A319

AIRPLANE CHARACTERISTICS

AC

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

HIGHLIGHTS

Revision No. 9 - Sep 01/10

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FIGURE Ground Service Connections - Starter Oil Tank – CFM56 Series Engine	N	ILLUSTRATION ADDED
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FIGURE Ground Service Connections - IDG Oil Tank – IAE V2500 Series Engine	N	NEW FIGURE ADDED ILLUSTRATION ADDED
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SCOPE

1-1-0 Purpose

****ON A/C A319-100**

Purpose

1. General
   The A319 AIRPLANE CHARACTERISTICS (AC) manual is issued for the A319 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.

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1-2-0 Introduction

**ON A/C A319-100

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 A319 new version with the associated size change.

Chapter 9: SCALED DRAWING

This chapter contains different A319 scaled drawings.

AIRPLANE DESCRIPTION

2-1-0 General Airplane Characteristics

****ON A/C A319-100**

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 A319-100**

General Airplane Characteristics Data

1. The following table provides characteristics of A319-100 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	64 400	70 400	75 900	68 400	68 400
	Pounds	141 978	155 205	167 331	150 796	150 796
Maximum Takeoff Weight (MTOW)	Kilograms	64 000	70 000	75 500	68 000	68 000
	Pounds	141 096	154 324	166 449	149 914	149 914
Maximum Landing Weight (MLW)	Kilograms	61 000	61 000	62 500	61 000	62 500
	Pounds	134 482	134 482	137 789	134 482	137 789
Maximum Zero Fuel Weight (MZFW)	Kilograms	57 000	57 000	58 500	57 000	58 500
	Pounds	125 663	125 663	128 970	125 663	128 970
Estimated Operational Empty Weight (OEW)	CFM Engines	39 725 kg (87 579 lb)				
	IAE Engines	39 826 kg (87 801 lb)				
Estimated Maximum Payload CFM 56	Kilograms	17 275		18 775	17 275	18 775
	Pounds	38 085		41 392	38 085	41 392
Estimated Maximum Payload IAE V2500	Kilograms	17 174		18 674	17 174	18 674
	Pounds	37 862		41 169	37 862	41 169

Aircraft Characteristics			
		WV005	WV006
Maximum Ramp Weight (MRW) Maximum Taxi Weight (MTW)	Kilograms	70 400	73 900
	Pounds	155 205	162 922
Maximum Takeoff Weight (MTOW)	Kilograms	70 000	73 500
	Pounds	154 324	162 040
Maximum Landing Weight (MLW)	Kilograms	62 500	62 500
	Pounds	137 789	137 789
Maximum Zero Fuel Weight (MZFW)	Kilograms	58 500	58 500
	Pounds	128 970	128 970
Estimated Operational Empty Weight (OEW)	CFM Engines	39 725 kg (87 579 lb)	
	IAE Engines	39 826 kg (87 801 lb)	
Estimated Maximum Payload CFM 56	Kilograms	18 775	
	Pounds	41 392	

Aircraft Characteristics			
		WV005	WV006
Estimated Maximum Payload IAE V2500	Kilograms	18 674	
	Pounds	41 169	

2. The following table provides characteristics of A319-100 Models, these data are common to each Weight Variant:

Aircraft Characteristics		
Standard Seating Capacity	Single-class	156
Usable Fuel Capacity	Liters	23 859
	US gallons	6 303
	Kilograms (density = 0.785 kg/l)	18 729
	Pounds	41 290
Pressurized Fuselage Volume (A/C non equipped)	Cubic meters	285
	Cubic feet	10 065
Passenger Compartment Volume	Cubic meters	120
	Cubic feet	4 238
Cockpit Volume	Cubic meters	9
	Cubic feet	318
Usable Volume, FWD CC	Cubic meters	8.52
	Cubic feet	300
Usable Volume, AFT CC	Cubic meters	11.92
	Cubic feet	421
Usable Volume, Bulk CC	Cubic meters	7.22
	Cubic feet	255
Water Volume, FWD CC	Cubic meters	10.63
	Cubic feet	375.4
Water Volume, AFT CC	Cubic meters	13.91
	Cubic feet	491.2
Water Volume, Bulk CC	Cubic meters	7.51
	Cubic feet	265.2

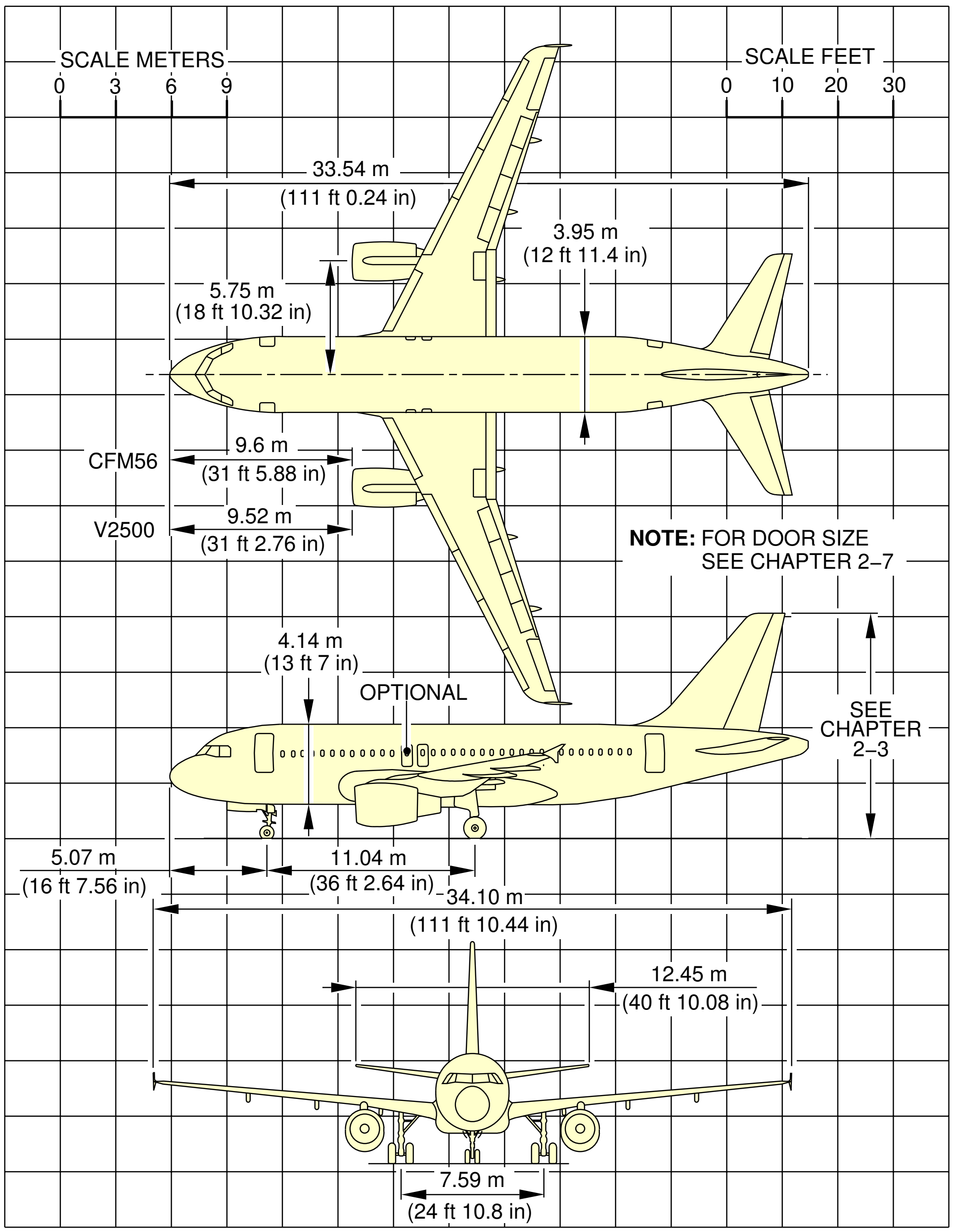
2-2-0 General Airplane Dimensions

****ON A/C A319-100**

General Airplane Dimensions

1. This section provides General Airplane Dimensions.

**ON A/C A319-100



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General Airplane Dimensions
FIGURE 1

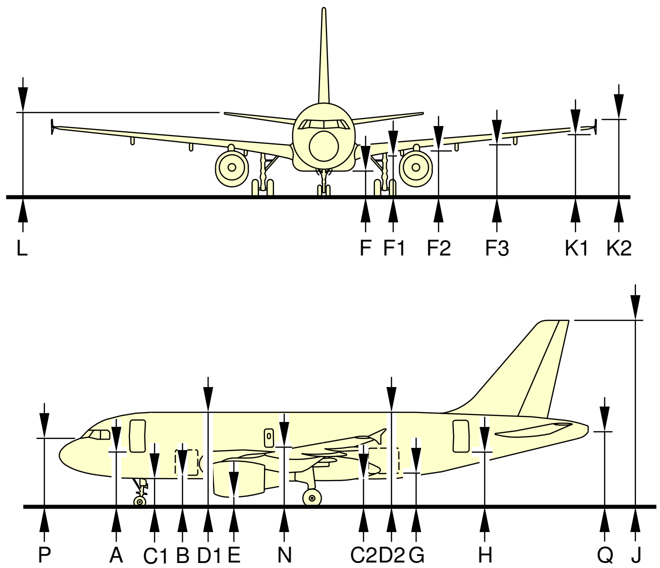
2-3-0 Ground Clearances

****ON A/C A319-100**

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 A319-100



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

	OWE 39 725 kg		MRW (WV0) 64 400 kg				MRW (WV8) 73 900 kg				AC JACKED FDL = 4.60 m	
	CG 28%		FWD CG 21%		AFT CG 36%		FWD CG 21%		AFT CG 36%			
	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft
A	3.47	11.38	3.39	11.12	3.45	11.32	3.38	11.09	3.43	11.25	4.13	13.55
B	2.09	6.86	2.01	6.59	2.05	6.73	1.99	6.53	2.03	6.66	2.71	8.89
C1	1.83	6.00	1.75	5.74	1.78	5.84	1.73	5.68	1.76	5.77	2.43	7.97
C2	1.94	6.36	1.87	6.14	1.84	6.04	1.84	6.04	1.81	5.94	2.43	7.97
D1	5.97	19.59	5.90	19.36	5.92	19.42	5.88	19.29	5.90	19.36	6.58	21.59
D2	6.09	19.98	6.02	19.75	5.98	19.62	5.99	19.65	5.95	19.52	6.58	21.59
E (CFM)	0.67	2.20	0.59	1.94	0.60	1.97	0.57	1.87	0.58	1.90	1.24	4.07
E (IAE)	0.85	2.79	0.78	2.56	0.78	2.56	0.76	2.49	0.76	2.49	1.42	4.66
F	1.73	5.68	1.66	5.45	1.64	5.38	1.63	5.35	1.62	5.31	2.26	7.41
F1	2.73	8.96	2.66	8.73	2.64	8.66	2.63	8.63	2.61	8.56	3.25	10.66
F2	3.16	10.37	3.09	10.14	3.07	10.07	3.06	10.04	3.04	9.97	3.68	12.07
F3	3.50	11.48	3.43	11.25	3.41	11.19	3.41	11.19	3.38	11.09	4.01	13.16
G	2.22	7.28	2.15	7.05	2.11	6.92	2.12	6.96	2.09	6.86	2.71	8.89
H	3.71	12.17	3.65	11.98	3.58	11.75	3.61	11.84	3.54	11.61	4.13	13.55
J	12.11	39.73	12.05	39.53	11.93	39.14	12.01	39.40	11.89	39.01	12.45	40.85
K1	3.90	12.80	3.84	12.60	3.79	12.43	3.81	12.50	3.77	12.37	4.38	14.37
K2	4.87	15.98	4.81	15.78	4.77	15.65	4.78	15.68	4.74	15.55	5.35	17.55
L	5.58	18.31	5.53	18.14	5.41	17.75	5.48	17.98	5.37	17.62	5.93	19.46
N	3.97	13.02	3.90	12.80	3.91	12.83	3.88	12.73	3.88	12.73	4.54	14.89
P	4.26	13.98	4.17	13.68	4.26	13.98	4.16	13.65	4.24	13.91	4.96	16.27
Q	4.87	15.98	4.82	15.81	4.69	15.39	4.78	15.68	4.65	15.26	5.20	17.06

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Ground Clearances
FIGURE 1

2-4-0 Interior Arrangements

****ON A/C A319-100**

Interior Arrangements

1. This section gives the standard interior arrangements configuration.

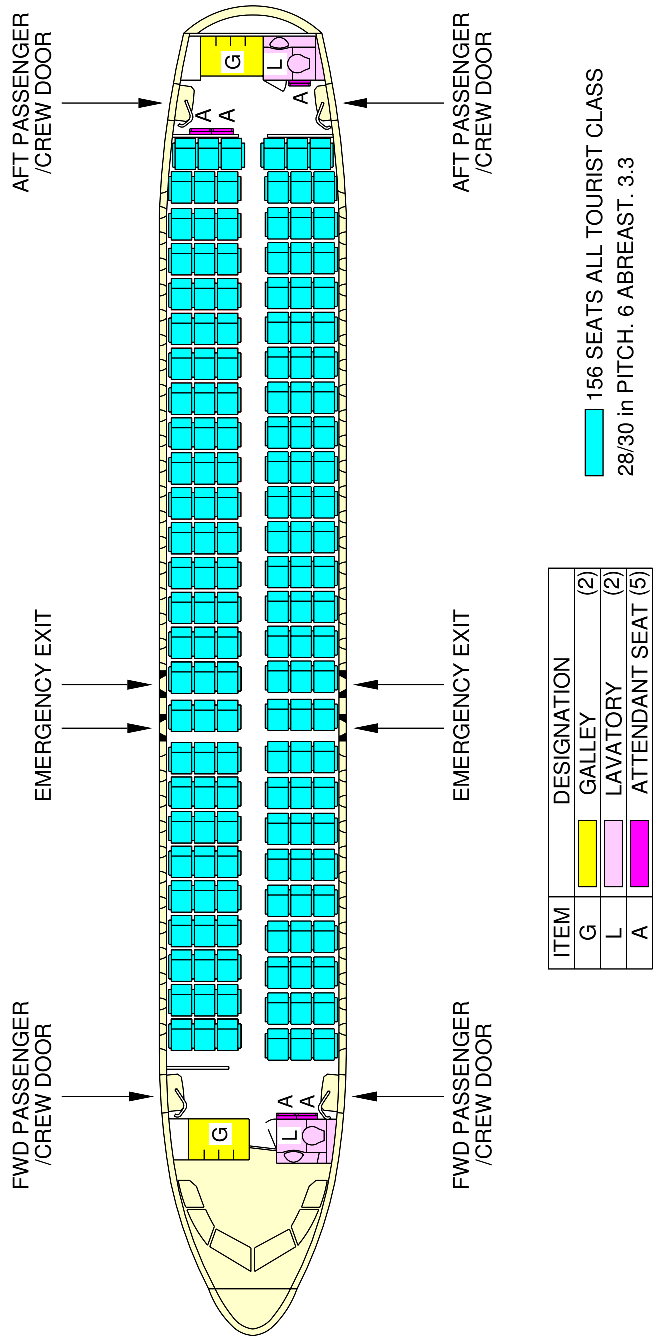
2-4-1 Passenger Compartment Layout

****ON A/C A319-100**

Typical Configuration

1. This section gives the typical interior configuration.

**ON A/C A319-100



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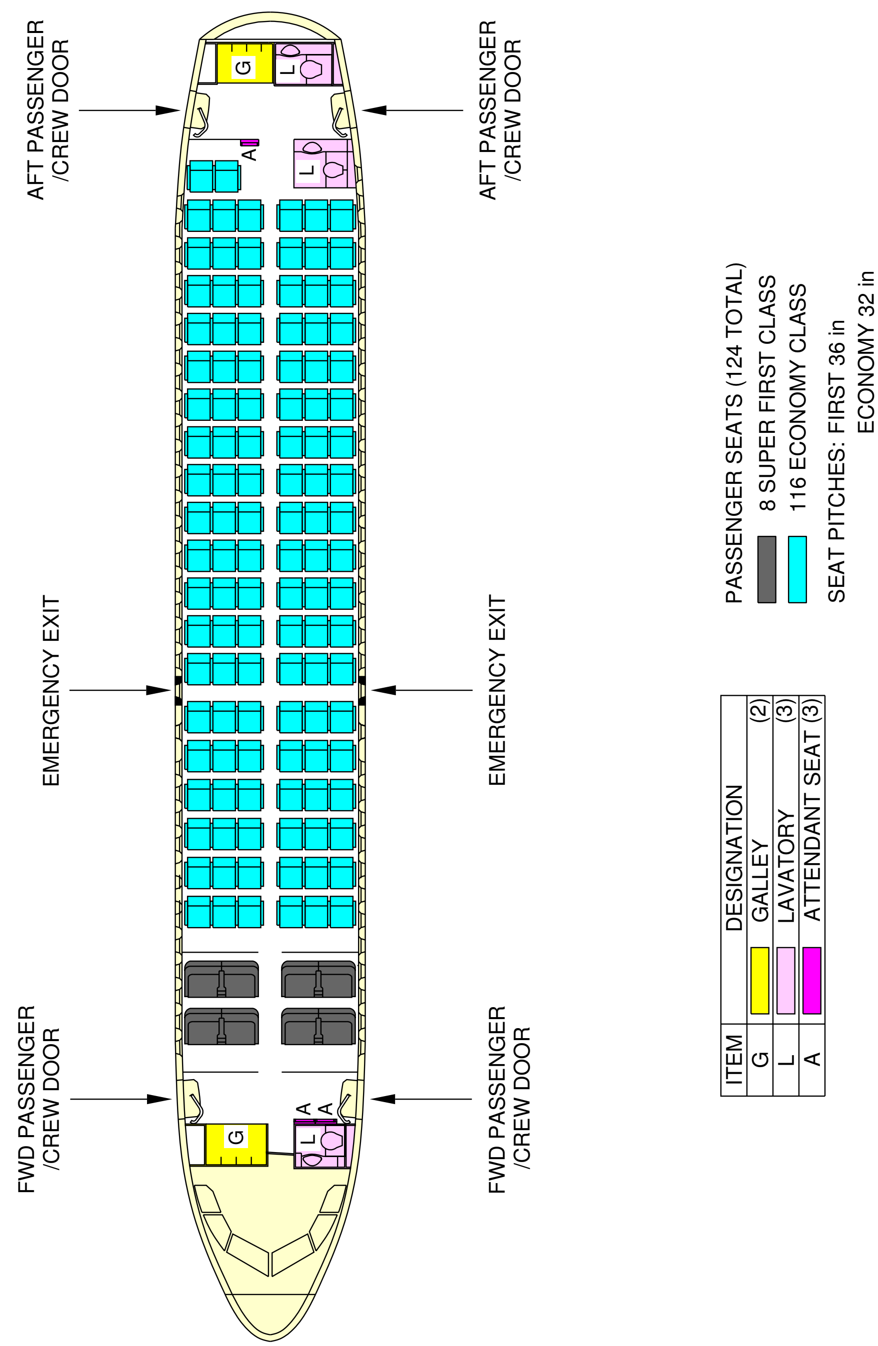
Typical Configuration
Typical Configuration Single-Class, High Density
FIGURE 1

**ON A/C A319-100



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Typical Configuration
Typical Configuration Two-Class
FIGURE 2

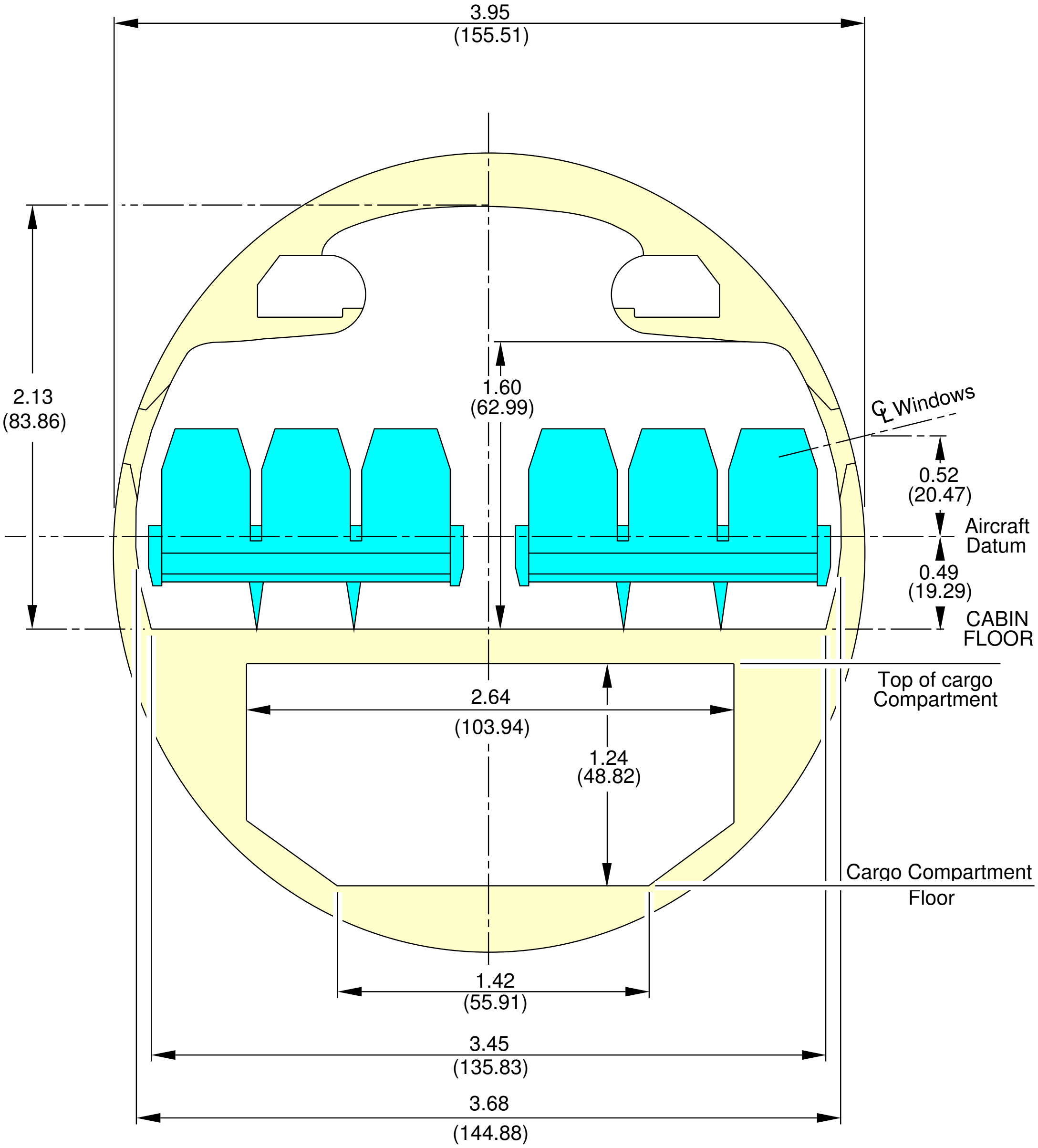
2-5-0 Passenger Compartment Cross Section

****ON A/C A319-100**

Passenger Compartment Cross-section

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

**ON A/C A319-100



NOTE: DIMENSIONS m (in)

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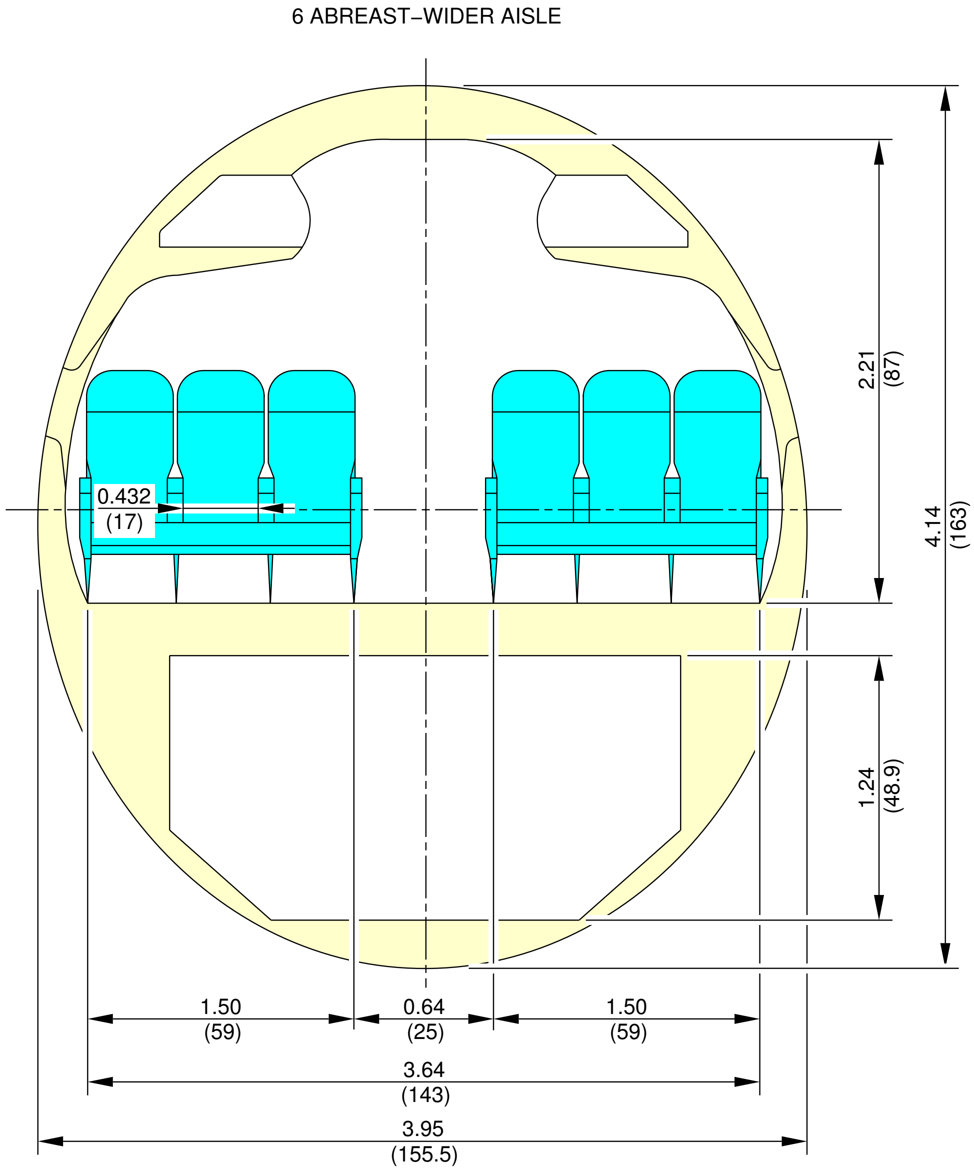
Passenger Compartment Cross-section
FIGURE 1

**ON A/C A319-100



NOTE: DIMENSIONS m (in)

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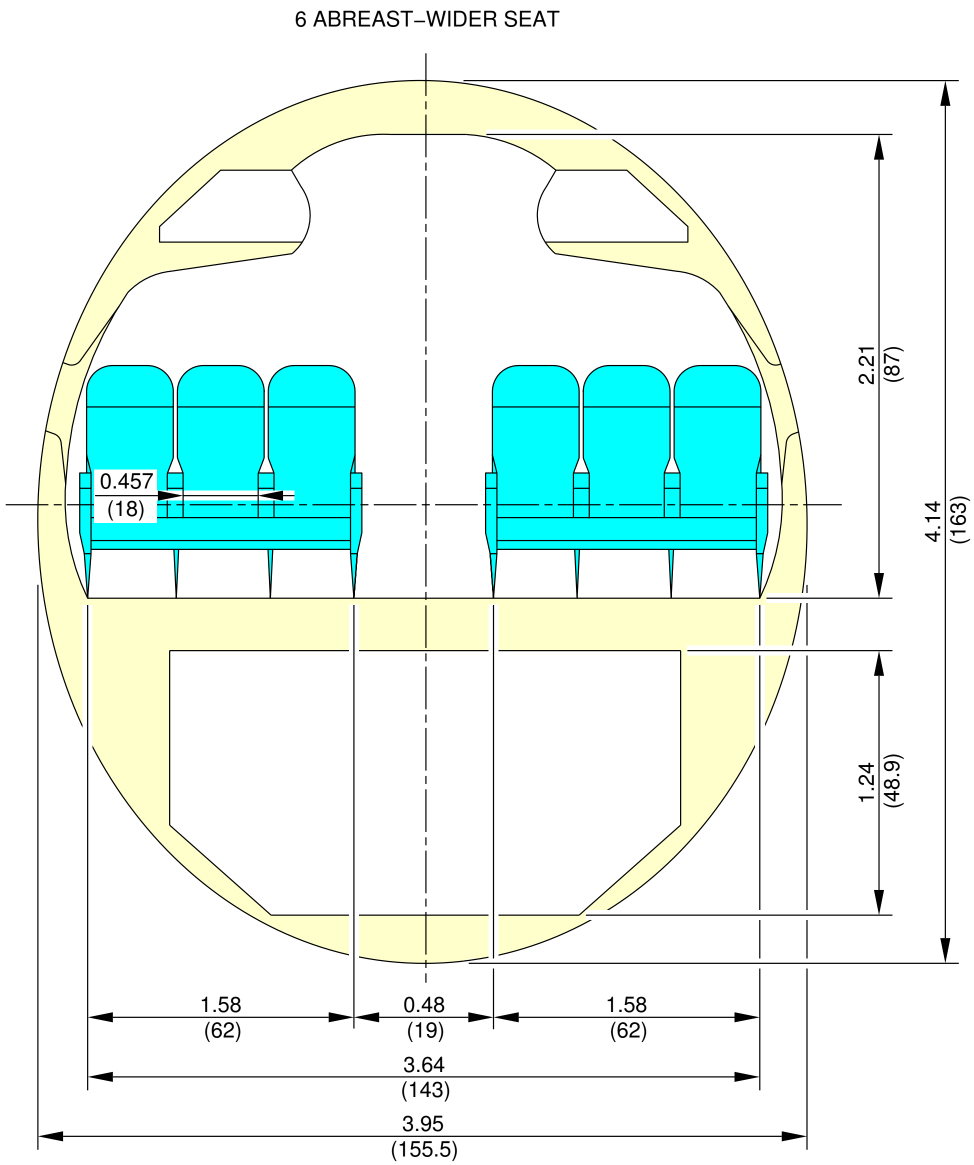
Passenger Compartment Cross-section
Economy Class, 6 Abreast - Wider Aisle (Sheet 1 of 2)
FIGURE 2

**ON A/C A319-100



NOTE: DIMENSIONS m (in)

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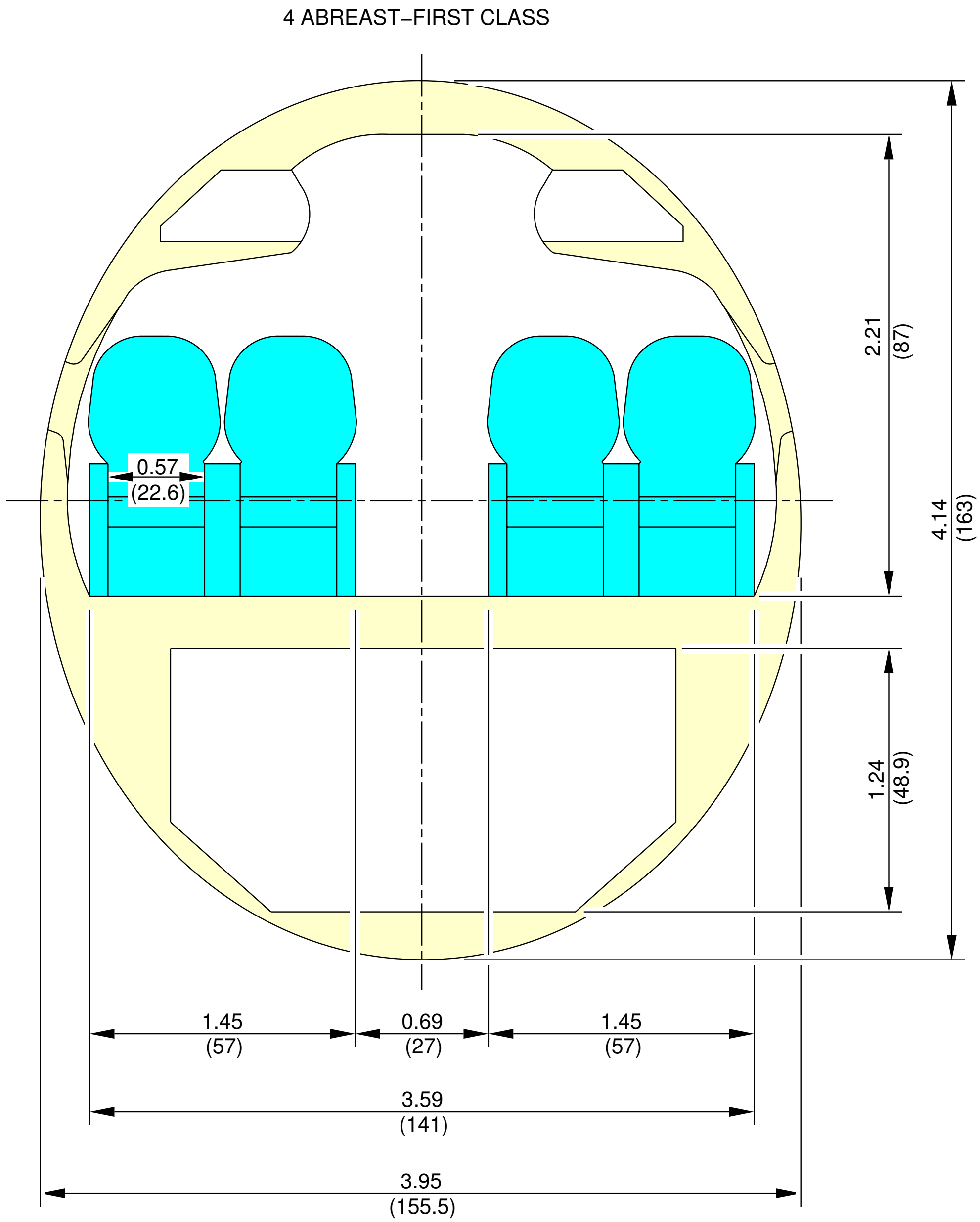
Passenger Compartment Cross-section
Economy Class, 6 Abreast - Wider Seat (Sheet 2 of 2)
FIGURE 3

