AIRBUS

A320

AIRPLANE CHARACTERISTICS

AC

AIRBUS S.A.S.
Customer Services
Technical Data Support and Services
31707 Blagnac Cedex
FRANCE

HIGHLIGHTS

Revision No. 25 - Sep 01/10

LOCATIONS	CHG CODE	DESCRIPTIONS OF CHANGE
CHAPTER 2		
Section 2-1		
Subject 2-1-1		
General Airplane Characteristics Data	R	PART EFFECTIVITY ADDED/REVISED/DELETED
Section 2-3		
Subject 2-3-0		
Ground Clearances	R	
FIGURE Ground Clearances - Ground Clearances	R	ILLUSTRATION REVISED AND COMPLETED
Section 2-4		
Subject 2-4-1		
Typical Configuration	R	
FIGURE Typical Configuration - Typical Configuration Single-Class, High Density	R	
FIGURE Typical Configuration - Typical Configuration Two-Class	N	ILLUSTRATION ADDED
Section 2-5		
Subject 2-5-0		
Passenger Compartment Cross-section	N	
FIGURE Passenger Compartment Cross-section - Passenger Compartment Cross-section	N	ILLUSTRATION ADDED
FIGURE Passenger Compartment Cross-section - Economy Class, 6 Abreast - Wider Aisle	N	ILLUSTRATION ADDED
FIGURE Passenger Compartment Cross-section - Passenger Compartment Cross-section, First-class	N	ILLUSTRATION ADDED
CHAPTER 5	R	
Section 5-0	N	

LOCATIONS	CHG CODE	DESCRIPTIONS OF CHANGE
Subject 5-0-0	N	
Terminal Servicing	N	
Section 5-1		
Subject 5-1-0		
Airplane Servicing Arrangements	N	
Subject 5-1-1		
Symbols Used on Servicing Diagrams	N	
Subject 5-1-2		
Aircraft at the Gate	R	DESCRIPTION TITLE UPDATED
FIGURE Aircraft at the Gate - Aircraft at the Gate	R	ILLUSTRATION REVISED AND COMPLETED ILLUSTRATION REVISED
Subject 5-1-3		
Aircraft at an Open Apron	R	DESCRIPTION TITLE UPDATED
FIGURE Aircraft at an Open Apron - Aircraft at an Open Apron (Bulk Loading)	R	ILLUSTRATION REVISED AND COMPLETED ILLUSTRATION REVISED
FIGURE Aircraft at an Open Apron - Aircraft at an Open Apron (ULD Loading)	N	NEW ILLUSTRATION ADDED ILLUSTRATION ADDED
Section 5-2		
Subject 5-2-0		
Terminal Operations - Full Servicing Turnaround	N	
Subject 5-2-1		
Full Servicing Turnaround Charts	R	DESCRIPTION TITLE UPDATED
FIGURE Turnaround Stations - Full Servicing (48 Min.)	R	TABLE REVISED AND COMPLETED ILLUSTRATION REVISED
Section 5-3		
Subject 5-3-0		
Terminal Operation	N	
Subject 5-3-1		
Minimum Servicing Turnaround Chart	R	DESCRIPTION TITLE UPDATED

LOCATIONS	CHG CODE	DESCRIPTIONS OF CHANGE
FIGURE Turnaround Stations - Minimum Servicing (23 Min.)	R	TABLE REVISED AND COMPLETED ILLUSTRATION REVISED
Section 5-4		
Subject 5-4-3		
Hydraulic System	N	
FIGURE Hydraulic System - Green System Ground Service Panel	N	ILLUSTRATION ADDED ILLUSTRATION ADDED
FIGURE Hydraulic System - Blue System Ground Service Panel	N	ILLUSTRATION ADDED ILLUSTRATION ADDED
FIGURE Hydraulic System - Yellow System Ground Service Panel	N	NEW ILLUSTRATION ADDED ILLUSTRATION ADDED
Subject 5-4-4		
Electrical System	N	
FIGURE Ground Service Connections - External Power Receptacles	N	NEW ILLUSTRATION ADDED ILLUSTRATION ADDED
Subject 5-4-6		
Fuel System	N	
FIGURE Ground Service Connections - Refuel/Defuel Panel	N	NEW ADDED ILLUSTRATION ADDED
FIGURE Ground Service Connections - Refuel/Defuel Couplings	N	NEW ADDED ILLUSTRATION ADDED
FIGURE Ground Service Connections - Gravity Refuel Couplings	N	NEW ADDED ILLUSTRATION ADDED
Subject 5-4-7		
Pneumatic System	R	NOTE AMENDED
Subject 5-4-8		
Potable Water System	N	
FIGURE Ground Service Connections - Potable Water Ground Drain Panel	N	NEW FIGURE ADDED ILLUSTRATION ADDED
Subject 5-4-9		
Oil System	N	
FIGURE Ground Service Connections - Engine Oil Tank – CFM56 Series Engine	N	ILLUSTRATION ADDED

LOCATIONS	CHG CODE	DESCRIPTIONS OF CHANGE
FIGURE Ground Service Connections - IDG Oil Tank – CFM56 Series Engine	N	ILLUSTRATION ADDED
FIGURE Ground Service Connections - Starter Oil Tank – CFM56 Series Engine	N	ILLUSTRATION ADDED
FIGURE Ground Service Connections - Engine Oil Tank – IAE V2500 Series Engine	N	NEW FIGURE ADDED ILLUSTRATION ADDED
FIGURE Ground Service Connections - IDG Oil Tank – IAE V2500 Series Engine	N	NEW FIGURE ADDED ILLUSTRATION ADDED
FIGURE Ground Service Connections - Starter Oil Tank – IAE V2500 Series Engine	N	NEW FIGURE ADDED ILLUSTRATION ADDED
FIGURE Ground Service Connections - APU Oil Tank	N	ILLUSTRATION ADDED
Subject 5-4-10		
Vacuum Toilet System	N	
FIGURE Ground Service Connections - Waste Water Ground Service Panel	N	NEW FIGURE ADDED ILLUSTRATION ADDED
Section 5-8	N	
Subject 5-8-0	N	
Ground Towing Requirements	N	
FIGURE Ground Towing Requirements - Ground Towing Requirements	N	ILLUSTRATION ADDED
FIGURE Ground Towing Requirements - Typical Tow Bar Configuration 1	N	ILLUSTRATION ADDED
FIGURE Ground Towing Requirements - Typical Tow Bar Configuration 2	N	ILLUSTRATION ADDED
CHAPTER 9	R	
Section 9-1	R	
Subject 9-1-0	R	
Scaled Drawings	R	DESCRIPTION TITLE UPDATED
FIGURE Scaled Drawing - Scaled Drawing	R	ILLUSTRATION REVISED, SCALE ADDED
FIGURE Scaled Drawing - Scaled Drawing	R	ILLUSTRATION REVISED, SCALE ADDED

LIST OF EFFECTIVE CONTENT

Revision No. 25 - Sep 01/10

CONTENT	CHG CODE	LAST REVISION DATE
Subject 5-4-3		
Hydraulic System	N	Sep 01/10
FIGURE Hydraulic System - Green System Ground Service Panel	N	Sep 01/10
FIGURE Hydraulic System - Blue System Ground Service Panel	N	Sep 01/10
FIGURE Hydraulic System - Yellow System Ground Service Panel	N	Sep 01/10
Subject 5-4-4		
Electrical System	N	Sep 01/10
FIGURE Ground Service Connections - External Power Receptacles	N	Sep 01/10
Subject 5-4-5		
Oxygen System		Dec 01/07
Subject 5-4-6		
Fuel System	N	Sep 01/10
FIGURE Ground Service Connections - Refuel/Defuel Panel	N	Sep 01/10
FIGURE Ground Service Connections - Refuel/Defuel Couplings	N	Sep 01/10
FIGURE Ground Service Connections - Gravity Refuel Couplings	N	Sep 01/10
Subject 5-4-7		
Pneumatic System	R	Sep 01/10
Subject 5-4-8		
Potable Water System	N	Sep 01/10
FIGURE Ground Service Connections - Potable Water Ground Drain Panel	N	Sep 01/10
Subject 5-4-9		
Oil System	N	Sep 01/10
FIGURE Ground Service Connections - Engine Oil Tank – CFM56 Series Engine	N	Sep 01/10
FIGURE Ground Service Connections - IDG Oil Tank – CFM56 Series Engine	N	Sep 01/10
FIGURE Ground Service Connections - Starter Oil Tank – CFM56 Series Engine	N	Sep 01/10
FIGURE Ground Service Connections - Engine Oil Tank – IAE V2500 Series Engine	N	Sep 01/10

CONTENT	CHG CODE	LAST REVISION DATE
FIGURE Ground Service Connections - IDG Oil Tank – IAE V2500 Series Engine	N	Sep 01/10
FIGURE Ground Service Connections - Starter Oil Tank – IAE V2500 Series Engine	N	Sep 01/10
FIGURE Ground Service Connections - APU Oil Tank	N	Sep 01/10
Subject 5-4-10		
Vacuum Toilet System	N	Sep 01/10
FIGURE Ground Service Connections - Waste Water Ground Service Panel	N	Sep 01/10
Subject 5-5-0		
Engine Starting Pneumatic Requirements		Dec 01/07
Subject 5-5-1		
Low Temperature -40 °C (-40 °F)		Dec 01/07
FIGURE Engine Starting Pneumatic Requirements - Temperature -40 °C (-40 °F) – CFM56 series engine		Dec 01/07
FIGURE Engine Starting Pneumatic Requirements - Temperature -40 °C (-40 °F) – IAE V2500 series engine		Dec 01/07
Subject 5-5-2		
Ambient Temperature +15 °C (+59 °F)		Dec 01/07
FIGURE Engine Starting Pneumatic Requirements - Temperature +15 °C (+59 °F) – CFM56 series engine		Dec 01/07
FIGURE Engine Starting Pneumatic Requirements - Temperature +15 °C (+59 °F) – IAE V2500 series engine		Dec 01/07
Subject 5-5-3		
High Temperature +50 °C (+122 °F) and +55 °C (+131 °F)		Dec 01/07
FIGURE Engine Starting Pneumatic Requirements - Temperature +55 °C (+131 °F) – CFM56 series engine		Dec 01/07
FIGURE Engine Starting Pneumatic Requirements - Temperature +50 °C (+122 °F) – IAE V2500 series engine		Dec 01/07
Subject 5-6-0		
Ground Pneumatic Power Requirements		Dec 01/07
Subject 5-6-1		

CONTENT	CHG CODE	LAST REVISION DATE
FIGURE Scaled Drawing - Scaled Drawing	R	Sep 01/10
FIGURE Scaled Drawing - Scaled Drawing	R	Sep 01/10

TABLE OF CONTENTS

SCOPE

1-1-0 Purpose

****ON A/C A320-100 A320-200**

Purpose

1. General
The A320 AIRPLANE CHARACTERISTICS (AC) manual is issued for the A320-100 and A320-200 basic versions to provide the necessary data needed by airport operators and airlines for the planning of airport facilities.

This document conforms to NAS 3601.

CORRESPONDENCE
Correspondence concerning this publication should be directed to:

AIRBUS S.A.S.
Customer Services
Technical Data Support and Services
1, Rond Point Maurice BELLONTE
31707 BLAGNAC CEDEX
FRANCE

1-2-0 Introduction

****ON A/C A320-100 A320-200**

Introduction

1. General

This manual comprises 9 chapters with a List of Effective Pages (LEP) at the beginning of the manual and a Table Of Content (TOC) at the beginning of each chapter.

Chapter 1: SCOPE

Chapter 2: AIRPLANE DESCRIPTION

This chapter contains general dimensional and other basic aircraft data.

It covers:
- aircraft dimensions and ground clearances,
- passenger and cargo compartment arrangement.

Chapter 3: AIRPLANE PERFORMANCE

This chapter indicates the aircraft performance.

It covers:
- payload range,
- takeoff and landing runway requirements,
- landing approach speed.

Chapter 4: GROUND MANEUVERING

This chapter provides the aircraft turning capability and maneuvering characteristics on the ground.

It includes:
- turning radii and visibility from the cockpit,
- runway and taxiway turn path.

Chapter 5: TERMINAL SERVICING

This chapter provides information for the arrangement of ground handling and servicing equipments.

It covers:
- location and connections of ground servicing equipments,

- engine starting pneumatic and preconditioned airflow requirements.

Chapter 6: OPERATING CONDITIONS

This chapter contains data and safety/environmental precautions related to engine and APU operation on the ground.

It covers:
- contour size and shape of the jet engine exhaust velocities and temperature,
- noise data.

Chapter 7: PAVEMENT DATA

This chapter contains the pavement data helpful for airport planning.

It gives:
- landing gear foot print and static load,
- charts for flexible pavements with Load Classification Number (LCN),
- charts for rigid pavements with LCN,
- Aircraft Classification Number (ACN), Pavement Classification Number (PCN), reporting system for flexible and rigid pavements.

Chapter 8: DERIVATIVE AIRPLANES

This chapter gives relevant data of possible A320 new version with the associated size change.

Chapter 9: SCALED DRAWING

This chapter contains different A320 scaled drawings.

AIRPLANE DESCRIPTION

2-1-0 General Airplane Characteristics

****ON A/C A320-100 A320-200**

General Airplane Characteristics

1. General Airplane Characteristics
   The weight terms used throughout this manual are given below together with their respective definitions.

   Maximum Taxi Weight (MTW):
   Maximum weight for ground maneuver as limited by aircraft strength and airworthiness requirements. (It includes weight of run-up and taxi fuel). It is also called Maximum Ramp Weight (MRW).

   Maximum Landing Weight (MLW):
   Maximum weight for landing as limited by aircraft strength and airworthiness requirements.

   Maximum Takeoff Weight (MTOW):
   Maximum weight for takeoff as limited by aircraft strength and airworthiness requirements. (This is the maximum weight at start of the takeoff run).

   Maximum Zero Fuel Weight (MZFW):
   Maximum operational weight of the aircraft without usable fuel.

   Operational Empty Weight (OEW):
   Weight of structure, powerplant, furnishings, systems, and other items of equipment that are an integral part of a particular aircraft configuration plus the operator's items. The operator's items are the flight and cabin crew and their baggage, unusable fuel, engine oil, emergency equipment, toilet chemical and fluids, galley structure, catering equipment, passenger seats and life vests, documents, etc.

   Maximum Payload:
   Maximum Zero Fuel Weight (MZFW) minus Operational Empty Weight (OEW).

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

   Maximum Cargo Volume:
   Maximum usable volume available for cargo.

   Usable Fuel:
   Fuel available for aircraft propulsion.

2-1-1 General Airplane Characteristics Data

****ON A/C A320-100 A320-200**

General Airplane Characteristics Data

****ON A/C A320-100**

1. The following table provides characteristics of A320-100 Models, these data are specific to each Weight Variant:

Aircraft Characteristics				
		WV000	WV001	WV002
Maximum Ramp Weight (MRW) Maximum Taxi Weight (MTW)	Kilograms	68 400	66 400	68 400
	Pounds	150 796	146 387	150 796
Maximum Takeoff Weight (MTOW)	Kilograms	68 000	66 000	68 000
	Pounds	149 914	145 505	149 914
Maximum Landing Weight (MLW)	Kilograms	63 000	63 000	63 000
	Pounds	138 891	138 891	138 891
Maximum Zero Fuel Weight (MZFW)	Kilograms	59 000	59 000	59 800
	Pounds	130 073	130 073	131 836
Estimated Operational Empty Weight (OEW)	CFM Engines	41 244 kg (90 927 lb)		
	IAE Engines			
Estimated Maximum Payload CFM 56	Kilograms	17 756		18 556
	Pounds	39 145		40 909
Estimated Maximum Payload IAE V2500	Kilograms			
	Pounds			

****ON A/C A320-200**

2. The following table provides characteristics of A320-200 Models, these data are specific to each Weight Variant:

Aircraft Characteristics						
		WV000	WV001	WV002	WV003	WV004
Maximum Ramp Weight (MRW) Maximum Taxi Weight (MTW)	Kilograms	73 900	68 400	70 400	75 900	71 900
	Pounds	162 922	150 796	155 205	167 331	158 512
Maximum Takeoff Weight (MTOW)	Kilograms	73 500	68 000	70 000	75 500	71 500
	Pounds	162 040	149 914	154 324	166 449	157 630
Maximum Landing Weight (MLW)	Kilograms	64 500	64 500	64 500	64 500	64 500
	Pounds	142 198	142 198	142 198	142 198	142 198

Aircraft Characteristics						
		WV000	WV001	WV002	WV003	WV004
Maximum Zero Fuel Weight (MZFW)	Kilograms	60 500	60 500	60 500	60 500	60 500
	Pounds	133 380	133 380	133 380	133 380	133 380
Estimated Operational Empty Weight (OEW)	CFM Engines	41 244 kg (90 927 lb)				
	IAE Engines	41 345 kg (91 150 lb)				
Estimated Maximum Payload CFM 56	Kilograms	19 256				
	Pounds	42 452				
Estimated Maximum Payload IAE V2500	Kilograms	19 155				
	Pounds	42 230				

Aircraft Characteristics						
		WV005	WV006	WV007	WV008	WV009
Maximum Ramp Weight (MRW) Maximum Taxi Weight (MTW)	Kilograms	67 400	66 400	77 400	73 900	75 900
	Pounds	148 592	146 387	170 638	162 922	167 331
Maximum Takeoff Weight (MTOW)	Kilograms	67 000	66 000	77 000	73 500	75 500
	Pounds	147 710	145 505	169 756	162 040	166 449
Maximum Landing Weight (MLW)	Kilograms	64 500	64 500	64 500	64 500	64 500
	Pounds	142 198	142 198	142 198	142 198	142 198
Maximum Zero Fuel Weight (MZFW)	Kilograms	60 500	60 500	60 500	61 000	61 000
	Pounds	133 380	133 380	133 380	134 482	134 482
Estimated Operational Empty Weight (OEW)	CFM Engines	41 244 kg (90 927 lb)				
	IAE Engines	41 345 kg (91 150 lb)				
Estimated Maximum Payload CFM 56	Kilograms	19 256			19 756	
	Pounds	42 452			43 555	
Estimated Maximum Payload IAE V2500	Kilograms	19 155			19 655	
	Pounds	42 230			43 332	

Aircraft Characteristics						
		WV010	WV011	WV012	WV013	WV014
Maximum Ramp Weight (MRW) Maximum Taxi Weight (MTW)	Kilograms	77 400	75 900	77 400	71 900	73 900
	Pounds	170 638	167 331	170 638	158 512	162 922
Maximum Takeoff Weight (MTOW)	Kilograms	77 000	75 500	77 000	71 500	73 500
	Pounds	169 756	166 449	169 756	157 630	162 040

Aircraft Characteristics						
		WV010	WV011	WV012	WV013	WV014
Maximum Landing Weight (MLW)	Kilograms	64 500	66 000	66 000	64 500	64 500
	Pounds	142 198	145 505	145 505	142 198	142 198
Maximum Zero Fuel Weight (MZFW)	Kilograms	61 000	62 500	62 500	61 000	61 500
	Pounds	134 482	137 789	137 789	134 482	135 584
Estimated Operational Empty Weight (OEW)	CFM Engines	41 244 kg (90 927 lb)				
	IAE Engines	41 345 kg (91 150 lb)				
Estimated Maximum Payload CFM 56	Kilograms	19 756	21 256		19 756	20 256
	Pounds	43 555	46 861		43 555	44 657
Estimated Maximum Payload IAE V2500	Kilograms	19 655	21 155		19 655	20 155
	Pounds	43 332	46 639		43 332	44 434

Aircraft Characteristics			
		WV015	WV016
Maximum Ramp Weight (MRW) Maximum Taxi Weight (MTW)	Kilograms	78 400	73 900
	Pounds	172 842	162 922
Maximum Takeoff Weight (MTOW)	Kilograms	78 000	73 500
	Pounds	171 961	162 040
Maximum Landing Weight (MLW)	Kilograms	64 500	66 000
	Pounds	142 198	145 505
Maximum Zero Fuel Weight (MZFW)	Kilograms	61 000	62 500
	Pounds	134 482	137 789
Estimated Operational Empty Weight (OEW)	CFM Engines	41 244 kg (90 927 lb)	
	IAE Engines	41 345 kg (91 150 lb)	
Estimated Maximum Payload CFM 56	Kilograms	19 756	21 256
	Pounds	43 555	46 861
Estimated Maximum Payload IAE V2500	Kilograms	19 655	21 155
	Pounds	43 332	46 639

****ON A/C A320-100**

3. The following table provides characteristics of A320-100 Models, these data are common to each Weight Variant:

Aircraft Characteristics		
Standard Seating Capacity	Single-class	180

Aircraft Characteristics		
Usable Fuel Capacity	Liters	23 667
	US gallons	6 252
	Kilograms (density = 0.785 kg/l)	18 578
	Pounds	40 957
Pressurized Fuselage Volume (A/C non equipped)	Cubic meters	330
	Cubic feet	11 654
Passenger Compartment Volume	Cubic meters	139
	Cubic feet	4 909
Cockpit Volume	Cubic meters	9
	Cubic feet	318
Usable Bulk, FWD CC	Cubic meters	13.28
	Cubic feet	469
Usable Bulk, AFT CC	Cubic meters	18.26
	Cubic feet	645
Usable Bulk, Bulk CC	Cubic meters	5.88
	Cubic feet	208
Water Volume, FWD CC	Cubic meters	15.56
	Cubic feet	549.5
Water Volume, AFT CC	Cubic meters	20.77
	Cubic feet	733.5
Water Volume, Bulk CC	Cubic meters	7.76
	Cubic feet	274

**ON A/C A320-200

4. The following table provides characteristics of A320-200 Models, these data are common to each Weight Variant:

Aircraft Characteristics		
Standard Seating Capacity	Single-class	180
Usable Fuel Capacity	Liters	23 859 - 26 759* - 29 659**
	US gallons	6 303 - 7 069* - 7 835**
	Kilograms (density = 0.785 kg/l)	18 729 - 21 005* - 23 282**
	Pounds	41 290 - 46 308* - 51 328**
Pressurized Fuselage Volume (A/C non equipped)	Cubic meters	330
	Cubic feet	11 654

Aircraft Characteristics		
Passenger Compartment Volume	Cubic meters	139
	Cubic feet	4 909
Cockpit Volume	Cubic meters	9
	Cubic feet	318
Usable Volume, FWD CC	Cubic meters	13.28
	Cubic feet	469
Usable Volume, AFT CC	Cubic meters	18.26
	Cubic feet	645
Usable Volume, Bulk CC	Cubic meters	5.88
	Cubic meters	208
Water Volume, FWD CC	Cubic meters	15.56
	Cubic feet	549.5
Water Volume, AFT CC	Cubic meters	20.77
	Cubic feet	733.5
Water Volume, Bulk CC	Cubic meters	7.76
	Cubic feet	274

* OPTION: 1 ACT
** OPTION: 2 ACT

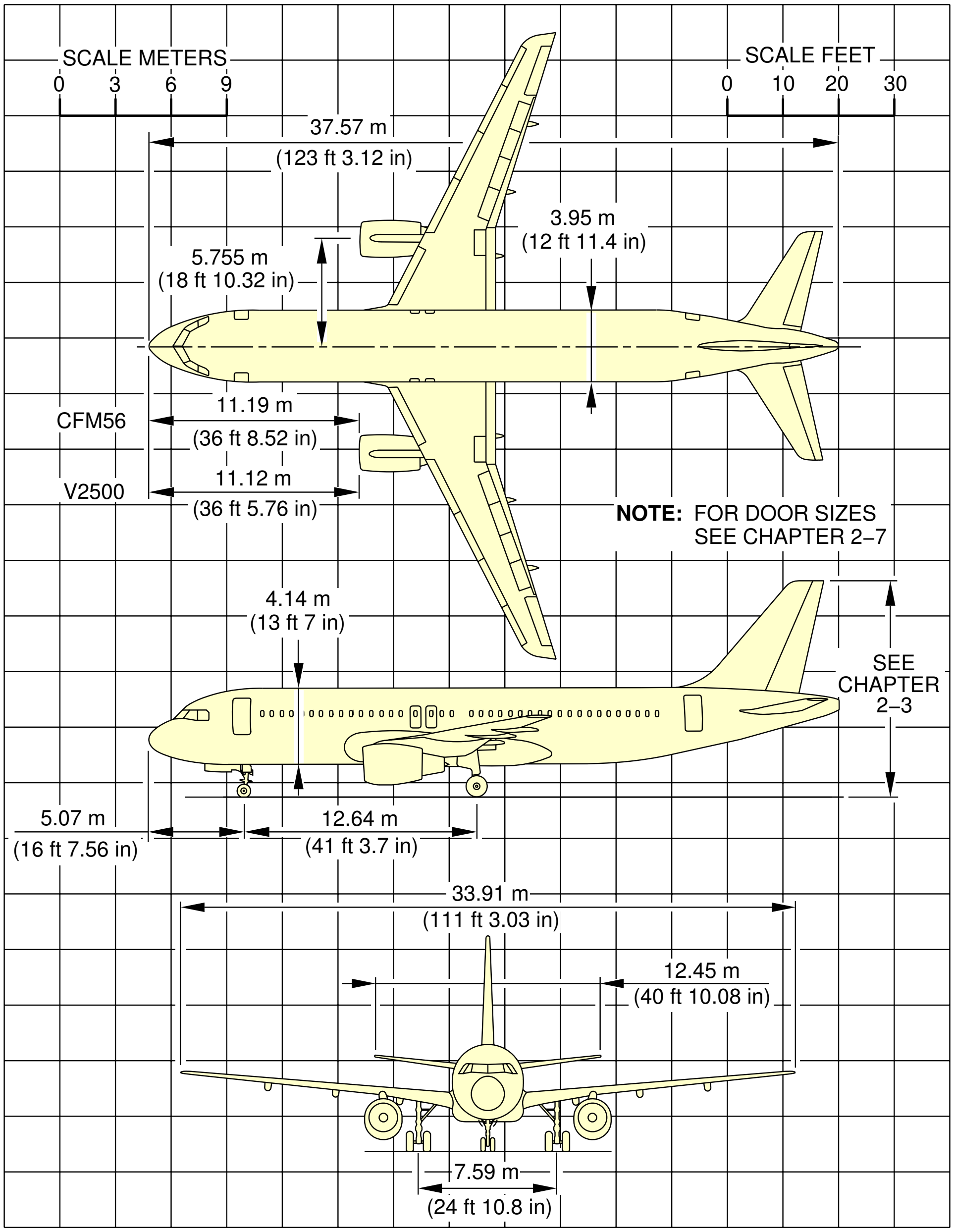
2-2-0 General Airplane Dimensions

****ON A/C A320-100 A320-200**

General Airplane Dimensions

1. This section provides General Airplane Dimensions.

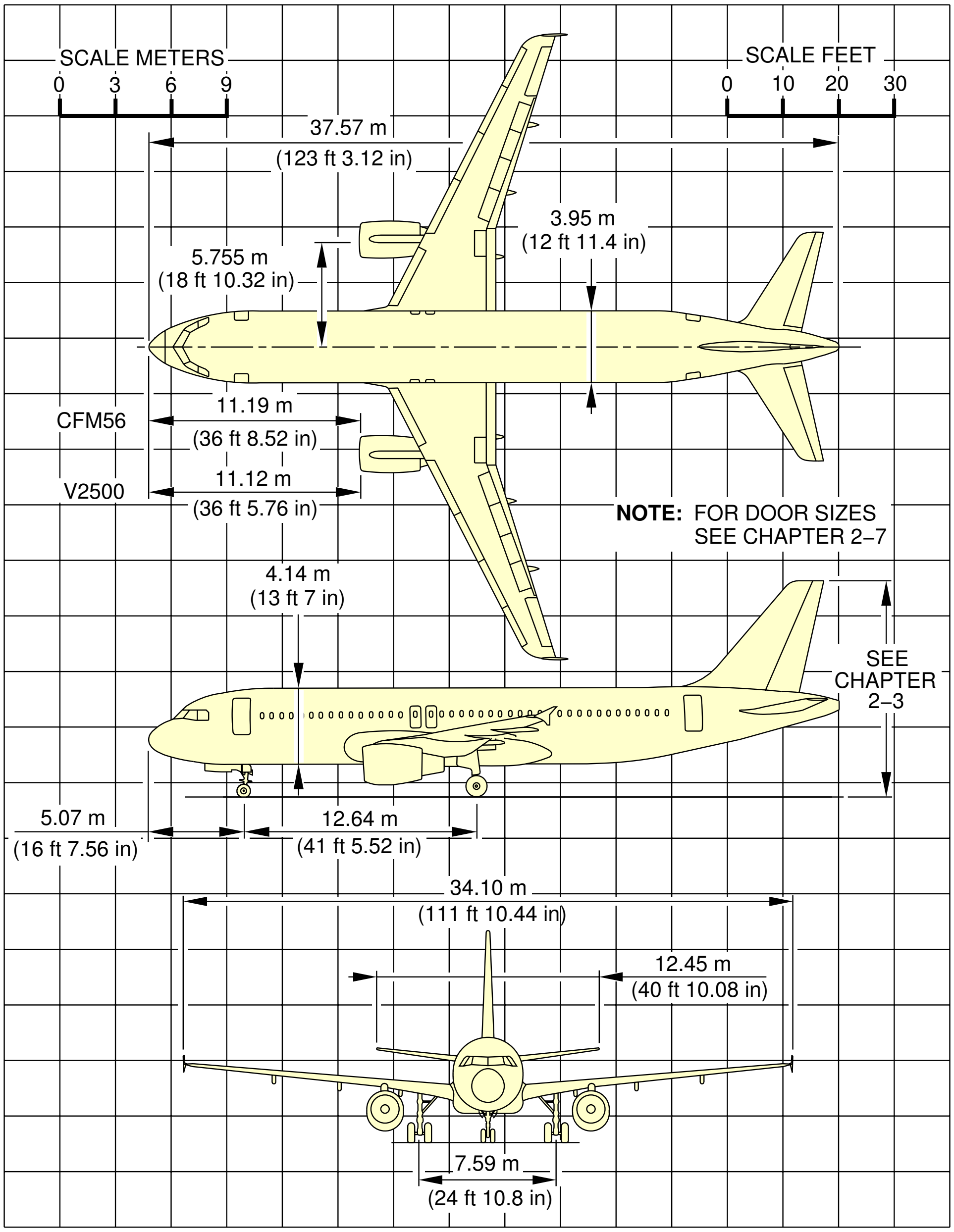
**ON A/C A320-100



N_AC_020200_1_0030101_01_01

General Airplane Dimensions
FIGURE 1

**ON A/C A320-200



N_AC_020200_1_0040101_01_01

General Airplane Dimensions
FIGURE 2

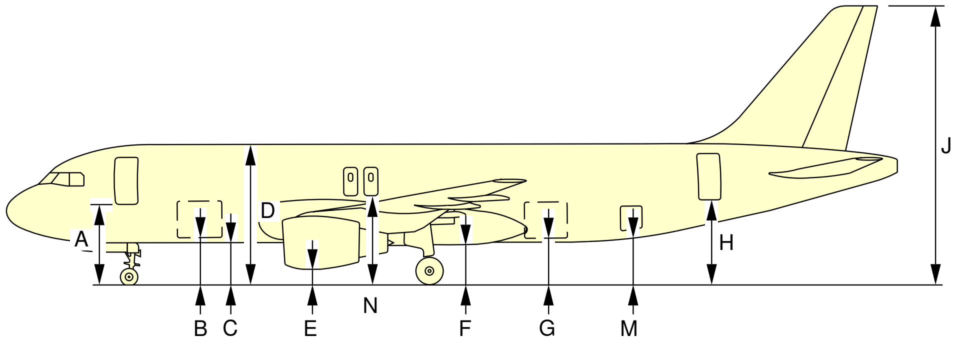
2-3-0 Ground Clearances

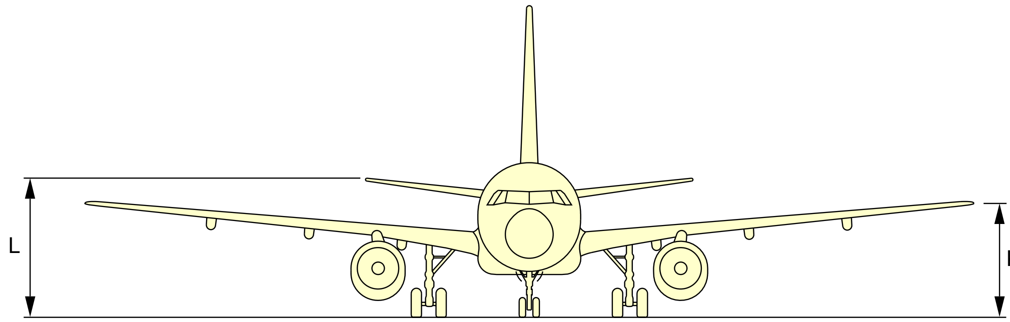
****ON A/C A320-100 A320-200**

Ground Clearances

1. This section gives the height of various points of the aircraft, above the ground, for different aircraft configurations.
   Dimensions in the tables are approximate and will vary with tire type and conditions.
   The dimensions are given for:
   - The basic aircraft OWE with a mid CG,
   - the MRW for the lightest weight variant with a FWD CG and a AFT CG,
   - the MRW for the heaviest weight variant with a FWD CG and a AFT CG,
   - aircraft on jacks, FDL at 4.6m (15.09ft).

**ON A/C A320-100





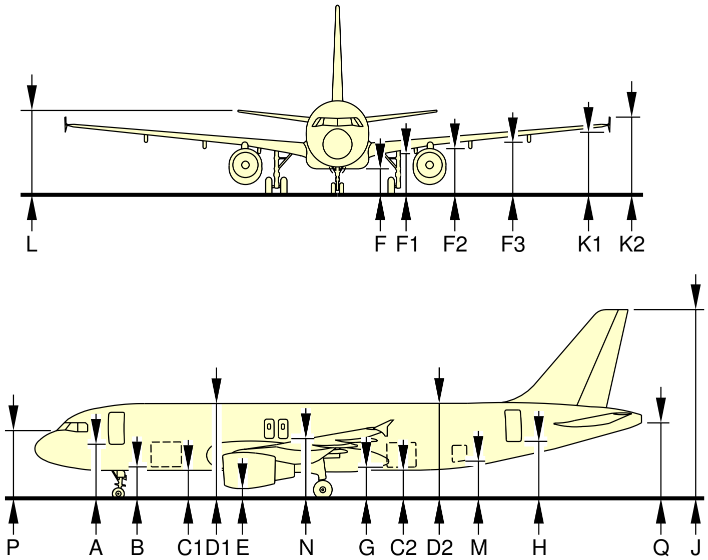
	OPERATING WEIGHT EMPTY		MAXIMUM RAMP WEIGHT FORWARD CG		MAXIMUM RAMP WEIGHT AFT CG		AIRCRAFT ON JACKS*	
	m	ft	m	ft	m	ft	m	ft
A	3.45	11.31	3.39	11.12	3.46	11.36	4.10	13.45
B	2.06	6.74	1.99	6.53	2.04	6.71	2.68	8.79
C	1.80	5.91	1.73	5.69	1.77	5.79	2.44	8.0
D	5.94	19.50	5.87	19.27	5.91	19.38	6.58	21.58
E	0.62	2.05	0.55	1.81	0.58	1.89	1.25	4.10
F	1.65	5.43	1.57	5.16	1.57	5.14	2.26	7.41
G	2.11	6.94	2.03	6.65	1.99	6.52	2.68	8.79
H	3.55	11.64	3.45	11.31	3.36	11.03	4.10	13.45
J	11.91	39.08	11.80	38.72	11.68	38.31	12.45	40.84
K	4.20	13.77	4.11	13.49	4.08	13.39	4.80	15.74
L	5.35	17.54	5.24	17.18	5.11	16.76	5.93	19.45
M	2.30	7.54	2.20	7.23	2.14	7.02	2.90	9.50
N	3.64	11.94	3.56	11.68	3.55	11.64	4.48	14.69

* **NOTE:** THESE FIGURES WILL GIVE AN AIRCRAFT CENTERLINE (C/L) AT 4600 MM.

N_AC_020300_1_0030101_01_01

Ground Clearances
FIGURE 1

**ON A/C A320-200



NOTE: POINTS A, B, G, H & N ARE MID DOOR AT FLOOR LEVEL.

	OWE 41 244 kg		MRW (WV0) 73 900 kg				MRW (WV8) 78 400 kg				AC JACKED FDL = 4.60 m	
	CG 26.5%		FWD CG 17%		AFT CG 40%		FWD CG 17%		AFT CG 36.8%			
	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft
A	3.48	11.42	3.38	11.09	3.48	11.42	3.38	11.09	3.45	11.32	4.13	13.55
B	2.09	6.86	1.99	6.53	2.06	6.76	1.98	6.50	2.04	6.69	2.71	8.89
C1	1.82	5.97	1.73	5.68	1.79	5.87	1.72	5.64	1.76	5.77	2.43	7.97
C2	1.95	6.40	1.86	6.10	1.79	5.87	1.84	6.04	1.79	5.87	2.43	7.97
D1	5.97	19.59	5.87	19.26	5.93	19.46	5.86	19.23	5.90	19.36	6.58	21.59
D2	6.09	19.98	6.00	19.68	5.93	19.46	5.99	19.65	5.93	19.46	6.58	21.59
E (CFM)	0.67	2.20	0.58	1.90	0.59	1.94	0.57	1.87	0.58	1.90	1.24	4.07
E (IAE)	0.85	2.79	0.76	2.49	0.77	2.53	0.75	2.46	0.76	2.49	1.42	4.66
F	1.72	5.64	1.63	5.35	1.61	5.28	1.62	5.31	1.60	5.25	2.26	7.41
F1	2.72	8.92	2.63	8.63	2.60	8.53	2.61	8.56	2.60	8.53	3.25	10.66
F2	3.15	10.33	3.06	10.04	3.03	9.95	3.05	10.01	3.03	9.94	3.68	12.07
F3	3.49	11.45	3.40	11.15	3.36	11.02	3.39	11.12	3.36	11.02	4.01	13.16
G	2.22	7.28	2.13	6.99	2.07	6.79	2.12	6.96	2.07	6.79	2.71	8.89
H	3.70	12.14	3.61	11.84	3.49	11.45	3.60	11.81	3.50	11.48	4.13	13.55
J	12.08	39.63	12.00	39.37	11.81	38.75	11.98	39.30	11.83	38.81	12.45	40.85
K1	3.89	12.76	3.80	12.47	3.74	12.27	3.78	12.40	3.74	12.27	4.38	14.37
K2	4.86	15.94	4.77	15.65	4.71	15.45	4.76	15.62	4.71	15.45	5.35	17.55
L	5.56	18.24	5.47	17.95	5.29	17.36	5.46	17.91	5.32	17.45	5.93	19.46
M	2.29	7.51	2.20	7.22	2.11	6.92	2.19	7.19	2.11	6.92	2.75	9.02
N	3.98	13.06	3.88	12.73	3.89	12.76	3.87	12.70	3.88	12.73	4.54	14.89
N1	3.97	13.02	3.87	12.70	3.89	12.76	3.86	12.66	3.87	12.70	4.54	14.89
P	4.28	14.04	4.17	13.68	4.31	14.14	4.17	13.68	4.27	14.01	4.96	16.27
Q	4.84	15.88	4.76	15.62	4.56	14.96	4.74	15.55	4.59	15.06	5.20	17.06

N_AC_020300_1_0040101_01_03

Ground Clearances
FIGURE 2

2-4-0 Interior Arrangements

****ON A/C A320-100 A320-200**

Interior Arrangements

1. This section gives the standard interior arrangements configuration.

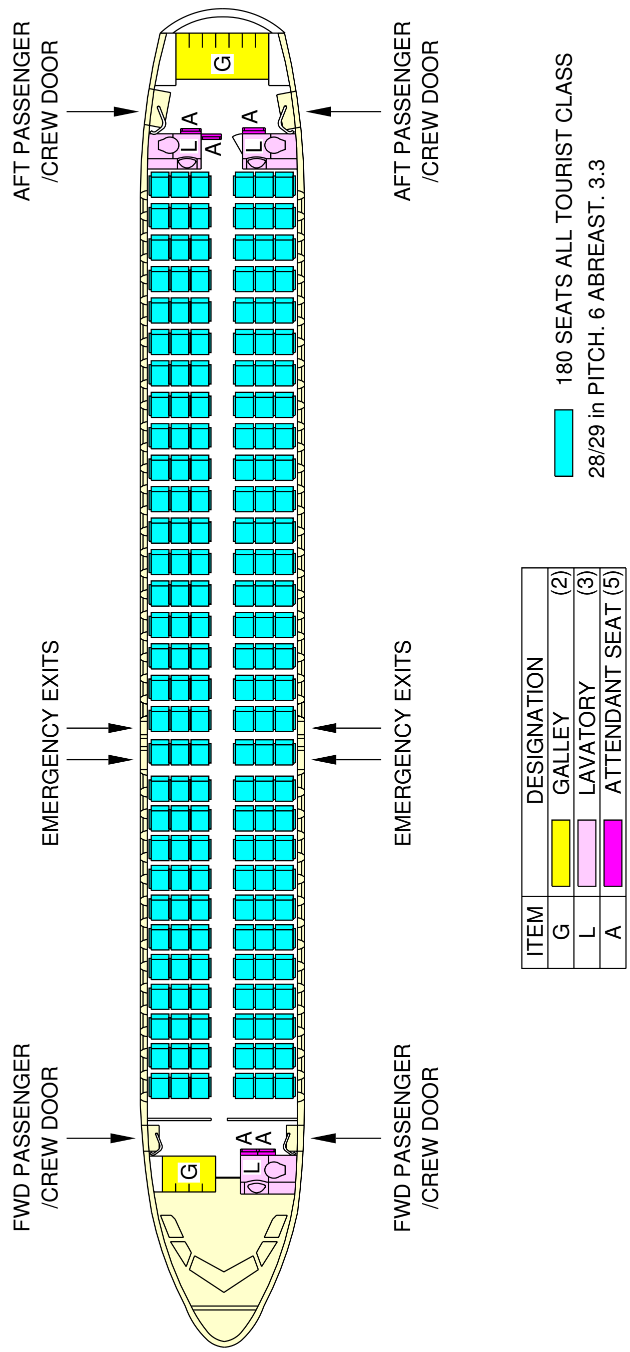
2-4-1 Passenger Compartment Layout

****ON A/C A320-100 A320-200**

Typical Configuration

1. This section gives the typical interior configuration.

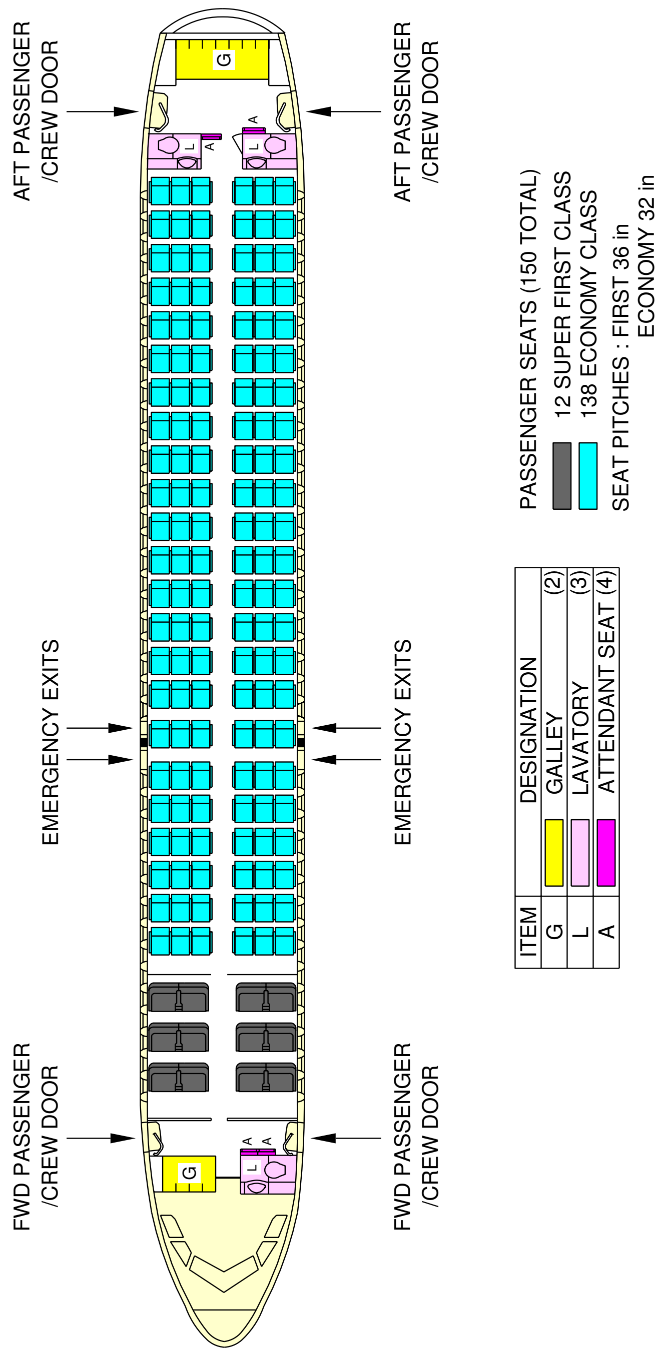
**ON A/C A320-100 A320-200



N_AC_020401_1_0030101_01_02

Typical Configuration
Typical Configuration Single-Class, High Density
FIGURE 1

**ON A/C A320-100 A320-200



N_AC_020401_1_0090101_01_00

Typical Configuration
Typical Configuration Two-Class
FIGURE 2

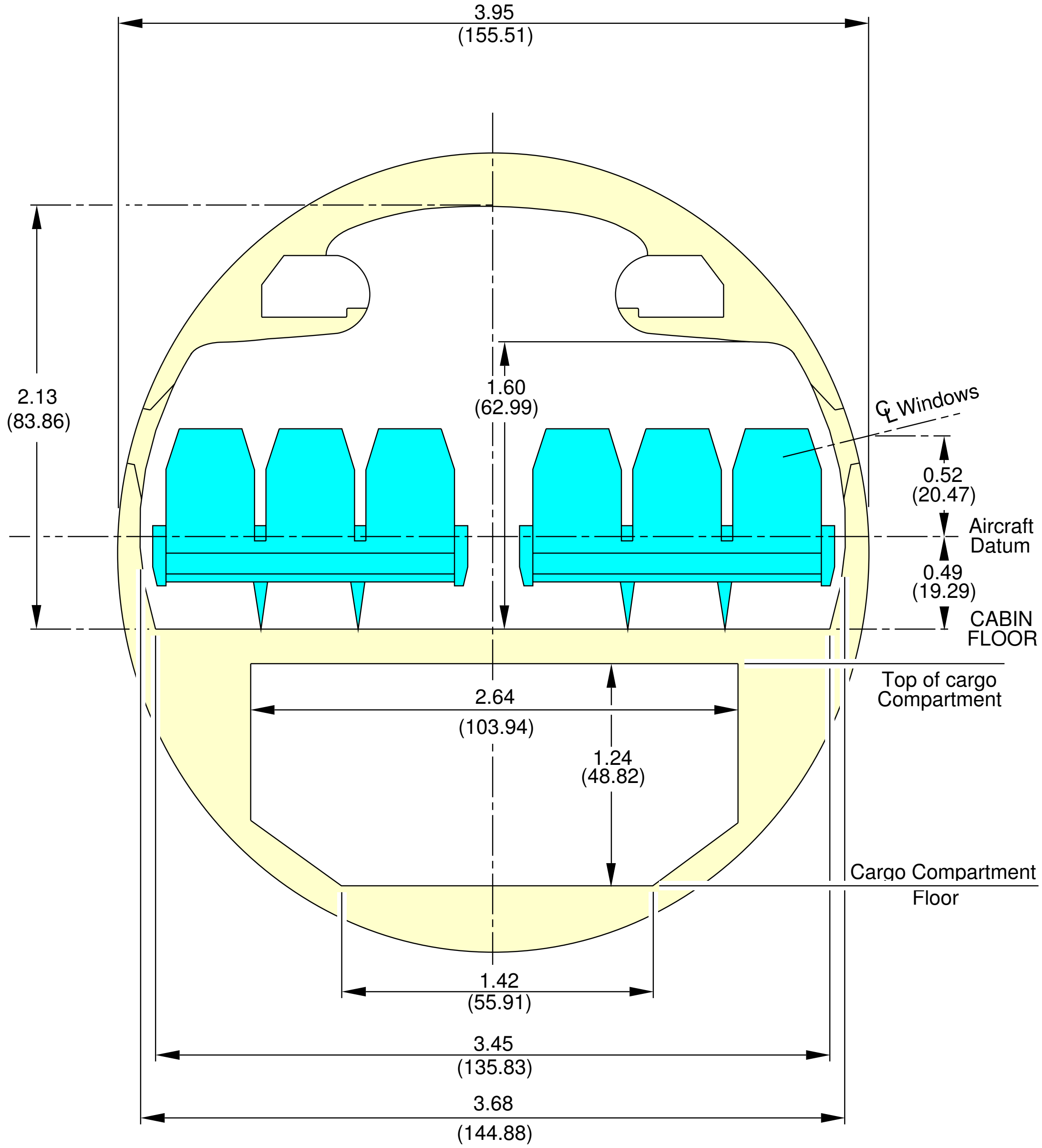
2-5-0 Passenger Compartment Cross Section

****ON A/C A320-100 A320-200**

Passenger Compartment Cross-section

1. This section gives the typical passenger compartment cross-section configuration.

**ON A/C A320-100 A320-200

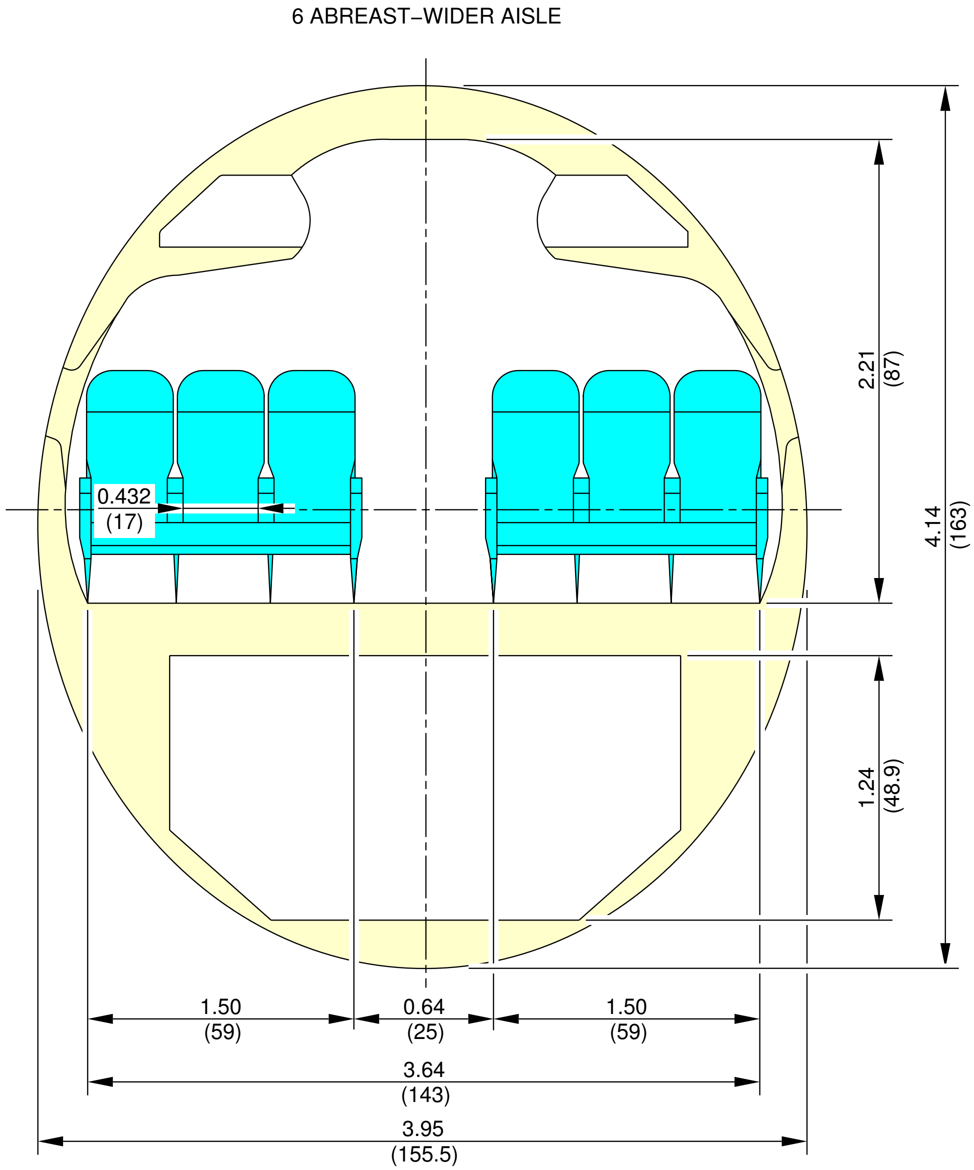


NOTE: DIMENSIONS m (in)

N_AC_020500_1_0010101_01_01

Passenger Compartment Cross-section
FIGURE 1

**ON A/C A320-100 A320-200

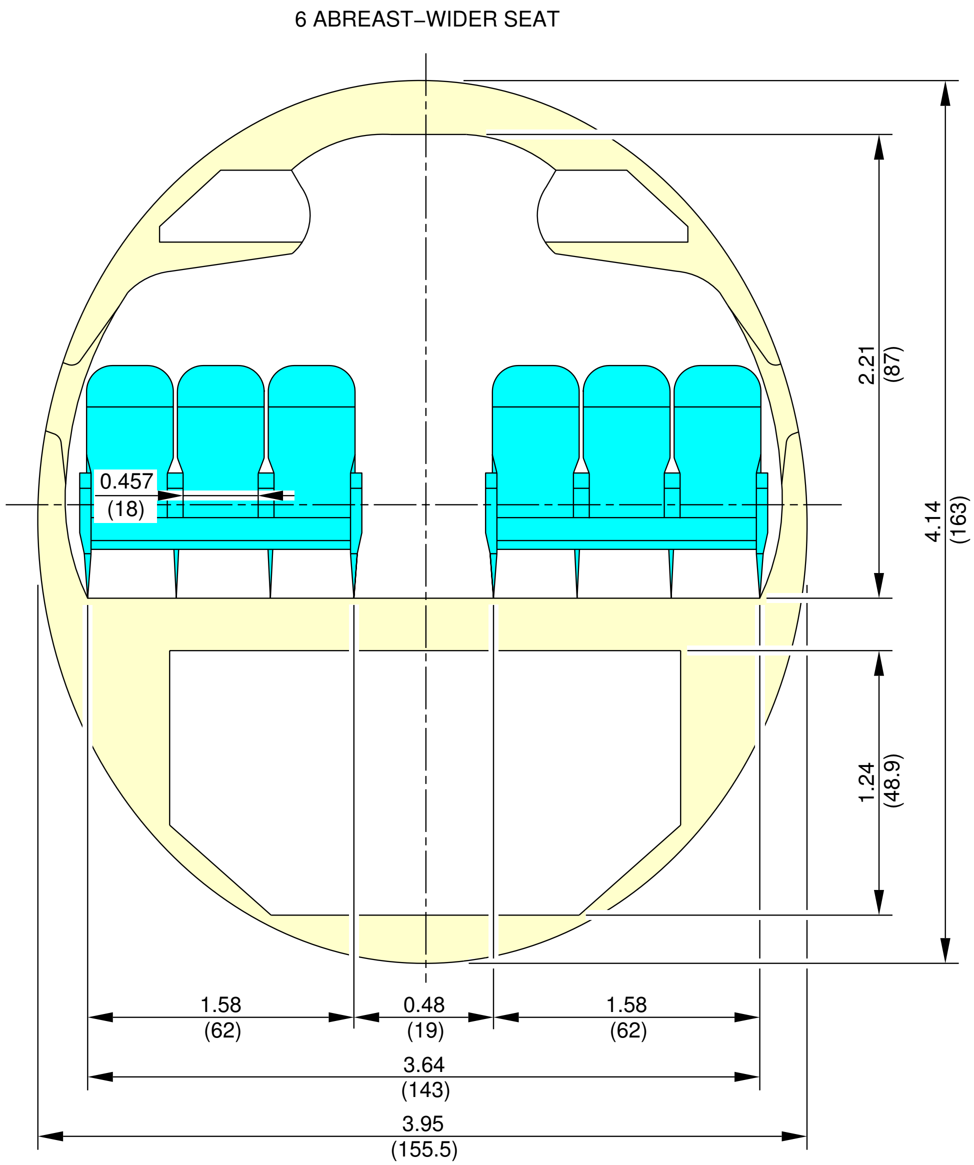


NOTE: DIMENSIONS m (in)

N_AC_020500_1_0050101_01_00

Passenger Compartment Cross-section
Economy Class, 6 Abreast - Wider Aisle (Sheet 1 of 2)
FIGURE 2

**ON A/C A320-100 A320-200

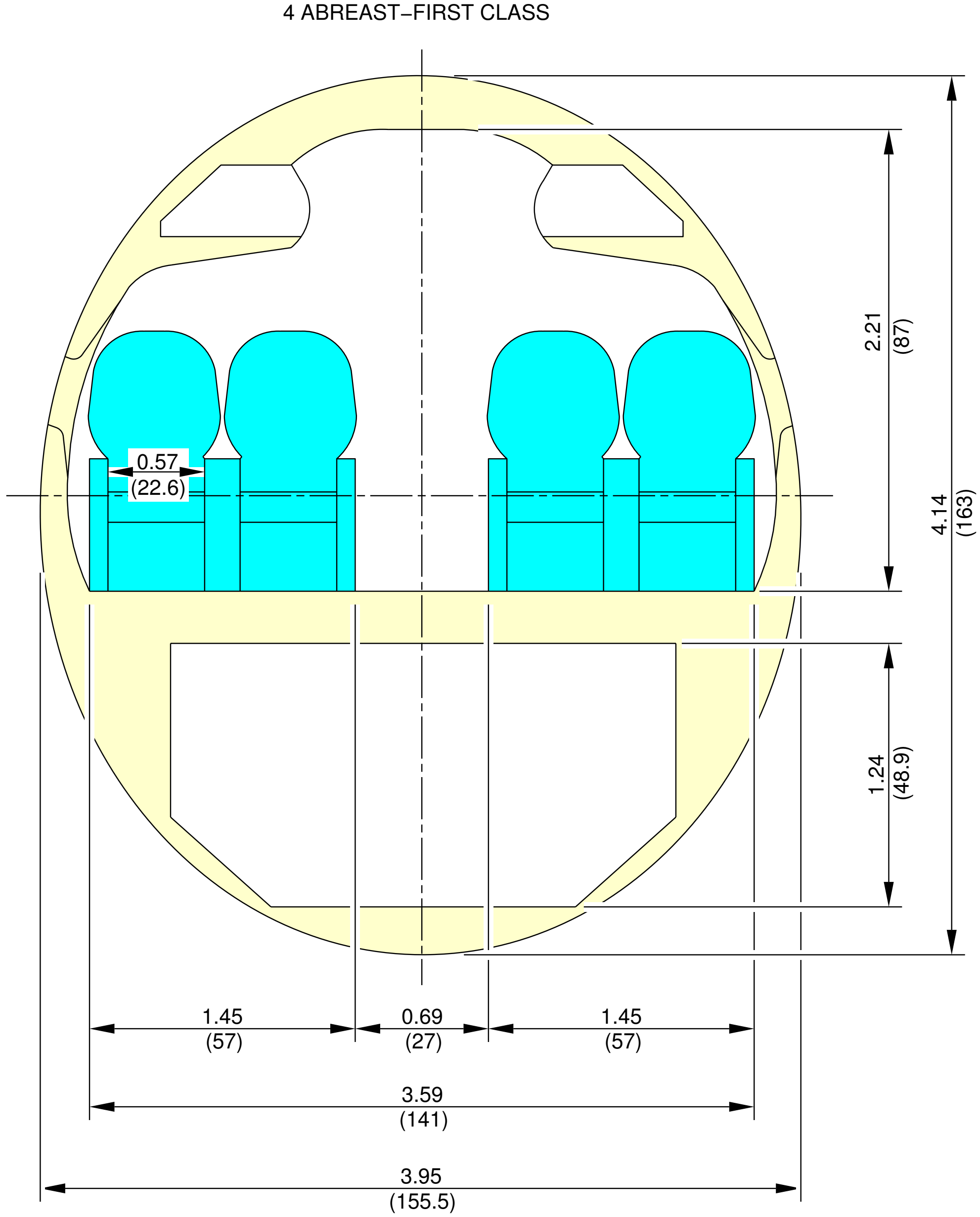


NOTE: DIMENSIONS m (in)

N_AC_020500_1_0050102_01_02

Passenger Compartment Cross-section
Economy Class, 6 Abreast - Wider Seat (Sheet 2 of 2)
FIGURE 3

**ON A/C A320-100 A320-200



NOTE: DIMENSIONS m (in)

N_AC_020500_1_0060101_01_00

Passenger Compartment Cross-section
Passenger Compartment Cross-section, First-class
FIGURE 4

2-6-0 Cargo Compartments

****ON A/C A320-100 A320-200**

Cargo Compartments

1. This section gives the cargo compartments location and dimensions.

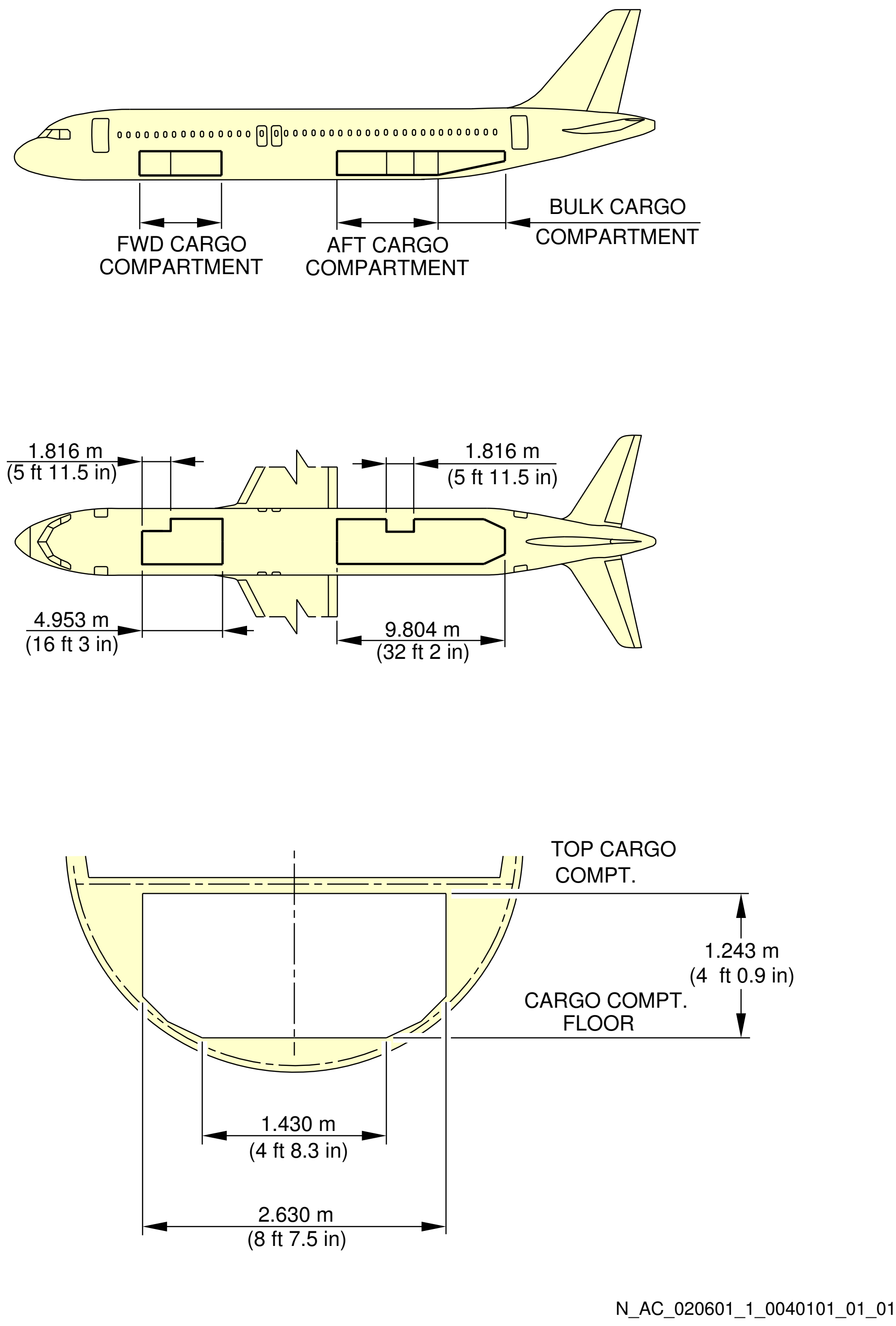
2-6-1 Lower Deck Cargo Compartments

****ON A/C A320-100 A320-200**

Lower Deck Cargo Compartments

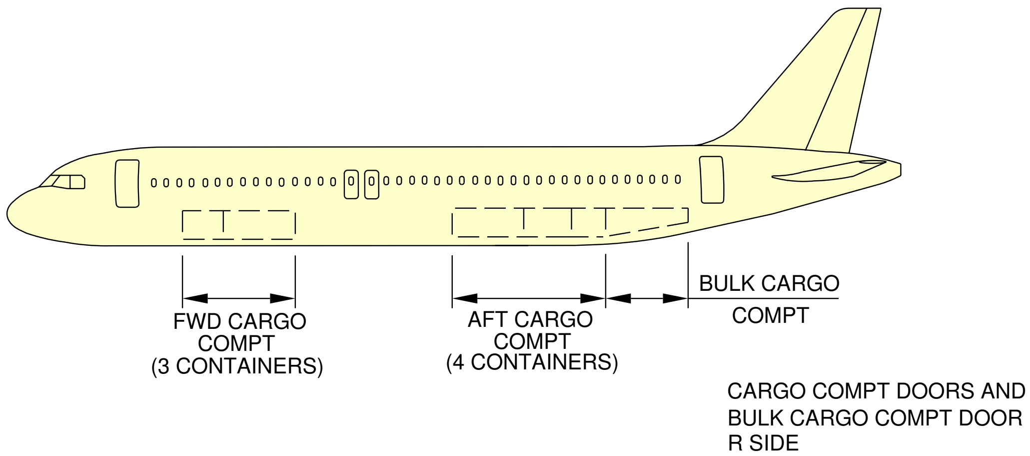
1. This section gives the lower deck cargo compartments.

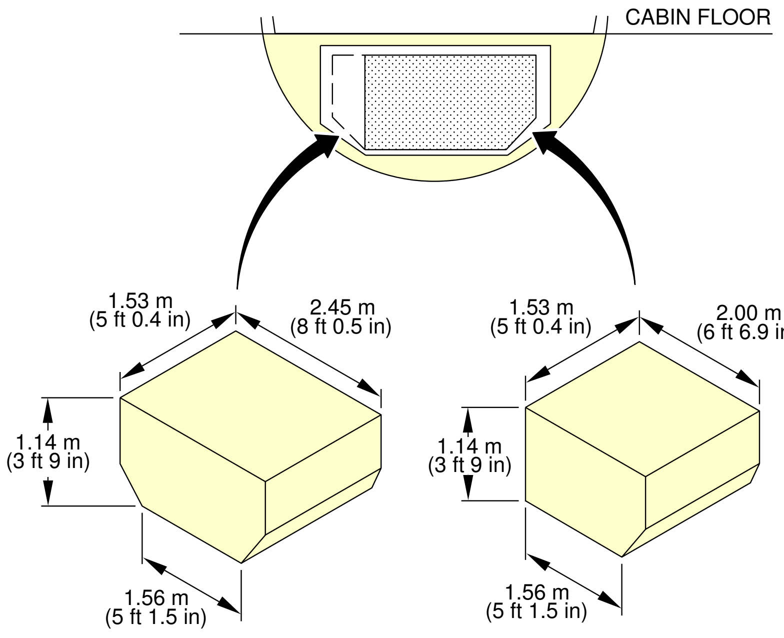
****ON A/C A320-100 A320-200**



Lower Deck Cargo Compartments
Lower Deck Cargo Compartments Dimensions
FIGURE 1

**ON A/C A320-100 A320-200





N_AC_020601_1_0050101_01_00

Lower Deck Cargo Compartments
Lower Deck Cargo Compartments Containers
FIGURE 2

2-7-0 Door Clearances

****ON A/C A320-100 A320-200**

Doors Clearances

1. This section gives doors clearances.

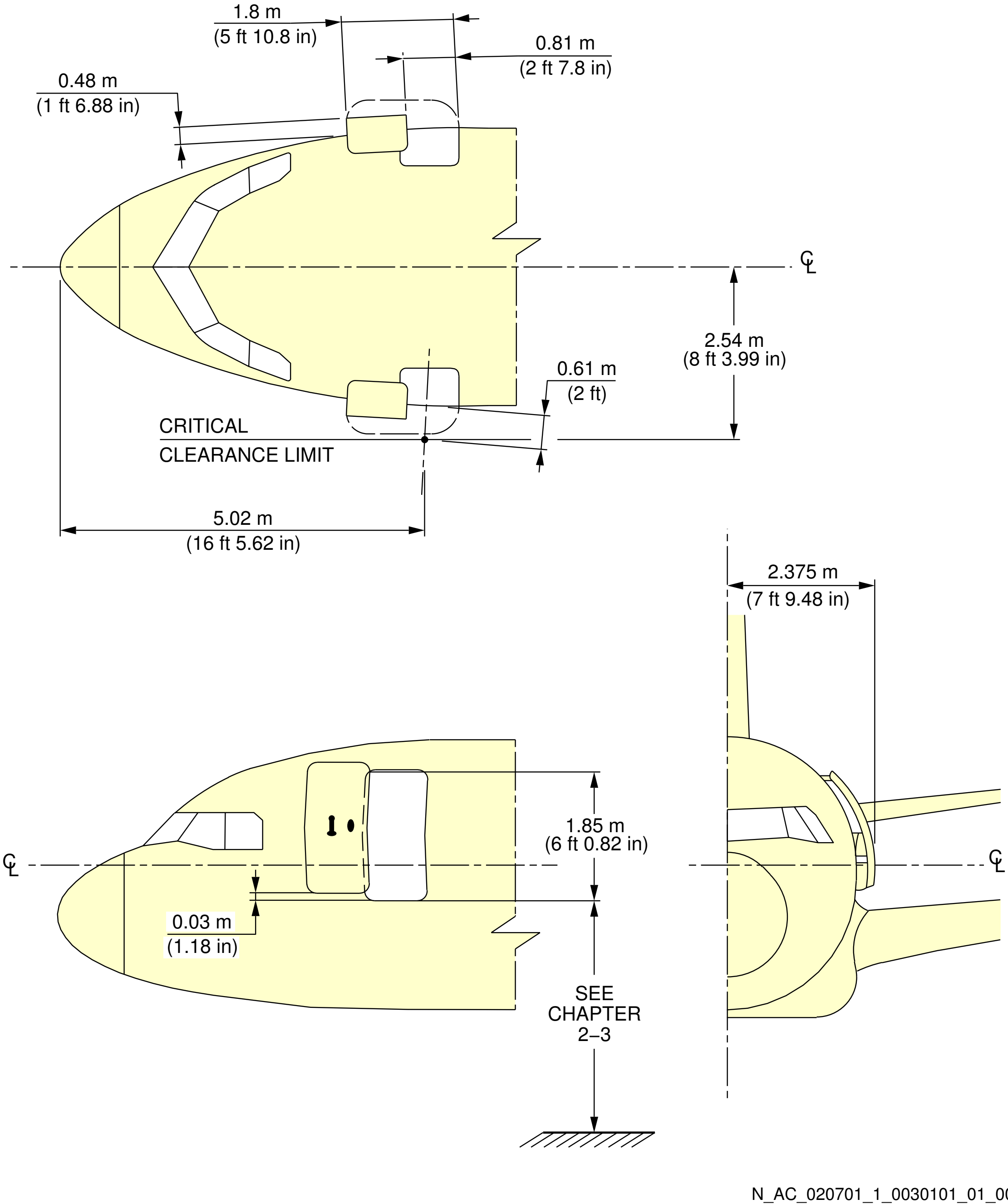
2-7-1 Forward Passenger / Crew Doors

****ON A/C A320-100 A320-200**

<u>Forward Passenger / Crew Doors</u>

1. This section gives forward passenger / crew doors clearances.

**ON A/C A320-100 A320-200



Doors Clearances
Forward Passenger / Crew Doors
FIGURE 1

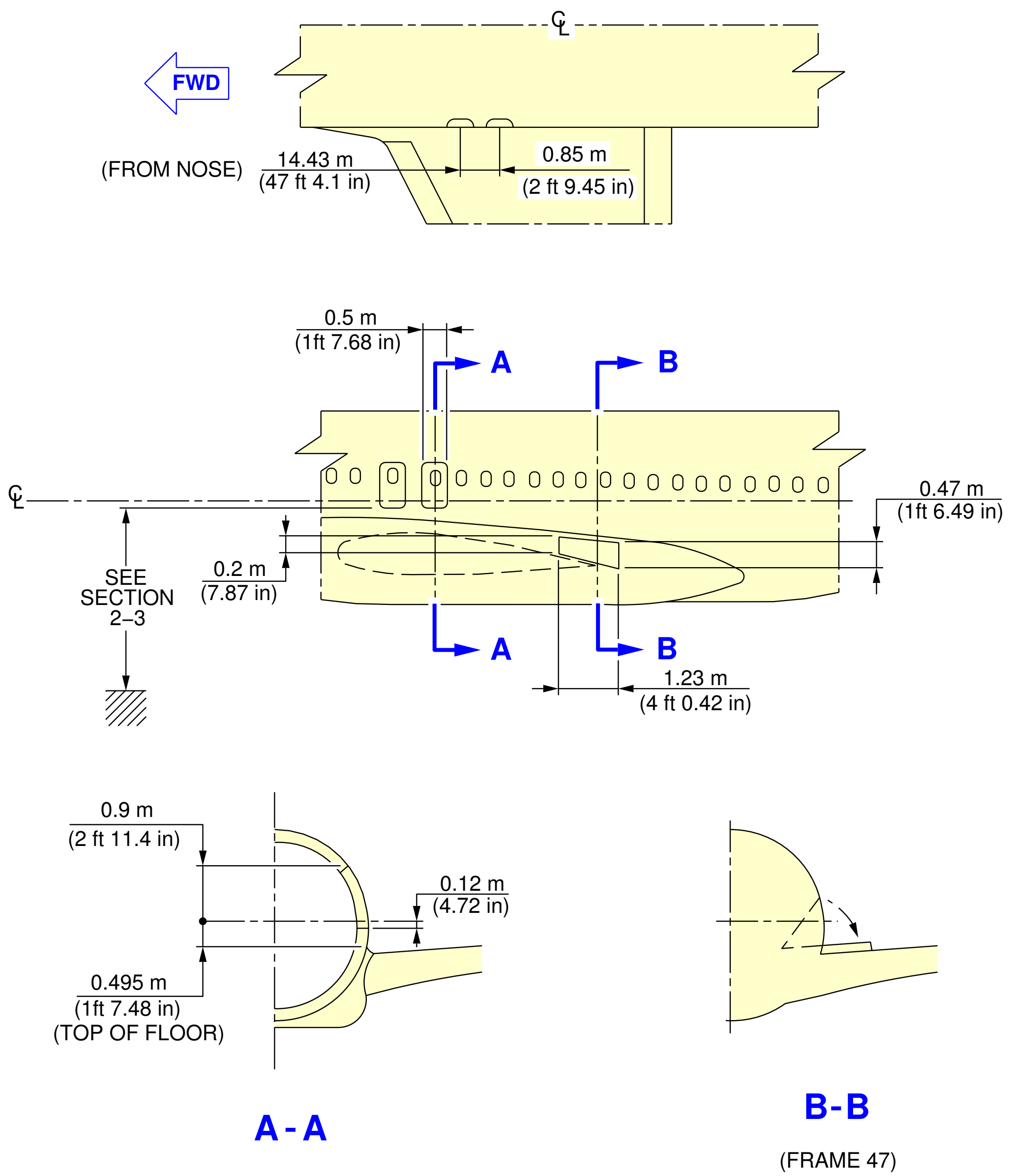
2-7-2 Emergency Exits

**ON A/C A320-100 A320-200

Emergency Exits

1. This section gives emergency exits doors clearances.

**ON A/C A320-100 A320-200



NOTE: ESCAPE SLIDE COMPARTMENT DOOR OPENS ON WING UPPER SURFACE.

