section II) the airspeed limits are the same for airplanes with JT9D-59A engines.

C.G. Range: See the appropriate FAA Approved Airplane Flight Manual and Weight and Balance Manual.

DC-10-40F Maximum Weight: (See Note 10)

572,000 pound Takeoff Weight
(See Serial Numbers Eligible)

	Center Main Gear Extended	Center Main Gear Retracted
Taxi and Ramp	575,000 lb.	478,000 lb.
Takeoff [39]	572,000 lb.	475,000 lb.
Landing [40]	424,000 lb.	400,000 lb.

[39] For takeoff weights above 555,000 pounds, 28 ply main landing gear tires and modifications per Douglas Service Bulletin 57-28 or equivalents are required.

[40] Fuel dump valves required for operation in excess of maximum landing weight. See NOTE 1(f).

VI - Model DC-10-40F (Transport Aircraft, Approved November 5, 1976 (cont'd)

DC-10-40F
Maximum Weight (cont'd)
(See NOTE 10)

572,000 pound Takeoff Weight
(See Serial Numbers Eligible)

	Center Main Gear Extended	Center Main Gear Retracted
Zero Fuel [41]	401,000 lb.	391,000 lb.
Gear Jacking Weight	575,000 lb.	478,000 lb.
Fuselage & Wing Jacking Weight	508,000 lb.	478,000 lb.

Minimum Crew: For all flights: Pilot, Copilot, and Flight Engineer.

Maximum Passenger: See FAA approved exemption number 6752 for the accommodation of up to four supernumeraries immediately aft of the cockpit on freighter aircraft equipped with a Class E cargo compartment.

Maximum Baggage: (See Weight and Balance Manual)

Fuel Capacity: (See Section II)

Oil Capacity: 77 lb./engine usable at 8.1 lb./gal. with wing engines moment arm at 1164.0 in. and tail engine moment arm at 2239.0 in.

Maximum Operating Altitude: 42,000 feet

MAC: 295.78 inches (Leading Edge of MAC Station 1311.95)

Service Life Limits: (See NOTE 3)

DC-10-40F Serial Numbers Eligible: (See NOTE 10)
Maximum Takeoff Weight of 572,000 lbs.

46920, 46661, 46966, 47823, 47855.

Other Information: See "Data Pertinent to All Models"

VII - Model DC-10-15 (Transport Aircraft), Approved June 12, 1981

Engines: 3 General Electric CF6-50C2-F Turbofan Engines

Fuel: See NOTE 4.

Oil: See NOTE 5.

[41] All weight in airplane above this weight must be fuel.

VII - Model DC-10-15 (Transport Aircraft), Approved June 12, 1981 (cont'd)

Engine Limits:	Takeoff Thrust, Sea Level, Static	CF6-50C2-F
	(5 min. flat to Std. + 28.3°C)	45,600 lb.
	Maximum Continuous (flat to Std. + 15°C)	43,250 lb.
	Maximum permissible engine rotor operating speeds	
	N_1 (Low Compressor)	4,067.5 rpm (111.3%)
	N_2 (High Compressor)	10,761 rpm (109.5%)
	Maximum permissible engine temperature Turbine exhaust gas temperatures at turbine outlet	
	Takeoff (5 min.)	1,733°F (945°C)
	Maximum Continuous	1,670°F (910°C)
	Maximum for Acceleration (2 min.)	1,760°F (960°C)
	Starting (Max. Transient for 40 sec.)	1,652°F (900°C)
	(Max. no time limit)	1,382°F (750°C)
	Maximum permissible oil outlet temperature	
	Continuous operation	320°F (160°C)
	Transient operation [42]	347°F (175°C)
APU Limits: (if installed)	AiResearch TSCP700-4	
	Power Rating	
	Maximum at sea level	189 hp
	Rotor Speeds	
	Low pressure speed (N_1)	31,570 rpm (110%)
	High pressure speed (N_2)	38,830 rpm (110%)
	Exhaust Gas Temperature	
	Maximum during operation	1085°F (585°C)
	Maximum indicated temperature during each starting cycle	1085°F (585°C)
Airspeed Limits: (CAS)	V_{MO}/M_{MO} (Maximum Operating)	
	At Sea Level	350K
	At 28,310 ft	350K (M = 0.88)
	At 42,000 ft	258K (M = 0.88)
	V_A (Maneuvering)	See FAA Approved Airplane Flight Manual
	V_{FE} Flap Position (Inboard)	
	5°	260K (M = 0.51)
	15°	250K (M = 0.51)
	20°	233K (M = 0.51)
	25°	214K (M = 0.51)
	35°	187K (M = 0.51)
	50°	171K (M = 0.51)

[42] Transient operation above 320°F (160°C) is limited to 15 minutes.

VII - Model DC-10-15 (Transport Aircraft), Approved June 12, 1981 (cont'd)

Airspeed Limits: (cont'd)
(CAS)

V_{SLAT} (Slat Operating)

Takeoff and Approach

Flap Position	
5^o	260K (M = 0.51)
15^o	250K (M = 0.51)
25^o	214K (M = 0.51)

Landing

Flap Position	
35^o	187K (M = 0.51)
50^o	171K (M = 0.51)

Autoslat

Flap retracted	260K (M = 0.51)

V_{LO} (Landing Gear)

Retraction	230K (M = 0.70)
Extension	260K (M = 0.70)

V_{LE} (Landing Gear Extended) 300K (M = 0.70)

(3) No fuel limitation

V (Landing light extension) - Maximum speed in extension, retraction, or extended position V_{MO}/M_{MO}

V (Fuel Dump) 325K up to 28,000 feet
M = 0.82 above 28,000 feet

C.G. Range: See the appropriate FAA Approved Airplane Flight Manual and Weight and Balance Manual.

DC-10-15
Maximum Weight
(See NOTE 10) 455,000 pounds Takeoff Weight
(See Serial Number Eligible)

Taxi and Ramp	458,000 lb.
Takeoff	455,000 lb.
Landing [43]	363,500 lb.
Zero Fuel [44]	335,000 lb.
Gear Jacking Weight	443,000 lb.
Fuselage and Wing Jack Weight	388,000 lb.

Minimum
Crew: For all flights: Pilot, Copilot, and Flight Engineer.

Maximum
Passenger: (See NOTE 6).

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[43] Fuel dump valves required for operation in excess of maximum landing weight. See NOTE 1(f).

[44] All weight in airplane above this weight must be fuel.

VII - Model DC-10-15 (Transport Aircraft), Approved June 12, 1981 (cont'd)

Maximum Baggage: (See Weight and Balance Manual).

Fuel Capacity: Fuel Tank Capacity (pounds)

Location	Structural	Usable (6.7 lb./gal)	Arm (inches)
Main No. 1	43,202	40,203	1488
Main No. 2	69,495	64,969	1296
Main No. 3	43,202	40,203	1488
Center Wing Auxiliary	36,849	32,727	1279
Crossfeed Manifold & Lines		609	1429

Oil Capacity: 24.3 lb./engine usable at 8.1 lb./gal. with wing engines moment arm at 1125 in. and tail engine moment arm at 2200 in.

Maximum Operating Altitude: 42,000 feet

MAC: 300.682 inches (Leading Edge of MAC Station 1299.83)

Service Life Limits: See NOTE 3.

DC-10-15 Serial Numbers Eligible: (See NOTE 10)
Maximum Takeoff Weight of 455,000 lbs.
48258, 48259, 48275, 48276, 48289, 48294, 48295.

Other Information: See "Data Pertinent to All Models"

VIII - Model MD-11 (Transport Aircraft), Approved November 8, 1990

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.

Fuel: See NOTE 4.

Oil: See NOTE 5.

Engine Limits, General Electric CF6-80C2D1F:

Takeoff thrust, sea level, static (5 min), lb	60,690
Maximum continuous thrust, sea level, static thrust, lb.	56,210
Flat rating ambient temperature:	
Takeoff	86^{o} F (30^{o} C)
Maximum continuous	77^{o} F (25^{o} C)

VIII - Model MD-11 (Transport Aircraft), Approved November 8, 1990 (cont'd)

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

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:	
Takeoff (5 min)	1760^{O} F (960^{O} C)
Maximum continuous	1697^{O} F (925^{O} C)
Starting (Max. transient for 40 sec)	1598^{O} F (870^{O} C)
Starting (Max. with no time limit)	1382^{O} F (750^{O} C)
Maximum permissible oil outlet temperatures:	
Continuous operation	320^{O} F (160^{O} C)
Transient operation (Transient operation is limited to 15 minutes.)	347^{O} F (175^{O} C)

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 vapor pressure to a maximum of 70 psig (482.6 kPa gage) (relative to atmosphere) with vapor/liquid ratio of zero at all conditions.

Oil: Pressure Limit at Idle.

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:

Takeoff thrust, sea level, static (5 min), lb.	60,000
Maximum continuous thrust, sea level, static thrust, lb.	51,050
Flat rating ambient temperature takeoff	86^{O} F (30^{O} C)
Maximum continuous	86^{O} F (30^{O} 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:	
Takeoff (5 min)	1202^{O} F (650^{O} C)
Maximum continuous	1157^{O} F (625^{O} C)
Starting on ground	995^{O} F (535^{O} C)
Starting in flight	1202^{O} F (650^{O} C)
Maximum permissible oil outlet temperatures:	
Continuous operation	325^{O} F (163^{O} C)
Transient operation (Transient operation is limited to 20 minutes)	350^{O} F (177^{O} C)

VIII - Model MD-11 (Transport Aircraft), Approved November 8, 1990 (cont'd)

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

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, gage) above the true vapor pressure of the fuel.