**ON A/C A319-100



NOTE: DIMENSIONS m (in)

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

2-6-0 Cargo Compartments

****ON A/C A319-100**

Cargo Compartments

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

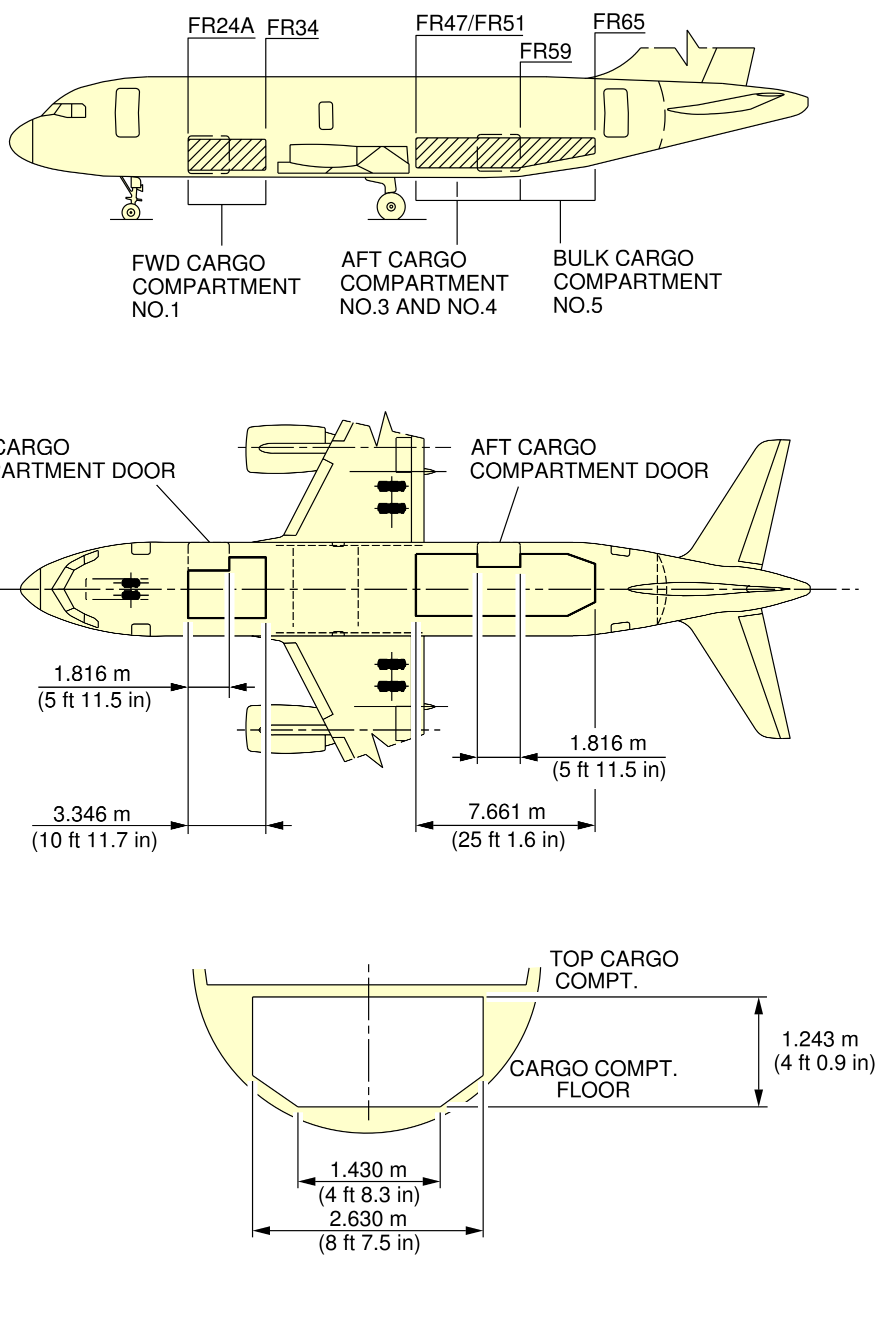
2-6-1 Lower Deck Cargo Compartments

****ON A/C A319-100**

Lower Deck Cargo Compartments

1. This section gives the lower deck cargo compartments.

**ON A/C A319-100



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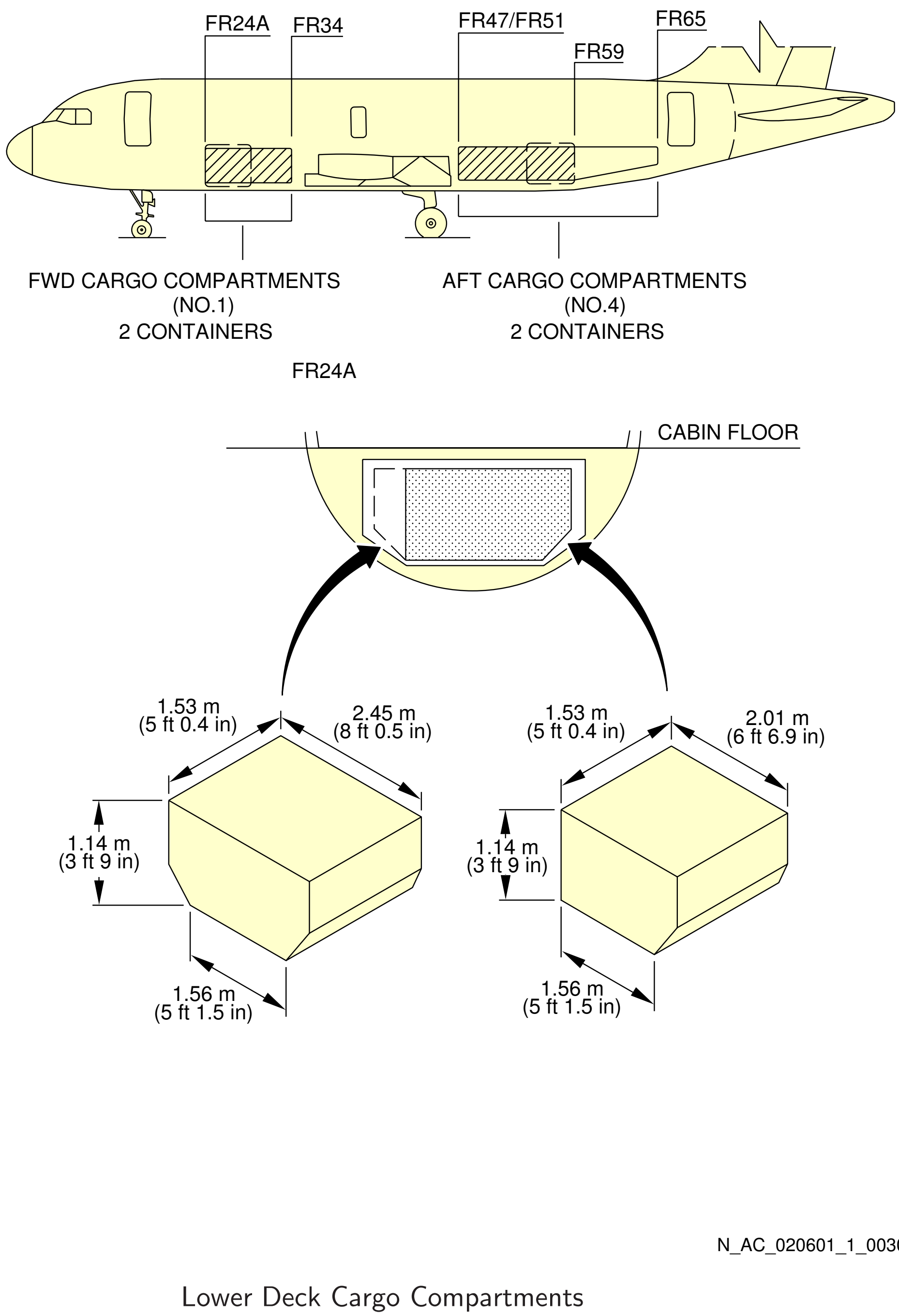
Lower Deck Cargo Compartments
Lower Deck Cargo Compartments Dimensions
FIGURE 1

**ON A/C A319-100



Lower Deck Cargo Compartments
Lower Deck Cargo Compartments Containers
FIGURE 2

2-7-0 Door Clearances

****ON A/C A319-100**

Doors Clearances

1. This section gives doors clearances.

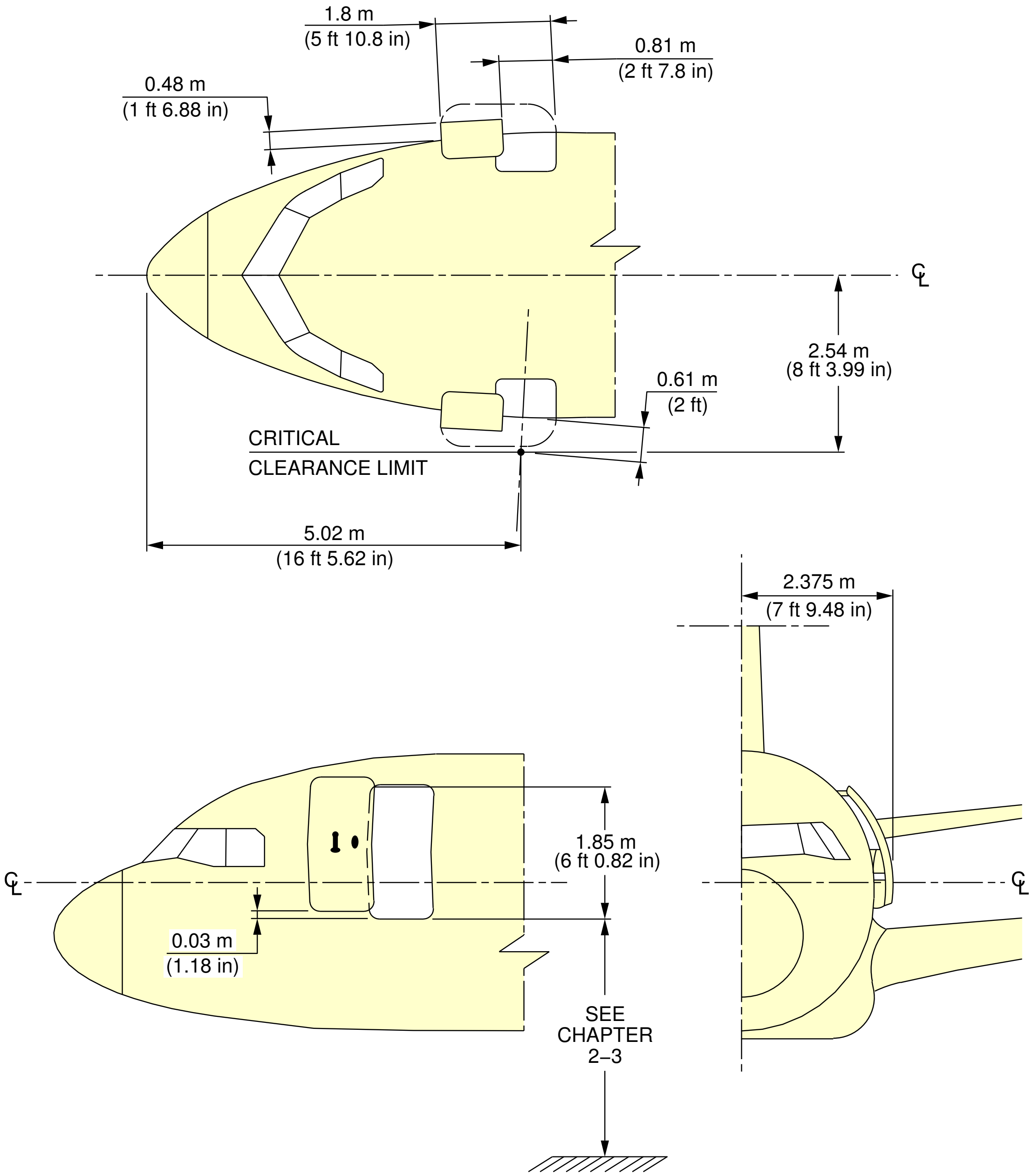
2-7-1 Forward Passenger / Crew Doors

****ON A/C A319-100**

Forward Passenger / Crew Doors

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

**ON A/C A319-100



N_AC_020701_1_0020101_01_00

Doors Clearances
Forward Passenger / Crew Doors
FIGURE 1

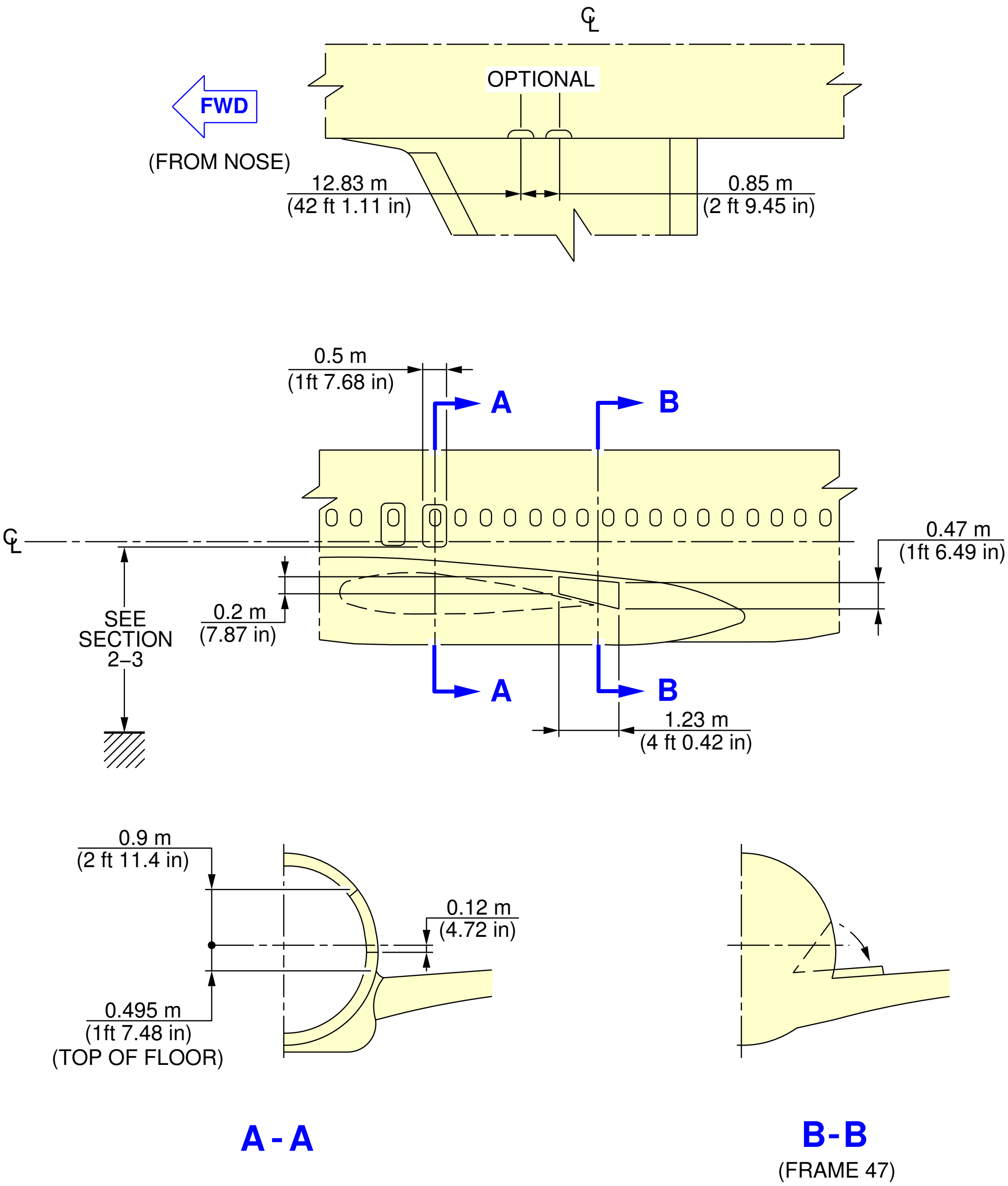
2-7-2 Emergency Exits

**ON A/C A319-100

Emergency Exits

1. This section gives emergency exits doors clearances.

**ON A/C A319-100



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

N_AC_020702_1_0030101_01_00

Doors Clearances
Emergency Exits
FIGURE 1

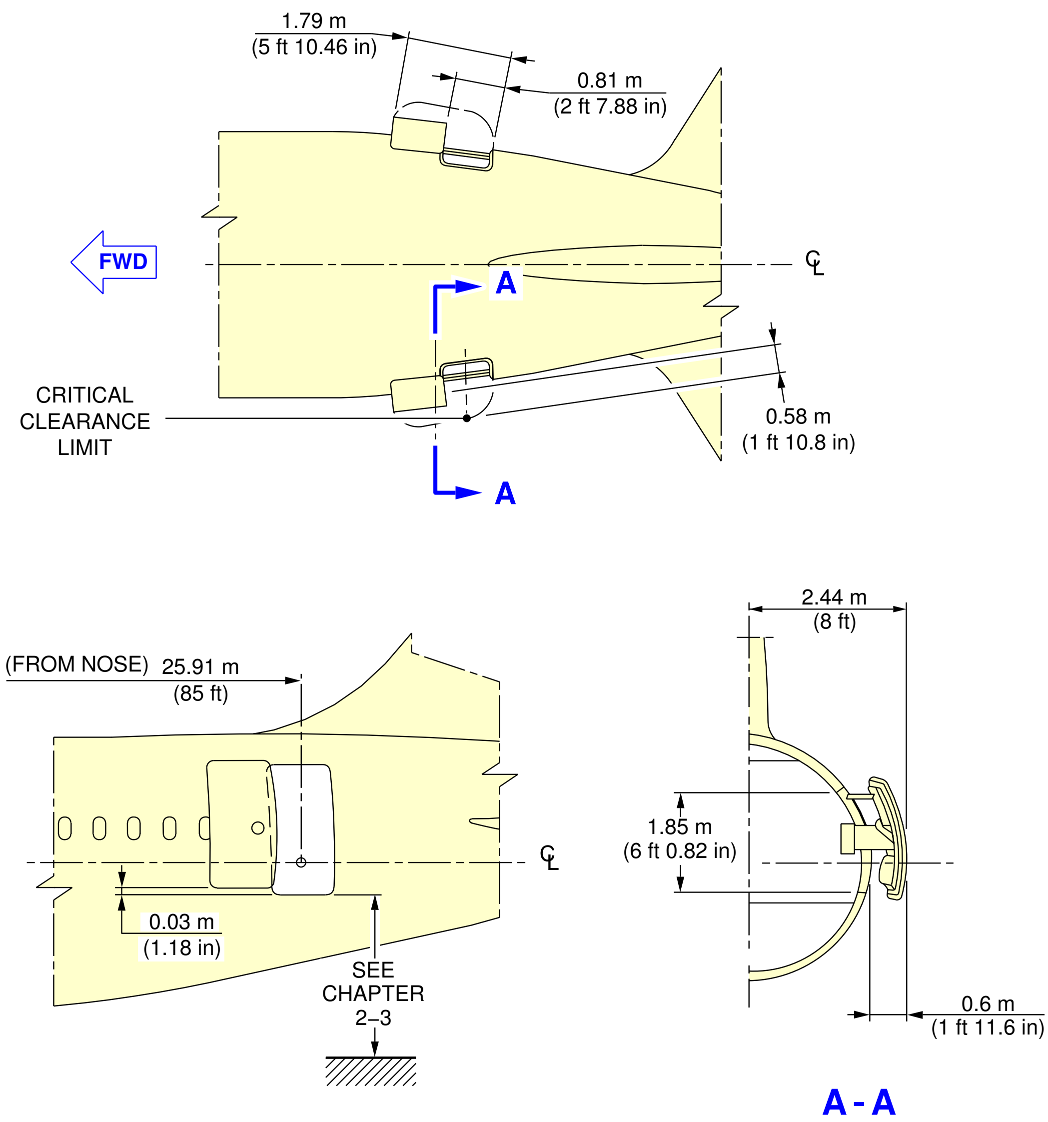
2-7-3 Aft Passenger / Crew Doors

****ON A/C A319-100**

Aft Passenger / Crew Doors

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

**ON A/C A319-100



N_AC_020703_1_0020101_01_00

Doors Clearances
Aft Passenger / Crew Doors
FIGURE 1

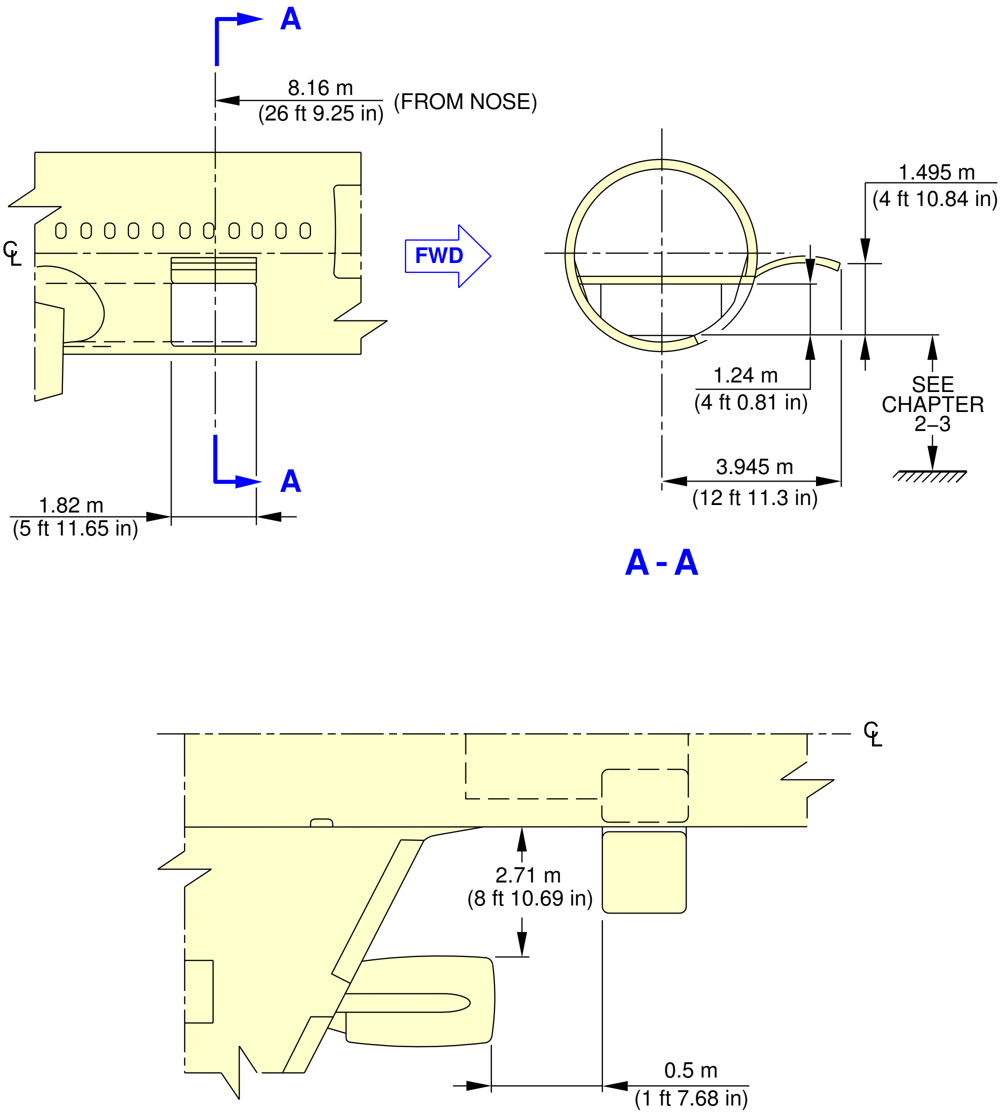
2-7-4 Forward Cargo Compartment Doors

****ON A/C A319-100**

Forward Cargo Compartment Door

1. This section gives forward cargo compartment door clearances.

**ON A/C A319-100



N_AC_020704_1_0020101_01_00

Doors Clearances
Forward Cargo Compartment Door
FIGURE 1

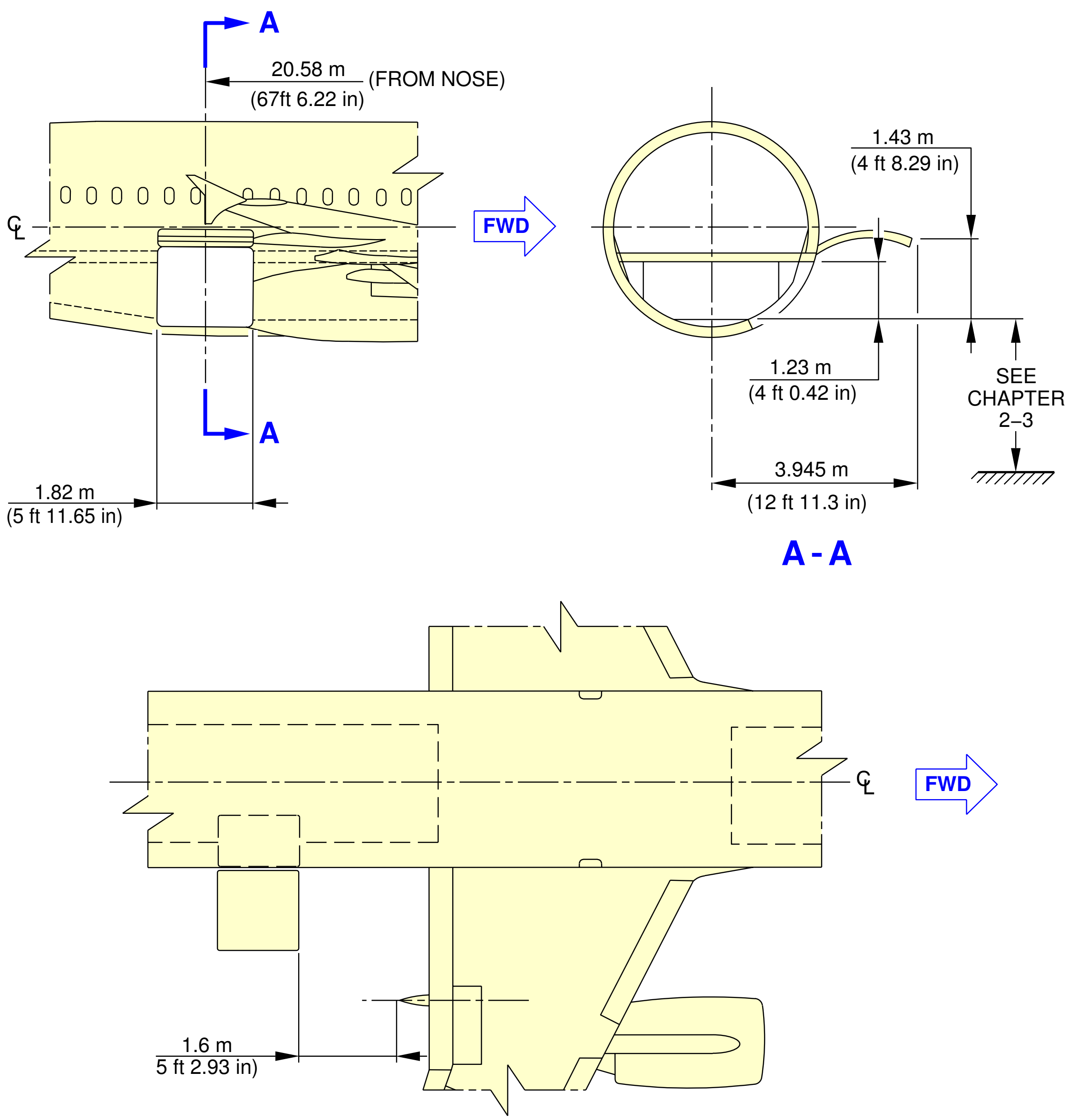
2-7-5 Aft Cargo Compartment Doors

****ON A/C A319-100**

Aft Cargo Compartment Door

1. This section gives Aft cargo compartment door clearances.

**ON A/C A319-100



N_AC_020705_1_0020101_01_01

Doors Clearances
Aft Cargo Compartment Door
FIGURE 1

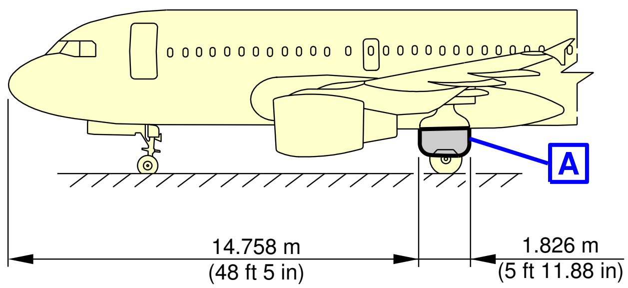
2-7-7 Main Landing Gear Doors

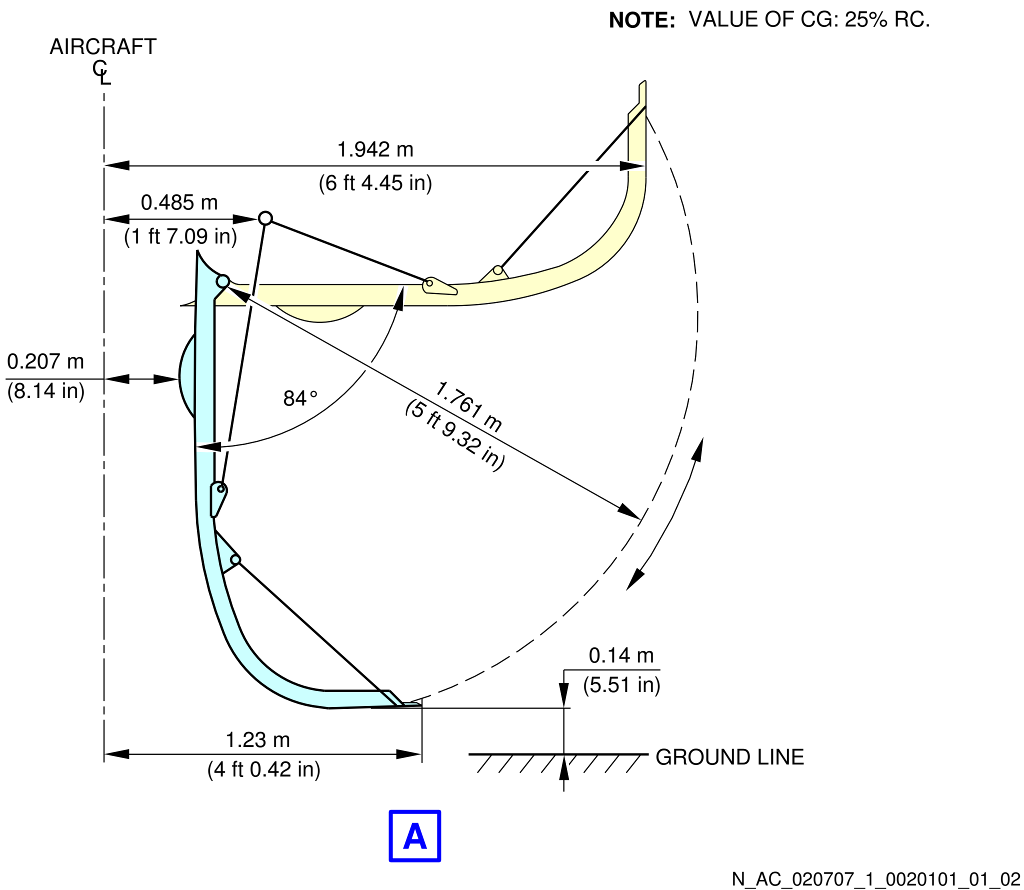
**ON A/C A319-100

Main Landing Gear Doors

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

**ON A/C A319-100





Doors Clearances
Main Landing Gear Doors
FIGURE 1

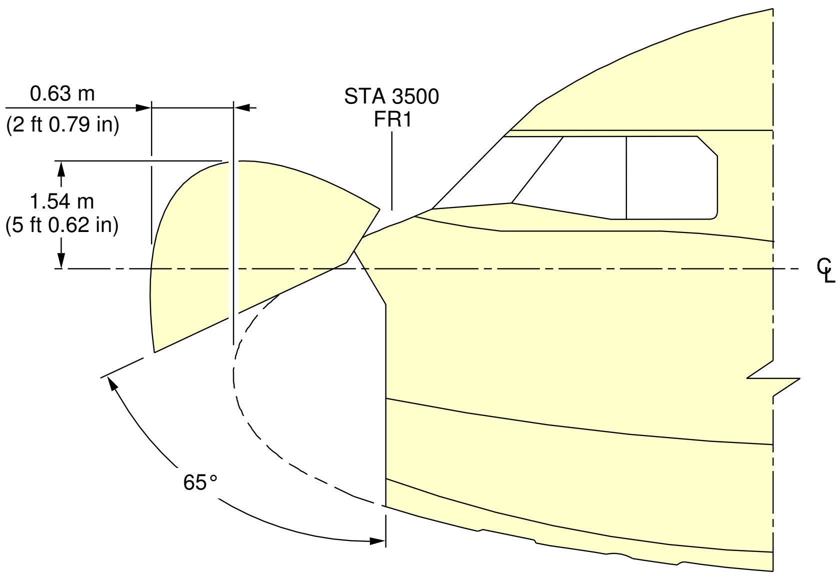
2-7-8 Radome

**ON A/C A319-100

Radome

1. This section gives the radome clearances.

**ON A/C A319-100



N_AC_020708_1_0020101_01_00

Doors Clearances
Radome
FIGURE 1

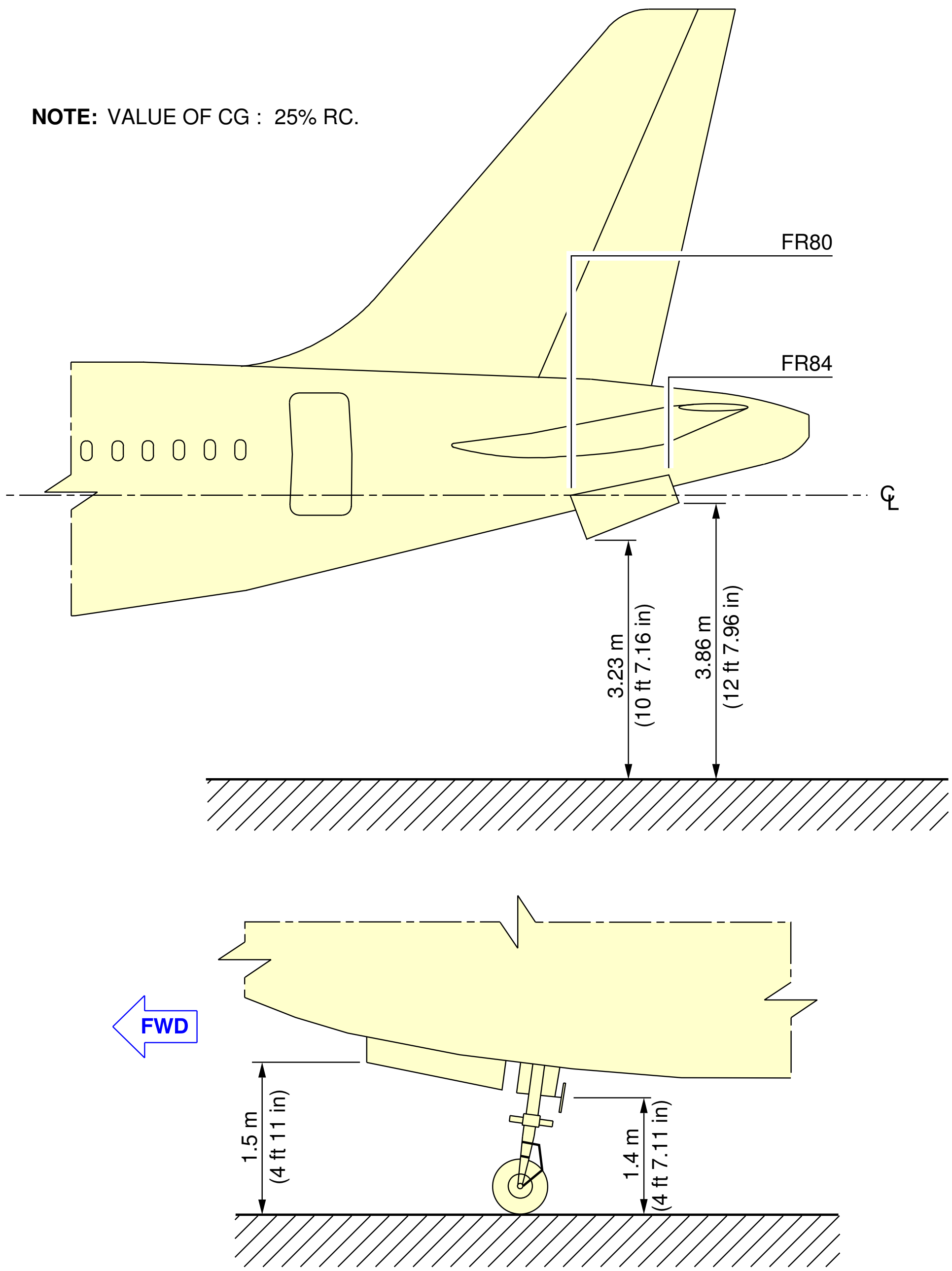
2-7-9 APU and Nose Landing Gear Doors

**ON A/C A319-100

APU and Nose Landing Gear Doors

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

**ON A/C A319-100



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Doors Clearances
APU and Nose Landing Gear Doors
FIGURE 1

