

**MCDONNELL DOUGLAS CORPORATION  
DOUGLAS AIRCRAFT COMPANY  
DC/MD-10**

**AIRPLANE  
CHARACTERISTICS  
FOR  
AIRPORT PLANNING**

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133	June 2010				
134	June 2010				
162	June 2010				
163	June 2010				
164	June 2010				
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# CONTENTS

	Page
1.0 SCOPE .....	1
1.1 Purpose .....	1
1.2 Introduction .....	2
1.3 Inclusion of MD-10-10F/-30F Information .....	2
2.0 AIRPLANE DESCRIPTION .....	3
2.1 General Airplane Characteristics .....	3
2.2 General Airplane Dimensions .....	6
2.3 Ground Clearances .....	12
2.4 Interior Arrangements .....	14
2.5 Passenger Cabin Cross Section .....	18
2.6 Lower Compartment Containers .....	25
2.7 Door Clearances .....	29
2.7.1 Passenger Loading Doors .....	30
2.7.2 Cargo Loading Doors .....	34
2.7.3 Critical Interference Path Door/Sill Wing Clearance .....	41
3.0 AIRPLANE PERFORMANCE .....	43
3.1 General Information .....	43
3.2 Payload/Range .....	44
3.2.1 Payload/Range .....	44
3.2.2 Payload/Range (Metric) .....	52
3.3 FAR Takeoff Runway Length Requirements .....	60
3.4 FAR Landing Runway Length Requirements .....	64
3.5 Approach Speed (Threshold) .....	67
4.0 GROUND MANEUVERING .....	69
4.1 General Information .....	69
4.2 Turning Radii, No Slip Angle .....	70
4.3 Minimum Turning Radii .....	72
4.4 Visibility From Cockpit in Static Position .....	74
4.5 Runway and Taxiway Turn Paths .....	75
4.5.1 More than 90° Turn – Runway to Taxiway .....	75
4.5.2 90° Turn – Runway to Taxiway .....	77
4.5.3 90° Turn – Taxiway to Taxiway .....	79
4.5.4 90° Turn – Taxiway to Taxiway .....	81
4.6 Runway Holding Bay Apron .....	83
4.7 Minimum Parking Space Requirements .....	85
4.7.1 Minimum Parking Space Requirements (Feet) .....	85
4.7.2 Minimum Parking Space Requirements (Meters) .....	88
5.0 TERMINAL SERVICING .....	91
5.1 Airplane Servicing Arrangement (Typical) .....	91
5.2 Terminal Operations, Turnaround Station .....	93
5.3 Terminal Operations, Enroute Station .....	99
5.4 Ground Service Connections .....	105
5.5 Engine Starting Pneumatic Requirements .....	113
5.6 Ground Pneumatic Power Requirements .....	116
5.7 Preconditioned Airflow Requirements .....	117
5.8 Ground Towing Requirements .....	118

# CONTENTS

	Page
6.0 OPERATING CONDITIONS .....	121
6.1 Jet Engine Exhaust Velocities and Temperatures .....	121
6.1.1 Jet Engine Exhaust Velocity Contours, Breakaway Power .....	122
6.1.2 Jet Engine Exhaust Velocity Contours, Takeoff Power .....	124
6.1.3 Jet Engine Exhaust Velocity Contours, Idle Power .....	127
6.1.4 Jet Engine Exhaust Temperature .....	130
6.2 Airport and Community Noise .....	131
7.0 PAVEMENT DATA .....	133
7.1 General Information .....	133
7.2 Footprint .....	135
7.3 Maximum Pavement Loads .....	137
7.4 Landing Gear Loading on Pavement .....	139
7.4.1 Loads on Main Landing Gear Group .....	139
7.4.2 Center Gear and Wing Gear Loading on Pavement .....	141
7.5 Flexible Pavement Requirements, U.S. Army Corps of Engineers Design Method S-77-1 .....	144
7.6 Flexible Pavement Requirements, LCN Conversion .....	148
7.7 Rigid Pavement Requirements, Portland Cement Association Design Method ....	152
7.8 Rigid Pavement Requirements, LCN Conversion .....	156
7.9 ACN-PCN Reporting System .....	162
7.9.1 Aircraft Classification Numbers (ACNs) .....	162
7.9.2 ACN-PCN System Background .....	169
8.0 POSSIBLE DC-10/MD-10 DERIVATIVE AIRPLANES .....	173
9.0 SCALE DRAWINGS .....	175

## **1.0 SCOPE**

1.1 Purpose

1.2 Introduction

1.3 Inclusion of MD-10-10F/-30F Information

## **1.0 SCOPE**

### **1.1 Purpose**

This document provides, in a standardized format, the recommended minimum airplane characteristics data that are needed for general airport planning information. The DC-10 data in this document are for each series considering airport operations. Since operational practices vary among airlines, specific data should be coordinated with the using airlines prior to facility design. The Douglas Aircraft Company should be contacted for any additional information required.

Content of the document reflects the results of a coordinated effort by representatives from the following organizations:

- Aerospace Industries Association
- Airport Operators' Council International
- Air Transport Association of America
- International Air Transport Association

## 1.2 Introduction

This document conforms to NAS 3601. It provides McDonnell Douglas DC-10 characteristics for airport operators, airlines, and engineering consultant organizations. Since airplane changes and available options may alter the information, the data presented herein must be regarded as subject to change.

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## 1.3 Inclusion of MD-10-10F/-30F Freighter Information

This document has been partially revised to incorporate key information for the MD-10-10F and MD-10-30F Freighters. The main change was the incorporation of the MD-11 landing gear tires and carbon brakes onto the MD-10-10F and the MD-10-30F Freighters. The general airplane characteristics table and select pages from section 7 of the document pertaining to pavement data were the only pages revised. All existing charts and diagrams for the DC-10 that were not revised can still be considered valid for the MD-10-10F and MD-10-30F Freighters.

## **2.0 AIRPLANE DESCRIPTION**

- 2.1 General Airplane Characteristics**
- 2.2 General Airplane Dimensions**
- 2.3 Ground Clearances**
- 2.4 Interior Arrangements**
- 2.5 Cabin Cross Section**
- 2.6 Lower Compartment Containers**
- 2.7 Door Clearances**

## 2.0 AIRPLANE DESCRIPTION

### 2.1 General Airplane Characteristics – Douglas DC-10

The DC-10 Series 10 has a maximum takeoff weight of 430,000 pounds and the Series 10CF has a maximum takeoff weight of 440,000 pounds. The DC-10 Series 30 and Series 40 Intercontinental Aircraft have a maximum takeoff weight of 555,000 pounds. Other weight parameters such as ramp weight, landing weight and zero fuel weight are set accordingly.

The following definitions refer to Figure 2.1.

Maximum Ramp Weight. Maximum weight authorized for ground maneuver by the applicable government regulations, including taxi and runup fuel. Also designated in some manuals as maximum design taxi weight.

Maximum Landing Weight. Maximum weight authorized at touchdown by the applicable government regulations.

Maximum Takeoff Weight. Maximum weight authorized at takeoff brake release by the applicable government regulations and excludes taxi and runup fuel.

Operating Weight Empty. Weight of structure, power plant, furnishing, systems, unusable fuel and other unusable propulsion agents, and other items of equipment that are considered an integral part of a particular airplane configuration. Also included are certain standard items, personnel, equipment, and supplies necessary for full operation, excluding fuel and payload. Described as “Operating Empty Weight” in some manuals.

Maximum Zero Fuel Weight. Maximum Airplane weight less usable fuel, engine injection fluid, and other consumable propulsion agents. It may include usable fuel in specified tanks when carried in lieu of payload. The addition of usable and consumable items to the Zero Fuel Weight must be in accordance with the applicable government regulations so that airplane structure and airworthiness requirements are not exceeded.

Maximum Structural Payload. Consists of the maximum design payload weight of passengers, passenger baggage and/or cargo.

Maximum Seating Capacity. The maximum number of passengers specifically certified or anticipated for certification.

Maximum Cargo Volume. The maximum space available for cargo.

Usable Fuel Capacity. The volume of fuel carried for a particular operation, less drainable unusable fuel and trapped fuel remaining after a fuel runout test has been accomplished.

SERIES		10****	30	40
MODE		PASSENGER	PASSENGER	PASSENGER
ENGINE		CF6-6D	CF6-50C	JT9D-59A *
MAXIMUM RAMP WEIGHT	POUNDS	433,000	558,000	558,000
	KILOGRAMS	196,406	253,105	253,105
MAXIMUM LANDING WEIGHT	POUNDS	363,500	403,000	403,000
	KILOGRAMS	164,881	182,798	182,798
MAXIMUM TAKEOFF WEIGHT	POUNDS	430,000	555,000	555,000
	KILOGRAMS	195,045	251,744	251,744
OPERATING WEIGHT EMPTY	POUNDS	240,171	266,191	270,213
	KILOGRAMS	108,940	120,742	122,567
MAXIMUM ZERO FUEL WEIGHT	POUNDS	335,000	368,000	368,000
	KILOGRAMS	151,954	166,922	166,922
MAXIMUM STRUCTURAL PAYLOAD (WEIGHT-LIMITED)	POUNDS	94,829	101,809	97,787
	KILOGRAMS	43,014	46,180	44,356
CARGO VOLUME (USING LD3 CONTAINERS)	CUBIC FEET	3,017	4,618**	4,618**
	CUBIC METERS	85.43	130.77	130.77
SEATING CAPACITY (STD/MAX)	STANDARD	270	255	255
	MAXIMUM	399	399	399
USABLE FUEL CAPACITY	U.S. GALLONS	21,762***	36,652	36,652
	LITERS	82,376	137,509	137,509

\*FOR JT9D-20 ENGINE VERSION, SUBTRACT 515 POUNDS FROM OWE

\*\*FOR NONEXTENDED CTR CARGO COMPARTMENT, REDUCE VOLUME 21 CU FT (SEE PAGE 27)

\*\*\*FUEL CAPACITY WITH AUXILIARY CENTER WING TANK, 26,647 GALLONS

\*\*\*\*SERIES 10 AVAILABLE AT HIGHER GROSS WEIGHT OPTION OF 458,000 POUNDS MAXIMUM RAMP WEIGHT

FOR 572,000-POUND MTOGW: ● ADD 379 POUNDS TO OWE AND SUBTRACT 379 POUNDS FROM MAXIMUM STRUCTURAL PAYLOAD

● INCREASE LANDING WEIGHT TO 421,000 POUNDS

## 2.1 GENERAL AIRPLANE CHARACTERISTICS

### MODEL DC-10 SERIES 10, 30 AND 40

SERIES		10CF		30CF		40CF		MD-10-10F	MD-10-30F
MODE		PSGR	CARGO	PSGR	CARGO	PSGR	CARGO	CARGO	CARGO
ENGINE		CF6-6D		CF6-50C		JT9D-59A*		CF6-6D	CF6-50C
MAXIMUM RAMP WEIGHT	POUNDS	443,000	443,000	558,000	558,000	558,000	558,000	443,000	583,000
	KILOGRAMS	200,942	200,942	253,105	253,105	253,105	253,105	200,942	264,444
MAXIMUM LANDING WEIGHT	POUNDS	363,500	363,500	411,000	411,000	411,000	411,000	375,000	436,000
	KILOGRAMS	164,881	164,881	186,427	186,427	186,427	186,427	170,097	197,766
MAXIMUM TAKEOFF WEIGHT	POUNDS	440,000	440,000	555,000	555,000	555,000	555,000	440,000	580,000
	KILOGRAMS	199,581	199,581	251,744	251,744	251,744	251,744	199,581	263,084
OPERATING WEIGHT EMPTY	POUNDS	243,750	215,444	268,751	238,036	272,773	242,058	216,000	236,500
	KILOGRAMS	110,563	97,724	121,904	107,971	123,728	109,796	97,976	107,275
MAXIMUM ZERO FUEL WEIGHT	POUNDS	335,000	335,000	391,000	391,000	391,000	391,000	355,000	414,000
	KILOGRAMS	151,954	151,954	177,355	177,355	177,355	177,355	161,025	187,787
MAXIMUM STRUCTURAL PAYLOAD (WEIGHT LIMITED)	POUNDS	91,250	119,556	122,249	152,964	118,227	148,942	139,000	177,500
	KILOGRAMS	41,390	54,230	55,451	69,383	53,627	67,559	63,049	80,512
MAXIMUM CARGO VOLUME	CUBIC FEET	4,597	16,845	4,618	16,866	4,618	16,866	14,200	14,200
	CUBIC METERS	130.17	477.05	130.77	477.65	130.77	477.65	402.1	402.1
SEATING CAPACITY (STD/MAX)	STANDARD	255	0	255	0	255	0	0	0
	MAXIMUM	399	0	399	0	399	0	0	0
USABLE FUEL CAPACITY	U.S. GALLONS	21,762***	21,762***	36,652	36,652	36,652	36,652	21,762	36,652
	LITERS	82,376	82,376	137,509	137,509	137,509	137,509	82,376	137,509

\* FOR JT9D-20 ENGINE VERSION, SUBTRACT 515 POUNDS FROM OWE

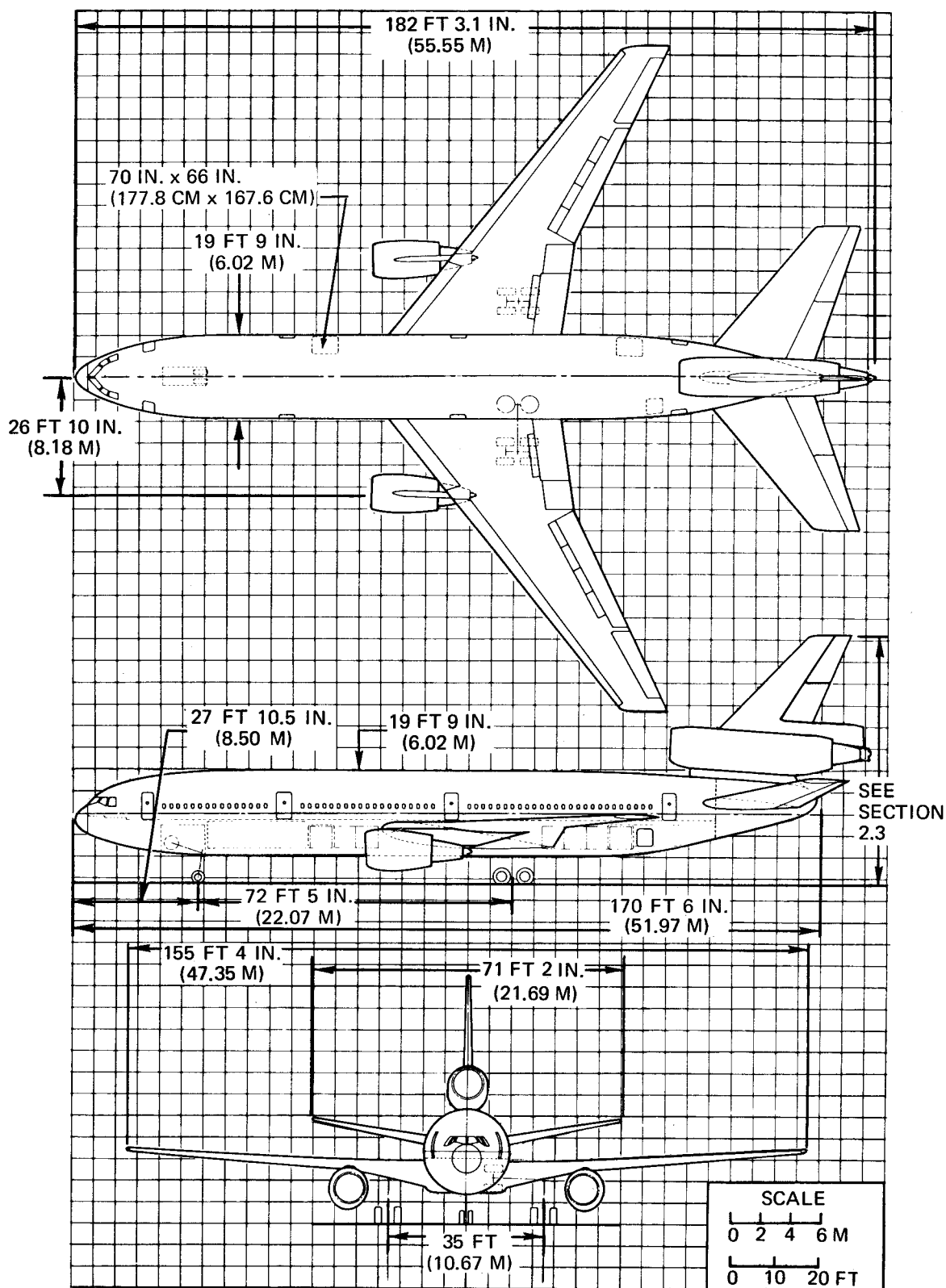
\*\* FOR NONEXTENDED CTR CARGO COMPARTMENT, REDUCE VOLUME 21 CU FT (SEE PAGE 27)

\*\*\*FUEL CAPACITY WITH AUXILIARY CENTER WING TANK, 26,647 GALLONS

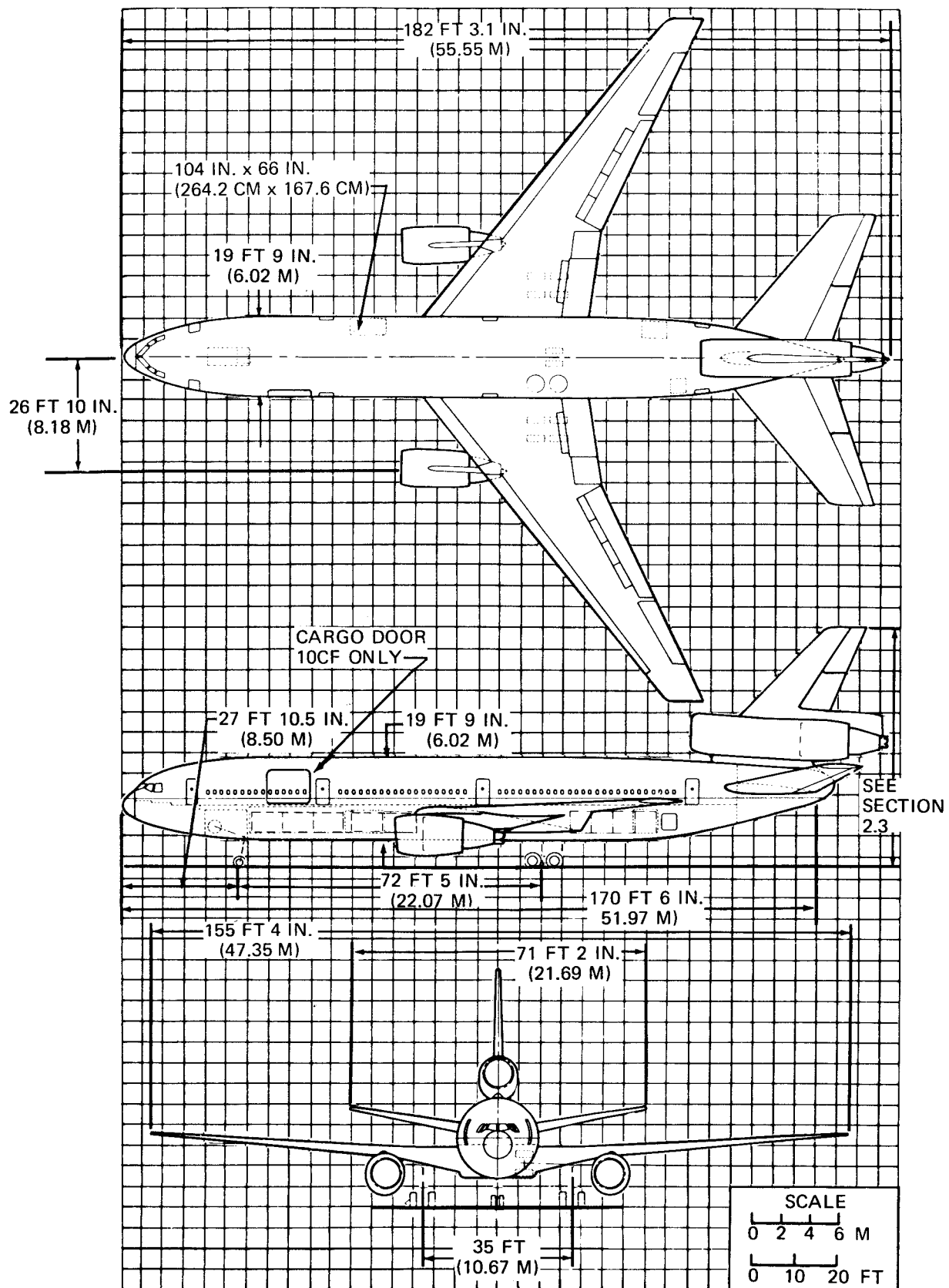
FOR 572,000 POUND MTOGW: · ADD 379 POUNDS TO OWE AND SUBTRACT 379 POUNDS FROM MAXIMUM STRUCTURAL PAYLOAD  
· INCREASE LANDING WEIGHT TO 421,000 POUNDS

## 2.1 GENERAL AIRPLANE CHARACTERISTICS

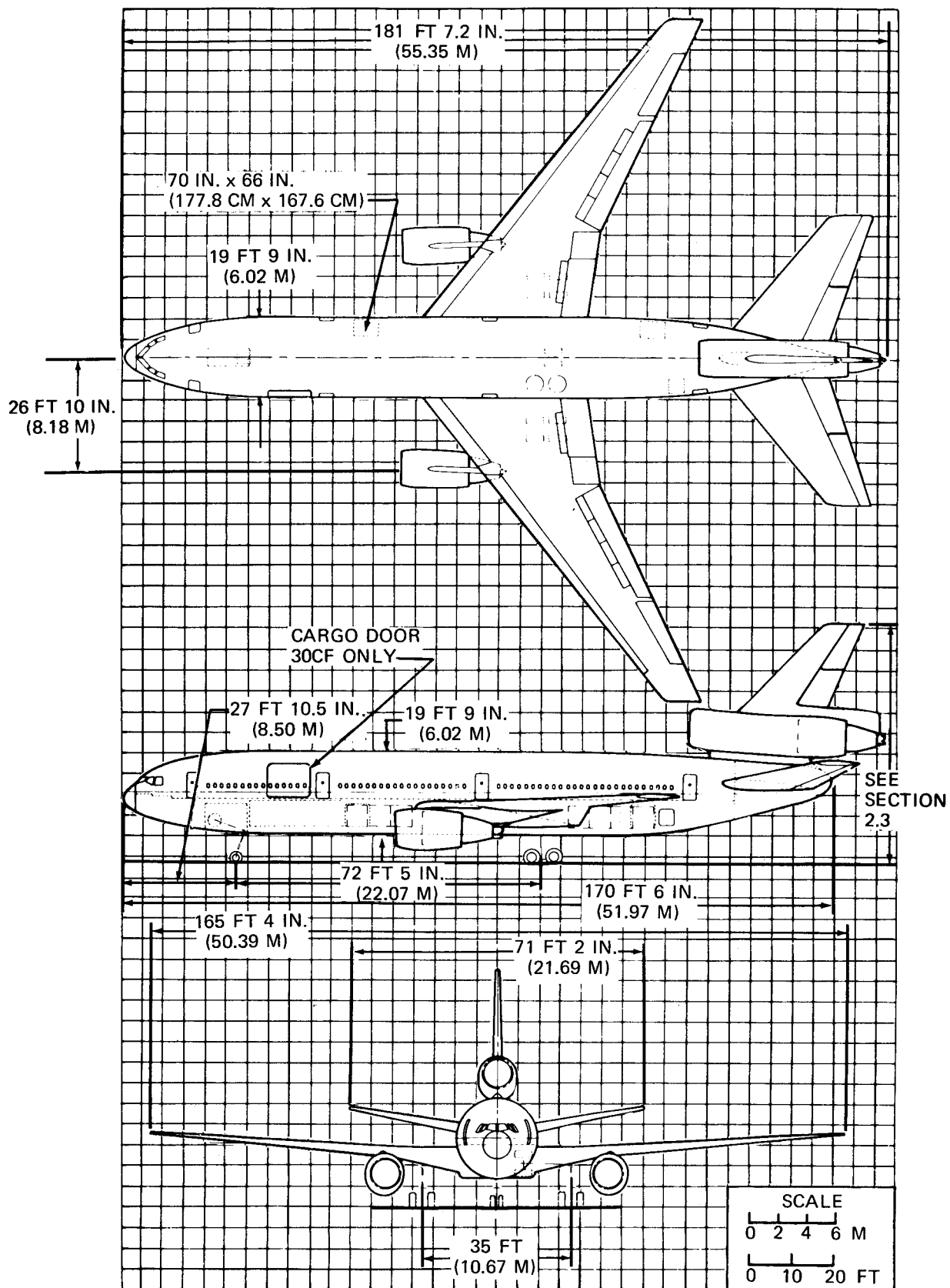
### MODEL DC-10 SERIES 10CF, 30CF, 40CF, AND MD-10 SERIES 10F AND 30F



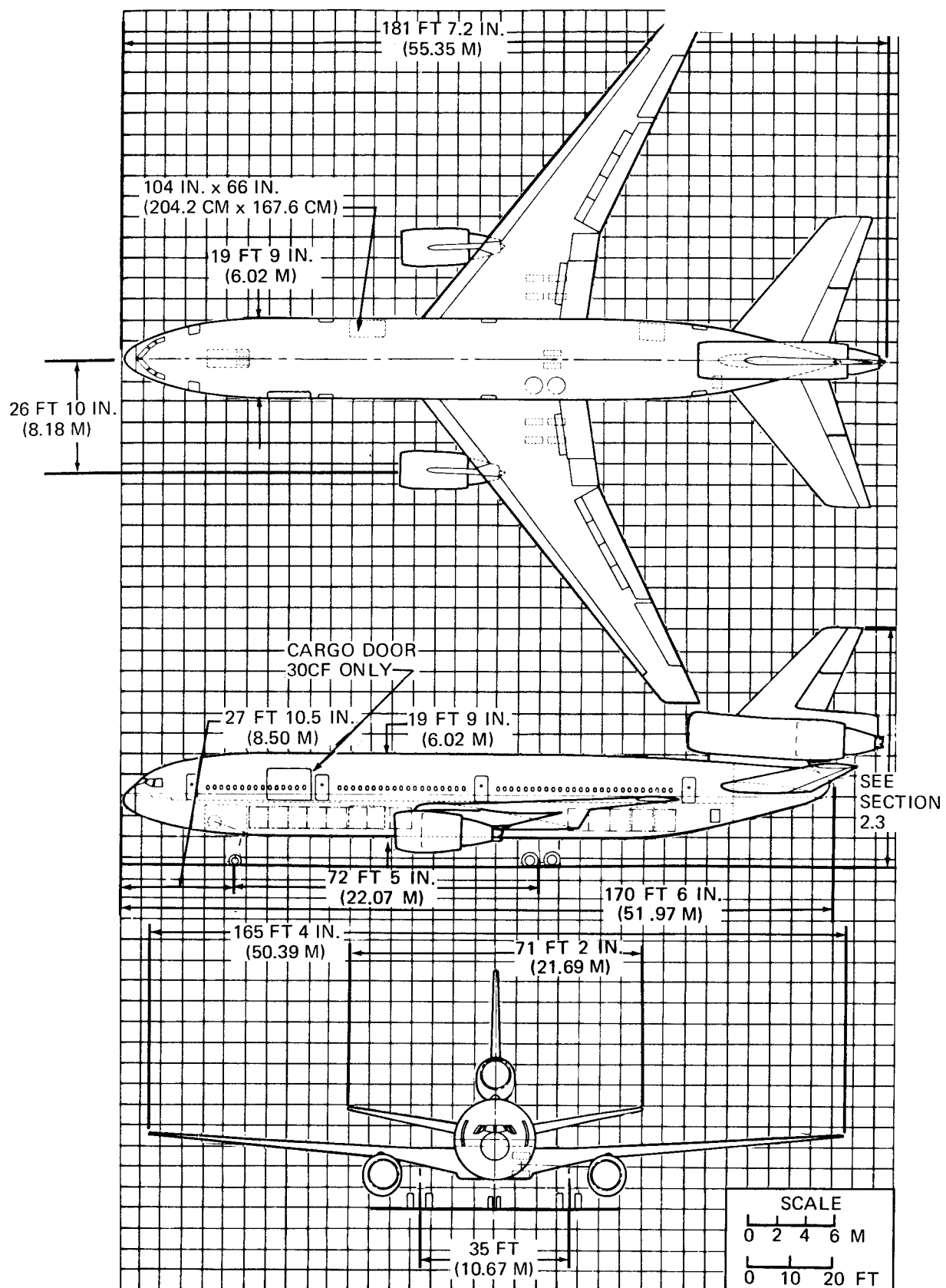
2.2 GENERAL AIRPLANE DIMENSIONS  
MODEL DC-10 SERIES 10 (LOWER GALLEY)



**2.2 GENERAL AIRPLANE DIMENSIONS**  
**MODEL DC-10 SERIES 10 AND 10CF (UPPER GALLEY)**

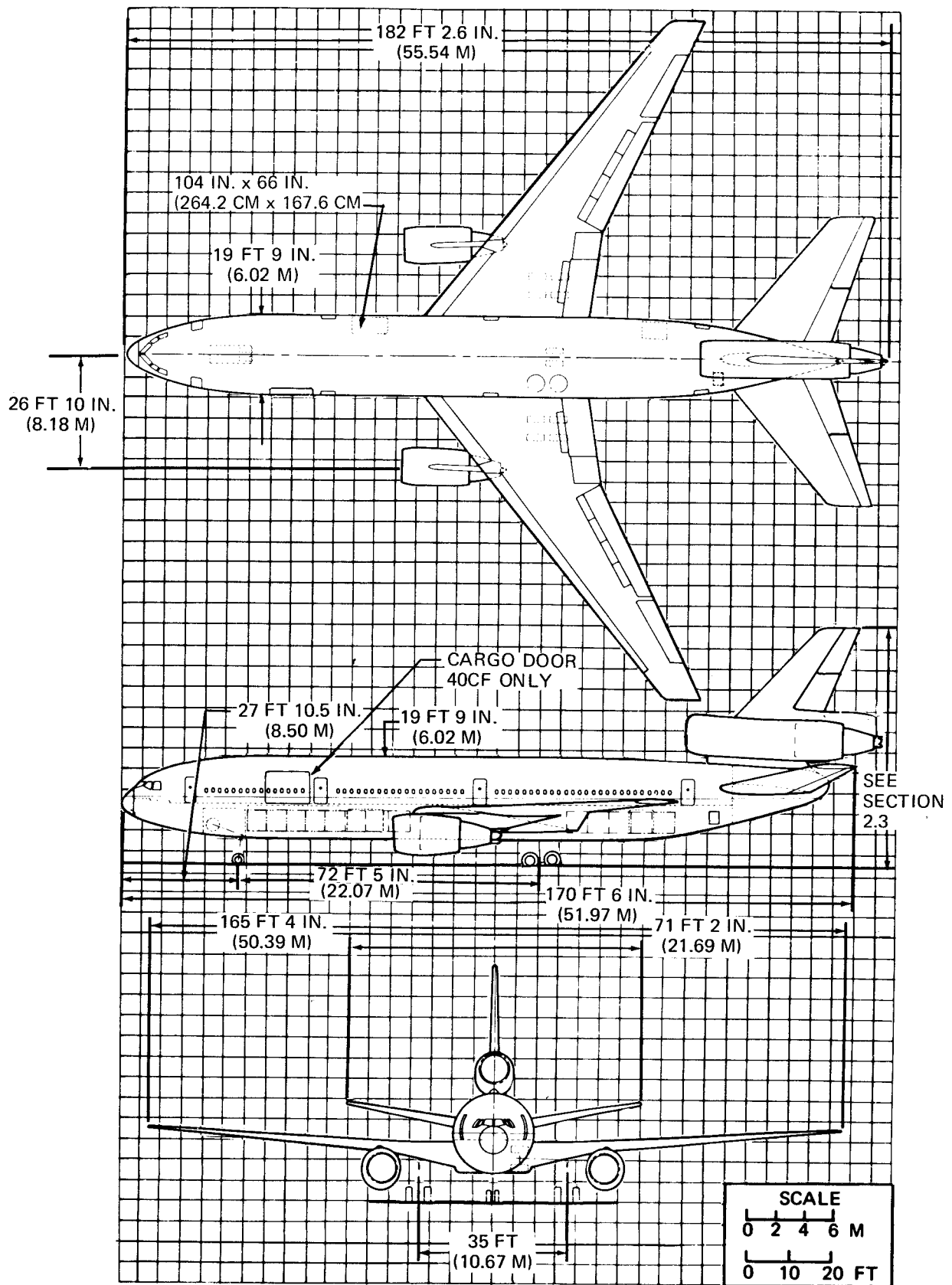


2.2 GENERAL AIRPLANE DIMENSIONS  
MODEL DC-10 SERIES 30 AND 30CF (LOWER GALLEY)

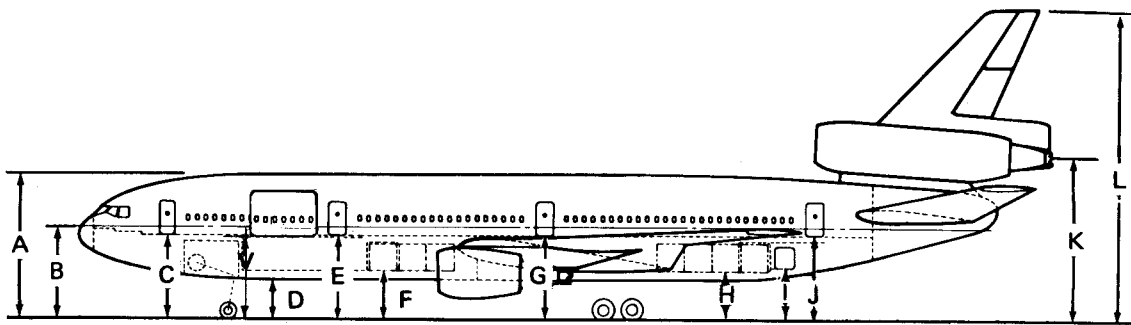


2.2 GENERAL AIRPLANE DIMENSIONS  
MODEL DC-10 SERIES 30 AND 30 CF (UPPER GALLEY)

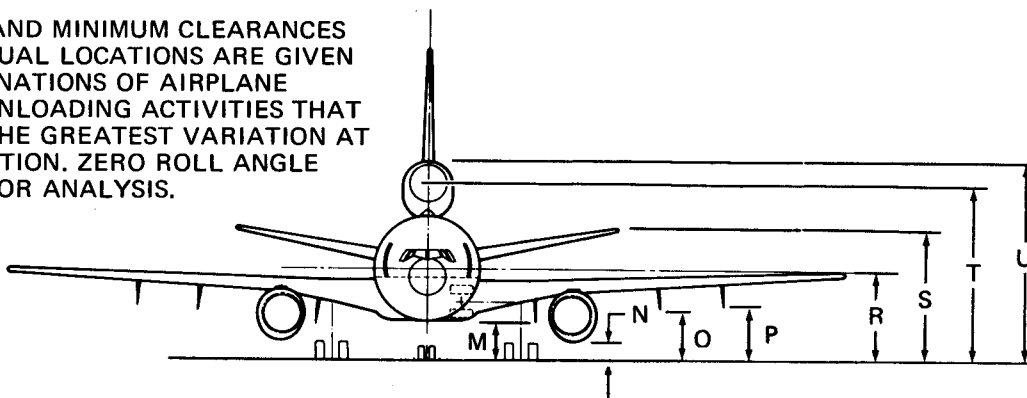




2.2 GENERAL AIRPLANE DIMENSIONS  
MODEL DC-10 SERIES 40 AND 40CF (UPPER GALLEY)



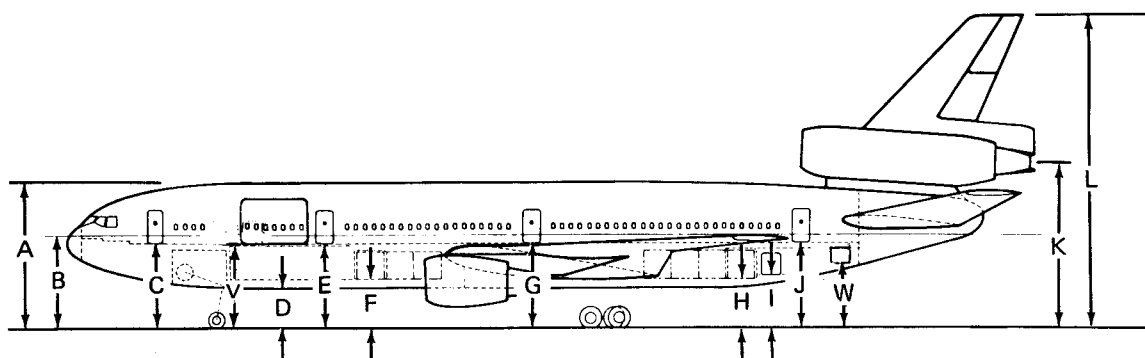
MAXIMUM AND MINIMUM CLEARANCES OF INDIVIDUAL LOCATIONS ARE GIVEN FOR COMBINATIONS OF AIRPLANE LOADING/UNLOADING ACTIVITIES THAT PRODUCE THE GREATEST VARIATION AT EACH LOCATION. ZERO ROLL ANGLE ASSUMED FOR ANALYSIS.



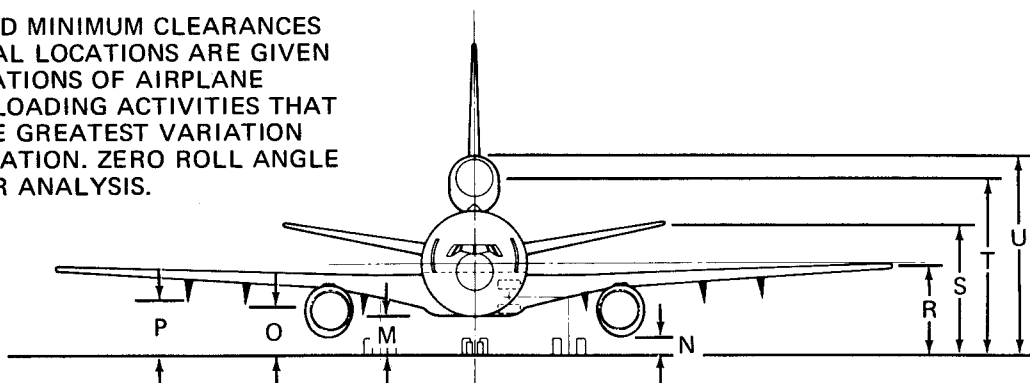
VERTICAL CLEARANCE						
	NOMINAL CLEARANCE MAX RAMP WT NOMINAL CG		MIN CLEARANCE CRITICAL WT AND CG		MAX CLEARANCE CRITICAL WT AND CG	
	FT-IN.	METERS	FT-IN.	METERS	FT-IN.	METERS
A	27-1	8.25	26-11	8.20	27-9	8.46
B	17-4	5.28	17-0	5.18	18-2	5.54
C	15-9	4.80	15-6	4.72	16-7	5.05
D	7-4	2.24	7-2	2.18	8-0	2.44
E	15-8	4.78	15-6	4.72	16-3	4.95
F	9-1	2.77	9-0	2.74	9-8	2.95
G	15-5	4.70	15-5	4.70	15-11	4.85
H	8-9	2.67	8-8	2.64	9-5	2.87
I	9-2	2.79	9-1	2.77	9-11	3.02
J	15-3	4.65	15-2	4.62	15-11	4.85
K	29-9	9.07	29-7	9.02	30-9	9.37
L	57-6	17.53	57-4	17.48	58-5	17.81
M	7-8	2.34	7-8	2.34	8-3	2.51
N	2-10	0.86	2-9	0.84	3-4	1.02
O	9-7	2.92	9-6	2.90	10-4	3.15
P	10-8	3.25	10-7	3.23	11-8	3.56
R	14-6	4.42	14-5	4.39	16-2	4.93
S	23-9	7.24	23-7	7.19	24-8	7.52
T	32-4	9.86	32-3	9.83	33-1	10.08
U	36-9	11.20	36-8	11.18	37-6	11.43
*V	15-8	4.78	15-7	4.75	17-0	5.18

\*CF VERSION ONLY

## 2.3 GROUND CLEARANCES MODEL DC-10 SERIES 10 AND 10CF



MAXIMUM AND MINIMUM CLEARANCES OF INDIVIDUAL LOCATIONS ARE GIVEN FOR COMBINATIONS OF AIRPLANE LOADING/UNLOADING ACTIVITIES THAT PRODUCE THE GREATEST VARIATION AT EACH LOCATION. ZERO ROLL ANGLE ASSUMED FOR ANALYSIS.



VERTICAL CLEARANCE						
	NOMINAL CLEARANCE MAX RAMP WT NOMINAL CG		MIN CLEARANCE CRITICAL WT AND CG		MAX CLEARANCE CRITICAL WT AND CG	
	FT-IN.	METERS	FT-IN.	METERS	FT-IN.	METERS
A	27-2	8.28	27-1	8.25	28-1	8.56
B	17-5	5.31	17-3	5.26	18-7	5.66
C	15-10	4.83	15-9	4.80	16-11	5.16
D	7-5	2.26	7-4	2.24	8-4	2.54
E	15-9	4.80	15-8	4.78	16-7	5.05
F	9-2	2.79	9-1	2.77	9-11	3.02
G	15-7	4.75	15-6	4.72	16-1	4.90
H	8-10	2.69	8-9	2.67	9-7	2.92
**I	9-3	2.82	9-1	2.77	10-0	3.05
J	15-4	4.67	15-1	4.60	16-1	4.90
K	29-11	9.12	29-6	8.99	30-11	9.42
L	57-7	17.55	57-2	17.42	58-7	17.86
M	7-9	2.36	7-9	2.36	8-5	2.57
N	2-11	0.89	2-10	0.86	3-7	1.09
O	9-8	2.95	9-7	2.92	10-6	3.20
P	10-9	3.28	10-8	3.25	11-10	3.61
R	14-6	4.42	14-4	4.37	16-3	4.95
S	23-10	7.26	23-5	7.14	24-10	7.57
T	32-5	9.88	32-3	9.83	33-3	10.13
U	36-10	11.23	36-7	11.15	37-8	11.48
*V	15-9	4.80	15-6	4.72	16-4	4.98
***W	10-3	3.12	10-0	3.05	11-1	3.38

\*CF VERSIONS ONLY

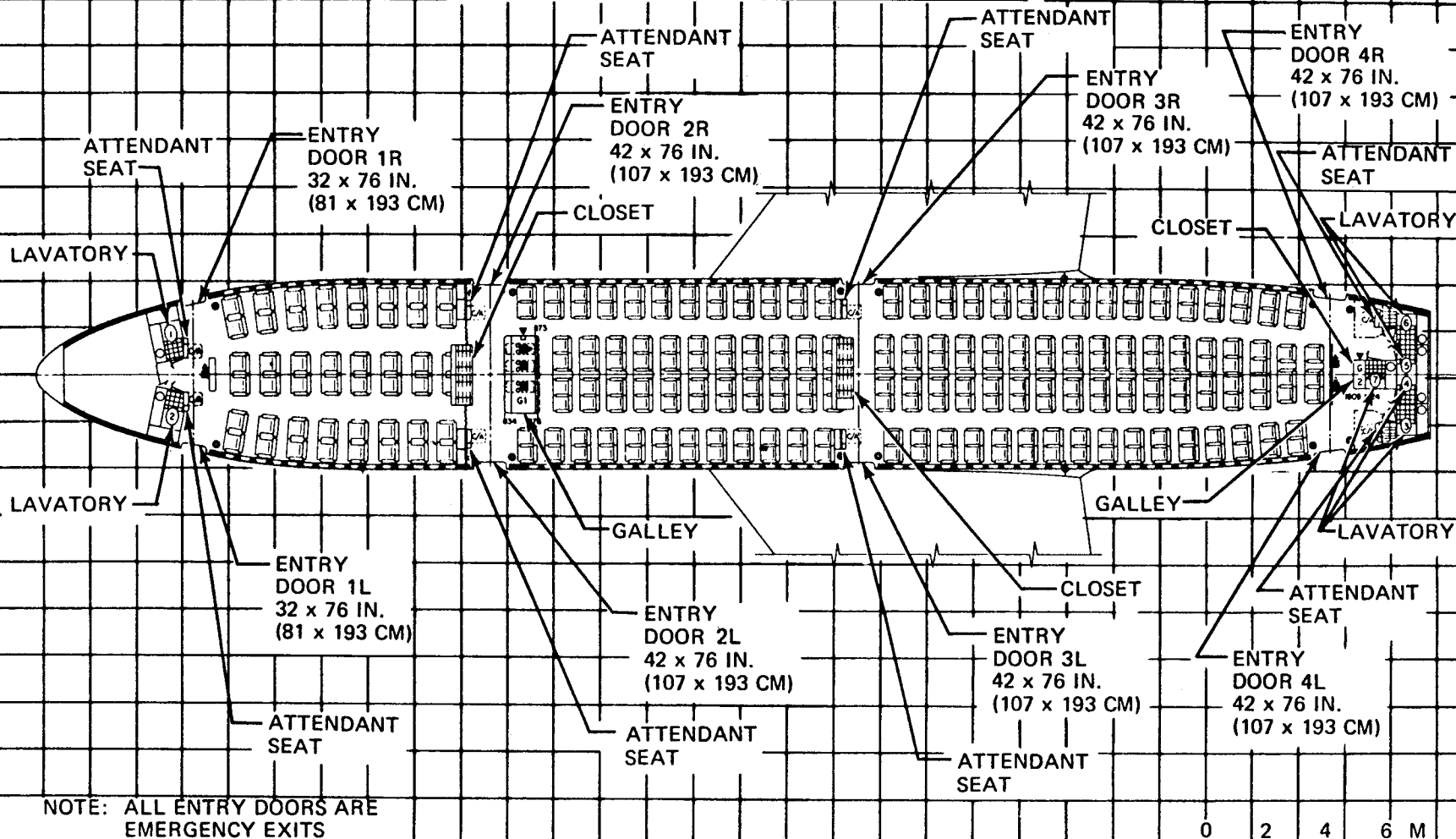
\*\*STANDARD CENTER CARGO COMPARTMENT

\*\*\*EXTENDED CENTER CARGO COMPARTMENT

## 2.3 GROUND CLEARANCES

### MODEL DC-10 SERIES 30, 30CF, 40 AND 40CF

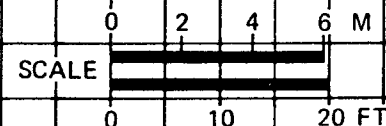
270 PASSENGERS  
 222 EIGHT-ABREAST SEATING AT 34 IN. (86 CM) PITCH  
 48 SIX-ABREAST SEATING AT 38 IN. (97 CM) PITCH

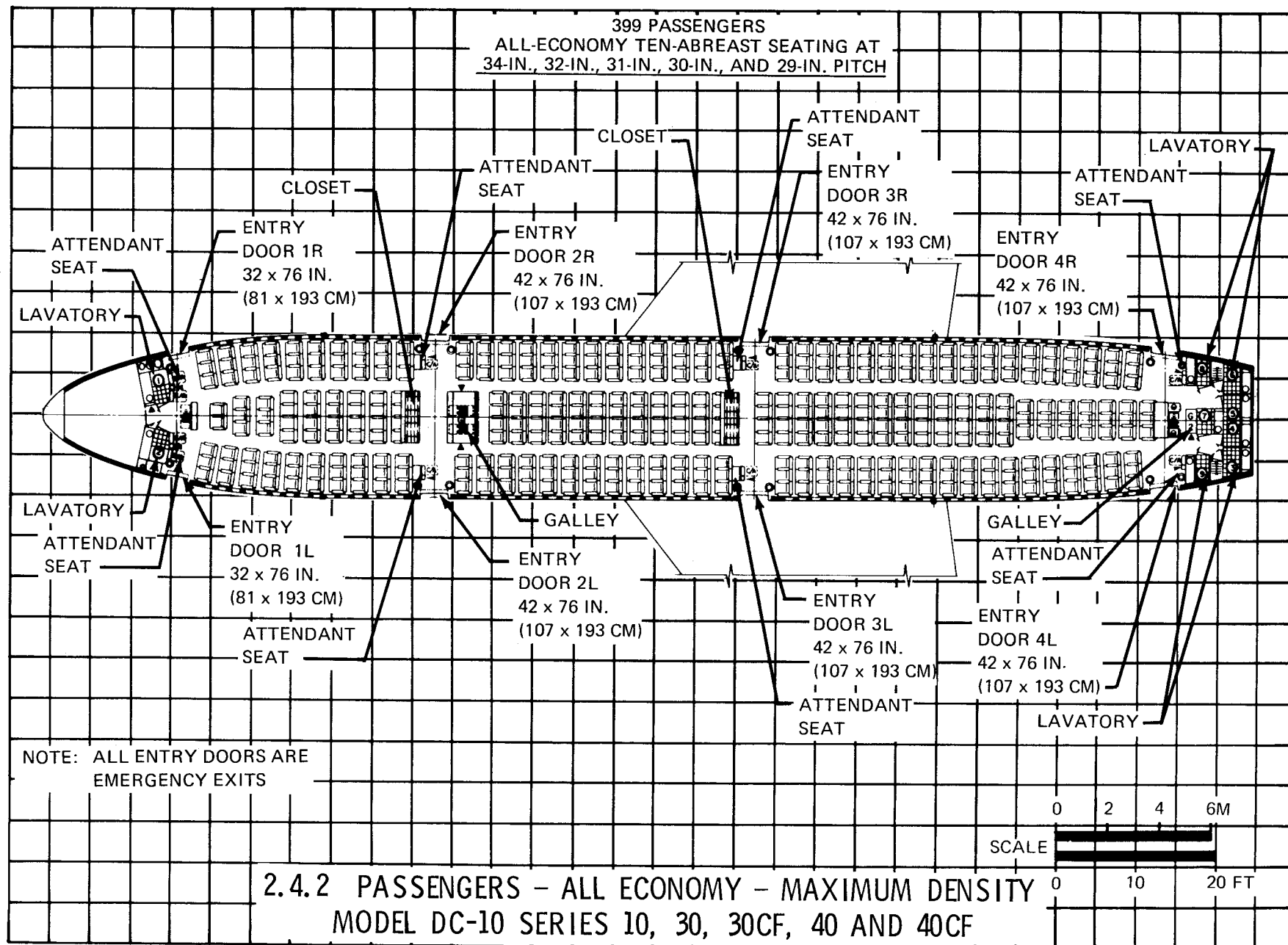


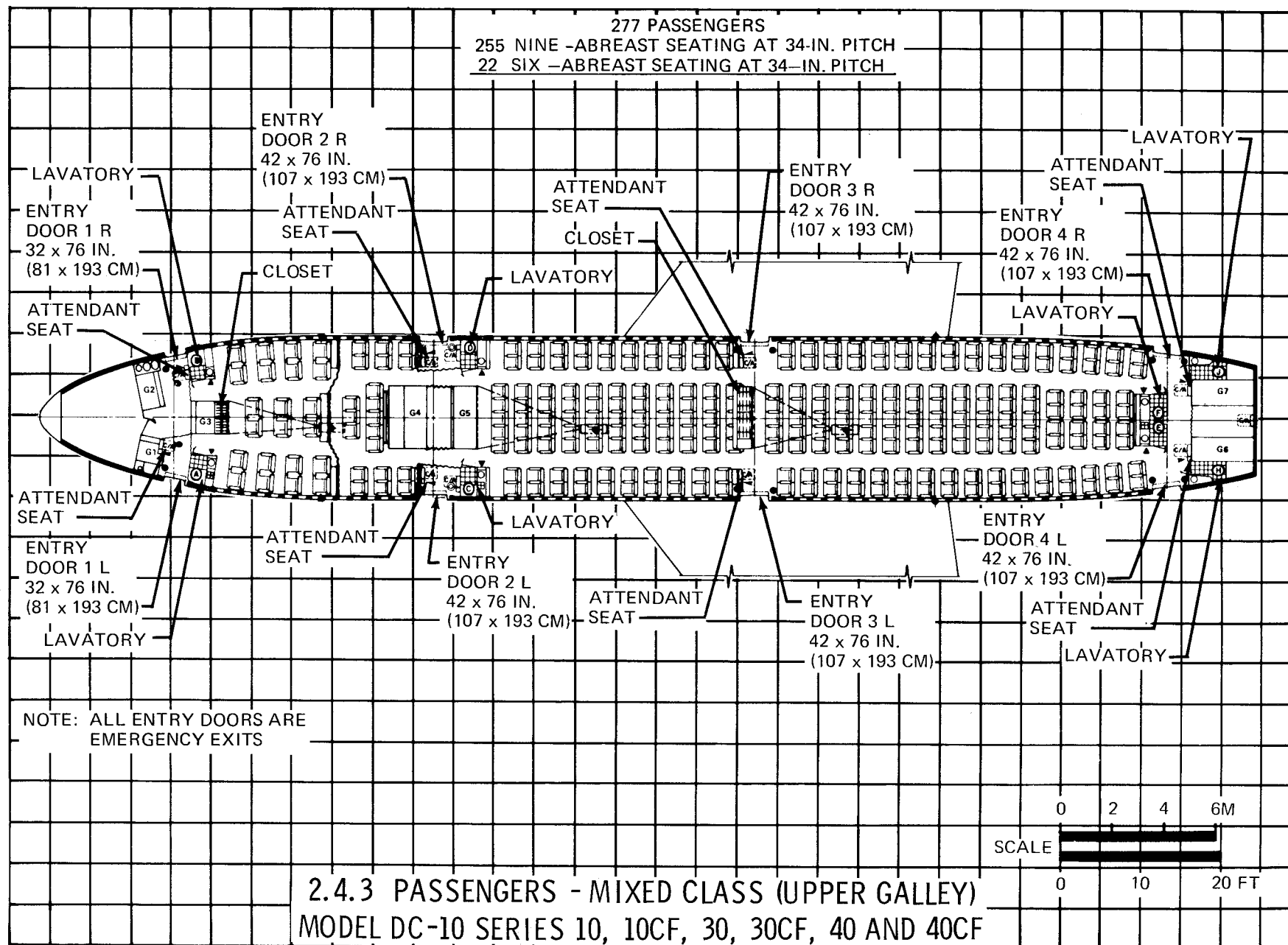
## 2.4 INTERIOR ARRANGEMENTS (TYPICAL)

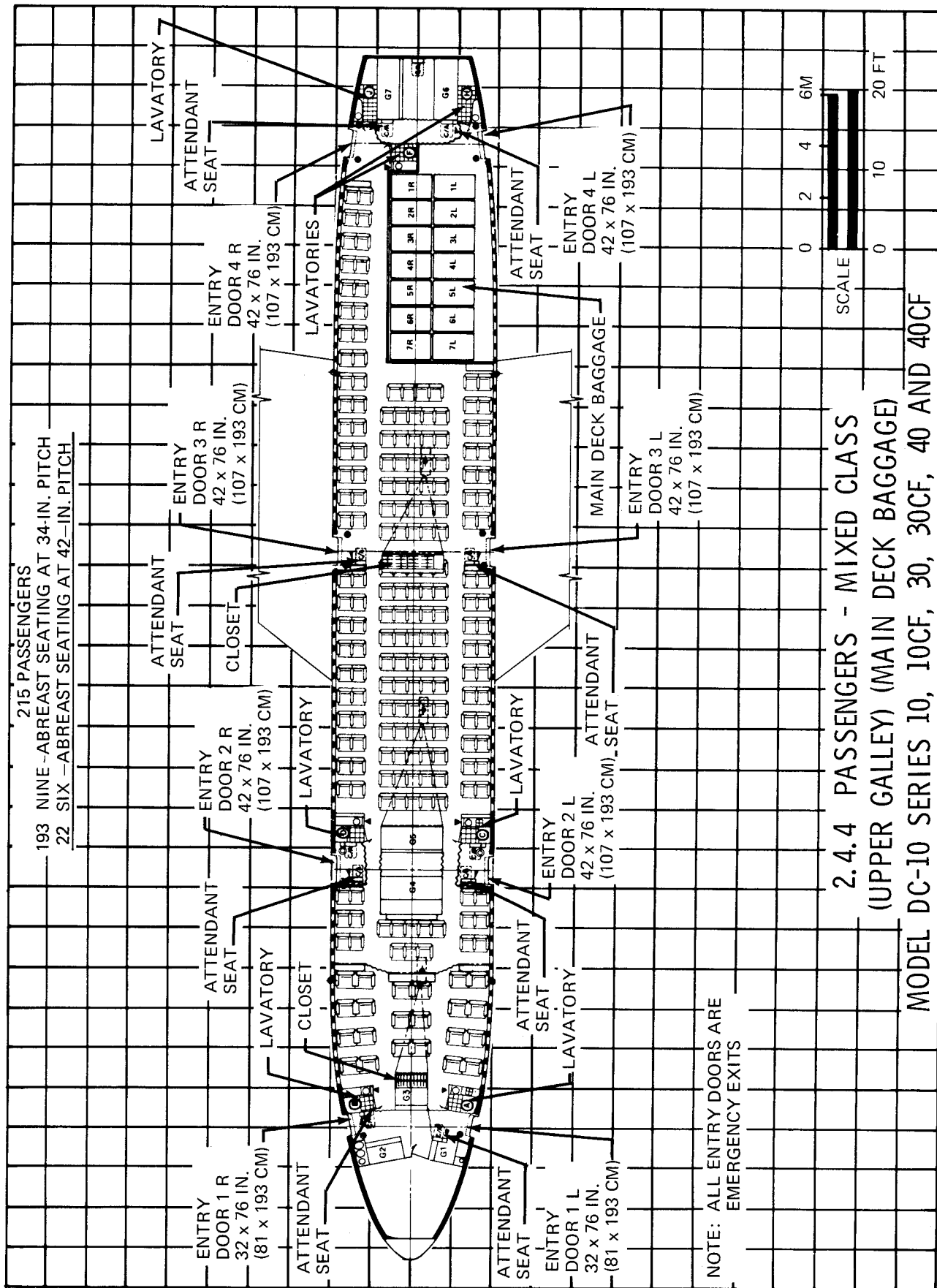
### 2.4.1 PASSENGERS - MIXED CLASS (LOWER GALLEY)

MODEL DC-10 SERIES 10, 30, 30CF, 40 AND 40CF

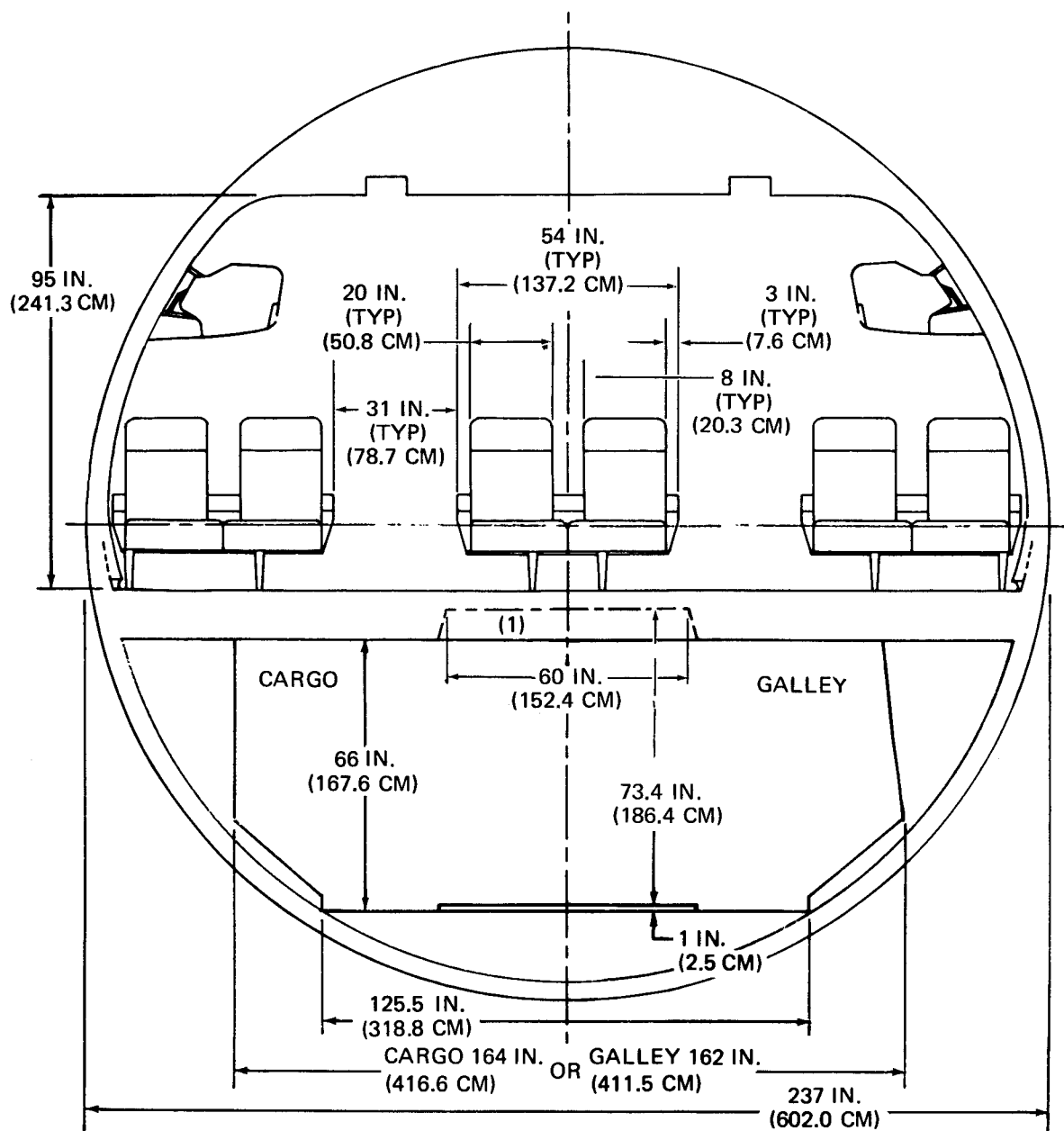








- (1) LOWER GALLEY CONFIGURATIONS  
 ADDITIONAL HEADROOM –  
 60 INCHES (152.4 CM) WIDE AND  
 8.4 INCHES (21.3 CM) HIGH  
 AT LOWER GALLEY

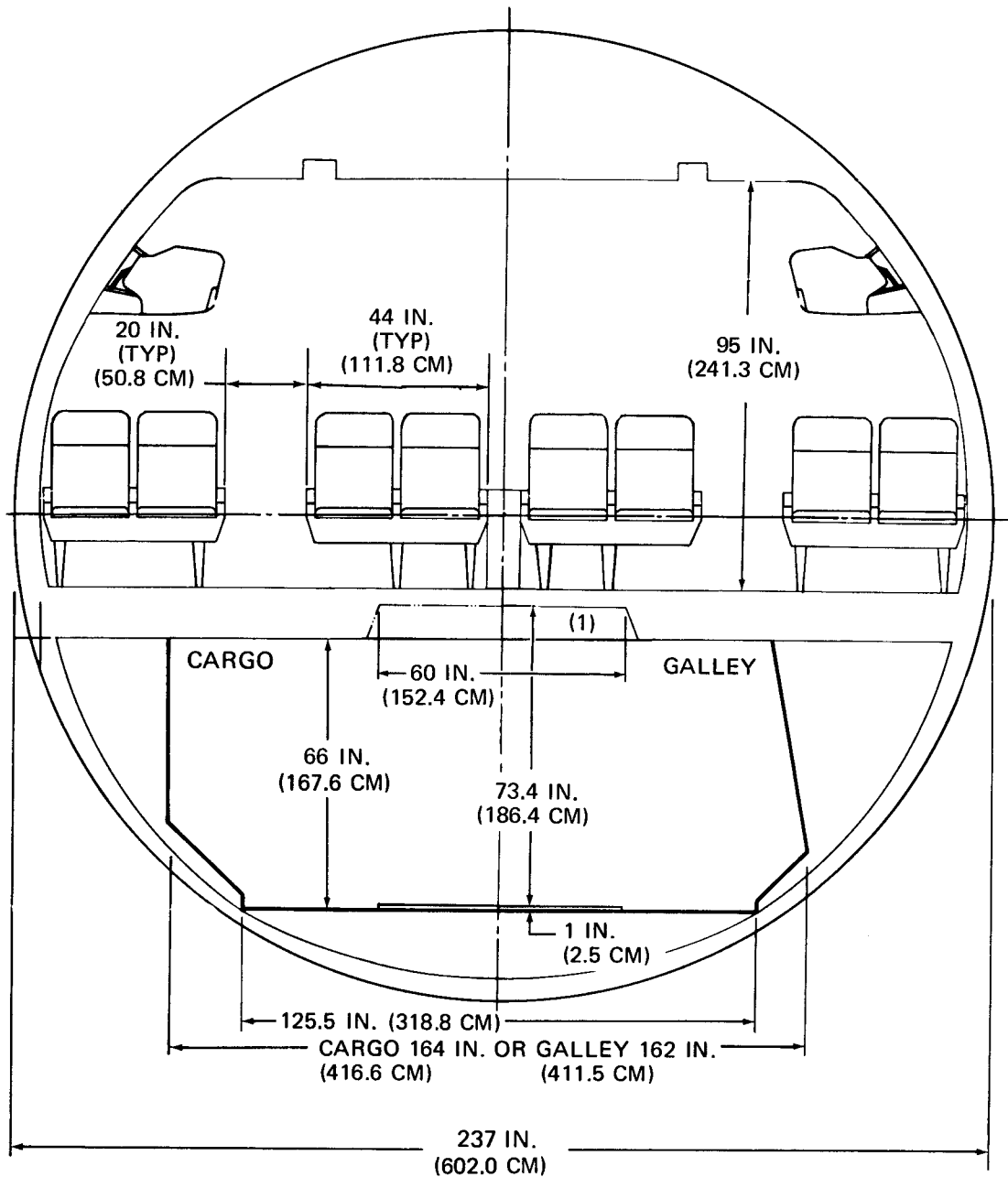


## 2.5 PASSENGER CABIN CROSS SECTION

### 2.5.1 FIRST CLASS

MODEL DC-10 SERIES 10, 10CF, 30, 30CF, 40 AND 40CF

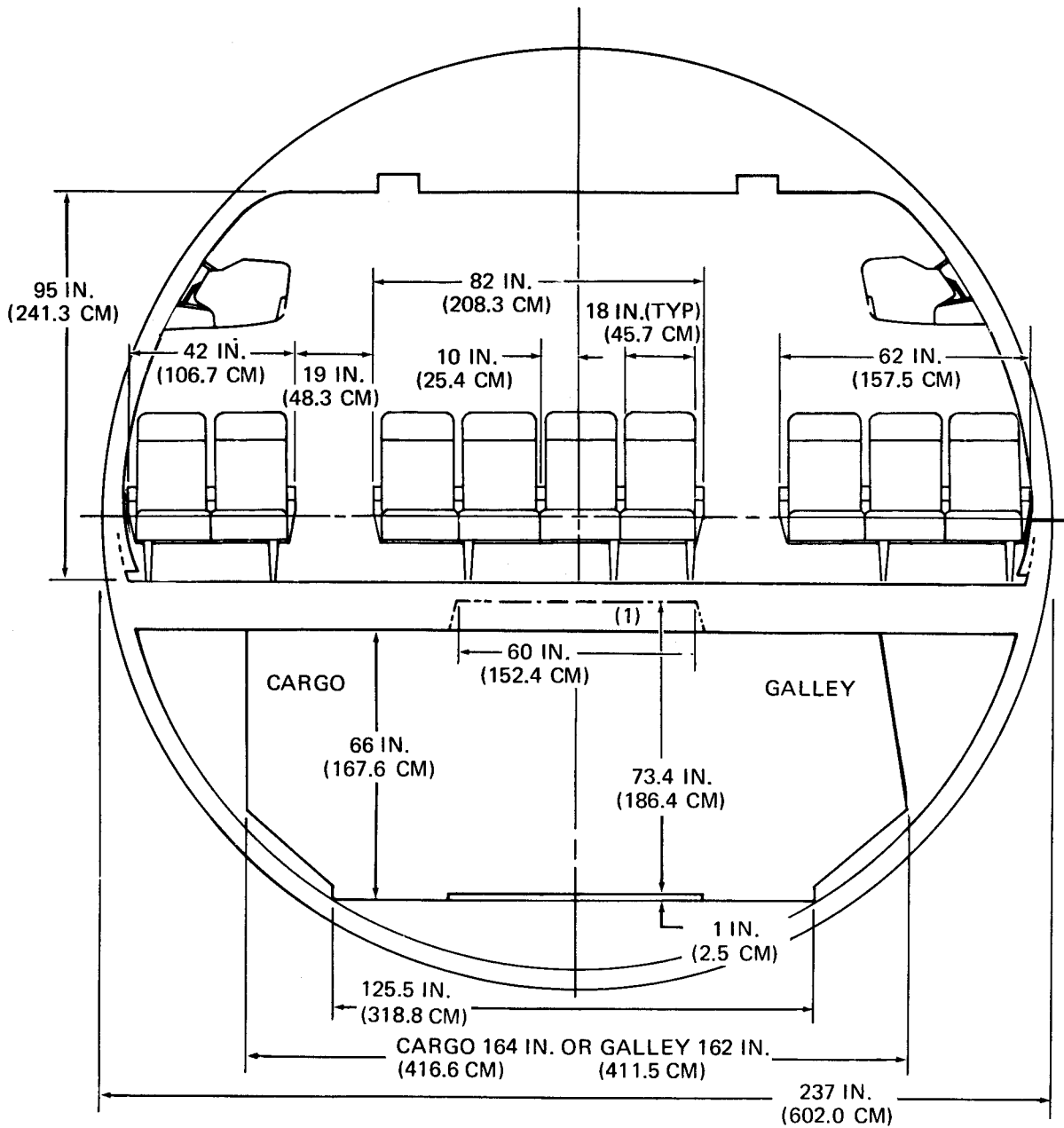
- (1) LOWER GALLEY CONFIGURATIONS  
 ADDITIONAL HEADROOM – 60 INCHES  
 (152.4 CM) WIDE AND 8.4 INCHES  
 (21.3 CM) HIGH AT LOWER GALLEYS



## 2.5.2 TOURIST

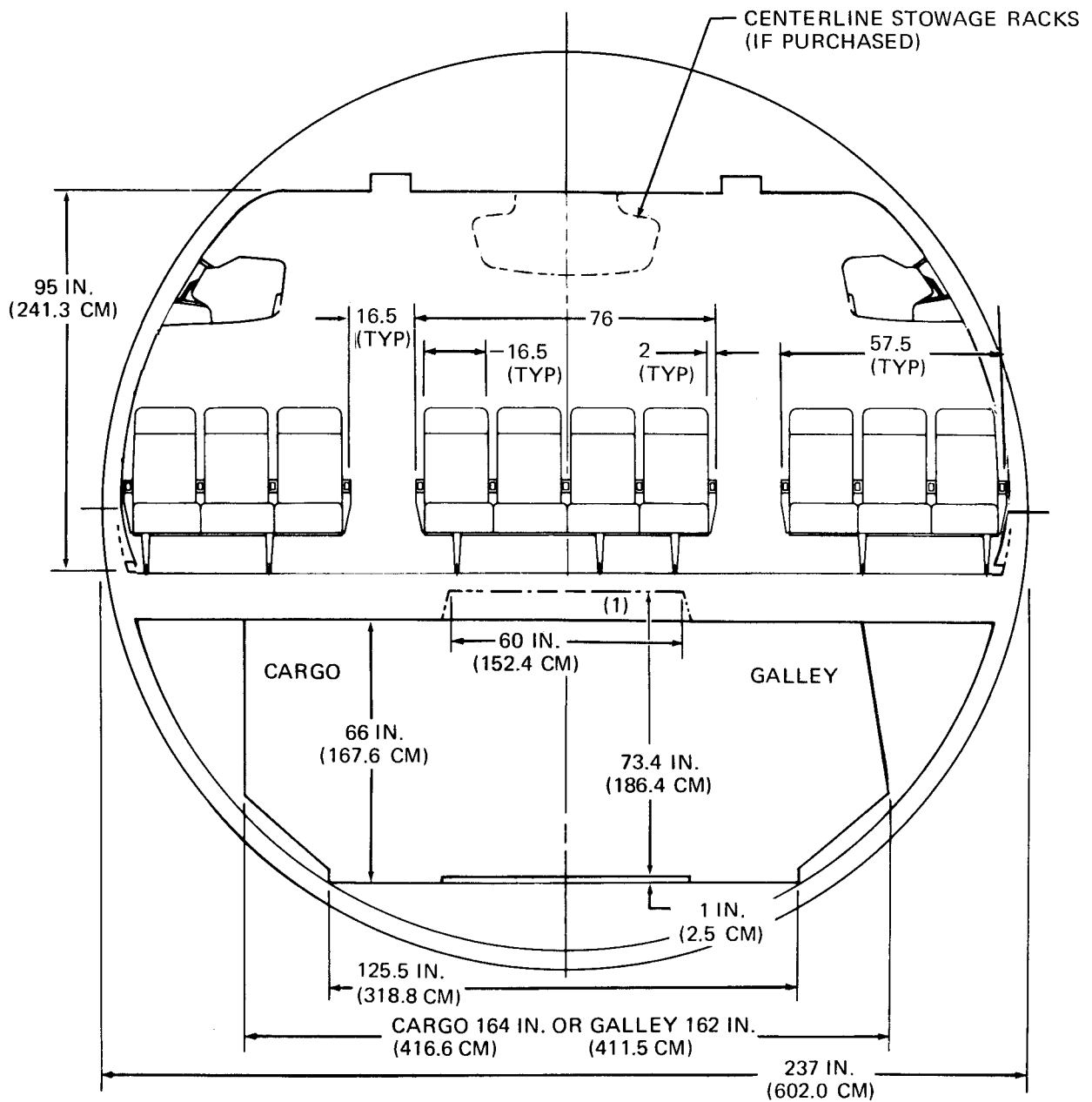
MODEL DC-10 SERIES 10, 10CF, 30, 30CF, 40 AND 40CF

- (1) LOWER GALLEY CONFIGURATIONS  
 ADDITIONAL HEADROOM – 60 INCHES  
 (152.4 CM) WIDE AND 8.4 INCHES  
 (21.3 CM) HIGH AT LOWER GALLEYS



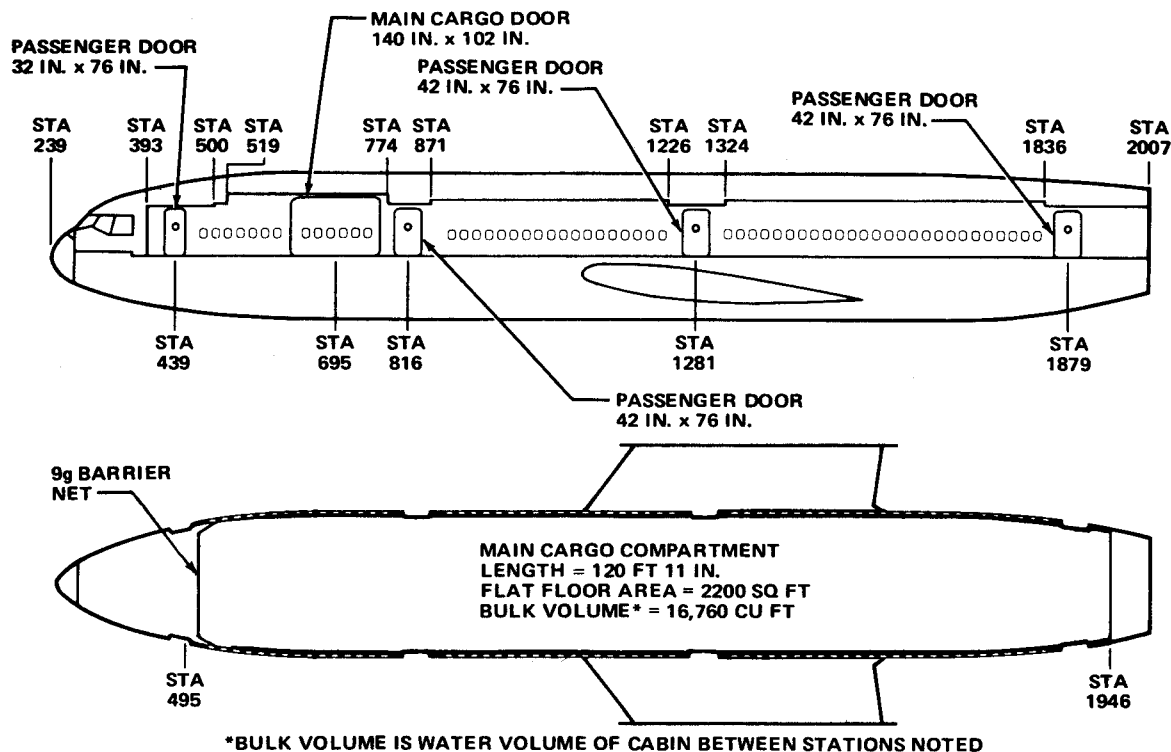
### 2.5.3 ECONOMY

MODEL DC-10 SERIES 10, 10CF, 30, 30CF, 40 AND 40CF

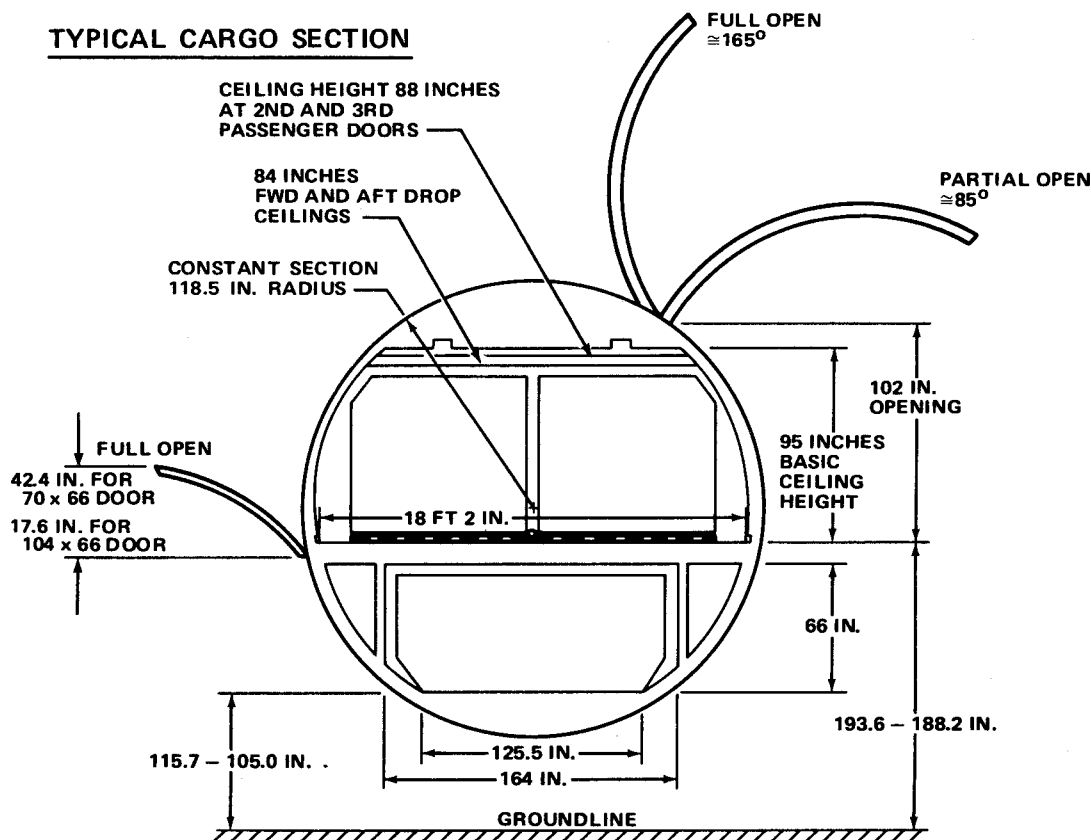


## 2.5.4 ECONOMY

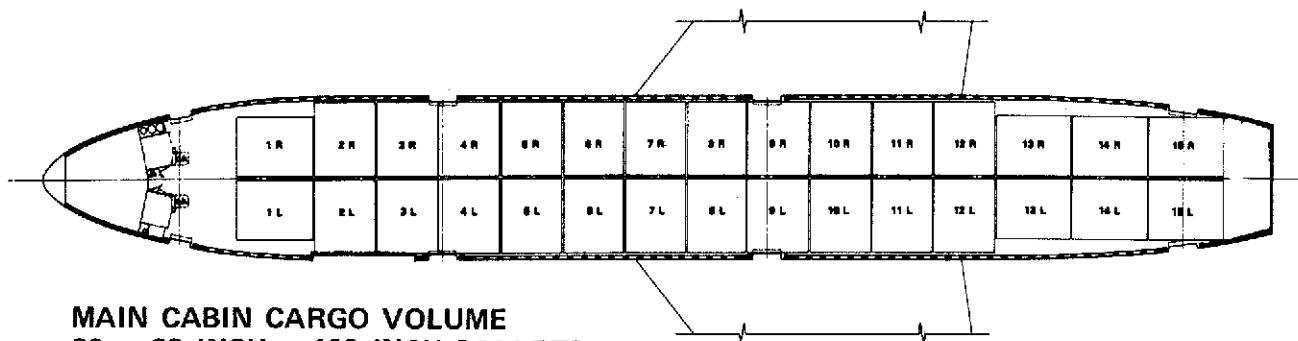
MODEL DC-10 SERIES 10, 10CF, 30, 30CF, 40 AND 40CF