Maximum fuel pressure must be not greater than 70 psig with a vapor-to-liquid ratio of zero.

Oil pressure, minimum 70 psid
(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:

Takeoff thrust, sea level, static (5 min), lb.	62,000
Maximum continuous thrust, sea level, static thrust, lb.	51,050
Flat rating ambient temperature takeoff	86^{o} F (30^{o} C)
Maximum continuous	86^{o} F (30^{o} 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:	
Takeoff (5 min)	1202^{o} F (650^{o} C)
Maximum continuous	1157^{o} F (625^{o} C)
Starting on ground	995^{o} F (535^{o} C)
Starting in flight	1202^{o} F (650^{o} C)
Maximum permissible oil outlet temperatures:	
Continuous operation	325^{o} F (163^{o} C)
Transient operation (Transient operation is limited to 20 minutes)	350^{o} F (177^{o} C)

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, gage) above the true vapor pressure of the fuel.

Maximum fuel pressure must be not greater than 70 psig with a vapor-to-liquid ratio of zero.

Oil pressure, minimum 70 psig
(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
(if installed)

Power Rating Maximum at sea level	189 hp

VIII - Model MD-11 (Transport Aircraft), Approved November 8, 1990 (cont'd)

APU Limits: (cont'd)
(if installed) Rotor Speeds

Low pressure speed (N_1)	31,570 rpm (110%)
High pressure speed (N_2)	38,830 rpm (110%)

Exhaust Gas Temperature -
Starting 1602^{o} F (872^{o} C)
Continuous 1085^{o} F (585^{o} C)

Airspeed Limits:
(CAS) 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	.87 Mach	.87 Mach

For additional airspeed limits below 90% wing tip fuel, see FAA Approved Airplane Flight Manual.

V_a (maneuvering). See FAA Approved Airplane Flight Manual.

FLAP AND SLAT SPEEDS:

FLAP	SLAT	SPEED	MACH	GROSS WEIGHT
0	ext	280	.55	MTOGW
15	ext	255	.51	MTOGW
22	ext	240	.51	MTOGW
25	ext	229	.51	MTOGW
28	ext	219	.51	MLW+3000 lb.
35	ext	198	.51	MLW+3000 lb.
50	ext	178	.51	MLW+3000 lb.

V_{lo} (LANDING GEAR SPEEDS:)

Gear Extension = 260 KCAS
Gear Retraction = 230 KCAS to .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 speed restriction is imposed upon the airplane during the time period in which fuel is being dumped.

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

VIII - Model MD-11 (Transport Aircraft), Approved November 8, 1990 (cont'd)

MD-11

Maximum Weight:	610,000pound Takeoff Weight	618,000pound Takeoff Weight (See Serial Numbers Eligible)	625, 500pound Takeoff Weight	630,500pound Takeoff Weight	Center Main Gear Retracted
Taxi and Ramp	613,000 lb.	621,000 lb.	628,000 lb.	633,000 lb.	448,000 lb.
Takeoff[45, 46]	610,000 lb.	618,000 lb.	625,500 lb.	630,500 lb.	445,000 lb.
Landing[47]	458,000 lb.	458,000 lb.	458,000 lb.	458,000 lb.	400,000 lb.
Zero Fuel[48]	430,000 lb.	430,000 lb.	430,000 lb.	430,000 lb.	370,000 lb.
Gear Jacking Weight	613,000 lb.	621,000 lb.	628,000 lb.	633,000 lb.	
Fuselage and Wing Jack Weight	508,000 lb.	508,000 lb.	508,000 lb.	508,000 lb.	

Minimum Crew: For all flights: pilot, copilot.

Maximum Passengers: (See NOTE 6)

Maximum Baggage: (See Weight and Balance Manual)

Fuel Capacity:

FUEL TANK CAPACITY (lb.)						
CAPACITY	1 MAIN	2 MAIN	3 MAIN	AUX	FWD CARGO AUX [49]	TAIL
MAX 7.1 lb./gal	42,908	67,863	42,908	103,968	21,724	13,908
USABLE 6.7 lb./gal	40,491	64,040	40,491	98,111	20,500	13,124
UNDUMPABLE 6.7 lb./gal	12,973	13,917	12,973	0	0	0

Note: An additional 436 lb. (6.7 lb./gal) of useable fuel is available from manifold piping upon the completion of crossfeeding.
This fuel is made available when the MANF DRAIN alert is displayed.
An additional 173 lb. (6.7 lb./gal) usable fuel in the engine and lines is available to the engine on the fuel runout. No action is required to make this fuel available.

[45] All MD-11 passenger aircraft are eligible for 618,000 pounds maximum takeoff weight when modified per Douglas Service Bulletin 103-1 or production equivalent.

[46] All MD-11 airplanes are eligible for 630,500 pound maximum takeoff weight when modified in accordance with Douglas Service Bulletins MD11-28-079, MD11-31-073 (or equivalent chapter 31 FMC and FCC Program Option approved Service Bulletin), MD11-32-057, and MD11-57-032 or Service Modification Drawing Number SM11570020 Revision A, or production equivalent.

[47] Fuel dump valves required for operation in excess of maximum landing weight (See NOTE 1 (f)).

[48] All weight in the airplane above this weight must be fuel.

[49] Applicable when forward cargo auxiliary fuel tank is installed per Douglas Service Modification Drawing SM11280036 Revision E, or production equivalent.

VIII - Model MD-11 (Transport Aircraft), Approved November 8, 1990 (cont'd)

Oil Capacity: 22 to 23 quarts Indicated 26 to 27 quarts (tank)

Maximum Operating Altitude: 43,200 feet

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

Service Life Limits: See NOTE 3.

MD-11 Serial Numbers Eligible: (See NOTE 10)

Maximum Takeoff Weight of 610,000 lbs.

GE Powered: 48449, 48450, 48459,

Maximum Takeoff Weight of 618,000 lbs.[50]

GE Powered: 48555.

P&W Powered: 48437, 48488, 48518, 48519, 48521

Maximum Takeoff Weight of 625,500 lbs[51]

GE Powered: 48556, 48557, 48558, 48559, 48560, 48561, 48562, 48563.

P&W Powered: 48532, 48533

Maximum Takeoff Weight of 630,500 lbs. [52]

GE Powered: 48564

P&W Powered: 48623, 48743

Other Information: See "Data Pertinent to All Models"

IX - Model MD-11F (Transport Aircraft), Approved November 8, 1990

Engines: See Section VIII (MD-11)

Fuel: See NOTE 4.

Oil: See NOTE 5.

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[50] All MD-11 passenger airplanes are eligible for 618,000 pound maximum takeoff weight when modified in accordance with Douglas Service Bulletin 103-1 or production equivalent.

[51] All MD-11 passenger airplanes are eligible for 625,500 pound maximum takeoff weight when modified in accordance with Douglas Service Bulletin 103-009 or production equivalent.

[52] All MD-11 passenger airplanes are eligible for 630,500 pound maximum takeoff weight when modified in accordance with Douglas Service Bulletins MD11-28-079, MD11-31-073 (or equivalent chapter 31 FMC and FCC Program Option approved Service Bulletin), MD11-32-057, and MD11-57-032, or Service Modification Drawing Number SM11570020 Revision A, or production equivalent.

IX - Model MD-11F (Transport Aircraft), Approved November 8, 1990 (cont'd)

Engine Limits: See Section VIII (MD-11)

APU Limits:
(if installed) See Section VIII (MD-11)

Airspeed Limits: See Section VIII (MD-11)

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

MD-11F
Maximum Weight:
(See NOTE 10)

	610,000pound Takeoff Weight	618,000pound Takeoff Weight (See Serial Numbers Eligible)	625,500pound Takeoff Weight	630,500pound Takeoff Weight	Center Main Gear Retracted
Taxi and Ramp	613,000 lb.	621,000 lb.	628,000 lb.	633,000 lb.	448,000 lb.
Takeoff	610,000 lb.	618,000 lb.	625,500 lb.	630,500 lb.	445,000 lb.
Landing[53]	471,500 lb.	471,500 lb.	481,500 lb.	491,500 lb.	400,000 lb.
Zero Fuel[54]	451,300 lb.	451,300 lb.	451,300 lb.	461,300 lb.	370,000 lb.
Gear Jacking Weight	613,000 lb.	621,000 lb.	628,000 lb.	633,000 lb.	
Fuselage and Wing Jack Weight	508,000 lb.	508,000 lb.	508,000 lb.	508,000 lb.	

Minimum Crew: For all flights: Pilot, Copilot.

Maximum
Passengers: See FAA approved exemption number 6656 for the accommodation of up to two supernumeraries immediately aft of the cockpit. And crew rest facility immediately aft of the smoke barrier and crash net, on MD-11 freighter aircraft equipped with a Class E cargo compartment.

See FAA approved exemption number 6753 for the accommodation of up to five supernumeraries immediately aft of the cockpit on MD-11 freighter aircraft equipped with a Class E cargo compartment

Maximum
Baggage: (See Weight and Balance Manual)

Fuel Capacity: See Section VIII MD-11

Oil Capacity: See Section VIII MD-11

Maximum
Operating
Altitude: 43,200 feet

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

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[53] Fuel dump valves required for operation in excess of maximum landing weight. (See NOTE 1(f)).

[54] All weight in the airplane above this weight must be fuel.

IX - Model MD-11F (Transport Aircraft), Approved November 8, 1990 (cont'd)

Service Life Limits: See NOTE 3

MD-11F Serial Numbers Eligible: (See NOTE 10)

Maximum Takeoff Weight of 610,000 lbs.