AIRPLANE PERFORMANCE

3-1-0 General Information

**ON A/C A319-100

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 A319-100**

Payload / Range

1. Payload / Range

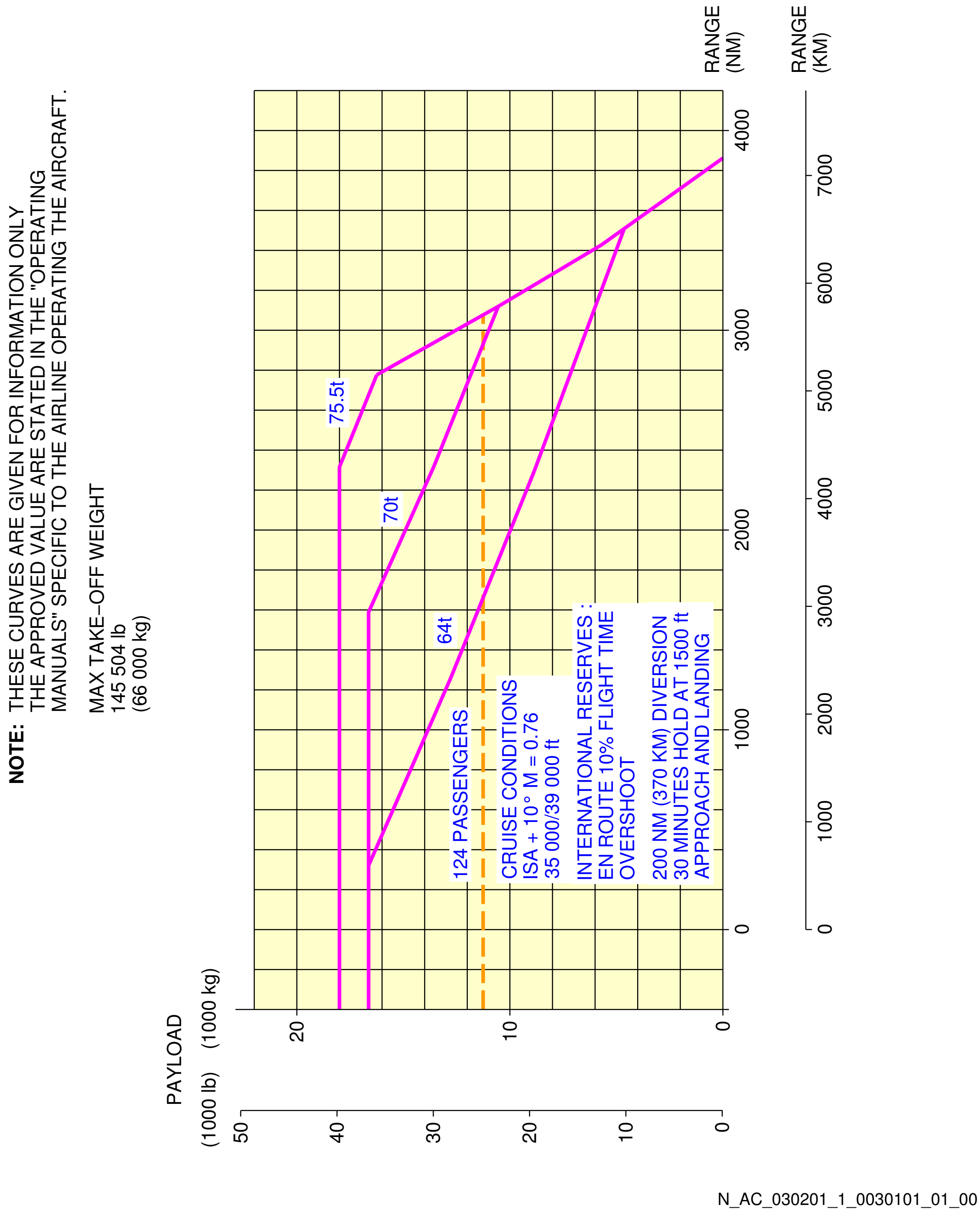
3-2-1 ISA Conditions

**ON A/C A319-100

ISA Conditions

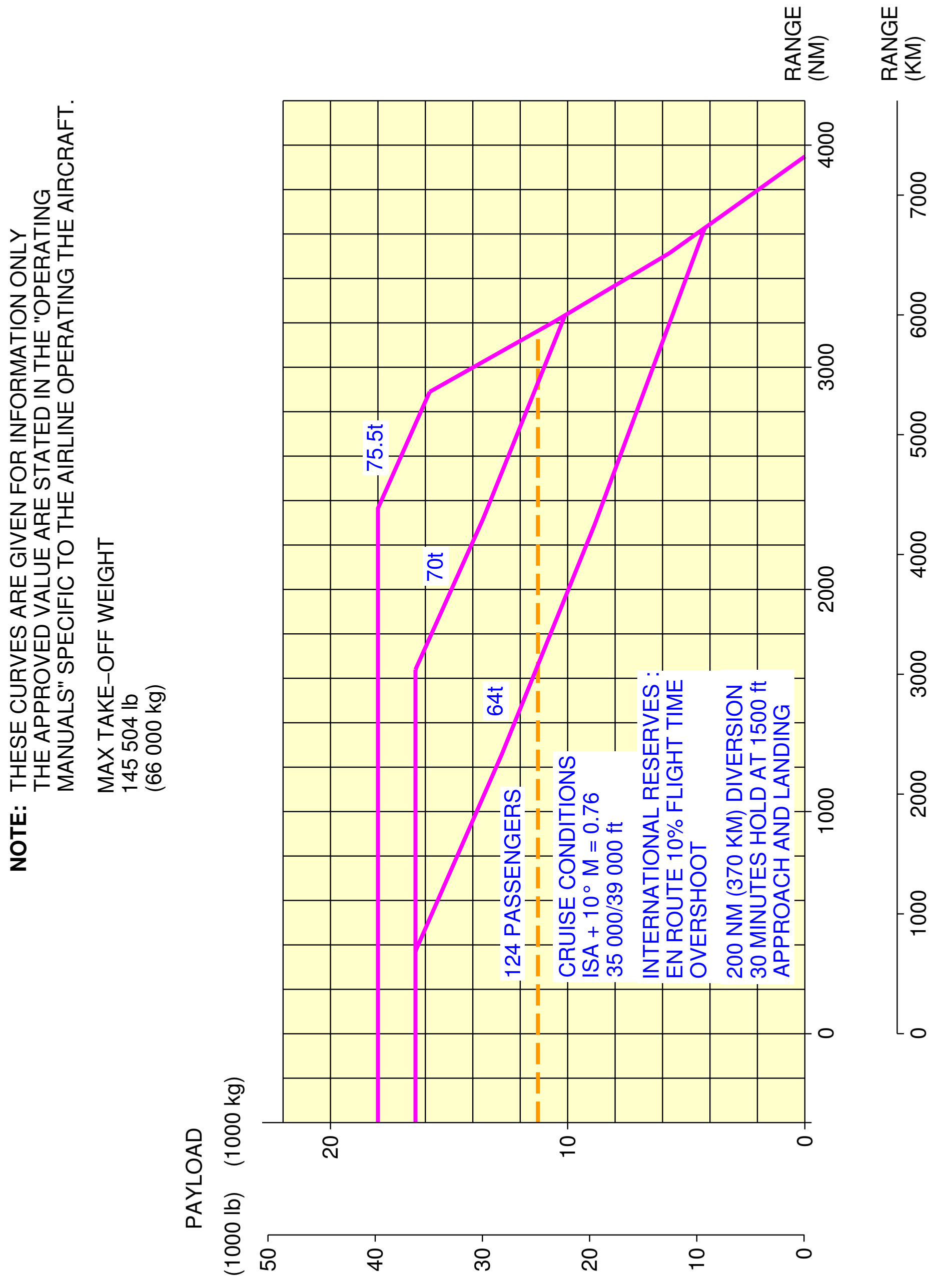
1. This section gives the payload / range at ISA conditions.

**ON A/C A319-100



Payload / Range
CFM56-5A series engine
FIGURE 1

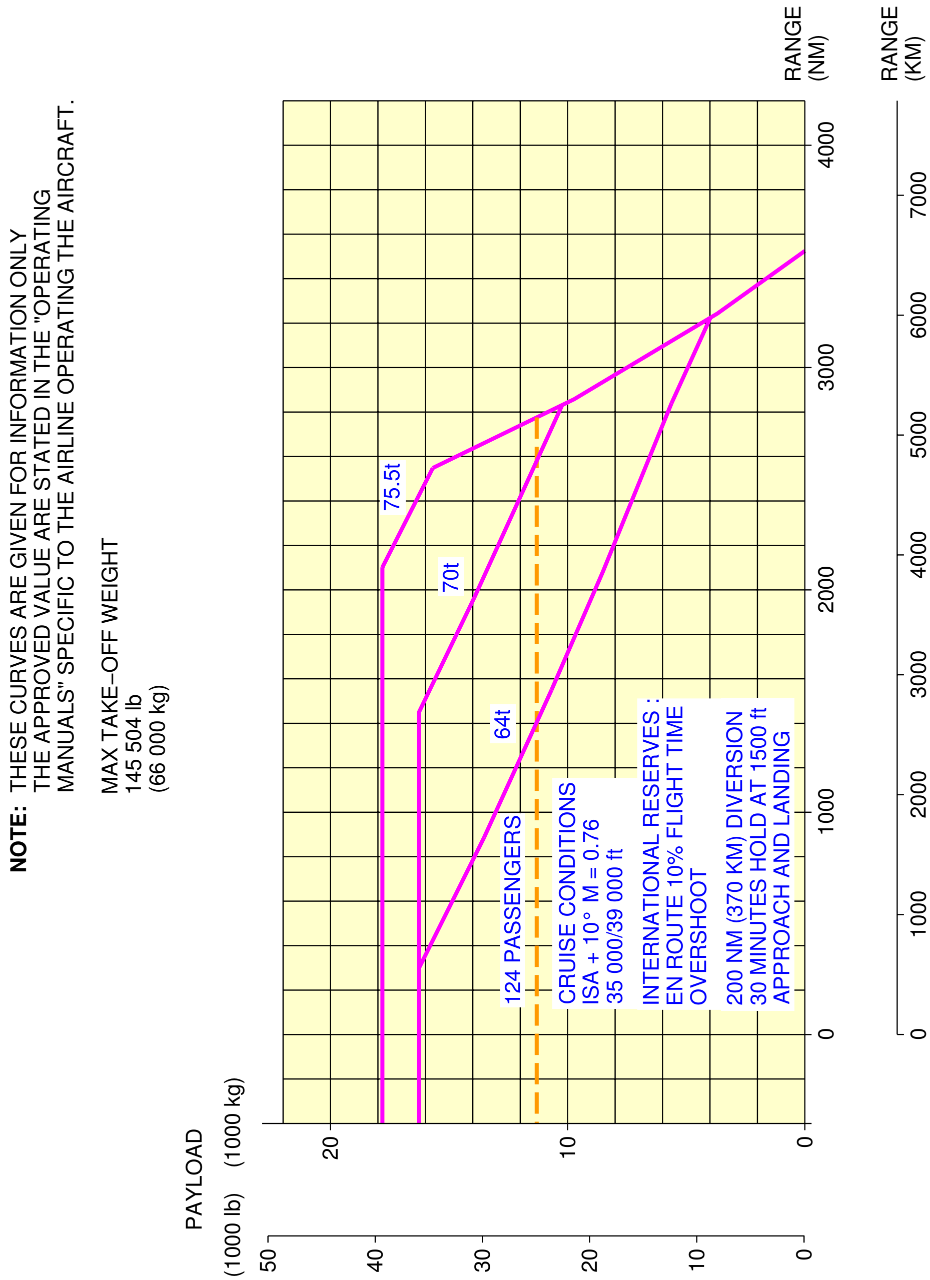
**ON A/C A319-100



N_AC_030201_1_0040101_01_00

Payload / Range
CFM56-5B series engine
FIGURE 2

**ON A/C A319-100



N_AC_030201_1_0050101_01_00

Payload / Range
IAE V2500-A5 series engine
FIGURE 3

3-3-0 FAR / JAR Takeoff Weight Limitation

**ON A/C A319-100

FAR / JAR Take-off Weight Limitation

1. FAR / JAR Take-off Weight Limitation

3-3-1 ISA Conditions

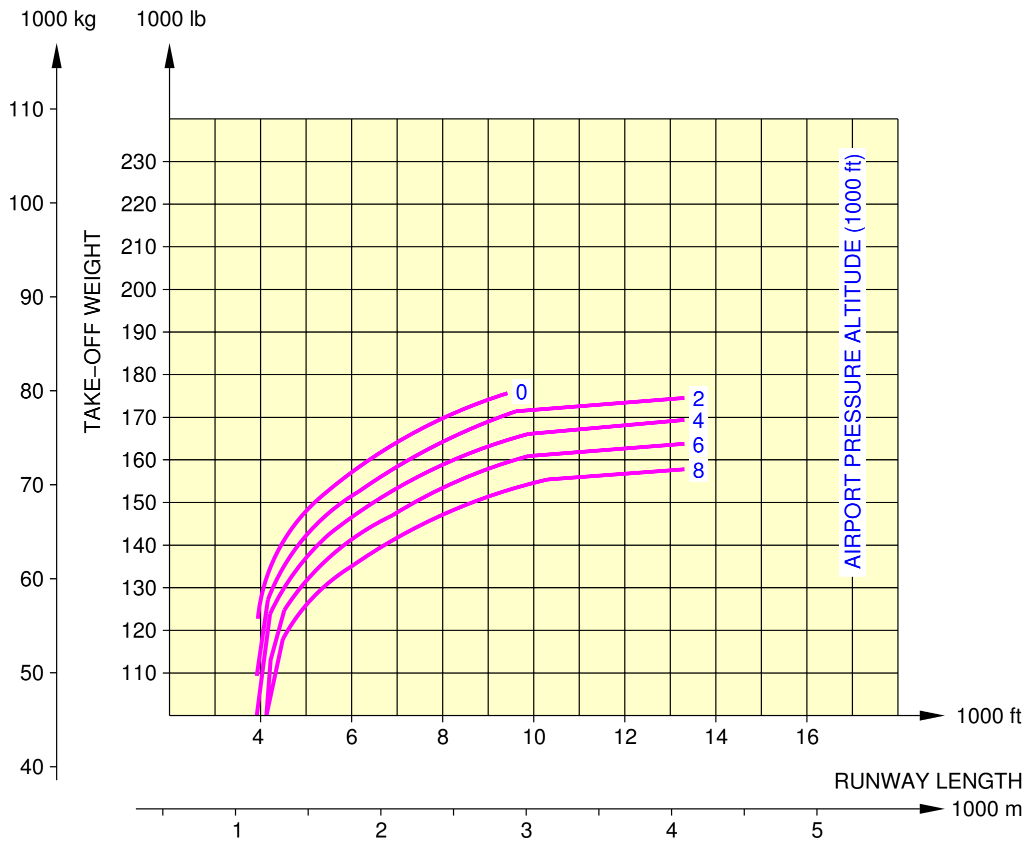
****ON A/C A319-100**

ISA Conditions

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

**ON A/C A319-100

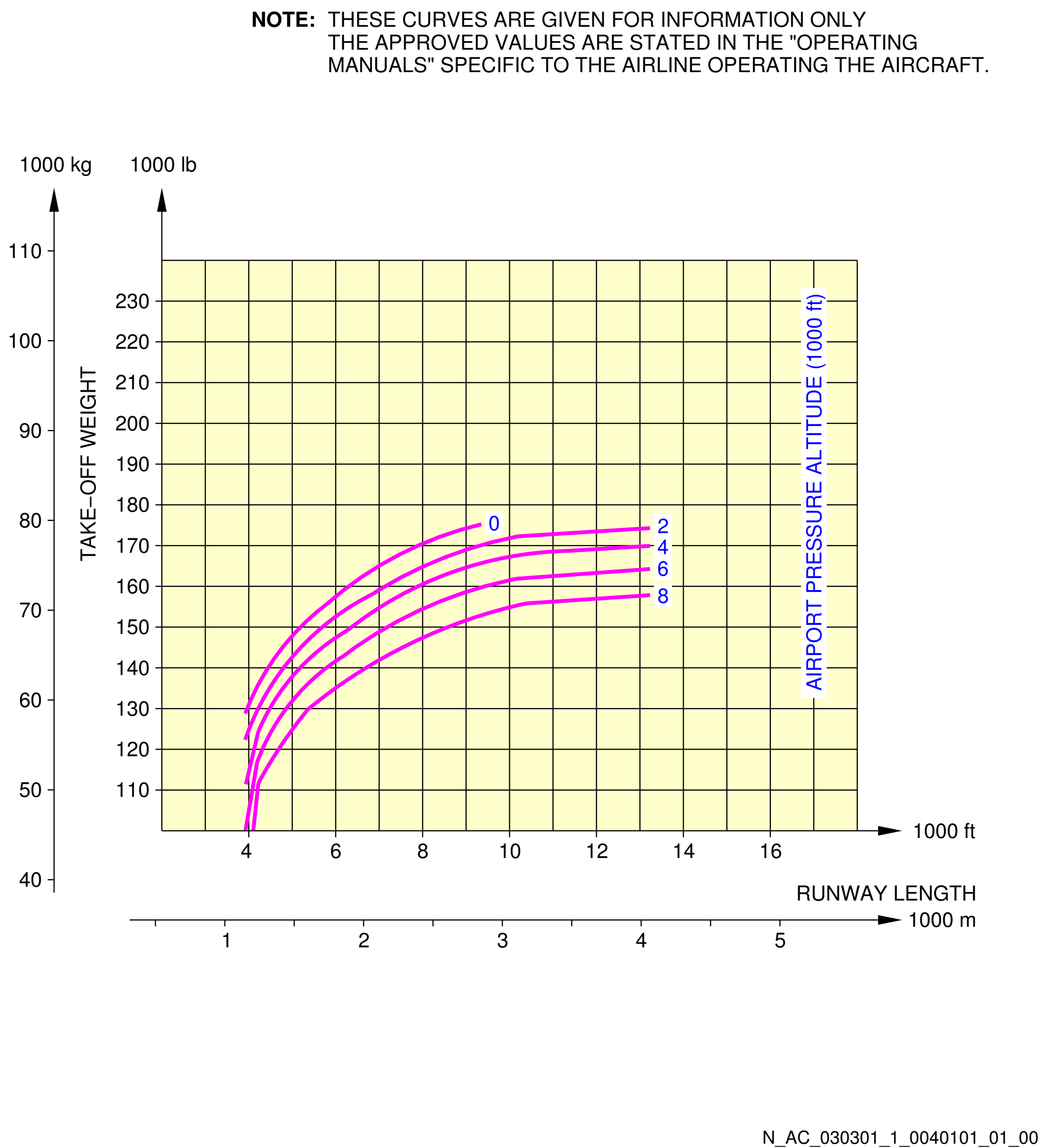
NOTE: THESE CURVES ARE GIVEN FOR INFORMATION ONLY
THE APPROVED VALUES ARE STATED IN THE "OPERATING MANUALS" SPECIFIC TO THE AIRLINE OPERATING THE AIRCRAFT.



N_AC_030301_1_0030101_01_00

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

**ON A/C A319-100



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

3-3-2 ISA +15°C (+59°F) Conditions

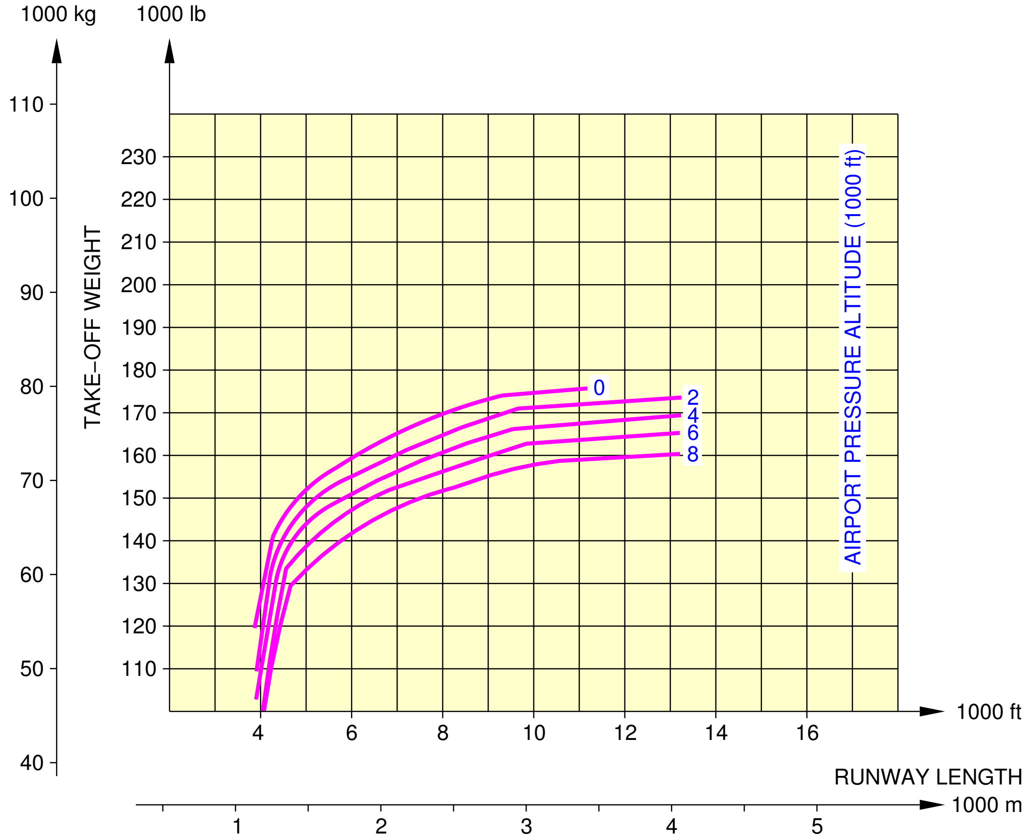
**ON A/C A319-100

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 A319-100

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

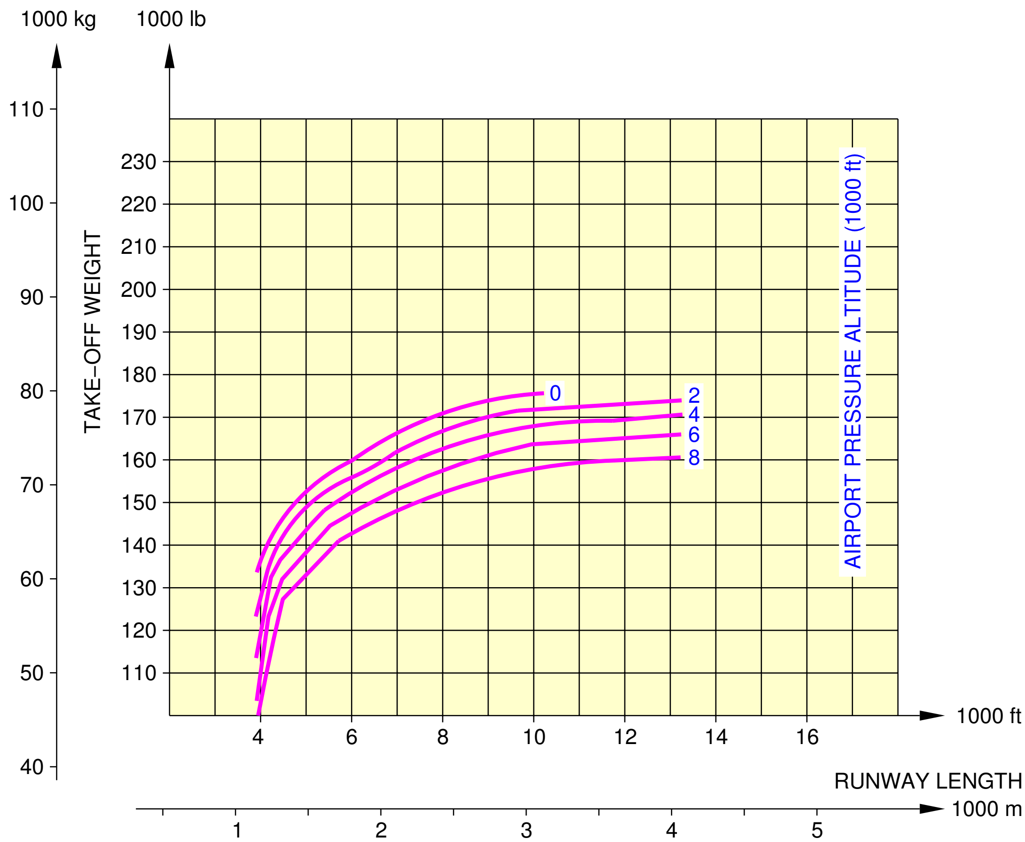


N_AC_030302_1_0030101_01_00

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

**ON A/C A319-100

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_0040101_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 A319-100**