N_AC_020702_1_0040101_01_00

Doors Clearances
Emergency Exits
FIGURE 1

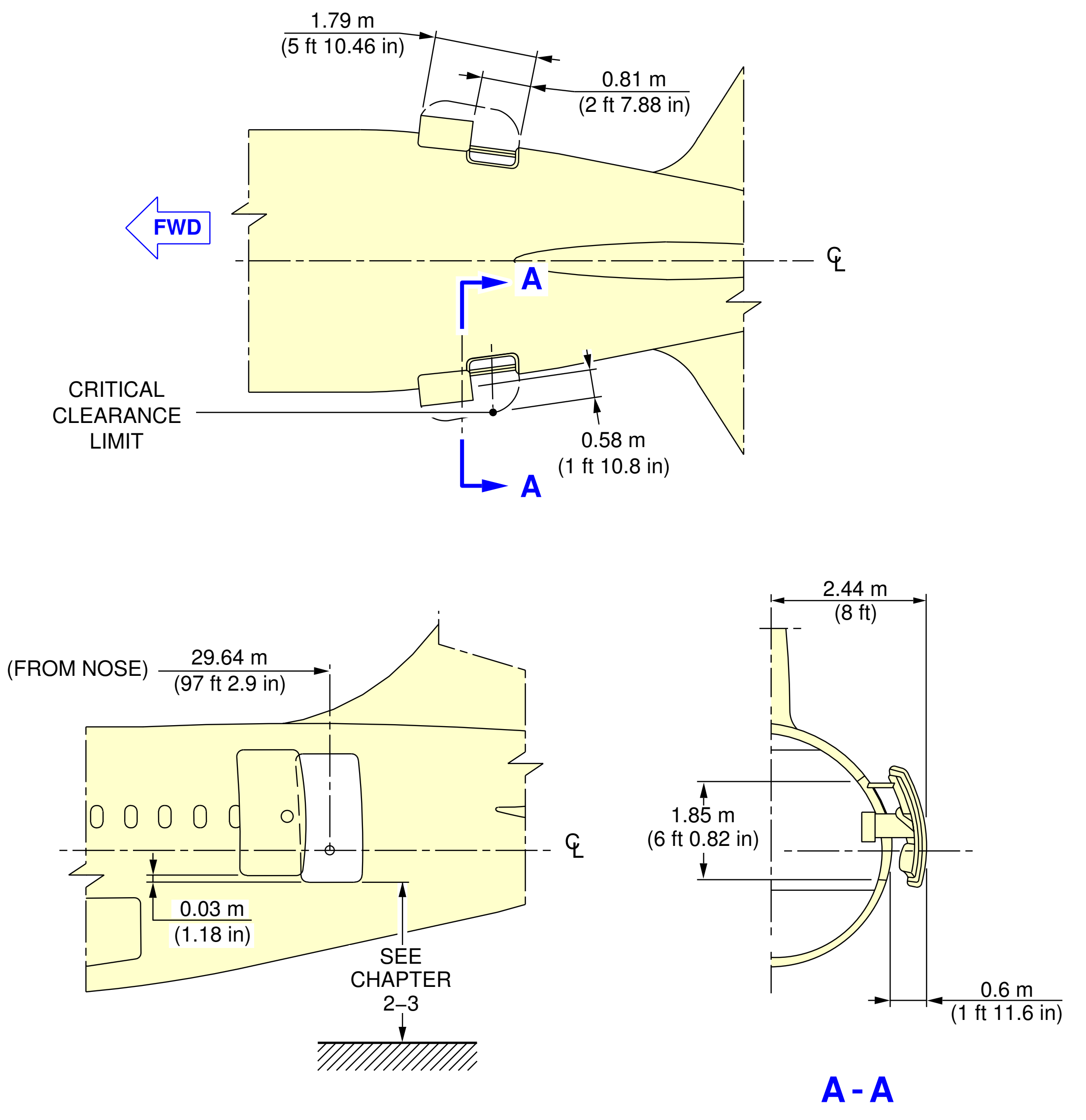
2-7-3 Aft Passenger / Crew Doors

****ON A/C A320-100 A320-200**

Aft Passenger / Crew Doors

1. This section gives Aft passenger / crew doors clearances.

**ON A/C A320-100 A320-200



N_AC_020703_1_0030101_01_00

Doors Clearances
Aft Passenger / Crew Doors
FIGURE 1

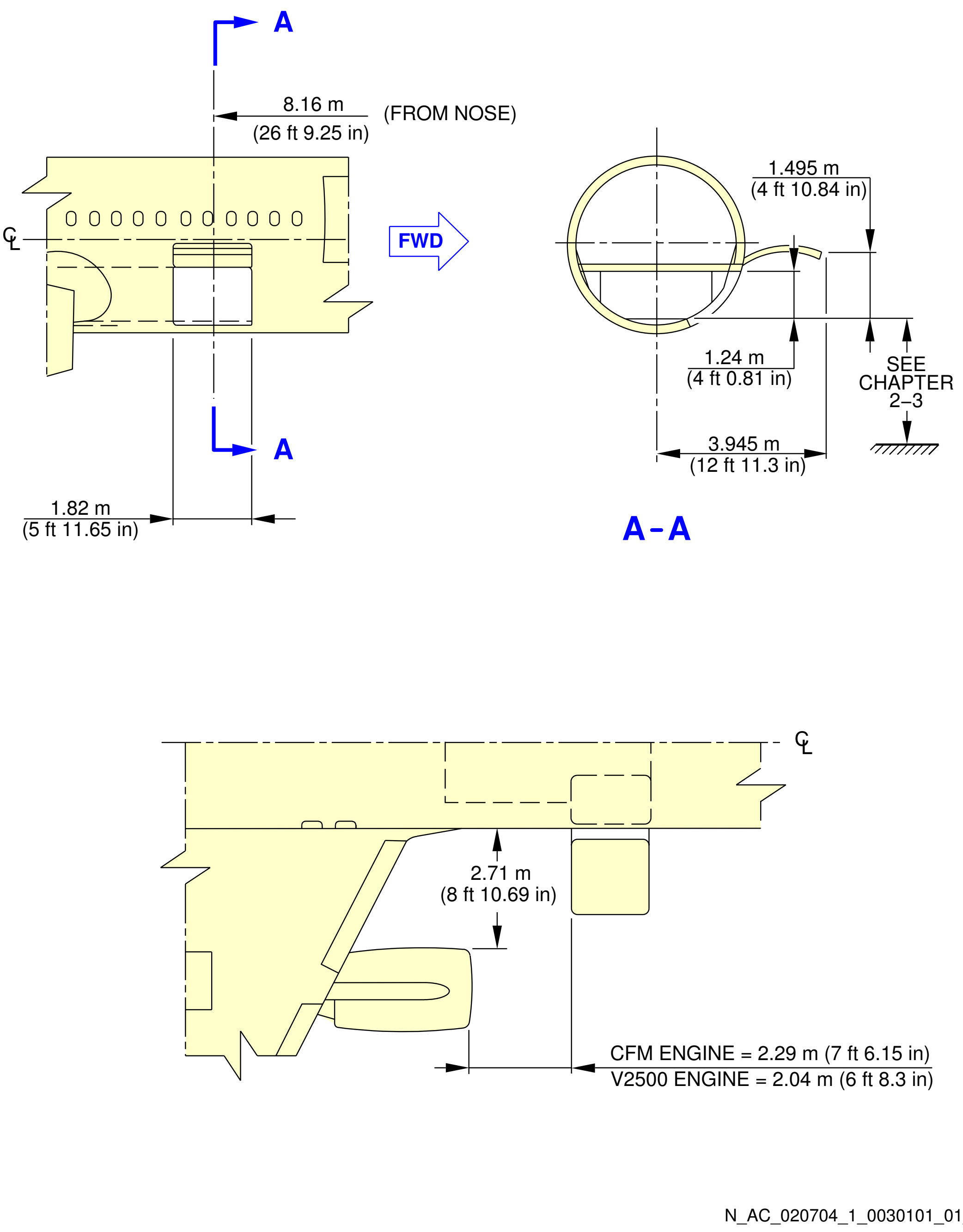
2-7-4 Forward Cargo Compartment Doors

****ON A/C A320-100 A320-200**

Forward Cargo Compartment Door

1. This section gives forward cargo compartment door clearances.

**ON A/C A320-100 A320-200



Doors Clearances
Forward Cargo Compartment Door
FIGURE 1

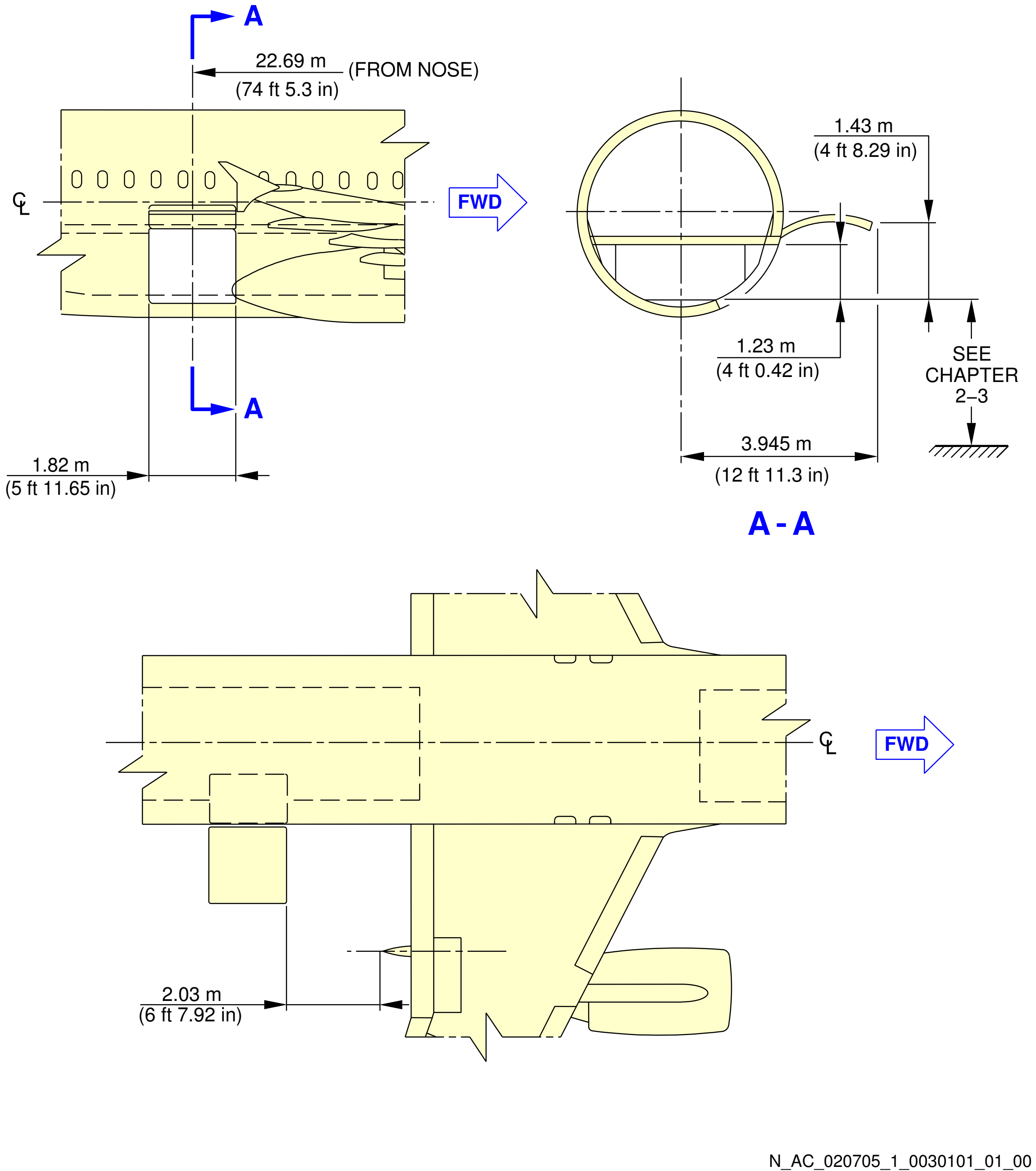
2-7-5 Aft Cargo Compartment Doors

****ON A/C A320-100 A320-200**

Aft Cargo Compartment Door

1. This section gives Aft cargo compartment door clearances.

**ON A/C A320-100 A320-200



Doors Clearances
Aft Cargo Compartment Door
FIGURE 1

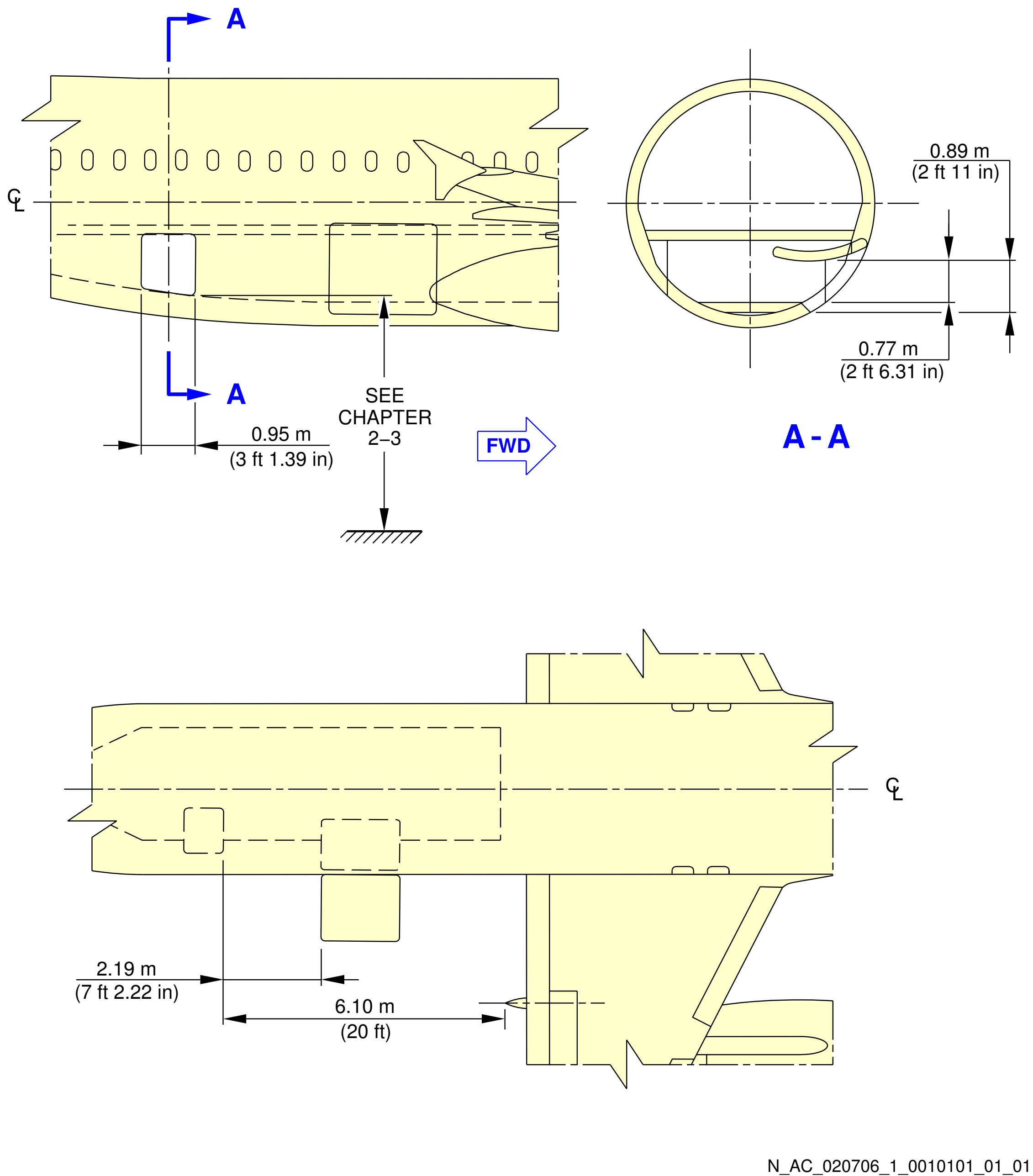
2-7-6 Bulk Cargo Compartment Doors

**ON A/C A320-100 A320-200

Bulk Cargo Compartment Door

1. This section gives the bulk cargo compartment door clearances.

**ON A/C A320-100 A320-200



Doors Clearances
Bulk Cargo Compartment Door
FIGURE 1

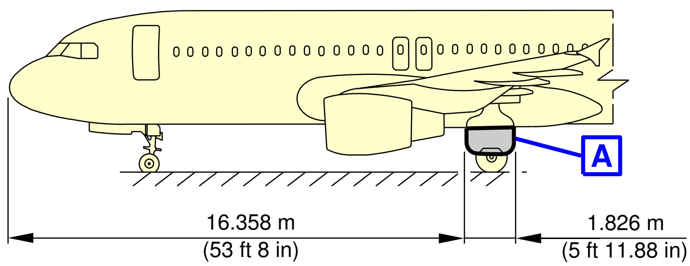
2-7-7 Main Landing Gear Doors

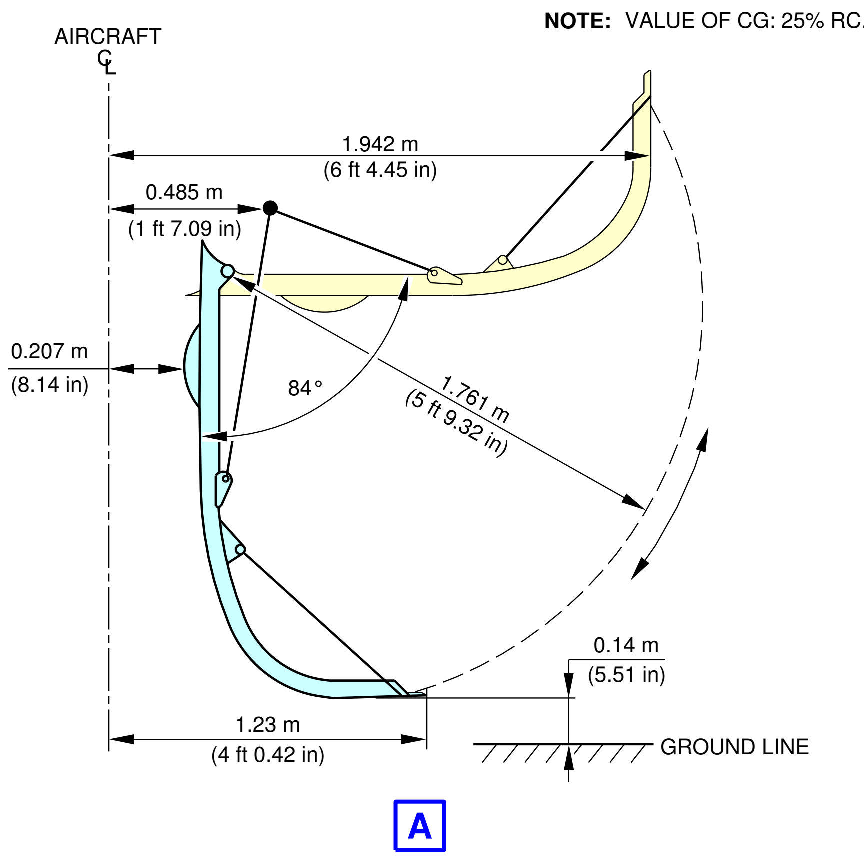
****ON A/C A320-100 A320-200**

Main Landing Gear Doors

1. This section gives the main landing gear doors clearances.

**ON A/C A320-100 A320-200

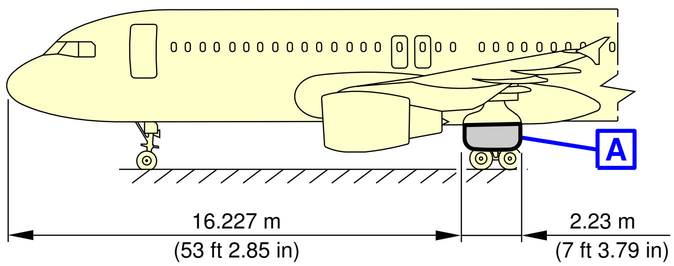


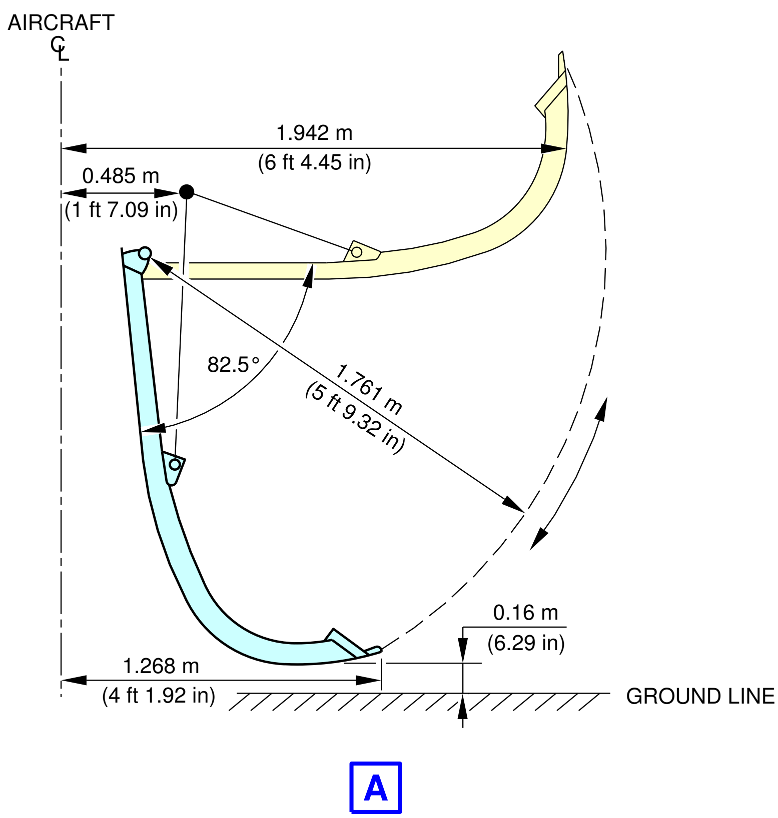


N_AC_020707_1_0030101_01_02

Doors Clearances
Main Landing Gear Doors
FIGURE 1

**ON A/C A320-100 A320-200





N_AC_020707_1_0040101_01_02

Doors Clearances
Main Landing Gear Doors (Bogie)
FIGURE 2

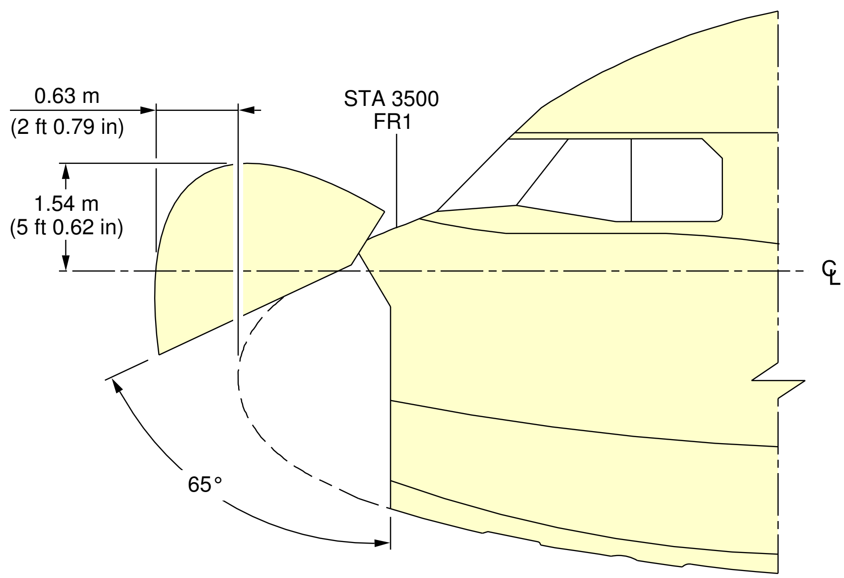
2-7-8 Radome

****ON A/C A320-100 A320-200**

Radome

1. This section gives the radome clearances.

**ON A/C A320-100 A320-200



N_AC_020708_1_0030101_01_00

Doors Clearances
Radome
FIGURE 1

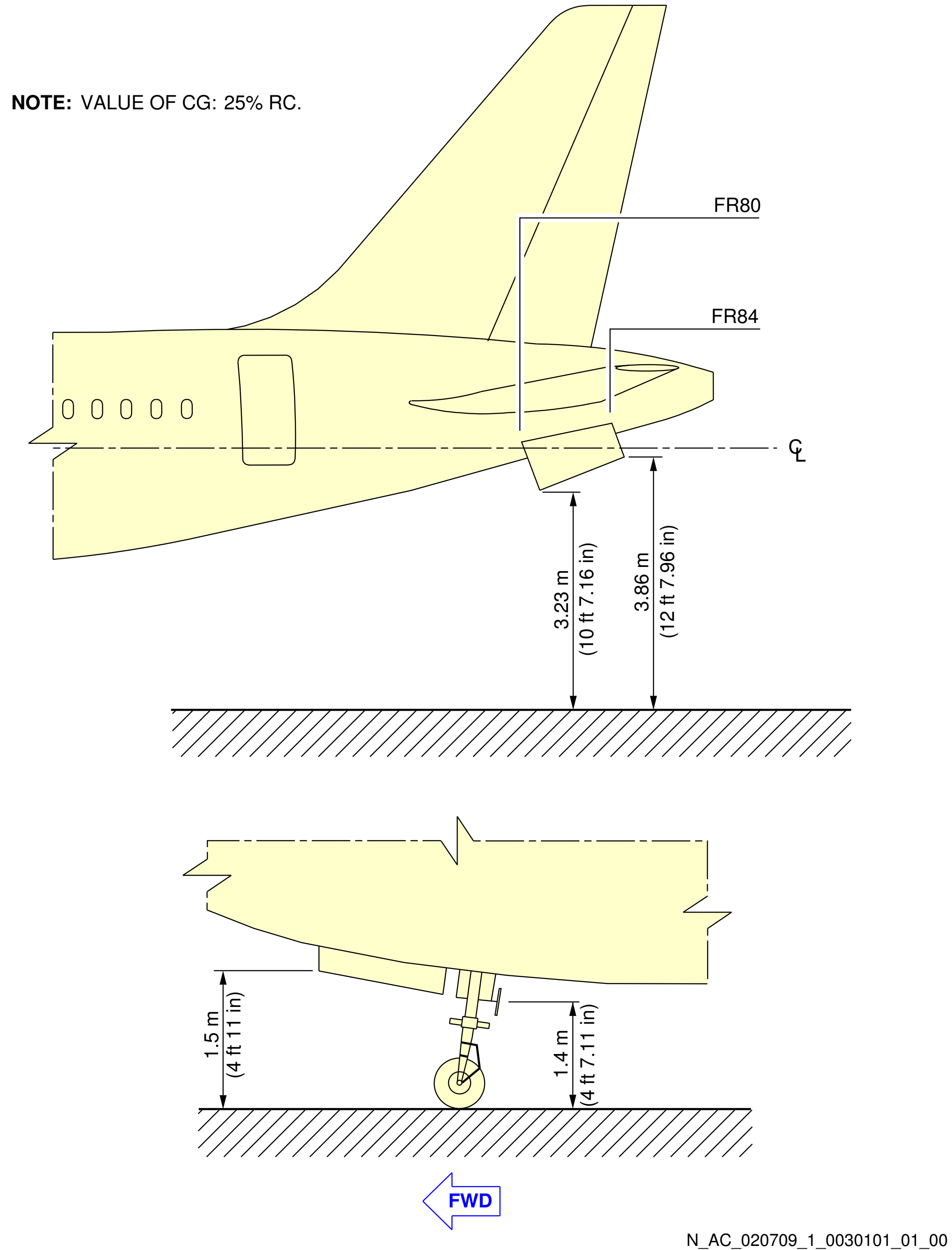
2-7-9 APU and Nose Landing Gear Doors

****ON A/C A320-100 A320-200**

APU and Nose Landing Gear Doors

1. This section gives APU and Nose Landing Gear doors clearances.

**ON A/C A320-100 A320-200



Doors Clearances
APU and Nose Landing Gear Doors
FIGURE 1

AIRPLANE PERFORMANCE

3-1-0 General Information

**ON A/C A320-100 A320-200

General Information

1. This section gives standard day temperatures.

   Section 3-2 indicates payload range information at specific altitudes recommended for long range cruise with a given fuel reserve condition.

   Section 3-3 represents FAR take-off runway length requirements at ISA and ISA +15˚C (+59˚F) for CFM56-5A, CFM56-5B and IAE V2500 series engine conditions for FAA certification.

   Section 3-4 represents FAR landing runway length requirements for FAA certification.

   Section 3-5 indicates final approach speeds.

   Standard day temperatures for the altitudes shown are tabulated below:

Standard day temperatures for the altitude			
Altitude		Standard Day Temperature	
FEET	METERS	˚F	˚C
0	0	59.0	15.0
2000	610	51.9	11.1
4000	1219	44.7	7.1
6000	1829	37.6	3.1
8000	2438	30.5	-0.8

3-2-0 Payload / Range

****ON A/C A320-100 A320-200**

Payload / Range

1. Payload / Range

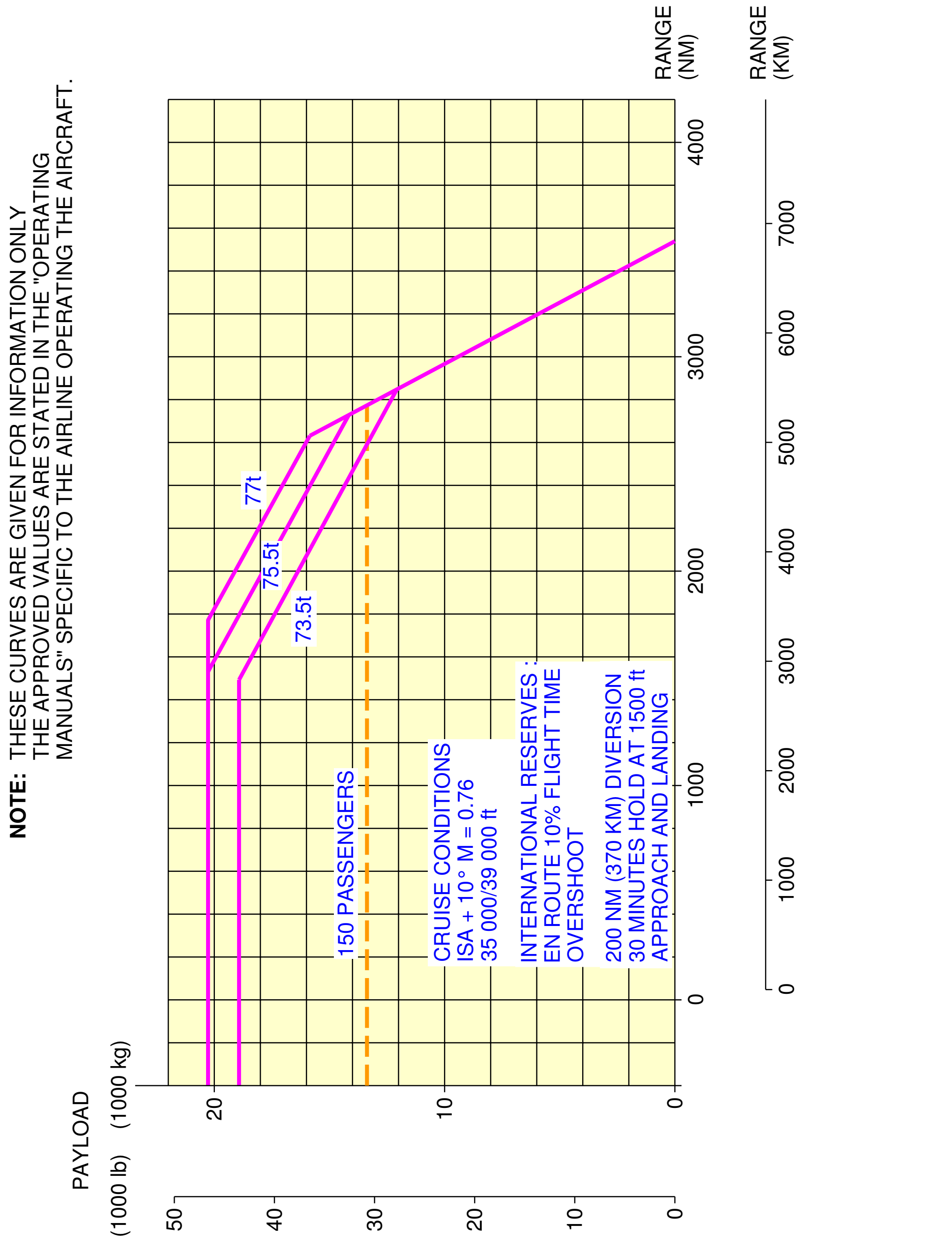
3-2-1 ISA Conditions

**ON A/C A320-100 A320-200

ISA Conditions

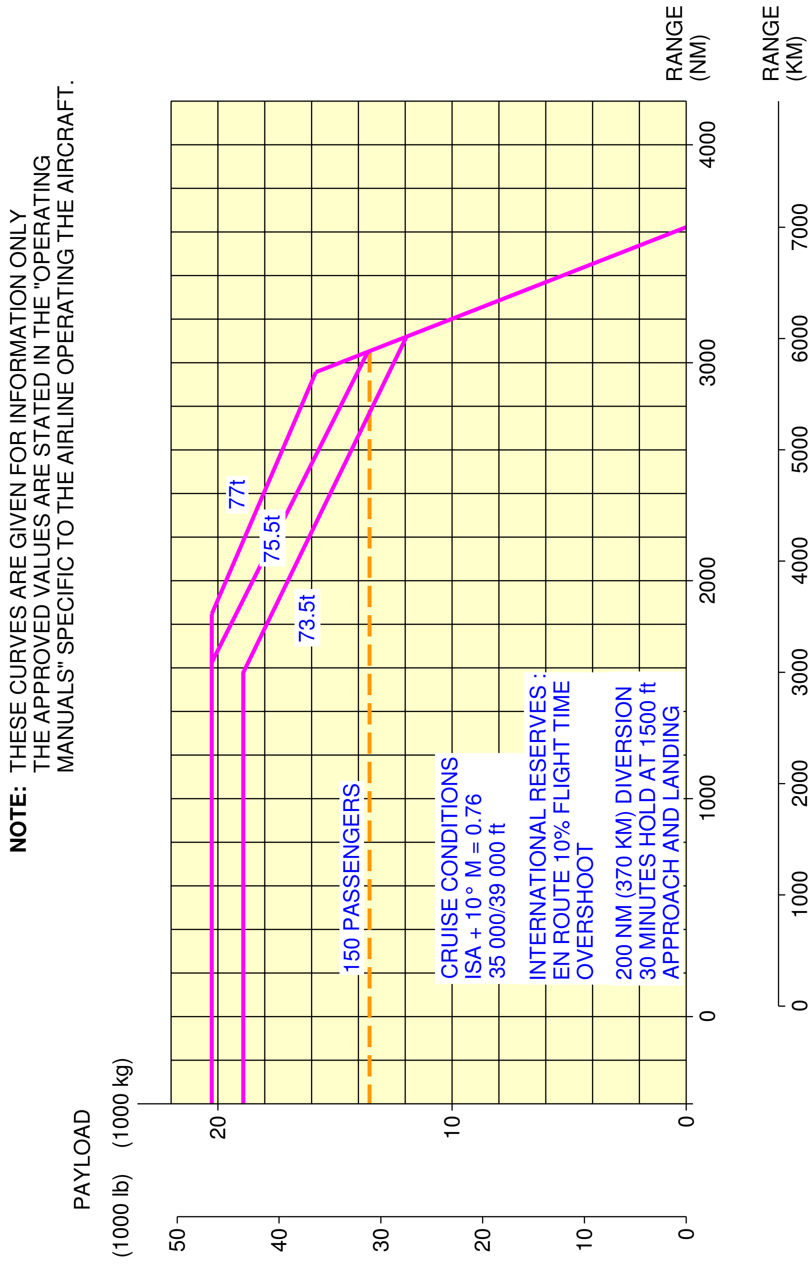
1. This section gives the payload / range at ISA conditions.

**ON A/C A320-100 A320-200



Payload / Range
CFM56-5A series engine
FIGURE 1

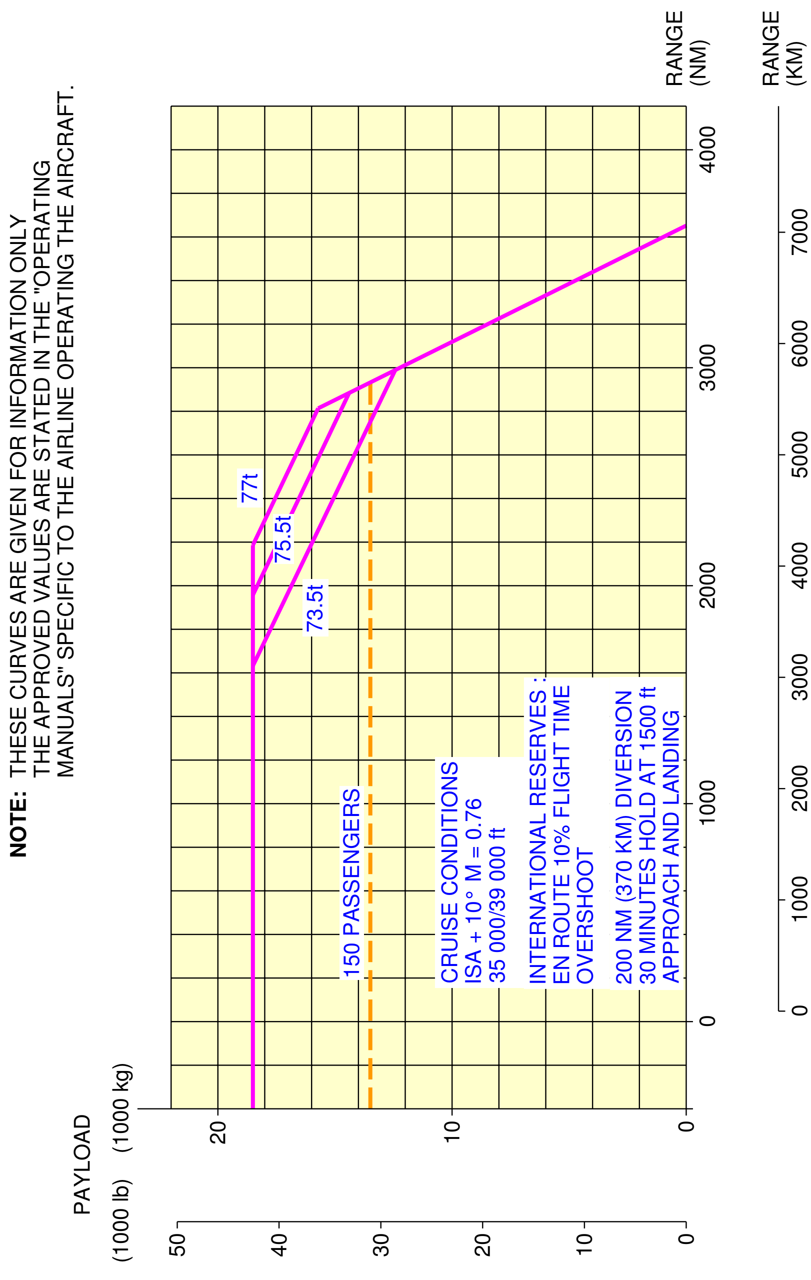
**ON A/C A320-100 A320-200



N_AC_030201_1_0070101_01_00

Payload / Range
CFM56-5B series engine
FIGURE 2

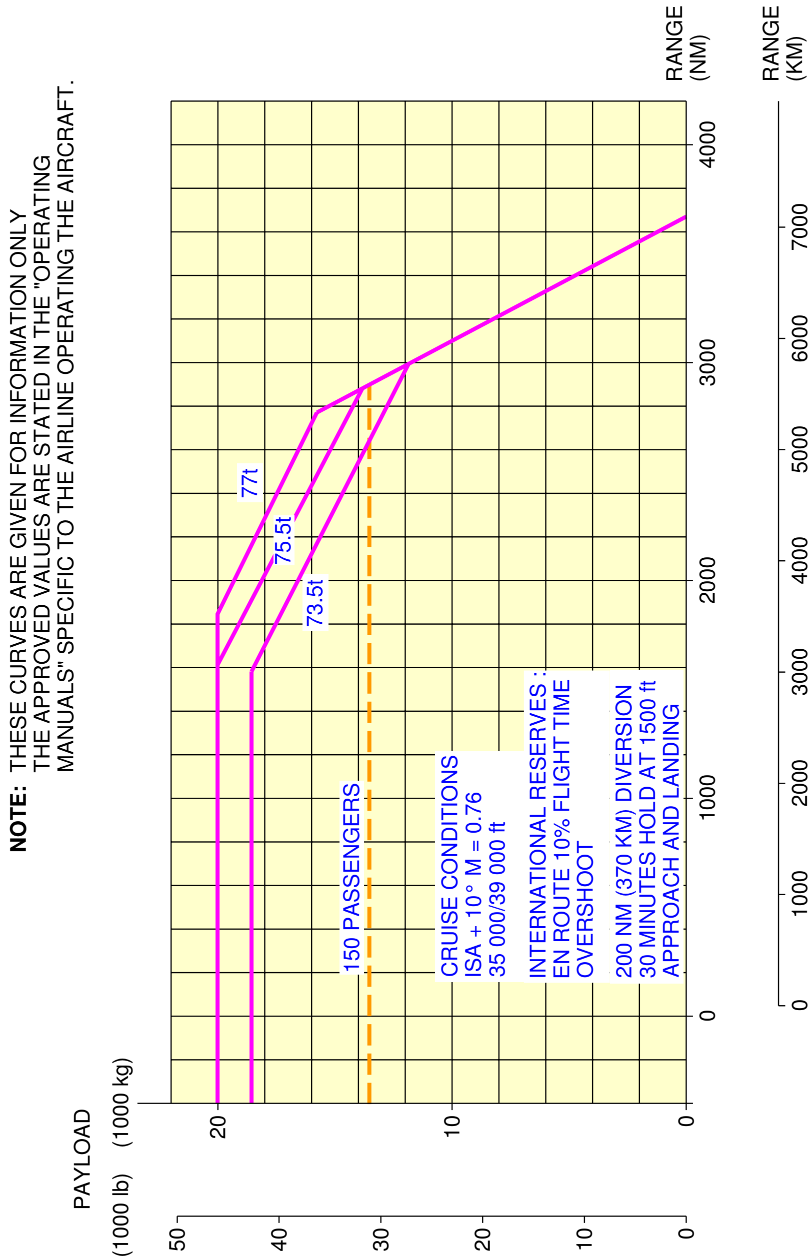
**ON A/C A320-100 A320-200



N_AC_030201_1_0080101_01_00

Payload / Range
IAE V2500-A1 series engine
FIGURE 3

**ON A/C A320-100 A320-200



N_AC_030201_1_0090101_01_00

Payload / Range
IAE V2500-A5 series engine
FIGURE 4

3-3-0 FAR / JAR Takeoff Weight Limitation

****ON A/C A320-100 A320-200**

FAR / JAR Take-off Weight Limitation

1. FAR / JAR Take-off Weight Limitation

3-3-1 ISA Conditions

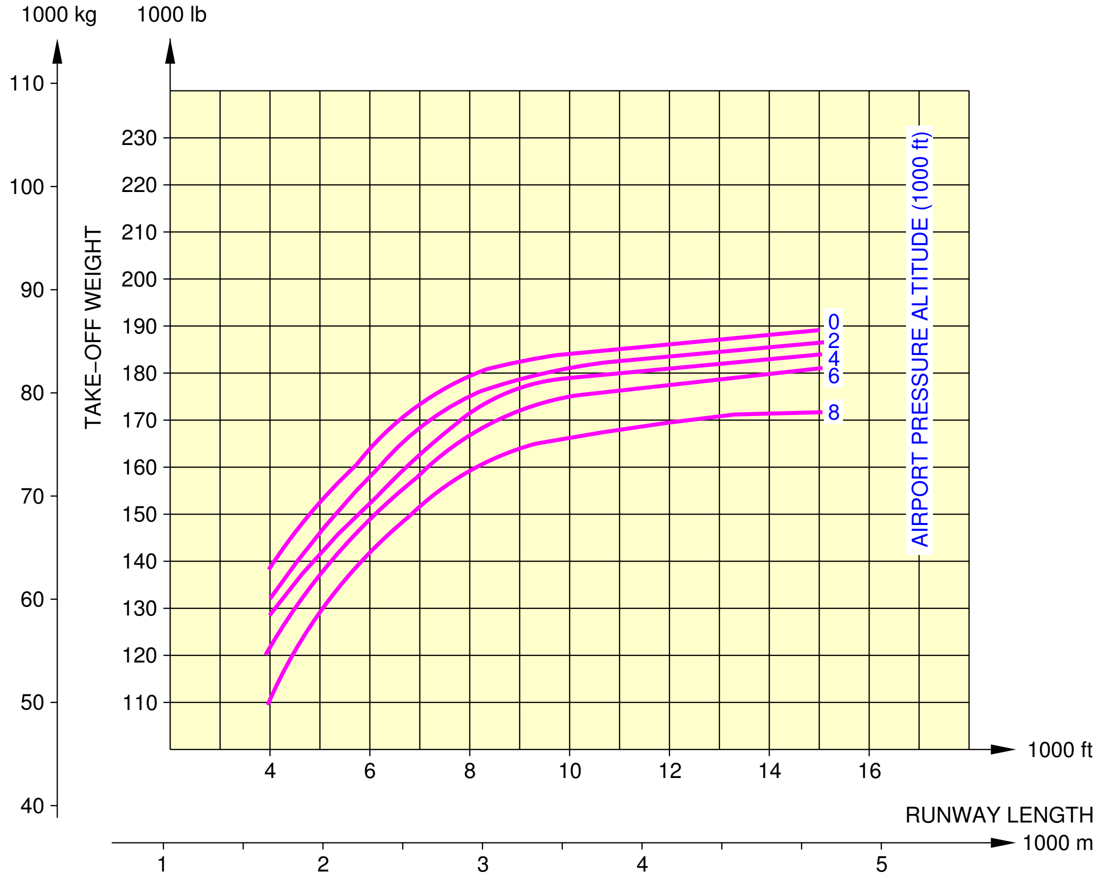
****ON A/C A320-100 A320-200**

ISA Conditions

1. This section gives the take-off weight limitation at ISA conditions.

**ON A/C A320-100 A320-200

NOTE: THESE CURVES ARE GIVEN FOR INFORMATION ONLY
THE APPROVED VALUES ARE STATED IN THE "OPERATING MANUALS" SPECIFIC TO THE AIRLINE OPERATING THE AIRCRAFT.

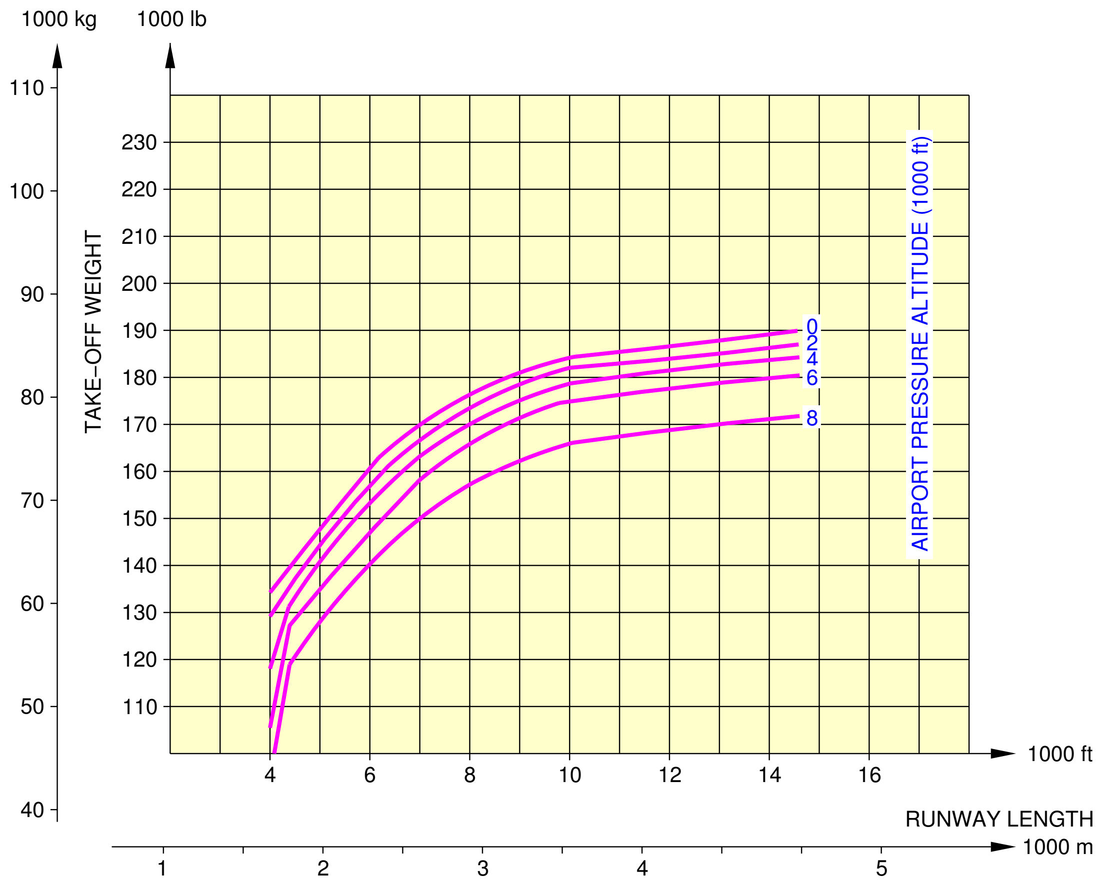


N_AC_030301_1_0050101_01_00

FAR / JAR Take-off Weight Limitation
ISA Conditions – CFM56 series engine
FIGURE 1

**ON A/C A320-100 A320-200

NOTE: THESE CURVES ARE GIVEN FOR INFORMATION ONLY
THE APPROVED VALUES ARE STATED IN THE "OPERATING MANUALS" SPECIFIC TO THE AIRLINE OPERATING THE AIRCRAFT.



N_AC_030301_1_0060101_01_00

FAR / JAR Take-off Weight Limitation
ISA Conditions – IAE V2500 series engine
FIGURE 2

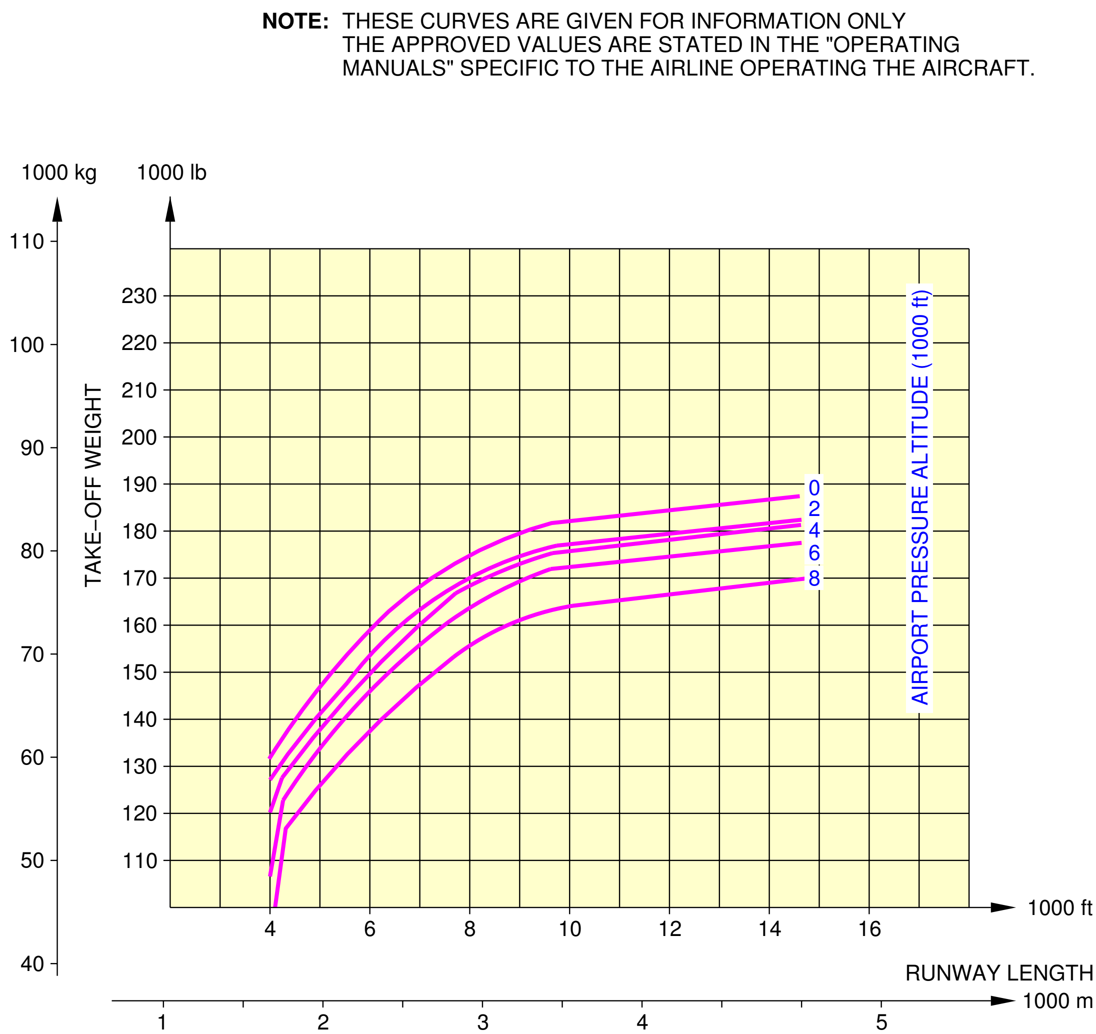
3-3-2 ISA +15°C (+59°F) Conditions

****ON A/C A320-100 A320-200**

ISA +15°C (+59°F) Conditions

1. This section gives the take-off weight limitation at ISA +15°C (+59°F) conditions.

**ON A/C A320-100 A320-200

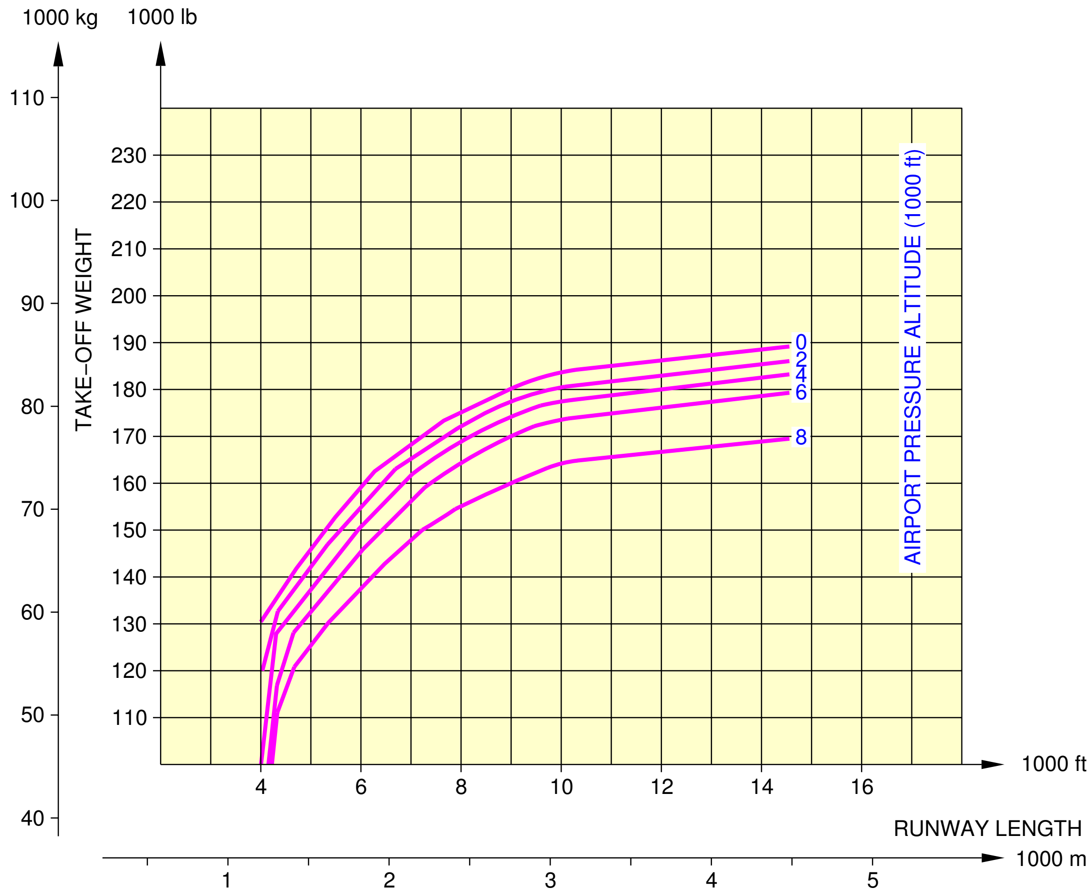


N_AC_030302_1_0050101_01_00

FAR / JAR Take-off Weight Limitation
ISA +15˚C (+59˚F) Conditions – CFM56 series engine
FIGURE 1

**ON A/C A320-100 A320-200

NOTE: THESE CURVES ARE GIVEN FOR INFORMATION ONLY
THE APPROVED VALUES ARE STATED IN THE "OPERATING MANUALS" SPECIFIC TO THE AIRLINE OPERATING THE AIRCRAFT.



N_AC_030302_1_0060101_01_00

FAR / JAR Take-off Weight Limitation
ISA +15°C (+59°F) Conditions – IAE V2500 series engine
FIGURE 2

3-4-0 FAR / JAR Landing Field Length

****ON A/C A320-100 A320-200**

FAR / JAR Landing Field Length

1. FAR / JAR Landing Field Length

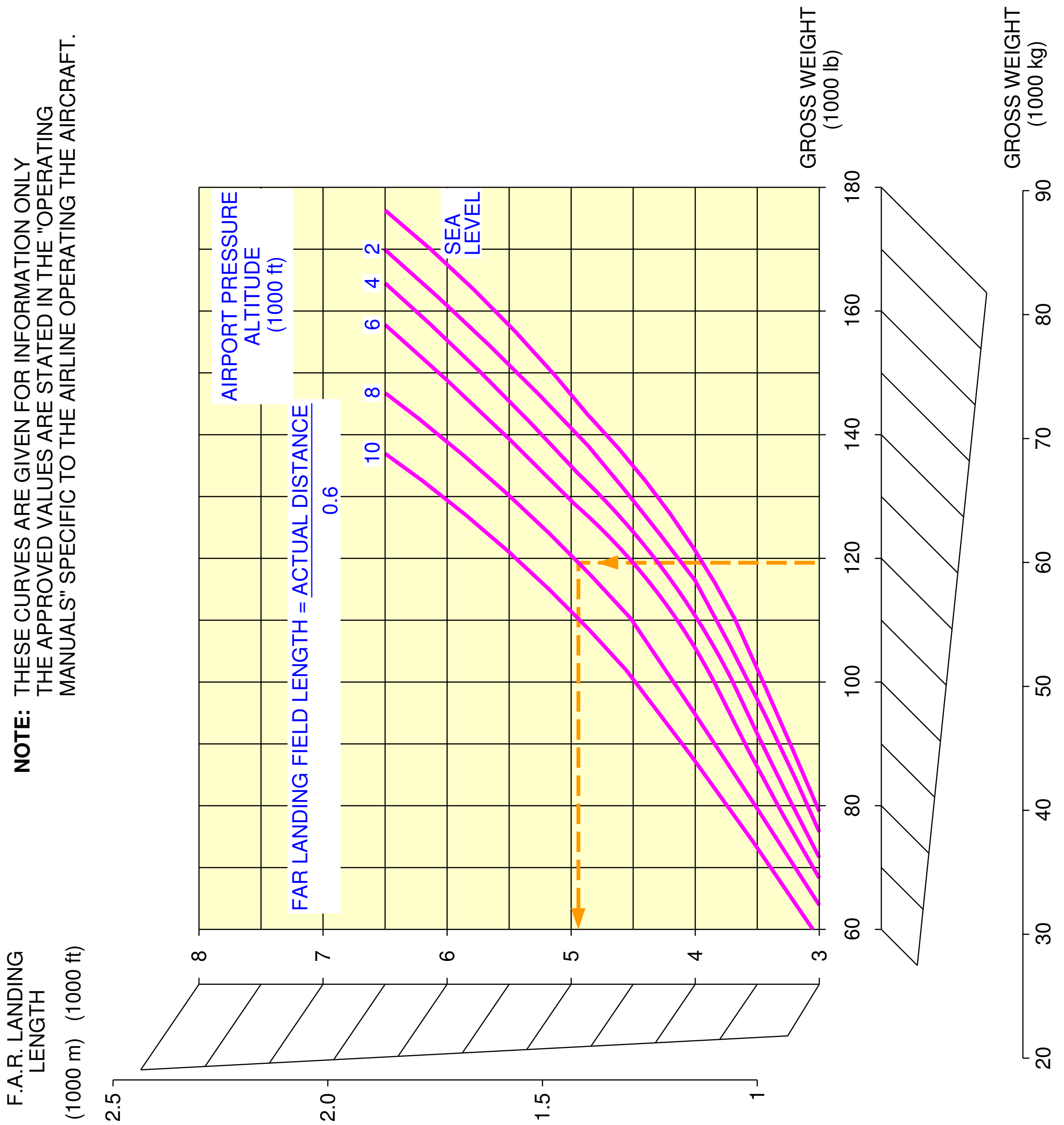
3-4-1 ISA Conditions

****ON A/C A320-100 A320-200**

ISA Conditions

1. This section gives the landing field length.

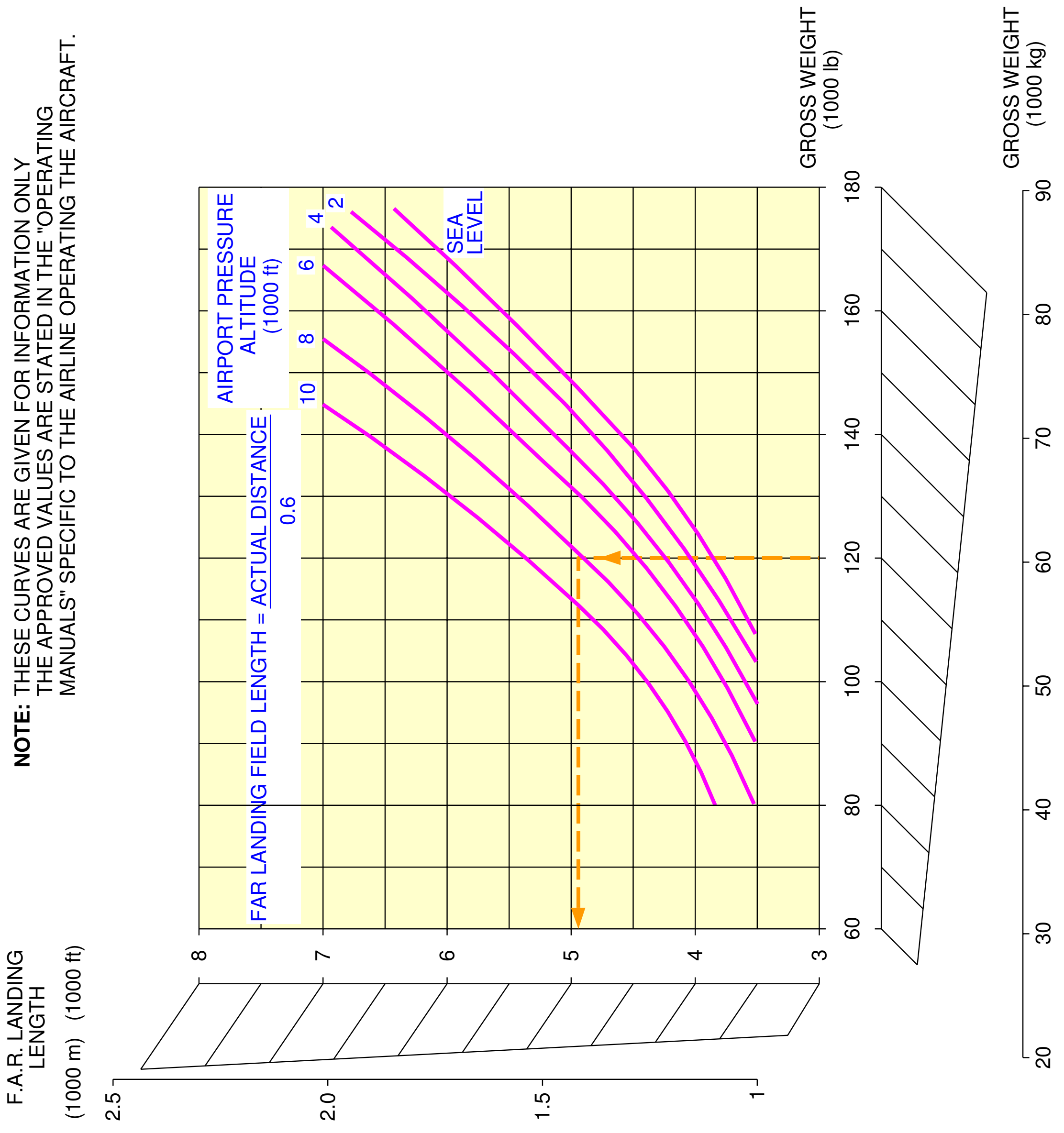
**ON A/C A320-100 A320-200



N_AC_030401_1_0050101_01_00

FAR / JAR Landing Field Length
CFM56 series engine
FIGURE 1

**ON A/C A320-100 A320-200



N_AC_030401_1_0060101_01_00

FAR / JAR Landing Field Length
IAE V2500 series engine
FIGURE 2

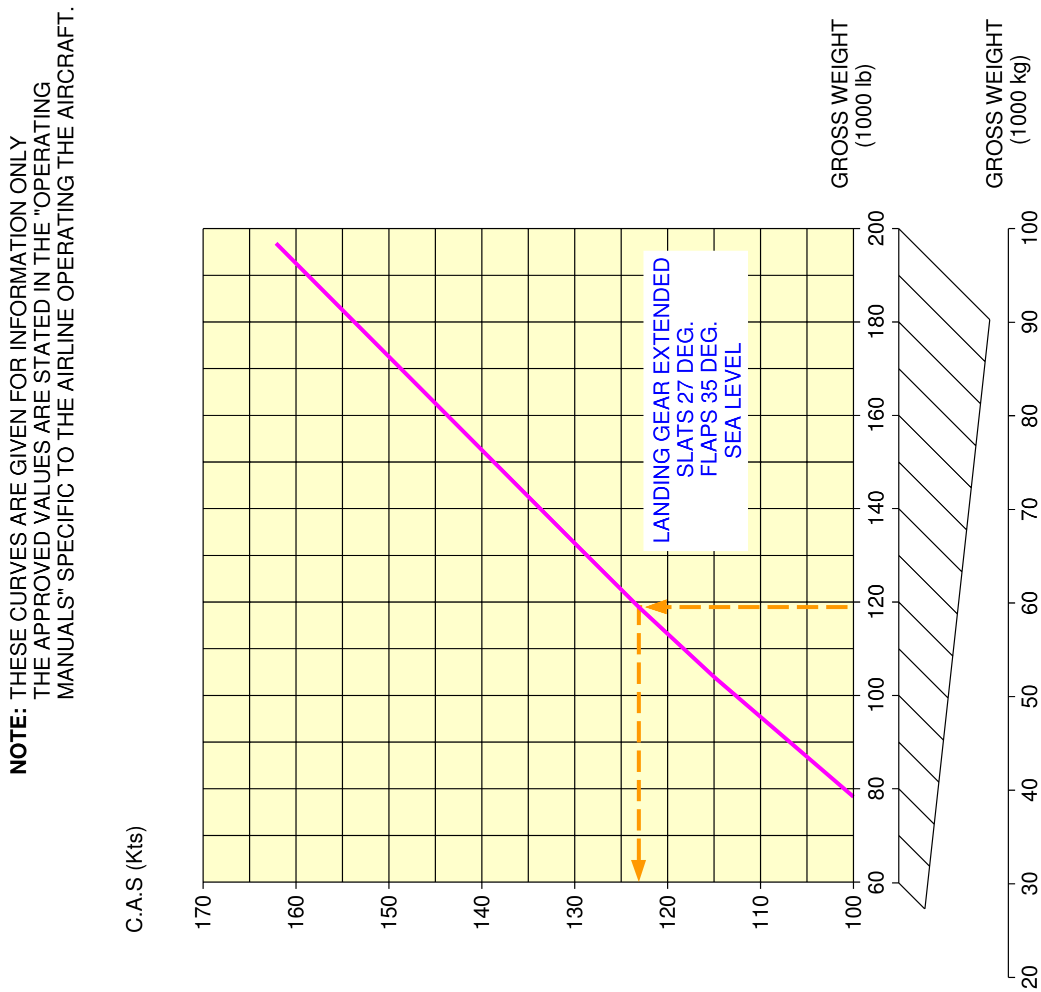
3-5-0 Final Approach Speed

****ON A/C A320-100 A320-200**

Final Approach Speed

1. This section gives the final approach speed.

**ON A/C A320-100 A320-200

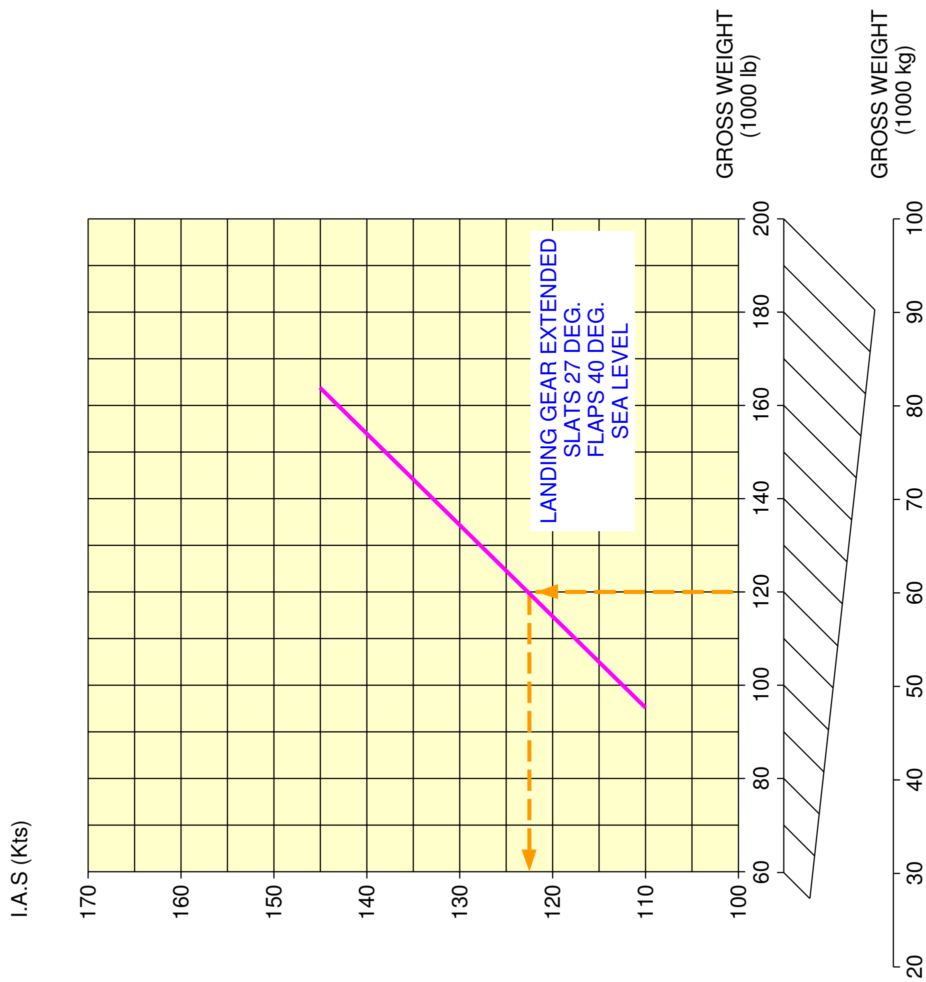


N_AC_030500_1_0050101_01_00

Final Approach Speed
CFM56 series engine
FIGURE 1

****ON A/C A320-100 A320-200**

NOTE: THESE CURVES ARE GIVEN FOR INFORMATION ONLY
THE APPROVED VALUES ARE STATED IN THE "OPERATING
MANUALS" SPECIFIC TO THE AIRLINE OPERATING THE AIRCRAFT.



N_AC_030500_1_0060101_01_00

Final Approach Speed
IAE V2500 series engine
FIGURE 2

GROUND MANEUVERING

4-1-0 General Information

****ON A/C A320-100 A320-200**

General Information

1. This section provides airplane turning capability and maneuvering characteristics.

   For ease of presentation, this data has been determined from the theoretical limits imposed by the geometry of the aircraft, and where noted, provides for a normal allowance for tire slippage. As such, it reflects the turning capability of the aircraft in favorable operating circumstances. This data 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.

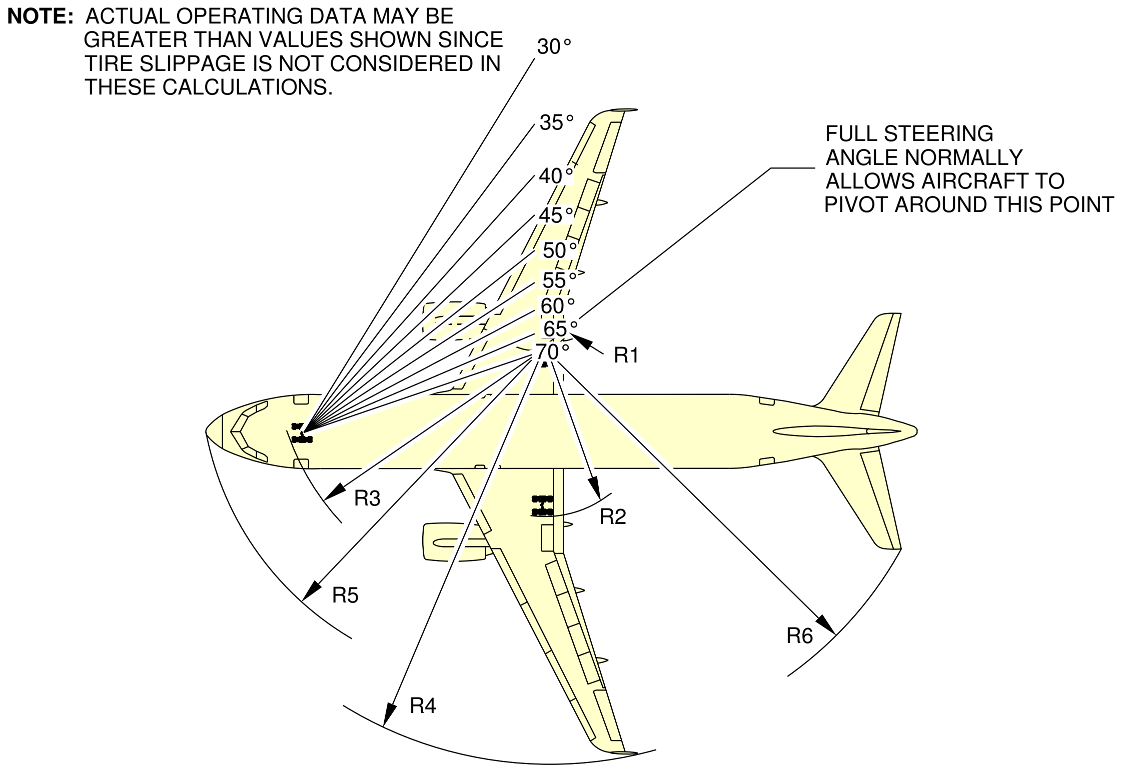
4-2-0 Turning Radii

****ON A/C A320-100 A320-200**

Turning Radii

1. This section gives the turning radii.

**ON A/C A320-100 A320-200

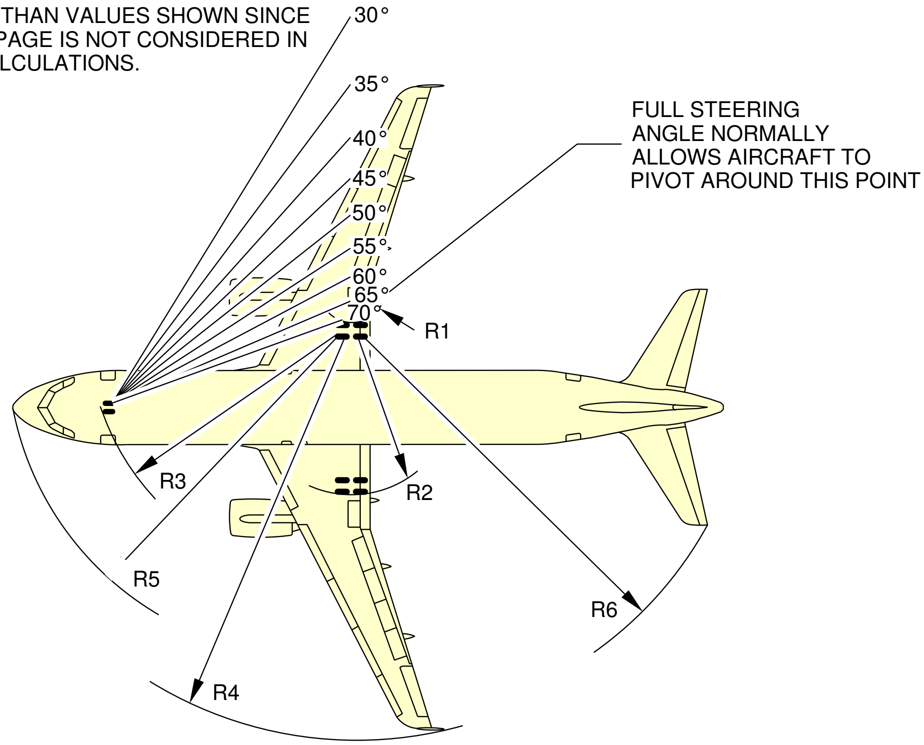


STEERING ANGLE (°)	R1		R2		R3		R4		R5		R6	
	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m
30	57.2	17.43	85.5	26.36	84.1	25.64	128.3	39.1	92.4	28.16	111.4	33.96
35	44.6	13.59	73.9	22.51	73.5	22.40	115.7	35.28	83.0	25.29	101.2	30.86
40	34.8	10.60	64.1	19.53	65.7	20.02	106.0	32.32	76.3	23.25	93.7	28.56
45	26.8	8.18	56.1	17.10	58.9	18.24	98.1	29.92	71.4	21.76	87.9	26.81
50	20.1	6.14	49.4	15.07	55.3	16.86	96.1	27.90	67.7	20.65	83.4	25.42
55	14.4	4.39	43.7	13.31	51.8	15.79	85.9	26.17	65.0	19.80	79.7	24.29
60	9.3	2.83	38.6	11.76	49.1	14.95	80.8	24.64	62.9	19.16	76.6	23.36
65	4.7	1.43	34.0	10.36	47.0	14.31	76.3	23.26	61.2	18.67	74.1	22.58
70	0.5	0.14	29.7	9.06	45.3	13.81	72.2	21.99	60.0	18.3	71.9	21.91

N_AC_040200_1_0050101_01_00

Turning Radii, no Slip Angle
Turning Radii, no Slip Angle – Dual Landing Gear
FIGURE 1

**ON A/C A320-100 A320-200



STEERING ANGLE (°)	R1		R2		R3		R4		R5		R6	
	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m
30	57.6	17.55	86.1	26.23	84.1	25.64	128.3	39.1	92.4	28.16	111.4	33.96
35	45.0	13.71	73.5	22.39	73.5	22.40	115.7	35.28	83.0	25.29	101.2	30.86
40	35.2	10.72	63.7	19.40	65.7	20.02	106.0	32.32	76.3	23.25	93.7	28.56
45	27.2	8.3	55.7	16.98	58.9	18.24	98.1	29.92	71.4	21.76	87.9	26.81
50	20.6	6.27	49.0	14.95	55.3	16.86	96.1	27.90	67.7	20.65	83.4	25.42
55	14.8	4.51	43.3	13.19	51.8	15.79	85.9	26.17	65.0	19.80	79.7	24.29
60	9.7	2.96	38.2	11.64	49.1	14.95	80.8	24.64	62.9	19.16	76.6	23.36
65	5.1	1.55	33.6	10.23	47.0	14.31	76.3	23.26	61.2	18.67	74.1	22.58
70	0.9	0.26	29.3	8.94	45.3	13.81	72.2	21.99	60.0	18.3	71.9	21.91

N_AC_040200_1_0060101_01_01

Turning Radii, no Slip Angle
Turning Radii, no Slip Angle – Bogie Landing Gear
FIGURE 2

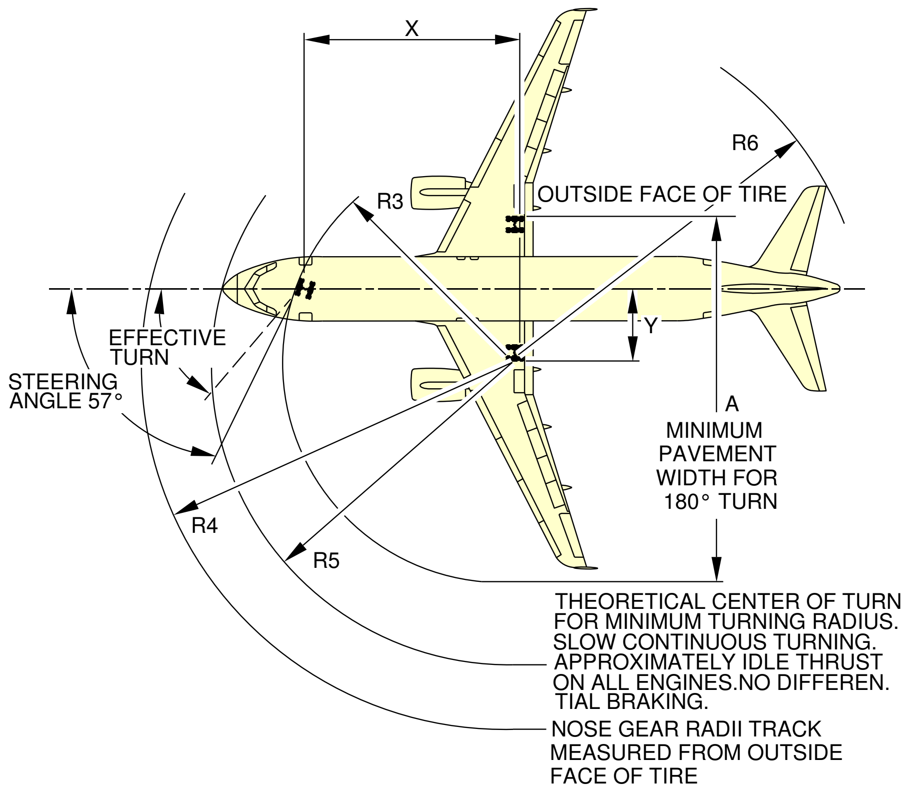
4-3-0 Minimum Turning Radii

****ON A/C A320-100 A320-200**

Minimum Turning Radii

1. This section gives the minimum turning radii.

**ON A/C A320-100 A320-200



EFFECTIVE TURN ANGLE		X	Y	A*	R3	R4	R5	R6
70°	m	12.64	4.60	22.9	13.81	21.99	18.30	21.91
	(ft)	41.5	15.1	75.1	45.3	72.2	60.0	71.9

* FOR DUAL L/G.
FOR BOGIE L/G. A = 22.75 m (74.64 ft)

N_AC_040300_1_0030101_01_00

Minimum Turning Radii
FIGURE 1

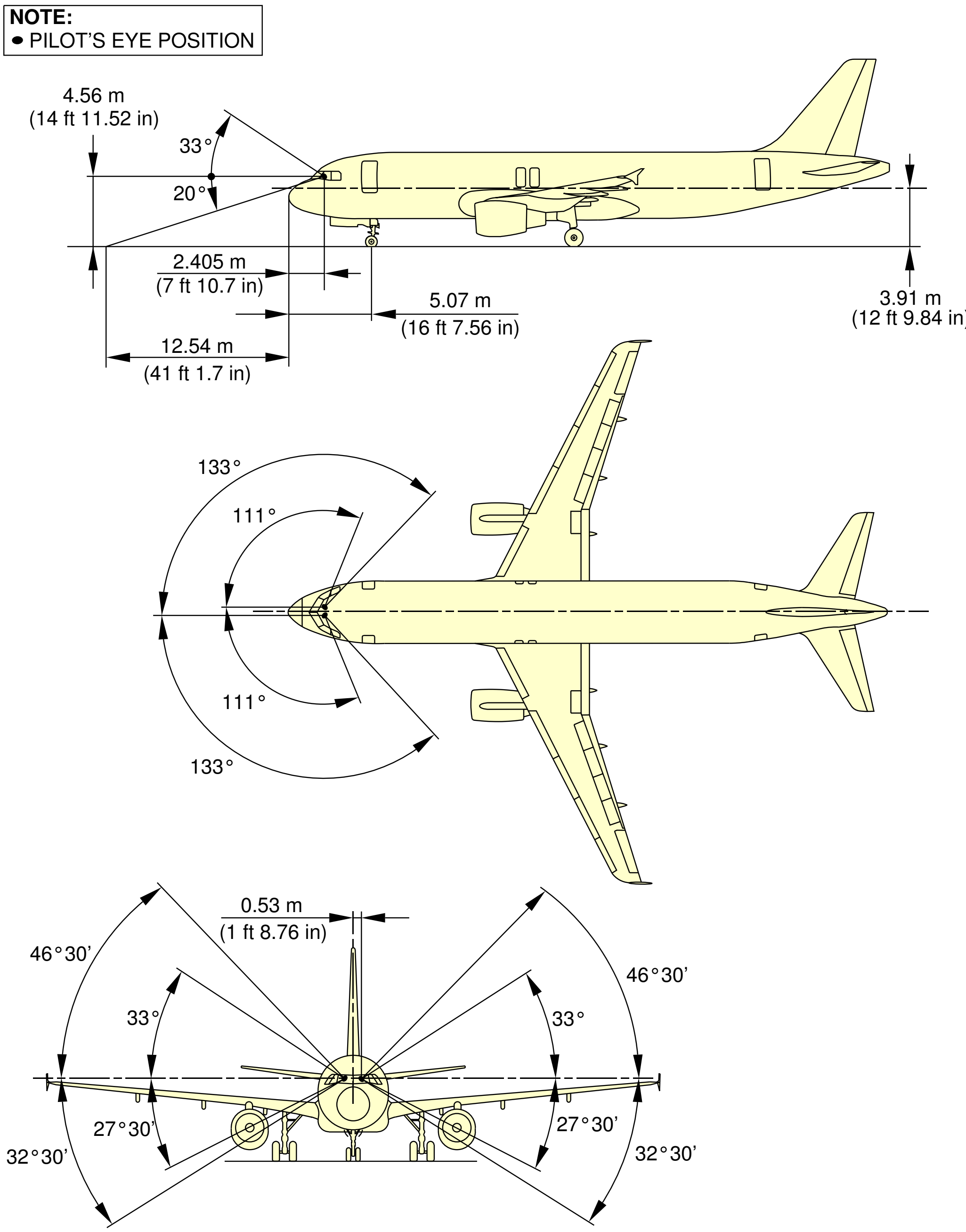
4-4-0 Visibility from Cockpit in Static Position

****ON A/C A320-100 A320-200**

Visibility from Cockpit in Static Position

1. This section gives the visibility from cockpit in static position.

**ON A/C A320-100 A320-200



N_AC_040400_1_0030101_01_00

Visibility from Cockpit in Static Position
FIGURE 1

4-5-0 Runway and Taxiway Turn Paths

****ON A/C A320-100 A320-200**

Runway and Taxiway Turn Paths

1. Runway and Taxiway Turn Paths.

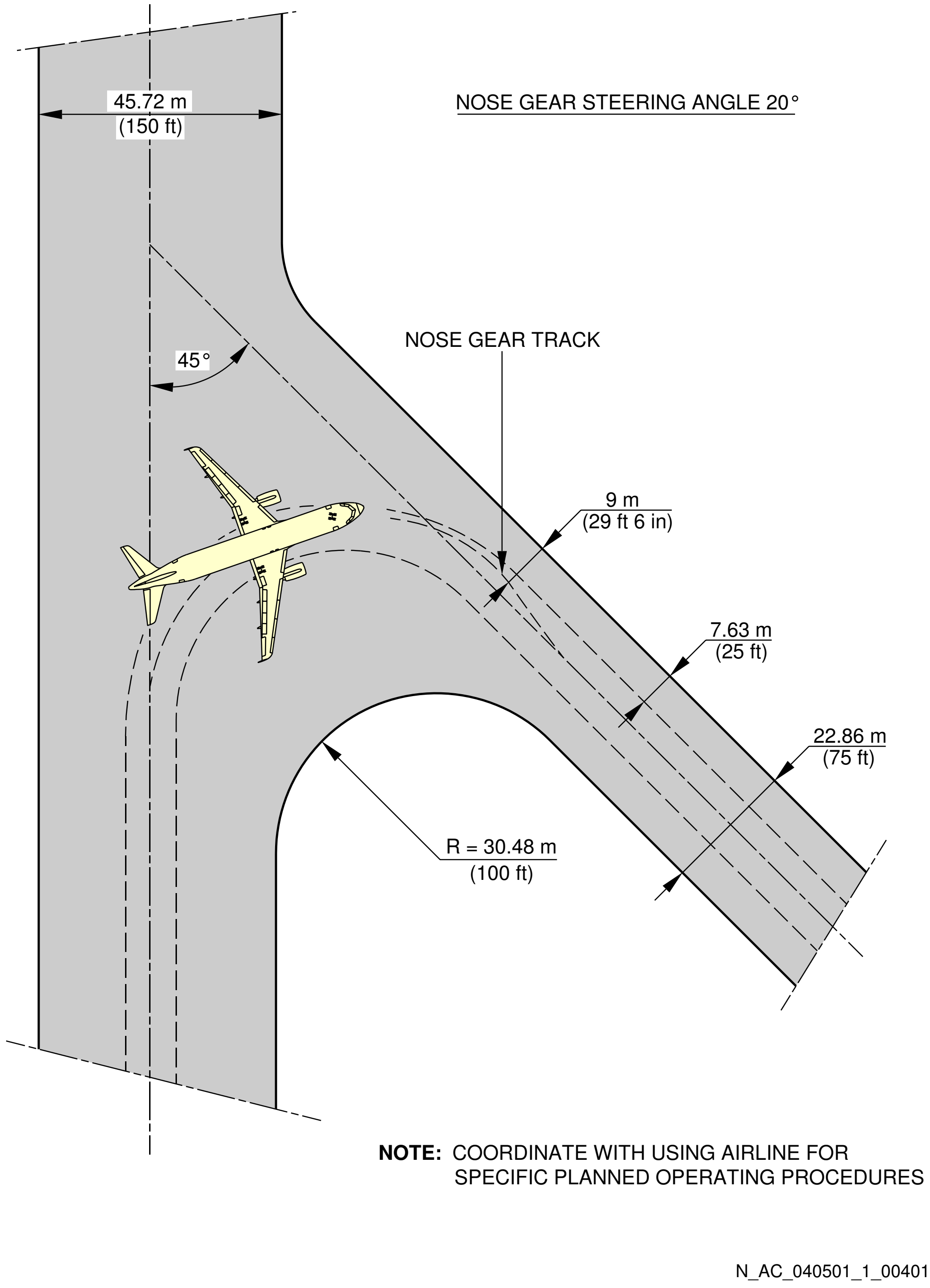
4-5-1 135° Turn - Runway to Taxiway

****ON A/C A320-100 A320-200**

135° Turn - Runway to Taxiway

1. This section gives the 135° turn - runway to taxiway.

**ON A/C A320-100 A320-200



135° Turn - Runway to Taxiway
FIGURE 1

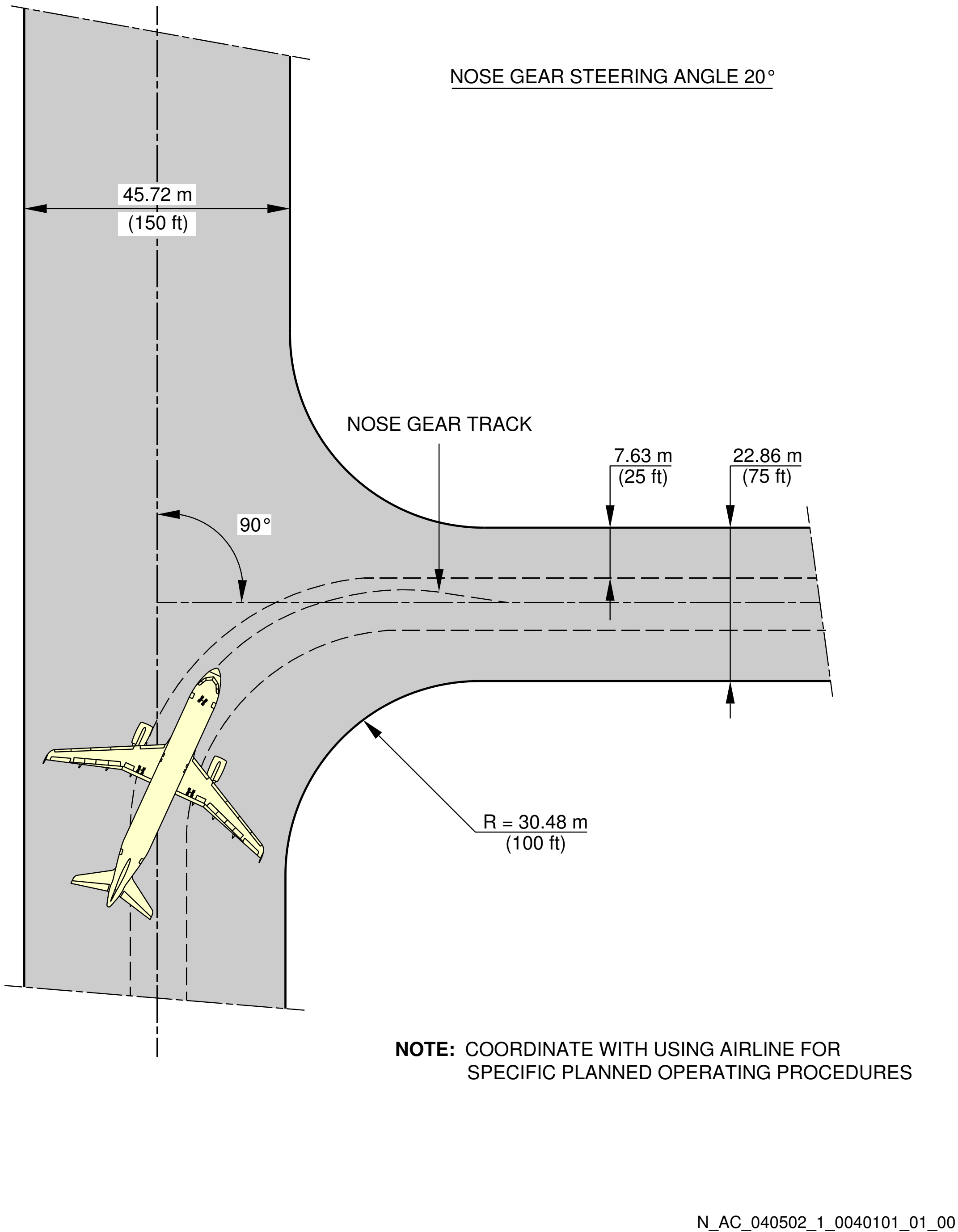
4-5-2 90° Turn - Runway to Taxiway

****ON A/C A320-100 A320-200**

90° Turn - Runway to Taxiway

1. This section gives the 90° turn - runway to taxiway.

****ON A/C A320-100 A320-200**



90° Turn - Runway to Taxiway
FIGURE 1

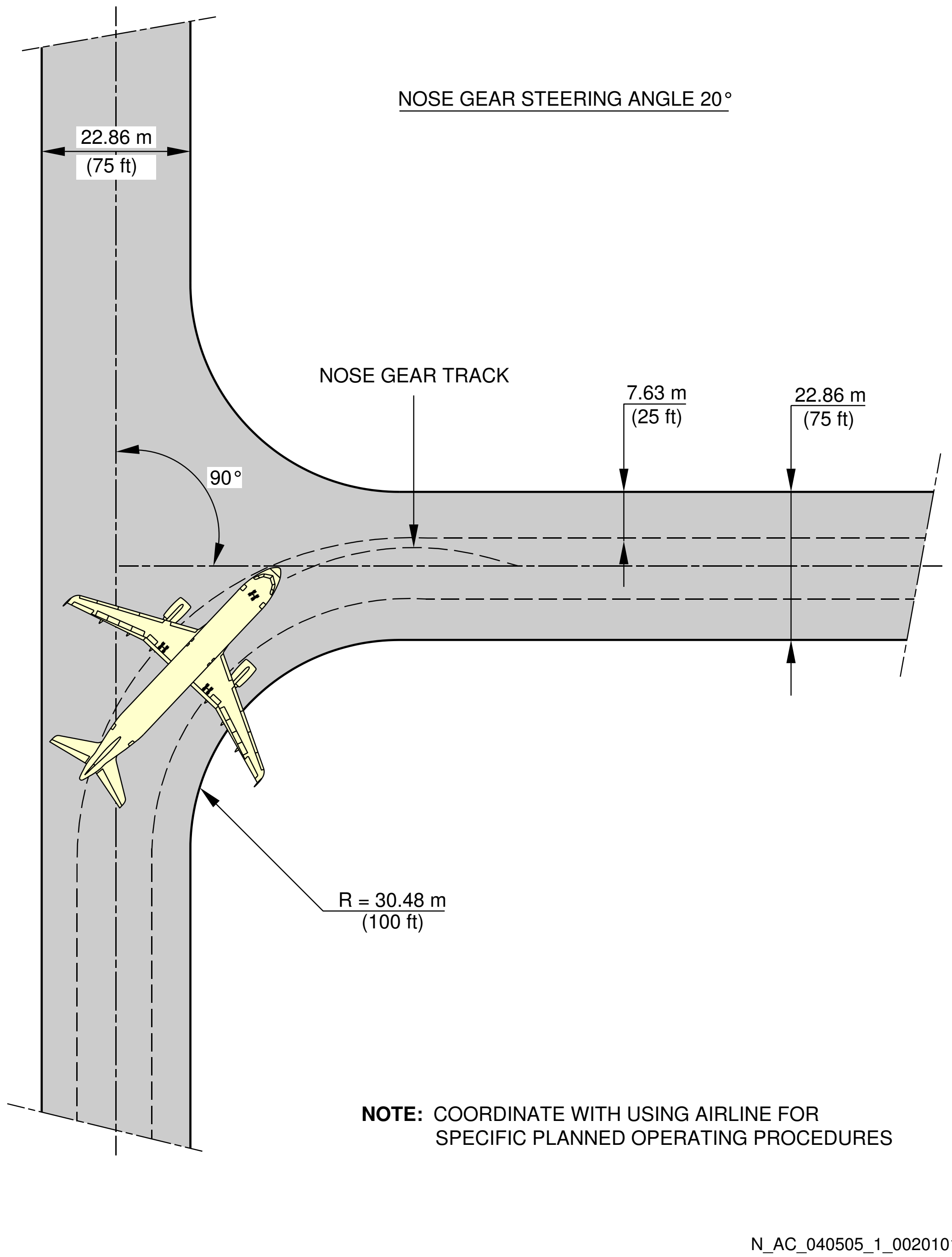
4-5-5 90° Turn - Taxiway to Taxiway

****ON A/C A320-100 A320-200**

90° Turn - Taxiway to Taxiway

1. This section gives the 90° turn - taxiway to taxiway.

**ON A/C A320-100 A320-200



90° Turn - Taxiway to Taxiway
FIGURE 1

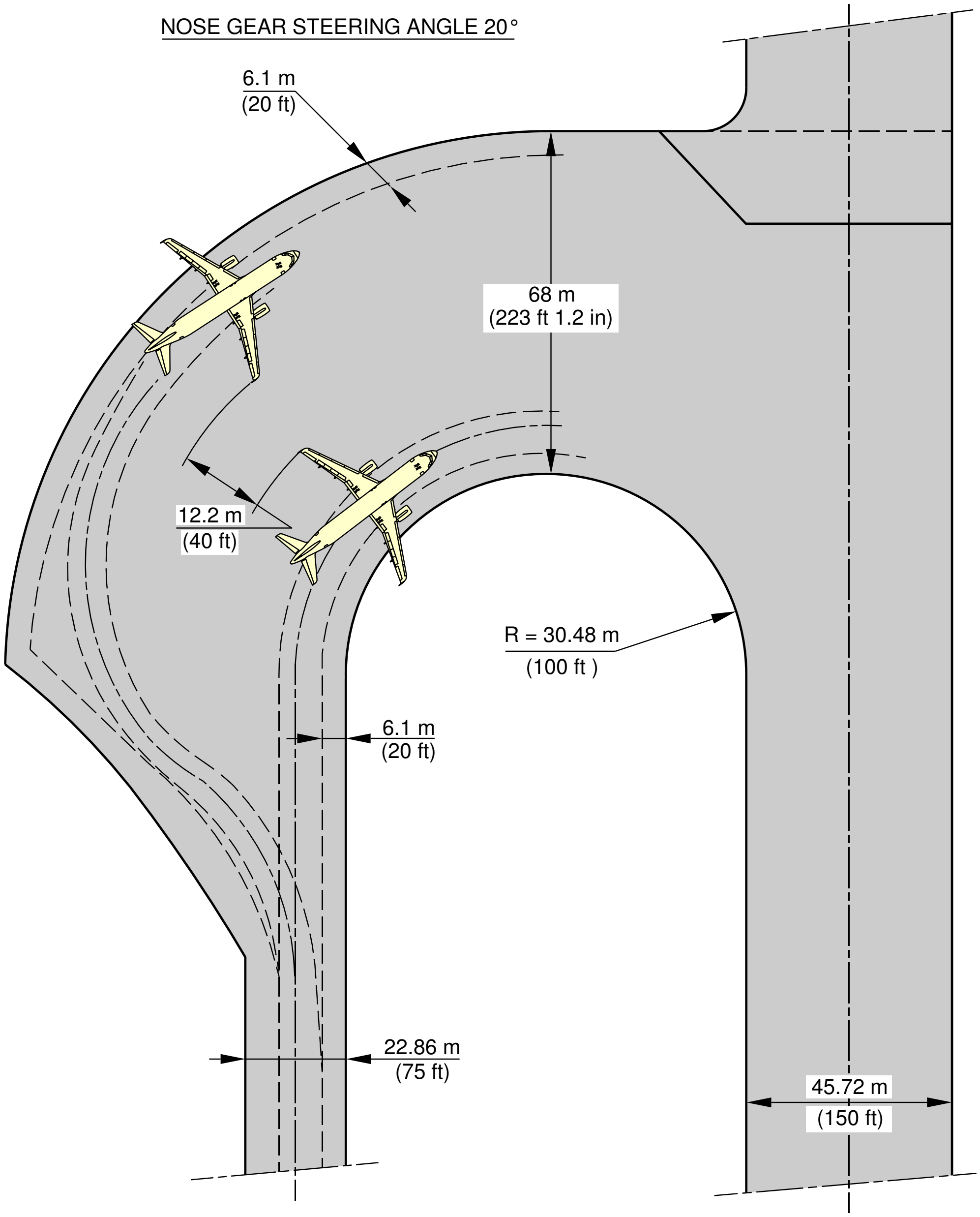
4-6-0 Runway Holding Bay (Apron)

****ON A/C A320-100 A320-200**

Runway Holding Bay (Apron)

1. This section gives the runway holding bay (Apron).

**ON A/C A320-100 A320-200



NOTE: COORDINATE WITH USING AIRLINE FOR SPECIFIC PLANNED OPERATING PROCEDURES

N_AC_040600_1_0030101_01_00

Runway Holding Bay (Apron)
FIGURE 1

TERMINAL SERVICING

5-0-0 TERMINAL SERVICING

****ON A/C A320-100 A320-200**

Terminal Servicing

1. General
   This chapter provides typical ramp layouts, corresponding minimum turnaround time estimations, locations of ground service points and service requirements.
   The information given in this chapter reflects ideal conditions. Actual ramp layouts and service requirements may vary according to local regulations, airline procedures and the airplane condition.
   - Section 5.1 shows typical ramp layouts for passenger aircraft at the gate or on an open apron.
   - Section 5.2 shows the minimum turnaround schedules for full servicing arrangements.
   - Section 5.3 shows the minimum turnaround schedule for reduced servicing arrangements.
   - Section 5.4 gives the locations of ground service connections, the standard of connections used and typical capacities and requirements.
   - Section 5.5 provides the engine starting pneumatic requirements for different engine types and different ambient temperatures.
   - Section 5.6 provides the air conditioning requirements for heating and cooling (pull-down and pull-up) using ground conditioned air for different ambient temperatures.
   - Section 5.7 provides the air conditioning requirements for heating and cooling to maintain a constant cabin air temperature using low pressure conditioned air.
   - Section 5.8 shows the ground towing requirements taking into account different ground surface and aircraft conditions.