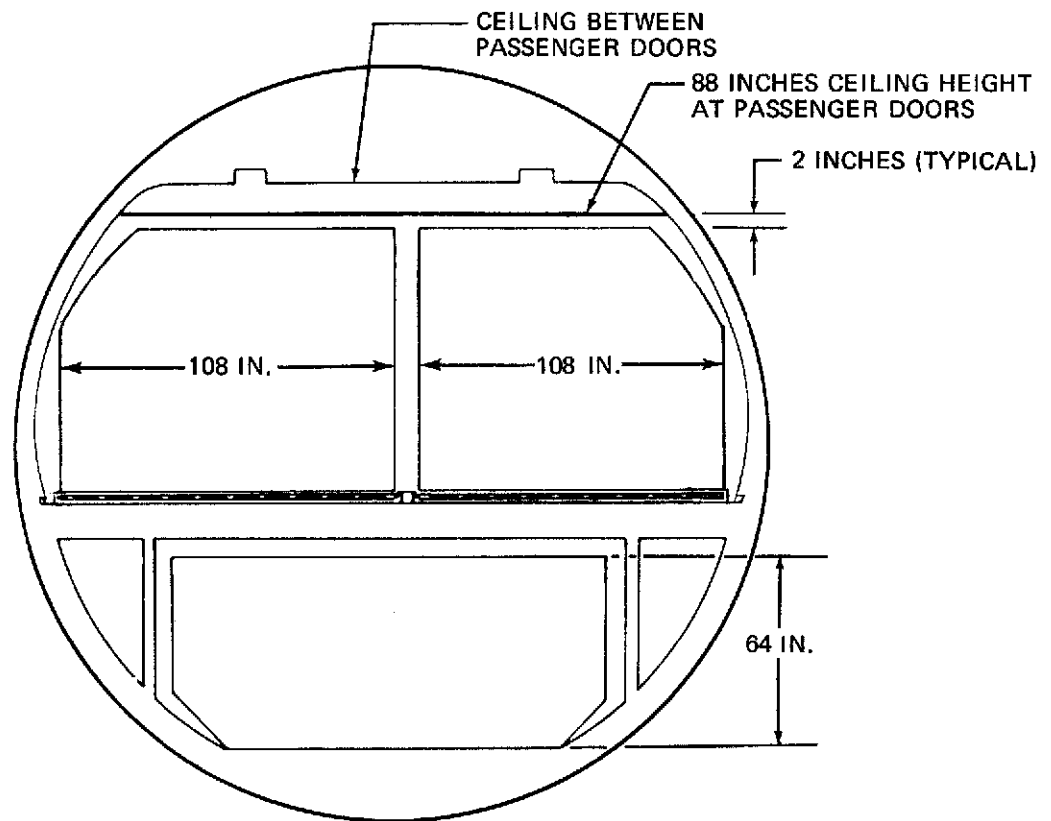
### TYPICAL CARGO SECTION



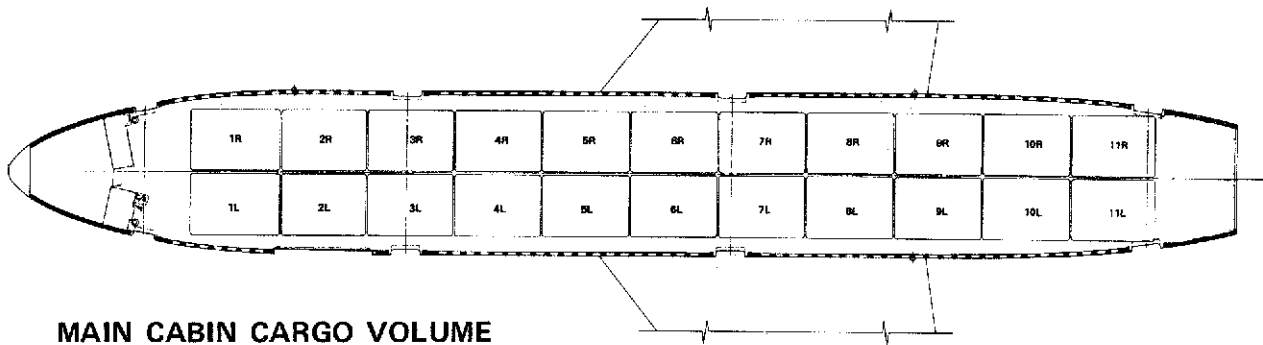
### 2.5.5 MAIN CABIN CARGO MODEL DC-10 SERIES 10CF, 30CF AND 40CF



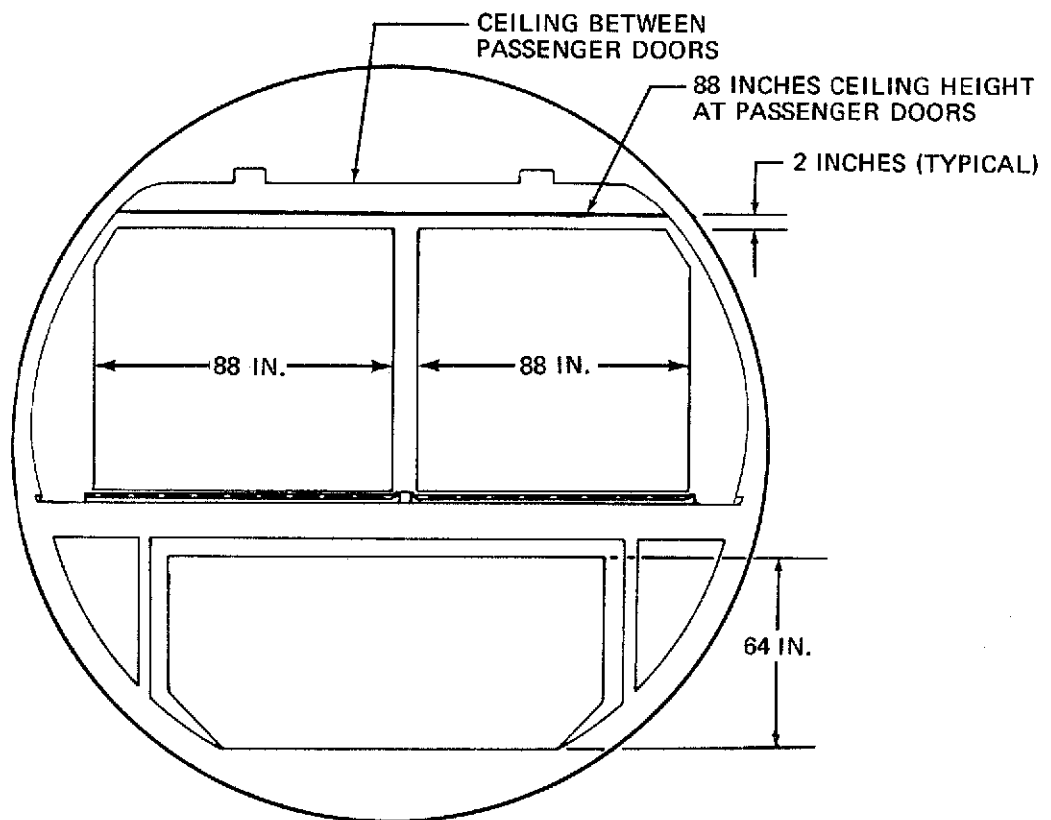
**MAIN CABIN CARGO VOLUME**  
**30 – 88 INCH x 108 INCH PALLETS**  
**12,248 CU FT (346.81 CU M)**



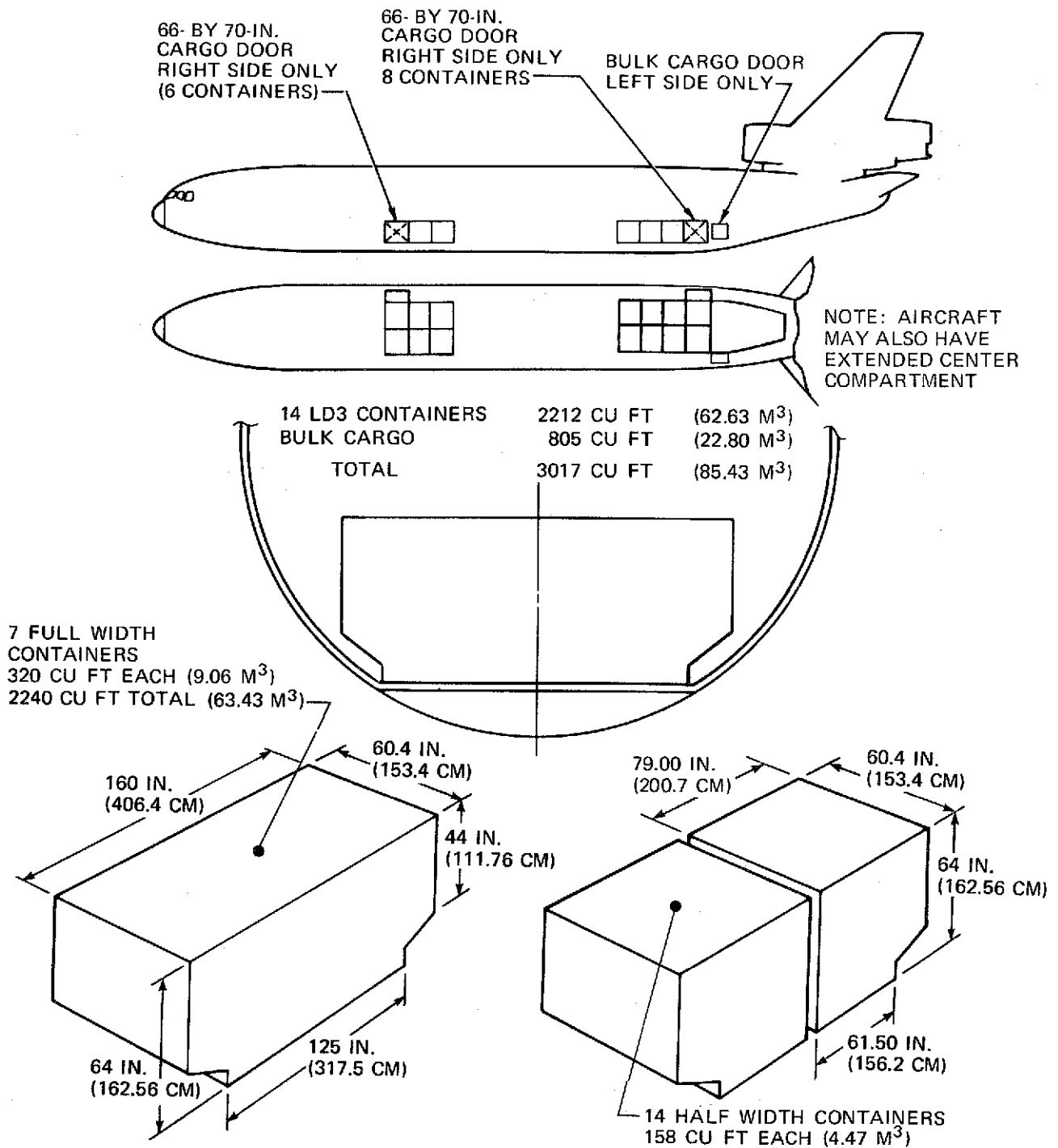
### 2.5.6 CARGO (88 x 108-INCH PALLETS) MODEL DC-10 SERIES 10CF, 30CF AND 40CF



**MAIN CABIN CARGO VOLUME**  
**22 – 88 INCH x 125 INCH PALLETS**  
**10,874 CU FT (307.95 CU M)**



**2.5.7 CARGO (88 x 125-INCH PALLETS)**  
**MODEL DC-10 SERIES 10CF, 30CF AND 40CF**



GROSS WEIGHT  
7000 LB EACH  
(3175 KG)

TARE WEIGHT  
600 LB EA  
(272.2 KG)

LD3 CONTAINER

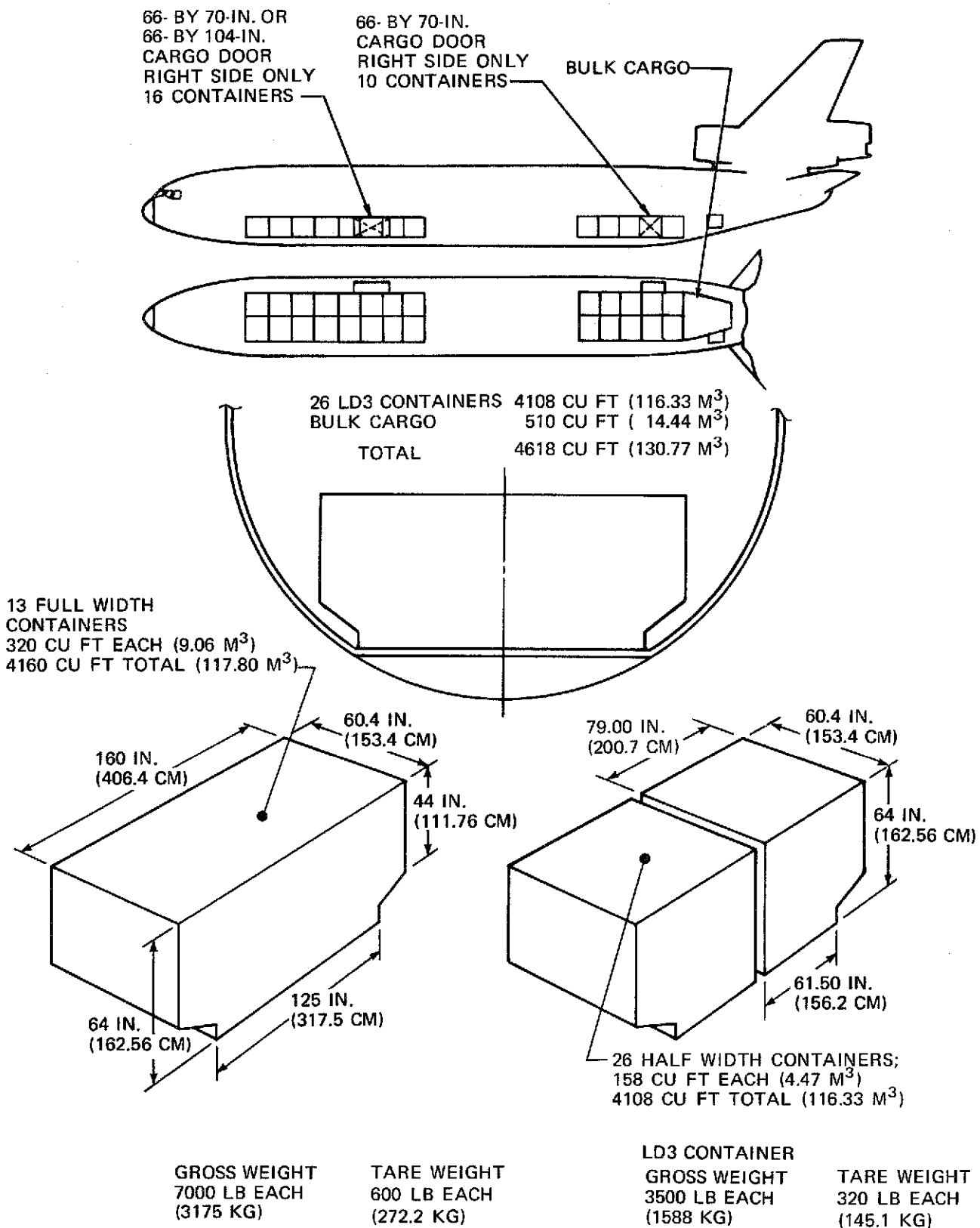
GROSS WEIGHT	TARE WEIGHT
3500 LB EACH	320 LB EACH
(1588 KG)	(145.1 KG)

## 2.6 LOWER COMPARTMENT CONTAINERS

### 2.6.1 CARGO COMPARTMENTS (LOWER GALLEY)

#### STANDARD CENTER CARGO COMPARTMENT

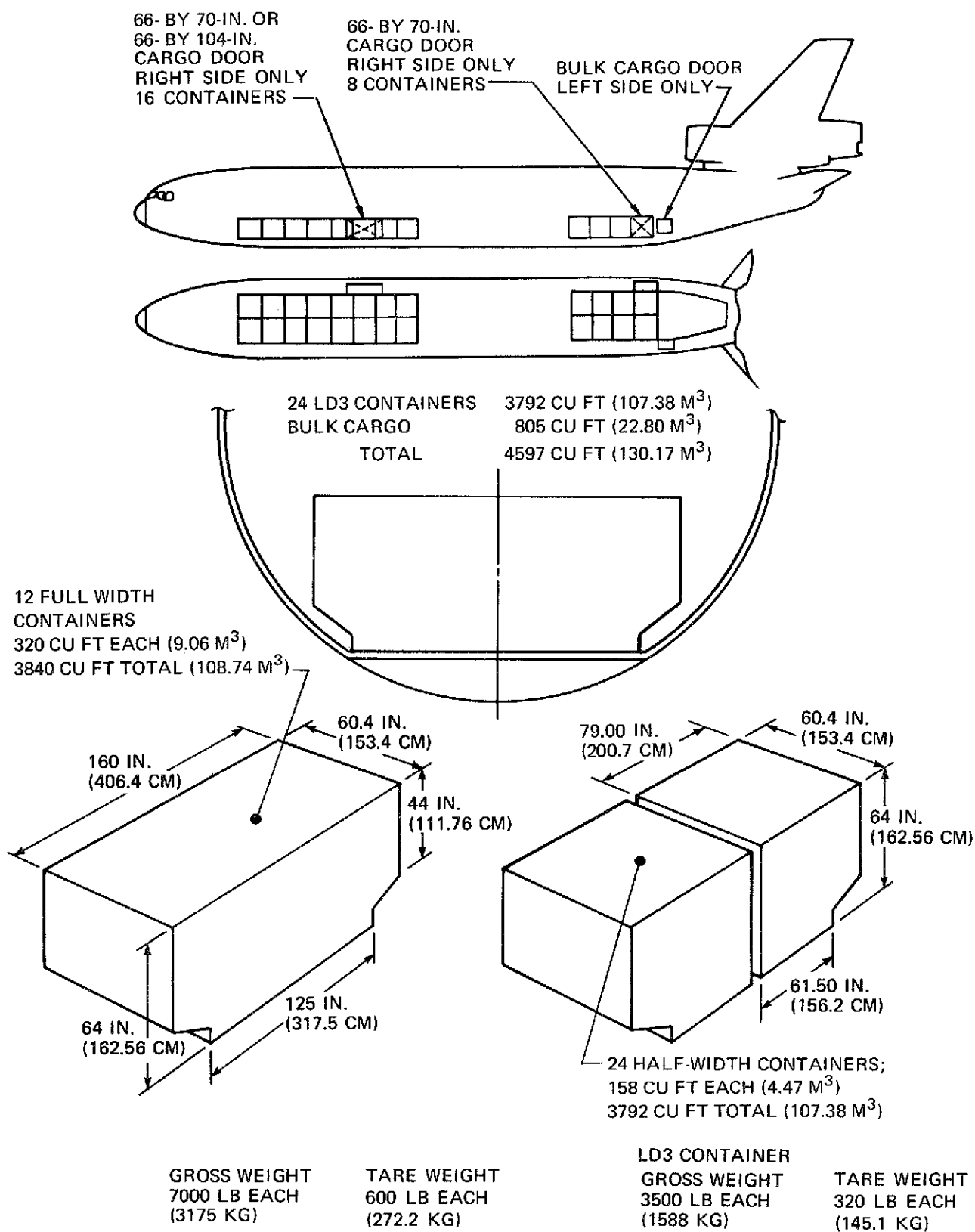
#### MODEL DC-10 SERIES 10, 30, 30CF, 40 AND 40CF



## 2.6.2 CARGO COMPARTMENTS (UPPER GALLEY)

### EXTENDED CENTER CARGO COMPARTMENT

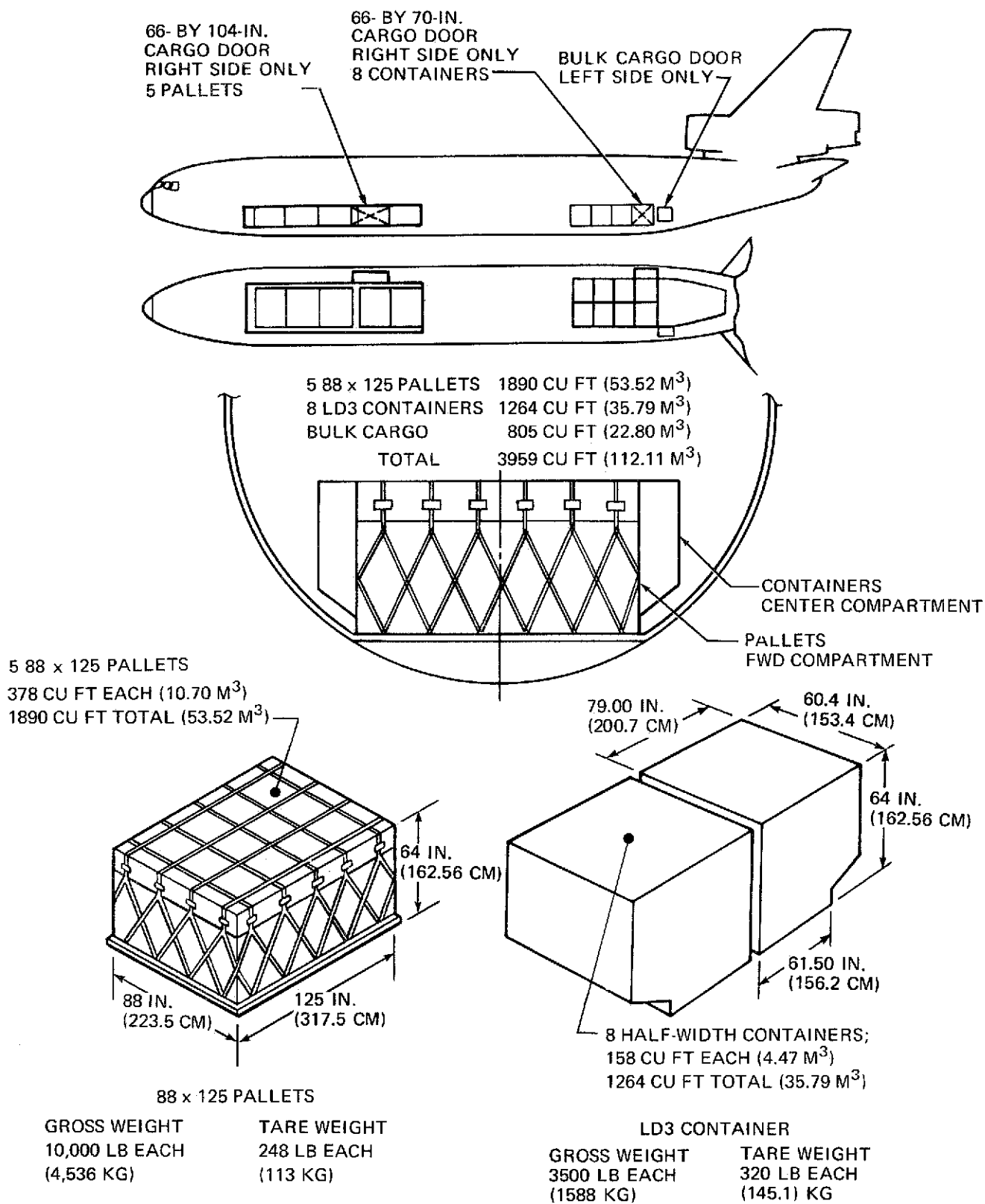
### MODEL DC-10 SERIES 30, 30CF, 40 AND 40CF



## 2.6.3 CARGO COMPARTMENTS - CONTAINERS (UPPER GALLEY)

### STANDARD CENTER CARGO COMPARTMENT

### MODEL DC-10 SERIES 10, 10CF, 30, 30CF, 40 AND 40CF



## 2.6.4 CARGO COMPARTMENTS - CONTAINERS/PALLETS (UPPER GALLEY)

### STANDARD CENTER CARGO COMPARTMENT

#### MODEL DC-10 SERIES 10, 10CF, 30, 30CF, 40 AND 40CF

## 2.7 DOOR CLEARANCES

The door clearance data sheets provide the door size and location of all passenger and cargo doors.

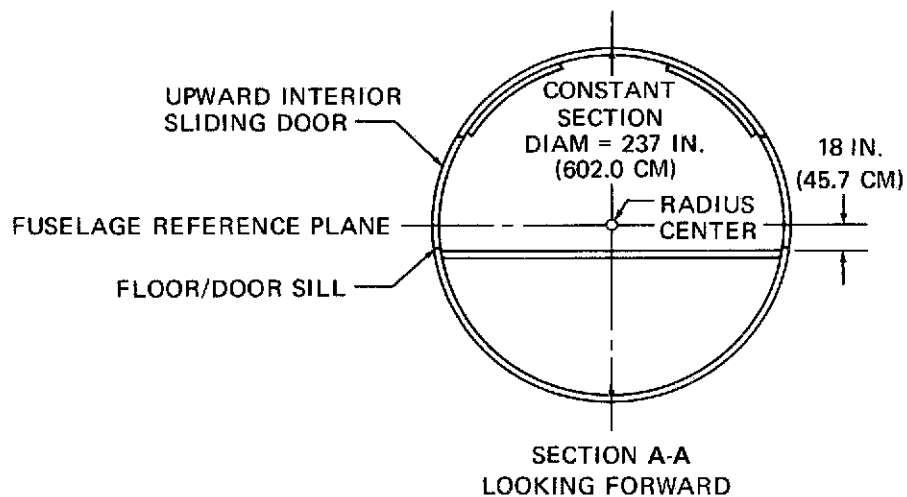
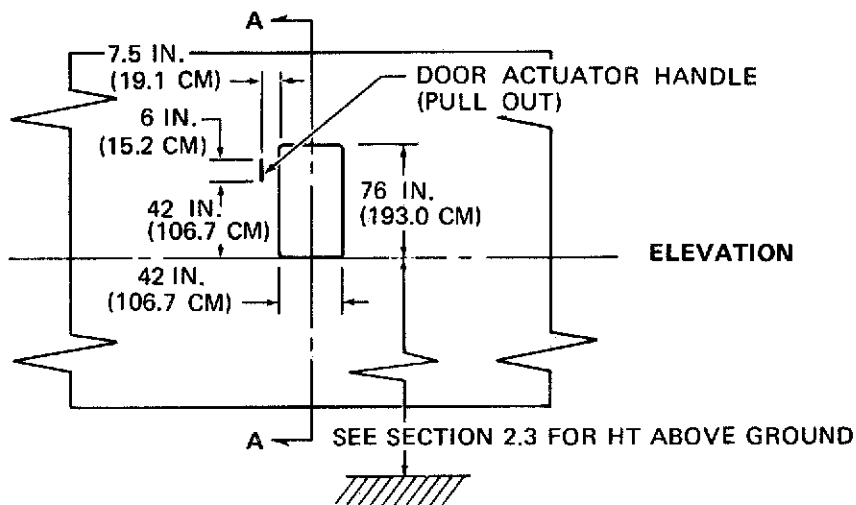
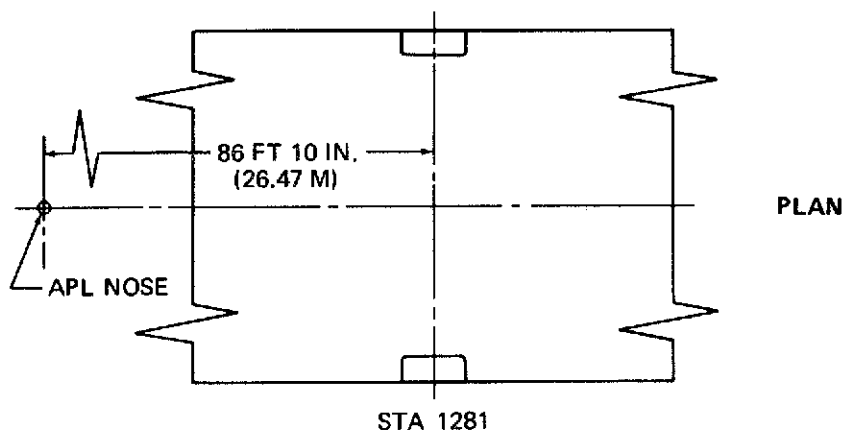
All passenger doors open and slide upward within the interior of the aircraft.

All cargo doors are upward swinging hinged canopy doors. These doors when placed in a full open position provide adequate clearance for cargo loading and unloading.

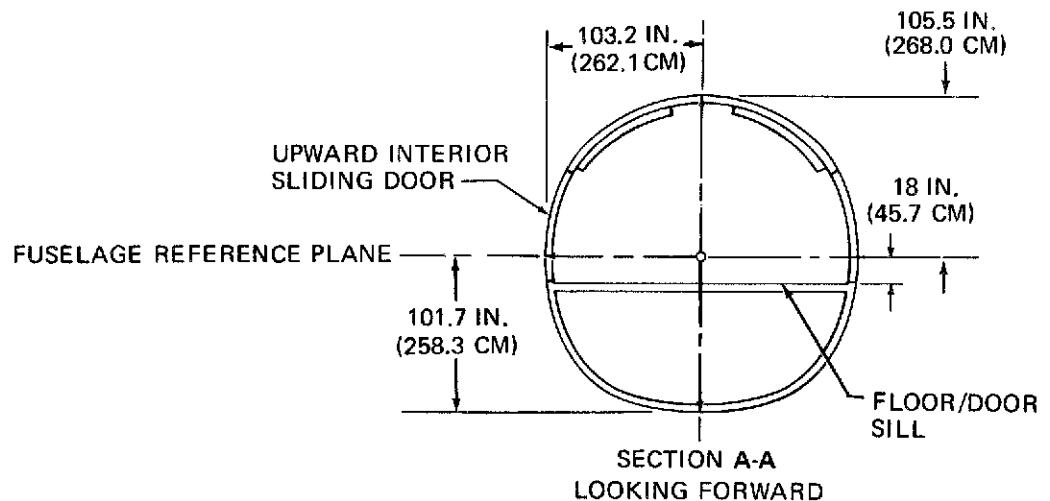
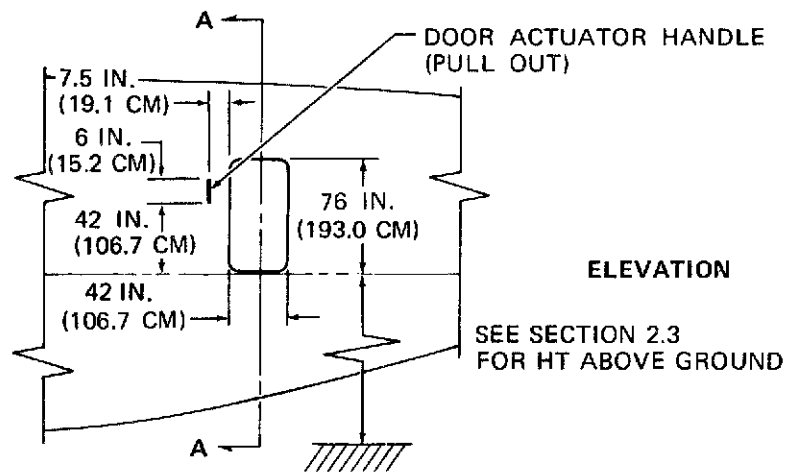
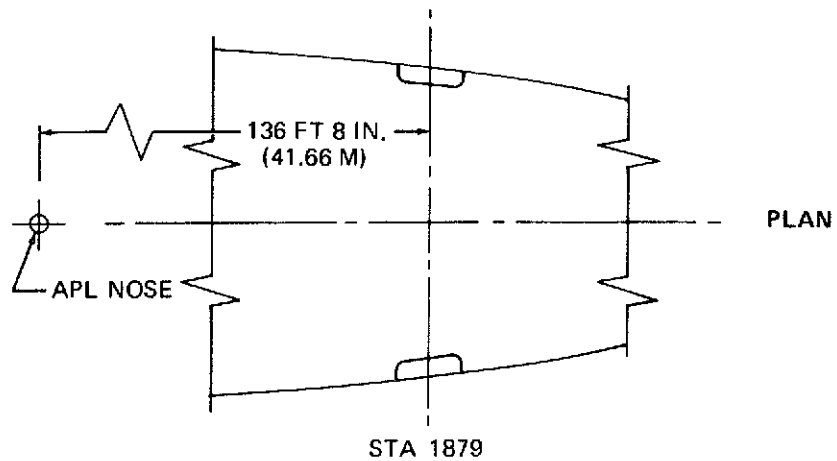
A data sheet is also provided that shows the critical clearance points on the wing in the area adjacent to the passenger door. The dimensions are expressed in relation to the door sill reference elevation of 0.0 inches.



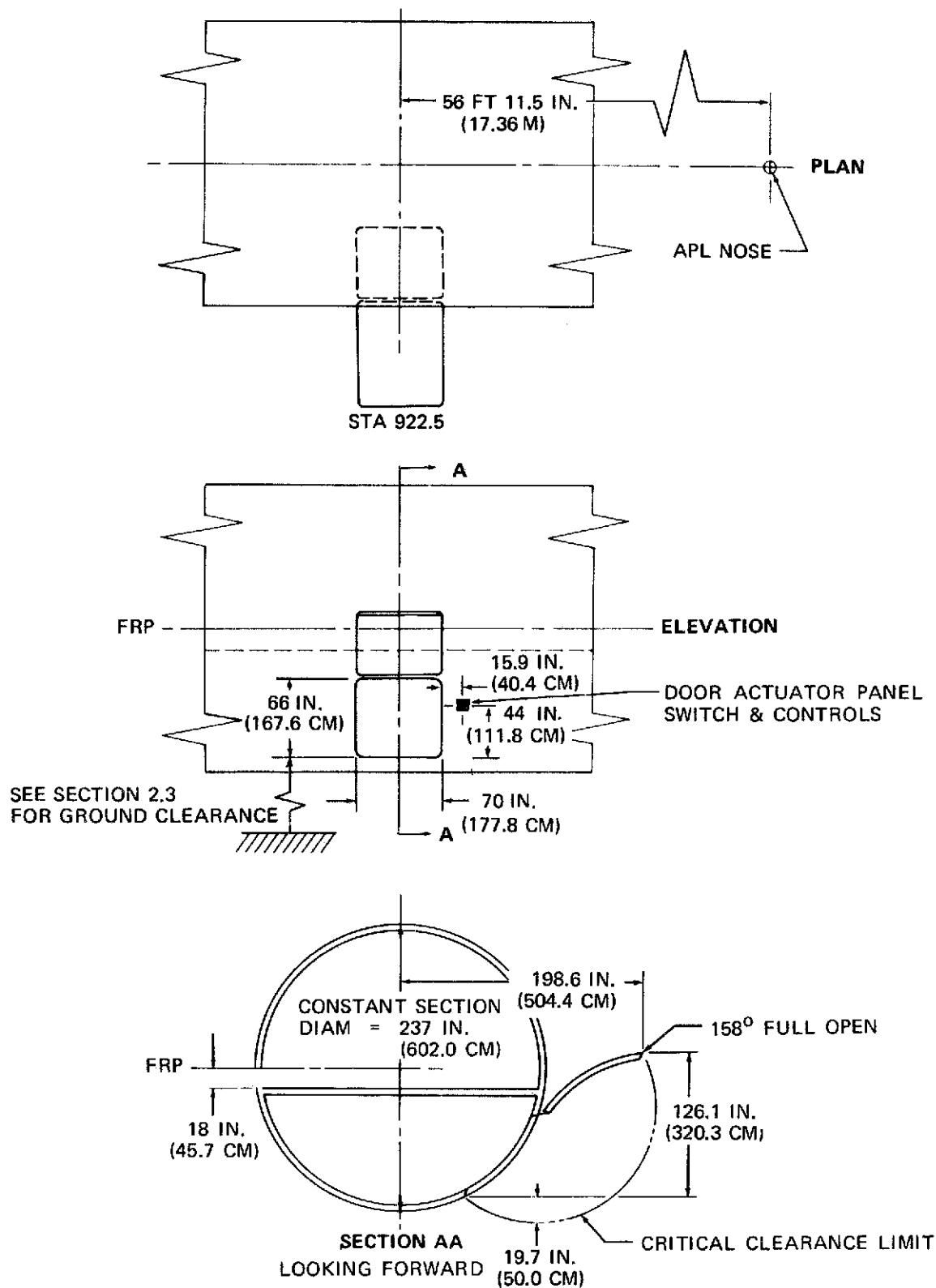




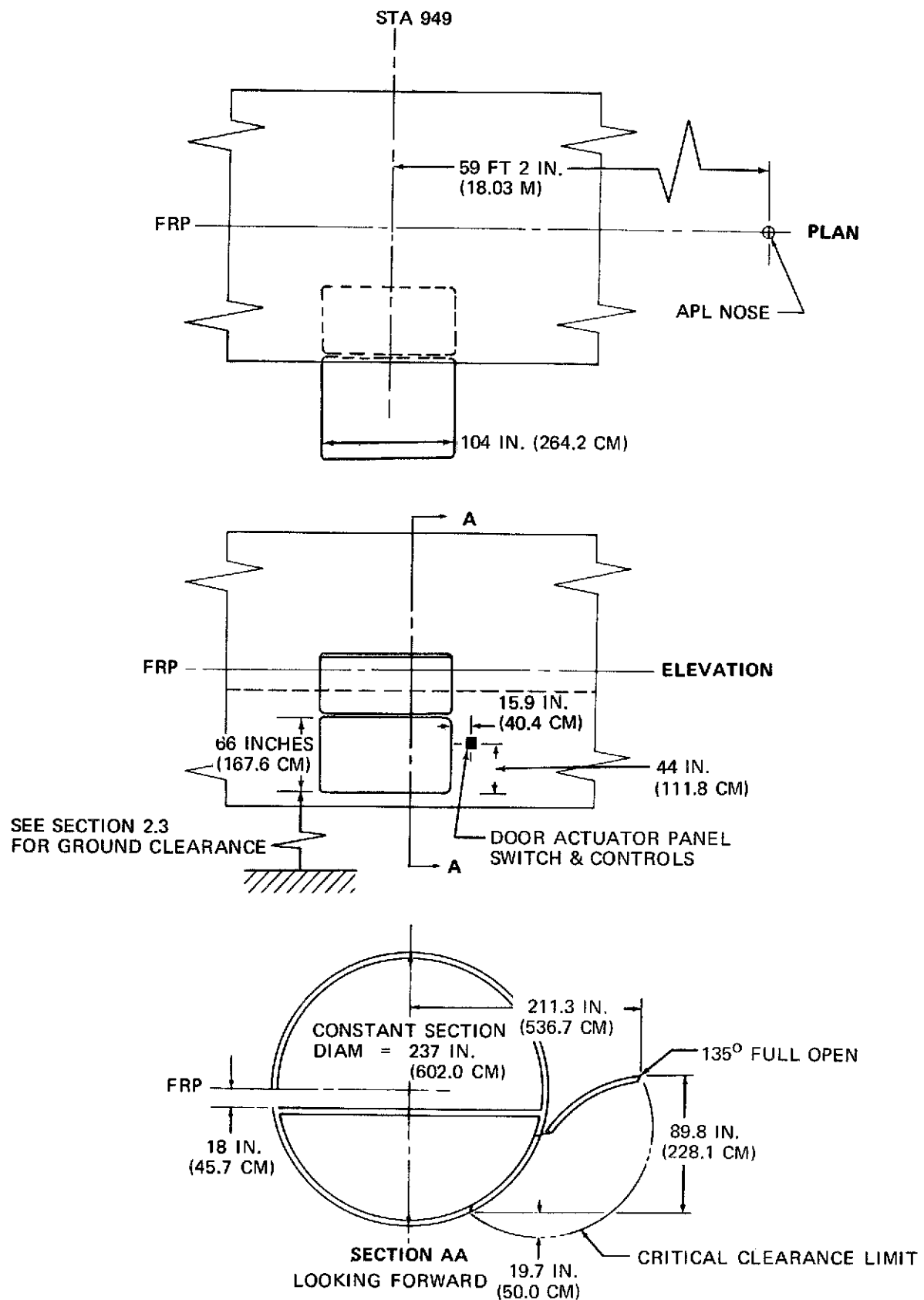
## 2.7.1 CLEARANCES, PASSENGER LOADING DOORS, STATION 1281 MODEL DC-10 SERIES 10, 10CF, 30, 30CF, 40 AND 40CF



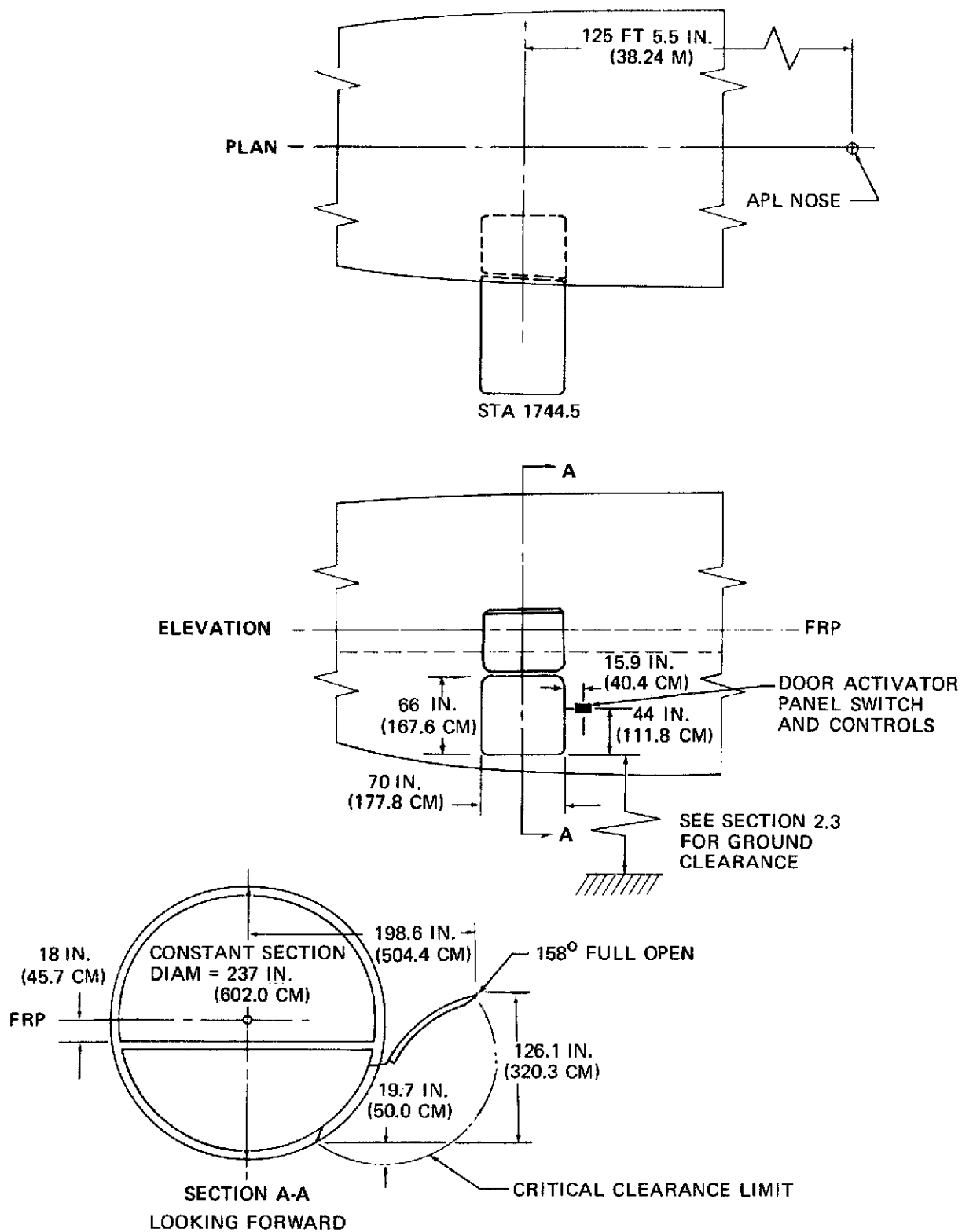
## 2.7.1 CLEARANCES, PASSENGER LOADING DOORS, STATION 1879 MODEL DC-10 SERIES 10, 10CF, 30, 30CF, 40 AND 40CF



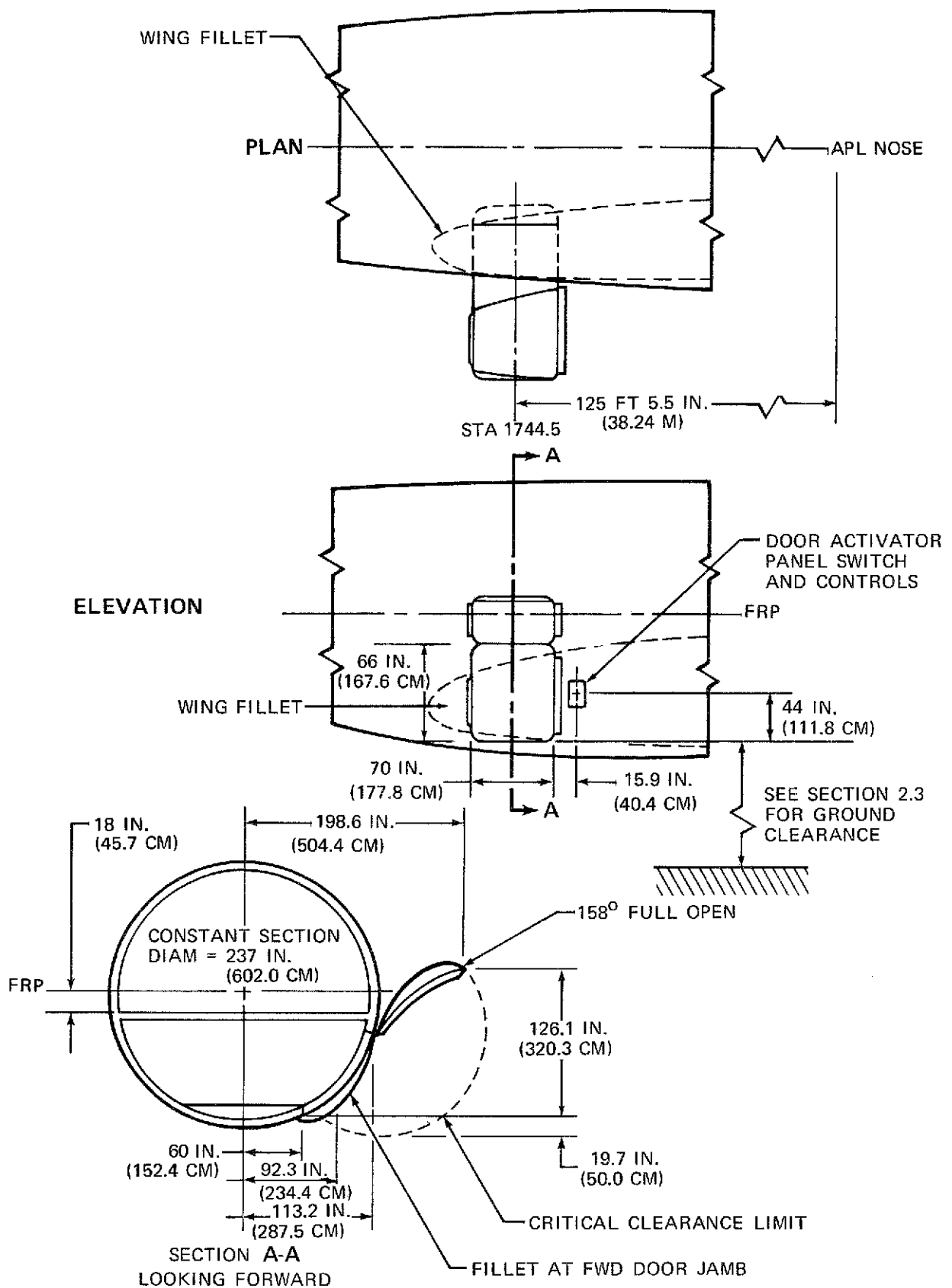
## 2.7.2 FORWARD CARGO LOADING DOOR, STATION 922.5 MODEL DC-10 SERIES 10, 30, 30CF, 40 AND 40CF (LOWER GALLEY)



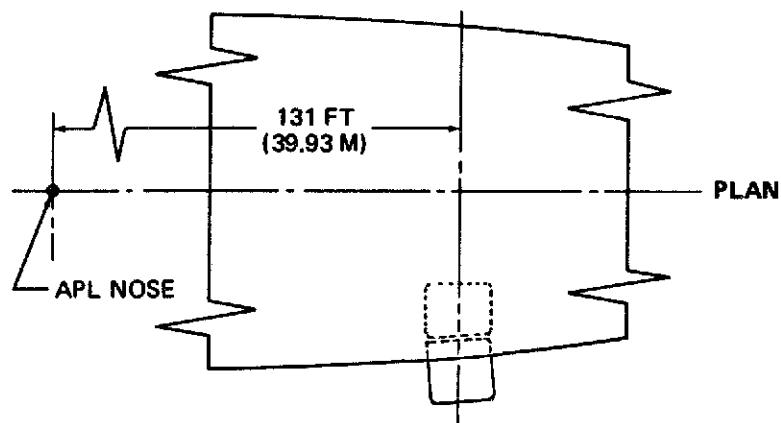
## 2.7.2 FORWARD CARGO LOADING DOOR, STATION 949 MODEL DC-10 SERIES 10, 10CF, 30, 30CF, 40 AND 40CF (UPPER GALLEY)



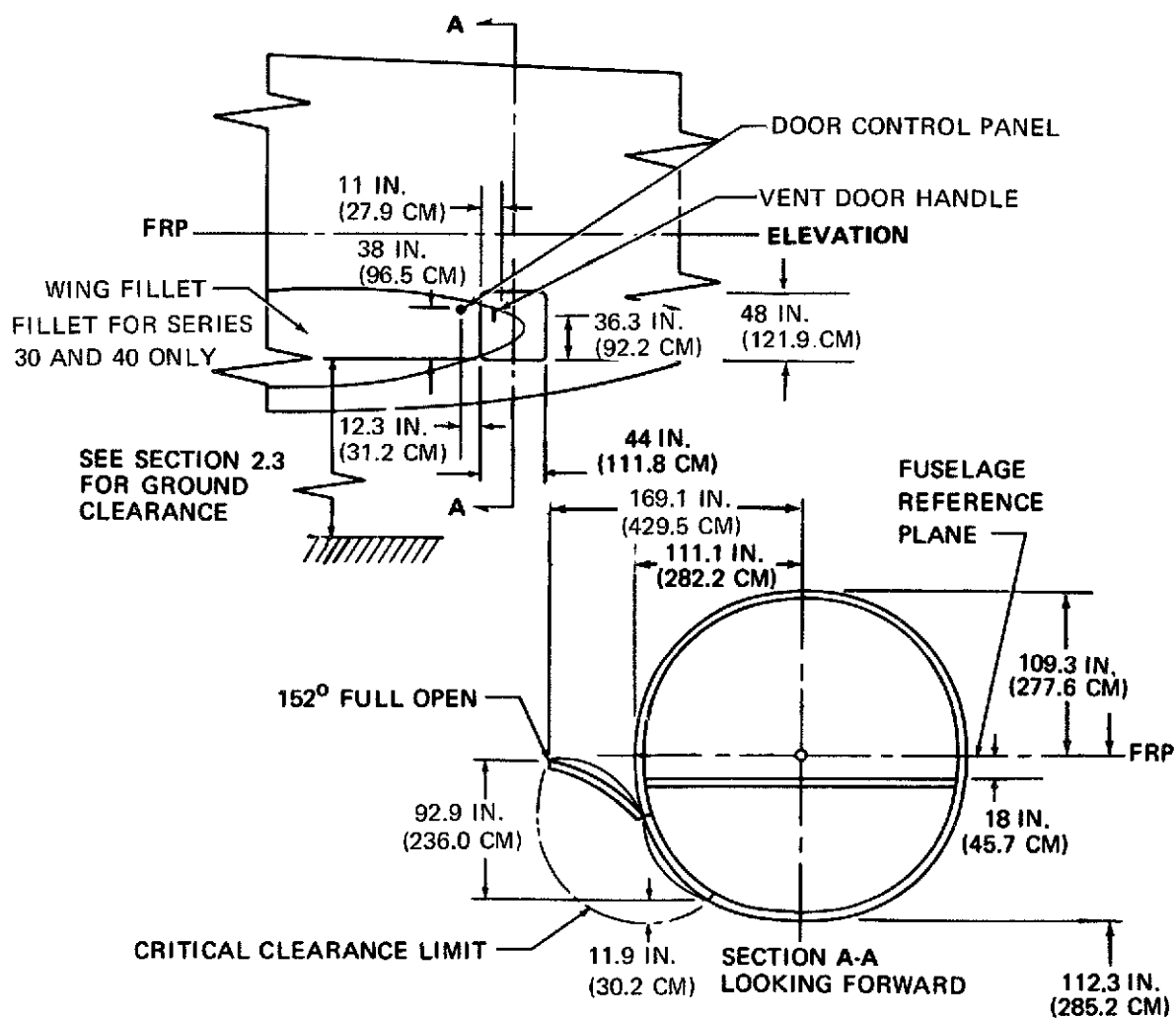
## 2.7.2 CENTER CARGO LOADING DOOR, STATION 1744.5 MODEL DC-10 SERIES 10 AND 10CF



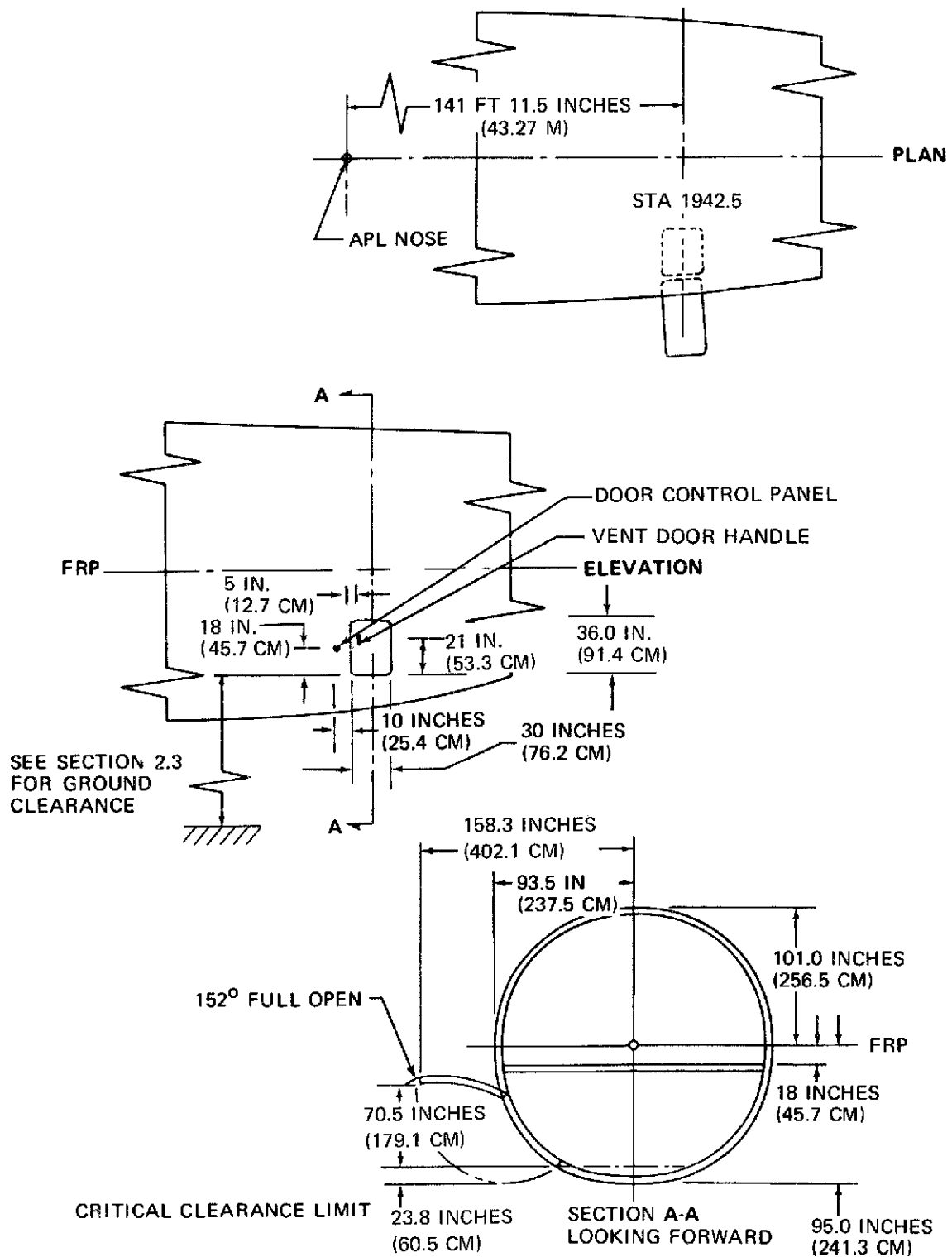
## 2.7.2 CENTER CARGO LOADING DOOR, STATION 1744.5 MODEL DC-10 SERIES 30, 30CF, 40 AND 40CF



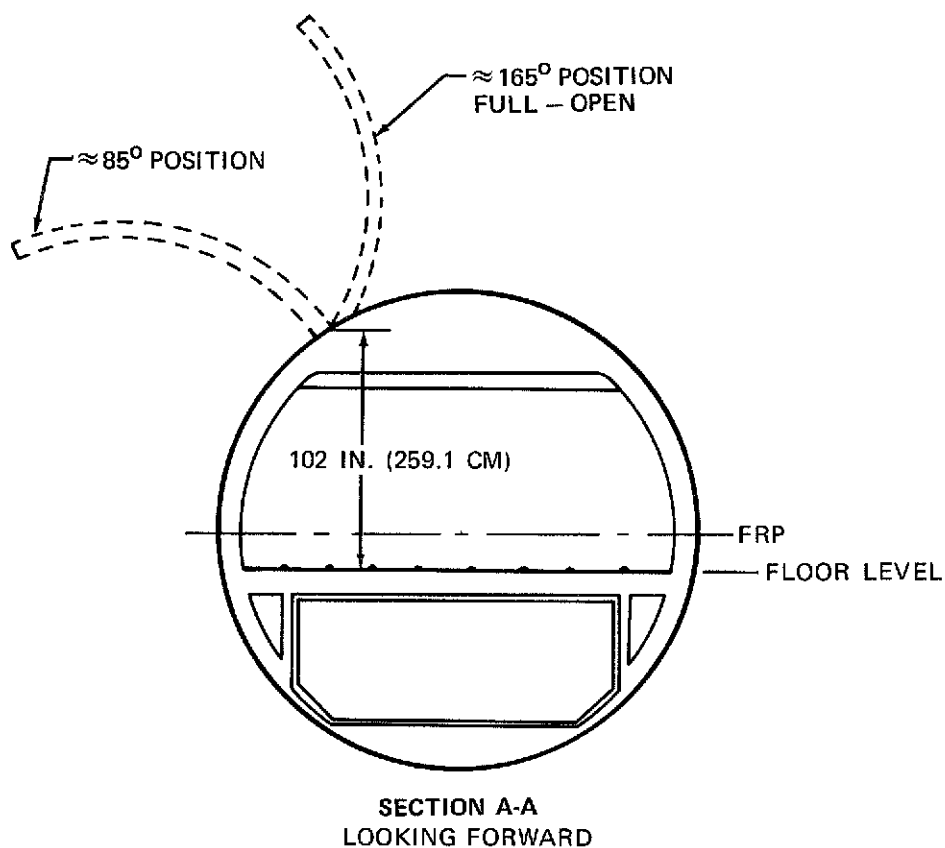
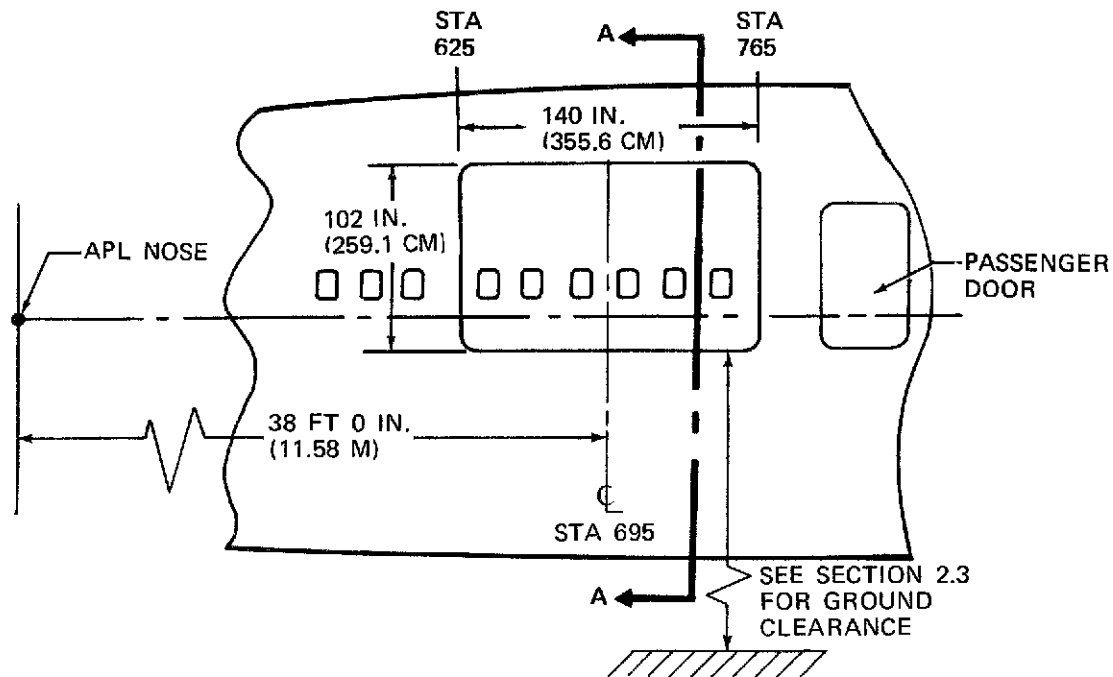
STA 1811



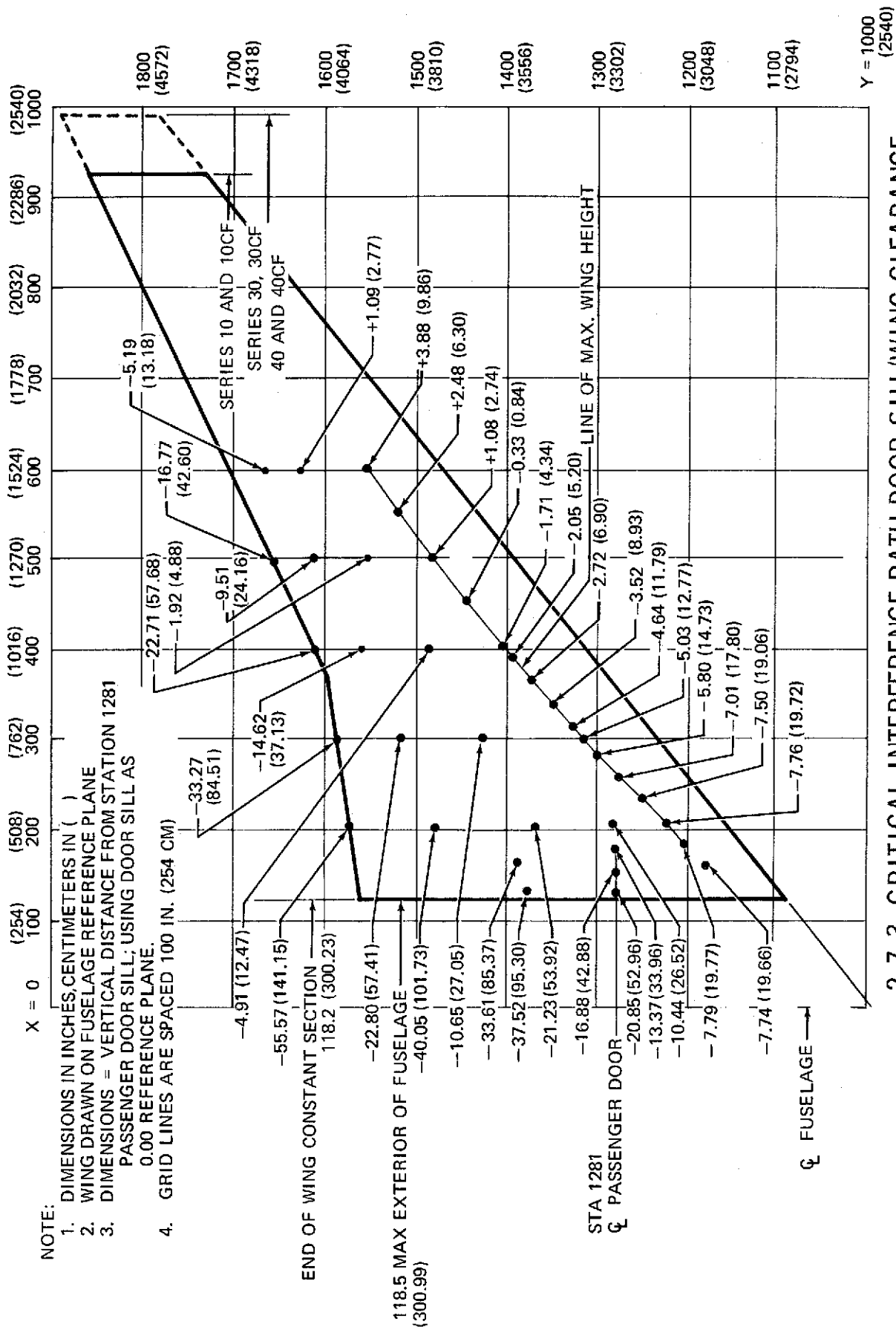
## 2.7.2 BULK CARGO LOADING DOOR, STATION 1811 MODEL DC-10 SERIES 10, 10CF, 30, 30CF, 40 AND 40CF STANDARD CENTER CARGO COMPARTMENT



## 2.7.2 BULK CARGO LOADING DOOR, STATION 1942.5 MODEL DC-10 SERIES 30 AND 40 EXTENDED CENTER CARGO COMPARTMENT



## 2.7.2 MAIN CARGO LOADING DOOR, STATION 695 MODEL DC-10 SERIES 10CF, 30CF AND 40CF



2.7.3 CRITICAL INTERFERENCE PATH DOOR SILL/WING CLEARANCE  
MODEL DC-10 SERIES 10, 10CF, 30, 30CF, 40 AND 40CF

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### **3.0 AIRPLANE PERFORMANCE**

3.1 General Information

3.2 Payload-Range

3.3 FAR Takeoff Runway Length Requirements

3.4 FAR Landing Runway Length Requirements

3.5 Landing Approach Speed

### 3.0 AIRPLANE PERFORMANCE

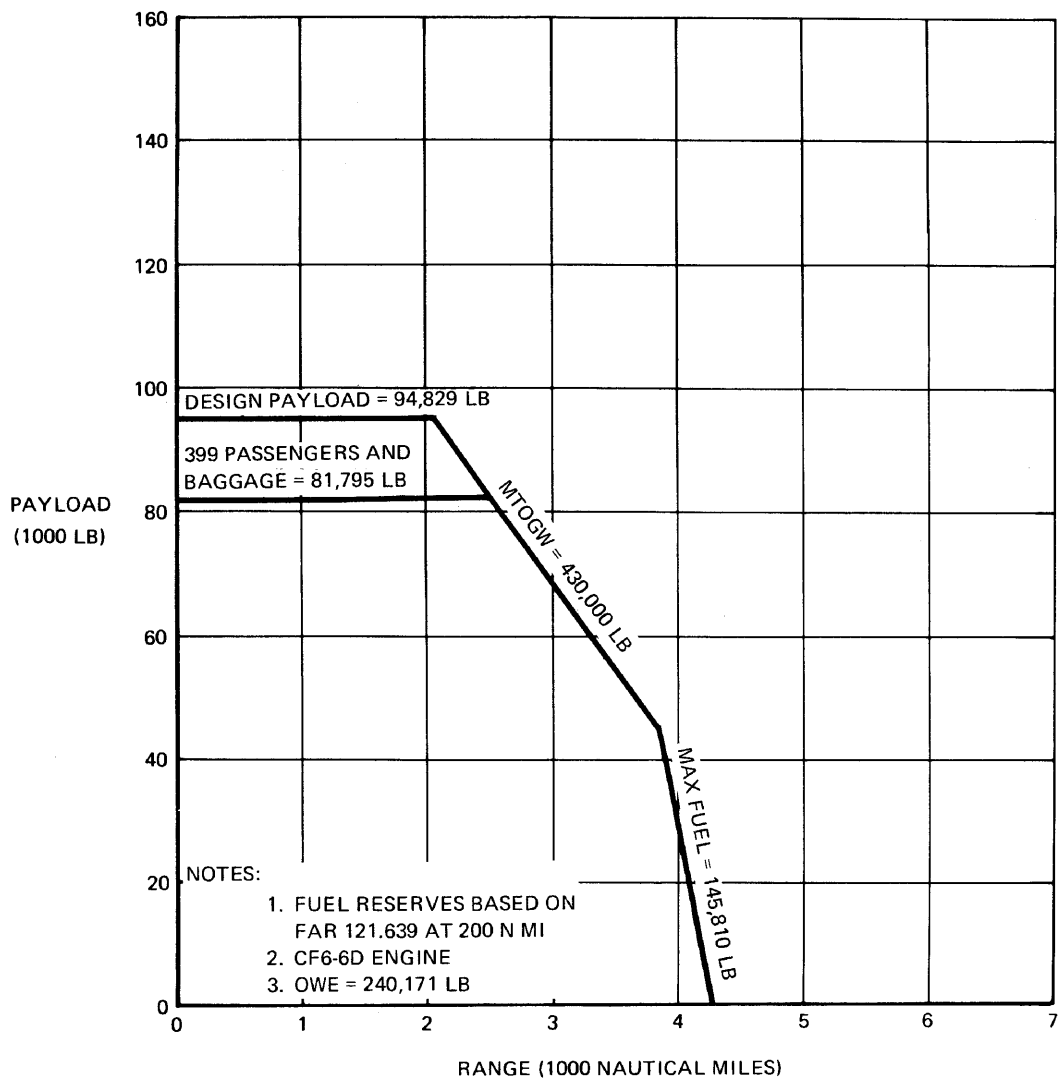
#### 3.1 General Information

Figures 3.2.1 and 3.2.2 present payload-range information for a specific Mach number cruise at the fuel reserve condition shown.

Figures 3.3, 3.3.1, and 3.4 represent FAR takeoff and landing field length requirements for FAA certification.

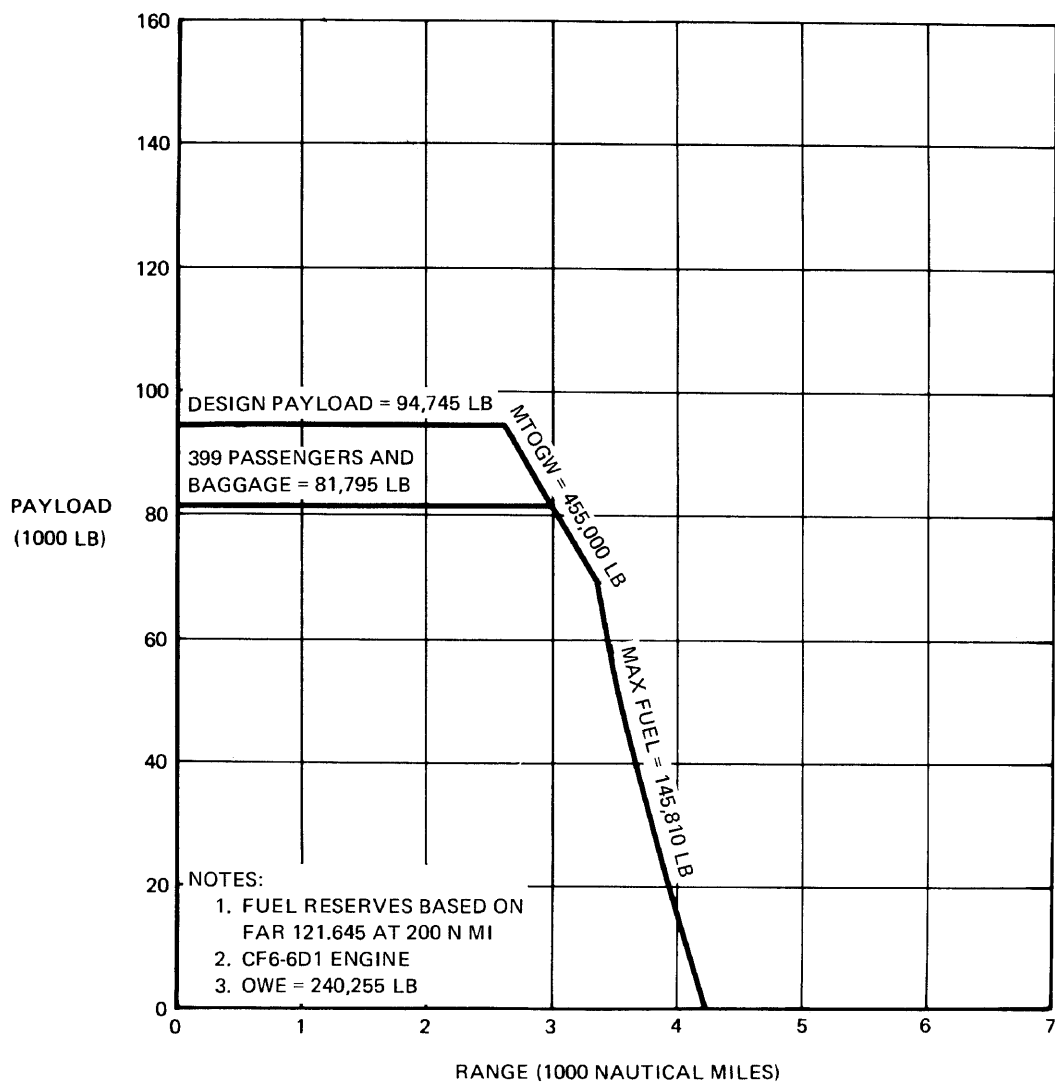
Standard day temperatures for the altitudes shown are tabulated below:

ELEVATION		STANDARD DAY TEMP	
FEET	METERS	°F	°C
0	0	59	15
2000	610	51.9	11.1
4000	1220	44.7	7.1
6000	1830	37.6	3.1
8000	2440	30.5	-0.8

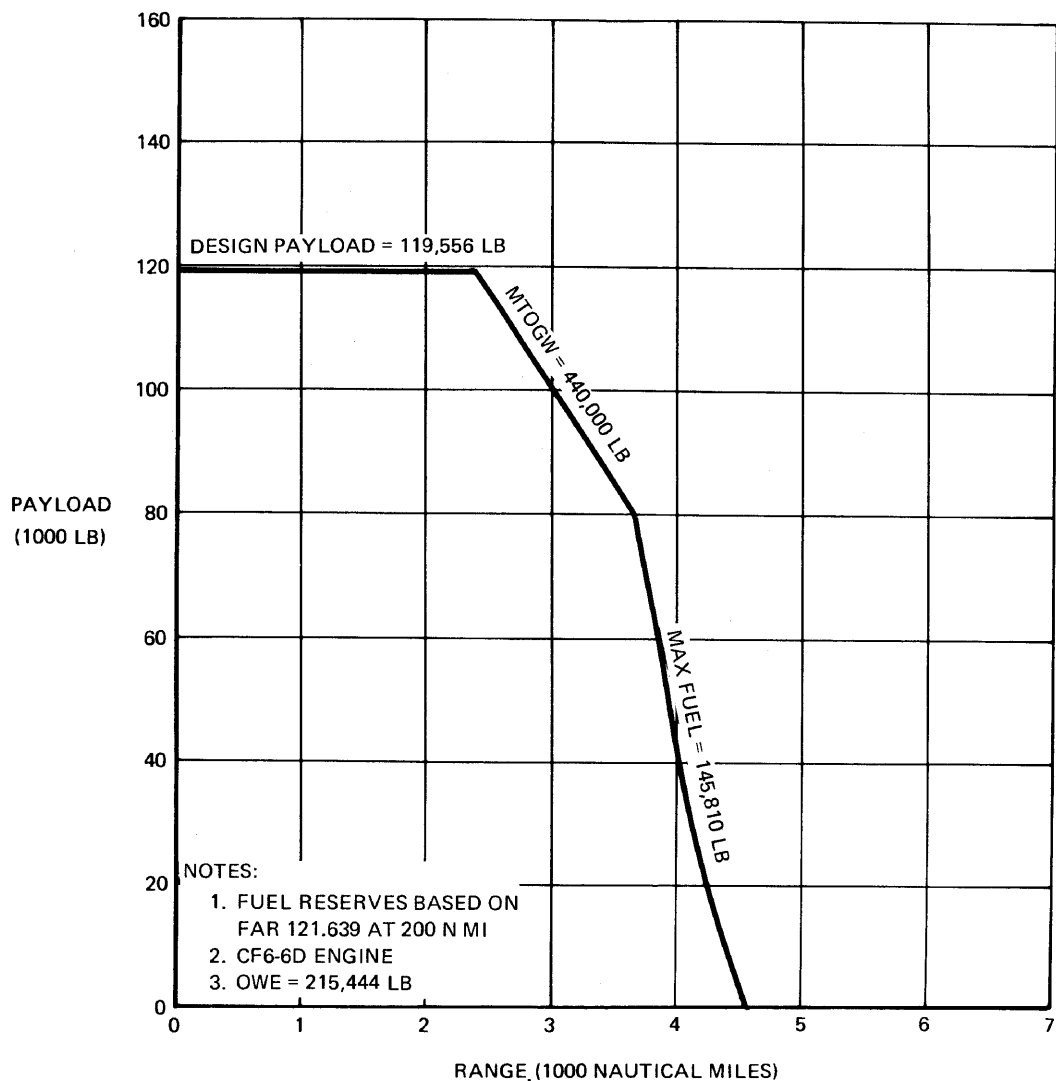


### 3.2 PAYLOAD-RANGE

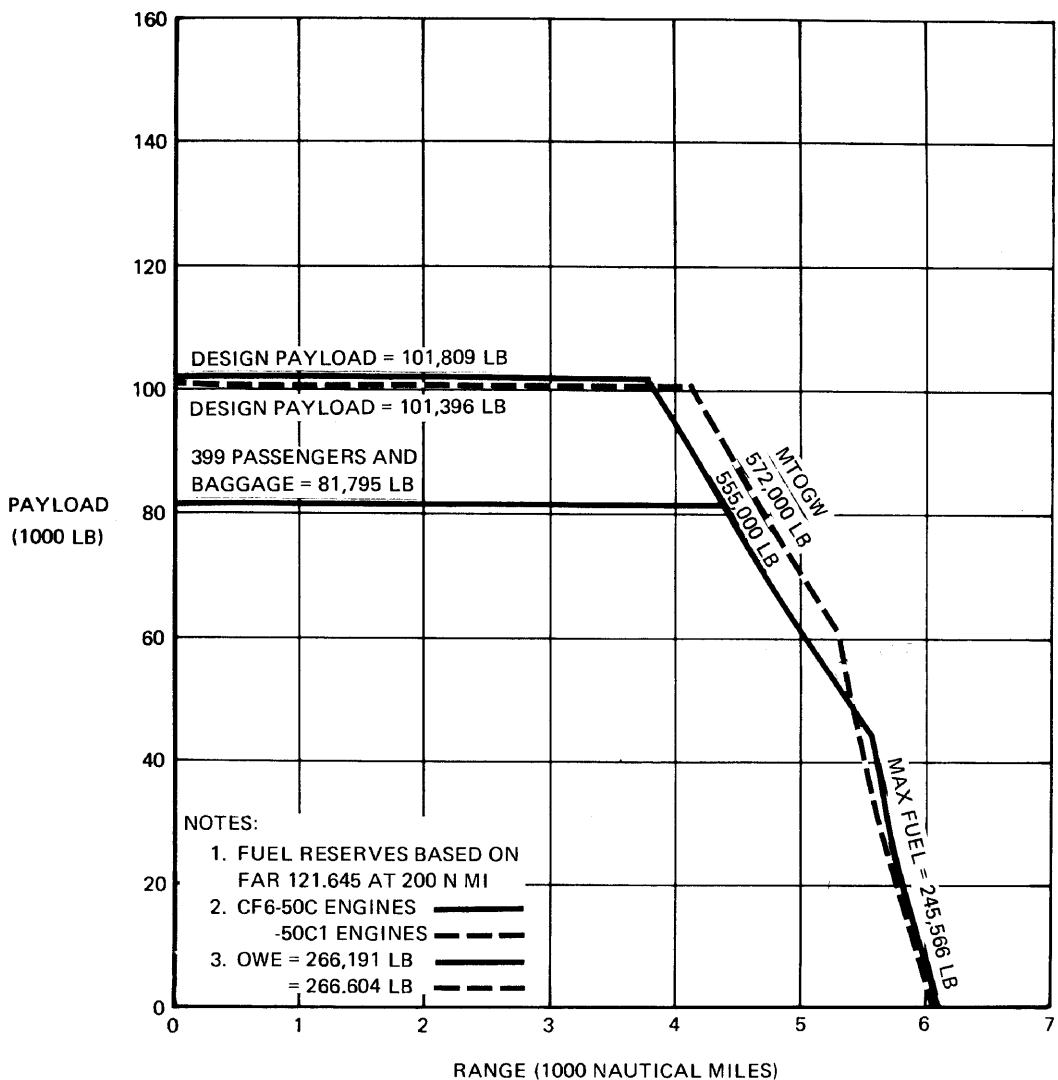
#### 3.2.1 PAYLOAD/RANGE FOR MACH 0.82 CRUISE 31,000/35,000 FEET STEP ALTITUDE CRUISE MODEL DC-10 SERIES 10



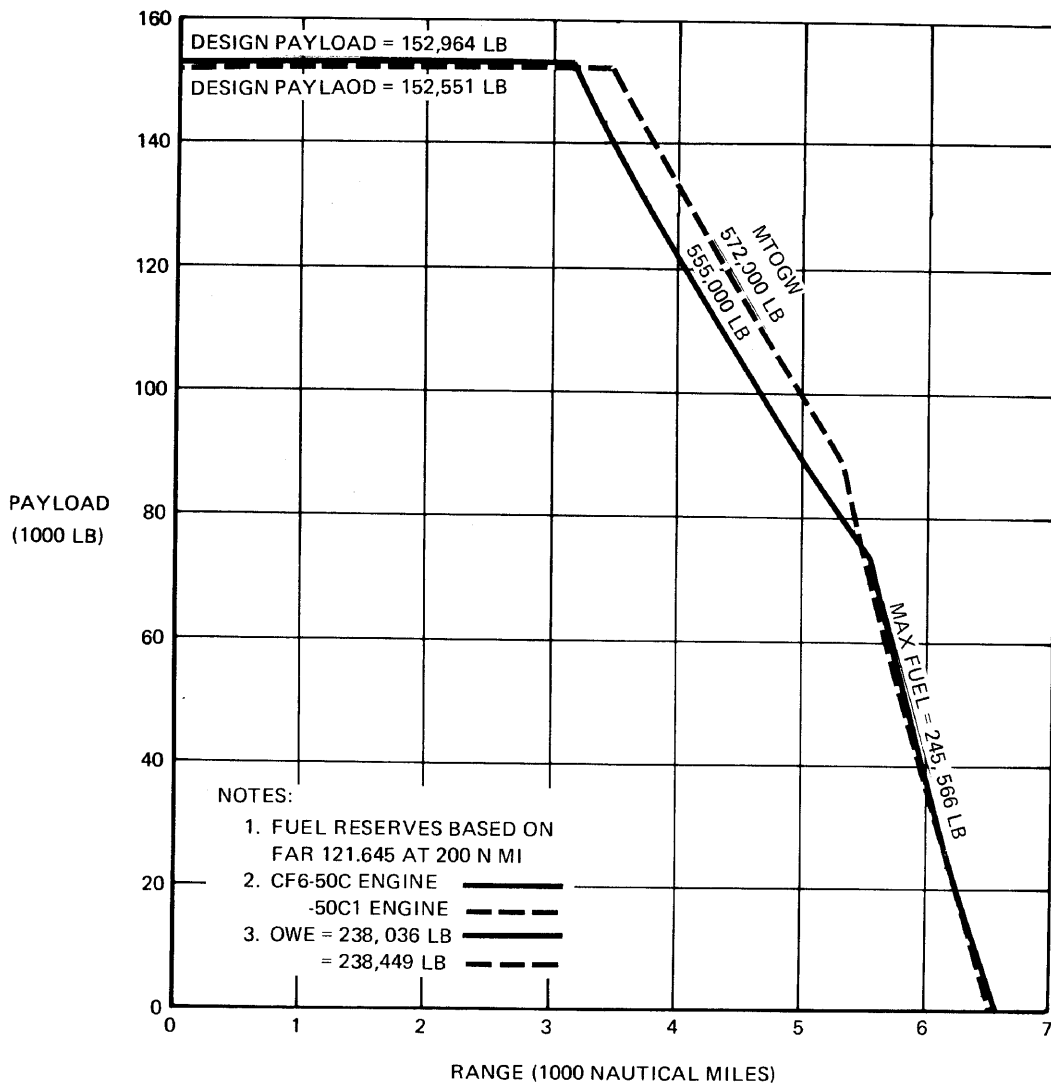
### 3.2.1 PAYLOAD/RANGE FOR MA CH 0.82 CRUISE 31,000/35,000 FEET STEP ALTITUDE CRUISE MODEL DC-10 SERIES 10