FAR / JAR Landing Field Length

1. FAR / JAR Landing Field Length

3-4-1 ISA Conditions

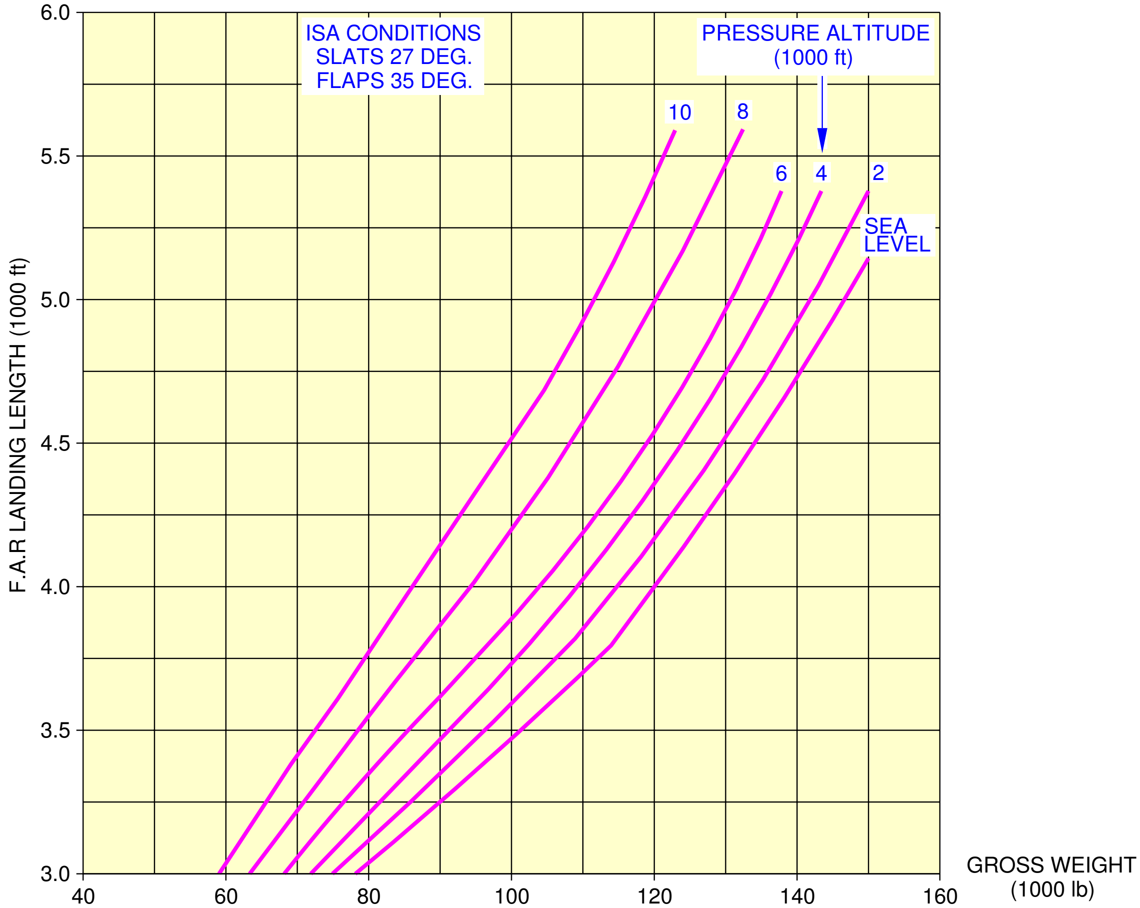
****ON A/C A319-100**

ISA Conditions

1. This section gives the landing field length.

**ON A/C A319-100

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

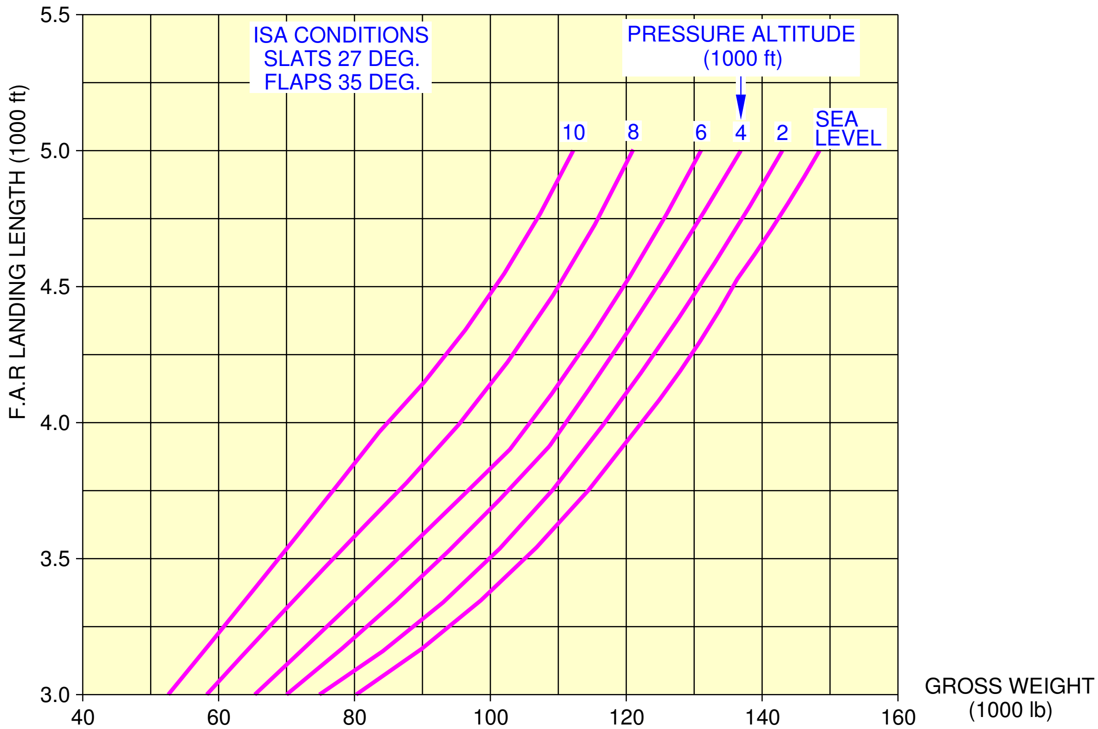


N_AC_030401_1_0030101_01_00

FAR / JAR Landing Field Length
CFM56-5A series engine
FIGURE 1

**ON A/C A319-100

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_030401_1_0040101_01_00

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

3-5-0 Final Approach Speed

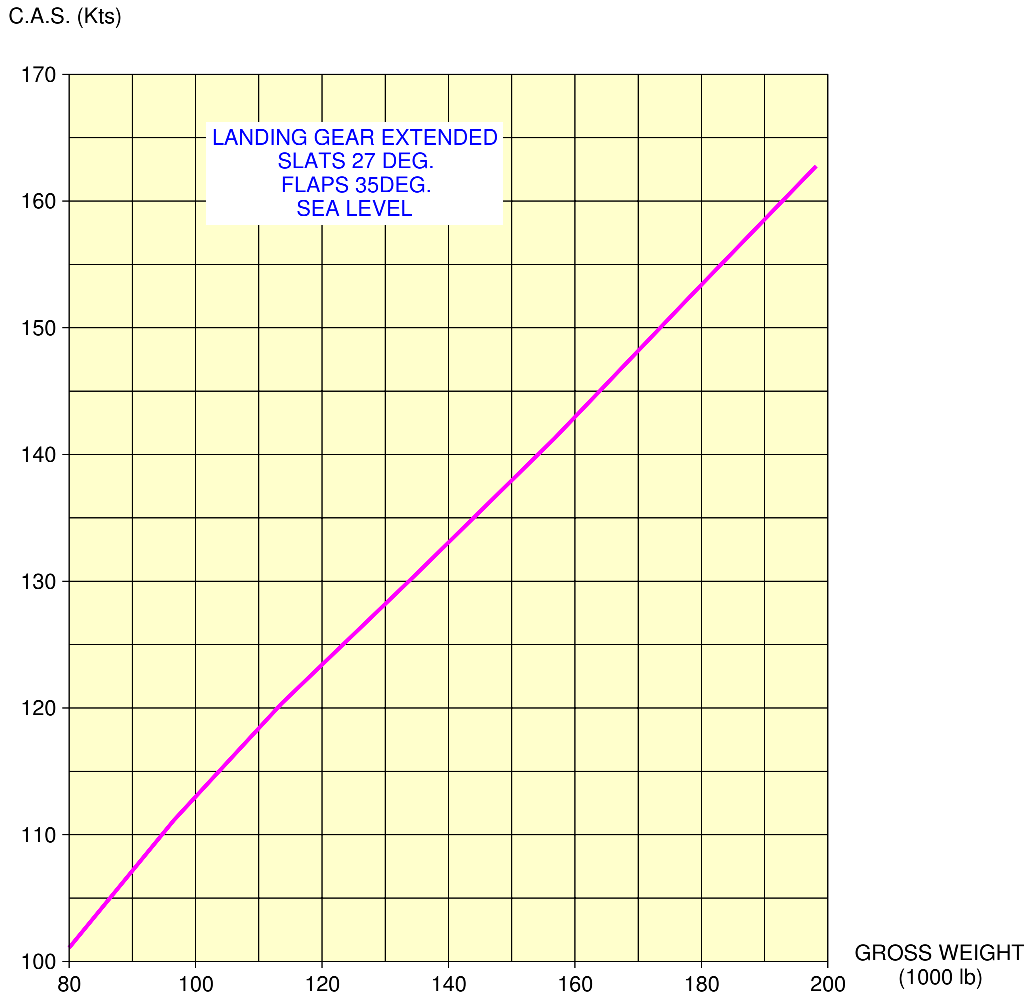
****ON A/C A319-100**

Final Approach Speed

1. This section gives the final approach speed.

**ON A/C A319-100

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



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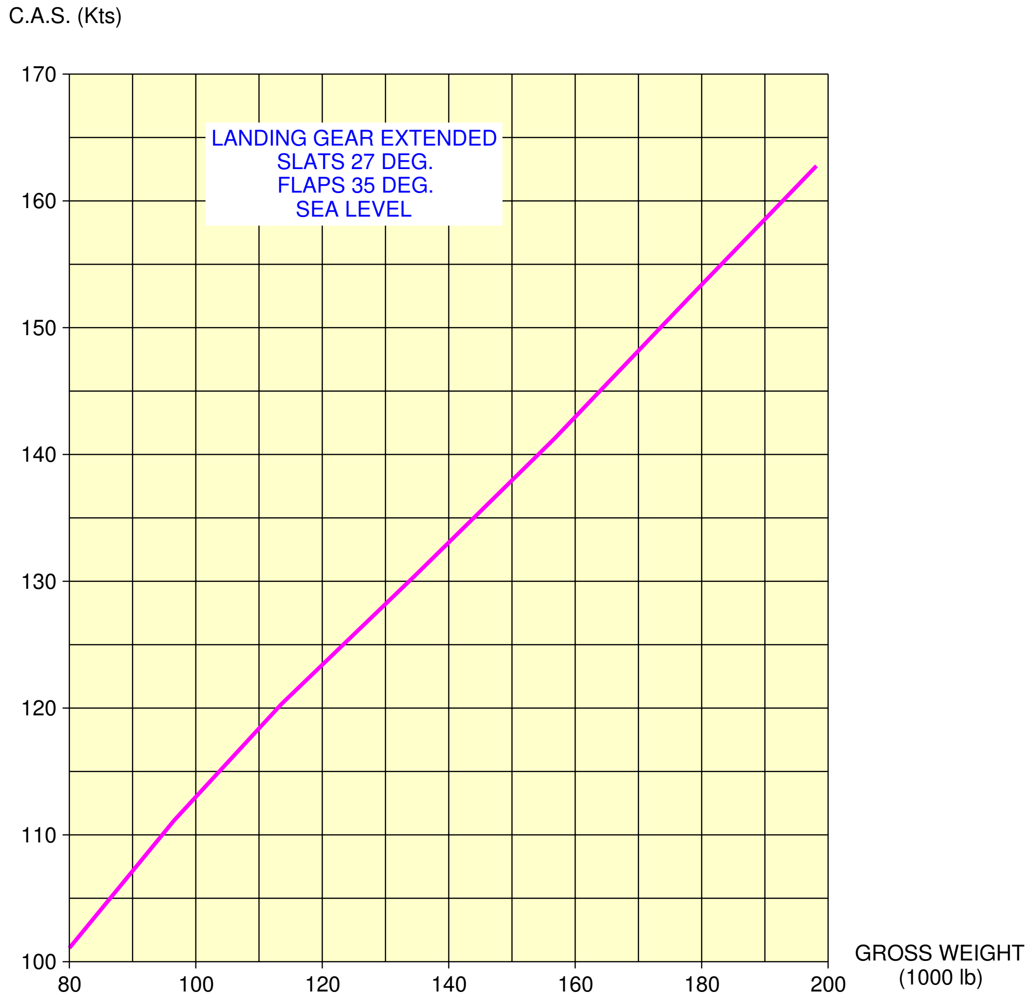
Final Approach Speed
CFM56-5A series engine
FIGURE 1

**ON A/C A319-100

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_0040101_01_00

Final Approach Speed
IAE V2500 series engine
FIGURE 2

GROUND MANEUVERING

4-1-0 General Information

**ON A/C A319-100

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.

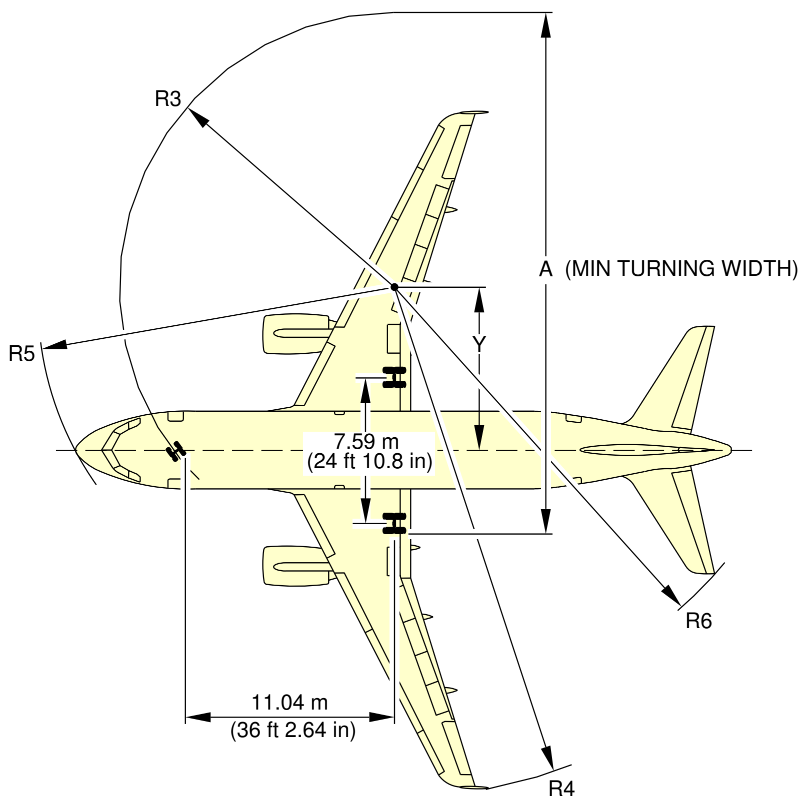
4-2-0 Turning Radii

****ON A/C A319-100**

Turning Radii

1. This section gives the turning radii.

**ON A/C A319-100



NOTE: FOR STEERING DIMENSION TABLE SEE SHEET 2.

TURN TYPE

1. ASYMMETRIC THRUST DIFFERENTIAL BRAKING (PIVOTTING ON ONE MAIN GEAR).
2. SYMMETRIC THRUST NO BRAKING

N_AC_040200_1_0030101_01_01

Turning Radii, no Slip Angle
FIGURE 1

**ON A/C A319-100

TURN TYPE	MAXIMUM RAMP WEIGHT STEERING ANGLE WT.30.3% A319–100	MAXIMUM RAMP WEIGHT STEERING ANGLE WT.31% A319–100 wv 002	EFFECTIVE STEERING ANGLE WITH SLIP ON NLG TYRES	Y m	Y ft	R3 m	R3 ft	R4 m	R4 ft	R5 m	R5 ft	R6 m	R6 ft	A m	A ft
1	–	–	71°	3.79	12.4	12.04	39.5	21.36	70.1	16.55	54.3	19.66	64.5	20.35	66.8
2	75.00°		70°	4.01	13.2	12.11	39.7	21.58	70.8	16.60	54.5	19.77	64.9	20.64	67.7
2		75.00°	70°	3.86	12.7	12.06	39.6	21.43	70.3	16.57	54.4	19.69	64.6	20.44	67.1
2	74.92°	73.91°	70°	4.02	13.2	13.12	39.7	21.58	70.8	16.61	54.5	19.77	64.9	20.64	67.7
2	66.01°	65.92°	65°	5.15	16.9	12.55	41.2	22.69	74.4	16.91	55.5	20.38	66.9	22.21	72.9
2	60.39°	60.40°	60°	6.37	20.9	13.11	43.0	23.89	78.4	17.33	56.8	21.09	69.2	24.00	78.7
2	55.32°	55.32°	55°	7.73	25.4	13.84	45.4	25.22	82.7	17.87	58.6	21.93	71.9	26.08	85.6
2	50.29°	50.28°	50°	9.26	30.4	14.78	48.5	26.73	87.7	18.59	61.0	22.93	75.2	28.55	93.7
2	45.25°	45.24°	45°	11.04	36.2	15.98	52.4	28.48	93.4	19.53	64.1	24.17	79.3	31.53	103.4
2	40.22°	40.21°	40°	13.16	43.2	17.54	57.6	30.57	100.3	20.80	68.2	25.72	84.4	35.21	115.5
2	35.19°	35.18°	35°	15.77	51.7	19.61	64.4	33.15	108.8	22.54	74.0	27.74	91.0	39.89	130.9
2	30.16°	30.15°	30°	19.12	62.7	22.45	73.6	36.47	119.7	25.00	82.0	30.47	100.0	46.08	151.2
2	25.13°	25.12°	25°	23.67	77.7	26.49	86.9	40.99	134.5	28.64	94.0	34.35	112.7	54.67	179.4
2	20.10°	20.10°	20°	30.33	99.5	32.64	107.1	47.61	156.2	34.34	112.7	40.28	132.1	67.49	221.4
2	15.08°	15.07°	15°	41.20	135.2	43.02	141.1	58.44	191.7	44.24	145.1	50.35	165.2	88.73	291.1

N_AC_040200_1_0040101_01_00

Turning Radii, no Slip Angle
FIGURE 2

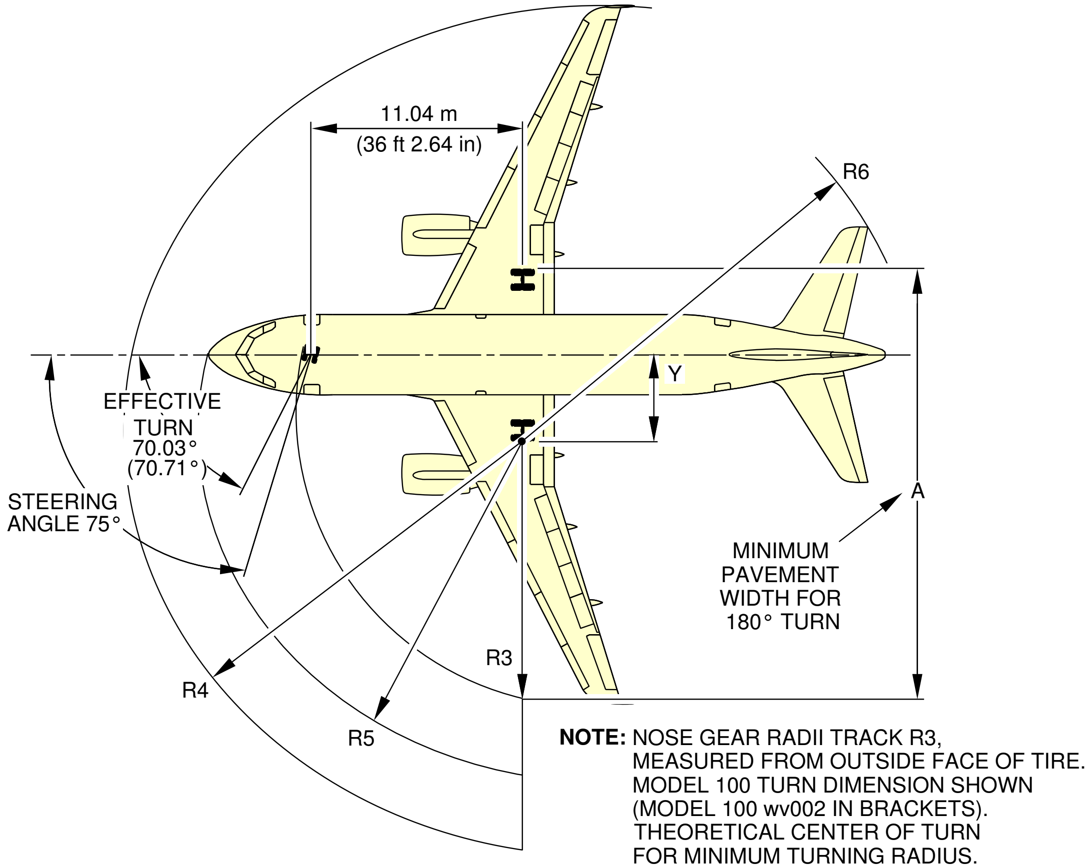
4-3-0 Minimum Turning Radii

****ON A/C A319-100**

Minimum Turning Radii

1. This section gives the minimum turning radii.

**ON A/C A319-100



A319–100 wv002

EFFECTIVE TURN ANGLE		Y	A	R3	R4	R5	R6
70.71° EFF	m	3.86	20.44	12.06	21.43	16.57	19.69
75° STEERED	(ft)	(12.7)	(67.1)	(39.6)	(70.3)	(54.4)	(64.6)

A319–100

EFFECTIVE TURN ANGLE		Y	A	R3	R4	R5	R6
70.03° EFFST	m	4.01	20.64	12.11	21.58	16.60	19.77
75° STEERED	(ft)	(13.2)	(67.7)	(39.7)	(70.8)	(54.5)	(64.9)

N_AC_040300_1_0020101_01_01

Minimum Turning Radii
FIGURE 1

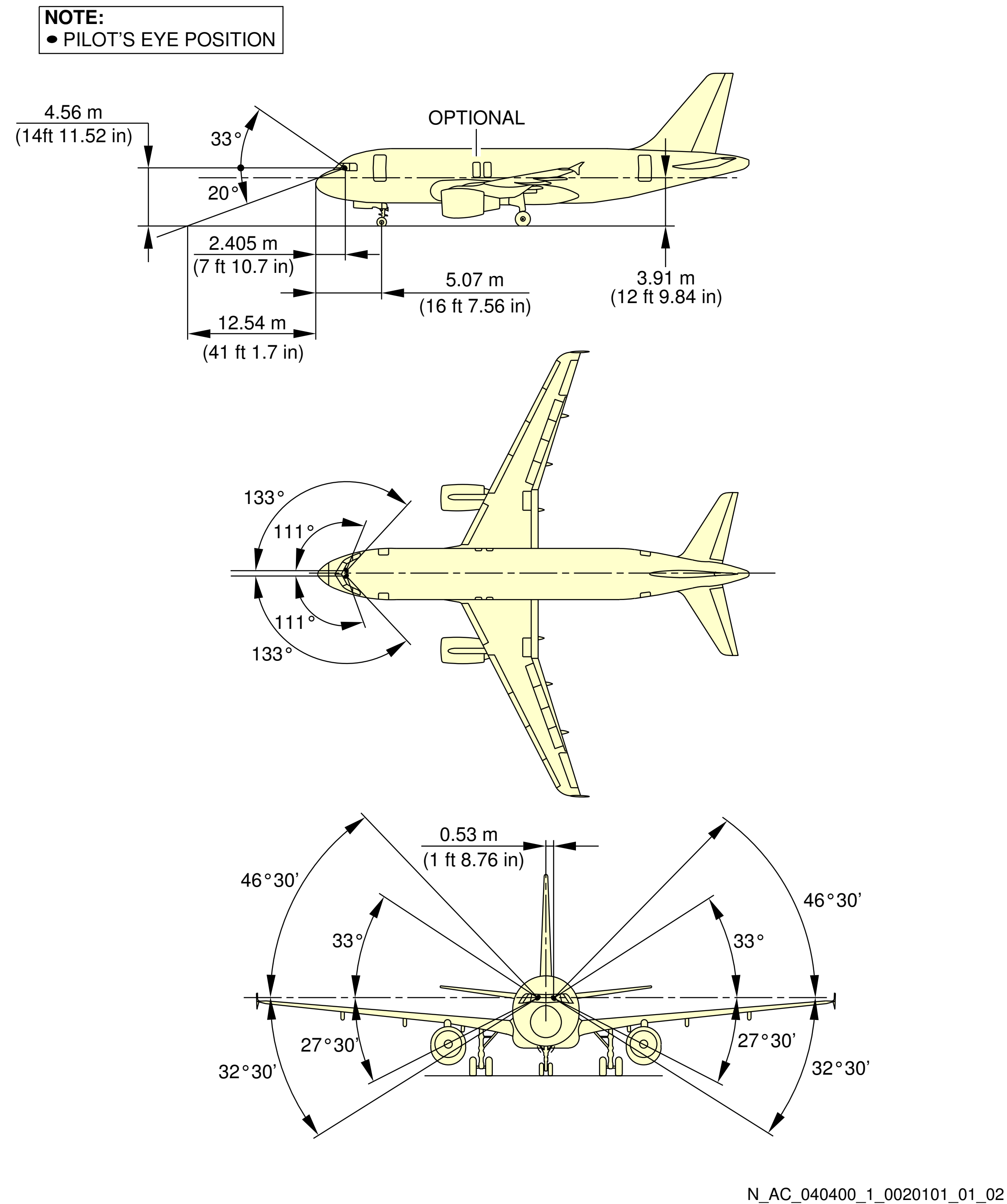
4-4-0 Visibility from Cockpit in Static Position

****ON A/C A319-100**

Visibility from Cockpit in Static Position

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

**ON A/C A319-100



Visibility from Cockpit in Static Position
FIGURE 1

4-5-0 Runway and Taxiway Turn Paths

**ON A/C A319-100

Runway and Taxiway Turn Paths

1. Runway and Taxiway Turn Paths.

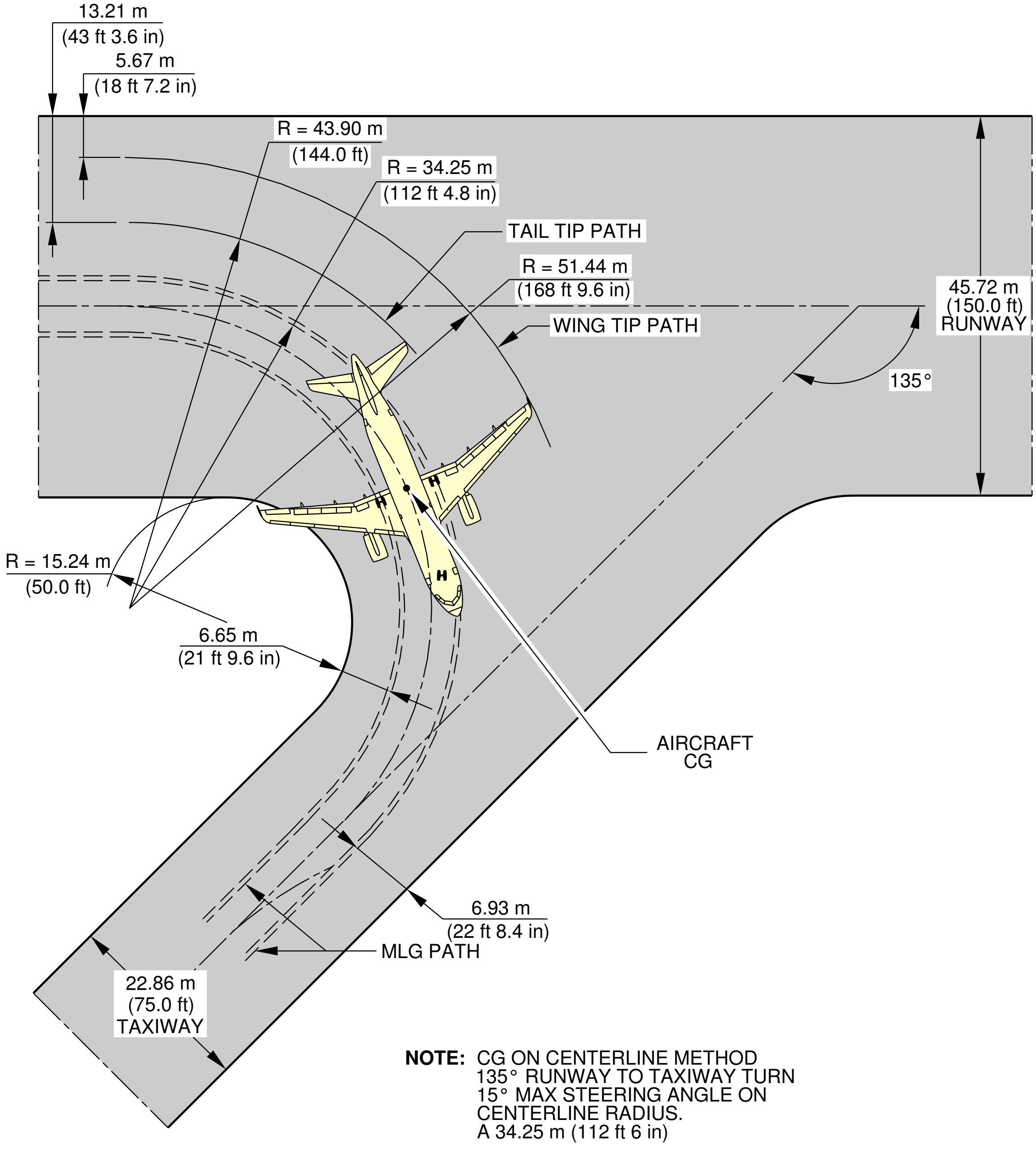
4-5-1 135° Turn - Runway to Taxiway

****ON A/C A319-100**

135° Turn - Runway to Taxiway

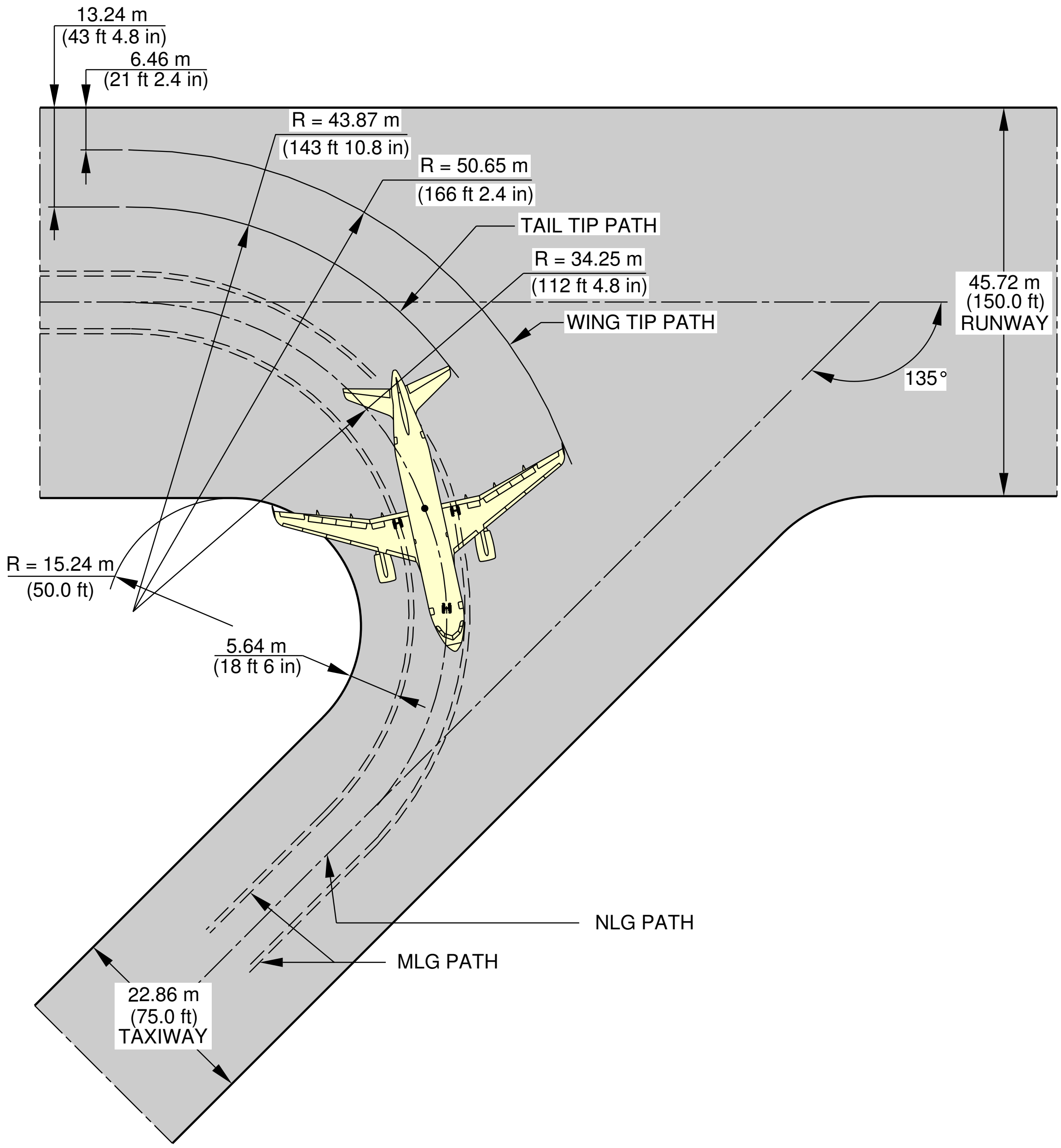
1. This section gives the 135° turn - runway to taxiway.

**ON A/C A319-100



135° Turn - Runway to Taxiway
CG on Centerline Method
FIGURE 1

**ON A/C A319-100



NOTE: NLG ON CENTERLINE METHOD 135° RUNWAY TO TAXIWAY TURN 15° MAX STEERING ANGLE ON A 34.25 m (112 ft 6 in) CENTERLINE RADIUS.