5-1-0 Airplane Servicing Arrangements

****ON A/C A320-100 A320-200**

Airplane Servicing Arrangements

1. General

   This chapter provides typical ramp layouts, showing the various GSE items in position during typical turnaround scenarios for the passenger aircraft.

   These ramp layouts show typical arrangements only. Each operator will have its own specific requirements/regulations for the positioning and operation on the ramp.

   The associated turnaround chart for full servicing is given in section 5.2.
   The associated turnaround chart for minimum servicing arrangement is given in section 5.3.

5-1-1 Symbols Used on Servicing Diagrams

****ON A/C A320-100 A320-200**

Symbols Used on Servicing Diagrams

1. This table gives the symbols used on servicing diagrams.

Ground Support Equipment	
AC	AIR CONDITIONING UNIT
AS	AIR STARTING UNIT
BULK	BULK TRAIN
CAT	CATERING TRUCK
CB	CONVEYOR BELT
CLEAN	CLEANING TRUCK
FUEL	FUEL HYDRANT DISPENSER or TANKER
GPU	GROUND POWER UNIT
LD CL	LOWER DECK CARGO LOADER
LV	LAVATORY VEHICLE
PBB	PASSENGER BOARDING BRIDGE
PS	PASSENGER STAIRS
TOW	TOW TRACTOR
ULD	ULD TRAIN
WV	POTABLE WATER VEHICLE

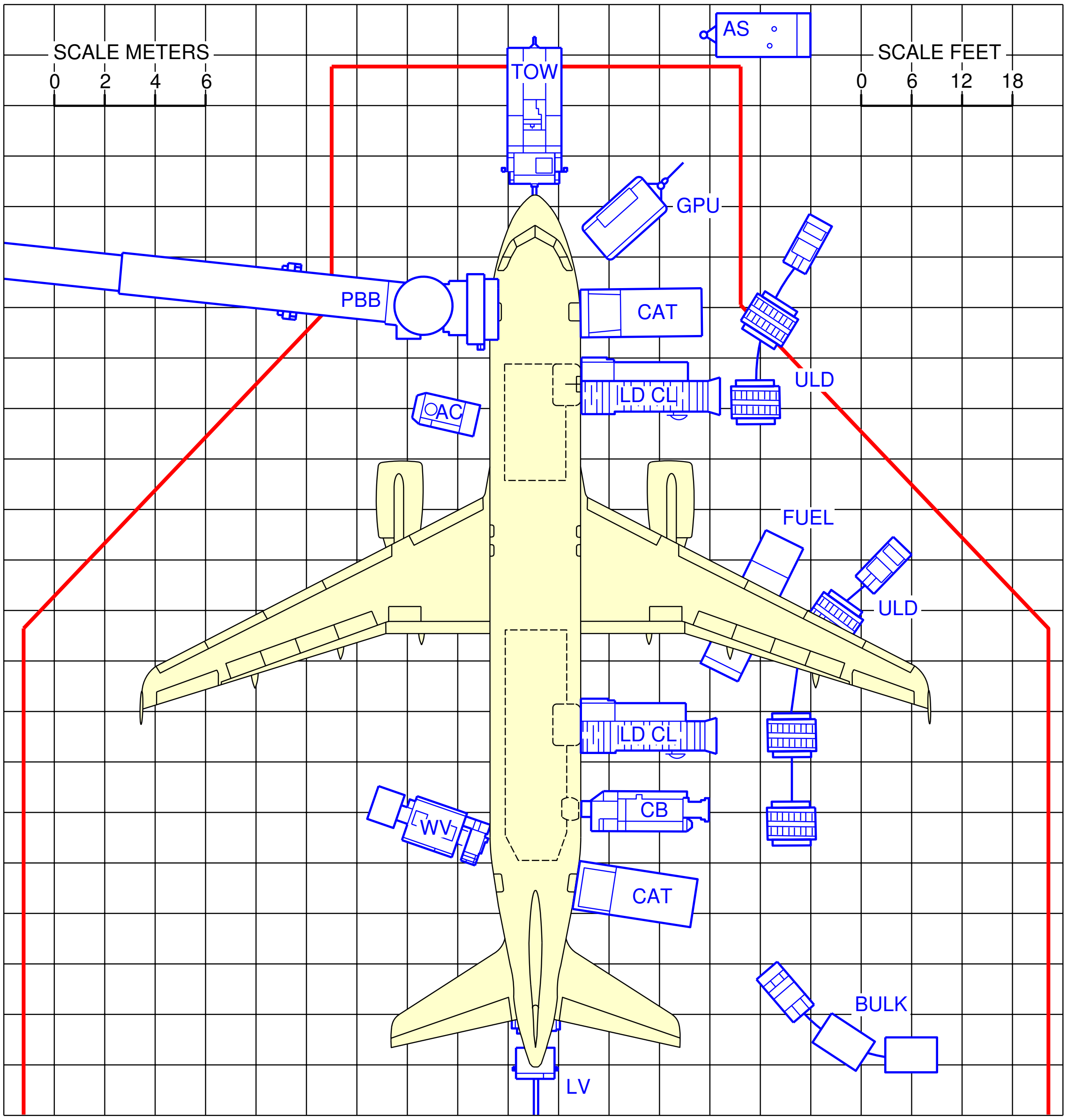
5-1-2 Typical Ramp Layout - Aircraft at the Gate

**ON A/C A320-100 A320-200

Aircraft at the Gate

1. This section gives the typical servicing arrangement for pax version (Passenger Bridge).

**ON A/C A320-100 A320-200



N_AC_050102_1_0030101_01_02

Aircraft at the Gate
FIGURE 1

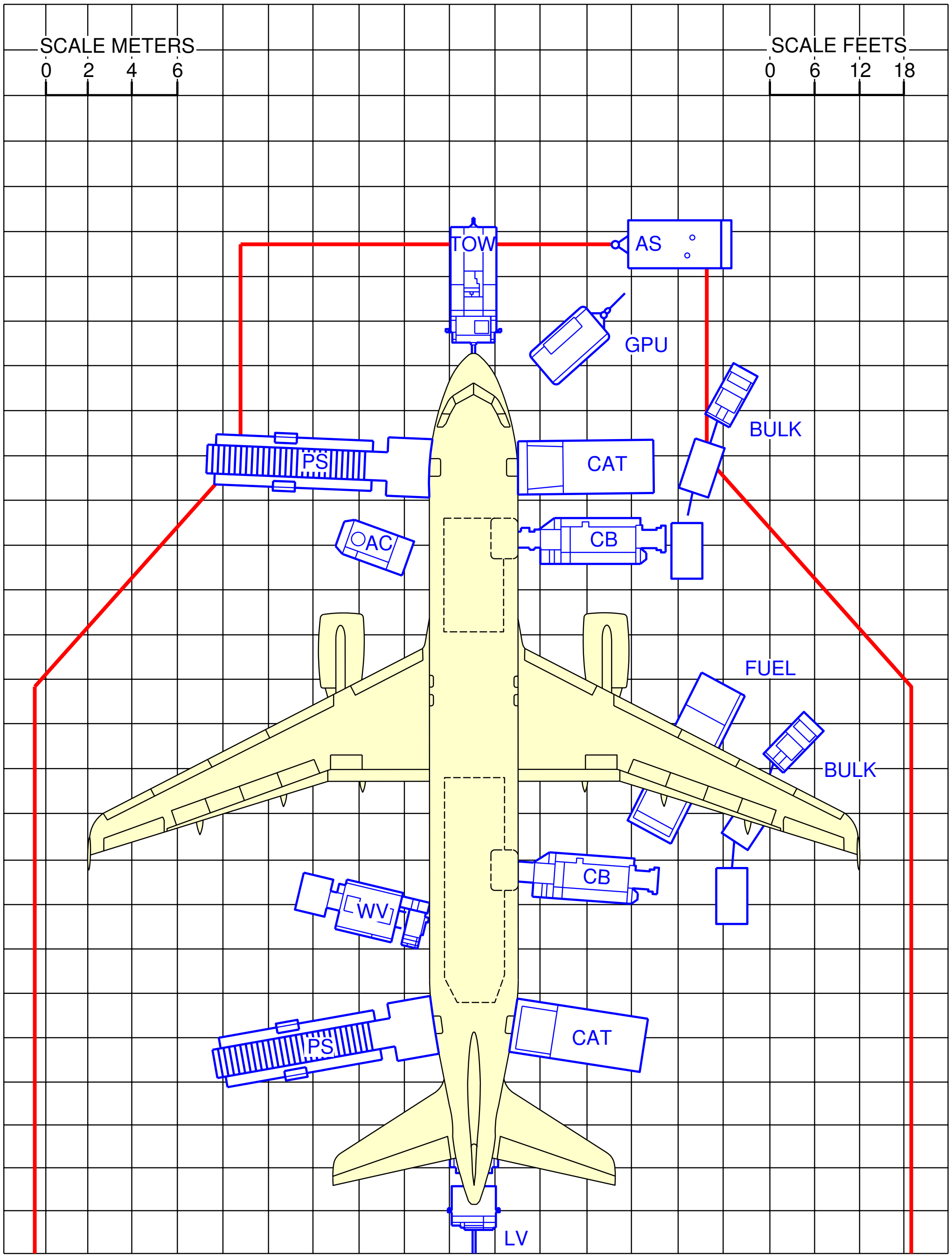
5-1-3 Typical Ramp Layout - Aircraft at an Open Apron

**ON A/C A320-100 A320-200

Aircraft at an Open Apron

1. This section gives the typical servicing arrangement for pax version (Open Apron).

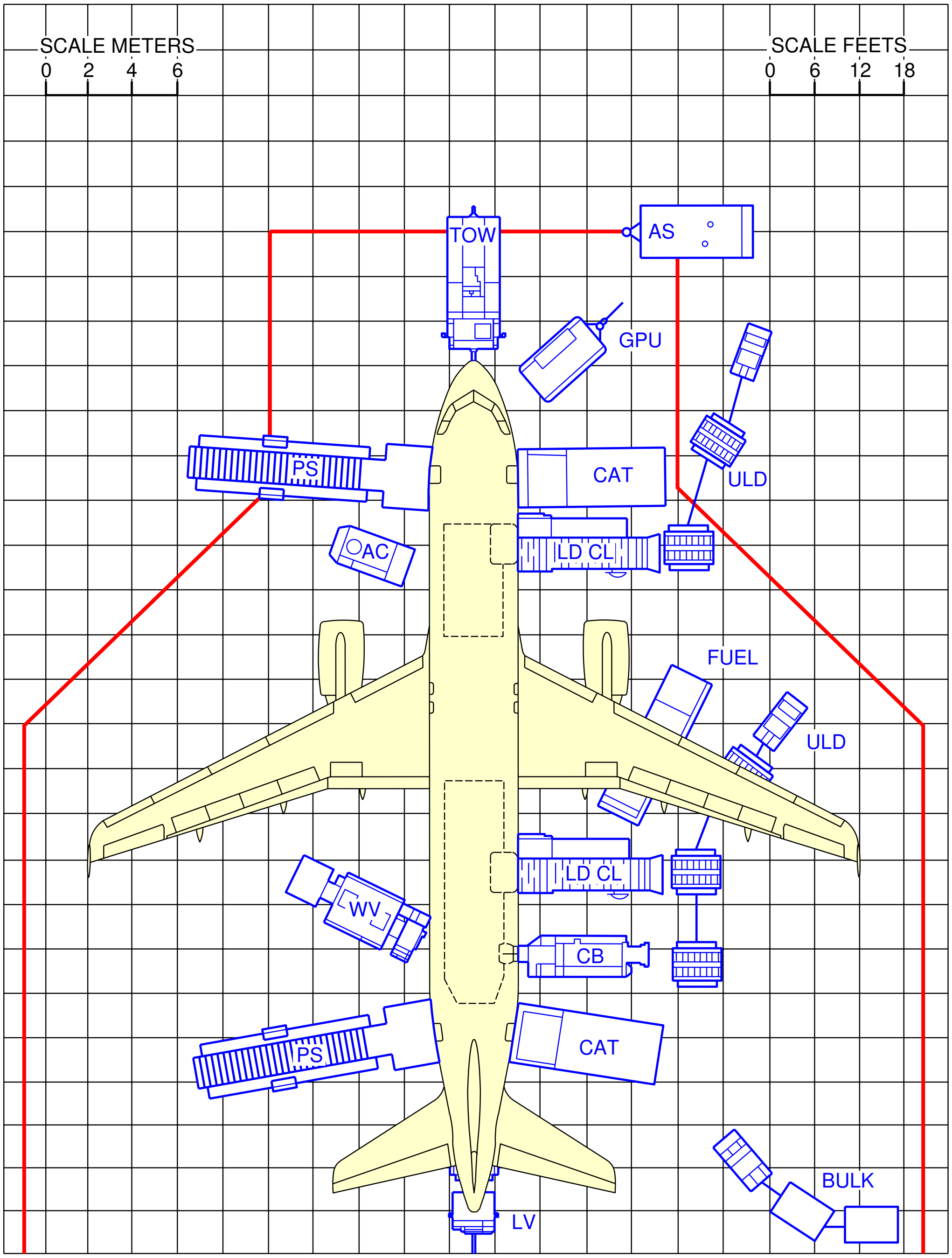
**ON A/C A320-100 A320-200



N_AC_050103_1_0020101_01_02

Aircraft at an Open Apron
Aircraft at an Open Apron (Bulk Loading)
FIGURE 1

**ON A/C A320-100 A320-200



N_AC_050103_1_0070101_01_01

Aircraft at an Open Apron
Aircraft at an Open Apron (ULD Loading)
FIGURE 2

5-2-0 Terminal Operations - Full Servicing Turnaround

**ON A/C A320-100 A320-200

Terminal Operations - Full Servicing Turnaround

1. This section provides a chart showing typical activities for full servicing turnaround.

   These data are provided to show the general scope and type of activities involved in ramp operations during the turnaround of an aircraft.

   Varying airline practices and operating circumstances may result in different sequences and different time intervals to do the activities shown.

5-2-1 Full Servicing Turnaround Charts

****ON A/C A320-100 A320-200**

Full Servicing Turnaround Charts

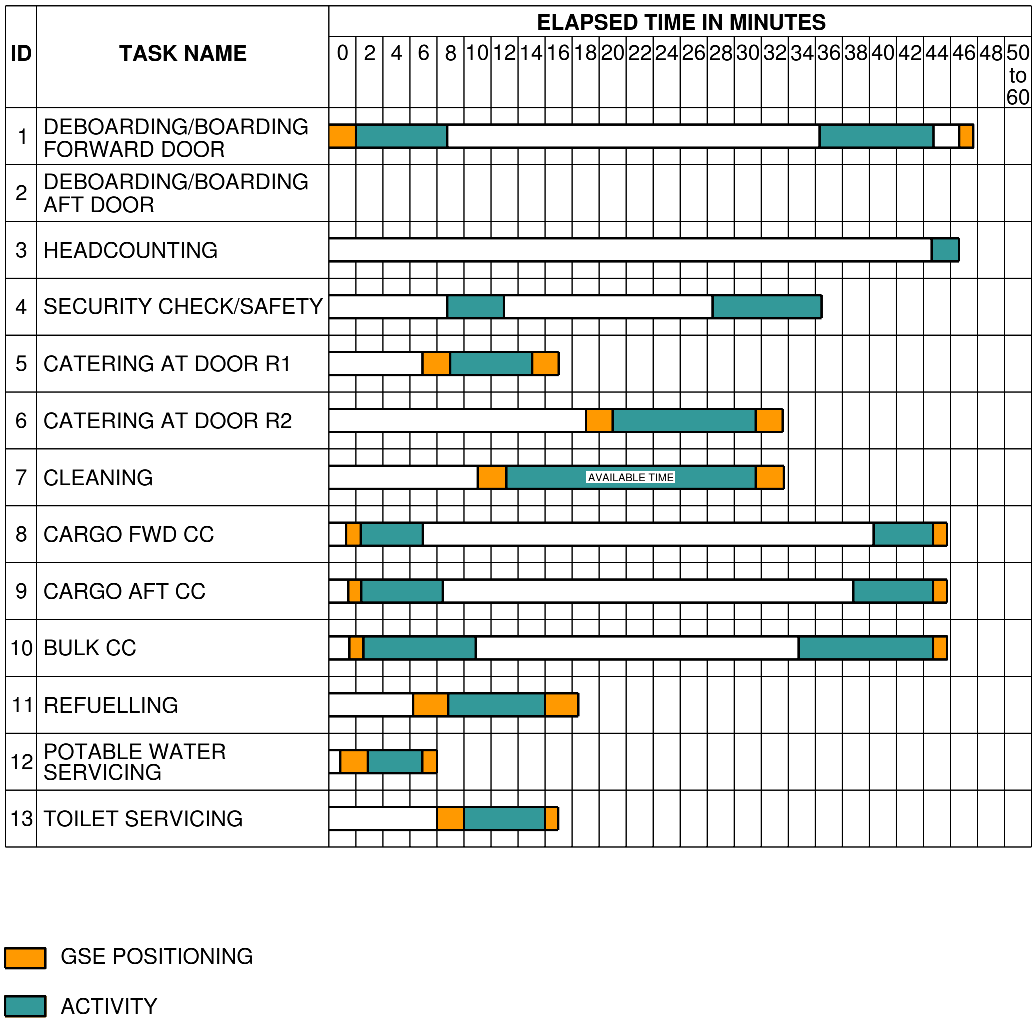
1. Assumptions for 48 minutes turnaround chart - Full Servicing.

   Please note this turnaround time is an assumption regarding a given example.

   A. Passenger handling: 150 pax / 1 bridge
      (1) Deboarding
         - 1L:150
         - 2L:0
         - Deboarding rate: 22 pax / min per door.
         - No PRM
      (2) Boarding
         - 1L:150
         - 2L:0
         - Boarding rate: 18 pax / min per door.
         - No PRM
   B. Catering: R1 - R 2 / sequential
      - Galley M1: 4 FSTE
      - Galley M2: 7 FSTE
   C. Cleaning: Time available
   D. Security/Safety checks: Yes (4 min each)
      - Cabin crew change: Yes (4 min)
   E. Cargo
      - 2 Cargo loaders
      - 1 Belt loader
      - 1 operator / BL
      - No sliding carpet
      - FWD compartment : 3 LD3
      - AFT compartment : 4 LD3
      - Bulk in bulk CC: 1000 kg
   F. Refuel: 5.6 tons, 7134 (l), 2 hoses (1 side)
   G. Water servicing: 100%
   H. Toilet servicing: 100%

**ON A/C A320-100 A320-200

TRT: 48 min



N_AC_050201_1_0050101_01_02

Turnaround Stations
Full Servicing (48 Min.)
FIGURE 1

5-3-0 Terminal Operation - Minimum Servicing Turnaround

****ON A/C A320-100 A320-200**

Terminal Operation

1. This section provides a chart showing typical activities for minimum servicing turnaround.

   These data are provided to show the general scope and type of activities involved in ramp operations during the turnaround of an aircraft.

   Varying airline practices and operating circumstances may result in different sequences and different time intervals to do the activities shown.

5-3-1 Minimum Servicing Turnaround Chart

****ON A/C A320-100 A320-200**

Minimum Servicing Turnaround Chart

1. Assumptions for 23 minutes turnaround chart - Minimum Servicing.

   Please note this turnaround time is an assumption regarding a given example.

   A. Passenger handling: 180 pax / 2 stairways
      (1) Deboarding
         - 1L:90
         - 2L:90
         - Deboarding rate: 20 pax / min per door.
         - No PRM
      (2) Boarding
         - 1L:90
         - 2L:90
         - Boarding rate: 15 pax / min per door.
         - No PRM

   B. Catering: No
      - Galley M1:
      - Galley M2:

   C. Cleaning: No

   D. Security/Safety checks: Yes (4 min each)
      - Cabin crew change: No

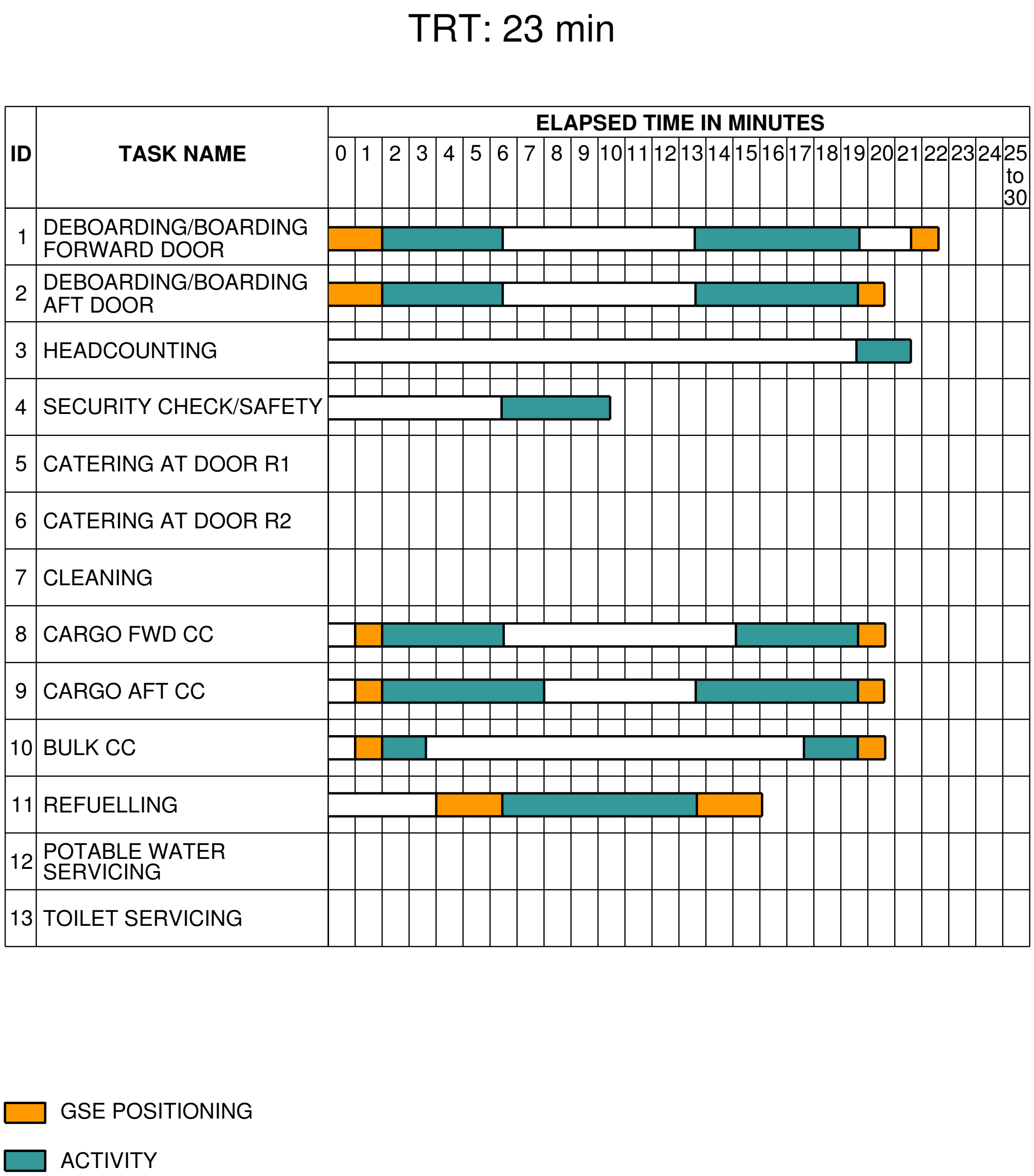
   E. Cargo
      - 2 Cargo loaders
      - 1 Belt loader
      - 1 operator / BL
      - No sliding carpet
      - FWD compartment bulk: 3 LD3
      - AFT compartment bulk: 4 LD3
      - Bulk in bulk CC: 1000 kg

   F. Refuel: 5.6 tons, 7134 (l), 2 hoses (1 side)

   G. Water servicing: 0%:

   H. Toilet servicing: 0%

**ON A/C A320-100 A320-200



N_AC_050301_1_0030101_01_02

Turnaround Stations
Minimum Servicing (23 Min.)
FIGURE 1

5-4-0 Ground Service Connections

****ON A/C A320-100 A320-200**

Ground Service Connections

1. Ground Service Connections.

5-4-1 Ground Service Connections Layout

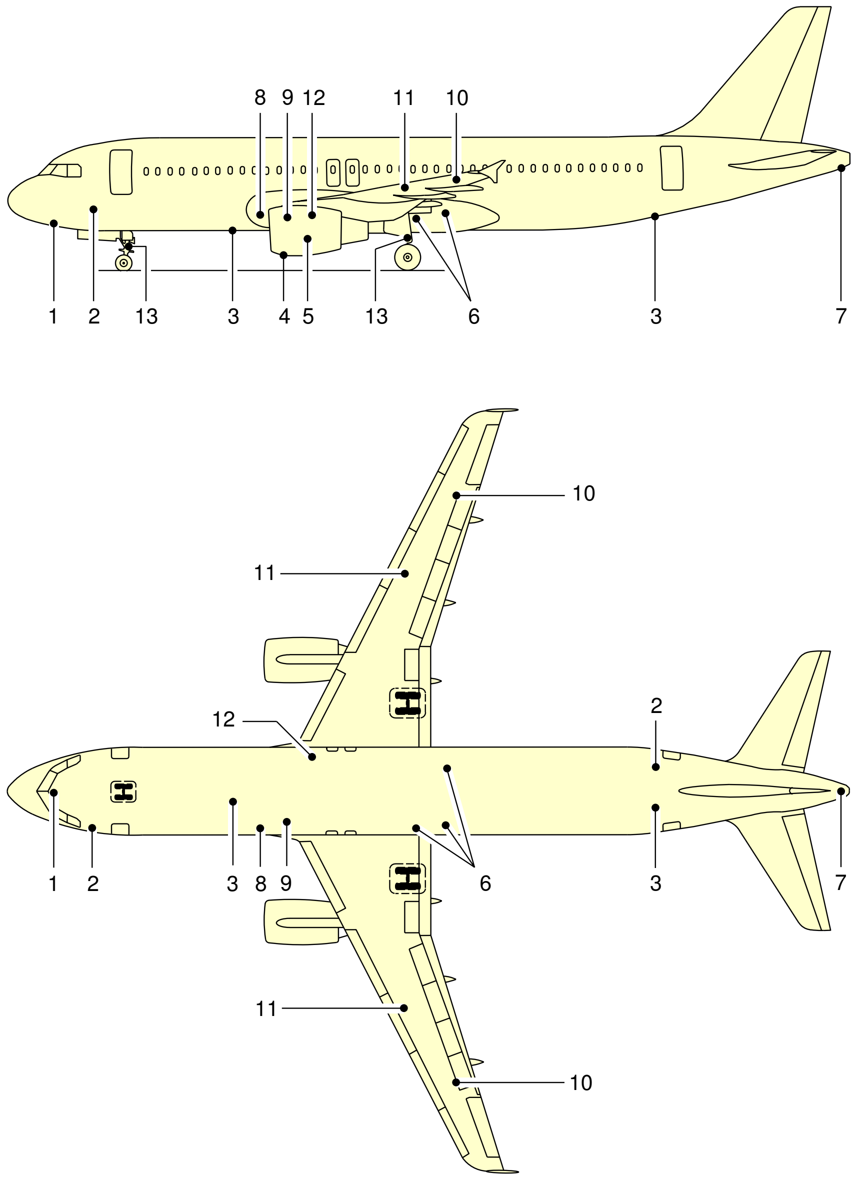
****ON A/C A320-100 A320-200**

Ground Service Connections Layout

1. This section gives the ground service connections layout.

Ground Service Connections Layout	
1	– GROUND ELECTRICAL POWER RECEPTABLE
2	– TOILET SERVICING
3	– WATER FILLING AND DRAINAGE
4	– IDG OIL FILLING CONNECTOR
5	– ENGINE OIL FILLING CONNECTOR
6	– HYDRAULIC
7	– APU OIL FILLING CONNECTOR
8	– GROUND SERVICE CONDITIONED AIR CONNECTOR
9	– GROUND AIR CONDITIONING AND AIR START CONNECTOR
10	– GRAVITY FILLING PANELS
11	– REFUEL/DEFUEL CONNECTOR
12	– REFUEL/DEFUEL PANEL
13	– AIRCRAFT GROUNDING

****ON A/C A320-100 A320-200**



N_AC_050401_1_0050101_01_00

Ground Service Connections
Ground Service Connections Layout
FIGURE 1

5-4-2 Grounding Points

****ON A/C A320-100 A320-200**

Grounding Points

1. Grounding Points.

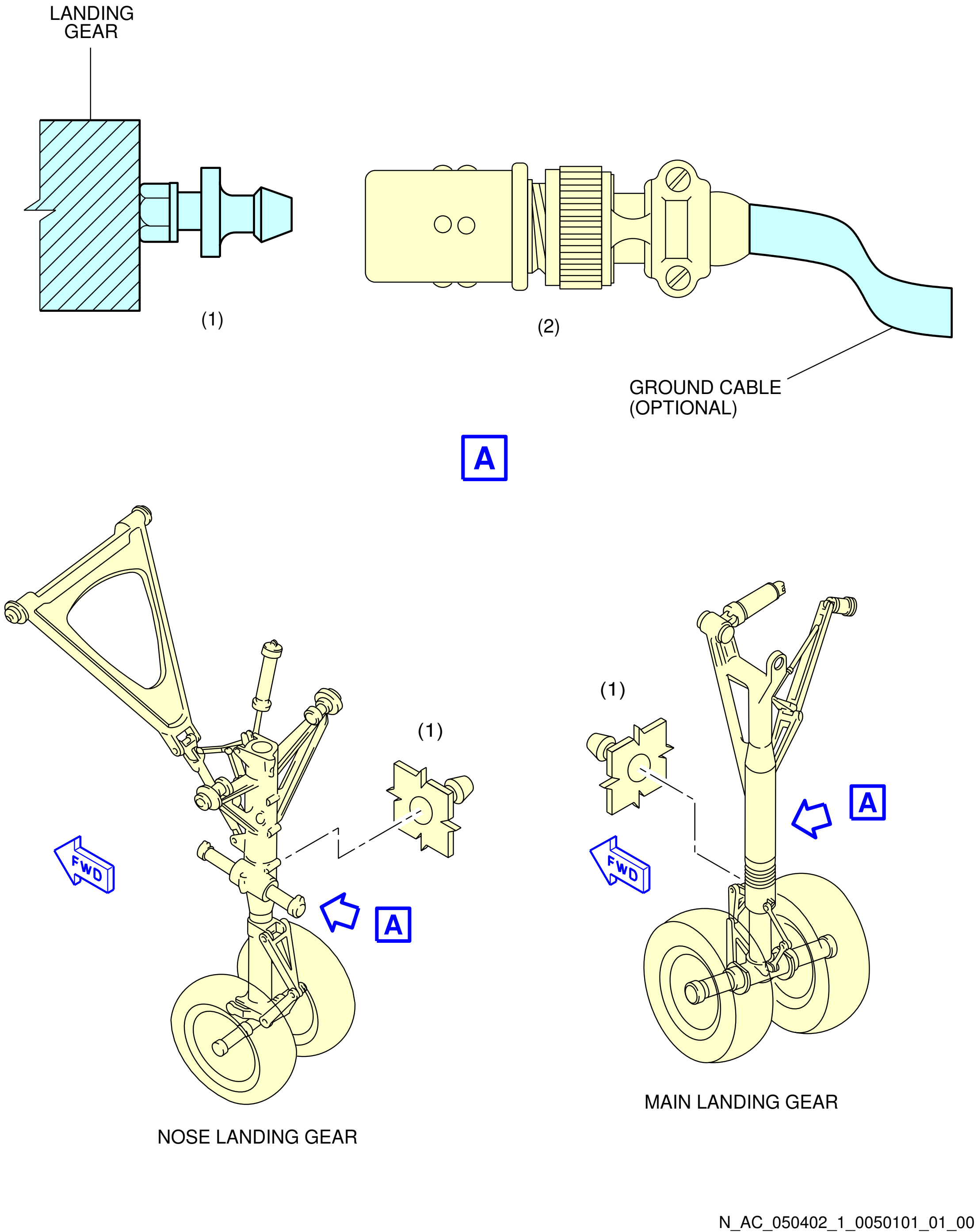
	DISTANCE: Meters (ft)			
	AFT OF NOSE	FROM AIRPLANE CENTERLINE		MEAN HEIGHT FROM GROUND
		R SIDE	L SIDE	
On Nose Landing Gear leg:	5.07 m (16.63 ft)	on centerline		0.94 m (3.08 ft)
On left Main Landing Gear leg:	20.25 m (66.44 ft)		3.79 m (12.43 ft)	1.07 m (3.51 ft)
On right Main Landing Gear leg:	20.25 m (66.44 ft)	3.79 m (12.43 ft)		1.07 m (3.51 ft)

A. The grounding stud on each landing gear leg is designed for use with a clip-on connector (such as Appleton TGR).

B. The grounding studs are used to connect the aircraft to an approved ground connection on the ramp or in the hangar for:
- refuel/defuel operations,
- maintenance operations,
- bad weather conditions.

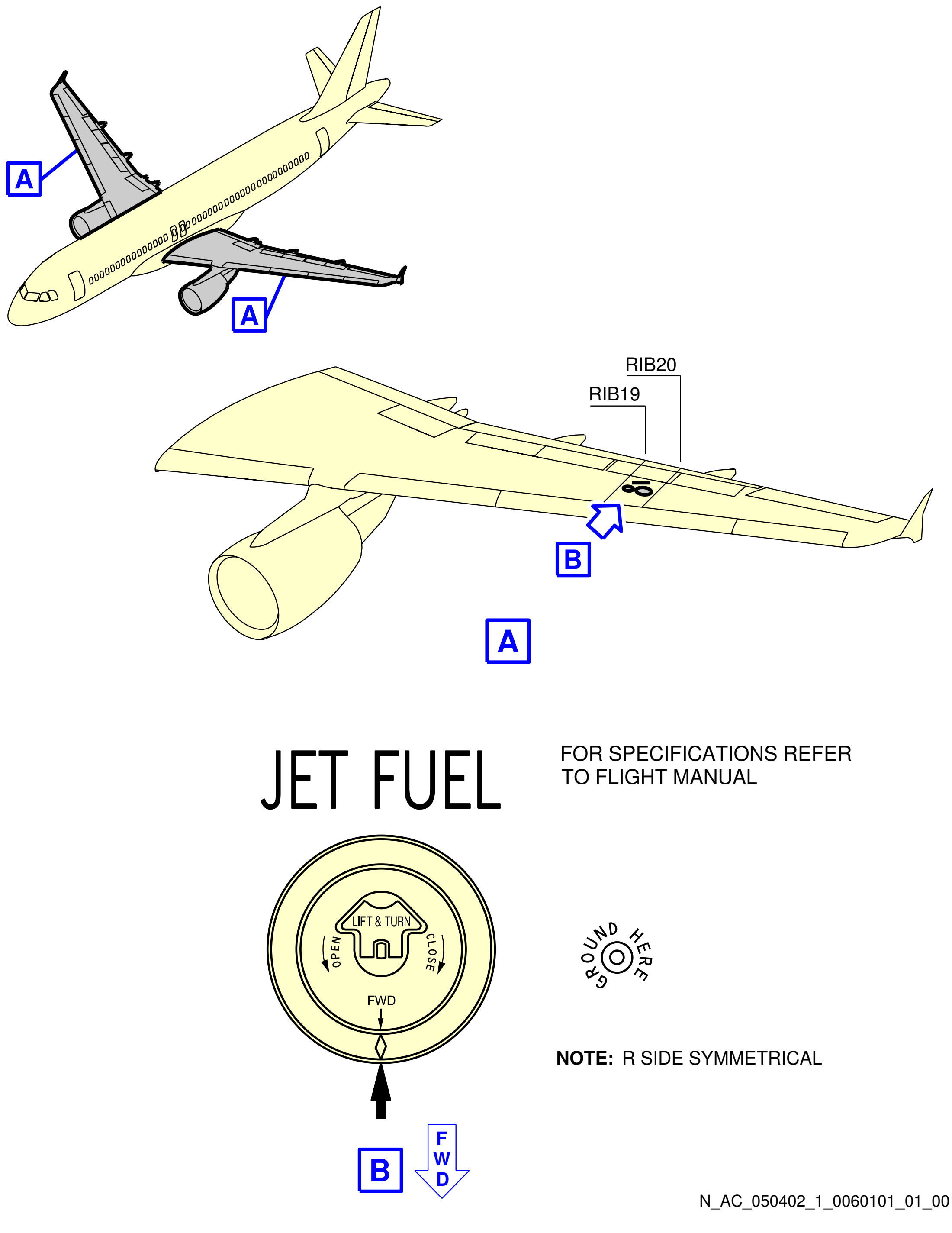
NOTE : In all other conditions, the electrostatic discharge through the tyre is sufficient.

**ON A/C A320-100 A320-200



Ground Service Connections
Grounding Points
FIGURE 1

**ON A/C A320-100 A320-200



Ground Service Connections
Grounding Points
FIGURE 2

5-4-3 Hydraulic System

****ON A/C A320-100 A320-200**

Hydraulic System

1. Access.

ACCESS	AFT OF NOSE m (ft)	POSITION FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND m (ft)
		RH SIDE m (ft)	LH SIDE m (ft)	
Green System: Access door 197CB	19.17 (62.89)	1.27 (4.17)		1.76 (5.77)
Yellow System: Access door 198CB	19.17 (62.89)		1.27 (4.17)	1.76 (5.77)
Blue System: Access door 197EB	20.22 (66.34)	1.27 (4.17)		1.76 (5.77)

NOTE : Distances are approximate.

2. Reservoir Pressurization.
   On the air pressurization manifold:

ACCESS	AFT OF NOSE m (ft)	POSITION FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND m (ft)
		RH SIDE m (ft)	LH SIDE m (ft)	
Access door 195AB	15.65 (51.35)		0.25 (0.82)	1.74 (5.71)

NOTE : Distances are approximate.

- One 1/4 in. AEROQUIP AE 96994E self-sealing connection common to the 3 reservoirs.

3. Accumulator Charging.
   Four (MS28889-1) connections (one for each accumulator) for:

ACCESS	AFT OF NOSE m (ft)	POSITION FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND m (ft)
		RH SIDE m (ft)	LH SIDE m (ft)	
Yellow System accumulator: Access door 196BB	16.1 (52.82)	0.25 (0.82)		1.99 (6.53)
Green System accumulator: Left MLG door	16.77 (55.02)		0.25 (0.82)	3.2 (10.5)
Blue System accumulator: Access door 195BB	18.2 (59.71)		0.25 (0.82)	1.99 (6.53)
Yellow System braking accumulator: Access door 196BB	16.1 (52.82)	0.76 (2.49)		1.74 (5.71)

NOTE : Distances are approximate.

4. Reservoir Filling.
On the Green system ground service panel:

ACCESS	AFT OF NOSE m (ft)	POSITION FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND m (ft)
		RH SIDE m (ft)	LH SIDE m (ft)	
Access door 197CB	19.17 (62.89)	1.27 (4.17)		1.76 (5.77)

NOTE : Distances are approximate
One 1/4 in. AEROQUIP AE96993E self-sealing connection for pressurized supply.
One handpump filling connection for unpressurized (suction) supply.

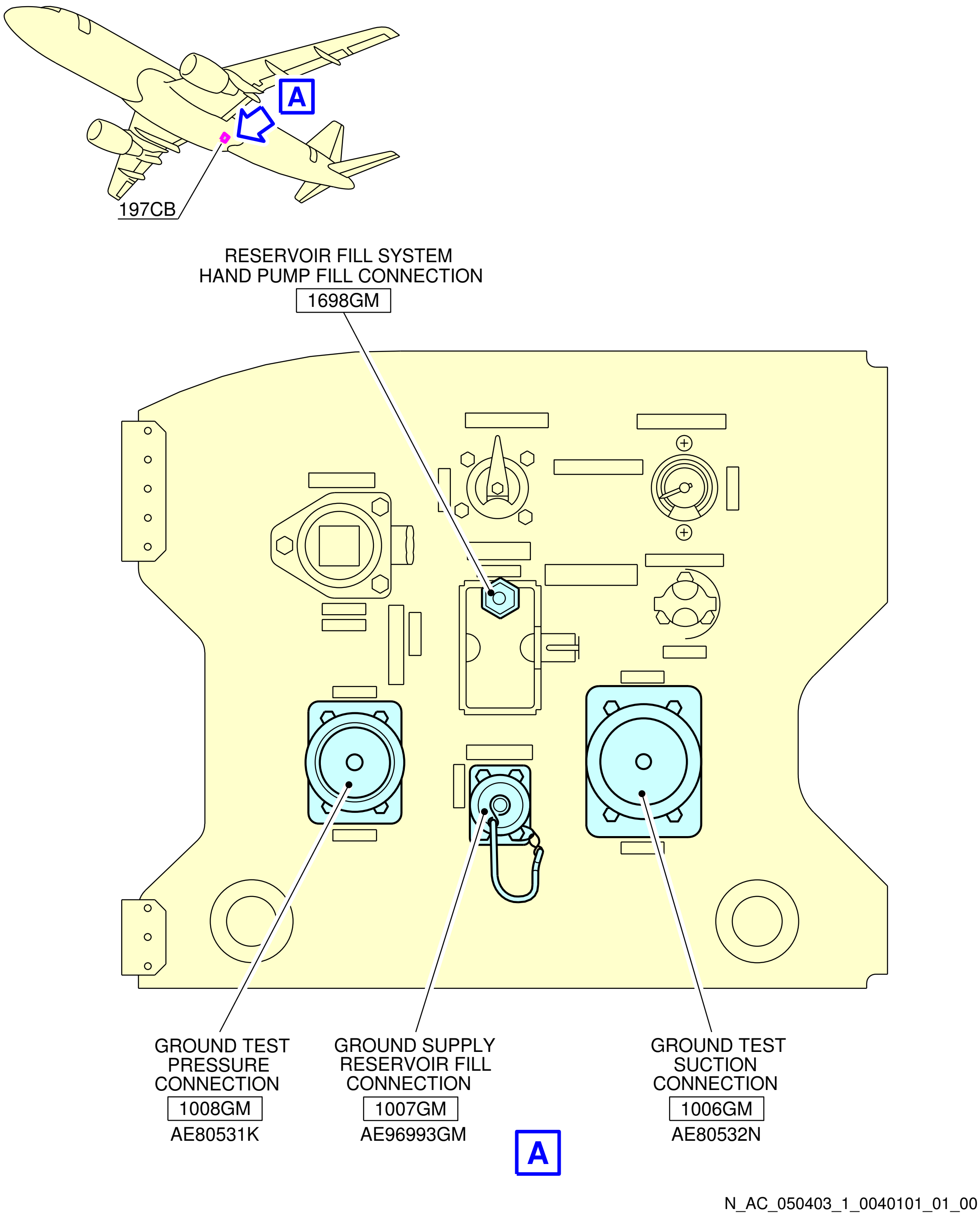
5. Reservoir Drain.
On 3/8 in. self-sealing connection on reservoir for:

ACCESS	AFT OF NOSE m (ft)	POSITION FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND m (ft)
		RH SIDE m (ft)	LH SIDE m (ft)	
Yellow System: Access door 196BB - 198CB	16.1 (52.82)	1.43 (4.69)		1.90 (6.23)
Green System: Left MLG door	16.77 (55.02)		1.27 (4.17)	2.61 (8.56)
Blue System Access door 197EB	20.22 (66.34)	1.27 (4.17)		1.76 (5.77)

NOTE : Distances are approximate.
On 3/8 in. self-sealing connection for the Blue system on:
- Blue system ground service panel.

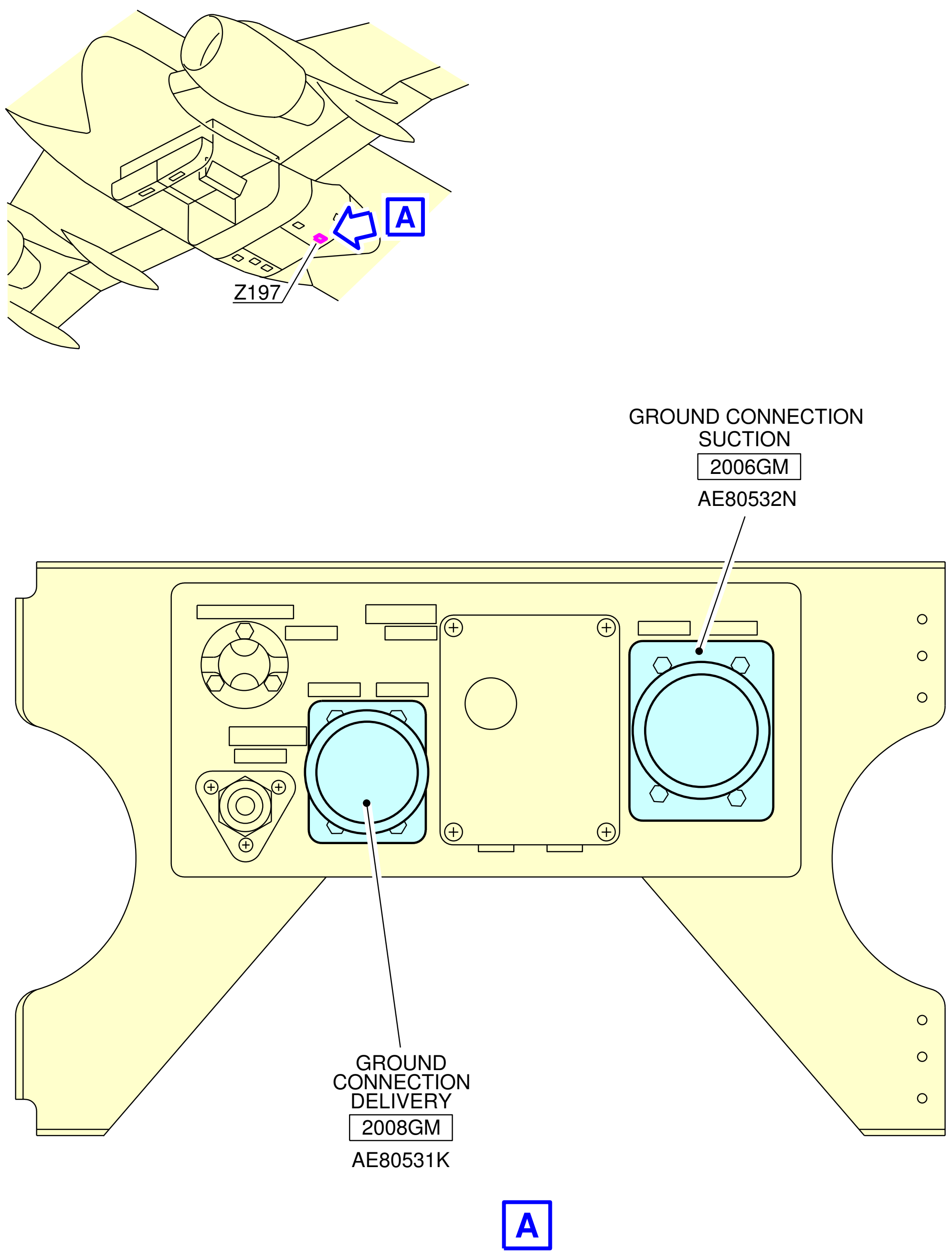
6. Ground Test.
On each ground service panel:
- One self-sealing connector AE80532N (suction).
- One self-sealing connector AE80531K (delivery).

**ON A/C A320-100 A320-200



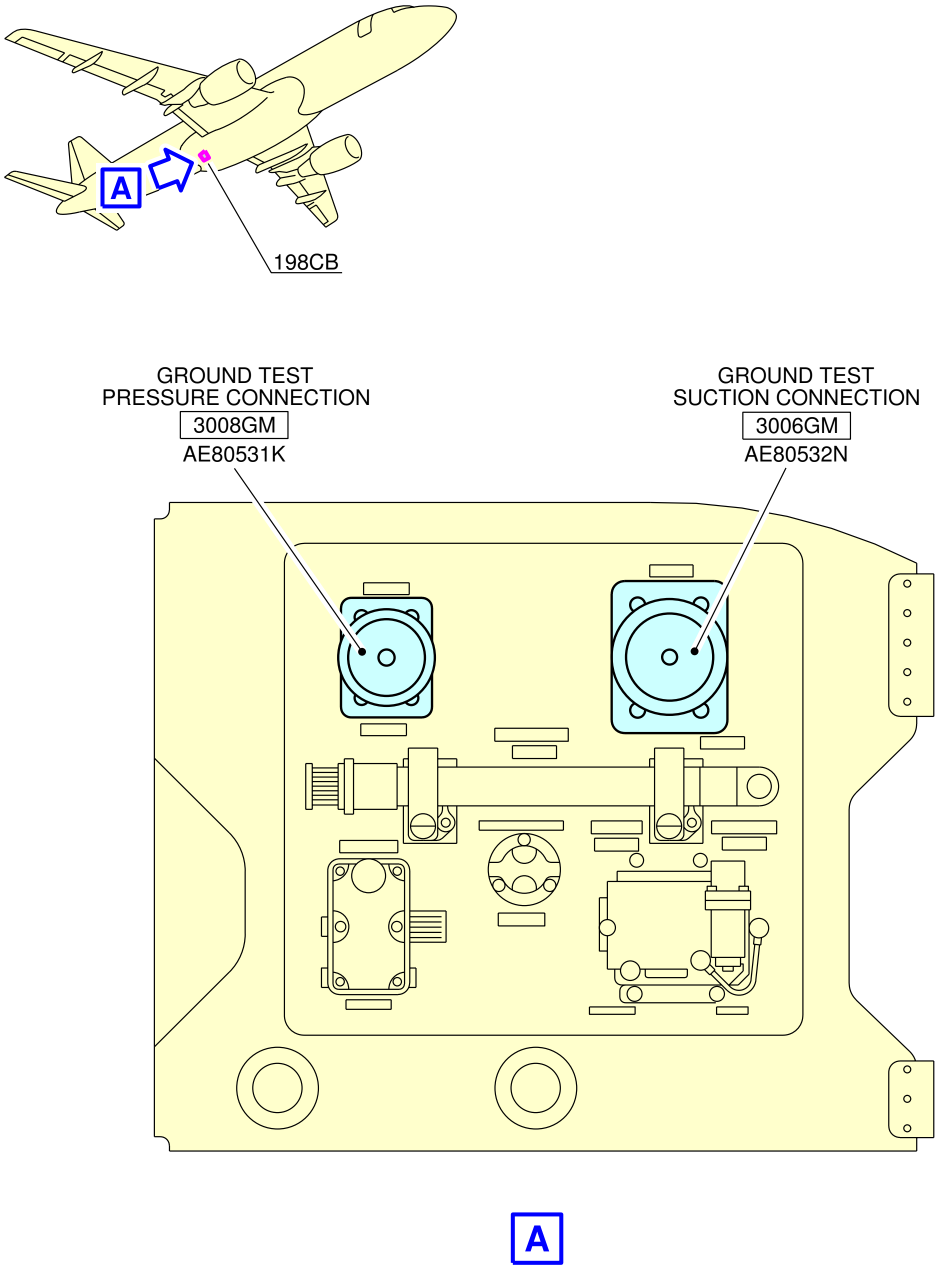
Hydraulic System
Green System Ground Service Panel
FIGURE 1

**ON A/C A320-100 A320-200



Hydraulic System
Blue System Ground Service Panel
FIGURE 2

**ON A/C A320-100 A320-200



N_AC_050403_1_0060101_01_00

Hydraulic System
Yellow System Ground Service Panel
FIGURE 3

5-4-4 Electrical System

**ON A/C A320-100 A320-200

Electrical System

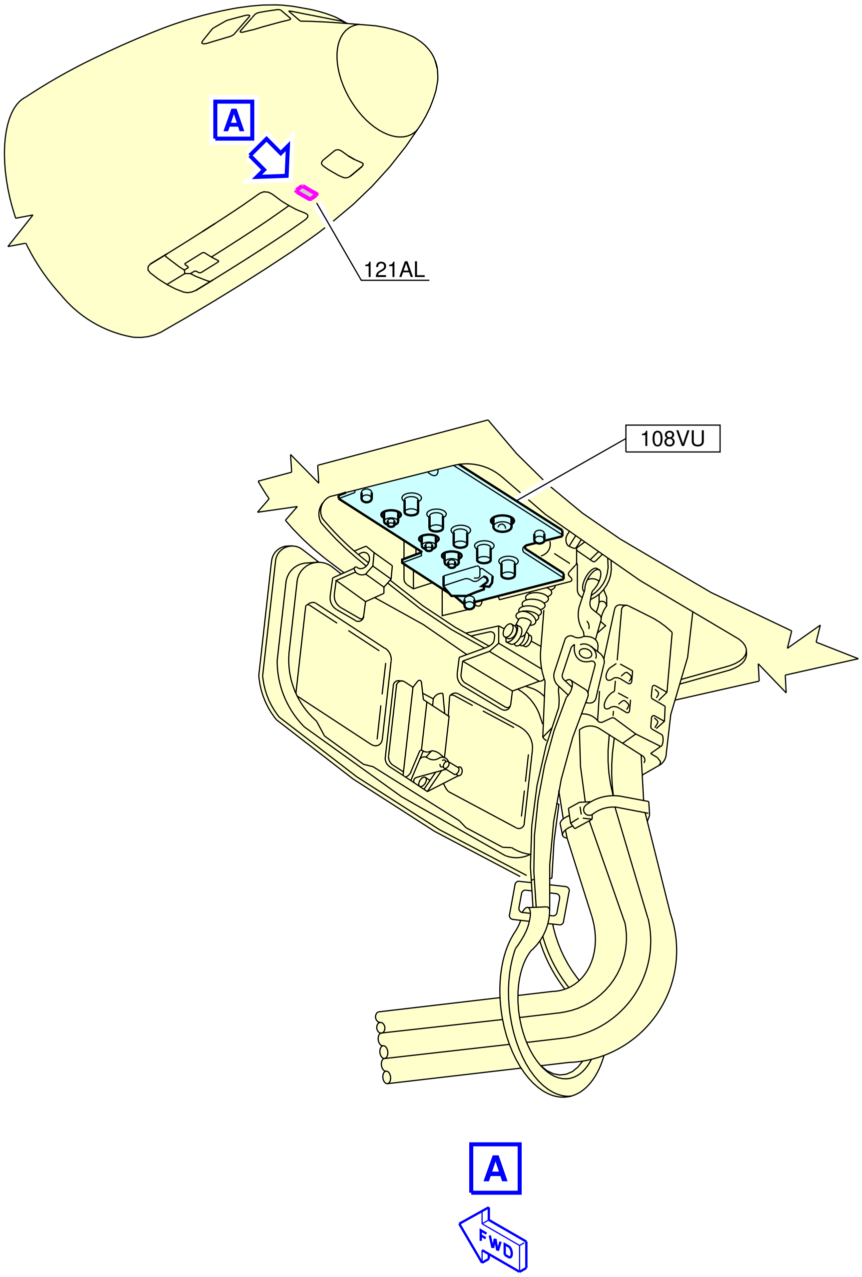
1. Electrical System.
This chapter gives data related to the location of the ground service connections.

ACCESS	AFT OF NOSE m (ft)	POSITION FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND m (ft)
		RH SIDE m (ft)	LH SIDE m (ft)	
A/C External Power: Access door 121AL	2.55 (8.37)	on centerline		2 (6.56)

NOTE : Distances are approximate.

2. Technical Specifications
This chapter gives data related to the location of the ground service connections.
   A. External Power Receptacle:
      - One MS90362-3 receptacle - 90 KVA.
   B. Power Supply:
      - Three-phase, 400 Hz, 115/200V
   C. Electrical connectors for servicing
      - AC outlets: Hubbel 5258
      - DC outlets: Hubbel 7472
      - Vacuum cleaner outlets: Hubbel 5258

**ON A/C A320-100 A320-200



N_AC_050404_1_0010101_01_01

Ground Service Connections
External Power Receptacles
FIGURE 1

5-4-5 Oxygen System

****ON A/C A320-100 A320-200**

Oxygen System

1. Oxygen System.

	DISTANCE: Meters (ft)			
	AFT OF NOSE	FROM AIRPLANE CENTERLINE		MEAN HEIGHT FROM GROUND
		R SIDE	L SIDE	
One service connection (external charging in the avionics compartment) MS22066 Std.	3.45 m (11.32 ft)		1.15 m (3.77 ft)	2.60 m (8.53 ft)

3/8'' UNF × 24 TPI

Nominal pressure: 1850 psi (127.55 bar)

Max fill pressure: 2035 psi (140.31 bar)

NOTE : Internal charging connection provided.

5-4-6 Fuel System

****ON A/C A320-100 A320-200**

Fuel System

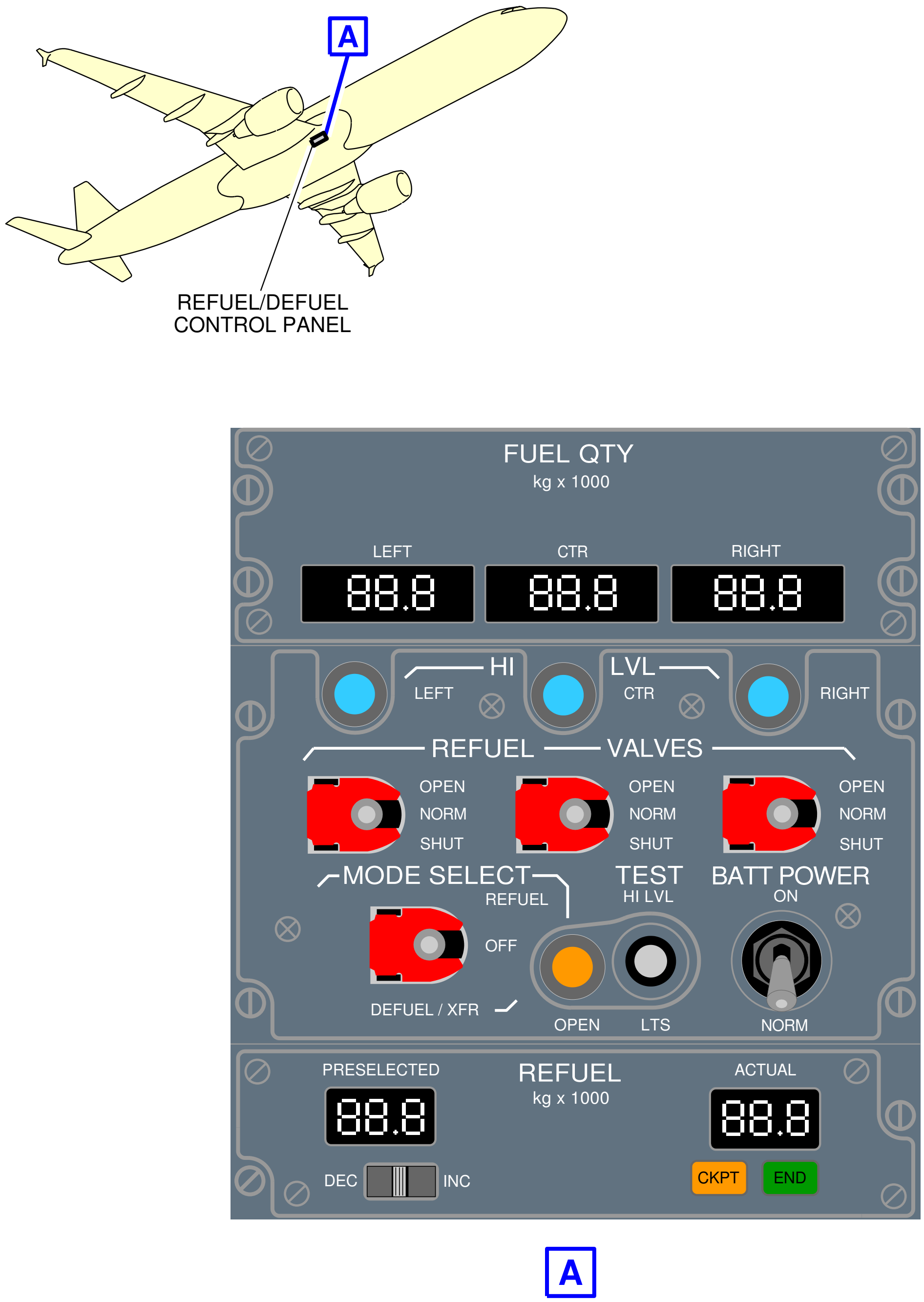
1. Refuel/Defuel Couplings.
   This chapter gives data related to the location of the ground service connections.

ACCESS	AFT OF NOSE m (ft)	POSITION FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND m (ft)
		RH SIDE m (ft)	LH SIDE m (ft)	
Refuel/Defuel Integrated Panel: Access door 192MB	16.4 (53.81)		1.8 (5.91	1.8 (5.91)
Refuel/defuel coupling, Left Access Door 522HB (Optional)	17.2 (56.43)	10 (32.81)		3.5 (11.48)
Refuel/defuel coupling, Right Access Door 622HB	17.2 (56.43)		10 (32.81)	3.5 (11.48)
Gravity Refuel Coupling	19.1 (62.66)	12.4 (40.68)	12.4 (40.68)	3.7 (12.14)

NOTE : Distances are approximate.

2. Technical Specifications
   This chapter gives data related to the specifications of the ground service connections.
   A. Refuel/defuel couplings:
      - Right wing: one standard ISO R45, 2.5in.
      - Left wing: one optional standard ISO R45, 2.5 in.
   B. Refuel pressure:
      - Maximum pressure: 3.45 bar (50 psi)
   C. Refuel Flow:
      - 1400 l/minute (369.84 US gal/minute)

**ON A/C A320-100 A320-200

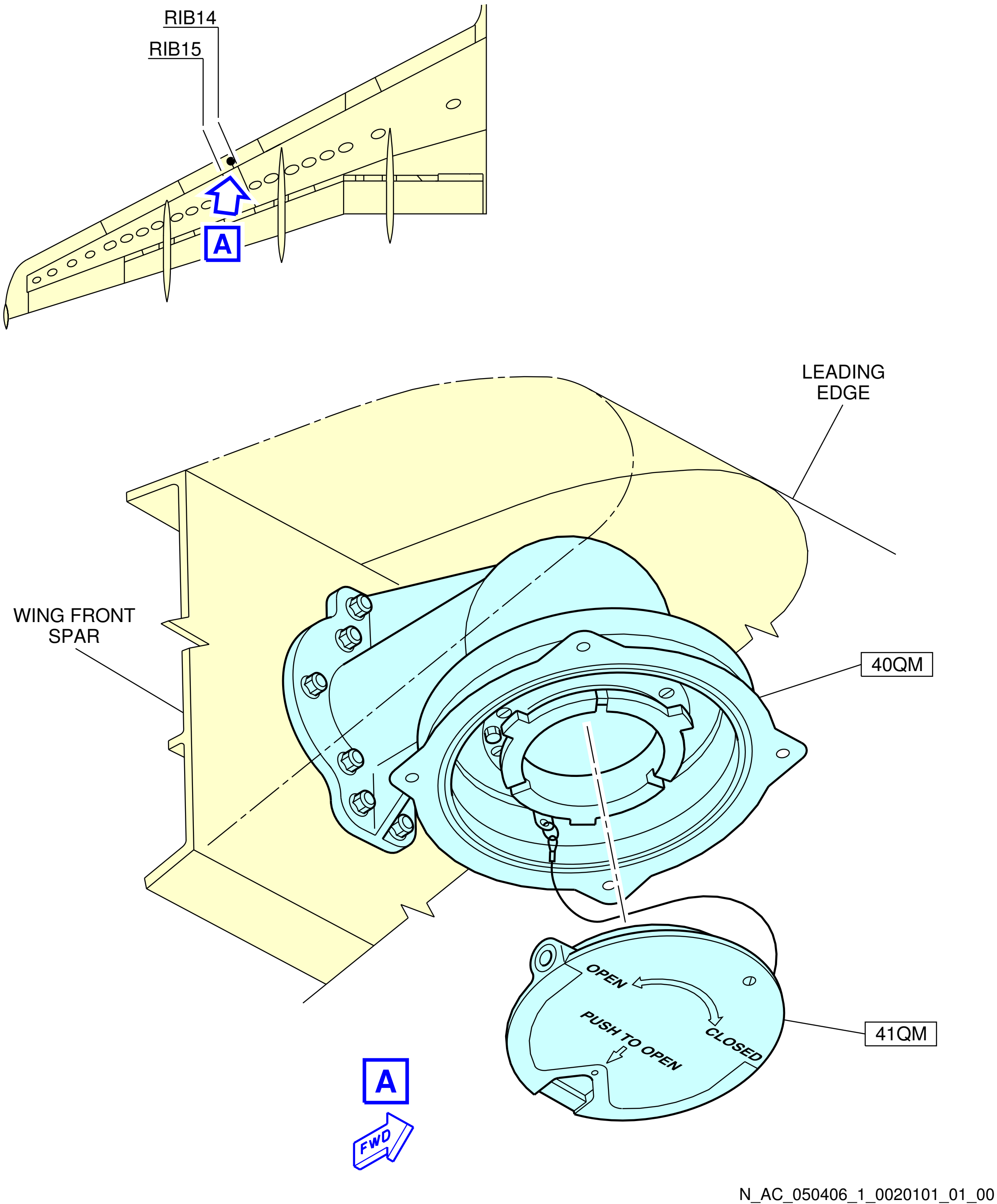


NOTE: STANDARD CONFIGURATION OF REFUEL/DEFUEL PANEL.

N_AC_050406_1_0010101_01_00

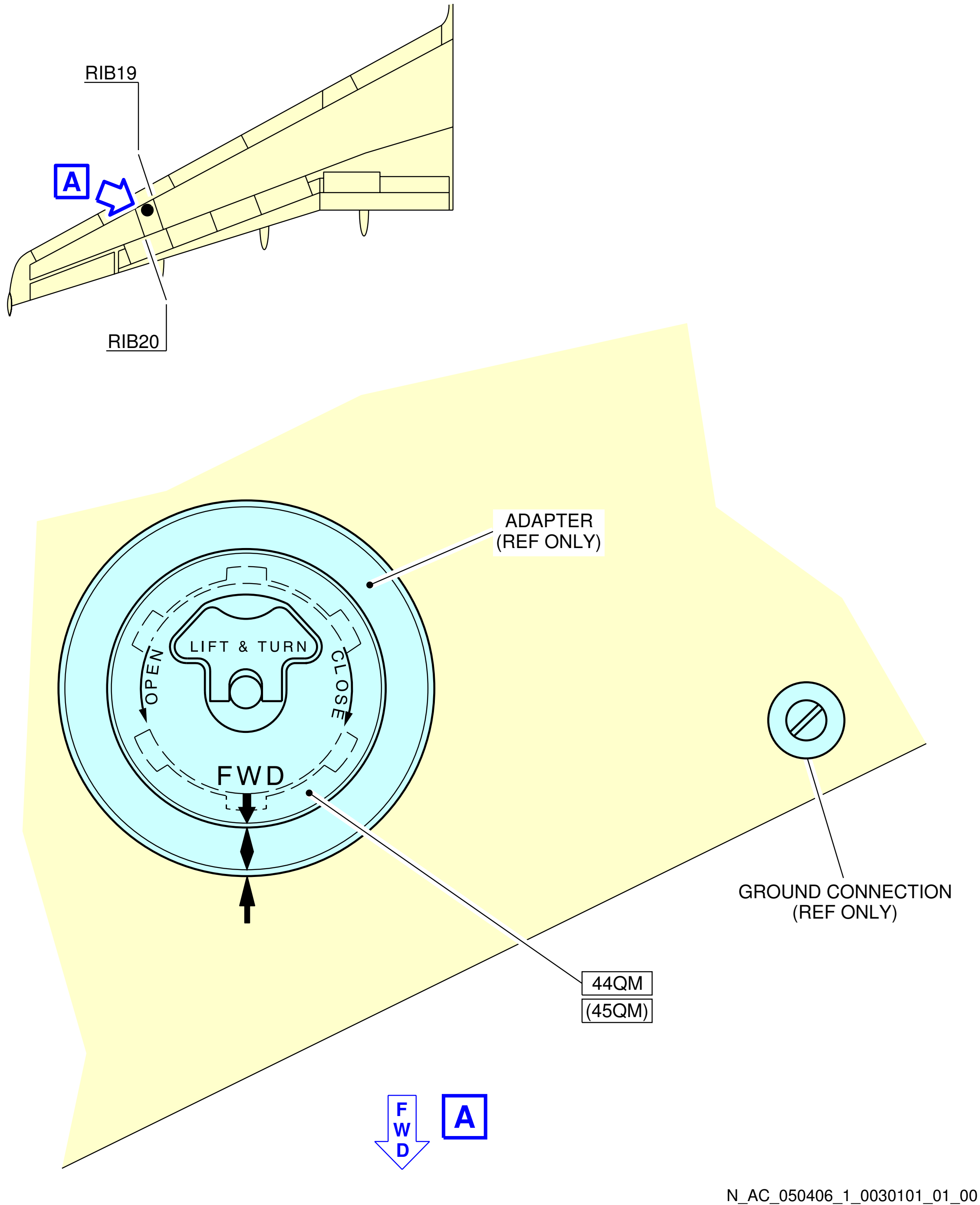
Ground Service Connections
Refuel/Defuel Panel
FIGURE 1

**ON A/C A320-100 A320-200



Ground Service Connections
Refuel/Defuel Couplings
FIGURE 2

**ON A/C A320-100 A320-200



Ground Service Connections
Gravity Refuel Couplings
FIGURE 3

5-4-7 Pneumatic System

****ON A/C A320-100 A320-200**

Pneumatic System

1. High Pressure Air Connectors.
   This chapter gives data related to the location of the ground service connections.

	AFT OF NOSE m (ft)	POSITION FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND m (ft)
		RH SIDE m (ft)	LH SIDE m (ft)	
HP Connector Access door 191DB	12.98 (42.59)		0.84 (2.76)	1.76 (5.77)

NOTE : Distances are approximate.

A. Connector:
   - One standard 3 in. ISO TC20 connection (MS33740) for engine starting and cabin air preconditioning (HP) installed on the left side of the belly fairing

2. Low Pressure Air Connectors.
   This chapter gives data related to the location of the ground service connections.

	AFT OF NOSE m (ft)	POSITION FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND m (ft)
		RH SIDE m (ft)	LH SIDE m (ft)	
LP Connector Access door 191CB	12.45 (40.85)		1.11 (3.64)	1.73 (5.68)

NOTE : Distances are approximate.

A. Connector:
   - One standard 8 in. connection (SAE AS4262 type B) for cabin air preconditioning (LP) installed on the left side of the belly fairing

5-4-8 Potable Water System

****ON A/C A320-100 A320-200**

Potable Water System

1. Potable Water Ground Service Panel.

ACCESS	AFT OF NOSE m (ft)	POSITION FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND m (ft)
		RH SIDE m (ft)	LH SIDE m (ft)	
Potable Water Ground Service Panel: Access door 171AL:	31.3 (102.69)		0.3 (0.98)	2.6 (8.53)

NOTE : Distances are approximate

2. Potable Water Ground Drain Panel.

ACCESS	AFT OF NOSE m (ft)	POSITION FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND m (ft)
		RH SIDE m (ft)	LH SIDE m (ft)	
Potable Water Ground Service Panel: Access door 133AL	11.8 (38.71)		0.15 (0.49)	1.75 (5.74)
Potable Water Ground Service Panel: Access door 192NB	12.5 (41.01)	0.51 (1.67)		1.75 (5.74)

NOTE : Distances are approximate

3. Technical Specifications

   A. Connectors:

      (1) On the potable ground service panel (Access Door 171AL)
         - Fill/Drain Nipple 3/4 in (ISO 17775).
         - One ground pressurization connector.

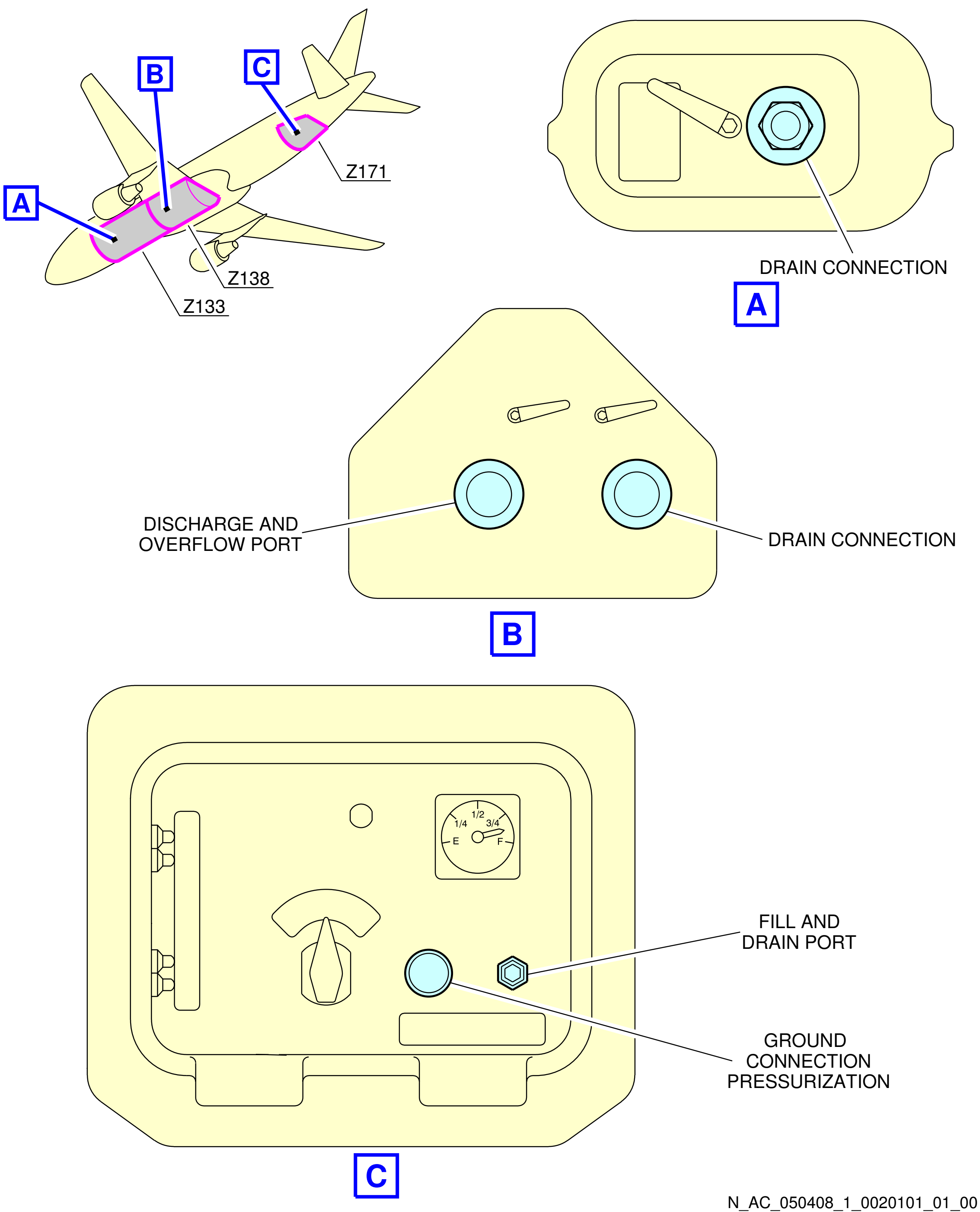
      (2) On drain panel (Access Door 133AL)
         - Drain Nipple 3/4 in (ISO 17775)

B. Usable capacity:
- Standard configuration - one tank:200 l (52.83 US gal)

C. Filling pressure:
- 3.45 bar (50 psi).

D. Typical flow rate:
- 50 l/min (13.21 US gal/min).

**ON A/C A320-100 A320-200



Ground Service Connections
Potable Water Ground Drain Panel
FIGURE 1

5-4-9 Oil System

****ON A/C A320-100 A320-200**

Oil System

1. Engine Oil Replenishment for CFM56 Series Engine (See FIGURE 5-4-9-991-001-A):
   One gravity filling cap and one pressure filling connection per engine.

ACCESS	AFT OF NOSE m (ft)	POSITION FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND m (ft)
		ENGINE 1 (LH) m (ft)	ENGINE 2 (RH) m (ft)	
Engine Oil Gravity Filling Cap: Access door: 437BL (LH), 447BL (RH)	13.12 (43.04)	6.63 (21.75)	4.82 (15.81)	1.46 (4.79)
Engine Oil Pressure Filling Port:	13 (42.65)	6.49 (21.29)	4.74 (15.55)	1.42 (4.66)

NOTE : Distances are approximate

A. Tank capacity:
   - Full level: 19.6 l (5.18 US gal)
   - Usable: 9.46 l (2.50 US gal)

B. Maximum delivery pressure required: 25 psi (1.72 bar)
   Maximum delivery flow required: 180 l/h (47.55 US gal/h)

2. IDG Oil Replenishment for CFM56 Series Engine (See FIGURE 5-4-9-991-002-A):
   One pressure filling connection per engine: OMP 2506-18 plus one connection overflow: OMP 2505-18.

ACCESS	AFT OF NOSE m (ft)	POSITION FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND m (ft)
		ENGINE 1 (LH) m (ft)	ENGINE 2 (RH) m (ft)	
IDG Oil Pressure Filling Connection: Access door 438DR (LH), 448DR (RH)	12.2 (40.03)	6.9 (22.64)	5.52 (18.11)	0.68 (2.23)

NOTE : Distances are approximate

A. Tank capacity: 5 l (1.32 US gal)

B. Delivery pressure required: 5 to 40 psi (0.34 to 2.76 bar) at the IDG inlet.

3. Starter Oil Replenishment for CFM56 Series Engine (See FIGURE 5-4-9-991-003-A:
One gravity filling cap per engine.

ACCESS	AFT OF NOSE m (ft)	POSITION FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND m (ft)
		ENGINE 1 (LH) m (ft)	ENGINE 2 (RH) m (ft)	
Starter Oil Filling Connection:	12.7 (41.67)	5.3 (17.39)	6.2 (20.34)	0.76 (2.49)

NOTE : Distances are approximate

A. Tank capacity: 0.8 l (0.21 US gal)

4. Engine Oil Replenishment for IAE V2500 Series Engine (See FIGURE 5-4-9-991-004-B):
One gravity filling cap per engine.

ACCESS	AFT OF NOSE m (ft)	POSITION FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND m (ft)
		ENGINE 1 (LH) m (ft)	ENGINE 2 (RH) m (ft)	
Engine Oil Gravity Filling Cap: Access door 437BL (LH), 447BL (RH)	12.24 (40.16)	6.56 (21.52)	4.92 (16.14)	1.22 (4)

NOTE : Distances are approximate

A. Tank capacity:
- Full level: 28 l (7.4 US gal)
- Usable: 23.50 l (6.21 US gal)

1. IDG Oil Replenishment for IAE V2500 Series Engine:
One pressure filling connection per engine: OMP 2506-2 plus one overflow connection: OMP 2505-2.

ACCESS	AFT OF NOSE m (ft)	POSITION FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND m (ft)
		ENGINE 1 (LH) m (ft)	ENGINE 2 (RH) m (ft)	
IDG Oil Pressure Filling Connection:	12.8 (41.99)	5.42 (17.78)	6.04 (19.82)	0.8 (2.62)

NOTE : Distances are approximate

A. Tank capacity: 4.1 l (1.08 US gal)

5. Starter Oil Replenishment for IAE V2500 Series Engine (See FIGURE 5-4-9-991-006-B):
One gravity filling cap per engine.