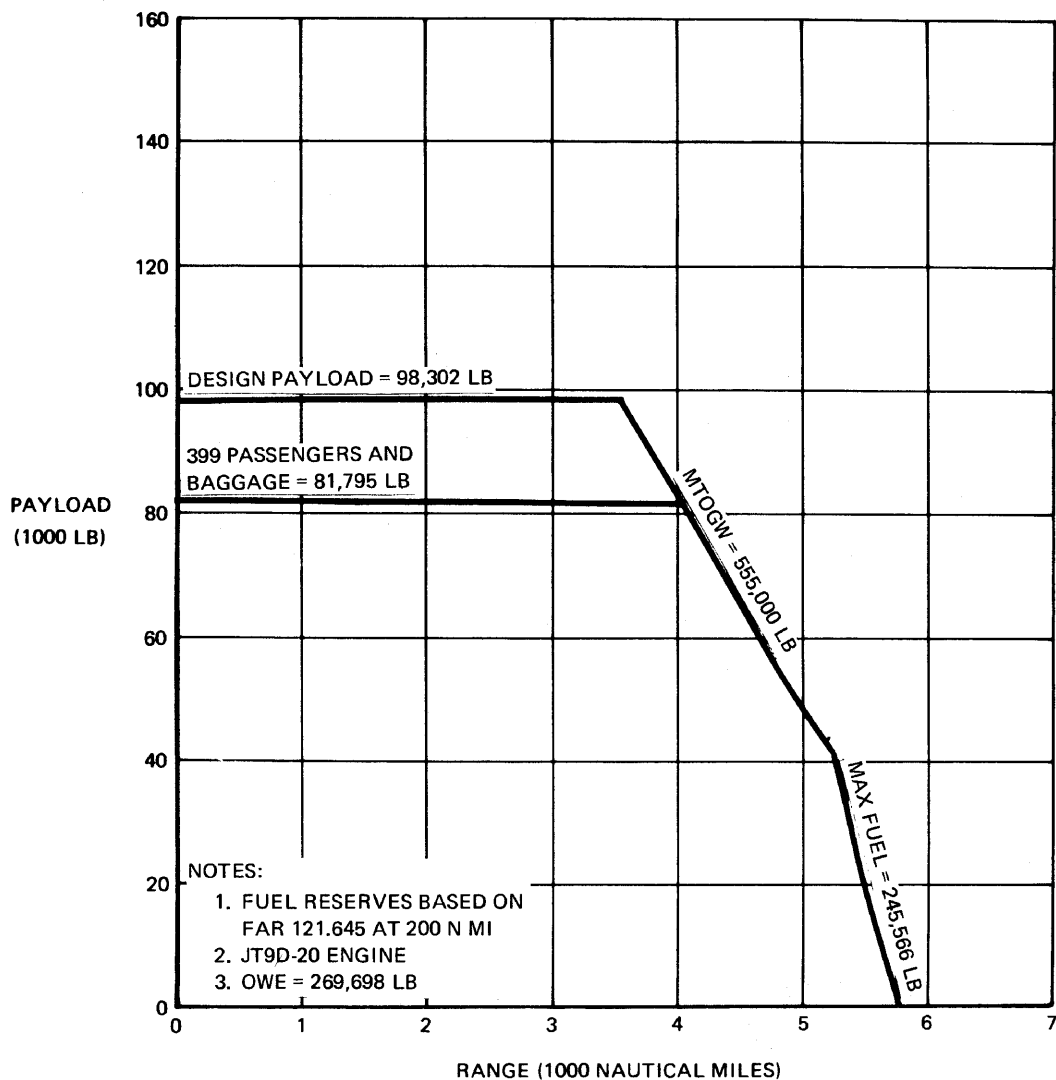
### 3.2.1 PAYLOAD/RANGE FOR MACH 0.82 CRUISE 31,000/35,000 FEET STEP ALTITUDE CRUISE MODEL DC-10 SERIES 10CF ALL-CARGO MODE



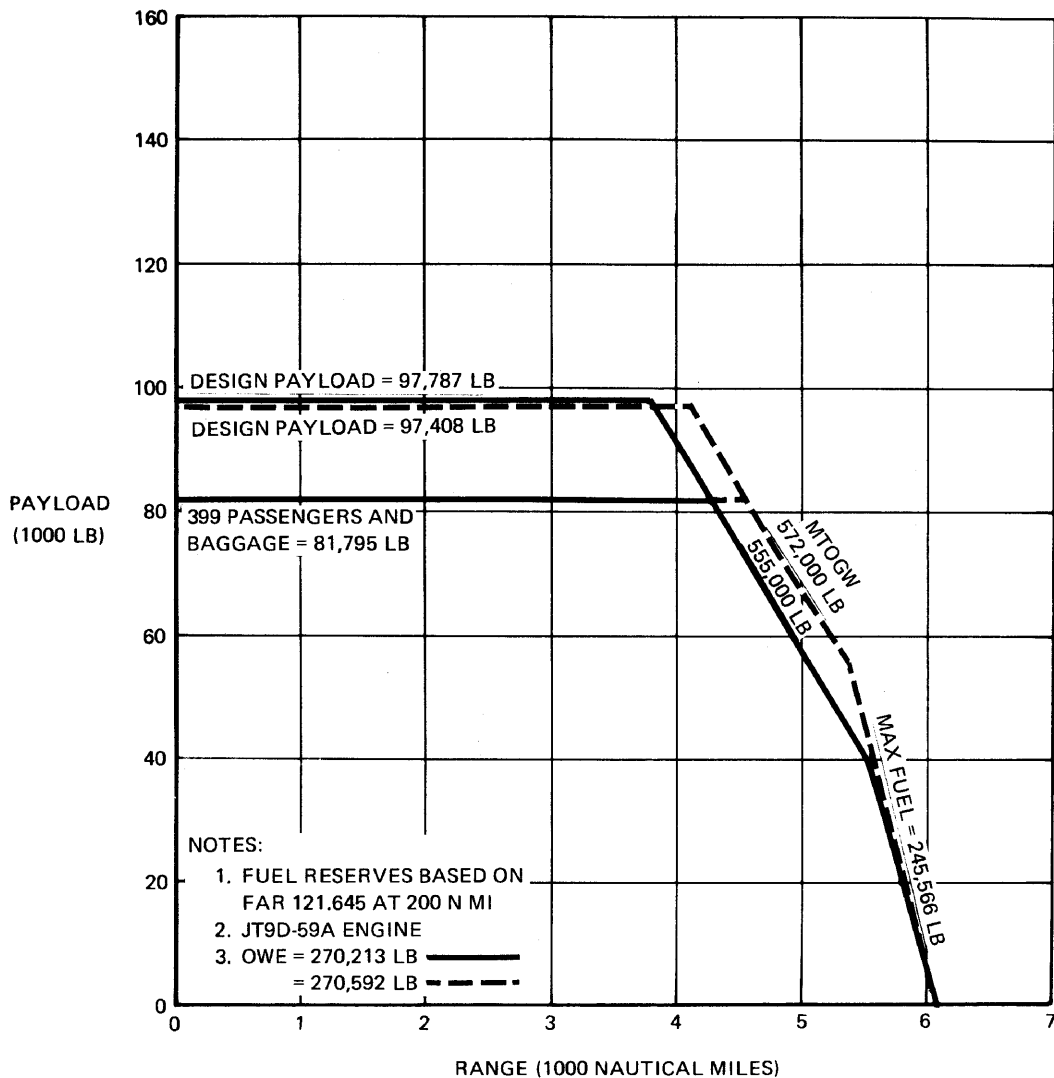
### 3.2.1 PAYLOAD/RANGE FOR MACH 0.82 CRUISE 31,000/35,000 FEET STEP ALTITUDE CRUISE MODEL DC-10 SERIES 30



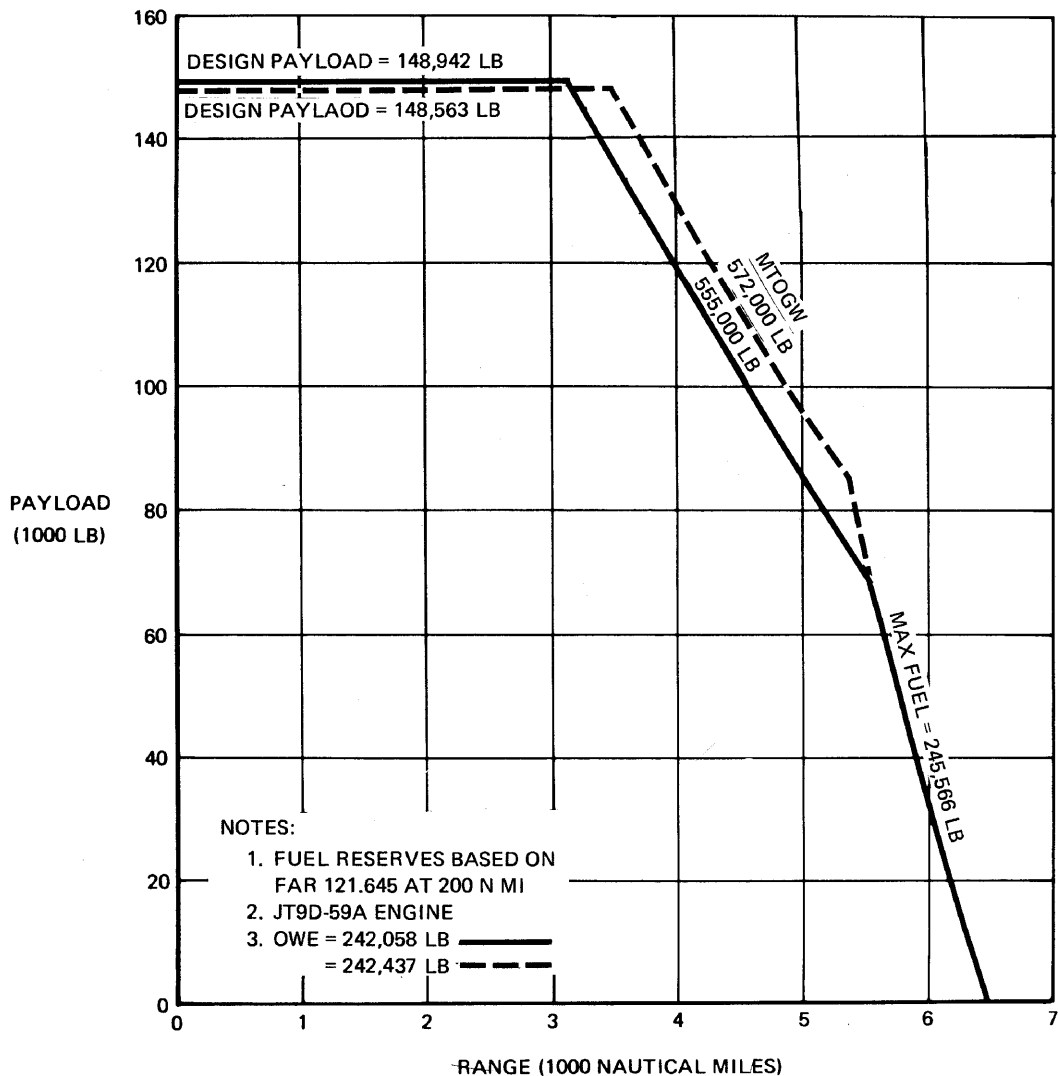
### 3.2.1 PAYLOAD/RANGE FOR MACH 0.82 CRUISE 31,000/35,000 FEET STEP ALTITUDE CRUISE MODEL DC-10 SERIES 30CF ALL-CARGO MODE



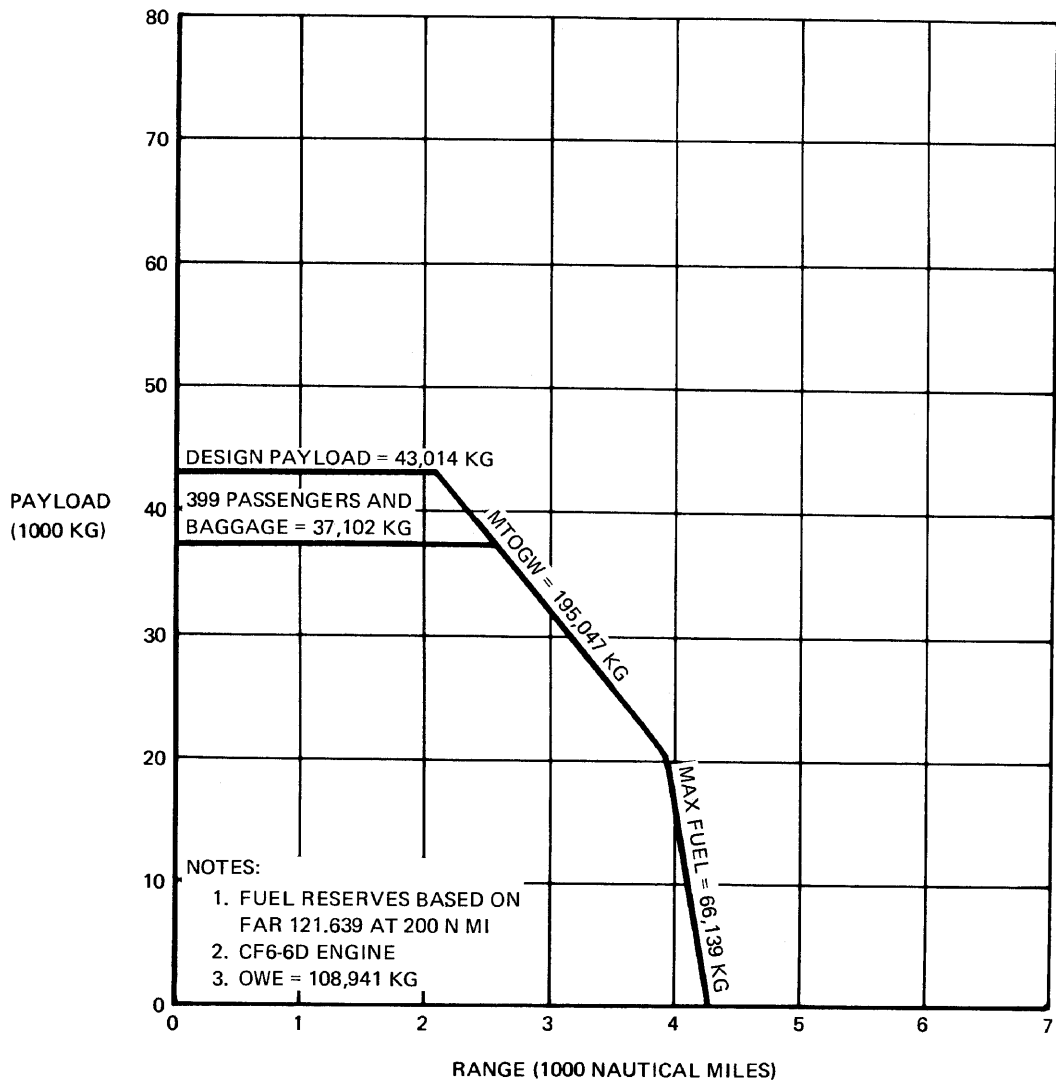
### 3.2.1 PAYLOAD/RANGE FOR MACH 0.83 CRUISE 31,000/35,000 FEET STEP ALTITUDE CRUISE MODEL DC-10 SERIES 40



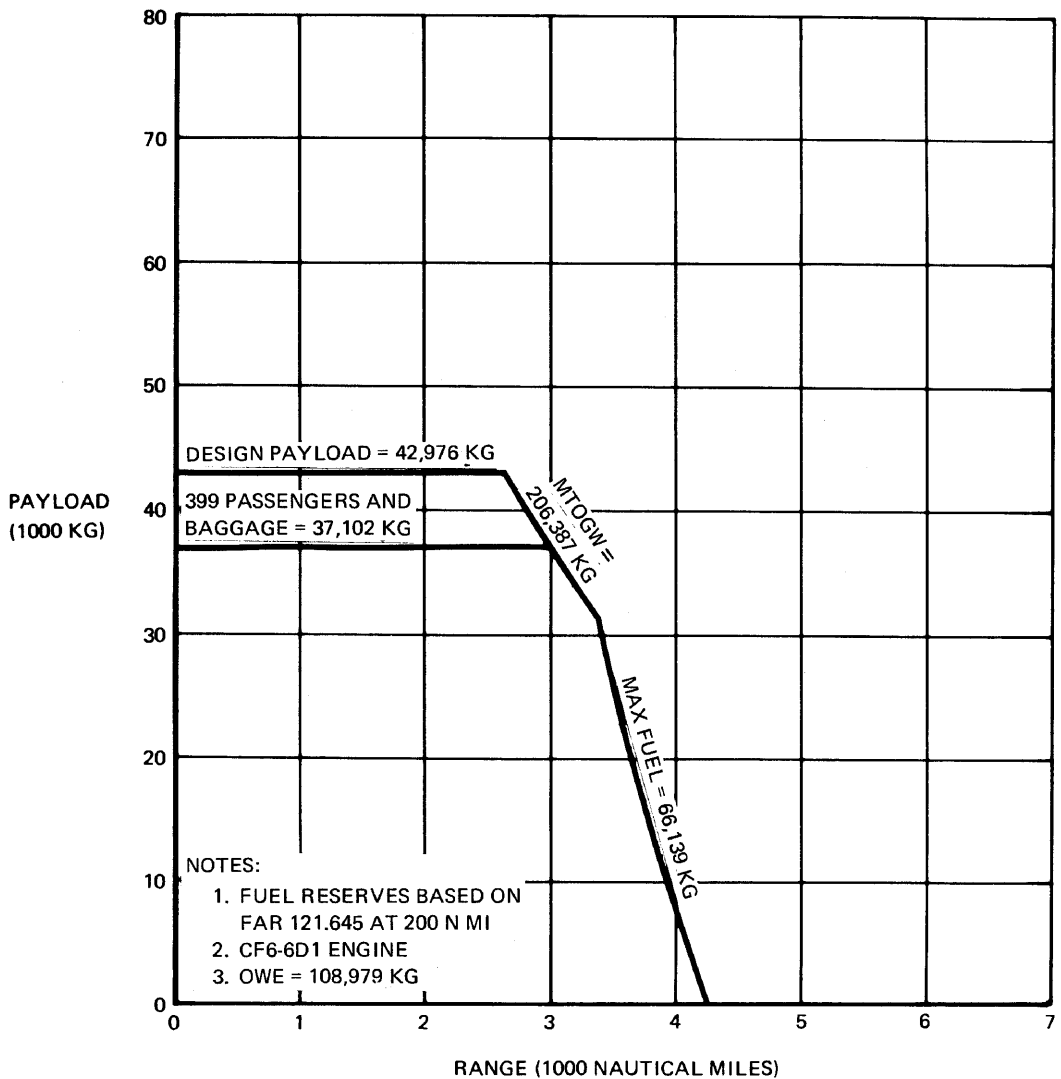
### 3.2.1 PAYLOAD/RANGE FOR MACH 0.82 CRUISE 31,000/35,000 FEET STEP ALTITUDE CRUISE MODEL DC-10 SERIES 40



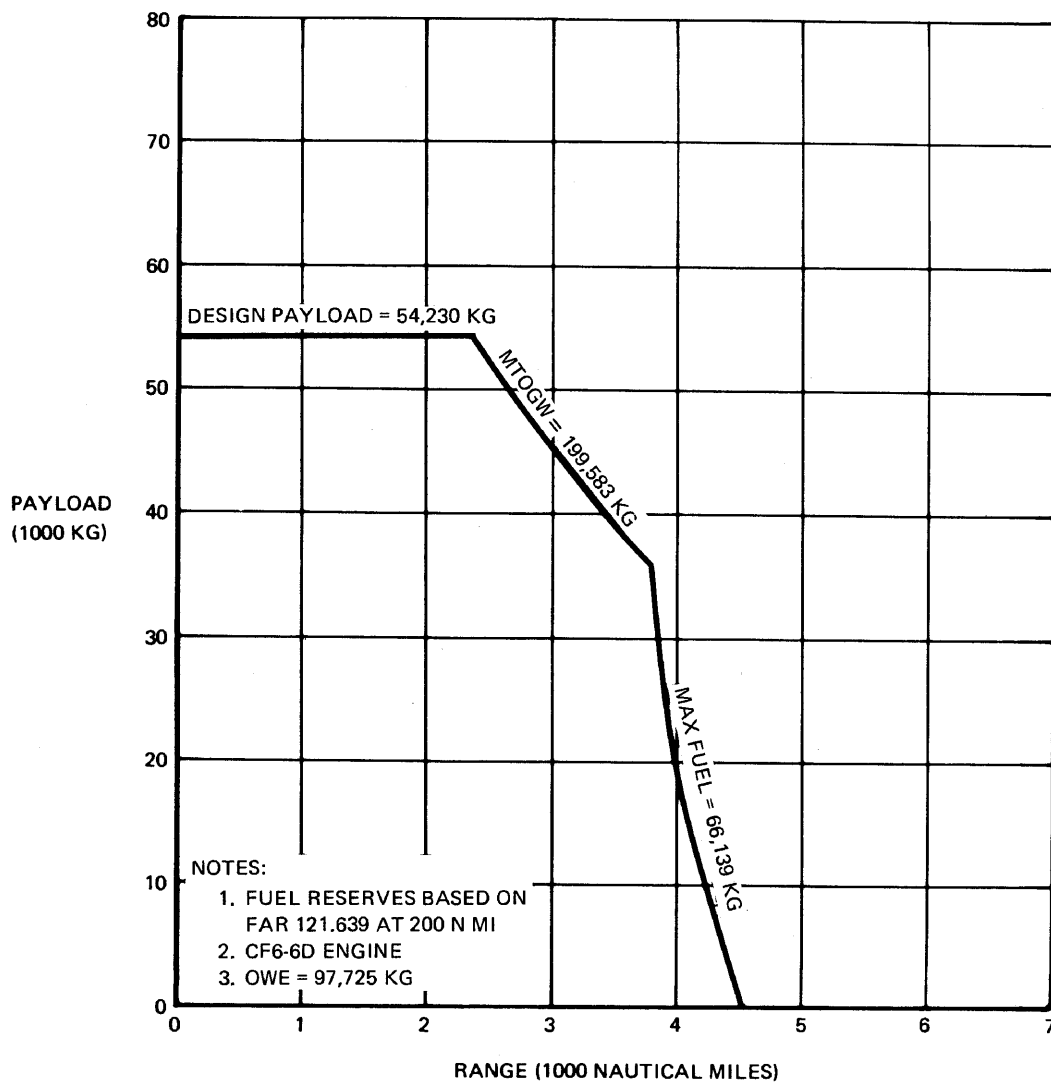
3.2.1 PAYLOAD/RANGE FOR MACH 0.82 CRUISE  
 31,000/35,000 FEET STEP ALTITUDE CRUISE  
 MODEL DC-10 SERIES 40CF  
 ALL-CARGO MODE



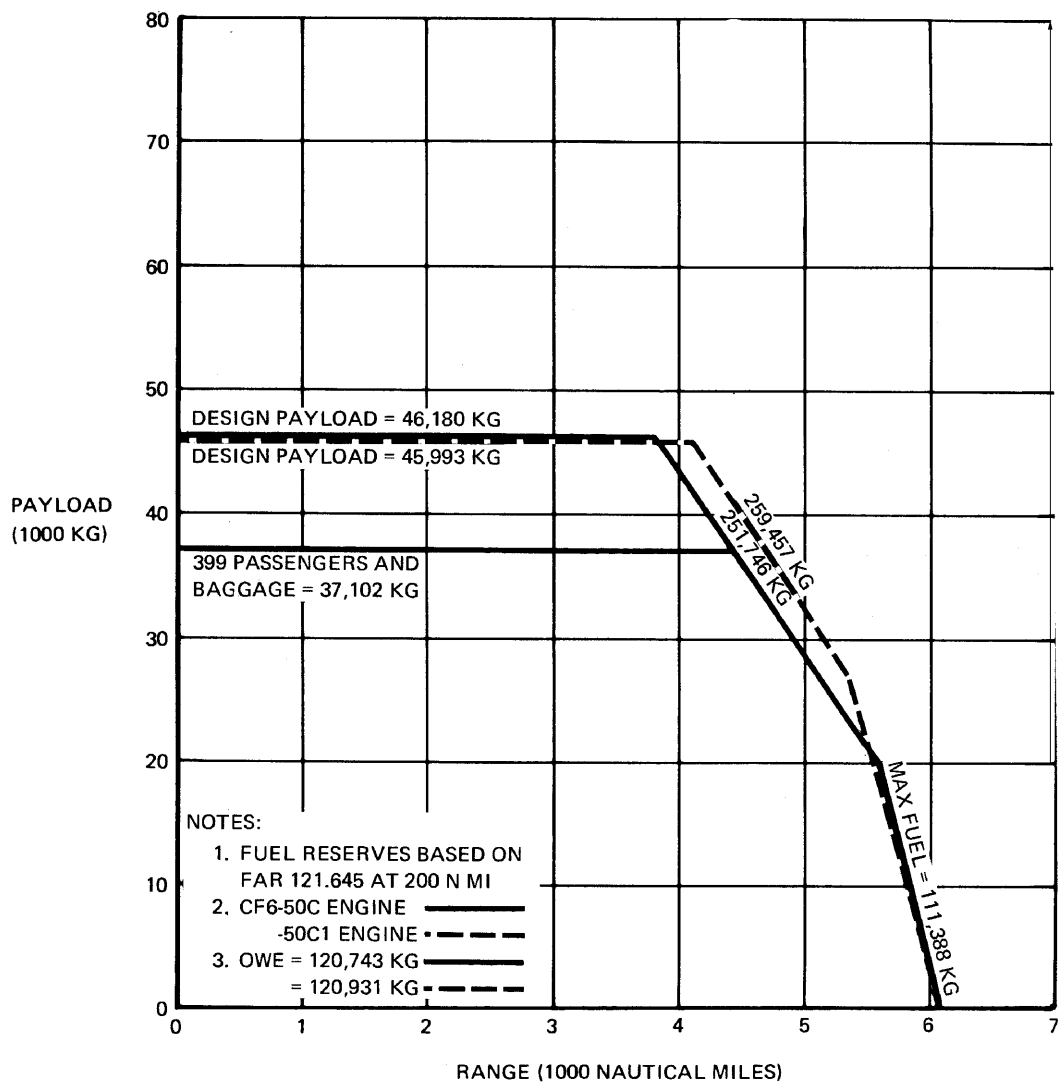
### 3.2.2 PAYLOAD/RANGE FOR MACH 0.82 CRUISE 9,450/10,668 METERS STEP ALTITUDE CRUISE MODEL DC-10 SERIES 10



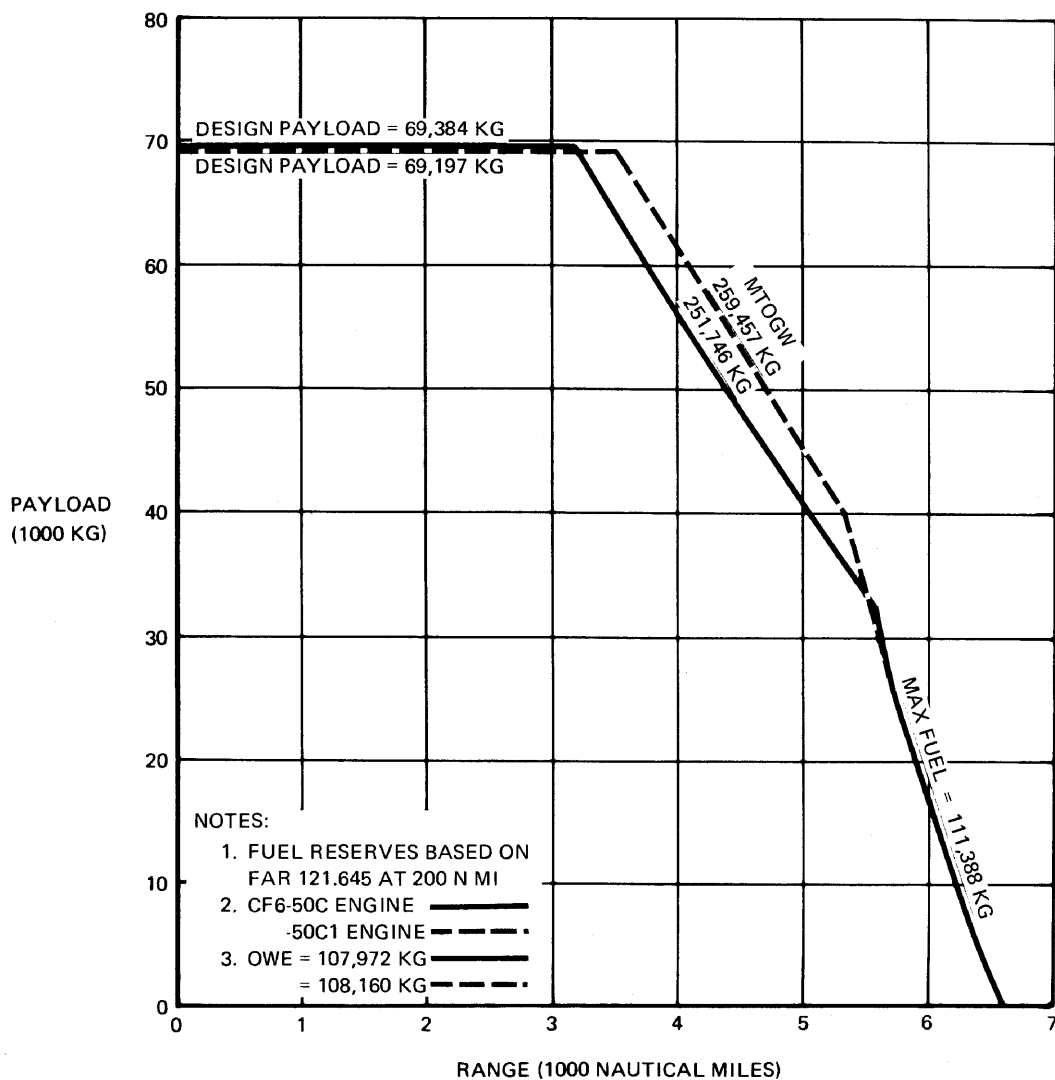
### 3.2.2 PAYLOAD/RANGE FOR MACH 0.82 CRUISE 9,450/10,668 METERS STEP ALTITUDE CRUISE MODEL DC-10 SERIES 10



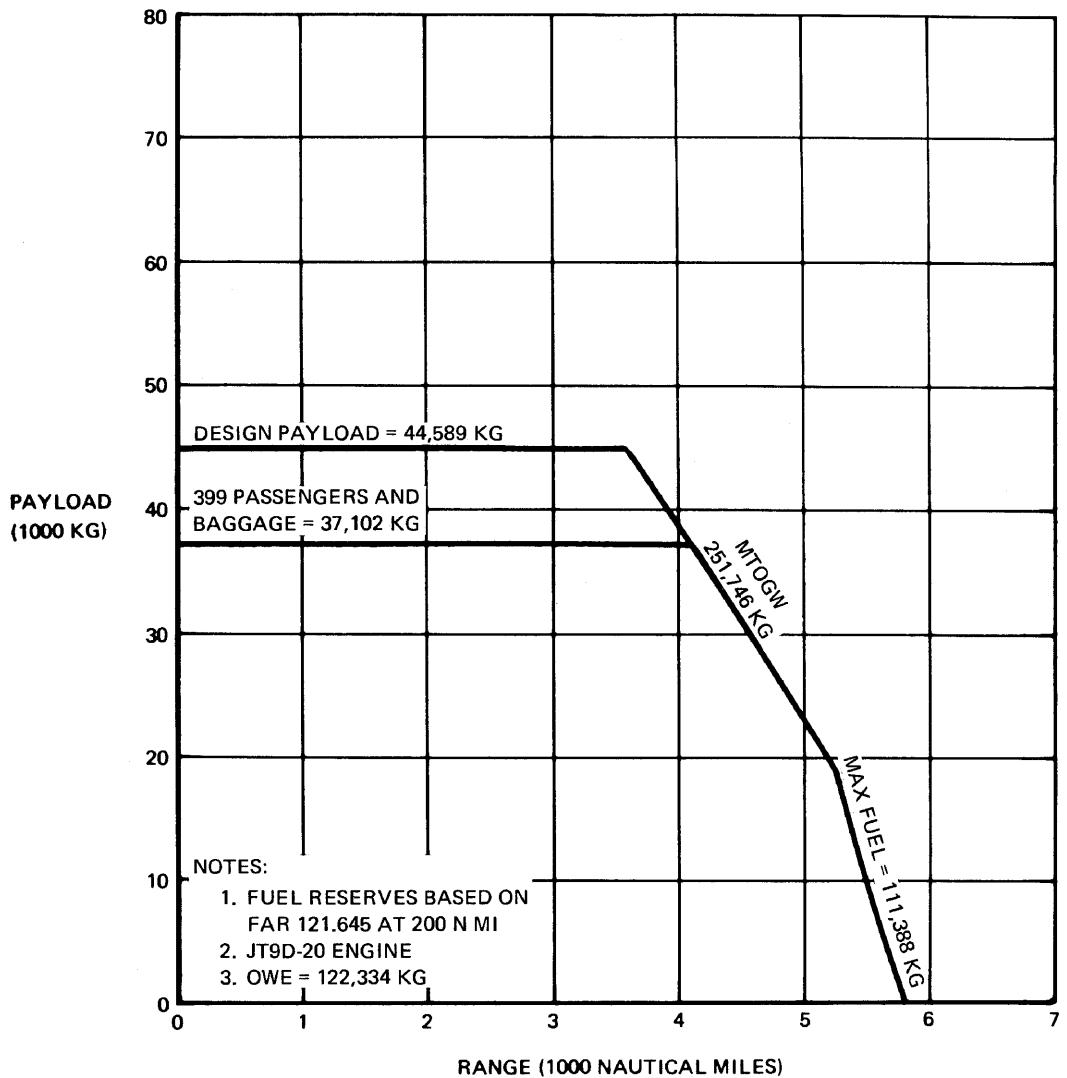
3.2.2 PAYLOAD/RANGE FOR MACH 0.82 CRUISE  
 9,450/10,668 METERS STEP ALTITUDE CRUISE  
 MODEL DC-10 SERIES 10CF  
 ALL-CARGO MODE



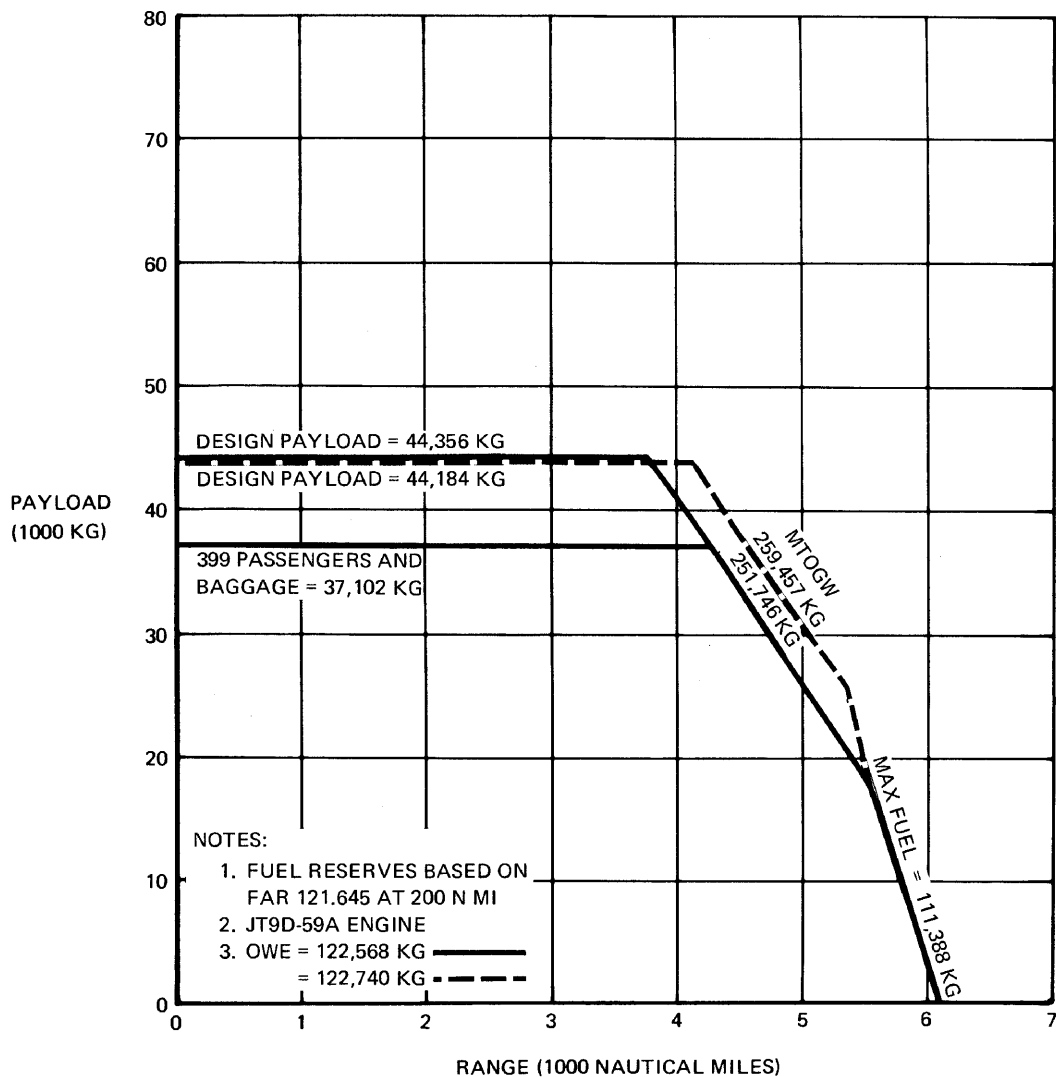
### 3.2.2 PAYLOAD/RANGE FOR MACH 0.82 CRUISE 9,450/10,668 METERS STEP ALTITUDE CRUISE MODEL DC-10 SERIES 30



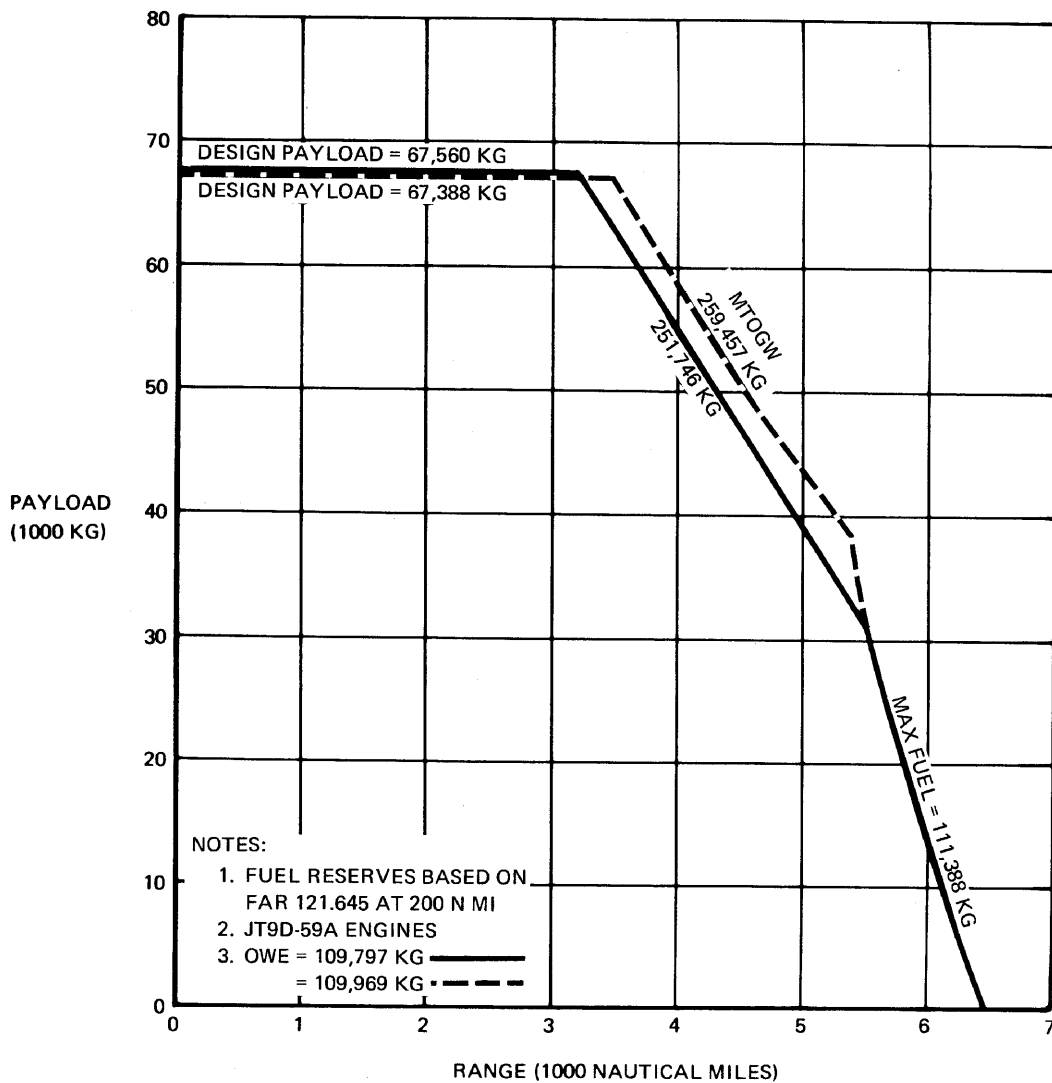
3.2.2 PAYLOAD/RANGE FOR MACH 0.82 CRUISE  
 9,450/10,668 METERS STEP ALTITUDE CRUISE  
 MODEL DC-10 SERIES 30CF  
 ALL-CARGO MODE



### 3.2.2 PAYLOAD/RANGE FOR MACH 0.83 CRUISE 9,450/10,668 METERS STEP ALTITUDE CRUISE MODEL DC-10 SERIES 40



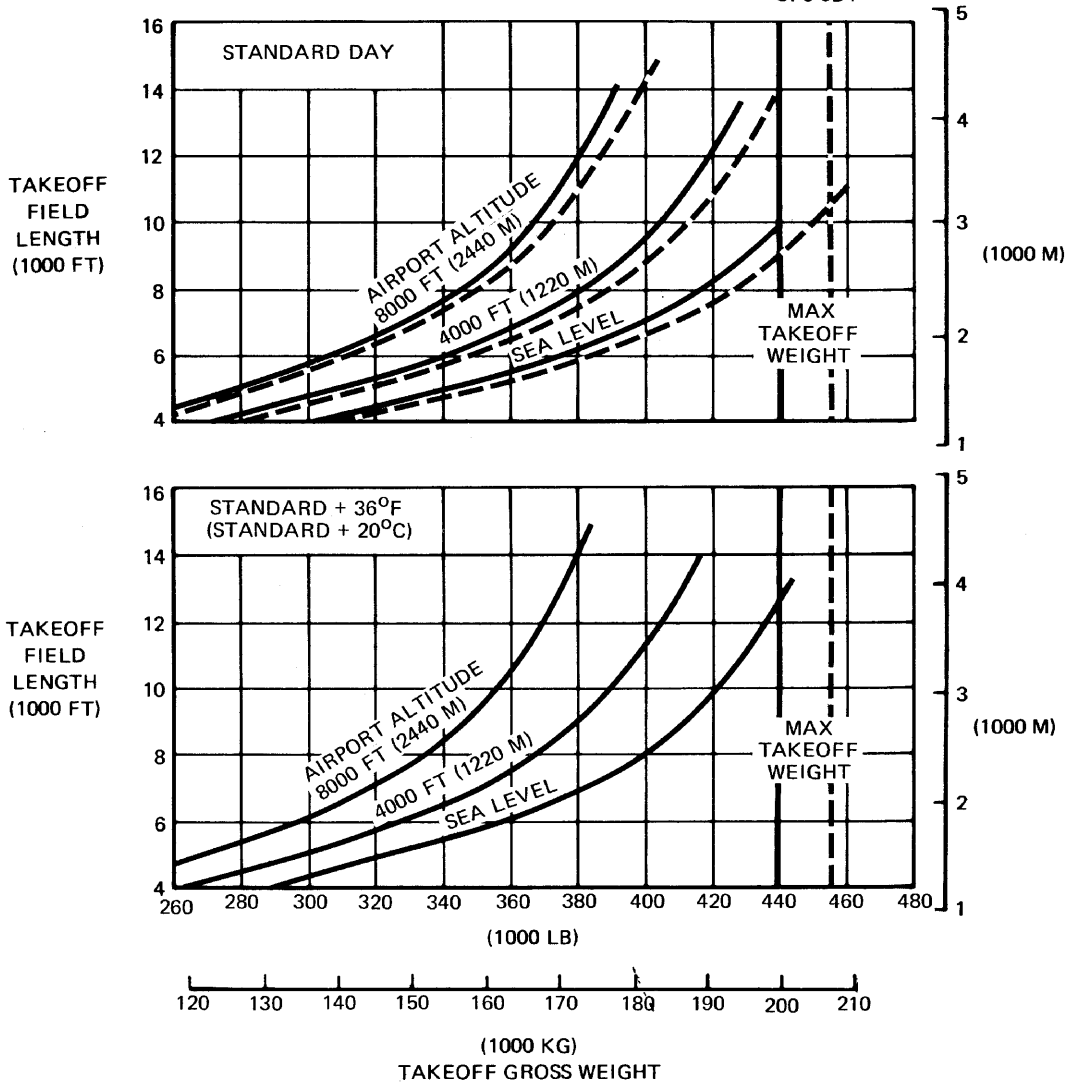
### 3.2.2 PAYLOAD/RANGE FOR MACH 0.82 CRUISE 9,450/10,668 METERS STEP ALTITUDE CRUISE MODEL DC-10 SERIES 40



### 3.2.2 PAYLOAD/RANGE FOR MACH 0.82 CRUISE 9,450/10,668 METERS STEP ALTITUDE CRUISE MODEL DC-10 SERIES 40CF ALL-CARGO MODE

- NOTES:
- TAKEOFF THRUST
  - ZERO RUNWAY SLOPE
  - ZERO WIND

- ACFT PACKS OFF
- GE ENGINES
- CF6-6D
- CF6-6D1

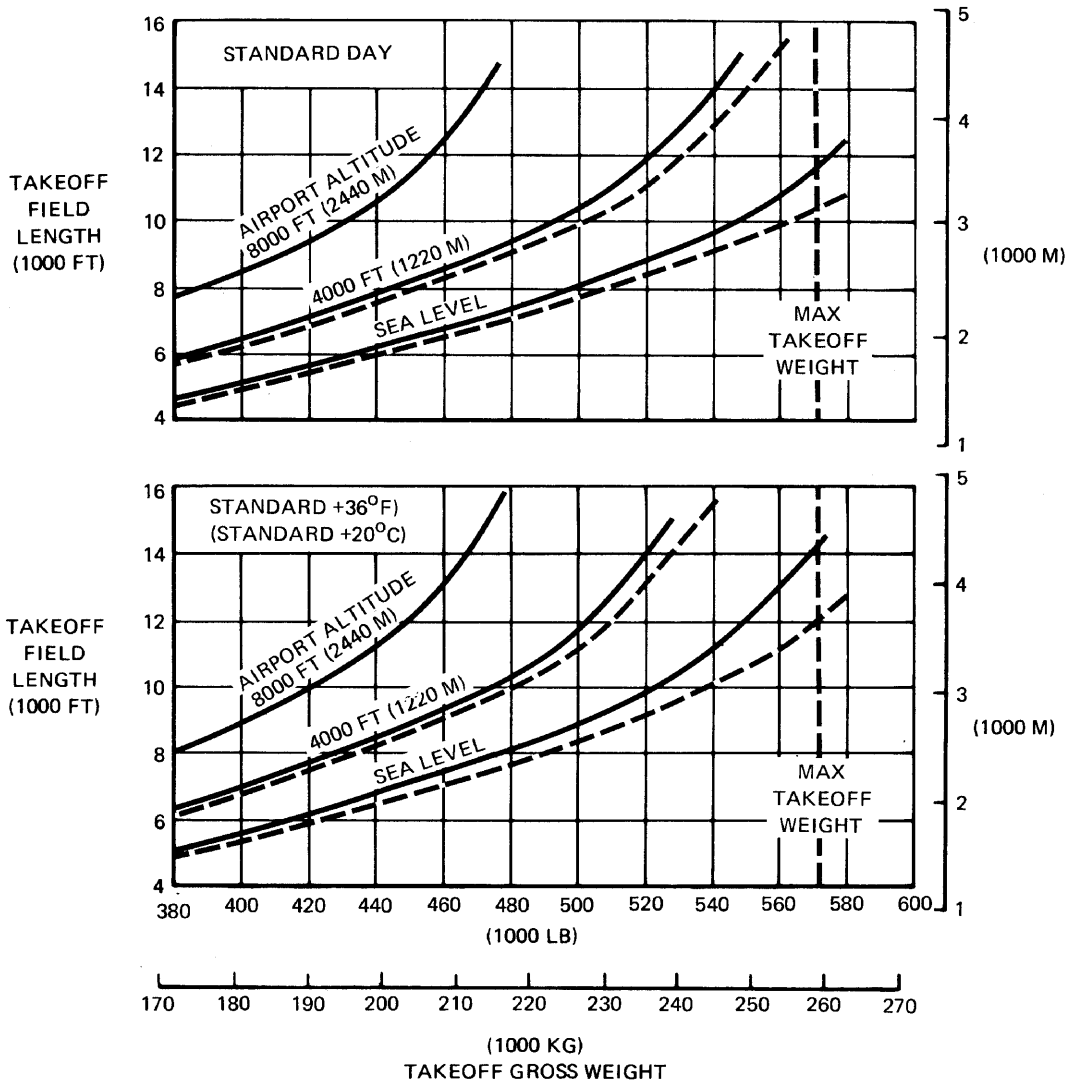


### 3.3 FAR TAKEOFF RUNWAY LENGTH REQUIREMENTS MODEL DC-10 SERIES 10 AND 10CF

NOTES:

- TAKEOFF THRUST
- ZERO RUNWAY SLOPE
- ZERO WIND

- A/C PACKS OFF
- G.E. ENGINES
- CF6-50C
- - - CF6-50C1

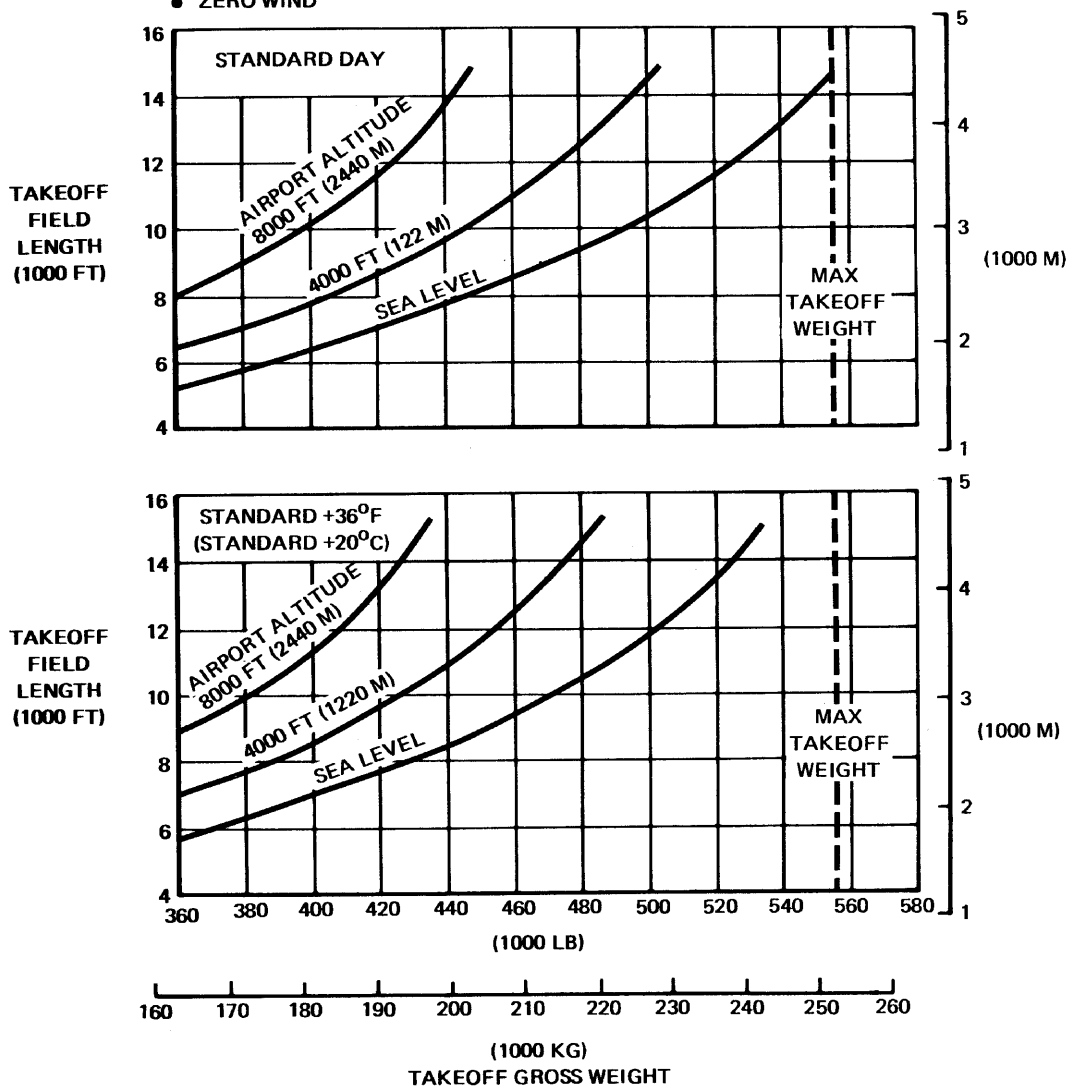


### 3.3 FAR TAKEOFF RUNWAY LENGTH REQUIREMENTS MODEL DC-10 SERIES 30 AND 30CF

NOTES:

- DRY TAKEOFF THRUST
- ZERO RUNWAY SLOPE
- ZERO WIND

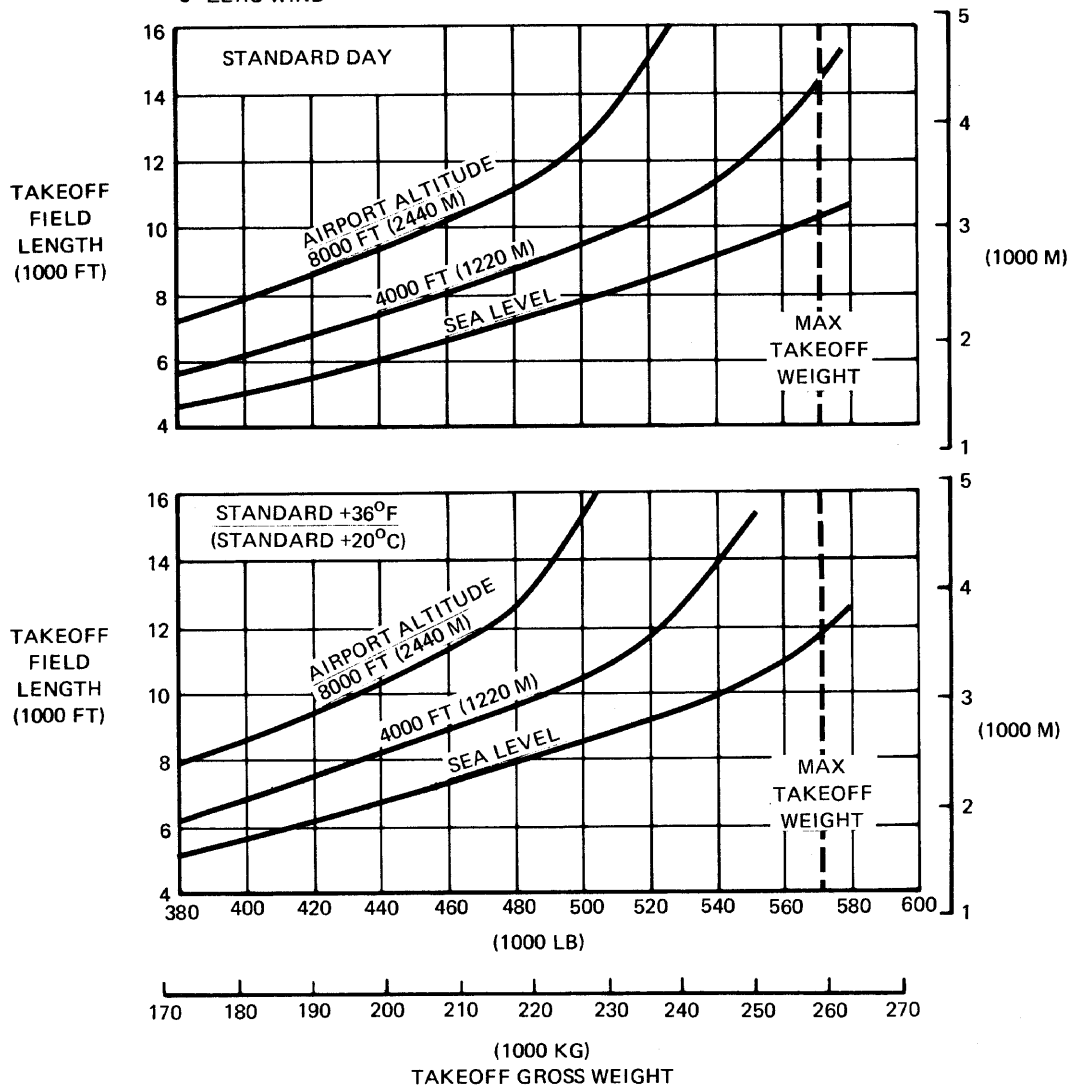
- A/C PACKS OFF
- JT9D-20 ENGINES



### 3.3 FAR TAKEOFF RUNWAY LENGTH REQUIREMENTS MODEL DC-10 SERIES 40 AND 40CF

NOTES:

- TAKEOFF THRUST
- ZERO RUNWAY SLOPE
- ZERO WIND
- A/C PACKS OFF
- JT9D-59A ENGINES



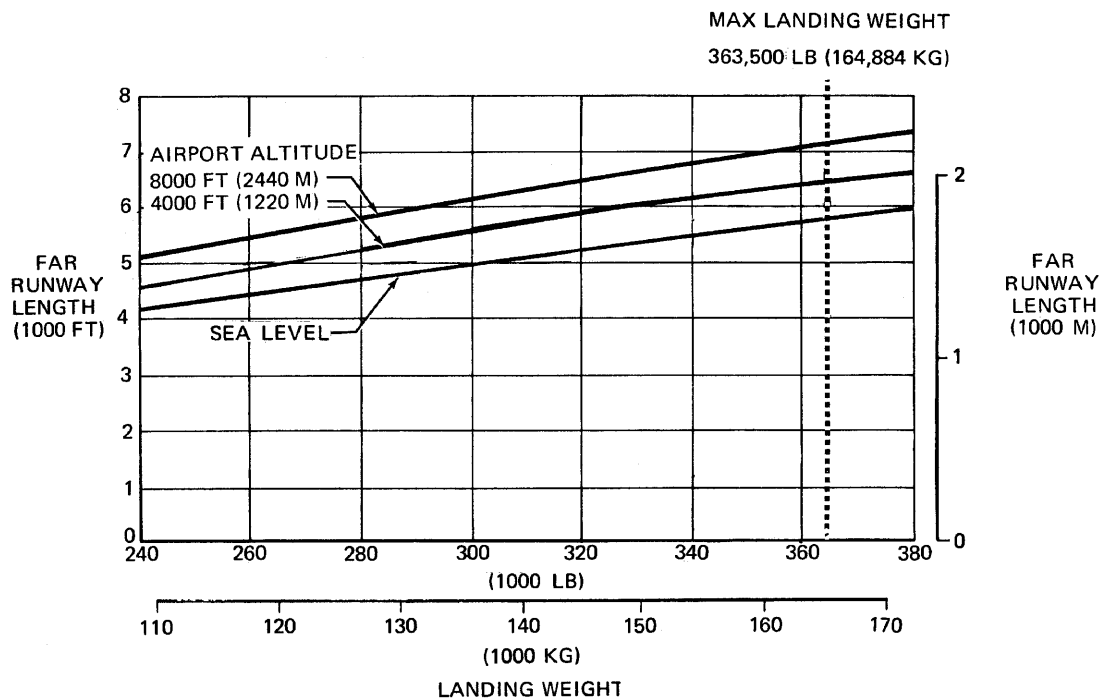
### 3.3 FAR TAKEOFF RUNWAY LENGTH REQUIREMENTS MODEL DC-10 SERIES 40 AND 40CF

NOTES:

- FLAPS 50°
- $V_{APP} = 1.3 V_S$  AT 50 FT
- ANTISKID OPERATIVE
- DRY HARD-SURFACE RUNWAY
- WET RUNWAY LENGTH REQUIREMENTS = 1.15 x DRY RUNWAY LENGTH REQUIREMENTS
- ENGINE CF6-6D/-6D1
- REVERSE THRUST NOT INCLUDED

LEGEND:

- $V_{APP}$  IS APPROACH VELOCITY
- $V_S$  IS STALL VELOCITY



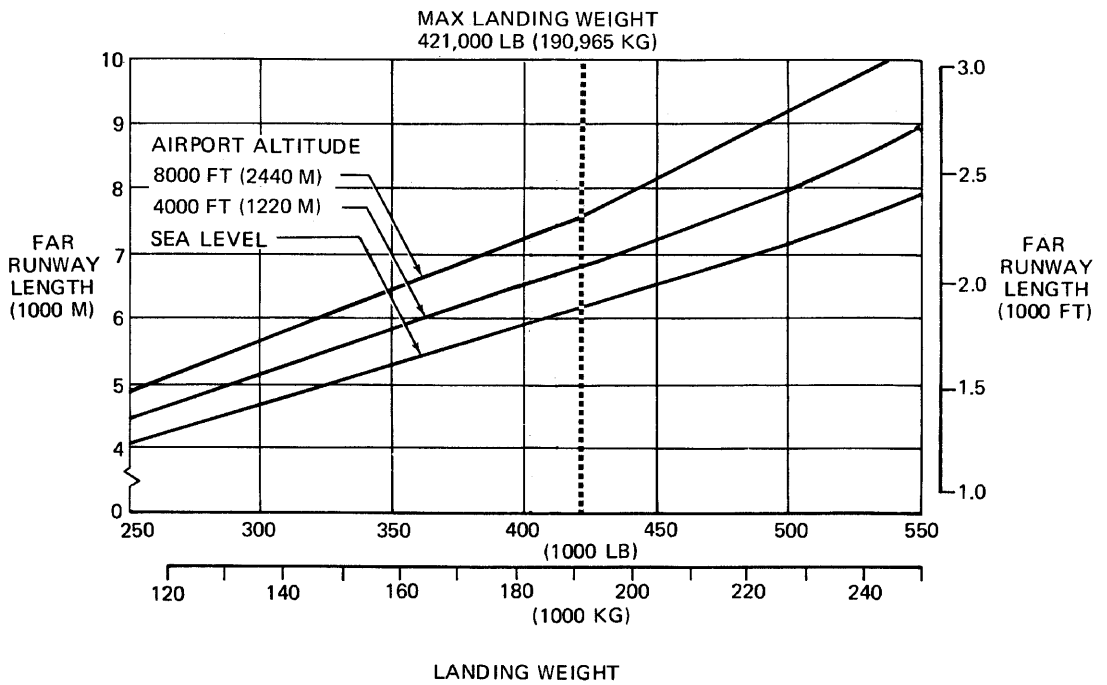
### 3.4 FAR LANDING RUNWAY LENGTH REQUIREMENTS MODEL DC-10 SERIES 10 AND 10CF

NOTES:

- FLAPS 50°
- $V_{APP} = 1.3 V_S$  AT 50 FT
- ANTISKID OPERATIVE
- DRY HARD-SURFACE RUNWAY
- WET RUNWAY LENGTH REQUIREMENTS = 1.15 x DRY RUNWAY LENGTH REQUIREMENTS
- ENGINE CF6-50C, -50C1
- REVERSE THRUST NOT INCLUDED

LEGEND:

- $V_{APP}$  IS APPROACH VELOCITY
- $V_S$  IS STALL VELOCITY



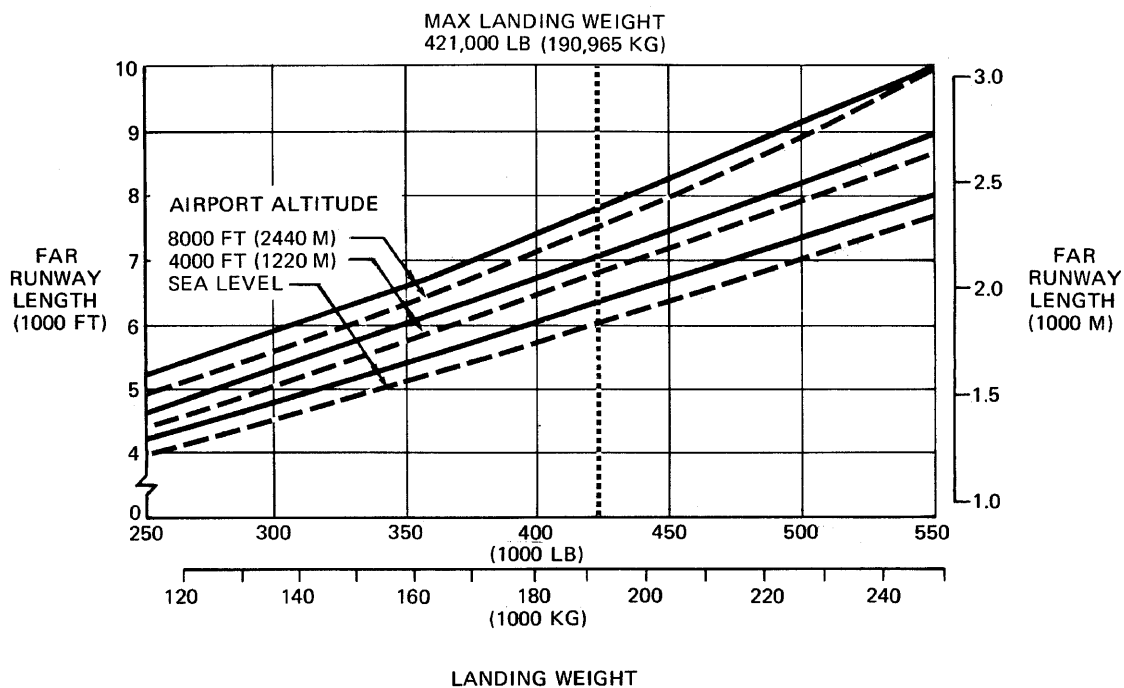
### 3.4 FAR LANDING RUNWAY LENGTH REQUIREMENTS MODEL DC-10 SERIES 30 AND 30CF

NOTES:

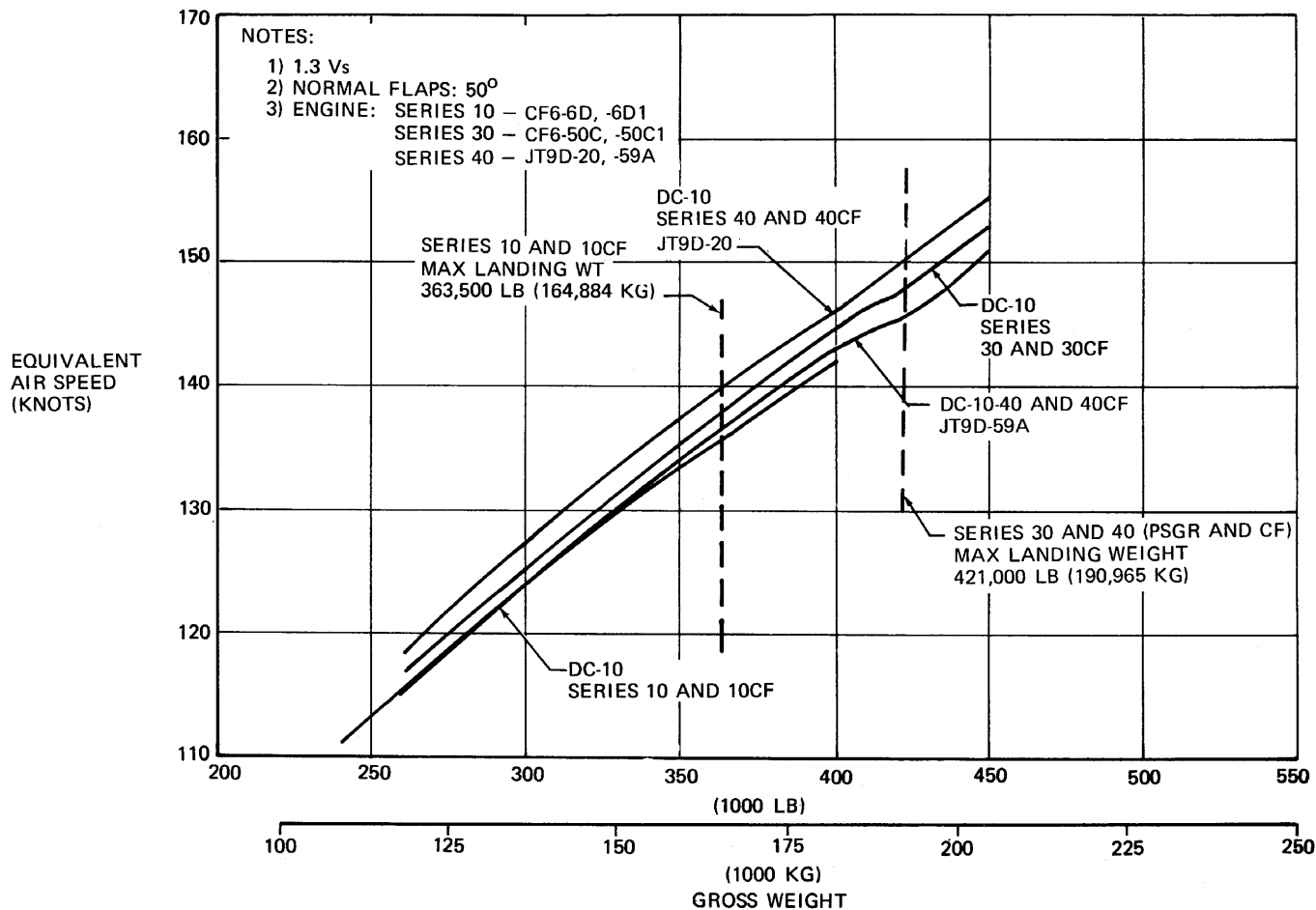
- FLAPS 50°
- $V_{APP} = 1.3 V_S$  AT 50 FT
- ANTI-SKID OPERATIVE
- REVERSE THRUST NOT INCLUDED
- ENGINE JT9D-20 —————
- ENGINE JT9D-59A - - - - -
- DRY HARD-SURFACE RUNWAY
- WET RUNWAY LENGTH REQUIREMENTS = 1.15 x DRY RUNWAY LENGTH REQUIREMENTS

LEGEND:

- $V_{APP}$  IS APPROACH VELOCITY
- $V_S$  IS STALL VELOCITY



### 3.4 FAR LANDING RUNWAY LENGTH REQUIREMENTS MODEL DC-10 SERIES 40 AND 40CF



3.5 APPROACH SPEED (THRESHOLD)  
 MODEL DC-10 SERIES 10, 10CF, 30, 30CF, 40 AND 40CF

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## **4.0 GROUND MANEUVERING**

- 4.1 General Information**
- 4.2 Turning Radii, No Slip Angle**
- 4.3 Minimum Turning Radii**
- 4.4 Visibility From Cockpit**
- 4.5 Runway and Taxiway Turn Paths**
- 4.6 Runway Holding Bay Apron**
- 4.7 Minimum Parking Space Requirements**

## 4.0 GROUND MANEUVERING

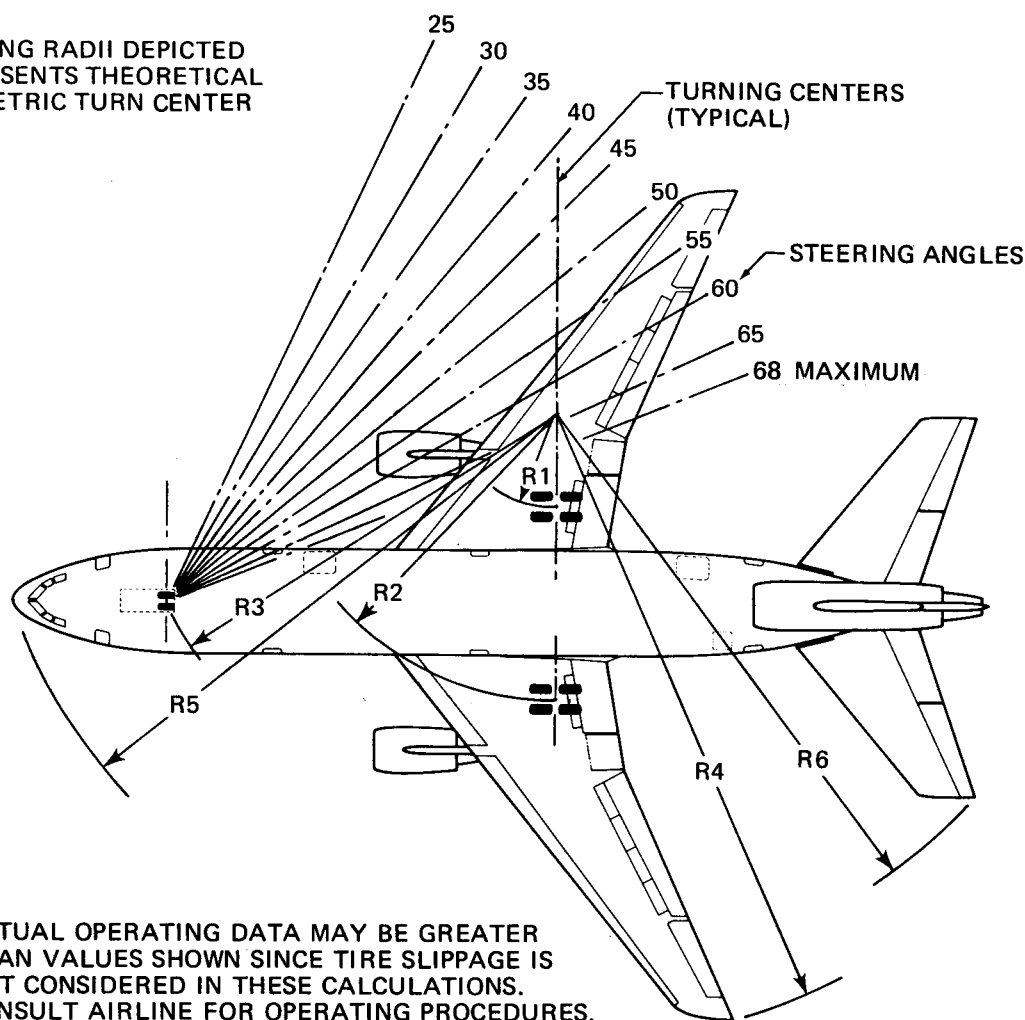
### 4.1 General Information

This section provides airplane turning capability and maneuvering characteristics.

For ease of presentation, these data have been determined from the theoretical limits imposed by the geometry of the aircraft, and where noted, provide for a normal allowance for tire slippage. As such, the data reflect the turning capability of the aircraft in favorable operating circumstances. They should only be used as guidelines for the method of determination of such parameters and for the maneuvering characteristics of this aircraft type.

In the ground operating mode, varying airline practices may demand that more conservative turning procedures be adopted to avoid excessive tire wear and reduce possible maintenance problems. Airline operating techniques will vary in the level of performance over a wide range of operating circumstances throughout the world. Variations from standard aircraft operating patterns may be necessary to satisfy physical constraints within the maneuvering area, such as adverse grades, limited area, or high risk of jet blast damage. For these reasons, ground maneuvering requirements should be coordinated with the using airlines prior to layout planning.

TURNING RADII DEPICTED  
REPRESENTS THEORETICAL  
GEOMETRIC TURN CENTER

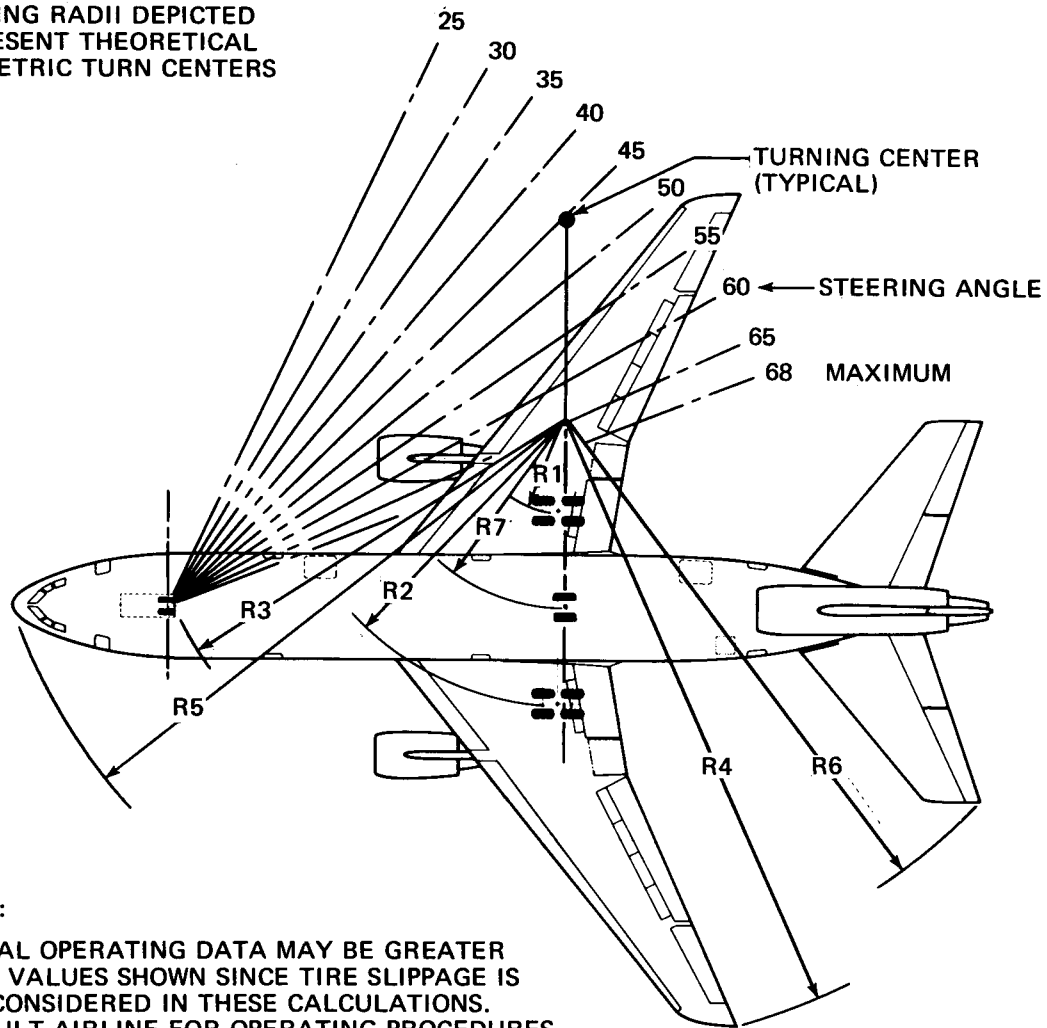


NOTE: ACTUAL OPERATING DATA MAY BE GREATER  
THAN VALUES SHOWN SINCE TIRE SLIPPAGE IS  
NOT CONSIDERED IN THESE CALCULATIONS.  
CONSULT AIRLINE FOR OPERATING PROCEDURES.

STEERING ANGLE (DEGREE)	R-1		R-2		R-3		R-4		R-5		R-6	
	FT	M	FT	M	FT	M	FT	M	FT	M	FT	M
25	138.2	42.1	172.9	52.7	171.6	52.3	235.7	71.8	185.1	56.4	206.2	62.9
30	108.3	33.0	142.9	43.6	145.0	44.2	206.2	62.9	160.8	49.0	178.8	54.5
35	82.2	26.3	120.9	36.9	126.4	38.5	184.5	56.2	144.2	44.0	159.2	48.5
40	69.1	21.1	103.8	31.6	112.8	34.4	167.7	51.1	132.5	40.4	144.5	44.0
45	55.2	16.8	89.9	27.4	102.6	31.3	154.1	47.0	123.8	37.7	133.0	40.5
50	43.5	13.3	78.2	23.8	94.7	28.9	142.8	43.5	117.4	35.8	123.7	37.7
55	33.4	10.2	68.1	20.8	88.5	27.0	133.0	40.5	112.5	34.3	116.0	35.4
60	24.5	7.5	59.2	18.0	83.7	25.5	124.4	37.9	108.8	33.2	109.5	33.4
65	16.5	5.0	51.2	15.6	80.0	24.4	116.7	35.6	105.9	32.3	104.0	31.7
68 MAXIMUM	12.0	3.7	46.6	14.2	78.2	23.8	112.4	34.3	104.6	31.9	101.0	30.8

## 4.2 TURNING RADII, NO SLIP ANGLE MODEL DC-10 SERIES 10 AND 10CF

TURNING RADII DEPICTED  
REPRESENT THEORETICAL  
GEOMETRIC TURN CENTERS

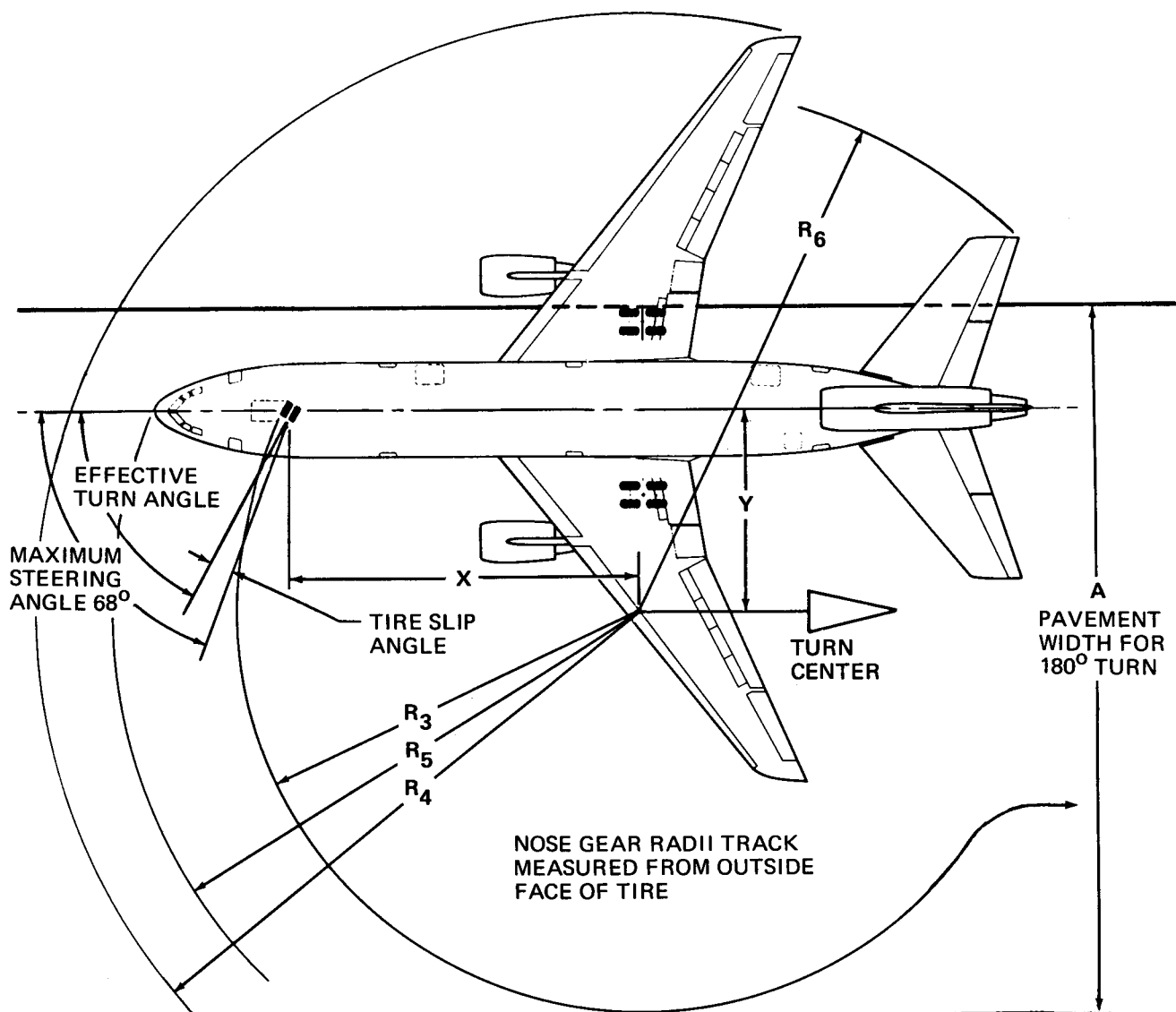


NOTE:

ACTUAL OPERATING DATA MAY BE GREATER  
THAN VALUES SHOWN SINCE TIRE SLIPPAGE IS  
NOT CONSIDERED IN THESE CALCULATIONS.  
CONSULT AIRLINE FOR OPERATING PROCEDURES.