GE Powered: 48401, 48402, 48459, 48460, 48461, 48514, 48528, 48547, 48548, 48549, 48602, 48603, 48605.

Maximum Takeoff Weight of 618,000 lbs. [55]

P&W Powered: 48408

Maximum Takeoff Weight of 625,500 lbs. [56]

GE Powered: 48415, 48420, 48487, 48542, 48543, 48544, 48545, 48546, 48747, 48748, 48749, 48767

P&W Powered: 48485, 48486, 48616, 48617, 48618, 48629, 48633.

Maximum Takeoff Weight of 630,500 lbs. [57]

GE Powered: 48404, 48405, 48406, 48411 - 48412, 48413, 48414, 48416, 48417, 48418, 48421, 48426, 48427, 48428, 48429, 48430, 48431, 48434 - 48436, 48439, 48451, 48458, 48481, 48489 - 48491, 48499, 48500, 48501, 48502, 48503, 48504, 48505, 48512, 48513, 48527, 48544, 48550, 48551- 48553, 48581, 48596- 48598, 48630, 48744, 48745, 48753 – 48755, 48758, 48766, 48768, 48769, 48770, 48773, 48775, 48776, 48777, 48778, 48779, 48780, 48781 – 48787, 48789, 48790, 48794, 48798 – 48806.

P&W Powered: 48407, 48410, 48443, 48444, 48445, 48446, 48447, 48452, 48453, 48454, 48455, 48456, 48457, 48458, 48461, 48469, 48470, 48471, 48472, 48473, 48474, 48475, 48476, 48477, 48478, 48479, 48480, 48484, 48495, 48496, 48497, 48498, 48520, 48523, 48538, 48539, 48540, 48541, 48565, 48566, 48571, 48572, 48573, 48574, 48575, 48576, 48577, 48578, 48579, 48600, 48601, 48623, 48624, 48631, 48632, 48634, 48746, 48756, 48757, 48774, 48788, 48791, 48792.

Other Information: See "Data Pertinent to All Models"

X – Model MD-10-10F (Transport Aircraft), Approved May 9, 2000

Engines: 3 General Electric CF6-6D or CF6-6K Turbofan Engines

Fuel: See NOTE 4.

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[55] All MD-11F freighter airplanes are eligible for 618,000 pound maximum takeoff weight when modified in accordance with Douglas Service Bulletin 103-1 or production equivalent.

[56] All MD-11F freighter airplanes are eligible for 625,500 pound maximum takeoff weight when modified in accordance with Douglas Service Bulletin 103-009 or009 or production equivalent.

[57] All MD-11F Freighter airplanes are eligible for 630,500 pound maximum takeoff weight when modified in accordance with Douglas Service Bulletins MD11-28-079, MD11-31-073 (or equivalent chapter 31 FMC and FCC Program Option approved Service Bulletin), MD11-32-057, and MD11-57-032, or Service Modification Drawing Number SM11570020 Revision A, or production equivalent.

X – Model MD-10-10F (Transport Aircraft), Approved May 9, 2000 (cont'd)

Oil: See NOTE 5.

Engine Limits:		CF6-6D/-6K
	Takeoff Thrust. Sea Level,	
	Static (5 min) - flat to 88°F	39,300 lb.
	Maximum Continuous (flat to 77°F)	37,500 lb.
	Maximum permissible engine rotor operating speeds	
	N_1 (Low Compressor)	3810 rpm (111%)
	N_2 (High Compressor)	9925 rpm (101%)
	Maximum permissible engine temperature Turbine exhaust gas temperatures at turbine outlet	
	Take off (5 min.)	1670°F (910°C)
	Maximum Continuous	1616°F (880°C)
	Maximum Acceleration (2 min.)	1697°F (925°C)
	Starting (Max. Transient for 40 sec.)	1652°F (900°C)
	(Max. No Time Limit)	1382°F (750°C)
	Maximum permissible oil outlet temperature	
	Continuous operation	320°F (160°C)
	Transient operation [58]	347°F (175°C)
APU Limits: (if installed)	AiResearch TSCP700-4B Power Rating Maximum at sea level	189 hp
	Rotor Speeds	
	Low pressure speed (N_1)	31,570 rpm (110%)
	High pressure speed (N_2)	38,830 rpm (110%)
	Exhaust Gas Temperature	
	Maximum during operation	1085°F (585°C)
	Maximum indicated temperature during each starting cycle	1085°F (585°C)

Airspeed Limits:
(CAS)

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

At Sea Level	340K
At 27,860 ft.	340K (M=0.85)
At 42,000 ft.	248K (M=0.85)

V_A (Maneuvering) See FAA Approved Airplane Flight Manual

V_{FE} Flap Position (Inboard)

5°	260K (M = 0.51)
15°	250K (M = 0.51)
20°	233K (M = 0.51)
25°	214K (M = 0.51)
35°	187K (M = 0.51)
50°	171K (M = 0.51)

[58] Transient operation above 320°F (160°C) is limited to 15 minutes.

X – Model MD-10-10F (Transport Aircraft), Approved May 9, 2000 (cont'd)

Airspeed Limits: (cont'd)
(CAS)

V_{SLAT} (Slat Operating)
Takeoff and Approach:
Flap Position (Inboard)

5^o	260K (M = 0.51)
15^o	250K (M = 0.51)
25^o	214K (M = 0.51)

Landing
Flap Position (Inboard)

35^o	187K (M = 0.51)
50^o	171K (M = 0.51)

Autoslat
Flaps retracted 260K (M = 0.51)

V_{LO} (Landing Gear)
Retraction 230K (M = 0.70)
Extension 260K (M = 0.70)

V_{LE} (Landing Gear Extended) 300K (M = 0.70)

V (Landing light extension)
Maximum speed extension retraction, or extended position V_{MO}/M_{MO}

V (Fuel Dump) 325K up to 28,000 feet
M = 0.82 above 28,000 feet

C.G. Range: See the appropriate FAA Approved Airplane Flight Manual and Weight and Balance Manual.

MD-10-10F
Maximum Weight:
(See NOTE 10)

For Takeoff Weight
440,000 pounds
(See Serial Numbers Eligible)

Taxi and Ramp	443,000 lb.
Takeoff	440,000 lb.
Landing [59]	375,000 lb. (374,500 lb. when carbon brakes are installed)
Zero Fuel [60]	355,000 lb.
Gear Jacking Weight	443,000 lb.
Fuselage and Wing Jack Weight	388,000 lb.

Minimum Crew: For all flights: Pilot, Copilot.

Maximum
Passengers: (See NOTE 23).

[59] Fuel dump valves required for operation in excess of maximum landing weight. See NOTE 1(f).

[60] All weight in airplanes above this weight must be fuel.

X – Model MD-10-10F (Transport Aircraft), Approved May 9, 2000 (cont'd)

Maximum Baggage: (See Weight and Balance Manual).

Fuel Capacity: Fuel Tank Capacity (pounds)

Location	Structural	Usable (6.7 lb./gal.)	Arm (inches)
Main No. 1	42,579	40,116	1488
Main No. 2	68,998	64,969	1296
Main No. 3	42,579	40,116	1488
Crossfeed Manifold & Lines		609	1429

Oil Capacity: 24.3 lb./engine usable at 8.1 lb./gal. with wing engines moment arm at 1125 in. and tail engine moment arm at 2200 in.

Maximum Operating Altitude: 42,000 feet

MAC: 300.682 inches (Leading Edge of MAC Station 1299.83)

Service Life Limits: See NOTE 3

MD-10-10F Serial Numbers Eligible: (See NOTE 10) Conversion from DC-10-10 or –10F to MD-10-10F (See NOTE 24).

Maximum Takeoff Weight of 440,000 pounds

46521, 46601, 46602, 46605, 46606, 46607, 46608, 46609, 46610, 46611, 46612, 46613, 46615, 46616, 46617, 46619, 46620, 46621, 46622, 46623, 46624, 46625 - 46628, 46629, 46630, 46631, 46633 - 46636, 46708, 46710, 46907, 46930, 46938, 46939, 46947, 46948, 46970, 46973, 46984, 46989, 46994, 46996, 47803-47808, 47810, 47827, 47828, 47829, 47830, 47965, 48260 - 48262, 48263, 48264.

Other Information: See "Data Pertinent to All Models"

XI Model MD-10-30F (Transport Aircraft), Approved May 9, 2000

Engines: 3 General Electric CF6-50C2 Turbofan Engines.

Fuel: See NOTE 4.

Oil: See NOTE 5.

Engine Limits:

	-	CF6-50C2
Static Thrust, Sea Level Takeoff [61]	-	51,800 lb.
Maximum Continuous (flat to 86°F)	-	46,300 lb.

[61] 5 minutes flat to 86°F.