ACCESS	AFT OF NOSE m (ft)	POSITION FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND m (ft)
		ENGINE 1 (LH) m (ft)	ENGINE 2 (RH) m (ft)	
Starter Oil Filling Connection:	15.4 (50.52)	5.3 (17.39)	6.14 (20.14)	0.75 (2.46)

NOTE : Distances are approximate

A. Tank capacity: 0.35 l (0.09 US gal)

6. APU Oil System (See FIGURE 5-4-9-991-007-A):
APU oil gravity filling cap.

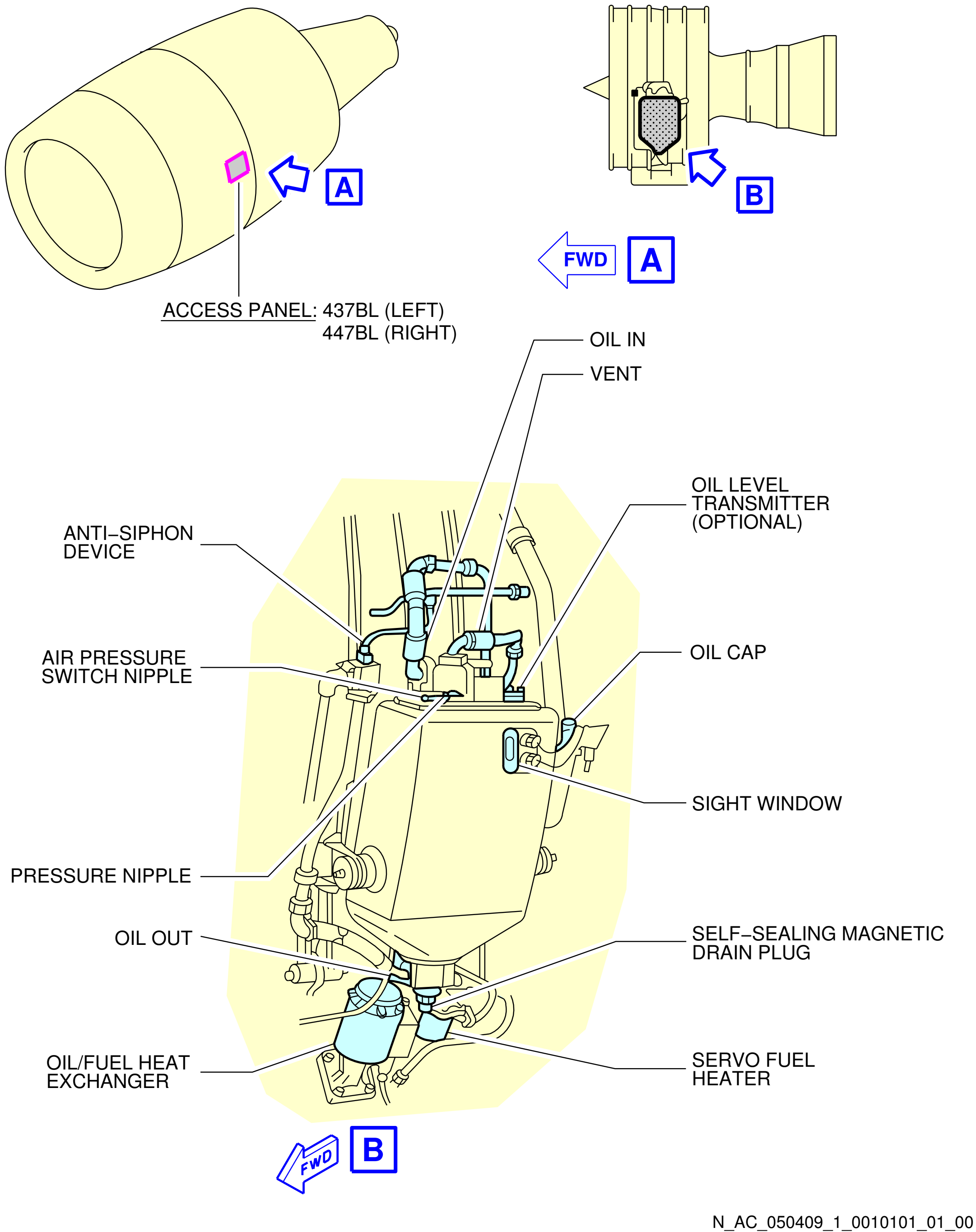
	AFT OF NOSE m (ft)	FROM AIRPLANE CENTERLINE (LEFT HAND) m (ft)	MEAN HEIGHT FROM GROUND m (ft)
GTCP 36-300	35.49 (116.44)	0.3 (0.98)	4.83 (15.85)
APS 3200	35.49 (116.44)	0.3 (0.98)	4.78 (15.68)
131-9	35.39 (116.11)	0.35 (1.15)	4.32 (14.17)

NOTE : Distances are approximate

A. Tank capacity (usable):
- APU type GTCP 36-300: 6.20 l (1.64 US gal)
- APU type APS 3200: 5.40 l (1.43 US gal)

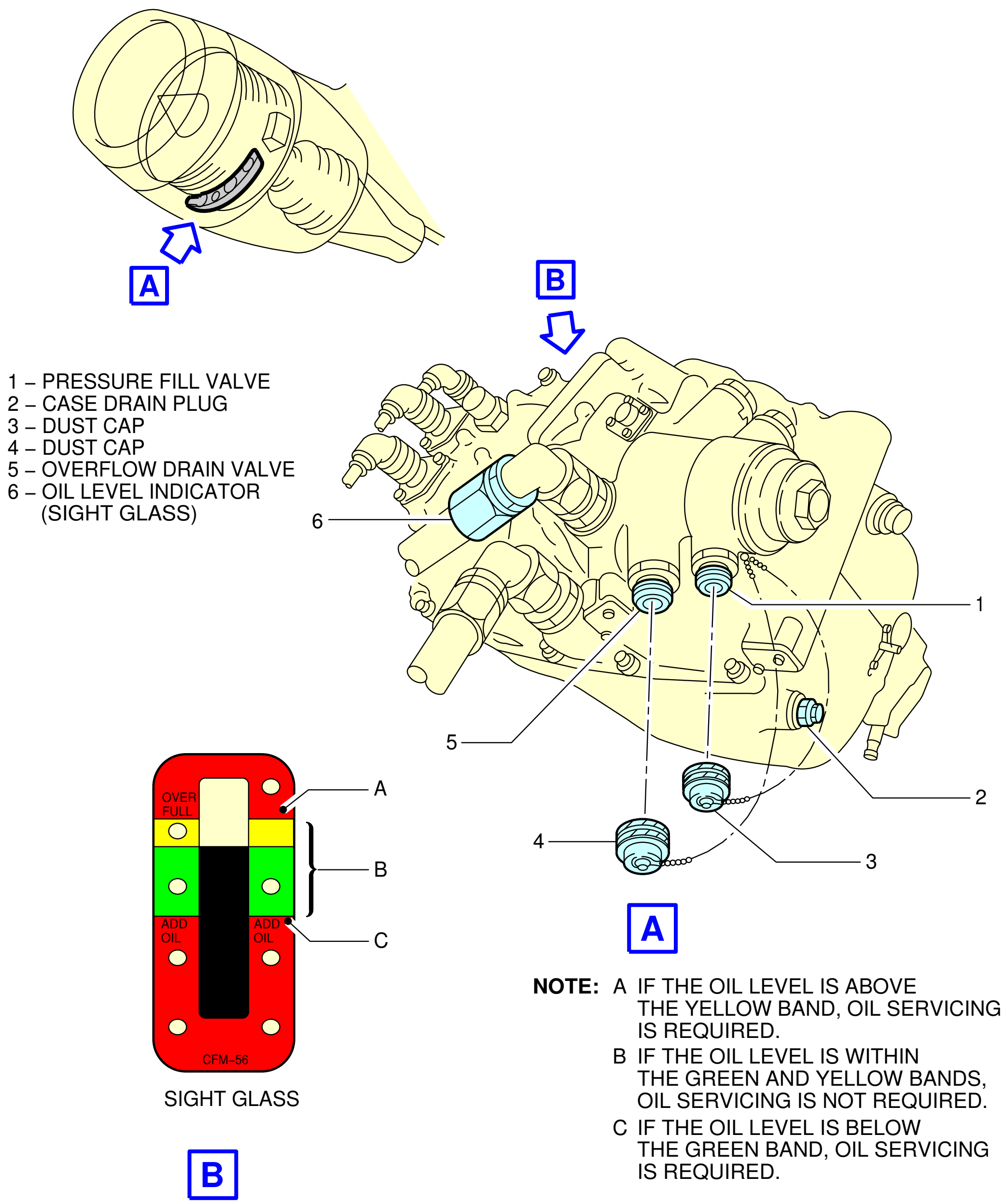
- APU type 131-9: 6.25 l (1.65 US gal)

**ON A/C A320-100 A320-200



Ground Service Connections
Engine Oil Tank – CFM56 Series Engine
FIGURE 1

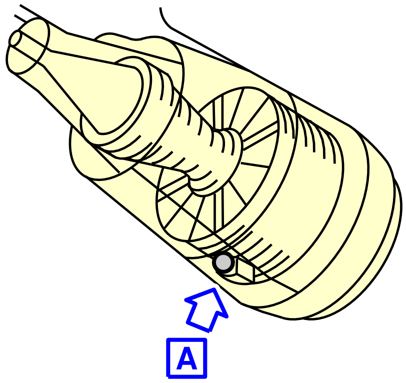
**ON A/C A320-100 A320-200

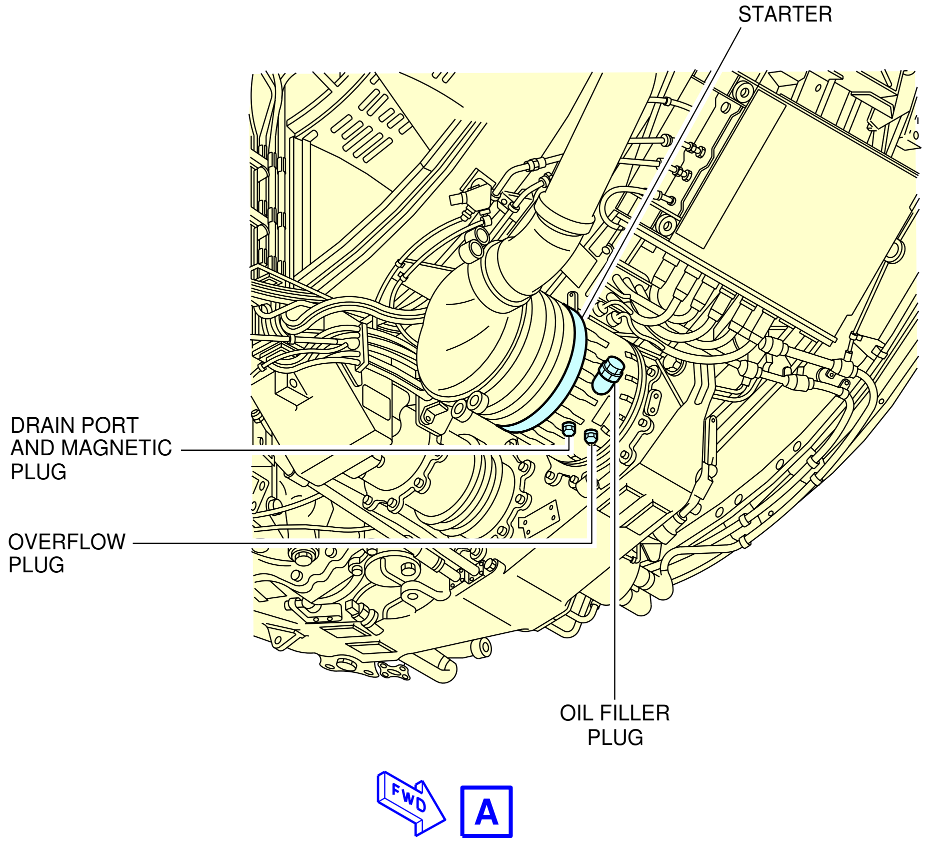


N_AC_050409_1_0020101_01_01

Ground Service Connections
IDG Oil Tank – CFM56 Series Engine
FIGURE 2

**ON A/C A320-100 A320-200

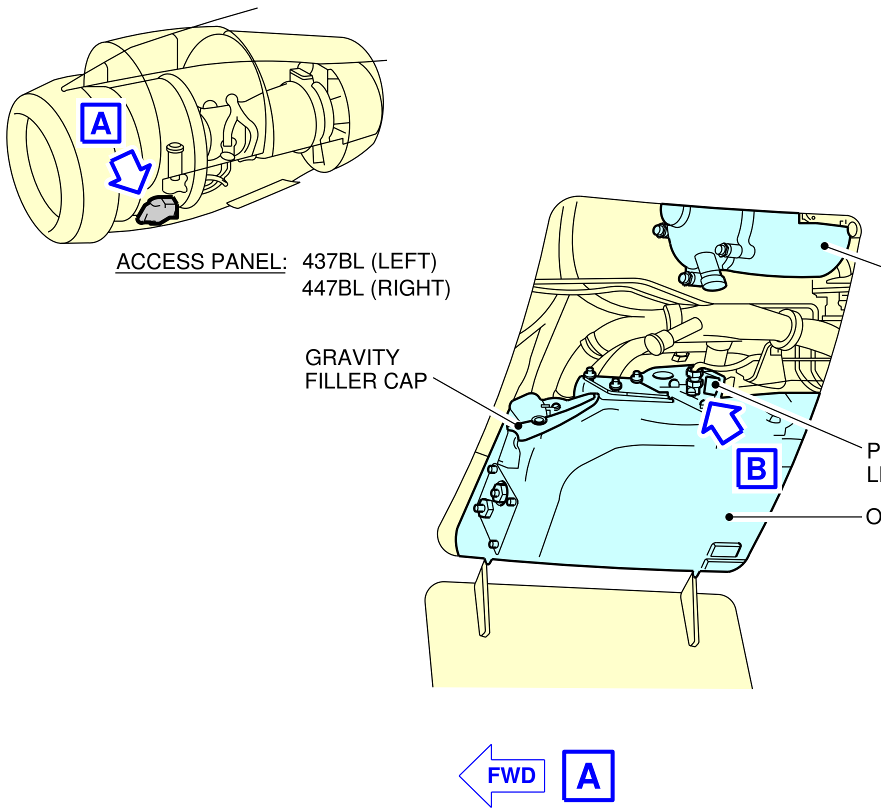


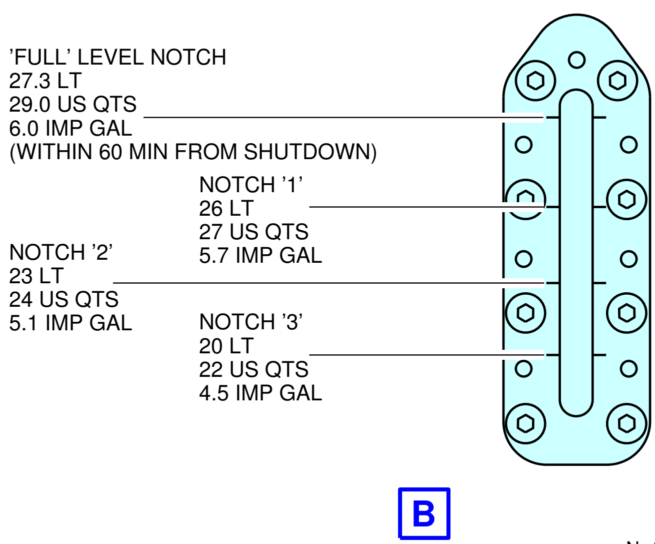


N_AC_050409_1_0030101_01_02

Ground Service Connections
Starter Oil Tank – CFM56 Series Engine
FIGURE 3

**ON A/C A320-100 A320-200

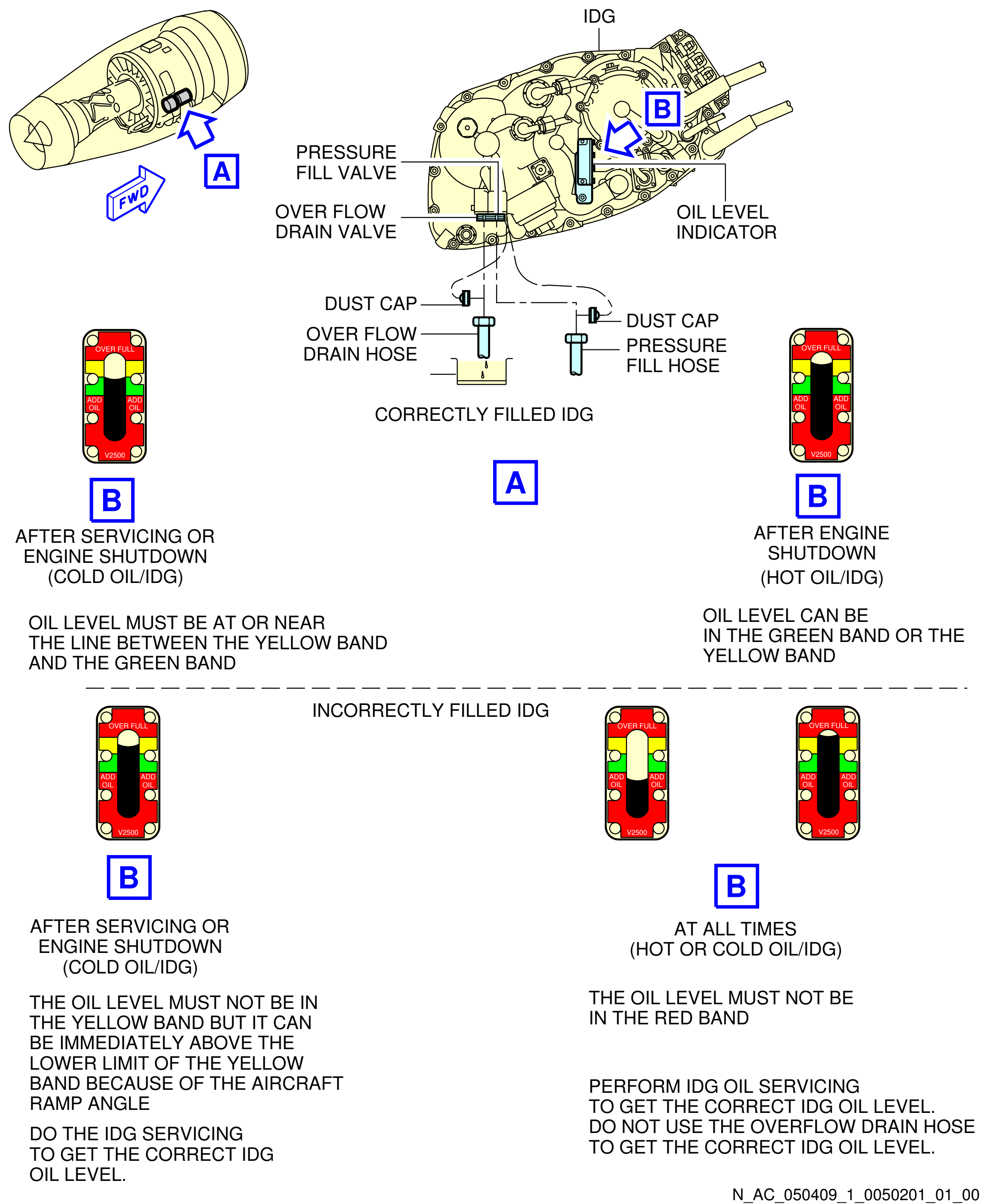




N_AC_050409_1_0040201_01_00

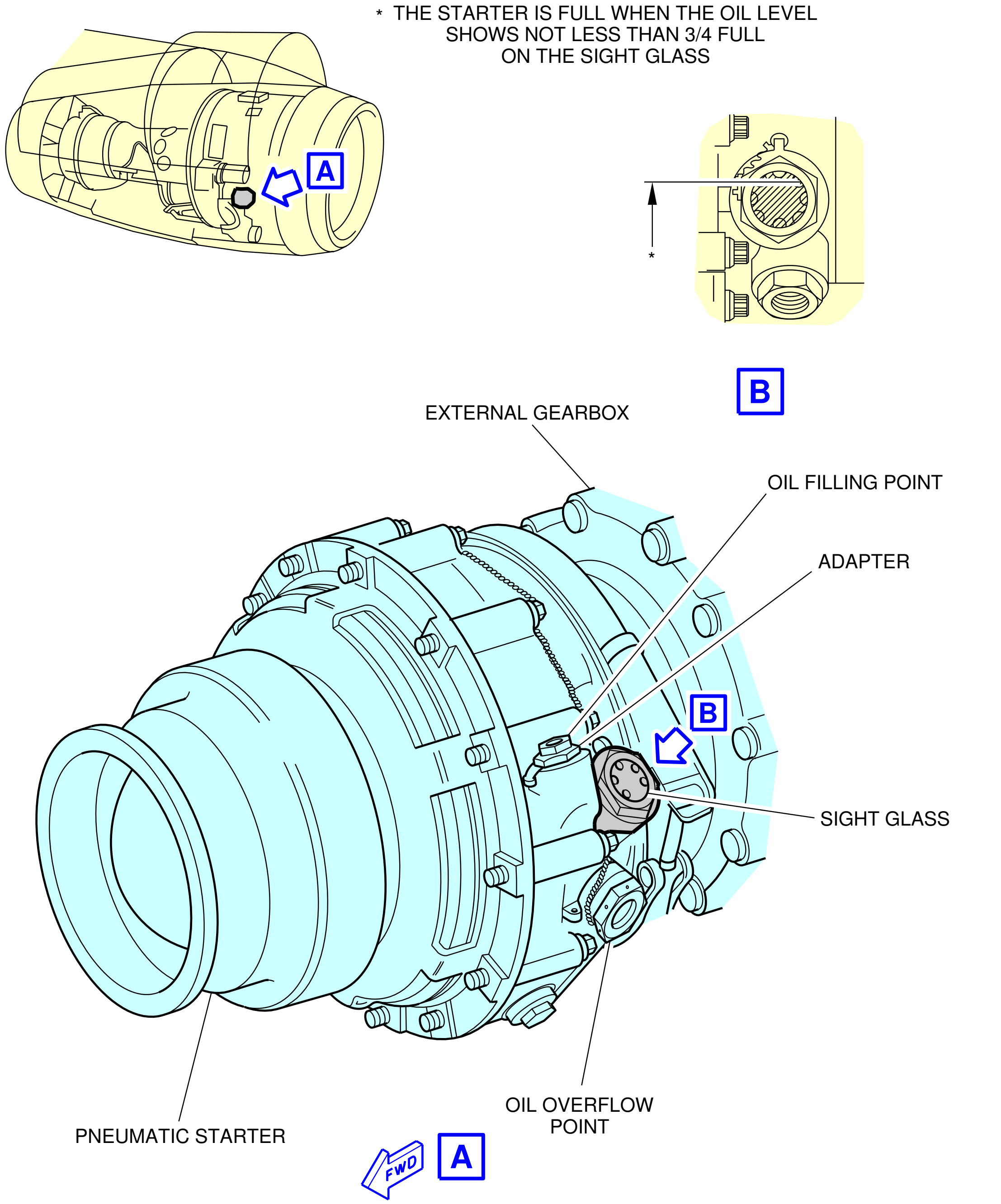
Ground Service Connections
Engine Oil Tank – IAE V2500 Series Engine
FIGURE 4

**ON A/C A320-100 A320-200



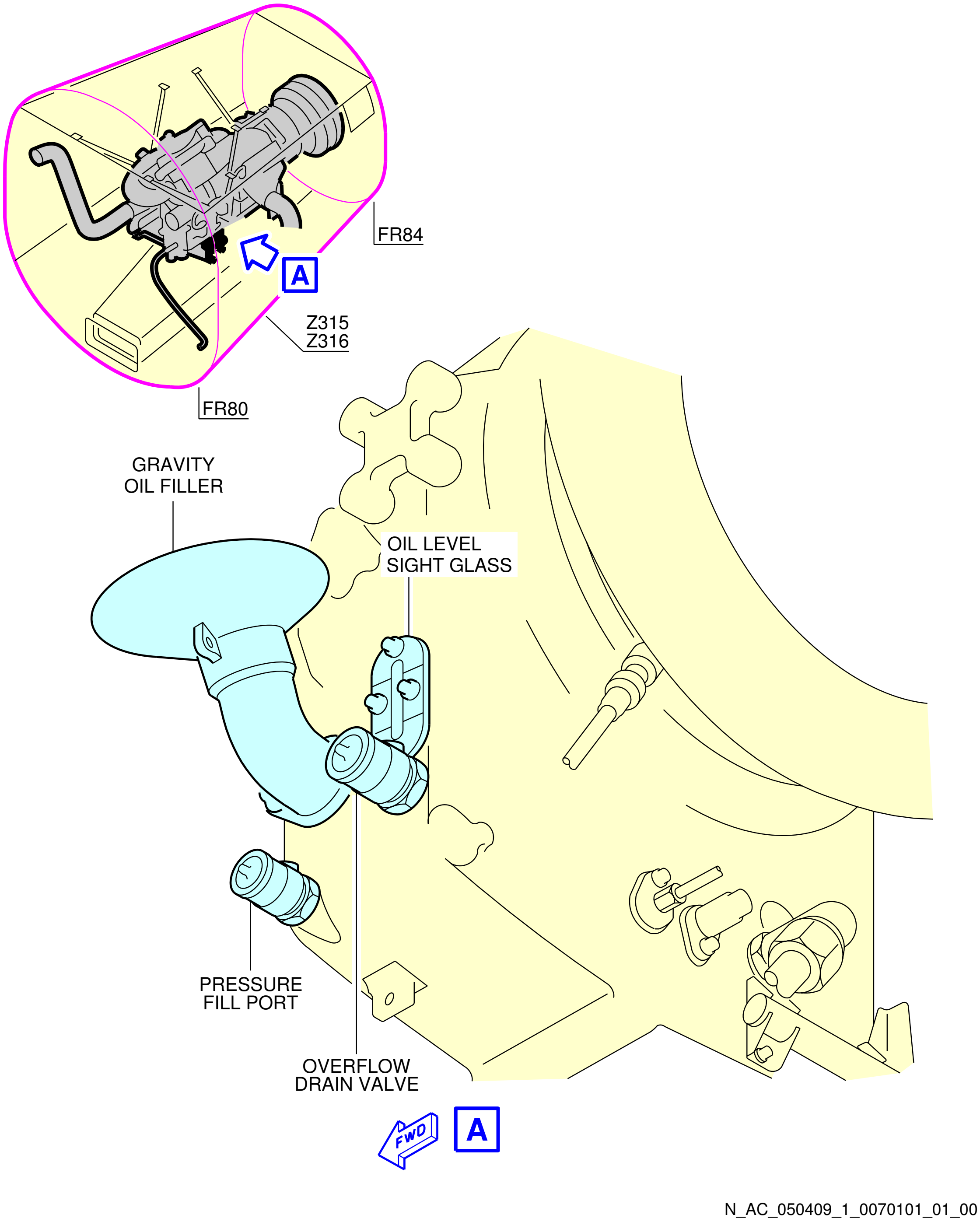
Ground Service Connections
IDG Oil Tank – IAE V2500 Series Engine
FIGURE 5

**ON A/C A320-100 A320-200



Ground Service Connections
Starter Oil Tank – IAE V2500 Series Engine
FIGURE 6

**ON A/C A320-100 A320-200



Ground Service Connections
APU Oil Tank
FIGURE 7

5-4-10 Vacuum Toilet System

****ON A/C A320-100 A320-200**

Vacuum Toilet System

1. Vacuum Toilet System.

ACCESS	AFT OF NOSE m (ft)	POSITION FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND m (ft)
		R SIDE m (ft)	L SIDE m (ft)	
Waste Water Ground Service Panel: Access door 172AR	31.3 (102.69)	0.8 (2.62)		2.8 (9.18)

NOTE : Distances are approximate

2. Technical Specifications

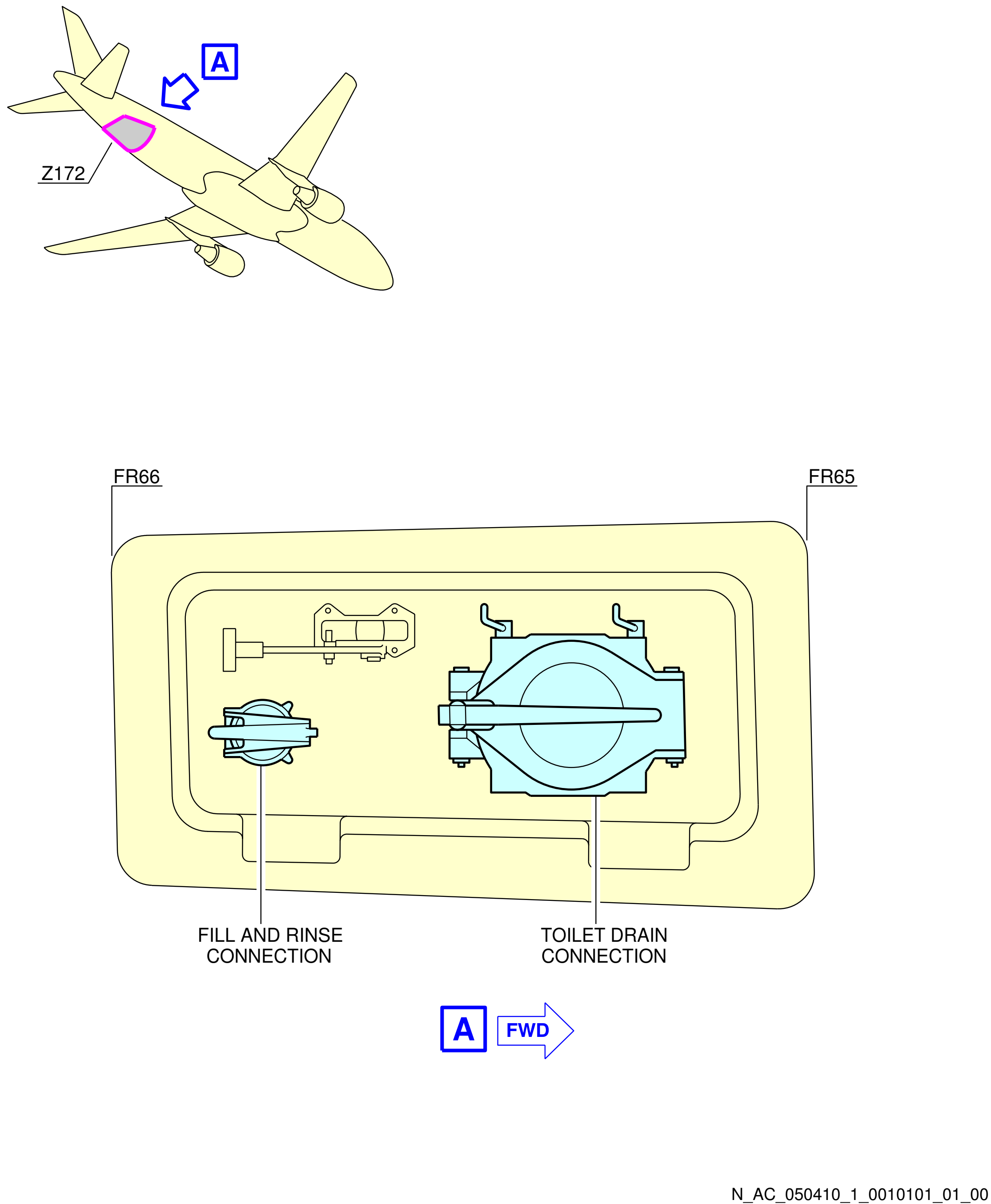
A. Connectors:
- Draining: 4 in (ISO 17775).
- Flushing and filling: 1 in (ISO 17775).

B. Usable waste tank capacity:
- Standard configuration - on tank: 177 l (30.91 US gal).

C. Waste tank - Rinsing:
- Operating pressure: 3.45 bar (50 psi).

D. Waste tank - Precharge:
- 10 l (2.64 US gal).

**ON A/C A320-100 A320-200



Ground Service Connections
Waste Water Ground Service Panel
FIGURE 1

5-5-0 Engine Starting Pneumatic Requirements

****ON A/C A320-100 A320-200**

Engine Starting Pneumatic Requirements

1. Engine Starting Pneumatic Requirements.

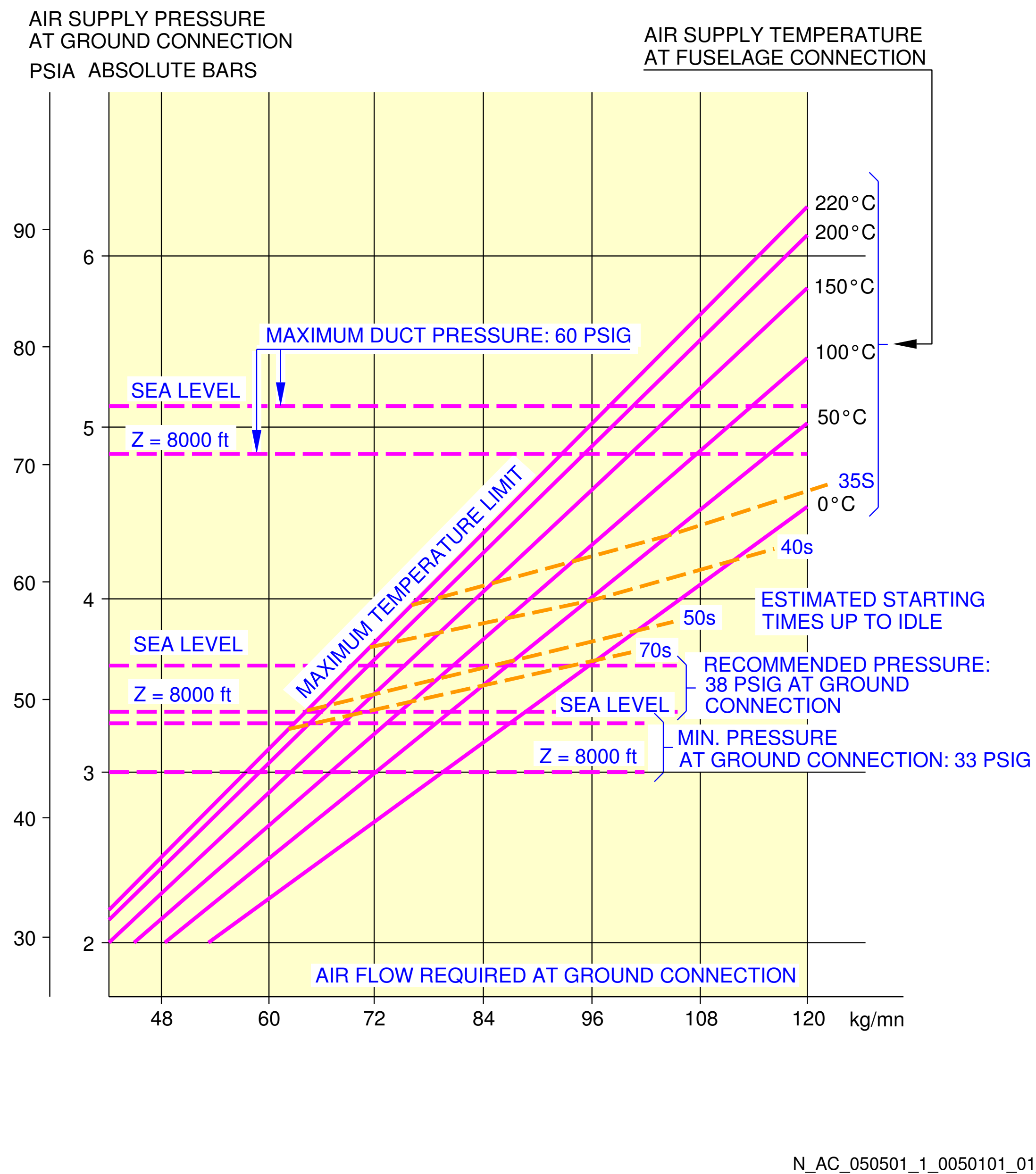
5-5-1 Low Temperatures

**ON A/C A320-100 A320-200

Low Temperature -40°C (-40°F)

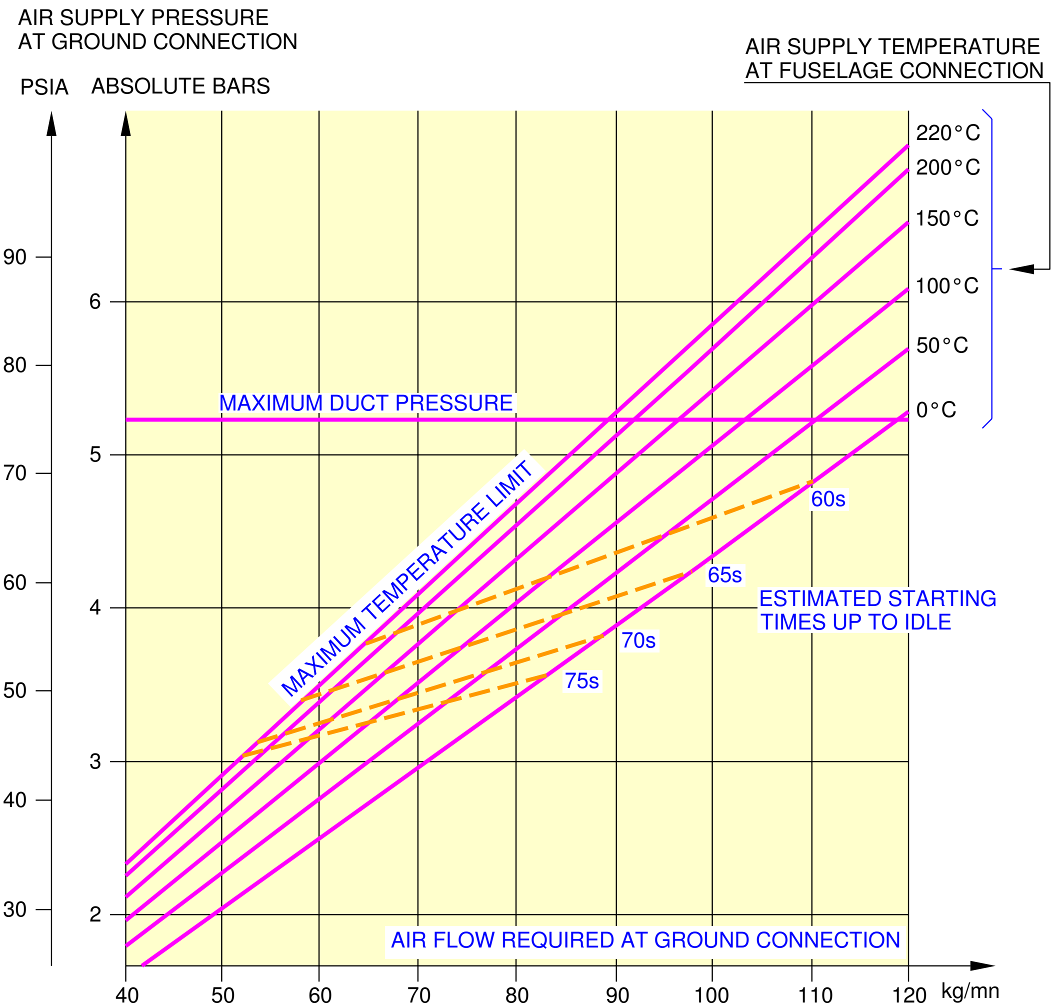
1. This section provides the engine starting pneumatic requirements for a temperature of -40°C (-40°F).

**ON A/C A320-100 A320-200



Engine Starting Pneumatic Requirements
Temperature -40°C (-40°F) – CFM56 series engine
FIGURE 1

**ON A/C A320-100 A320-200



N_AC_050501_1_0060101_01_00

Engine Starting Pneumatic Requirements
Temperature -40˚C (-40˚F) – IAE V2500 series engine
FIGURE 2

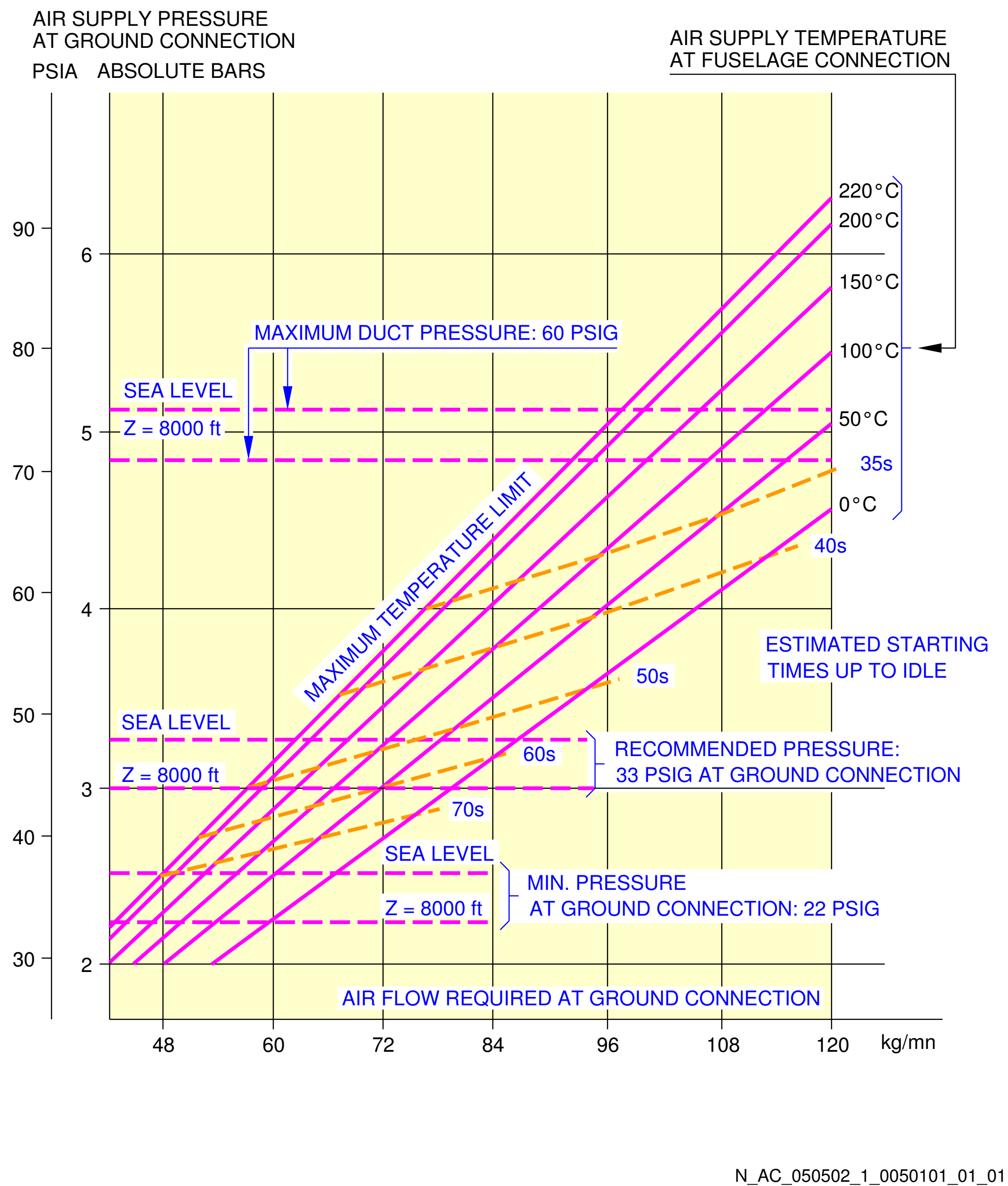
5-5-2 Ambient Temperatures

****ON A/C A320-100 A320-200**

Ambient Temperature +15°C (+59°F)

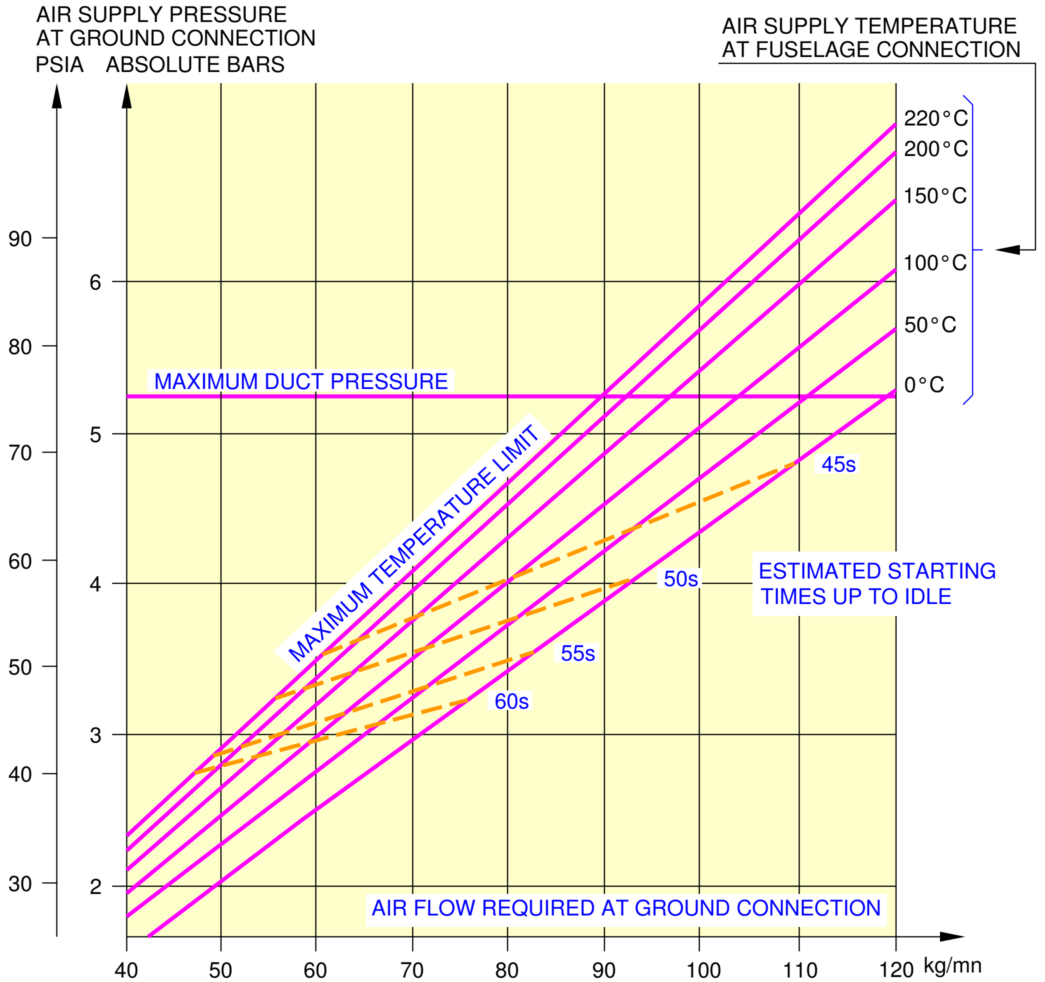
1. This section provides the engine starting pneumatic requirements for a temperature of +15°C (+59°F).

**ON A/C A320-100 A320-200



Engine Starting Pneumatic Requirements
Temperature +15°C (+59°F) – CFM56 series engine
FIGURE 1

**ON A/C A320-100 A320-200



N_AC_050502_1_0060101_01_00

Engine Starting Pneumatic Requirements
Temperature +15°C (+59°F) – IAE V2500 series engine
FIGURE 2

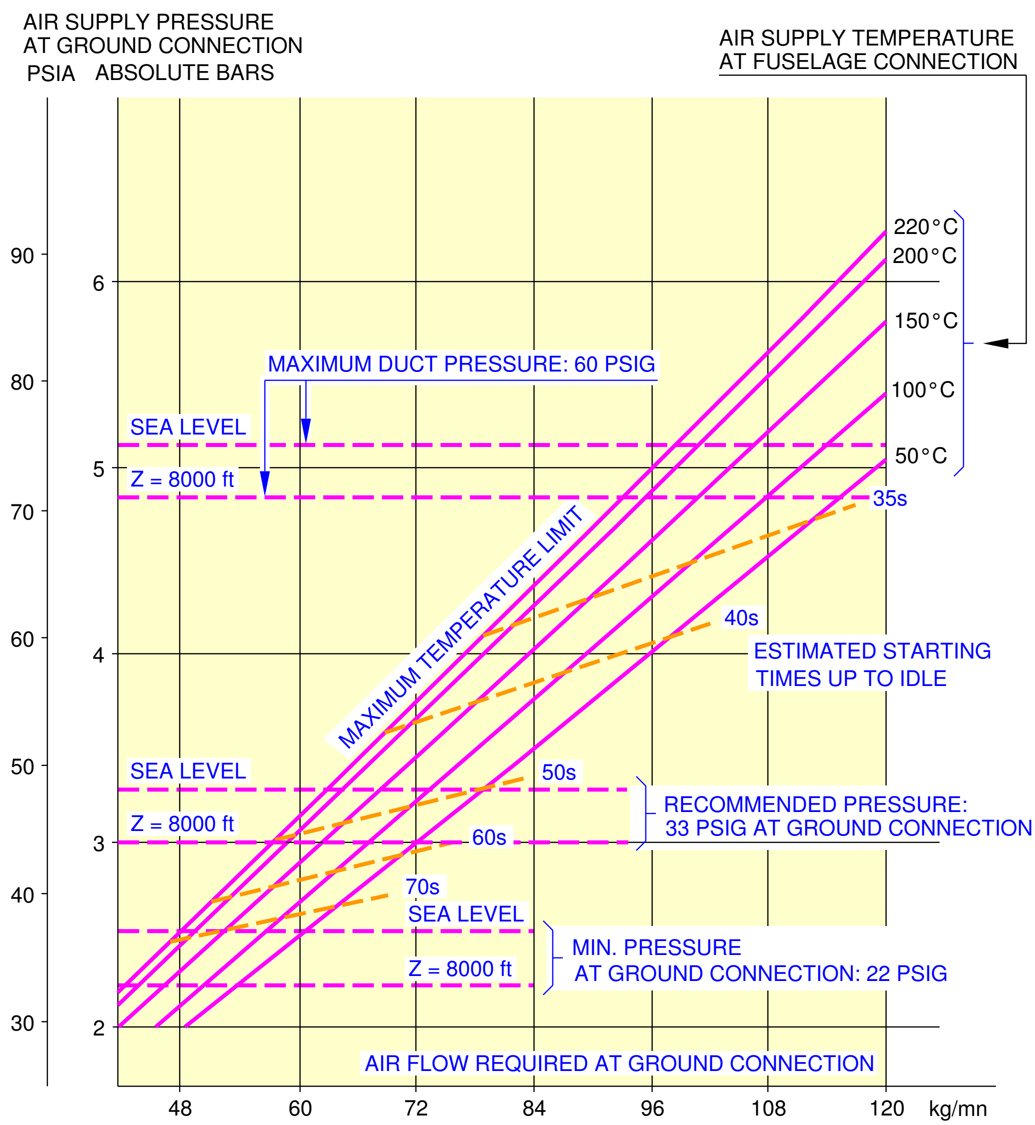
5-5-3 High Temperatures

****ON A/C A320-100 A320-200**

High Temperature +50°C (+122°F) and +55°C (+131°F)

1. This section provides the engine starting pneumatic requirements for a temperature upper:
   - +50°C (+122°F) – IAE V2500
   - +55°C (+131°F) – CFM56

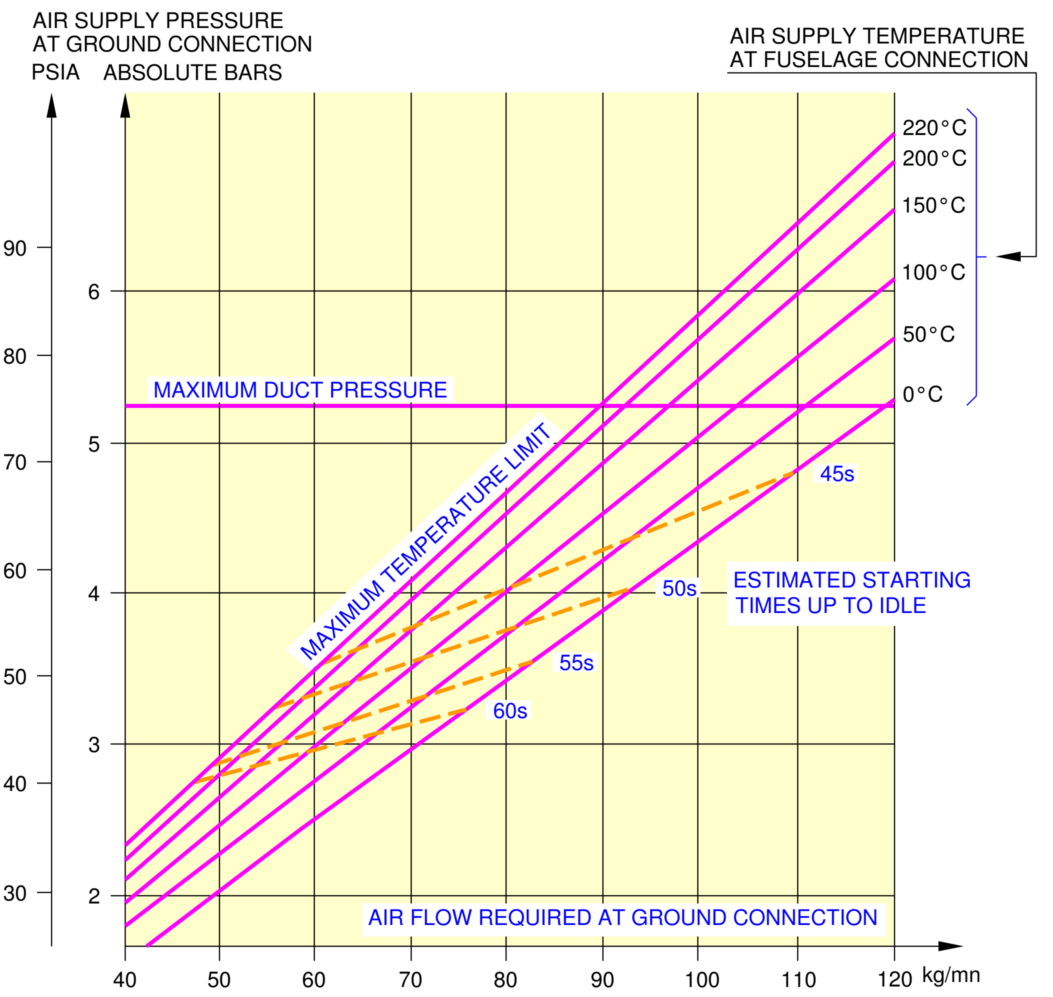
**ON A/C A320-100 A320-200



N_AC_050503_1_0050101_01_00

Engine Starting Pneumatic Requirements
Temperature +55°C (+131°F) – CFM56 series engine
FIGURE 1

**ON A/C A320-100 A320-200



N_AC_050503_1_0060101_01_00

Engine Starting Pneumatic Requirements
Temperature +50°C (+122°F) – IAE V2500 series engine
FIGURE 2

5-6-0 Ground Pneumatic Power Requirements

****ON A/C A320-100 A320-200**

Ground Pneumatic Power Requirements

1. Ground Pneumatic Power Requirements.

FRESH AIRFLOW				PULL UP	PULL DOWN
TOTAL		CABIN		TIME T	TIME T
(kg/s)	(lb/s)	(kg/s)	(lb/s)	(min.)	(min.)
0.5	1.10	0.433	0.955	after 60 min. 14.1°C	–
0.6	1.32	0.519	1.144	after 60 min. 18.2°C	–
0.7	1.54	0.606	1.336	57.5	–
0.8	1.76	0.692	1.526	49.0	after 60 min. 29°C
0.9	1.98	0.779	1.717	42.5	after 60 min. 27.4°C
1.0	2.20	0.865	1.907	37.0	48.0
1.1	2.43	0.952	2.099	32.0	37.0
1.2	2.65	1.038	2.288	29.5	29.5
1.3	2.87	1.125	2.480	26.5	24.0
1.4	3.09	1.211	2.670	24.0	19.5
1.5	3.31	1.298	2.862	21.5	16.5

NOTE : Data for unstabilized conditions see 5-6-1 and 5-6-2.

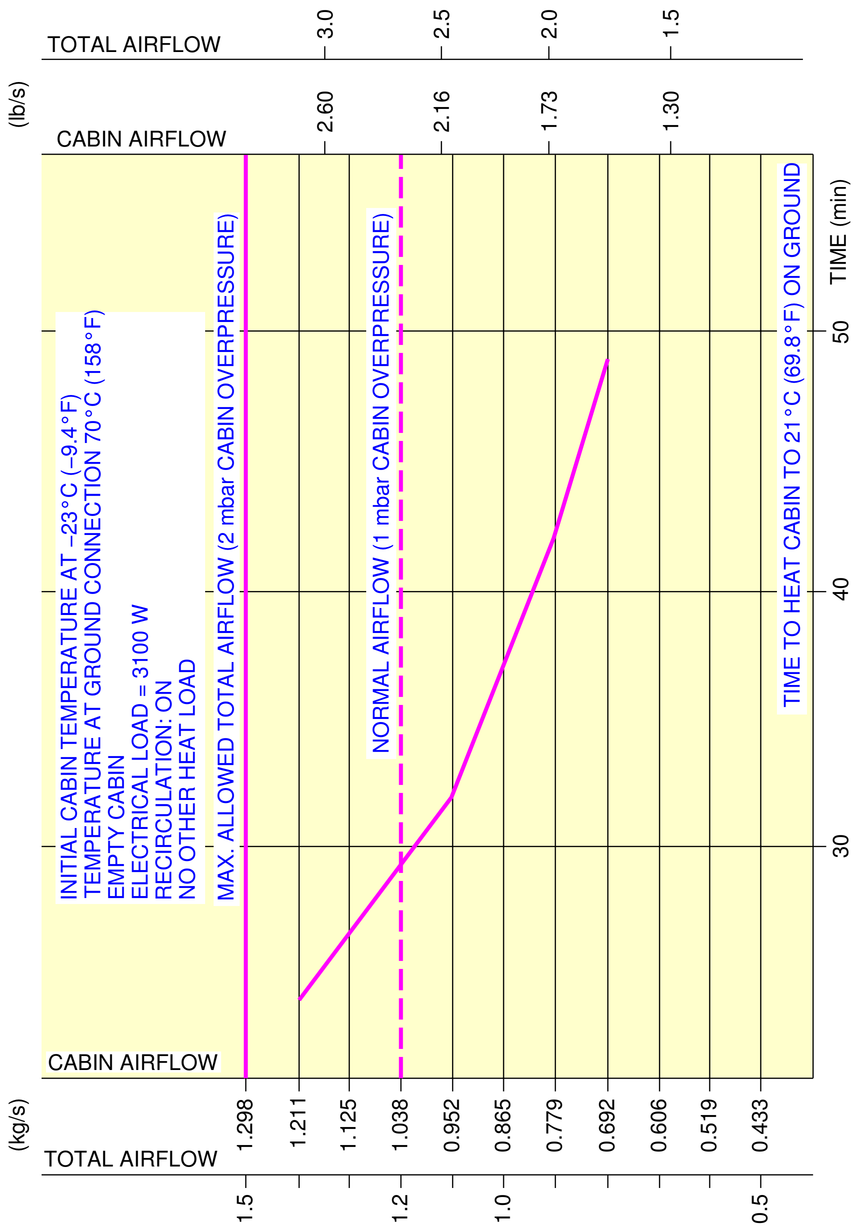
5-6-1 Heating

ON A/C A320-100 A320-200

Heating

1. This section provides the ground pneumatic power requirements heating.

**ON A/C A320-100 A320-200



N_AC_050601_1_0030101_01_01

Ground Pneumatic Power Requirements
Heating
FIGURE 1

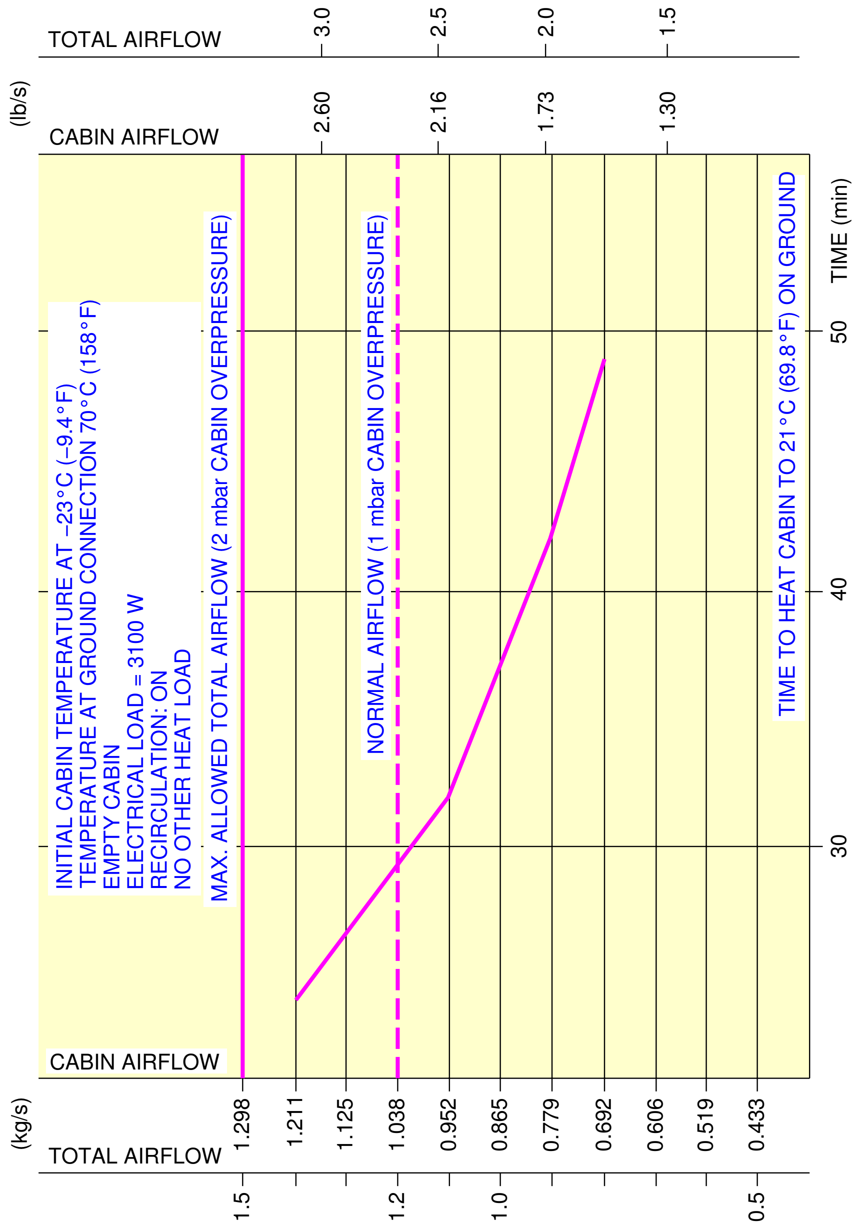
5-6-2 Cooling

****ON A/C A320-100 A320-200**

Cooling

1. This section provides the ground pneumatic power requirements cooling.

**ON A/C A320-100 A320-200



N_AC_050602_1_0030101_01_01

Ground Pneumatic Power Requirements
Cooling
FIGURE 1

5-7-0 Preconditioned Airflow Requirements

**ON A/C A320-100 A320-200

Preconditioned Airflow Requirements

1. This section gives the preconditioned airflow requirements for cabin air conditioning.

   A. Preconditioned Airflow Requirements.

FRESH AIRFLOW				CURVE 1	
TOTAL		CABIN		T FL	
(kg/s)	(lb/s)	(kg/s)	(lb/s)	(˚C)	(˚F)
0.5	1.10	0.433	0.955	-42.7	-44.9
0.6	1.32	0.519	1.144	-31.1	-24.0
0.7	1.54	0.606	1.336	-22.7	-8.9
0.8	1.76	0.692	1.526	-16.5	2.3
0.9	1.98	0.779	1.717	-11.6	11.1
1.0	2.20	0.865	1.907	-7.7	18.1
1.1	2.43	0.952	2.099	-4.5	23.9
1.2	2.65	1.038	2.288	-1.9	28.6
1.3	2.87	1.125	2.480	0.4	32.7
1.4	3.09	1.211	2.670	2.3	36.1
1.5	3.31	1.298	2.862	4.0	39.2

NOTE : Data for stabilized conditions see 5-7-0.

   B. Preconditioned Airflow Requirements.

FRESH AIRFLOW				CURVE 2	
TOTAL		CABIN		T FL	
(kg/s)	(lb/s)	(kg/s)	(lb/s)	(˚C)	(˚F)
0.5	1.10	0.433	0.955	27.8	82.0
0.6	1.32	0.519	1.144	26.6	79.9
0.7	1.54	0.606	1.336	25.7	78.3
0.8	1.76	0.692	1.526	25.1	77.2
0.9	1.98	0.779	1.717	24.6	76.3
1.0	2.20	0.865	1.907	24.2	75.6
1.1	2.43	0.952	2.099	23.8	74.8
1.2	2.65	1.038	2.288	23.5	74.3
1.3	2.87	1.125	2.480	23.3	73.9
1.4	3.09	1.211	2.670	23.1	73.6

FRESH AIRFLOW				CURVE 2	
TOTAL		CABIN		T FL	
(kg/s)	(lb/s)	(kg/s)	(lb/s)	(˚C)	(˚F)
1.5	3.31	1.298	2.862	22.9	73.2

NOTE : Data for stabilized conditions see 5-7-0.

C. Preconditioned Airflow Requirements.

FRESH AIRFLOW				CURVE 3	
TOTAL		CABIN		T FL	
(kg/s)	(lb/s)	(kg/s)	(lb/s)	(˚C)	(˚F)
0.5	1.10	0.433	0.955	32.2	90.0
0.6	1.32	0.519	1.144	30.2	86.4
0.7	1.54	0.606	1.336	28.8	83.8
0.8	1.76	0.692	1.526	27.8	82.0
0.9	1.98	0.779	1.717	26.9	80.4
1.0	2.20	0.865	1.907	26.3	79.3
1.1	2.43	0.952	2.099	25.7	78.3
1.2	2.65	1.038	2.288	25.3	77.5
1.3	2.87	1.125	2.480	24.9	76.8
1.4	3.09	1.211	2.670	24.6	76.3
1.5	3.31	1.298	2.862	24.3	75.7

NOTE : Data for stabilized conditions see 5-7-0.

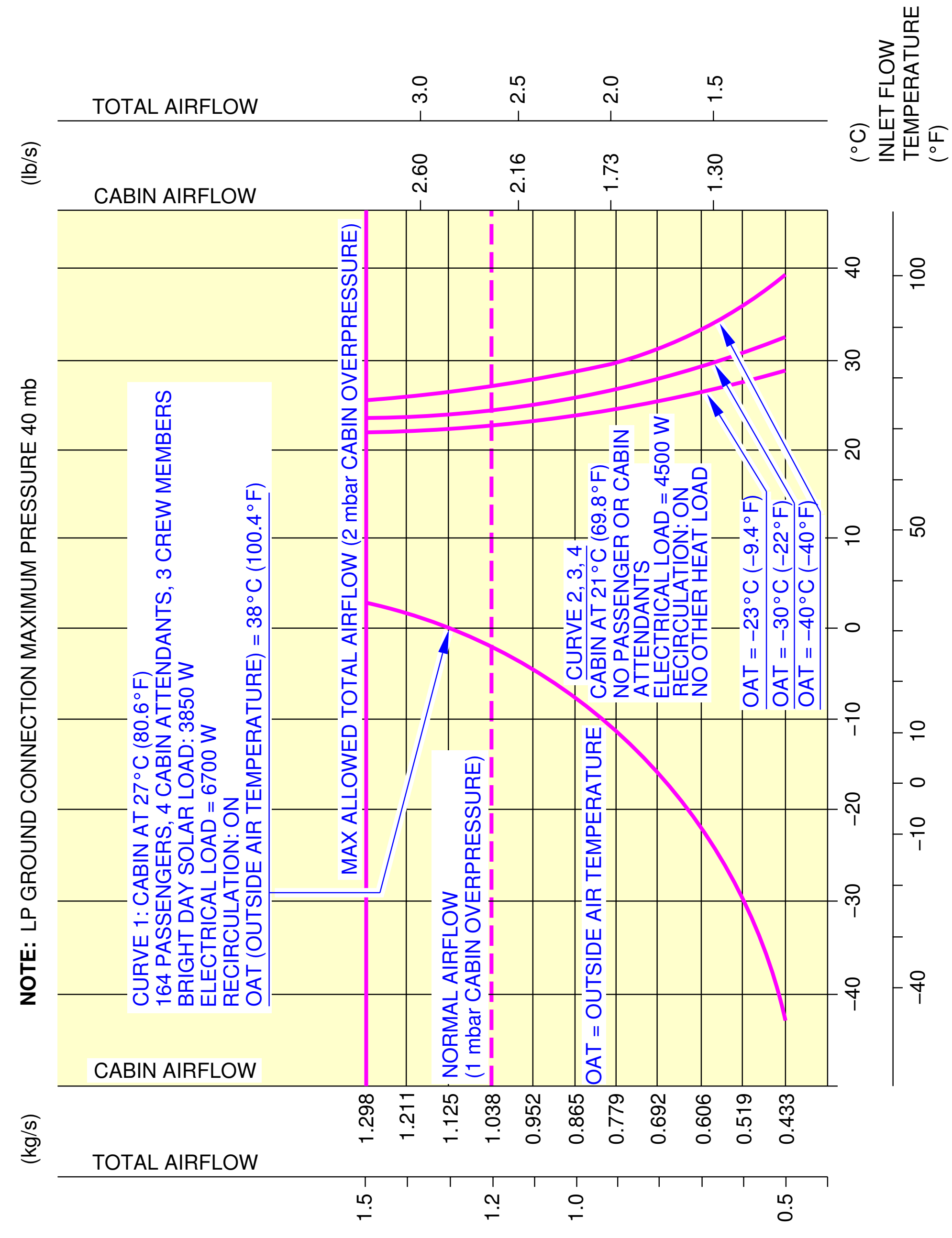
D. Preconditioned Airflow Requirements.

FRESH AIRFLOW				CURVE 4	
TOTAL		CABIN		T FL	
(kg/s)	(lb/s)	(kg/s)	(lb/s)	(˚C)	(˚F)
0.5	1.10	0.433	0.955	38.9	102.0
0.6	1.32	0.519	1.144	35.8	96.4
0.7	1.54	0.606	1.336	33.6	92.5
0.8	1.76	0.692	1.526	31.9	89.4
0.9	1.98	0.779	1.717	30.6	87.1
1.0	2.20	0.865	1.907	29.6	85.3
1.1	2.43	0.952	2.099	28.7	83.7
1.2	2.65	1.038	2.288	28.0	82.4
1.3	2.87	1.125	2.480	27.4	81.3
1.4	3.09	1.211	2.670	26.9	80.4

FRESH AIRFLOW				CURVE 4	
TOTAL		CABIN		T FL	
(kg/s)	(lb/s)	(kg/s)	(lb/s)	(°C)	(°F)
1.5	3.31	1.298	2.862	26.4	79.5

NOTE : Data for stabilized conditions see 5-7-0.

**ON A/C A320-100 A320-200



N_AC_050700_1_0030101_01_01

Preconditioned Airflow Requirements
FIGURE 1

5-8-0 Ground Towing Requirements

****ON A/C A320-100 A320-200**

Ground Towing Requirements

1. General

This section provides information on aircraft towing.
This aircraft is designed with means for conventional or towbarless towing.
Information/procedures can be found for both in chapter 9 of the Aircraft Maintenance Manual.
Status on towbarless towing equipment qualification can be found in SIL 09-002.
It is possible to tow or push the aircraft, at maximum ramp weight with engines at zero or up to idle thrust, using a tow bar attached to the nose gear leg (refer to AMM chap 9 for conditions and limitations).
One tow bar fitting is installed at the front of the leg.
The main landing gears have attachment points for towing or debogging (for details, refer to chapter 07 of the Aircraft Recovery Manual).

A. The first part of this section shows the chart to determine the draw bar pull and tow tractor mass requirements as function of the following physical characteristics:
   - Aircraft weight
   - Number of engines at idle
   - Slope.

   The chart is based on the engine type with the highest idle thrust level.

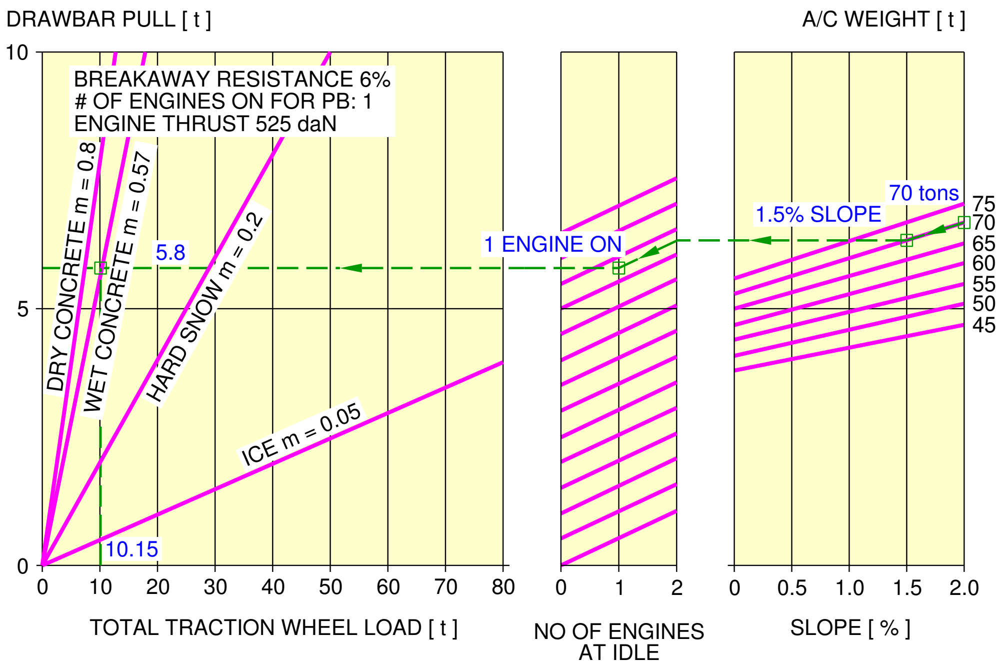
B. The second part of this section supplies guidelines for the tow bar.
   The aircraft tow bar shall respect the following norms:
   - SAE AS 1614, "Main Line Aircraft Tow Bar Attach Fitting Interface"
   - SAE ARP1915 Revision C, "Aircraft Tow Bar"
   - ISO 8267-1, "Aircraft - Tow bar attachment fitting - Interface requirements - Part 1: Main line aircraft"
   - ISO 9667, "Aircraft ground support equipment - Tow bars"
   - IATA Airport Handling Manual AHM 958, "Functional Specification for an Aircraft Tow bar".

   A conventional type tow bar is required which should be equipped with a damping system to protect the nose gear against jerks and with towing shear pins:
   - A traction shear pin calibrated at 9425 daN (21188 lbf)
   - A torsion pin calibrated at 826 m.daN (7311 lbf.in).

   The towing head is designed according to SAE/AS 1614 (issue C) cat. I.

   NOTE : Information on aircraft towing procedures and corresponding aircraft limitations are given in chapter 9 on the Aircraft Maintenance Manual.

**ON A/C A320-100 A320-200



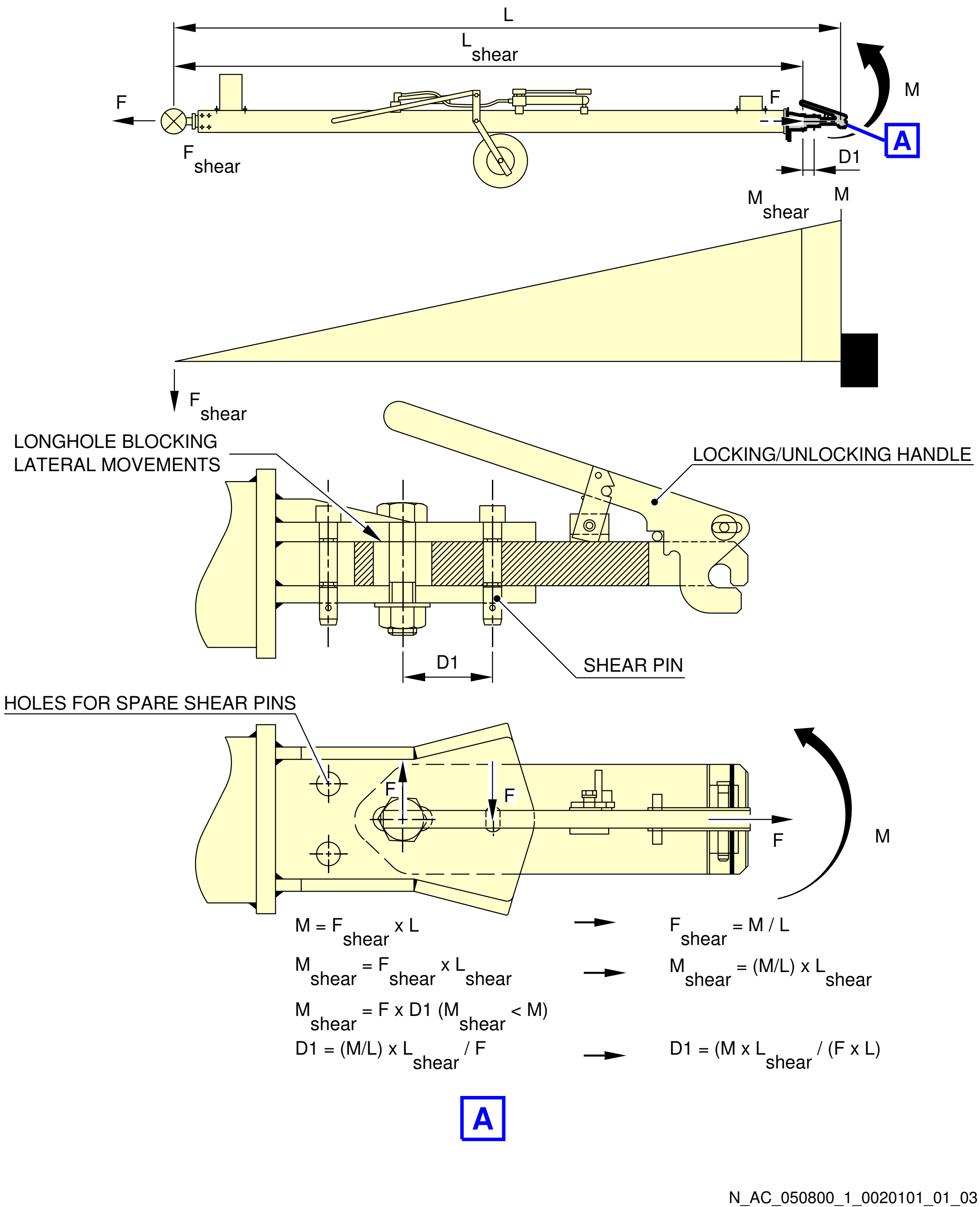
EXAMPLE HOW TO DETERMINE THE MASS REQUIREMENT TO TOW A A320 AT 70 t, AT 1.5% SLOPE, 1 ENGINE AT IDLE AND FOR WET TARMAC CONDITIONS:

- ON THE RIGHT HAND SIDE OF THE GRAPH, CHOOSE THE RELEVANT AIRCRAFT WEIGHT (70 t)
- FROM THIS POINT DRAW A PARALLEL LINE TO THE REQUIRED SLOPE PERCENTAGE (1.5%)
- FROM THE POINT OBTAINED DRAW A STRAIGHT HORIZONTAL LINE UNTIL NO OF ENGINES AT IDLE = 2
- FROM THIS POINT DRAW A PARALLEL LINE TO THE REQUESTED NUMBER OF ENGINES (1)
- FROM THIS POINT DRAW A STRAIGHT HORIZONTAL LINE TO THE DRAWBAR PULL AXIS
- THE Y–COORDINATE OBTAINED IS THE NECESSARY DRAWBAR PULL FOR THE TRACTOR (5.8 t)
- SEARCH THE INTERSECTION WITH THE "WET CONCRETE" LINE. THE OBTAINED X–COORDINATE IS THE RECOMMENDED MINIMUM TRACTOR WEIGHT (10.1 t)

N_AC_050800_1_0010301_01_03

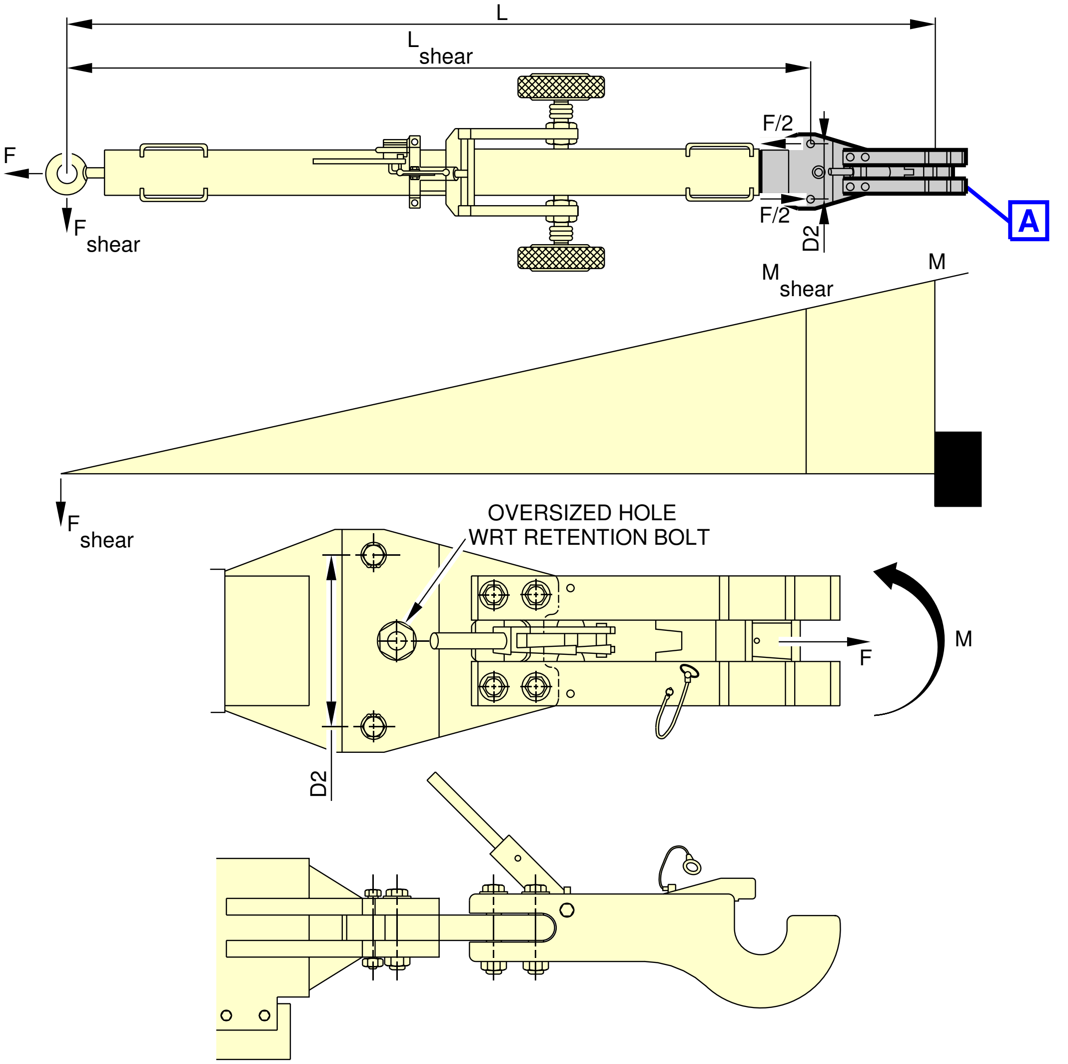
Ground Towing Requirements
FIGURE 1

**ON A/C A320-100 A320-200



Ground Towing Requirements
Typical Tow Bar Configuration 1
FIGURE 2

**ON A/C A320-100 A320-200



$M = F_{shear} \times L \rightarrow F_{shear} = M / L$

$M_{shear} = F_{shear} \times L_{shear} \rightarrow M_{shear} = (M / L) \times L_{shear}$

$M_{shear} = F/2 \times D2$ ($M_{shear} < M$)

$D2 = (2 \times M_{shear}) / F \rightarrow D2 = (2 \times M \times L_{shear}) / (F \times L)$

F [daN]	M [m.daN]	D1 [mm]	D2 [mm]
9425	826	78.9	168.3

RESULTS FOR A TOWBAR LENGTH OF $L_{shear}/L = 0.90$

A

N_AC_050800_1_0030101_01_01

Ground Towing Requirements
Typical Tow Bar Configuration 2
FIGURE 3

OPERATING CONDITIONS

6-1-0 Engine Exhaust Velocities and Temperatures

****ON A/C A320-100 A320-200**

Engine Exhaust Velocities and Temperatures

1. General
   This section shows the estimated engine exhaust efflux velocities and temperatures contours for Ground Idle, Breakaway, Maximum Takeoff conditions.

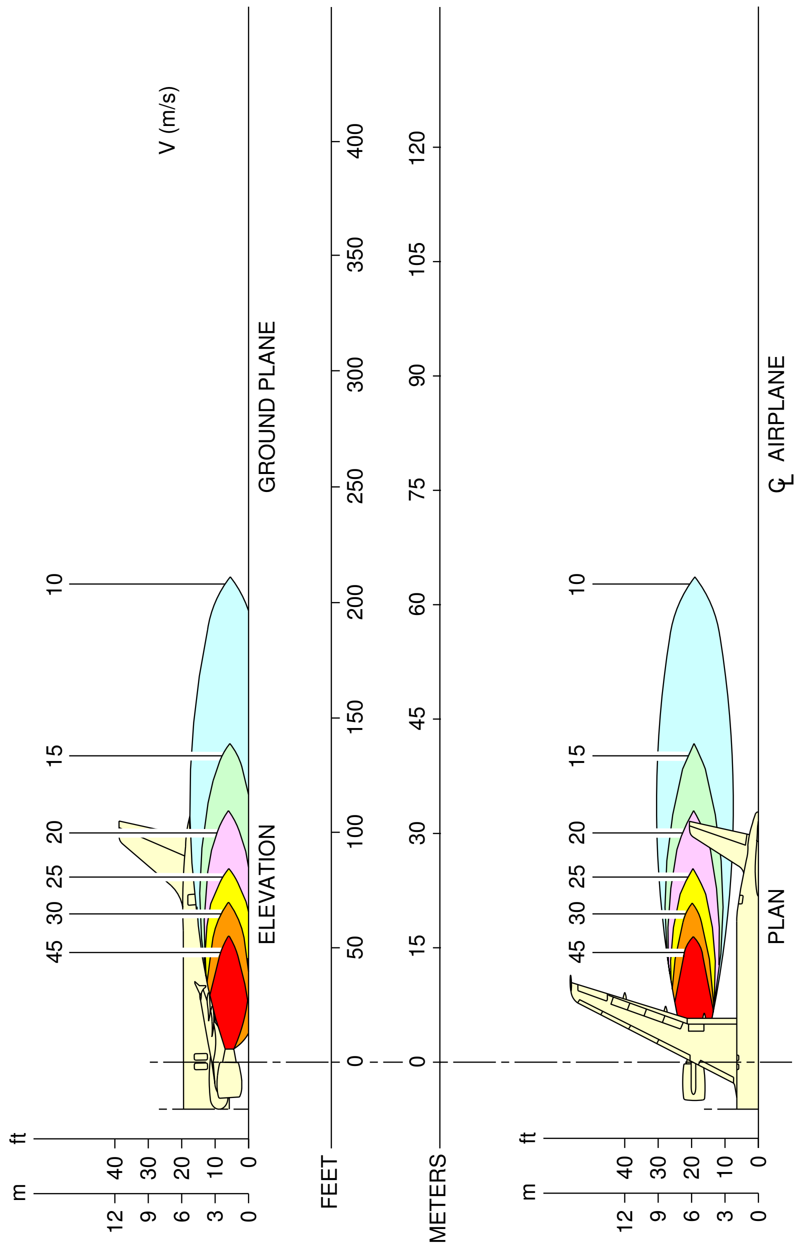
6-1-1 Engine Exhaust Velocities Contours - Ground Idle Power

****ON A/C A320-100 A320-200**

Engine Exhaust Velocities Contours - Ground Idle Power

1. This section gives engine exhaust velocities contours at ground idle power.

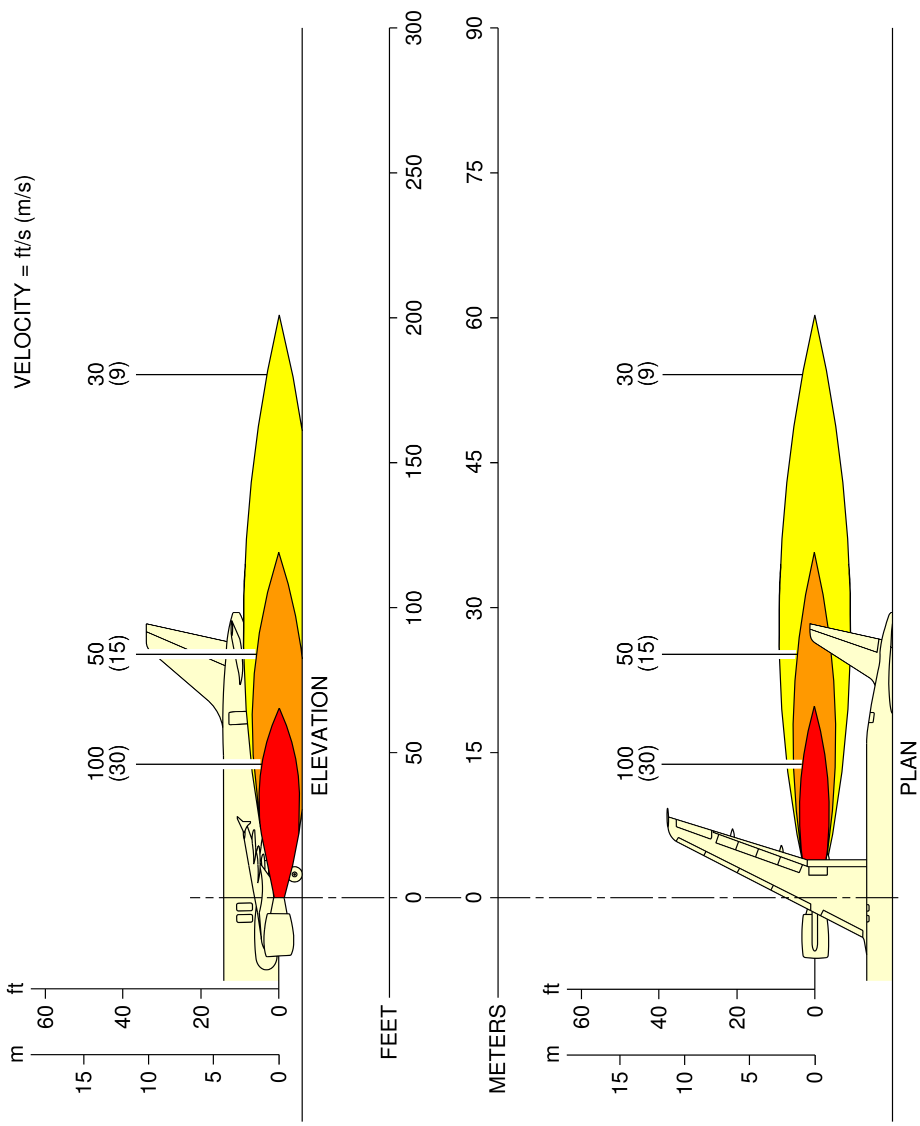
**ON A/C A320-100 A320-200



N_AC_060101_1_0050101_01_00

Engine Exhaust Velocities
Ground Idle Power – CFM56 series engine
FIGURE 1

**ON A/C A320-100 A320-200



N_AC_060101_1_0060101_01_00

Engine Exhaust Velocities
Ground Idle Power – IAE V2500 series engine
FIGURE 2

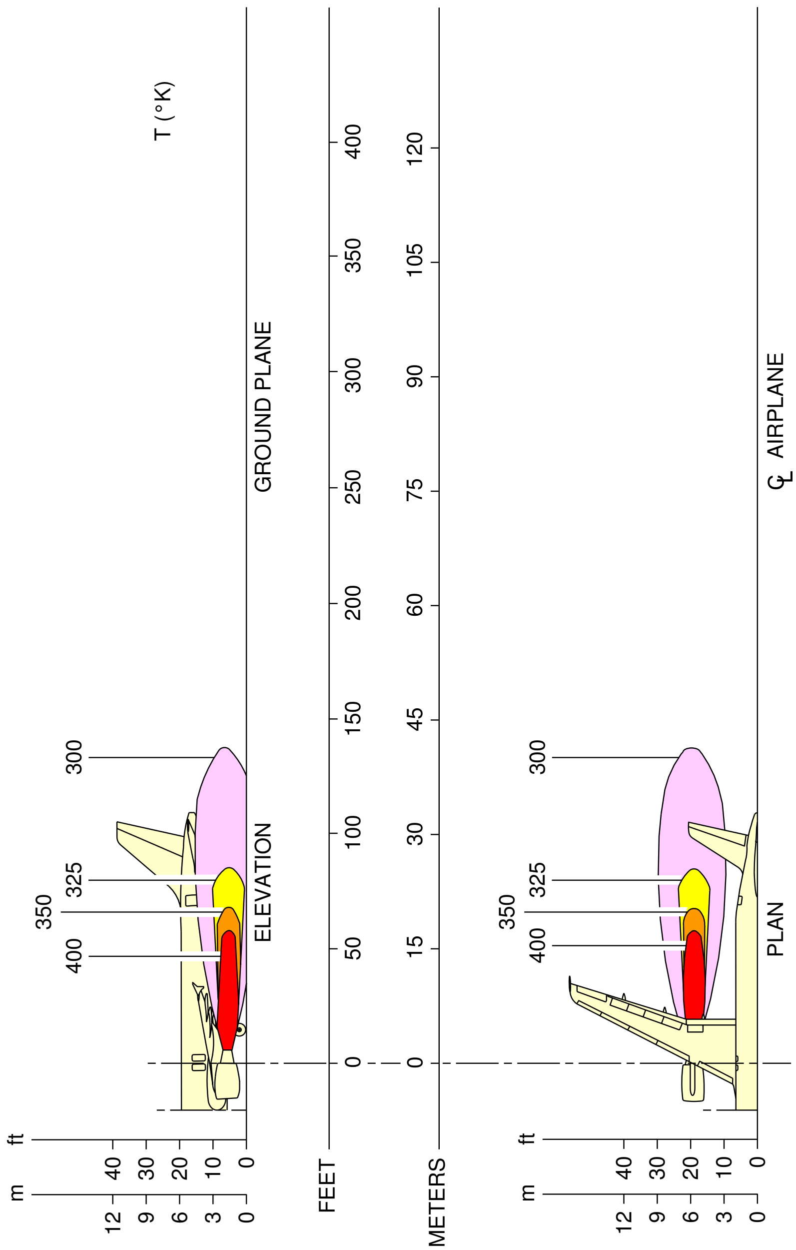
6-1-2 Engine Exhaust Temperatures Contours - Ground Idle Power

****ON A/C A320-100 A320-200**

Engine Exhaust Temperatures Contours - Ground Idle Power

1. This section gives engine exhaust temperatures contours at ground idle power.

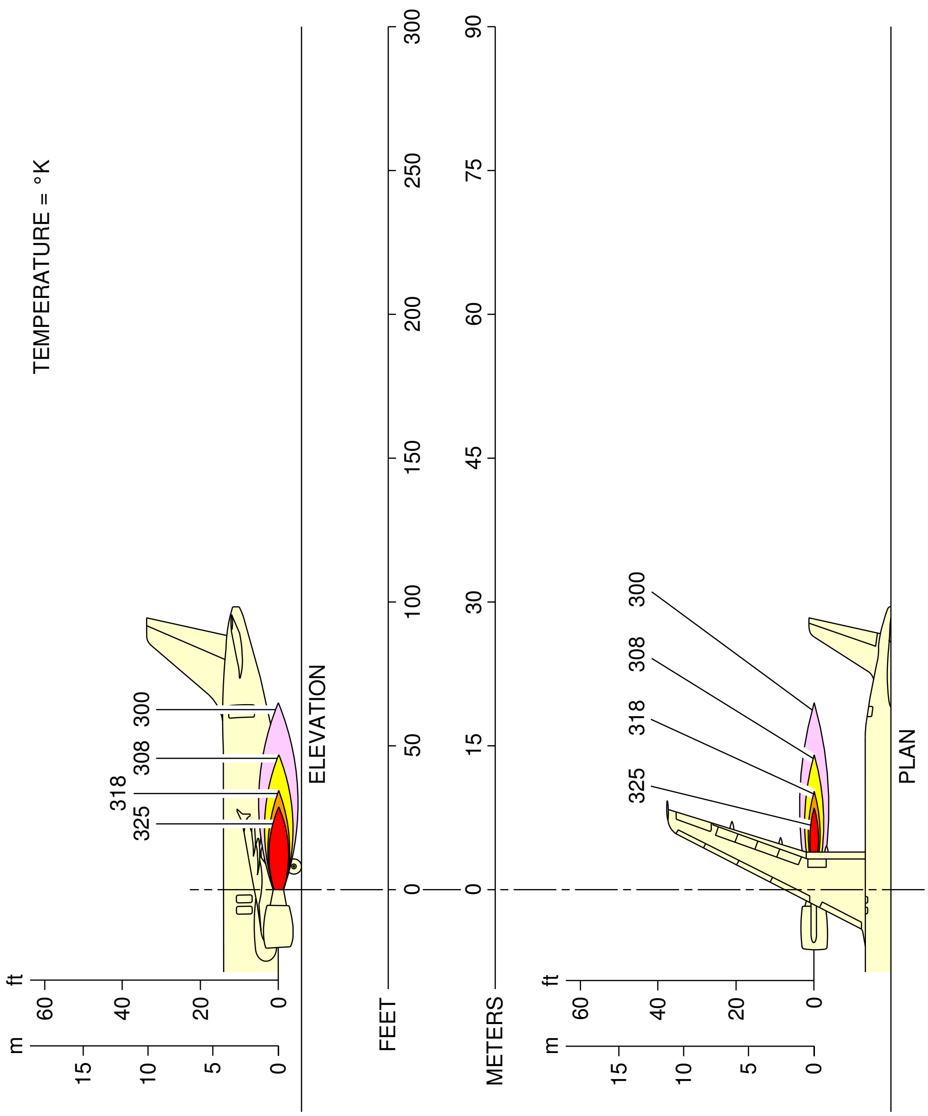
**ON A/C A320-100 A320-200



N_AC_060102_1_0050101_01_00

Engine Exhaust Temperatures
Ground Idle Power – CFM56 series engine
FIGURE 1

****ON A/C A320-100 A320-200**



N_AC_060102_1_0060101_01_00

Engine Exhaust Temperatures
Ground Idle Power – IAE V2500 series engine
FIGURE 2

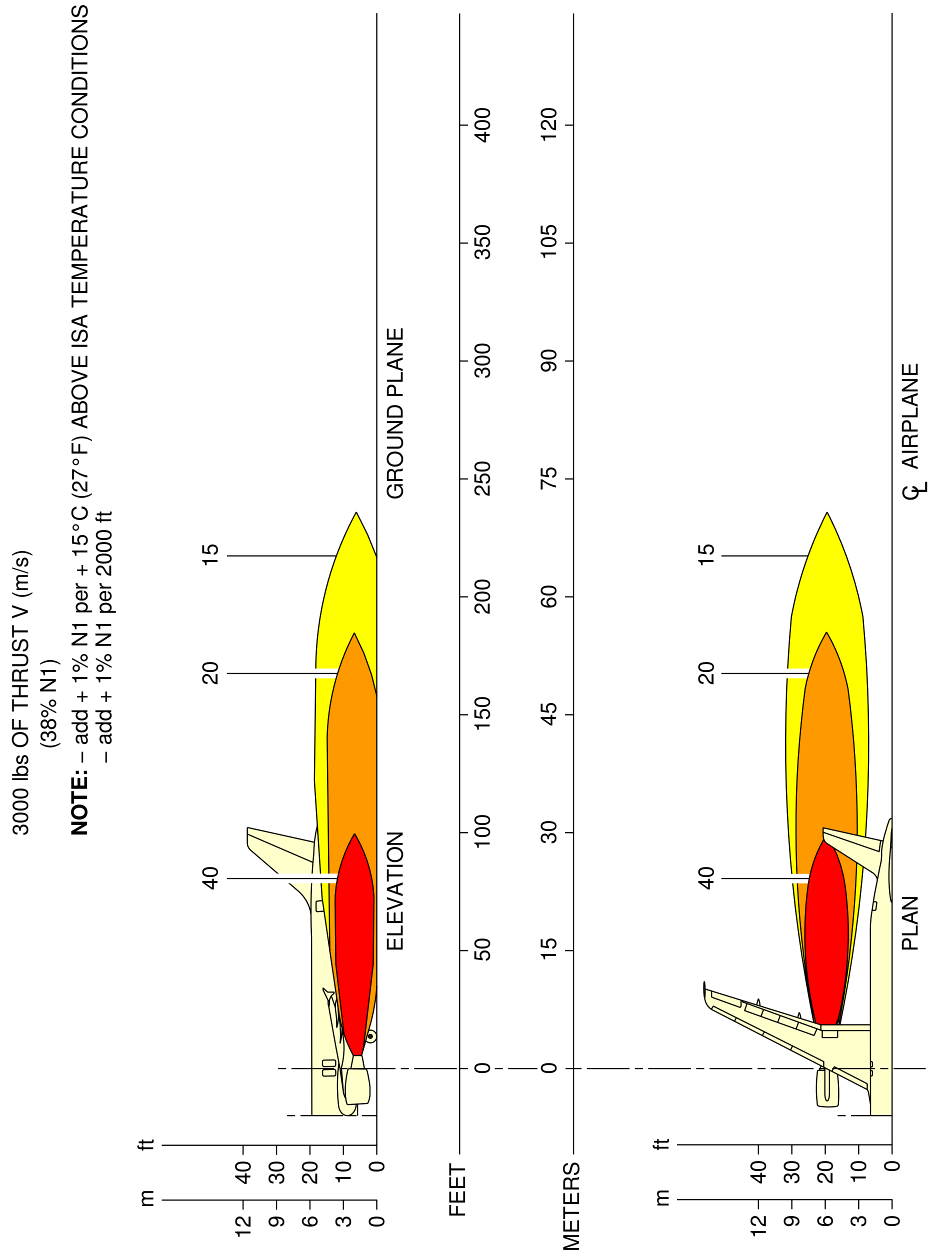
6-1-3 Engine Exhaust Velocities Contours - Breakaway Power

****ON A/C A320-100 A320-200**

Engine Exhaust Velocities Contours - Breakaway Power

1. This section gives engine exhaust velocities contours at breakaway power.

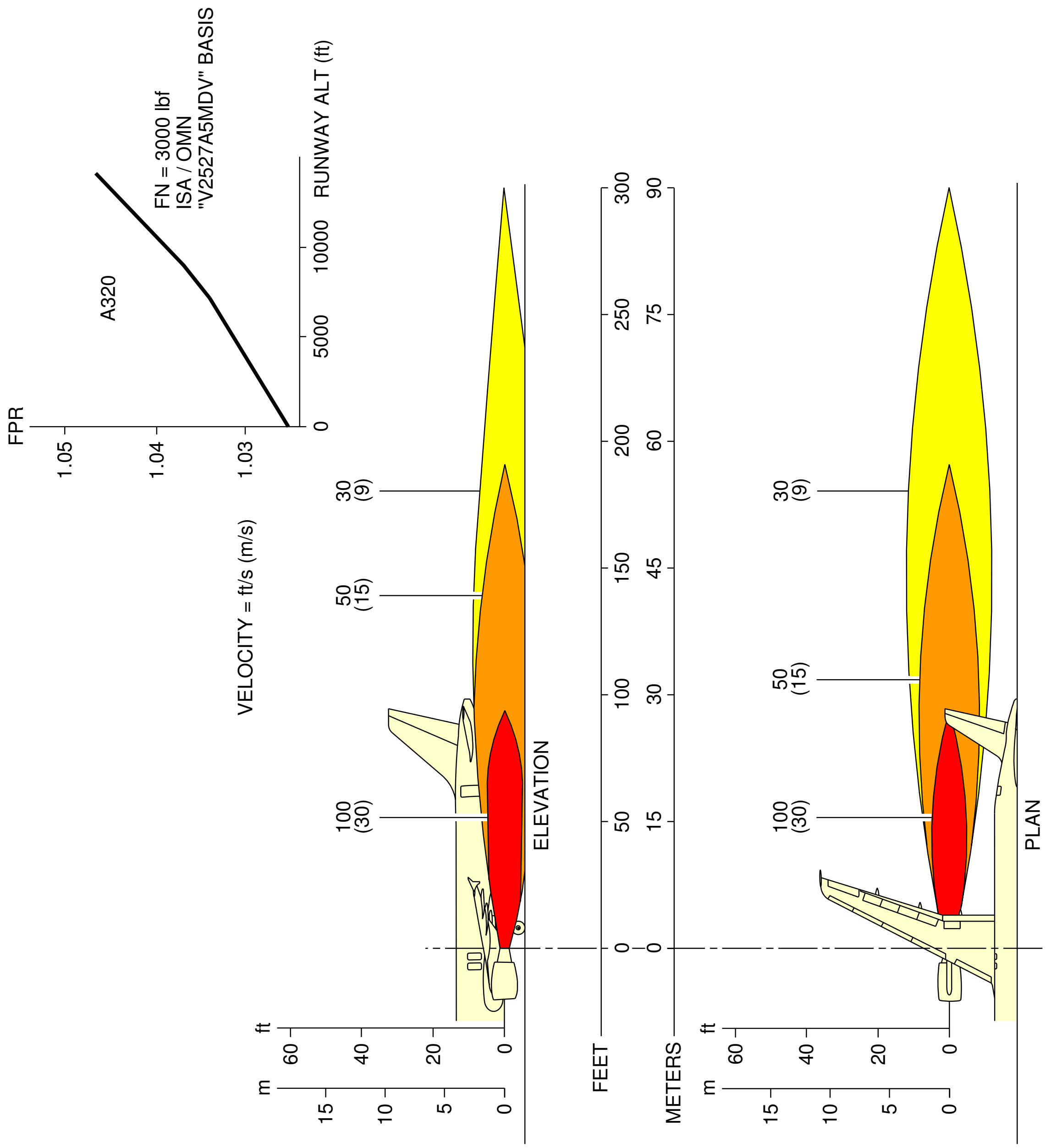
****ON A/C A320-100 A320-200**



N_AC_060103_1_0030101_01_00

Engine Exhaust Velocities
Breakaway Power – CFM56 series engine
FIGURE 1

****ON A/C A320-100 A320-200**



N_AC_060103_1_0040101_01_00

Engine Exhaust Velocities
Breakaway Power – IAE V2500 series engine
FIGURE 2

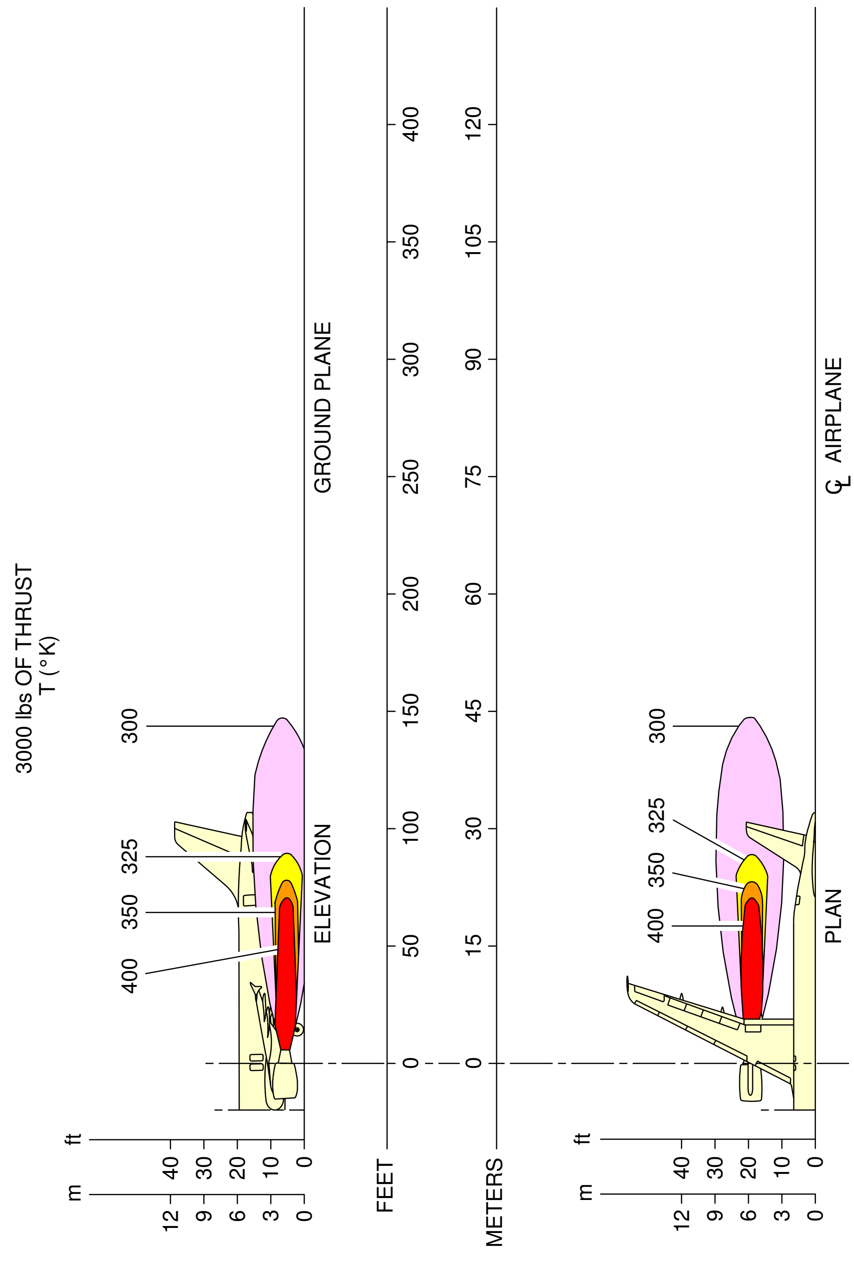
6-1-4 Engine Exhaust Temperatures Contours - Breakaway Power

****ON A/C A320-100 A320-200**

Engine Exhaust Temperatures Contours - Breakaway Power

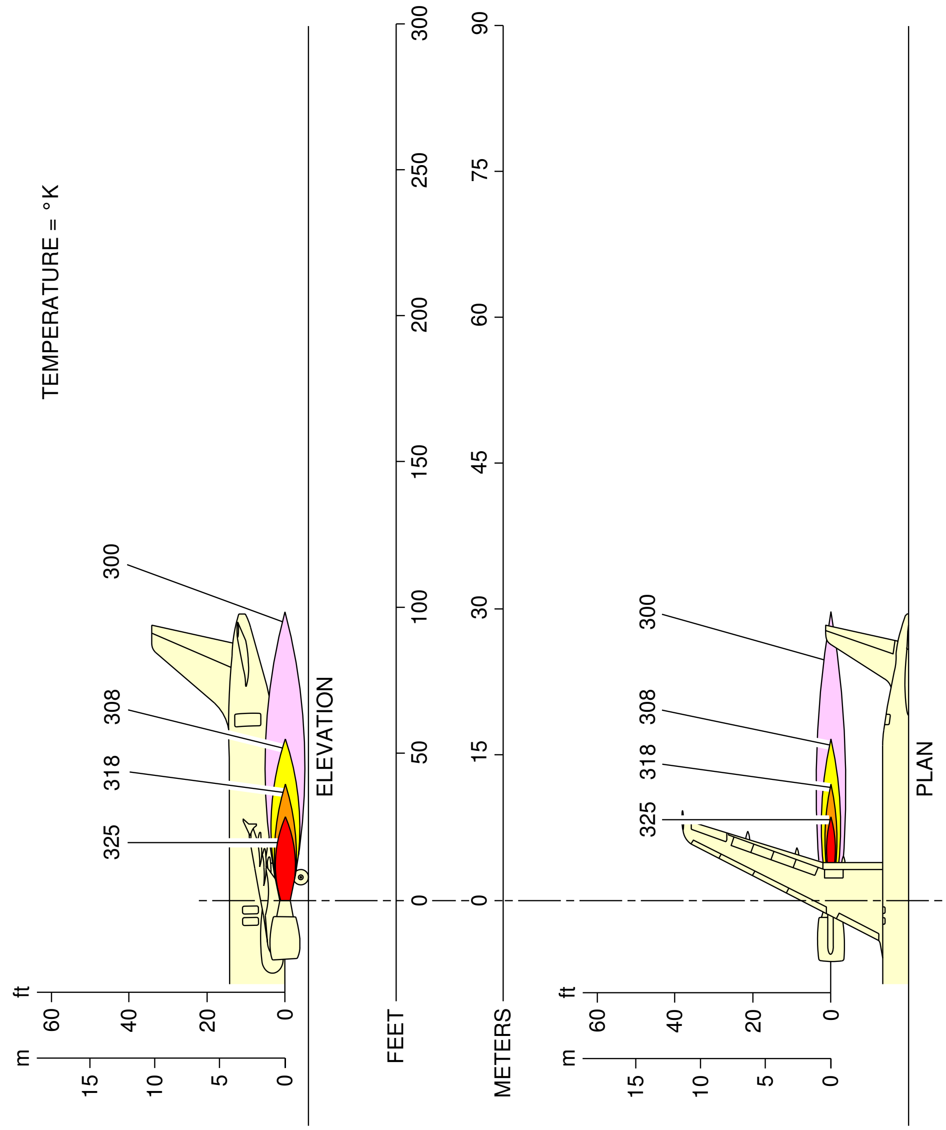
1. This section gives engine exhaust temperatures contours at breakaway power.