STEERING ANGLE (DEGREE)	R-1		R-2		R-3		R-4		R-5		R-6		R-7	
	FT	M	FT	M	FT	M	FT	M	FT	M	FT	M	FT	M
25	138.9	42.3	173.9	53.0	172.6	52.6	241.9	73.7	186.1	56.7	206.9	63.1	156.4	47.7
30	108.8	33.2	143.8	43.8	145.9	44.5	212.3	64.7	161.6	49.3	179.3	54.7	126.3	38.5
35	86.7	26.4	121.7	37.1	127.2	38.8	190.5	58.1	145.0	44.2	159.5	48.6	104.2	31.8
40	69.4	21.2	104.4	31.8	113.5	34.6	173.6	52.9	133.1	40.6	144.7	44.1	86.9	26.5
45	55.4	16.9	90.4	27.6	103.1	31.4	159.9	48.7	124.4	37.9	133.1	40.6	73.0	22.3
50	43.7	13.3	78.7	24.0	95.2	29.0	148.5	45.3	117.9	35.9	123.7	37.7	61.2	18.7
55	33.6	10.2	68.6	20.9	89.0	27.1	138.8	42.3	113.0	34.4	115.9	35.3	51.1	15.6
60	24.6	7.5	59.6	18.2	84.2	25.7	130.1	39.7	109.2	33.3	109.4	33.3	42.2	12.9
65	16.5	5.0	51.5	15.7	80.5	24.5	122.4	37.3	106.4	32.4	103.8	31.6	34.1	10.4
68 MAXIMUM	12.0	3.7	47.0	14.3	78.7	24.0	118.1	36.0	105.0	32.0	100.8	30.7	29.5	9.0

## 4.2 TURNING RADII, NO SLIP ANGLE MODEL DC-10 SERIES 30, 30CF, 40 AND 40CF



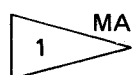
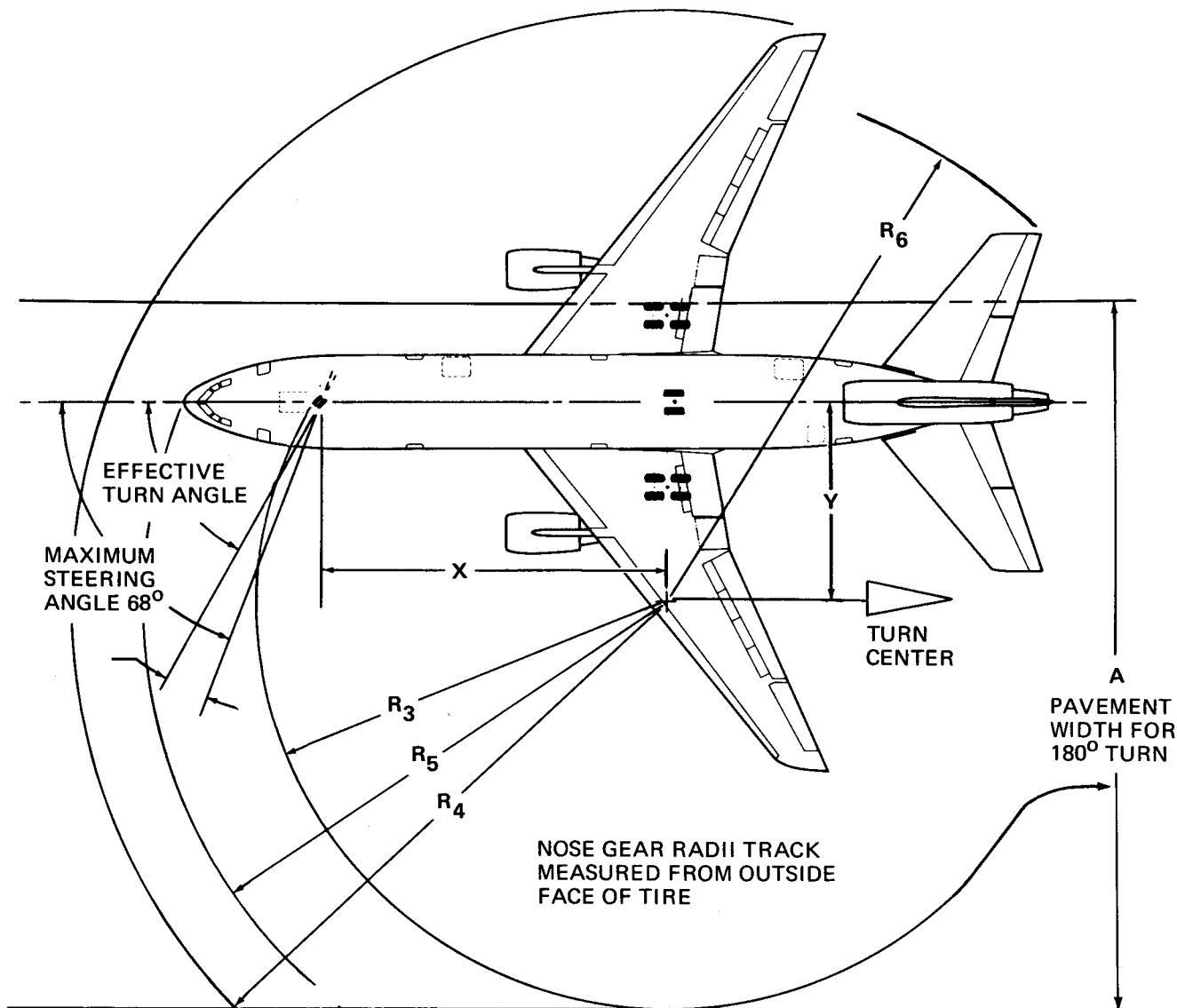
1 MAXIMUM STEERING:  
 SYMMETRICAL THRUST AND  
 NO DIFFERENTIAL BRAKING  
 SLOW CONTINUOUS TURN  
 AFT CENTER OF GRAVITY  
 MAX GROSS WEIGHT

2 MAXIMUM STEERING:  
 UNSYMMETRICAL THRUST AND  
 LIGHT DIFFERENTIAL BRAKING  
 SLOW CONTINUOUS TURN  
 AFT CENTER OF GRAVITY  
 MAX GROSS WEIGHT

3 MINIMUM RADIUS TURN RECOMMENDED  
 FOR NORMAL, ROUTINE OPERATIONS.  
 LIMITED TO AVOID EXCESSIVE TIRE  
 WEAR AND REDUCTION OF LANDING  
 GEAR FATIGUE LIFE.

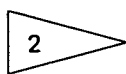
TYPE OF TURN	EFFECTIVE TURN ANGLE	TIRE SLIP ANGLE	X	Y	A	R <sub>3</sub>	R <sub>4</sub>	R <sub>5</sub>	R <sub>6</sub>
1	61.7°	6.3°	72.5 FT 22.1 M	39.0 FT 11.9 M	143.5 FT 43.7 M	83.9 FT 25.6 M	121.7 FT 37.1 M	107.6 FT 32.8 M	107.5 FT 32.8 M
2	69.5°	-1.5°	72.5 FT 22.1 M	27.0 FT 8.2 M	126.5 FT 38.6 M	78.8 FT 24.0 M	110.4 FT 33.6 M	103.8 FT 31.6 M	99.7 FT 30.4 M
3	—	—	72.5 FT 22.1 M	39.5 FT 12.0 M	144.3 FT 43.9 M	84.1 FT 25.6 M	122.2 FT 37.2 M	108.0 FT 32.9 M	107.9 FT 32.9 M

#### 4.3 MINIMUM TURNING RADII MODEL DC-10 SERIES 10 AND 10CF



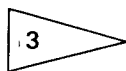
#### MAXIMUM STEERING:

SYMMETRICAL THRUST AND  
NO DIFFERENTIAL BRAKING  
SLOW CONTINUOUS TURN  
AFT CENTER OF GRAVITY  
MAX GROSS WEIGHT



#### MAXIMUM STEERING:

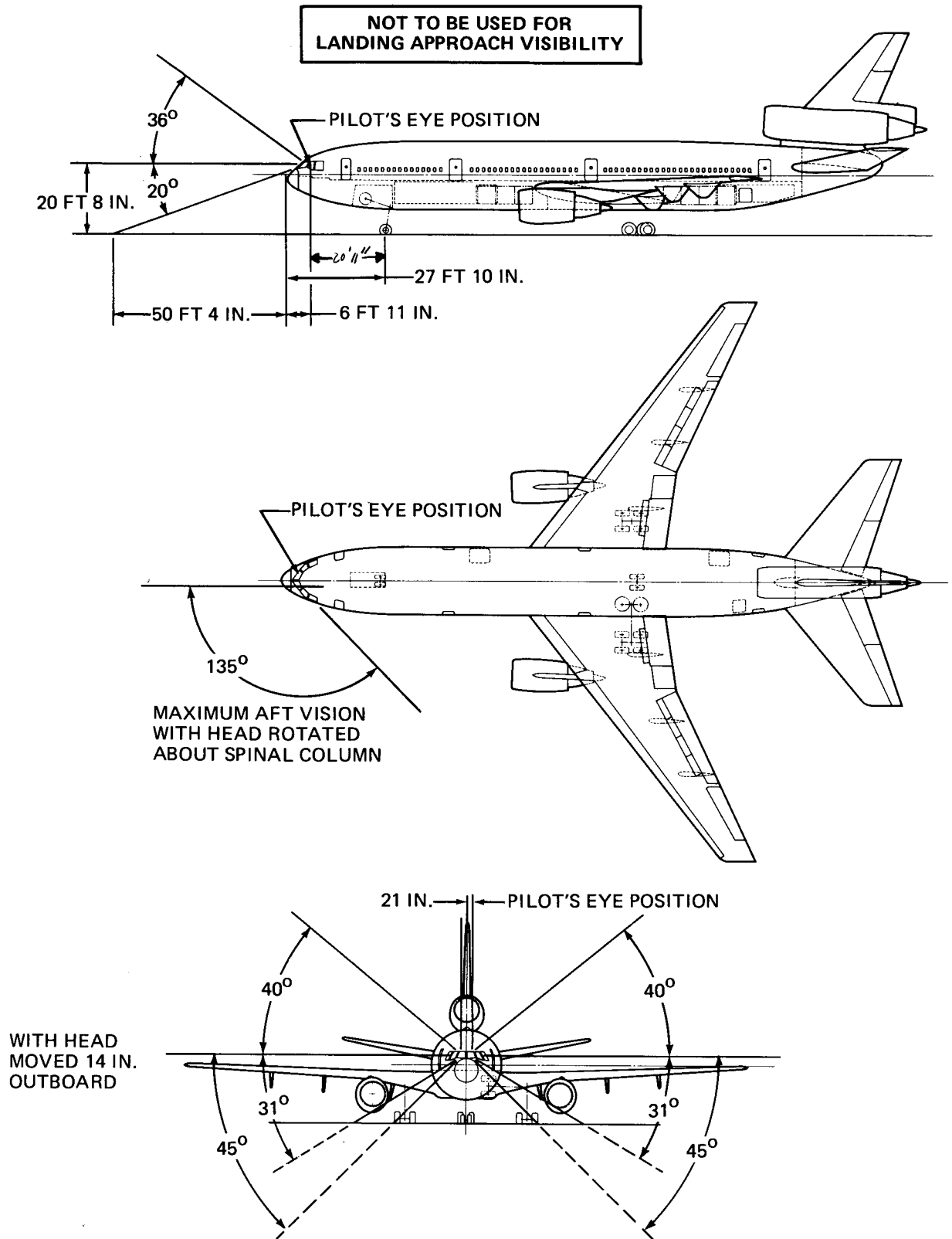
UNSYMMETRICAL THRUST AND  
LIGHT DIFFERENTIAL BRAKING  
SLOW CONTINUOUS TURN  
AFT CENTER OF GRAVITY  
MAX GROSS WEIGHT



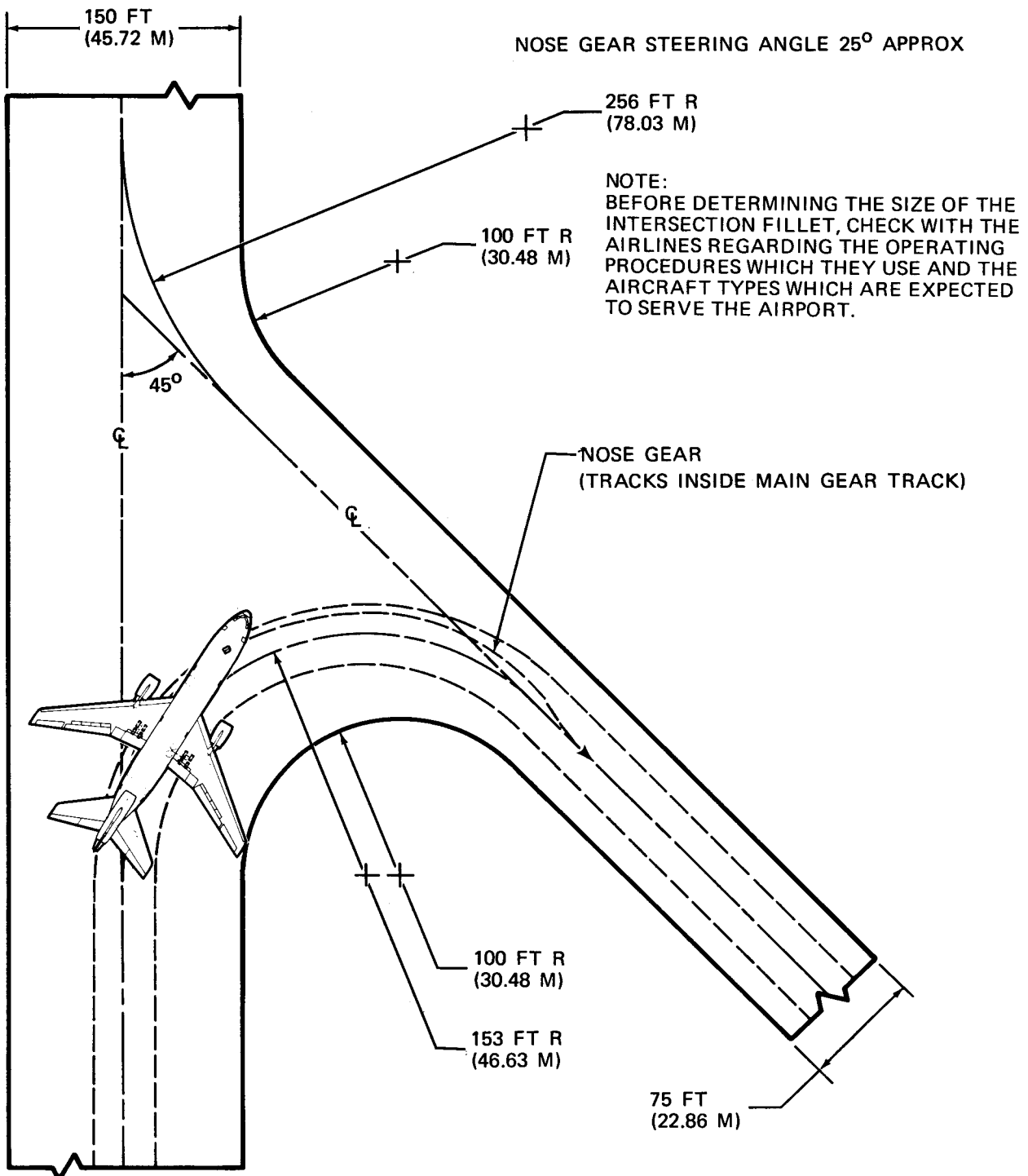
MINIMUM RADIUS TURN RECOMMENDED  
FOR NORMAL, ROUTINE OPERATIONS.  
LIMITED TO AVOID EXCESSIVE TIRE  
WEAR AND REDUCTION OF LANDING  
GEAR FATIGUE LIFE.

TYPE OF TURN	EFFECTIVE TURN ANGLE	TIRE SLIP ANGLE	X	Y	A	R <sub>3</sub>	R <sub>4</sub>	R <sub>5</sub>	R <sub>6</sub>
1	62.9°	5.1°	72.9 FT 22.2 M	37.2 FT 11.3 M	141.4 FT 43.1 M	83.5 FT 25.5 M	125.3 FT 38.2 M	107.5 FT 32.8 M	105.9 FT 32.3 M
2	69.3°	-1.3°	72.9 FT 22.2 M	27.6 FT 8.4 M	128.0 FT 39.0 M	79.8 FT 24.3 M	116.1 FT 35.4 M	104.7 FT 31.9 M	99.5 FT 30.3 M
3	-	-	72.9 FT 22.2 M	42.7 FT 13.0 M	149.5 FT 45.5 M	85.2 FT 26.0 M	130.5 FT 39.8 M	109.6 FT 33.4 M	109.8 FT 33.5 M

### 4.3 MINIMUM TURNING RADII MODEL DC-10 SERIES 30, 30CF, 40 AND 40CF



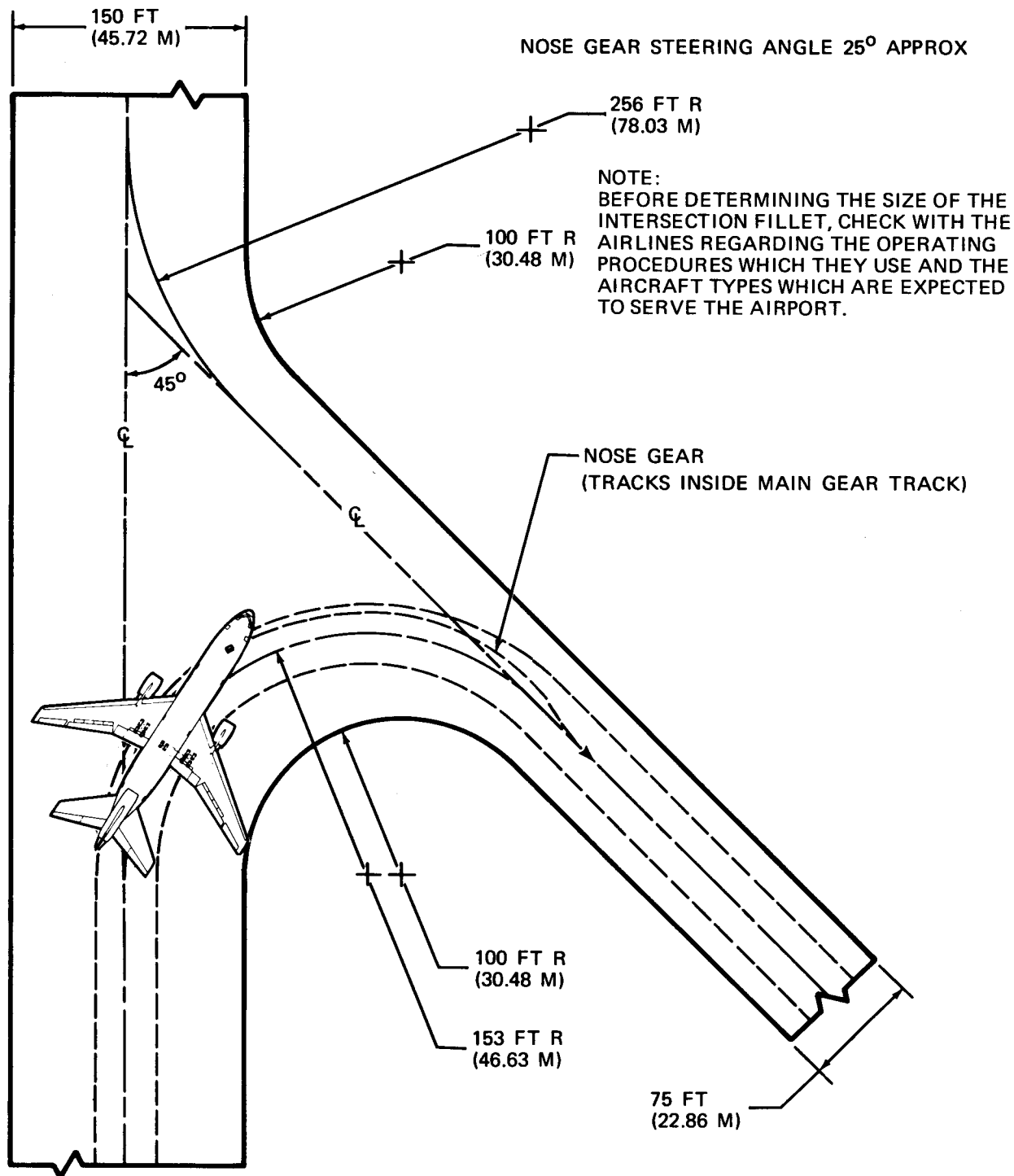
#### 4.4 VISIBILITY FROM COCKPIT IN STATIC POSITION MODEL DC-10 SERIES 10, 30, AND 40



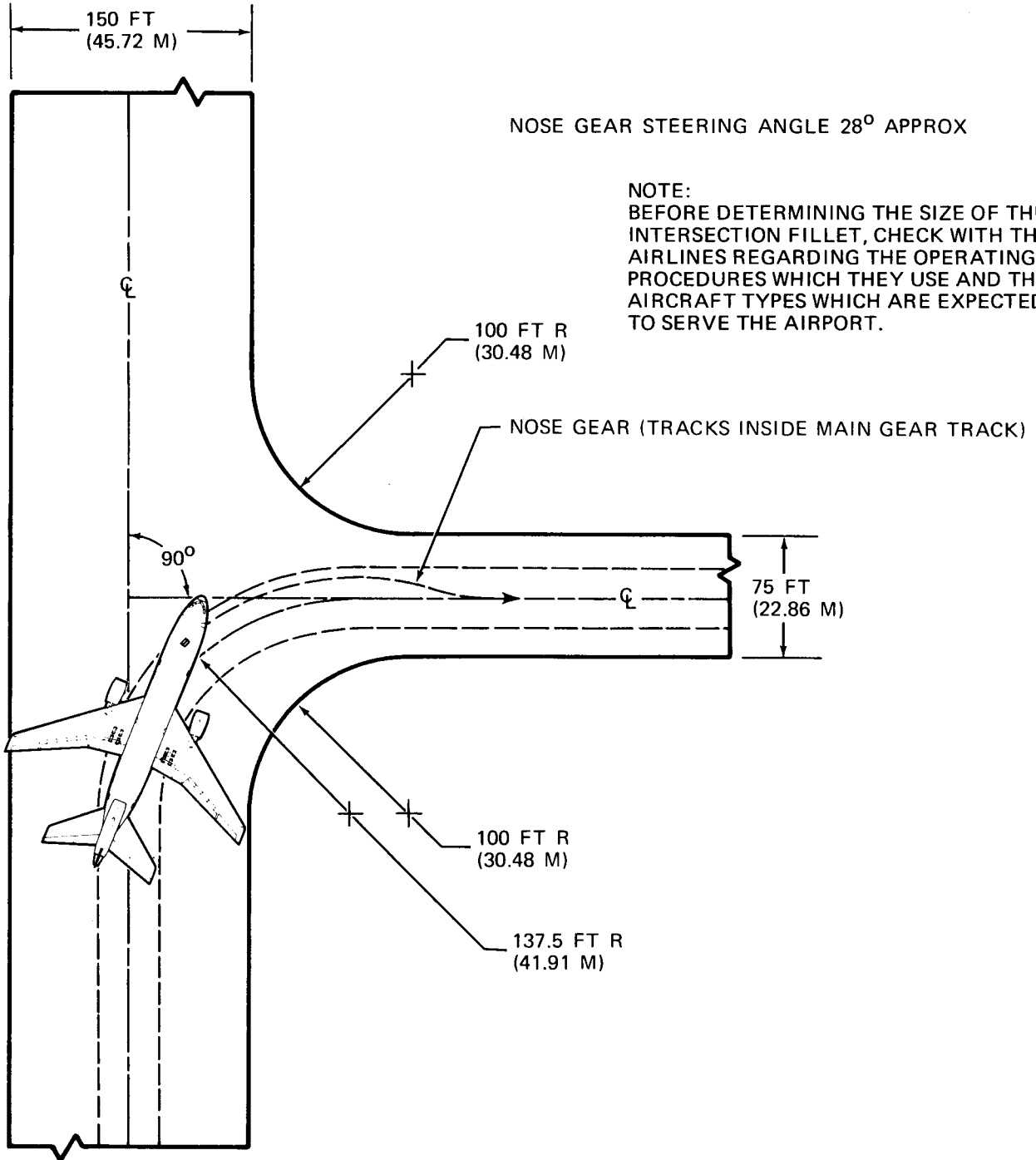
#### 4.5 RUNWAY AND TAXIWAY TURN PATHS

##### 4.5.1 MORE THAN 90° TURN - RUNWAY TO TAXIWAY

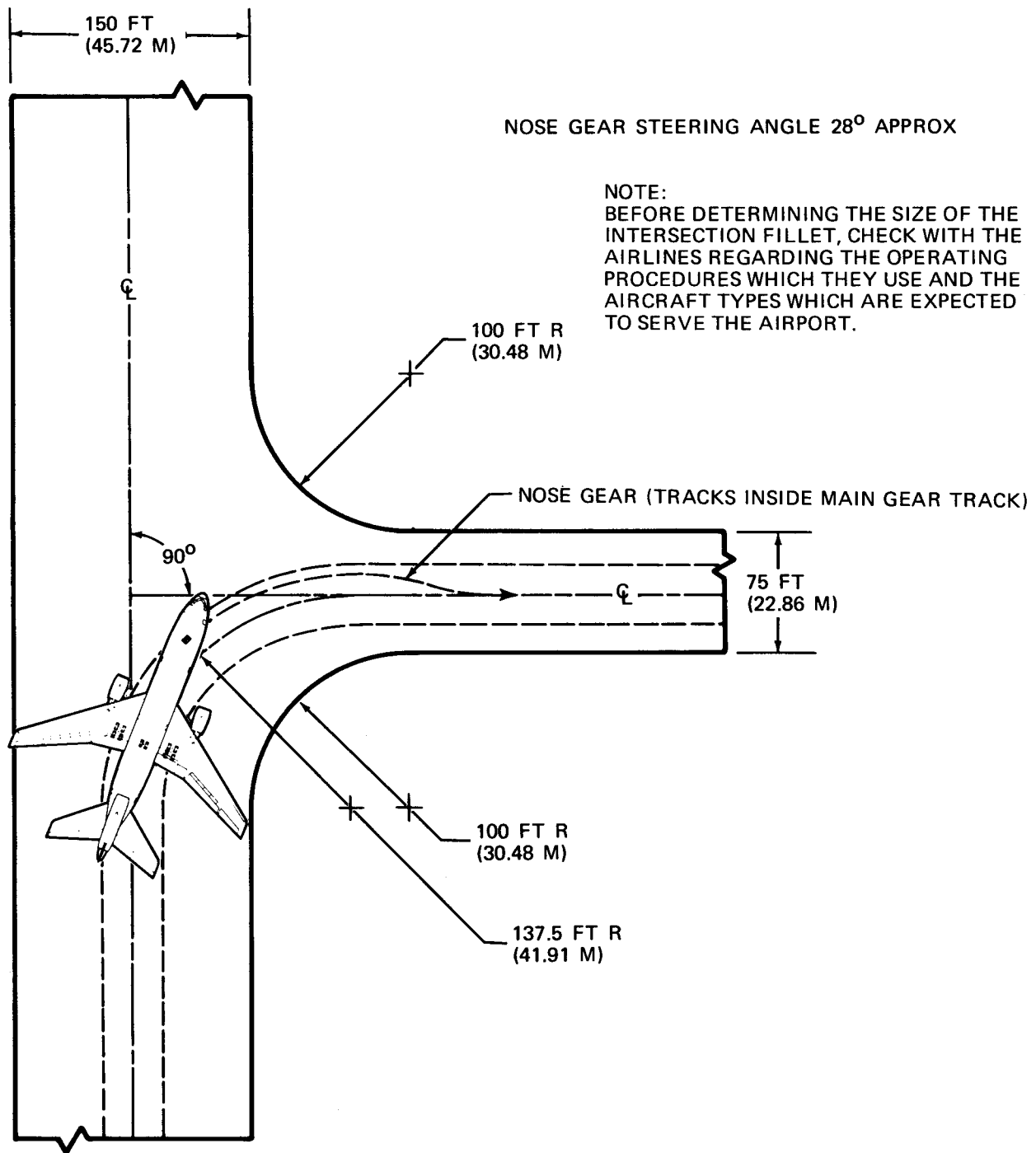
##### MODEL DC-10 SERIES 10 AND 10CF



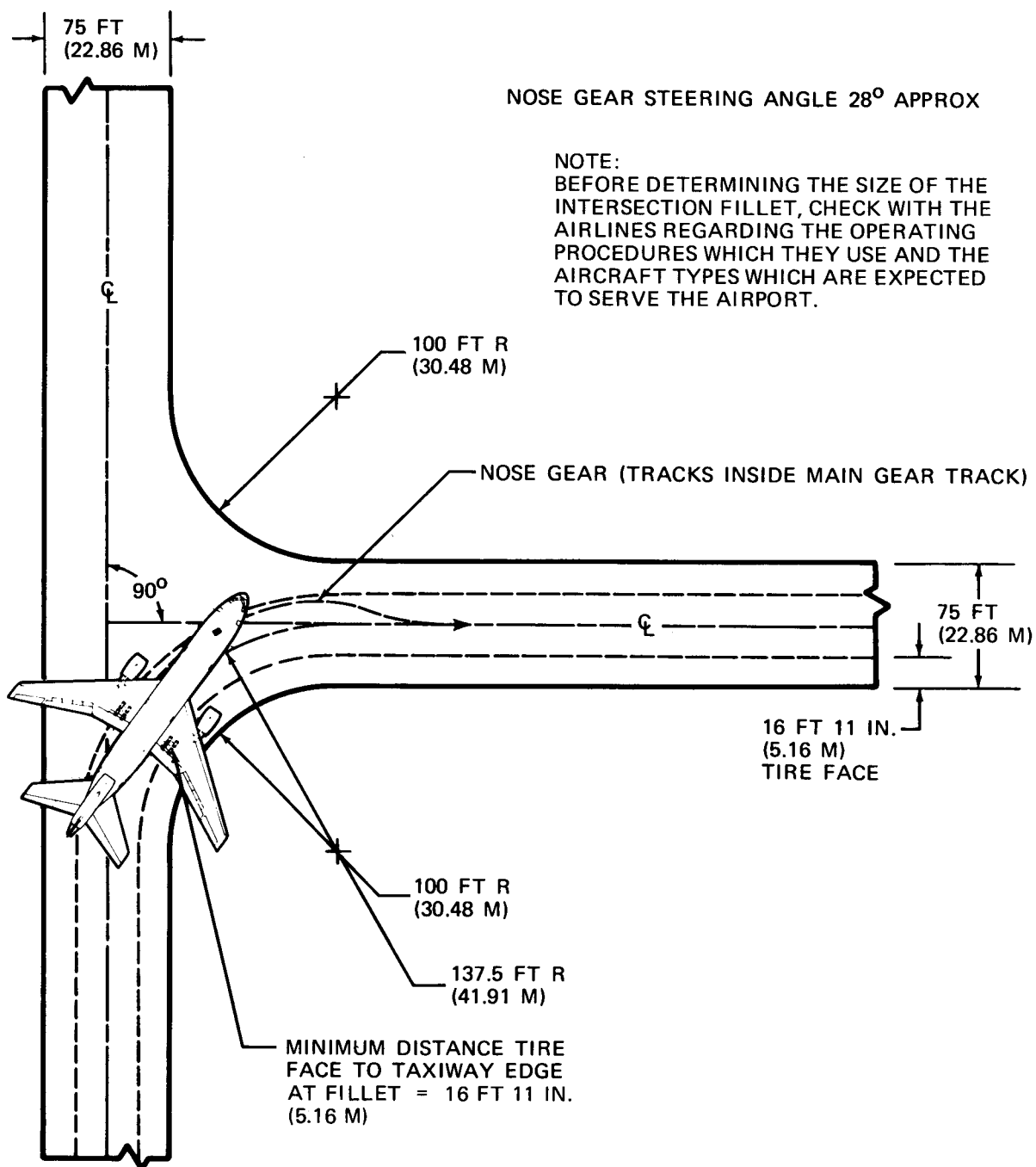
#### 4.5.1 MORE THAN 90° TURN - RUNWAY TO TAXIWAY MODEL DC-10 SERIES 30, 30CF, 40 AND 40CF



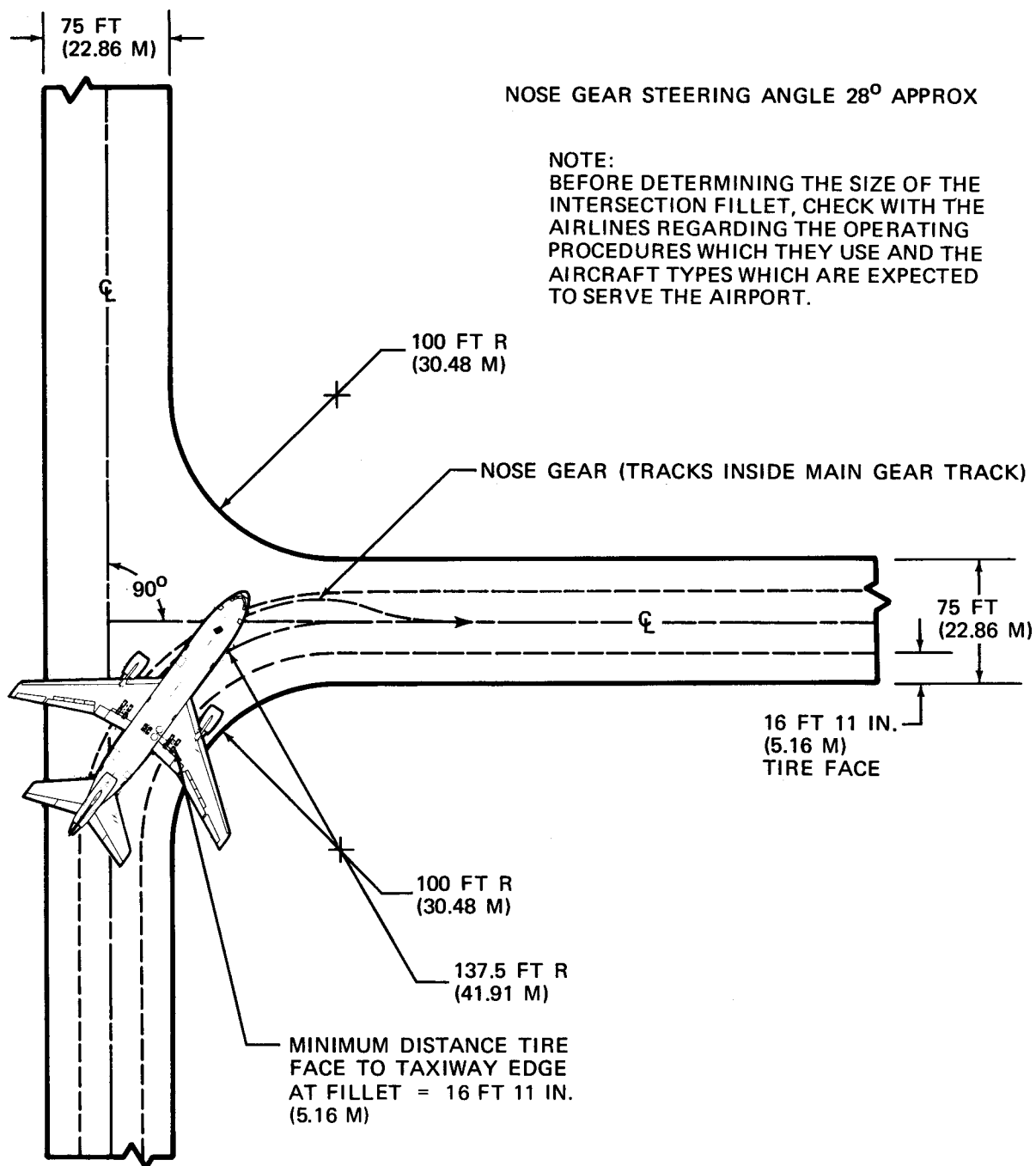
#### 4.5.2 $90^{\circ}$ TURN - RUNWAY TO TAXIWAY MODEL DC-10 SERIES 10 AND 10CF



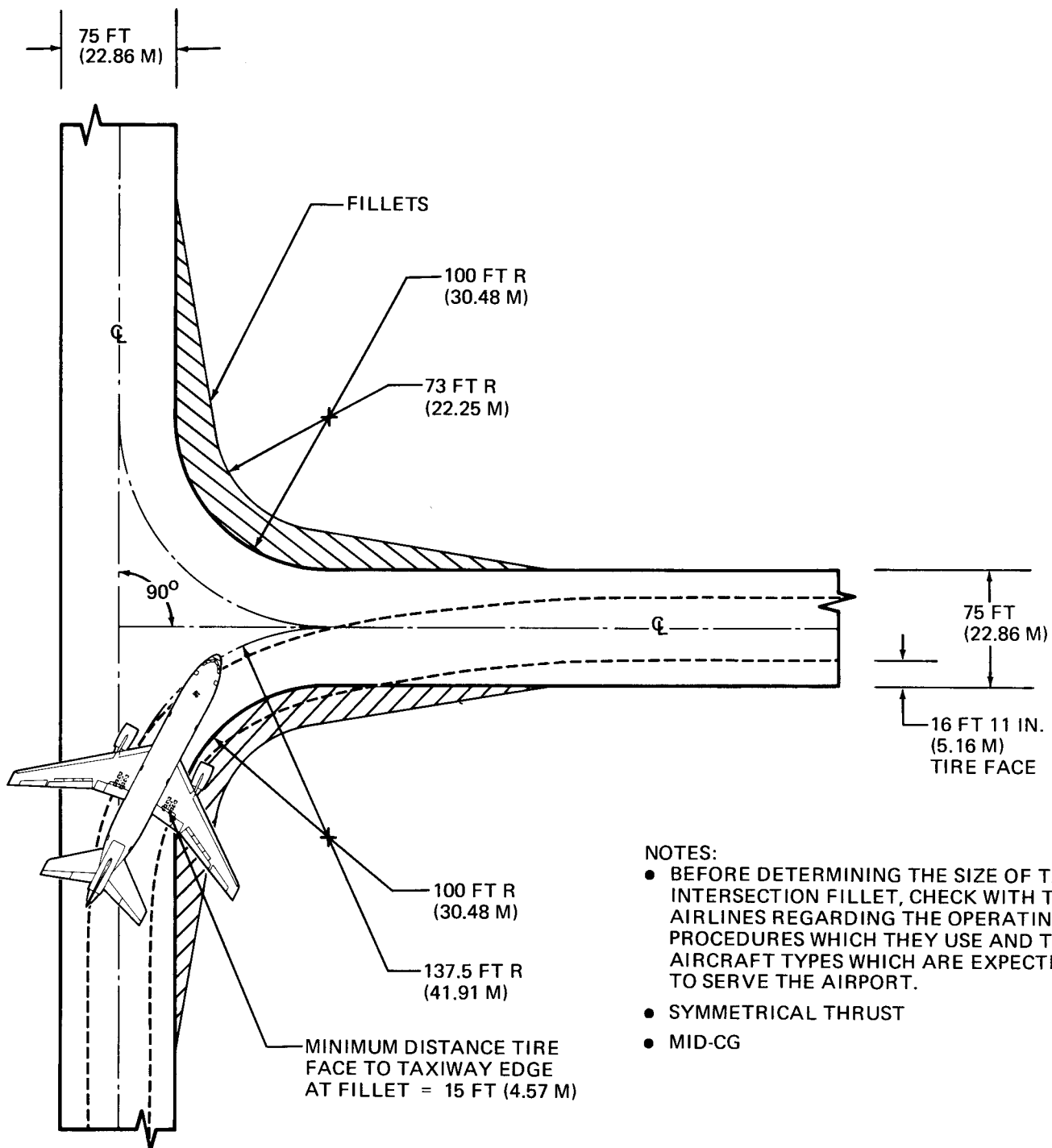
#### 4.5.2 90° TURN - RUNWAY TO TAXIWAY MODEL DC-10 SERIES 30, 30CF, 40 AND 40CF



#### 4.5.3 90° TURN - TAXIWAY TO TAXIWAY MODEL DC-10 SERIES 10 AND 10CF

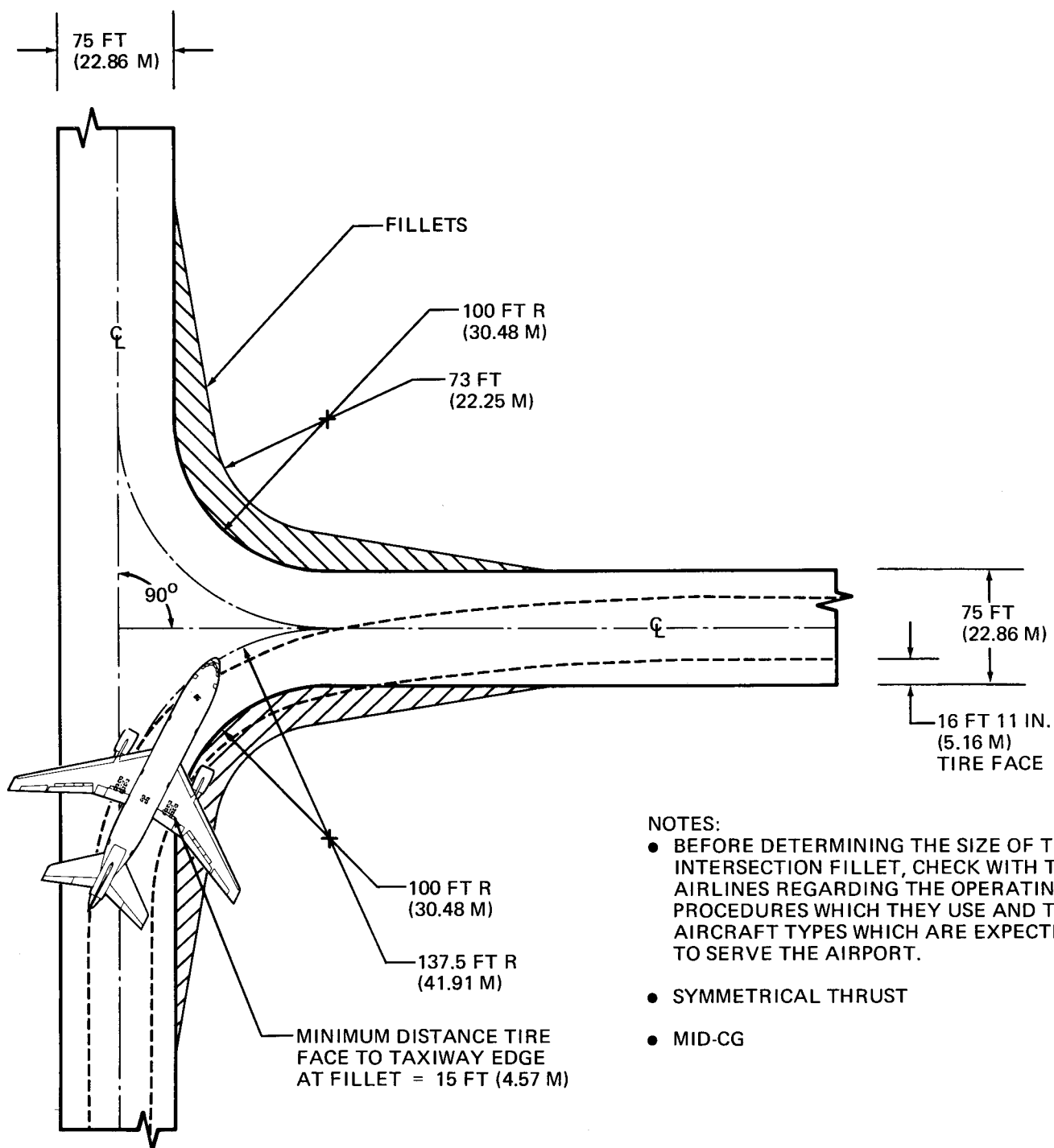


#### 4.5.3 90° TURN - TAXIWAY TO TAXIWAY MODEL DC-10 SERIES 30, 30CF, 40 AND 40CF



#### 4.5.4 90° TURN - TAXIWAY TO TAXIWAY MODEL DC-10 SERIES 10 AND 10CF

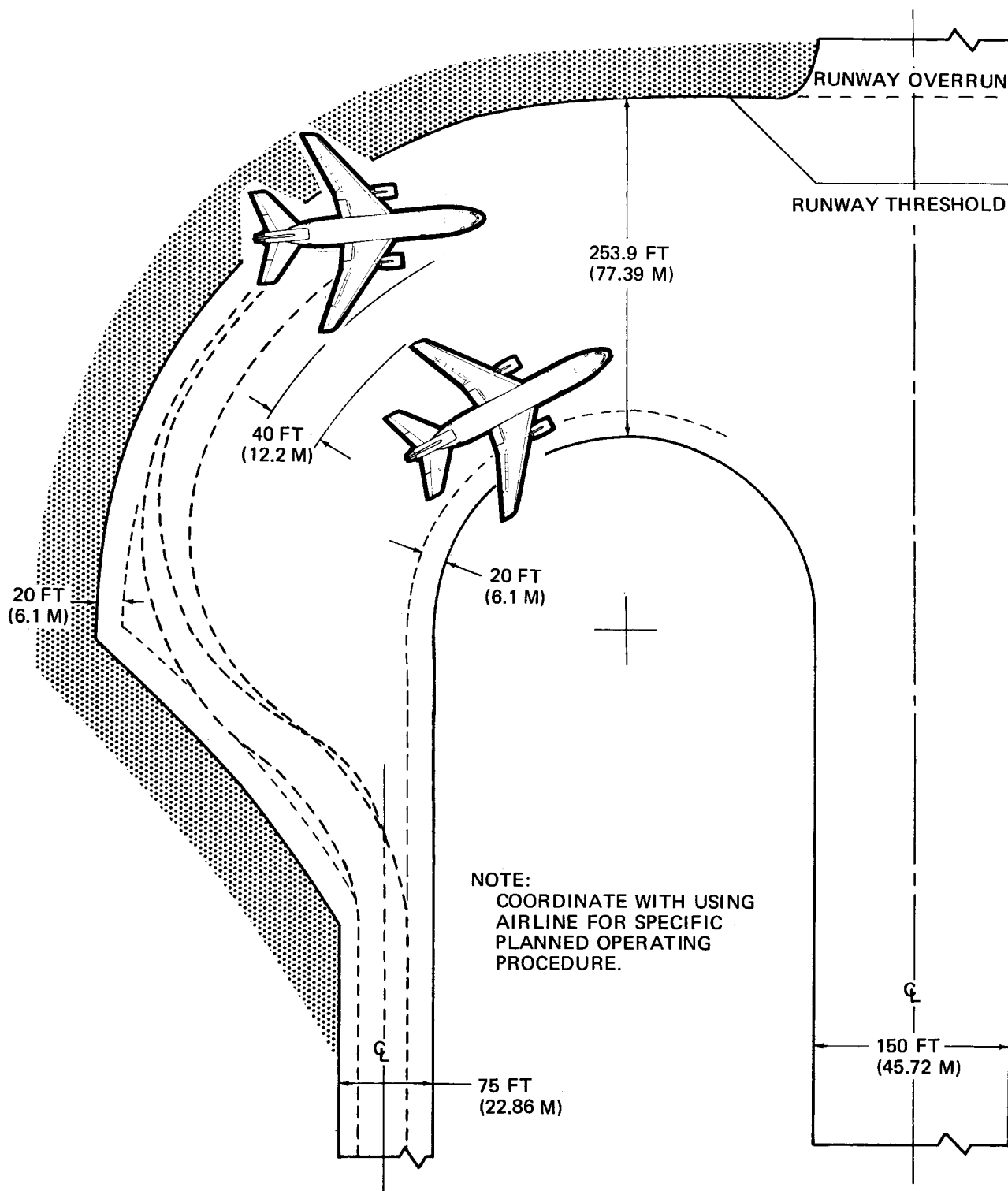
COCKPIT TRACKS  
CENTERLINE TO CENTERLINE



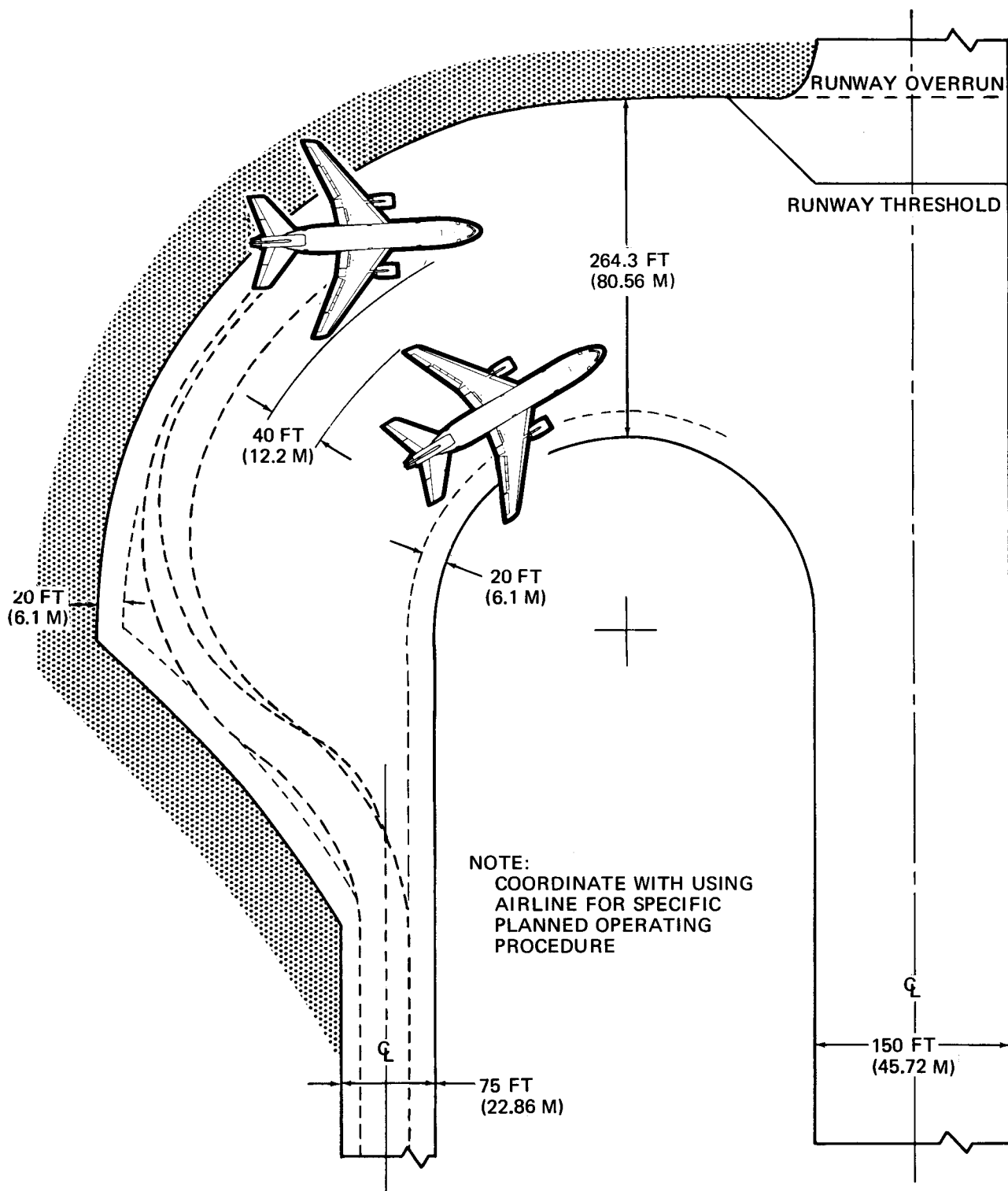
NOTES:

- BEFORE DETERMINING THE SIZE OF THE INTERSECTION FILLET, CHECK WITH THE AIRLINES REGARDING THE OPERATING PROCEDURES WHICH THEY USE AND THE AIRCRAFT TYPES WHICH ARE EXPECTED TO SERVE THE AIRPORT.
- SYMMETRICAL THRUST
- MID-CG

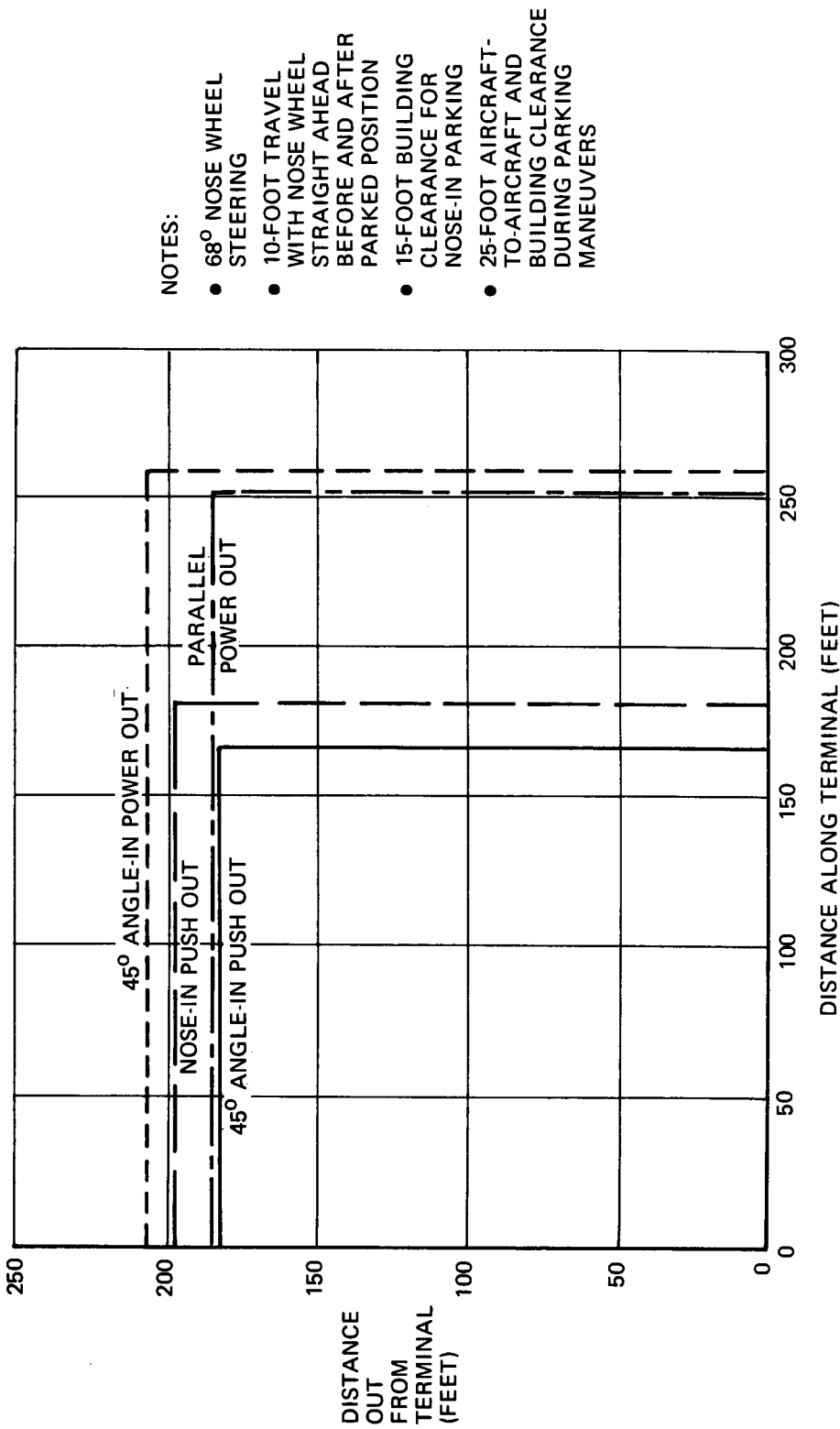
4.5.4 90° TURN - TAXIWAY TO TAXIWAY  
 MODEL DC-10 SERIES 30, 30CF, 40 AND 40CF  
 COCKPIT TRACKS  
 CENTERLINE TO CENTERLINE



4.6 RUNWAY HOLDING BAY APRON  
MODEL DC-10 SERIES 10 AND 10CF



4.6 RUNWAY HOLDING BAY APRON  
MODEL DC-10 SERIES 30, 30CF, 40 AND 40CF



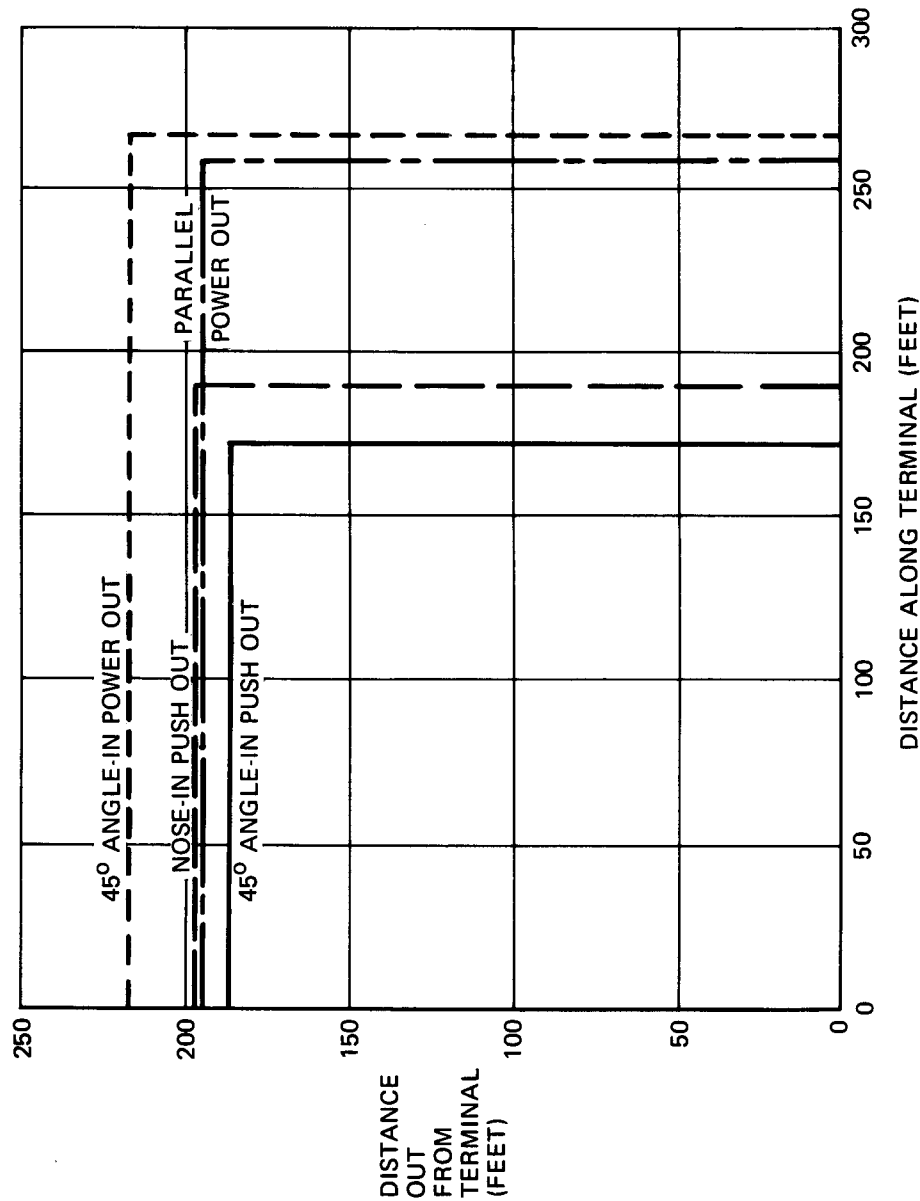
NOTES:

- 68° NOSE WHEEL STEERING
- 10-FOOT TRAVEL WITH NOSE WHEEL STRAIGHT AHEAD BEFORE AND AFTER PARKED POSITION
- 15-FOOT BUILDING CLEARANCE FOR NOSE-IN PARKING
- 25-FOOT AIRCRAFT-TO-AIRCRAFT AND BUILDING CLEARANCE DURING PARKING MANEUVERS

## 4.7 MINIMUM PARKING SPACE REQUIREMENTS

### 4.7.1 MINIMUM PARKING SPACE REQUIREMENTS IN FEET

#### MODEL DC-10 SERIES 10 AND 10CF



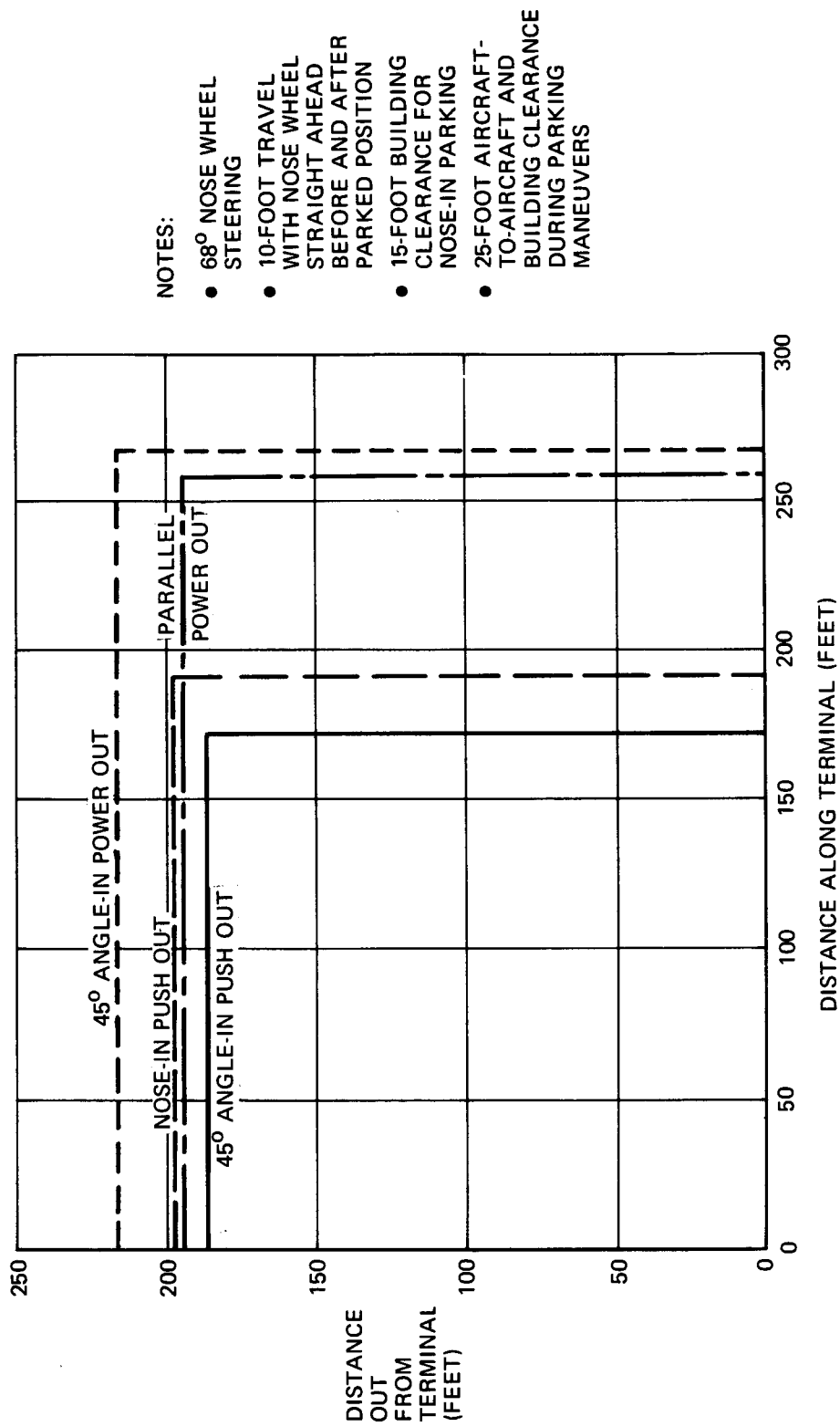
NOTES:

- 68° NOSE WHEEL STEERING
- 10-FOOT TRAVEL WITH NOSE WHEEL STRAIGHT AHEAD BEFORE AND AFTER PARKED POSITION
- 15-FOOT BUILDING CLEARANCE FOR NOSE-IN PARKING
- 25-FOOT AIRCRAFT-TO-AIRCRAFT AND BUILDING CLEARANCE DURING PARKING MANEUVERS

## 4.7 MINIMUM PARKING SPACE REQUIREMENTS

### 4.7.1 MINIMUM PARKING SPACE REQUIREMENTS IN FEET

#### MODEL DC-10 SERIES 30 AND 30CF



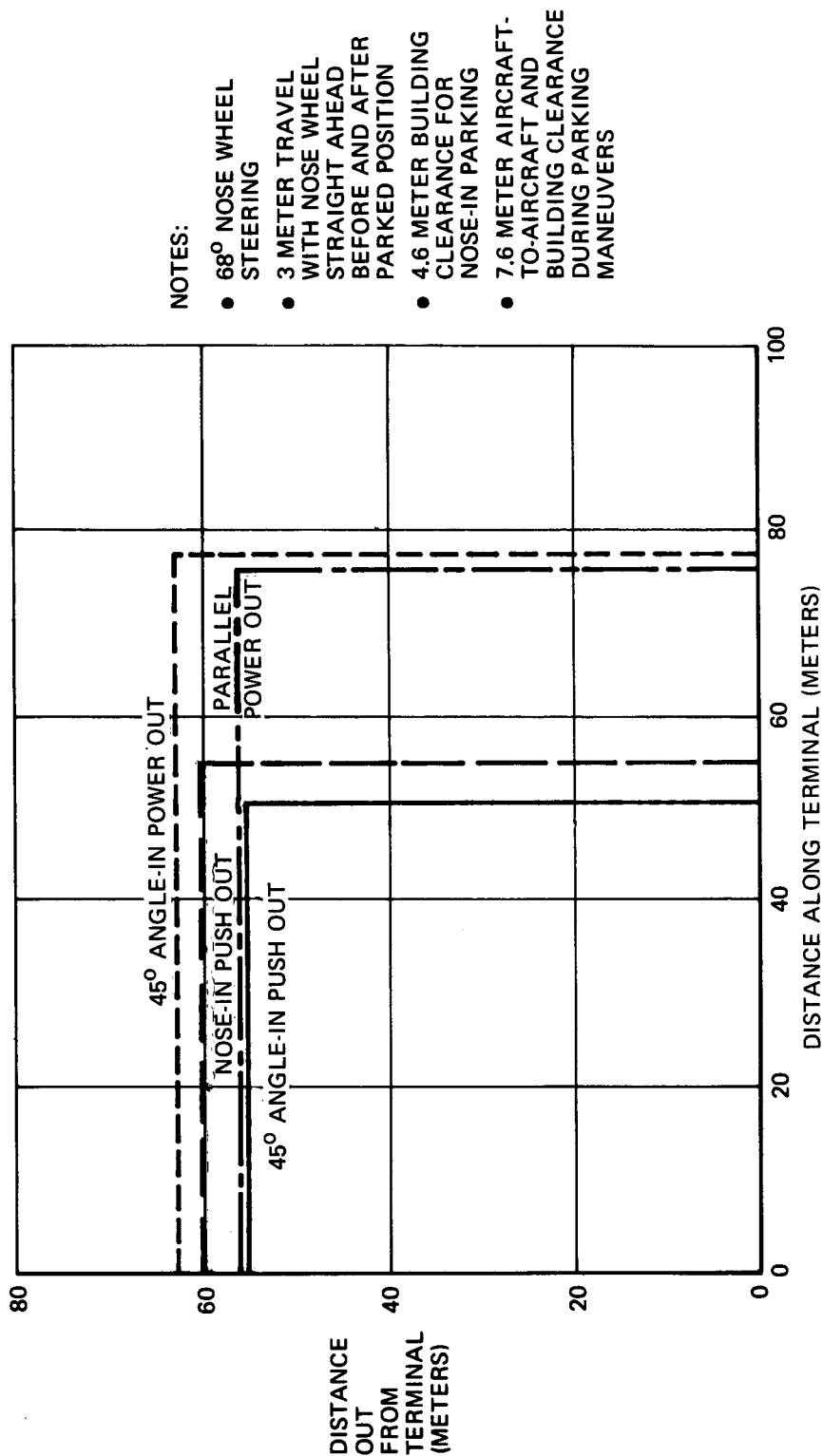
NOTES:

- 68° NOSE WHEEL STEERING
- 10-FOOT TRAVEL WITH NOSE WHEEL STRAIGHT AHEAD BEFORE AND AFTER PARKED POSITION
- 15-FOOT BUILDING CLEARANCE FOR NOSE-IN PARKING
- 25-FOOT AIRCRAFT-TO-AIRCRAFT AND BUILDING CLEARANCE DURING PARKING MANEUVERS

## 4.7 MINIMUM PARKING SPACE REQUIREMENTS

### 4.7.1 MINIMUM PARKING SPACE REQUIREMENTS IN FEET

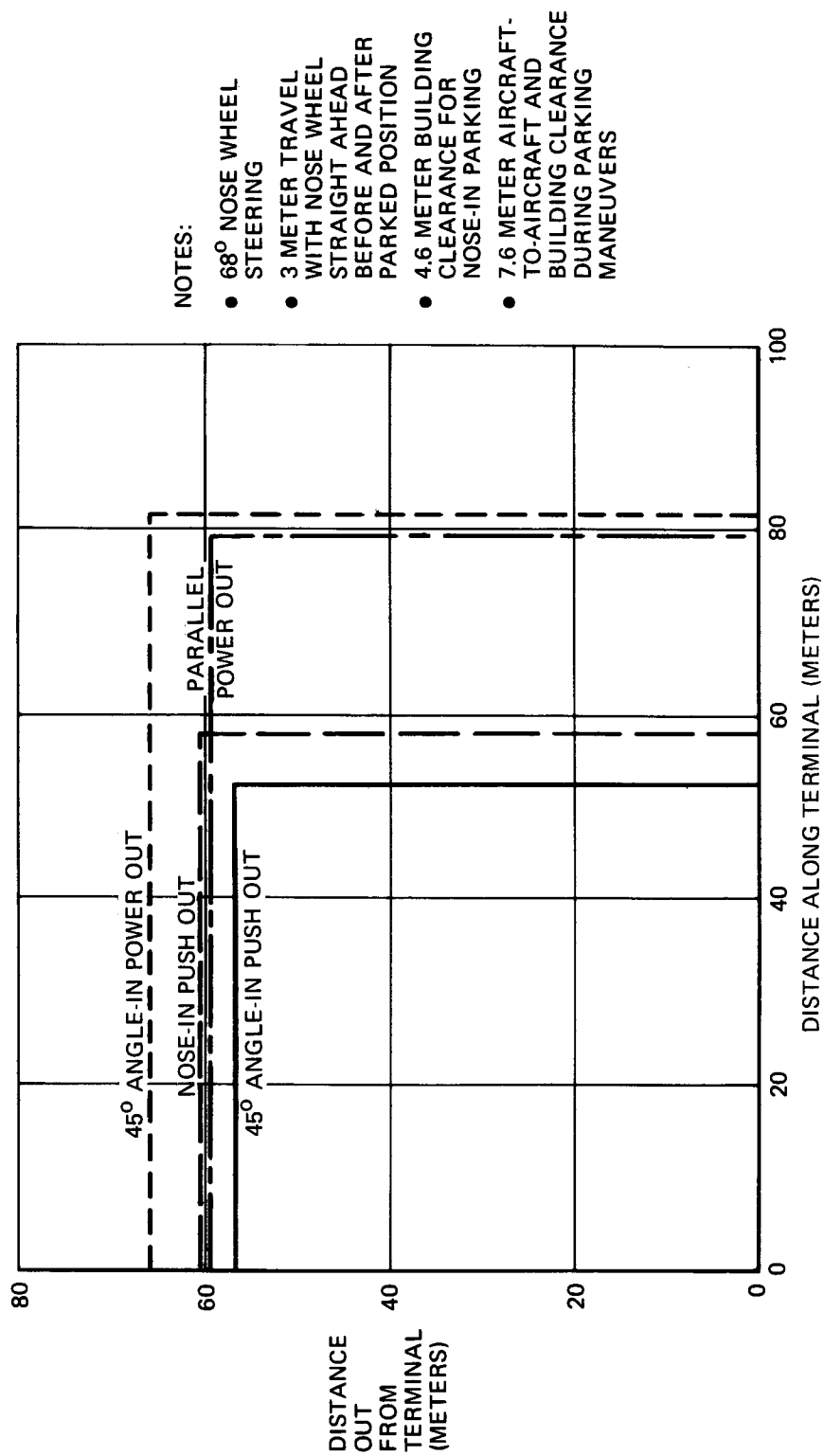
#### MODEL DC-10 SERIES 40 AND 40CF



#### 4.7 MINIMUM PARKING SPACE REQUIREMENTS

##### 4.7.2 MINIMUM PARKING SPACE REQUIREMENTS IN METERS

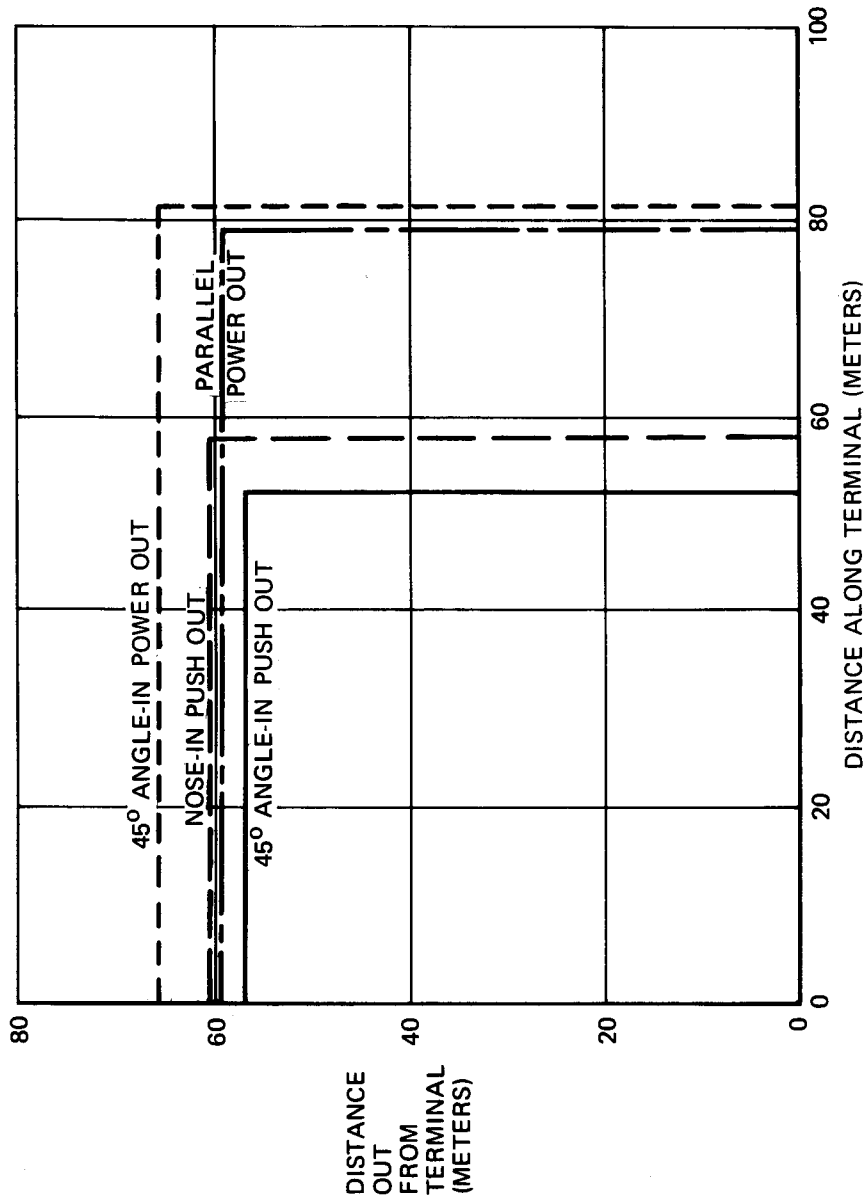
###### MODEL DC-10 SERIES 10 AND 10CF



#### 4.7 MINIMUM PARKING SPACE REQUIREMENTS

##### 4.7.2 MINIMUM PARKING SPACE REQUIREMENTS IN METERS

MODEL DC-10 SERIES 30 AND 30CF



NOTES:

- 68° NOSE WHEEL STEERING
- 3 METER TRAVEL WITH NOSE WHEEL STRAIGHT AHEAD BEFORE AND AFTER PARKED POSITION
- 4.6 METER BUILDING CLEARANCE FOR NOSE-IN PARKING
- 7.6 METER AIRCRAFT-TO-AIRCRAFT AND BUILDING CLEARANCE DURING PARKING MANEUVERS

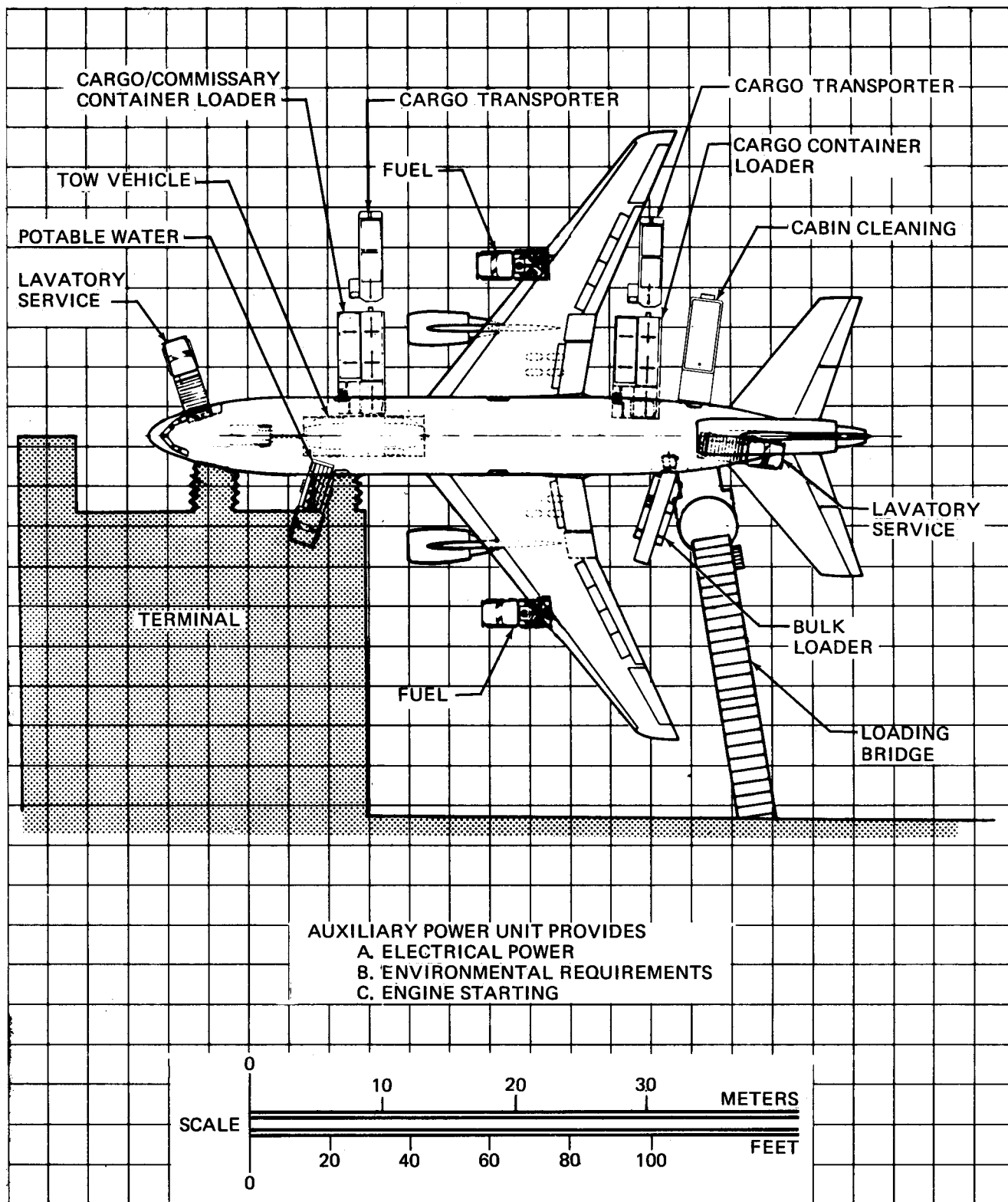
#### 4.7 MINIMUM PARKING SPACE REQUIREMENTS