N_AC_040501_1_0030101_01_01

135° Turn - Runway to Taxiway
NLG on Centerline Method
FIGURE 2

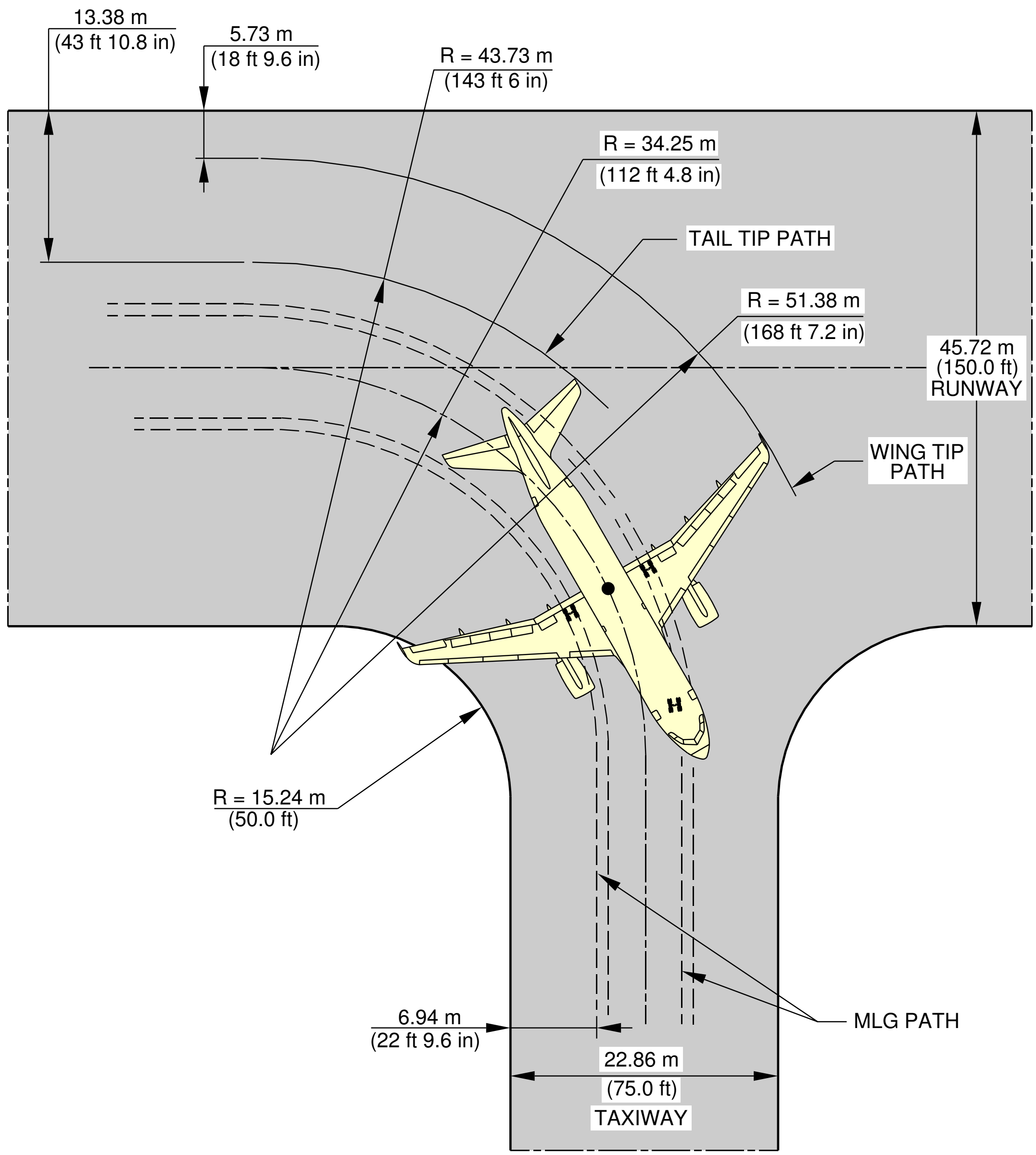
4-5-2 90° Turn - Runway to Taxiway

****ON A/C A319-100**

90° Turn - Runway to Taxiway

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

**ON A/C A319-100

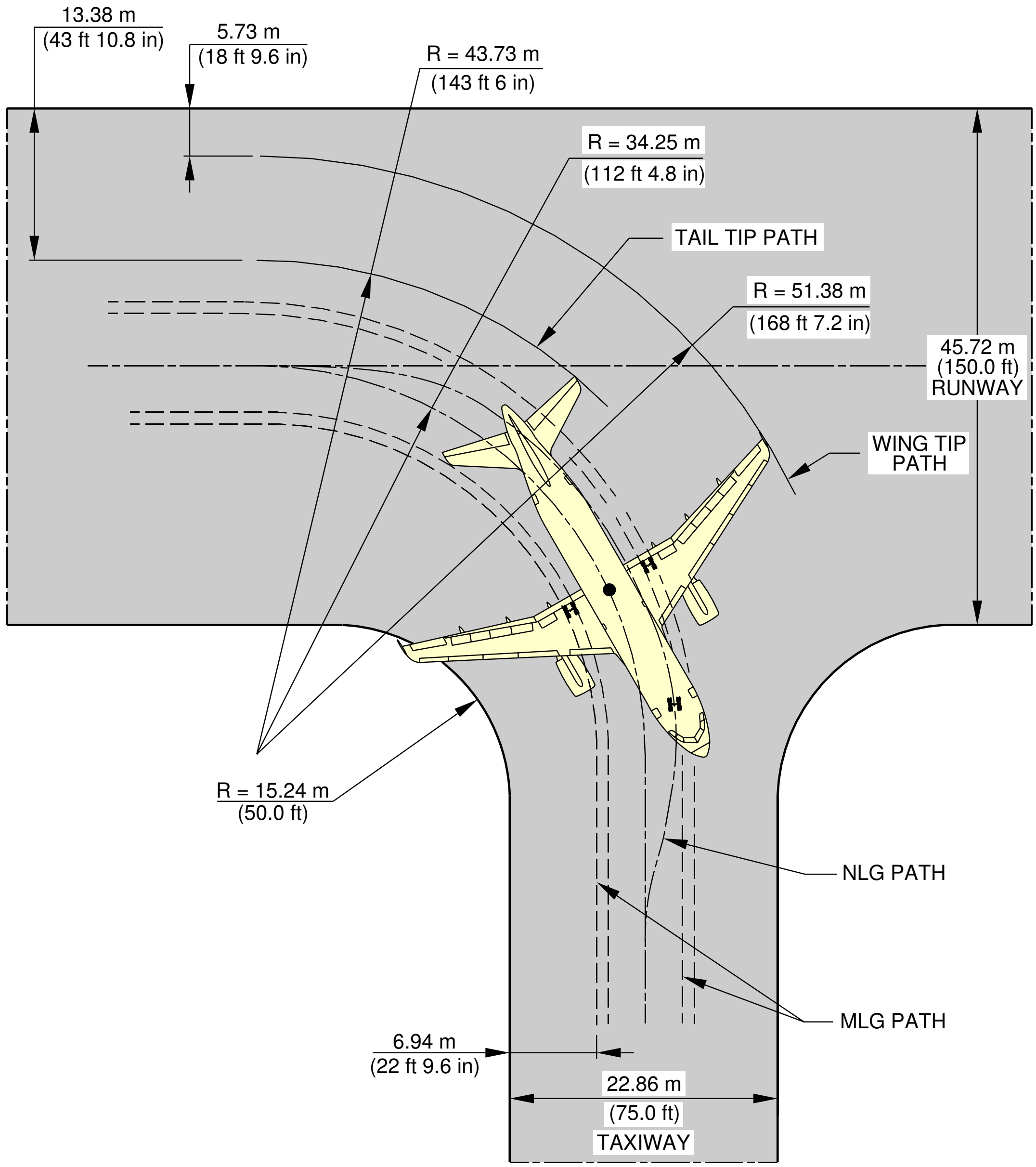


NOTE: C.G. ON CENTERLINE METHOD
90° RUNWAY TO TAXIWAY TURN
15° MAX. STEERING ANGLE
ON A 34.25 m (112 ft 6 in) CENTERLINE RAD.

N_AC_040502_1_0020101_01_00

90° Turn - Runway to Taxiway
CG on Centerline Method
FIGURE 1

**ON A/C A319-100



NOTE: NLG ON CENTERLINE METHOD
90° RUNWAY TO TAXIWAY TURN
15° MAX. STEERING ANGLE
ON A 34.25 m (112 ft 6 in) CENTERLINE RAD.

N_AC_040502_1_0030101_01_00

90° Turn - Runway to Taxiway
NLG on Centerline Method
FIGURE 2

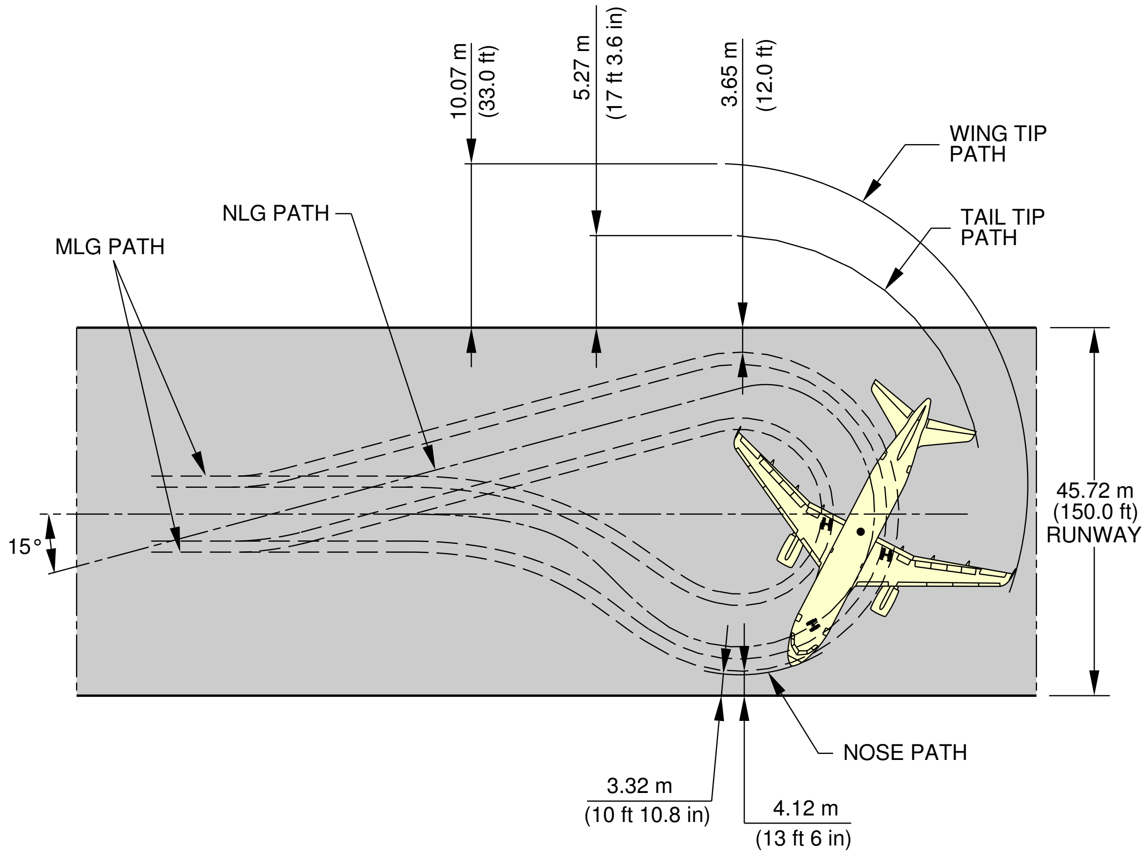
4-5-3 180° Turn on a Runway

****ON A/C A319-100**

180° Turn on a Runway

1. This section gives the 180° turn on a runway.

**ON A/C A319-100



NOTE: NLG ON CENTERLINE METHOD.
180° ANGLED TURN ON A 150 ft RUNWAY.
40° MAX TURN ANGLE, 17.17 m (56 ft 4.08 in)
CENTERLINE RADIUS.

N_AC_040503_1_0010101_01_01

180° Turn on a 150 ft Runway
NLG on Centerline Method
FIGURE 1

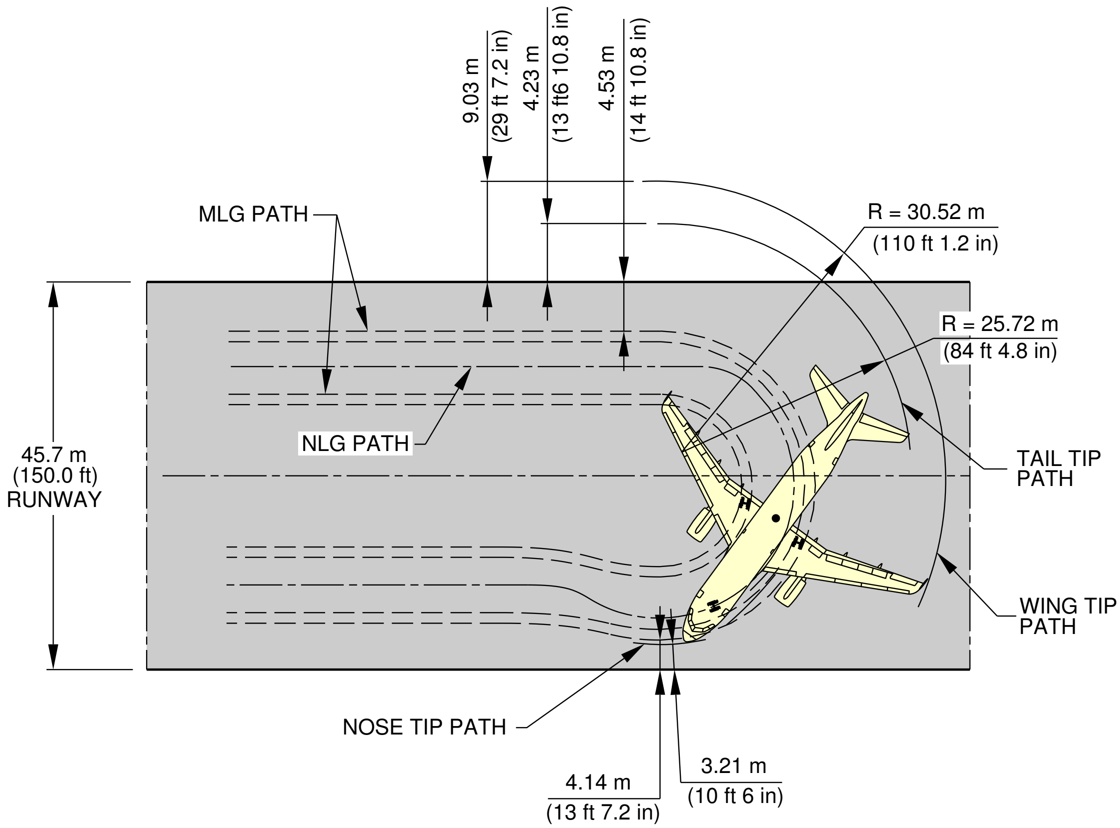
4-5-6 180° Turn on a Wide Runway

****ON A/C A319-100**

180° Turn on a Wide Runway

1. This section gives the 180° turn on a wide runway.

**ON A/C A319-100



NOTE: EDGE OF RUNWAY METHOD.
180° PARALLEL TURN ON A 150 ft WIDE RUNWAY.
40° MAX. TURN ANGLE ON A 17.17 m (56 ft 4.08 in)
CENTERLINE RADIUS.

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180° Parallel Turn on a 150 ft Wide Runway
Edge of Runway Method
FIGURE 1

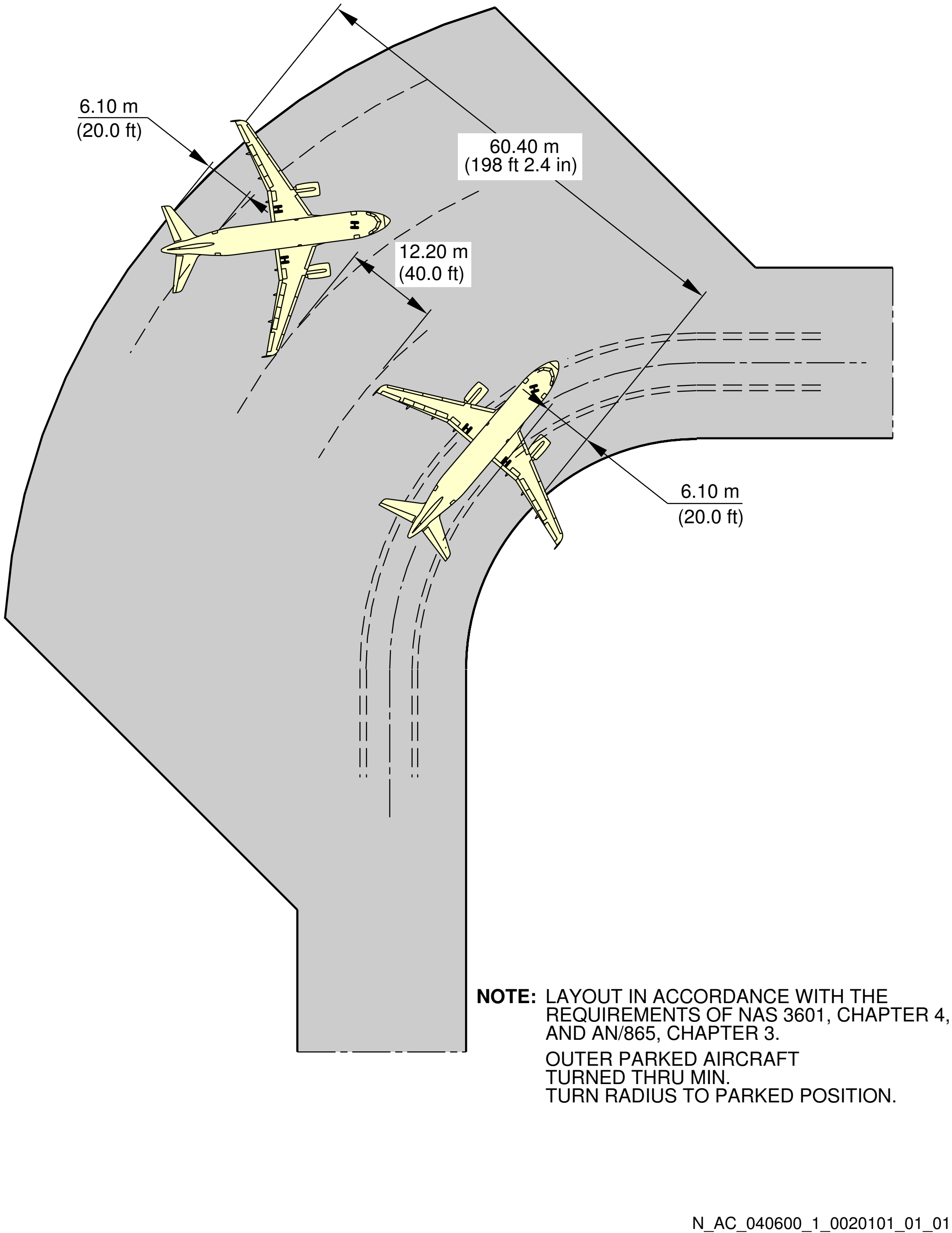
4-6-0 Runway Holding Bay (Apron)

****ON A/C A319-100**

Runway Holding Bay (Apron)

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

**ON A/C A319-100



Runway Holding Bay (Apron)
FIGURE 1

4-7-0 Airplane Parking

****ON A/C A319-100**

Airplane Parking

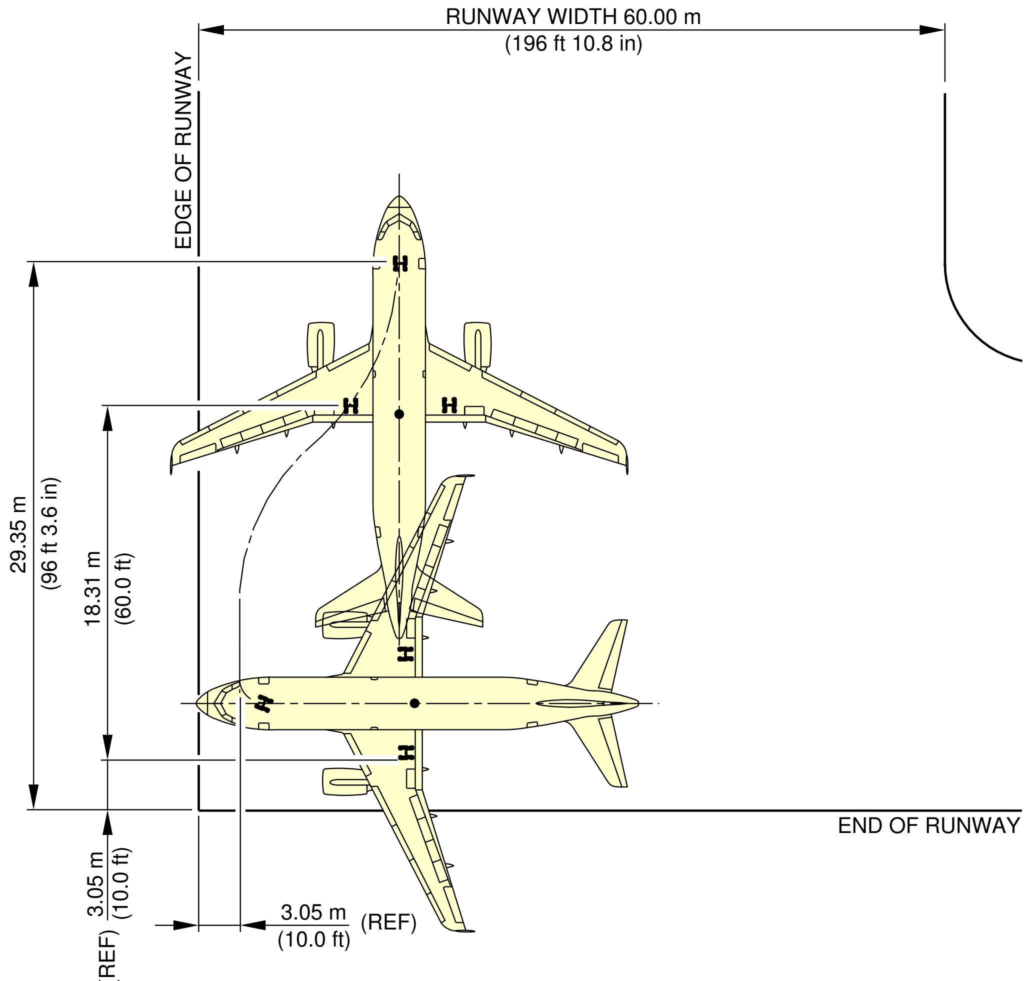
1. The following figures and charts show the rectangular space required for parking against the terminal building.

AIRPLANE MODEL	MAX. EFF. STEERING	MIN. LINE UP DISTANCE	
90° TURN	ANGLE DEGREES	TODA m (ft)	ASDA m (ft)
A319	69	12.07 (39.6)	23.11 (75.8)

AIRPLANE MODEL	MIN. LINE UP DISTANCE		REQUIRED MIN. PAVEMENT WIDTH	NOMINAL LINE UP DISTANCE	
180° TURN	TODA m (ft)	ASDA m (ft)	m (ft)	TODA m (ft)	ASDA m (ft)
A319	15.34 (50.3)	26.38 (86.5)	27.4 (89.9)	21.58 (70.8)	32.62 (107.0)

Abbreviations:
- TODA (Take-Off Distance Adjustment)
- ASDA (Accelerate-Stop Distance Adjustment)

**ON A/C A319-100



NOTE: 69° STEERING AND NO SLIP ON NLG TIRES.

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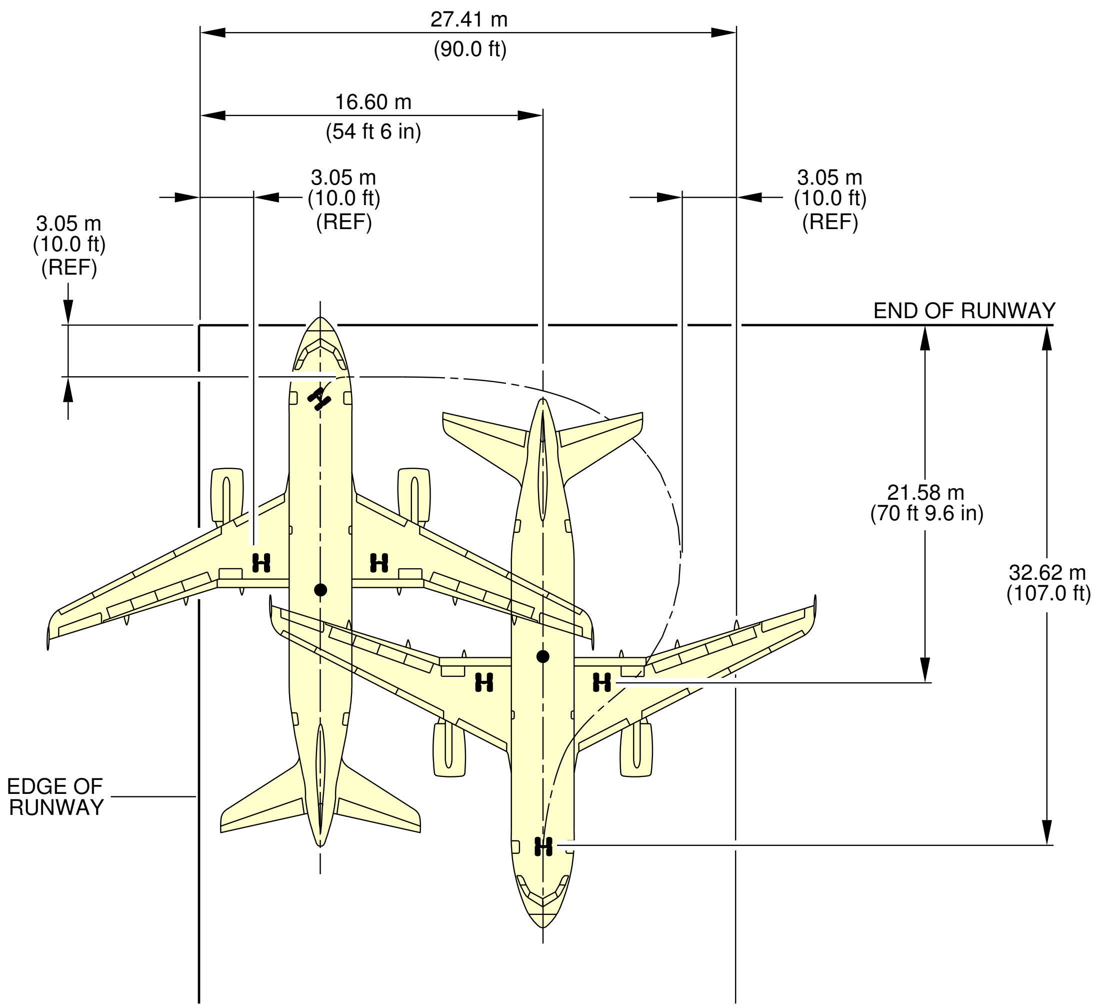
Runway Length Alterations
Line Up Distances – 90° Turn
FIGURE 1

**ON A/C A319-100



NOTES: 69° STEERING AND NO SLIP ON NLG TIRES.

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Runway Length Alterations
Line Up Distances – 180° Turn
FIGURE 2

TERMINAL SERVICING

5-0-0 TERMINAL SERVICING

**ON A/C A319-100

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 A319-100**

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 A319-100**

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

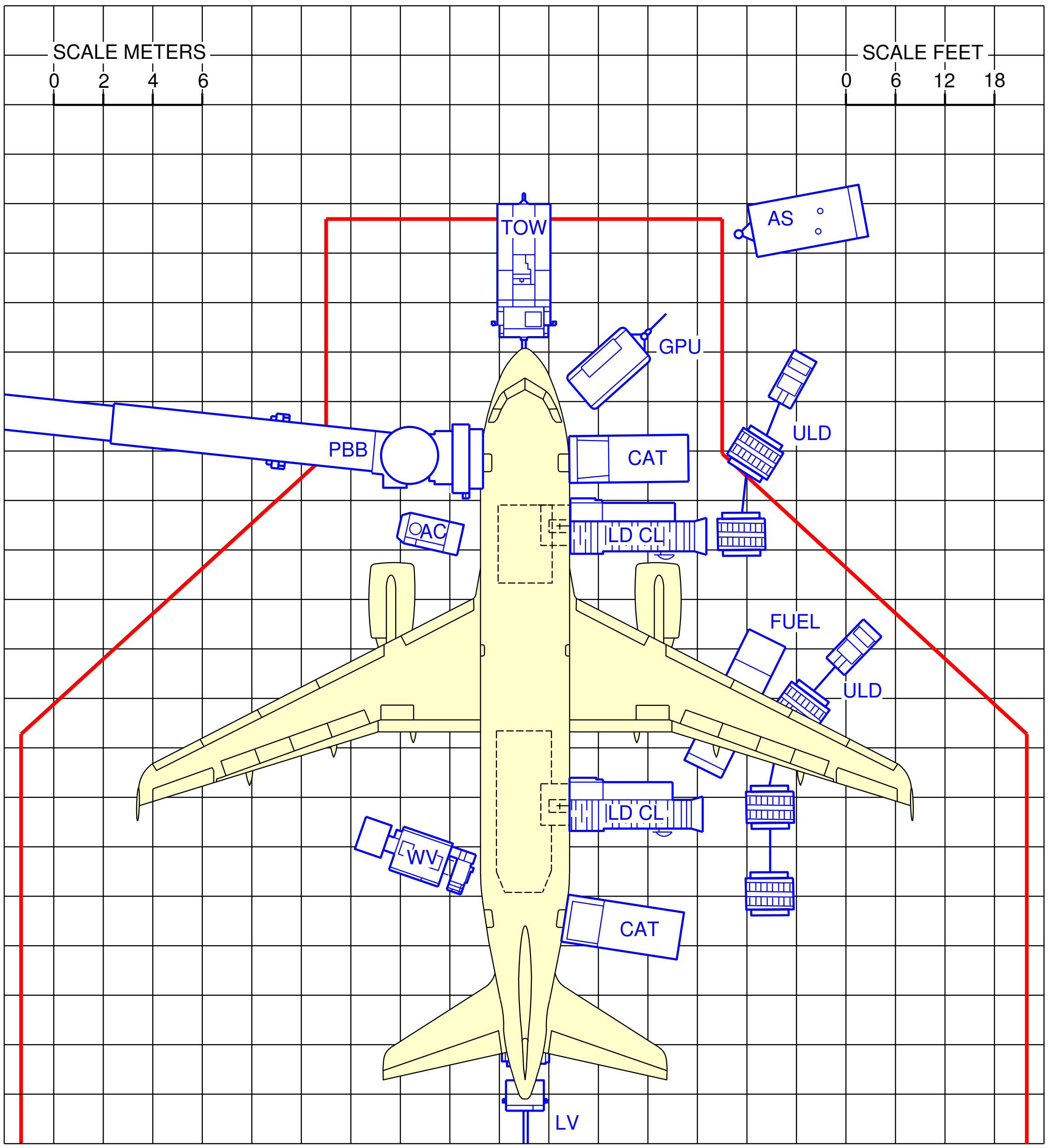
5-1-2 Typical Ramp Layout - Aircraft at the Gate

**ON A/C A319-100

Aircraft at the Gate

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

**ON A/C A319-100



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Aircraft at the Gate
FIGURE 1

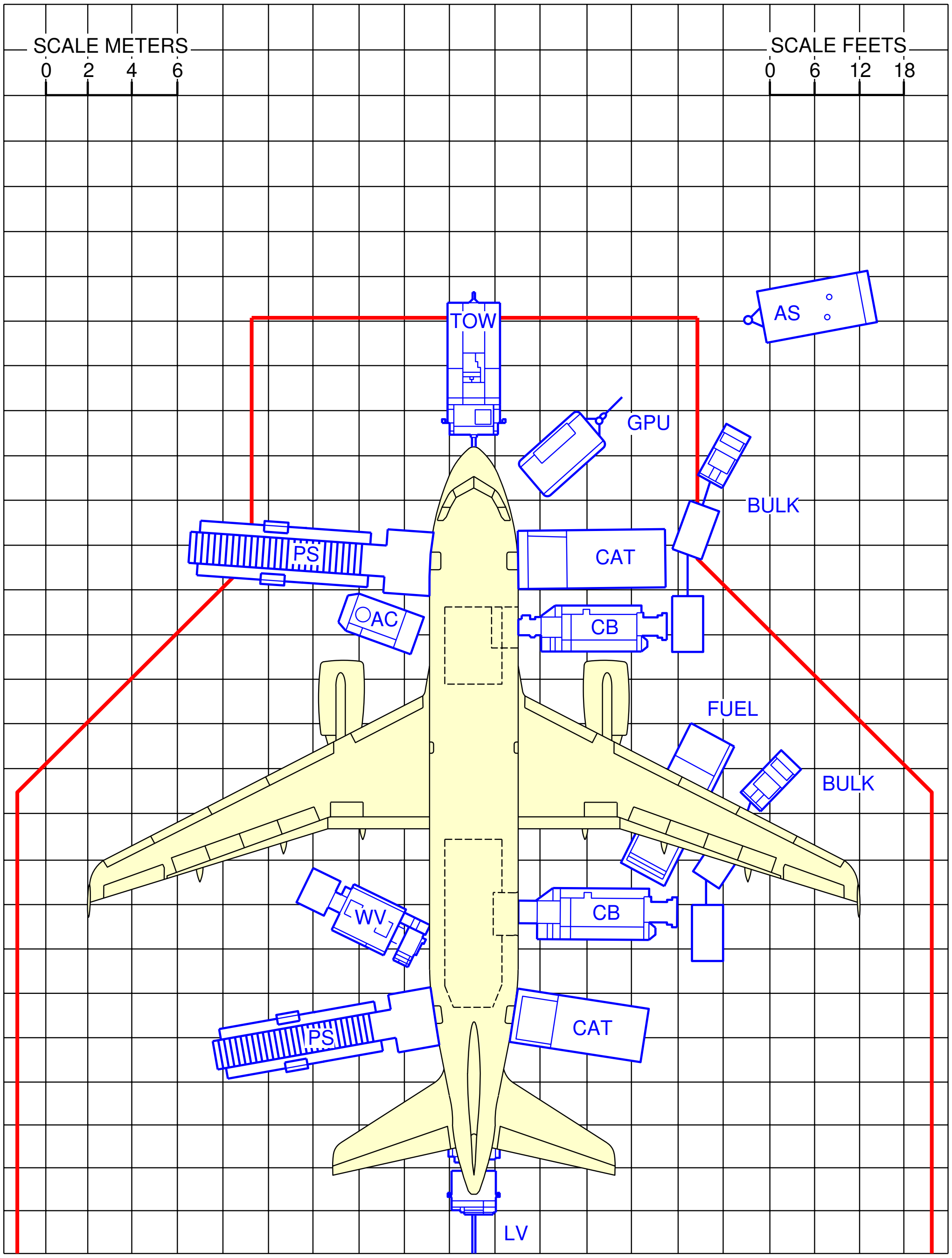
5-1-3 Typical Ramp Layout - Aircraft at an Open Apron

**ON A/C A319-100

Aircraft at an Open Apron

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

**ON A/C A319-100



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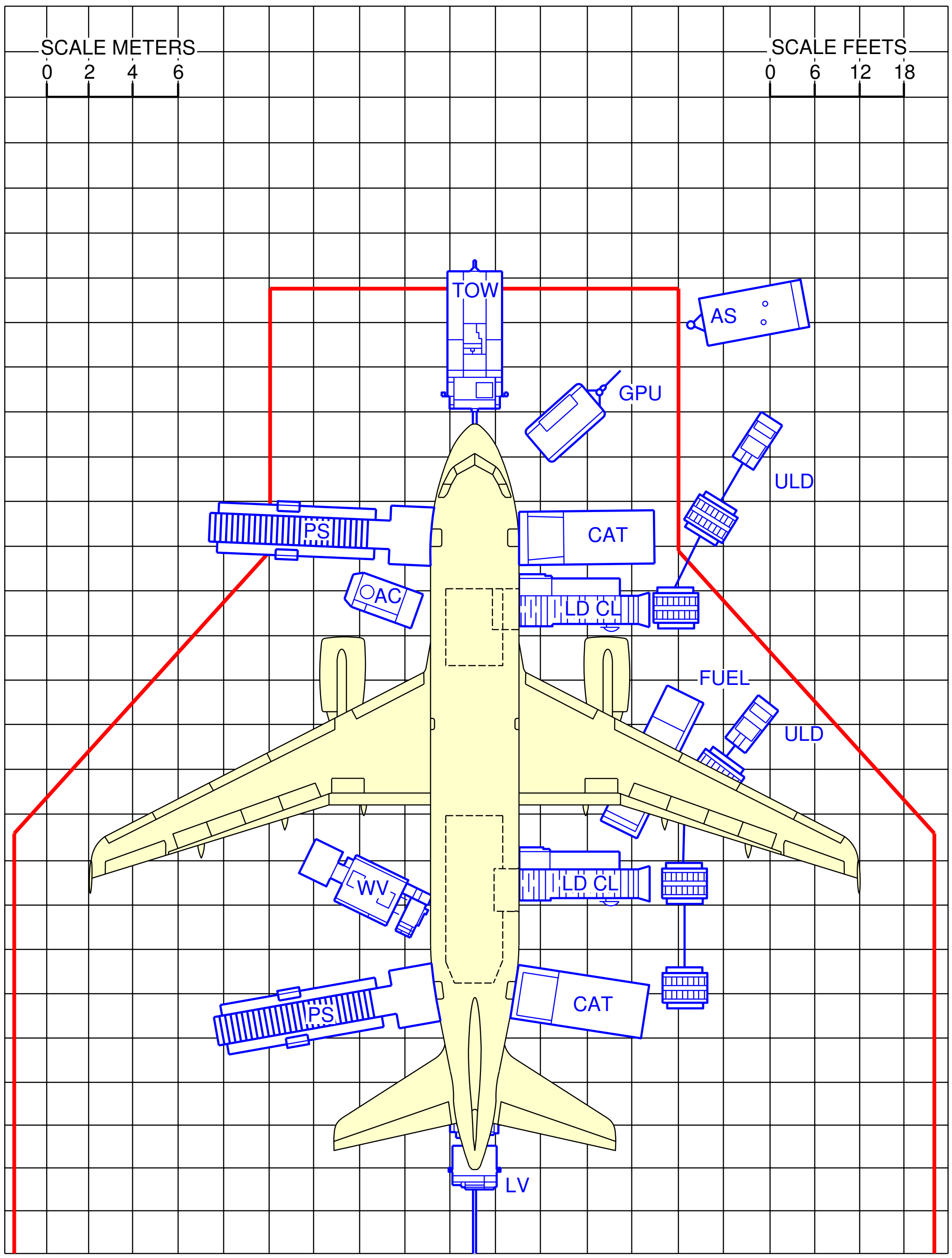
Aircraft at an Open Apron
Aircraft at an Open Apron (Bulk Loading)
FIGURE 1