**ON A/C A320-100 A320-200



Engine Exhaust Temperatures
Breakaway Power – CFM56 series engine
FIGURE 1

****ON A/C A320-100 A320-200**



N_AC_060104_1_0040101_01_00

Engine Exhaust Temperatures
Breakaway Power – IAE V2500 series engine
FIGURE 2

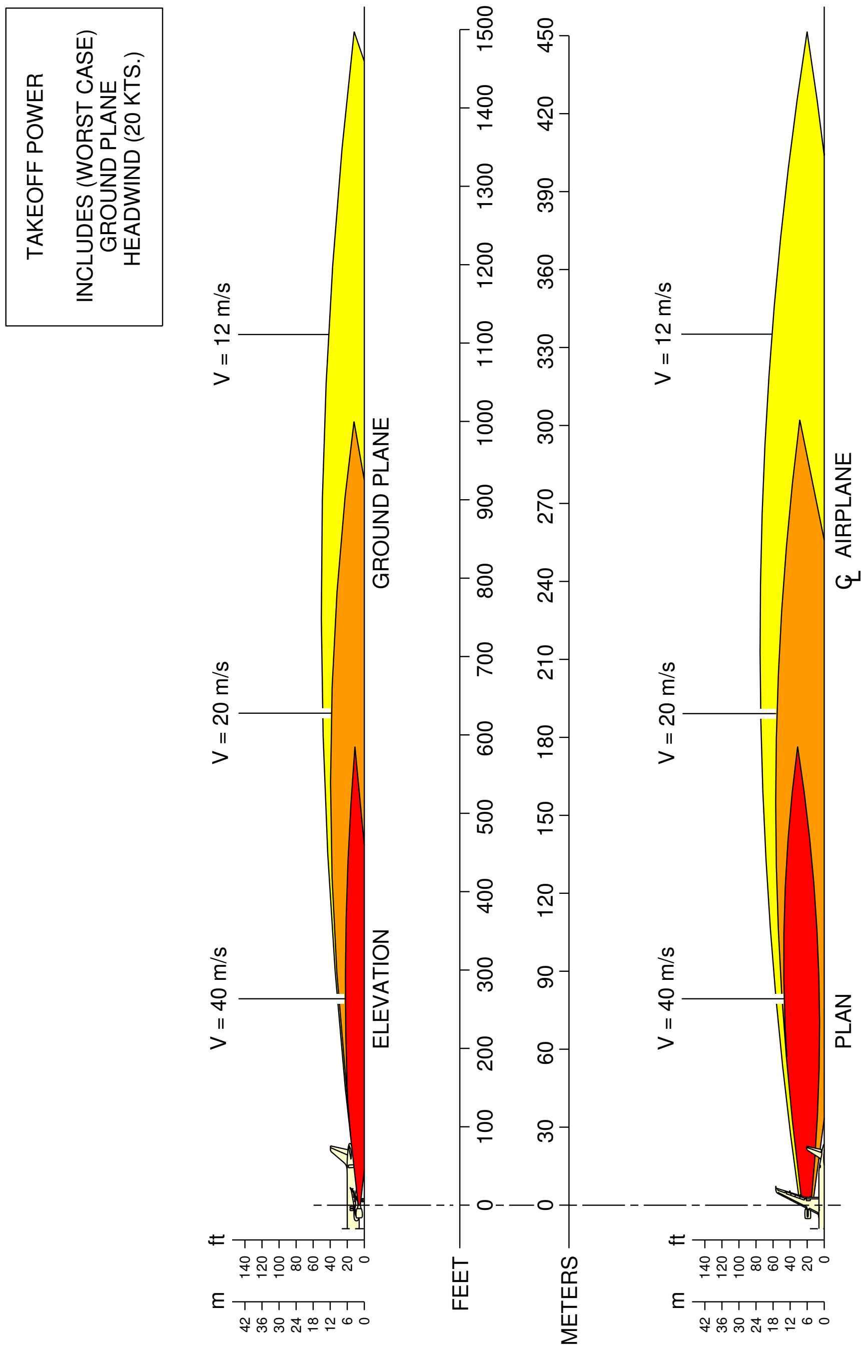
6-1-5 Engine Exhaust Velocities Contours - Takeoff Power

****ON A/C A320-100 A320-200**

Engine Exhaust Velocities Contours - Takeoff Power

1. This section gives engine exhaust velocities contours at takeoff power.

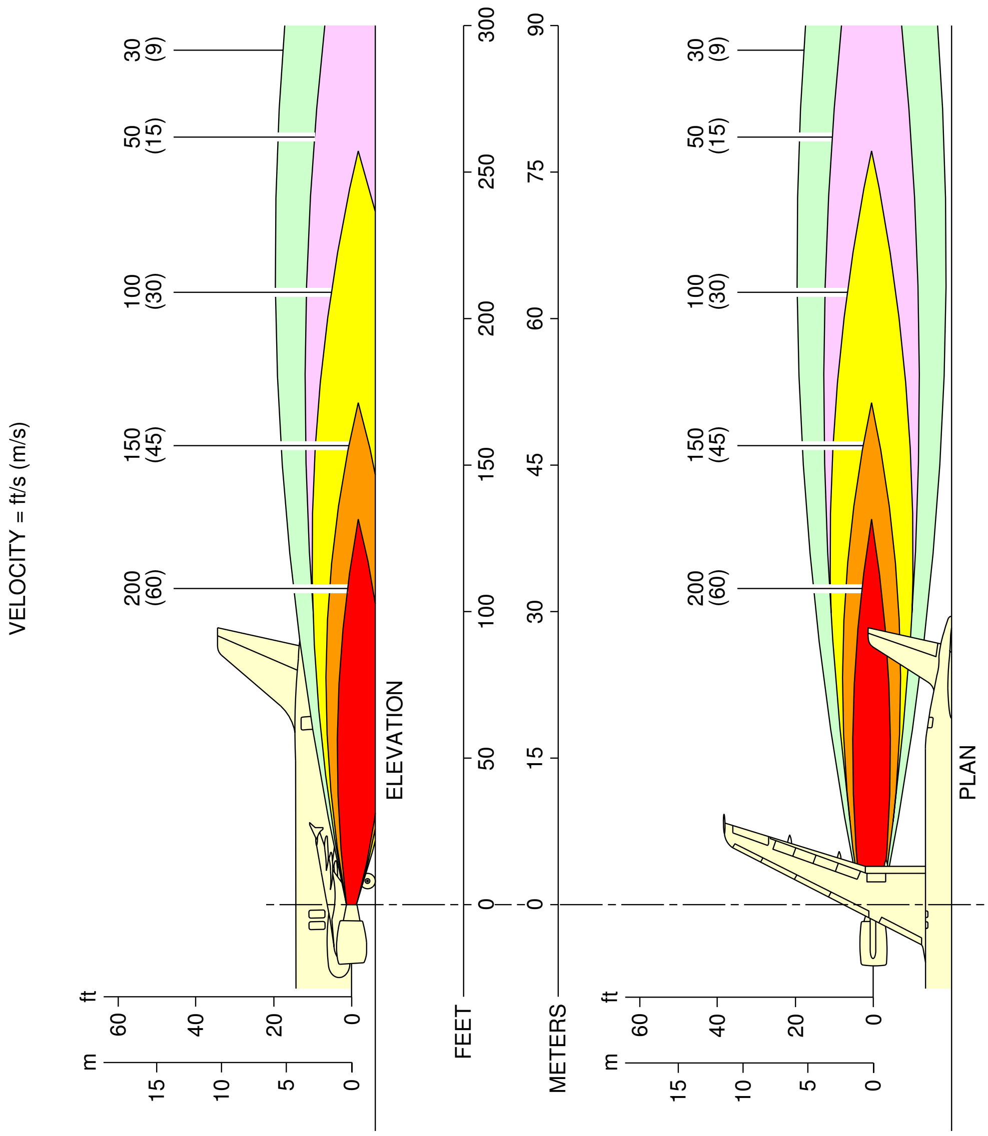
**ON A/C A320-100 A320-200



N_AC_060105_1_0050101_01_00

Engine Exhaust Velocities
Takeoff Power – CFM56 series engine
FIGURE 1

**ON A/C A320-100 A320-200



N_AC_060105_1_0060101_01_01

Engine Exhaust Velocities
Takeoff Power – IAE V2500 series engine
FIGURE 2

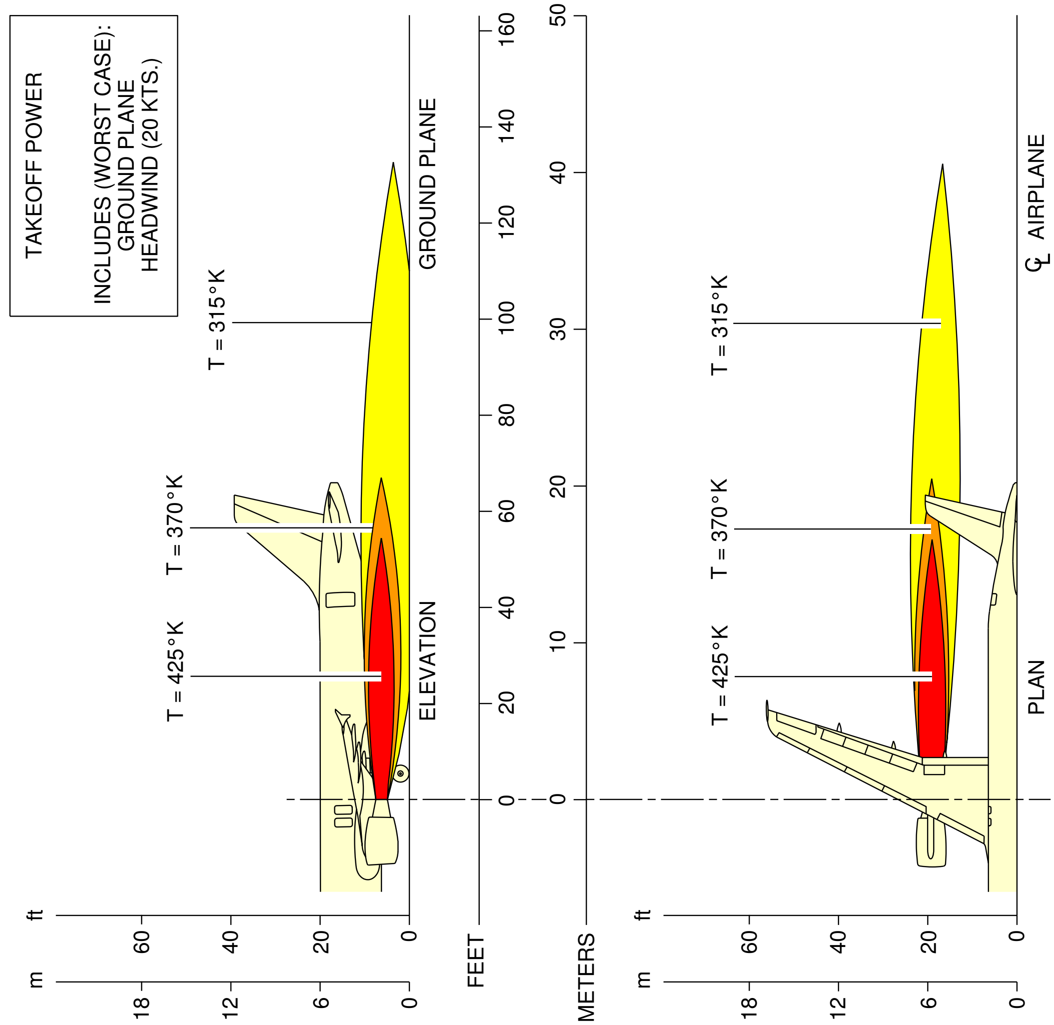
6-1-6 Engine Exhaust Temperatures Contours - Takeoff Power

****ON A/C A320-100 A320-200**

Engine Exhaust Temperatures Contours - Takeoff Power

1. This section gives engine exhaust temperatures contours at takeoff power.

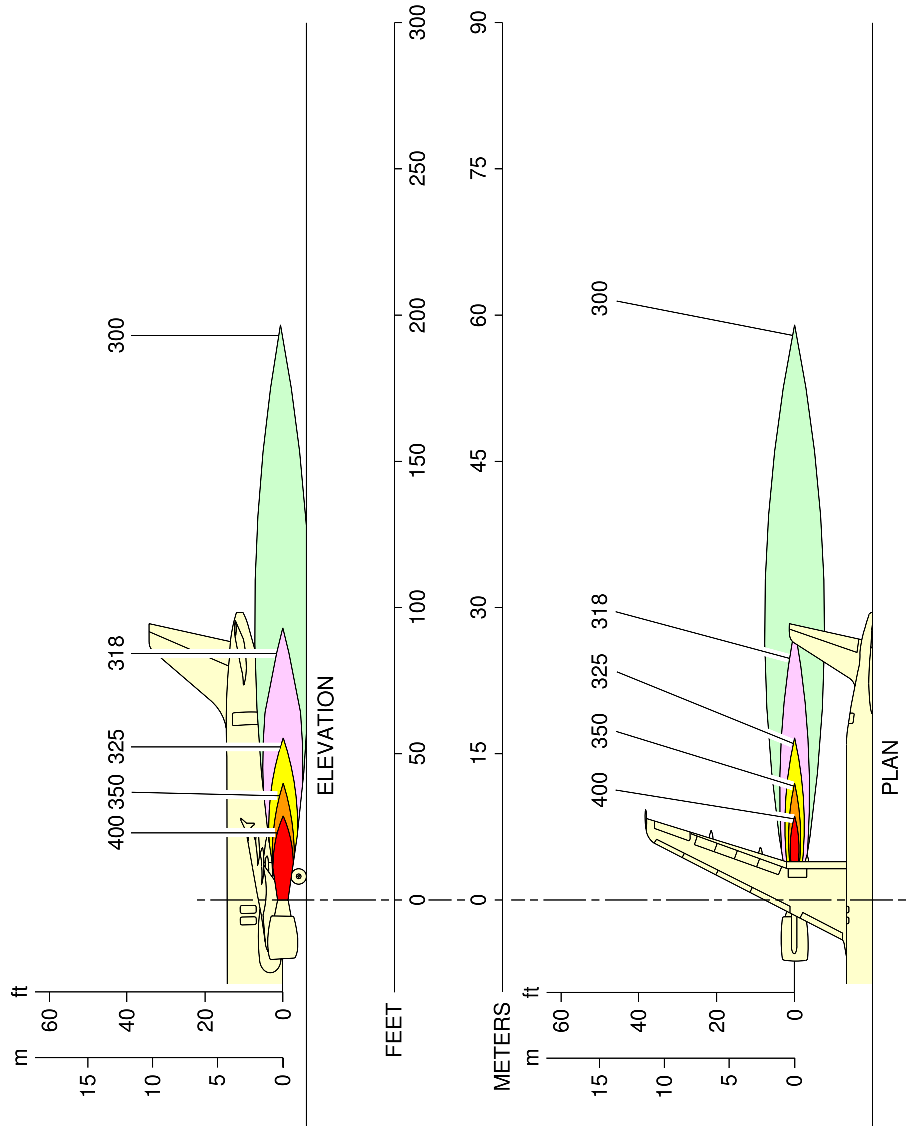
**ON A/C A320-100 A320-200



N_AC_060106_1_0050101_01_00

Engine Exhaust Temperatures
Takeoff Power – CFM56 series engine
FIGURE 1

**ON A/C A320-100 A320-200



N_AC_060106_1_0060101_01_00

Engine Exhaust Temperatures
Takeoff Power – IAE V2500 series engine
FIGURE 2

6-2-0 Airport and Community Noise

****ON A/C A320-100 A320-200**

Airport and Community Noise

1. Airport and Community Noise Data

   This section gives data concerning engine maintenance run-up noise to permit evaluation of possible attenuation requirements.

6-2-1 Noise Data

****ON A/C A320-100 A320-200**

Noise Data

1. Noise Data for CFM56-5A series engine

   A. Description of test conditions:

      The arc of circle (radius = 60 m (196.85 ft)), with microphones 1.2 m (3.94 ft) high, is centered on the position of the noise reference point.
      A.P.U.: off; E.C.S.: Packs off.

   B. Engine parameters: 2 engines running

   C. Meteorological data:

      The meteorological parameters measured 1.6 m (5.25 ft) from the ground on the day of test were as follows:
      - Temperature: 3°C (37°F)
      - Relative humidity: 66%
      - Atmospheric pressure: 1016 hPa
      - Wind speed: Negligible
      - No rain

2. Noise Data for CFM56-5B series engine

   A. Description of test conditions:

      The arc of circle (radius = 60 m (196.85 ft)), with microphones 1.2 m (3.94 ft) high, is centered on the position of the noise reference point.
      A.P.U.: off; E.C.S.: Packs off.

   B. Engine parameters: 2 engines running

   C. Meteorological data:

      The meteorological parameters measured 1.6 m (5.25 ft) from the ground on the day of test were as follows:
      - Temperature: 22°C (72°F)
      - Relative humidity: 42%
      - Atmospheric pressure: 1003 hPa
      - Wind speed: Negligible
      - No rain

3. Noise Data for IAE V2500 series engine

   A. Description of test conditions:

The arc of circle (radius = 60 m (196.85 ft)), with microphones 1.2 m (3.94 ft) high, is centered on the position of the noise reference point.
A.P.U.: off; E.C.S.: Packs off.

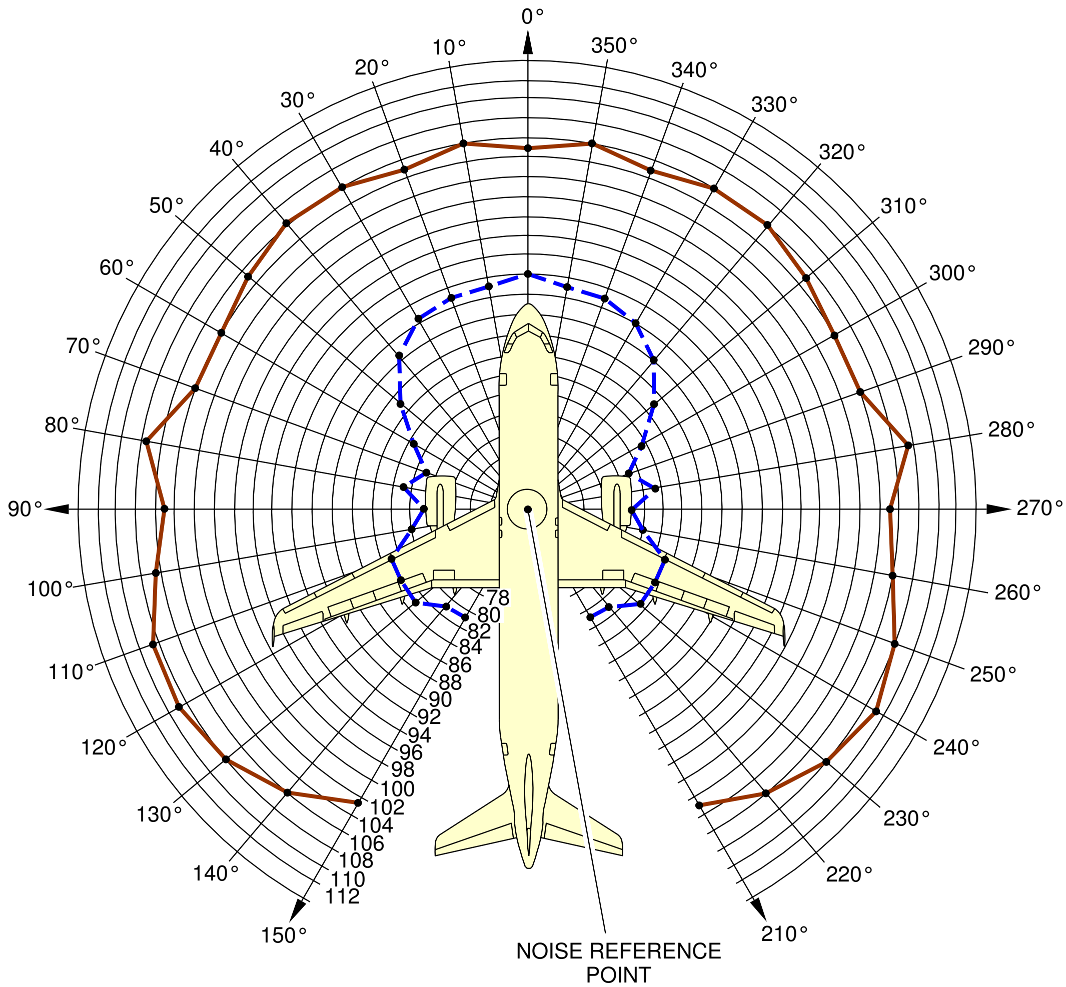
B. Engine parameters: 2 engines running

C. Meteorological data:

The meteorological parameters measured 1.6 m (5.25 ft) from the ground on the day of test were as follows:
- Temperature: 12°C (54°F)
- Relative humidity: 62.5%
- Atmospheric pressure: 1000 hPa
- Wind speed: Negligible
- No rain

**ON A/C A320-100 A320-200

	GROUND IDLE	MAX THRUST POSSIBLE ON BRAKES
N1	20.8%	90%
CURVE	dashed blue line	solid brown line

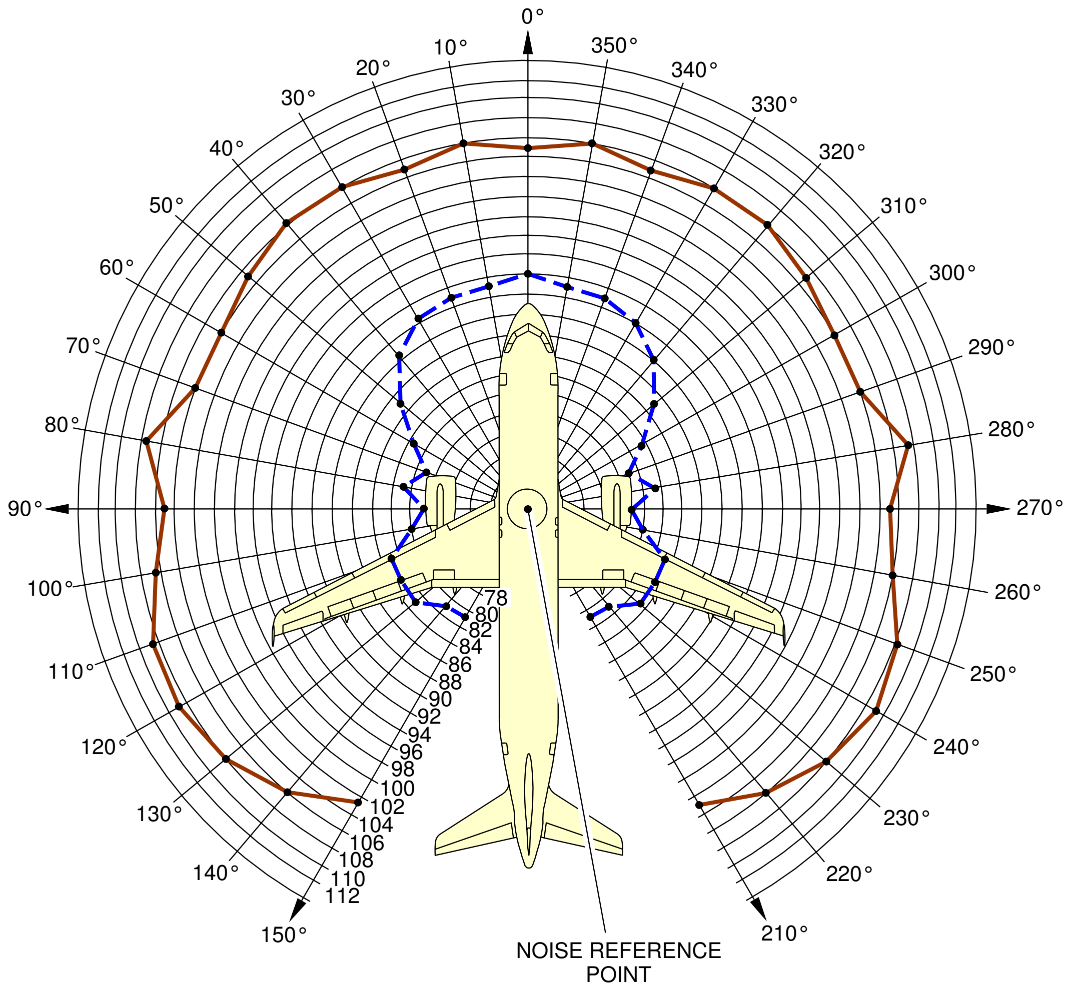


N_AC_060201_1_0070101_01_00

Airport and Community Noise
CFM56-5A series engine
FIGURE 1

**ON A/C A320-100 A320-200

	GROUND IDLE	MAX THRUST POSSIBLE ON BRAKES
N1	18.9%	87%
CURVE		

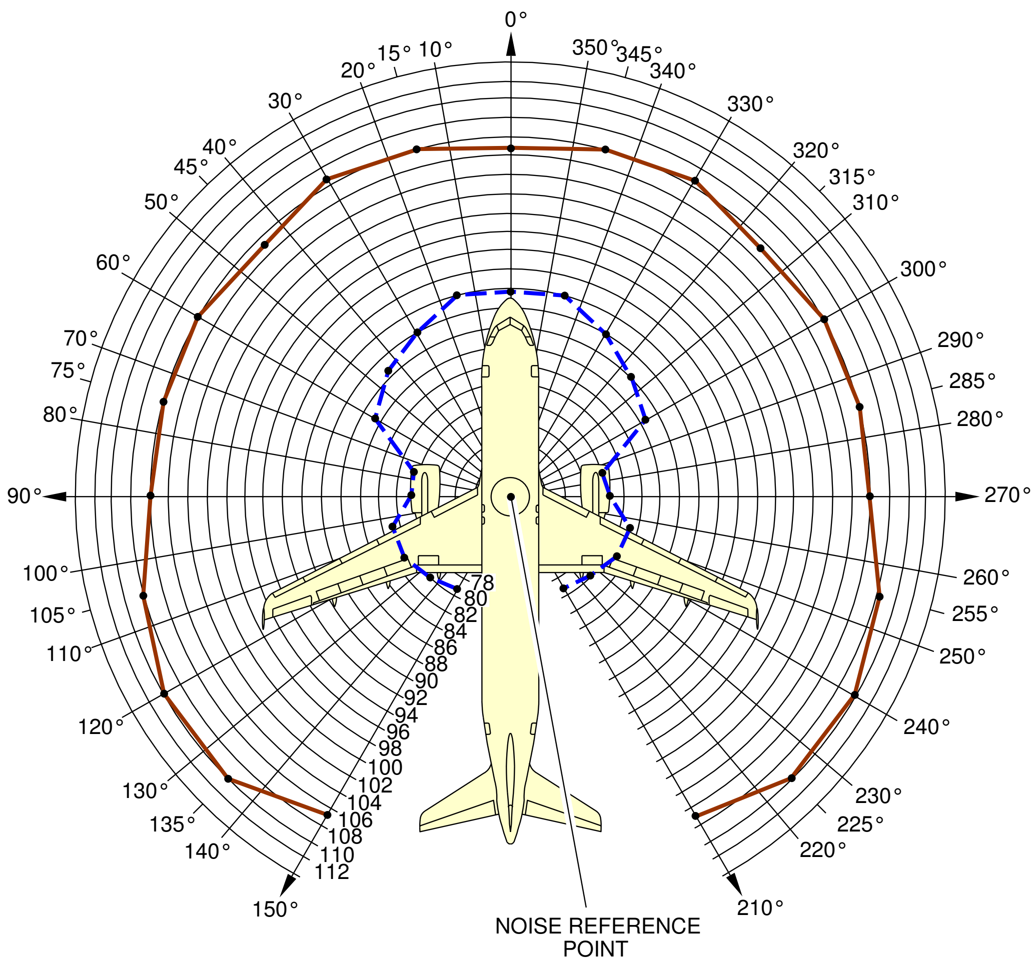


N_AC_060201_1_0080101_01_00

Airport and Community Noise
CFM56-5B series engine
FIGURE 2

**ON A/C A320-100 A320-200

	GROUND IDLE	MAX THRUST POSSIBLE ON BRAKES
E.P.R	1.007	1.397
N2	57.7%	92.5%
CURVE		



N_AC_060201_1_0090101_01_00

Airport and Community Noise
IAE V2500 series engine
FIGURE 3

6-3-0 Danger Areas of Engines

****ON A/C A320-100 A320-200**

Danger Areas of Engines

1. Danger Areas of the Engines.

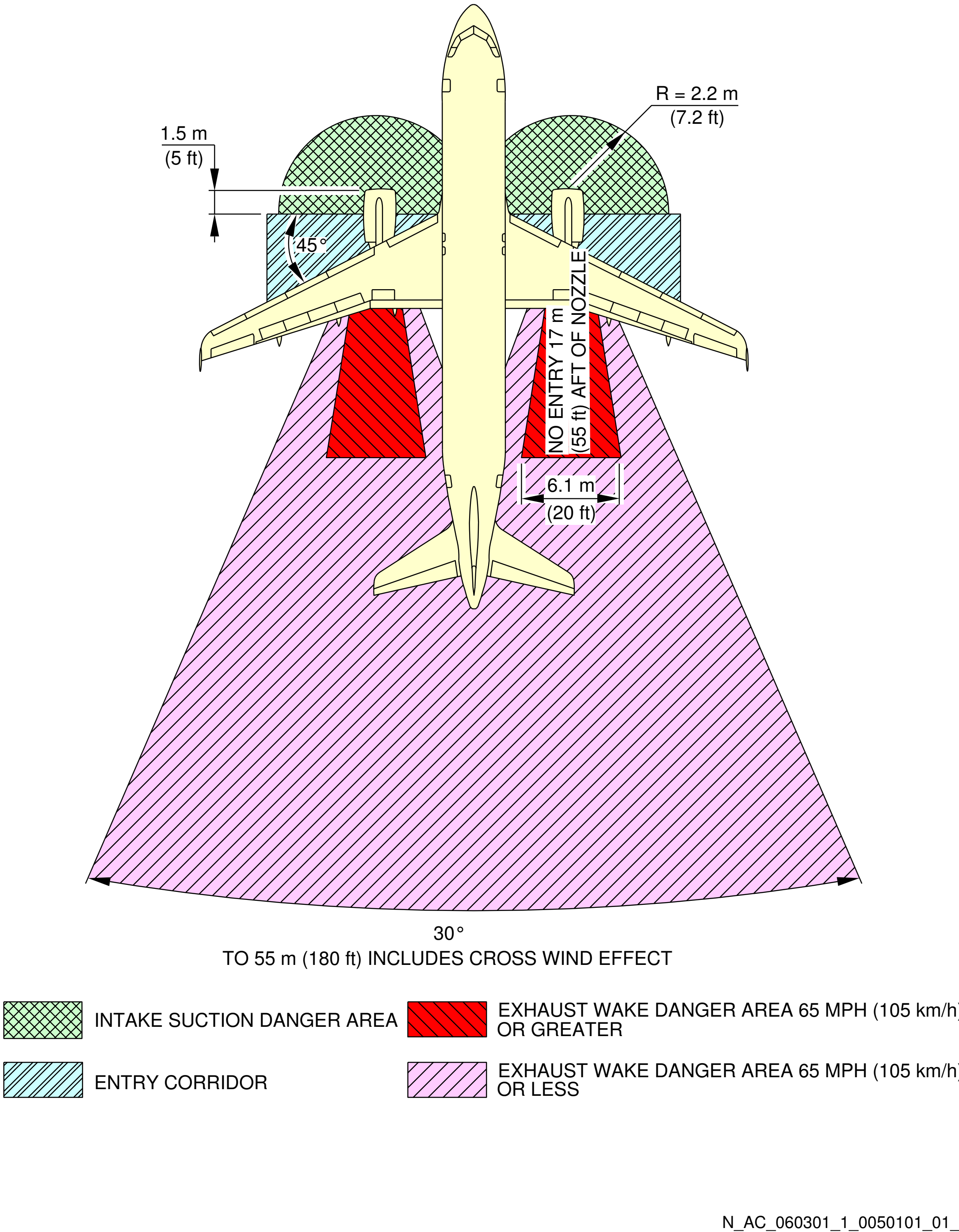
6-3-1 Ground Idle Power

****ON A/C A320-100 A320-200**

Ground Idle Power

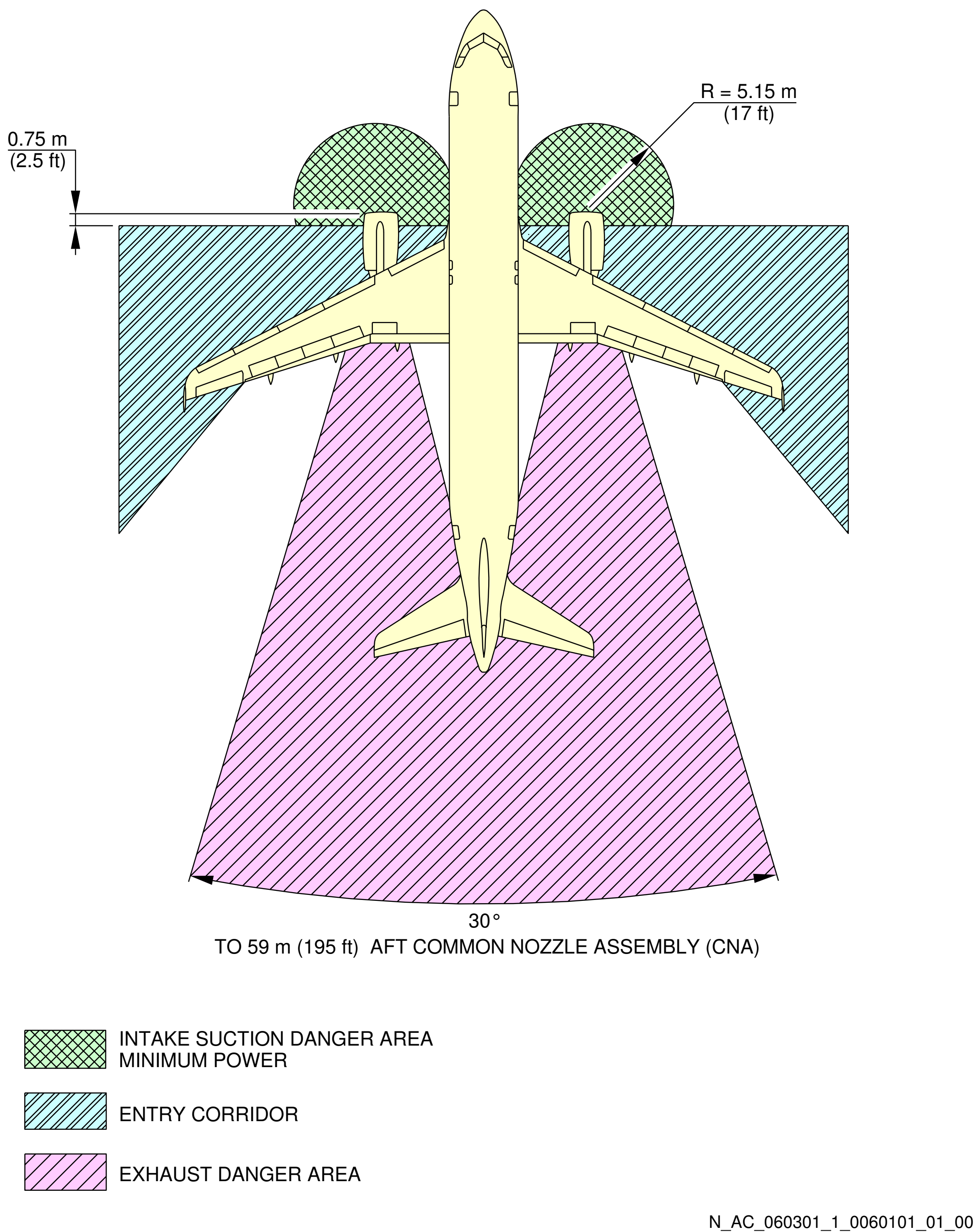
1. This section gives danger areas of the engines at ground idle power conditions.

**ON A/C A320-100 A320-200



Danger Areas of Engines
CFM56 series engine
FIGURE 1

**ON A/C A320-100 A320-200



Danger Areas of Engines
IAE V2500 series engine
FIGURE 2

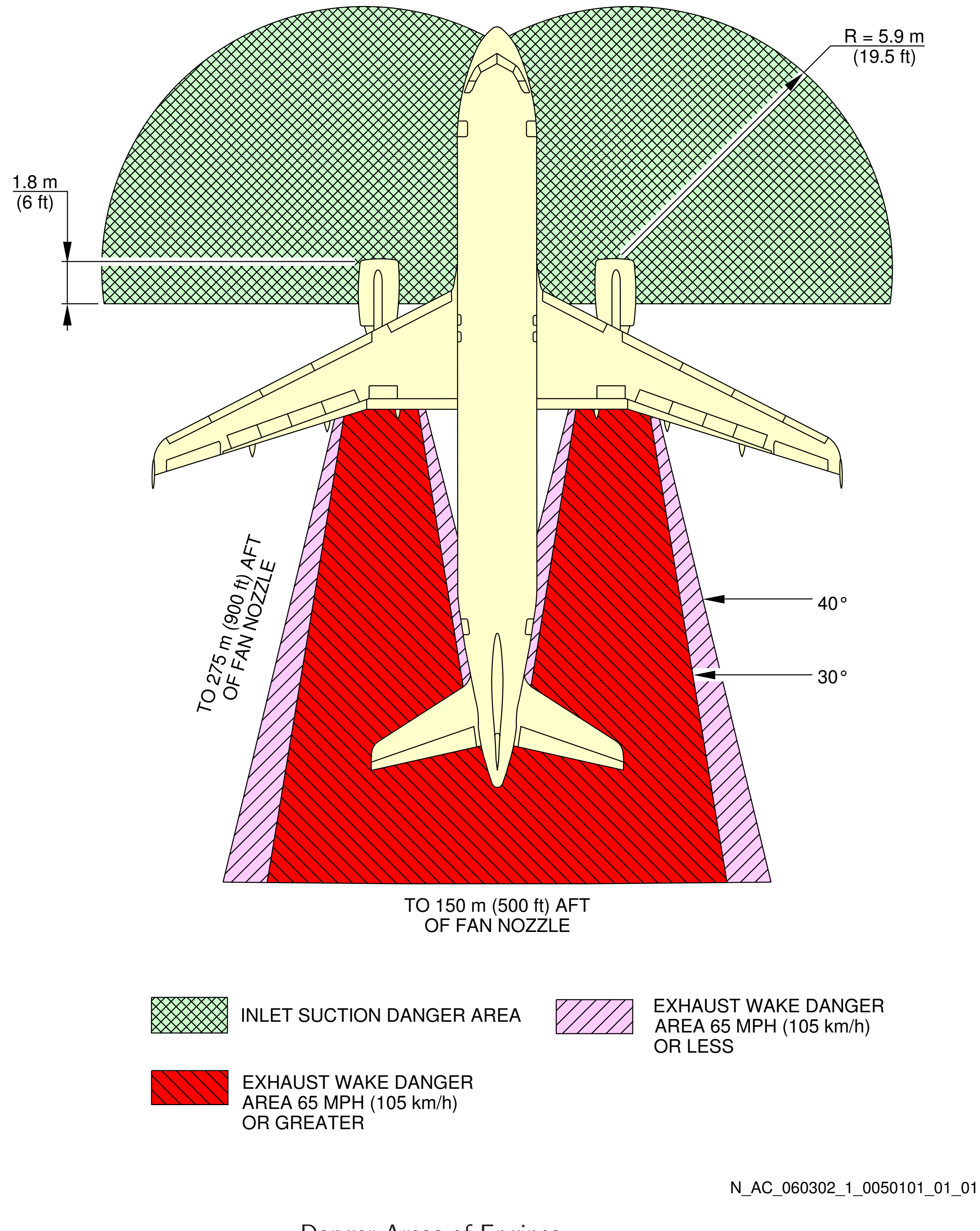
6-3-2 Takeoff Power

****ON A/C A320-100 A320-200**

Takeoff Power

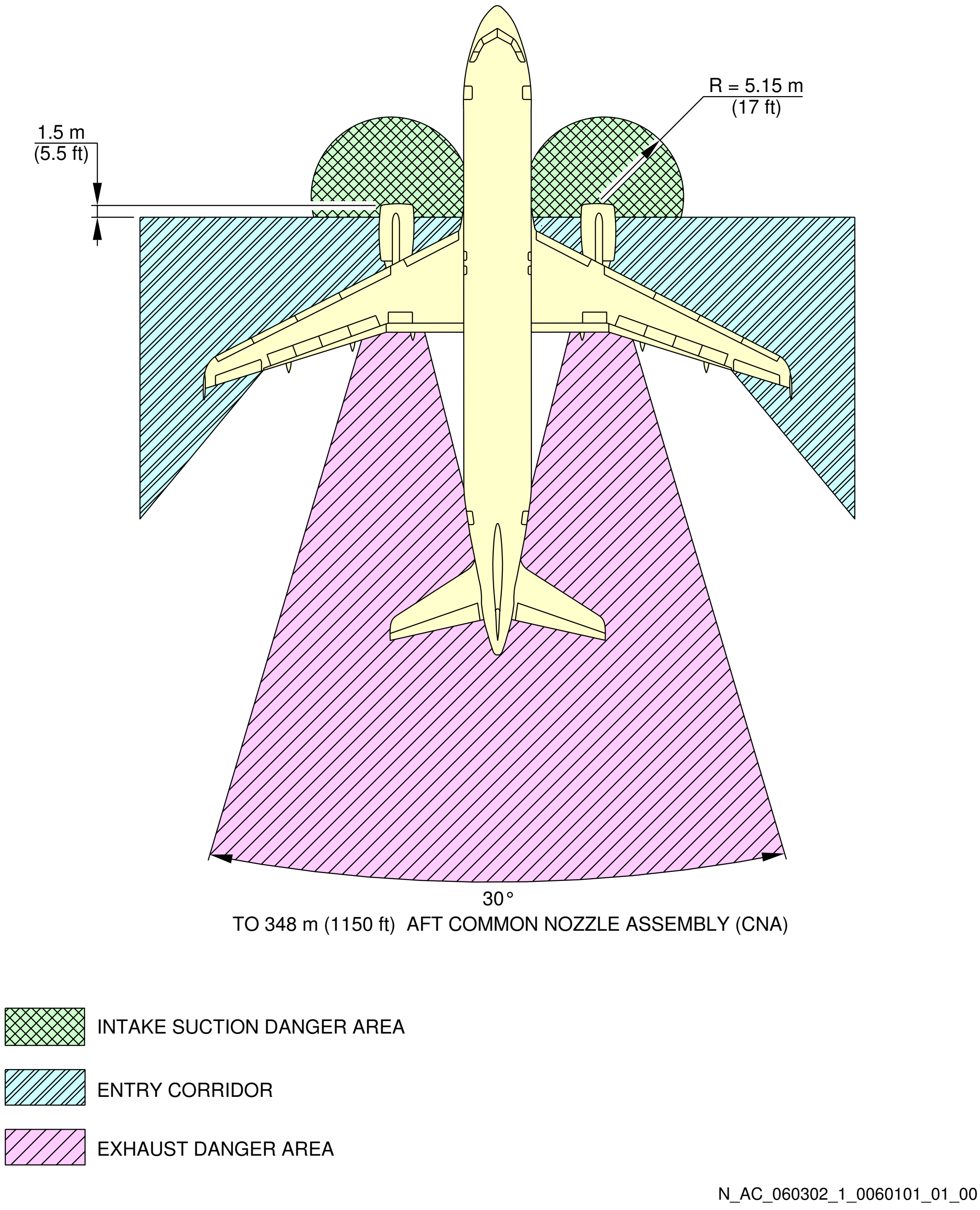
1. This section gives danger areas of the engines at max takeoff conditions.

**ON A/C A320-100 A320-200



Danger Areas of Engines
CFM56 series engine
FIGURE 1

**ON A/C A320-100 A320-200



Danger Areas of Engines
IAE V2500 series engine
FIGURE 2

6-4-0 APU Exhaust Velocities and Temperatures

****ON A/C A320-100 A320-200**

APU Exhaust Velocities and Temperatures

1. APU Exhaust Velocities and Temperatures.

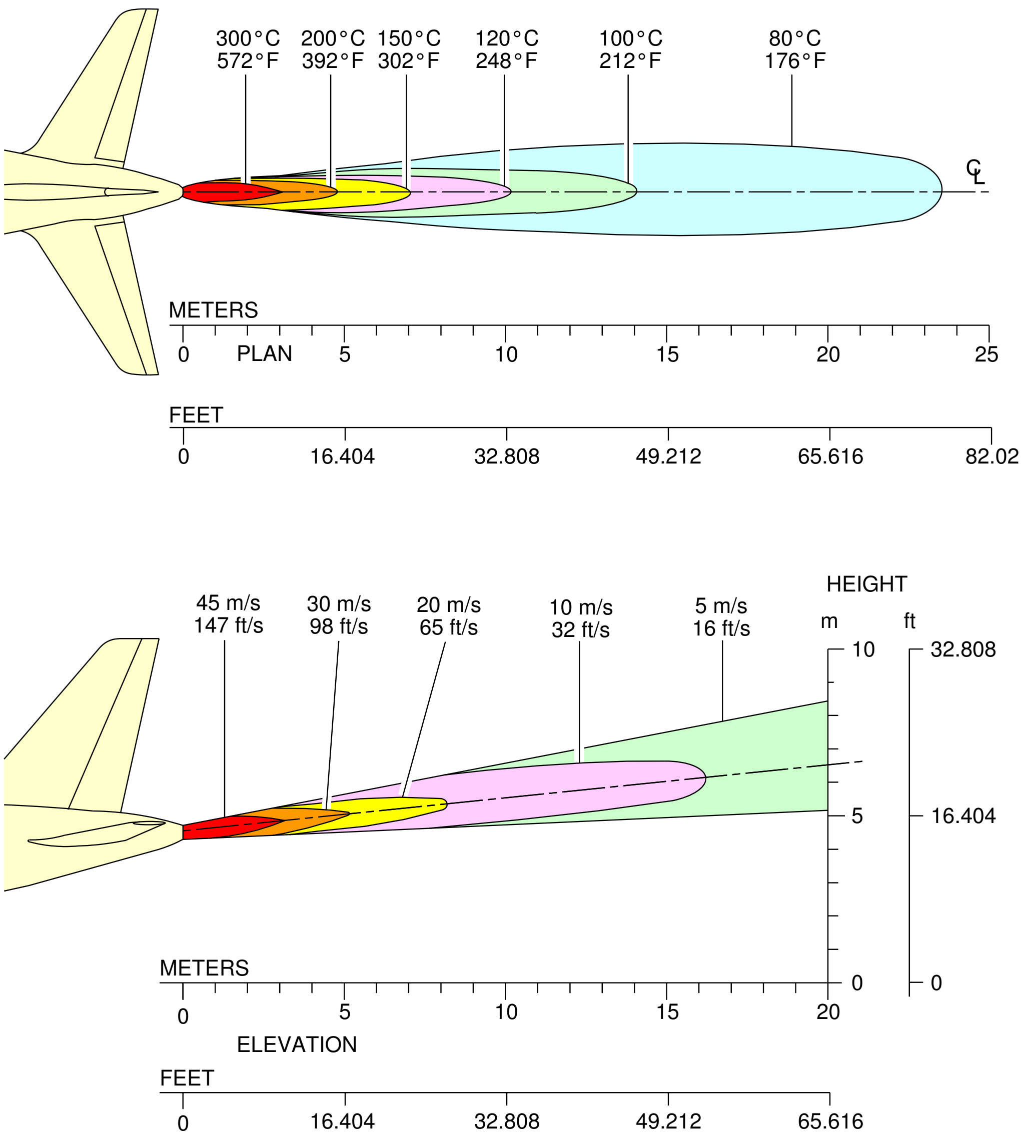
6-4-1 APU

****ON A/C A320-100 A320-200**

<u>APU - APIC & GARRETT</u>

1. This section gives APU exhaust velocities and temperatures.

**ON A/C A320-100 A320-200



N_AC_060401_1_0030101_01_00

Exhaust Velocities and Temperatures
APU – APIC & GARRETT
FIGURE 1

PAVEMENT DATA

7-1-0 General Information

**ON A/C A320-100 A320-200

General Information

**ON A/C A320-100

1. General Information

A brief description of the pavement charts that follow will help in airport planning.

To aid in the interpolation between the discrete values shown, each airplane configuration is shown with a minimum range of five loads on the main landing gear.

All curves on the charts represent data at a constant specified tire pressure with:
- the airplane loaded to the maximum ramp weight
- the CG at its maximum permissible aft position.

Pavement requirements for commercial airplanes are derived from the static analysis of loads imposed on the main landing gear struts.

Section 7-2 presents basic data on the landing gear footprint configuration, maximum ramp weights and tire sizes and pressures.

Section 7-2 pages 1 to 2: Model 100.

Section 7-3 shows maximum vertical and horizontal pavement loads for certain critical conditions at the tire-ground interfaces.

Section 7-3 page 1: Model 100.

Section 7-4 contains charts to find these loads throughout the stability limits of the airplane at rest on the pavement.

Section 7-4-1 pages 1 to 2: Model 100.

These main landing gear loads are used as the point of entry to the pavement design charts which follow, interpolating load values where necessary.

All Load Classification Number (LCN) curves shown in Section 7-6-1 and Section 7-8-2 have been developed from a computer program based on data provided in International Civil Aviation Organisation (ICAO) document 7920-AN/865/2, Aerodrome Manual, Part 2, "Aerodrome Physical Characteristics", Second Edition, 1965.

The flexible pavement charts in Section 7-6-1 show LCN against equivalent single wheel load, and equivalent single wheel load against pavement thickness.

Section 7-6-1 pages 1 to 2: Model 100.

The rigid pavement charts in Section 7-8-2 show LCN against equivalent single wheel load, and equivalent single wheel load against radius of relative stiffness.

Section 7-8-2 pages 1 to 2: Model 100.

Section 7-9 provides ACN data prepared according to the ACN/PCN system as referenced in ICAO Annex 14, "Aerodromes", Volume 1 Third Edition July 1999, incorporating Amendments 1 to 3.

The ACN/PCN system provides 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.

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 Airport Authority must decide on the method of pavement analysis and the results of their evaluation shown as follows:

PCN			
PAVEMENT TYPE	SUBGRADE CATEGORY	TIRE PRESSURE CATEGORY	EVALUATION METHOD
R – Rigid	A – High	W – No Limit	T – Technical
F – Flexible	B – Medium	X – To 1.5 Mpa (217 psi)	U – Using Aircraft
	C – Low	Y – To 1.0 Mpa (145 psi)	

PCN			
PAVEMENT TYPE	SUBGRADE CATEGORY	TIRE PRESSURE CATEGORY	EVALUATION METHOD
	D – Ultra Low	Z – To 0.5 Mpa (73 psi)	

Section 7-9-1 pages 1 to 2: Model 100 shows the aircraft ACN values for flexible pavements.

The four subgrade categories are:
- A. High Strength CBR 15
- B. Medium Strength CBR 10
- C. Low Strength CBR 6
- D. Ultra Low Strength CBR 3

Section 7-9-2 pages 1 to 2: Model 100 shows the aircraft ACN for rigid pavements.

The four subgrade categories are:
- A. High Strength Subgrade k = 150 MN/m^3 (550 pci)
- B. Medium Strength Subgrade k = 80 MN/m^3 (300 pci)
- C. Low Strength Subgrade k = 40 MN/m^3 (150 pci)
- D. Ultra Low Strength Subgrade k = 20 MN/m^3 (75 pci)

A. Flexible Pavement

Section 7-5-1 uses procedures in Instruction Report N° S-77-1 "Procedures for Development of CBR Design Curves", dated June 1977 to show flexible pavement design curves.

The report was prepared by the U.S. Army Corps Engineers Waterways Experiment Station, Soils and Pavement Laboratory, Vicksburg, Mississippi.

Section 7-5-1 pages 1 to 2: Model 100.

The line showing 10000 coverages is used to calculate Aircraft Classification Number (ACN).

The procedure that follows is used to develop flexible pavement design curves such as shown in Section 7-5-1.
- With the scale for pavement thickness at the bottom and the scale for CBR at the top, an arbitrary line is drawn representing 10000 coverages.
- Incremental values of the weight on the main landing gear are then plotted.
- Annual departure lines are drawn based on the load lines of the weight on the main landing gear that is shown on the graph.

B. Rigid pavement

Section 7-7-1 gives the rigid pavement design curves that have been prepared with the use of the Westergaard Equation. This is in general accordance with the procedures outlined in the Portland Cement Association publications, "Design of Concrete Airport Pavement", 1973 and "Computer Program for Airport Pavement Design", (Program PDILB), 1967 both by Robert G. Packard.

Section 7-7-1 pages 1 to 2: Model 100.

The procedure that follows is used to develop rigid pavement design curves such as those shown in Section 7-7-1.

- With the scale for thickness on the left and the scale for allowable working stress on the right, an arbitrary load line is drawn. This represents the maximum weight to be shown for the main landing gear.
- All values of the subgrade modulus (k values) are then plotted.
- Additional load lines for the incremental values of weight on the main landing gear are drawn on the basis of the curve for k = 80 MN/m^3 already shown on the graph.

****ON A/C A320-200**

2. General Information

A brief description of the pavement charts that follow will help in airport planning.

To aid in the interpolation between the discrete values shown, each airplane configuration is shown with a minimum range of five loads on the main landing gear.

All curves on the charts represent data at a constant specified tire pressure with:

- the airplane loaded to the maximum ramp weight
- the CG at its maximum permissible aft position.

Pavement requirements for commercial airplanes are derived from the static analysis of loads imposed on the main landing gear struts.

Section 7-2 presents basic data on the landing gear footprint configuration, maximum ramp weights and tire sizes and pressures.

Section 7-2 pages 3-11: Model 200.

Section 7-3 shows maximum vertical and horizontal pavement loads for certain critical conditions at the tire-ground interfaces.

Section 7-3 page 2 to 6: Model 200.

Section 7-4 contains charts to find these loads throughout the stability limits of the airplane at rest on the pavement.

Section 7-4-1 pages 3 to 12: Model 200.

These main landing gear loads are used as the point of entry to the pavement design charts which follow, interpolating load values where necessary.

All Load Classification Number (LCN) curves shown in Section 7-6-1 and Section 7-8-2 have been developed from a computer program based on data provided in International Civil Aviation Organisation (ICAO) document 7920-AN/865/2, Aerodrome Manual, Part 2, "Aerodrome Physical Characteristics", Second Edition, 1965.

The flexible pavement charts in Section 7-6-1 show LCN against equivalent single wheel load, and equivalent single wheel load against pavement thickness.

Section 7-6-1 pages 3 to 8: Model 200.

The rigid pavement charts in Section 7-8-2 show LCN against equivalent single wheel load, and equivalent single wheel load against radius of relative stiffness.

Section 7-8-2 pages 3 to 8: Model 200.

Section 7-9 provides ACN data prepared according to the ACN/PCN system as referenced in ICAO Annex 14, "Aerodromes", Volume 1 Third Edition July 1999, incorporating Amendments 1 to 3.

The ACN/PCN system provides 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.

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 Airport Authority must decide on the method of pavement analysis and the results of their evaluation shown as follows:

PCN			
PAVEMENT TYPE	SUBGRADE CATEGORY	TIRE PRESSURE CATEGORY	EVALUATION METHOD
R – Rigid	A – High	W – No Limit	T – Technical
F – Flexible	B – Medium	X – To 1.5 Mpa (217 psi)	U – Using Aircraft
	C – Low	Y – To 1.0 Mpa (145 psi)	
	D – Ultra Low	Z – To 0.5 Mpa (73 psi)	

Section 7-9-1 pages 3 to 12: Model 200 shows the aircraft ACN values for flexible pavements.

The four subgrade categories are:
- A. High Strength CBR 15
- B. Medium Strength CBR 10
- C. Low Strength CBR 6
- D. Ultra Low Strength CBR 3

Section 7-9-2 pages 3 to 12: Model 200 shows the aircraft ACN for rigid pavements.

The four subgrade categories are:
- A. High Strength Subgrade k = 150 MN/m^3 (550 pci)
- B. Medium Strength Subgrade k = 80 MN/m^3 (300 pci)
- C. Low Strength Subgrade k = 40 MN/m^3 (150 pci)
- D. Ultra Low Strength Subgrade k = 20 MN/m^3 (75 pci)

A. Flexible Pavement

Section 7-5-1 uses procedures in Instruction Report N° S-77-1 "Procedures for Development of CBR Design Curves", dated June 1977 to show flexible pavement design curves.

The report was prepared by the U.S. Army Corps Engineers Waterways Experiment Station, Soils and Pavement Laboratory, Vicksburg, Mississippi.

Section 7-5-1 pages 3 to 6: Model 200.

The line showing 10000 coverages is used to calculate Aircraft Classification Number (ACN).

The procedure that follows is used to develop flexible pavement design curves such as shown in Section 7-5-1.
- With the scale for pavement thickness at the bottom and the scale for CBR at the top, an arbitrary line is drawn representing 10000 coverages.

- Incremental values of the weight on the main landing gear are then plotted.
- Annual departure lines are drawn based on the load lines of the weight on the main landing gear that is shown on the graph.

B. Rigid pavement

Section 7-7-1 gives the rigid pavement design curves that have been prepared with the use of the Westergaard Equation. This is in general accordance with the procedures outlined in the Portland Cement Association publications, "Design of Concrete Airport Pavement", 1973 and "Computer Program for Airport Pavement Design", (Program PDILB), 1967 both by Robert G. Packard.

Section 7-7-1 pages 3 to 6: Model 200.

The procedure that follows is used to develop rigid pavement design curves such as those shown in Section 7-7-1.

- With the scale for thickness on the left and the scale for allowable working stress on the right, an arbitrary load line is drawn. This represents the maximum weight to be shown for the main landing gear.
- All values of the subgrade modulus (k values) are then plotted.
- Additional load lines for the incremental values of weight on the main landing gear are drawn on the basis of the curve for $k = 80$ MN/m^3 already shown on the graph.

7-2-0 Landing Gear Footprint

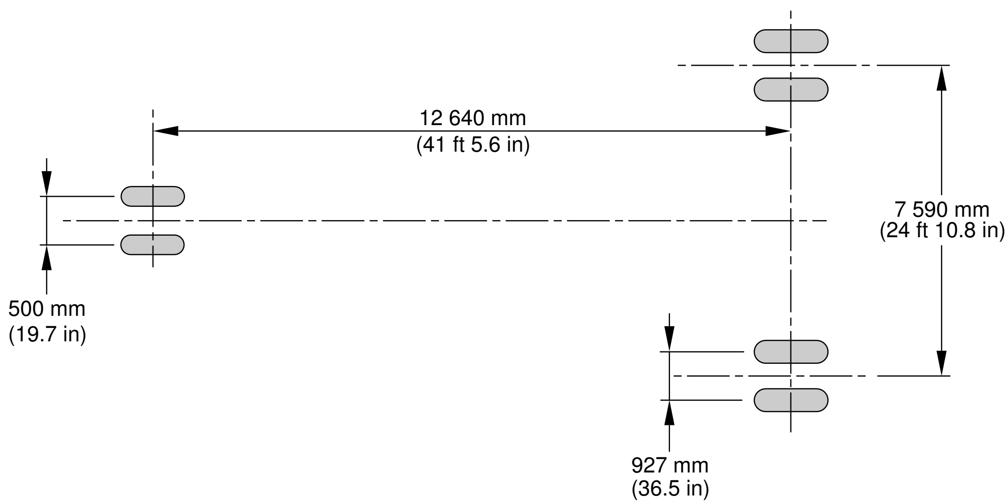
****ON A/C A320-100 A320-200**

Landing Gear Footprint

1. This section gives Landing Gear Footprint.

**ON A/C A320-100

MAXIMUM RAMP WEIGHT	66 400 kg (146 375 lb)		
PERCENTAGE OF WEIGHT ON MAIN GEAR GROUP	SEE SHEET 7–4–1 PAGE 1		
NOSE GEAR TIRE SIZE	30 x 8.8 R15 (30 x 8.8 – 15)		
NOSE GEAR TIRE PRESSURE	11 bar (160 psi)		
MAIN GEAR TIRE SIZE	46 x 17 R20 (46 x 16 – 20)	49 x 17 – 20	49 x 19 – 20
MAIN GEAR TIRE PRESSURE	12.3 bar (178 psi)	10.2 bar (148 psi)	9.2 bar (133 psi)

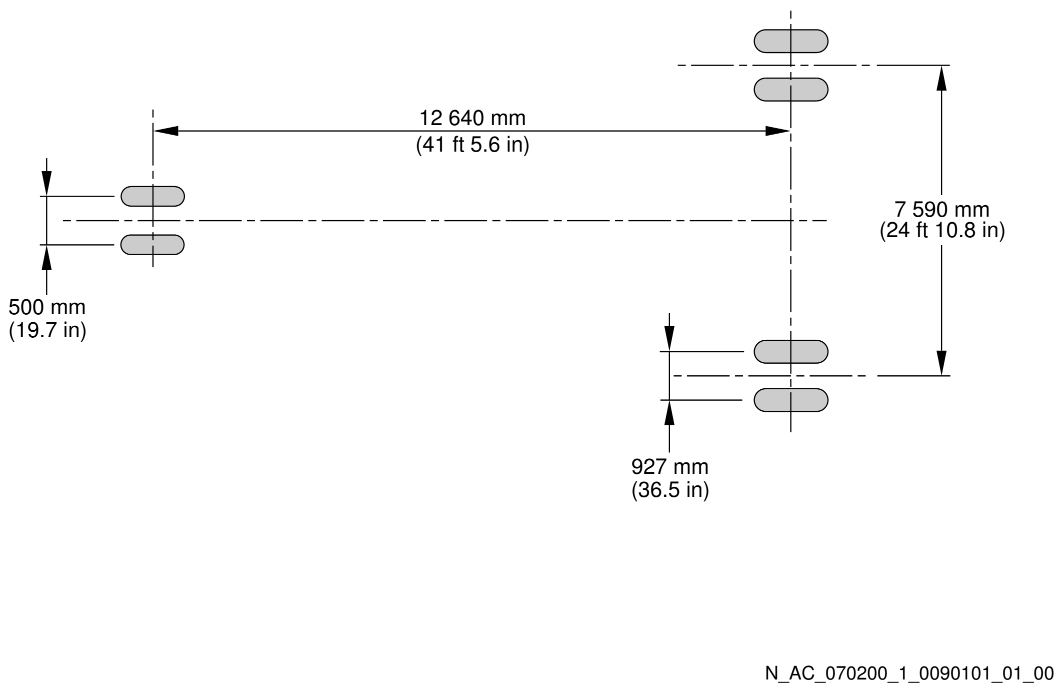


N_AC_070200_1_0080101_01_00

Landing Gear Footprint
MTOW 66 T
FIGURE 1

**ON A/C A320-100

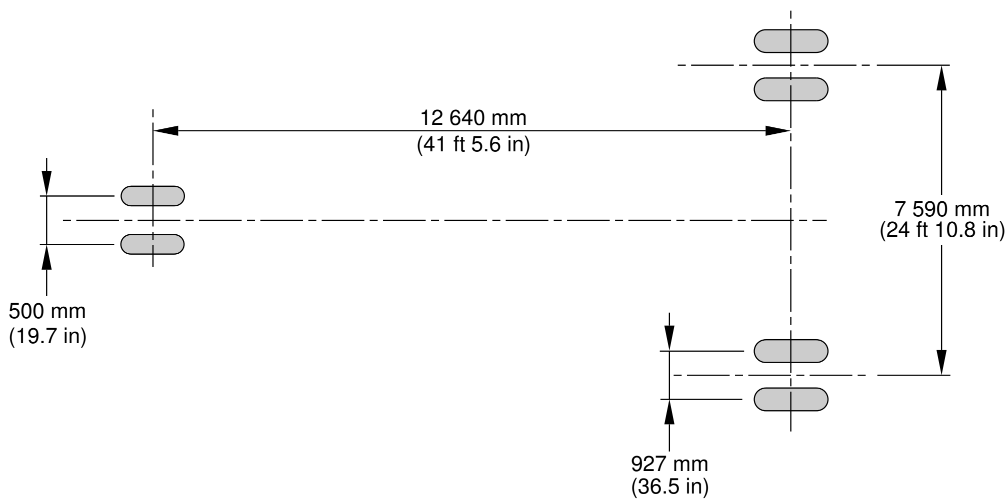
MAXIMUM RAMP WEIGHT	68 400 kg (150 800 lb)			
PERCENTAGE OF WEIGHT ON MAIN GEAR GROUP	SEE SHEET 7–4–1 PAGE 2			
NOSE GEAR TIRE SIZE	30 x 8.8 R15 (30 x 8.8 – 15)			
NOSE GEAR TIRE PRESSURE	11.4 bar (165 psi)			
MAIN GEAR TIRE SIZE	46 x 17 R20 (46 x 16 – 20)	1270 x 455 R22 (49 x 18 – 22)	49 x 17 – 20	49 x 19 – 20
MAIN GEAR TIRE PRESSURE	12.8 bar (186 psi)	10.9 bar (158 psi)	10.6 bar (154 psi)	9.6 bar (139 psi)



Landing Gear Footprint
MTOW 68 T
FIGURE 2

**ON A/C A320-200

MAXIMUM RAMP WEIGHT	66 400 kg (146 375 lb)		
PERCENTAGE OF WEIGHT ON MAIN GEAR GROUP	SEE SHEET 7–4–1 PAGE 3		
NOSE GEAR TIRE SIZE	30 x 8.8 R15 (30 x 8.8 – 15)		
NOSE GEAR TIRE PRESSURE	11 bar (160 psi)		
MAIN GEAR TIRE SIZE	46 x 17 R20 (46 x 16 – 20)	49 x 17 – 20	49 x 19 – 20
MAIN GEAR TIRE PRESSURE	12.3 bar (178 psi)	10.2 bar (148 psi)	9.2 bar (133 psi)

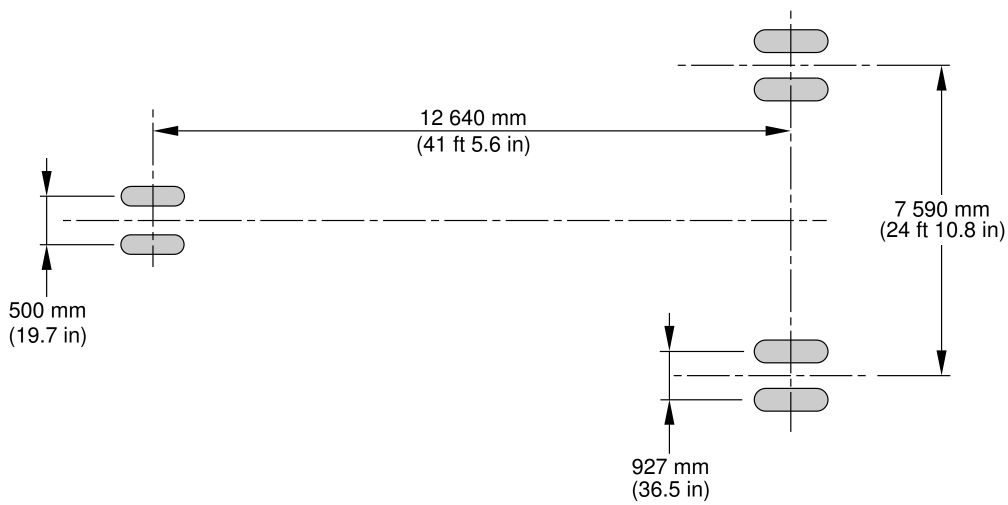


N_AC_070200_1_0100101_01_00

Landing Gear Footprint
MTOW 66 T
FIGURE 3

**ON A/C A320-200

MAXIMUM RAMP WEIGHT	68 400 kg (150 800 lb)			
PERCENTAGE OF WEIGHT ON MAIN GEAR GROUP	SEE SHEET 7–4–1 PAGE 3			
NOSE GEAR TIRE SIZE	30 x 8.8 R15 (30 x 8.8 – 15)			
NOSE GEAR TIRE PRESSURE	11.4 bar (165 psi)			
MAIN GEAR TIRE SIZE	46 x 17 R20 (46 x 16 – 20)	1270 x 455 R22 (49 x 18 – 22)	49 x 17 – 20	49 x 19 – 20
MAIN GEAR TIRE PRESSURE	12.8 bar (186 psi)	10.9 bar (158 psi)	10.6 bar (154 psi)	9.6 bar (139 psi)

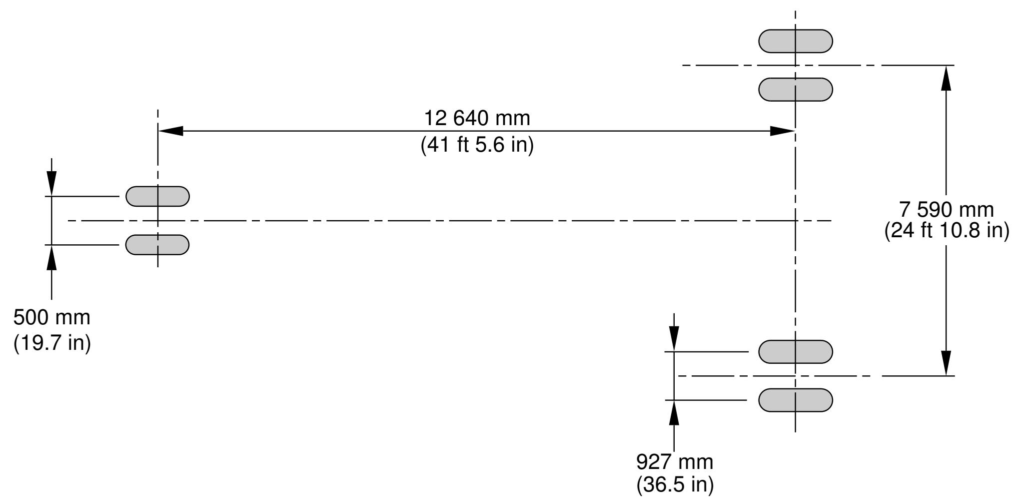


N_AC_070200_1_0110101_01_00

Landing Gear Footprint
MTOW 68 T
FIGURE 4

**ON A/C A320-200

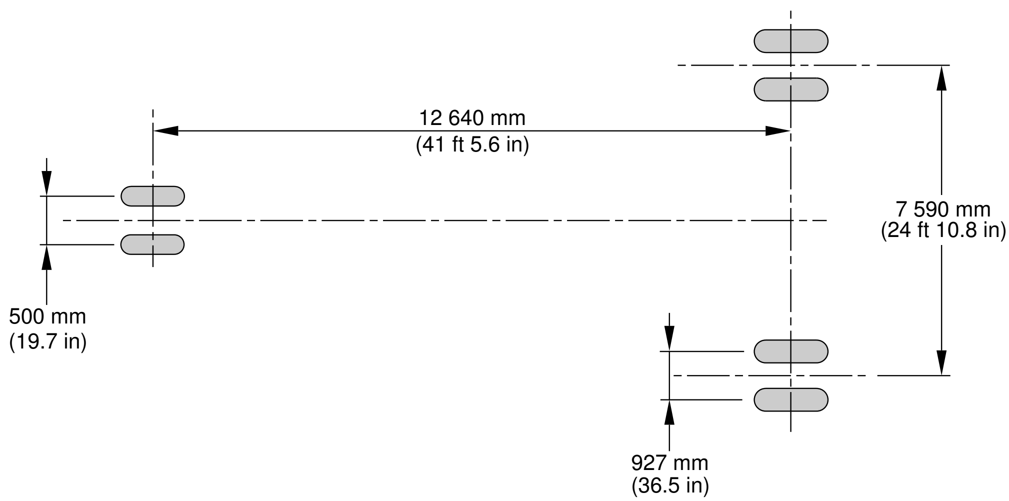
MAXIMUM RAMP WEIGHT	70 400 kg (155 200 lb)			
PERCENTAGE OF WEIGHT ON MAIN GEAR GROUP	SEE SHEET 7–4–1 PAGE 4			
NOSE GEAR TIRE SIZE	30 x 8.8 R15 (30 x 8.8 – 15)			
NOSE GEAR TIRE PRESSURE	11.4 bar (165 psi)			
MAIN GEAR TIRE SIZE	46 x 17 R20 (46 x 16 – 20)	1270 x 455 R22 (49 x 18 – 22)	49 x 17 – 20	49 x 19 – 20
MAIN GEAR TIRE PRESSURE	12.8 bar (186 psi)	10.9 bar (158 psi)	10.6 bar (154 psi)	9.6 bar (139 psi)



Landing Gear Footprint
MTOW 70 T
FIGURE 5

**ON A/C A320-200

MAXIMUM RAMP WEIGHT	71 900 kg (158 500 lb)			
PERCENTAGE OF WEIGHT ON MAIN GEAR GROUP	SEE SHEET 7–4–1 PAGE 5			
NOSE GEAR TIRE SIZE	30 x 8.8 R15 (30 x 8.8 – 15)			
NOSE GEAR TIRE PRESSURE	12.3 bar (178 psi)			
MAIN GEAR TIRE SIZE	46 x 17 R20 (46 x 16 – 20)	1270 x 455 R22 (49 x 18 – 22)	49 x 17 – 20	49 x 19 – 20
MAIN GEAR TIRE PRESSURE	13.8 bar (200 psi)	11.8 bar (171 psi)	11.4 bar (165 psi)	10.3 bar (149 psi)

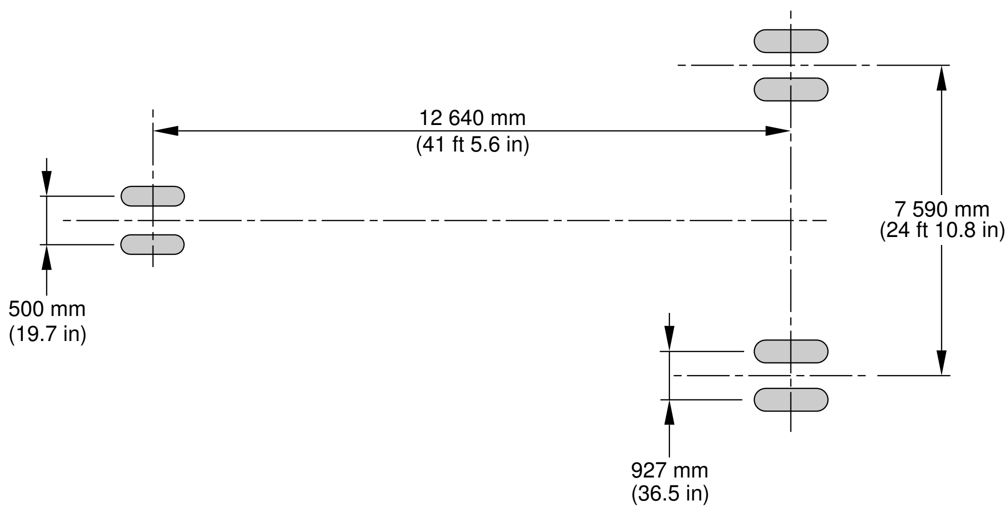


N_AC_070200_1_0130101_01_00

Landing Gear Footprint
MTOW 71.5 T
FIGURE 6

**ON A/C A320-200

MAXIMUM RAMP WEIGHT	73 900 kg (162 925 lb)			
PERCENTAGE OF WEIGHT ON MAIN GEAR GROUP	SEE SHEET 7–4–1 PAGES 6 & 7			
NOSE GEAR TIRE SIZE	30 x 8.8 R15 (30 x 8.8 – 15)			
NOSE GEAR TIRE PRESSURE	12.3 bar (178 psi)			
MAIN GEAR TIRE SIZE	46 x 17 R20 (46 x 16 – 20)	1270 x 455 R22 (49 x 18 – 22)	49 x 17 – 20	49 x 19 – 20
MAIN GEAR TIRE PRESSURE	13.8 bar (200 psi)	11.8 bar (171 psi)	11.4 bar (165 psi)	10.3 bar (149 psi)

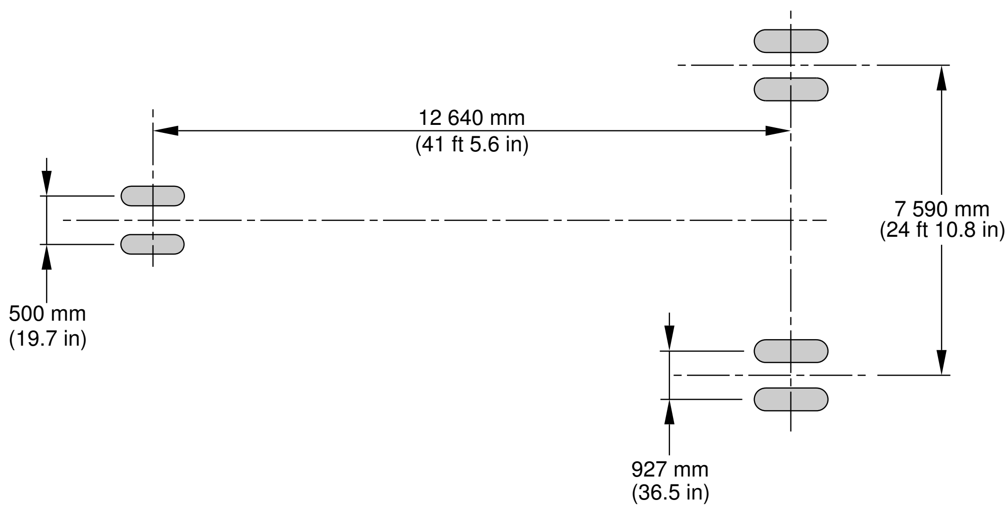


N_AC_070200_1_0140101_01_00

Landing Gear Footprint
MTOW 73.5 T
FIGURE 7

**ON A/C A320-200

MAXIMUM RAMP WEIGHT	75 900 kg (167 325 lb)			
PERCENTAGE OF WEIGHT ON MAIN GEAR GROUP	SEE SHEET 7–4–1 PAGES 8 & 9			
NOSE GEAR TIRE SIZE	30 x 8.8 R15 (30 x 8.8 – 15)			
NOSE GEAR TIRE PRESSURE	12.3 bar (178 psi)			
MAIN GEAR TIRE SIZE	46 x 17 R20 (46 x 16 – 20)	1270 x 455 R22 (49 x 18 – 22)	49 x 17 – 20	49 x 19 – 20
MAIN GEAR TIRE PRESSURE	13.8 bar (200 psi)	11.8 bar (171 psi)	11.4 bar (165 psi)	10.3 bar (149 psi)