##### 4.7.2 MINIMUM PARKING SPACE REQUIREMENTS IN METERS

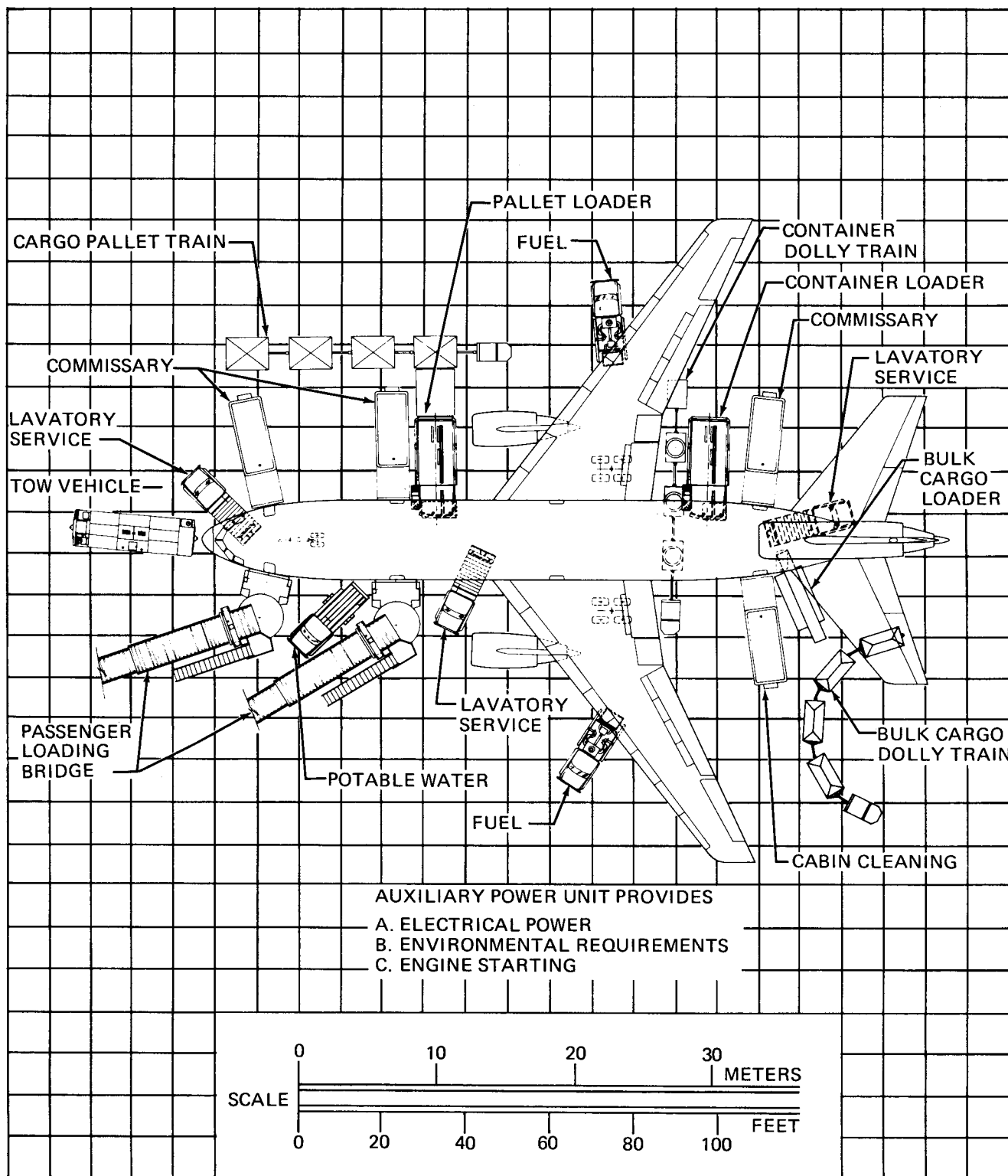
###### MODEL DC-10 SERIES 40 AND 40CF

## **5.0 TERMINAL SERVICING**

- 5.1 Airplane Servicing Arrangement (Typical)
- 5.2 Terminal Operations, Turnaround Station
- 5.3 Terminal Operations, En Route Station
- 5.4 Ground Service Connections
- 5.5 Engine Starting Pneumatic Requirements
- 5.6 Ground Pneumatic Power Requirements
- 5.7 Preconditioned Airflow Requirements
- 5.8 Ground Towing Requirements



5.0 TERMINAL SERVICING (LOWER GALLEY)  
5.1 AIRPLANE SERVICING ARRANGEMENT (TYPICAL)  
MODEL DC-10 SERIES 10, 30, 30CF, 40 AND 40CF



5.0 TERMINAL SERVICING (UPPER GALLEY)  
 5.1 AIRPLANE SERVICING ARRANGEMENT (TYPICAL)  
 MODEL DC-10 SERIES 10, 10CF, 30, 30CF, 40 AND 40CF

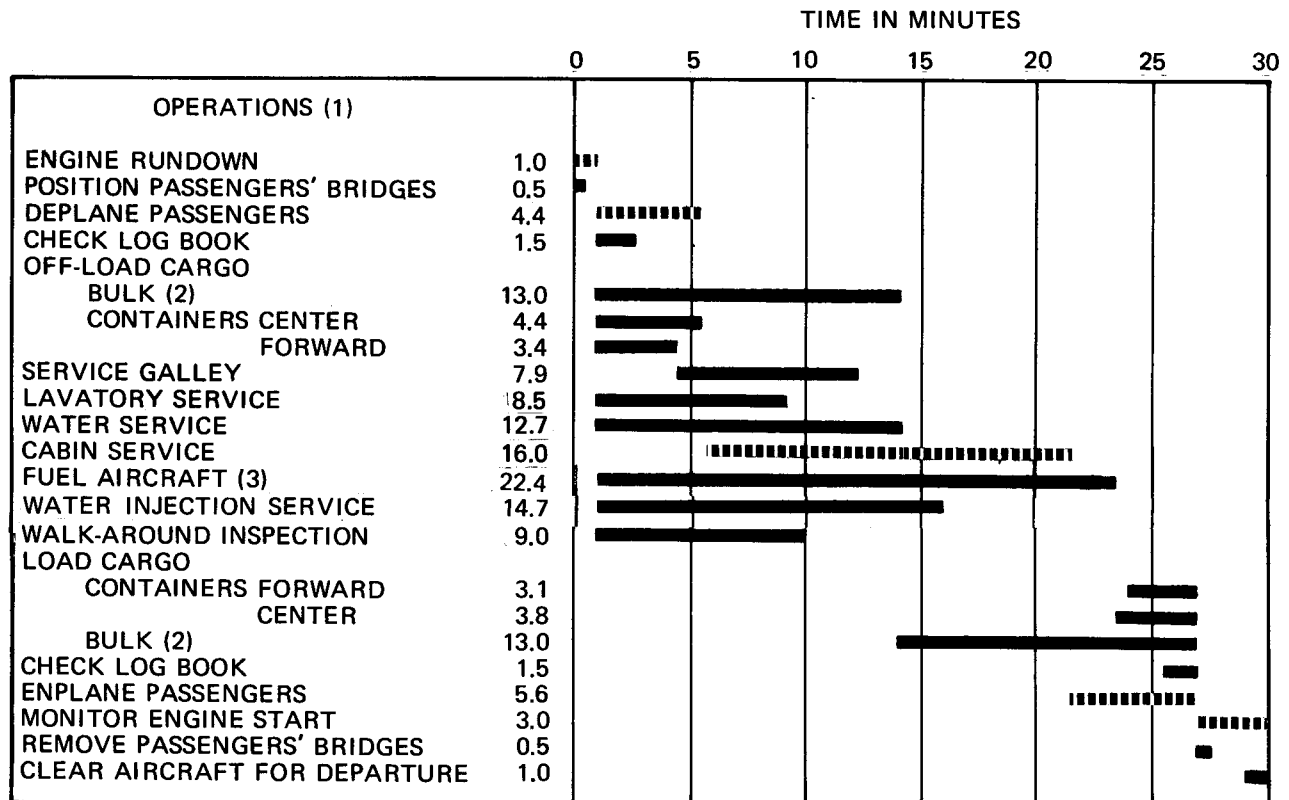






## 95





■■■■■ CRITICAL TIME PATH

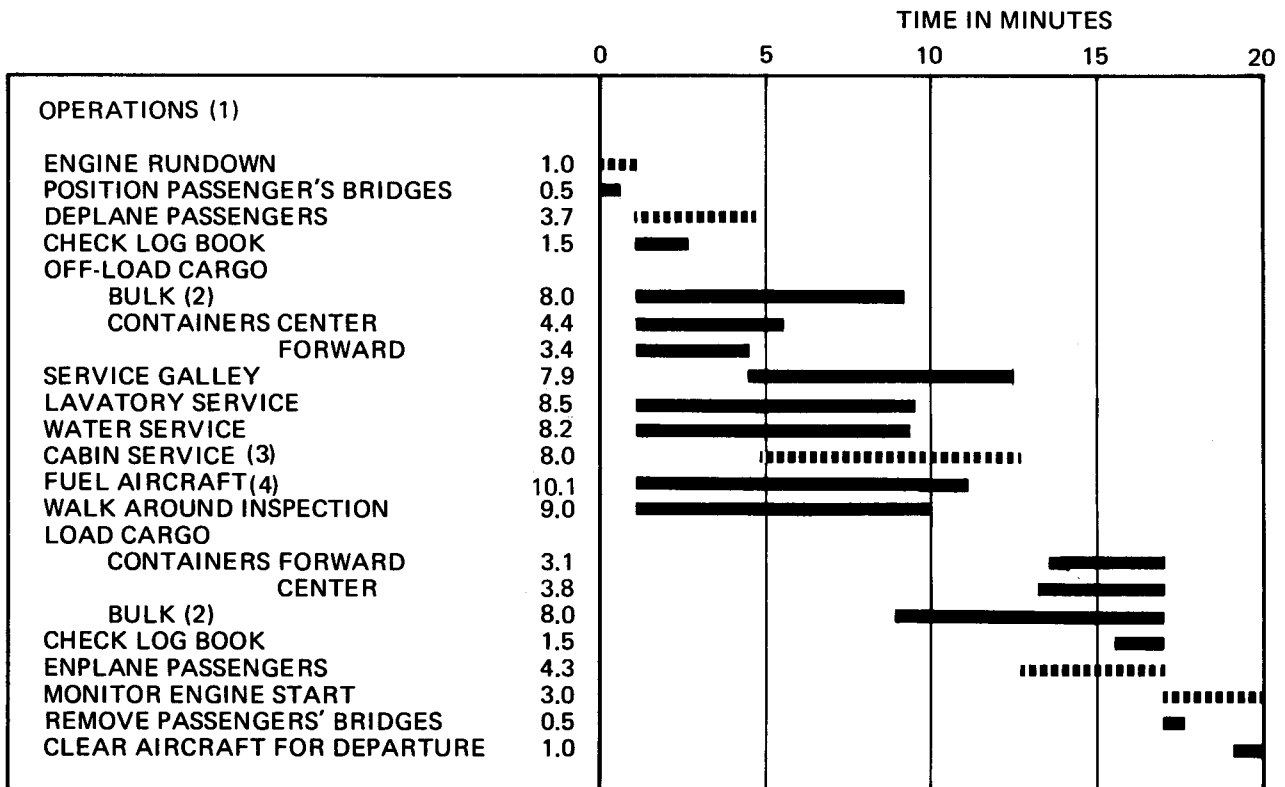
- (1) TIME INCLUDES EQUIPMENT POSITIONING & REMOVAL
- (2) TIME AVAILABLE FOR BULK LOADING
- (3) 1975 GPM INITIAL PUMPING RATE (7476 LITERS PER MIN)

- MIXED CLASS CONFIGURATION
- 48 FIRST CLASS
- 222 TOURIST CLASS
- 100% LOAD FACTOR

## 5.2 TERMINAL OPERATIONS, TURNAROUND STATION MODEL DC-10 SERIES 40 AND 40CF (LOWER GALLEY)



## 98



■■■■CRITICAL TIME PATH

(1) TIME INCLUDES EQUIPMENT POSITIONING AND REMOVAL

(2) TIME AVAILABLE FOR BULK LOADING

(3) CABIN TIDIED BY CABIN CREW

(4) 1600 GPM INITIAL PUMPING RATE  
(6056 LITERS PER MIN)

● MIXED CLASS CONFIGURATION

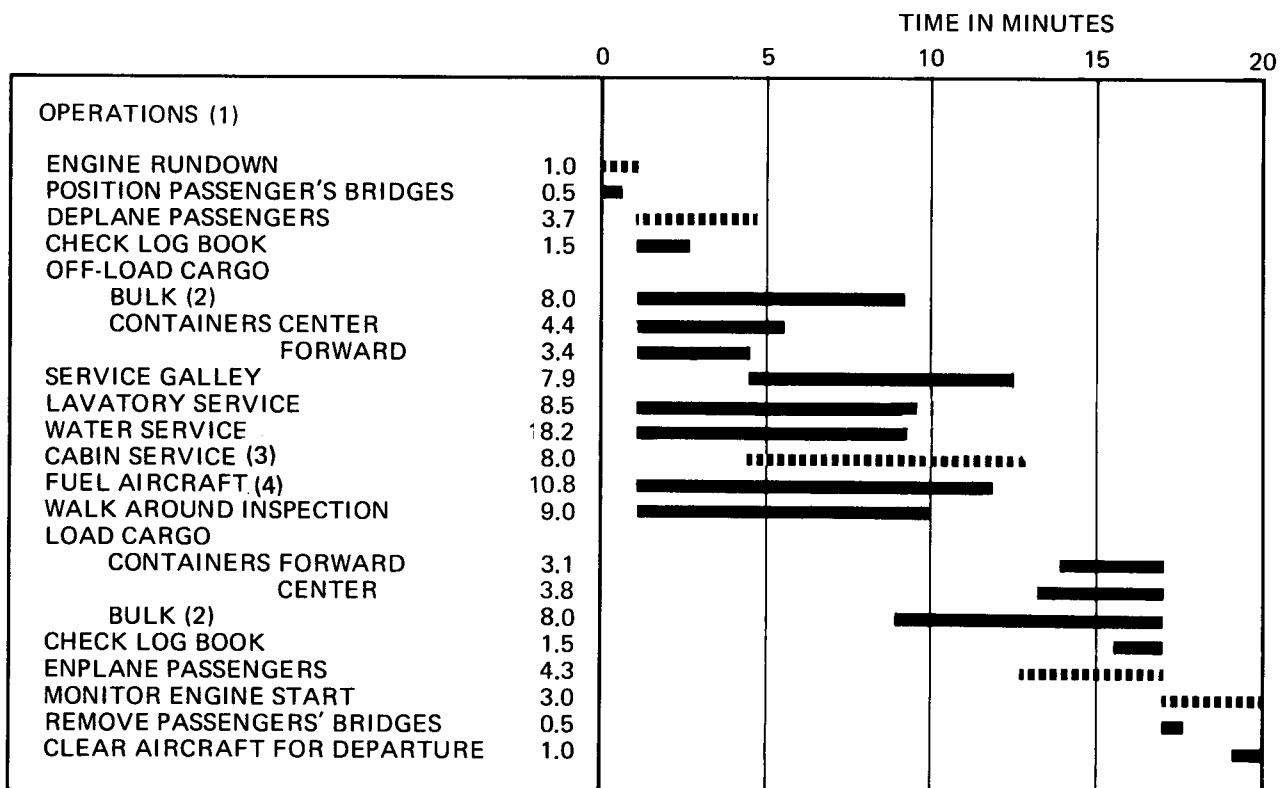
● 26 FIRST CLASS

● 122 TOURIST CLASS

● 55% LOAD FACTOR

### 5.3 TERMINAL OPERATIONS, EN ROUTE STATION MODEL DC-10 SERIES 10 (LOWER GALLEY)





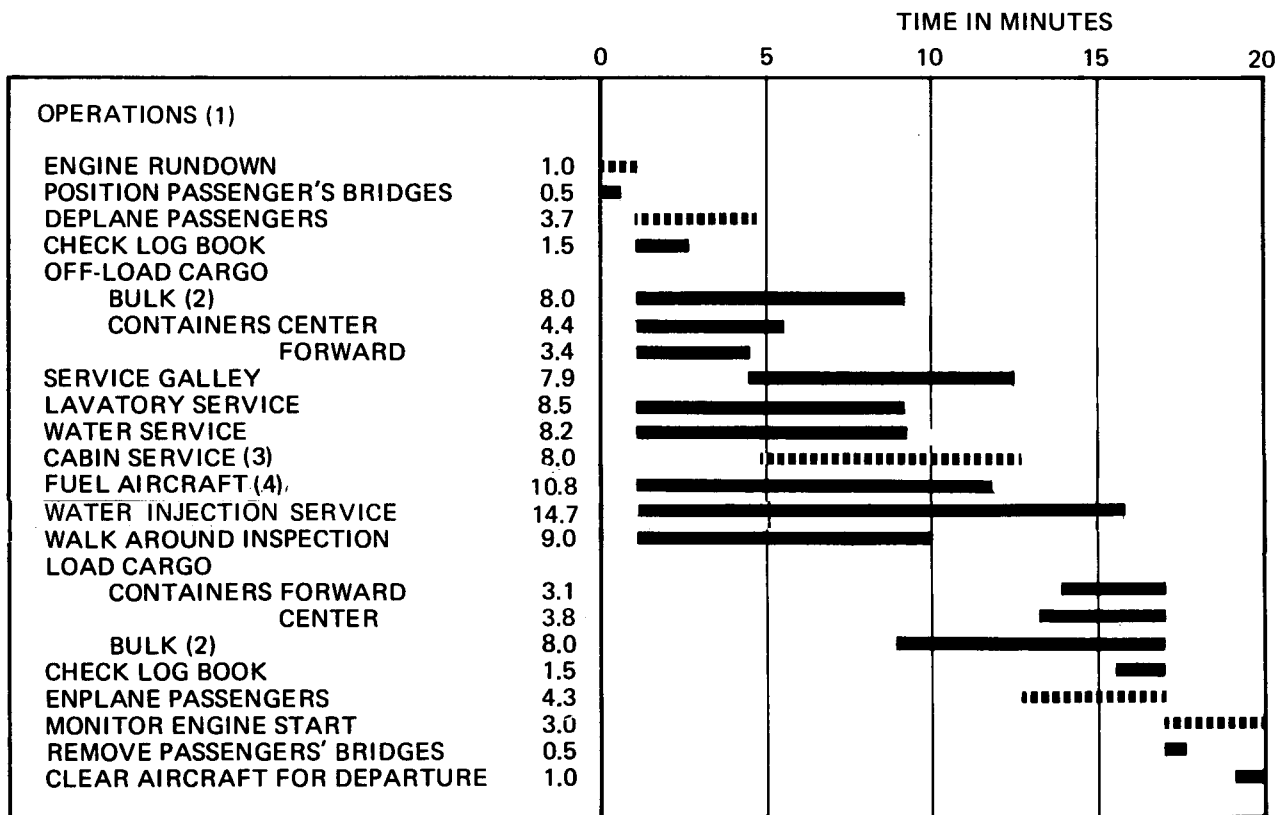
■■■■CRITICAL TIME PATH

- (1) TIME INCLUDES EQUIPMENT POSITIONING AND REMOVAL
- (2) TIME AVAILABLE FOR BULK LOADING
- (3) CABIN TIDIED BY CABIN CREW
- (4) 1600 GPM INITIAL PUMPING RATE  
(6056 LITERS PER MIN)

- MIXED CLASS CONFIGURATION
- 26 FIRST CLASS
- 122 TOURIST CLASS
- 55% LOAD FACTOR

### 5.3 TERMINAL OPERATIONS, EN ROUTE STATION MODEL DC-10 SERIES 30 AND 30CF (LOWER GALLEY)



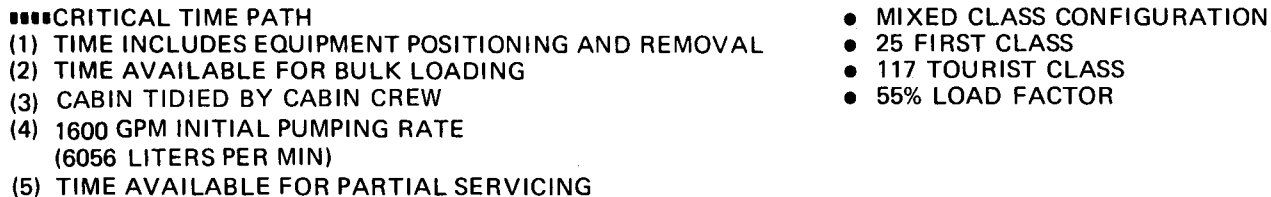


■■■■CRITICAL TIME PATH

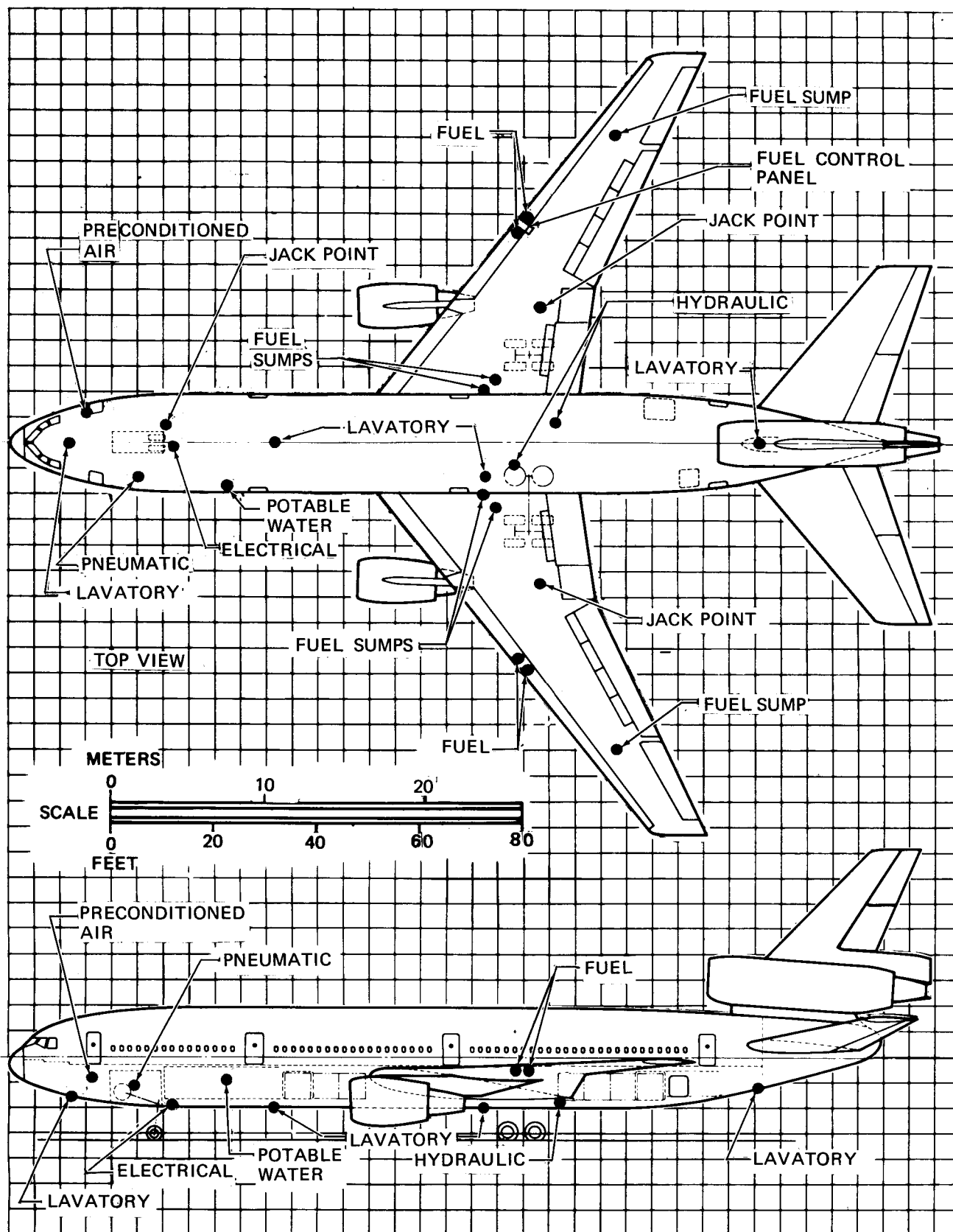
- (1) TIME INCLUDES EQUIPMENT POSITIONING AND REMOVAL
- (2) TIME AVAILABLE FOR BULK LOADING
- (3) CABIN TIDIED BY CABIN CREW
- (4) 1600 GPM INITIAL PUMPING RATE  
(6056 LITERS PER MIN)

- MIXED CLASS CONFIGURATION
- 26 FIRST CLASS
- 122 TOURIST CLASS
- 55% LOAD FACTOR

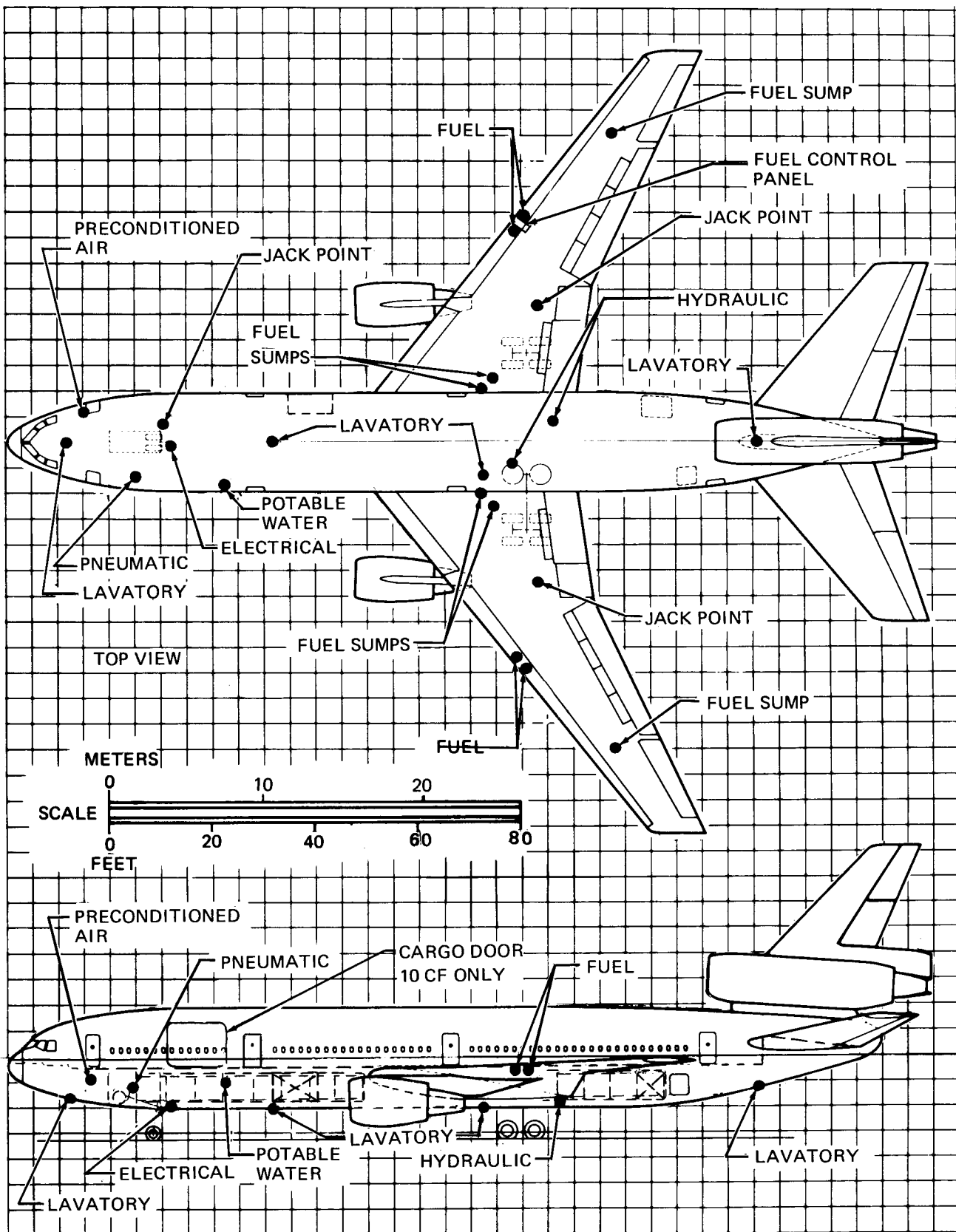
### 5.3 TERMINAL OPERATIONS, EN ROUTE STATION MODEL DC-10 SERIES 40 AND 40CF (LOWER GALLEY)



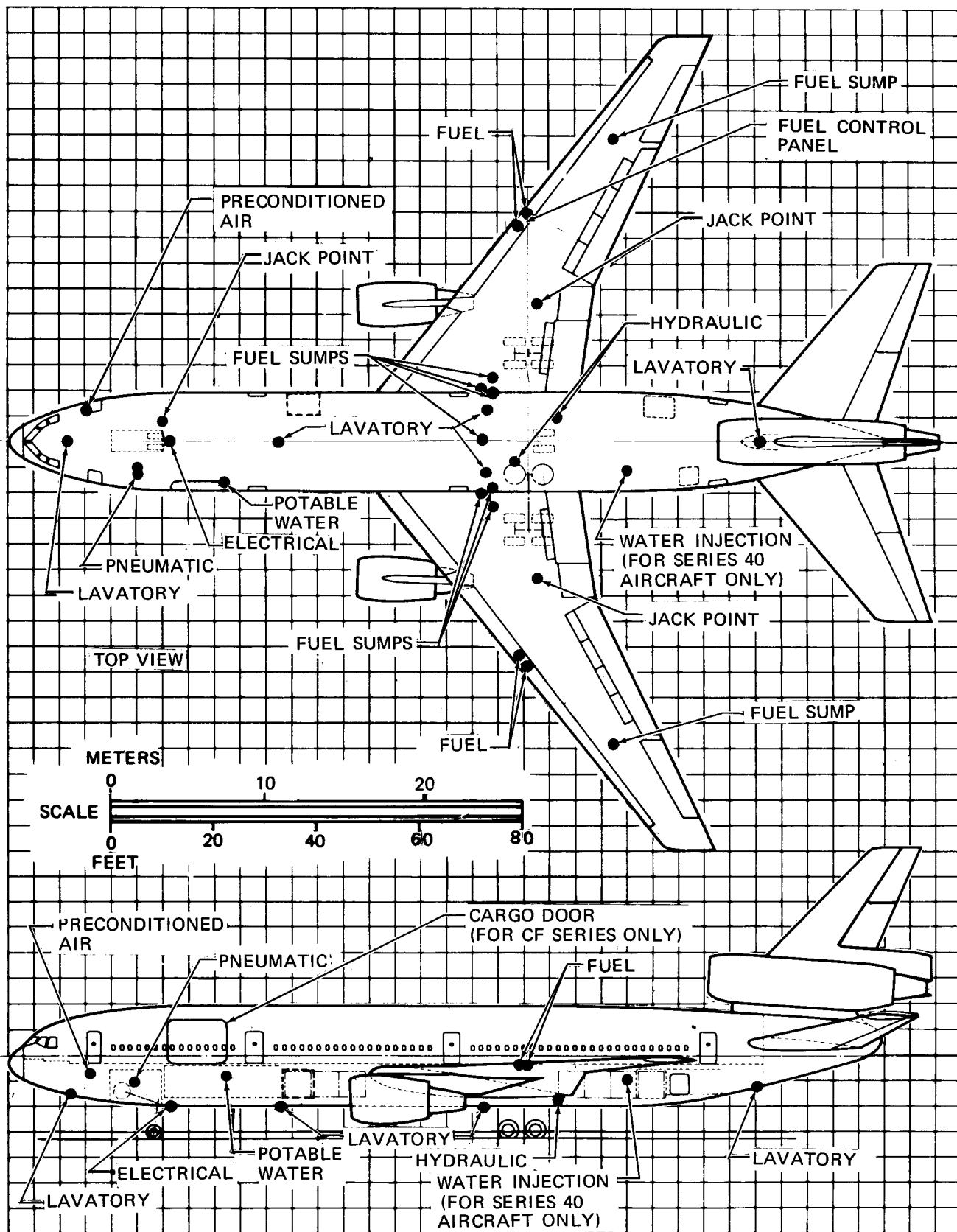
## 104



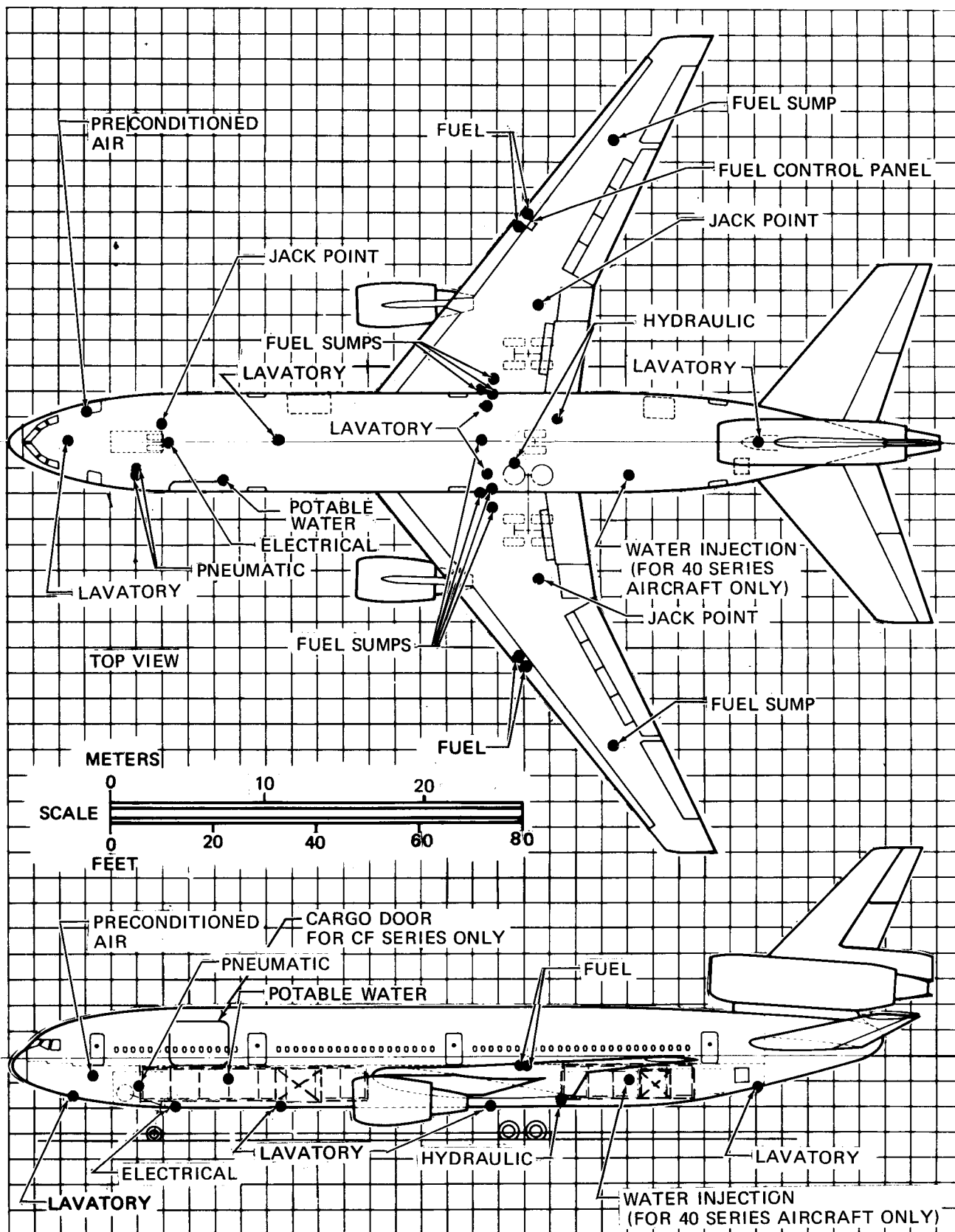
**5.4 GROUND SERVICE CONNECTIONS  
 MODEL DC-10 SERIES 10  
 (LOWER GALLEY)**



5.4 GROUND SERVICE CONNECTIONS  
MODEL DC-10 SERIES 10 AND 10CF  
(UPPER GALLEY)



**5.4 GROUND SERVICE CONNECTIONS  
MODEL DC-10 SERIES 30, 30CF, 40 AND 40CF  
(LOWER GALLEY)**



5.4 GROUND SERVICE CONNECTIONS  
MODEL DC-10 SERIES 30, 30CF, 40 AND 40CF  
(UPPER GALLEY)

	DISTANCE AFT OF NOSE		DISTANCE FROM AIRPLANE CENTERLINE				HEIGHT ABOVE GROUND					
	FT - IN.	METERS	RIGHT SIDE		LEFT SIDE		NOMINAL		MINIMUM		MAXIMUM	
			FT - IN.	METERS	FT - IN.	METERS	FT - IN.	METERS	FT - IN.	METERS	FT - IN.	METERS
5.4.1 HYDRAULIC SYSTEM <ul style="list-style-type: none"> <li>TWO SERVICE CONNECTIONS:</li> <li>A. SERVICE PANEL CONTAINING PRESSURE AND TEST STAND CONNECTIONS, 3000 PSI AT 50 GPM MAXIMUM</li> <li>B. RESERVOIR FILL CONNECTIONS, 60 PSI</li> </ul>	106 - 2	32.36	4 - 10	1.47			8 - 1	2.46	8 - 1	2.46	8 - 8	2.64
	99 - 4	30.28			3 - 0	0.91	9 - 9	2.97	9 - 9	2.97	10 - 3	3.12
5.4.2 ELECTRICAL SYSTEM <ul style="list-style-type: none"> <li>TWO SERVICE CONNECTIONS, 80 KVA, EA. 115 VOLT, 400 CPS, 3 PHASE.</li> </ul>	30 - 6	9.30			1 - 2	0.35	7 - 5	2.25	7 - 3	2.20	8 - 1	2.47
5.4.3 OXYGEN - INDEPENDENT AIRCREW AND PASSENGER SYSTEMS <ul style="list-style-type: none"> <li>AIRCREW OXYGEN SYSTEM.</li> <li>PASSENGER OXYGEN SYSTEM.</li> </ul>	CYLINDER IN AVIONICS COMPARTMENT, CONNECTED TO MANIFOLD. PORTABLE CYLINDER FOR CREW IN-FLIGHT COMPARTMENT. CHEMICAL OXYGEN SYSTEM IN MODULES IN SEAT BACKS, LAVATORIES, AND ATTENDANT STATIONS. PORTABLE CYLINDERS FOR FIRST AID.											
5.4.4 FUEL SYSTEM TWO PRESSURE SERVICE POINTS IN EACH WING LEADING EDGE. 1250 GPM THROUGH 2 POINTS - 1600 GPM THROUGH 4 POINTS AT 50 PSIG. TOTAL USABLE CAPACITY 26,501 U.S. GALLONS 5987 U.S. GALLONS EACH WING TANK 1 AND 3 EACH 9697 U.S. GALLONS NUMBER 2 TANK 4830 U.S. GALLONS AUX CENTER WING TANK												
<ul style="list-style-type: none"> <li>RH WING SERVICE RECEPTACLES</li> <li>LH WING SERVICE RECEPTACLES</li> </ul>	99 - 6	30.40	42 - 3	12.88			14 - 7	4.44	14 - 6	4.42	15 - 3	4.65
	99 - 6	30.40			42 - 3	12.88	14 - 7	4.44	14 - 6	4.42	15 - 3	4.65

## GROUND SERVICE CONNECTION DATA MODEL DC-10 SERIES 10 AND 10CF

	DISTANCE AFT OF NOSE		DISTANCE FROM AIRPLANE CENTERLINE				HEIGHT ABOVE GROUND					
	FT - IN.	METERS	RIGHT SIDE		LEFT SIDE		NOMINAL		MINIMUM		MAXIMUM	
			FT - IN.	METERS	FT - IN.	METERS	FT - IN.	METERS	FT - IN.	METERS	FT - IN.	METERS
5.4.5 PNEUMATIC SYSTEM  TWO 3-IN. SERVICE CONNECTIONS FOR ENGINE START AND AIR CONDITIONING	25 - 2	7.63			6 - 7	2.01	10 - 5	3.17	10 - 2	3.10	11 - 2	3.40
5.4.6 PRECONDITIONED AIR  TWO 8-IN. SERVICE CONNECTIONS FOR AIR CONDITIONING	15 - 2	4.63	6 - 2	1.88			12 - 3	3.74	12 - 0	3.66	13 - 1	3.98
5.4.7 POTABLE WATER SYSTEM  ● ONE SERVICE CONNECTION  ● TOTAL TANK CAPACITY 150 U.S. GALLONS (568 LITERS)	42 - 2	12.85			8 - 11	2.73	13 - 0	3.95	12 - 10	3.91	13 - 8	4.17
5.4.8 LAVATORY SYSTEM												
(1) NUMBER OF TOILETS												
1 - 2 FORWARD	13 - 10	4.22	☒				9 - 6	2.89	9 - 3	2.81	10 - 3	3.13
1 - 2 MID	52 - 6	16.00	☒				7 - 3	2.21	7 - 2	2.18	7 - 10	2.39
1 - 2 OVERWING	93 - 11	28.63			6 - 11	2.11	7 - 4	2.24	7 - 4	2.24	7 - 9	2.36
2 - 5 AFT	145 - 2	44.28	☒				10 - 0	3.05	9 - 11	3.02	10 - 10	3.30
(2) SERVICE CAPACITIES (7 TOILETS)												
WASTE - 119 U.S. GAL. (450 LITERS)												
FLUSH - 70 U.S. GAL. (265 LITERS)												
CHEMICAL PRECHARGE - 12 U.S. GAL. (45 LITERS)												

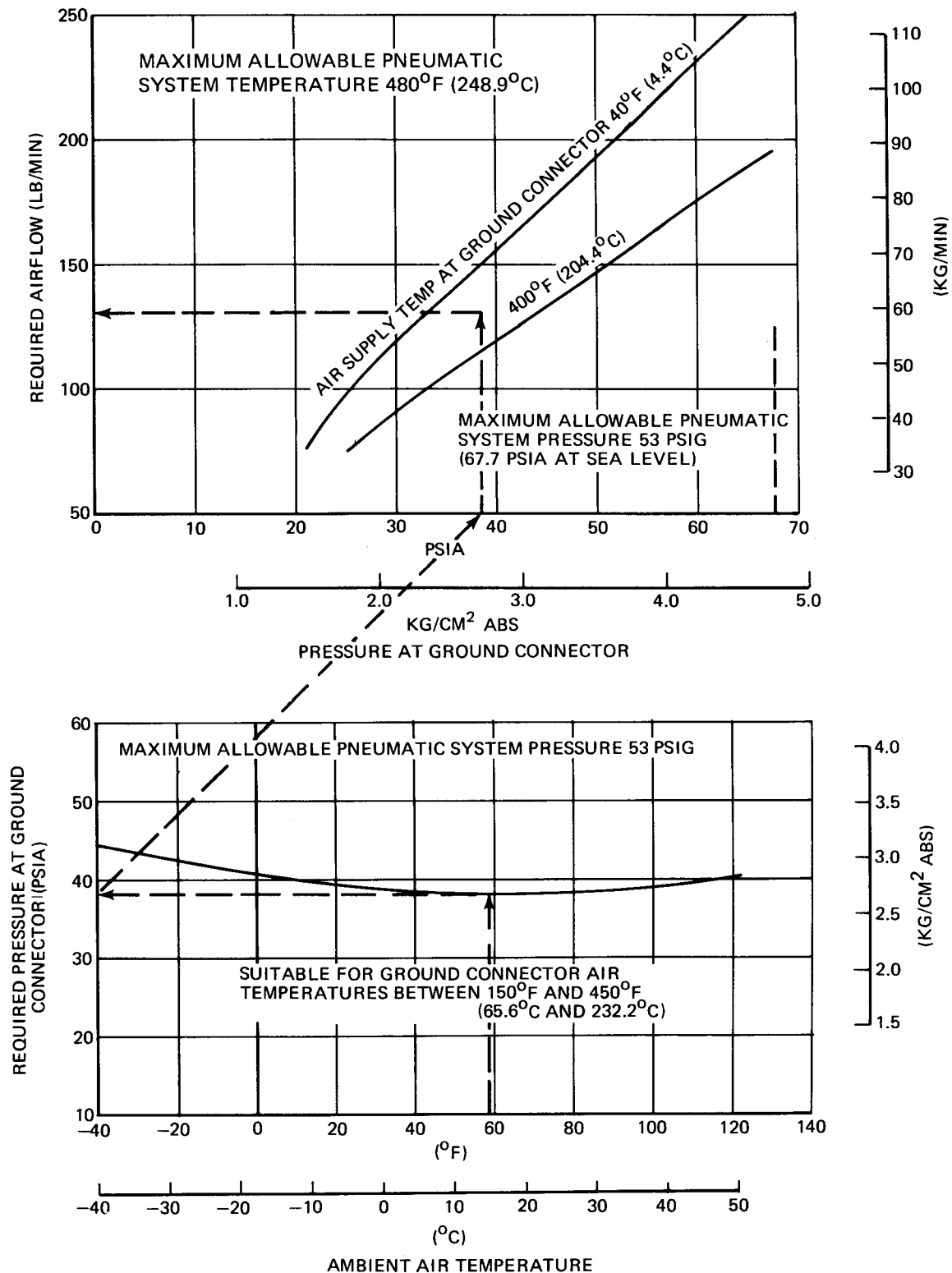
# GROUND SERVICE CONNECTION DATA MODEL DC-10 SERIES 10 AND 10CF

	DISTANCE AFT OF NOSE		DISTANCE FROM AIRPLANE CENTERLINE				HEIGHT ABOVE GROUND					
	FT - IN.	METERS	RIGHT SIDE		LEFT SIDE		NOMINAL		MINIMUM		MAXIMUM	
			FT - IN.	METERS	FT - IN.	METERS	FT - IN.	METERS	FT - IN.	METERS	FT - IN.	METERS
5.4.1 HYDRAULIC SYSTEM												
● TWO SERVICE CONNECTIONS:												
A. SERVICE PANEL CONTAINING PRESSURE AND TEST STAND CONNECTIONS, 3000 PSI AT 50 GPM MAXIMUM	106 - 2	32.36	4 - 10	1.47			8 - 2	2.49	8 - 2	2.49	8 - 10	2.69
B. RESERVOIR FILL CONNECTIONS, 60 PSI	99 - 4	30.28			3 - 0	0.91	9 - 10	3.00	9 - 10	3.00	10 - 5	3.17
5.4.2 ELECTRICAL SYSTEM												
● TWO SERVICE CONNECTIONS, 80 KVA, EA. 115 VOLT, 400 CPS, 3 PHASE	30 - 6	9.30			1 - 2	00.35	7 - 6	2.28	7 - 5	2.26	8 - 5	2.57
5.4.3 OXYGEN - INDEPENDENT AIRCREW AND PASSENGER SYSTEMS												
● AIRCREW OXYGEN SYSTEM.												
● PASSENGER OXYGEN SYSTEM.												
5.4.4 FUEL SYSTEM												
TWO PRESSURE SERVICE POINTS IN EACH WING LEADING EDGE. 1250 GPM THROUGH 2 POINTS - 1600 GPM THROUGH 4 POINTS AT 50 PSIG.												
TOTAL USABLE CAPACITY 36,522 U.S. GALLONS 6,090 U.S. GALLONS EACH WING TANK 1 AND 3 EACH 9,654 U.S. GALLONS NUMBER 2 TANK 12,731 U.S. GALLONS CTR WING AUX TANK 1,957 U.S. GALLONS UNDER WING AUX TANK												
● RH WING SERVICE RECEPTACLES	99 - 6	30.40	42 - 3	12.88			14 - 8	4.47	14 - 8	4.47	15 - 5	4.70
● LH WING SERVICE RECEPTACLES	99 - 6	30.40			42 - 3	12.88	14 - 8	4.47	14 - 8	4.47	15 - 5	4.70

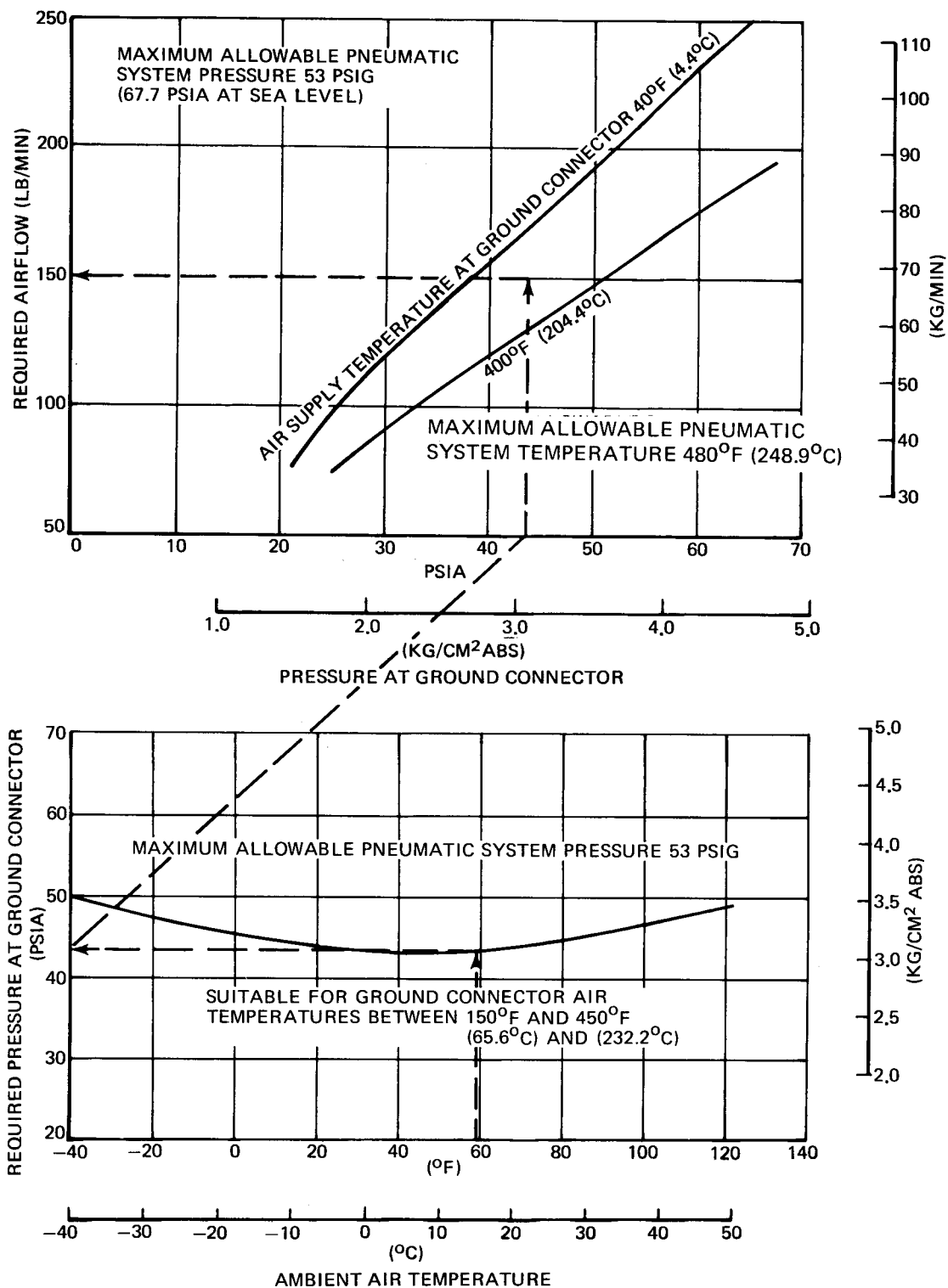
**GROUND SERVICE CONNECTION DATA**  
**MODEL DC-10 SERIES 30, 30CF, 40 AND 40CF**

	DISTANCE AFT OF NOSE		DISTANCE FROM AIRPLANE CENTERLINE				HEIGHT ABOVE GROUND					
	FT - IN.	METERS	RIGHT SIDE		LEFT SIDE		NOMINAL		MINIMUM		MAXIMUM	
			FT - IN.	METERS	FT - IN.	METERS	FT - IN.	METERS	FT - IN.	METERS	FT - IN.	METERS
5.4.5 PNEUMATIC SYSTEM  TWO 3-IN. SERVICE CONNECTIONS FOR ENGINE START AND AIR CONDITIONING	25 - 2	7.63			6 - 7	2.01	10 - 6	3.20	10 - 4	3.16	11 - 6	3.50
5.4.6 PRECONDITIONED AIR  TWO 8-IN. CONNECTIONS FOR AIR CONDITIONING.	15 - 2	4.63	6 - 2	1.88			12 - 4	3.77	12 - 3	3.73	13 - 5	4.09
5.4.7 POTABLE WATER SYSTEM  ● ONE SERVICE CONNECTION  ● THREE-TANK SYSTEM 65 U.S. GALLONS EACH (246 LITERS) - TOTAL SYSTEM CAPACITY 195 GAL (738 LITERS)	42 - 2	12.85			8 - 5	2.57	12 - 1	3.68	12 - 0	3.66	12 - 11	3.95
5.4.8 LAVATORY SYSTEM  (1) NUMBER OF TOILETS      SERVICE LOCATION 1 - 2      FORWARD 1 - 2      CENTER 1 - 2      OVERWING 2 - 5      AFT  (2) SERVICE CAPACITIES (8 TOILETS) WASTE      - 189 U.S. GAL. (715 LITERS) FLUSH      - 47 U.S. GAL. (178 LITERS) CHEMICAL PRECHARGE      - 19 U.S. GAL. (72 LITERS)	13 - 10 52 - 6 93 - 11 145 - 2	4.22 22.07 28.63 44.28	℄ ℄ 6 - 11 ℄	2.11	6 - 11	2.11	9 - 7 7 - 4 7 - 5 10 - 1	2.92 2.23 2.26 3.08	9 - 5 7 - 3 7 - 5 9 - 10	2.87 2.21 2.26 3.00	10 - 8 8 - 1 7 - 11 10 - 11	3.24 2.47 2.41 3.34
5.4.9 WATER INJECTION (SERIES 40 AIRCRAFT ONLY) 500 U.S. GALLONS (1893 LITERS)	120 - 2	36.63			5 - 9	1.77	8 - 5	2.56	8 - 3	2.53	9 - 1	2.78

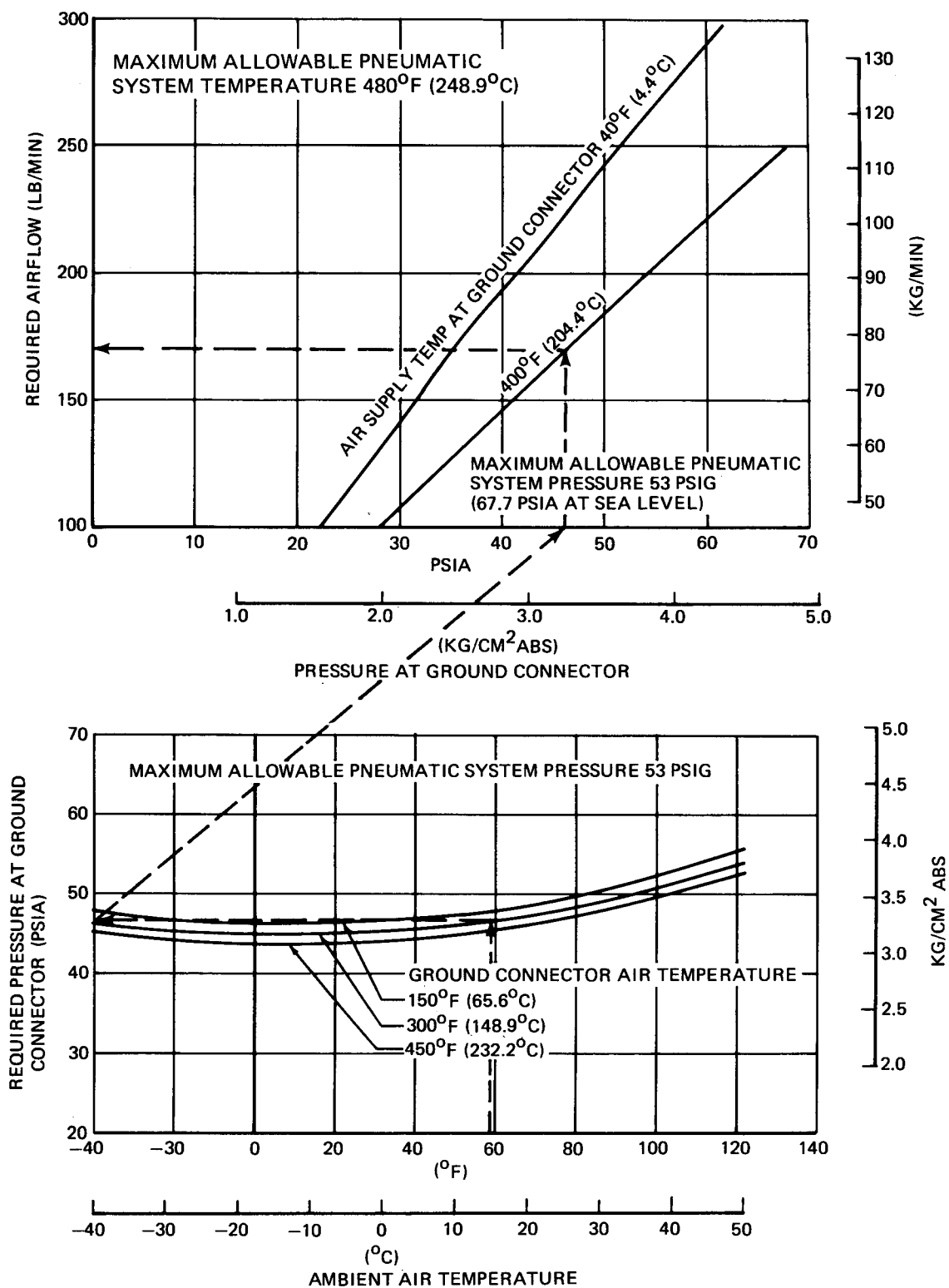
**GROUND SERVICE CONNECTION DATA  
MODEL DC-10 SERIES 30, 30CF, 40 AND 40CF**



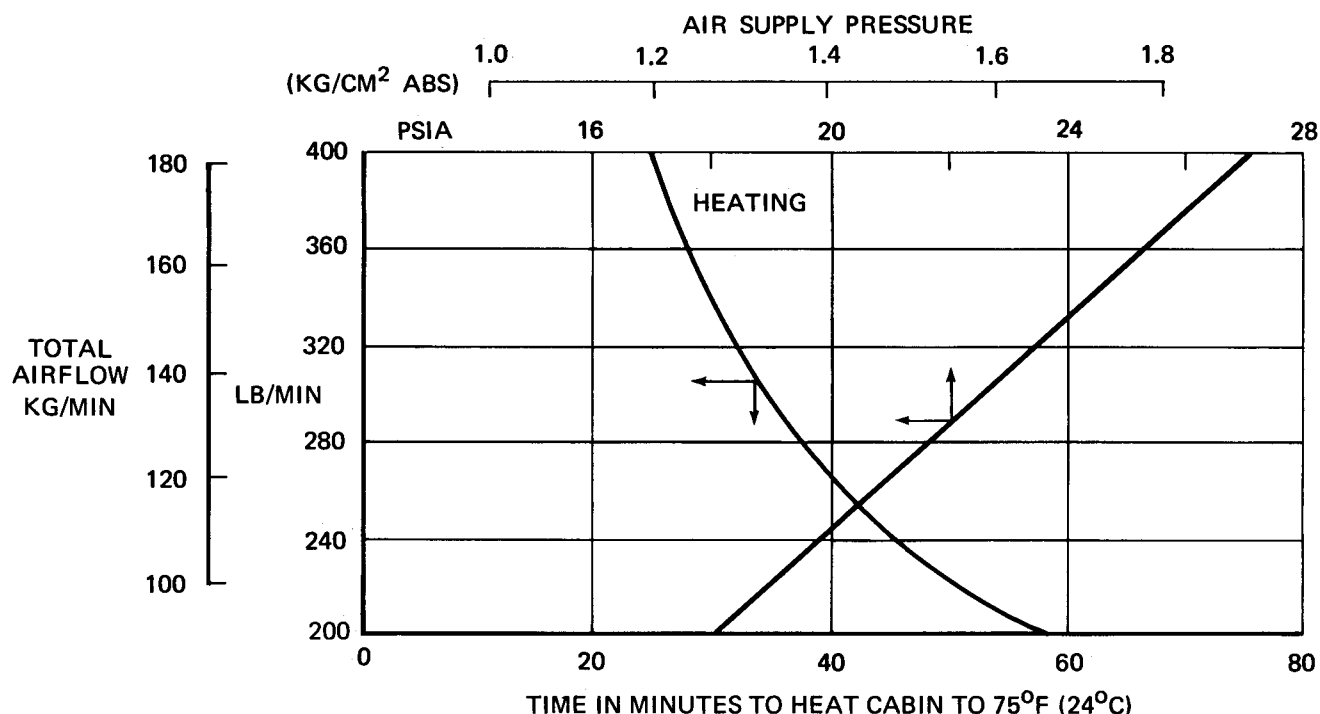
## 5.5 GE CF6-6D ENGINE STARTING PNEUMATIC REQUIREMENTS MODEL DC-10 SERIES 10



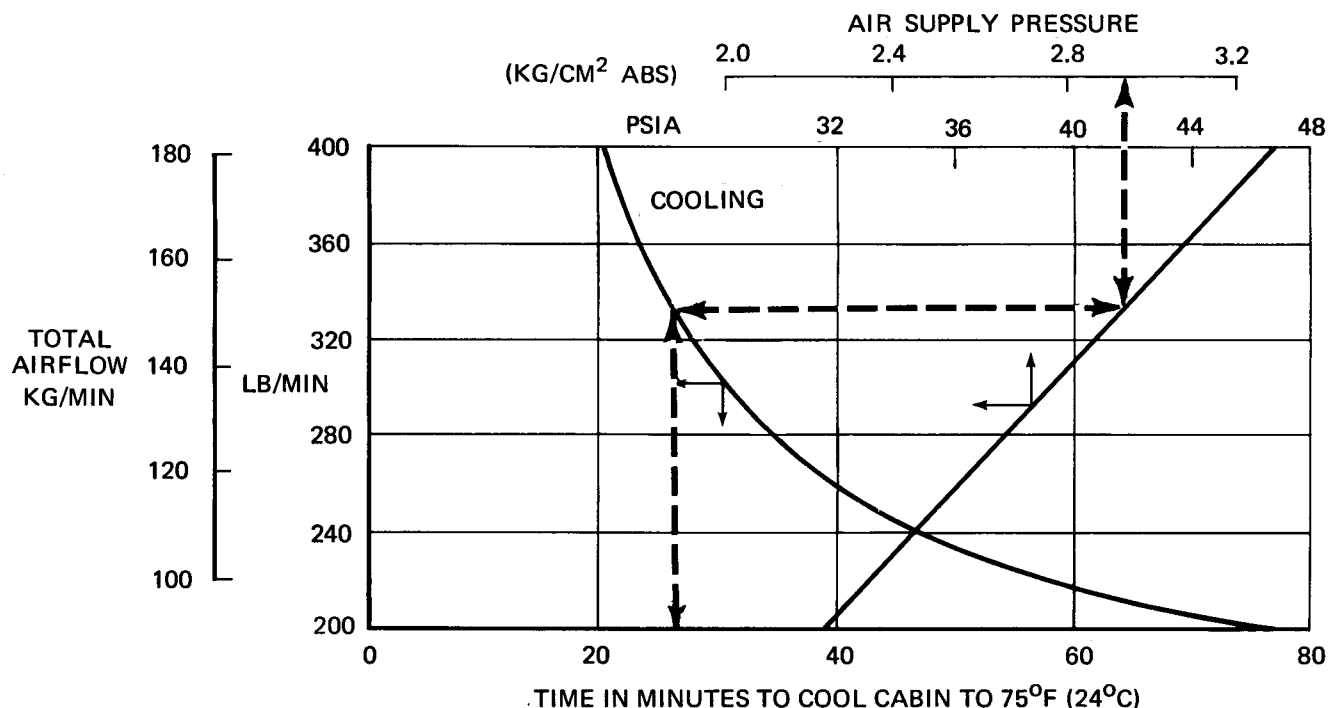
## 5.5 GE CF6-50 ENGINE STARTING PNEUMATIC REQUIREMENTS MODEL DC-10 SERIES 30



## 5.5 JT9D-59 ENGINE STARTING PNEUMATIC REQUIREMENTS MODEL DC-10 SERIES 40



- INITIAL CABIN TEMPERATURE -25°F (-32°C)
- OUTSIDE AIR TEMP -40°F (-40°C)
- MAX TEMP AT GROUND CONN 440°F (227°C)
- MIN TEMP NOT LESS THAN 200°F (93°C) ABOVE O.A.T.
- DULL DAY - NO SOLAR IRRADIATION
- NO CABIN OCCUPANTS OR ELECTRICAL LOAD
- MAX ALLOWABLE SUPPLY PRESSURE 45 PSIG
- BOTH GROUND CONNECTIONS USED

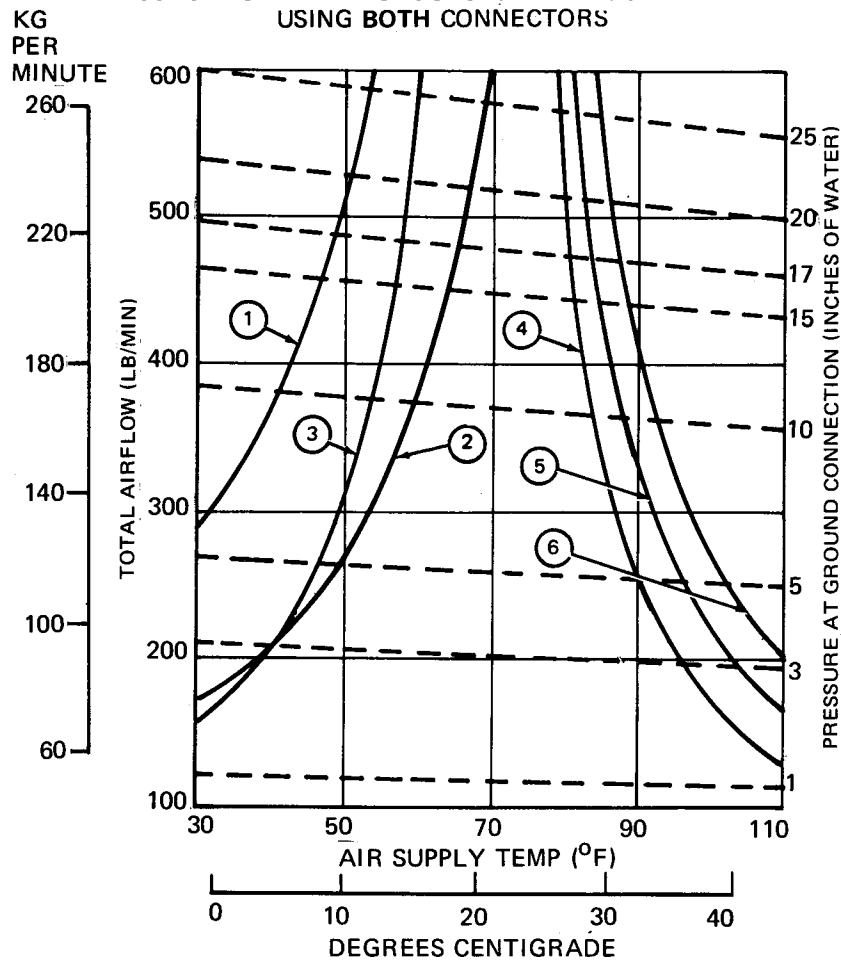


- INITIAL CABIN TEMPERATURE 115°F (46°C)
- OUTSIDE AIR TEMP 103°F (40°C) REL HUM 42%
- MAX TEMP AT GROUND CONN 440°F (227°C)
- MIN TEMP NOT LESS THAN 200°F (93°C) ABOVE O.A.T.
- BRIGHT DAY - NO SOLAR IRRADIATION
- NO CABIN OCCUPANTS OR ELECTRICAL LOAD
- MAX ALLOWABLE SUPPLY PRESSURE 45 PSIG
- BOTH GROUND CONNECTIONS USED

## 5.6 GROUND PNEUMATIC POWER REQUIREMENTS

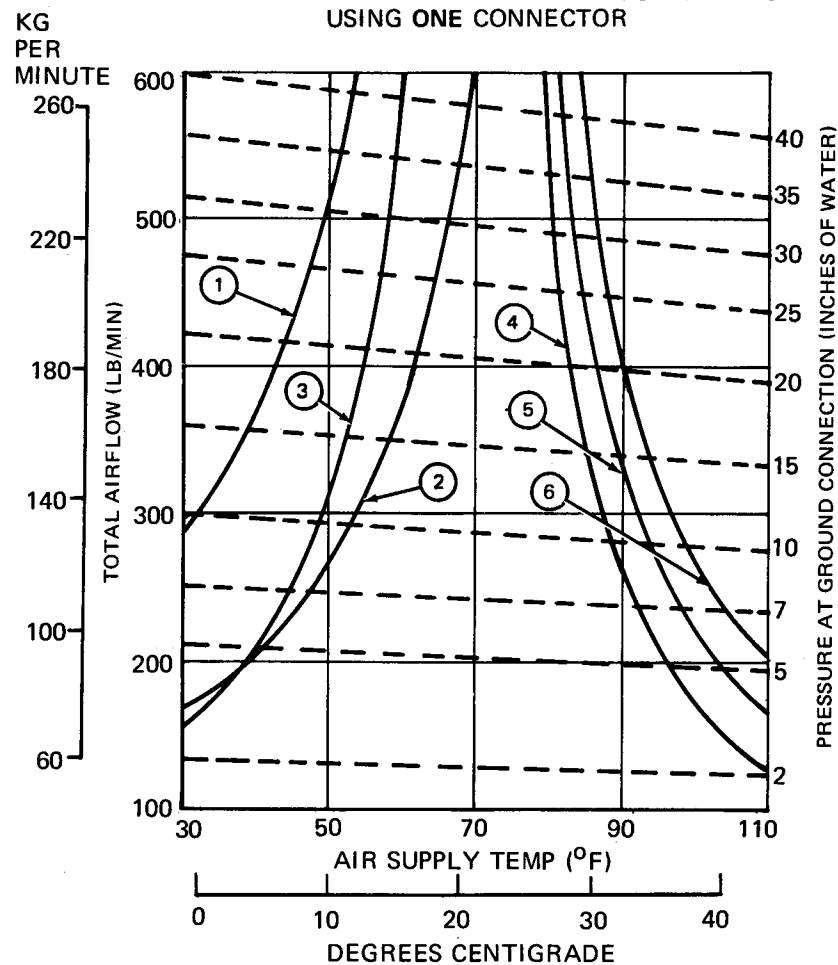
### MODEL DC-10 SERIES 10, 10CF, 30, 30CF, 40 AND 40CF

CONDITIONED AIR GROUND CART REQUIREMENTS  
USING BOTH CONNECTORS



- ① CABIN AT 75°F (24°C), 353 OCCUPANTS, BRIGHT DAY (SOLAR IRRADIATION), 103°F (39°C) DAY
- ② SAME AS 1 EXCEPT CABIN AT 85°F (29°C)
- ③ SAME AS 1 EXCEPT CABIN AT 70°F (21°C), NO CABIN OCCUPANTS, FIVE CREW MEMBERS ONLY

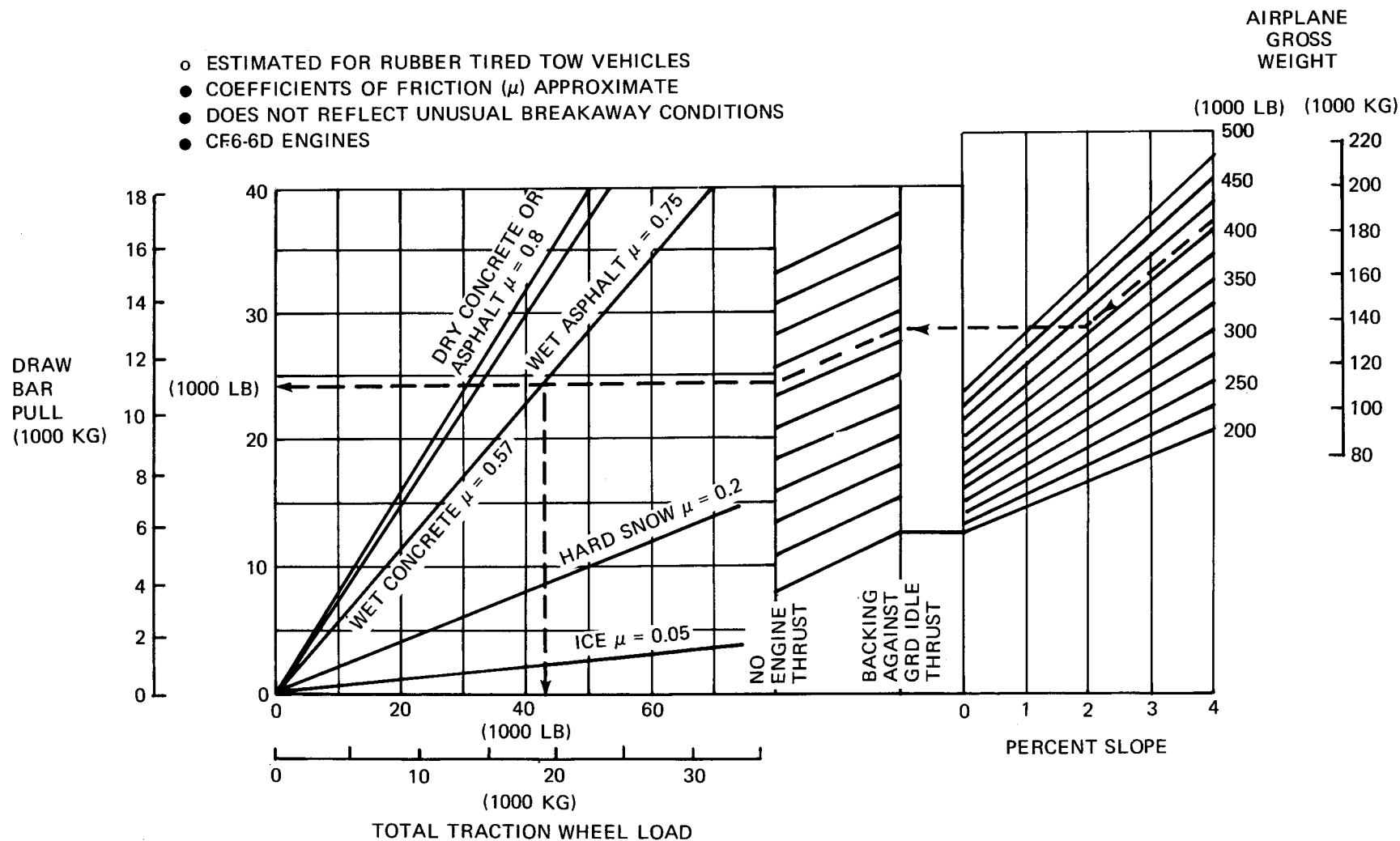
CONDITIONED AIR GROUND CART REQUIREMENTS  
USING ONE CONNECTOR



- ④ CABIN AT 70°F (21°C), 50 CABIN OCCUPANTS, DULL DAY (NO SOLAR IRRADIATION), 0°F (-18°C) DAY
- ⑤ SAME AS 4 EXCEPT -20°F (-29°C) DAY
- ⑥ SAME AS 4 EXCEPT -40°F (-40°C) DAY

MAXIMUM ALLOWABLE TEMPERATURE 190°F (88°C)

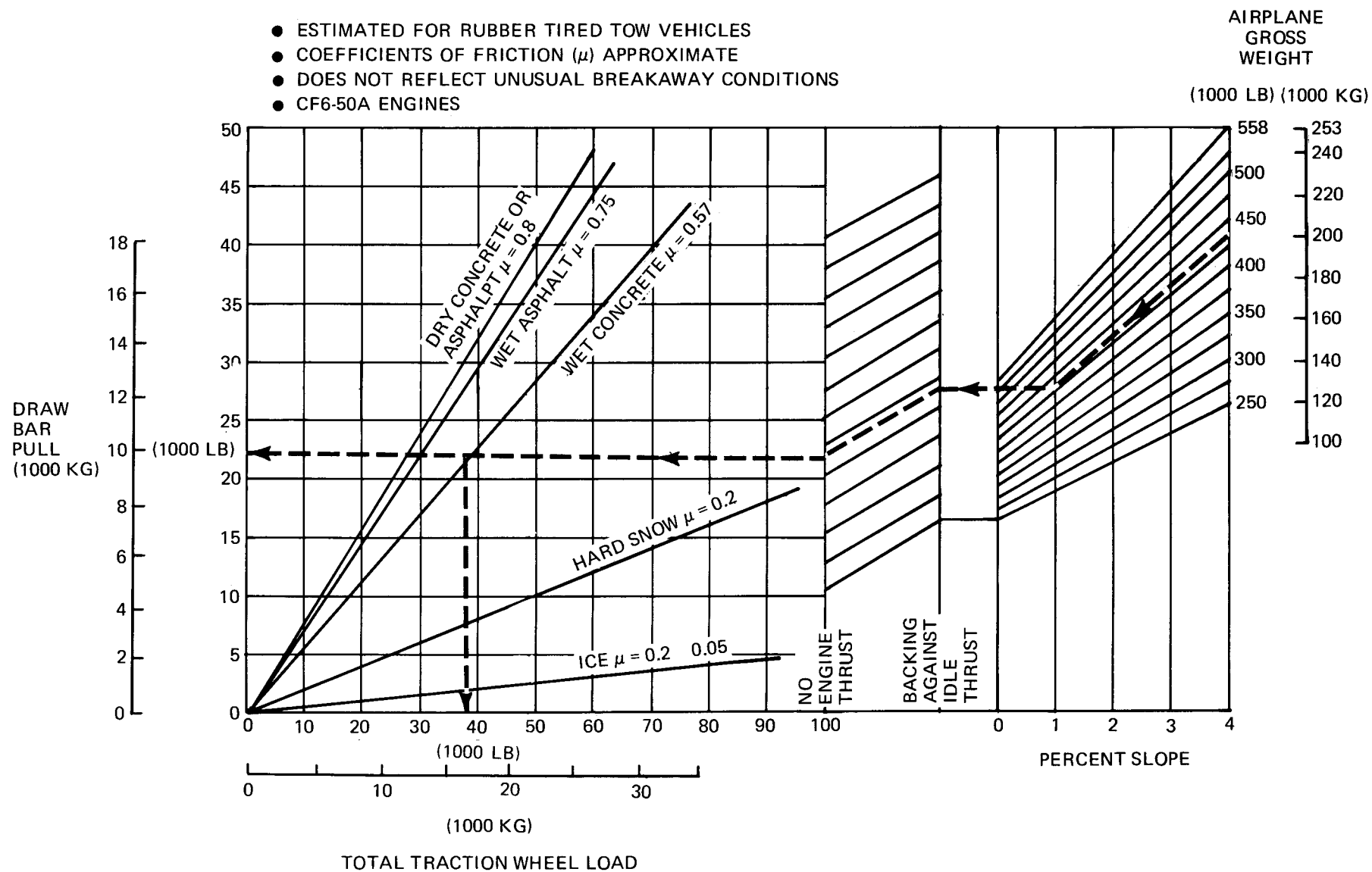
## 5.7 PRECONDITIONED AIRFLOW REQUIREMENTS MODEL DC-10 SERIES 10, 10CF, 30, 30CF, 40 AND 40CF



## 5.8 GROUND TOWING REQUIREMENTS

### MODEL DC-10 SERIES 10 AND 10CF

- ESTIMATED FOR RUBBER TIRED TOW VEHICLES
- COEFFICIENTS OF FRICTION ( $\mu$ ) APPROXIMATE
- DOES NOT REFLECT UNUSUAL BREAKAWAY CONDITIONS
- CF6-50A ENGINES



## 5.8 GROUND TOWING REQUIREMENTS MODEL DC-10 SERIES 30 AND 30CF

- AIRPLANE  
GROSS  
WEIGHT  
(1000 LB) (1000 KG)

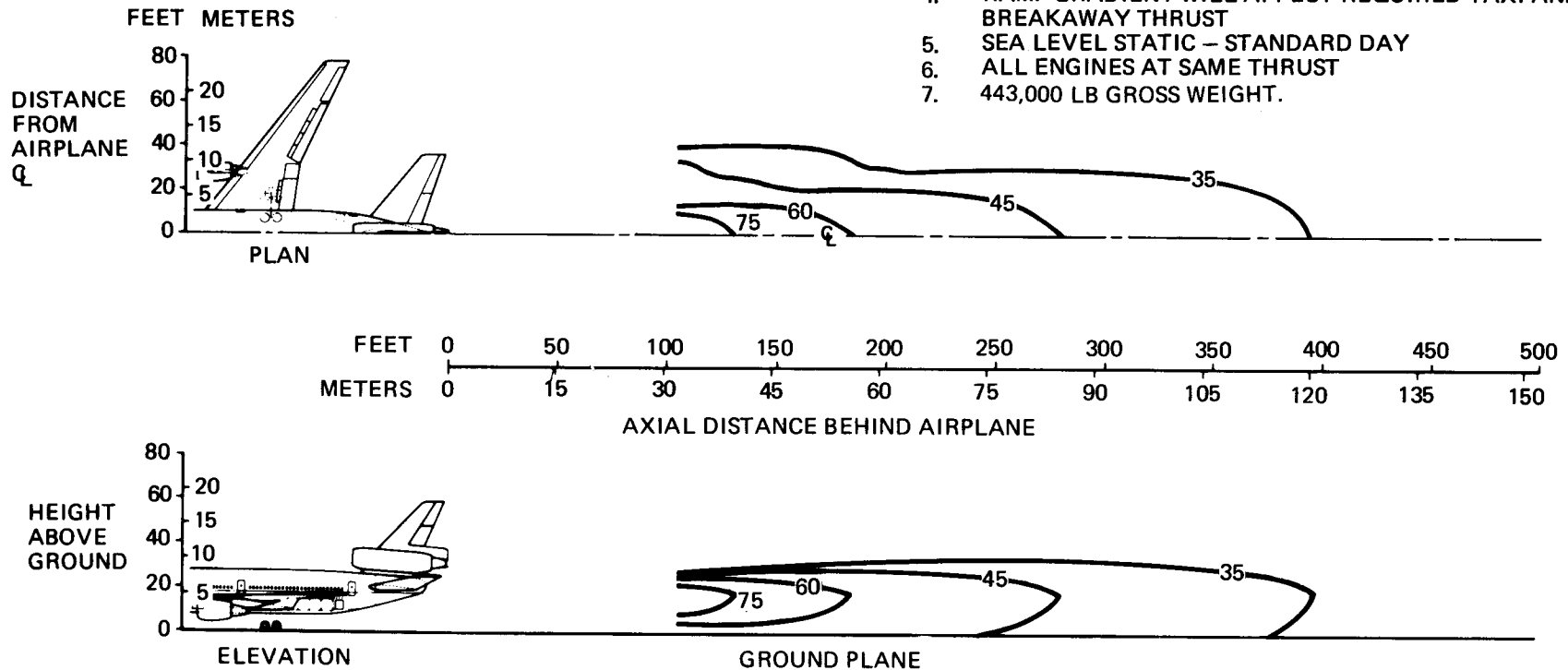


## **6.0 OPERATING CONDITIONS**

**6.1 Jet Engine Exhaust Velocities and Temperatures**

**6.2 Airport and Community Noise**

- NOTES: 1. THESE CONTOURS ARE TO BE USED AS GUIDELINES ONLY SINCE OPERATIONAL ENVIRONMENT VARIES GREATLY – OPERATIONAL SAFETY ASPECTS ARE THE RESPONSIBILITY OF THE USER/PLANNER.
2. ALL VELOCITY VALUES ARE STATUTE MILES/HOUR
3. CROSSWINDS WILL HAVE CONSIDERABLE EFFECT ON CONTOURS
4. RAMP GRADIENT WILL AFFECT REQUIRED TAXI AND BREAKAWAY THRUST
5. SEA LEVEL STATIC – STANDARD DAY
6. ALL ENGINES AT SAME THRUST
7. 443,000 LB GROSS WEIGHT.