XI Model MD-10-30F (Transport Aircraft), Approved May 9, 2000 (cont'd)

Engine Limits: (cont'd)

CF6-50C2

Maximum permissible engine rotor operating speeds

N_1 (Low Compressor)	4102 rpm (119.5%)
N_2 (High Compressor)	10761 rpm (109.5%)

Maximum permissible engine temperature
Turbine exhaust gas temperature at turbine outlet

Takeoff (5 min.)	1733^{O}F (945^{O}C)
Maximum Continuous	1670^{O}F (910^{O}C)
Maximum for Acceleration (2 min.)	1760^{O}F (960^{O}C)
Starting	
(Max. Transient for 40 sec.)	1652^{O}F (900^{O}C)
(Max. no time limit)	1382^{O}F (750^{O}C)

Maximum permissible oil outlet temperature

Continuous Operation	320^{O}F (160^{O}C)
Transient Operation [62]	347^{O}F (175^{O}C)

APU Limits: (if installed) AiResearch TSCP700-4B

Power Rating Maximum at sea level	189 hp
Rotor Speeds	
Low pressure speed (N_1)	31,570 rpm (110%)
High pressure speed (N_2)	38,830 rpm (110%)
Exhaust Gas Temperature	
Maximum during operation	1085^{O}F (585^{O}C)
Maximum indicated temperature during each starting cycle	1085^{O}F (585^{O}C)

Airspeed Limits: (CAS) V_{MO}/M_{MO} (Maximum Operating)

At Sea Level	350K
At 10,000 ft.	376K
At 24,820 ft.	376K (M = 0.88)
At 42,000 ft.	258K (M = 0.88)

V_A (Maneuvering) See FAA Approved Airplane Flight Manual

[62] Transient operation above 320°F (160°C) is limited to 15 minutes.

XI Model MD-10-30F (Transport Aircraft), Approved May 9, 2000 (cont'd)

Airspeed Limits: (cont'd)
(CAS)

	Flap Position (Inboard)	For Takeoff Weight 565,000 lb. (See Serial Numbers Eligible)	For Takeoff Weights 572,000 lb./580,000 lb. (See Serial Numbers Eligible)
V_{FE}	5^o	260K (M = 0.51)	270K (M = 0.55)
	15^o	255K (M = 0.51)	255K (M = 0.51)
	20^o	240K (M = 0.51)	240K (M = 0.51)
	25^o	221K (M = 0.51)	221K (M = 0.51)
	35^o	194K (M = 0.51)	194K (M = 0.51)
	50^o	178K (M = 0.51)	178K (M = 0.51)
V_{SLAT} (Slat Operating)			
Takeoff and Approach			
Flap Position			
	5^o	260K (M = 0.51)	270K (M = 0.55)
	15^o	255K (M = 0.51)	255K (M = 0.51)
	25^o	221K (M = 0.51)	221K (M = 0.51)
Landing			
Flap Position			
	35^o	194K (M = 0.51)	194K (M = 0.51)
	50^o	178K (M = 0.51)	178K (M = 0.51)
Autoslat			
Flaps retracted		260K (M = 0.51)	270K (M = 0.55)
V_{LO} Landing Gear			
Retraction		230K (M = 0.70)	230K (M = 0.70)
Extension		260K (M = 0.70)	260K (M = 0.70)
V_{LE} (Landing Gear Extended)		300K (M = 0.70)	300K (M = 0.70)

V (Landing light extension) - Maximum speed in extension, retraction, or extended position V_{MO}/M_{MO}

V (Fuel Dump) 325K up to 28,000 feet
M = 0.82 above 28,000 feet

C.G. Range: See the appropriate FAA Approved Airplane Flight Manual and Weight and Balance Manual.

XI Model MD-10-30F (Transport Aircraft), Approved May 9, 2000 (cont'd)

MD-10-30F
Maximum Weight:
(See NOTE 10)

	For Takeoff Weight 565,000 pound (See Serial Numbers Eligible)		For Takeoff Weight 572,000 pound (See Serial Numbers Eligible)	
	Center Main Gear Extended	Center Main Gear Retracted	Center Main Gear Extended	Center Main Gear Retracted or Removed
Taxi and Ramp	568,000 lb.	463,000 lb.	575,000 lb.	478,000 lb.
Takeoff [63]	565,000 lb.	460,000 lb.	572,000 lb.	475,000 lb.
Landing [64]	421,000 lb.	400,000 lb.	424,000 lb.	400,000 lb.
Zero Fuel [65]	401,000 lb.	391,000 lb.	401,000 lb.	391,000 lb.
Gear Jacking Wt.	568,000 lb.	463,000 lb.	575,000 lb.	478,000 lb.
Fuselage & Wing Jack Weight	508,000 lb.	463,000 lb.	508,000 lb.	478,000 lb.

	For Takeoff Weight 580,000 pounds (See Serial Numbers Eligible)	
	Center Main Gear Extended	Center Main Gear Retracted or Removed
Taxi and Ramp	583,000 lb.	478,000 lb.
Takeoff [66]	580,000 lb.	475,000 lb.
Landing [67]	424,000 lb.	400,000 lb.
Zero Fuel [68]	401,000 lb.	391,000 lb.
Gear Jacking Wt.	583,000 lb.	478,000 lb.
Fuselage & Wing Jack Weight	508,000 lb.	478,000 lb.

Minimum Crew: For all Flights: Pilot, Copilot

Maximum Passengers: (See NOTE 23).

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[63] For takeoff weights above 555,000 pounds, 28 ply main landing gear tires and modification per Douglas Service Bulletin 57-28 or equivalents are required.

[64] Fuel dump valves required for operation in excess of maximum landing weight. See NOTE 1 (f).

[65] All weight in airplane above this weight must be fuel.

[66] For takeoff weights above 555,000 pounds, 28 ply main landing gear tires and modification per Douglas Service Bulletin 57-28 or equivalents are required.

[67] Fuel dump valves required for operation in excess of maximum landing weight. See NOTE 1 (f).

[68] All weight in airplane above this weight must be fuel.

XI Model MD-10-30F (Transport Aircraft), Approved May 9, 2000 (cont'd)

Maximum Baggage: (See Weight and Balance Manual).

Fuel Capacity: Fuel Tank Capacity (pounds)

Location	Usable Structural	(6.7 lb./gal.)	Usable [69] (6.7 lb./gal.)	Arm (inches)
Main No. 1	43,202	40,203	40,704	1492.6
Main No. 2	69,495	64,969	65,438	1296.0
Main No. 3	43,202	40,203	40,704	1492.6
Center Wing Auxiliary	104,141	97,409	98,111	1266.1
Crossfeed Manifold & Lines		609	609	1420.5

NOTE: The integrity of the transfer system must be demonstrated per Maintenance Manual, Chapter 28-21-100, section titled "Manifold Integrity Check" whenever the system is disturbed for maintenance. Also, if the tank overfilled light is illuminated any time during fueling, comply with the caution note in Chapter 12-11-04, section titled "Safety and Operating Precautions", item pertaining to tank overfilled condition.

Oil Capacity: 24.3 lb./engine usable at 8.1 lb./gal. with wing engines moment arm at 1125 in. and tail engine moment arm at 2200 in.

Maximum Operating Altitude: 42,000 feet

MAC: 295.78 inches (Leading Edge of MAC St. 1311.95)

Service Life Limits: See NOTE 3.

MD-10-30F Serial Numbers Eligible: (See NOTE 10) Conversion from DC-10-30 or –30F to MD-10-30F (See NOTE 24).

Maximum Takeoff Weight of 565,000 pounds
46800, 46801, 46802, 46871, 47835, 47836.

Maximum Takeoff Weight of 572,000 pounds
46835, 46837, 46992, 47820,

Maximum Takeoff Weight of 580,000 pounds
48287, 48291, 48297, 48300, 48311, 48312, 48313, 48314.

Other Information: See "Data Pertinent to All Models"

Datum: For DC-10: 239 inches forward of fuselage nose (Station 0)
For MD-11: 139 inches forward of fuselage nose (Station 0)
For MD-10: 239 inches forward of fuselage nose (Station 0)

[69] When modified per Douglas Service Bulletins 28-27 and 28-32 or equivalents.

DATA PERTINENT TO ALL MODELS

Leveling Means: One of the following three systems in each airplane:

(a) Two sets of lugs in nose wheel well

(1) DC-10: Lateral at station 595

MD-11: Lateral on centerline 2 inches forward of station 495.

MD-10: Lateral at station 595

(2) DC-10: Longitudinal 24 inches left of centerline, 20 inches and 40 inches forward of station 595.

MD-11: Longitudinal 24 inches left of centerline, 20 inches and 40 inches forward of station 495.

MD-10: Longitudinal 24 inches left of centerline, 20 inches and 40 inches forward of station 595.

(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 station 1521 in right hand main gear wheel well. Lay flat plate on which to put level for either lateral or longitudinal.

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

For DC-10: Douglas Drawing NXH 6004, "Rigging Procedures," and NXH-6005, "Throws - Flight Controls."

For MD-11: Douglas Drawing NXH 6704, "Rigging Instructions – Flight & Accessory Controls," and NXH-6705, "Throws - Flight Controls."

For MD-10: Douglas Drawing SP10270016, "Rigging Procedures," and NXH-6005, "Throws - Flight Controls."

Certification Basis: For all Model DC-10 airplanes issuance of a Type Certificate is based upon compliance with the following:

(1) FAR 25, dated February 1, 1965, with Amendments 1 through 22 "Airworthiness Standards: Transport Category Airplanes," and FAR 25.471 of Amendment 25-23.

(2) FAR Part 36 "Noise Standards: Aircraft Type Certification."

(3) Special Conditions No. 25-18-WE-7 dated January 7, 1970 and Special Conditions No. 25-18-WE-7, Amendment No. 1 dated July 9, 1971. [70]

(4) Special Condition No. 25-46-WE-14 dated October 26, 1972. (Models DC-10-30, DC-10-30F, DC-10-40, and DC-10-40F)

[70] See NOTE 7

DATA PERTINENT TO ALL MODELS (cont'd)

Certification Basis: (cont'd)

(5) Based on 14 CFR § 21.101(g) for changes to type certificates (TCs), applicable provisions of 14 CFR part 26 are included in this certification basis. For any future 14 CFR part 26 amendments, the holder of this TC must demonstrate compliance with the applicable sections.