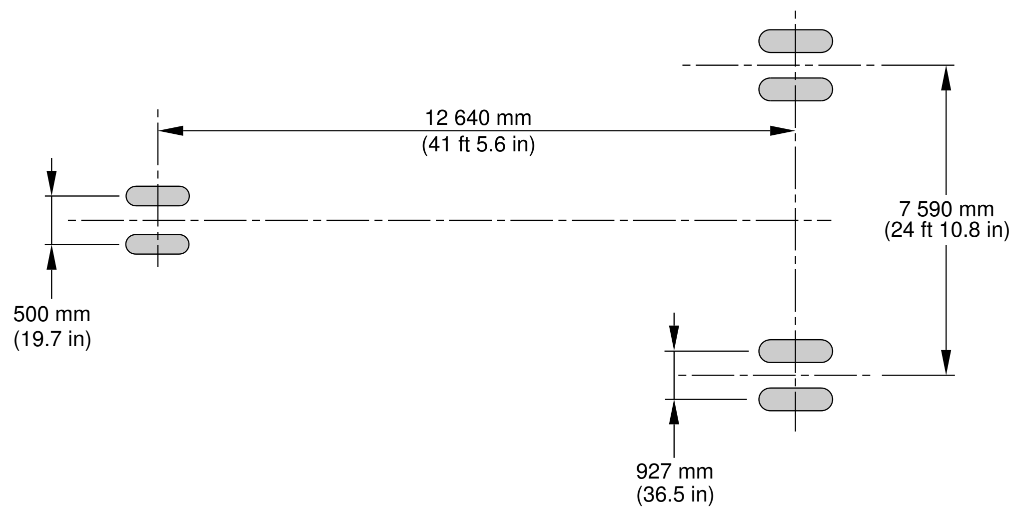


N_AC_070200_1_0150101_01_00

Landing Gear Footprint
MTOW 75.5 T
FIGURE 8

**ON A/C A320-200

MAXIMUM RAMP WEIGHT	77 400 kg (170 650 lb)			
PERCENTAGE OF WEIGHT ON MAIN GEAR GROUP	SEE SHEET 7–4–1 PAGES 10 & 11			
NOSE GEAR TIRE SIZE	30 x 8.8 R15 (30 x 8.8 – 15)			
NOSE GEAR TIRE PRESSURE	12.3 bar (178 psi)			
MAIN GEAR TIRE SIZE	46 x 17 R20 (46 x 16 – 20)	1270 x 455 R22 (49 x 18 – 22)	49 x 17 – 20	49 x 19 – 20
MAIN GEAR TIRE PRESSURE	14.4 bar (209 psi)	12.3 bar (178 psi)	12 bar (174 psi)	10.7 bar (155 psi)

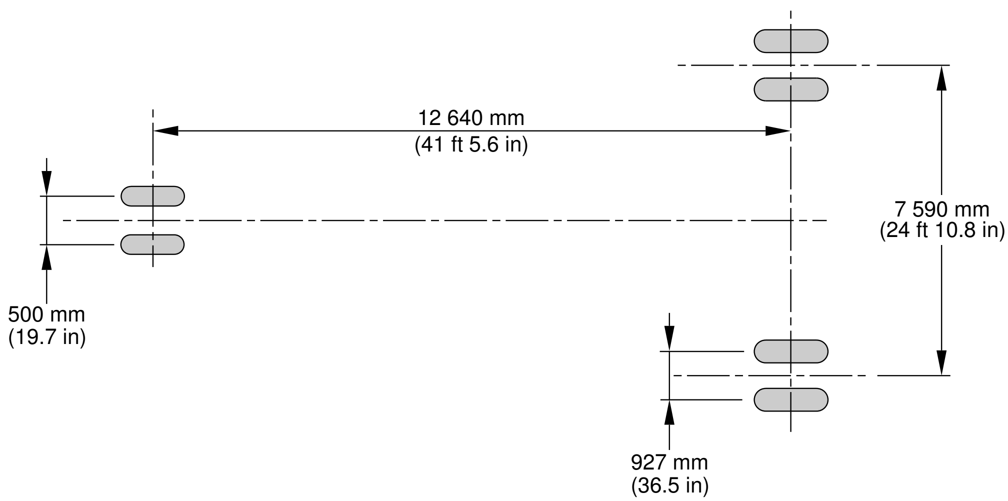


N_AC_070200_1_0160101_01_00

Landing Gear Footprint
MTOW 77 T
FIGURE 9

**ON A/C A320-200

MAXIMUM RAMP WEIGHT	78 400 kg (172 850 lb)			
PERCENTAGE OF WEIGHT ON MAIN GEAR GROUP	SEE SHEET 7–4–1 PAGE 12			
NOSE GEAR TIRE SIZE	30 x 8.8 R15 (30 x 8.8 – 15)			
NOSE GEAR TIRE PRESSURE	12.3 bar (178 psi)			
MAIN GEAR TIRE SIZE	46 x 17 R20 (46 x 16 – 20)	1270 x 455 R22 (49 x 18 – 22)	49 x 17 – 20	49 x 19 – 20
MAIN GEAR TIRE PRESSURE	14.4 bar (209 psi)	12.3 bar (178 psi)	12 bar (174 psi)	10.7 bar (155 psi)

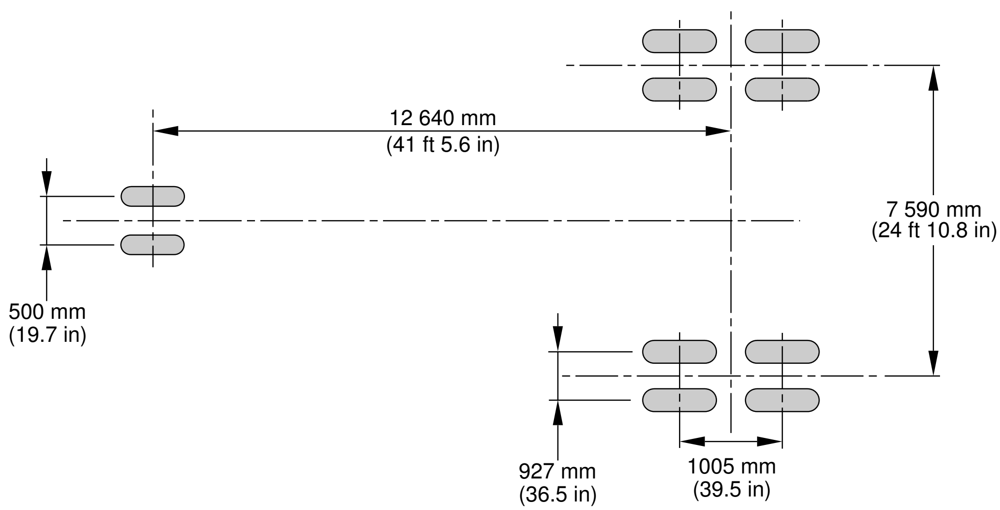


N_AC_070200_1_0170101_01_00

Landing Gear Footprint
MTOW 78 T
FIGURE 10

**ON A/C A320-200

MAXIMUM RAMP WEIGHT	70 400 kg (155 200 lb)	73 900 kg (162 925 lb)
PERCENTAGE OF WEIGHT ON MAIN GEAR GROUP	SEE SHEET 7–4–1 PAGE 1	SEE SHEET 7–4–1 PAGE 6 & PAGE 7
NOSE GEAR TIRE SIZE	30 x 8.8 R15 (30 x 8.8 – 15)	
NOSE GEAR TIRE PRESSURE	11.4 bar (165 psi)	12.3 bar (178 psi)
MAIN GEAR TIRE SIZE	915 x 300 R16 (36 x 11 – 16)	
MAIN GEAR TIRE PRESSURE	11.2 bar (162 psi)	12.2 bar (177 psi)



N_AC_070200_1_0180101_01_00

Landing Gear Footprint
Bogie – MTOW 70 T/73.5 T
FIGURE 11

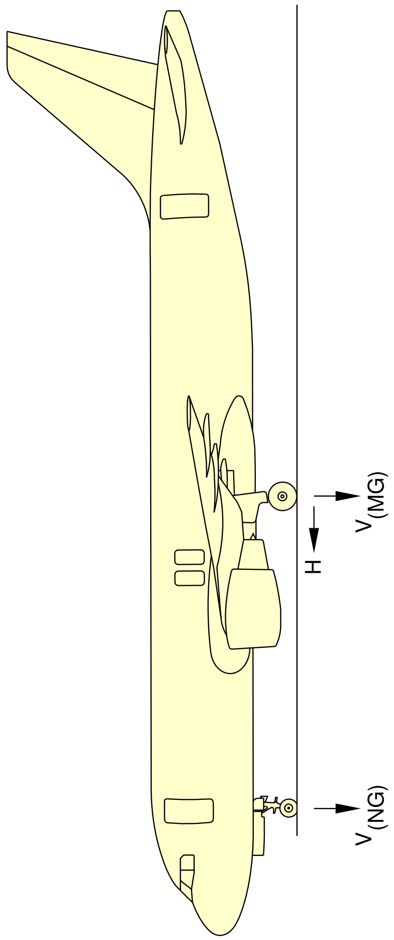
7-3-0 Maximum Pavement Loads

**ON A/C A320-100 A320-200

Maximum Pavement Loads

1. This section gives Maximum Pavement Loads.

****ON A/C A320-100**



1	2		3		4		5		6			
			VNG				VMG (PER STRUT)		H (PER STRUT)			
MODEL	MAXIMUM RAMP WEIGHT		STATIC LOAD AT MOST FWD CG (1)		STATIC BRAKING @ 10 ft/s² DECELERATION		STATIC LOAD AT MAX AFT CG		STEADY BRAKING @ 10 ft/s² DECELERATION		AT INSTANTANEOUS BRAKING COEFFICIENT = 0.8	
	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg
−100	146 375	64 400	20 375	9 240	32 275	14 640	69 025 (2)	31 310 (2)	22 750	10 320	55 225	25 050
−100	150 800	64 400	20 975	9 510	33 225	15 070	71 025 (3)	32 220 (3)	23 425	10 630	56 825	25 780

$V_{(NG)}$ MAXIMUM VERTICAL NOSE GEAR GROUND LOAD AT MOST FORWARD CG
$V_{(MG)}$ MAXIMUM VERTICAL MAIN GEAR GROUND LOAD AT MOST AFT CG
H MAXIMUM HORIZONTAL GROUND LOAD FROM BRAKING

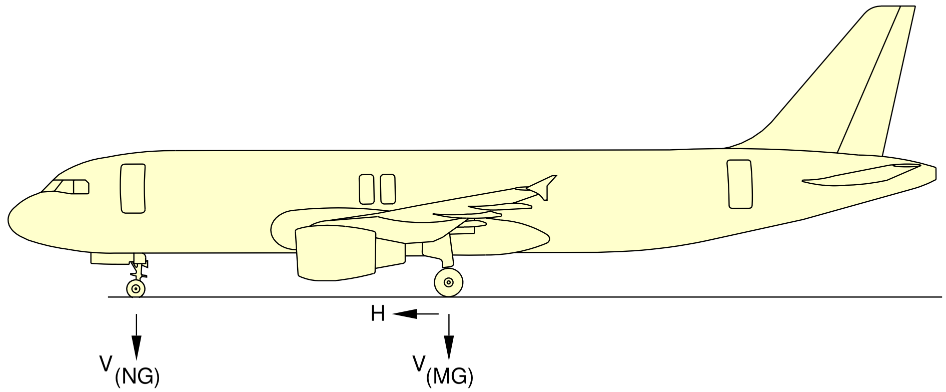
(1) FWD CG = 17 % MAC
(2) AFT CG = 41 % MAC
(3) AFT CG = 40.7 % MAC

NOTE: ALL LOADS CALCULATED USING AIRPLANE MAXIMUM RAMP WEIGHT

N_AC_070300_1_0090101_01_00

Maximum Pavement Loads
MTOW 66 T/68 T
FIGURE 1

**ON A/C A320-200



1	2		3		4		5		6			
			VNG				VMG (PER STRUT)		H (PER STRUT)			
MODEL	MAXIMUM RAMP WEIGHT		STATIC LOAD AT MOST FWD CG (1)		STATIC BRAKING @ 10 ft/s² DECELERATION		STATIC LOAD AT MAX AFT CG (2)		STEADY BRAKING @ 10 ft/s² DECELERATION		AT INSTANTANEOUS BRAKING COEFFICIENT = 0.8	
	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg
–200	146 375	66 400	20 375	9 240	32 275	14 640	69 550	31 540	22 750	10 320	55 625	25 230
–200	150 800	68 400	20 975	9 510	33 225	15 070	71 650	32 500	23 425	10 630	57 300	26 000

$V_{(NG)}$ MAXIMUM VERTICAL NOSE GEAR GROUND LOAD AT MOST FORWARD CG
$V_{(MG)}$ MAXIMUM VERTICAL MAIN GEAR GROUND LOAD AT MOST AFT CG
H MAXIMUM HORIZONTAL GROUND LOAD FROM BRAKING

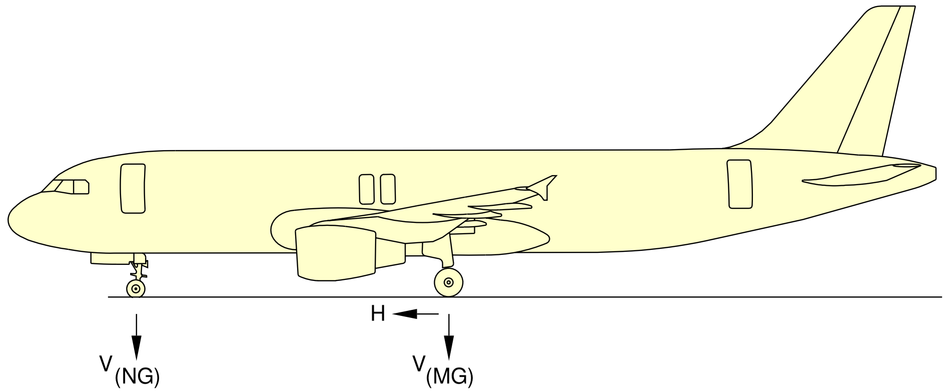
(1) FWD CG = 17 % MAC
(2) AFT CG = 43 % MAC

NOTE: ALL LOADS CALCULATED USING AIRPLANE MAXIMUM RAMP WEIGHT

N_AC_070300_1_0100101_01_00

Maximum Pavement Loads
MTOW 66 T/68 T
FIGURE 2

**ON A/C A320-200



1	2		3		4		5		6			
			VNG				VMG (PER STRUT)		H (PER STRUT)			
MODEL	MAXIMUM RAMP WEIGHT		STATIC LOAD AT MOST FWD CG (1)		STATIC BRAKING @ 10 ft/s² DECELERATION		STATIC LOAD AT MAX AFT CG		STEADY BRAKING @ 10 ft/s² DECELERATION		AT INSTANTANEOUS BRAKING COEFFICIENT = 0.8	
	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg
–200	155 200	70 400	21 575	9 790	34 150	15 490	73 200 (2)	33 200 (2)	24 125	10 940	58 550	26 560
–200	158 500	71 900	22 025	9 990	34 850	15 810	74 875 (3)	33 960 (3)	24 625	11 170	59 900	27 170

$V_{(NG)}$ MAXIMUM VERTICAL NOSE GEAR GROUND LOAD AT MOST FORWARD CG
$V_{(MG)}$ MAXIMUM VERTICAL MAIN GEAR GROUND LOAD AT MOST AFT CG
H MAXIMUM HORIZONTAL GROUND LOAD FROM BRAKING

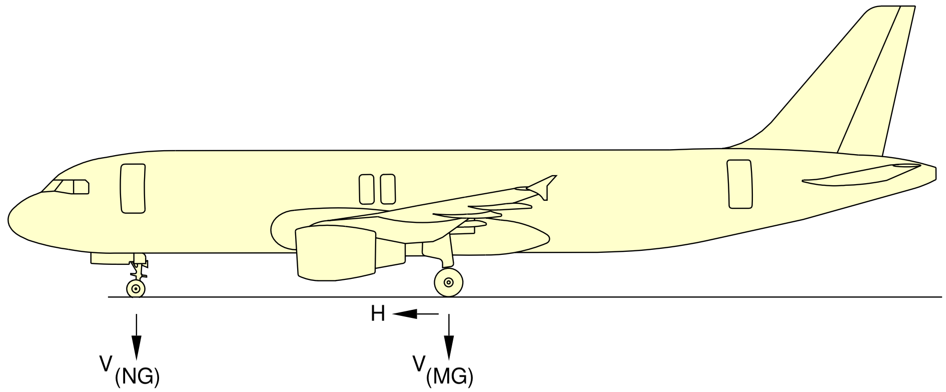
(1) FWD CG = 17 % MAC
(2) AFT CG = 41 % MAC
(3) AFT CG = 41.42 % MAC

NOTE: ALL LOADS CALCULATED USING AIRPLANE MAXIMUM RAMP WEIGHT

N_AC_070300_1_0110101_01_00

Maximum Pavement Loads
MTOW 70 T/71.5 T
FIGURE 3

**ON A/C A320-200



1	2		3		4		5		6			
			VNG				VMG (PER STRUT)		H (PER STRUT)			
MODEL	MAXIMUM RAMP WEIGHT		STATIC LOAD AT MOST FWD CG (1)		STATIC BRAKING @ 10 ft/s² DECELERATION		STATIC LOAD AT MAX AFT CG		STEADY BRAKING @ 10 ft/s² DECELERATION		AT INSTANTANEOUS BRAKING COEFFICIENT = 0.8	
	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg
–200	162 925	73 900	22 050	10 000	34 900	15 830	76 550 (2)	34 720 (2)	25 325	11 480	61 250	27 780
–200	167 325	75 900	22 050	10 000	34 900	15 830	78 250 (3)	35 490 (3)	26 000	11 800	62 600	28 390

$V_{(NG)}$ MAXIMUM VERTICAL NOSE GEAR GROUND LOAD AT MOST FORWARD CG
$V_{(MG)}$ MAXIMUM VERTICAL MAIN GEAR GROUND LOAD AT MOST AFT CG
H MAXIMUM HORIZONTAL GROUND LOAD FROM BRAKING

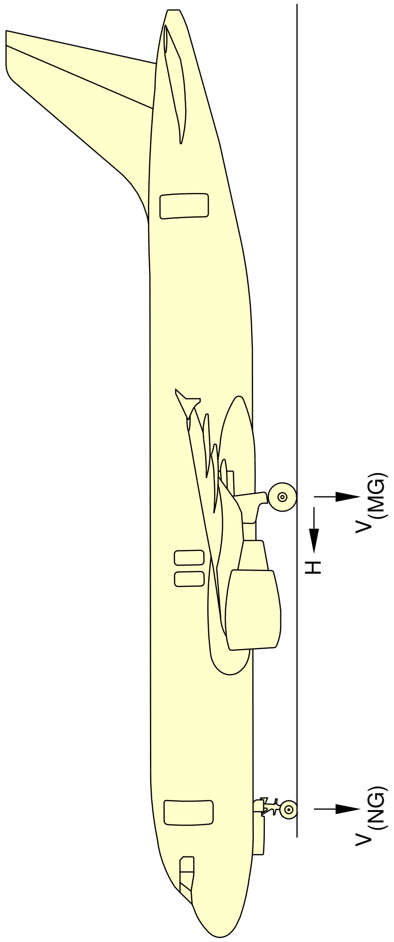
(1) FWD CG = 17 % MAC AT A/C WEIGHT = 72 000 kg
(2) AFT CG = 40 % MAC
(3) AFT CG = 38.7 % MAC

NOTE: ALL LOADS CALCULATED USING AIRPLANE MAXIMUM RAMP WEIGHT

N_AC_070300_1_0120101_01_00

Maximum Pavement Loads
MTOW 73.5 T/75.5 T
FIGURE 4

**ON A/C A320-200



1	2		3		4		5		6			
			VNG				VMG (PER STRUT)		H (PER STRUT)			
MODEL	MAXIMUM RAMP WEIGHT		STATIC LOAD AT MOST FWD CG (1)		STATIC BRAKING @ 10 ft/s² DECELERATION		STATIC LOAD AT MAX AFT CG		STEADY BRAKING @ 10 ft/s² DECELERATION		AT INSTANTANEOUS BRAKING COEFFICIENT = 0.8	
	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg
-200	170 650	77 400	22 050	10 000	34 900	15 830	79 450 (2)	36 030 (2)	26 525	12 030	63 550	28 830
-200	172 850	78 400	22 050	10 000	34 900	15 830	80 250 (3)	36 400 (3)	26 850	12 180	64 200	29 120

$V_{(NG)}$ MAXIMUM VERTICAL NOSE GEAR GROUND LOAD AT MOST FORWARD CG
$V_{(MG)}$ MAXIMUM VERTICAL MAIN GEAR GROUND LOAD AT MOST AFT CG
H MAXIMUM HORIZONTAL GROUND LOAD FROM BRAKING

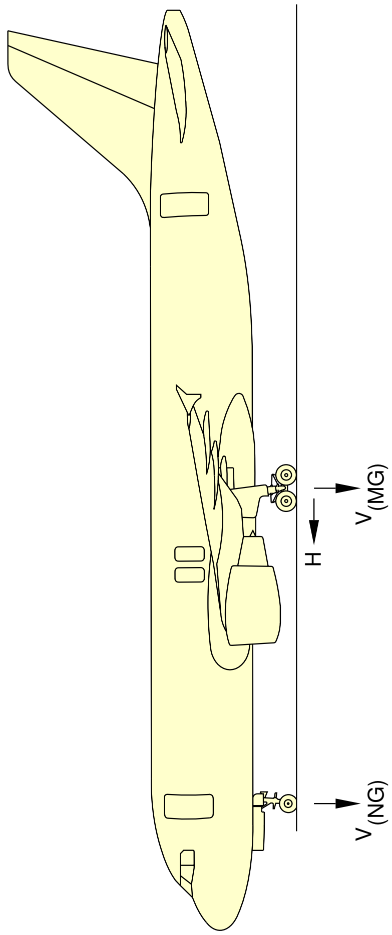
(1) FWD CG = 17 % MAC AT A/C WEIGHT = 72 000 kg
(2) AFT CG = 37.5 % MAC
(3) AFT CG = 36.8 % MAC

NOTE: ALL LOADS CALCULATED USING AIRPLANE MAXIMUM RAMP WEIGHT

N_AC_070300_1_0130101_01_00

Maximum Pavement Loads
MTOW 77 T/78 T
FIGURE 5

**ON A/C A320-200



1	2		3		4		5		6			
			VNG				VMG (PER STRUT)		H (PER STRUT)			
MODEL	MAXIMUM RAMP WEIGHT		STATIC LOAD AT MOST FWD CG		STATIC BRAKING @ 10 ft/s² DECELERATION		STATIC LOAD AT MAX AFT CG		STEADY BRAKING @ 10 ft/s² DECELERATION		AT INSTANTANEOUS BRAKING COEFFICIENT = 0.8	
	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg
–200	155 200	70 400	21 675 (1)	9 830 (1)	34 225	15 520	73 150 (3)	33 180 (3)	24 125	10 940	58 525	26 540
–200	162 925	73 900	22 150 (2)	10 050 (2)	35 000	15 870	76 500 (4)	34 700 (4)	25 325	11 480	61 200	27 760

$V_{(NG)}$ MAXIMUM VERTICAL NOSE GEAR GROUND LOAD AT MOST FORWARD CG
$V_{(MG)}$ MAXIMUM VERTICAL MAIN GEAR GROUND LOAD AT MOST AFT CG
H MAXIMUM HORIZONTAL GROUND LOAD FROM BRAKING

(1) FWD CG = 17 % MAC
(2) FWD CG = 17 % MAC AT A/C WEIGHT = 72 000 kg
(3) AFT CG = 41 % MAC
(4) AFT CG = 40 % MAC

NOTE: ALL LOADS CALCULATED USING AIRPLANE MAXIMUM RAMP WEIGHT

N_AC_070300_1_0140101_01_00

Maximum Pavement Loads
Bogie – MTOW 70 T/73.5 T
FIGURE 6

7-4-0 Landing Gear Loading on Pavement

****ON A/C A320-100 A320-200**

Landing Gear Loading on Pavement

****ON A/C A320-100**

1. General

   In the example shown in Section 7-4-1, page 1, the Gross Aircraft Weight is 49 tonnes (108026 lb) and the percentage of weight on the Main Landing Gear is 94.25 %.

   For these conditions the total weight on the Main Landing Gear Group is 46.2 tonnes (101854 lb).

****ON A/C A320-200**

2. General

   In the example shown in Section 7-4-1, page 3, the Gross Aircraft Weight is 49 tonnes (108026 lb) and the percentage of weight on the Main Landing Gear is 94.95 %.

   For these conditions the total weight on the Main Landing Gear Group is 46.52 tonnes (102559 lb).

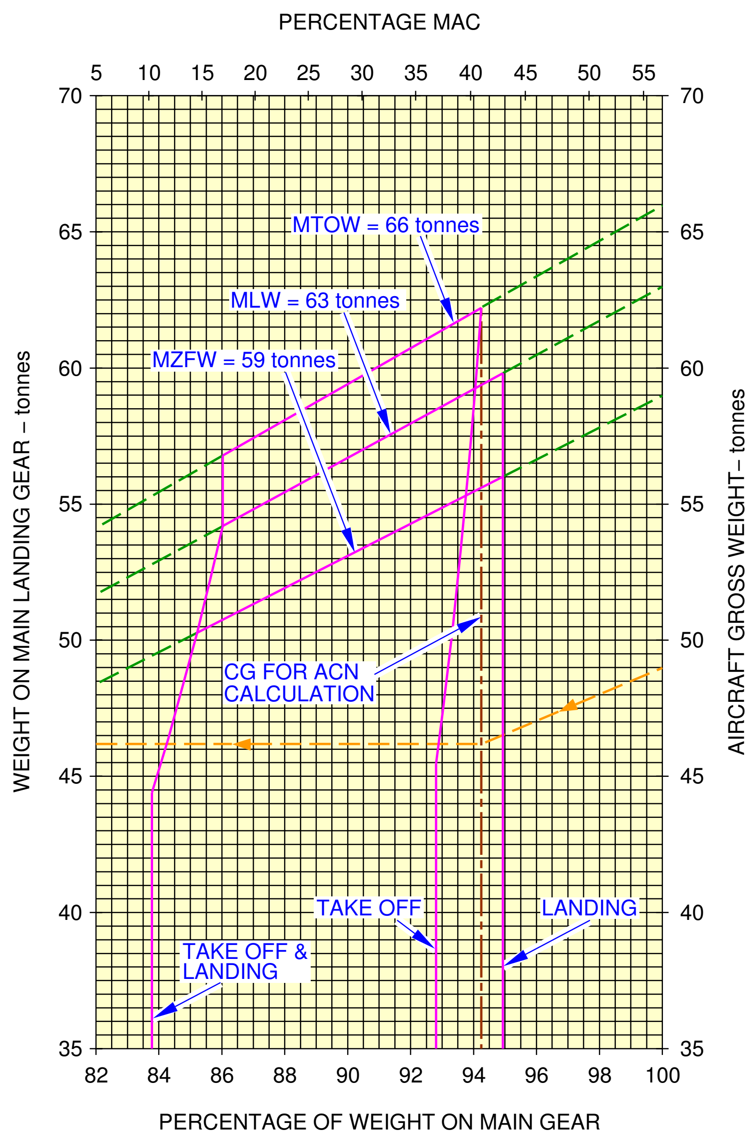
7-4-1 Landing Gear Loading on Pavement

****ON A/C A320-100 A320-200**

<u>Landing Gear Loading on Pavement</u>

1. This section gives Landing Gear Loading on Pavement.

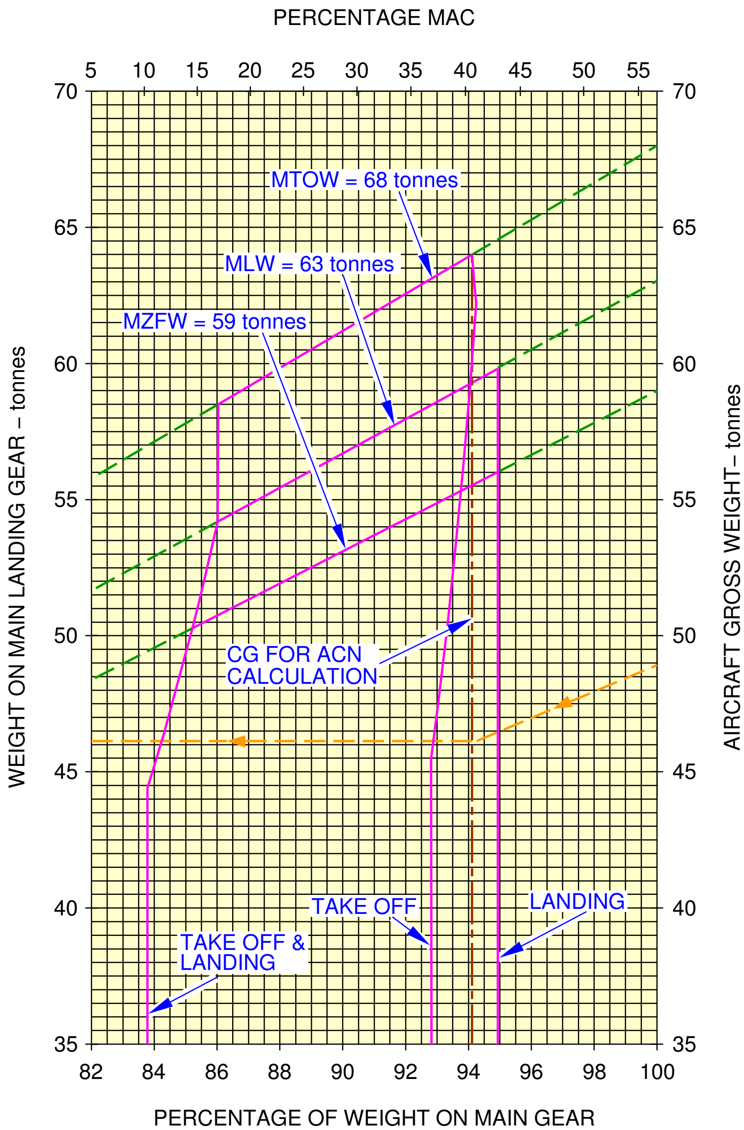
**ON A/C A320-100



N_AC_070401_1_0090101_01_01

Landing Gear Loading on Pavement
MTOW 66 T
FIGURE 1

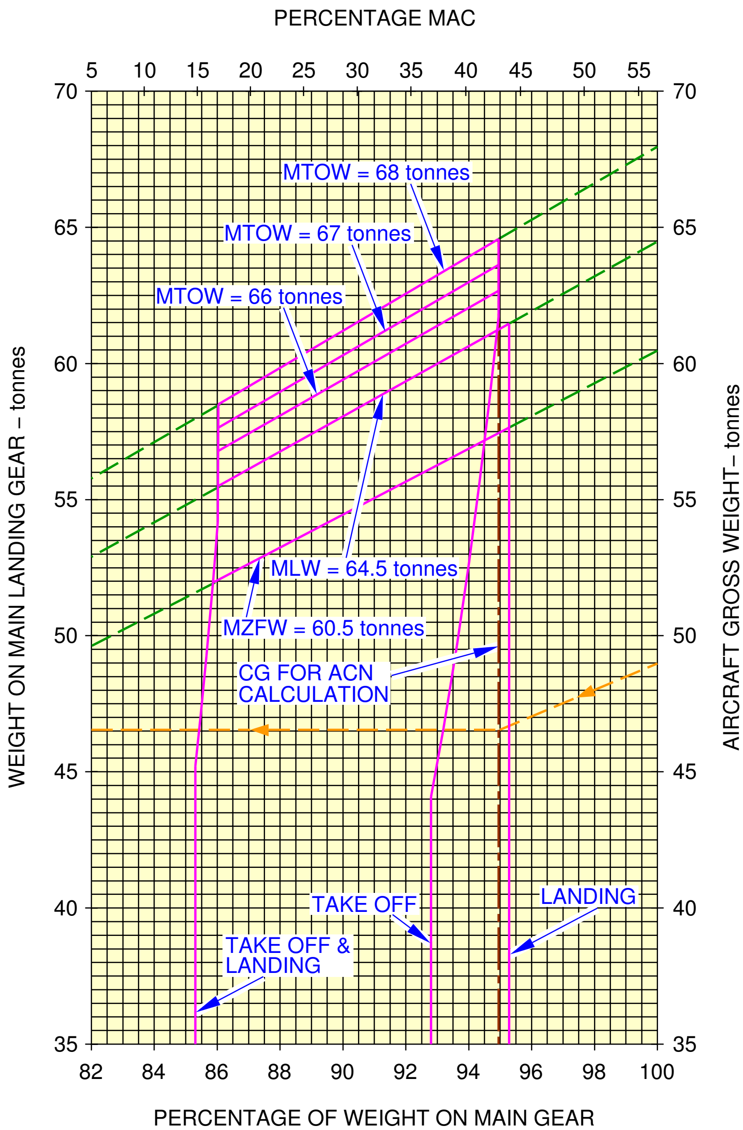
**ON A/C A320-100



N_AC_070401_1_0100101_01_01

Landing Gear Loading on Pavement
MTOW 68 T
FIGURE 2

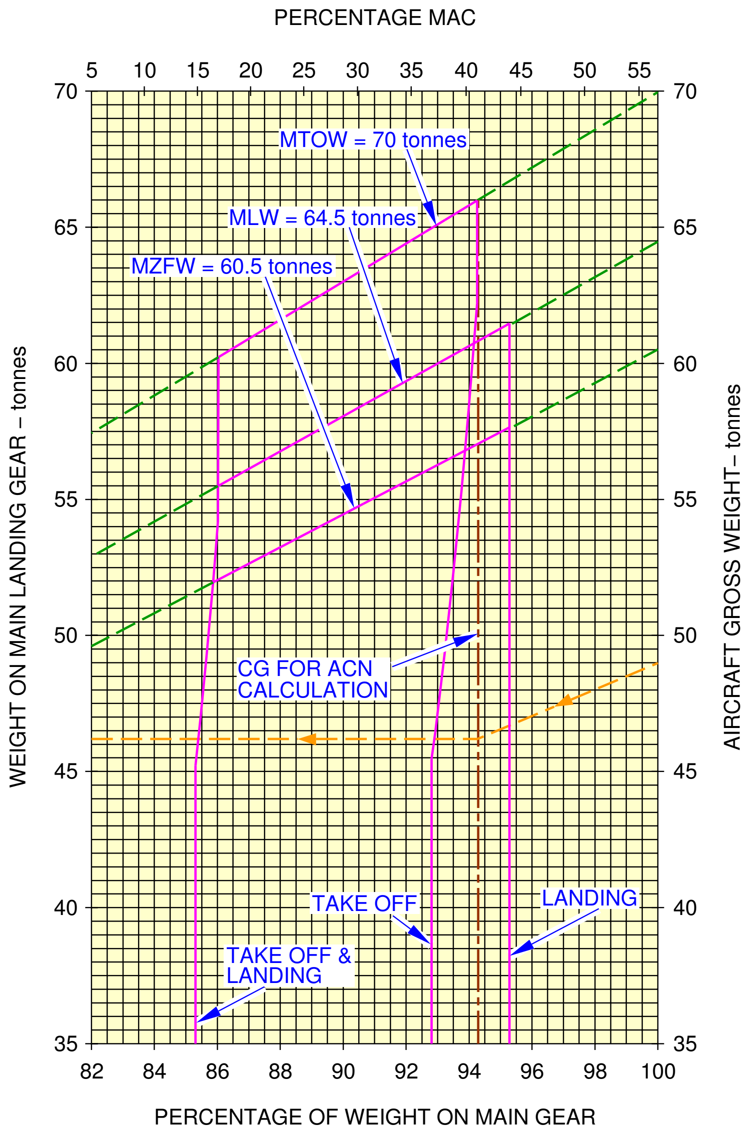
**ON A/C A320-200



N_AC_070401_1_0110101_01_01

Landing Gear Loading on Pavement
MTOW 68 T
FIGURE 3

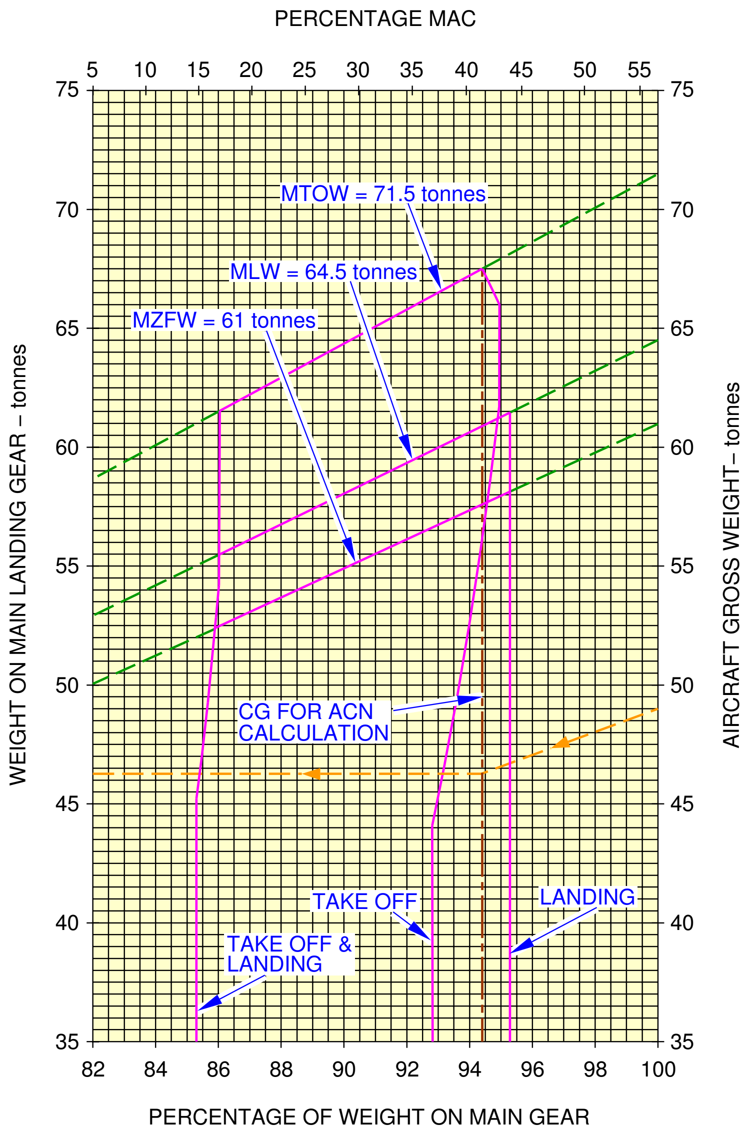
**ON A/C A320-200



N_AC_070401_1_0120101_01_01

Landing Gear Loading on Pavement
MTOW 70 T
FIGURE 4

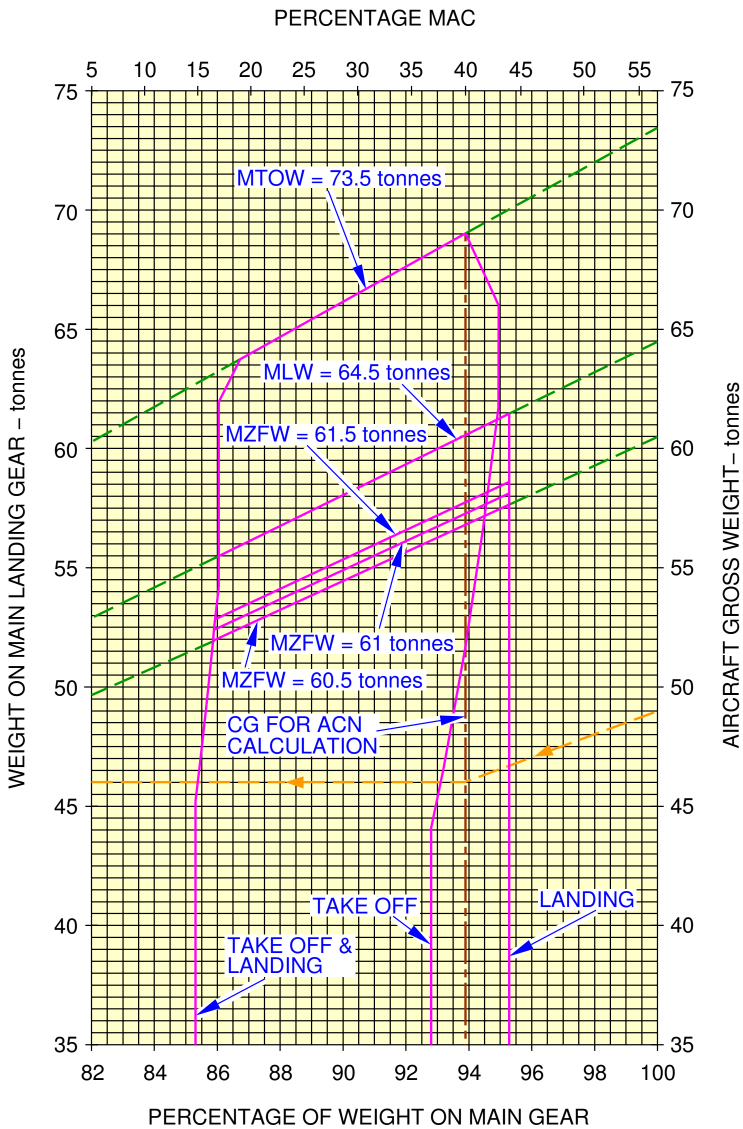
**ON A/C A320-200



N_AC_070401_1_0130101_01_01

Landing Gear Loading on Pavement
MTOW 71.5 T
FIGURE 5

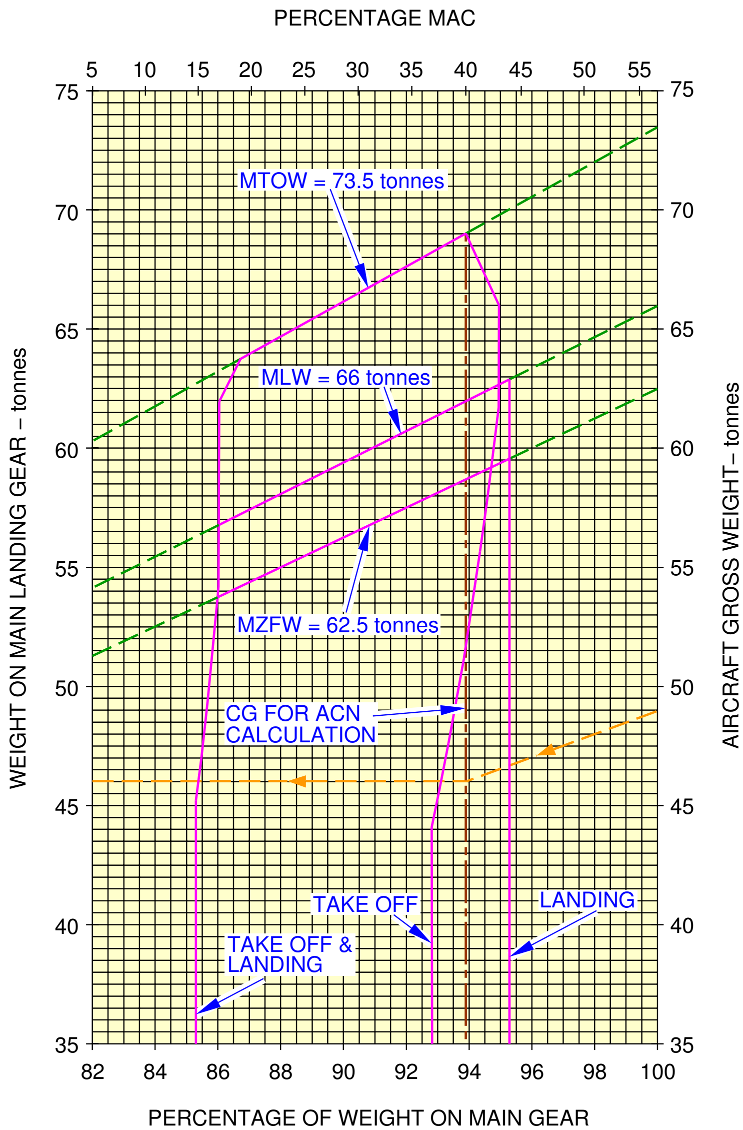
**ON A/C A320-200



N_AC_070401_1_0140101_01_01

Landing Gear Loading on Pavement
MTOW 73.5 T
FIGURE 6

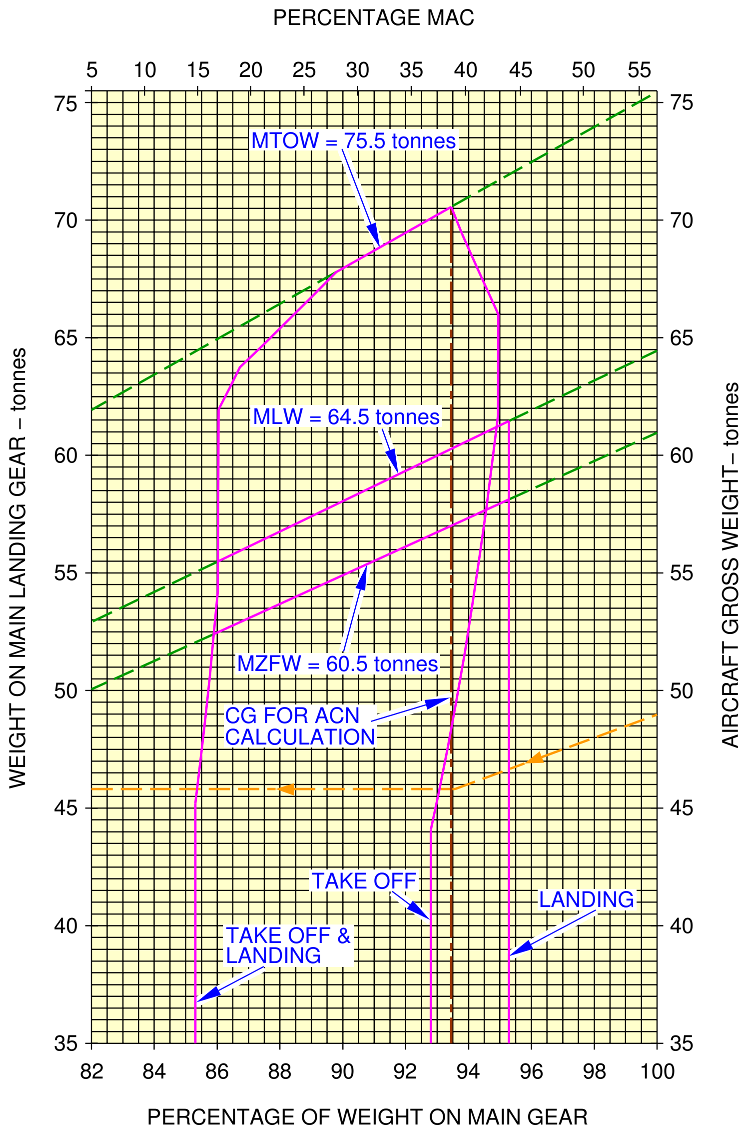
**ON A/C A320-200



N_AC_070401_1_0150101_01_01

Landing Gear Loading on Pavement
MTOW 73.5 T
FIGURE 7

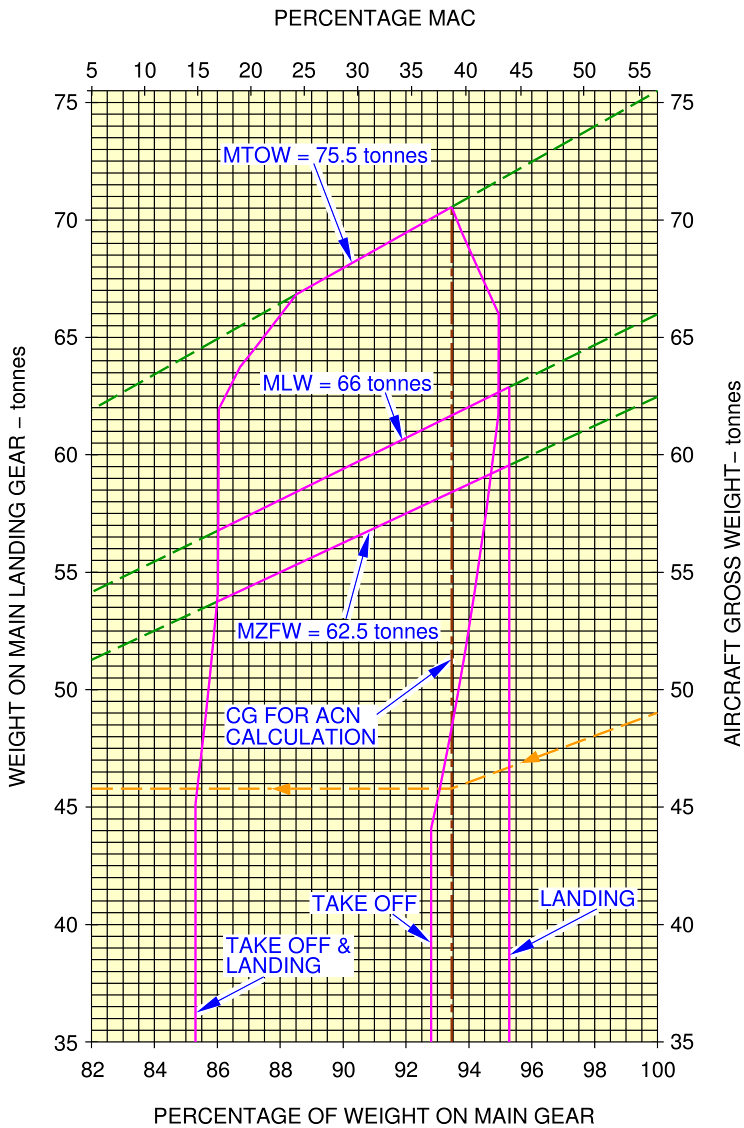
**ON A/C A320-200



N_AC_070401_1_0160101_01_01

Landing Gear Loading on Pavement
MTOW 75.5 T
FIGURE 8

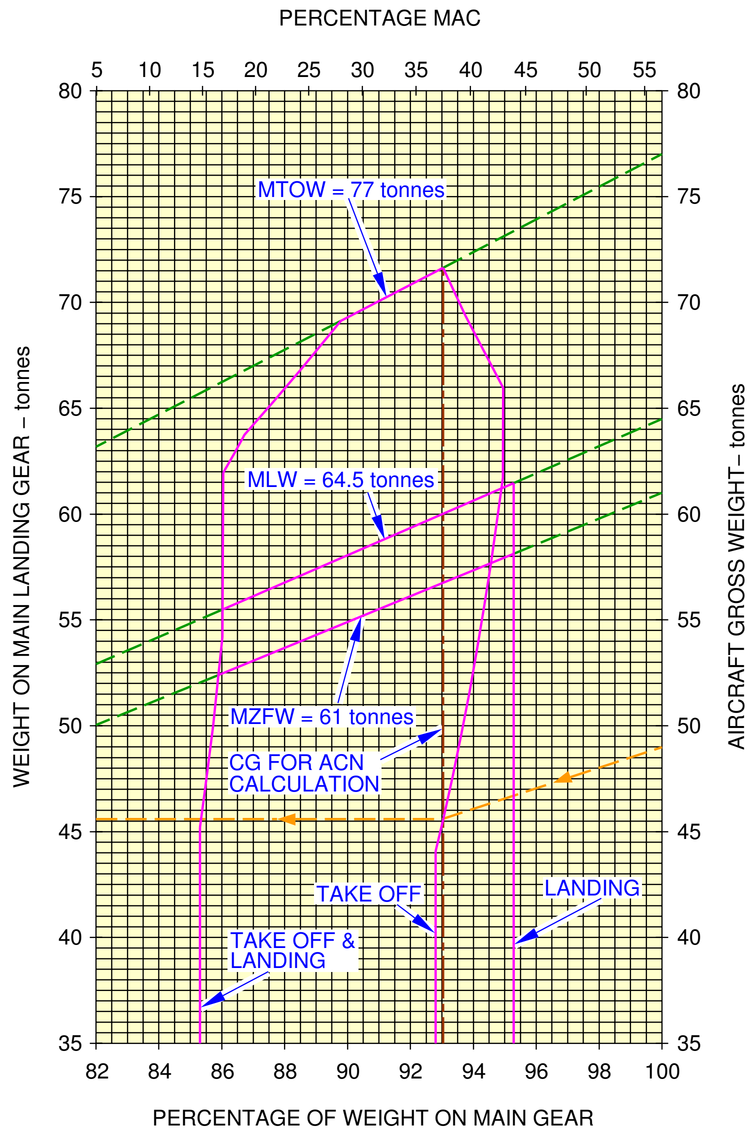
**ON A/C A320-200



N_AC_070401_1_0170101_01_01

Landing Gear Loading on Pavement
MTOW 75.5 T
FIGURE 9

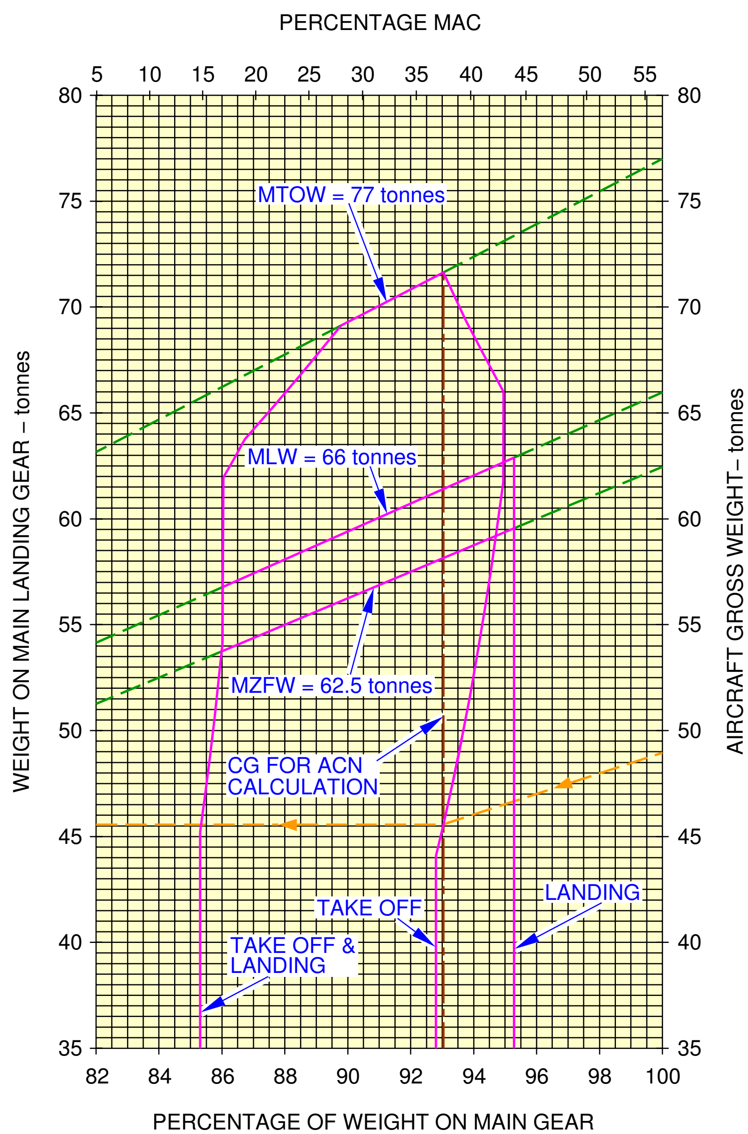
**ON A/C A320-200



N_AC_070401_1_0180101_01_01

Landing Gear Loading on Pavement
MTOW 77 T
FIGURE 10

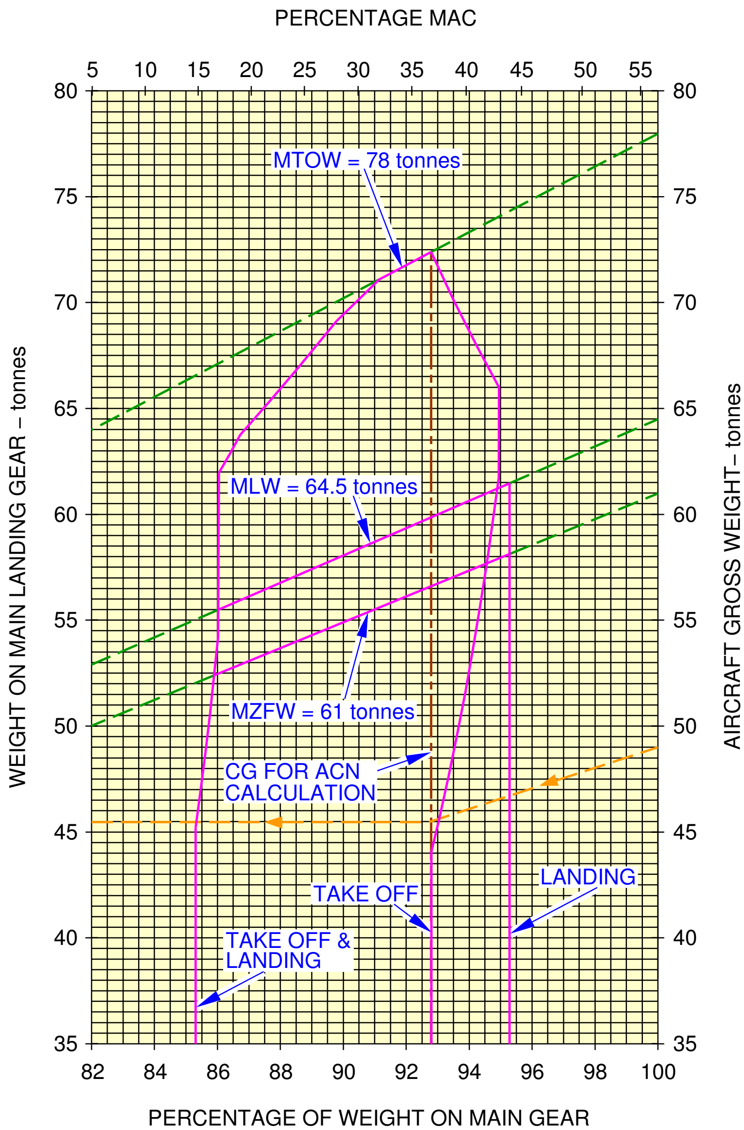
**ON A/C A320-200



N_AC_070401_1_0190101_01_01

Landing Gear Loading on Pavement
MTOW 77 T
FIGURE 11

**ON A/C A320-200



N_AC_070401_1_0200101_01_01

Landing Gear Loading on Pavement
MTOW 78 T
FIGURE 12

7-5-0 Flexible Pavement Requirements - U.S. Army Corps of Engineers Design Method

****ON A/C A320-100 A320-200**

Flexible Pavement Requirements - U.S. Army Corps of Engineers Design Method

1. General

In order to determine a particular Flexible Pavement Thickness, the Subgrade Strength (CBR), the Annual Departure Level and the weight on one Main Landing Gear must be known.

In the example shown in Section 7-5-1 page 1 for:
- a CBR value of 10
- an Annual Departure Level of 25000
- the Load on one MLG of 20000 kg (44092 lb).

For these conditions the Flexible Pavement Thickness is 41.4 cm (16.3 in).

In the example shown in Section 7-5-1 page 6 for:
- a CBR value of 10
- an Annual Departure Level of 25000
- the Load on one MLG of 20000 kg (44092 lb).

For these conditions the Flexible Pavement Thickness is 41.8 cm (16.5 in).

The line showing 10000 Coverages is used to calculate Aircraft Classification Number (ACN).

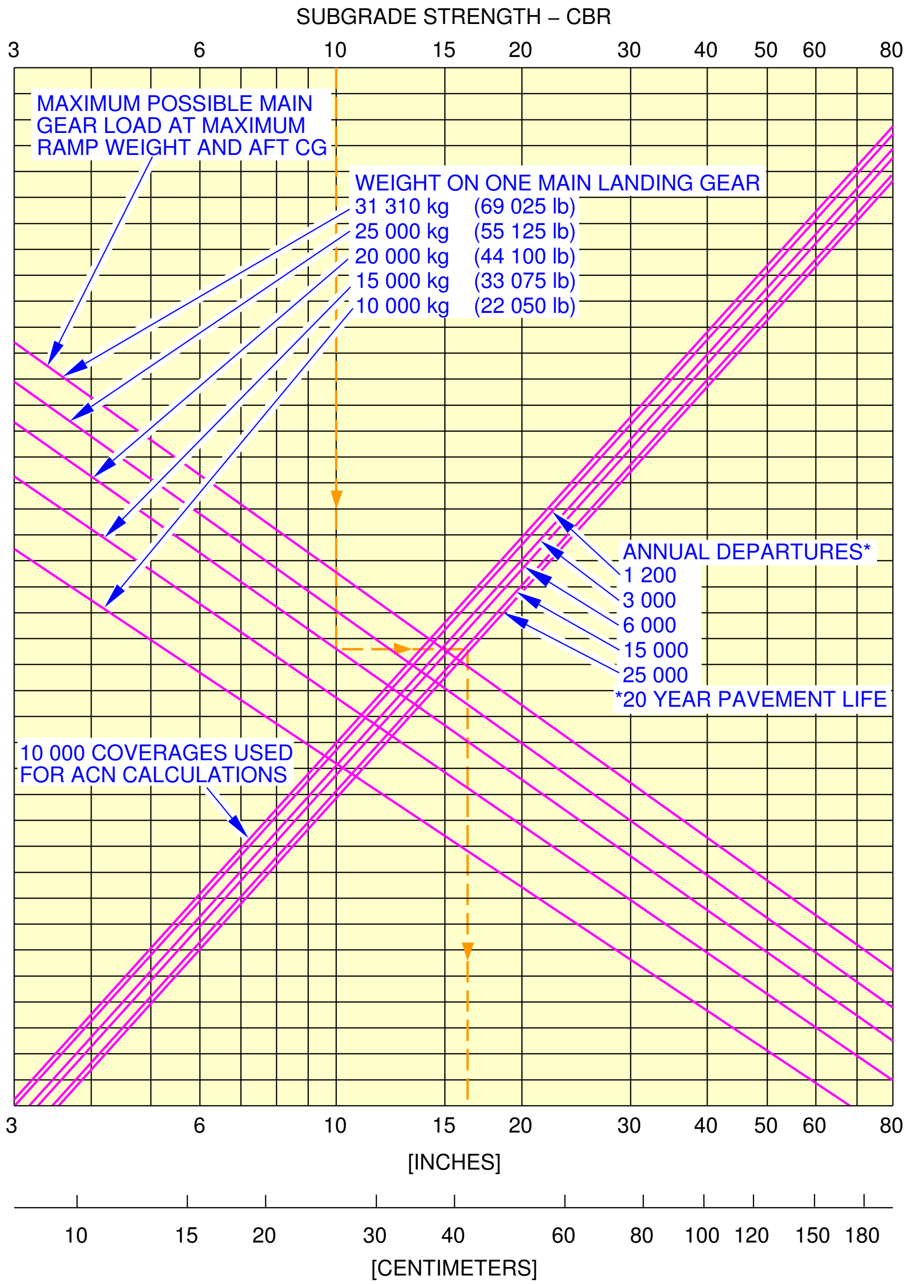
7-5-1 Flexible Pavement Requirements - U.S. Army Corps of Engineers Design Method

****ON A/C A320-100 A320-200**

Flexible Pavement Requirements - U.S. Army Corps of Engineers Design Method

1. This section gives Flexible Pavement Requirements.

**ON A/C A320-100

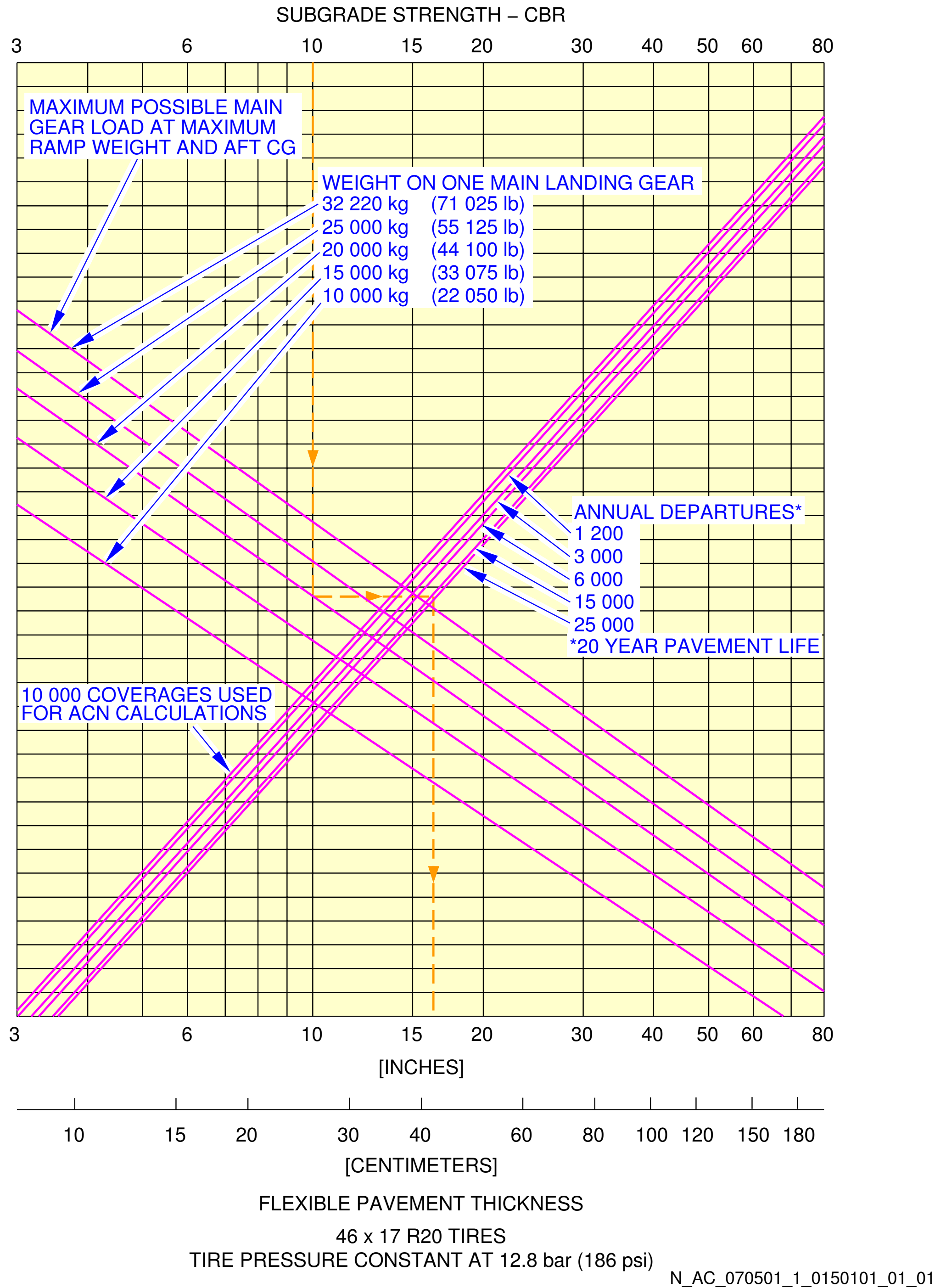


46 x 17 R20 TIRES
TIRE PRESSURE CONSTANT AT 12.3 bar (178 psi)

N_AC_070501_1_0140101_01_01

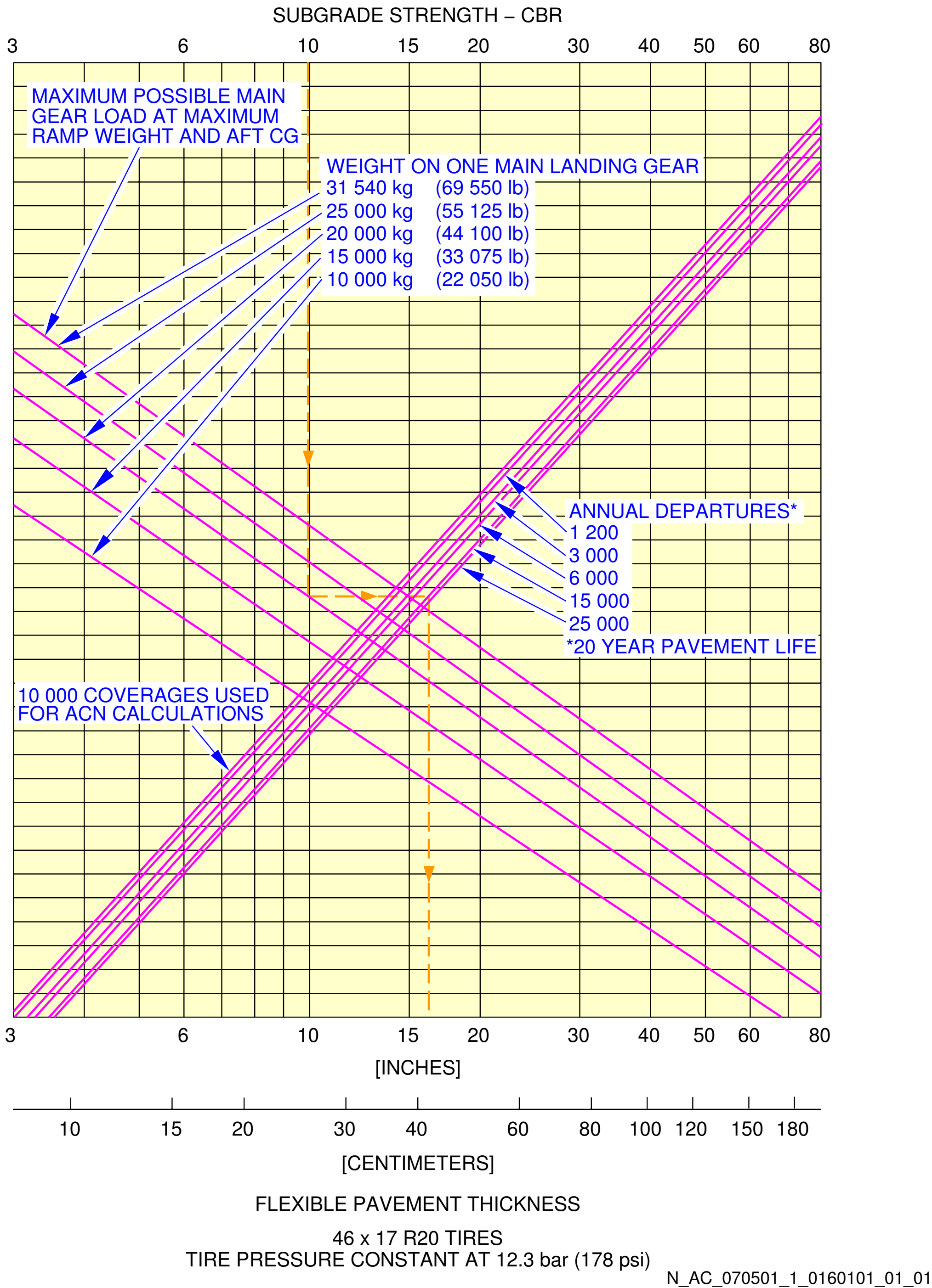
Flexible Pavement Requirements
MTOW 66 T
FIGURE 1

**ON A/C A320-100



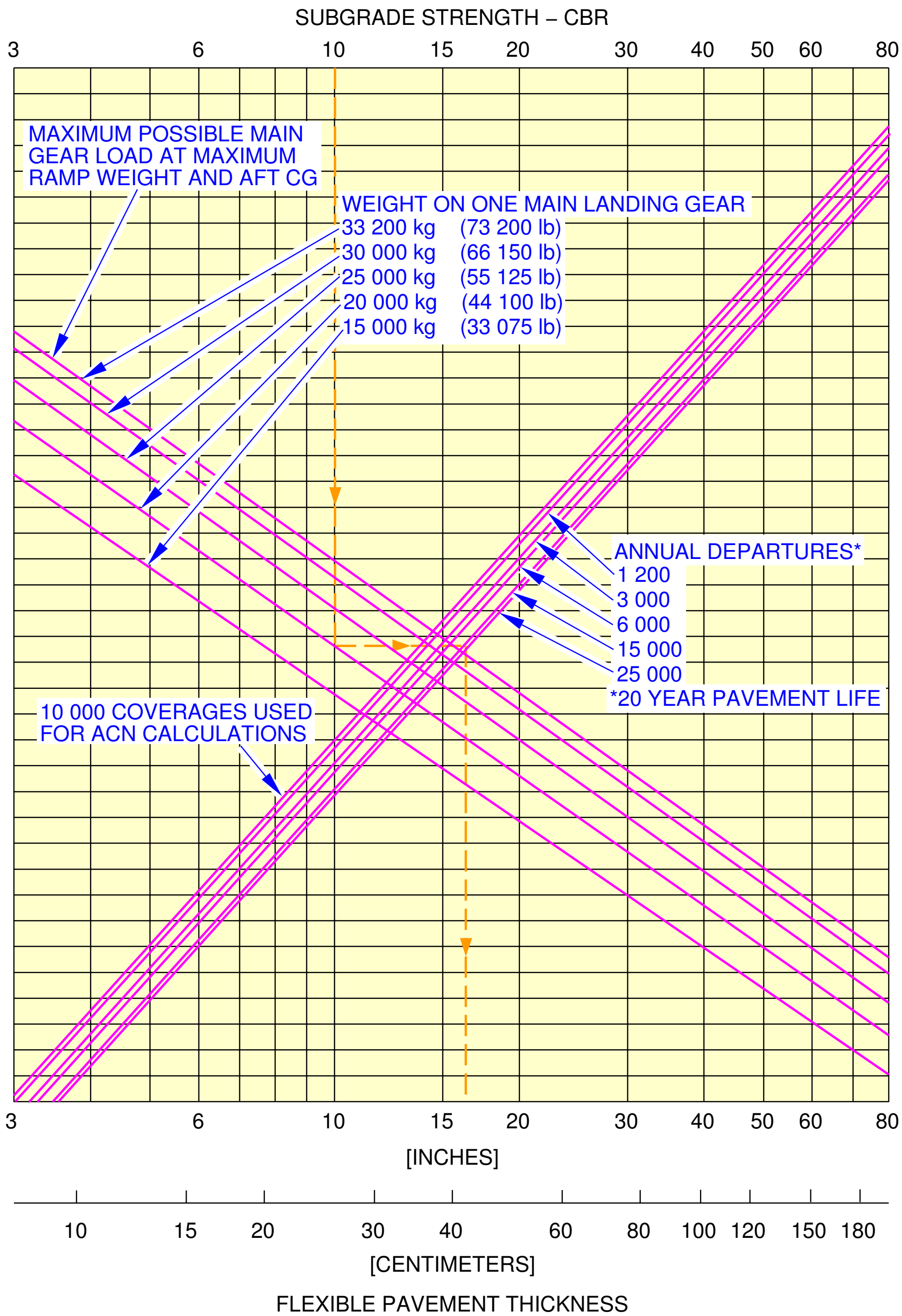
Flexible Pavement Requirements
MTOW 68 T
FIGURE 2

**ON A/C A320-200



Flexible Pavement Requirements
MTOW 66 T
FIGURE 3

**ON A/C A320-200

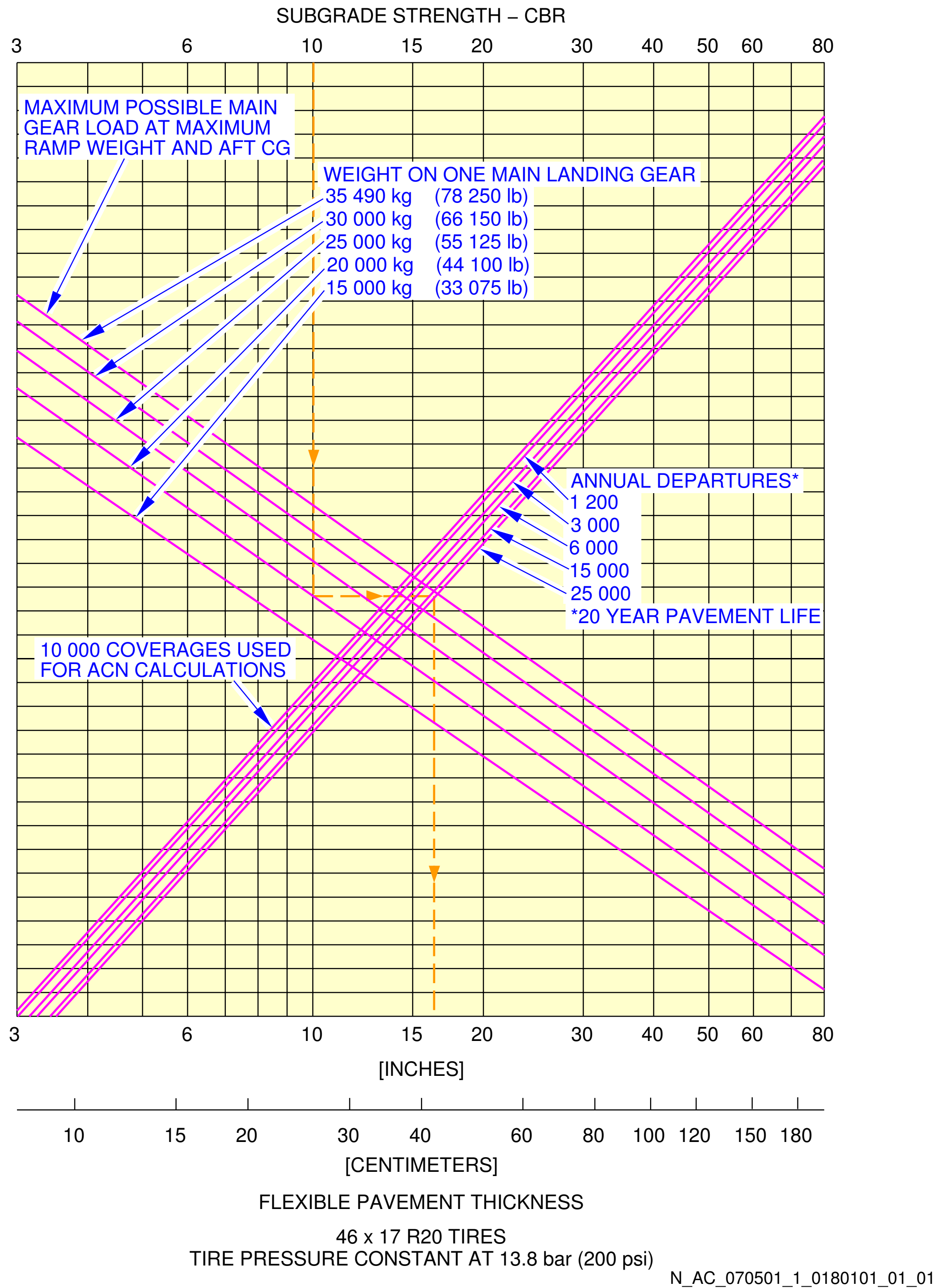


46 x 17 R20 TIRES
TIRE PRESSURE CONSTANT AT 12.8 bar (186 psi)

N_AC_070501_1_0170101_01_01

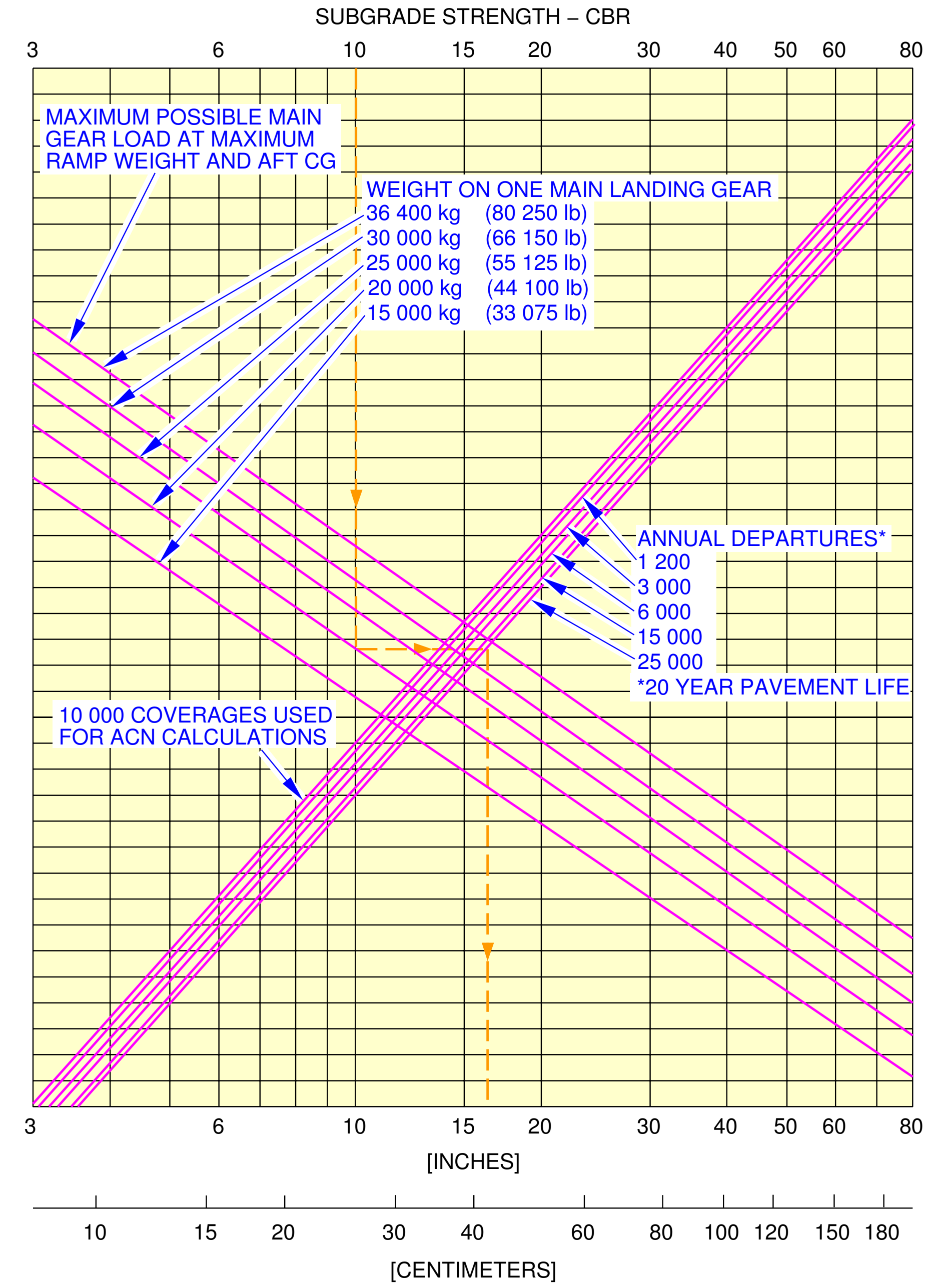
Flexible Pavement Requirements
MTOW 70 T
FIGURE 4

**ON A/C A320-200



Flexible Pavement Requirements
MTOW 75.5 T
FIGURE 5

**ON A/C A320-200



46 x 17 R20 TIRES
TIRE PRESSURE CONSTANT AT 14.4 bar (209 psi)

N_AC_070501_1_0190101_01_01

Flexible Pavement Requirements
MTOW 78 T
FIGURE 6

7-6-0 Flexible Pavement Requirements - LCN Conversion

****ON A/C A320-100 A320-200**

<u>Flexible Pavement Requirements - LCN Conversion</u>

1. General

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

In the example shown in Section 7-6-1, page 1, for a Flexible Pavement, the thickness (h) is shown at 20 inches with an LCN of 53.

For these conditions the weight on one Main Landing Gear is 25000 kg (55116 lb).

In the example shown in Section 7-6-1, page 6, for a Flexible Pavement, the thickness (h) is shown at 20 inches with an LCN of 57.

For these conditions the weight on one Main Landing Gear is 25000 kg (55116 lb).