**ON A/C A319-100



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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 A319-100

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 A319-100**

Full Servicing Turnaround Charts

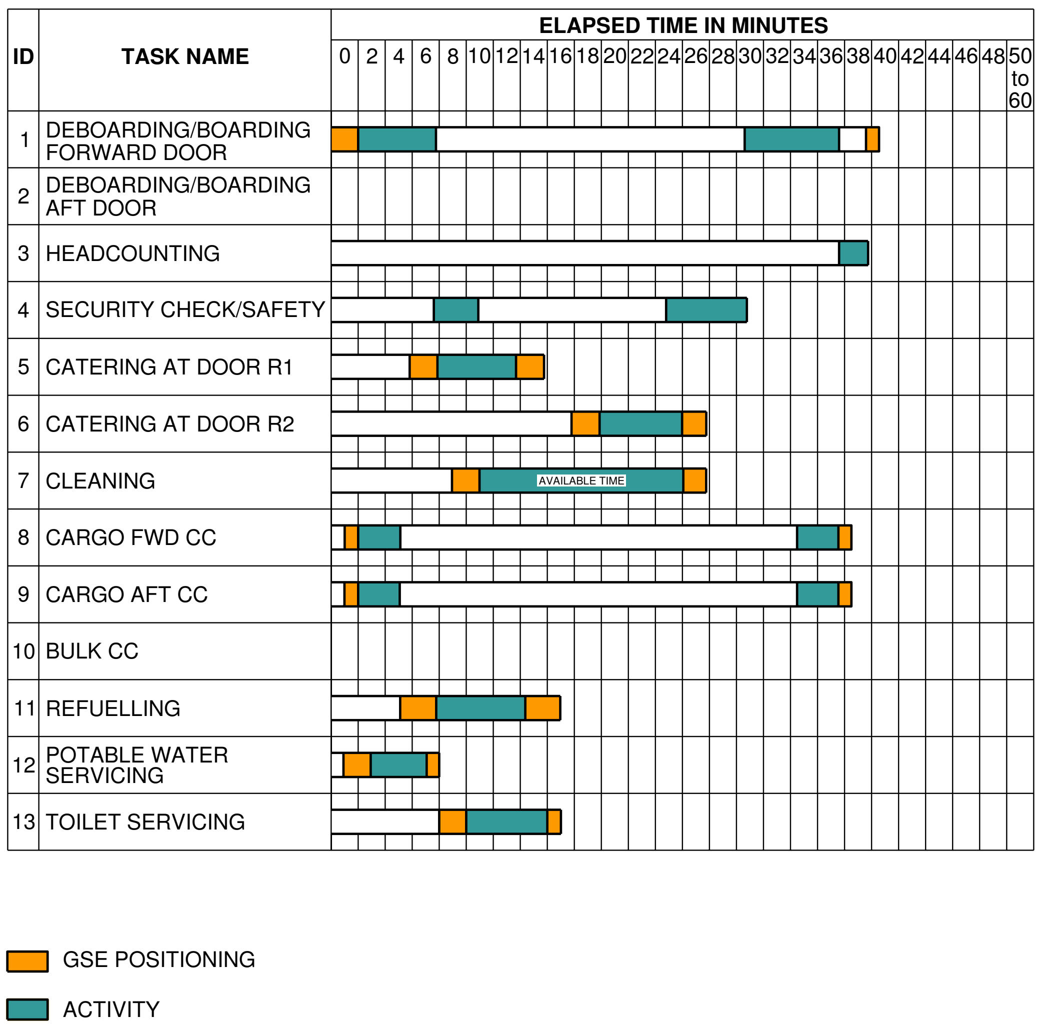
1. Assumptions for 41 minutes turnaround chart - Full Servicing.

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

   A. Passenger handling: 124 pax / 1 bridge
      (1) Deboarding
         - 1L:124
         - 2L:0
         - Deboarding rate: 22 pax / min per door.
         - No PRM
      (2) Boarding
         - 1L:124
         - 2L:0
         - Boarding rate: 18 pax / min per door.
         - No PRM
   B. Catering: R1 - R 2 / sequential
      - Galley M1: 4 FSTE
      - Galley M2: 4 FSTE
   C. Cleaning: Time available
   D. Security/Safety checks: Yes (3 min each)
      - Cabin crew change: Yes (3min)
   E. Cargo
      - ULD only
      - 2 Cargo loaders
      - FWD compartment : 2 LD3
      - AFT compartment : 2 LD3
   F. Refuel: 5.2 tons, 6624 (l), 2 hoses (1 side)
   G. Water servicing: 100%
   H. Toilet servicing: 100%

**ON A/C A319-100

TRT: 41 min



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Turnaround Stations
Full Servicing (41 Min.)
FIGURE 1

5-3-0 Terminal Operation - Minimum Servicing Turnaround

**ON A/C A319-100

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 A319-100**

Minimum Servicing Turnaround Chart

1. Assumptions for 21 minutes turnaround chart - Minimum servicing.

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

   A. Passenger handling: 156 pax / 2 stairways

      (1) Deboarding
         - 1L:78
         - 2L:78
         - Deboarding rate: 20 pax / min per door.
         - No PRM

      (2) Boarding
         - 1L:78
         - 2L:78
         - Boarding rate: 15 pax / min per door.
         - No PRM

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

   C. Cleaning: No

   D. Security/Safety checks: Yes (3 min each)
      - Cabin crew change: No

   E. Cargo
      - ULD only
      - 2 Cargo loaders
      - FWD compartment bulk: 2 LD3
      - AFT compartment bulk: 2 LD3

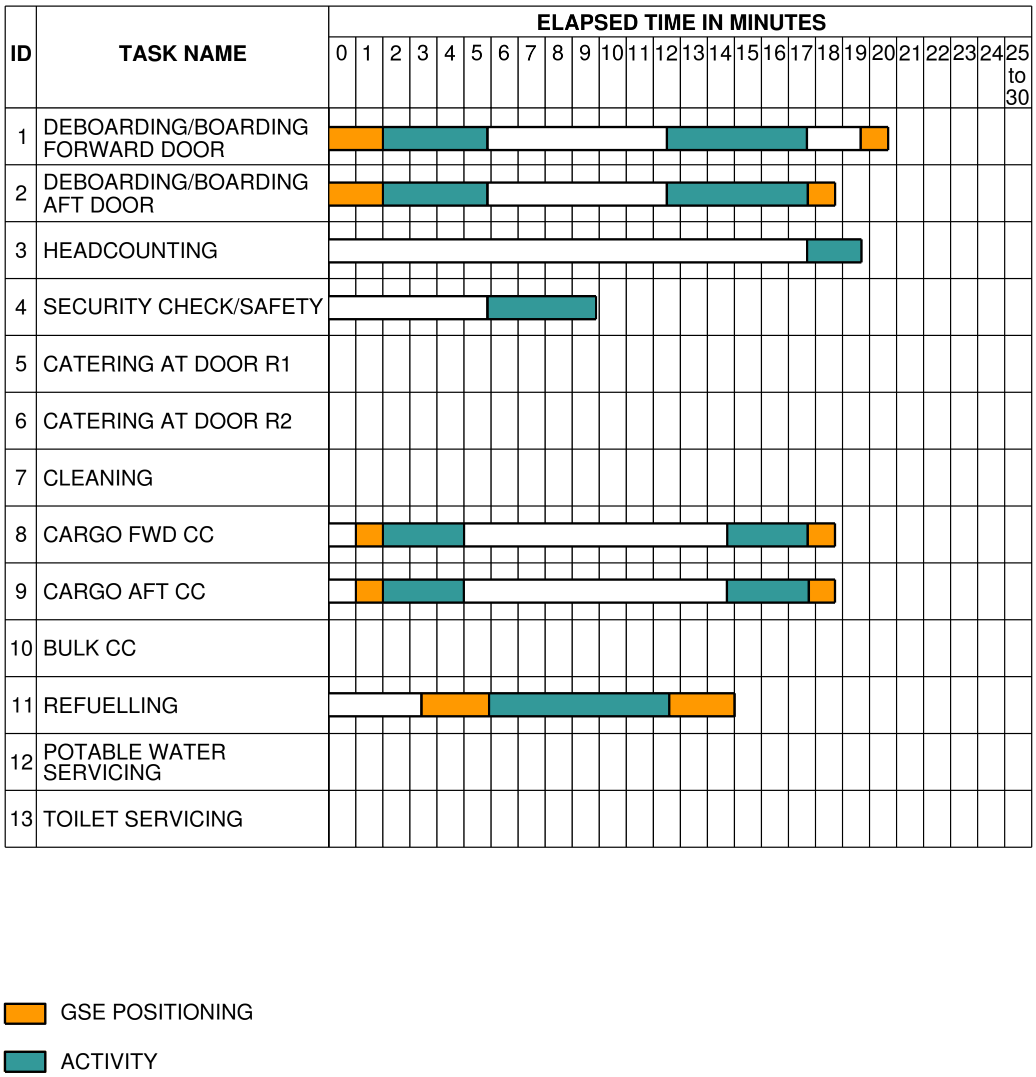
   F. Refuel: 5.2 tons, 6624 (l), 2 hoses (1 side)

   G. Water servicing: 0%:

   H. Toilet servicing: 0%

**ON A/C A319-100

TRT: 21 min



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Turnaround Stations
Minimum Servicing (21 Min.)
FIGURE 1

5-4-0 Ground Service Connections

****ON A/C A319-100**

Ground Service Connections

1. Ground Service Connections.

5-4-1 Ground Service Connections Layout

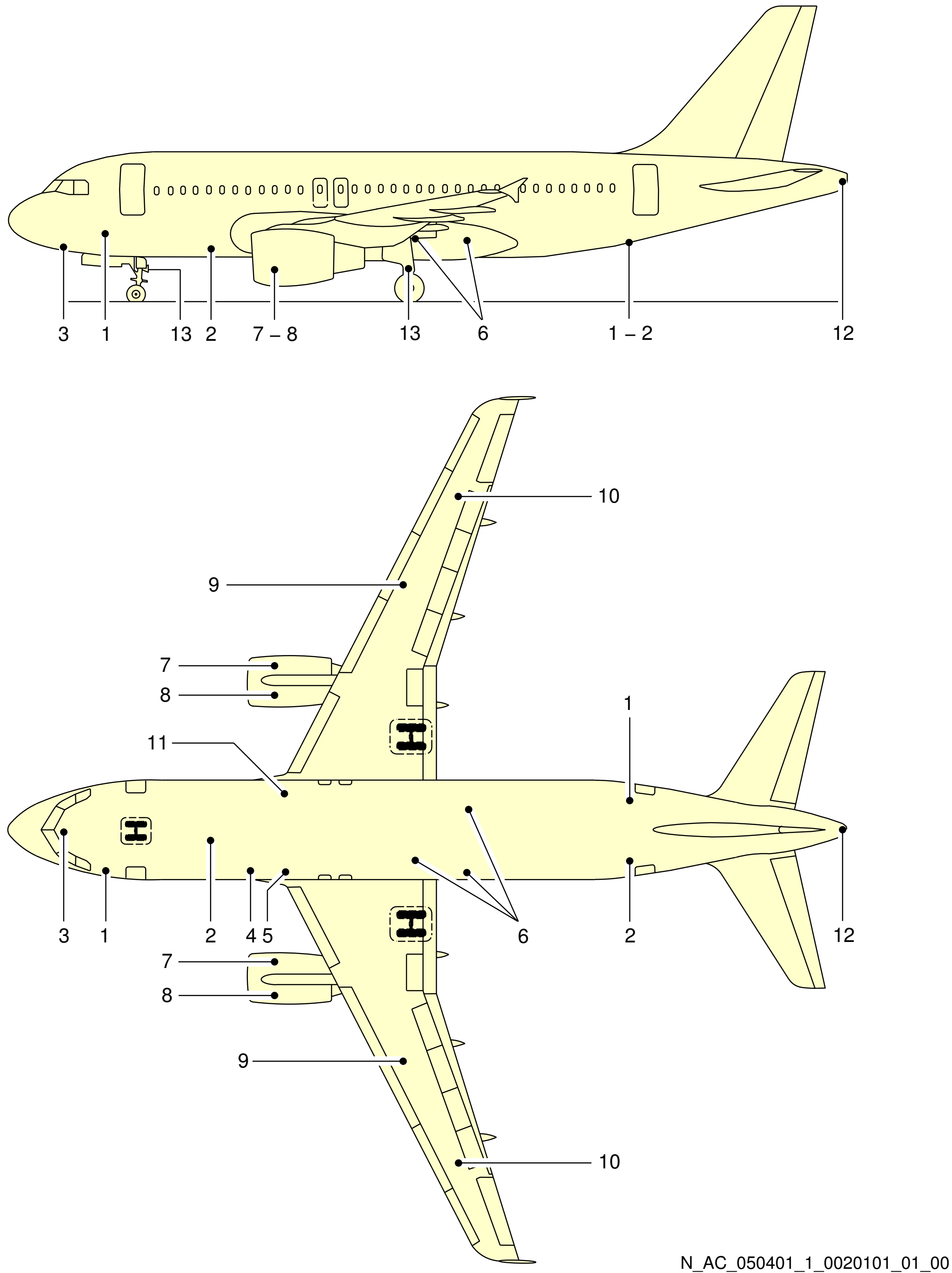
**ON A/C A319-100

Ground Service Connections Layout

1. This section gives the ground service connections layout.

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

**ON A/C A319-100



Ground Service Connections
Ground Service Connections Layout
FIGURE 1

5-4-2 Grounding Points

**ON A/C A319-100

Grounding Points

1. Grounding Points.

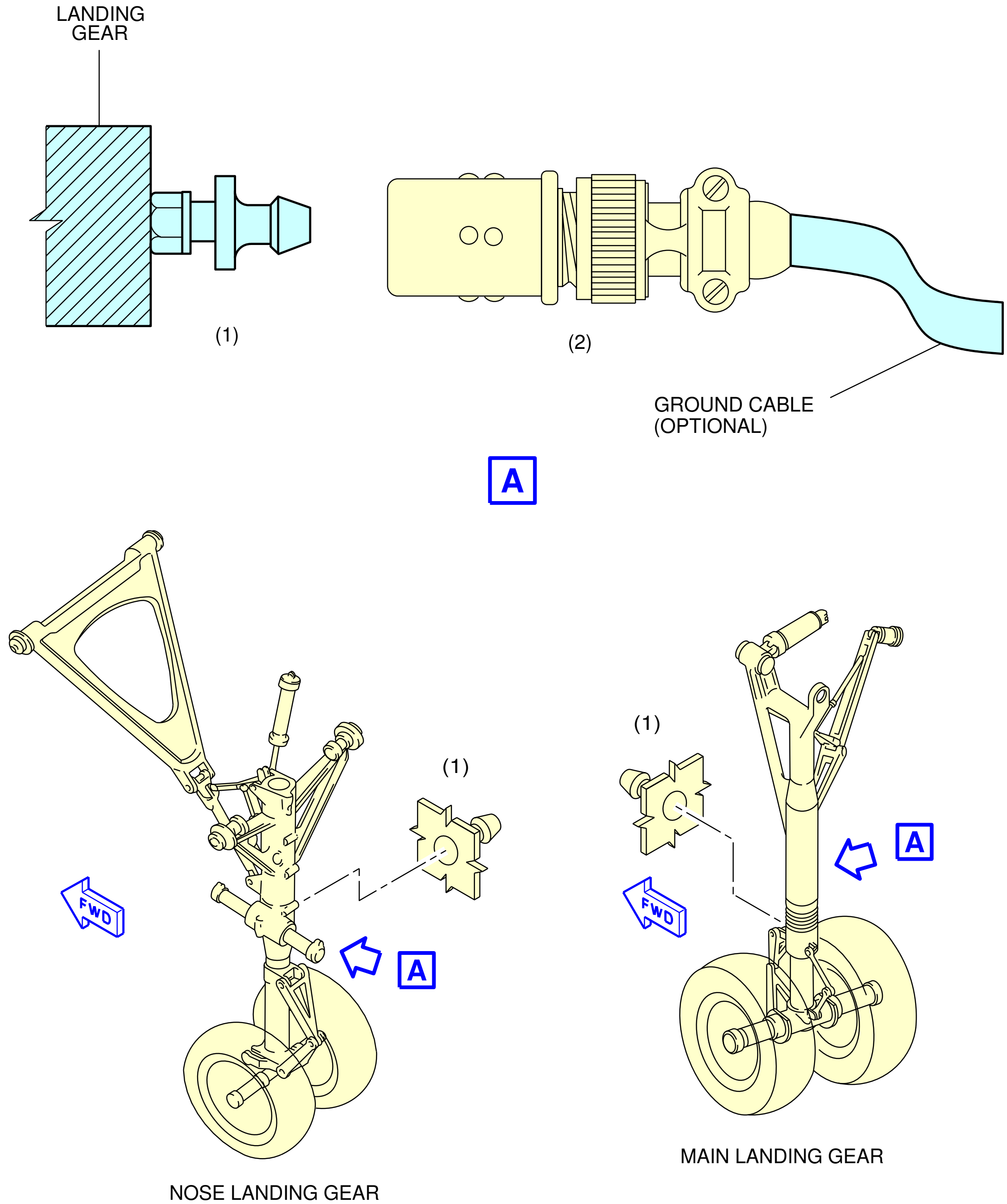
	DISTANCE: Meters (ft)			
	AFT OF NOSE	FROM AIRPLANE CENTERLINE		MEAN HEIGHT FROM GROUND
		R SIDE	L SIDE	
On Nose Landing Gear leg:	5.07 m (16.63 ft)	on centerline		0.94 m (3.08 ft)
On left Main Landing Gear leg:	16.11 m (52.85 ft)		3.79 m (12.43 ft)	1.07 m (3.51 ft)
On right Main Landing Gear leg:	16.11 m (52.85 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 A319-100



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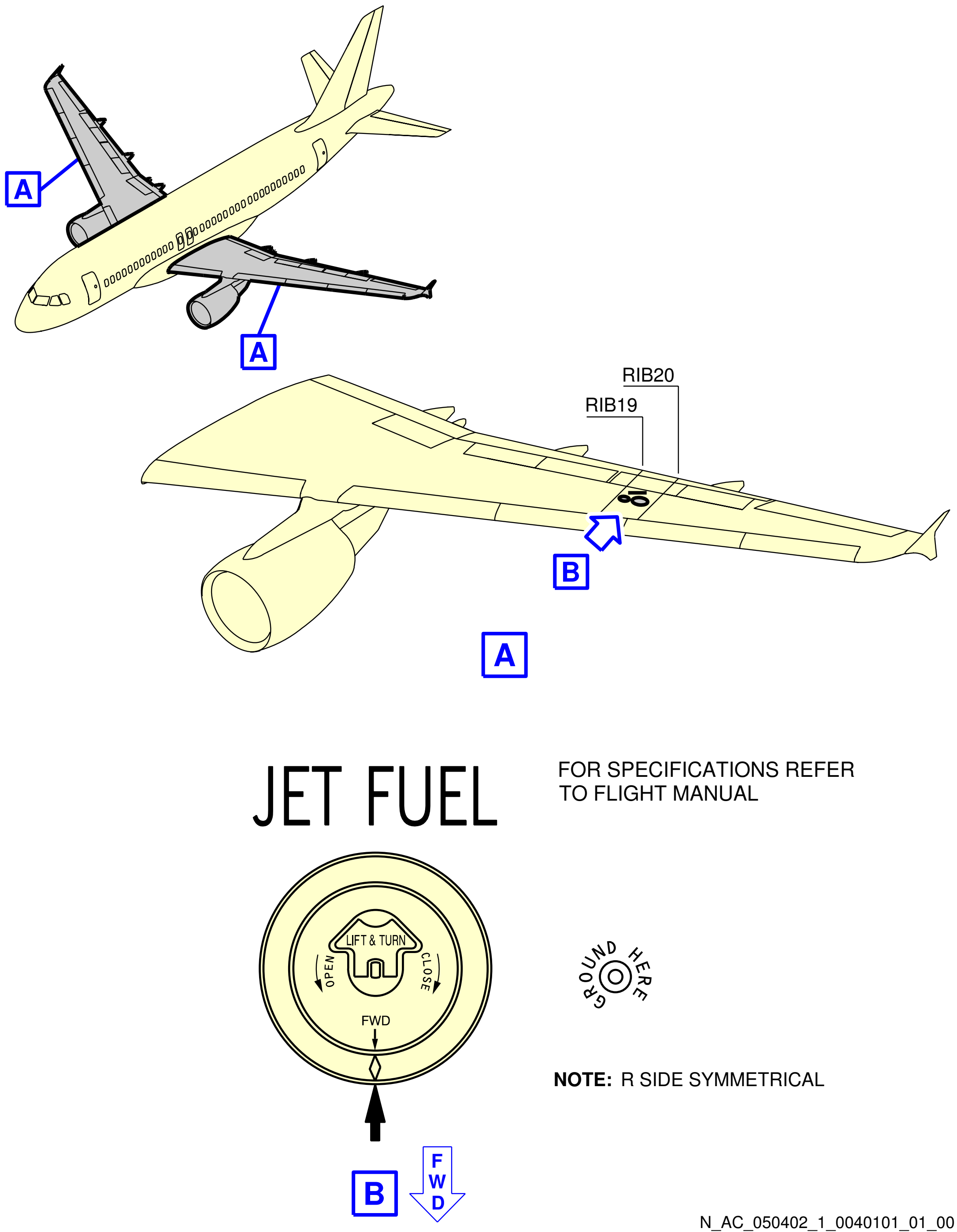
Ground Service Connections
Grounding Points
FIGURE 1

**ON A/C A319-100



Ground Service Connections
Grounding Points
FIGURE 2

5-4-3 Hydraulic System

****ON A/C A319-100**

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	17.57 (57.64)	1.27 (4.17)		1.76 (5.77)
Yellow System: Access door 198CB	17.57 (57.64)		1.27 (4.17)	1.76 (5.77)
Blue System: Access door 197EB	18.92 (60.07)	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	14.05 (46.1)		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	14.5 (47.57)	0.25 (0.82)		1.99 (6.53)
Green System accumulator: Left MLG door	15.67 (51.41)		0.25 (0.82)	3.2 (10.5)
Blue System accumulator: Access door 195BB	14.31 (46.95)		0.25 (0.82)	1.99 (6.53)
Yellow System braking accumulator: Access door 196BB	14.5 (47.57)	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	17.57 (57.64)	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	14.5 (47.57)	1.43 (4.69)		1.90 (6.23)
Green System: Left MLG door	15.67 (51.41)		1.27 (4.17)	2.61 (8.56)
Blue System: Access door 197EB	18.92 (62.07)	1.27 (4.17)		1.76 (5.77)

NOTE : Distances are approximate.

On 3/8 in. self-sealing connection for the Blue system on:

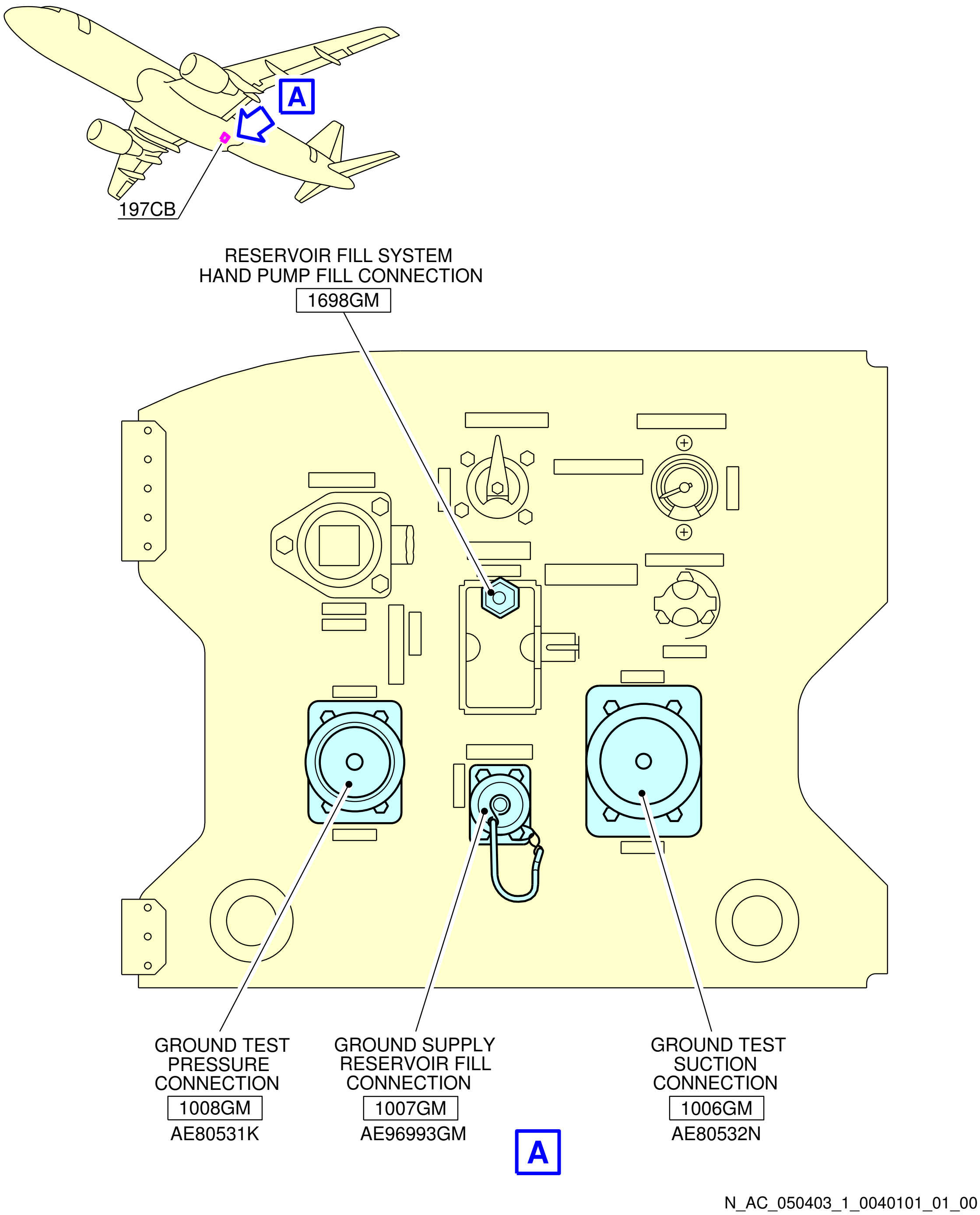
- Blue system ground service panel.

6. Ground Test.

On each ground service panel:

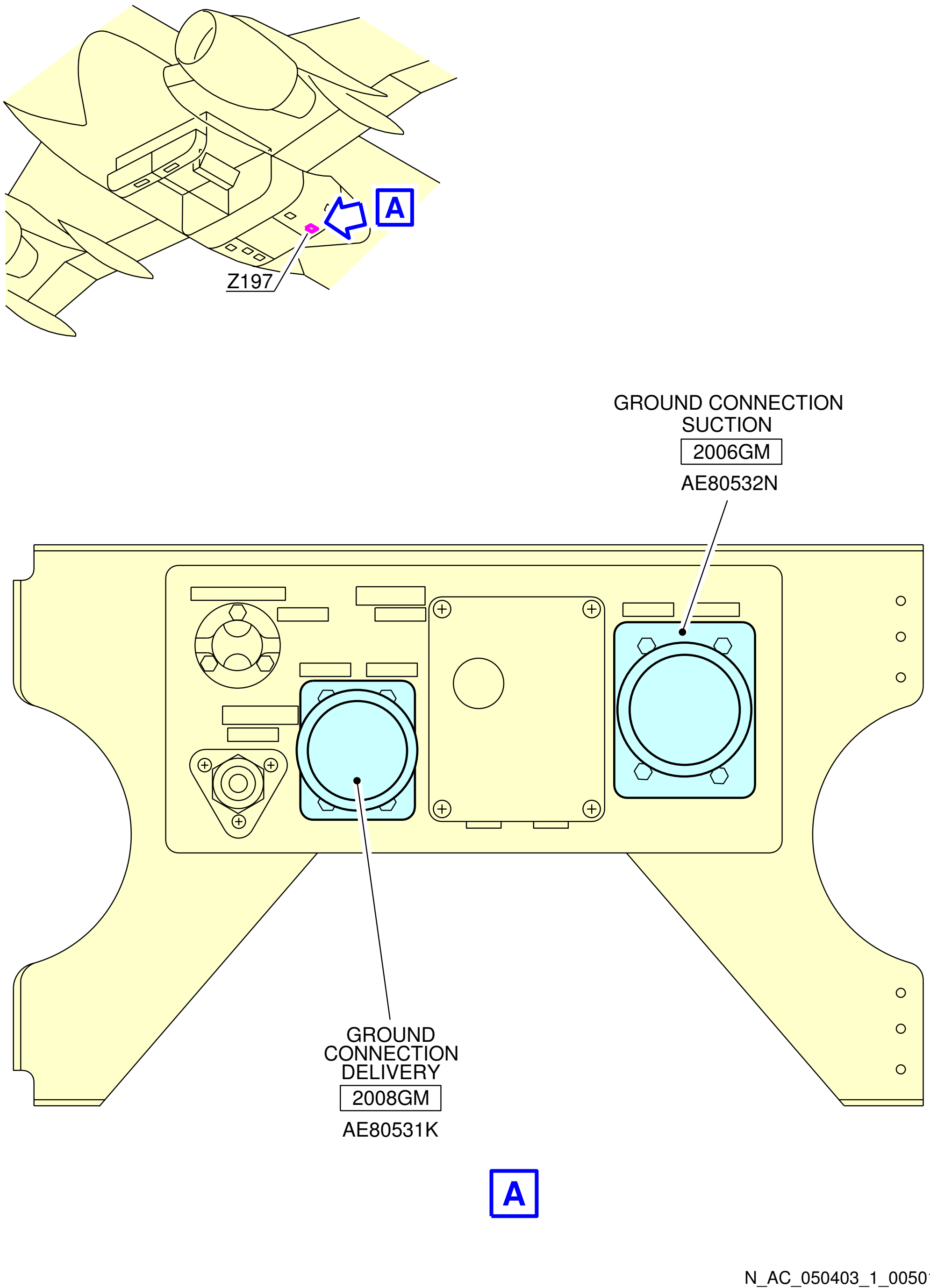
- One self-sealing connector AE80532N (suction).
- One self-sealing connector AE80531K (delivery).