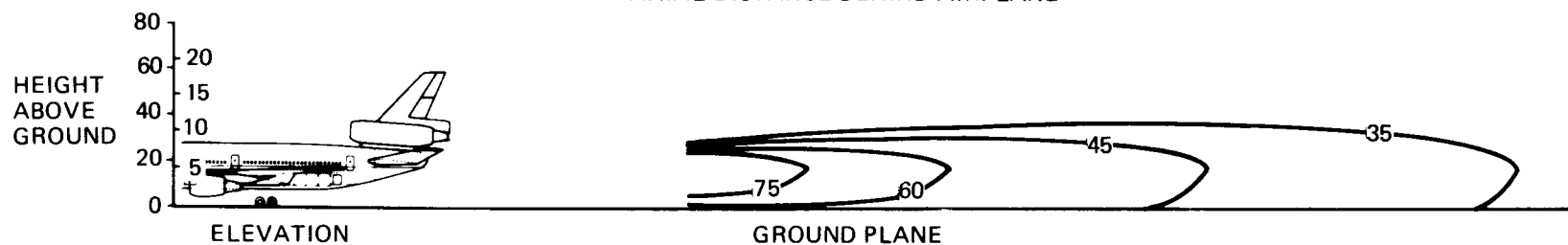
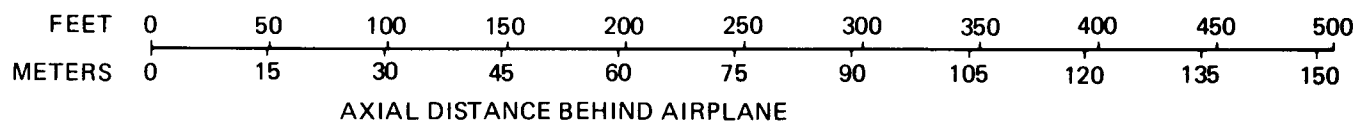
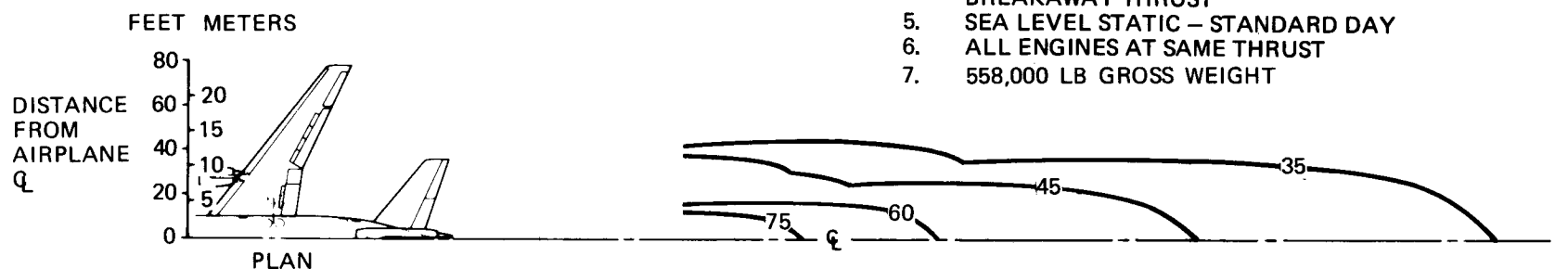


CONVERSION FACTOR  
1 MPH = 1.6 KM PER HOUR

## 6.0 OPERATING CONDITIONS

### MODEL DC-10 SERIES 10 AND 10CF

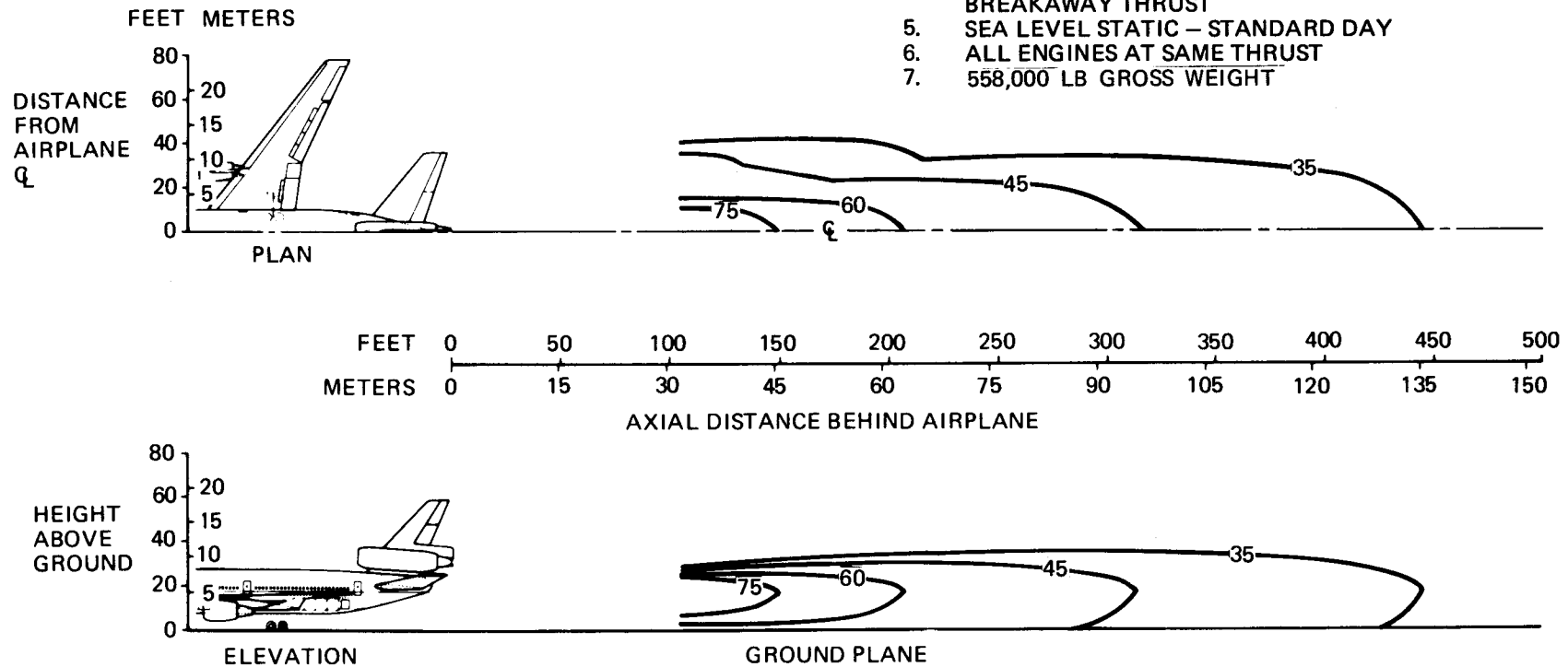
- NOTES:
1. THESE CONTOURS ARE TO BE USED AS GUIDELINES ONLY SINCE OPERATIONAL ENVIRONMENT VARIES GREATLY – OPERATIONAL SAFETY ASPECTS ARE THE RESPONSIBILITY OF THE USER/PLANNER.
  2. ALL VELOCITY VALUES ARE STATUTE MILES/HOUR
  3. CROSSWINDS WILL HAVE CONSIDERABLE EFFECT ON CONTOURS
  4. RAMP GRADIENT WILL AFFECT REQUIRED TAXI AND BREAKAWAY THRUST
  5. SEA LEVEL STATIC – STANDARD DAY
  6. ALL ENGINES AT SAME THRUST
  7. 558,000 LB GROSS WEIGHT



CONVERSION FACTOR  
1 MPH = 1.6 KM PER HOUR

### 6.1.1 JET ENGINE VELOCITY CONTOURS, BREAKAWAY POWER MODEL DC-10 SERIES 30 AND 30CF (ESTIMATED)

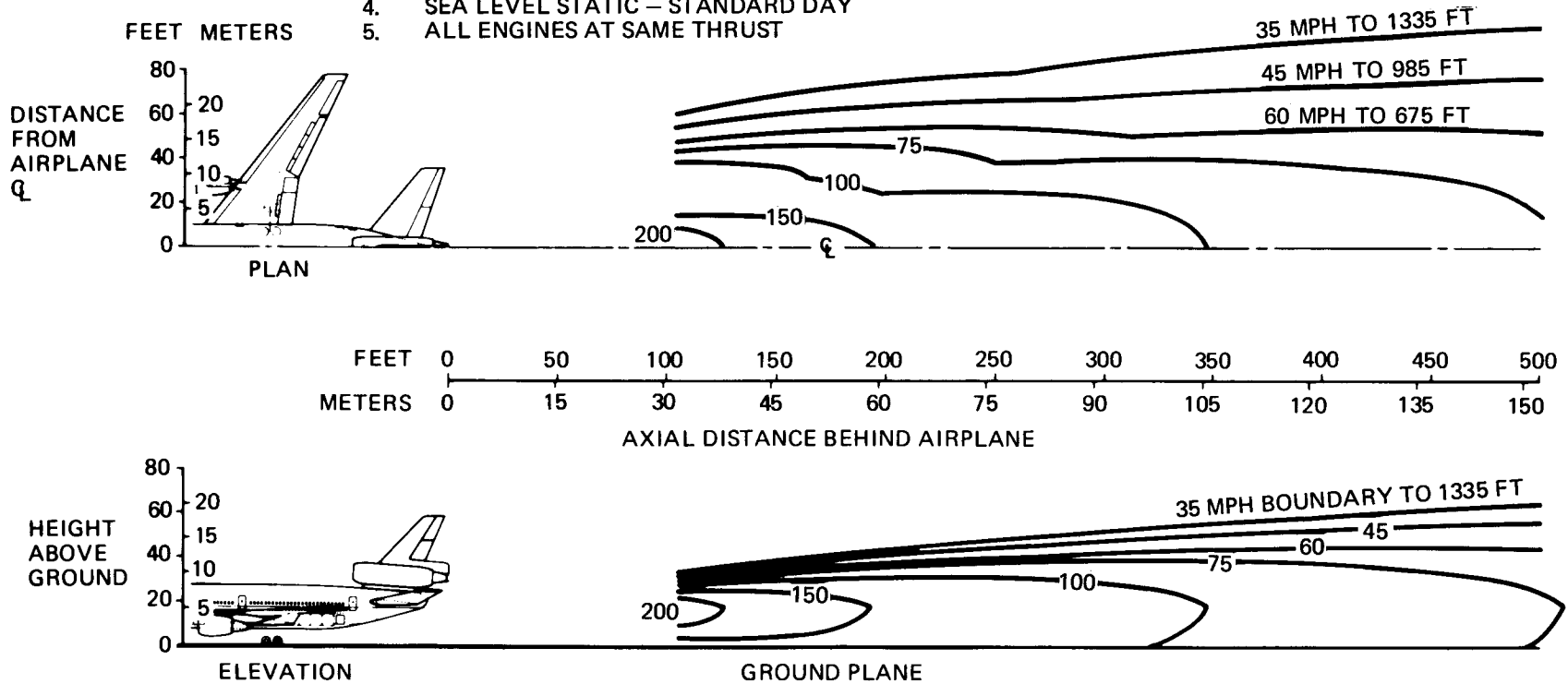
- NOTES:
1. THESE CONTOURS ARE TO BE USED AS GUIDELINES ONLY SINCE OPERATIONAL ENVIRONMENT VARIES GREATLY – OPERATIONAL SAFETY ASPECTS ARE THE RESPONSIBILITY OF THE USER/PLANNER.
  2. ALL VELOCITY VALUES ARE STATUTE MILES/HOUR
  3. CROSSWINDS WILL HAVE CONSIDERABLE EFFECT ON CONTOURS
  4. RAMP GRADIENT WILL AFFECT REQUIRED TAXI AND BREAKAWAY THRUST
  5. SEA LEVEL STATIC – STANDARD DAY
  6. ALL ENGINES AT SAME THRUST
  7. 558,000 LB GROSS WEIGHT



CONVERSION FACTOR  
1 MPH = 1.6 KM PER HOUR

### 6.1.1 JET ENGINE VELOCITY CONTOURS, BREAKAWAY POWER MODEL DC-10 SERIES 40 AND 40CF (ESTIMATED)

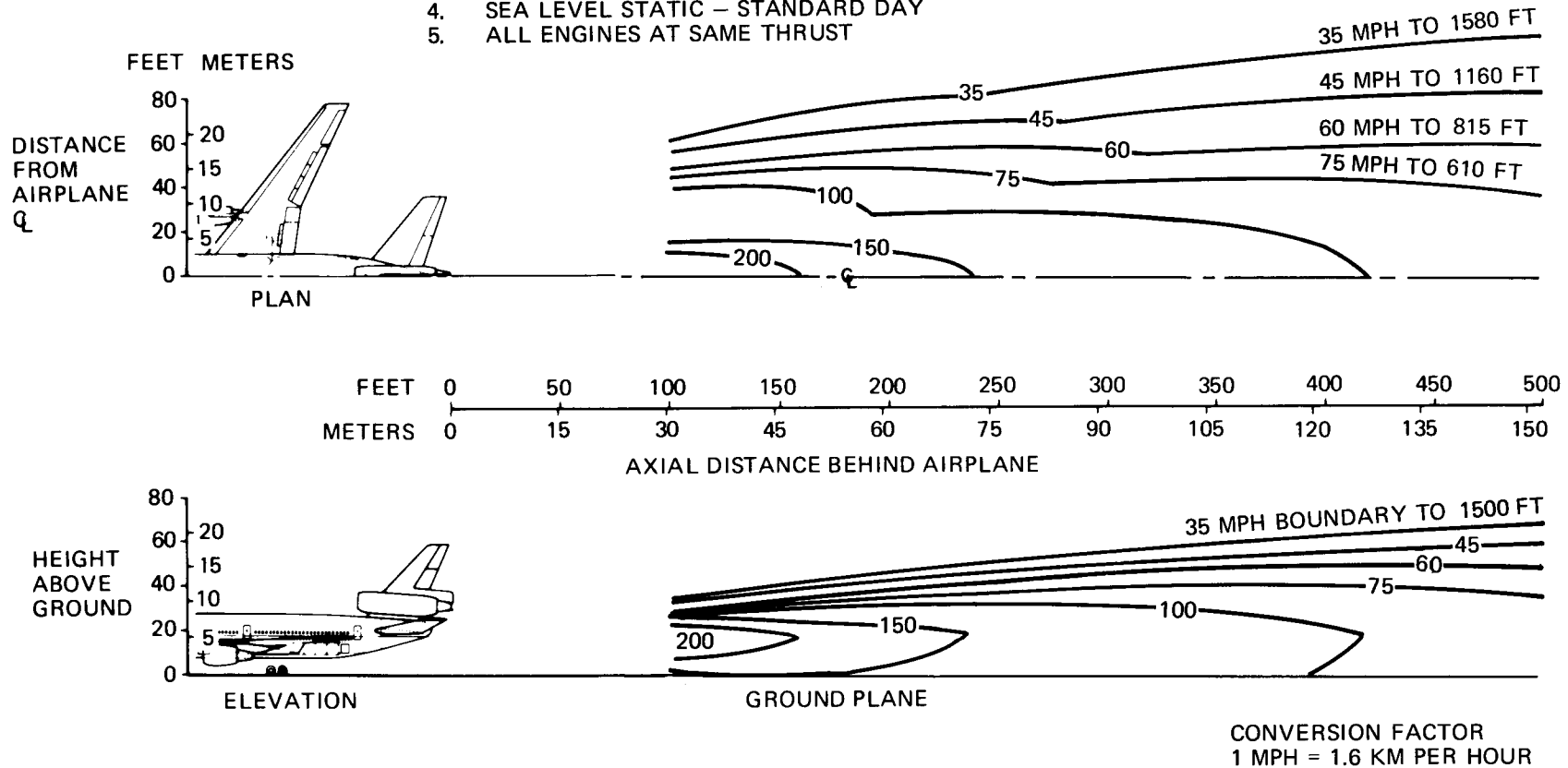
- NOTES: 1. THESE CONTOURS ARE TO BE USED AS GUIDELINES ONLY SINCE OPERATIONAL ENVIRONMENT VARIES GREATLY – OPERATIONAL SAFETY ASPECTS ARE THE RESPONSIBILITY OF THE USER/PLANNER.  
 2. ALL VELOCITY VALUES ARE STATUTE MILES/HOUR  
 3. CROSSWINDS WILL HAVE CONSIDERABLE EFFECT ON CONTOURS  
 4. SEA LEVEL STATIC – STANDARD DAY  
 5. ALL ENGINES AT SAME THRUST



CONVERSION FACTOR  
 1 MPH = 1.6 KM PER HOUR

## 6.1.2 JET ENGINE EXHAUST VELOCITY CONTOURS, TAKEOFF POWER MODEL DC-10 SERIES 10 AND 10CF

- NOTES: 1. THESE CONTOURS ARE TO BE USED AS GUIDELINES ONLY SINCE OPERATIONAL ENVIRONMENT VARIES GREATLY – OPERATIONAL SAFETY ASPECTS ARE THE RESPONSIBILITY OF THE USER/PLANNER.
2. ALL VELOCITY VALUES ARE STATUTE MILES/HOUR
3. CROSSWINDS WILL HAVE CONSIDERABLE EFFECT ON CONTOURS
4. SEA LEVEL STATIC – STANDARD DAY
5. ALL ENGINES AT SAME THRUST

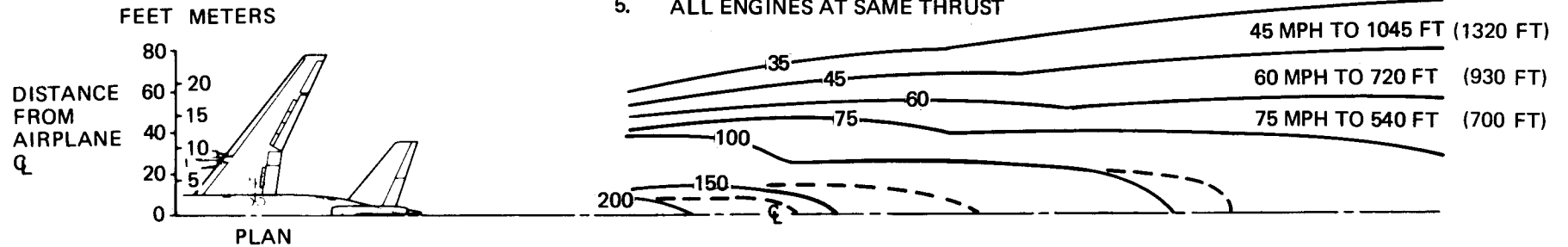


## 6.1.2 JET ENGINE EXHAUST VELOCITY CONTOURS, TAKEOFF POWER MODEL DC-10 SERIES 30 AND 30CF (ESTIMATED)

- NOTES:
1. THESE CONTOURS ARE TO BE USED AS GUIDELINES ONLY SINCE OPERATIONAL ENVIRONMENT VARIES GREATLY – OPERATIONAL SAFETY ASPECTS ARE THE RESPONSIBILITY OF THE USER/PLANNER.
  2. ALL VELOCITY VALUES ARE STATUTE MILES/HOUR
  3. CROSSWINDS WILL HAVE CONSIDERABLE EFFECT ON CONTOURS
  4. SEA LEVEL STATIC – STANDARD DAY
  5. ALL ENGINES AT SAME THRUST

JT9D ENGINE MODEL

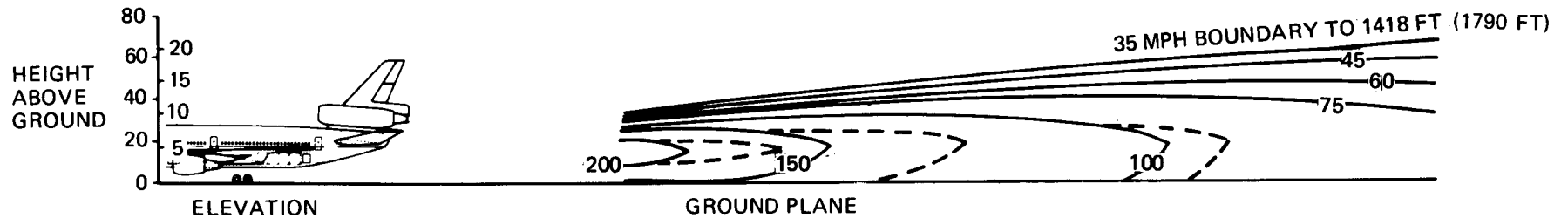
–20 –59A



FEET 0 50 100 150 200 250 300 350 400 450 500

METERS 0 15 30 45 60 75 90 105 120 135 150

AXIAL DISTANCE BEHIND AIRPLANE

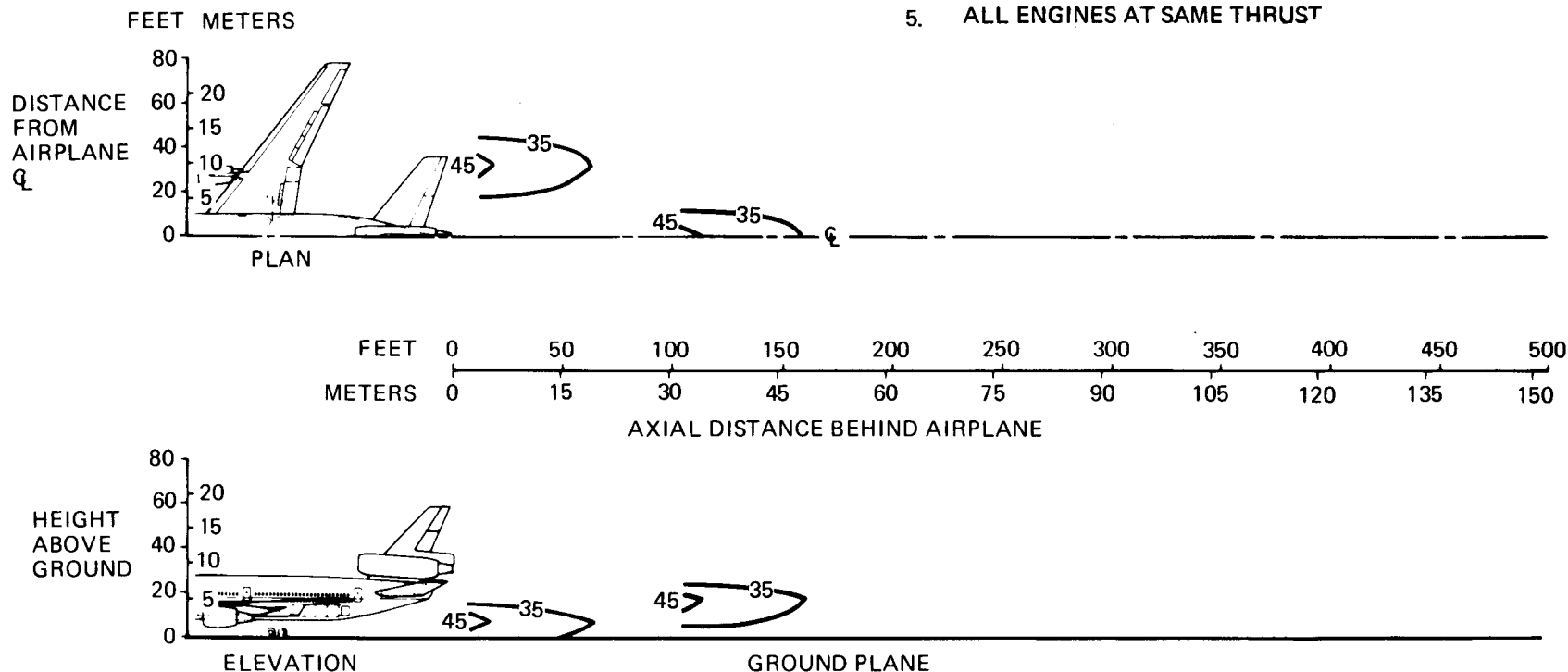


CONVERSION FACTOR  
1 MPH = 1.6 KM PER HOUR

--- JT9D-59A CONTOURS

## 6.1.2 JET ENGINE EXHAUST VELOCITY CONTOURS, TAKEOFF POWER MODEL DC-10 SERIES 40 AND 40CF (ESTIMATED)

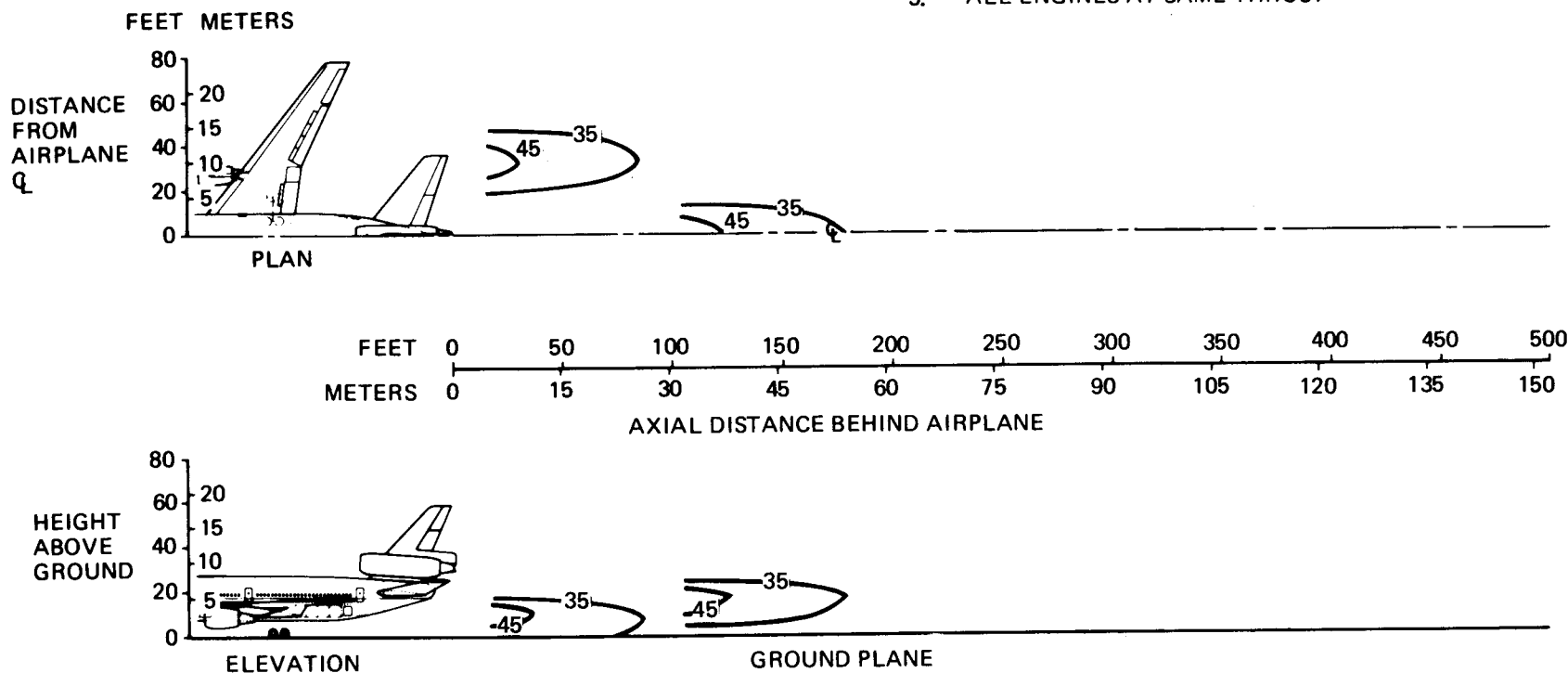
- NOTES: 1. THESE CONTOURS ARE TO BE USED AS GUIDELINES ONLY SINCE OPERATIONAL ENVIRONMENT VARIES GREATLY – OPERATIONAL SAFETY ASPECTS ARE THE RESPONSIBILITY OF THE USER/PLANNER.
2. ALL VELOCITY VALUES ARE STATUTE MILES/HOUR
3. CROSSWINDS WILL HAVE CONSIDERABLE EFFECT ON CONTOURS
4. SEA LEVEL STATIC – STANDARD DAY
5. ALL ENGINES AT SAME THRUST



CONVERSION FACTOR  
1 MPH = 1.6 KM PER HOUR

### 6.1.3 JET ENGINE EXHAUST VELOCITY CONTOURS, IDLE POWER MODEL DC-10 SERIES 10 AND 10CF

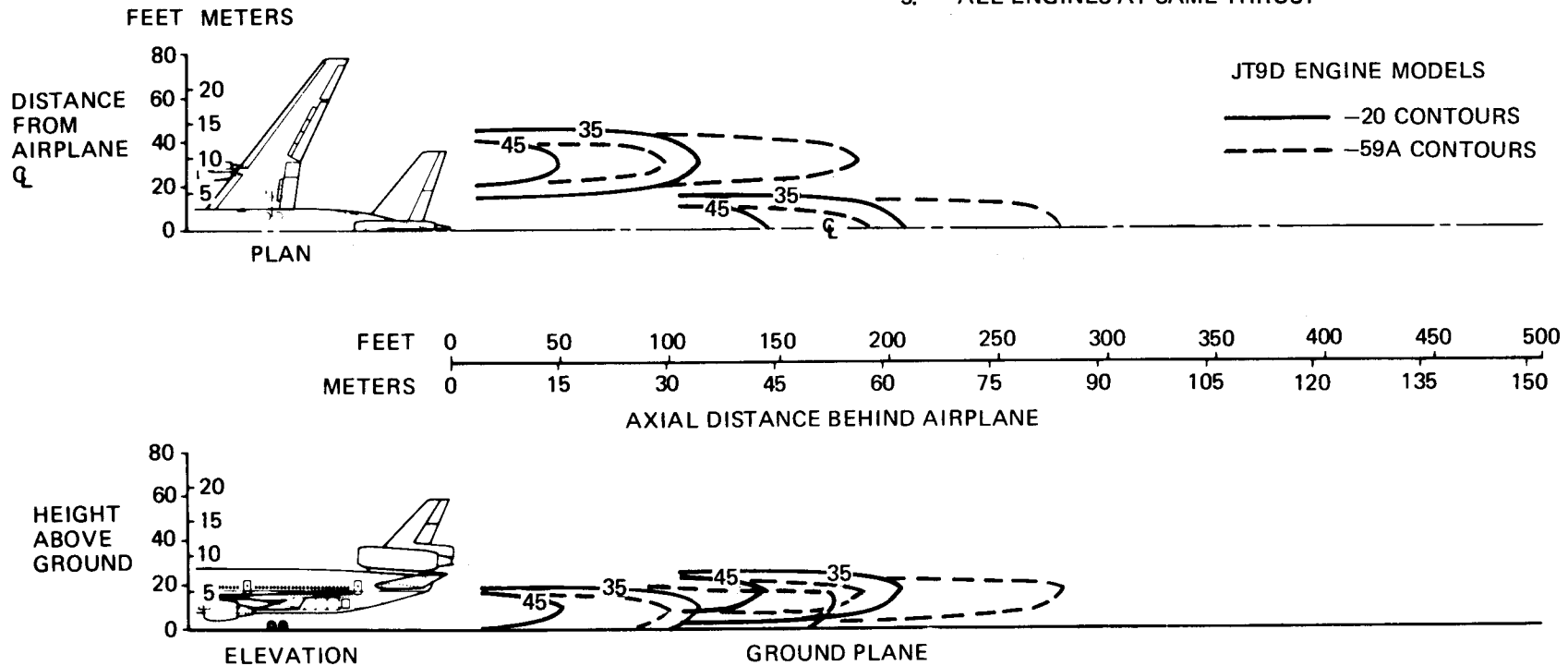
- NOTES: 1. THESE CONTOURS ARE TO BE USED AS GUIDELINES ONLY SINCE OPERATIONAL ENVIRONMENT VARIES GREATLY – OPERATIONAL SAFETY ASPECTS ARE THE RESPONSIBILITY OF THE USER/PLANNER.
2. ALL VELOCITY VALUES ARE STATUTE MILES/HOUR
3. CROSSWINDS WILL HAVE CONSIDERABLE EFFECT ON CONTOURS
4. SEA LEVEL STATIC – STANDARD DAY
5. ALL ENGINES AT SAME THRUST



CONVERSION FACTOR  
1 MPH = 1.6 KM PER HOUR

### 6.1.3 JET ENGINE EXHAUST VELOCITY CONTOURS, IDLE POWER MODEL DC-10 SERIES 30 AND 30CF (ESTIMATED)

- NOTES: 1. THESE CONTOURS ARE TO BE USED AS GUIDELINES ONLY SINCE OPERATIONAL ENVIRONMENT VARIES GREATLY – OPERATIONAL SAFETY ASPECTS ARE THE RESPONSIBILITY OF THE USER/PLANNER.  
 2. ALL VELOCITY VALUES ARE STATUTE MILES/HOUR  
 3. CROSSWINDS WILL HAVE CONSIDERABLE EFFECT ON CONTOURS  
 4. SEA LEVEL STATIC – STANDARD DAY  
 5. ALL ENGINES AT SAME THRUST



CONVERSION FACTOR  
 1 MPH = 1.6 KM PER HOUR

### 6.1.3 JET ENGINE EXHAUST VELOCITY CONTOURS, IDLE POWER MODEL DC-10 SERIES 40 AND 40CF (ESTIMATED)

#### 6.1.4 Jet Engine Exhaust Temperature (DC-10 Series 10, 30, 40 All Engine Models)

Jet engine exhaust temperature contour lines have not been presented because the adverse effects of exhaust temperature at any given position behind the aircraft fitted with these high-bypass engines are considerably less than the effects of exhaust velocity.

## 6.2 Airport and Community Noise

Aircraft noise is of major concern to the airport and community planner. The airport is a major element in the community's transportation system and, as such, is vital to its growth. However, the airport must also be a good neighbor, and this can be accomplished only with proper planning. Since aircraft noise extends beyond the boundaries of the airport, it is vital to consider the impact on surrounding communities. Many means have been devised to provide the planner with a tool to estimate the impact of airport operations. Too often they oversimplify noise to the point where the results become erroneous. Noise is not a simple subject; therefore, there are no simple answers.

The cumulative noise contour is an effective tool. However, care must be exercised to ensure that the contours, used correctly, estimate the noise resulting from aircraft operations conducted at an airport.

The size and shape of the single-event contours, which are inputs into the cumulative noise contours, are dependent upon numerous factors. They include:

### 1. Operational Factors

- (a) **Aircraft Weight** – Aircraft weight is dependent on distance to be traveled, en route winds, payload, and anticipated aircraft delay upon reaching the destination.
- (b) **Engine Power Settings** – The rates of ascent and descent and the noise levels emitted at the source are influenced by the power setting used.
- (c) **Airport Altitude** – Higher airport altitude will affect engine performance and thus can influence noise.

### 2. Atmospheric Conditions – Sound Propagation

- (a) **Wind** – With stronger headwinds, the aircraft can take off and climb more rapidly relative to the ground. Also, winds can influence the distribution of noise in surrounding communities.
- (b) **Temperature and Relative Humidity** – The absorption of noise in the atmosphere along the transmission path between the aircraft and the ground observer varies with both temperature and relative humidity.

### 3. Surface Condition – Shielding, Extra Ground Attenuation (EGA)

**Terrain** – If the ground slopes down after takeoff or up before landing, noise will be reduced since the aircraft will be at a higher altitude above ground. Additionally, hills, shrubs, trees, and large buildings can act as sound buffers.

All of these factors can alter the shape and size of the contours appreciably. To demonstrate the effect of some of these factors, estimated noise level contours for two different operating conditions are shown below. These contours reflect a given noise level upon a ground level plane at runway elevation.

#### Condition 1

##### Landing:

Maximum Structural Landing Weight

10-knot Headwind

3° Approach

84°F

Humidity 15%

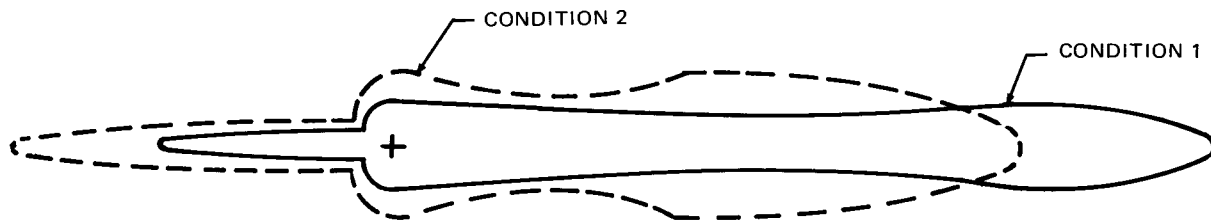
##### Takeoff:

Maximum Gross Takeoff Weight

Zero Wind

84°F

Humidity 15%



#### Condition 2

##### Landing:

85% of Maximum Structural  
Landing Weight

10-knot Headwind

3° Approach

59°F

Humidity 70%

##### Takeoff:

80% of Maximum Gross  
Takeoff Weight

10-knot Headwind

59°F

Humidity 70%

As indicated from these data, the contour size varies substantially with operating and atmospheric conditions. Most aircraft operations are, of course, conducted at less than maximum gross weights because average flight distances are much shorter than maximum aircraft range capability and average load factors are less than 100 percent. Therefore, in developing cumulative contours for planning purposes, it is recommended that the airlines serving a particular city be contacted to provide operational information.

In addition, there are no universally accepted methods for developing aircraft noise contours or for relating the acceptability of specific noise zones to specific land uses. It is therefore expected that noise contour data for particular aircraft and the impact assessment methodology will be changing. To ensure that currently available information of this type is used in any planning study, it is recommended that it be obtained directly from the Office of Environmental Quality in the Federal Aviation Administration in Washington, D.C.

It should be noted that the contours shown herein are only for illustrating the impact of operating and atmospheric conditions and do not represent the single-event contour of the family of aircraft described in this document. It is expected that the cumulative contours will be developed as required by planners using the data and methodology applicable to their specific study.

## **7.0 PAVEMENT DATA**

### **7.1 General Information**

### **7.2 Footprint**

### **7.3 Maximum Pavement Loads**

### **7.4 Landing Gear Loading on Pavement**

### **7.5 Flexible Pavement Requirements**

### **7.6 Flexible Pavement Requirements, LCN Conversion**

### **7.7 Rigid Pavement Requirements**

### **7.8 Rigid Pavement Requirements, LCN Conversion**

### **7.9 ACN-PCN Reporting System**

## 7.0 PAVEMENT DATA

### 7.1 General Information

A brief description of the pavement charts that follow will help in their use for airport planning. Each airplane configuration is depicted with a minimum range of four loads imposed on the main landing gear to aid in interpolation between the discrete values shown. All curves for any single chart represent data based on rated loads and tire pressures considered normal and acceptable by current aircraft tire manufacturer's standards.

Section 7.2.1 and 7.2.2 present basic data on the landing gear footprint configuration, maximum design taxi loads, and tire sizes and pressures.

Maximum pavement loads for certain critical conditions at the tire-to-ground interface are shown in Section 7.3.1 and 7.3.2.

Pavement requirements for commercial airplanes are customarily derived from the static analysis of loads imposed on the main landing gear struts. Paragraph 7.4.1 and Figures 7.4.1 and 7.4.2 are provided in order to determine these loads throughout the stability limits of the airplane at rest on the pavement. These main landing gear loads are used as the point of entry to the pavement design charts, interpolating load values where necessary.

The flexible pavement design curves paragraph 7.5 and Figures 7.5.1 through 7.5.3 are based on procedures set forth in Instruction Report No. S-77-1, "Procedures for Development of CBR Design Curves," dated June 1977, and as modified according to the methods described in ICAO Aerodrome Design Manual, Part 3, Pavements, 2<sup>nd</sup> Edition, 1983, Section 1.1 (The ACN/PCN Method), and utilizing the alpha factors approved by ICAO in October 2007. Instruction Report No. S-77-1 was prepared by the U.S. Army Corps of Engineers Waterways Experiment Station, Soils and Pavements Laboratory, Vicksburg, Mississippi.

Rigid pavement design curves Paragraph 7.7 and Figures 7.7.1 through 7.7.3 have been prepared with the Westergaard equation in general accordance with the procedures outlined in the Design of Concrete Airport Pavement (1955 edition) by Robert G. Packard, published by the American Concrete Pavement Association, 3800 North Wilke Road, Arlington Heights, Illinois 60004-1268. These curves are modified to the format described in the Portland Cement Association publication XP6705-2, Computer Program for Airport Pavement Design (Program PDILB), 1968, by Robert G. Packard.

The following procedure is used to develop the rigid pavement design curves such as those shown in Section 7.7.1 through 7.7.3:

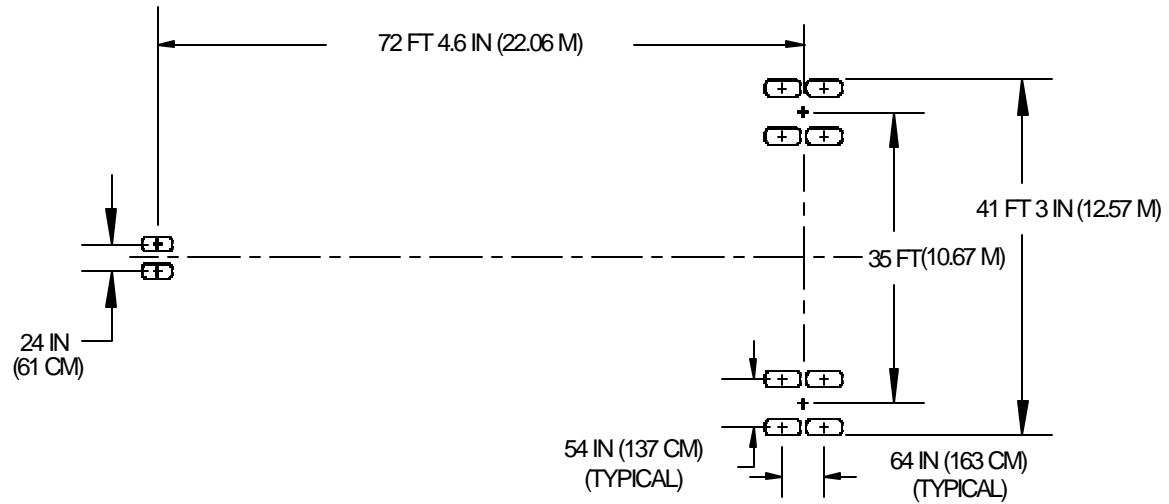
1. Having established the scale for pavement thickness to the left and the scale for allowable working stress to the right, an arbitrary load line is drawn representing the main landing gear maximum weight to be shown.
2. Values of the subgrade modulus ( $k$ ) are then plotted as shown in Figures 7.7.1 through 7.7.3.
3. Additional load lines for the incremental values of weight on the main landing gear are drawn on the basis of the curve for  $k = 300$ , already established.

All LCN curves have been plotted from data in the International Civil Aviation Organization (ICAO) document 7290-AM/865/2, Aerodrome Manual, Part 2, "Aerodrome Physical Characteristics," 2<sup>nd</sup> Edition, 1965.

On the same charts showing LCN versus equivalent single wheel load, there are load plots showing equivalent single wheel load versus pavement thickness for flexible pavements and versus radius of relative stiffness for rigid pavements.

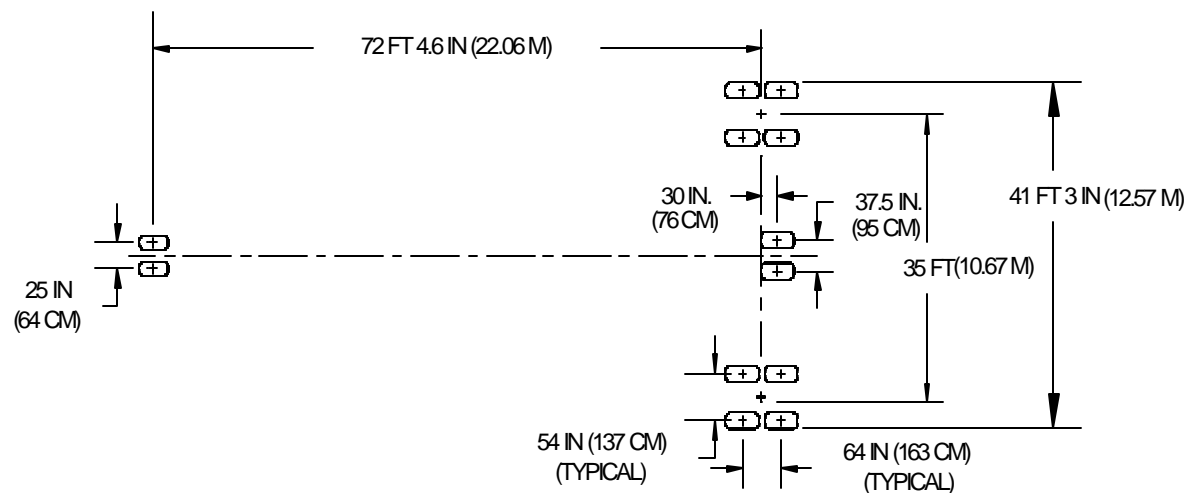
Procedures and curves provided in the ICAO Aerodrome Manual – Part 2, Chapter 4 are used to determine equivalent single wheel loads for use in making LCN conversion of rigid pavement requirements.

ICAO has adopted the ACN/PCN Reporting System, described in Paragraph 7.9, which will replace other strength reports systems.



	UNITS	SERIES 10 AND 10CF	MD-10-10F
MAXIMUM DESIGN TAXI WEIGHT	LB KG	458,000 207,746	443,000 200,941
PERCENT OF WEIGHT ON MAIN GEAR	%	SEE SECTION 7.4	
NOSE GEAR TIRE SIZE	IN.	37 x 14 - 14	37 x 14 - 14
NOSE GEAR TIRE PRESSURE	PSI KG/CM <sup>2</sup>	165 11.60	165 11.60
MAIN GEAR TIRE SIZE	IN.	50 X 20 - 20	H54 X 21 - 24
MAIN GEAR TIRE PRESSURE	PSI KG/CM <sup>2</sup>	195 13.71	155 10.90

### 7.2.1 FOOTPRINT MODEL DC-10 SERIES 10, 10CF AND MD-10 SERIES 10F



	UNITS	SERIES 30, 30CF, 40, 40CF	MD-10-30F
MAXIMUM DESIGN TAXI WEIGHT	LB KG	583,000 264,445	583,000 264,445
PERCENT OF WEIGHT ON MAIN GEAR	%	SEE SECTION 7.4	
NOSE GEAR TIRE SIZE	IN.	40 x 15.5 - 16	40 x 15.5 - 16
NOSE GEAR TIRE PRESSURE	PSI KG/CM <sup>2</sup>	185 13.01	185 13.01
WING AND CENTER GEAR TIRE SIZE	IN.	52 X 20.5 - 23	H54 X 21 - 24
WING GEAR TIRE PRESSURE	PSI KG/CM <sup>2</sup>	177 12.45	175 12.30
CENTER GEAR TIRE PRESSURE	PSI KG/CM <sup>2</sup>	153 10.76	145 10.19

## 7.2.2 FOOTPRINT

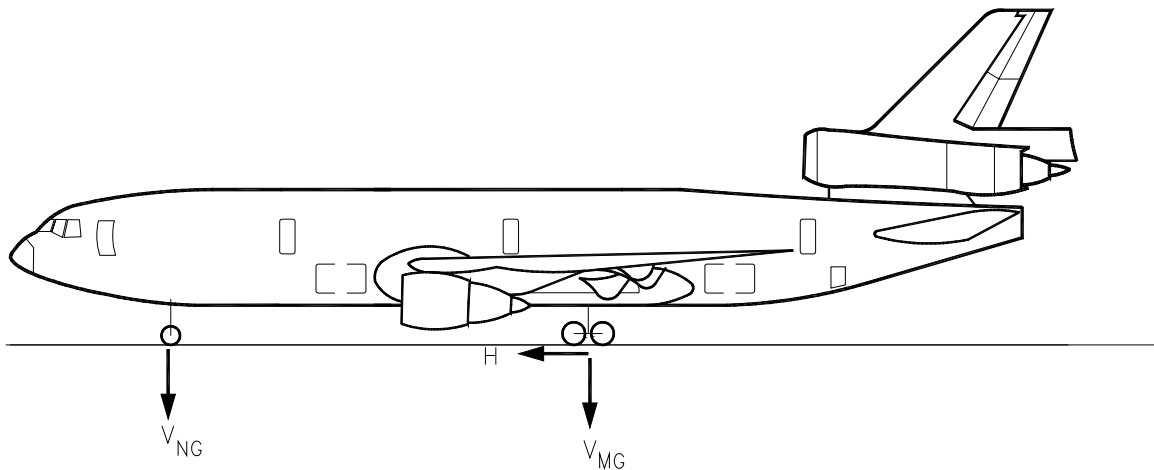
### MODEL DC-10 SERIES 30, 30CF, 40, 40CF AND MD-10 SERIES 30F

$V_N$  = MAXIMUM VERTICAL NOSE GEAR GROUND LOAD PER STRUT AT MOST FORWARD CENTER OF GRAVITY

$V_W$  = MAXIMUM VERTICAL WING GEAR GROUND LOAD PER STRUT AT MOST AFT CENTER OF GRAVITY

$H_w$  = MAXIMUM HORIZONTAL GROUND LOAD PER STRUT FROM BRAKING

NOTE: ALL LOADS CALCULATED USING AIRPLANE MAXIMUM DESIGN TAXI WEIGHT



AIRPLANE MODEL	UNITS	MAX DESIGN TAXI WEIGHT	NOSE GEAR $V_N$		WING GEAR $V_w$	$H_w$ PER STRUT	
			STATIC AT MOST FWD C.G.	STATIC + BRAKING 10 FT/SEC <sup>2</sup> DECEL	MAX LOAD AT STATIC AFT C.G.	STEADY BRAKING 10 FT/SEC <sup>2</sup> DECEL	AT INSTANTANEOUS BRAKING ( $m = 0.8$ )
SERIES 10, 10CF	LB	458,000	50,243	84,959	213,680	71,501	170,944
	KG	207,746	22,790	38,537	96,923	32,433	77,538
MD-10- 10F FREIGHTER	LB	443,000	47,454	80,705	207,123	68,798	165,698
	KG	200,941	21,525	36,607	93,949	31,206	75,159

### 7.3.1 MAXIMUM PAVEMENT LOADS MODEL DC-10 SERIES 10, 10CF AND MD-10 SERIES 10F

$V_N$  = MAXIMUM VERTICAL NOSE GEAR GROUND LOAD PER STRUT AT MOST FORWARD CENTER OF GRAVITY

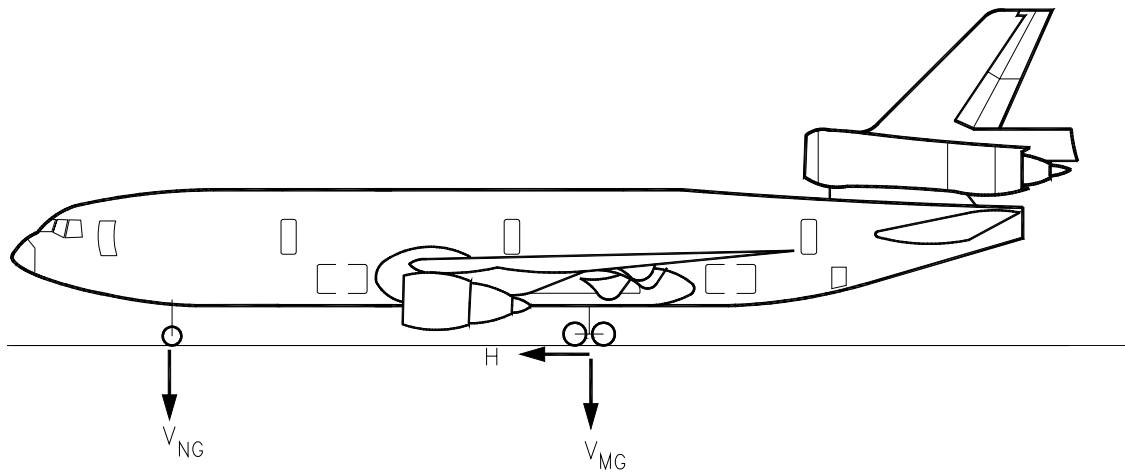
$V_W$  = MAXIMUM VERTICAL WING GEAR GROUND LOAD PER STRUT AT MOST AFT CENTER OF GRAVITY

$V_C$  = MAXIMUM VERTICAL CENTER GEAR GROUND LOAD PER STRUT AT MOST AFT CENTER OF GRAVITY

$H_W$  = MAXIMUM HORIZONTAL WING GEAR GROUND LOAD PER STRUT FROM BRAKING

$H_C$  = MAXIMUM HORIZONTAL CENTER GEAR GROUND LOAD PER STRUT FROM BRAKING

NOTE: ALL LOADS CALCULATED USING AIRPLANE MAXIMUM DESIGN TAXI WEIGHT



AIRPLANE MODEL	UNITS	MAX DESIGN TAXI WT	NOSE GEAR		WING GEAR			CENTER GEAR		
			$V_N$	$V_N$	$V_W$	$H_W$		$V_C$	$H_C$	
			STATIC AT FWD C.G.	STATIC + BRAKING 10 FT/SEC^2	STATIC AT AFT C.G.	STEADY BRAKING 10 FT/SEC^2	INST BRAKING (M=0.8)	STATIC AT AFT C.G.	STEADY BRAKING 10 FT/SEC^2	INST BRAKING (M=0.8)
SERIES 30, 30CF, 40, 40CF	LB	583,000	72,234	112,229	218,767	74,278	175,014	94,746	32,170	75,797
	KG	264,445	32,965	50,906	99,231	33,692	67,454	42,976	14,952	29,215
MD-10- 30F FREIGHTER	LB	583,000	71,060	111,375	221,432	74,424	177,145	96,102	32,300	76,882
	KG	264,445	32,232	50,518	100,440	33,758	80,352	43,591	14,651	34,873

### 7.3.2 MAXIMUM PAVEMENT LOADS MODEL DC-10 SERIES 30, 30CF, 40, 40CF AND MD-10 SERIES 30F

## **7.4 Landing Gear Loading on Pavement**

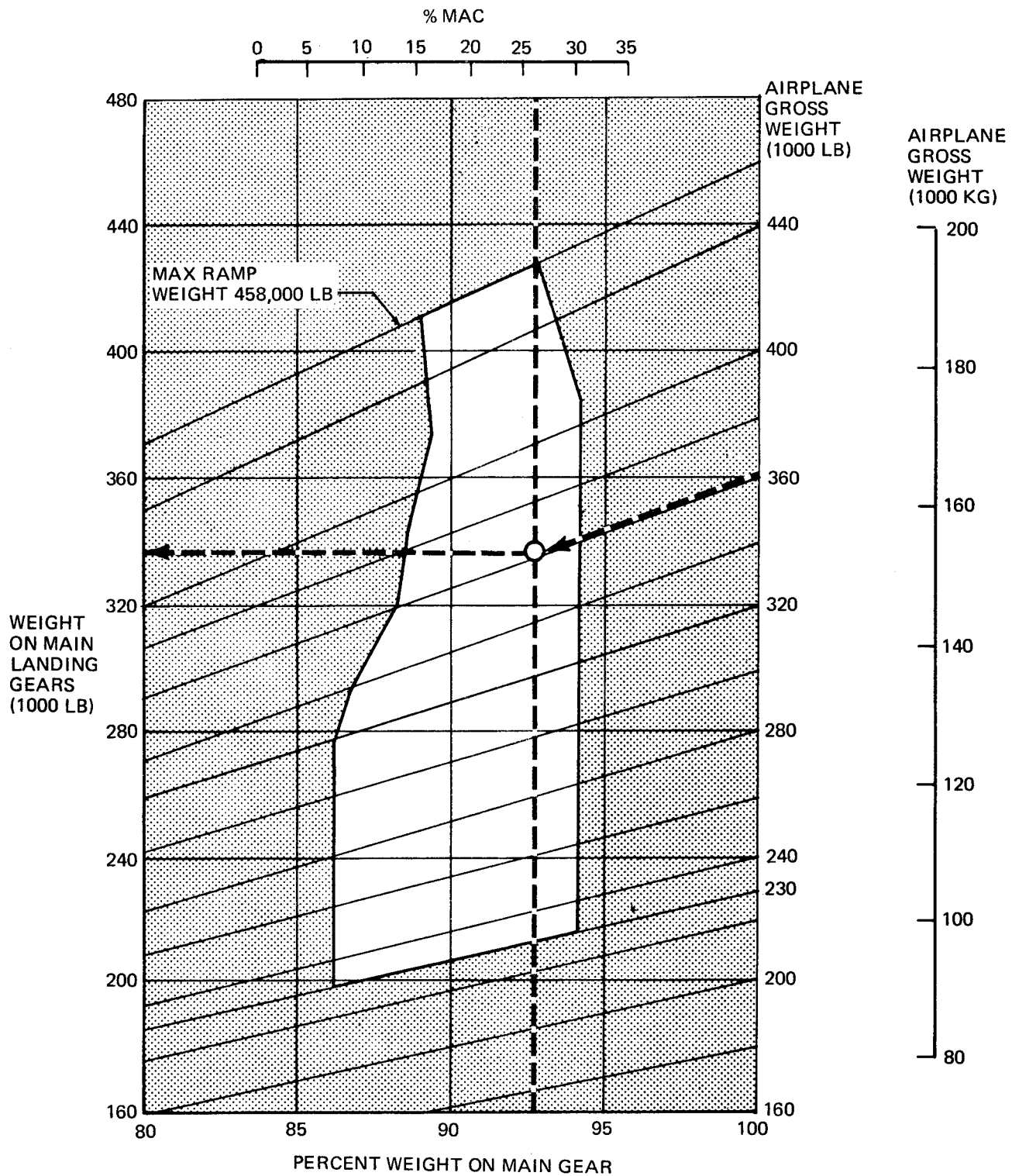
### **7.4.1 Loads on the Main Landing Gear Group**

For the Series 10 the main gear group consists of the two wing gears, whereas the Series 30/40 main landing gear group consists of two wing gears plus one center gear.

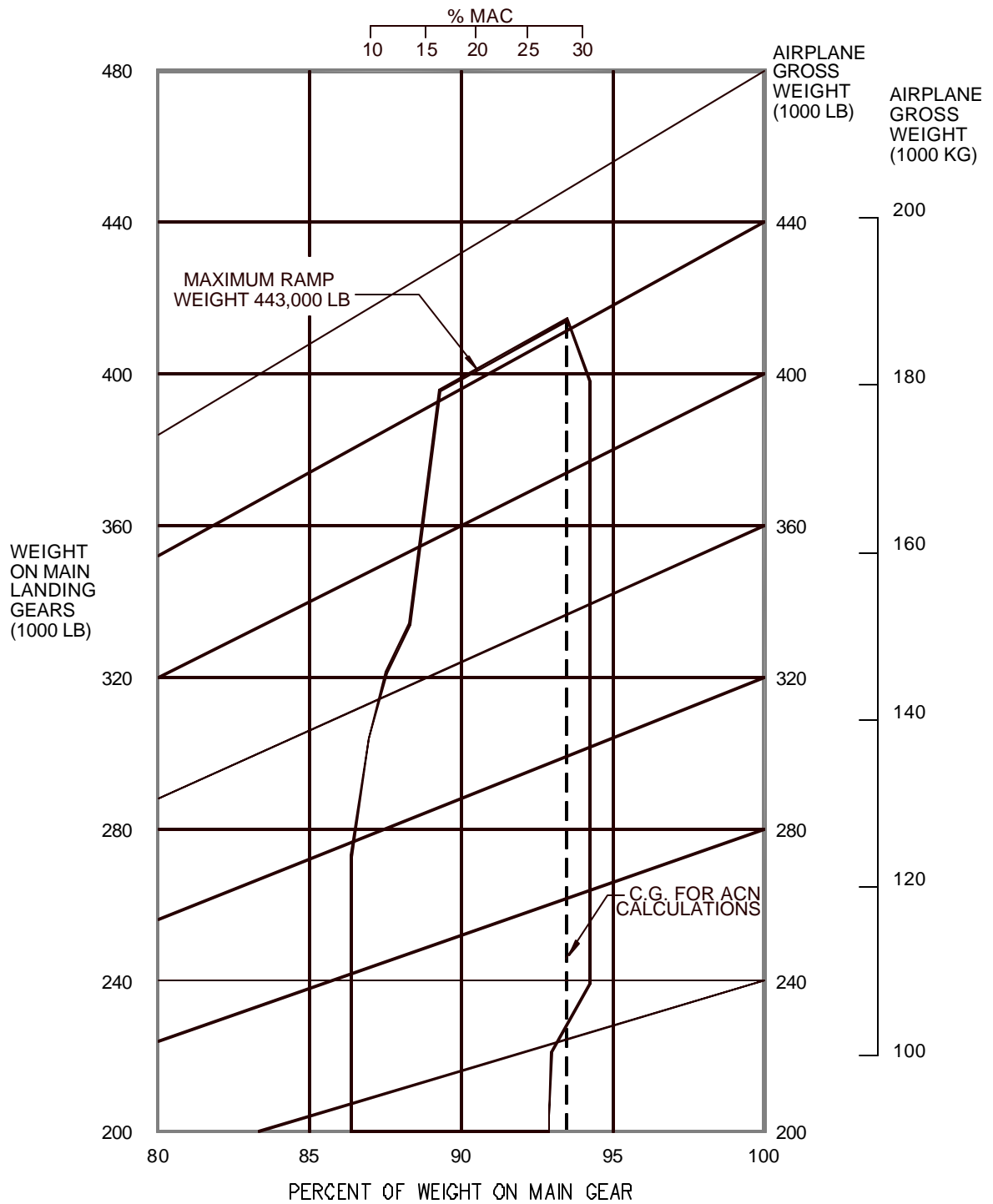
In the example for the Series 10, the gross weight is 360,000 pounds, the percent of weight on the main gears is 93.3 percent, and the total weight on two main gears is 335,476 pounds.

In the example for the Series 30/40, the gross weight is 470,000 pounds, the percent of weight on the main gears is 91.3 percent, and the total weight on the three main gears is 429,115 pounds.

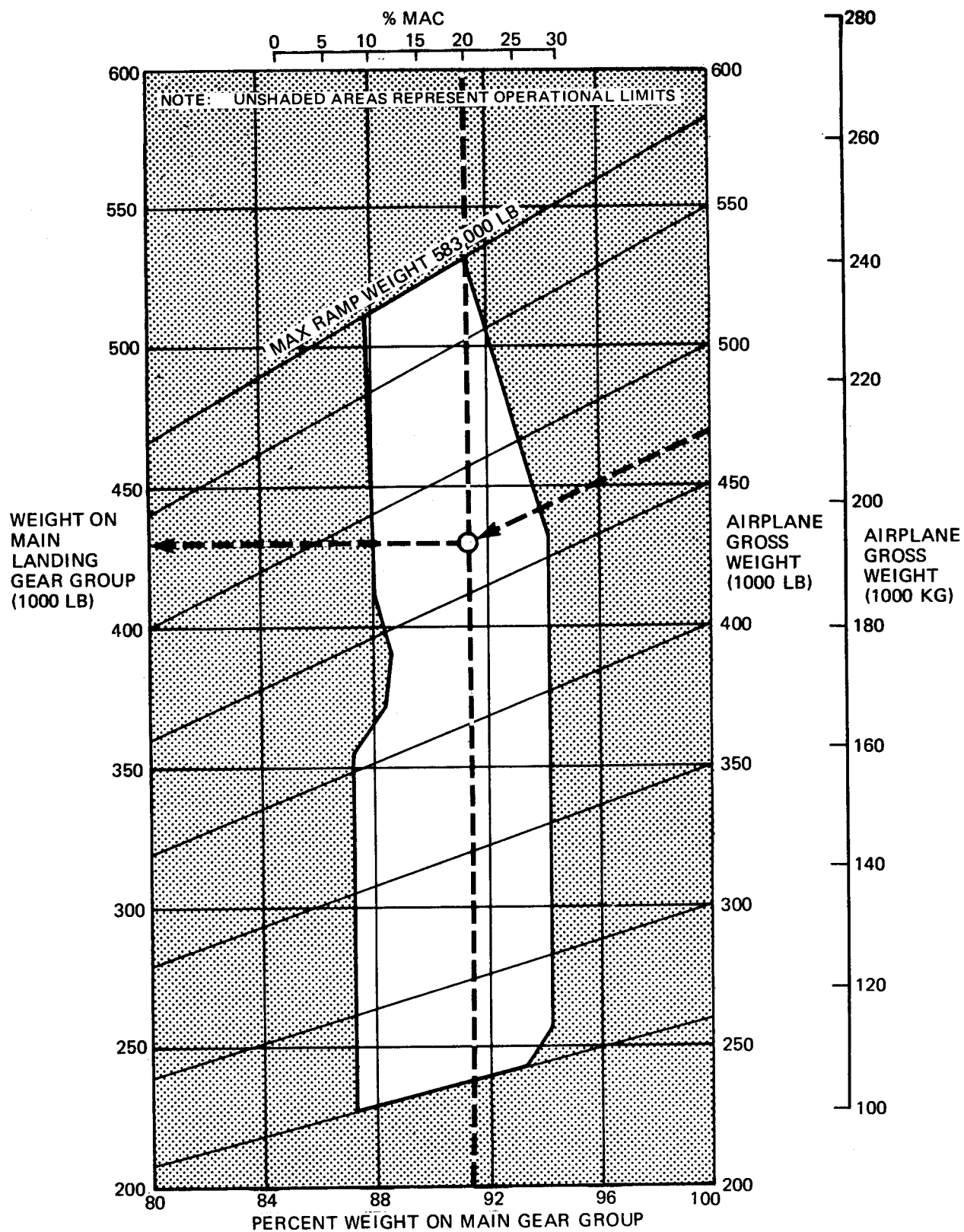
NOTE: UNSHADED AREAS REPRESENT OPERATIONAL LIMITS



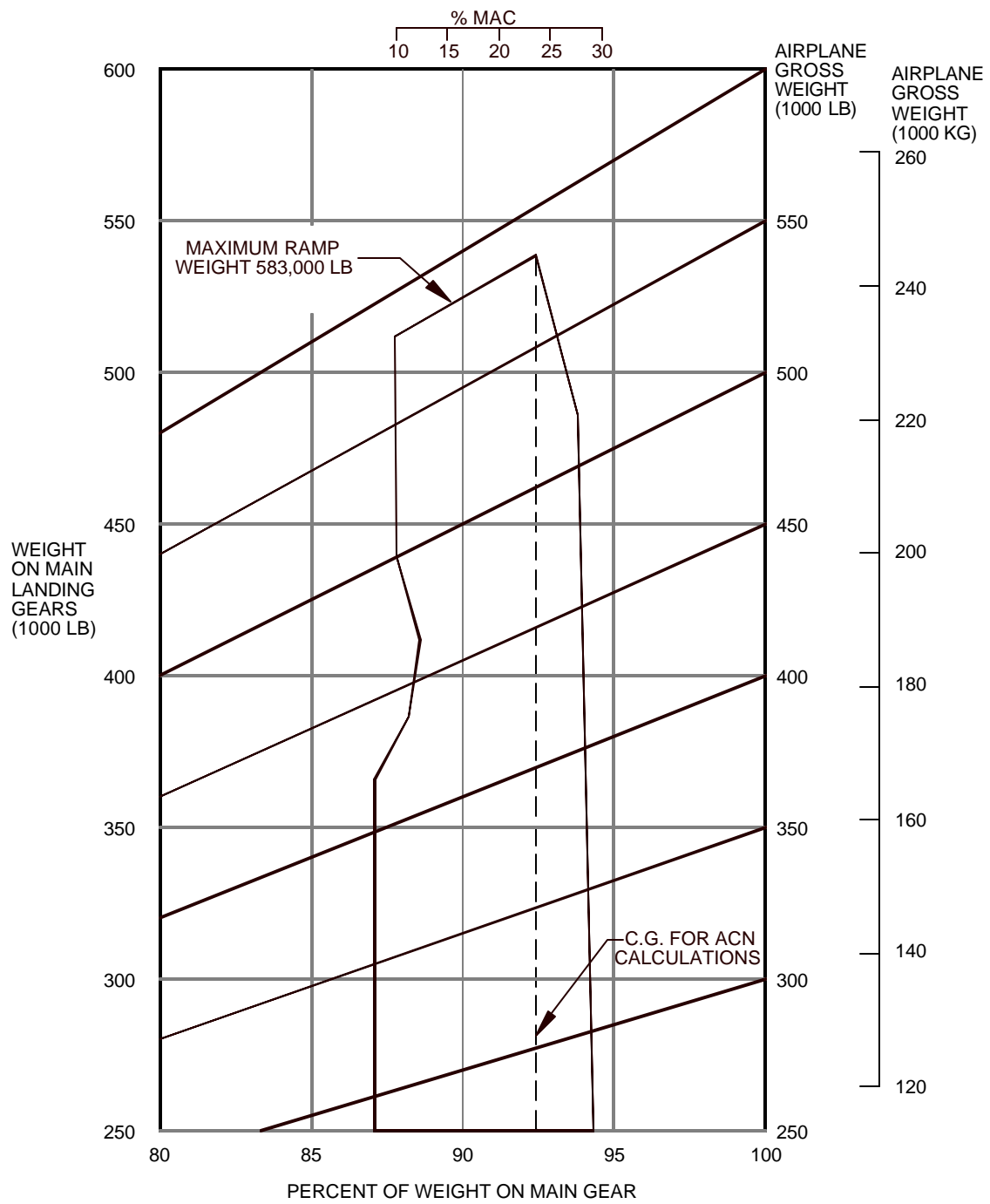
#### 7.4.1 LANDING GEAR LOADING ON PAVEMENT MODEL DC-10 SERIES 10 AND 10CF



7.4.1-A LANDING GEAR LOADING ON PAVEMENT  
MODEL MD-10 SERIES 10F



7.4.2 LANDING GEAR LOADING ON PAVEMENT  
MODEL DC-10 SERIES 30, 30CF, 40 AND 40CF

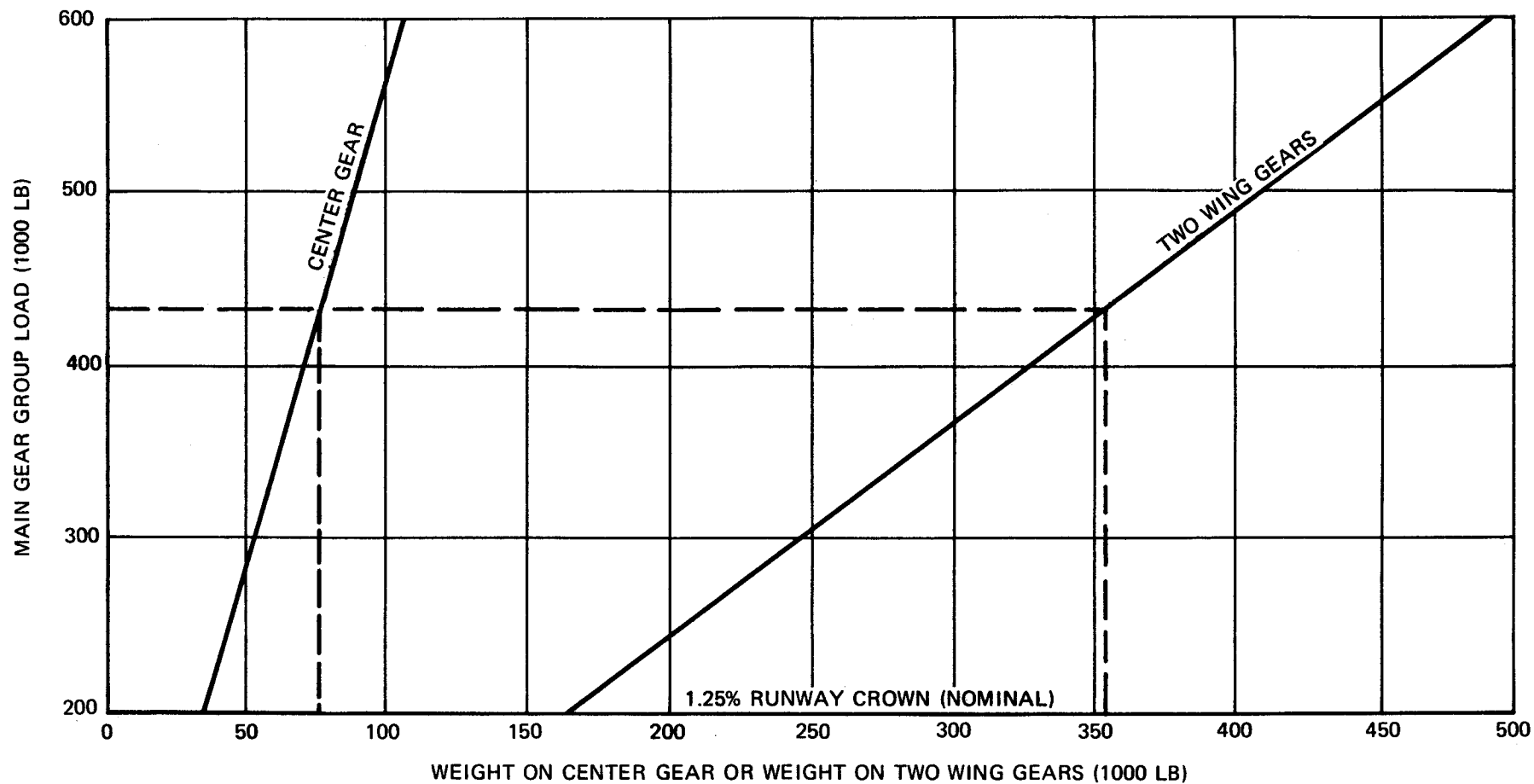


7.4.2-A LANDING GEAR LOADING ON PAVEMENT  
MODEL MD-10 SERIES 30F

#### **7.4.2 Center Gear and Wing Gear Loading on Pavement**

For the Series 30 and 40, the main gear group consists of one center gear and two wing gears; group weight is divided between the center gear and the two wing gears.

In the example in Figure 7.4.3, the total weight on the main landing gear group is 429,115 pounds (194,644 KG). The center gear load is 76,382 pounds (34,647 KG), and the load on the two wing gears is 352,733 pounds (159,997 KG).

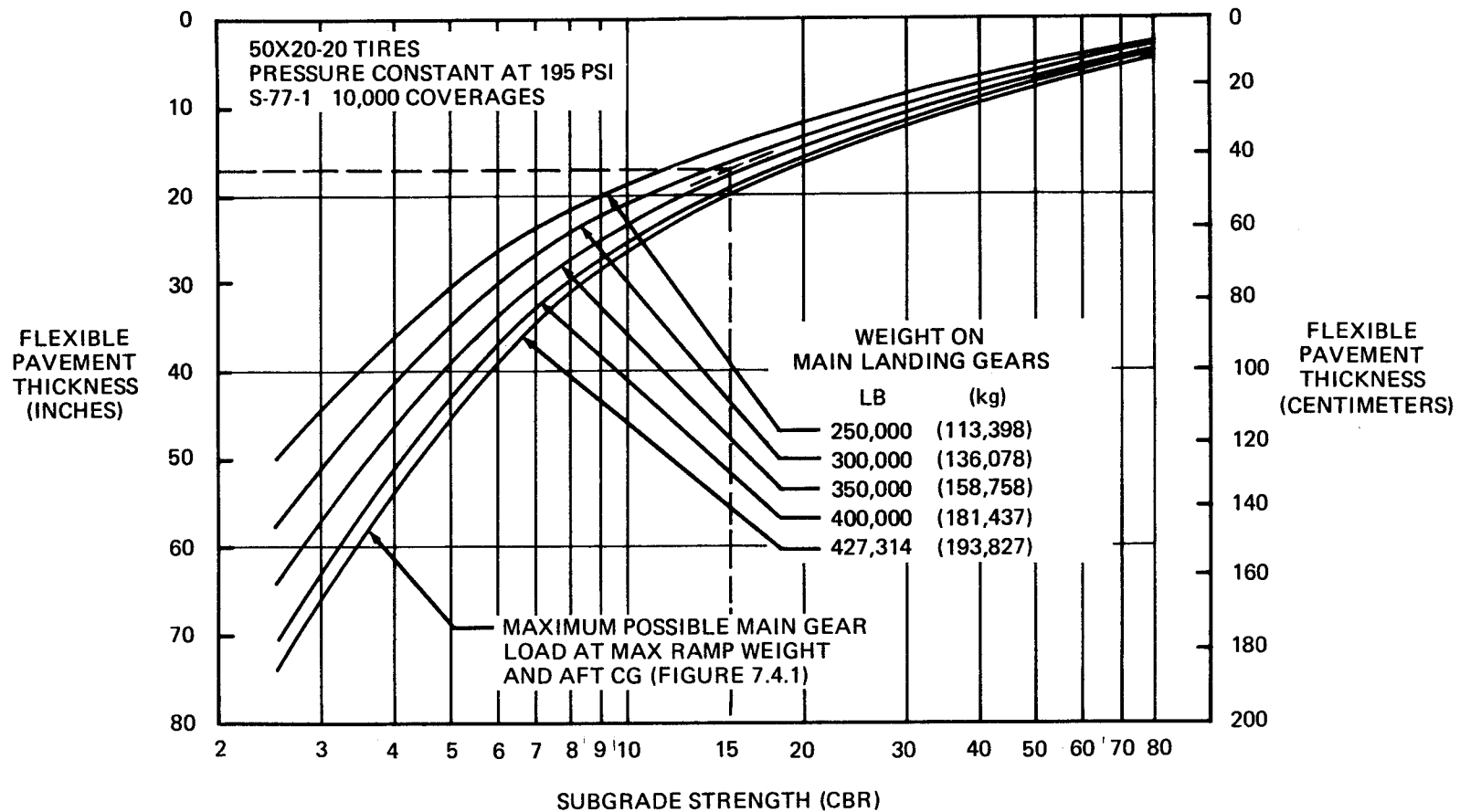


7.4.3 CENTER GEAR AND WING GEAR LOADING ON PAVEMENT  
MODEL DC-10 SERIES 30, 30CF, 40 AND 40CF

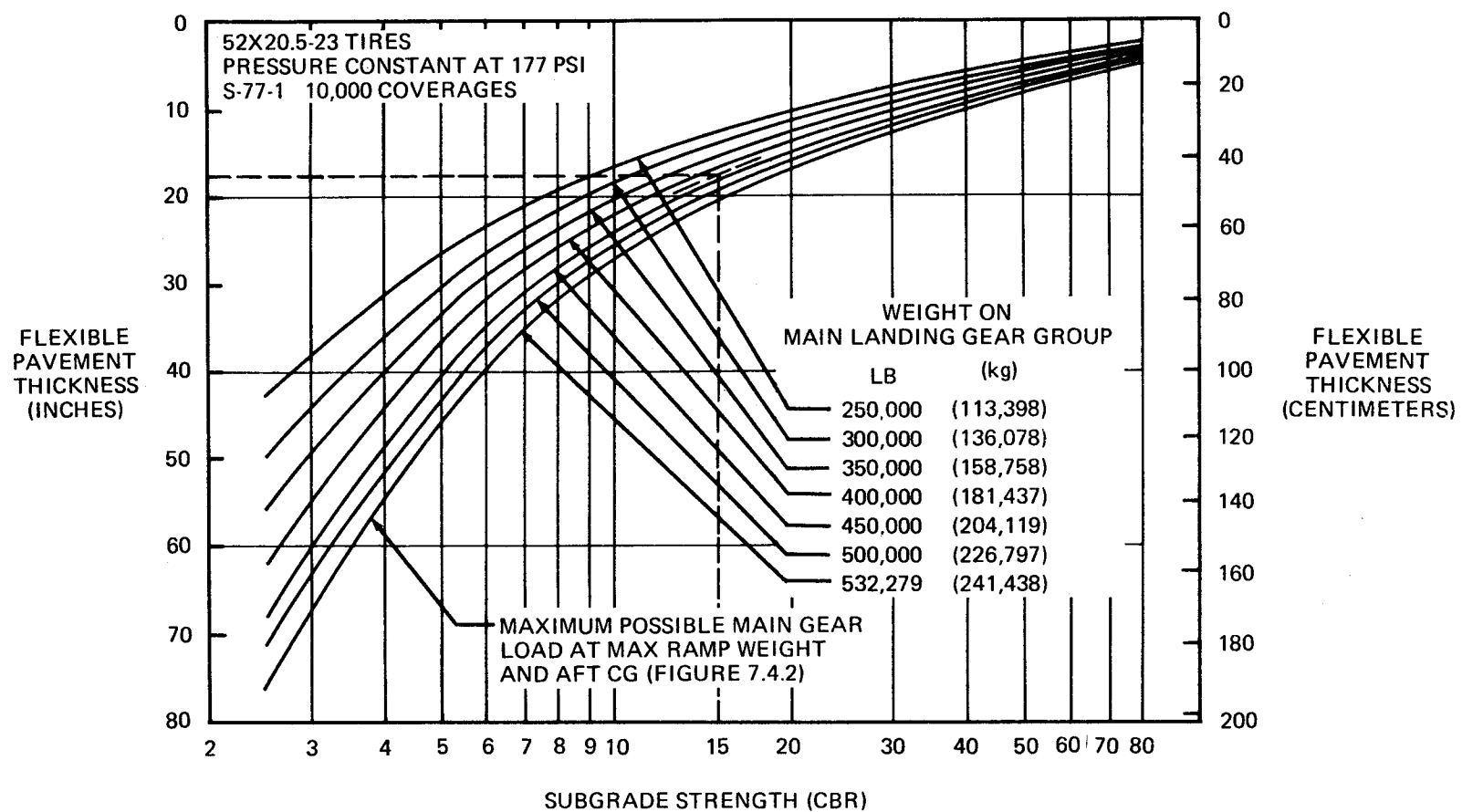
### **7.5 Flexible Pavement Requirements, U.S. Army Corps of Engineers Design Method S-77-1**

In the example for the Series 10, the subgrade CBR is 15 and the main landing gear weight is 335,476 pounds. For these conditions, the required thickness of flexible pavement is 17.1 inches.

In the example for the Series 30/40, the subgrade CBR is 15 and the main landing gear group weight is 429,115 pounds. For these conditions, the wing gear requires 18.0 inches of flexible pavement and the center gear requires 16.0 inches. Thus, the wing gear governs the pavement requirements, and the aircraft requires 18.0 inches of flexible pavement.