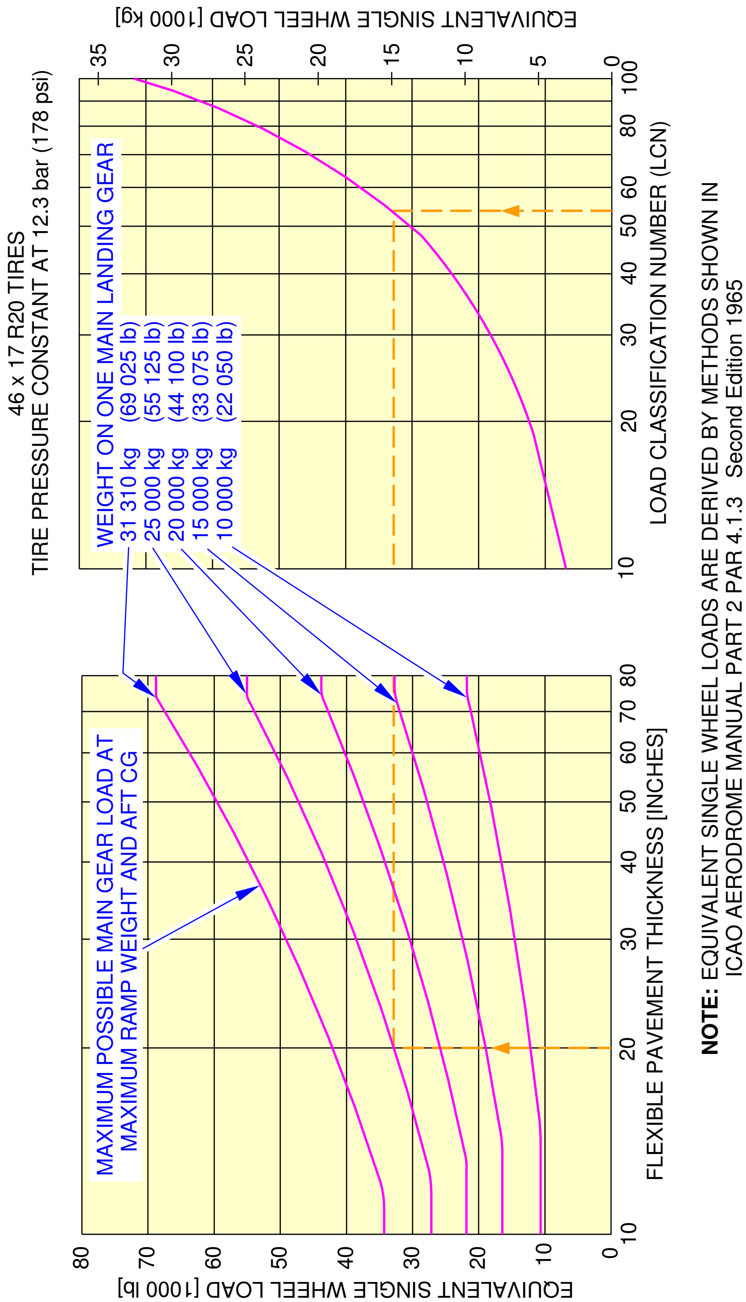
7-6-1 Flexible Pavement Requirements - LCN Conversion

****ON A/C A320-100 A320-200**

Flexible Pavement Requirements - LCN Conversion

1. This section gives Flexible Pavement Requirements - LCN Conversion.

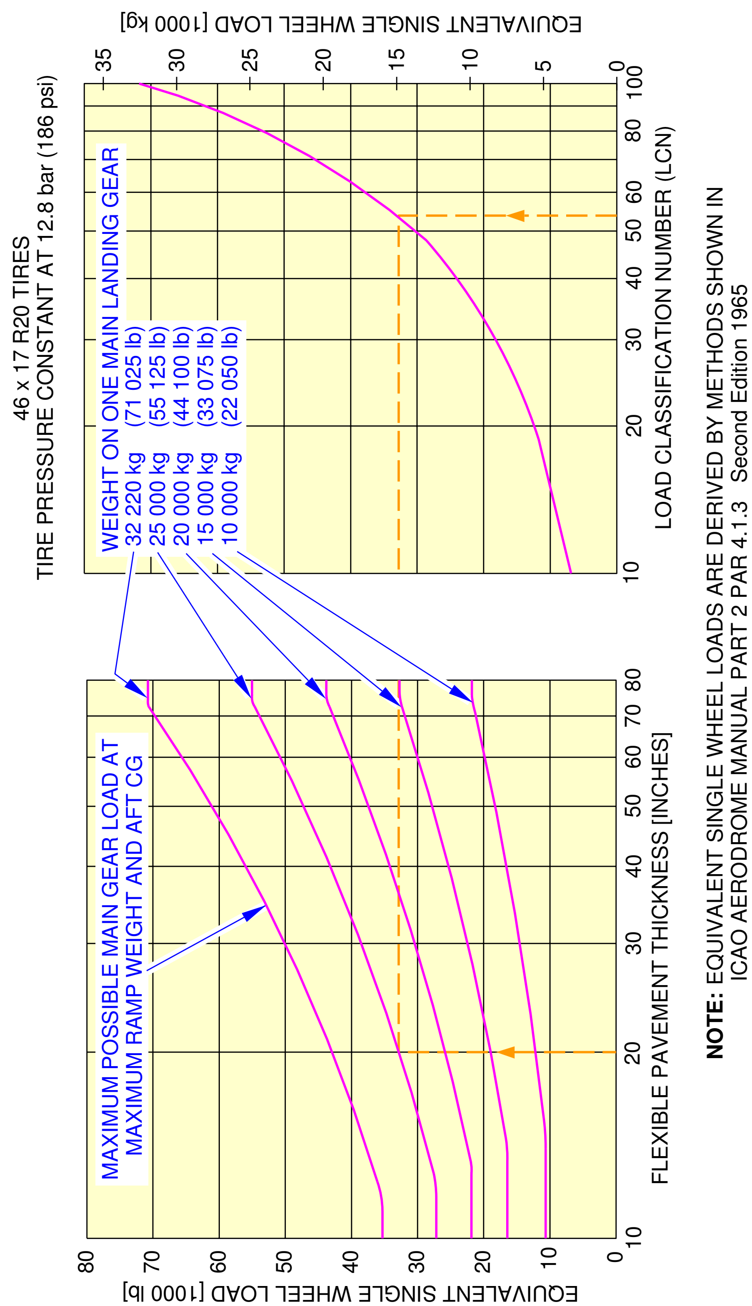
****ON A/C A320-100**



N_AC_070601_1_0150101_01_01

Flexible Pavement Requirements - LCN Conversion
MTOW 66 T
FIGURE 1

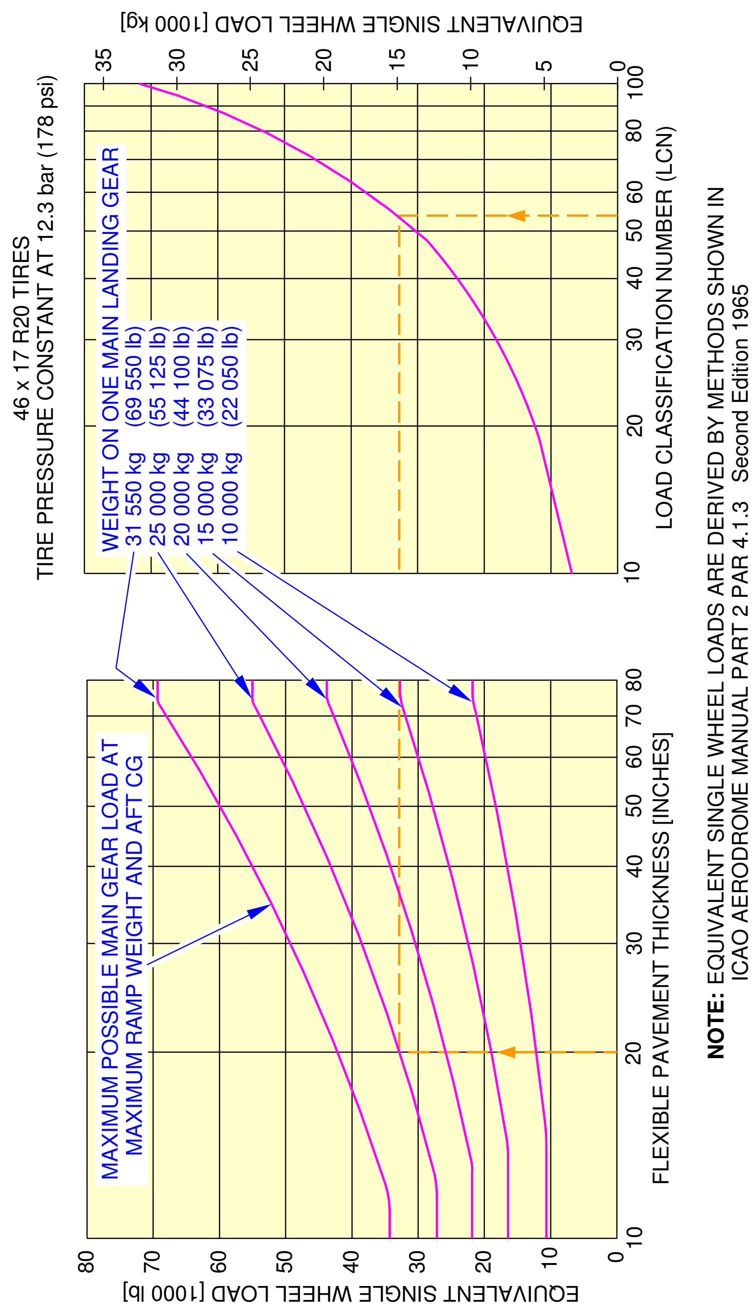
****ON A/C A320-100**



N_AC_070601_1_0160101_01_01

Flexible Pavement Requirements - LCN Conversion
MTOW 68 T
FIGURE 2

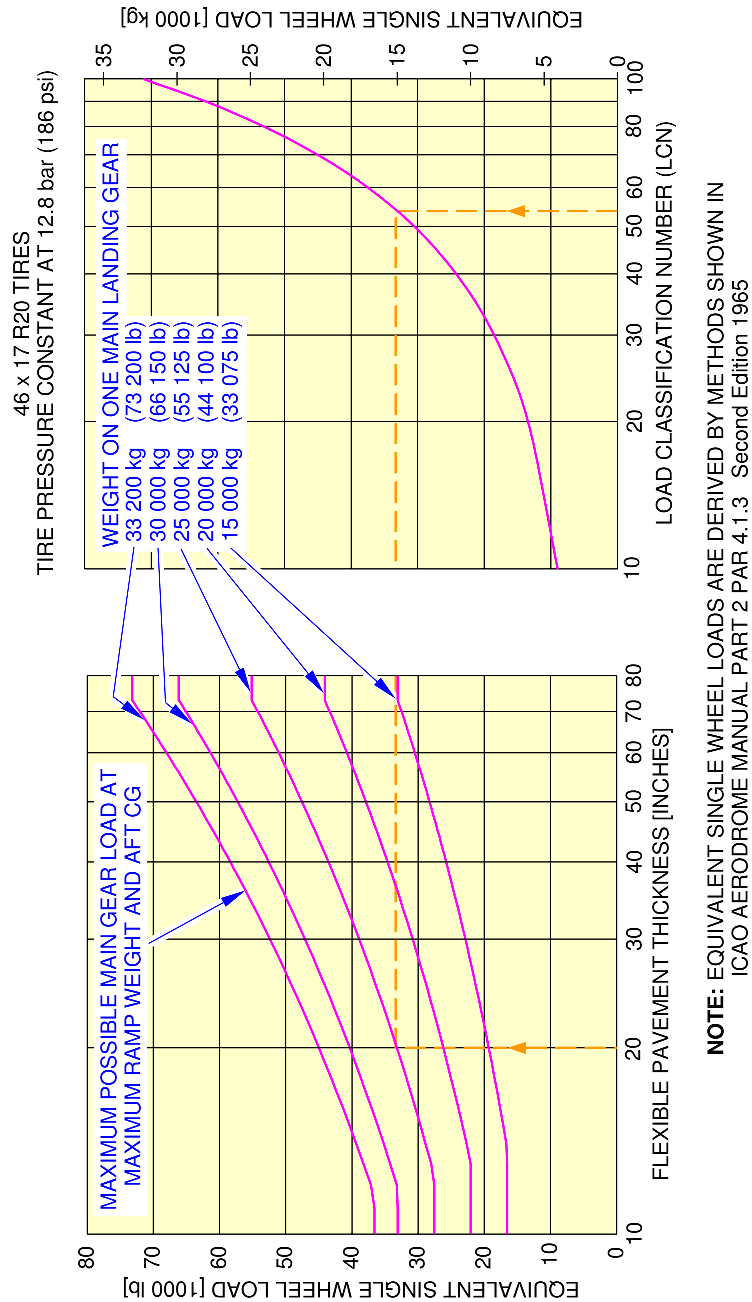
**ON A/C A320-200



N_AC_070601_1_0170101_01_01

Flexible Pavement Requirements - LCN Conversion
MTOW 66 T
FIGURE 3

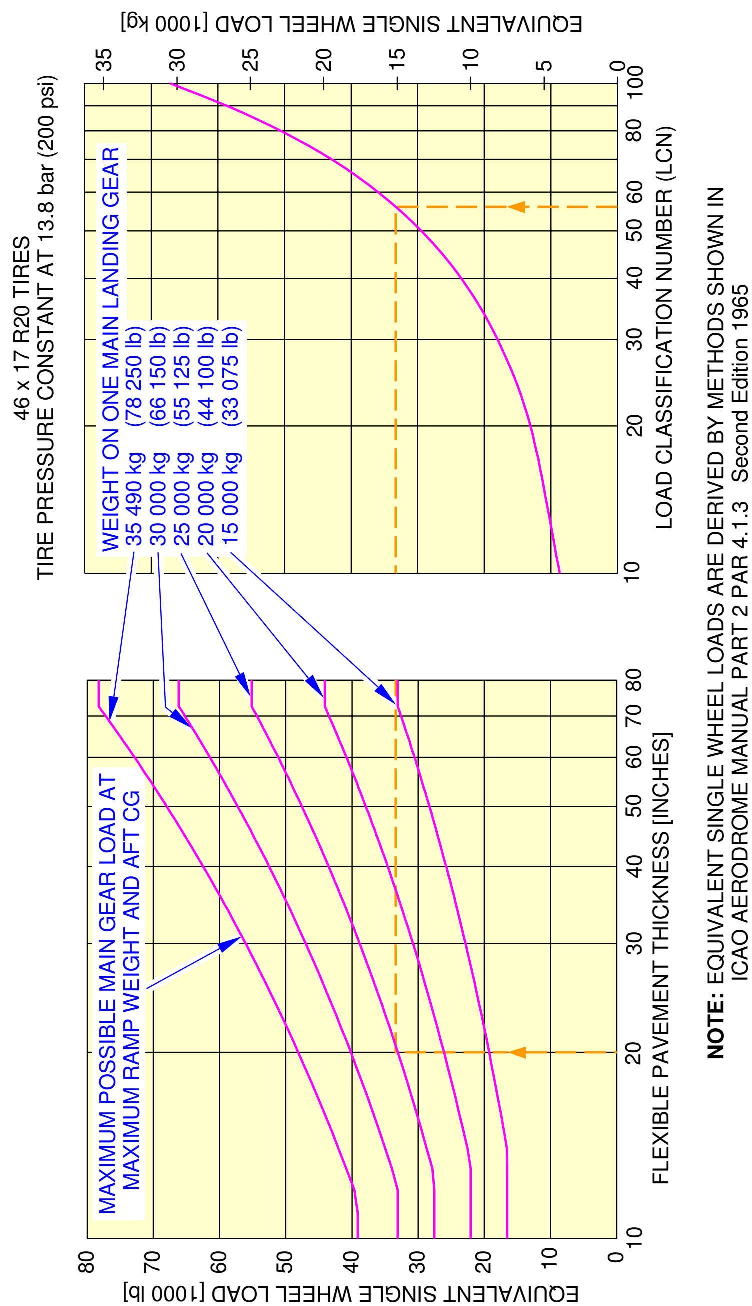
**ON A/C A320-200



N_AC_070601_1_0180101_01_01

Flexible Pavement Requirements - LCN Conversion
MTOW 70 T
FIGURE 4

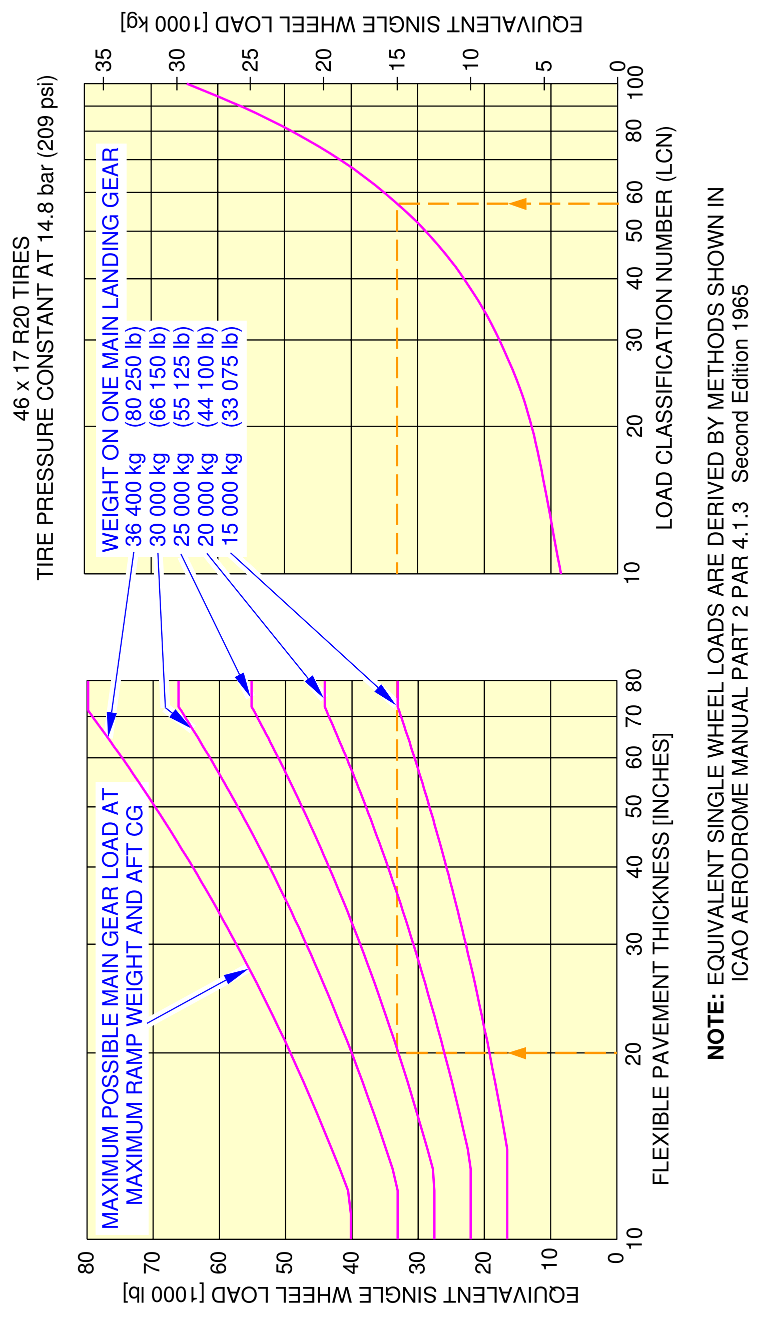
**ON A/C A320-200



N_AC_070601_1_0190101_01_01

Flexible Pavement Requirements - LCN Conversion
MTOW 75.5 T
FIGURE 5

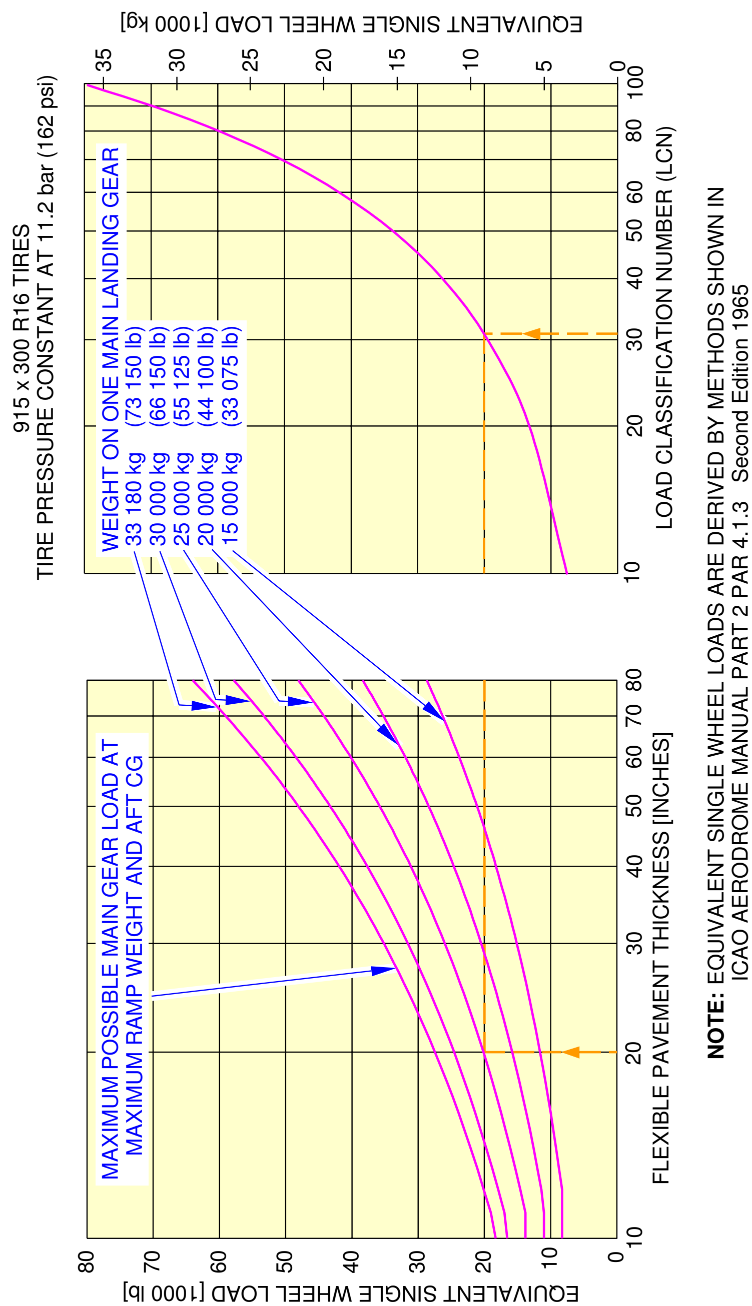
**ON A/C A320-200



N_AC_070601_1_0200101_01_01

Flexible Pavement Requirements - LCN Conversion
MTOW 78 T
FIGURE 6

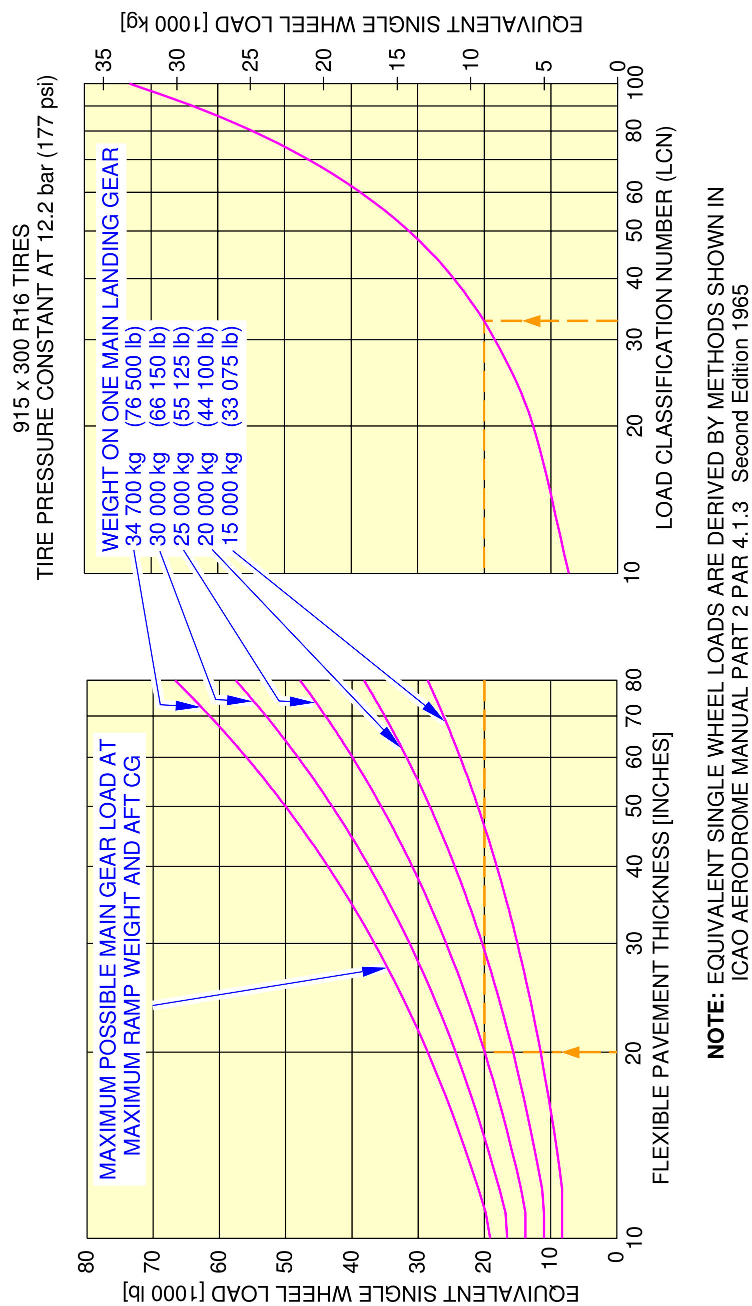
**ON A/C A320-200



N_AC_070601_1_0210101_01_01

Flexible Pavement Requirements - LCN Conversion
Bogie – MTOW 70 T
FIGURE 7

**ON A/C A320-200



N_AC_070601_1_0220101_01_01

Flexible Pavement Requirements - LCN Conversion
Bogie – MTOW 73.5 T
FIGURE 8

7-7-0 Rigid Pavement Requirements - Portland Cement Association Design Method

****ON A/C A320-100 A320-200**

Rigid Pavement Requirements - Portland Cement Association Design Method

1. General

To determine a Rigid Pavement Thickness, the Subgrade Modules (k), the allowable working stress and the weight on one Main Landing Gear must be known.

In the example shown in Section 7-7-1, page 1 for:
- a k value of 80 MN/m^3 (300 lb/in^3)
- an allowable working stress of 33.3 kgf/cm^2 (473.5 lbf/in^2)
- the Load on one Main Landing Gear of 20000 kg (44092 lb).

The required Rigid Pavement Thickness is 19 cm (7.5 in).

In the example shown in Section 7-7-1, page 6 for:
- a k value of 80 MN/m^3 (300 lb/in^3)
- an allowable working stress of 34 kgf/cm^2 (484 lbf/in^2)
- the Load on one Main Landing Gear of 20000 kg (44092 lb).

The required Rigid Pavement Thickness is 19 cm (7.5 in).

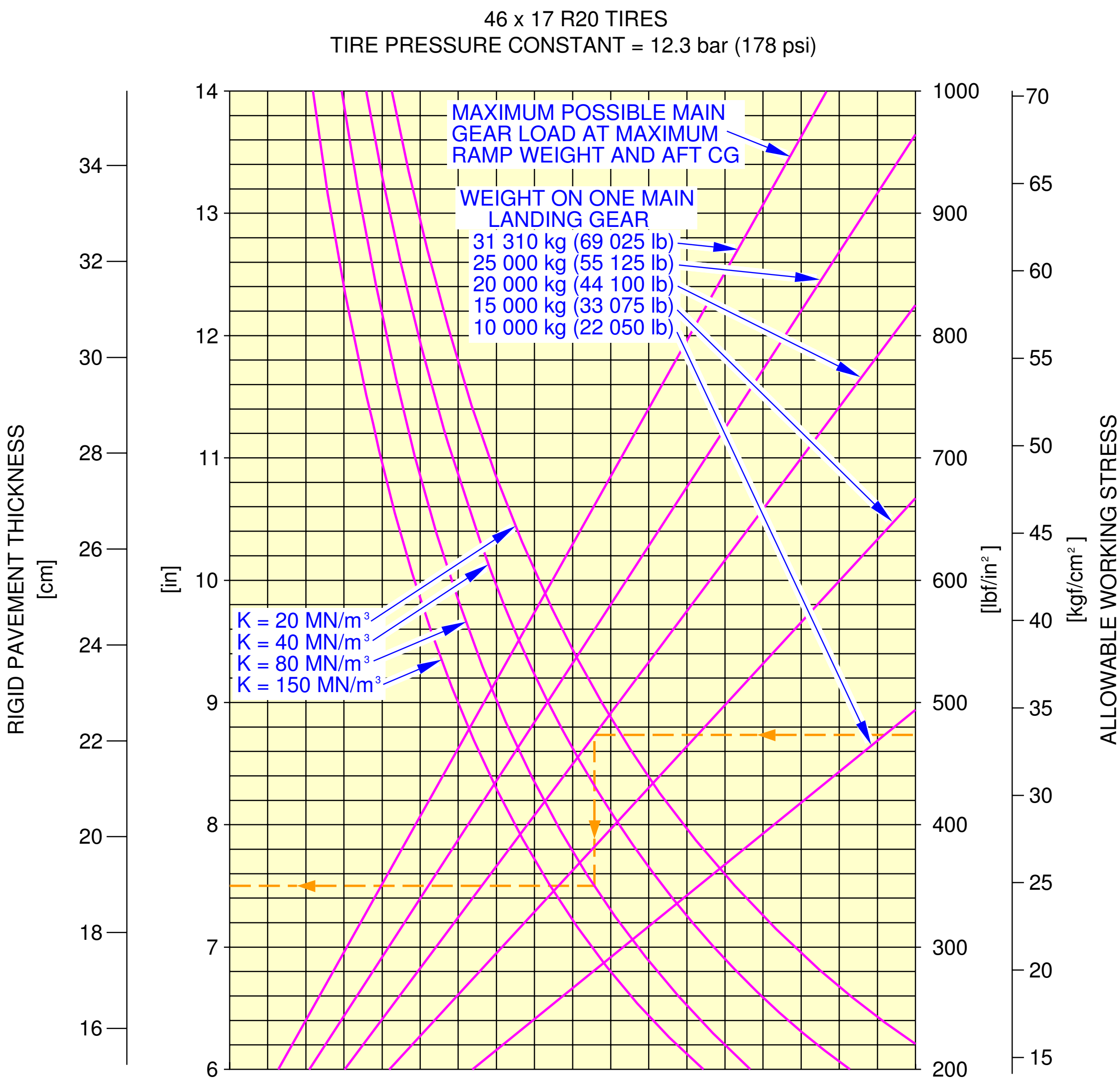
7-7-1 Rigid Pavement Requirements - Portland Cement Association Design Method

****ON A/C A320-100 A320-200**

Rigid Pavement Requirements - Portland Cement Association Design Method

1. This section gives Rigid Pavement Requirements.

**ON A/C A320-100



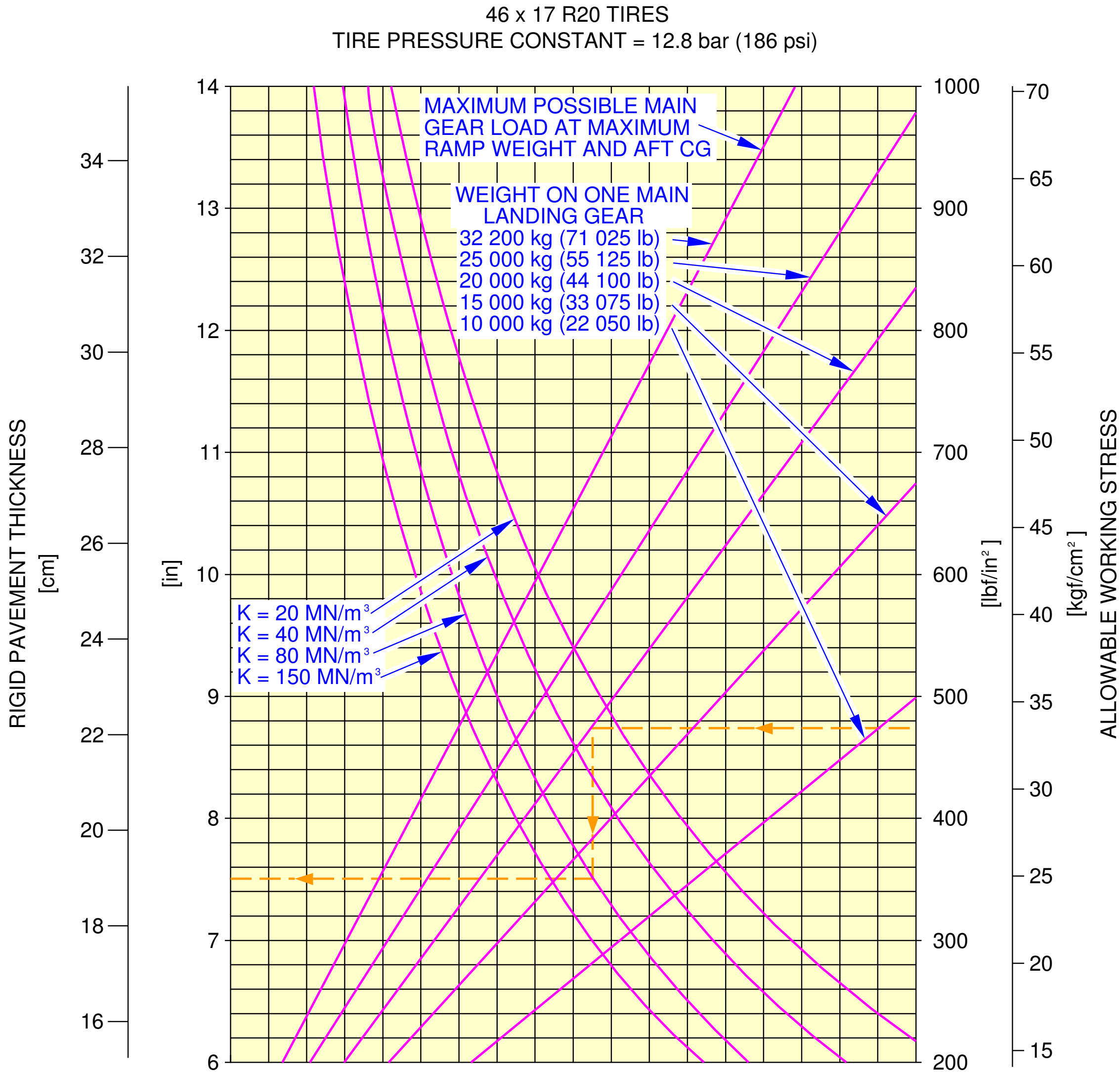
NOTE:
THE VALUES OBTAINED BY USING THE MAXIMUM LOAD REFERENCE LINE AND ANY VALUES FOR K ARE EXACT. FOR LOADS LESS THAN MAXIMUM, THE CURVES ARE EXACT FOR K = 80 MN/m³ BUT DEVIATE SLIGHTLY FOR ANY OTHER VALUES OF K

REFERENCE:
"DESIGN OF CONCRETE AIRPORT PAVEMENTS" AND "COMPUTER PROGRAM FOR AIRPORT PAVEMENT DESIGN – PROGRAM PDILB" PORTLAND CEMENT ASSOCIATION

N_AC_070701_1_0140101_01_01

Rigid Pavement Requirements (PCA)
MTOW 66 T
FIGURE 1

**ON A/C A320-100



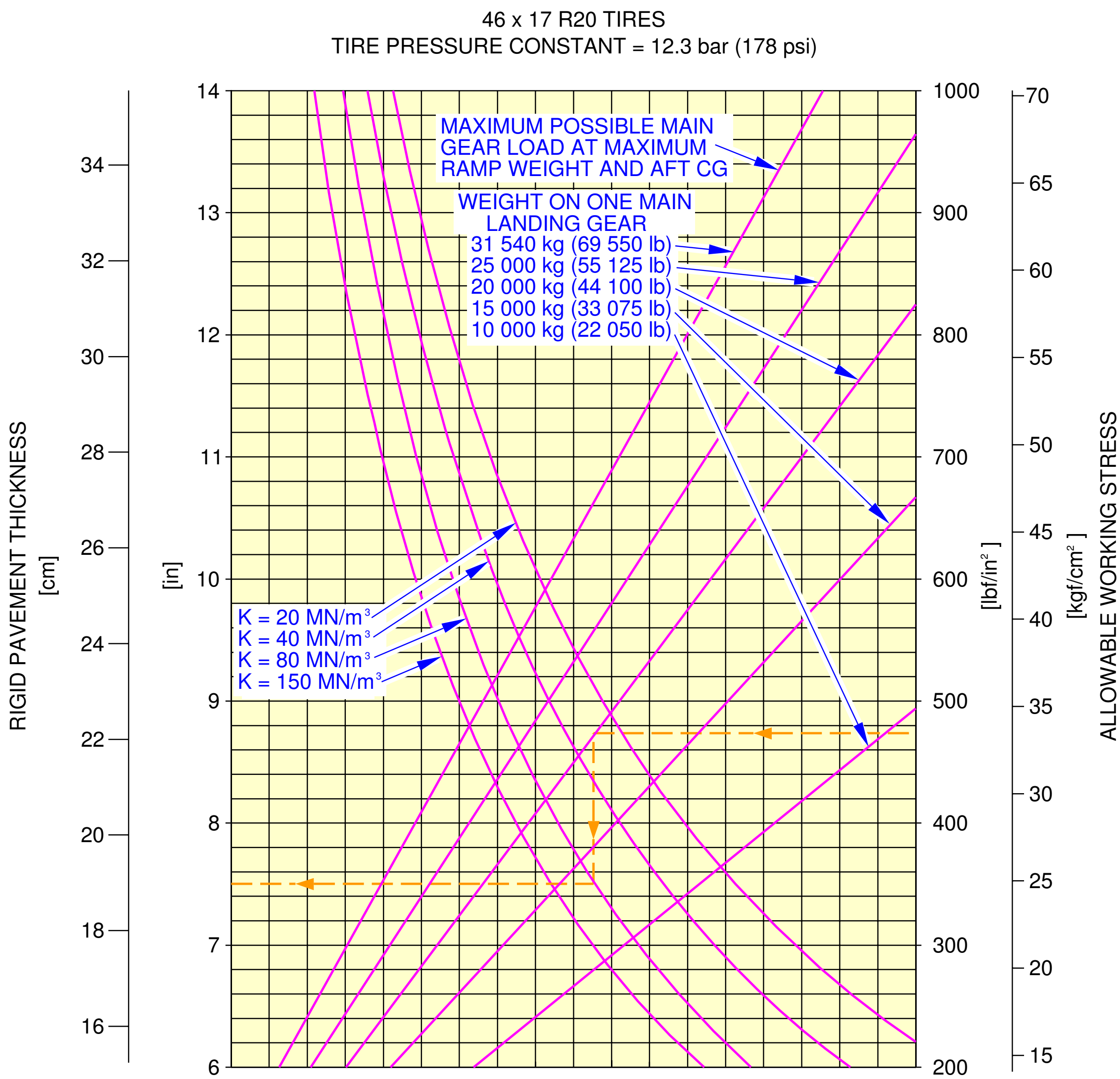
NOTE:
THE VALUES OBTAINED BY USING THE MAXIMUM LOAD REFERENCE LINE AND ANY VALUES FOR K ARE EXACT. FOR LOADS LESS THAN MAXIMUM, THE CURVES ARE EXACT FOR K = 80 MN/m³ BUT DEVIATE SLIGHTLY FOR ANY OTHER VALUES OF K

REFERENCE:
"DESIGN OF CONCRETE AIRPORT PAVEMENTS" AND "COMPUTER PROGRAM FOR AIRPORT PAVEMENT DESIGN – PROGRAM PDILB" PORTLAND CEMENT ASSOCIATION

N_AC_070701_1_0150101_01_01

Rigid Pavement Requirements (PCA)
MTOW 68 T
FIGURE 2

**ON A/C A320-200



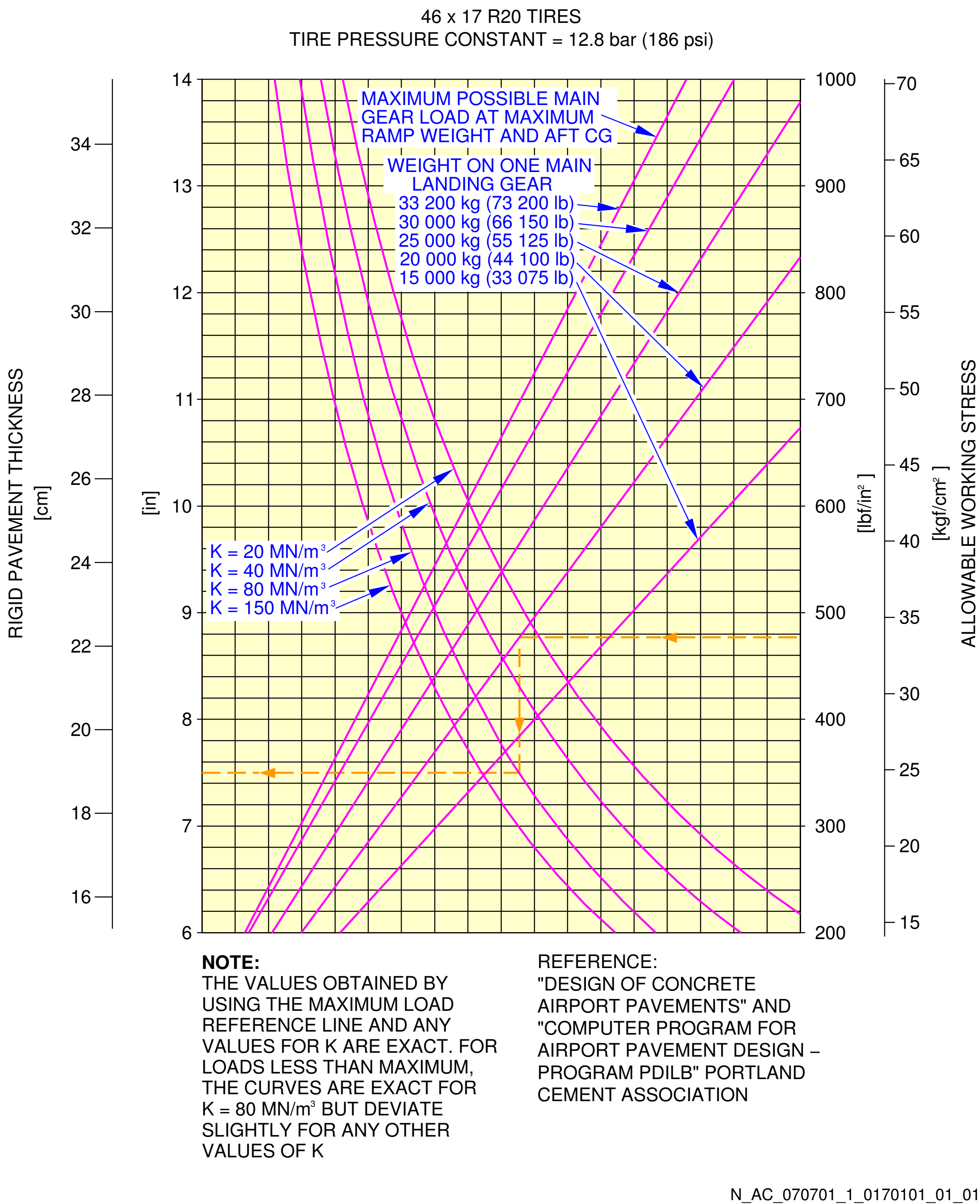
NOTE:
THE VALUES OBTAINED BY USING THE MAXIMUM LOAD REFERENCE LINE AND ANY VALUES FOR K ARE EXACT. FOR LOADS LESS THAN MAXIMUM, THE CURVES ARE EXACT FOR K = 80 MN/m³ BUT DEVIATE SLIGHTLY FOR ANY OTHER VALUES OF K

REFERENCE:
"DESIGN OF CONCRETE AIRPORT PAVEMENTS" AND "COMPUTER PROGRAM FOR AIRPORT PAVEMENT DESIGN – PROGRAM PDILB" PORTLAND CEMENT ASSOCIATION

N_AC_070701_1_0160101_01_01

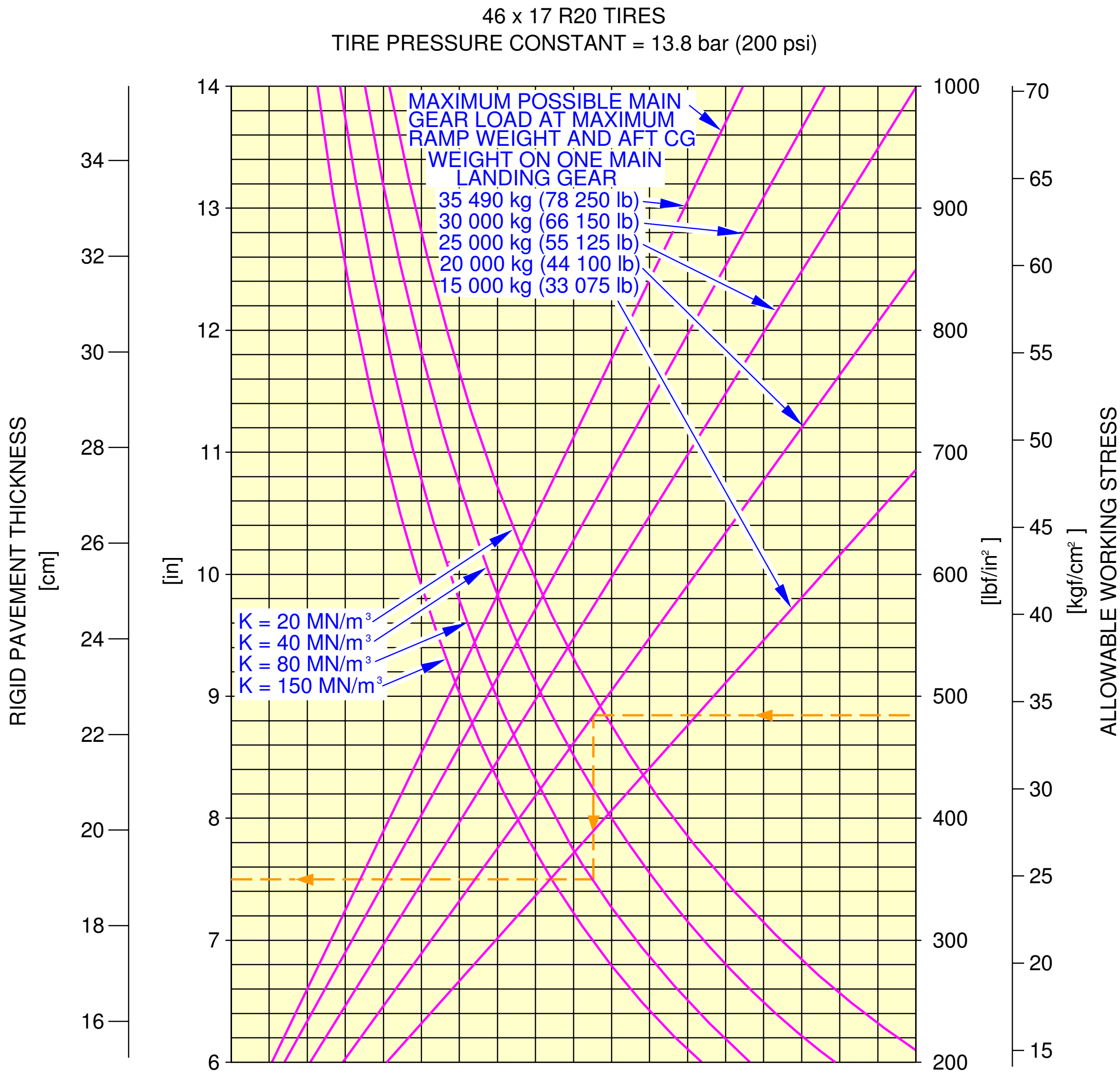
Rigid Pavement Requirements (PCA)
MTOW 66 T
FIGURE 3

**ON A/C A320-200



Rigid Pavement Requirements (PCA)
MTOW 70 T
FIGURE 4

**ON A/C A320-200



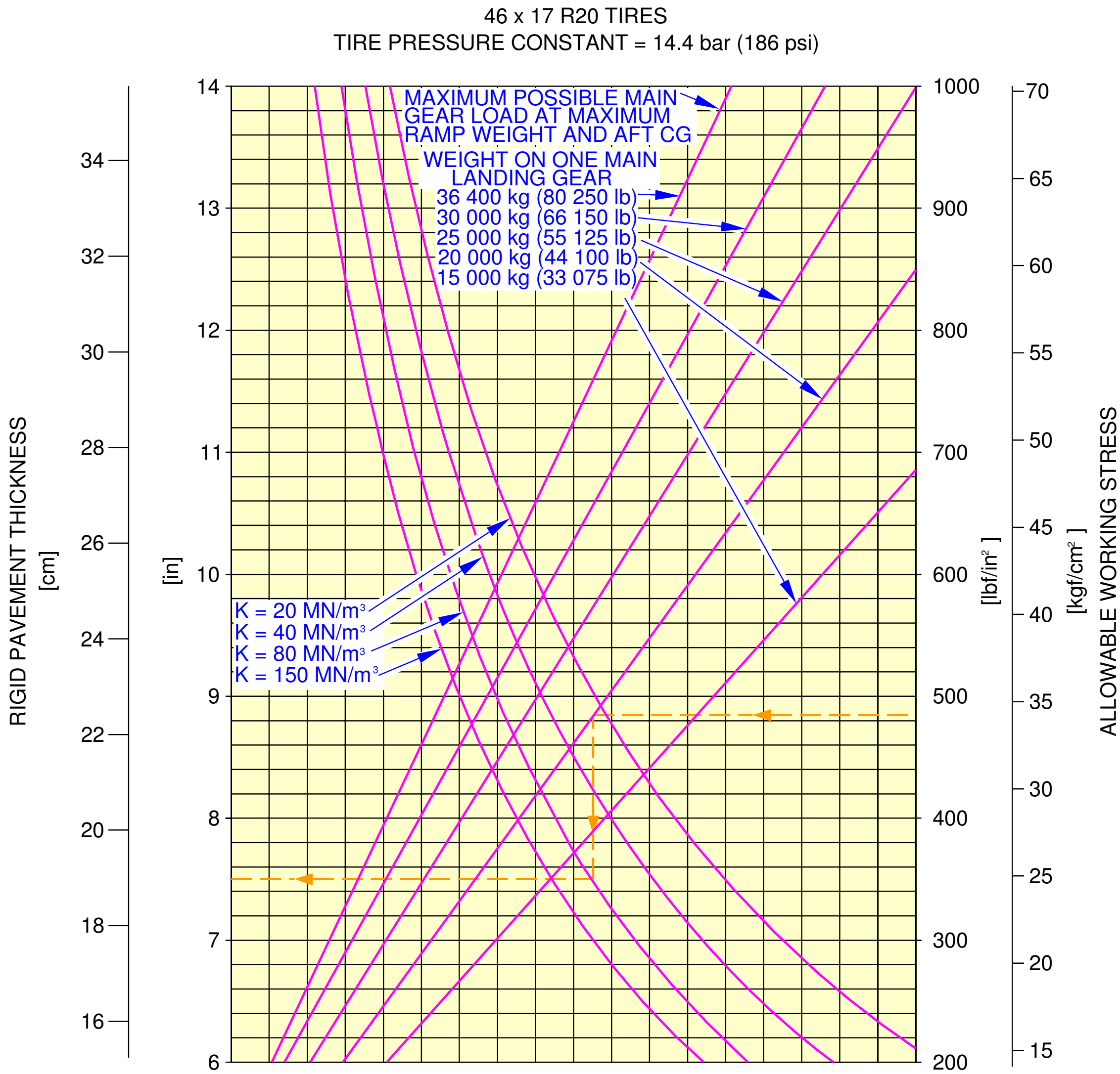
NOTE:
THE VALUES OBTAINED BY USING THE MAXIMUM LOAD REFERENCE LINE AND ANY VALUES FOR K ARE EXACT. FOR LOADS LESS THAN MAXIMUM, THE CURVES ARE EXACT FOR K = 80 MN/m³ BUT DEVIATE SLIGHTLY FOR ANY OTHER VALUES OF K

REFERENCE:
"DESIGN OF CONCRETE AIRPORT PAVEMENTS" AND "COMPUTER PROGRAM FOR AIRPORT PAVEMENT DESIGN – PROGRAM PDILB" PORTLAND CEMENT ASSOCIATION

N_AC_070701_1_0180101_01_01

Rigid Pavement Requirements (PCA)
MTOW 75.5 T
FIGURE 5

**ON A/C A320-200



NOTE:
THE VALUES OBTAINED BY USING THE MAXIMUM LOAD REFERENCE LINE AND ANY VALUES FOR K ARE EXACT. FOR LOADS LESS THAN MAXIMUM, THE CURVES ARE EXACT FOR K = 80 MN/m³ BUT DEVIATE SLIGHTLY FOR ANY OTHER VALUES OF K

REFERENCE:
"DESIGN OF CONCRETE AIRPORT PAVEMENTS" AND "COMPUTER PROGRAM FOR AIRPORT PAVEMENT DESIGN – PROGRAM PDILB" PORTLAND CEMENT ASSOCIATION

N_AC_070701_1_0190101_01_01

Rigid Pavement Requirements (PCA)
MTOW 78 T
FIGURE 6

7-8-0 Rigid Pavement Requirements - LCN Conversion

****ON A/C A320-100 A320-200**

Rigid Pavement Requirements - LCN Conversion

1. General

In order to determine the airplane weight that can be accommodated on a particular Rigid Pavement, both the LCN of the pavement and the Radius of Relative Stiffness (L) must be known.

In the example shown in Section 7-8-2, page 1:

The radius of Relative Stiffness is shown at 30 inches with an LCN of 57.
For these conditions the weight on one Main Landing Gear is 25000 kg (55116 lb).

In the example shown in Section 7-8-2, page 6:

The radius of Relative Stiffness is shown at 30 inches with an LCN of 61.
For these conditions the weight on one Main Landing Gear is 25000 kg (55116 lb).

7-8-1 Radius of Relative Stiffness

****ON A/C A320-100 A320-200**

Radius of Relative Stiffness

1. This section gives Radius of Relative Stiffness.

**ON A/C A320-100 A320-200

RADIUS OF RELATIVE STIFFNESS (L)
VALUES IN INCHES

$$L = \sqrt[4]{\frac{Ed^3}{12(1-\mu^2)k}} = 24.1652 \sqrt[4]{\frac{d^3}{k}}$$

WHERE E = Young's Modulus = 4×10^6 psi
k = Subgrade Modulus, lbf/in^3
d = Rigid Pavement Thickness, inches
μ = Poisson's Ratio = 0.15

d	k=75	k=100	k=150	k=200	k=250	k=300	k=350	k=400	k=550
6.0	31.48	29.30	26.47	24.63	23.30	22.26	21.42	20.72	19.13
6.5	33.43	31.11	28.11	26.16	24.74	23.64	22.74	22.00	20.31
7.0	35.34	32.89	29.72	27.65	26.15	24.99	24.04	23.25	21.47
7.5	37.22	34.63	31.29	29.12	27.54	26.32	25.32	24.49	22.61
8.0	39.06	36.35	32.85	30.57	28.91	27.62	26.58	25.70	23.74
8.5	40.88	38.04	34.37	31.99	30.25	28.91	27.81	26.90	24.84
9.0	42.67	39.71	35.88	33.39	31.58	30.17	29.03	28.08	25.93
9.5	44.43	41.35	37.36	34.77	32.89	31.42	30.23	29.24	27.00
10.0	46.18	42.97	38.83	36.14	34.17	32.65	31.42	30.39	28.06
10.5	47.90	44.57	40.28	37.48	35.45	33.87	32.59	31.52	29.11
11.0	49.60	46.16	41.71	38.81	36.71	35.07	33.75	32.64	30.14
11.5	51.28	47.72	43.12	40.13	37.95	36.26	34.89	33.74	32.16
12.0	52.94	49.27	44.52	41.43	39.18	37.44	36.02	34.84	32.17
12.5	54.59	50.80	45.90	42.72	40.40	38.60	37.14	35.92	33.17
13.0	56.22	52.32	47.27	43.99	41.61	39.75	38.25	36.99	34.16
13.5	57.83	53.82	48.63	45.26	42.80	40.89	39.35	38.06	35.14
14.0	59.43	55.31	49.98	46.51	43.98	42.02	40.44	39.11	36.12
14.5	61.02	56.78	51.31	47.75	45.16	43.15	41.51	40.15	37.08
15.0	62.59	58.25	52.63	48.98	46.32	44.26	42.58	41.19	38.03
15.5	64.15	59.70	53.94	50.20	47.47	45.36	43.64	42.21	38.98
16.0	65.69	61.13	55.24	51.41	48.62	46.45	44.70	43.23	39.92
16.5	67.23	62.56	56.53	52.61	49.75	47.54	45.74	44.24	40.85
17.0	68.75	63.98	57.81	53.80	50.88	48.61	46.77	45.24	41.78
17.5	70.26	65.38	59.08	54.98	52.00	49.68	47.80	46.23	42.70
18.0	71.76	66.78	60.34	56.15	53.11	50.74	48.82	47.22	43.61
19.0	74.73	69.54	62.84	58.48	55.31	52.84	50.84	49.17	45.41
20.0	77.66	72.27	65.30	60.77	57.47	54.91	52.84	51.10	47.19
21.0	80.55	74.96	67.74	63.04	59.62	56.96	54.81	53.01	48.95
22.0	83.41	77.63	70.14	65.28	61.73	58.98	56.75	54.89	50.69
23.0	86.24	80.26	72.52	67.49	63.83	60.98	58.68	56.75	52.41
24.0	89.04	82.86	74.87	69.68	65.90	62.96	60.58	58.59	54.11
25.0	91.81	85.44	77.20	71.84	67.95	64.92	62.46	60.41	55.79

N_AC_070801_1_0030101_01_00

Radius of Relative Stiffness
(Reference: Portland Cement Association)
FIGURE 1

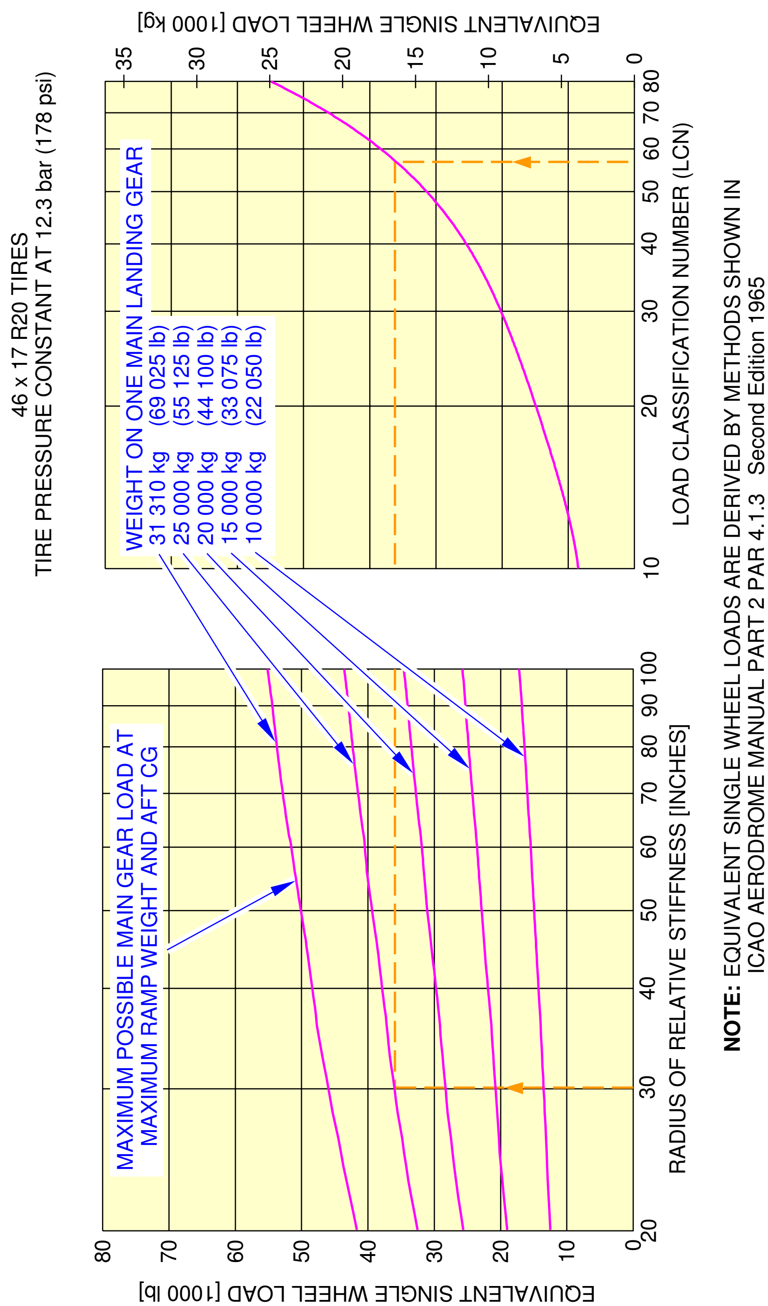
7-8-2 Rigid Pavement Requirements - LCN Conversion

****ON A/C A320-100 A320-200**

Rigid Pavement Requirements - LCN Conversion

1. This section gives Rigid Pavement Requirements - LCN Conversion.

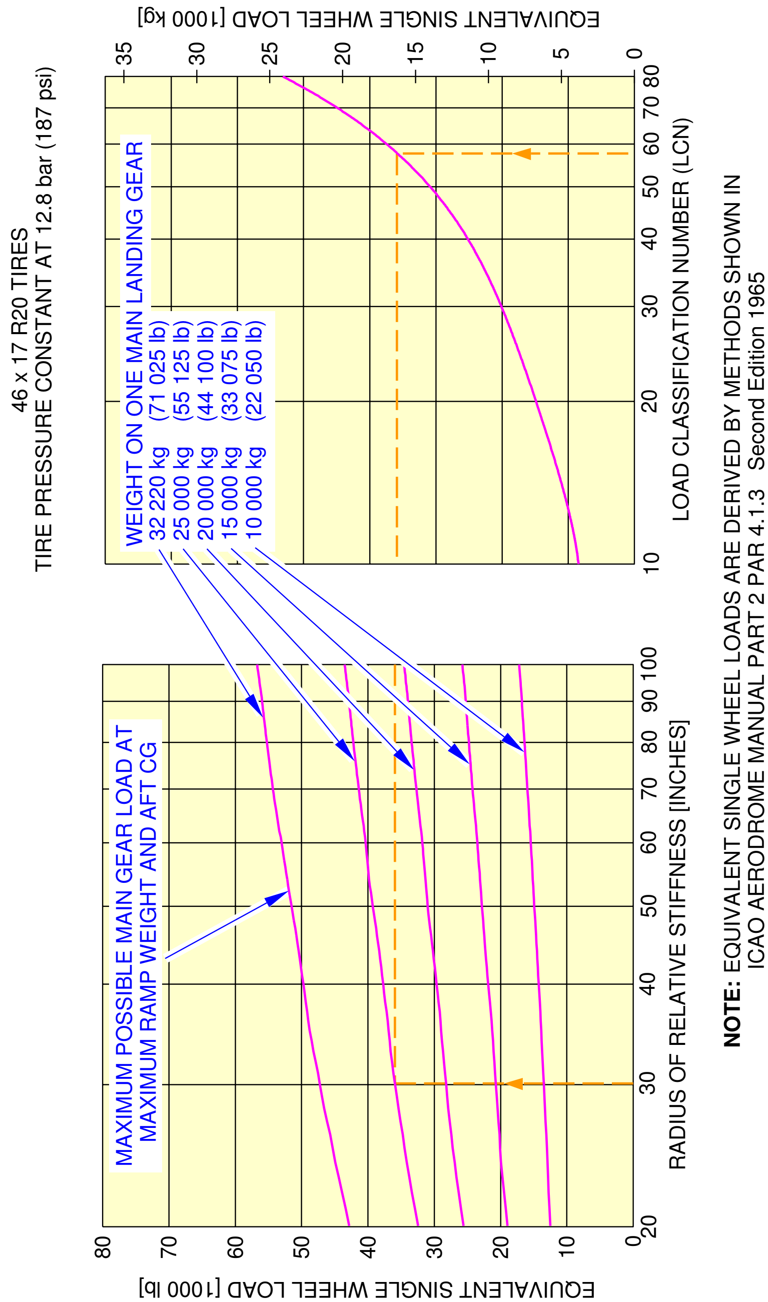
****ON A/C A320-100**



N_AC_070802_1_0150101_01_01

Rigid Pavement Requirements - LCN Conversion
MTOW 66 T
FIGURE 1

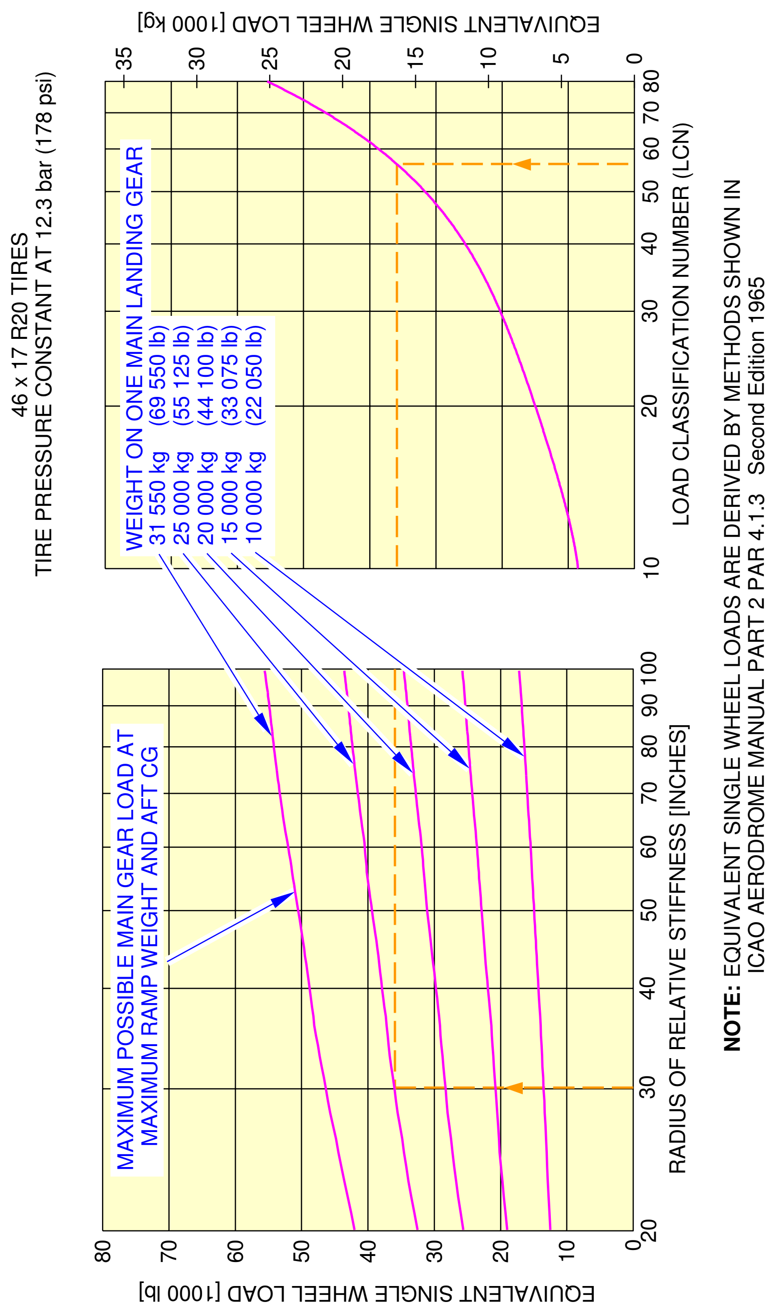
**ON A/C A320-100



N_AC_070802_1_0160101_01_01

Rigid Pavement Requirements - LCN Conversion
MTOW 68 T
FIGURE 2

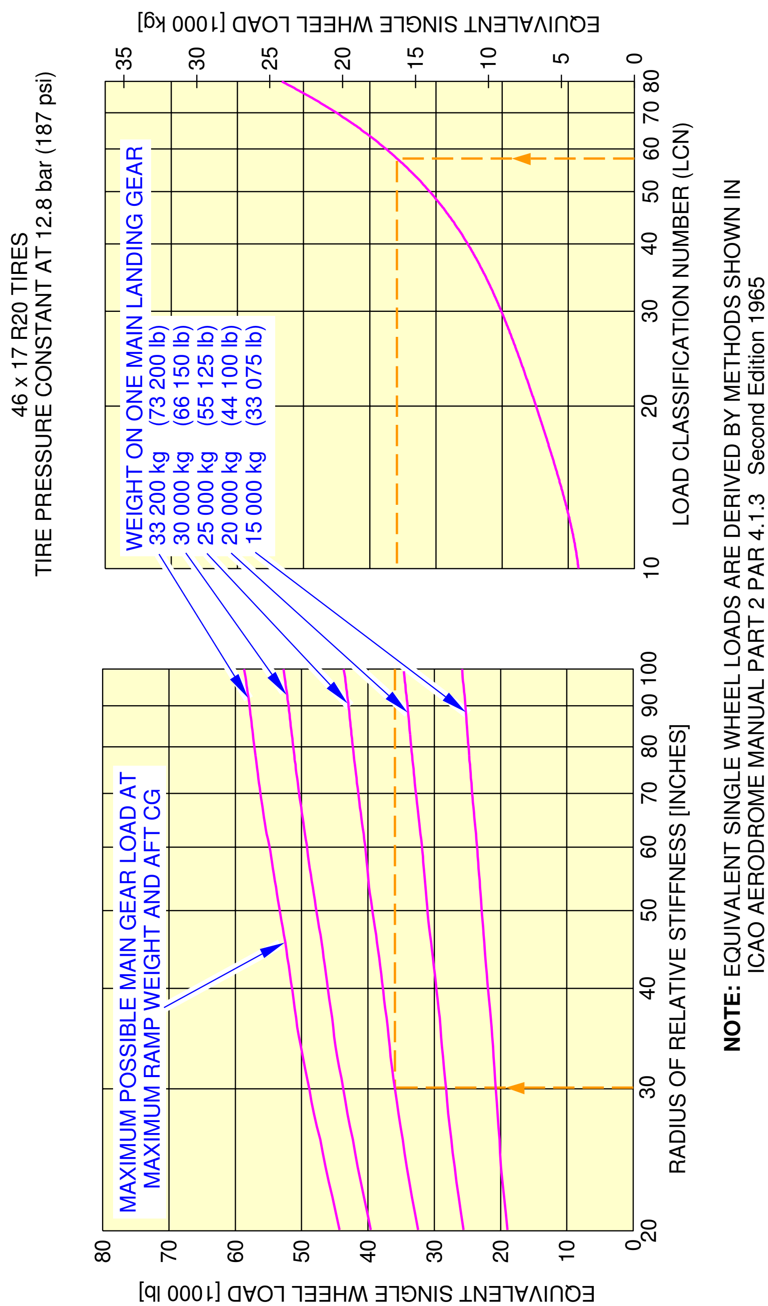
**ON A/C A320-200



N_AC_070802_1_0170101_01_01

Rigid Pavement Requirements - LCN Conversion
MTOW 66 T
FIGURE 3

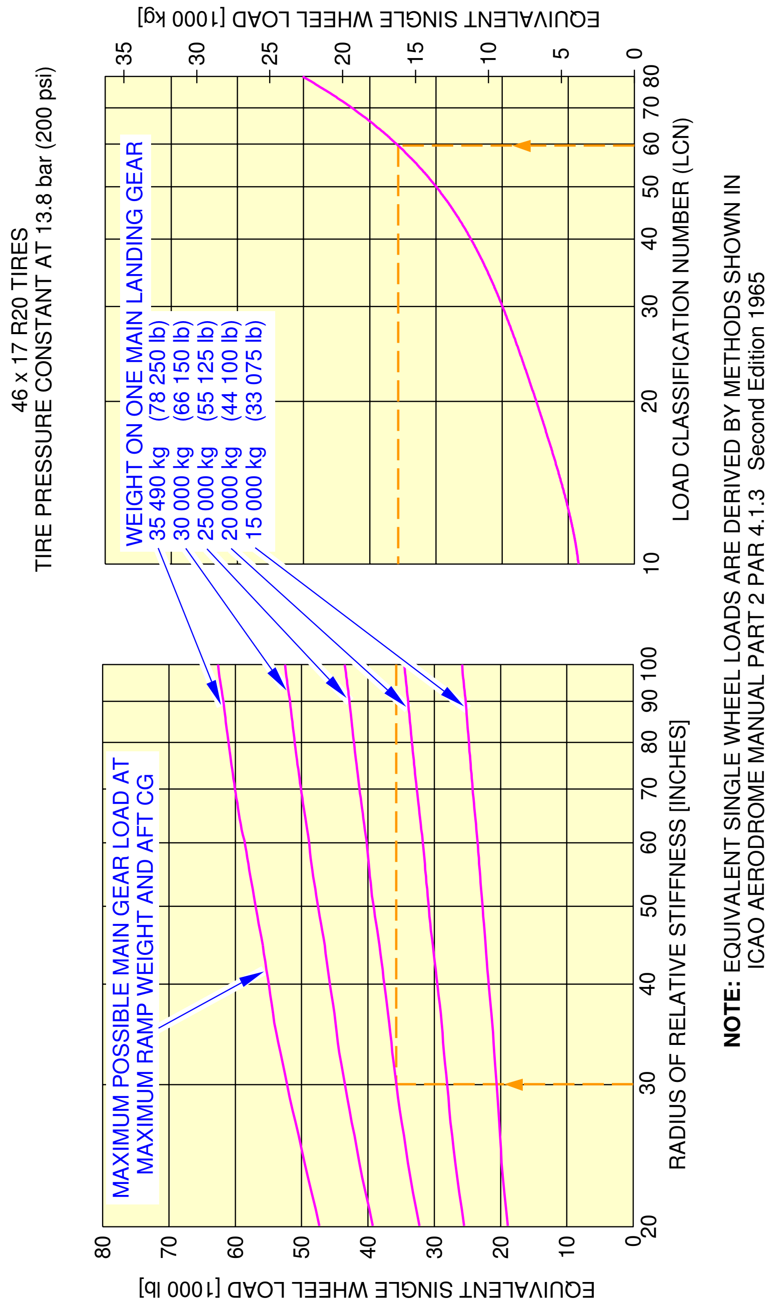
**ON A/C A320-200



N_AC_070802_1_0180101_01_01

Rigid Pavement Requirements - LCN Conversion
MTOW 70 T
FIGURE 4

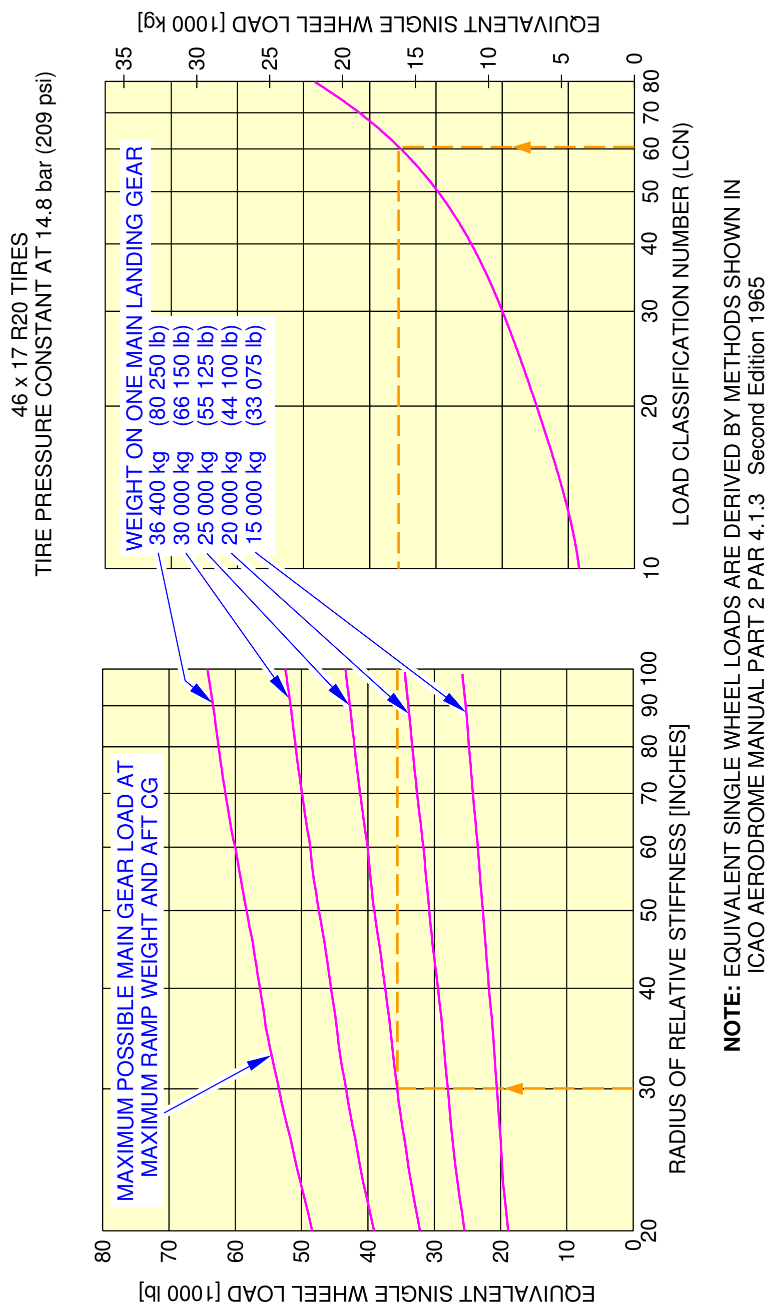
**ON A/C A320-200



N_AC_070802_1_0190101_01_01

Rigid Pavement Requirements - LCN Conversion
MTOW 75.5 T
FIGURE 5

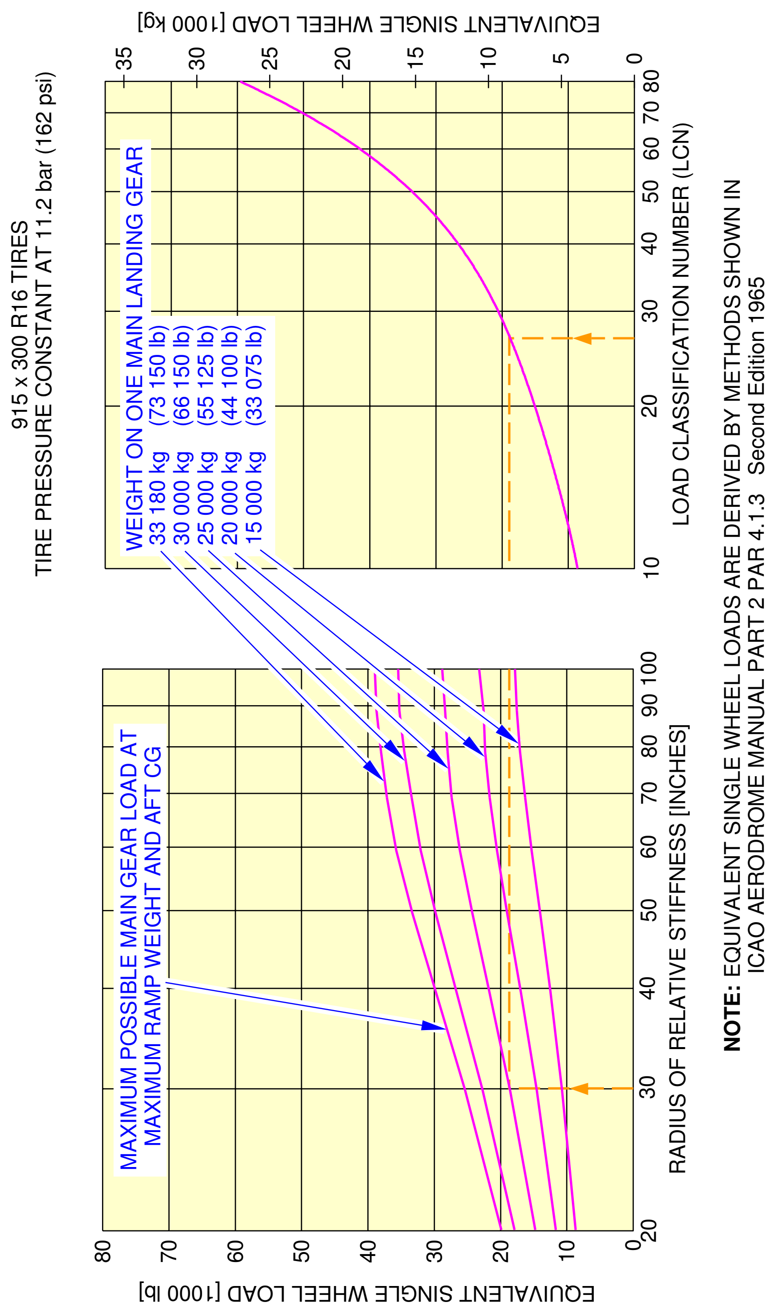
**ON A/C A320-200



N_AC_070802_1_0200101_01_01

Rigid Pavement Requirements - LCN Conversion
MTOW 78 T
FIGURE 6

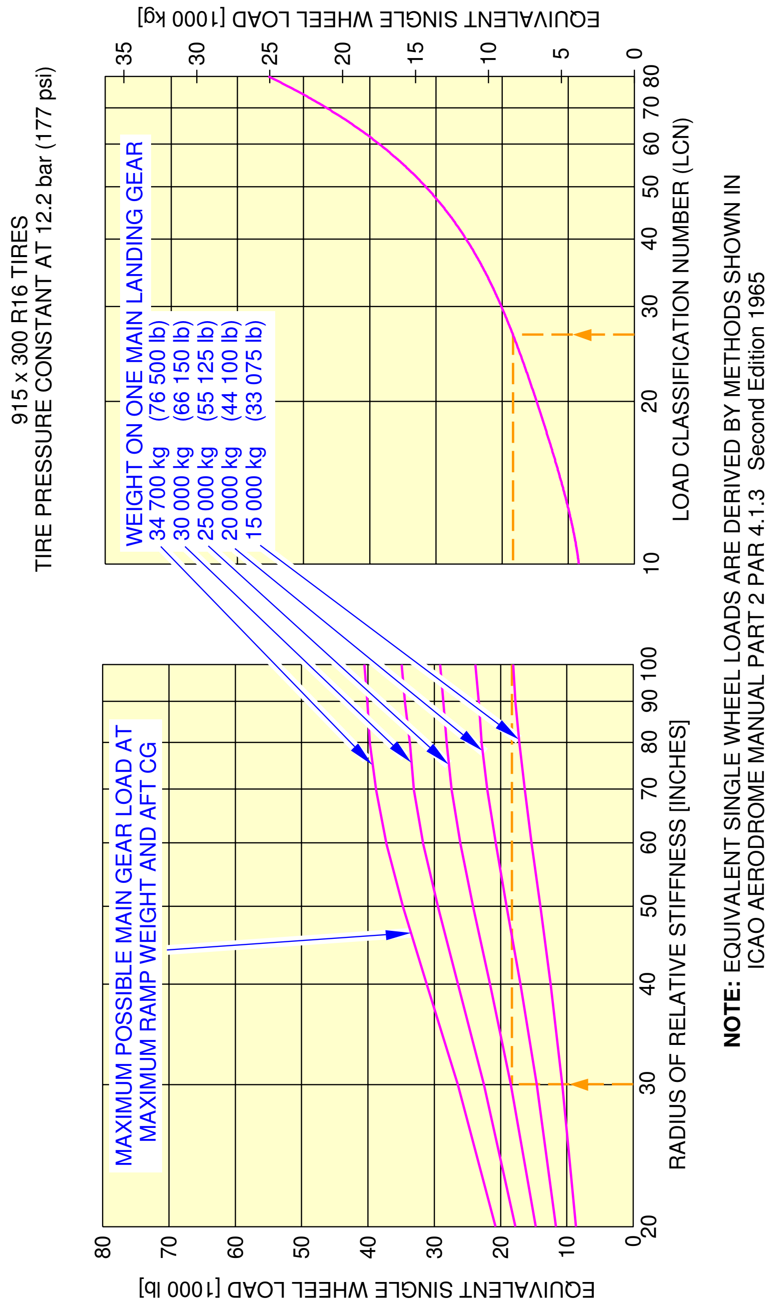
**ON A/C A320-200



N_AC_070802_1_0210101_01_01

Rigid Pavement Requirements - LCN Conversion
Bogie – MTOW 70 T
FIGURE 7

**ON A/C A320-200



N_AC_070802_1_0220101_01_01

Rigid Pavement Requirements - LCN Conversion
Bogie – MTOW 73.5 T
FIGURE 8

7-8-3 Radius of Relative Stiffness (Other values of E and L)

****ON A/C A320-100 A320-200**

Radius of Relative Stiffness (Other values of "E" and "L")

1. General

The chart of Section 7-8-1, page 1 presents "L" values based on Young's Modulus (E) of 4 000 000 psi and Poisson's Radio (μ) of 0.15.

For convenience in finding "L" values based on other values of "E" and "μ", the curves of Section 7-8-4 are included.

For example, to find an "L" value based on an "E" of 3 000 000 psi, the "E" factor of 0.931 is multiplied by the "L" value found in the table of Section 7-8-1, page 1.

The effect of variations of "μ" on the "L" value is treated in a similar manner.

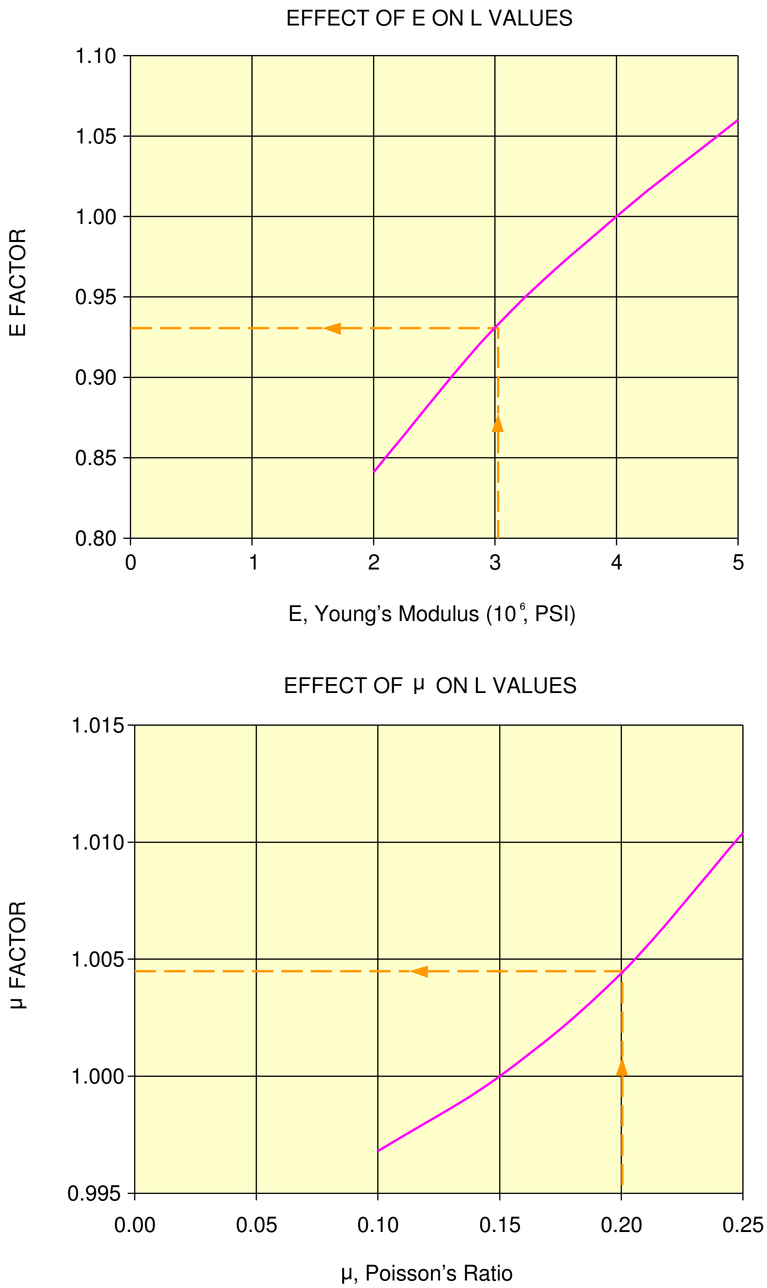
7-8-4 Radius of Relative Stiffness

****ON A/C A320-100 A320-200**

Radius of Relative Stiffness

1. This section gives Radius of Relative Stiffness.

**ON A/C A320-100 A320-200



NOTE: BOTH CURVES ON THIS PAGE ARE USED TO ADJUST THE L VALUES OF TABLE 7–8–1

N_AC_070804_1_0030101_01_01

Radius of Relative Stiffness
(Other Values of "E" and "L")
FIGURE 1

7-9-0 ACN/PCN Reporting System

****ON A/C A320-100 A320-200**

ACN/PCN Reporting System

****ON A/C A320-100**

1. General

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

In the example shown in Section 7-9-1, page 1, for an Aircraft Gross Weight of 55 tonnes (121254 lb) and medium subgrade strength (code C), the ACN for the flexible pavement is 31.

In the example shown in Section 7-9-2, page 1, for the same Aircraft Gross Weight and medium subgrade strength (code C), the ACN for the rigid pavement is 34.

NOTE : An aircraft with an ACN equal to or less than the reported PCN can operate on that pavement, subject to any limitation on the tire pressure.
(Ref.: ICAO Aerodrome Design Manual Part 3, Chapter 1, Second Edition 1983).

****ON A/C A320-200**

2. General

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

In the example shown in Section 7-9-1, page 10, for an Aircraft Gross Weight of 55 tonnes (121254 lb) and medium subgrade strength (code C), the ACN for the flexible pavement is 30.

In the example shown in Section 7-9-2, page 10, for the same Aircraft Gross Weight and medium subgrade strength (code C), the ACN for the rigid pavement is 34.

NOTE : An aircraft with an ACN equal to or less than the reported PCN can operate on that pavement, subject to any limitation on the tire pressure.
(Ref.: ICAO Aerodrome Design Manual Part 3, Chapter 1, Second Edition 1983).