Compliance has been found for the following regulations: 14 CFR § 26.11 (Amdt. No. 26-0), 26.43 and 26.45 (Amdt.No. 26-1).

Compliance with the following optional requirements has been established:

Ditching Provisions 25.801

(Overwater operation can be approved when the aircraft has been equipped and installation has been approved according to FAR 25.801)

Ice Protection Provisions 25.1419

In accordance with Title 14 CFR Part 21.21(b)(1), the following Equivalent Safety Findings (ESF) exist for the DC-10 with respect to the following regulations:

§25.981(a)(3) at Amdt. 102 Fault Current Detectors

The following exemptions are part of the DC-10 certification

1. Number 1573 issued April 28, 1972 - exemption from §25.807(c)(5) to permit evacuation with a passenger seating capacity of 80 for a pair of oversize Type I exits.

2. Number 2453 issued September 26, 1977 - exemption from §25.807(c)(1) to permit evacuation of passengers with either of the following exit-seat configurations:

   a. one oversize Type I emergency exit meeting the conditions specified in Exemption No. 1573 on each side of the fuselage with a passenger seating capacity of 50; or

   b. one Type A emergency exit on each side of the fuselage with a passenger seating capacity of 70.

3. Number 6752 dated April 18, 1997, - exemption from 14 CFR §§ 25.785(d), 25.807(c)(1), 25.857(e), and 25.1447(c)(1) for the accommodation of up to four supernumeraries immediately aft of the cockpit on freighter aircraft equipped with a Class E cargo compartment.

4. Number 10842 issued August 15, 2013, - exemptions from 14 CFR §§ 25.981(a)(3) and 25.901(c), for the installation of an improved fuel pump electrical connector independently of the improved fuel pump electrical connector until such time as both are required to be installed by AD 2013-08-23.

For all Model MD-11 airplanes issuance of a Type Certificate is based upon compliance with the following:

(1) Part 25 of the Federal Aviation Regulations, as amended by Amendments 25-1 through 25-61, except for §§ 25.607, 25.631 [71], and 25.1309 [72] as amended by Amendment 25-22; §25.109 as amended by Amendment 25-41; and §25.832 [73] and §25.858.

[71] New structure will comply with Amendment 25-61.

[72] New systems and systems with major changes will comply with Amendment 25-61.

[73] The ozone converters are not required for MD-11F airplanes operated in all cargo configurations.

DATA PERTINENT TO ALL MODELS (cont'd)

Certification Basis: (cont'd)

(2) Special Federal Aviation Regulation (SFAR) 27, as amended by Amendments 27-1 through 27-6 and any later amendments in existence at the time of certification.

(3) Part 36 of the Federal Aviation Regulations, as amended by Amendments 36-1 through 36-16, and any later amendments in existence at the time of certification. McDonnell Douglas has elected to comply with the Stage 3 noise level requirements.

(4) Special Condition No. 25-ANM-35 dated October 12, 1990. "Lightning and External High Energy Radio Frequency (RF) Protection and Automatic Longitudinal and Lateral Stability Augmentation System" (All MD-11 Models).

(5) Based on 14 CFR § 21.101(g) for changes to type certificates (TCs), applicable provisions of 14 CFR part 26 are included in this certification basis. For any future 14 CFR part 26 amendments, the holder of this TC must demonstrate compliance with the applicable sections.

Compliance has been found for the following regulations: 14 CFR § 26.11 (Amdt. No. 26-0), § 26.33 (Amdt. No 26-3), and § 26.43 and § 26.45 (Amdt.No. 26-1).

Compliance with the following optional requirements has been established:

Ditching Provisions 25.801

(Overwater operation can be approved when the aircraft has been equipped and installation has been approved according to FAR 25.801)

Ice Protection Provisions 25.1419

In accordance with Title 14 CFR Part 21.21(b)(1), the following Equivalent Safety Findings (ESF) exist for the MD-11 with respect to the following regulations:

§25.677(b) Trim Position Indicator
§25.819 Isolated Cabin Crew Rest module
§25.981(a)(3) at Amdt. 102 Fault Current Detectors
§25.1447(c)(1) & (c)(3) Lavatory oxygen installation
§25.1459(a)(6) Flight Data Recorder time marking of SATCOM Transmissions

The following exemptions are part of the MD-11 certification basis:

(1) Number 1573 issued April 28, 1972 - exemption from §25.807(c)(5) to permit evacuation with a passenger seating capacity of 80 for a pair of oversize Type I exits.

(2) Number 2453 issued September 26, 1977 - exemption from §25.807(c)(1) to permit evacuation of passengers with either of the following exit-seat configurations:

a. one oversize Type I emergency exit meeting the conditions specified in Exemption No. 1573 on each side of the fuselage with a passenger seating capacity of 50; or
b. one Type A emergency exit on each side of the fuselage with a passenger seating capacity of 70.

(3) Number 5405 issued February 11, 1992, - exemption from §25.813(e) to permit installation of a door between passenger compartments.

(4) Number 6656 dated December 4, 1996 and April 3, 1997, - exemption from 14 CFR §§ 25.785(d), 25.807(c)(1), 25.857(e), and 25.1447(c)(1) for the accommodation of up to two supernumeraries immediately aft of the cockpit. And crew rest facility immediately aft of the smoke barrier and crash net, on MD-11 freighter aircraft equipped with a Class E cargo compartment.

DATA PERTINENT TO ALL MODELS (cont'd)

Certification Basis: (cont'd)

(5) Number 6753 April 21, 1998, - exemption from 14 CFR §§ 25.785(d), 25.807(c)(1), 25.857(e), and 25.1447(c)(1) for the accommodation of up to five supernumeraries immediately aft of the cockpit on MD-11 freighter aircraft equipped with a Class E cargo compartment

(6) Number 10842 issued August 15, 2013, - exemptions from 14 CFR §§ 25.981(a)(3) and 25.901(c), for the installation of an improved fuel pump electrical connector independently of the improved fuel pump electrical connector until such time as both are required to be installed by AD 2013-08-23.

For all Model MD-10 airplanes issuance of a Type Certificate is based upon compliance with the following:

(1) 14 CFR Part 25 of the Federal Aviation Regulations, dated February 1, 1965, with Amendments 1 through 22 "Airworthiness Standards: Transport Category Airplanes," and FAR 25.471 of Amendment 25-23, for all areas not affected by the change.

(2) 14 CFR Part 25 of the Federal Aviation Regulations, dated February 1, 1965, including Amendments 25-1 through 25-89 for all areas affected by the change. The following list indicates the FAR's that are complied with through Amendment Level 25-89.

25.103	25.603	25.683	25.831	25.1019	25.1323	25.1431	25.1529
25.125	25.605	25.685	25.841	25.1039	25.1325	25.1435	25.1541
25.145	25.607	25.689	25.843	25.1141	25.1326	25.1439	25.1543
25.149	25.609	25.693	25.855	25.1142	25.1327	25.1441	25.1545
25.207	25.611	25.699	25.857	25.1145	25.1329	25.1443	25.1549
25.301	25.613	25.703	25.858	25.1161	25.1331	25.1445	25.1551
25.303	25.615	25.729	25.863	25.1165	25.1333	25.1447	25.1553
25.305	25.619	25.733	25.901	25.1207	25.1335	25.1449	25.1555
25.307	25.621	25.771	25.903	25.1301	25.1337	25.1451	25.1563
25.397	25.623	25.773	25.943	25.1303	25.1351	25.1453	25.1581
25.399	25.625	25.777	25.952	25.1305	25.1353	25.1457	25.1583
25.405	25.629	25.779	25.954	25.1307	25.1355	25.1459	25.1585
25.561	25.671	25.783	25.961	25.1309	25.1357	25.1461	25.1587
25.571	25.672	25.789	25.991	25.1316	25.1363	25.1501	
25.581	25.675	25.801	25.993	25.1321	25.1381	25.1525	
25.601	25.677	25.812	25.1001	25.1322	25.1419	25.1527	

(3) Compliance as defined in McDonnell Douglas Report MDC 97K1097 where some equipment installations and equipment comply with §25.1309 as amended by Amendment 25-22 and others comply with §25.1309 as amended through Amendment 25-89.

(4) 14 CFR Part 36 of the Federal Aviation Regulations "Noise Standards: Aircraft Type Certification", effective December 1, 1969, including Amendments 36-1 through 36-22.

(5) 14 CFR Part 34 of the Federal Aviation Regulation "Fuel Venting and Exhaust Emissions Requirements" effective September 10, 1990, Amendment 34-1 through 34-3.

(6) Special Conditions No. 25-18-WE-7 dated January 7, 1970 and Special Conditions No. 25-18-WE-7, Amendment No. 1 dated July 9, 1971. [74]

(7) Special Condition No. 25-46-WE-14 dated October 26, 1972. (Models DC-10-30, DC-10-30F, DC-10-40, and DC-10-40F.)

[74] See NOTE 7

DATA PERTINENT TO ALL MODELS (cont'd)

Certification Basis: (cont'd)

(8) Special Condition "High Intensity radiated Fields (HIRF)" Special Condition No. 25-156-SC dated February 15, 2000.

(9) Special Condition No. 25-ANM-35 dated October 12, 1990. "Lightning and External High Energy Radio Frequency (RF) Protection" (On components originally certified on MD-11 Models, see McDonnell Report MDC 97K1097 where some equipment installations and equipment comply.)

(10) Based on 14 CFR § 21.101(g) for changes to type certificates (TCs), applicable provisions of 14 CFR part 26 are included in this certification basis. For any future 14 CFR part 26 amendments, the holder of this TC must demonstrate compliance with the applicable sections.