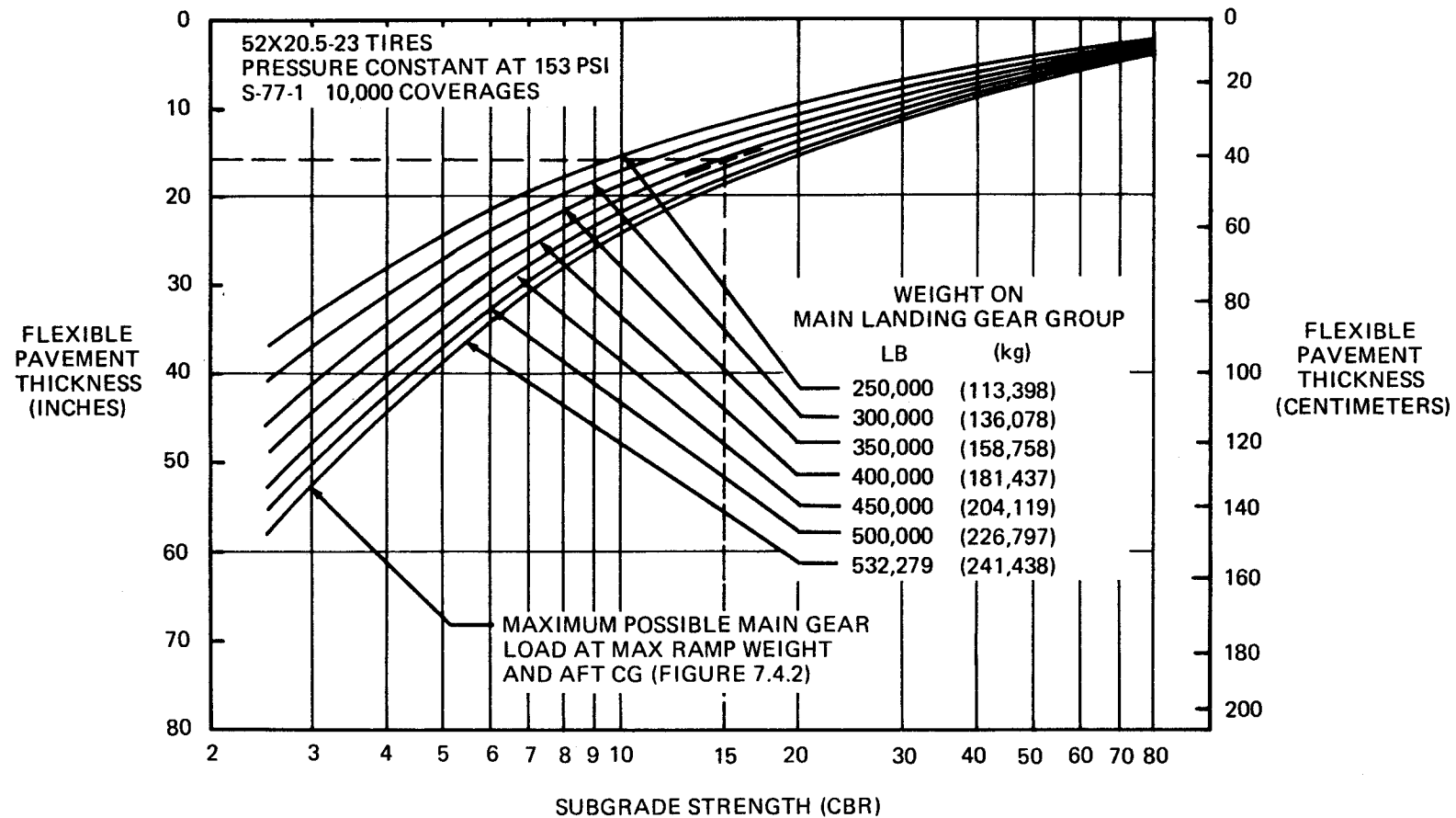


### 7.5.1 FLEXIBLE PAVEMENT REQUIREMENTS – U. S. CORPS OF ENGINEERS DESIGN METHOD MODEL DC-10 SERIES 10 AND 10CF



### 7.5.2 FLEXIBLE PAVEMENT REQUIREMENTS – U.S. CORPS OF ENGINEERS DESIGN METHOD

#### MODEL DC-10 SERIES 30, 30CF, 40, AND 40CF WING GEAR



### 7.5.3 FLEXIBLE PAVEMENT REQUIREMENTS – U. S. CORPS OF ENGINEERS DESIGN METHOD

#### MODEL DC-10 SERIES 30, 30CF, 40, AND 40CF CENTER GEAR

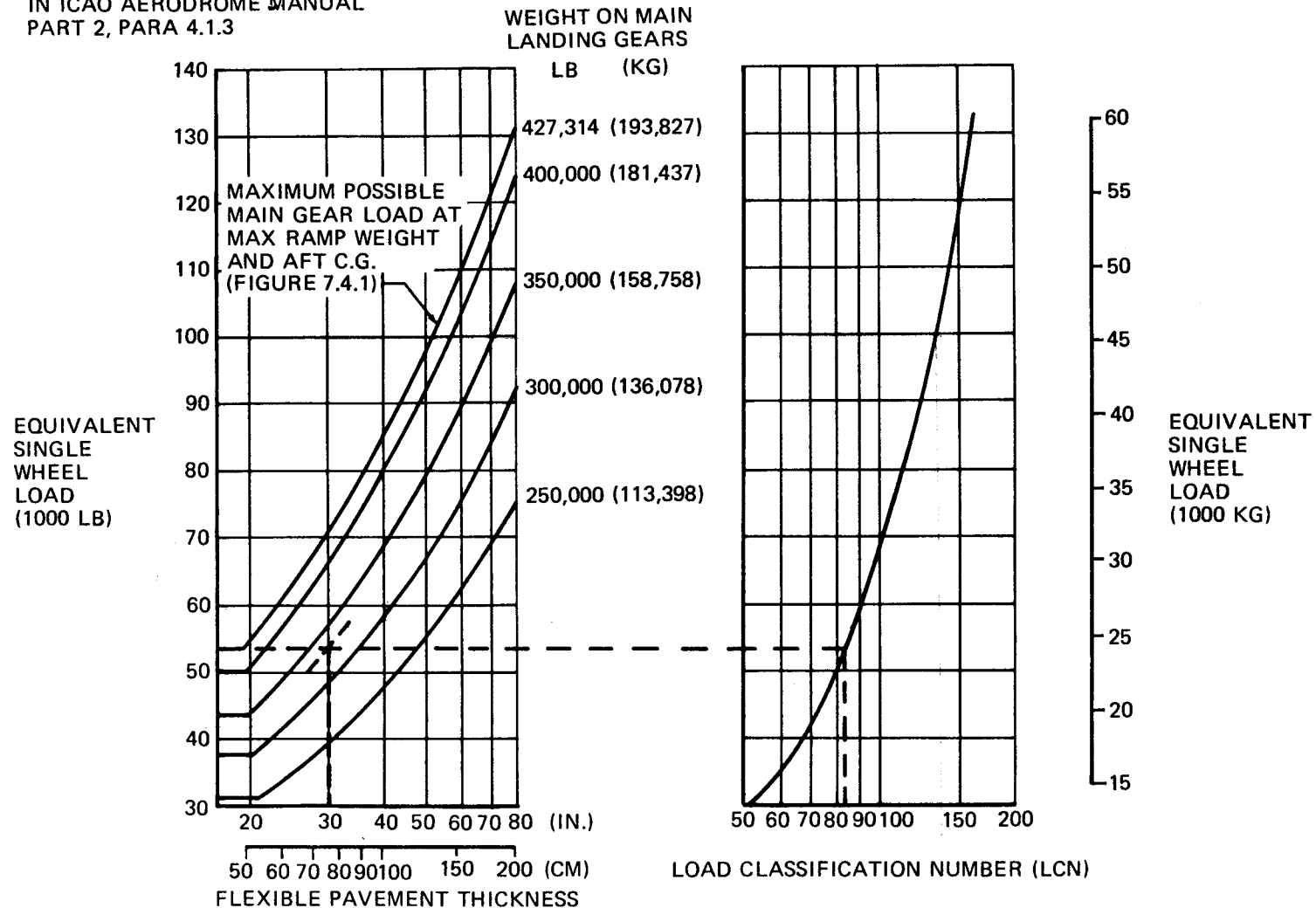
## **7.6 Flexible Pavement Requirements, LCN Conversion**

In order to determine the airplane weight that can be accommodated on a particular flexible airport pavement, both the LCN of the pavement and the thickness (h) of the pavement must be known.

In the example for the Series 10, the flexible pavement thickness is 30 inches and the main landing gear weight is 335,476 pounds. For these conditions the LCN required is 83.

In the example for the Series 30 and 40, the flexible pavement thickness is 30 inches and the main landing gear group weight is 429,115 pounds. For these conditions, the LCN required by the wing gear is 85. The LCN required by the center gear is 73. Thus, the wing gear governs the pavement requirements, and the LCN required by the aircraft is 85.

NOTE:  
EQUIVALENT SINGLE WHEEL LOADS 50 x 20-20 TIRES AT 195 PSI  
ARE DERIVED BY METHODS SHOWN TIRE PRESSURE CONSTANT  
IN ICAO AERODROME MANUAL  
PART 2, PARA 4.1.3

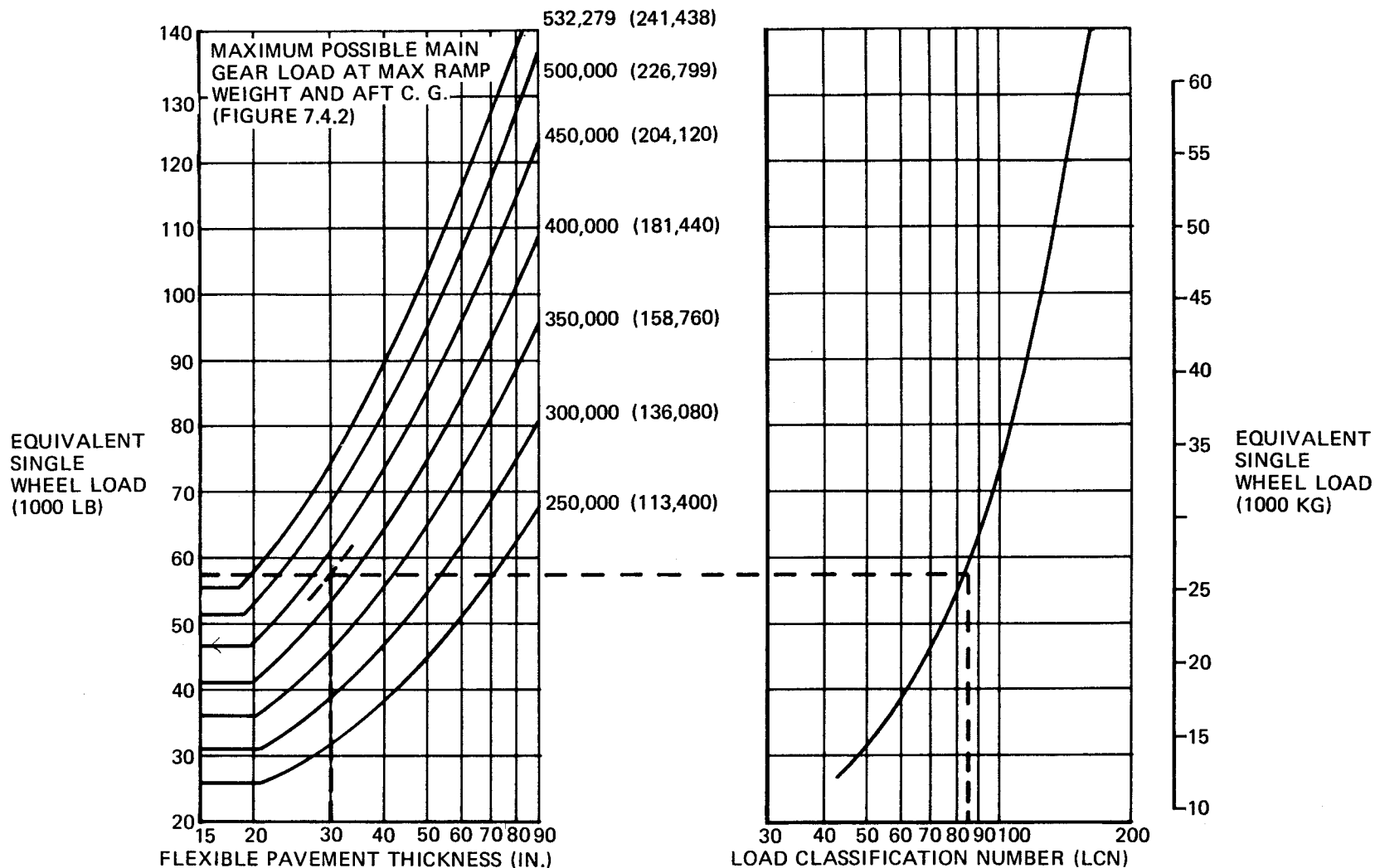


## 7.6.1 FLEXIBLE PAVEMENT REQUIREMENTS - LCN CONVERSION MODEL DC-10 SERIES 10 AND 10CF

NOTE: EQUIVALENT SINGLE WHEEL LOADS ARE DERIVED BY METHODS SHOWN IN ICAO AERODROME MANUAL; PART 2, PAR 4.1.3

WEIGHT ON MAIN LANDING GEAR GROUP  
LB (KG)

52 x 20.5-23 TIRES  
TIRE PRESSURE CONSTANT AT 177 PSI



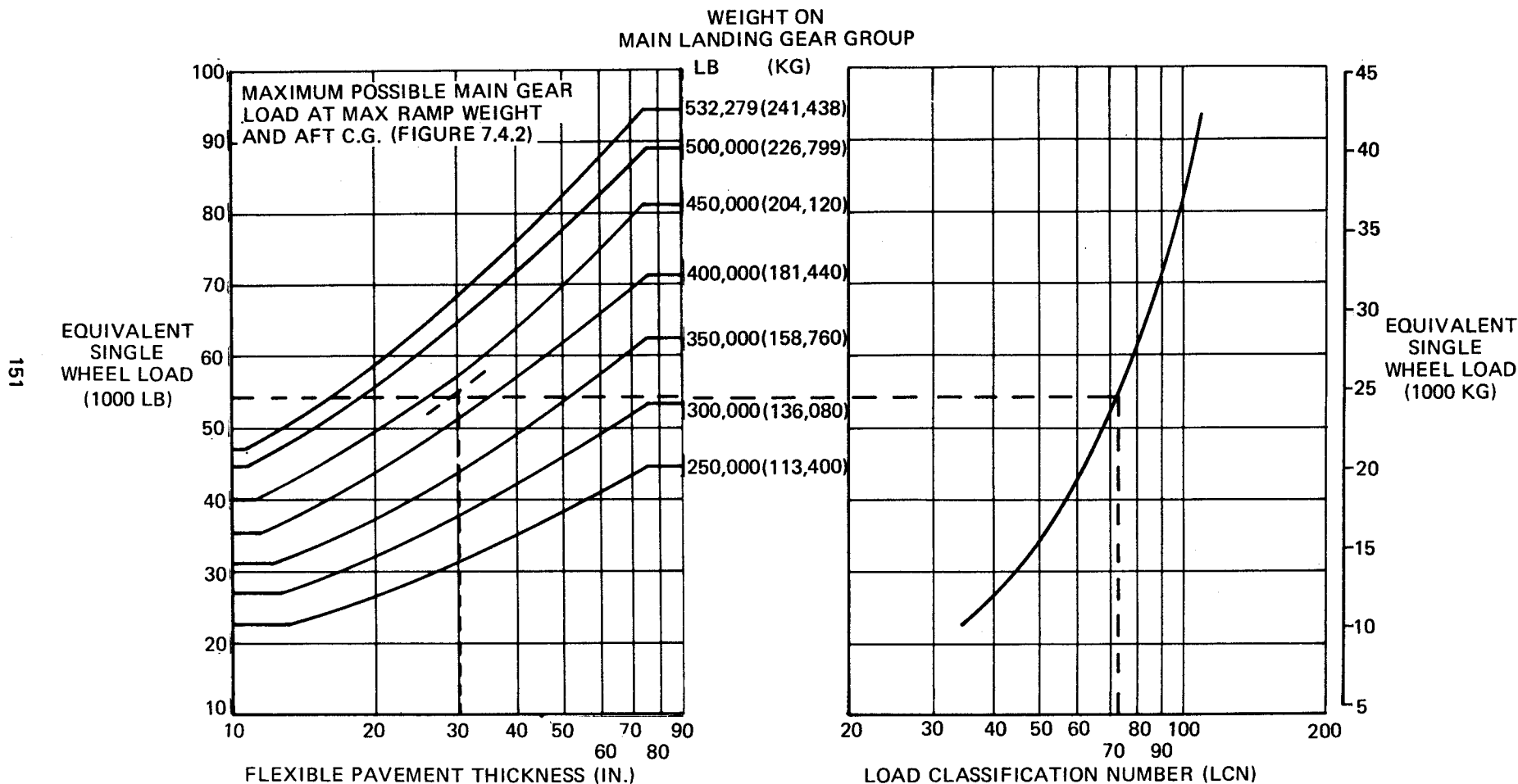
## 7.6.2 FLEXIBLE PAVEMENT REQUIREMENTS – LCN CONVERSION

MODEL DC-10 SERIES 30, 30CF, 40 AND 40CF

WING GEAR

NOTE: EQUIVALENT SINGLE WHEEL LOADS ARE  
DERIVED BY METHODS SHOWN

52 x 20.5-23 TIRES  
TIRE PRESSURE CONSTANT AT 153 PSI



### 7.6.3 FLEXIBLE PAVEMENT REQUIREMENTS - LCN CONVERSION

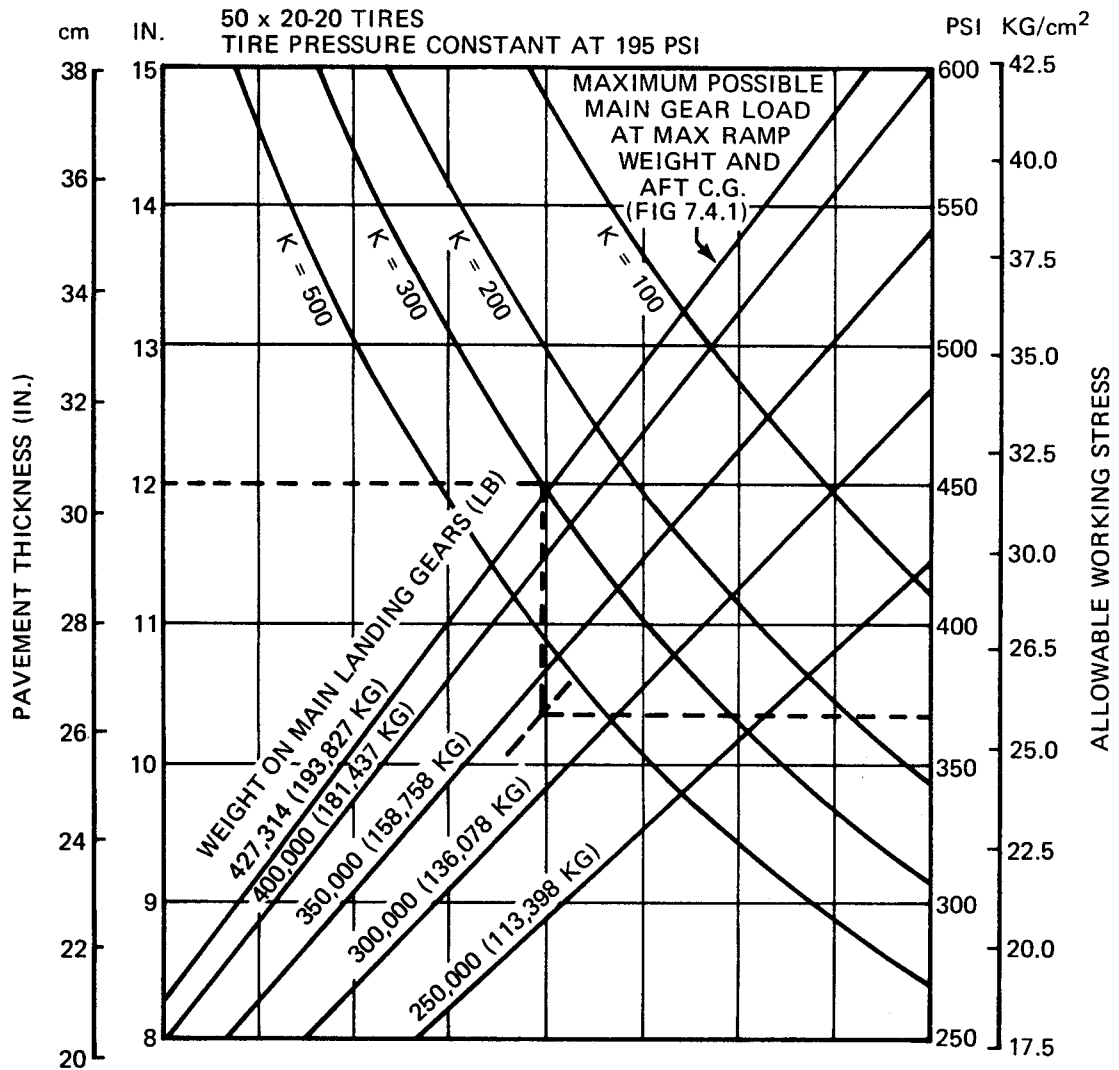
MODEL DC-10 SERIES 30, 30CF, 40 AND 40CF

CENTER GEAR

### **7.7 Rigid Pavement Requirements, Portland Cement Association Design Method**

In the example for the Series 10, the pavement thickness is 12 inches, the subgrade modulus is 300 psi per inch, and the main landing gear weight is 335,476 pounds. For these conditions, the maximum concrete stress is 367 psi.

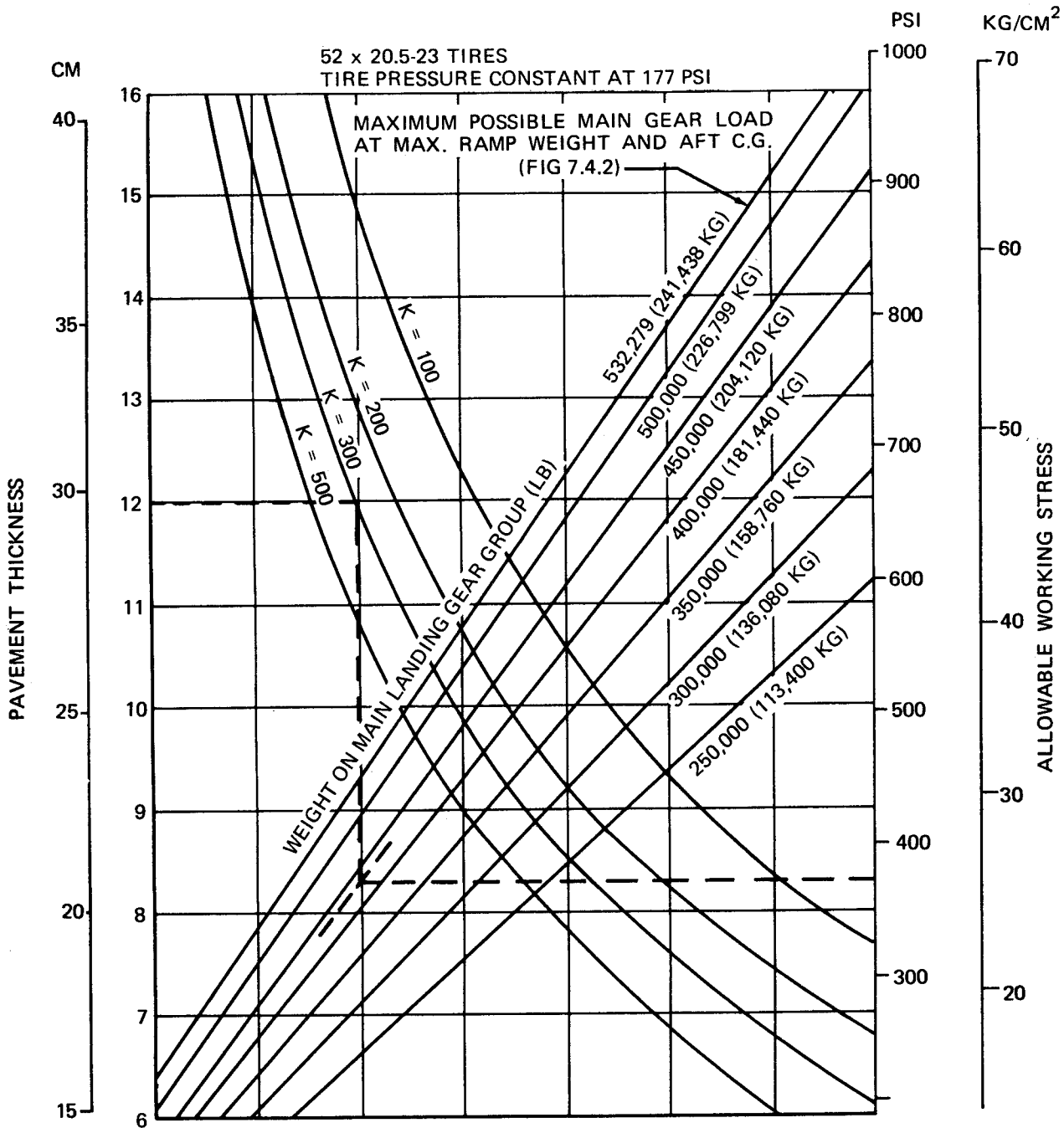
In the example for the Series 30/40, the pavement thickness is 12 inches, the subgrade modulus is 300 psi, and the main landing gear group weight is 429,115 pounds. For these conditions, the concrete stress is 370 psi under the wing gear and 370 psi under the center gear. Thus, the wing gear stress and the center gear stress are balanced for these conditions and the maximum concrete stress is 370 psi.



REF: "DESIGN OF CONCRETE AIRPORT PAVEMENT," PORTLAND CEMENT ASSOCIATION COMPUTER PROGRAM FOR PAVEMENT DESIGN, 1968

NOTE: THE VALUES OBTAINED BY USING THE MAXIMUM LOAD REFERENCE LINE AND ANY VALUES OF  $k$  ARE EXACT. FOR LOADS LESS THAN MAXIMUM, THE CURVES ARE EXACT FOR  $k = 300$  PCI, BUT DEVIATE SLIGHTLY FOR OTHER VALUES OF  $k$ .

### 7.7.1 RIGID PAVEMENT REQUIREMENTS PORTLAND CEMENT ASSOCIATION DESIGN METHOD MODEL DC-10 SERIES 10 AND 10CF

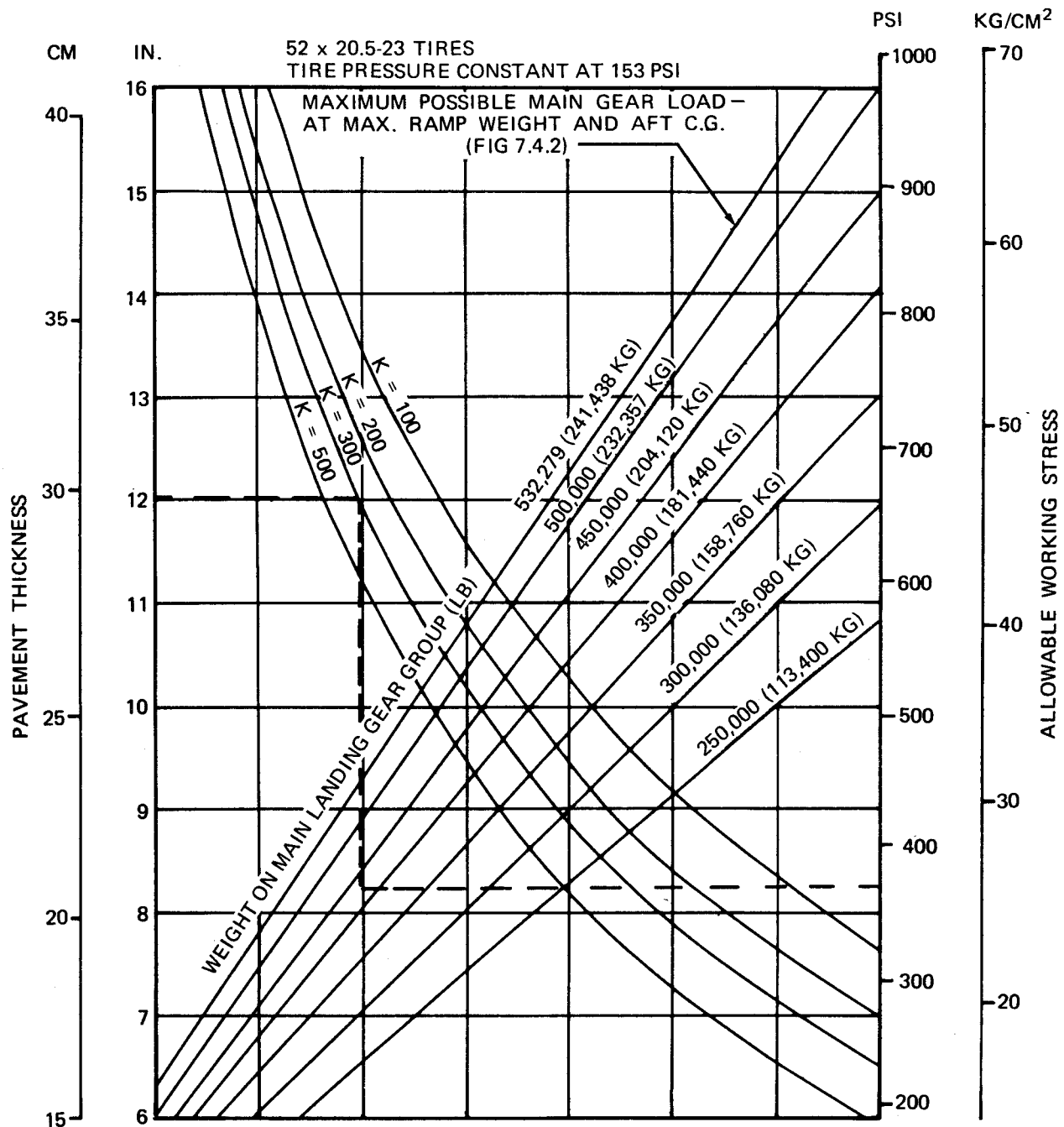


NOTE: THE VALUES OBTAINED BY USING THE MAXIMUM LOAD REFERENCE LINE AND ANY VALUES OF K ARE EXACT. FOR LOADS LESS THAN MAXIMUM, THE CURVES ARE EXACT FOR K = 300, BUT DEVIATE SLIGHTLY FOR OTHER VALUES OF K.

REFERENCE: "DESIGN OF CONCRETE AIRPORT PAVEMENT," 1968 PORTLAND CEMENT ASSOCIATION COMPUTER PROGRAM

## 7.7.2 RIGID PAVEMENT REQUIREMENTS, PORTLAND CEMENT ASSOCIATION DESIGN METHOD

### MODEL DC-10 SERIES 30, 30CF, 40 AND 40CF WING GEAR



NOTE: THE VALUES OBTAINED BY USING THE MAXIMUM LOAD REFERENCE LINE AND ANY VALUES OF K ARE EXACT. FOR LOADS LESS THAN MAXIMUM, THE CURVES ARE EXACT FOR K = 300, BUT DEVIATE SLIGHTLY FOR OTHER VALUES OF K.

REFERENCE: "DESIGN OF CONCRETE AIRPORT PAVEMENT," 1968 PORTLAND CEMENT ASSOCIATION COMPUTER PROGRAM

### 7.7.3 RIGID PAVEMENT REQUIREMENTS, PORTLAND CEMENT ASSOCIATION DESIGN METHOD MODEL DC-10 SERIES 30, 30CF, 40 AND 40CF CENTER GEAR

## 7.8 Rigid Pavement Requirements, LCN Conversion

In order to determine the LCN rating required on a particular rigid airport pavement, both the weight of the aircraft and the radius of relative stiffness must be known.

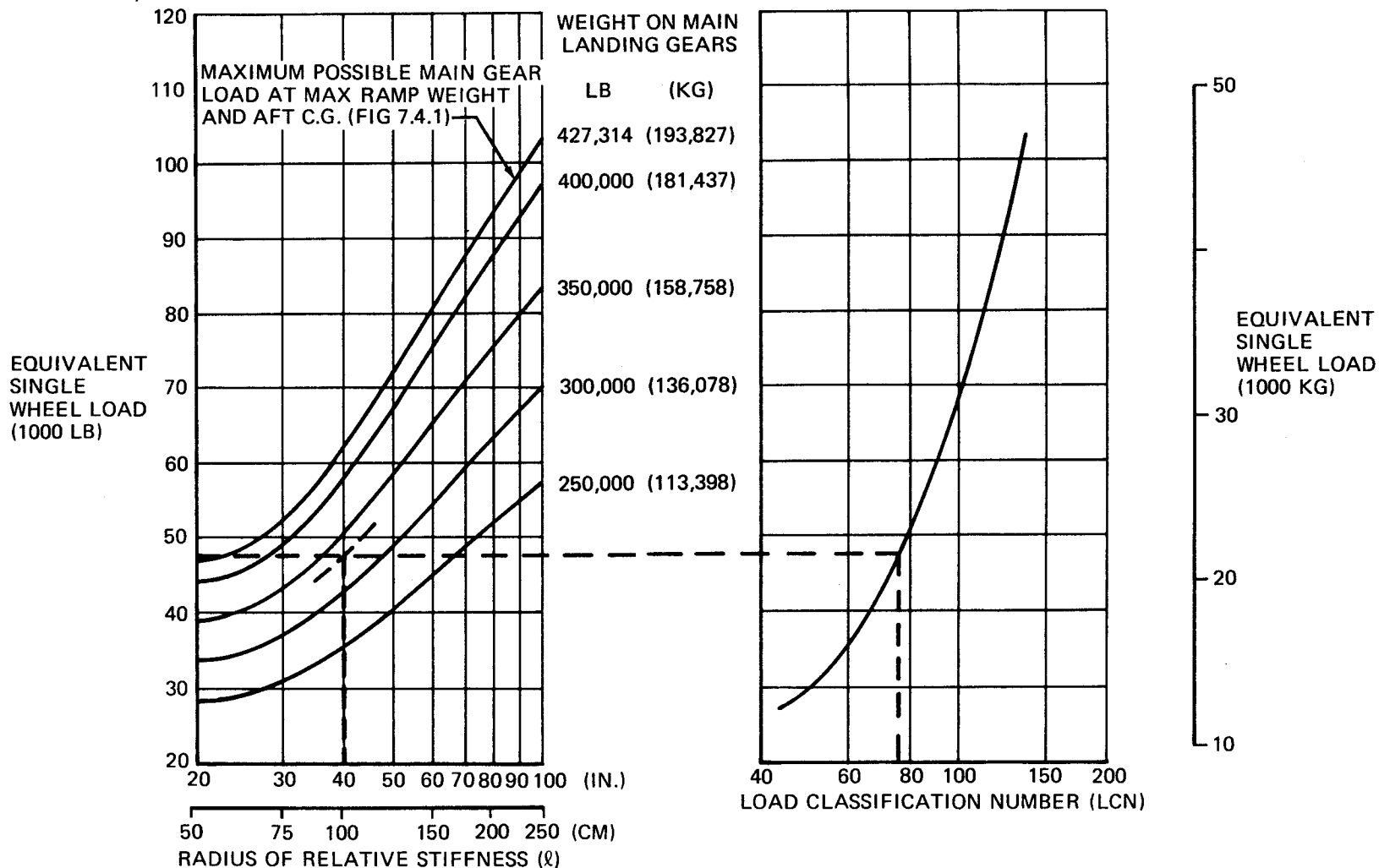
In the example for the Series 10, the radius of relative stiffness is 40 inches and the main gear weight is 335,476 pounds. For these conditions, the LCN required is 76.

In the example for the Series 30/40, the radius of relative stiffness is 40 inches and the main gear weight is 429,115 pounds. For these conditions, the LCN required by the wing gear is 78. The LCN required by the center gear is 72. Thus, the wing gear governs the pavement requirements, and the LCN required by the aircraft is 78.

Figure 7.8.4 presents  $\ell$ -values based on Young's modulus ( $E$ ) of 4,000,000 psi and Poisson's ratio ( $\mu$ ) of 0.15. For convenience in finding  $\ell$ -values based on other values of  $E$  and  $\mu$ , the curves of Figure 7.8.5 are included. For example, to find an  $\ell$ -value based on an  $E$  of 3,000,000 psi, the "E" factor of 0.931 is multiplied by the  $\ell$ -value found in Figure 7.8.4. The effect of variations of " $\mu$ " on the  $\ell$ -value is treated in a similar manner.

NOTE: EQUIVALENT SINGLE WHEEL LOADS  
ARE DERIVED BY METHODS SHOWN  
IN ICAO AERODROME MANUAL  
PART 2, PARA 4.1.3

LCN REQUIREMENTS ARE BASED  
ON CENTER OF SLAB LOADING  
50 x 20-20 TIRES  
TIRE PRESSURE CONSTANT AT 195 PSI

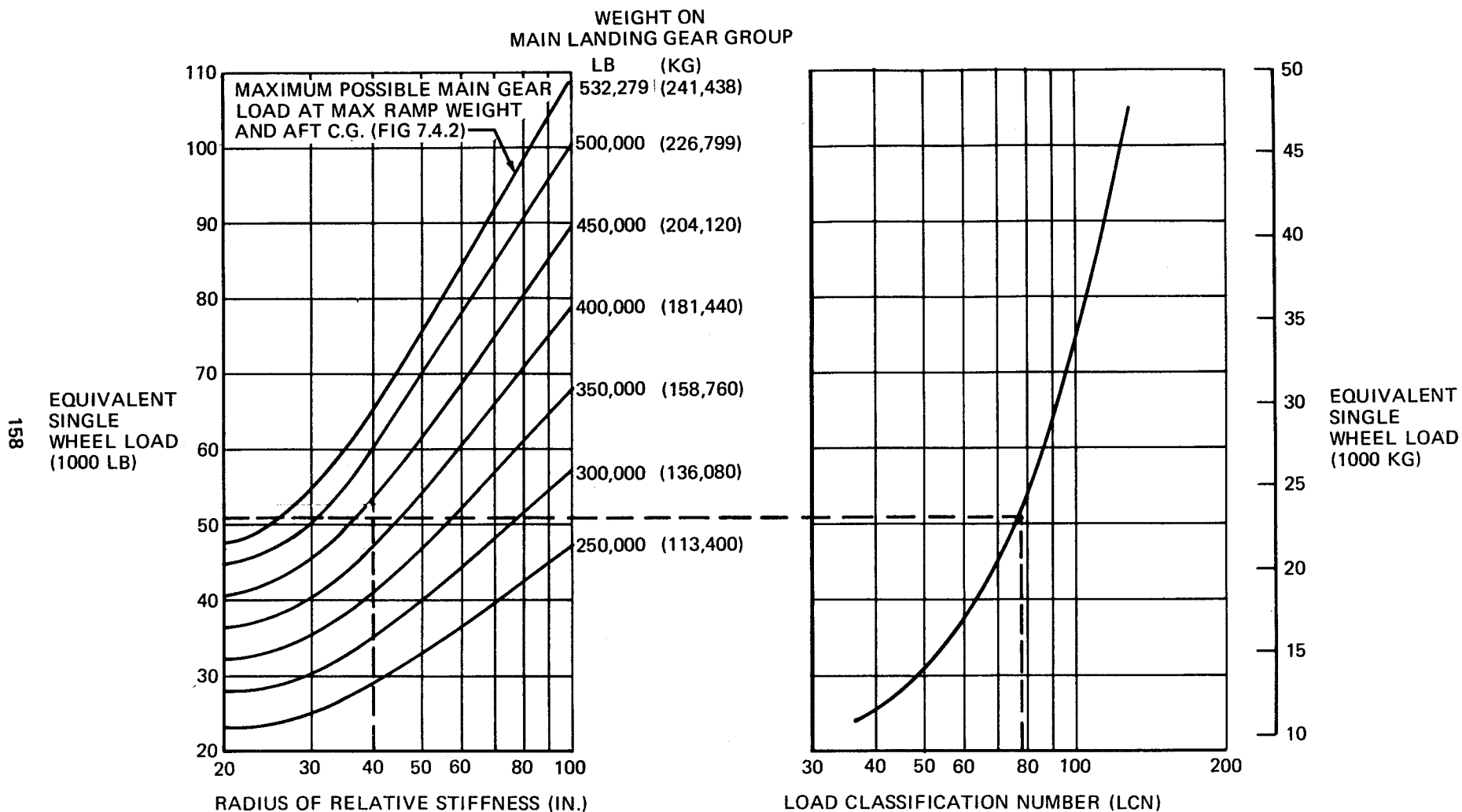


### 7.8.1 RIGID PAVEMENT REQUIREMENTS – LCN CONVERSION MODEL DC-10 SERIES 10 AND 10CF

NOTE: EQUIVALENT SINGLE WHEEL LOADS ARE  
DERIVED BY METHODS SHOWN IN ICAO  
AERODROME MANUAL, PART 2, PAR. 4.1.3

LCN REQUIREMENTS ARE BASED  
ON CENTER OF SLAB LOADING

52 x 20.5-23 TIRES TIRE PRESSURE CONSTANT AT 177 PSI



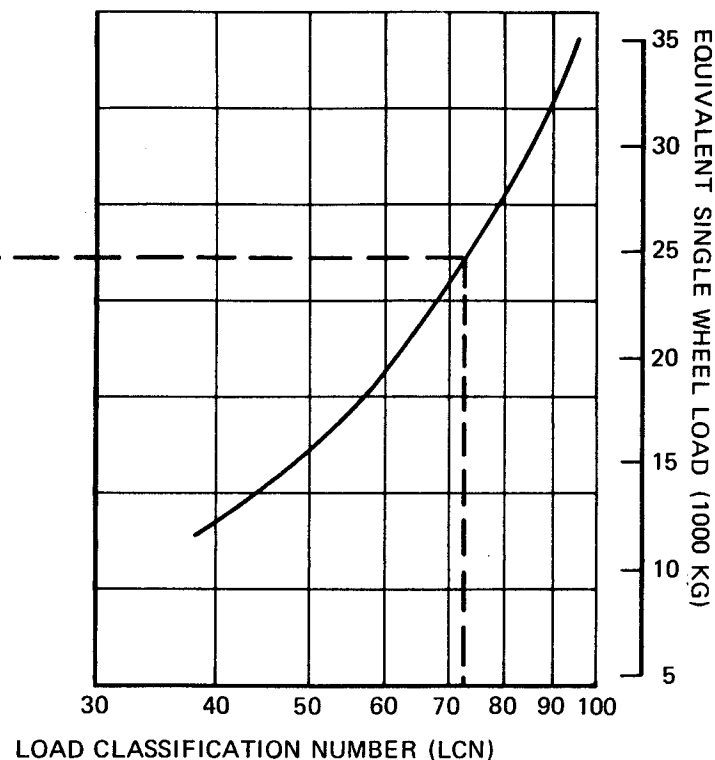
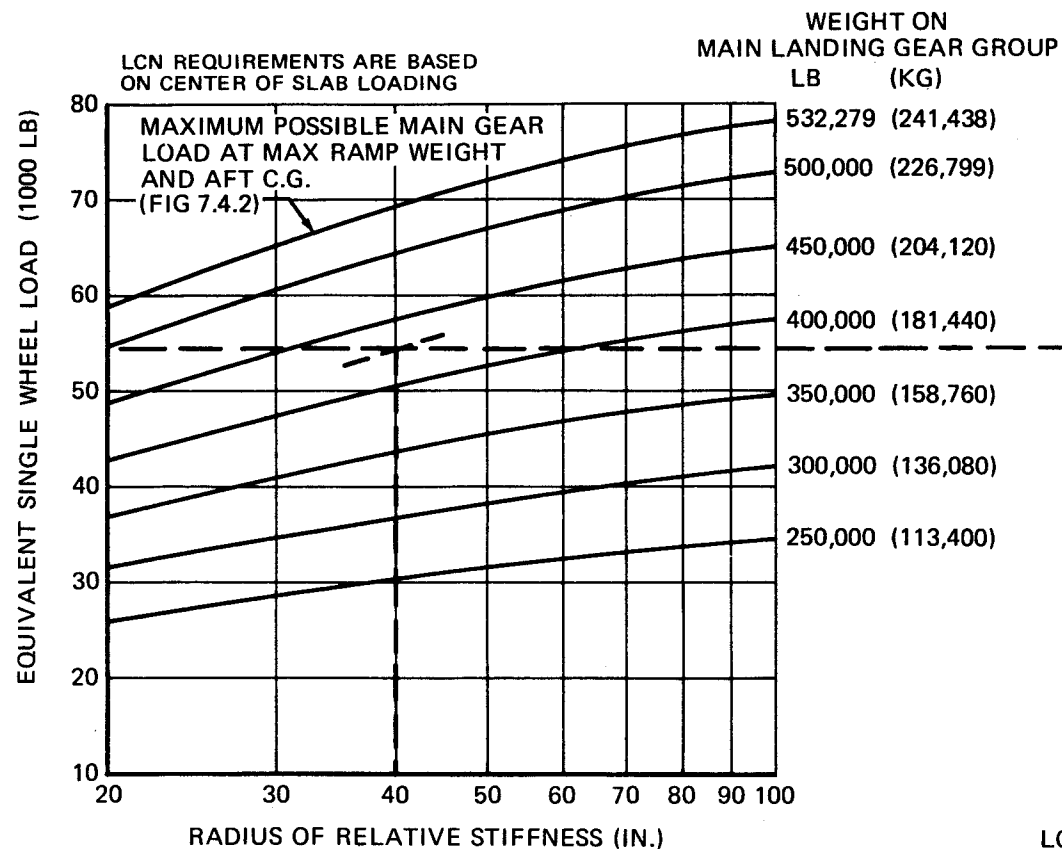
## 7.8.2 RIGID PAVEMENT REQUIREMENTS – LCN CONVERSION

### MODEL DC-10 SERIES 30, 30CF, 40 AND 40CF

### WING GEAR

NOTE: EQUIVALENT SINGLE WHEEL LOADS ARE  
DERIVED BY METHODS SHOWN IN ICAO  
AERODROME MANUAL, PART 2, PARA 4.1.3

52 x 20.5-23 TIRES  
TIRE PRESSURE CONSTANT AT 153 PSI



### 7.8.3 RIGID PAVEMENT REQUIREMENTS – LCN CONVERSION

MODEL DC-10 SERIES 30, 30CF, 40 AND 40CF  
CENTER GEAR

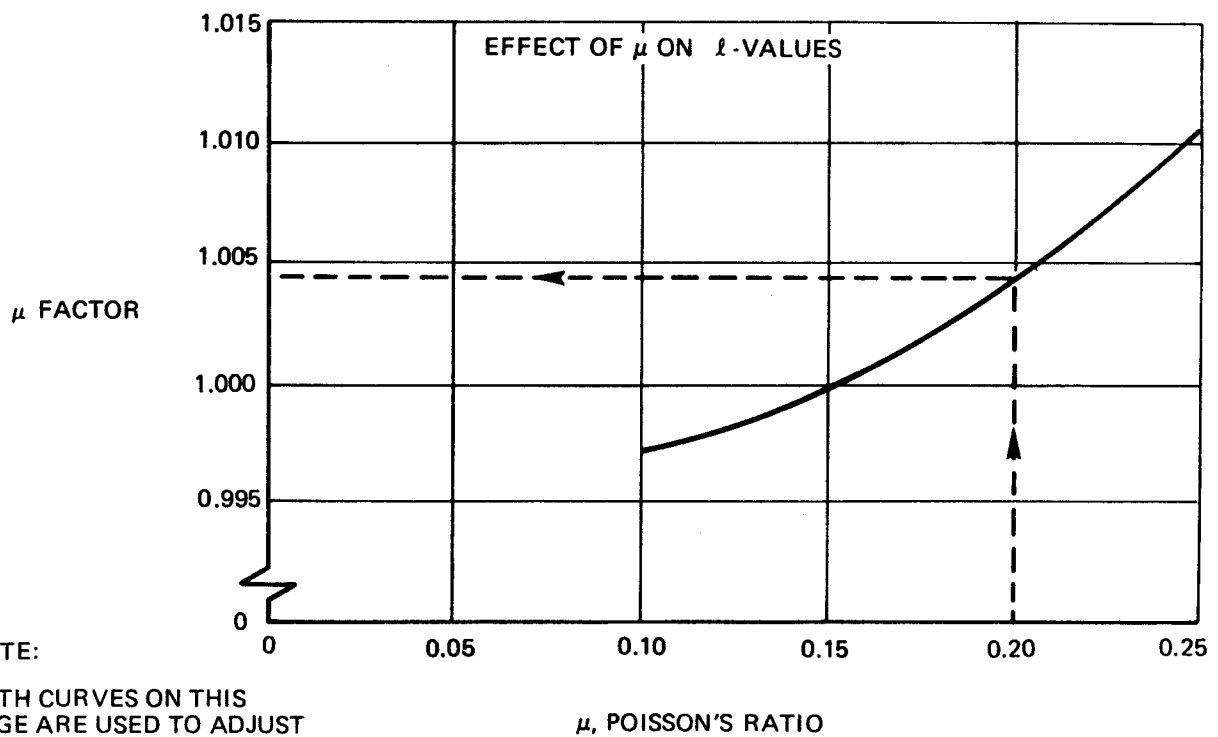
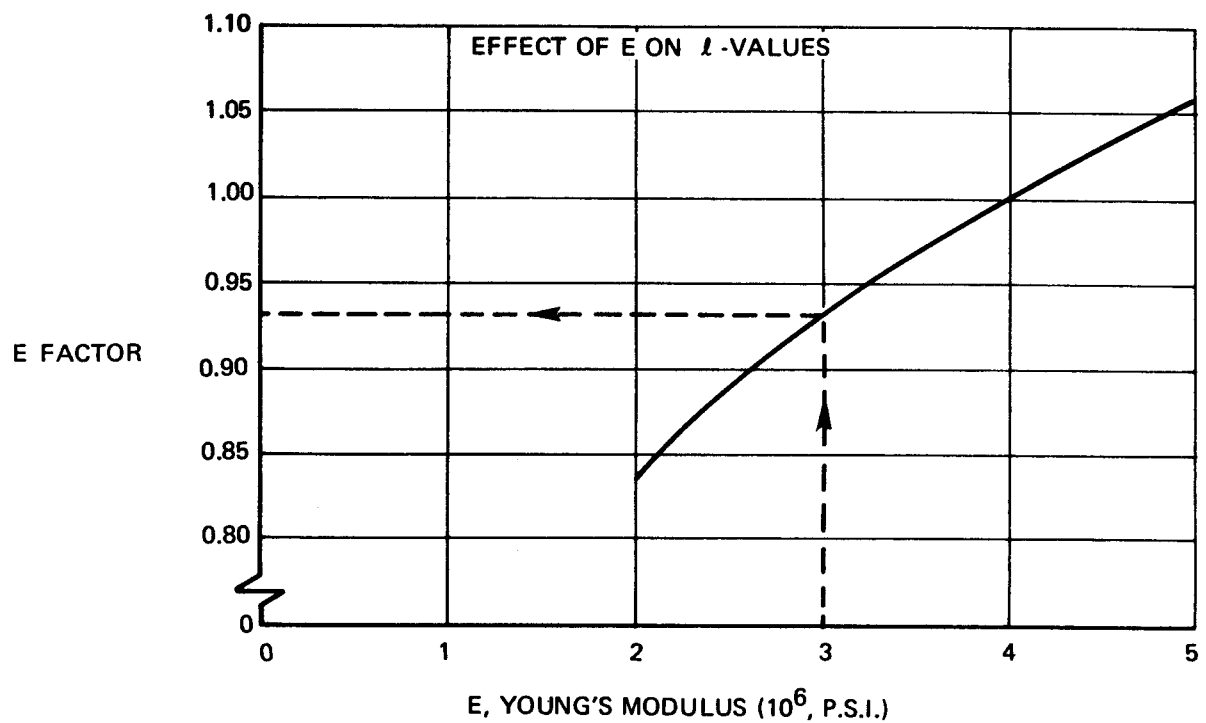
RADIUS OF RELATIVE STIFFNESS ( $\ell$ )  
VALUES OF  $\ell$  IN INCHES  
FOR E = 4,000,000 P.S.I. AND  $\mu$  = 0.15

$$\text{RADIUS OF RELATIVE STIFFNESS} = \ell = \sqrt[4]{\frac{E_d^3}{12(1-\mu^2)k}} = 24.1652 \sqrt[4]{\frac{d^3}{k}}$$

d in in.	k=50	k=100	k=150	k=200	k=250	k=300	k=350	k=400	k=500
6	34.84	29.30	26.47	24.63	23.30	22.26	21.42	20.72	19.59
6.5	36.99	31.11	28.11	26.16	24.74	23.64	22.74	22.00	20.80
7	39.11	32.89	29.72	27.65	26.15	24.99	24.04	23.25	21.99
7.5	41.19	34.63	31.29	29.12	27.54	26.32	25.32	24.49	23.16
8	43.23	36.35	32.85	30.57	28.91	27.62	26.58	25.70	24.31
8.5	45.24	38.04	34.37	31.99	30.25	28.91	27.81	26.90	25.44
9	47.22	39.71	35.88	33.39	31.58	30.17	29.03	28.08	26.55
9.5	49.17	41.35	37.36	34.77	32.89	31.42	30.23	29.24	27.65
10	51.10	42.97	38.83	36.14	34.17	32.65	31.42	30.39	28.74
10.5	53.01	44.57	40.28	37.48	35.45	33.87	32.59	31.52	29.81
11	54.89	46.16	41.71	38.81	36.71	35.07	33.75	32.64	30.87
11.5	56.75	47.72	43.12	40.13	37.95	36.26	34.89	33.74	31.91
12	58.59	49.27	44.52	41.43	39.18	37.44	36.02	34.84	32.95
12.5	60.41	50.80	45.90	42.72	40.40	38.60	37.14	35.92	33.97
13	62.22	52.32	47.27	43.99	41.61	39.75	38.25	36.99	34.99
13.5	64.00	53.82	48.63	45.26	42.80	40.89	39.35	38.06	35.99
14	65.77	55.31	49.98	46.51	43.98	42.02	40.44	39.11	36.99
14.5	67.53	56.78	51.31	47.75	45.16	43.15	41.51	40.15	37.97
15	69.27	58.25	52.63	48.98	46.32	44.26	42.58	41.19	38.95
15.5	70.99	59.70	53.94	50.20	47.47	45.36	43.64	42.21	39.92
16	72.70	61.13	55.24	51.41	48.62	46.45	44.70	43.23	40.88
16.5	74.40	62.56	56.53	52.61	49.75	47.54	45.74	44.24	41.84
17	76.08	63.98	57.81	53.80	50.88	48.61	46.77	45.24	42.78
17.5	77.75	65.38	59.48	54.98	52.00	49.68	47.80	46.23	43.72
18	79.41	66.78	60.35	56.16	53.11	50.74	48.82	47.22	44.66
19	82.70	69.54	62.84	58.48	55.31	52.84	50.84	49.17	46.51
20	85.95	72.27	65.30	60.77	57.47	54.92	52.84	51.10	48.33
21	89.15	74.97	67.74	63.04	59.62	56.96	54.81	53.01	50.13
22	92.31	77.63	70.14	65.28	61.73	58.98	56.75	54.89	51.91
23	95.44	80.26	72.52	67.49	63.83	60.98	58.68	56.75	53.67
24	98.54	82.86	74.87	69.68	65.90	62.96	60.58	58.59	55.41

## 7.8.4 RADIUS OF RELATIVE STIFFNESS

(REFERENCE: PORTLAND CEMENT ASSOCIATION)



NOTE:

BOTH CURVES ON THIS  
PAGE ARE USED TO ADJUST  
THE  $\ell$ -VALUES OF  
TABLE 7.8.1

### 7.8.5 EFFECT OF E AND $\mu$ ON $\ell$ VALUES MODEL DC-10

## **7.9 ACN-PCN REPORTING SYSTEM**

### **7.9.1 Aircraft Classification Numbers (ACNs)**

To determine the ACN of an aircraft on flexible or rigid pavement, both the aircraft gross weight and the subgrade strength must be known.

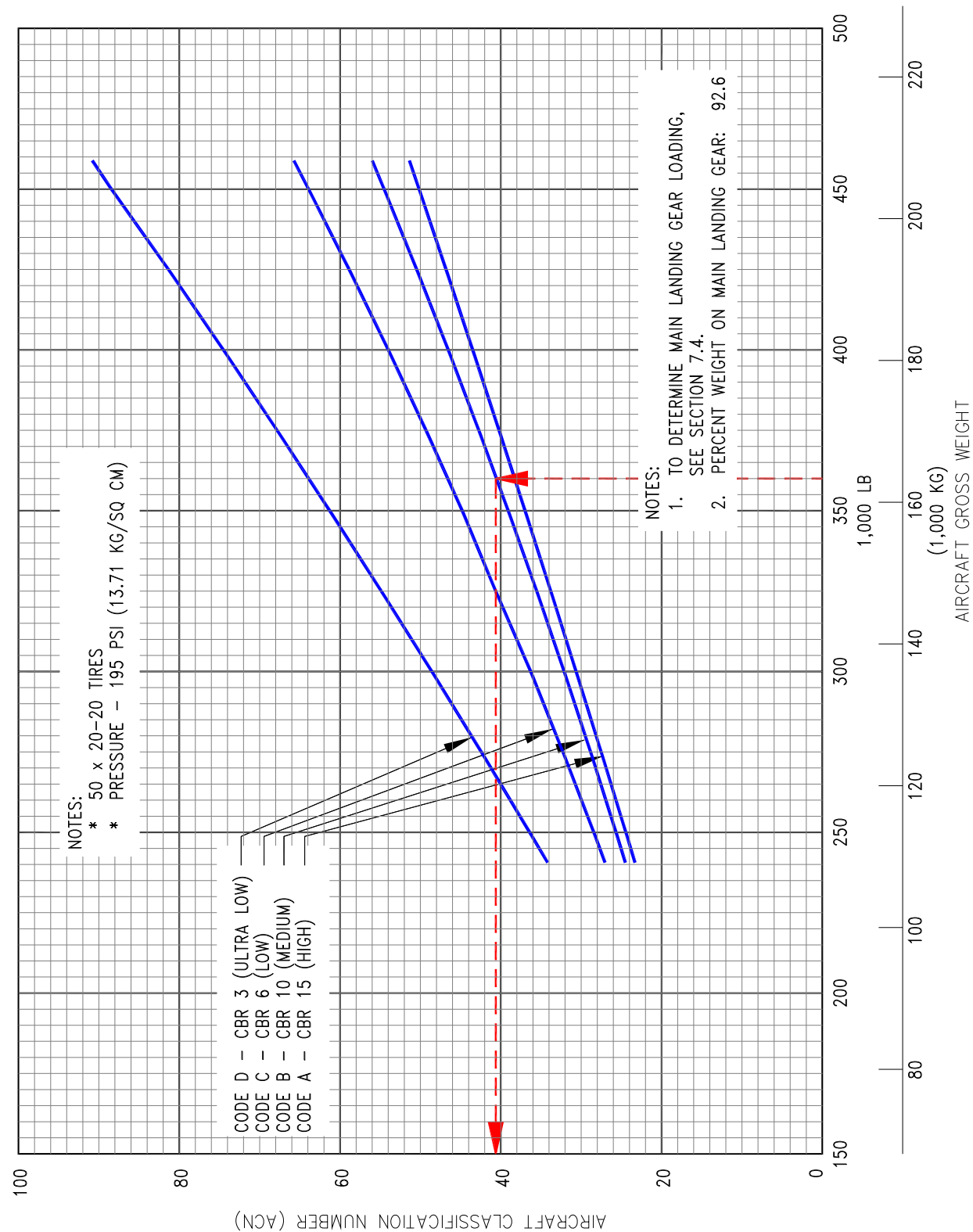
In the flexible pavement ACN example for the Series 10 presented in Figure 7.9.1, the subgrade strength is medium and the gross weight is 360,000 pounds. For these conditions, the ACN is 44.

In the flexible pavement ACN example for the Series 30/40 presented in Figure 7.9.2 and 7.9.3, the subgrade strength is medium and the gross weight is 470,000 pounds. For these conditions the wing gear ACN is 46 and the center gear ACN is 38. Thus the wing gear is critical and the aircraft ACN is 46.

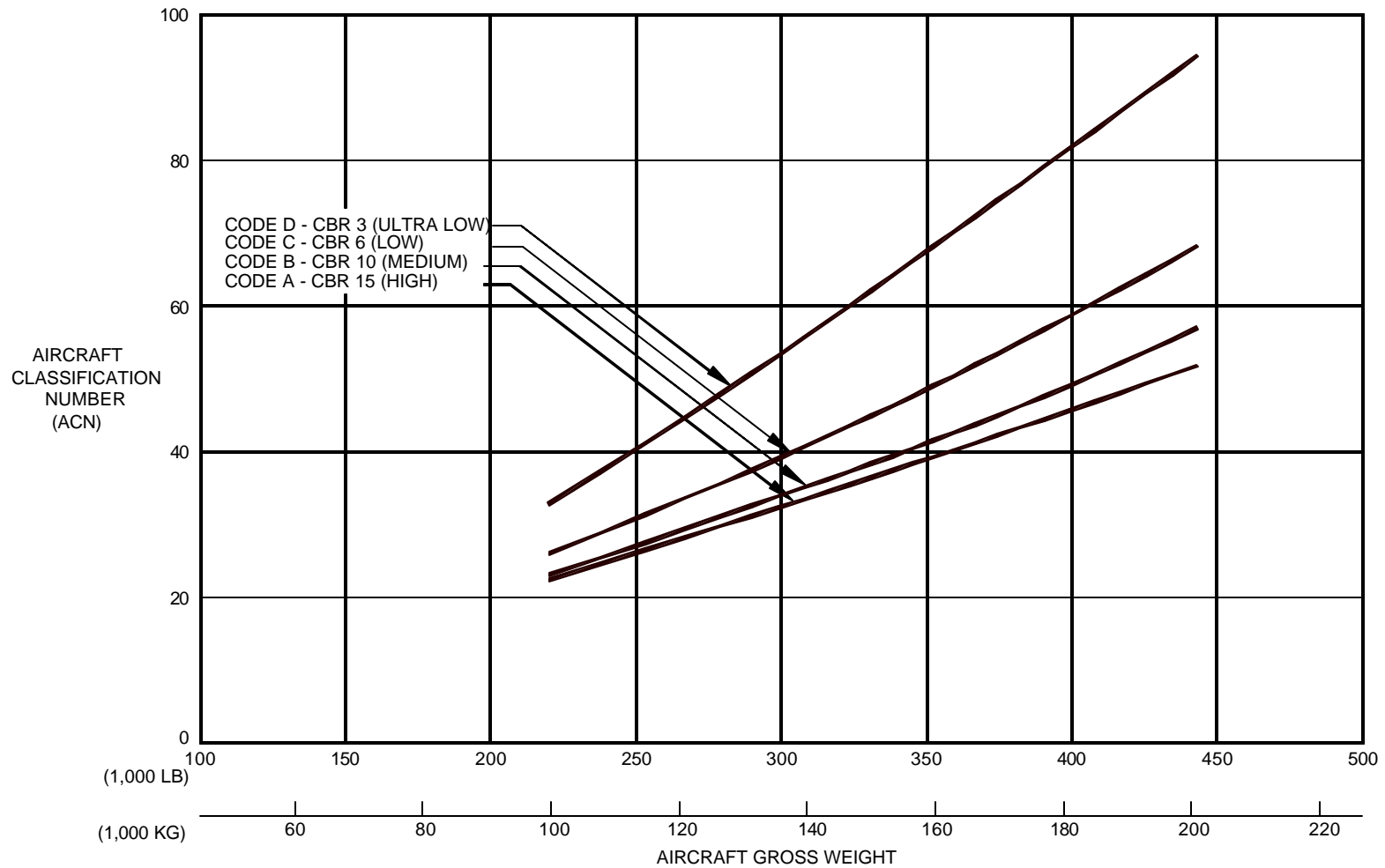
In the rigid pavement ACN example for the Series 10 presented in Figure 7.9.4, the subgrade strength is medium and the gross weight is 360,000 pounds. For these conditions, the ACN is 41.

In the rigid pavement ACN examples for the Series 30/40 presented in Figure 7.9.5 and 7.9.6, the subgrade strength is medium and the gross weight is 470,000 pounds. For these conditions the wing gear ACN is 42, and the center gear ACN is 42. Thus the wing gear and the center gear requirements are equal for these conditions and the aircraft ACN is 42.

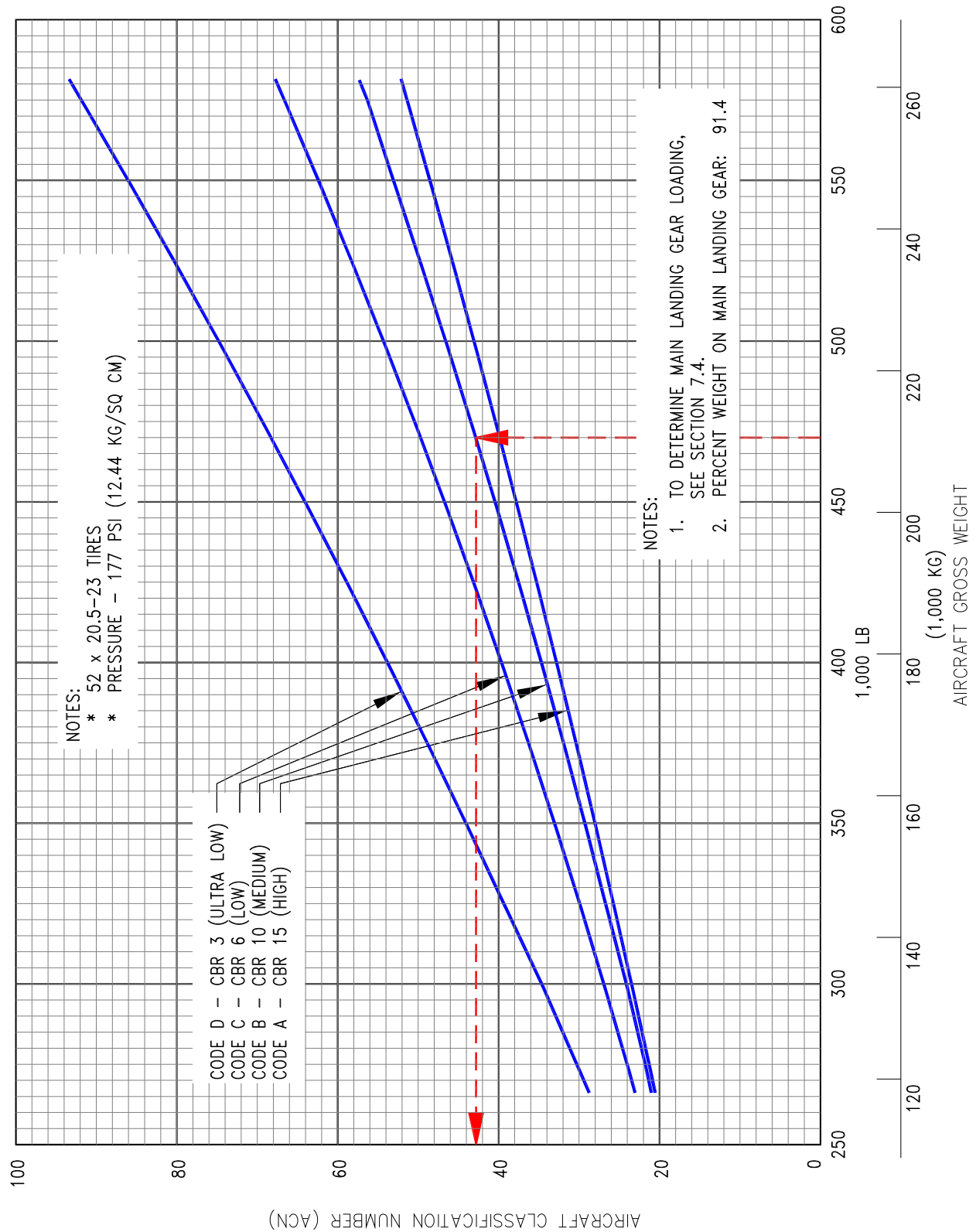
**NOTE:** The PCN reported indicates that an aircraft with an ACN equal to or less than the reported PCN can operate without restrictions on the pavement. (Reference: ICAO State Letter AN 4/1.1.17-80/9)



H54 X 21-24 36 PR TIRES  
PRESSURE CONSTANT AT 155PSI  
CG AT MOST AFT POSITION FOR MAXIMUM RAMP WEIGHT



7.9.1-A AIRCRAFT CLASSIFICATION NUMBER - FLEXIBLE PAVEMENT  
MODEL MD-10 SERIES 10F

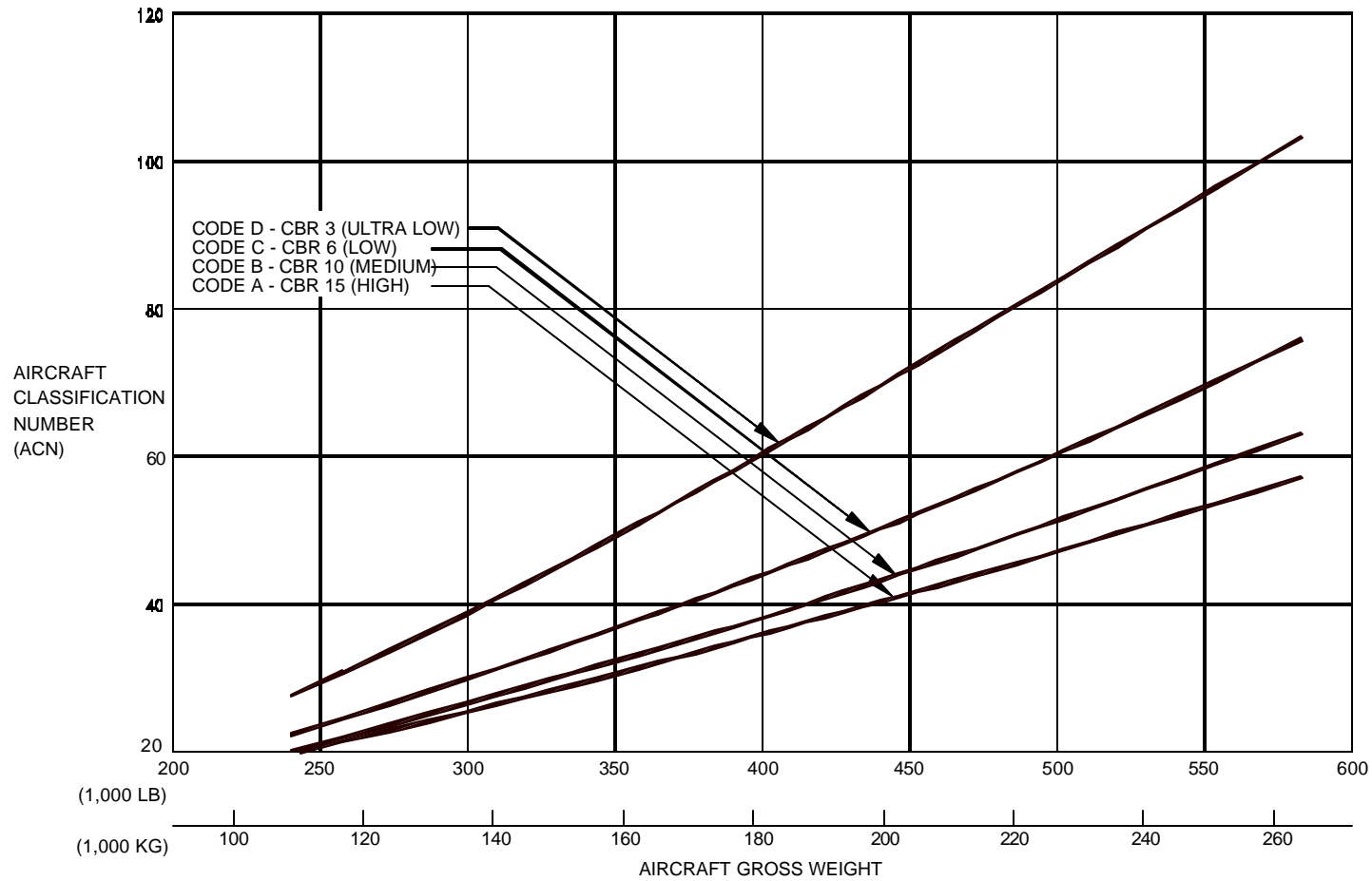


## 7.9.2 AIRCRAFT CLASSIFICATION NUMBER - FLEXIBLE PAVEMENT

MODEL DC-10 SERIES 30, 30CF, 40, AND 40CF

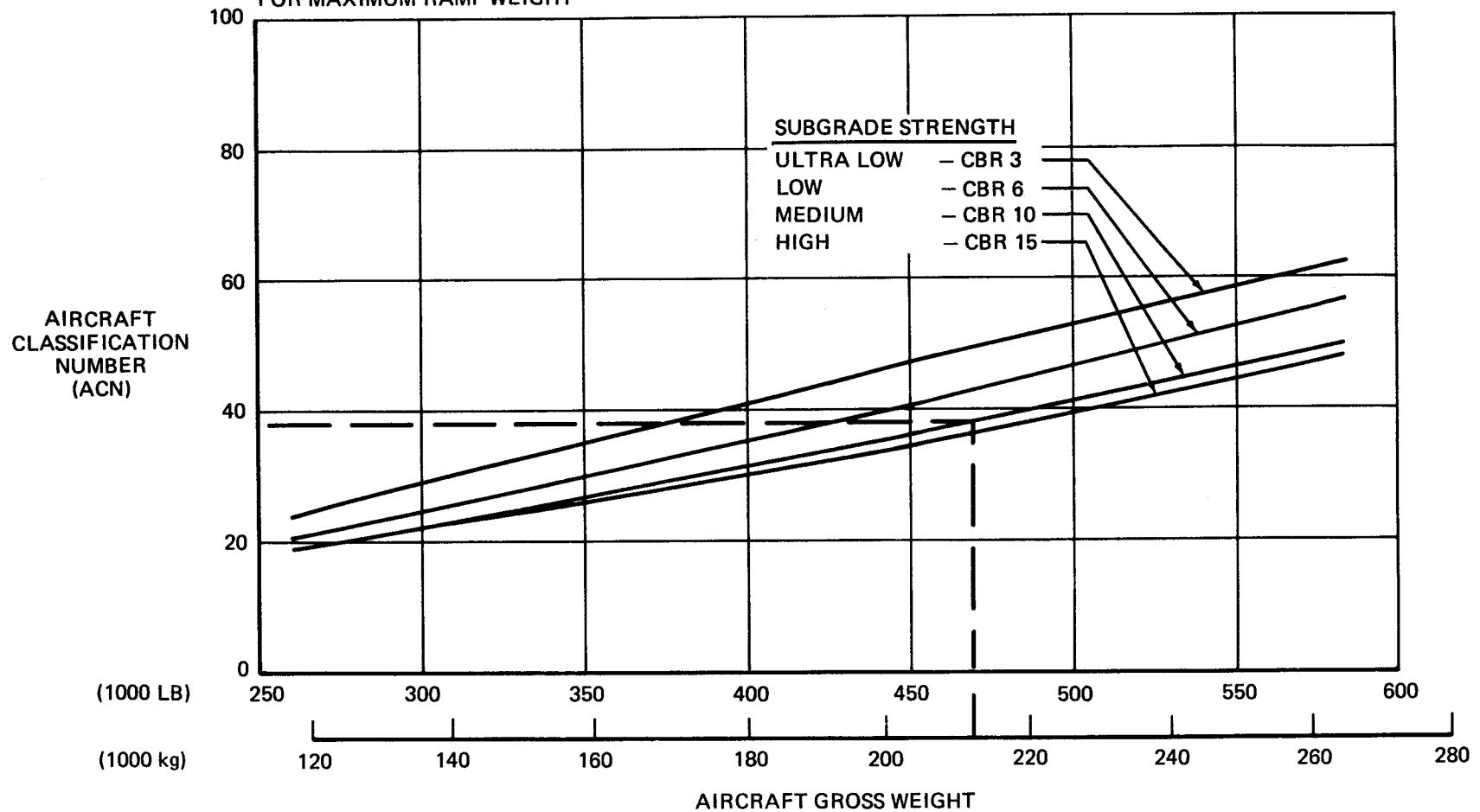
H54 X 21-24 36 PR TIRES  
 PRESSURE CONSTANT AT 175PSI  
 CG AT MOST AFT POSITION FOR MAXIMUM RAMP WEIGHT

164-A



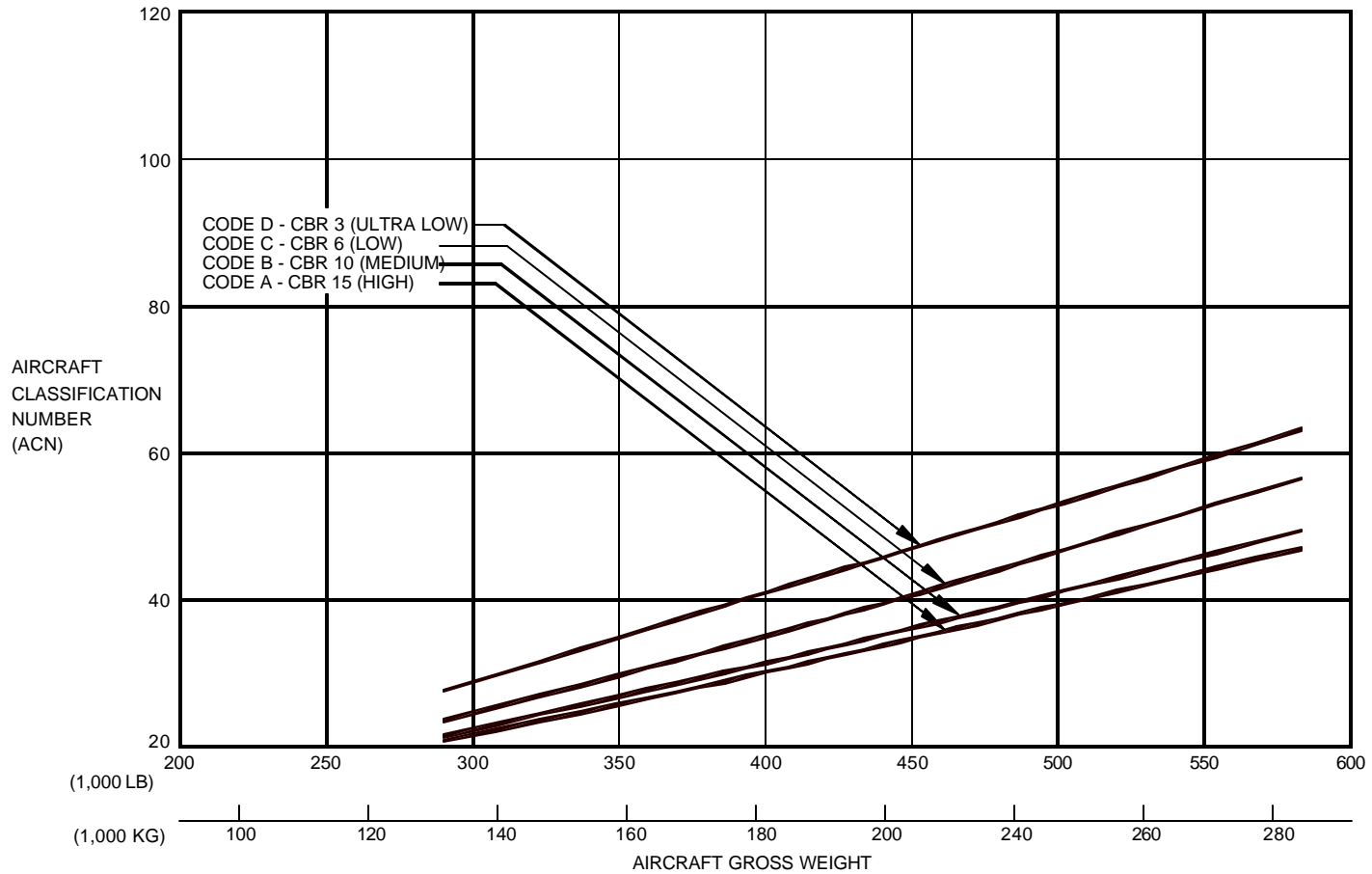
7.9.2-A AIRCRAFT CLASSIFICATION NUMBER - FLEXIBLE PAVEMENT  
 MODEL MD-10 SERIES 30F  
 WING GEAR

52 x 20.5-23 TIRES  
 PRESSURE CONSTANT AT 153 PSI  
 CG AT MOST AFT POSITION  
 FOR MAXIMUM RAMP WEIGHT



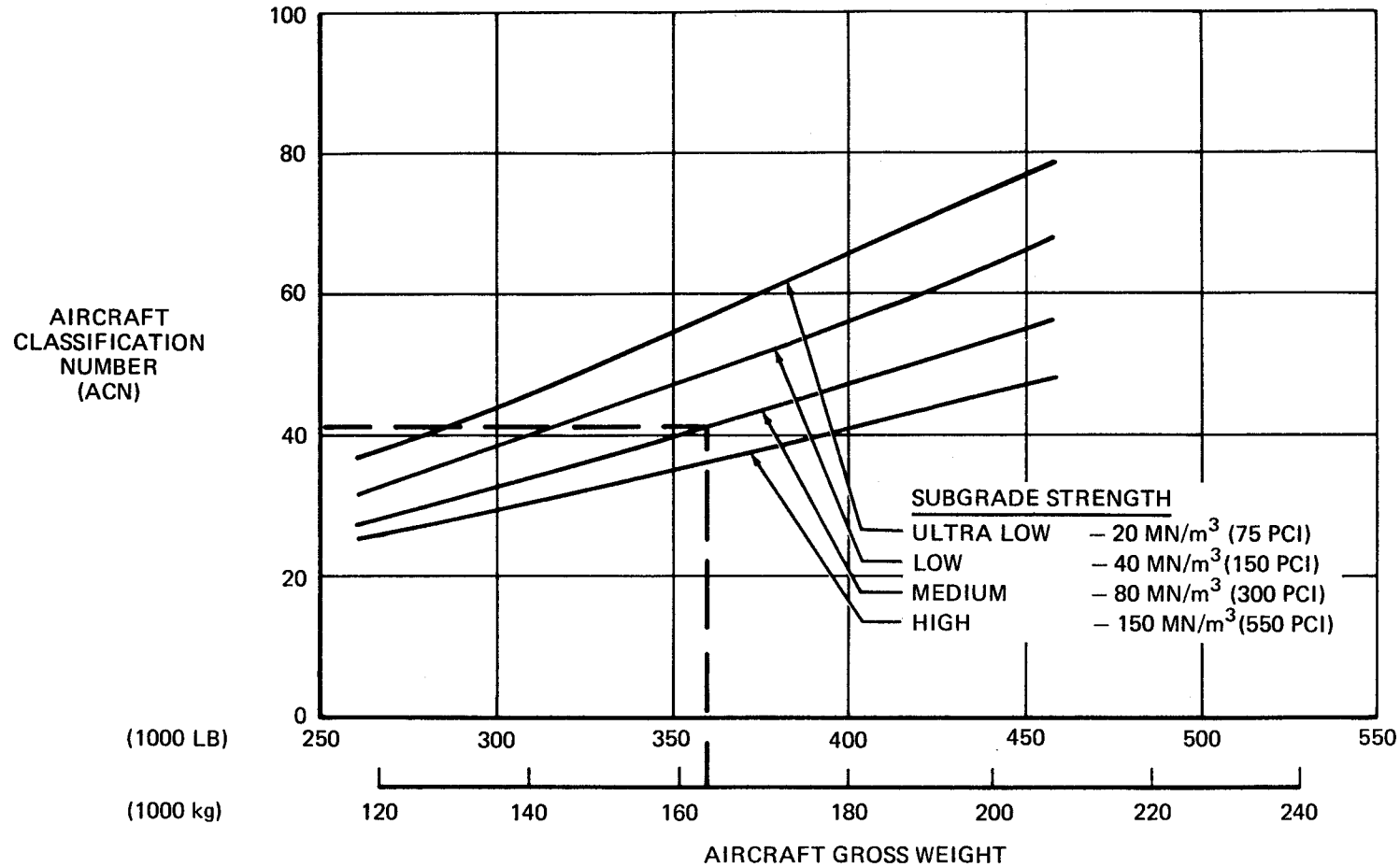
### 7.9.3 AIRCRAFT CLASSIFICATION NUMBER – FLEXIBLE PAVEMENT MODEL DC-10 SERIES 30, 30CF, 40, AND 40CF CENTER GEAR