**ON A/C A319-100



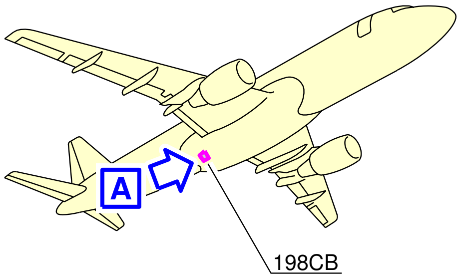
Hydraulic System
Green System Ground Service Panel
FIGURE 1

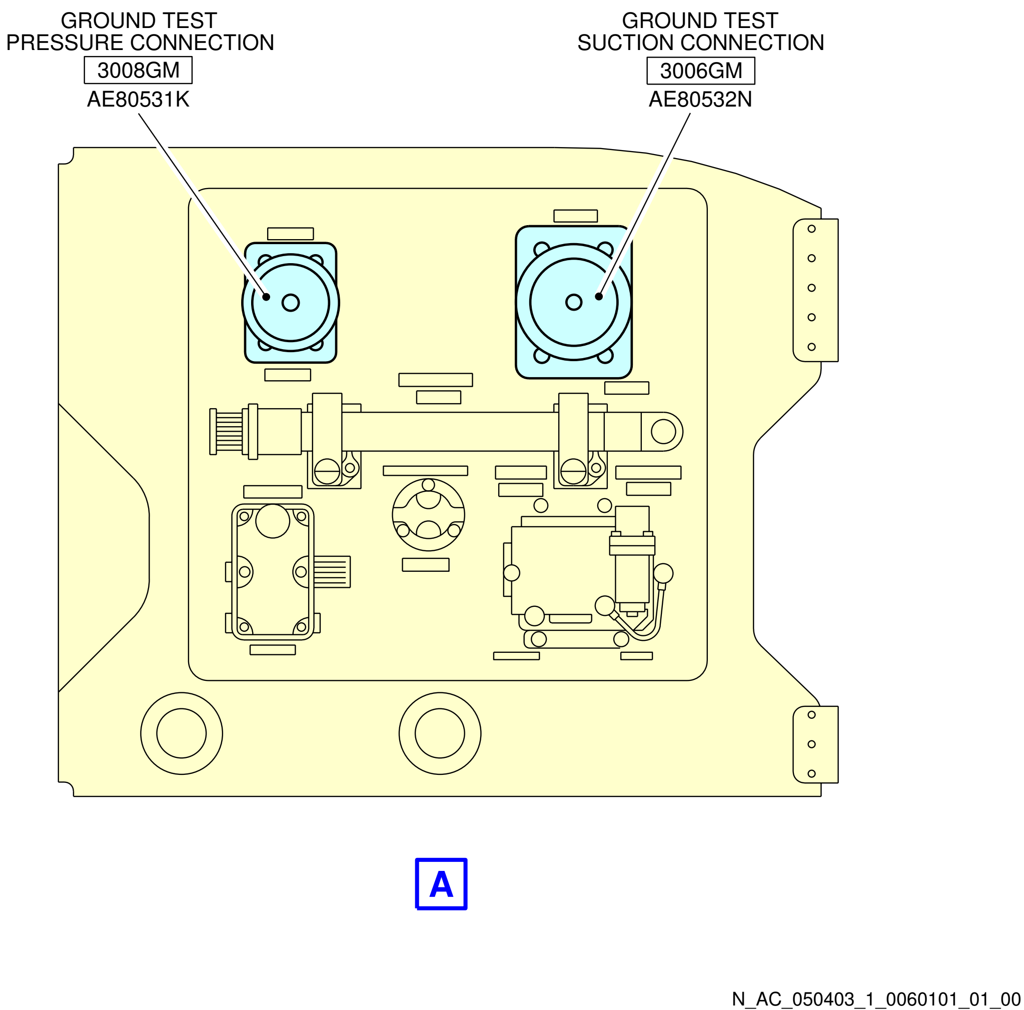
**ON A/C A319-100



Hydraulic System
Blue System Ground Service Panel
FIGURE 2

**ON A/C A319-100





Hydraulic System
Yellow System Ground Service Panel
FIGURE 3

5-4-4 Electrical System

**ON A/C A319-100

Electrical System

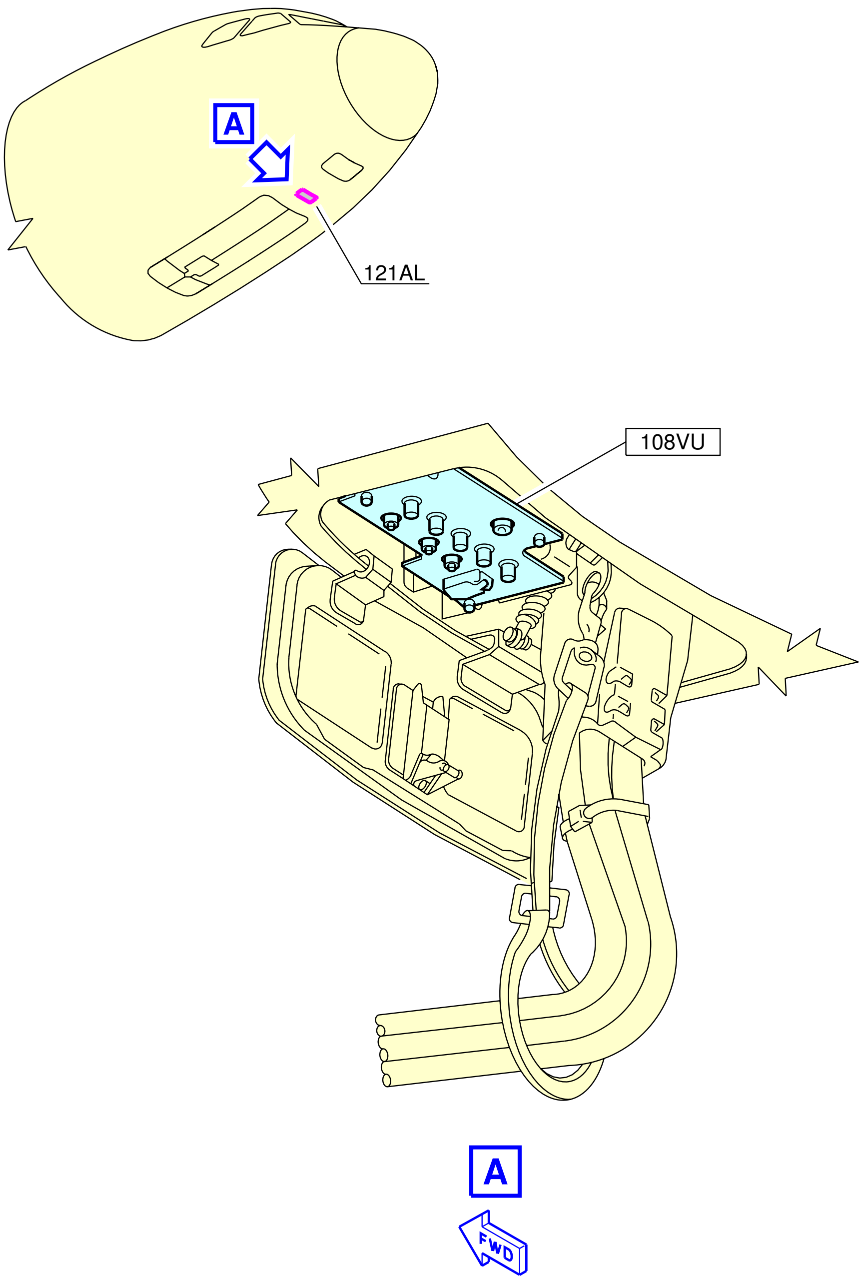
1. Electrical System.
This chapter gives data related to the location of the ground service connections.

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 A319-100



Ground Service Connections
External Power Receptacles
FIGURE 1

5-4-5 Oxygen System

****ON A/C A319-100**

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 A319-100**

Fuel System

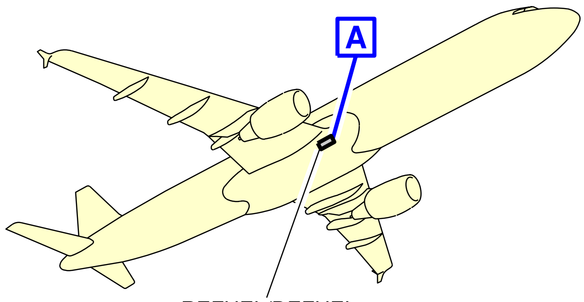
1. Refuel/Defuel Couplings.
   This chapter gives data related to the location of the ground service connections.

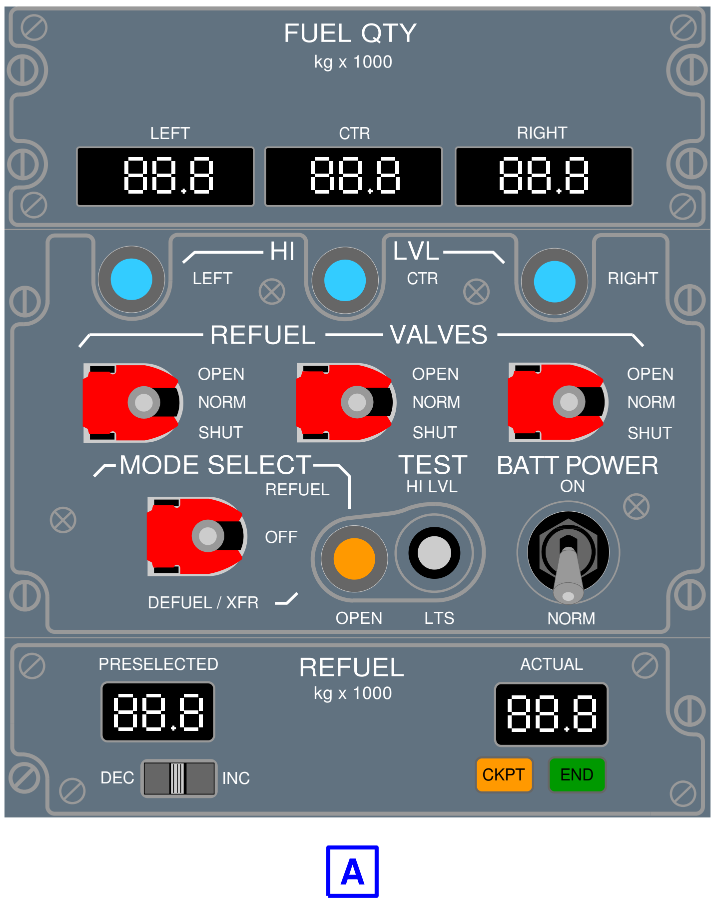
ACCESS	AFT OF NOSE m (ft)	POSITION FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND m (ft)
		RH SIDE m (ft)	LH SIDE m (ft)	
Refuel/Defuel Integrated Panel: Access door 192MB	14.8 (48.56)		1.8 (5.91)	1.8 (5.91)
Refuel/defuel coupling, Left Access Door 522HB (Optional)	15.6 (51.18)	10 (32.81)		3.5 (11.48)
Refuel/defuel coupling, Right Access Door 622HB	15.6 (51.18)		10 (32.81)	3.5 (11.48)
Gravity Refuel Coupling	17.4 (57.09)	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 A319-100





NOTE: STANDARD CONFIGURATION OF REFUEL/DEFUEL PANEL.

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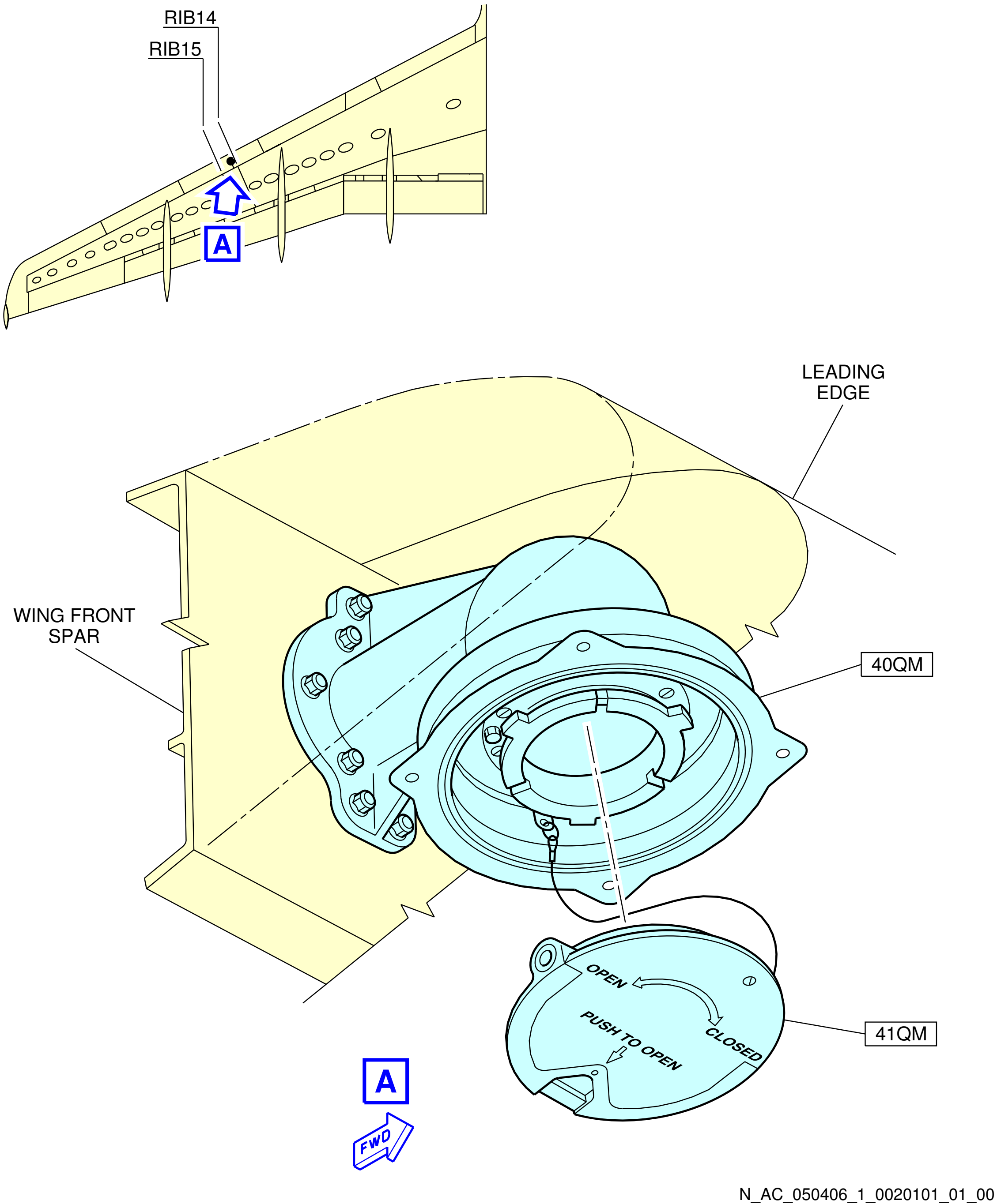
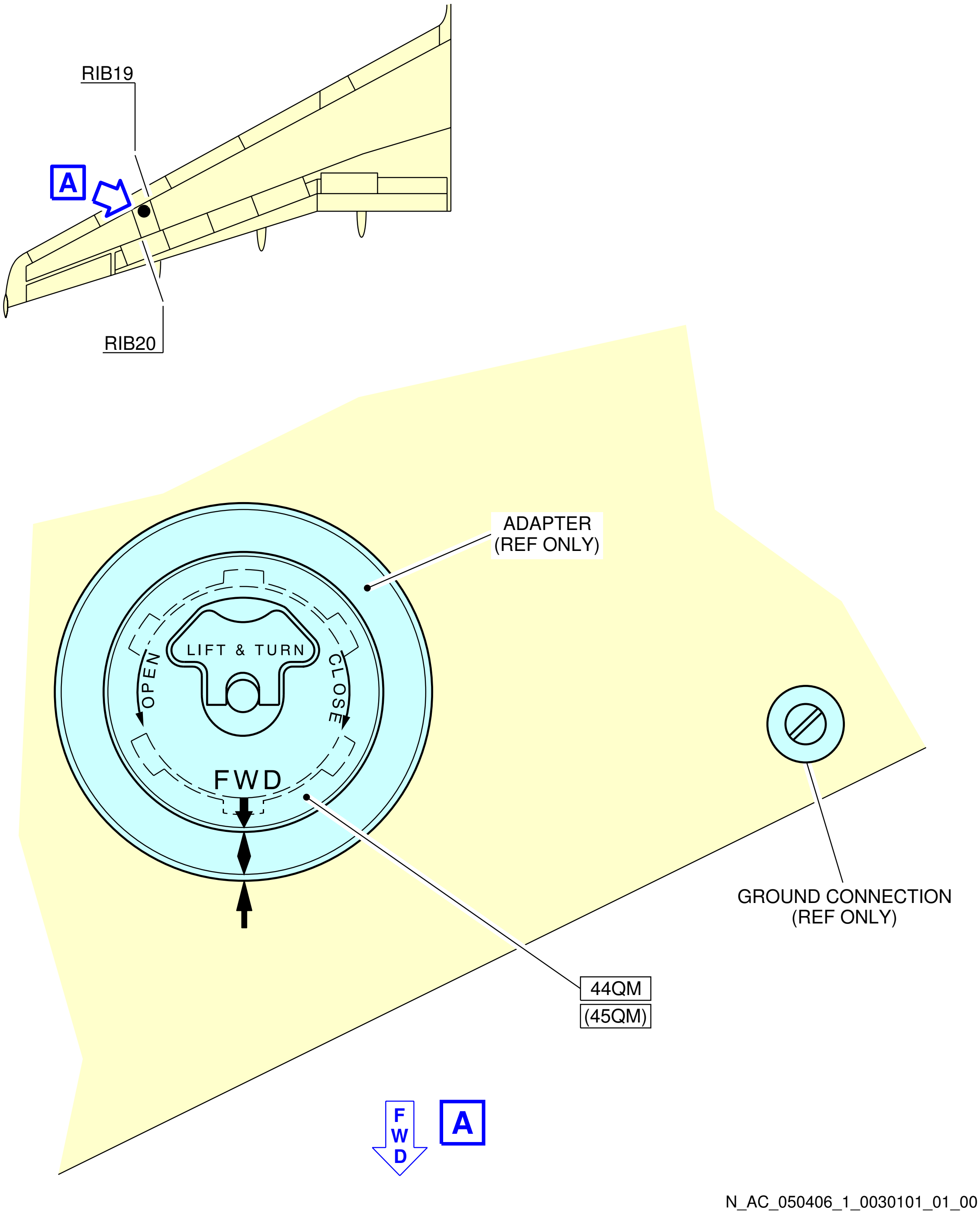
Ground Service Connections
Refuel/Defuel Panel
FIGURE 1

**ON A/C A319-100



Ground Service Connections
Refuel/Defuel Couplings
FIGURE 2

**ON A/C A319-100



Ground Service Connections
Gravity Refuel Couplings
FIGURE 3

5-4-7 Pneumatic System

****ON A/C A319-100**

Pneumatic System

1. High Pressure Air Connectors.
   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)	
HP Connector Access door 191DB	11.38 (37.34)		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.

ACCESS	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	10.85 (35.6)		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 A319-100

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:	27.5 (90.22)		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)

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.

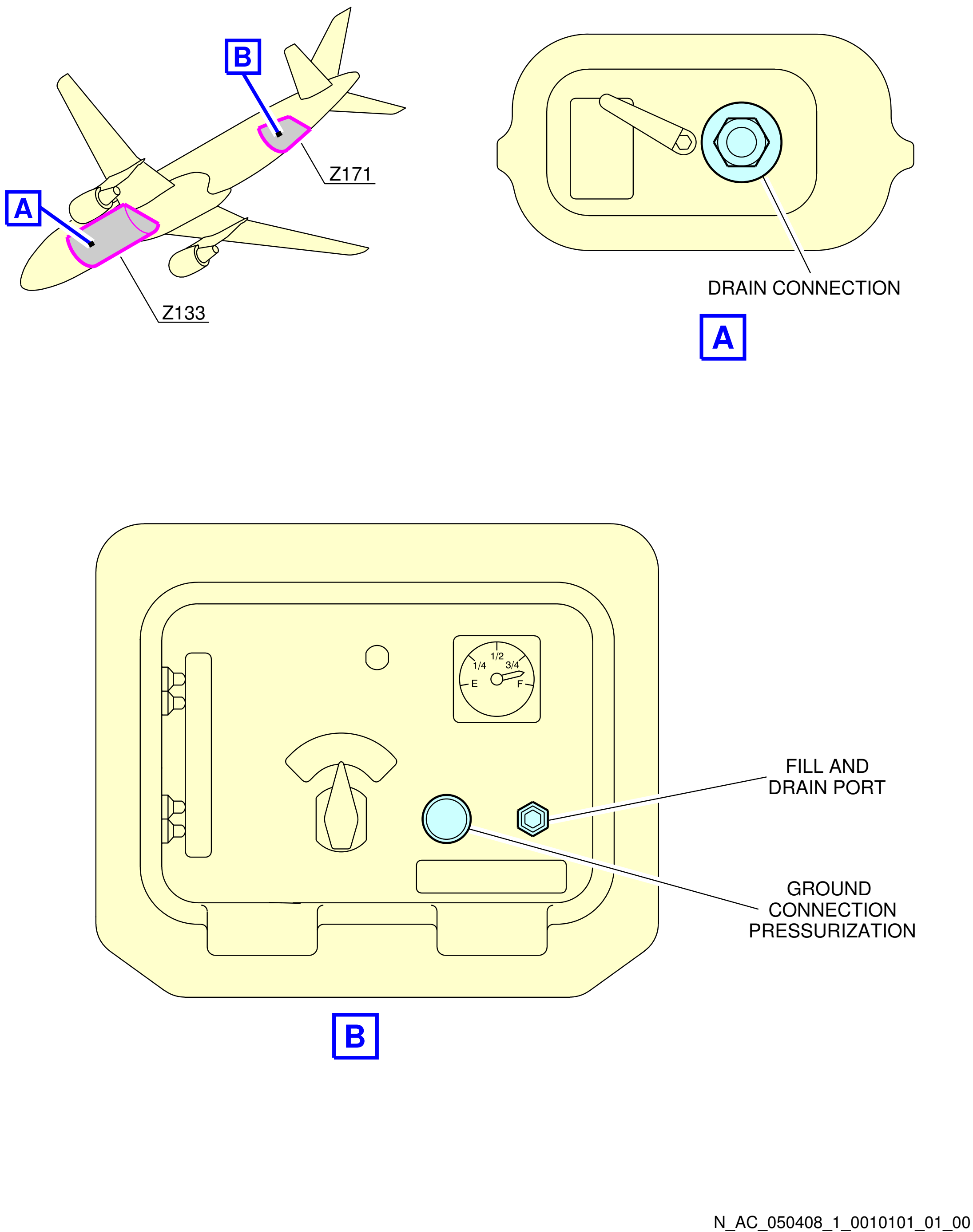
      (2) On drain panel (Access Door 133AL)
         - Drain Nipple 3/4 in (ISO 17775)

   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 A319-100



Ground Service Connections
Potable Water Ground Service Panel
FIGURE 1

5-4-9 Oil System

**ON A/C A319-100

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)	11.56 (37.79)	6.63 (21.75)	4.82 (15.81)	1.46 (4.79)
Engine Oil Pressure Filling Port:	11.4 (37.4)	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)	10.6 (34.77)	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:	11.04 (37.4)	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)	10.64 (34.9)	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:	11.2 (36.74)	5.42 (17.78)	6.04 (19.81)	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:	11.04 (37.4)	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.

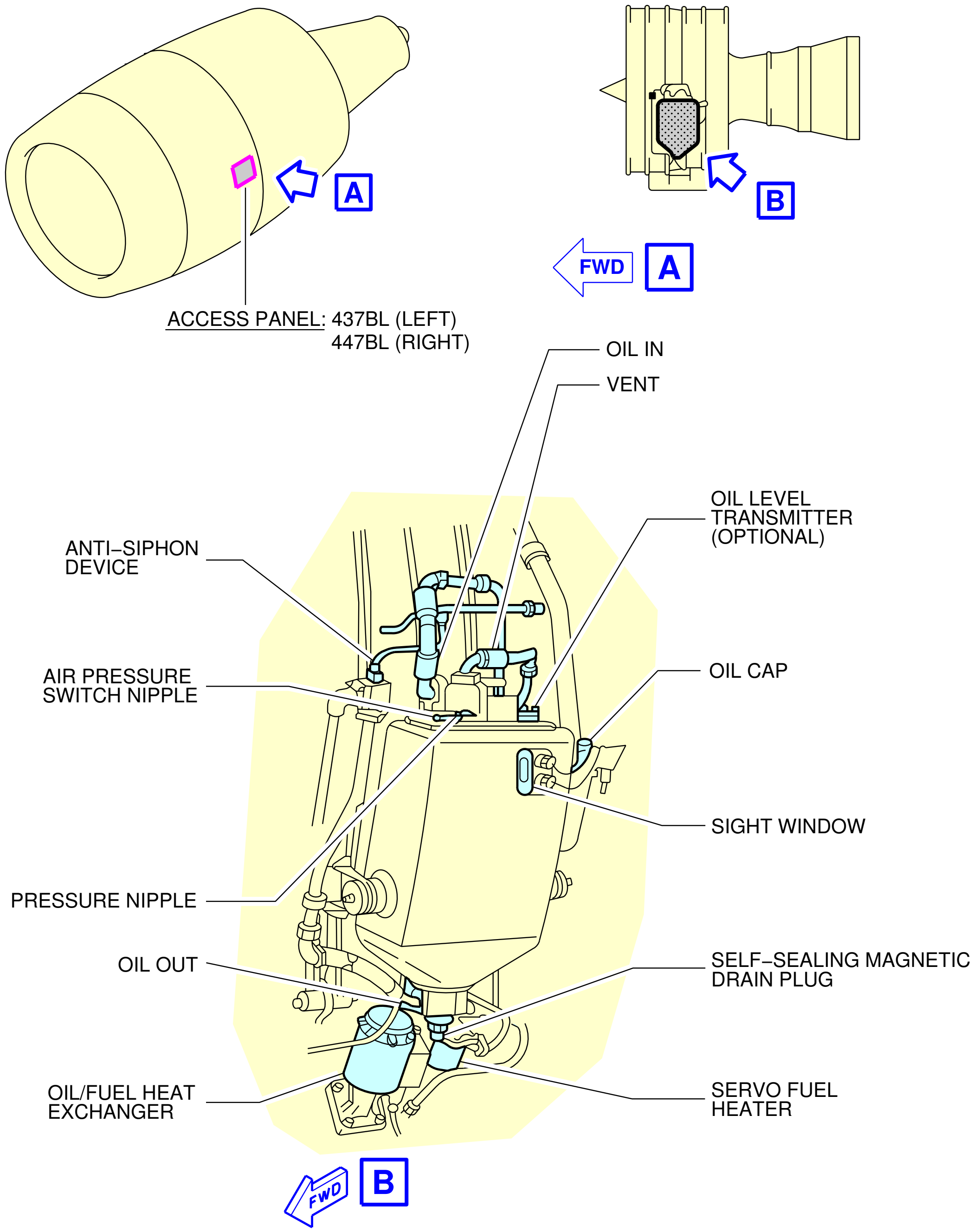
	AFT OF NOSE m (ft)	FROM AIRPLANE CENTERLINE (LEFT HAND) m (ft)	MEAN HEIGHT FROM GROUND m (ft)
GTCP 36-300	31.76 (104.19)	0.3 (0.98)	4.83 (15.85)
APS 3200	31.76 (104.19)	0.3 (0.98)	4.78 (15.68)
131-9	31.66 (103.87)	0.35 (1.15)	4.32 (14.17)

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 A319-100



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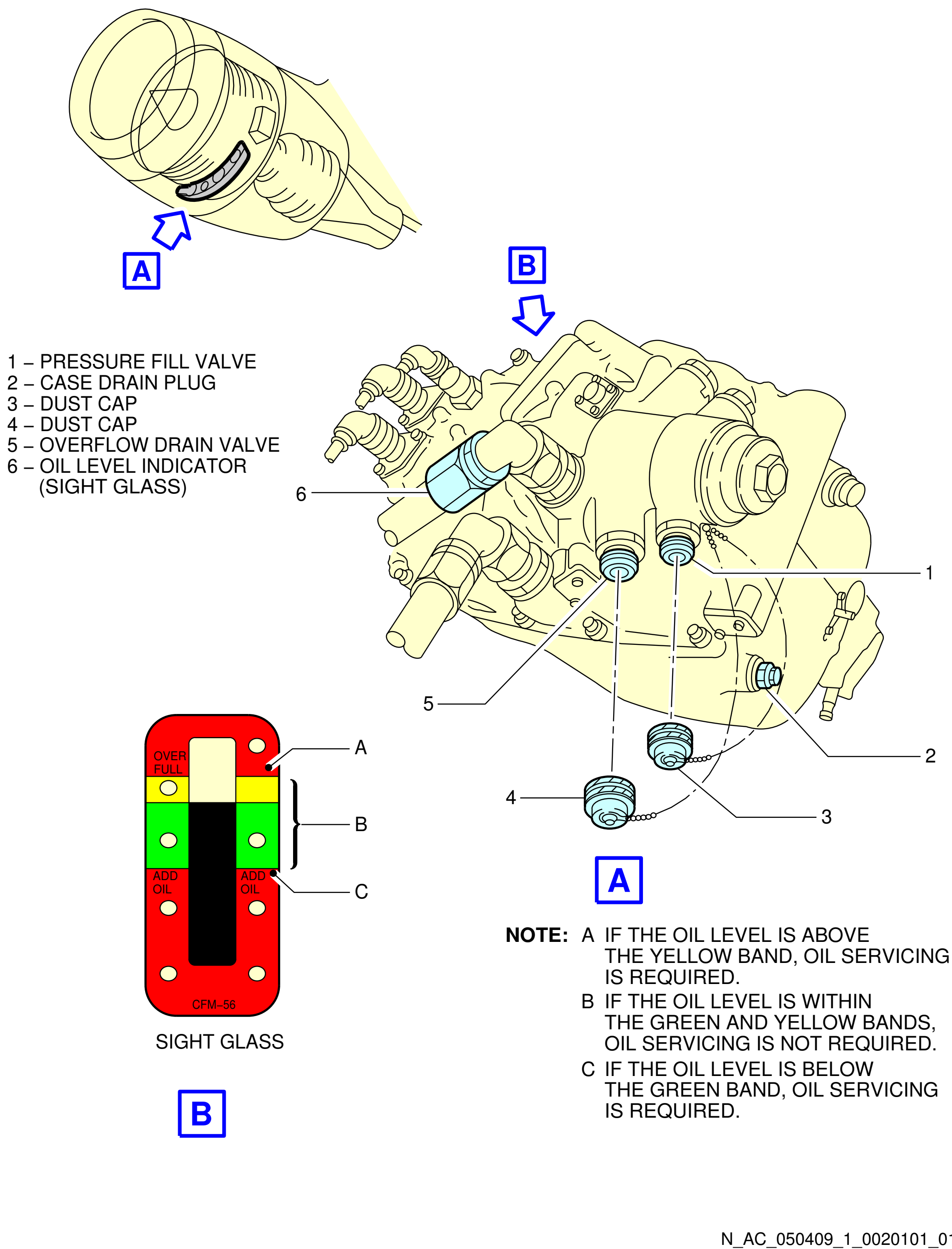
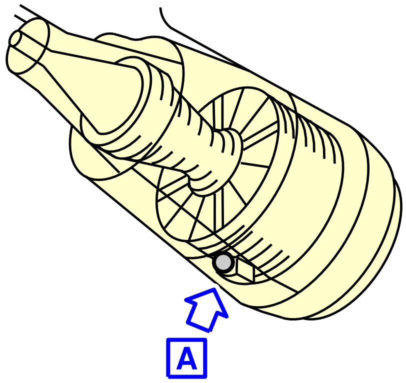
Ground Service Connections
Engine Oil Tank – CFM56 Series Engine
FIGURE 1

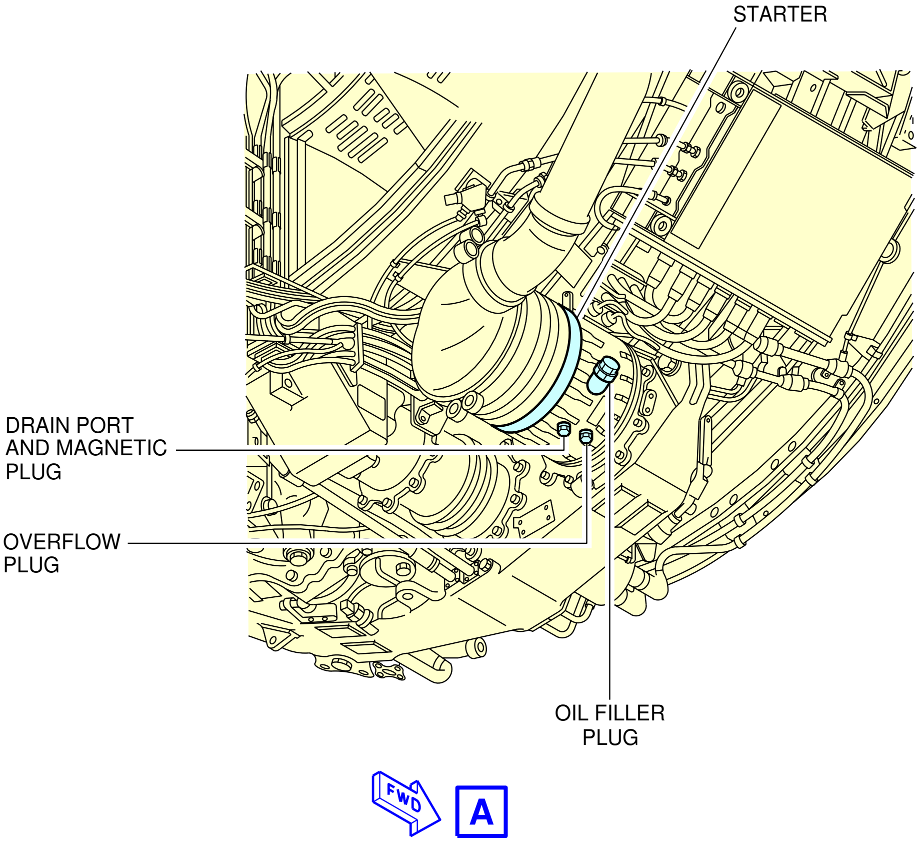
**ON A/C A319-100



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

**ON A/C A319-100





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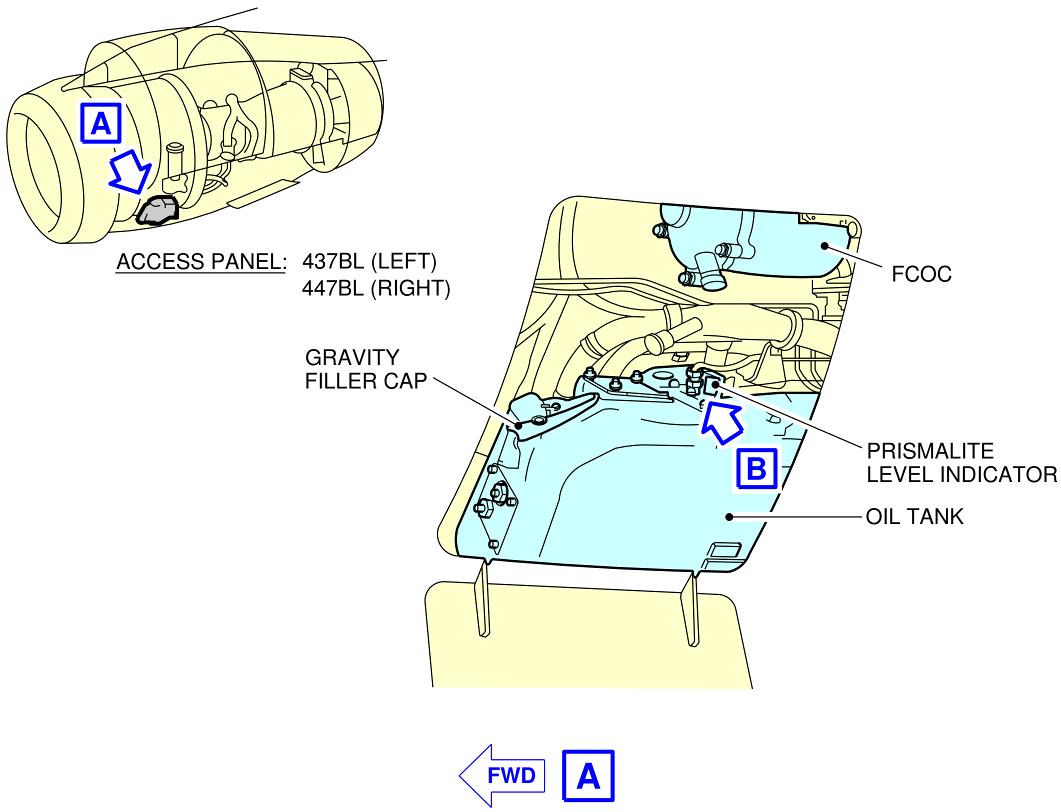
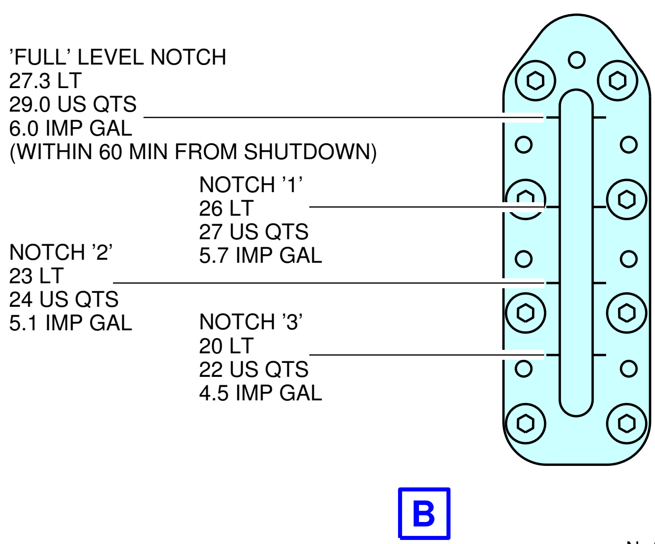
Ground Service Connections
Starter Oil Tank – CFM56 Series Engine
FIGURE 3