Compliance has been found for the following regulations: 14 CFR § 26.11 (Amdt. No. 26-0), § 26.33 (Amdt. No 26-3), and § 26.43 and § 26.45 (Amdt.No. 26-1).

Compliance with the following optional requirements has been established:

Ditching Provisions 25.801
(Overwater operation can be approved when the aircraft has been equipped and installation has been approved according to FAR 25.801.)

Ice Protection Provisions 25.1419

In accordance with Title 14 CFR Part 21.21(b)(1), the following Equivalent Safety Findings (ESF) exist for the MD-10 with respect to the following regulations:

§25.677(b) Trim Position Indicator
§25.981(a)(3) at Amdt. 102 Fault Current Detectors
§25.1309(a)(1). Unwanted In-Flight Thrust Reversal Deployment

The following exemption is part of the MD-10 certification basis:

(1) Number 6873 issued March 23, 1999, - exemptions from 14 CFR §§ 25.785(d), 25.807(c)(1), 25.857(e), and 25.1447(c)(1) for the accommodations up to four supernumeraries in a "courier area" aft of the cockpit door and forward of a rigid cargo barrier. Or allow up to two supernumeraries in a "courier module" area aft of the cockpit door and forward of a 9g crash net MD-10 freighter aircraft equipped with a Class E cargo compartment.

(2) Number 10842 issued August 15, 2013, - exemptions from 14 CFR §§ 25.981(a)(3) and 25.901(c), for the installation of an improved fuel pump electrical connector independently of the improved fuel pump electrical connector until such time as both are required to be installed by AD 2013-08-23.

Certification Maintenance Requirements:

DC-10 Certification Maintenance Requirements (CMR) are listed in FAA approved MDC Report No. MDC-03K1006, Revision NEW or later FAA approved revision and the engine Type Certificate Data Sheet. The more restrictive requirement from these two documents shall be in force.

MD-11 Certification Maintenance Requirements (CMR) are listed in FAA approved MDC Report No. MDC-K4174, Revision Q or later FAA approved revision and the engine Type Certificate Data Sheet. The more restrictive requirement from these two documents shall be in force.

MD-10 Certification Maintenance Requirements (CMR) are listed in FAA approved MDC Report No. MDC-99K1069, Revision B or later FAA approved revision and the engine Type Certificate Data Sheet. The more restrictive requirement from these two documents shall be in force.

Production Basis:

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

DATA PERTINENT TO ALL MODELS (cont'd)

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 FAA are contained in the following:

DC-10-10 Report No. MDC-J0994, Chapter 2, "Weight and Balance Manual"

DC-10-10F Report No. MDC-J0997, Chapter 2, "Weight and Balance Manual"

DC-10-15 Report No. MDC-J0995, Chapter 2, "Weight and Balance Manual"

DC-10-40 Report No. MDC-J0998, Chapter 2, "Weight and Balance Manual"

DC-10-30 Report No. MDC-J1001, Chapter 2, "Weight and Balance Manual"

DC-10-30F Report No. MDC-J1002, Chapter 2, "Weight and Balance Manual"

DC-10-30F (KC-10A) T.O. 1C-10(K) A-5, Chg. 1 dated March 18, 1981, Section II.

DC-10-30F (KDC-10) Report No. MDC-94K0295, Chapter 2, "Weight and Balance Manual"

DC-10-40F Report No. MDC-J0999, Chapter 2, "Weight and Balance Manual"

MD-11 Report No. MDC-K0032, Chapter 2, "Weight and Balance Manual." Model MD-11.

MD-11 Report No. MDC-K5542, Chapter 2, "Weight and Balance Manual." Model MD-11F.

MD-10-10F Report No. MDC 98K1080, Chapter 2, "Weight and Balance Manual."

MD-10-30F Report No. MDC 99K1043, Chapter 2, "Weight and Balance Manual."

Service Information: McDonnell Douglas Model DC-10, MD-11 and MD-10 Structural Repair Manual, Volume I and Volume IV is FAA approved.

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

Automatic Landing System Limitations: See NOTE 8.

NOTES

NOTE 1: (a) Current weight and balance report including list of equipment included in certificated empty weight, and loading instructions must be in each aircraft at the time of original certification and at all times thereafter except in the case of operators having an approved weight control system. The following Douglas Aircraft Company Report or Military Tech. order contains loading information for each airplane and interior arrangement configuration as delivered. This report contains, or refers to, information relative to location of all passenger and crew member seats, location and capacity of all cargo and baggage compartments, buffets, storage spaces and coat rooms, location and capacity of lounges and lavatories, and the required placards in the passenger compartment.

Report No. MDC-J0994, "Weight & Balance Manual", Model DC-10-10.
Report No. MDC-J0997, "Weight & Balance Manual", Model DC-10-10F.
Report No. MDC-J0998, "Weight & Balance Manual", Model DC-10-40.
Report No. MDC-J1001, "Weight & Balance Manual", Model DC-10-30.
Report No. MDC-J1002, "Weight & Balance Manual", Model DC-10-30F.
T.O. 1C-10(K) A-5, Chg. 1, dated 15 March 1981, "Basic Weight Checklist and Loading Data," KC-10A.
Report No. MDC-94K0295, "Weight and Balance Manual", Model DC-10-30F (KDC-10).
Report No. MDC-J0999, "Weight & Balance Manual", Model DC-10-40F.
Report No. MDC-J0995, "Weight & Balance Manual", Model DC-10-15.
Report No. MDC-K0032, "Weight & Balance Manual", Model MD-11.
Report No. MDC-K5542, "Weight & Balance Manual", Model MD-11F.

Report No. MDC-K5543, "Weight & Balance Manual", Model MD-11F (Combi)
Report No. MDC-93K1163, Chapter 2, "Weight & Balance Manual", Model MD-11F (CF)
Report No. MDC 98K1080, "Weight & Balance Manual", Model MD-10-10F
Report No. MDC 99K1043, "Weight & Balance Manual", Model MD-10-30F

(b) The airplane must be loaded so that the C.G. is within specified limits at all times, considering fuel loading and usage, gear retraction, and movement of crew and passengers from their assigned positions. The lateral loading limits contained in the weight and balance document listed above should not be exceeded.

(c) The weight of system fuel and oil, as defined below and hydraulic fluid, all of which must be included in the airplane empty weight, is listed in Douglas Master Weight and Balance Manual or Military Tech. Order specified in paragraph (a) above, for each airplane.

System Fuel:

The weight of all fuel required to fill all lines and tanks up to the zero fuel point on the fuel gages in the most critical flight attitude. This includes the unusable tank fuel as defined by FAR Part 25.959. The DC-10-10, DC-10-10F, DC-10-15, DC-10-30, DC-10-30F, MD-11, MD-11F, MD-10-10F and MD-10-30F have 609 pounds and the DC-10-40 and DC-10-40F have 622 pounds (based on 6.7 lb./gal fuel) of usable fuel in the cross feed manifold lines, manifolds, and engine that is not part of the system fuel and must be included in the total usable fuel to obtain correct weight and C.G. for takeoff. (See FAA Approved AFM for approved procedures.)

System Oil:

The weight of oil remaining in the engine, constant speed drive, lines and tanks after subtracting the oil in the tanks which is above the standpipe (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.

(d) The "Unusable" fuel is that amount of fuel in the tanks which is unavailable to the engines under critical flight conditions as defined in FAR Part 25.959. See Weight and Balance Manual for "Unusable" fuel. This "Unusable" fuel is included in System Fuel as indicated in 1(c) above and need not be accounted for separately.

(e) Fuel capacities shown in Sections I and II as well as fuel loading and usage procedures are dictated by structural design and to maintain airplane C.G. within approved limits. Fuel must be loaded symmetrically about the airplane centerline and in accordance with the following procedures and used as described below unless alternate procedures are approved and incorporated in the FAA Approved Airplane Flight Manual. The fuel system contains automatic transfer and quantity control features, which will permit main tank-to-engine utilization of all fuel without manual control. During engine-out conditions, symmetrical fuel distribution must be maintained by cross feed or transfer of fuel to the tanks being used.

Fuel Loading - All Model MD-11, all Model MD-10 and all Model DC-10 (including DC-10-30F(KDC-10)) airplanes except DC-10-30F (KC-10A)
Fill all main tanks equally until No. 1 and No. 3 tanks are full. Add additional fuel to No. 2 tank until full. Load remainder into center wing auxiliary fuel tank, if installed on DC-10 or MD-10.

MD-11 only: After filling of center wing aux tank, load remainder of fuel into the horizontal tail fuel tank.

Fuel Loading - (DC-10-30F (KC-10A))
Load fuel per T.O. 1C-10 (K) A-5, Chg. 1, dated 15 March 1981.

Fuel Usage - All Model MD-11, all Model MD-10 and all Model DC-10 airplanes, except KC-10A and KDC-10:
Each main tank feeds its respective engine. Additional fuel added to the lower center wing auxiliary fuel tank, if installed, and the upper center wing auxiliary fuel tank, if installed, is transferred to the three main tanks numbers 1, 2, and 3. Simultaneously as the upper auxiliary tank fuel is used, fuel is transferred to it from the lower auxiliary tank until the lower auxiliary is depleted and the transfer of the fuel from the upper

auxiliary tank is continued until it is empty. Fuel transfer is then initiated from No. 2 main tank to main tanks No. 1 and 3 until fuel in all main tanks is equal. Then use fuel equally from each fuel tank.