H54 X 21-24 36 PR TIRES  
 PRESSURE CONSTANT AT 145PSI  
 CG AT MOST AFT POSITION FOR MAXIMUM RAMP WEIGHT



7.9.3-A AIRCRAFT CLASSIFICATION NUMBER - FLEXIBLE PAVEMENT  
 MODEL MD-10 SERIES 30F  
 CENTER GEAR

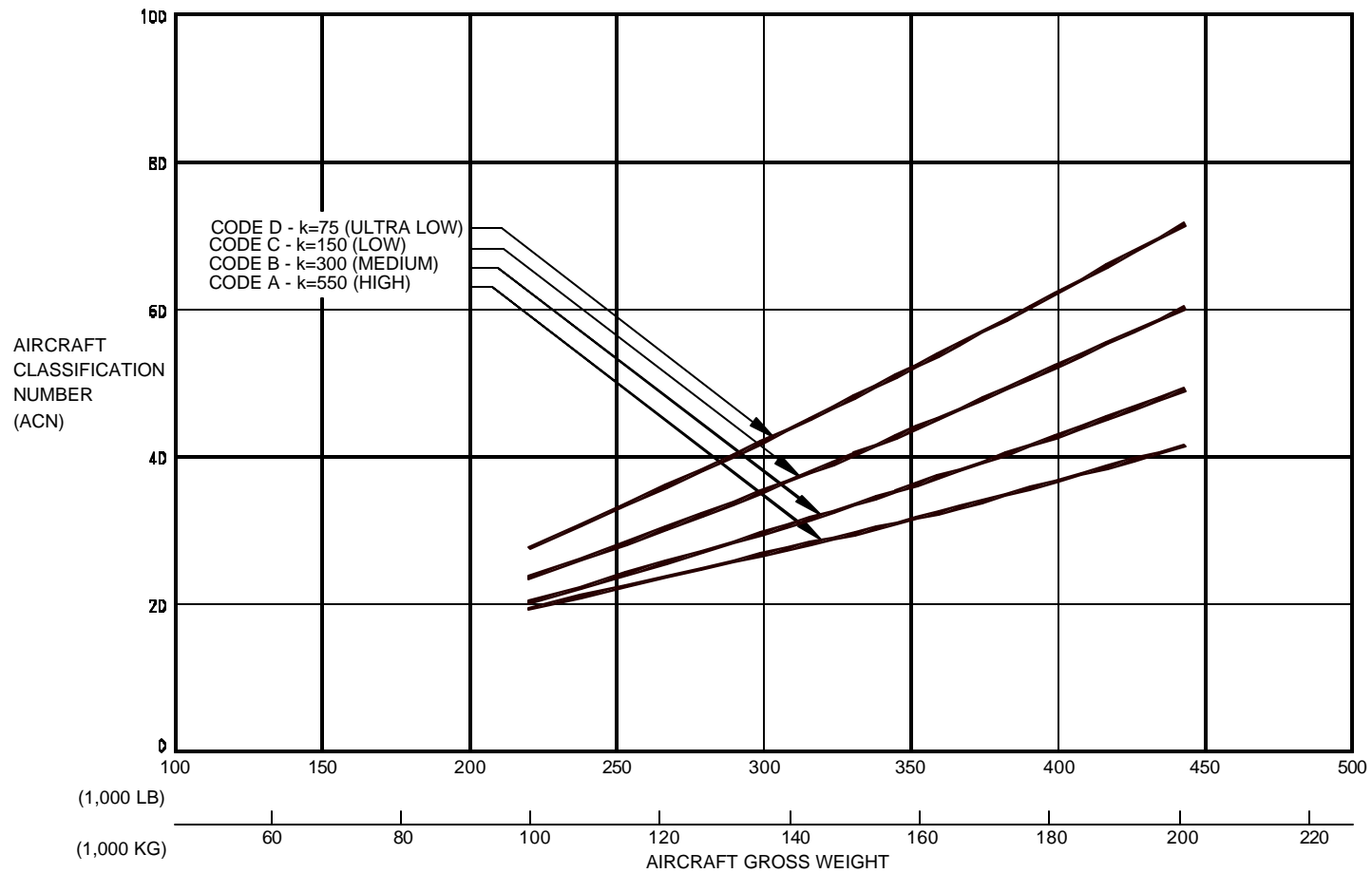
50 x 20-20 TIRES  
PRESSURE CONSTANT AT 195 PSI  
CG AT MOST AFT POSITION  
FOR MAXIMUM RAMP WEIGHT



#### 7.9.4 AIRCRAFT CLASSIFICATION NUMBER – RIGID PAVEMENT MODEL DC-10 SERIES 10 AND 10CF

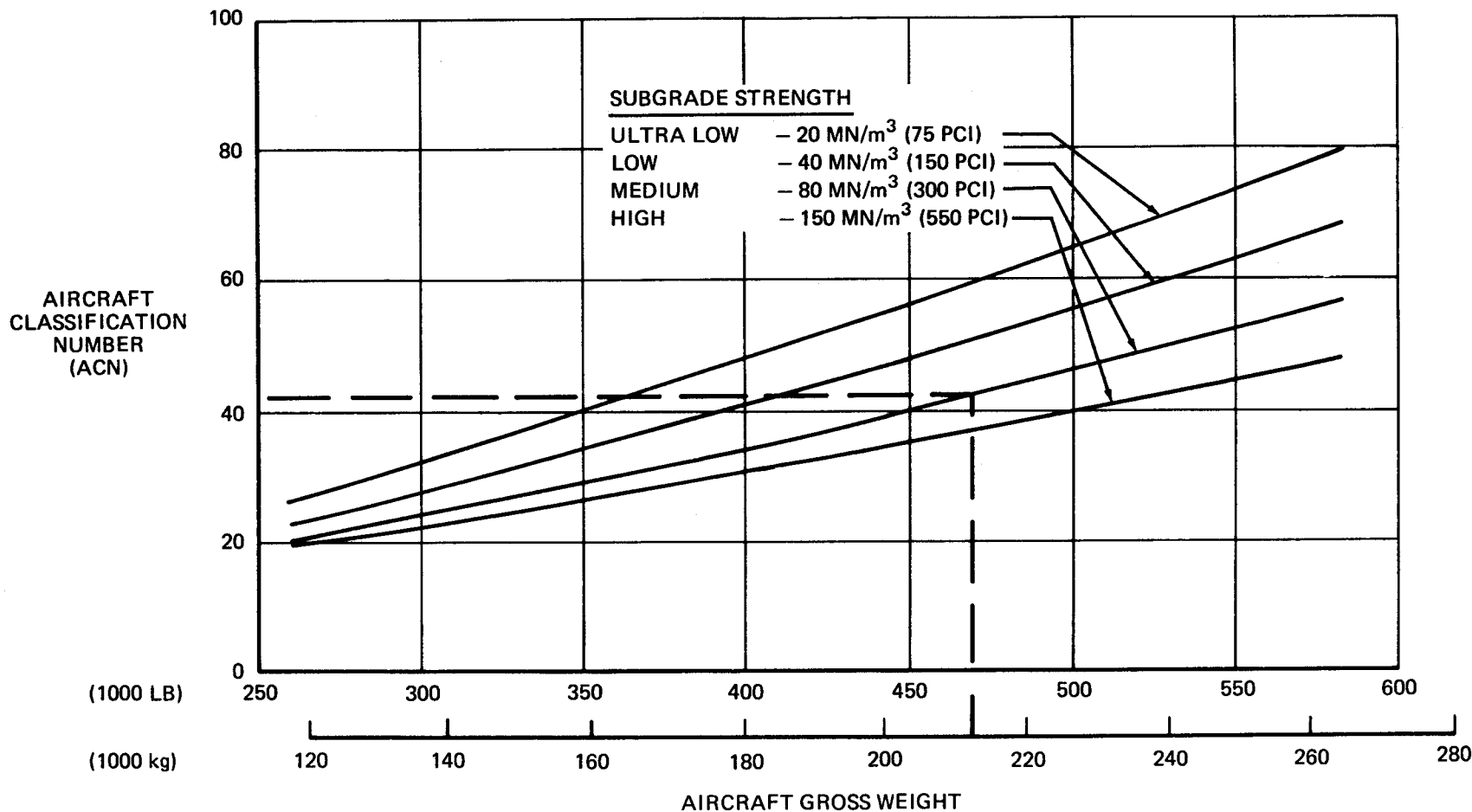
H54 X 21-24 36 PR TIRES  
 PRESSURE CONSTANT AT 155PSI  
 CG AT MOST AFT POSITION FOR MAXIMUM RAMP WEIGHT

166-A



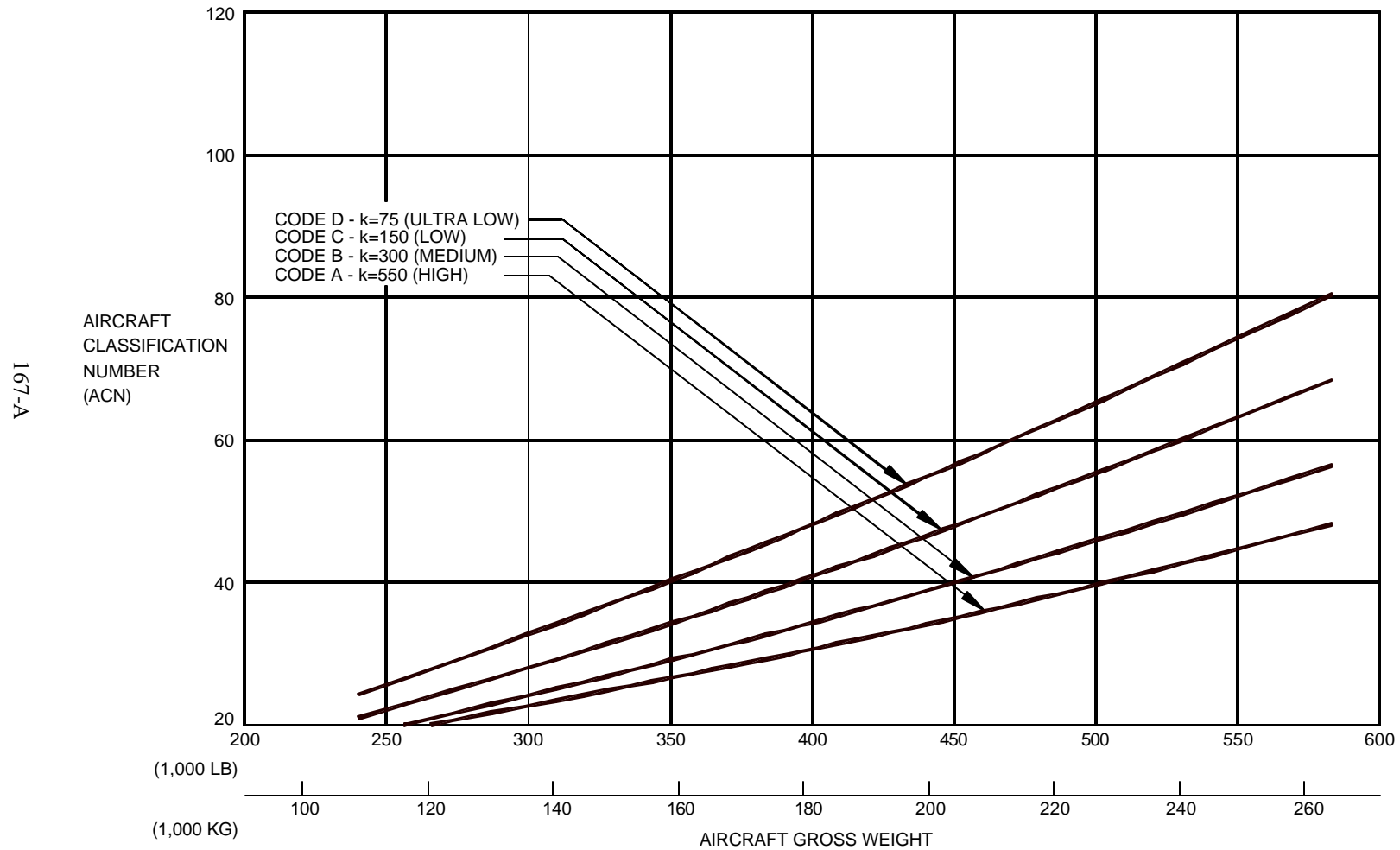
7.9.4-A AIRCRAFT CLASSIFICATION NUMBER - RIGID PAVEMENT  
 MODEL MD-10 SERIES 10F

52 x 20.5-23 TIRES  
 PRESSURE CONSTANT AT 177 PSI  
 CG AT MOST AFT POSITION  
 FOR MAXIMUM RAMP WEIGHT



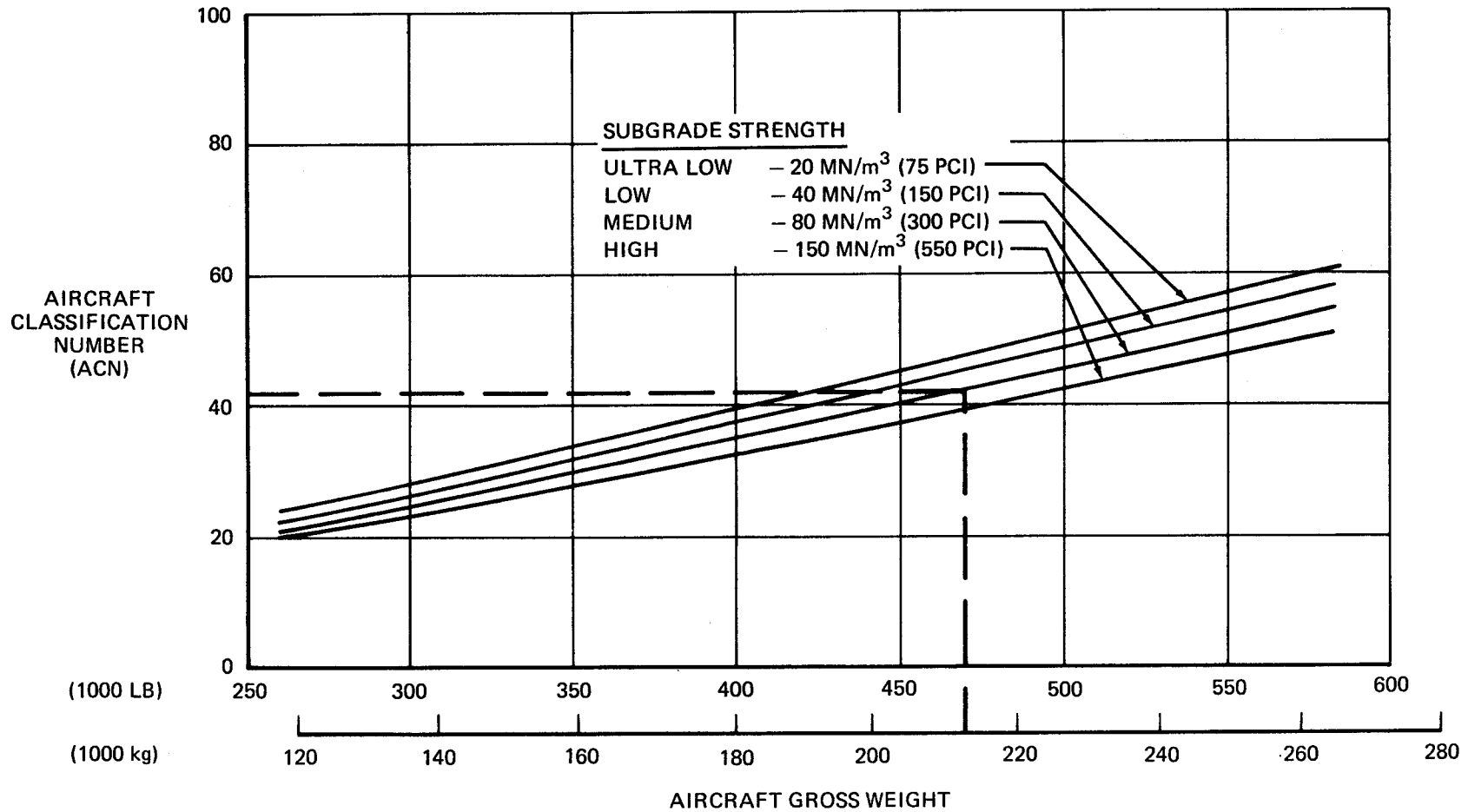
### 7.9.5 AIRCRAFT CLASSIFICATION NUMBER – RIGID PAVEMENT MODEL DC-10 SERIES 30, 30CF, 40, AND 40CF WING GEAR

H54 X 21-24 36 PR TIRES  
 PRESSURE CONSTANT AT 175PSI  
 CG AT MOST AFT POSITION FOR MAXIMUM RAMP WEIGHT



7.9.5-A AIRCRAFT CLASSIFICATION NUMBER - RIGID PAVEMENT  
 MODEL MD-10 SERIES 30F  
 WING GEAR

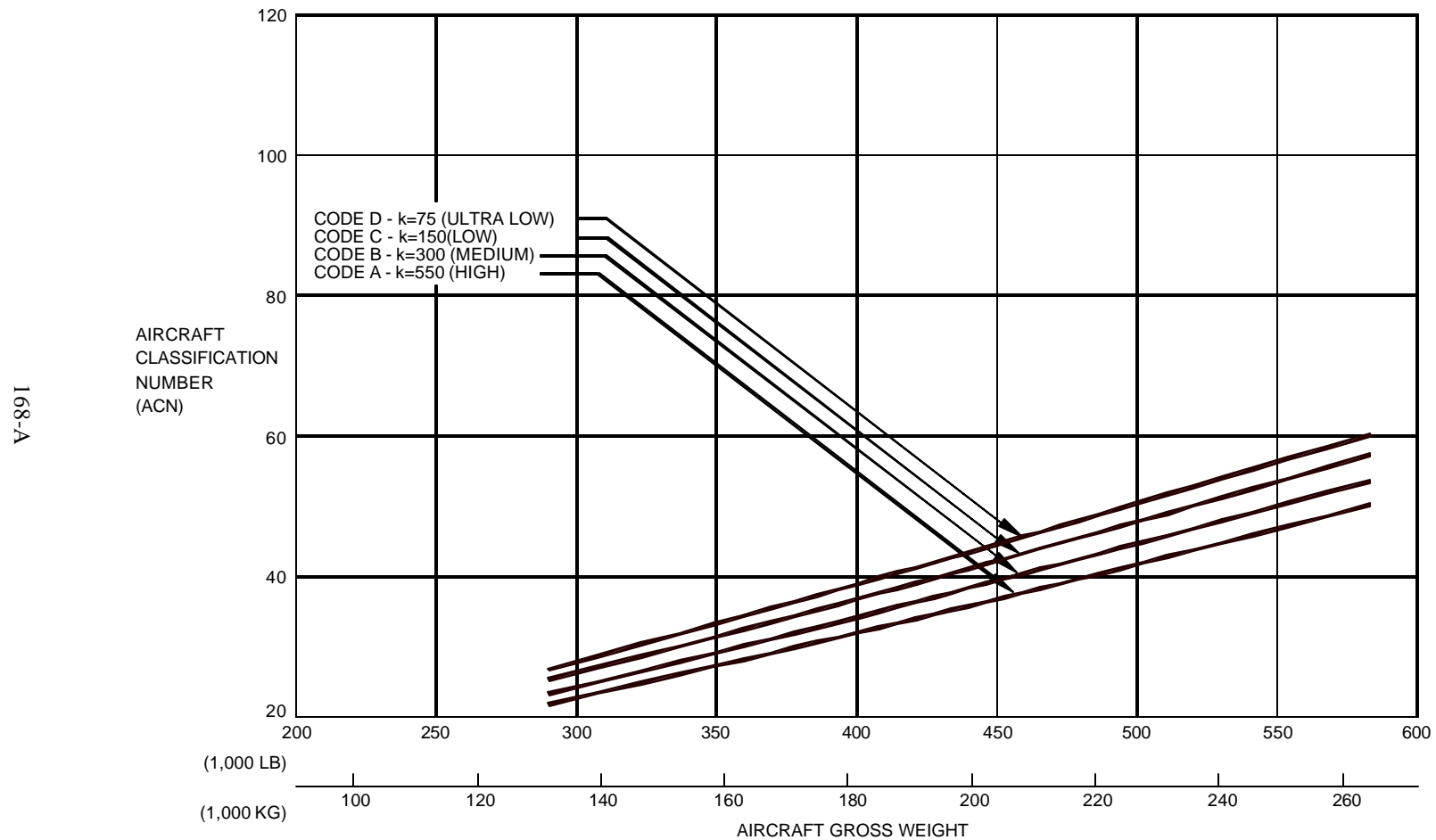
52 x 20.5-23 TIRES  
 PRESSURE CONSTANT AT 153 PSI  
 CG AT MOST AFT POSITION  
 FOR MAXIMUM RAMP WEIGHT



### 7.9.6 AIRCRAFT CLASSIFICATION NUMBER – RIGID PAVEMENT

MODEL DC-10 SERIES 30, 30CF, 40, AND 40CF  
 CENTER GEAR

H54 X 21-24 36 PR TIRES  
 PRESSURE CONSTANT AT 145PSI  
 CG AT MOST AFT POSITION FOR MAXIMUM RAMP WEIGHT



7.9.6- A AIRCRAFT CLASSIFICATION NUMBER - RIGID PAVEMENT  
 MODEL MD-10 SERIES 30F  
 CENTER GEAR

### 7.9.2 ACN-PCN System Background

The ACN/PCN system is described in "ICAO Develops New Pavement Strength Reporting System", ICAO Bulletin, January, 1980 and in ICAO State Letter AN 1.1.17-80/9. It has been approved by the ICAO Council, and will be incorporated into "Aerodromes, Annex 14 to the Convention on International Civil Aviation", and into the "Aerodrome Design Manual", ICAO Doc 9157-An/901.

ACN-PCN will provide a standardized international airplane/pavement rating system replacing the various S, T, TT, LCN, AUW, ISWL, etc., rating systems used throughout the world. ACN is the Aircraft Classification Number and PCN is the corresponding Pavement Classification Number. An aircraft having an ACN equal to or less than the PCN can operate without restriction on the pavement. Numerically, the ACN is two times the derived single wheel load expressed in thousands of kilograms where the derived single wheel load is defined as the load on a single tire inflated to 1.25 MPa (181 psi) that would have the same pavement requirements as the aircraft. Computationally, the ACN-PCN system uses PCA program PDILB for rigid pavements and S-77-1 for flexible pavements to calculate ACN values. The method of pavement evaluation is the responsibility of the airport with the results of their evaluation presented as follows:

Report Example: PCN 80/R/B/W/T

PCN	Pavement Classification Number	Code	Pavement Type	Code	Subgrade Category	Code	Tire Pressure Category	Code	Evaluation Method
(#)	(Bearing strength for unrestricted operations)	R	Rigid	A	High (K = 150 MN/m <sup>3</sup> or CBR = 15%)	W	High (No limit)	T	Technical
		F	Flexible	B	Medium (K = 80 MN/m <sup>3</sup> or CBR = 10%)	X	Medium (Limited to 1.75 MPa)	U	Using Aircraft
				C	Low (K = 40 MN/m <sup>3</sup> or CBR = 6%)	Y	Low (Limited to 1.25 MPa)		
				D	Ultra Low (K = 20 MN/m <sup>3</sup> or CBR = 3%)	Z	Very Low (Limited to 0.5 MPa)		

All ACN curves have been plotted based on the methods described in State Letter AN4/1.1.17-80/9, dated 22 April 1980, Subject: "Amendment of Annex 14".

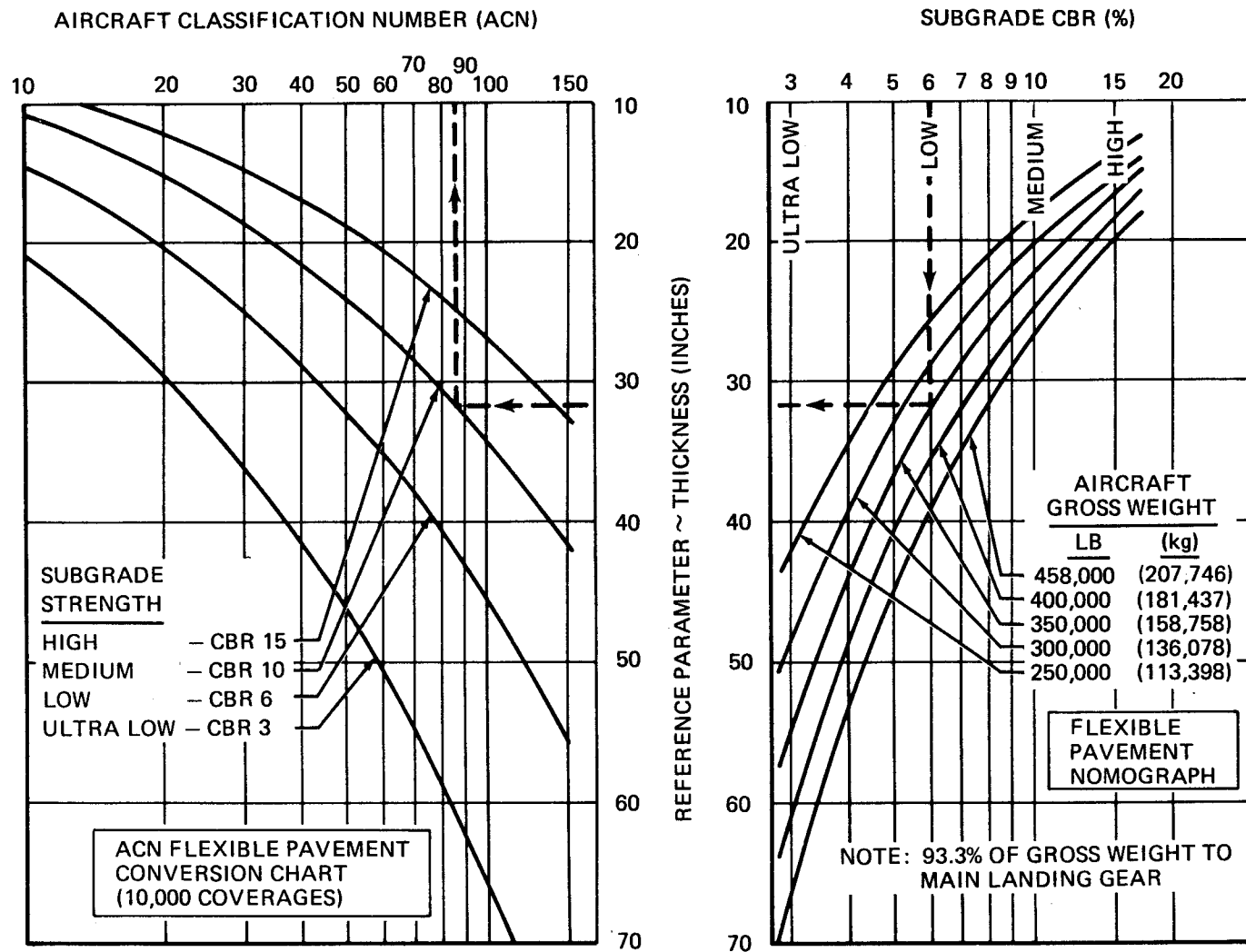
The following procedure, used to develop the flexible pavement ACN curves, is illustrated in Figure 7.9.7.

1. Determine the percent of gross weight to be used below as the maximum aft cg position which yields the critical loading on the critical gear. This value is used to determine main gear loads at all gross weights.
2. Establish a flexible pavement nomograph using U.S. Army Waterways Experiment Station Instruction Report S-77-1 for standard subgrade strengths of CBR 3, 6, 10 and 15 percent and for 10,000 coverages.

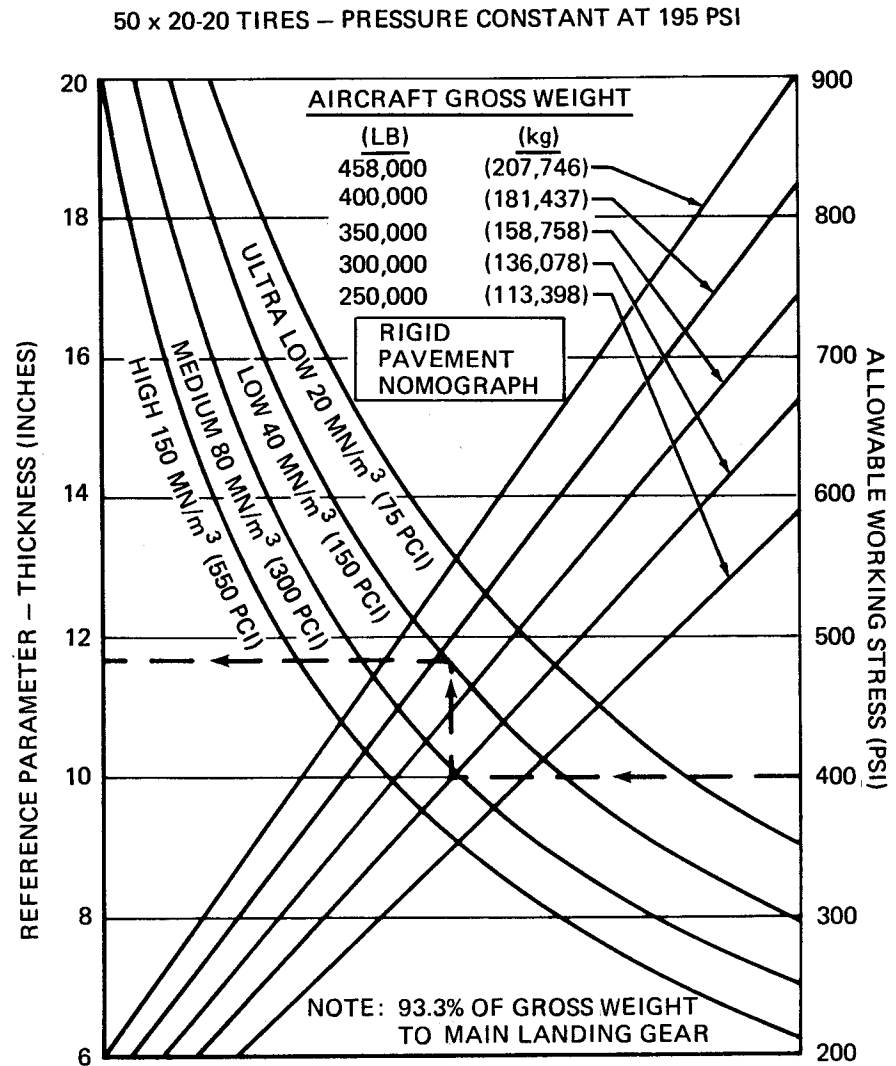
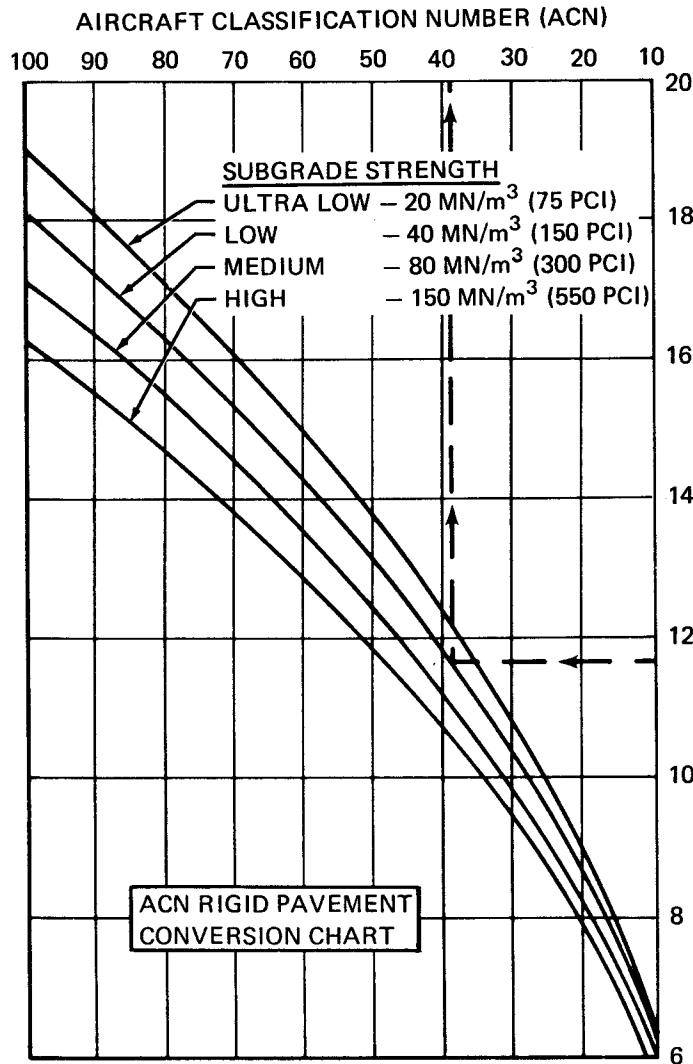
3. Determine reference thickness values for each standard subgrade strength and gear loading.
4. Enter the reference thickness values into the ACN Flexible Pavement Conversion Chart to determine ACN.

The following procedure, used to develop the rigid pavement ACN curves, is illustrated in Figure 7.9.8

1. Determine the percent of gross weight to be used below at the maximum aft cg position which yields the critical loading on the main gear. This value is used to determine main gear loads at all gross weights.
2. Establish a rigid pavement nomograph using the PCA computer program PDILB for standard subgrade strengths of  $k = 75, 150, 300$  and  $550$  PCI (nominal values for  $k = 20, 40, 80$ , and  $150 \text{ MN/m}^3$ ).
3. Determine reference thickness values for each standard subgrade strength and gear loading at  $400 \text{ PSI}$  working stress (nominal value for  $2.75 \text{ MPa}$  working stress).
4. Enter the reference thickness values into the ACN Rigid Pavement Conversion Chart to determine ACN.



7.9.7 DEVELOPMENT OF AIRCRAFT CLASSIFICATION NUMBER (ACN)  
FLEXIBLE PAVEMENT  
DC-10 SERIES 10 AND 10CF



7.9.8 DEVELOPMENT OF AIRCRAFT CLASSIFICATION NUMBER (ACN)  
RIGID PAVEMENT  
DC-10 SERIES 10 AND 10CF

## **8.0 POSSIBLE DC-10/MD-10 DERIVATIVE AIRPLANES**

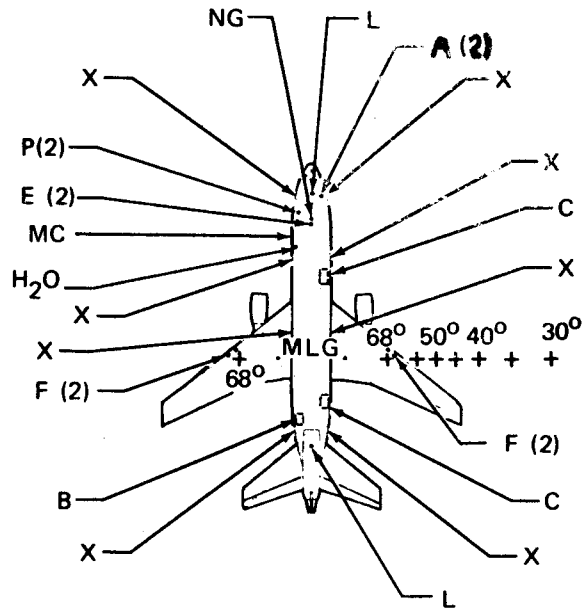
## **8.0 POSSIBLE DC-10/MD-10 DERIVATIVE AIRPLANES**

No additional versions of the DC-10/MD-10 series aircraft are currently planned.

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## **9.0 DC-10 SCALE DRAWINGS**

SCALE: 1 IN. = 100 FT

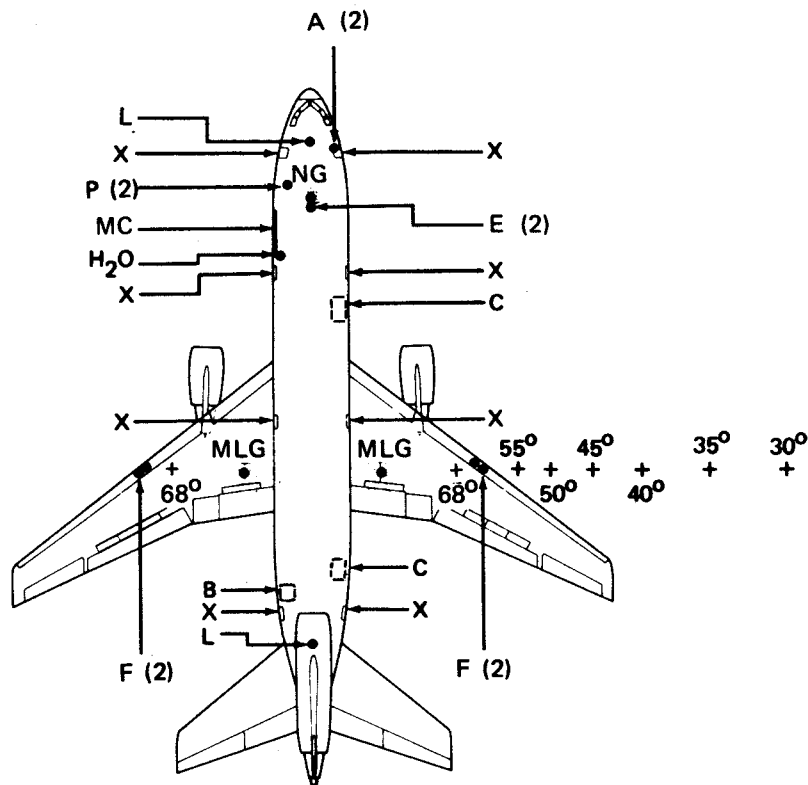


#### LEGEND

A (2)	AIR CONDITIONING (2 CONN)
B	BULK CARGO DOOR
C	CARGO CONTAINER DOOR
E (2)	ELECTRICAL (2 CONNECTIONS)
F (2)	FUEL (2 CONNECTIONS)
H <sub>2</sub> O	POTABLE WATER
L	LAVATORY
MLG	MAIN LANDING GEAR
NG	NOSE GEAR
P (2)	PNEUMATIC (2 CONNECTIONS)
X	PASSENGER DOOR
+	TURNING RADIUS POINTS: 68°, 55°, 50°, 45°, 40°, 35°, 30°
MC	MAIN DECK CARGO DOOR

## 9.0 SCALE DRAWINGS MODEL DC-10 SERIES 10 AND 10CF

SCALE: 1 IN. = 50 FT

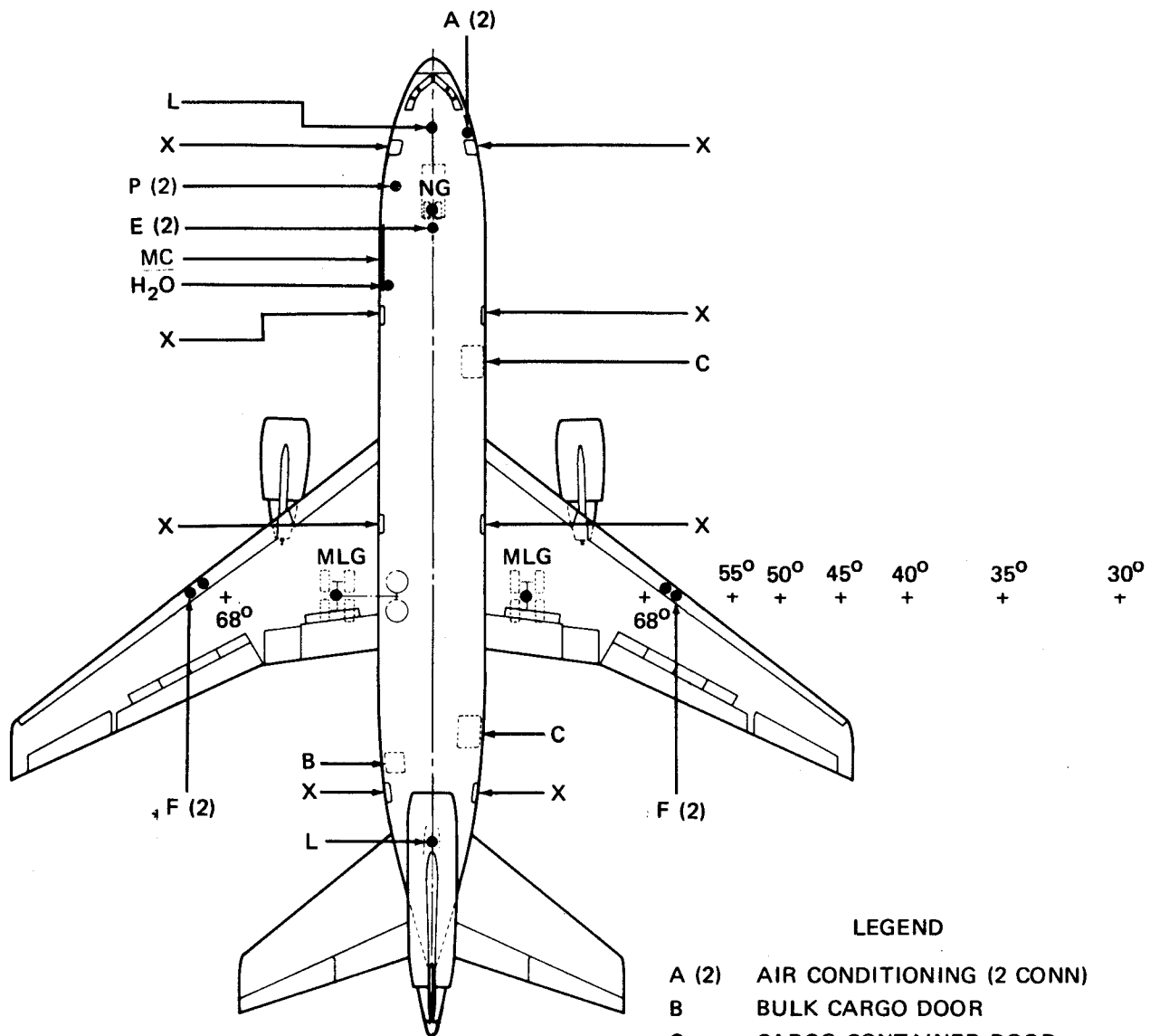


#### LEGEND

A (2)	AIR CONDITIONING (2 CONN)
B	BULK CARGO DOOR
C	CARGO CONTAINER DOOR
E (2)	ELECTRICAL (2 CONNECTIONS)
F (2)	FUEL (2 CONNECTIONS)
H <sub>2</sub> O	POTABLE WATER
L	LAVATORY
MLG	MAIN LANDING GEAR
NG	NOSE GEAR
P (2)	PNEUMATIC (2 CONNECTIONS)
X	PASSENGER DOOR
+	TURNING RADIUS POINTS: 68°, 55°, 50°, 45°, 40°, 35°, 30°
MC	MAIN DECK CARGO DOOR

## 9.0 SCALE DRAWINGS MODEL DC-10 SERIES 10 AND 10CF

SCALE: 1 IN. = 32 FT

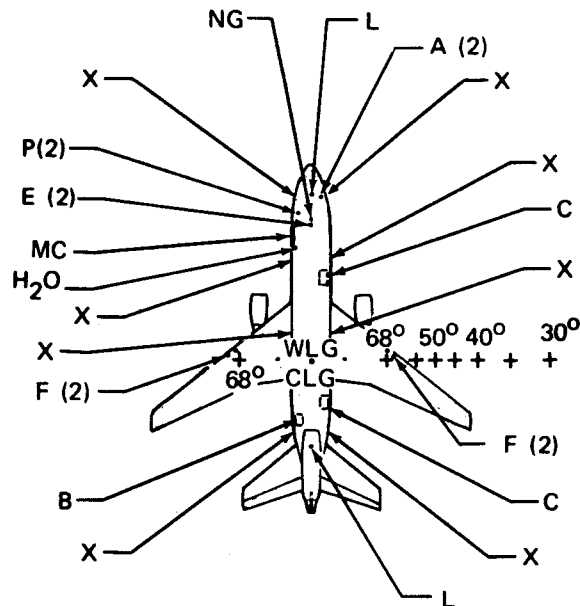


#### LEGEND

- A (2) AIR CONDITIONING (2 CONN)
- B BULK CARGO DOOR
- C CARGO CONTAINER DOOR
- E (2) ELECTRICAL (2 CONNECTIONS)
- F (2) FUEL (2 CONNECTIONS)
- H<sub>2</sub>O POTABLE WATER
- L LAVATORY
- MLG MAIN LANDING GEAR
- NG NOSE GEAR
- P (2) PNEUMATIC (2 CONNECTIONS)
- X PASSENGER DOOR
- + TURNING RADIUS POINTS:  
68°, 55°, 50°, 45°, 40°, 35°, 30°
- MC MAIN DECK CARGO DOOR

### 9.0 SCALE DRAWINGS MODEL DC-10 SERIES 10 AND 10CF

SCALE: 1 IN. = 100 FT

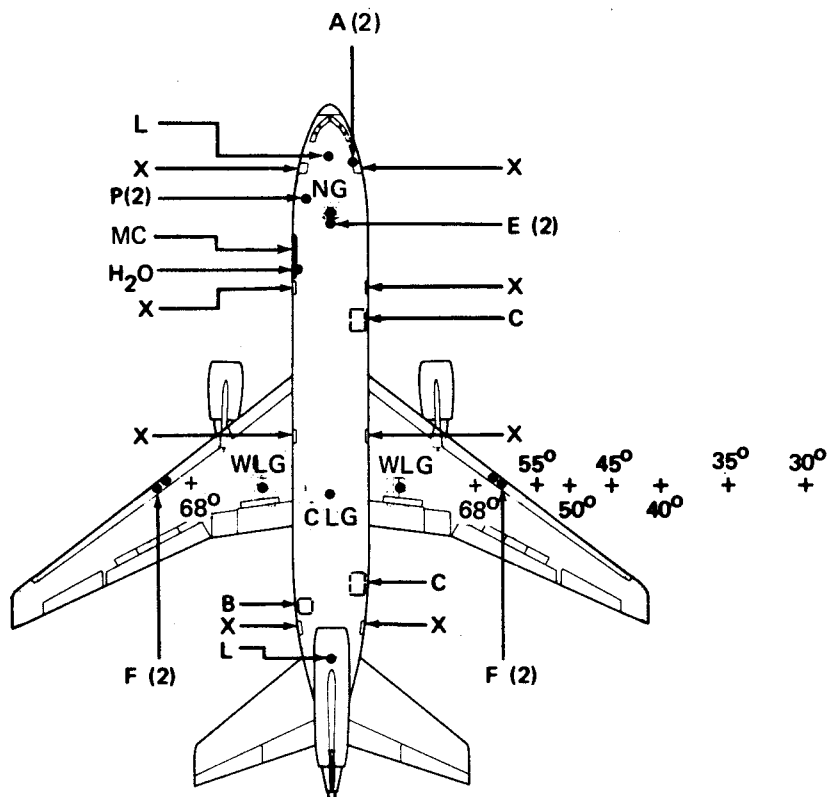


#### LEGEND

A (2)	AIR CONDITIONING (2 CONN)
B	BULK CARGO DOOR
C	CARGO CONTAINER DOOR
E (2)	ELECTRICAL (2 CONNECTIONS)
F (2)	FUEL (2 CONNECTIONS)
H <sub>2</sub> O	POTABLE WATER
L	LAVATORY
WLG	WING LANDING GEAR
CLG	CENTER LANDING GEAR
NG	NOSE GEAR
P (2)	PNEUMATIC (2 CONNECTIONS)
X	PASSENGER DOOR
+	TURNING RADIUS POINTS: 68°, 55°, 50°, 45°, 40°, 35°, 30°
MC	MAIN DECK CARGO DOOR

## 9.0 SCALE DRAWINGS MODEL DC-10 SERIES 30, AND 30CF (LOWER GALLEY)

SCALE: 1 IN. = 50 FT

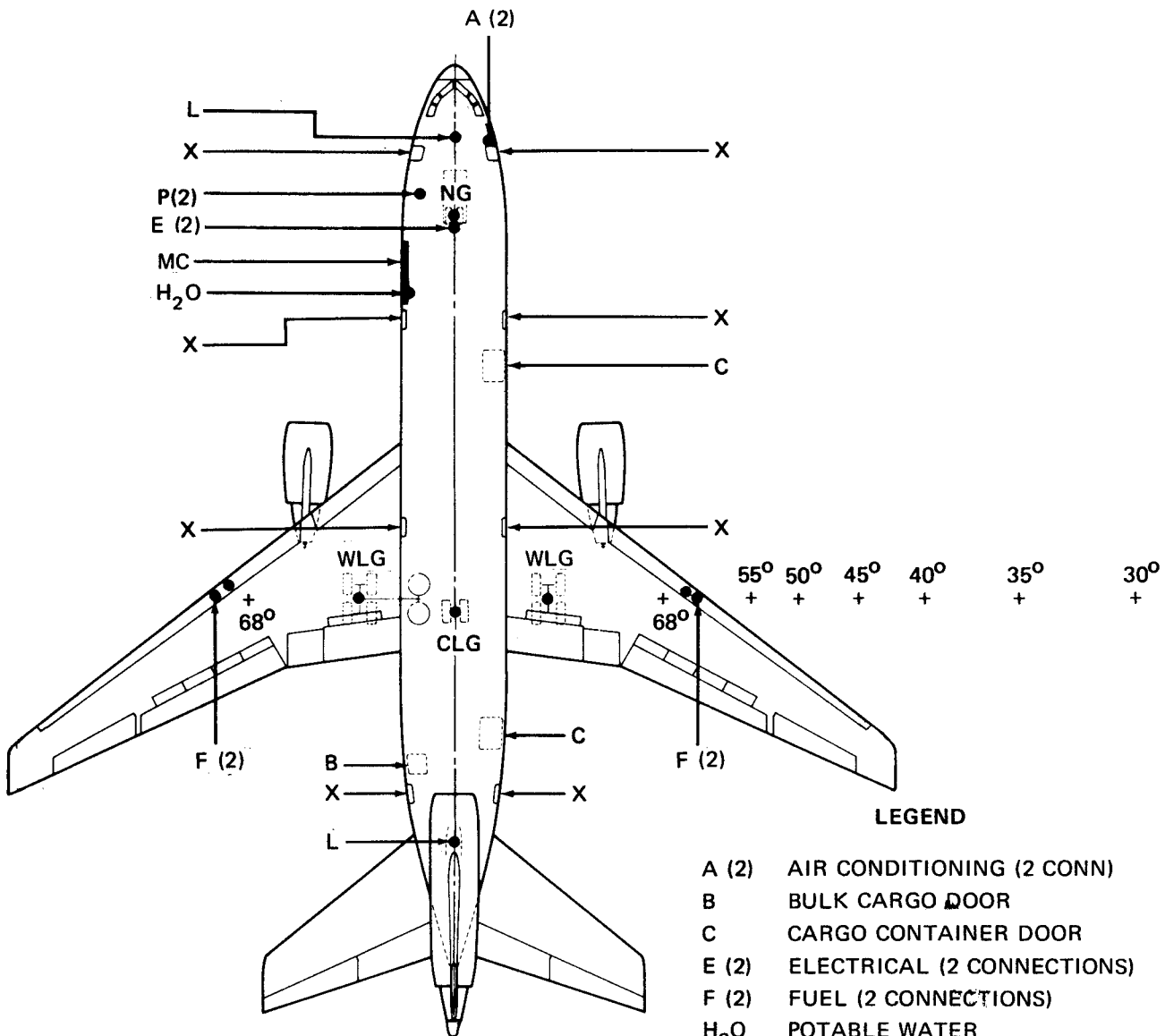


#### LEGEND

- A (2) AIR CONDITIONING (2 CONN)
- B BULK CARGO DOOR
- C CARGO CONTAINER DOOR
- E (2) ELECTRICAL (2 CONNECTIONS)
- F (2) FUEL (2 CONNECTIONS)
- H<sub>2</sub>O POTABLE WATER
- L LAVATORY
- WLG WING LANDING GEAR
- CLG CENTER LANDING GEAR
- NG NOSE GEAR
- P (2) PNEUMATIC (2 CONNECTIONS)
- X PASSENGER DOOR
- + TURNING RADIUS POINTS:  
68°, 55°, 50°, 45°, 40°, 35°, 30°
- MC MAIN DECK CARGO DOOR

### 9.0 SCALE DRAWINGS MODEL DC-10 SERIES 30, AND 30CF (LOWER GALLEY)

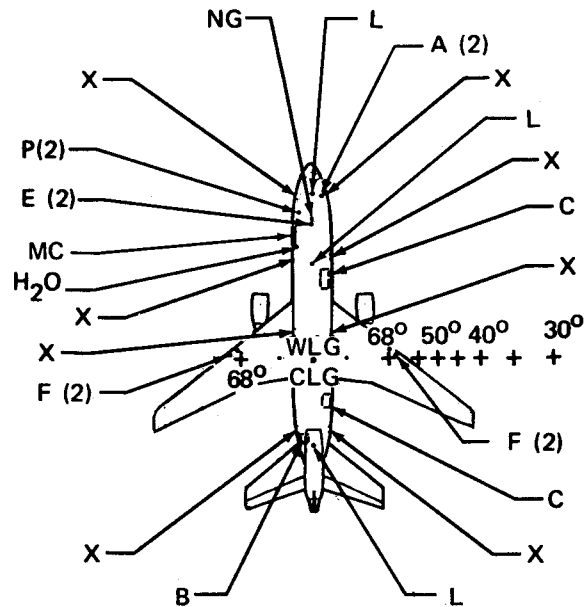
SCALE: 1 IN. = 32 FT



- LEGEND**
- A (2) AIR CONDITIONING (2 CONN)
  - B BULK CARGO DOOR
  - C CARGO CONTAINER DOOR
  - E (2) ELECTRICAL (2 CONNECTIONS)
  - F (2) FUEL (2 CONNECTIONS)
  - H<sub>2</sub>O POTABLE WATER
  - L LAVATORY
  - WLG WING LANDING GEAR
  - CLG CENTER LANDING GEAR
  - NG NOSE GEAR
  - P (2) PNEUMATIC (2 CONNECTIONS)
  - X PASSENGER DOOR
  - + TURNING RADIUS POINTS:  
68°, 55°, 50°, 45°, 40°, 35°, 30°
  - MC MAIN DECK CARGO DOOR

## 9.0 SCALE DRAWINGS MODEL DC-10 SERIES 30, AND 30CF (LOWER GALLEY)

SCALE: 1 IN. = 100 FT

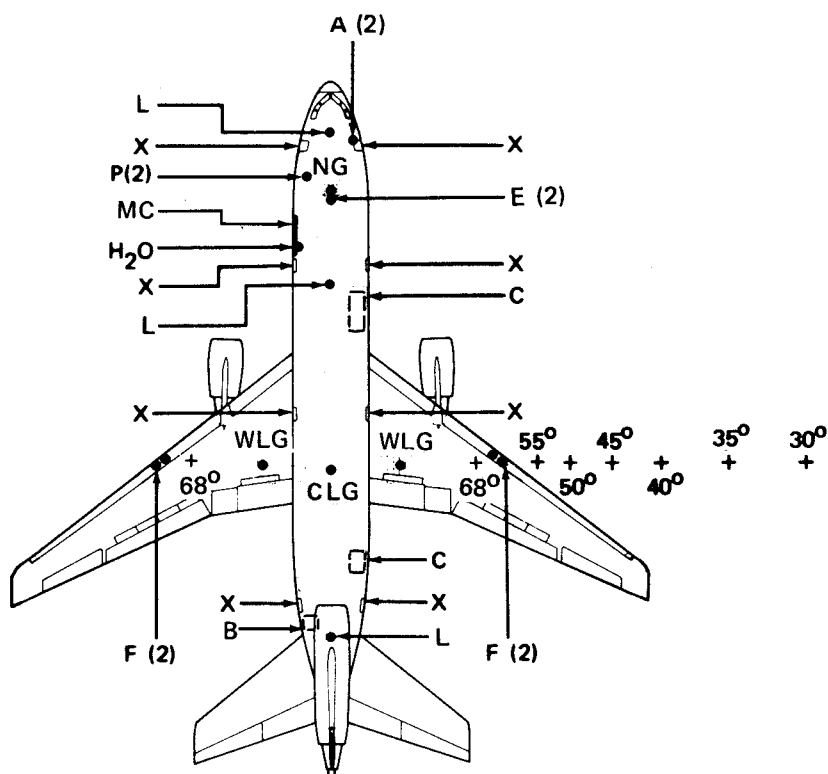


#### LEGEND

A (2)	AIR CONDITIONING (2 CONN)
B	BULK CARGO DOOR
C	CARGO CONTAINER DOOR
E (2)	ELECTRICAL (2 CONNECTIONS)
F (2)	FUEL (2 CONNECTIONS)
H <sub>2</sub> O	POTABLE WATER
L	LAVATORY
WLG	WING LANDING GEAR
CLG	CENTER LANDING GEAR
NG	NOSE GEAR
P (2)	PNEUMATIC (2 CONNECTIONS)
X	PASSENGER DOOR
+	TURNING RADIUS POINTS: 68°, 55°, 50°, 45°, 40°, 35°, 30°
MC	MAIN DECK CARGO DOOR

### 9.0 SCALE DRAWINGS MODEL DC-10 SERIES 30 AND 30CF (UPPER GALLEY)

SCALE: 1 IN. = 50 FT

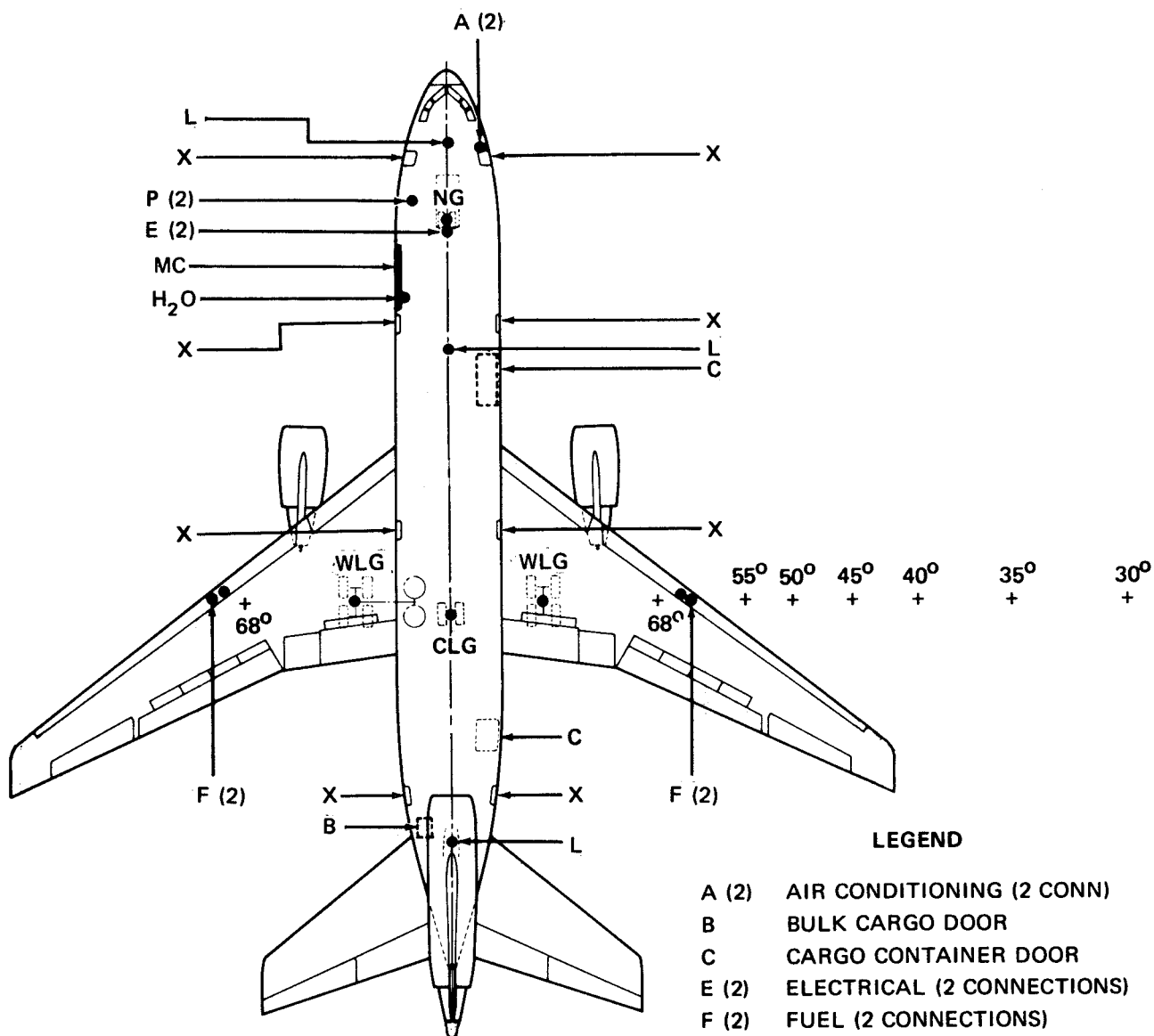


#### LEGEND

A (2)	AIR CONDITIONING (2 CONN)
B	BULK CARGO DOOR
C	CARGO CONTAINER DOOR
E (2)	ELECTRICAL (2 CONNECTIONS)
F (2)	FUEL (2 CONNECTIONS)
H <sub>2</sub> O	POTABLE WATER
L	LAVATORY
WLG	WING LANDING GEAR
CLG	CENTER LANDING GEAR
NG	NOSE GEAR
P (2)	PNEUMATIC (2 CONNECTIONS)
X	PASSENGER DOOR
+	TURNING RADIUS POINTS: 68°, 55°, 50°, 45°, 40°, 35°, 30°
MC	MAIN DECK CARGO DOOR

### 9.0 SCALE DRAWINGS MODEL DC-10 SERIES 30 AND 30CF (UPPER GALLEY)

SCALE: 1 IN. = 32 FT

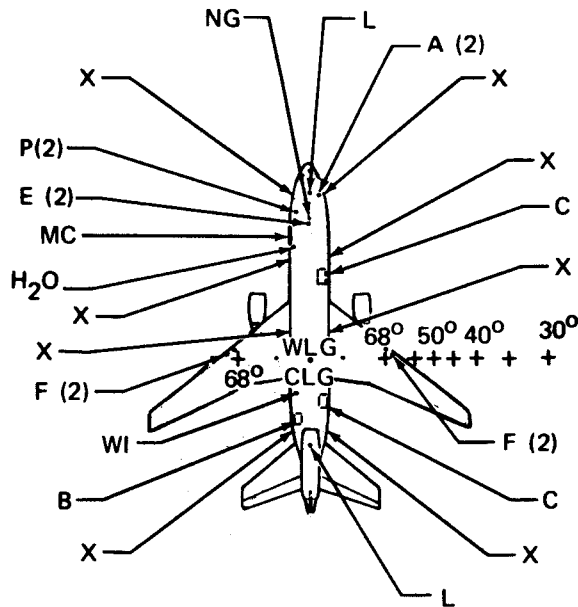


#### LEGEND

- A (2) AIR CONDITIONING (2 CONN)
- B BULK CARGO DOOR
- C CARGO CONTAINER DOOR
- E (2) ELECTRICAL (2 CONNECTIONS)
- F (2) FUEL (2 CONNECTIONS)
- H<sub>2</sub>O POTABLE WATER
- L LAVATORY
- WLG WING LANDING GEAR
- CLG CENTER LANDING GEAR
- NG NOSE GEAR
- P (2) PNEUMATIC (2 CONNECTIONS)
- X PASSENGER DOOR
- + TURNING RADIUS POINTS:  
68°, 55°, 50°, 45°, 40°, 35°, 30°
- MC MAIN DECK CARGO DOOR

### 9.0 SCALE DRAWINGS MODEL DC-10 SERIES 30 AND 30CF (UPPER GALLEY)

SCALE: 1 IN. = 100 FT

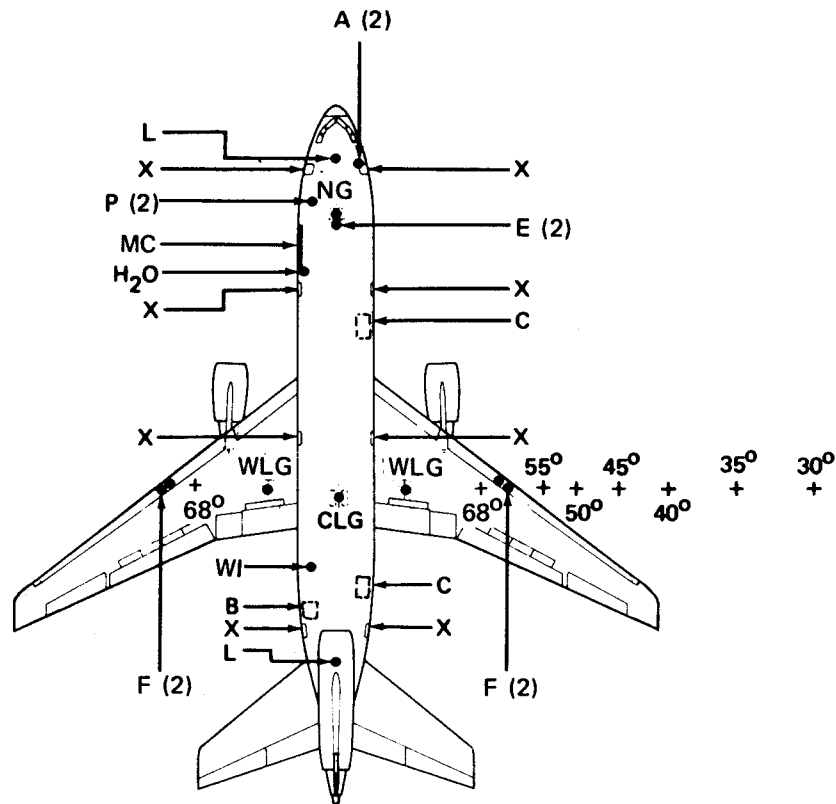


#### LEGEND

A (2)	AIR CONDITIONING (2 CONN)
B	BULK CARGO DOOR
C	CARGO CONTAINER DOOR
E (2)	ELECTRICAL (2 CONNECTIONS)
F (2)	FUEL (2 CONNECTIONS)
H <sub>2</sub> O	POTABLE WATER
WI	WATER INJECTION
L	LAVATORY
WLG	WING LANDING GEAR
CLG	CENTER LANDING GEAR
NG	NOSE GEAR
P (2)	PNEUMATIC (2 CONNECTIONS)
X	PASSENGER DOOR
+	TURNING RADIUS POINTS: 68°, 55°, 50°, 45°, 40°, 35°, 30°
MC	MAIN DECK CARGO DOOR

### 9.0 SCALE DRAWINGS MODEL DC-10 SERIES 40 AND 40CF (LOWER GALLEY)

SCALE: 1 IN. = 50 FT

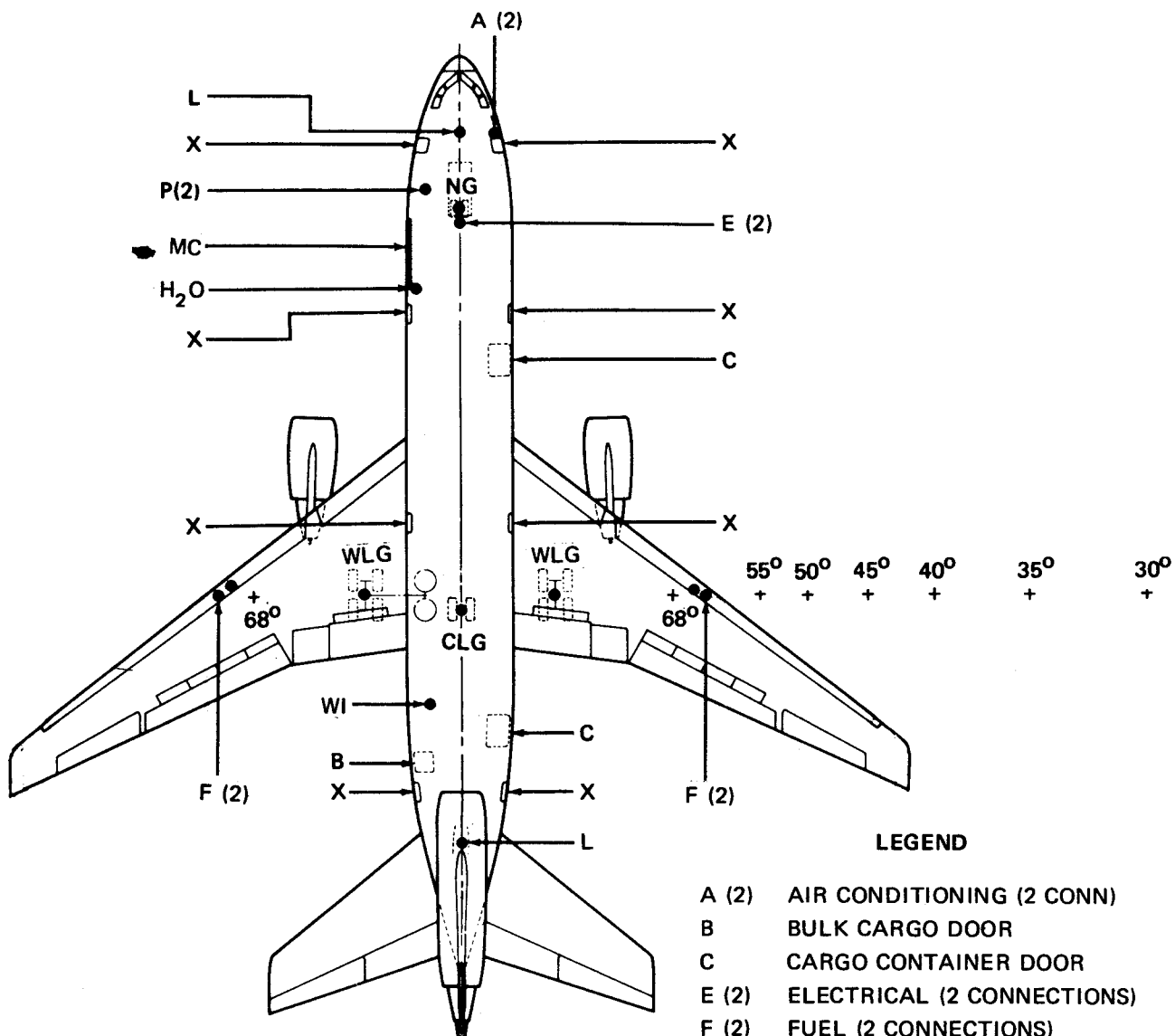


#### LEGEND

A (2)	AIR CONDITIONING (2 CONN)
B	BULK CARGO DOOR
C	CARGO CONTAINER DOOR
E (2)	ELECTRICAL (2 CONNECTIONS)
F (2)	FUEL (2 CONNECTIONS)
H <sub>2</sub> O	POTABLE WATER
WI	WATER INJECTION
L	LAVATORY
WLG	WING LANDING GEAR
CLG	CENTER LANDING GEAR
NG	NOSE GEAR
P (2)	PNEUMATIC (2 CONNECTIONS)
X	PASSENGER DOOR
+	TURNING RADIUS POINTS: 68°, 55°, 50°, 45°, 40°, 35°, 30°
MC	MAIN DECK CARGO DOOR

### 9.0 SCALE DRAWINGS MODEL DC-10 SERIES 40 AND 40CF (LOWER GALLEY)

SCALE: 1 IN. = 32 FT

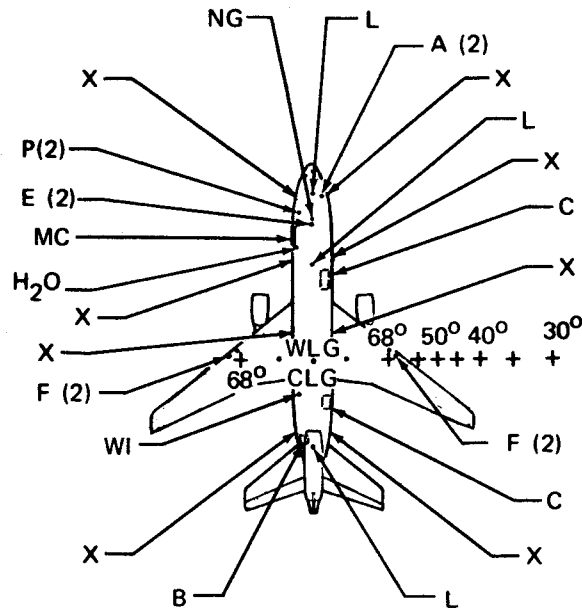


#### LEGEND

- A (2) AIR CONDITIONING (2 CONN)
- B BULK CARGO DOOR
- C CARGO CONTAINER DOOR
- E (2) ELECTRICAL (2 CONNECTIONS)
- F (2) FUEL (2 CONNECTIONS)
- H<sub>2</sub>O POTABLE WATER
- WI WATER INJECTION
- L LAVATORY
- WLГ WING LANDING GEAR
- CLG CENTER LANDING GEAR
- NG NOSE GEAR
- P (2) PNEUMATIC (2 CONNECTIONS)
- X PASSENGER DOOR
- + TURNING RADIUS POINTS:  
68°, 55°, 50°, 45°, 40°, 35°, 30°
- MC MAIN DECK CARGO DOOR

### 9.0 SCALE DRAWINGS MODEL DC-10 SERIES 40 AND 40CF (LOWER GALLEY)

SCALE: 1 IN. = 100 FT

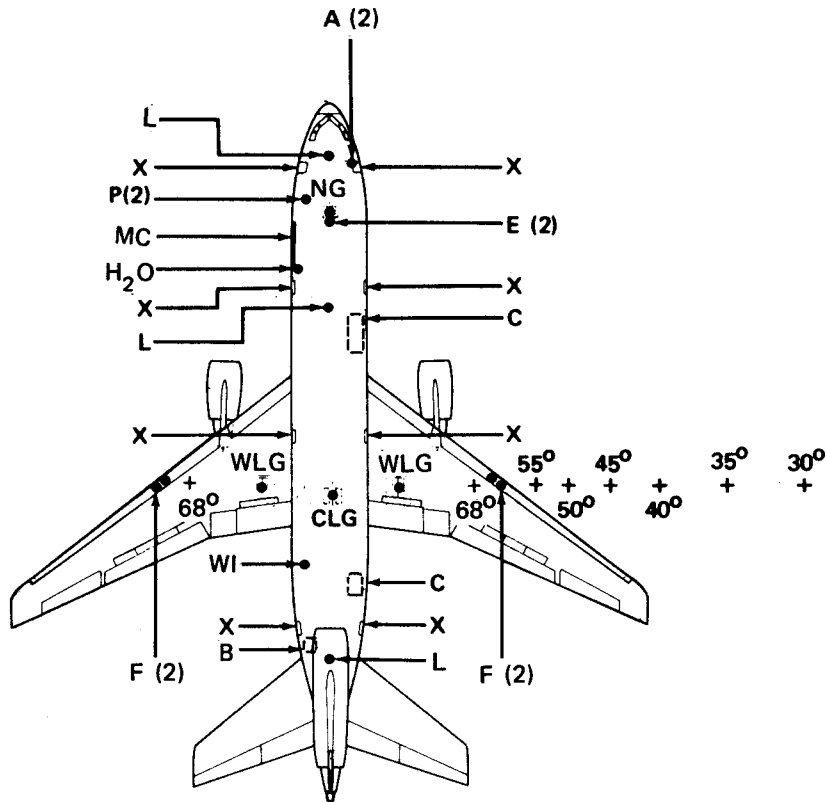


#### LEGEND

A (2)	AIR CONDITIONING (2 CONN)
B	BULK CARGO DOOR
C	CARGO CONTAINER DOOR
E (2)	ELECTRICAL (2 CONNECTIONS)
F (2)	FUEL (2 CONNECTIONS)
H <sub>2</sub> O	POTABLE WATER
WI	WATER INJECTION
L	LAVATORY
WL.G	WING LANDING GEAR
CLG	CENTER LANDING GEAR
NG	NOSE GEAR
P (2)	PNEUMATIC (2 CONNECTIONS)
X	PASSENGER DOOR
+	TURNING RADIUS POINTS: 68°, 55°, 50°, 45°, 40°, 35°, 30°
MC	MAIN DECK CARGO DOOR

### 9.0 SCALE DRAWINGS MODEL DC-10 SERIES 40 AND 40CF (UPPER GALLEY)

SCALE: 1 IN. = 50 FT

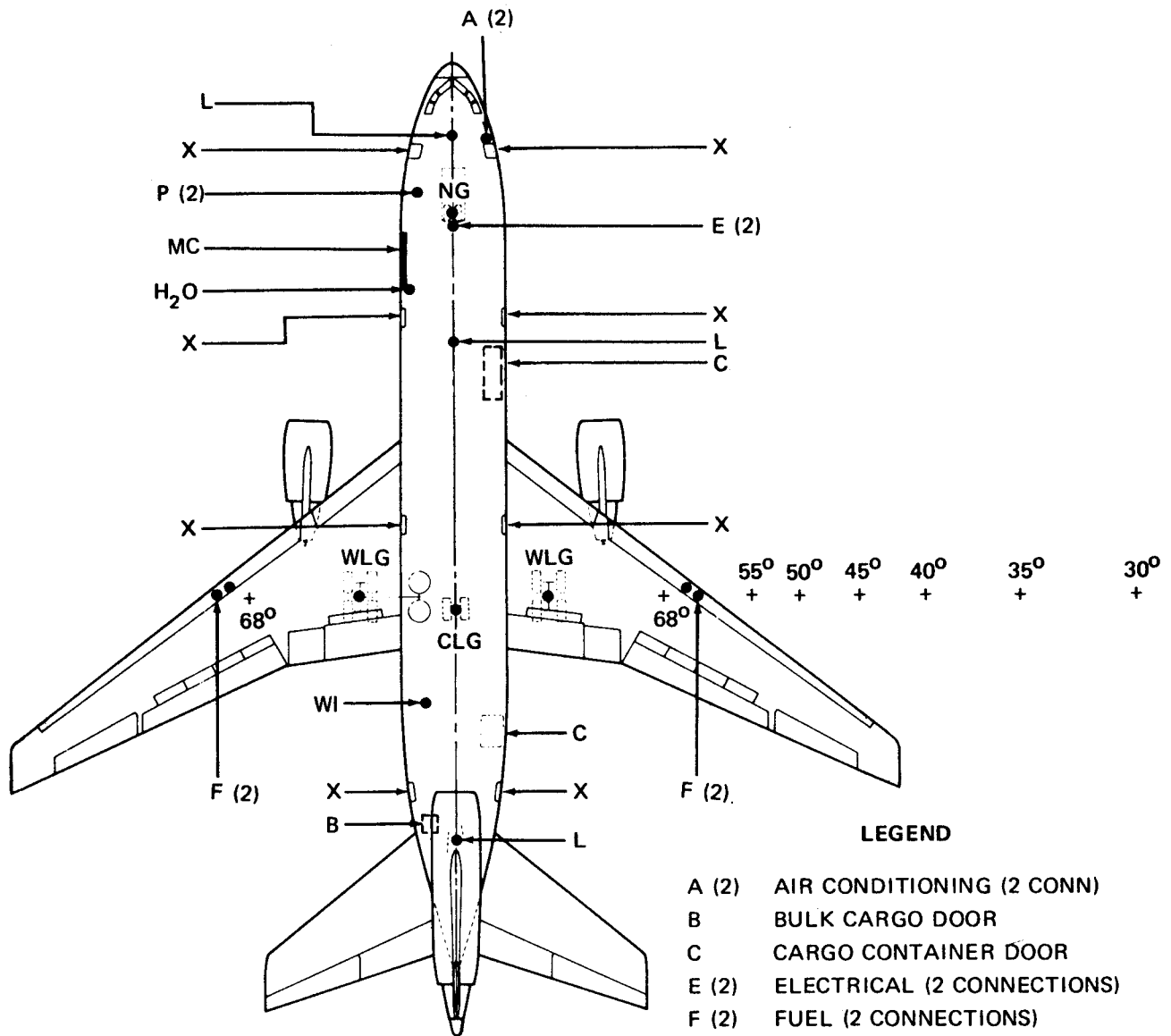


#### LEGEND

A (2)	AIR CONDITIONING (2 CONN)
B	BULK CARGO DOOR
C	CARGO CONTAINER DOOR
E (2)	ELECTRICAL (2 CONNECTIONS)
F (2)	FUEL (2 CONNECTIONS)
H <sub>2</sub> O	POTABLE WATER
WI	WATER INJECTION
L	LAVATORY
WLG	WING LANDING GEAR
CLG	CENTER LANDING GEAR
NG	NOSE GEAR
P (2)	PNEUMATIC (2 CONNECTIONS)
X	PASSENGER DOOR
+	TURNING RADIUS POINTS: 68°, 55°, 50°, 45°, 40°, 35°, 30°
MC	MAIN DECK CARGO DOOR

### 9.0 SCALE DRAWINGS MODEL DC-10 SERIES 40 AND 40CF (UPPER GALLEY)

SCALE: 1 IN. = 32 FT



#### LEGEND

- A (2) AIR CONDITIONING (2 CONN)
- B BULK CARGO DOOR
- C CARGO CONTAINER DOOR
- E (2) ELECTRICAL (2 CONNECTIONS)
- F (2) FUEL (2 CONNECTIONS)
- H<sub>2</sub>O POTABLE WATER
- WI WATER INJECTION
- L LAVATORY
- WLG WING LANDING GEAR
- CLG CENTER LANDING GEAR
- NG NOSE GEAR
- P (2) PNEUMATIC (2 CONNECTIONS)
- X PASSENGER DOOR
- + TURNING RADIUS POINTS:  
68°, 55°, 50°, 45°, 40°, 35°, 30°
- MC MAIN DECK CARGO DOOR

### 9.0 SCALE DRAWINGS MODEL DC-10 SERIES 40 AND 40CF (UPPER GALLEY)

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