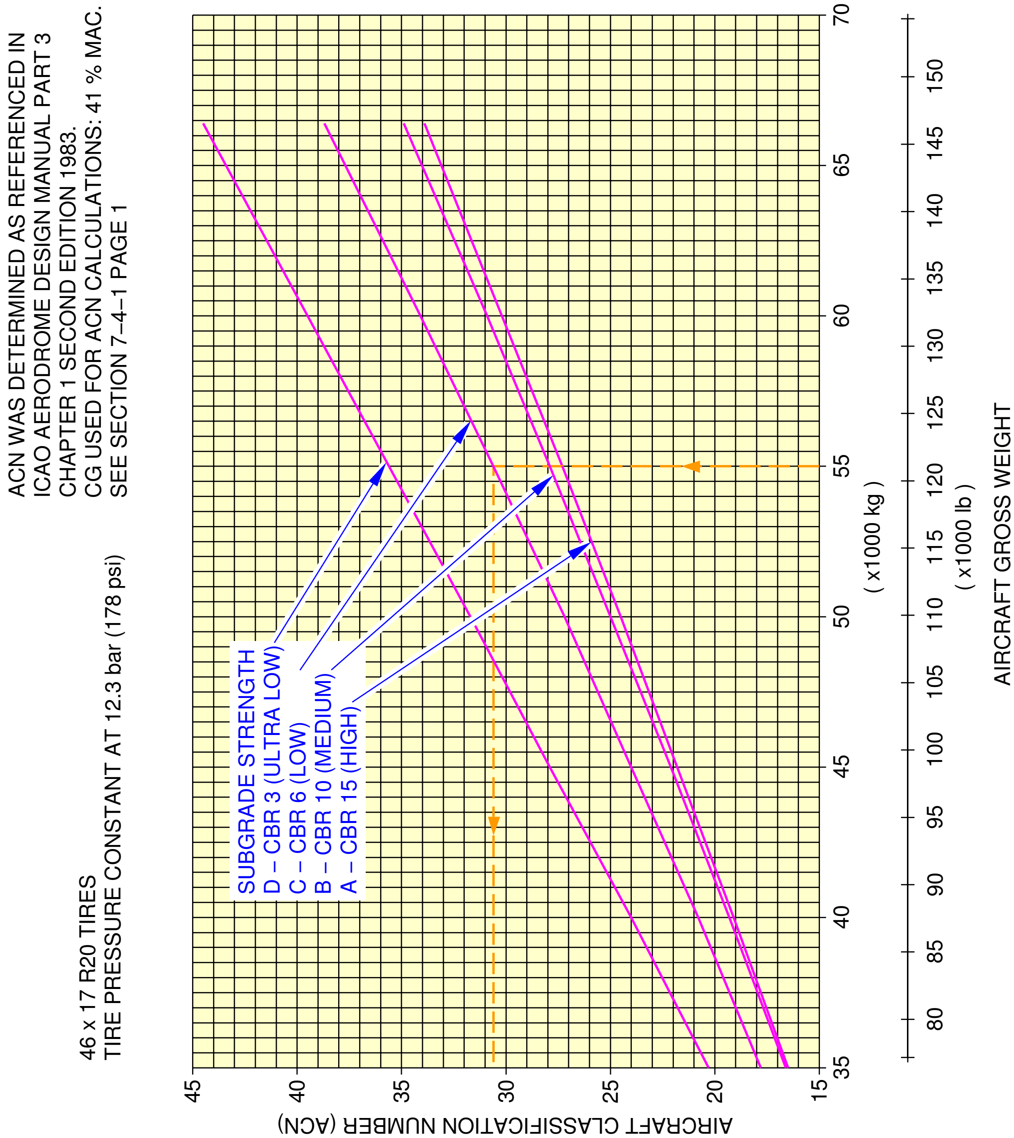
7-9-1 Aircraft Classification Number - Flexible Pavement

****ON A/C A320-100 A320-200**

<u>Aircraft Classification Number - Flexible Pavement</u>

1. This section gives the Aircraft Classification Number - Flexible Pavement.

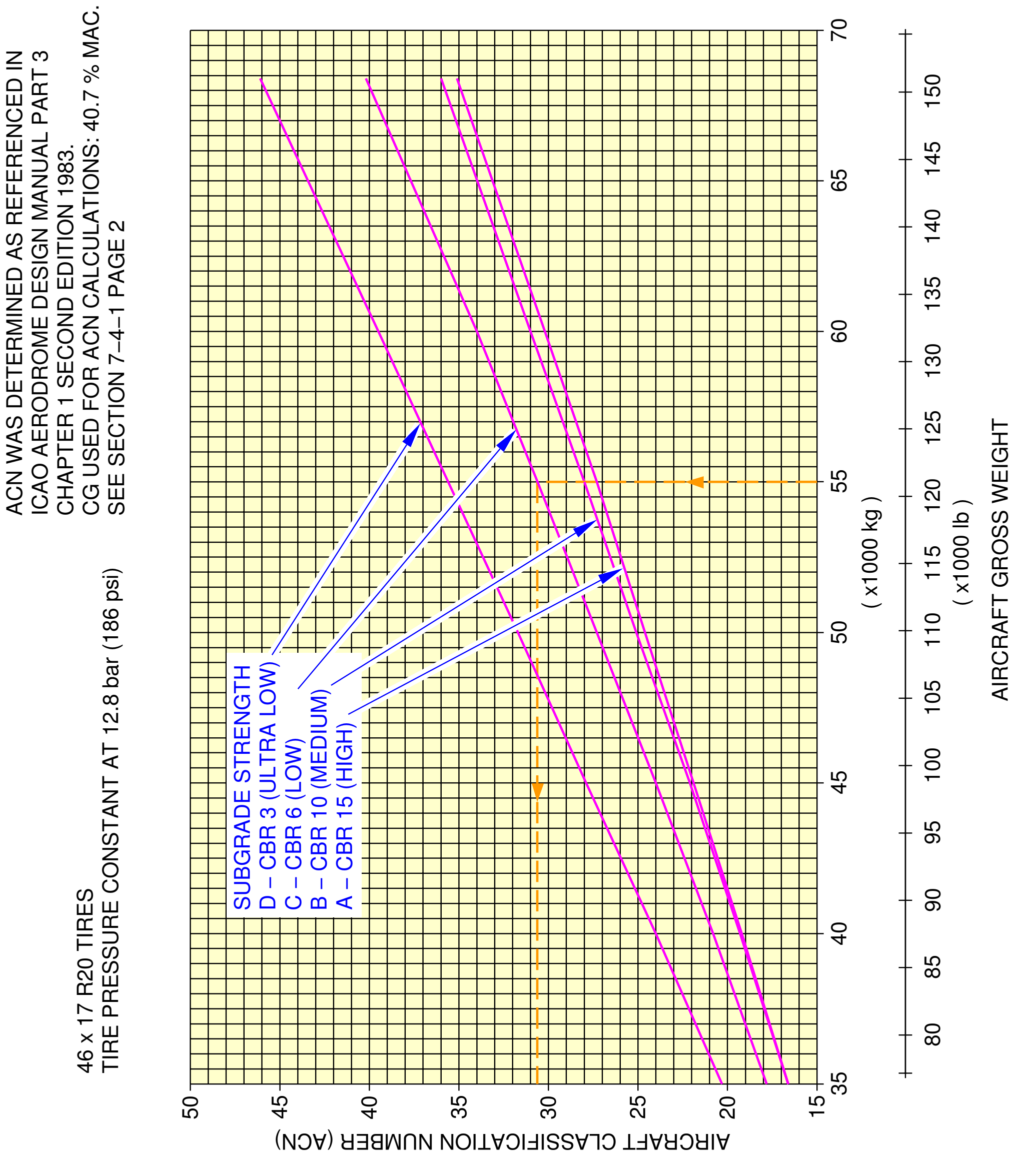
**ON A/C A320-100



N_AC_070901_1_0180101_01_01

Aircraft Classification Number – Flexible Pavement
MTOW 66 T
FIGURE 1

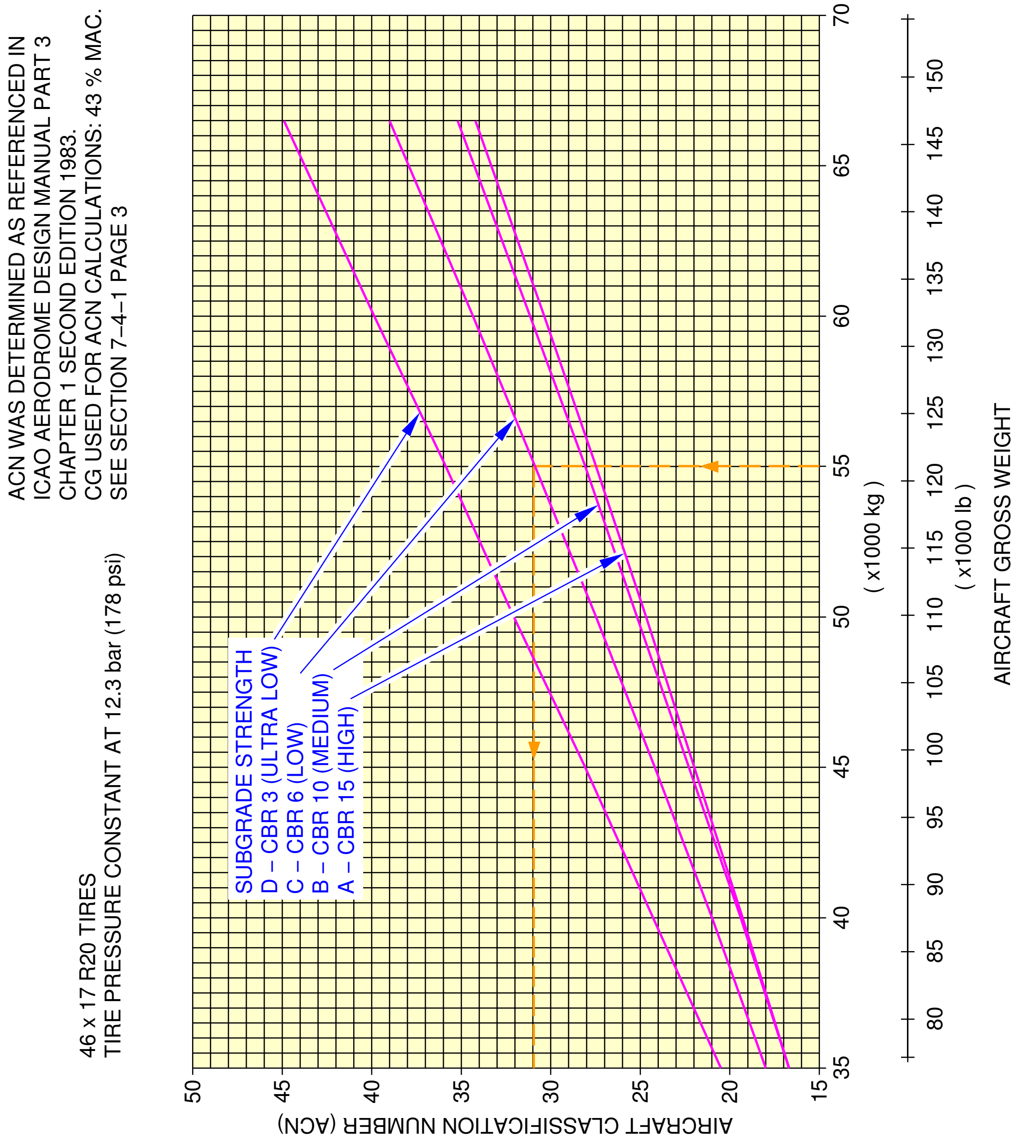
****ON A/C A320-100**



N_AC_070901_1_0190101_01_01

Aircraft Classification Number − Flexible Pavement
MTOW 68 T
FIGURE 2

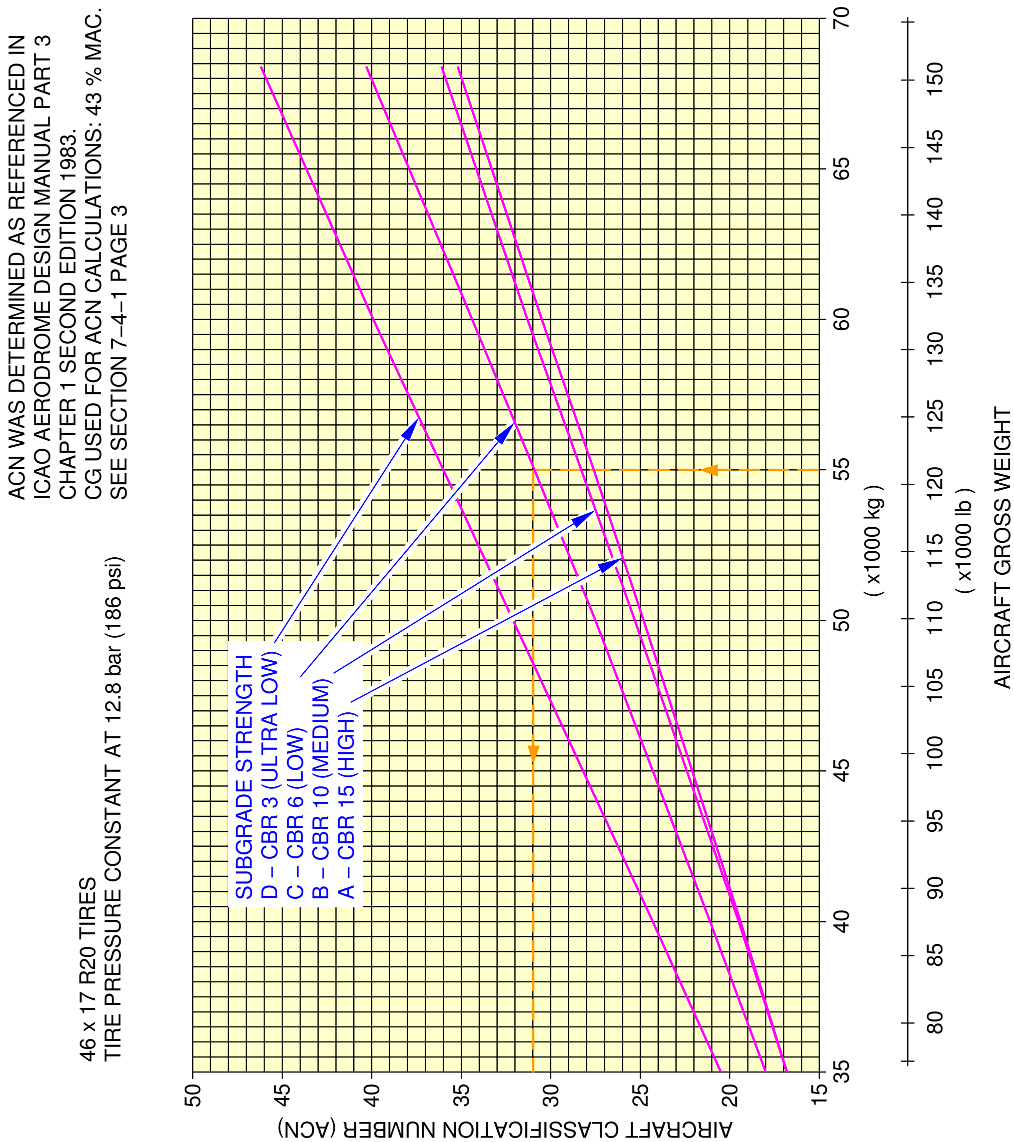
**ON A/C A320-200



N_AC_070901_1_0200101_01_01

Aircraft Classification Number – Flexible Pavement
MTOW 66 T
FIGURE 3

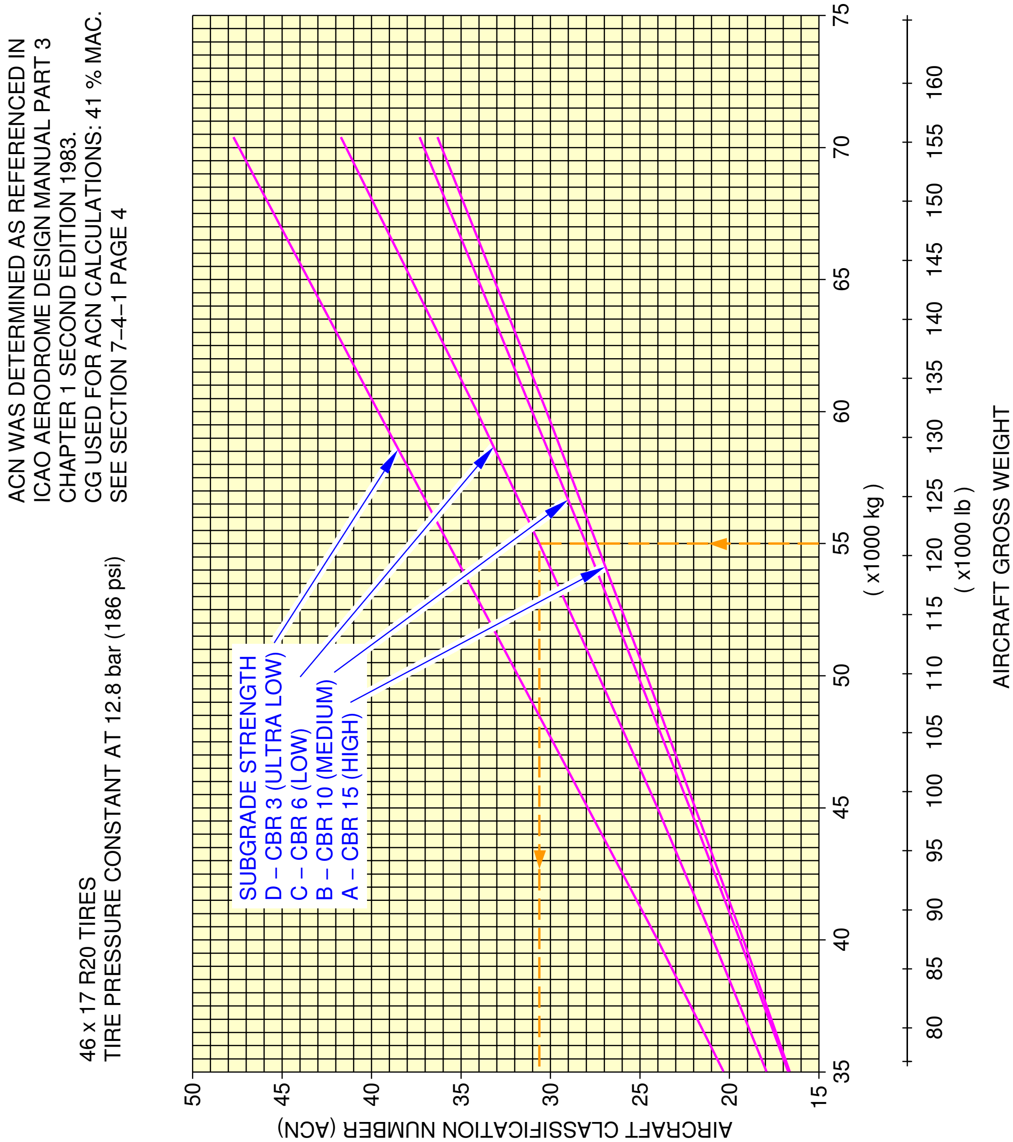
**ON A/C A320-200



N_AC_070901_1_0210101_01_01

Aircraft Classification Number – Flexible Pavement
MTOW 68 T
FIGURE 4

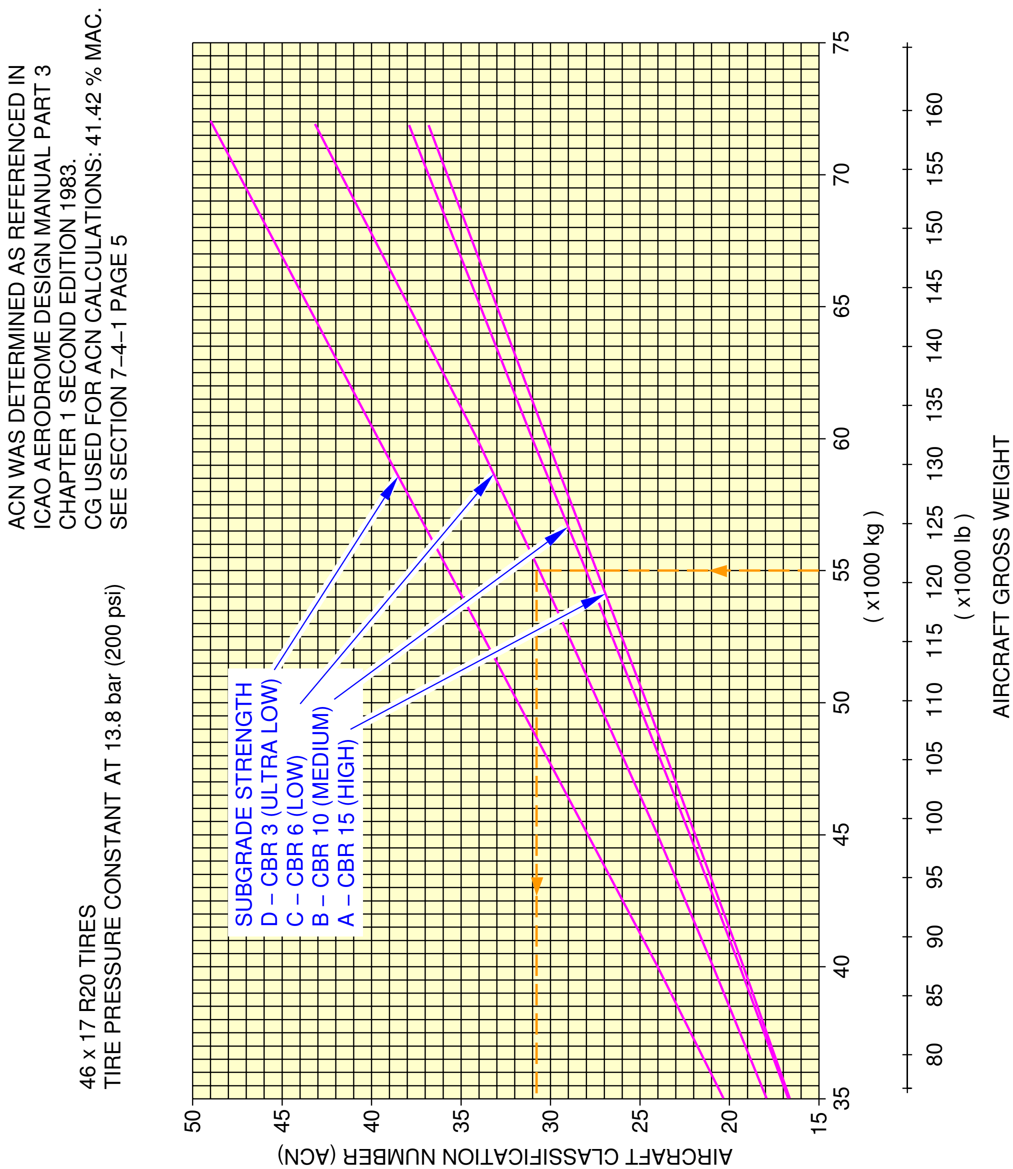
****ON A/C A320-200**



N_AC_070901_1_0220101_01_01

Aircraft Classification Number – Flexible Pavement
MTOW 70 T
FIGURE 5

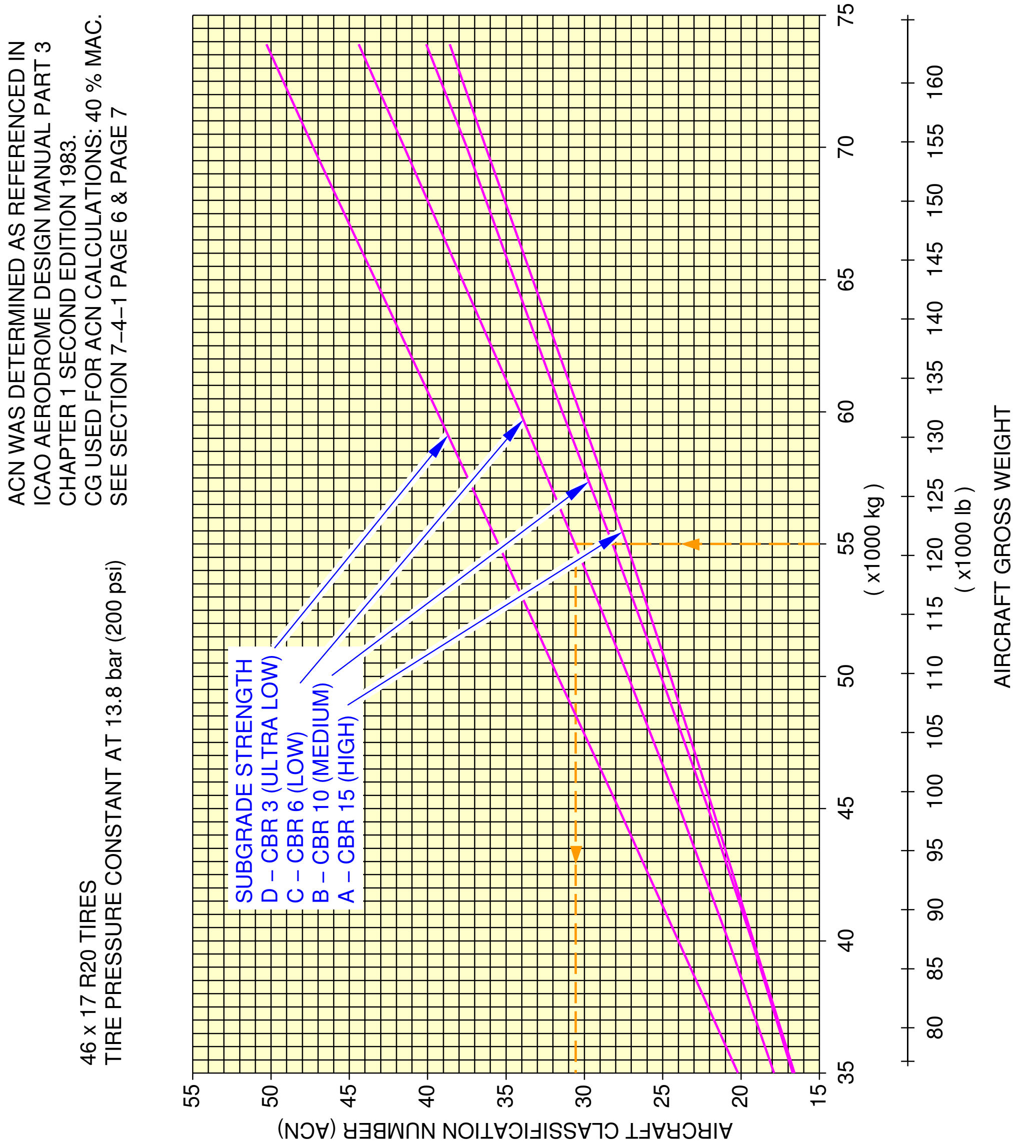
**ON A/C A320-200



N_AC_070901_1_0230101_01_01

Aircraft Classification Number – Flexible Pavement
MTOW 71.5 T
FIGURE 6

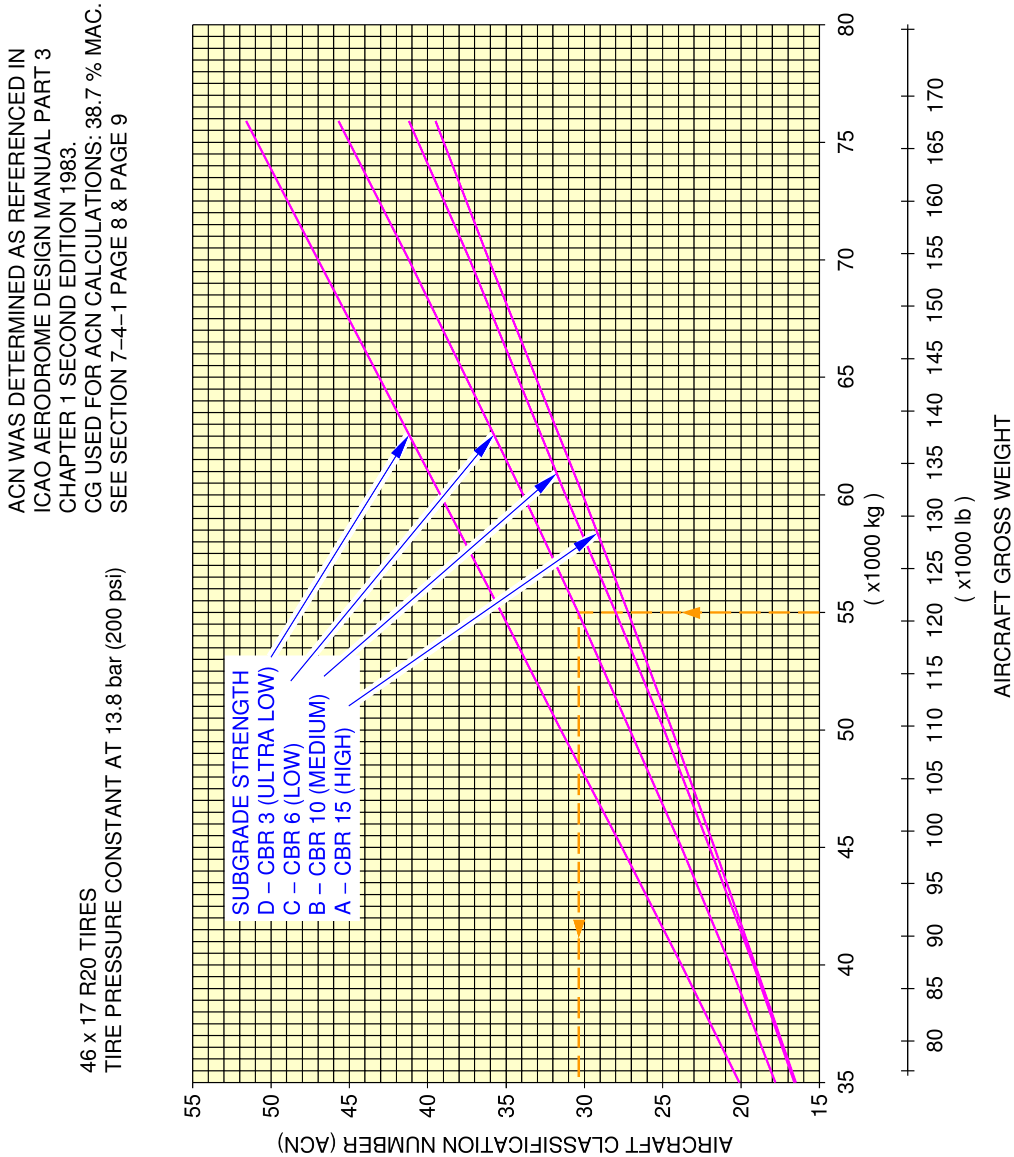
**ON A/C A320-200



N_AC_070901_1_0240101_01_01

Aircraft Classification Number – Flexible Pavement
MTOW 73.5 T
FIGURE 7

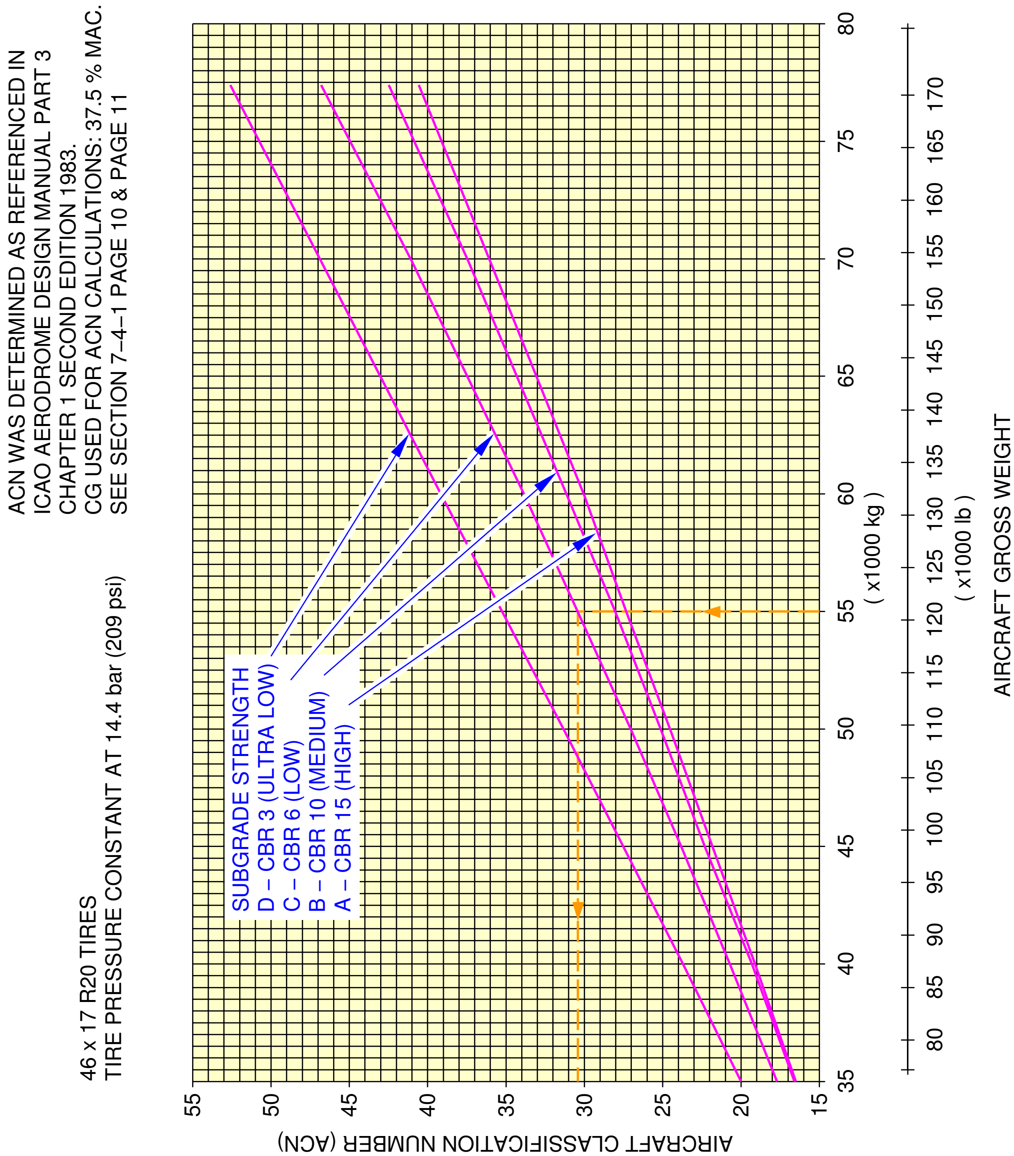
**ON A/C A320-200



N_AC_070901_1_0250101_01_01

Aircraft Classification Number − Flexible Pavement
MTOW 75.5 T
FIGURE 8

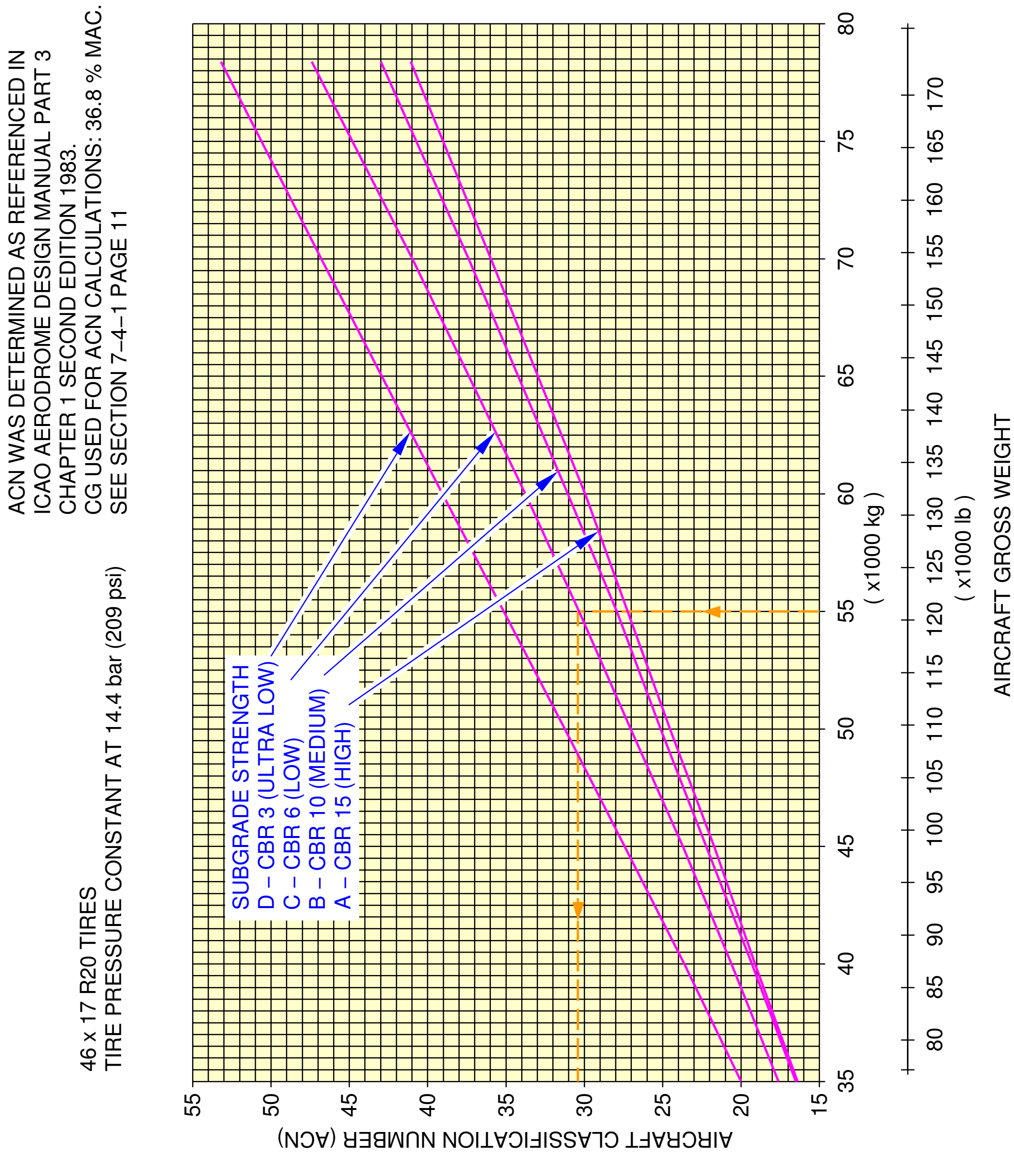
****ON A/C A320-200**



N_AC_070901_1_0260101_01_01

Aircraft Classification Number – Flexible Pavement
MTOW 77 T
FIGURE 9

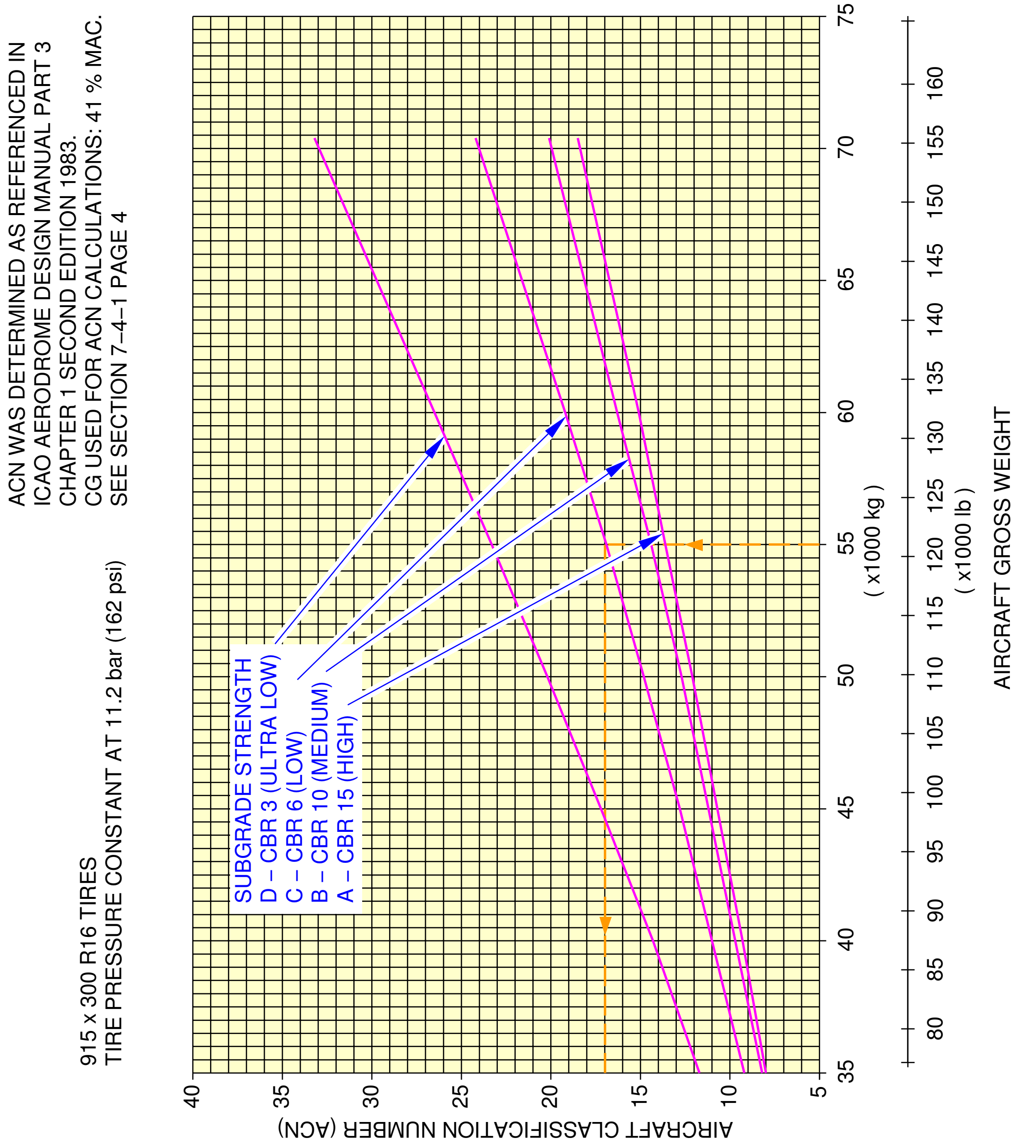
****ON A/C A320-200**



N_AC_070901_1_0270101_01_01

Aircraft Classification Number – Flexible Pavement
MTOW 78 T
FIGURE 10

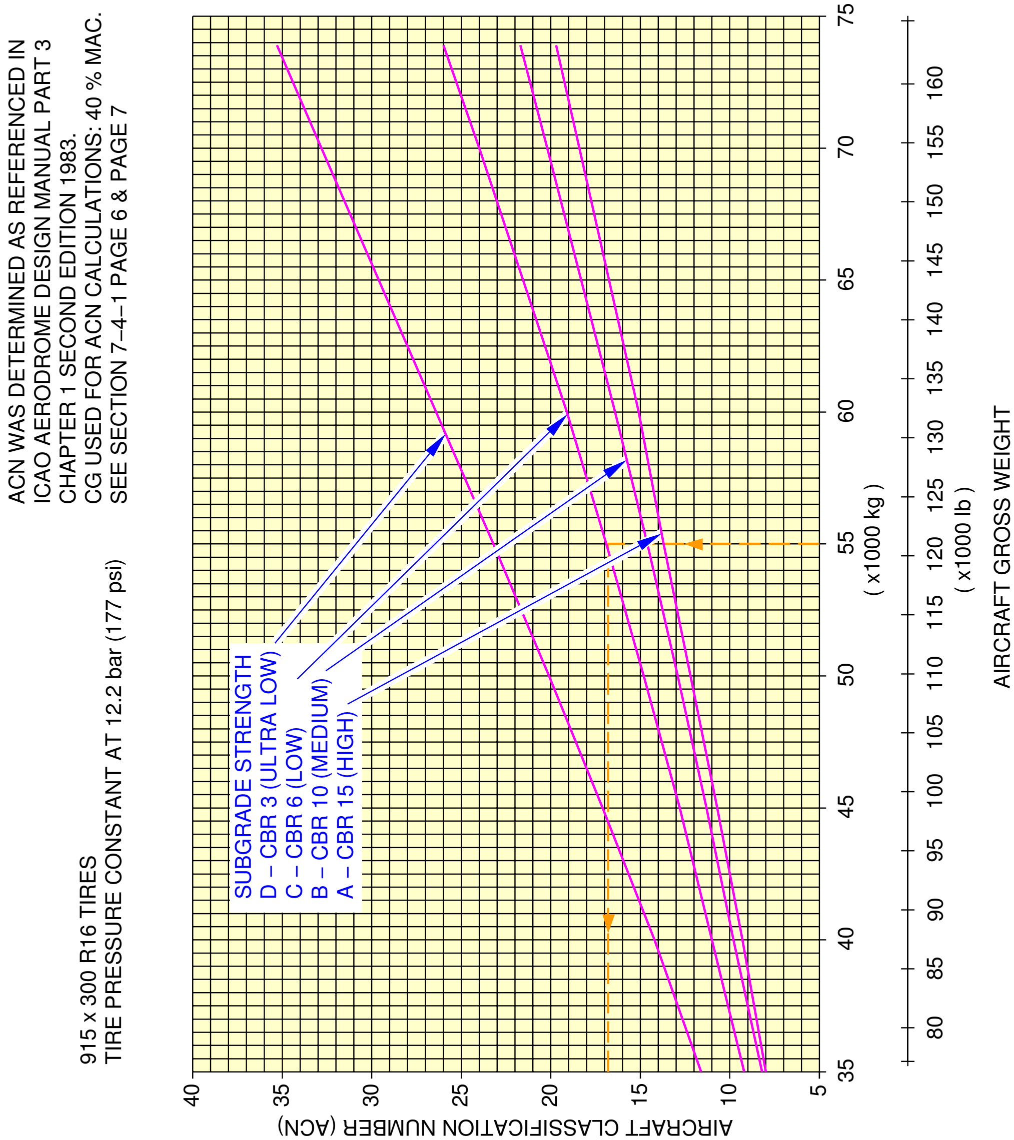
**ON A/C A320-200



N_AC_070901_1_0280101_01_01

Aircraft Classification Number − Flexible Pavement
Bogie − MTOW 70 T
FIGURE 11

**ON A/C A320-200



N_AC_070901_1_0290101_01_01

Aircraft Classification Number – Flexible Pavement
Bogie – MTOW 73.5 T
FIGURE 12

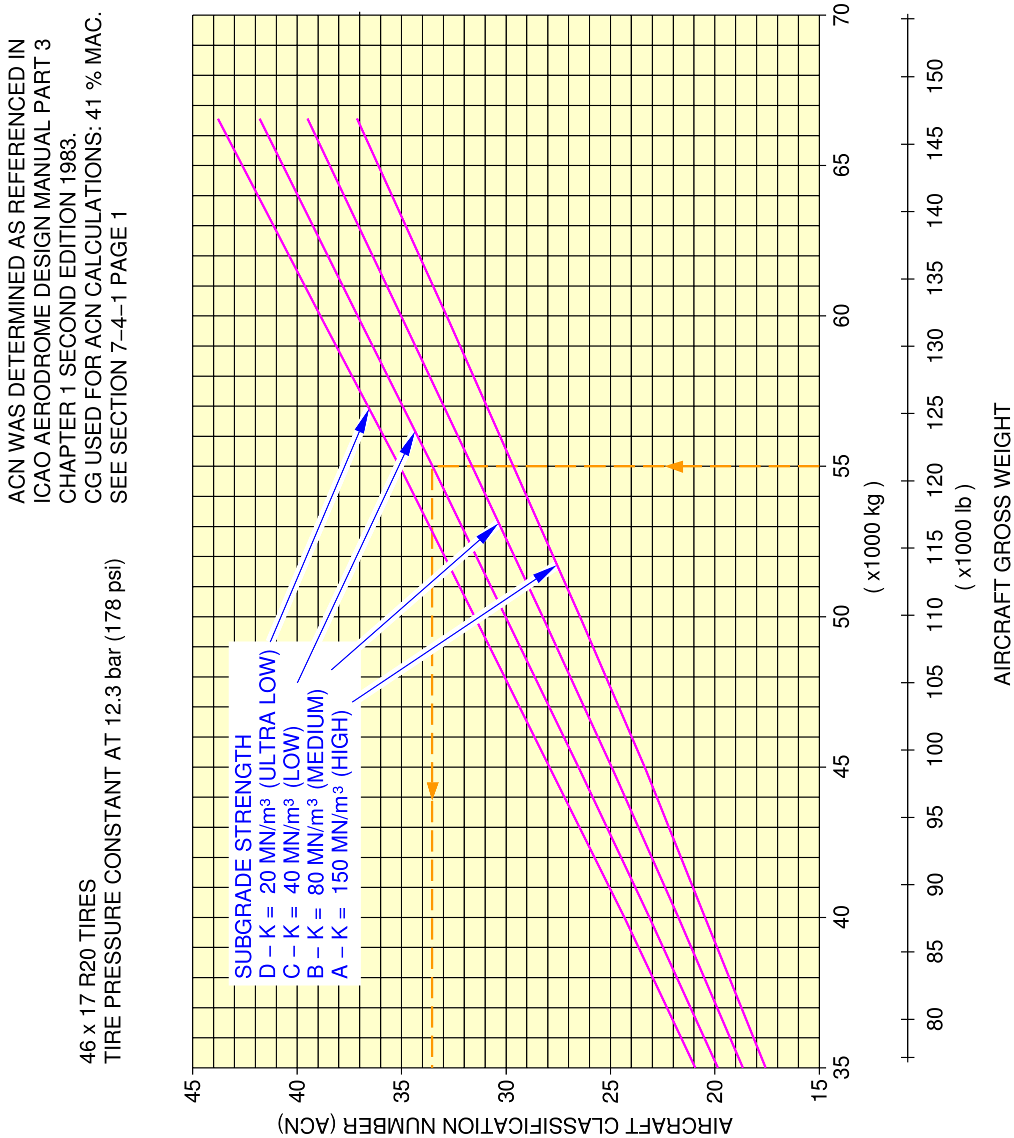
7-9-2 Aircraft Classification Number - Rigid Pavement

****ON A/C A320-100 A320-200**

Aircraft Classification Number - Rigid Pavement

1. This section gives the Aircraft Classification Number - Rigid Pavement.

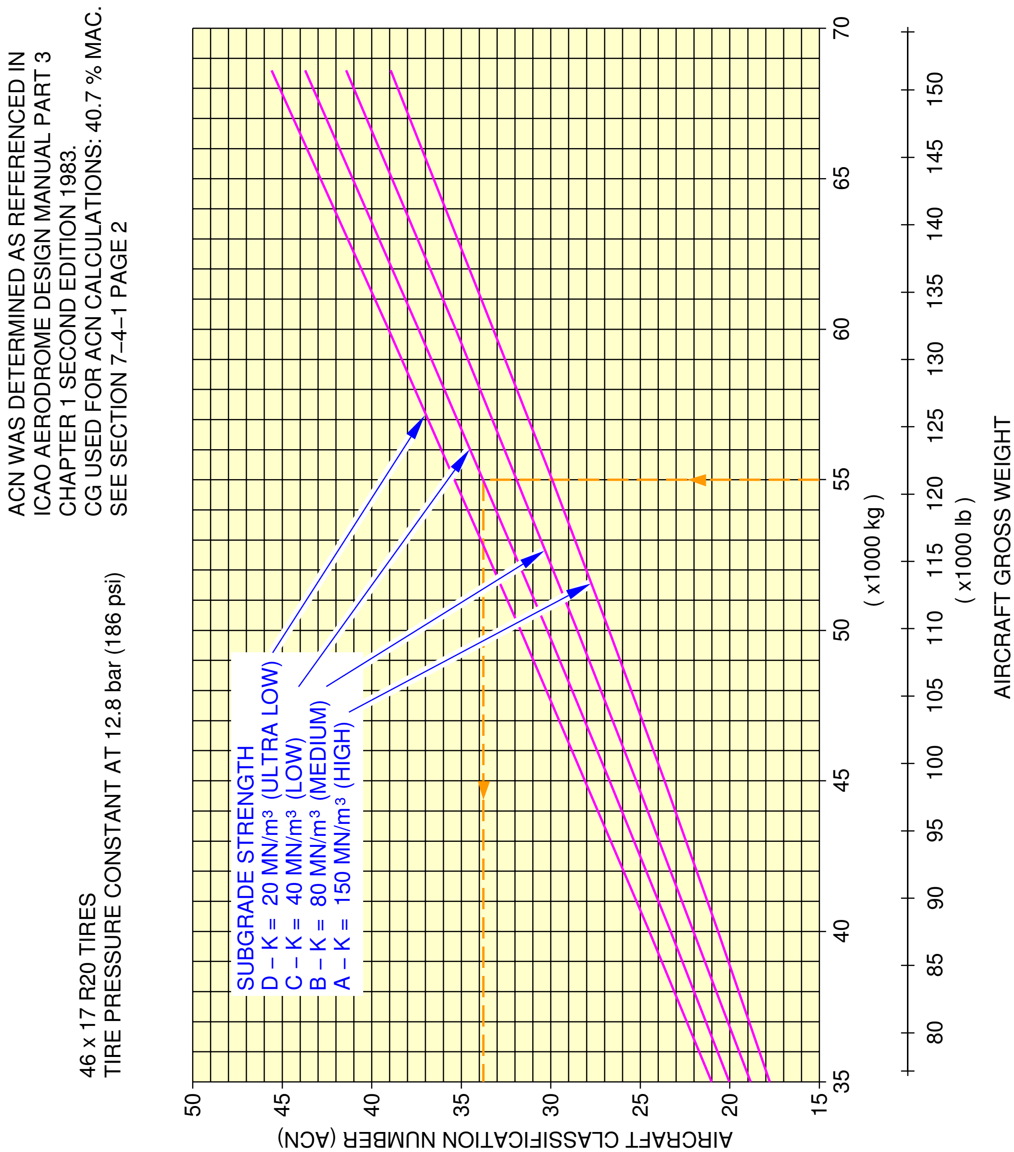
**ON A/C A320-100



N_AC_070902_1_0180101_01_01

Aircraft Classification Number − Rigid Pavement
MTOW 66 T
FIGURE 1

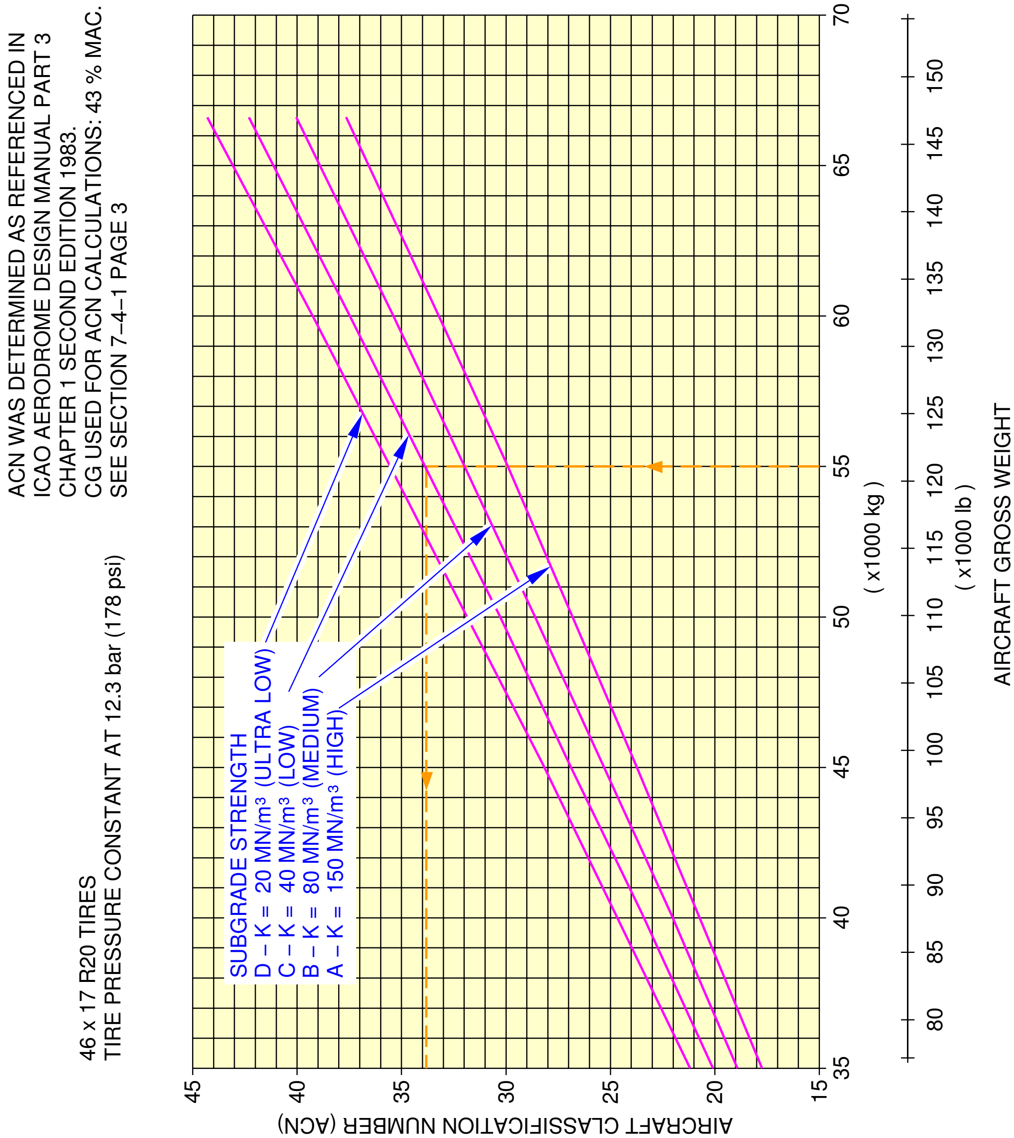
****ON A/C A320-100**



N_AC_070902_1_0190101_01_01

Aircraft Classification Number – Rigid Pavement
MTOW 68 T
FIGURE 2

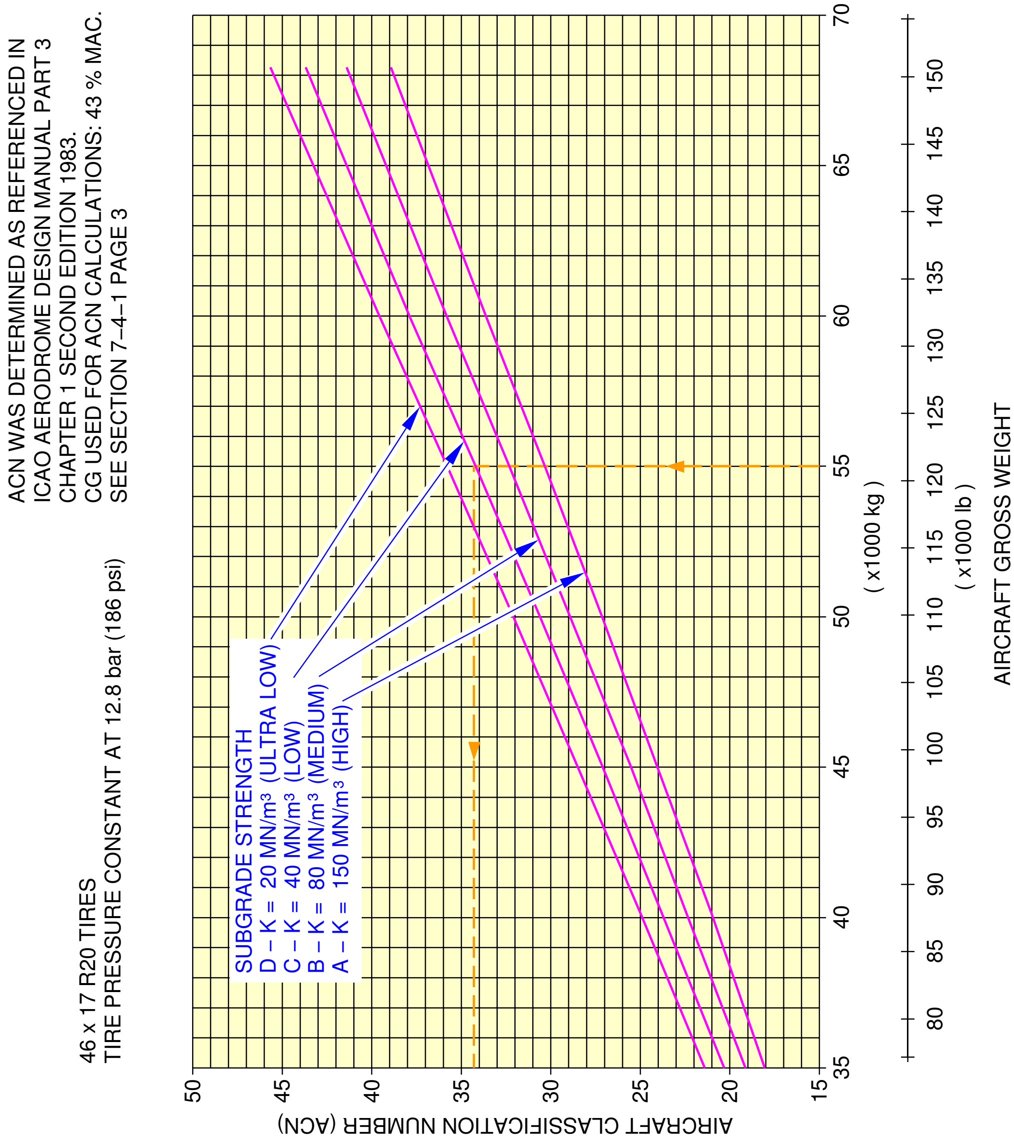
**ON A/C A320-200



N_AC_070902_1_0200101_01_01

Aircraft Classification Number – Rigid Pavement
MTOW 66 T
FIGURE 3

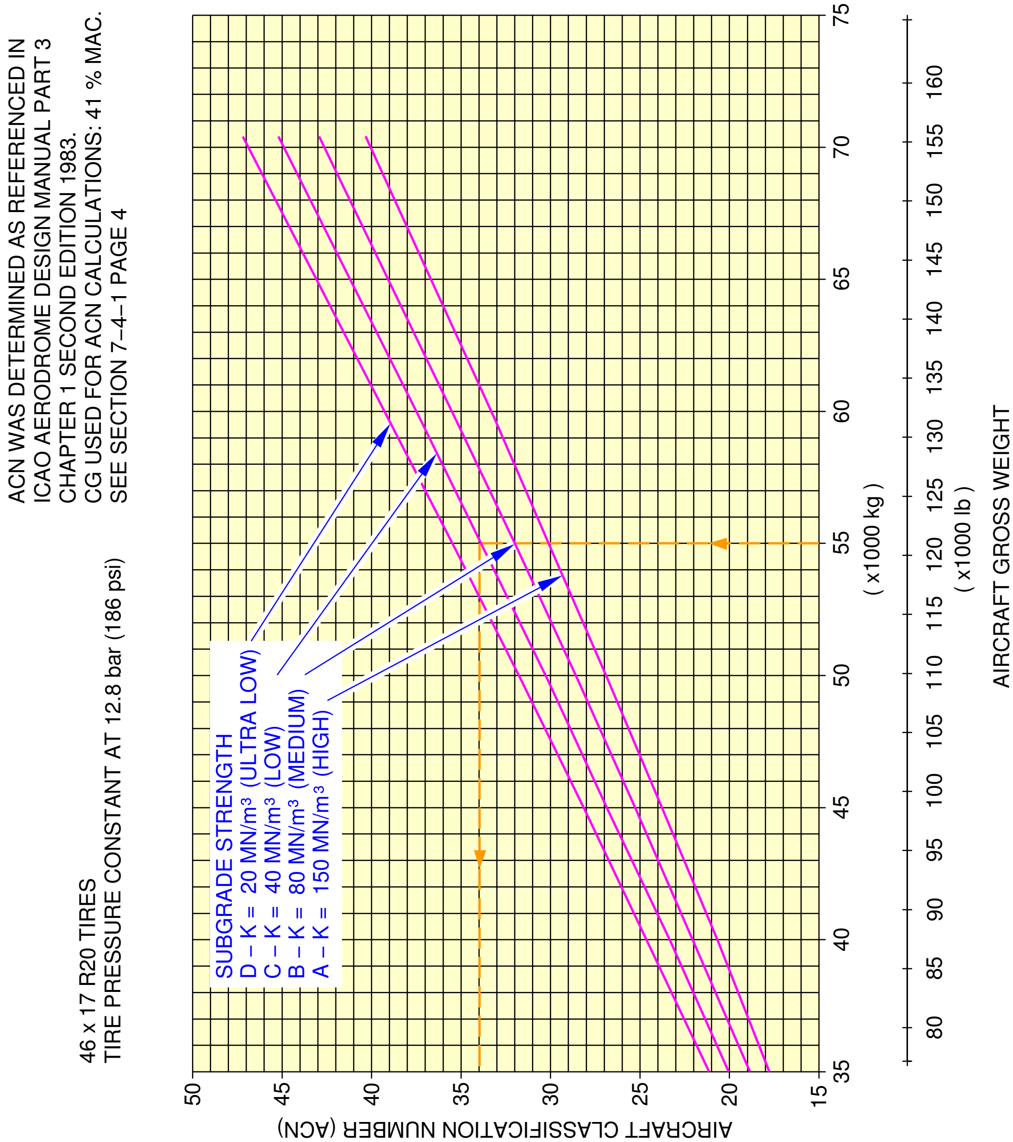
****ON A/C A320-200**



N_AC_070902_1_0210101_01_01

Aircraft Classification Number – Rigid Pavement
MTOW 68 T
FIGURE 4

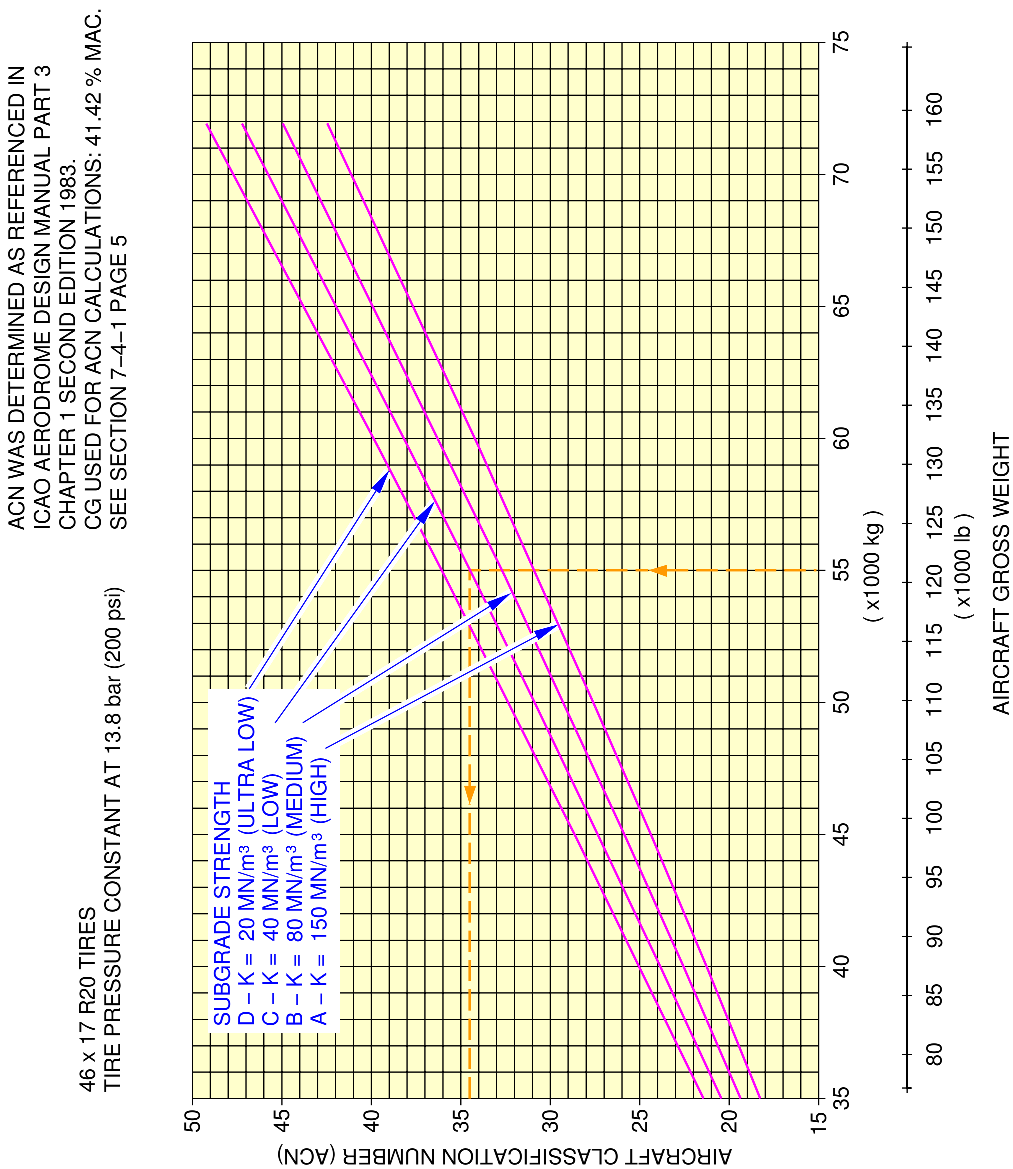
**ON A/C A320-200



N_AC_070902_1_0220101_01_01

Aircraft Classification Number − Rigid Pavement
MTOW 70 T
FIGURE 5

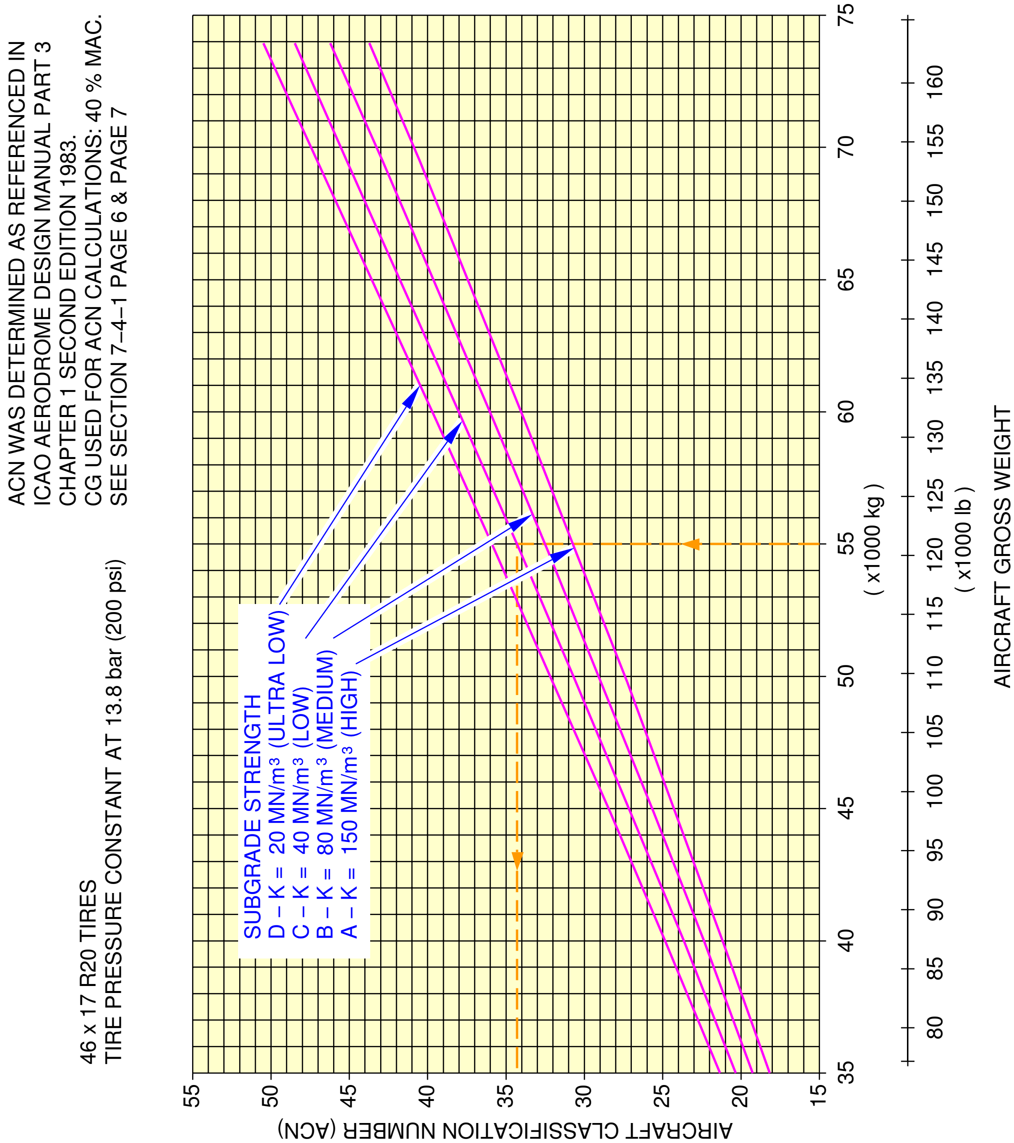
**ON A/C A320-200



N_AC_070902_1_0230101_01_01

Aircraft Classification Number – Rigid Pavement
MTOW 71.5 T
FIGURE 6

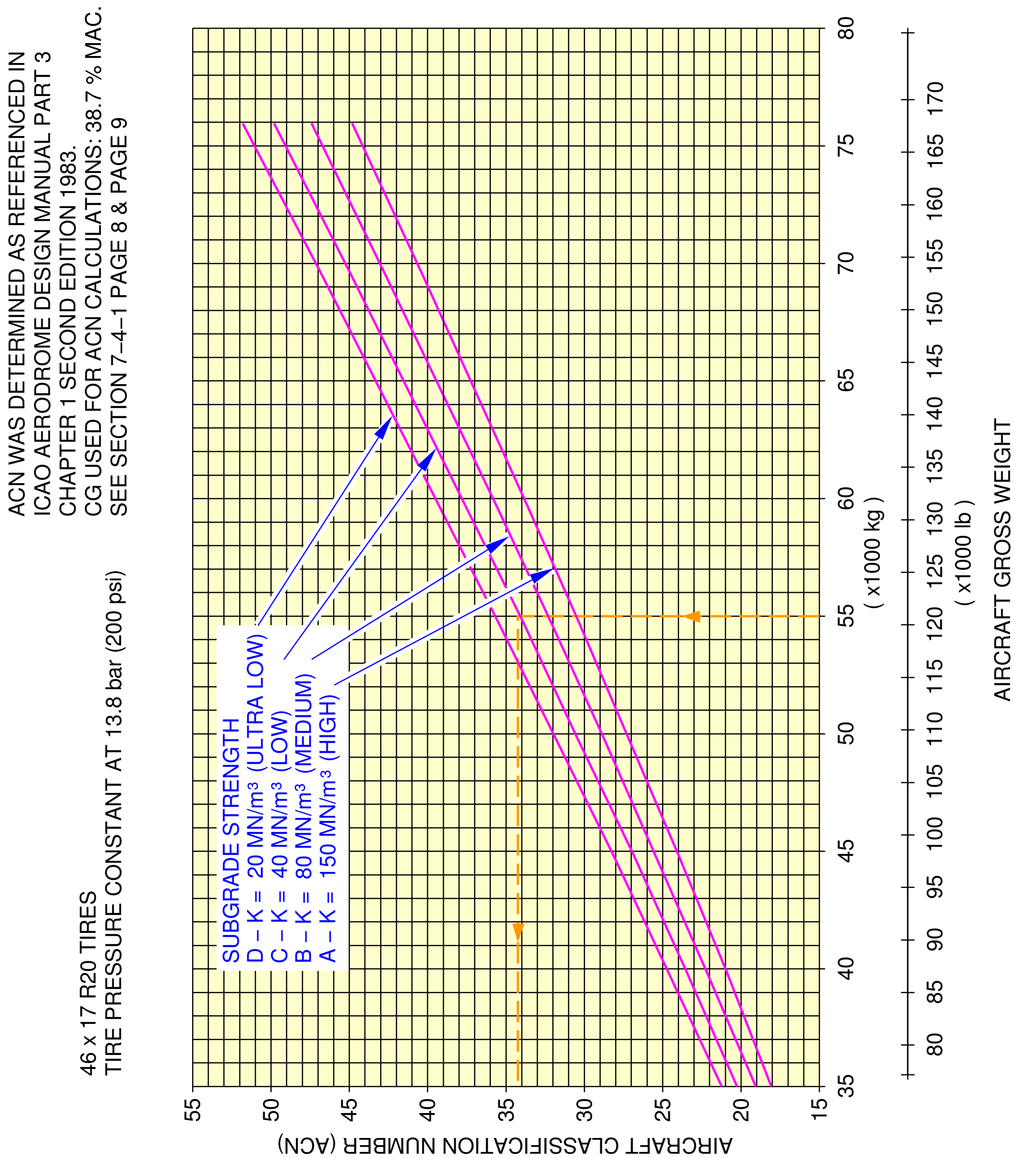
**ON A/C A320-200



N_AC_070902_1_0240101_01_01

Aircraft Classification Number – Rigid Pavement
MTOW 73.5 T
FIGURE 7

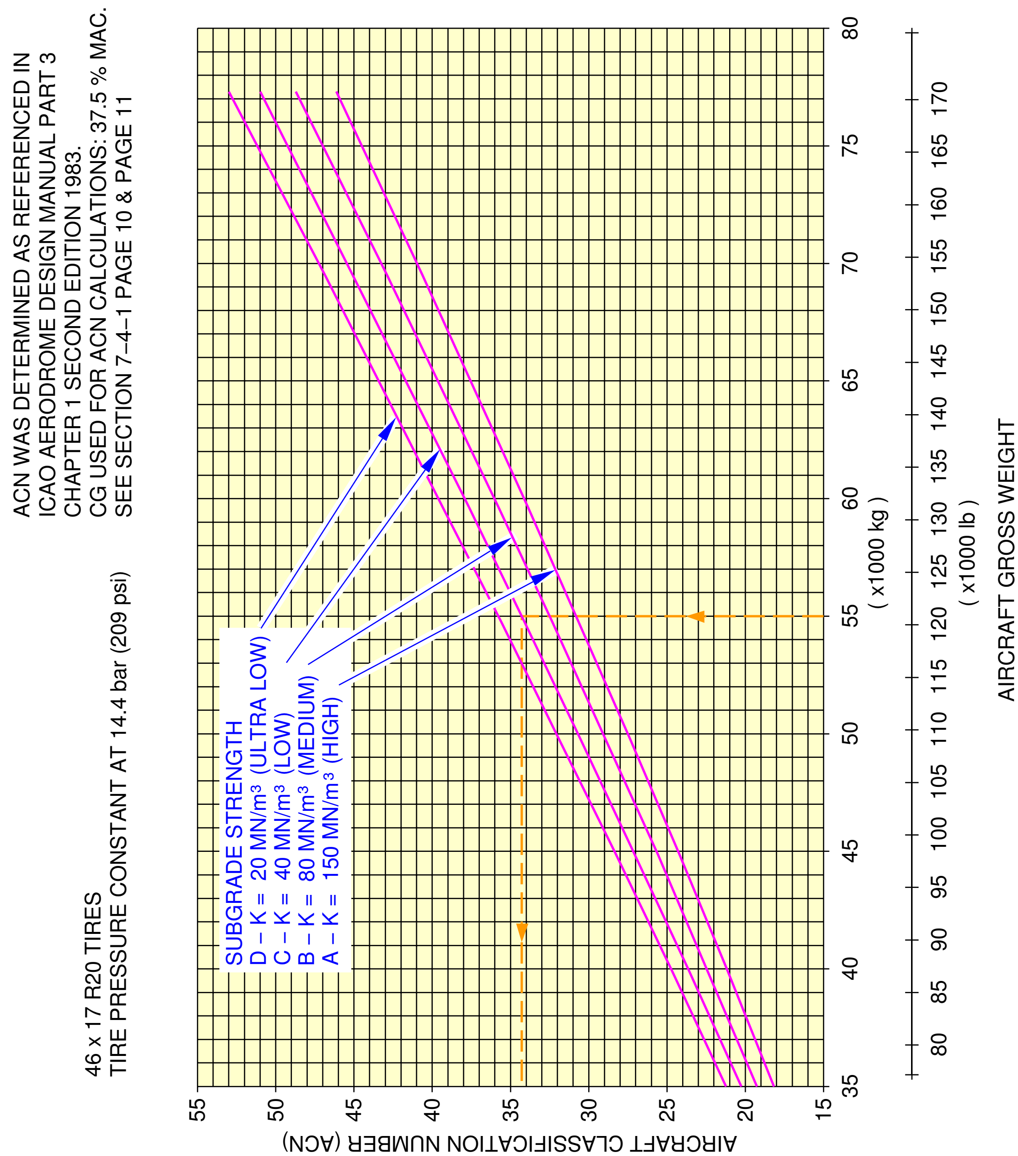
**ON A/C A320-200



N_AC_070902_1_0250101_01_01

Aircraft Classification Number – Rigid Pavement
MTOW 75.5 T
FIGURE 8

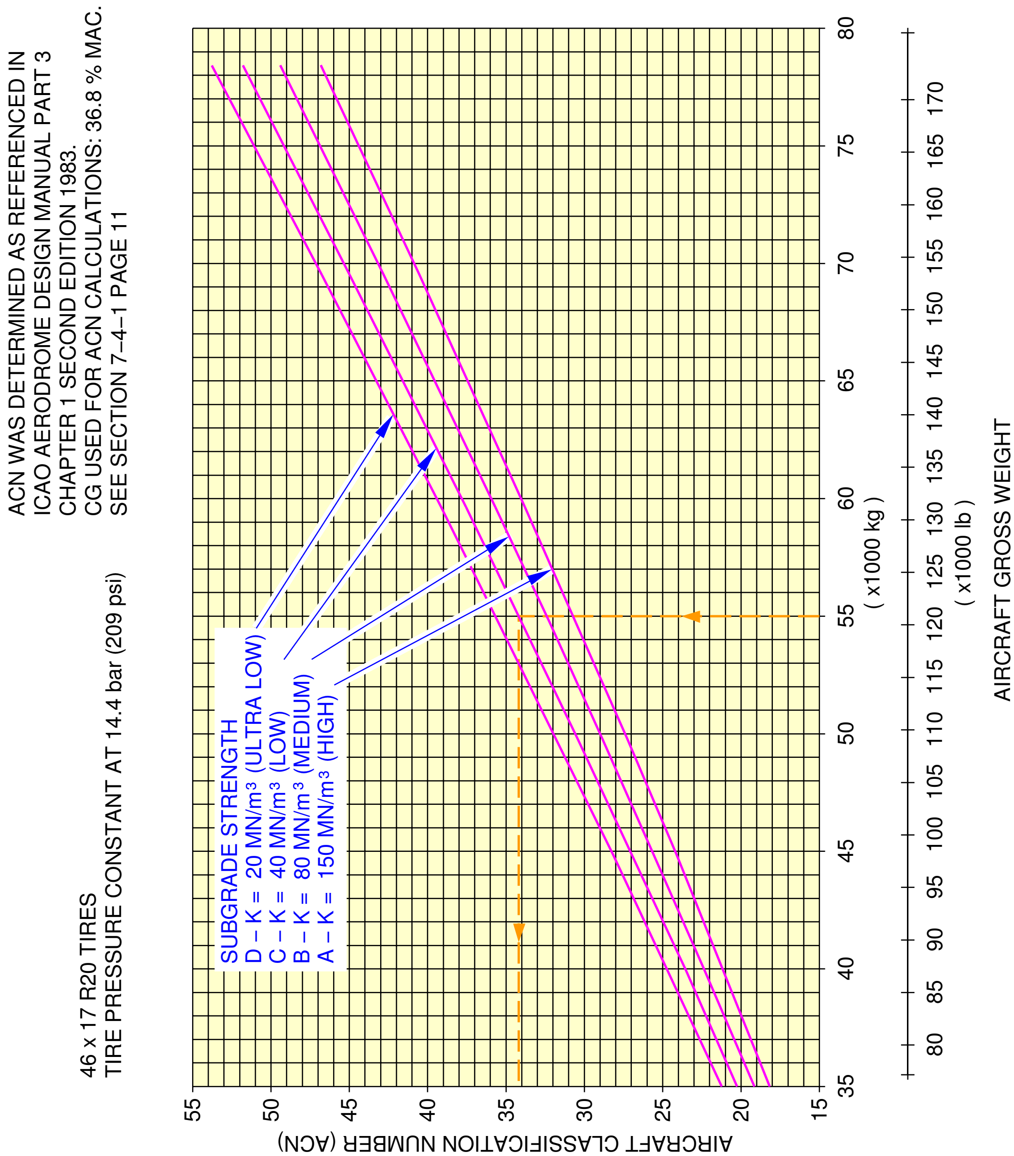
**ON A/C A320-200



N_AC_070902_1_0260101_01_01

Aircraft Classification Number – Rigid Pavement
MTOW 77 T
FIGURE 9

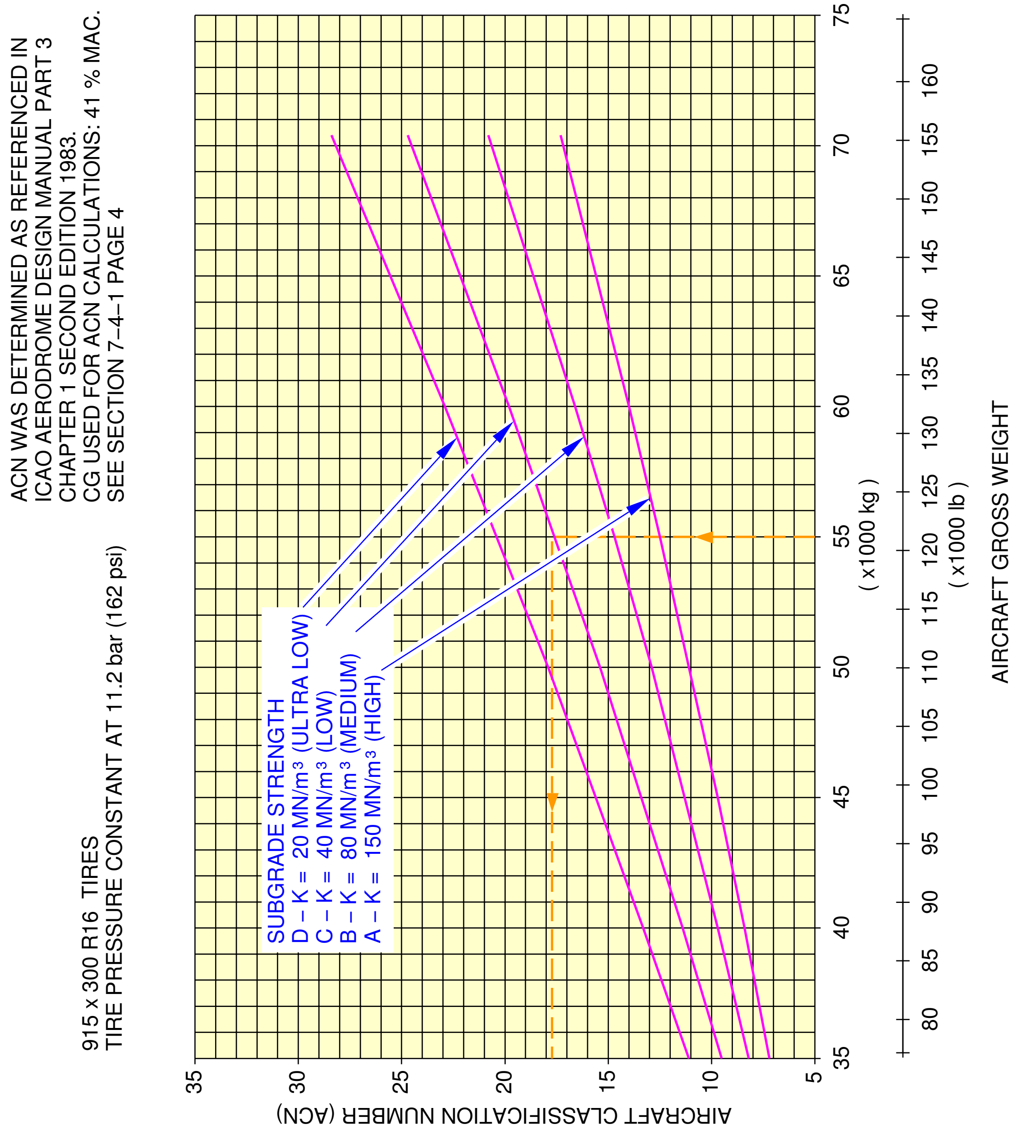
****ON A/C A320-200**



N_AC_070902_1_0270101_01_01

Aircraft Classification Number – Rigid Pavement
MTOW 78 T
FIGURE 10

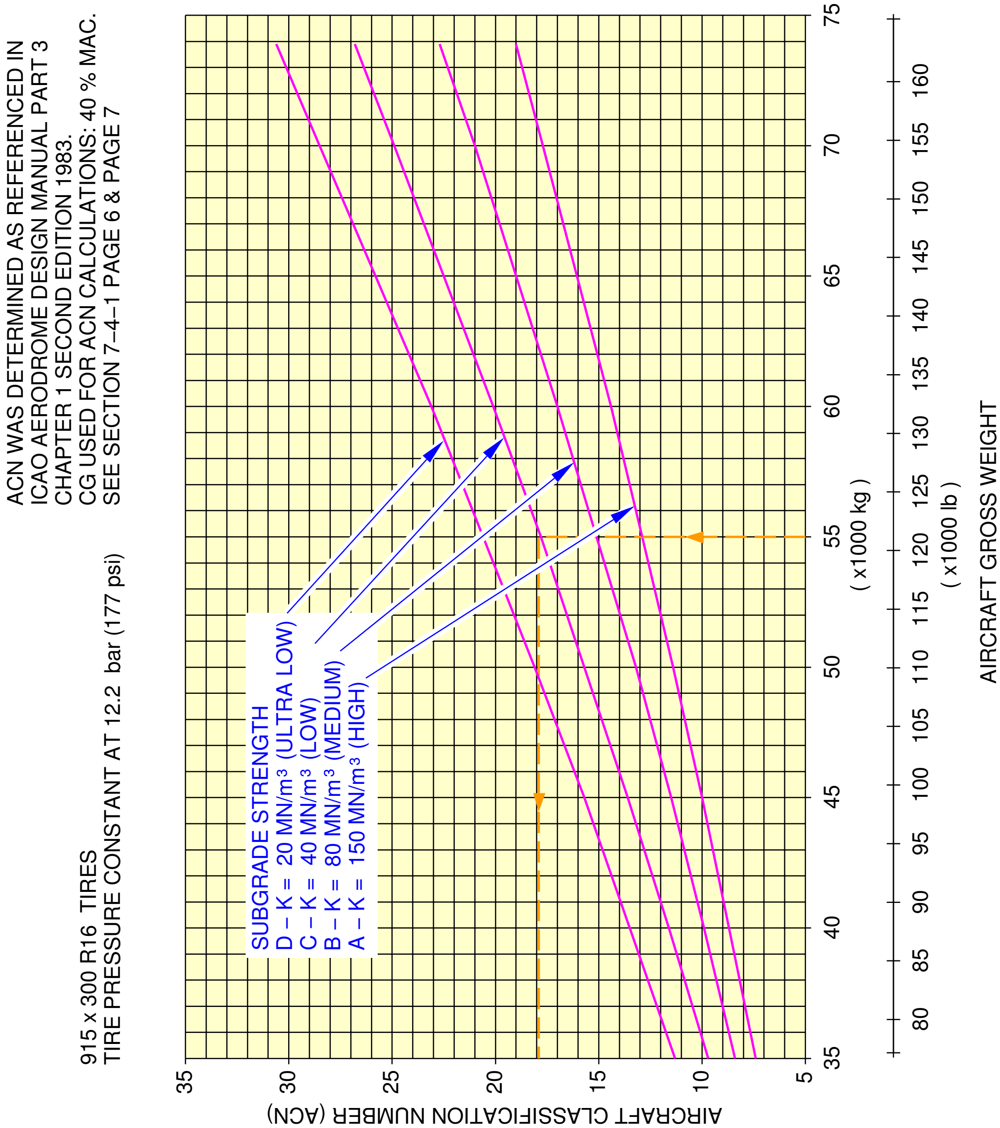
****ON A/C A320-200**



N_AC_070902_1_0280101_01_01

Aircraft Classification Number – Rigid Pavement
Bogie – MTOW 70 T
FIGURE 11

**ON A/C A320-200



N_AC_070902_1_0290101_01_01

Aircraft Classification Number – Rigid Pavement
Bogie – MTOW 73.5 T
FIGURE 12

DERIVATIVE AIRPLANES

8-1-0 Possible Future Derivative Airplane

****ON A/C A320-100 A320-200**

Possible Future Derivative Airplane

1. General

   Derivative versions of the A320 are planned. All product line airplanes are studied for possible size changes that might be required for fulfilling future airline needs. History has proved that derivative airplanes of a given model can encompass both increases and decreases in linear dimensions and weight.

SCALED DRAWINGS

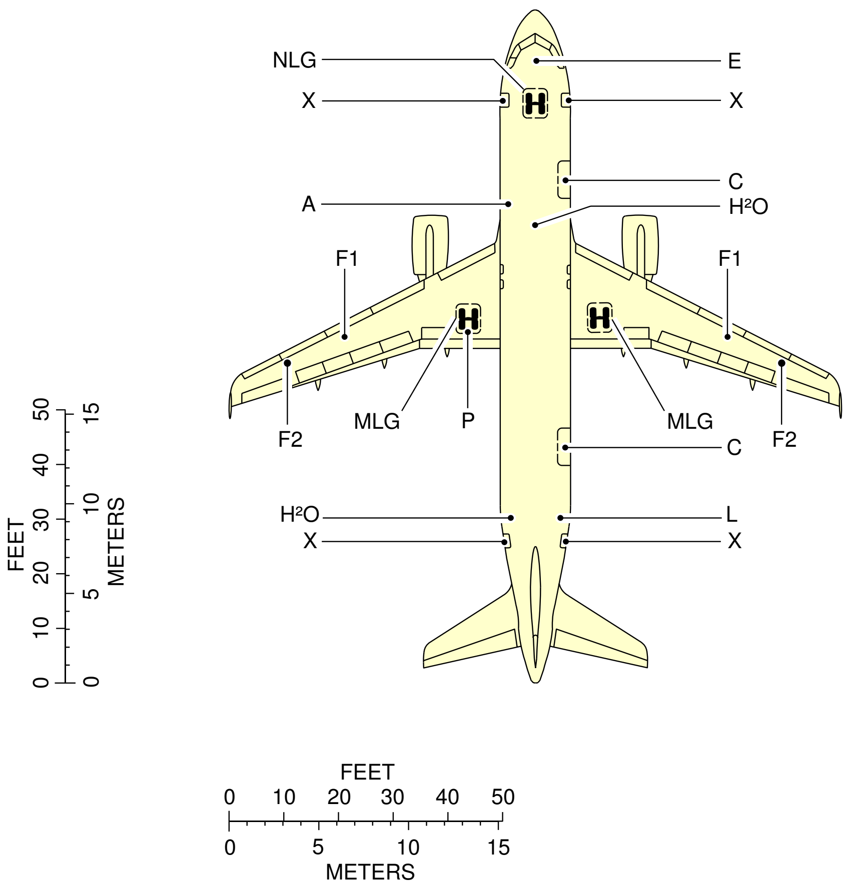
9-1-0 Scaled Drawings

****ON A/C A320-100 A320-200**

Scaled Drawings

1. This section gives scaled drawings of the aircraft.

**ON A/C A320-100 A320-200



LEGEND:

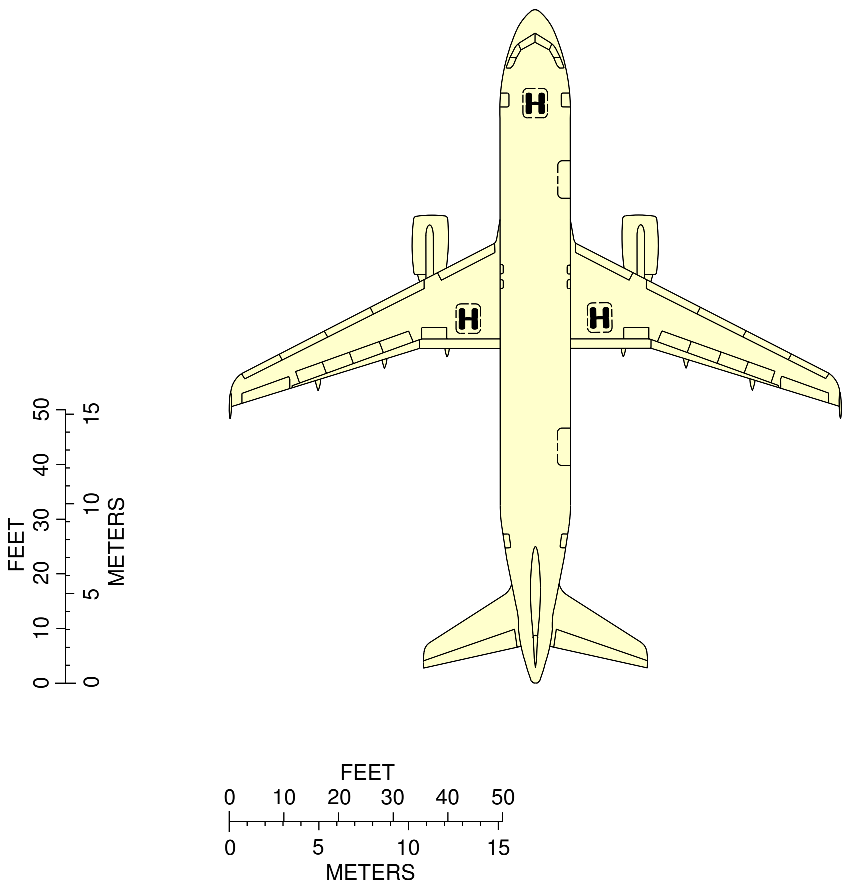
A	AIR CONDITIONING		
C	CARGO COMPT DOOR	L	LAVATORY
E	ELECTRICAL	MLG	MAIN LANDING GEAR
F1	FUEL (COUPLING)	NLG	NOSE LANDING GEAR
F2	FUEL (GRAVITY)	P	PNEUMATIC
H²O	POTABLE WATER	X	PASSENGER/CREW DOOR

NOTE: WHEN PRINTING, MAKE SURE TO ADJUST FOR PROPER SCALING.

N_AC_090100_1_0050101_01_03

Scaled Drawing
FIGURE 1

**ON A/C A320-100 A320-200



NOTE: WHEN PRINTING, MAKE SURE TO ADJUST FOR PROPER SCALING.

N_AC_090100_1_0060101_01_03

Scaled Drawing
FIGURE 2