Fuel Usage - KC-10A Only:

Fuel offloading is accomplished using fuel from the forward and aft fuselage fuel tanks, the center wing tanks and the main tanks as required. When off loading is complete, if the C.G. of the airplane, less usable fuel, is aft of 23.8 percent MAC, 15,000 pounds of fuel must remain in the forward fuel tank until the main fuel tanks are depleted to 5,000 pounds each. The 15,000 pounds in the forward fuselage fuel tanks may then be transferred equally to the main fuel tanks or off loaded.

Fuel Usage - KDC-10 Only:

Fuel off loading is accomplished using fuel from the center wing tanks and the main tanks as required. When off loading is complete, transfer center wing fuel to the three main tanks until the center wing tank is empty. Transfer the excess fuel from the No. 2 main tank to main tanks No. 1 and No. 3 until fuel in all main tanks is equal. Then use fuel equally from each fuel tank.

(f) Fuel Dump

Refer to FAA Approved Airplane Flight Manual for limitations to be observed during fuel dumping. The total undumpable fuel remaining in the fuel tanks after dumping is as follows for fuel weight based on 6.7 lb. /gal. fuel:

	All DC-10 Models All MD-10 Models	All MD-11 Models
No.1 Main Tank	12,973 lb.	12,973 lb.
No.2 Main Tank	13,917 lb.	13,917 lb.
No.3 Main Tank	12,973 lb.	12,973 lb.
Center Wing Auxiliary Tank (if installed)	0 lb.	0 lb.
AFT Auxiliary Tank (if installed)		0 lb.
Manifold Piping	436 lb.	436 lb.

Undumpable fuel not applicable to MD-11 tail tank.

NOTE 2: Reserved.

NOTE 3: Life Limited Parts and Airworthiness Limitations:

(a) DC-10 life limited components are listed in FAA approved Report MDC-J5752.

(b) MD-11 life limited components and required structural inspections for damage tolerant structure, are listed in FAA approved Report MDC-K5225.

(c) The DC-10/MD-11 FAA mandatory brake wear limits are contained in FAA Airworthiness Directives or McDonnell Douglas Report MDC-94K1158.

(d) MD-10 life limited components are listed in the FAA approved Airworthiness Limitations Instructions (ALI) Report MDC-99K1082.

(e) The MD-10 brake system was not affected by the DC-10 to MD-10 modification, therefore the FAA mandatory brake wear limits are identical to the DC-10 and are contained in the DC-10 portion of McDonnell Douglas Report MDC-K1158.

(f) DC-10, MD-11, and MD-10 non-structural components which are life limited, fuel system critical design configuration control limitations (CDCCL), and fuel system ALIs are listed in report MDC-02K1003, “Trijet Special Compliance Item Report.”

The life limited components must be replaced as indicated in the appropriate life limit report and revisions thereto. The MD-11 damage tolerance inspections must be conducted in accordance with Report MDC-

K5225. The MD-10 damage tolerance inspections must be conducted in accordance with Report MDC-99K1082. Copies of the reports may be obtained from the manufacturer:

Boeing Commercial Airplane Group
Data and Service Management (C1-L5A)
Mail Code D800-0024
3855 Lakewood Blvd.
Long Beach, CA 90846

NOTE 4:

(a) The following fuels are eligible provided and to the extent they are allowed by P&W Service Bulletin No. 2016 for PW engines, or they conform to GE Specification No. D50TF2 for GE engines:

MD-11: Kerosene type fuels MIL-T-5624H (JP-5), MIL-T-83133 (JP-8) and ASTM D 1655-657 (Jet A and A-1). Russian fuels conforming to Specification GOST 10227 (RT and TS-1), Chinese fuel conforming to Specification SY1008-80 (RP-3/Number 3 Jet Fuel), and any fuel conforming to P&W Service Bulletin No. 2016 for PW engines, or any fuel conforming to GE Specification No. D50TF2 for GE engines, may be used separately or mixed in any proportions without adversely affecting the engine operation or power output. No fuel control adjustment is required when switching fuel types.

To Use MIL-T-5624 (JP-4), Jet B, or any wide cut fuels in MD-11 and MD-11F airplanes, McDonnell Douglas Drawing PZV0007 or Production Equivalent must be installed and the following limitations found in the MD-11 AFM Appendix 14 must be applied.

DC-10: Kerosene type fuels MIL-T-5624G (JP-4 and JP-5), ASTM D 1655-65T (Jet A, A-1 and B), and MIL-T-83133 (JP-8). Russian fuels conforming to Specification GOST 10227 (RT and TS-1), Chinese fuel conforming to Specification SY1008-80 (RP-3/Number 3 Jet Fuel), and any fuel conforming to P&W Service Bulletin No. 2016 for PW engines, or any fuel conforming to GE Specification No. D50TF2 for GE engines, may be used separately or mixed in any proportions without adversely affecting the engine operation or power output. No fuel control adjustment is required when switching fuel types.

To use MIL-T-5624 (JP-4), Jet B, or any wide cut fuels in DC-10-10 and DC-10-10F airplanes that have not incorporated Service Bulletin No. 28-13, the following limitations must be applied.

1. A maximum altitude of 10,000 feet with a tank fuel temperature above 80° F.

2. A maximum altitude of 25,000 feet with a tank fuel temperature at 80° F or below.

3. A minimum of two aft tank pumps must be on for engine number 2 operation.

4. A minimum of one aft tank pump must be on for each wing engine.

MD-10: Kerosene type fuels MIL-T-5624G (JP-4 and JP-5), ASTM D 1655-65T (Jet A, A-1 and B), and MIL-T-83133 (JP-8). Russian fuels conforming to Specification GOST 10227 (RT and TS-1), Chinese fuel conforming to Specification SY1008-80 (RP-3/Number 3 Jet Fuel), and any fuel conforming to GE Specification No. D50TF2 for GE engines may be used separately or mixed in any proportions without adversely affecting the engine operation or power output. No fuel control adjustment is required when switching fuel types.

To use MIL-T-5624 (JP-4), Jet B, or any wide cut fuels in MD-10-10F and MD-10-30F airplanes the following limitations found in the MD-10 AFM Appendix 14 must be applied.

(b) 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.

(c) NALCO 5403 or DU PONT DCI-4A corrosion inhibitor fuel additive may be used if concentration delivered to airplane does not exceed 8 lb/1000bbl (23mg/l) of turbine fuel.

NOTE 5: The following oils are eligible for all CF6 engines:

Synthetic type conforming to GE Specification D501F1, classes A or B. GE Service Bulletin No.79-1 lists approved brand oils.

The following oils are eligible for all JT9D engines:

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

NOTE 6: (a) For DC-10 model airplanes, the maximum number of passengers demonstrated for emergency evacuation is 380. See FAA approved interior schematic drawing for maximum passenger capacities approved for each aircraft when delivered.

(b) For MD-11 model airplanes, the maximum number of passengers approved for emergency evacuation is 410. Airplanes with a passenger configuration between 400 and 410 passengers require incorporation of MCDonnell Douglas Service Bulletin 25-145 or production equivalent. See FAA approved interior schematic drawing for the maximum passenger capacities approved for each aircraft when delivered.

NOTE 7: For purposes of administration, Special Airframe Conditions Numbers 5-17 contained in Special Conditions No. 25-18-WE-7, Amendment No. 1 dated 9 July 1971 (Docket No. 10058; Amendment No. 1) have been retitled and renumbered. Special Systems Condition No. 3 contained in the aforementioned Special Conditions has also been renumbered. These conditions are contained in the document entitled "SPECIAL CONDITIONS RETITLED AND RENUMBERED BY THE WESTERN REGION" dated 9 July 1971. Flammability requirements for compartment interior materials and electric wiring and cable insulation are also contained in FAR 25.853 and 25.1359(d) as revised by Amendment 25-32.

NOTE 8: Only those DC-10 model airplanes which meet, in addition to normal maintenance requirements, criteria of McDonnell Douglas Report No. MDC-J1221 dated October 21, 1975, are eligible for Category IIIa auto-landings.

Only those MD-11 model airplanes which meet, in addition to normal maintenance requirements, the MD-11 Certification Maintenance Requirements (CMR) listed in FAA approved report MDC-K4174, revision Q or later FAA approved revision and have incorporated MD-11 Service Bulletin 22-4 or production equivalent, are eligible for Category IIIb auto-landings.

MD-10 model aircraft airplanes are eligible for Category IIIb auto-landings.

NOTE 9: Adding (CF) to the DC-10-10F, DC-10-30F or MD-11F model designation does not alter the aircraft. For example, a DC-10-10F airplane and DC-10-10F (CF) airplane are the same. The convertible freighter "CF" designator signifies that there is a FAA Approved passenger and freighter configuration, delivered by the manufacture, for the aircraft. The "CF" designator may be used in parentheses, but must be accompanied by the official designator (i.e., DC-10-10F (CF)).

NOTE 10: The identified serial numbers are eligible for these weights when appropriately configured. Specific airplanes may not attain these weights without structural, gear, and other changes. The Airplane Flight Manual (AFM) defines the actual weight approved for each serial number.

NOTE 11: KC-10A airplanes are tanker/cargo versions of the Model DC-10-30F.
Prior to operation as a commercial aircraft, the following must be accomplished:

(a) The maintenance, overhaul and modifications records of each aircraft must be reviewed for changes made by the military services that may affect the airworthiness of the aircraft. Modifications,

changes of equipment and repairs, which affect the safety or performance of the aircraft, must be approved by the FAA.

(b) All aircraft returned to civil operations must comply with all applicable Airworthiness Directives.

(c) All items that are not FAA approved must be removed from the aircraft if they affect the safety or performance of the aircraft.

(d) Each deviation from the FAA approved type design as listed on FAA Form 8130-2, "Conformity Certificate - Military Aircraft" that is required for civil certification must be corrected per FAA approved data.

NOTE 12: The MD-11 incorporates a number of computer systems which feature "option pins" allowing easy selection of variable features (i.e., "split" flight director command bars versus "single cue" flight director command bars - selection of one or the other made by grounding the appropriate connector pin on the Flight Control Computer) Some features are required and are identified as follows:

(a) On the Ground Proximity Warning System (GPWS) computer,
"Envelope Modulation" must be disabled.

After incorporation of Service Bulletin 34-16 and Service Bulletin 34-17, or production equivalent, "Envelope Modulation" may be enabled.

(b) On the Automatic Flight System (AFS) computer,
"A/P Disconnect Aural warning" must be enabled.
"G/S - LOC Capture No Priority" must be disabled.

After incorporation of Service Bulletin 22-05 or production equivalent, "A/P Disconnect Aural Warning" may be disabled.

After incorporation of Service Bulletin 22-10 and Service Bulletin 31-42, or production equivalent, "G/S - LOC Capture No Priority" may be enabled.

(c) On the Electronic Display System (EIS) DEU,
"Tape Engine Instrument" must be disabled.
"Deletes Digital Altitude" must be disabled.

After incorporation of Service Bulletin 31-09, or production equivalent, "Tape Engine Instrument" may be enabled.

(d) On the Flight Management System (FMS) computer,
"V Speed Inhibit" must be enabled.
"Alternate T/O Thrust #1" must be disabled.
"Install Fuel Dipstick 2" must be disabled.
"Install BFE ACARS System" must be disabled.
"Install Single Weight & Balance System" must be disabled.

After incorporation of Service Bulletin 34-16 or production equivalent, "V Speed Inhibit" may be disabled.

After incorporation of Service Bulletin 34-16 or production equivalent and Collins ACARS P/N 622-9967-001, "Install BFE ACARS System" may be enabled. Also, this option pin maybe enabled when Teledyne Controls ACARS P/N 2231500-2 or 2231500-6A is installed.

After installation of Service Bulletin 34-16 and Service Bulletin 31-30, or production equivalent "Install Single Weight & Balance System" may be enabled.

After incorporation of Service Bulletin 34-33 or production equivalent, "Alternate T/O Thrust #1" may be enabled.

After incorporation of Service Bulletin 34-33 or production equivalent, "Install Fuel Dipstick 2" may be enabled.

NOTE 13: McDonnell Douglas DC-10, MD-11 and MD-10 FAA Approved Maintenance Review Board Reports contain the initial minimum requirements used for development of a maintenance program that meets the requirements for continued airworthiness.

NOTE 14: Engine and APU life limited components are listed in the respective manufacturers overhaul manuals and engine and APU Type Certificate Data Sheets.

NOTE 15: Reserved.

NOTE 16: MD-11F with 160" Aft Main Deck Cargo Door:

(a) Factory Serial Numbers (FSN's) 48426, 48427, 48428, 48429 and 48430 are eligible to operate in the all-passenger configuration when the 160 inch main deck cargo door deactivated in accordance with Douglas Report No. MDC-91K0528.

(b) Factory Serial Numbers (FSN's) 48426, 48427, 48428, 48429 and 48430 are eligible to operate in the Combi, 192 passenger/4 pallet configuration when:

1. Service Bulletin 25-109, Revision 1 or production equivalent is incorporated, and

2. Configured in accordance with Douglas Drawing NZZ6760-1.

3. The upper exterior surface of the fuselage forward of station 1821.0 between longerons 16R and 16L must be painted white. Any deviation to this requirement must be FAA approved.

(c) Factory Serial Numbers (FSN's) 48426, 48427, 48428, 48429 and 48430 are eligible to operate in the main deck all-freight configuration when:

1. MDC drawing SP11251075 is installed, and
2. The upper exterior surface of the fuselage forward of station 1821.0 between longerons 16R and 16L must be painted white. Any deviation to this requirement must be FAA approved.

NOTE 17: The location of flight attendant seats demonstrated to comply with the direct view requirements of FAR 25.785(h)(1), for the MD-11, are shown on the manufacturers interior arrangement drawing, entitled, "FAA Interior Schematic."

NOTE 18: The number of required flight attendants which have been used to demonstrate compliance with the emergency evacuation requirements of FAR 25.803(c) or (d) is as follows:

(a) For between one (1) and 306 passengers:

One (1) flight attendant for every 50 passenger seats plus two (2) additional flight attendants, when the following slides are installed:

Part Number 60289-101, or -103 at door 1,
Part Number 60290-101, or -103 at doors 2 and 4
Part Number 60291-101 through -104 at door 3.
See note 18(e)

(b) For between one (1) and 381 passengers and 165 passenger seats or less in Zone "C":

One (1) flight attendant for every 50 passenger seats, when the following slides, or later FAA approved slides are installed:

Part Number 60289-111, or -113 at door 1,
Part Number 60290-111, or -113 at doors 2 and 4
Part Number 60291-111 through -114 at door 3.
See note 18(e)

(c) For between one (1) and 381 passengers and more than 165 passenger seats in Zone "C":

One (1) flight attendant for every 50 passenger seats plus one (1) additional flight attendants when the following slides, or later FAA approved slides are installed:

Part Number 60289-111, or -113 at door 1,
Part Number 60290-111, or -113 at doors 2 and 4
Part Number 60291-111 through -114 at door 3.
See NOTE 18(e)

(d) For between 382 and 410 passengers:

One (1) flight attendant for every 50 passenger seats plus one (1) additional flight attendant (total of 9 flight attendants maximum), and the following slides, or later FAA approved slides must be installed:

Part Number 60289-115, or -117 at door 1,
Part Number 60290-115, or -117 at doors 2 and 4
Part Number 60291-115 through -118 at door 3.

If less than eight flight attendants are required for a particular passenger capacity, the flight attendants should be located at each overwing exit first, and then distributed equally throughout the cabin at the exit doors.

If nine flight attendants are required, the ninth should be located at door 2.

The number and location of flight attendants for compliance with FAR 25.803(c) or (d) shall not conflict with the requirements of NOTE 17, and may require additional attendants to meet both requirements.

(e) AD 92-23-02 amendment 39-8402 effective November 25, 1992 requires upgraded slides to be installed.

NOTE 19: KDC-10 Airplanes Factory Serial Numbers 46956 and 46985 are tanker/cargo versions of the Model DC-10-30F when modified in accordance with Douglas Aircraft Drawing SP10280012, Revision B, dated April 6, 1995.

The KDC-10 is equipped with a Remote Aerial Refueling Operator (RARO) station in the main cabin. Only two RARO stations with the following Part Numbers (P/N) are approved for installation on the KDC-10 aircraft: P/N 1D83300-1, Serial Numbers 0001 and 0002.

Prior to operation as a commercial aircraft, the following must be accomplished:

(a) The maintenance, overhaul and modifications records of each aircraft must be reviewed for changes made by the military services that may affect the airworthiness of the aircraft. Modifications, changes of equipment and repairs, which affect the safety or performance of the aircraft, must be approved by the FAA.

(b) All aircraft returned to civil operations must comply with all applicable Airworthiness Directives.

(c) All items that are not FAA approved must be removed from the aircraft if they affect the safety or performance of the aircraft.

NOTE 20: The DC-10 aircraft is qualified for operations within Reduced Vertical Separation Minimum (RVSM) airspace. See McDonnell Douglas Service Bulletin DC10-34-134 for establishing the basis for operational approval.

NOTE 21: 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.

NOTE 22 The MD-10 aircraft is qualified for operations within Reduced Vertical Separation Minimum (RVSM) airspace, when equipped with approved MD-10 Air Data Systems that are maintained in accordance with the MD-10 Maintenance Review Board Document.

NOTE 23: MD-10 Maximum Passengers: The following is applicable to crew and supernumeraries:

For MD-10 model airplanes, a maximum of four supernumeraries in a "courier area" aft of the cockpit door and forward of a rigid cargo barrier, or two supernumeraries in a "courier module" area aft of the cockpit door and forward of a 9g crash net is permitted per FAA approved exemption number 6873.

NOTE 24: Conversion of a DC-10 to an MD-10-10F or –30F can be accomplished by either Douglas Aircraft Drawing SP10250349 or SP10250354, as appropriate, along with the requirement in NOTE 25.

NOTE 25: For MD-10 model airplanes, upon induction of a specific aircraft for modification, a review must be conducted to ensure that all DC-10 AD's are accounted for per Report MDC 99K1087, Revision A or later.

NOTE 26: Upon completion of the modification from DC-10-10/-10F, DC-10-30/-30F to MD-10-10F, MD10-30F, respectively, in accordance with Douglas Aircraft Drawing SP10250349 or SP10250354, a data plate must be installed adjacent to the existing data plate in accordance with Douglas Aircraft Drawing No. SP10510226 or SP10530234.

NOTE 27: The MD-10 Anomalies are contained in the MD-10 Aircraft Fault Anomalies Report, Report No. MDC 00K1108.

NOTE 28: Each Aircraft modified to a MD-10-10F or -30F, must have an applicable FAA approved "Airplane Flight Manual".

NOTE 29: For specific dimensional and weight limits, static unbalance, rated pressure, load rating, speed rating, etc., see the following McDonnell Douglas Tire Specification Drawing:

Tire Spec. Dwg.	Tire	Max. Weight	Airplane Series
PS5914	H54x21.0-24	325 lbs	MD-10-10F (when carbon brakes are installed)

END