**ON A/C A319-100





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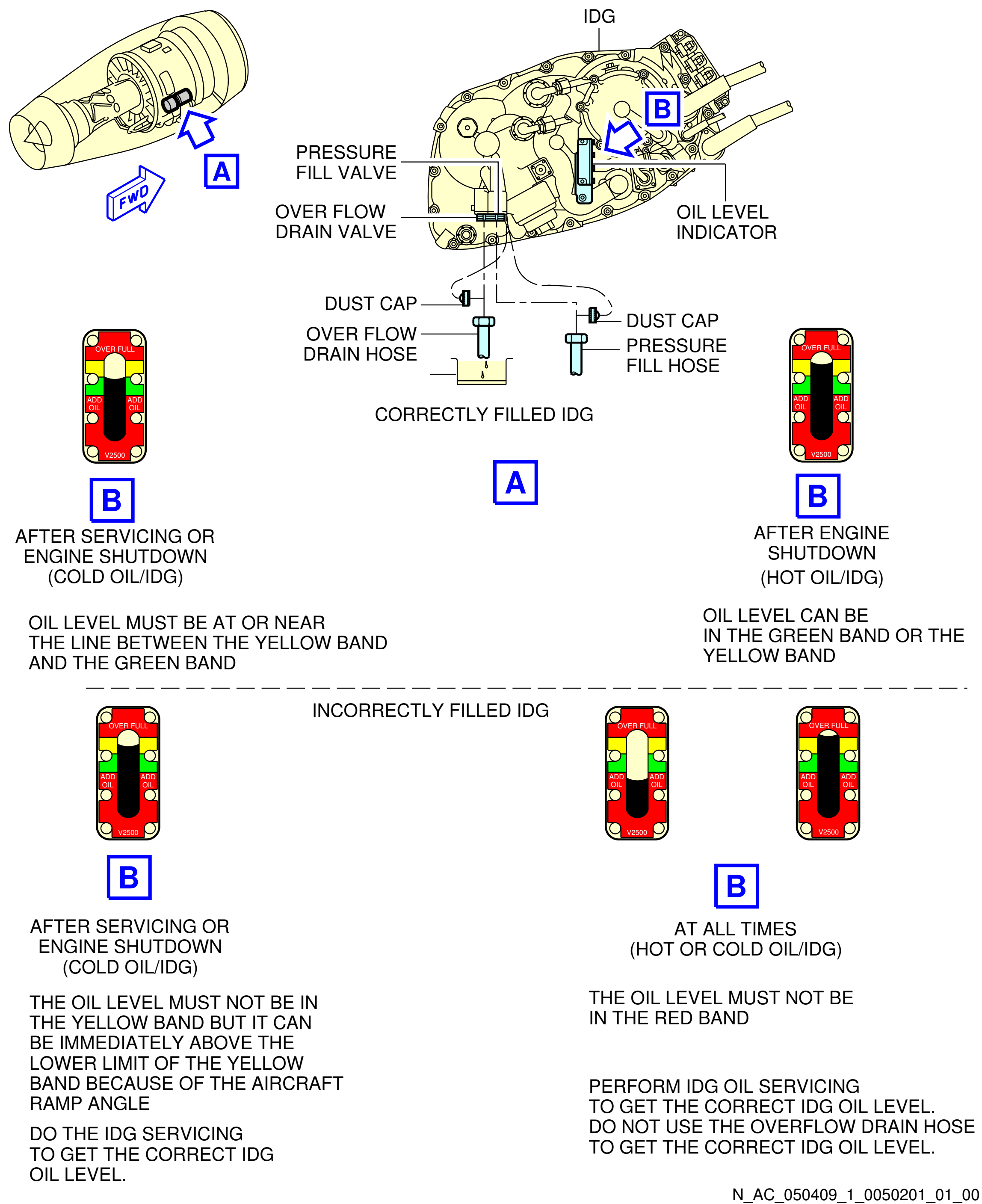
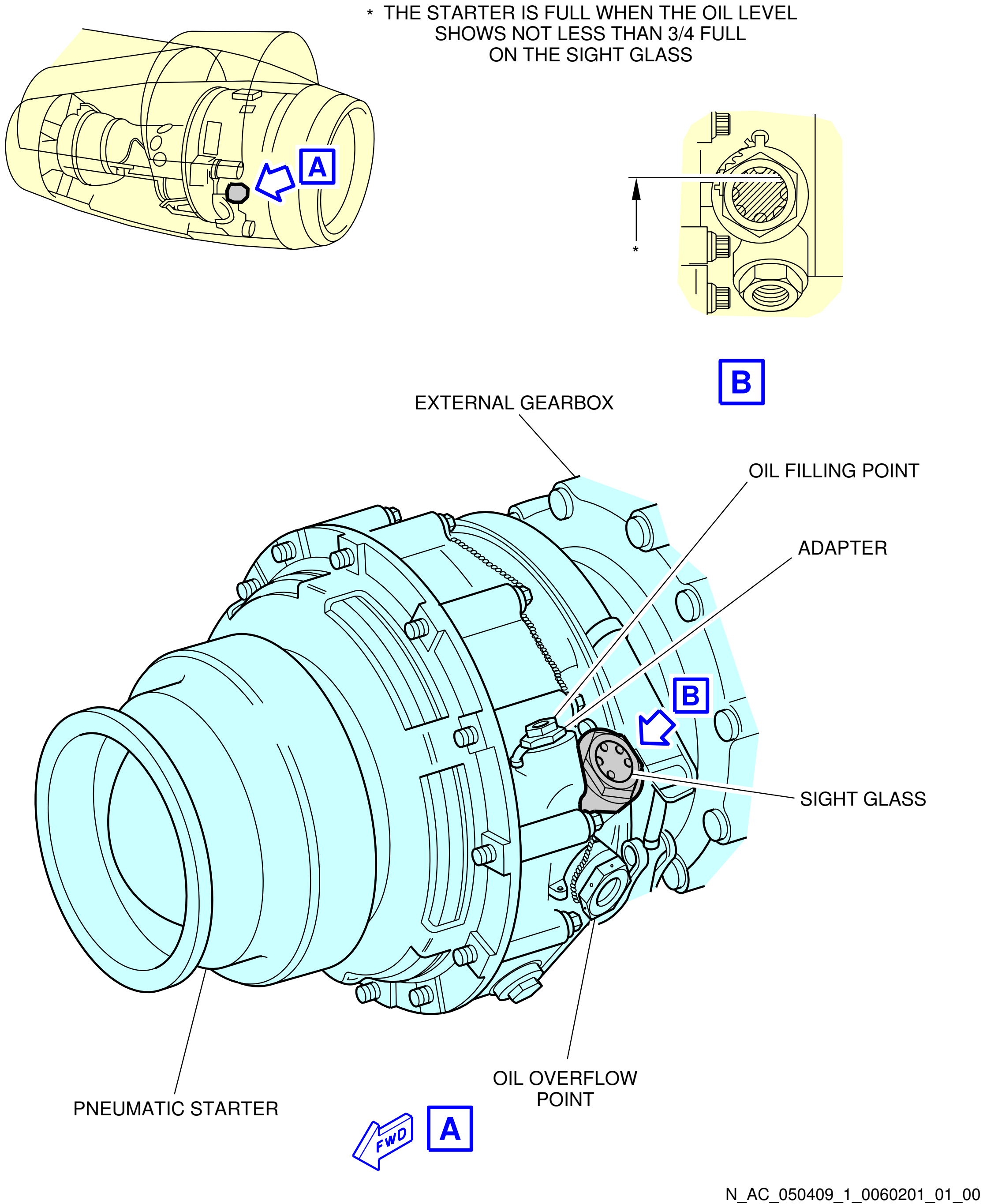
Ground Service Connections
Engine Oil Tank – IAE V2500 Series Engine
FIGURE 4

**ON A/C A319-100



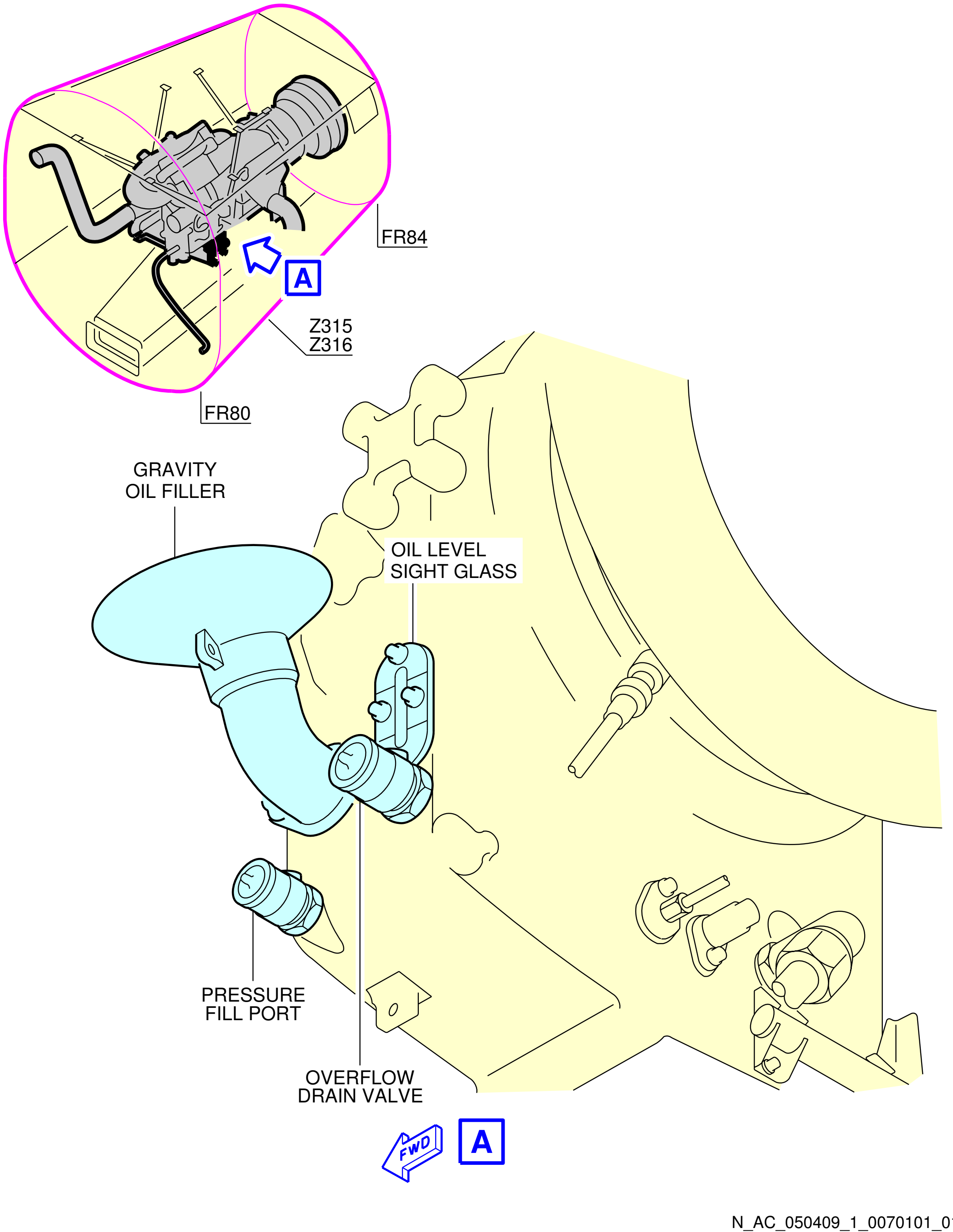
Ground Service Connections
IDG Oil Tank – IAE V2500 Series Engine
FIGURE 5

**ON A/C A319-100



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

**ON A/C A319-100



Ground Service Connections
APU Oil Tank
FIGURE 7

5-4-10 Vacuum Toilet System

****ON A/C A319-100**

Vacuum Toilet System

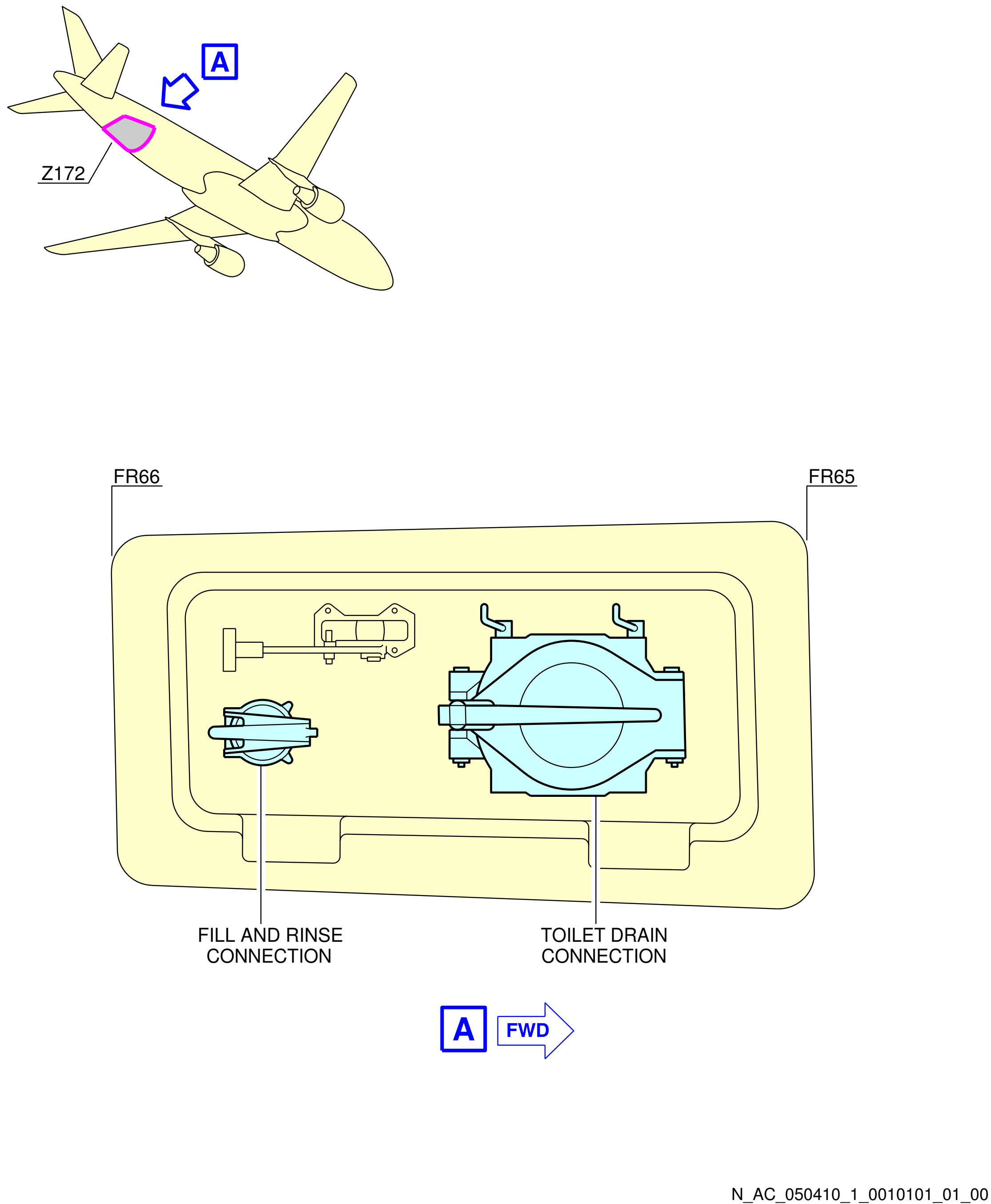
1. Vacuum Toilet System.

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	27.5 (90.22)	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 A319-100



Ground Service Connections
Waste Water Ground Service Panel
FIGURE 1

5-5-0 Engine Starting Pneumatic Requirements

**ON A/C A319-100

Engine Starting Pneumatic Requirements

1. Engine Starting Pneumatic Requirements.

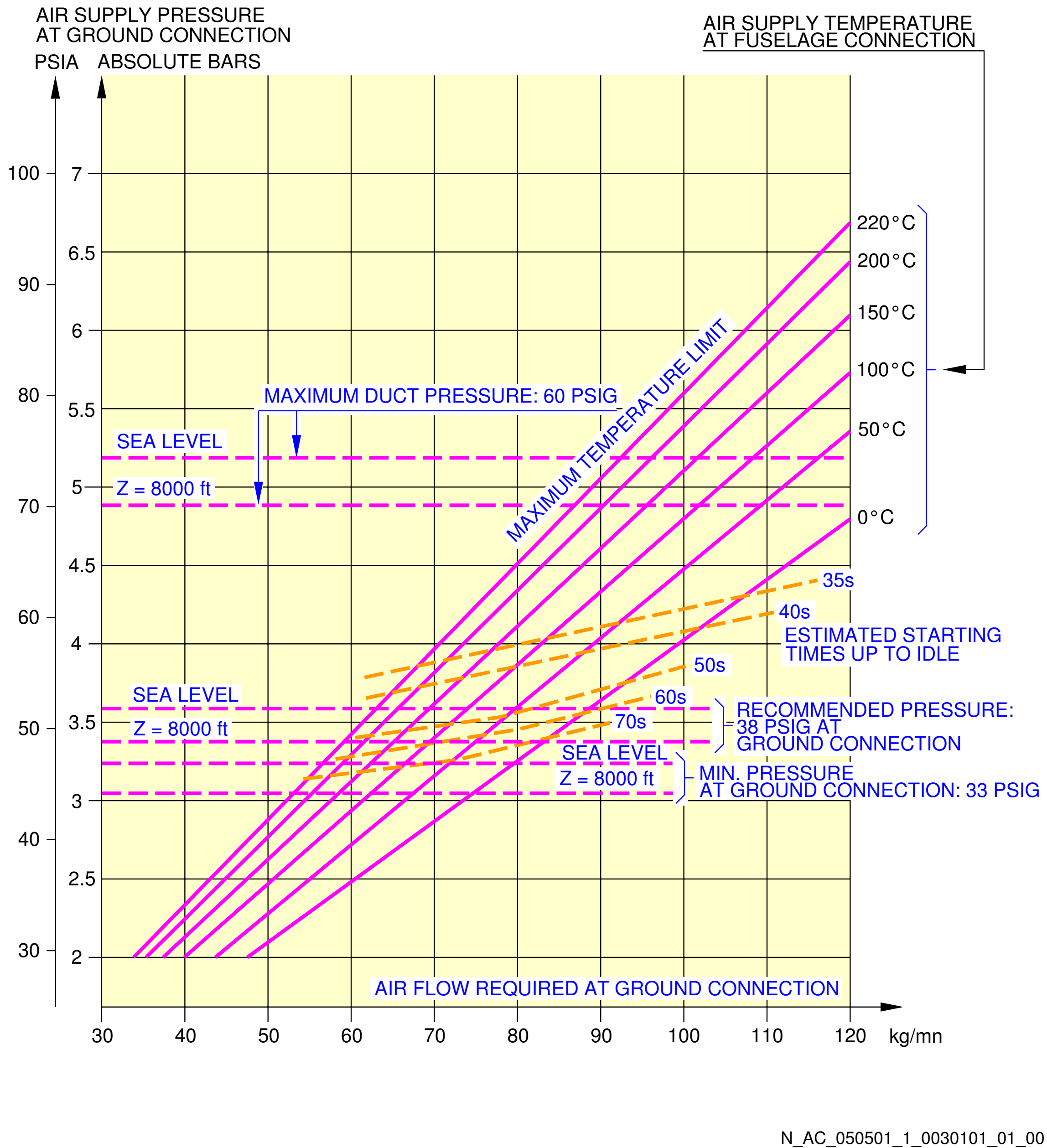
5-5-1 Low Temperatures

****ON A/C A319-100**

Low Temperature -40°C (-40°F)

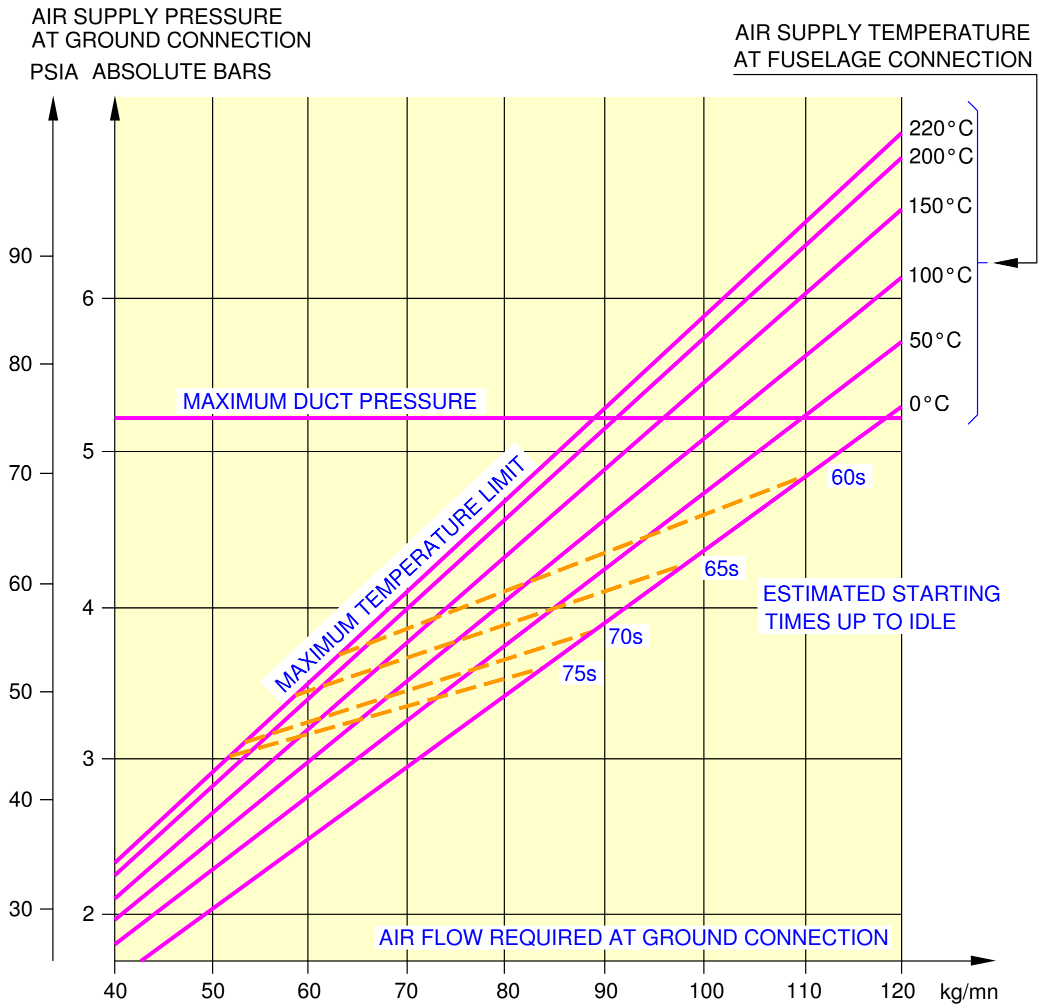
1. This section provides the engine starting pneumatic requirements for a temperature of -40°C (-40°F).

**ON A/C A319-100



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

**ON A/C A319-100



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

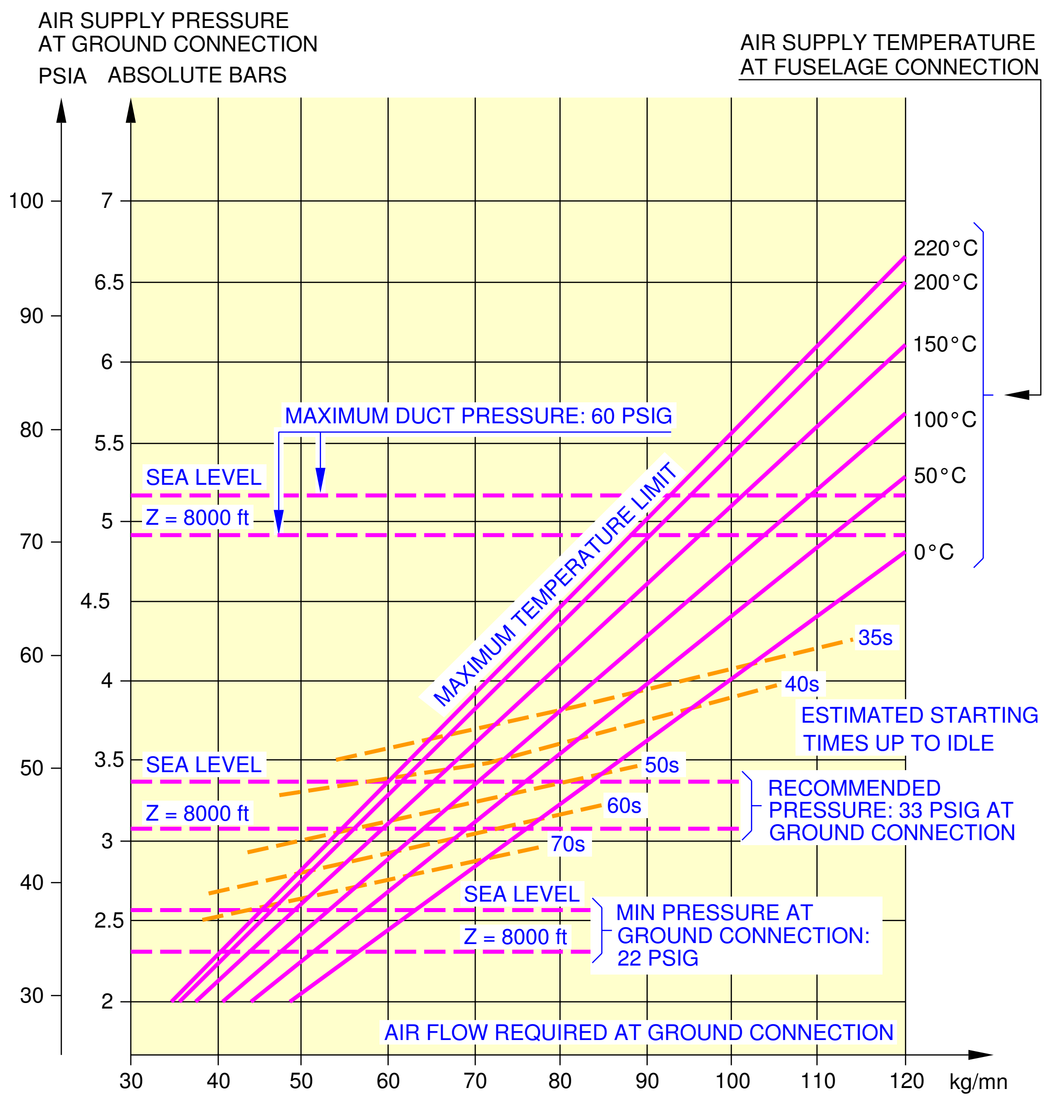
5-5-2 Ambient Temperatures

****ON A/C A319-100**

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 A319-100



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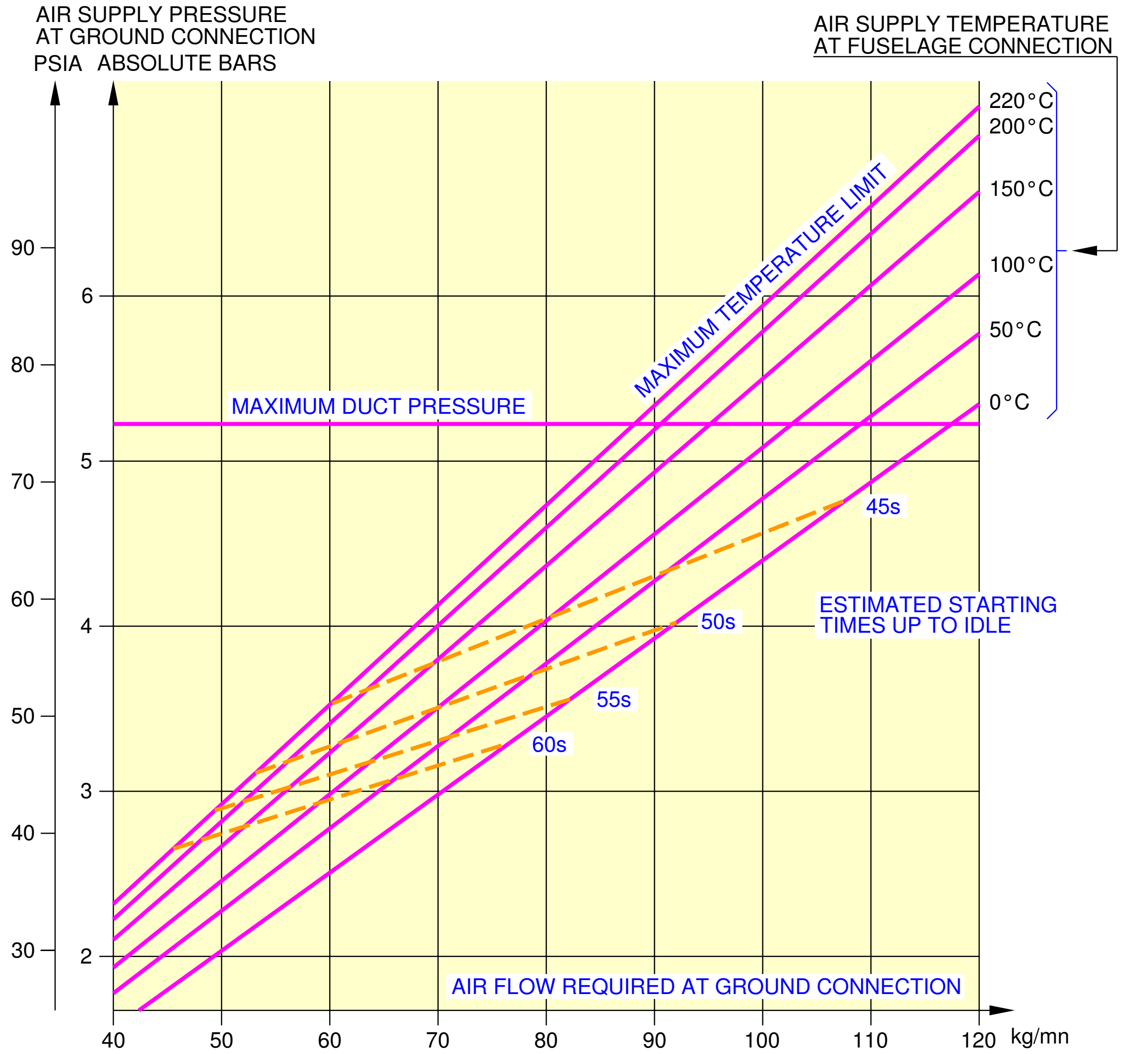
Engine Starting Pneumatic Requirements
Temperature +15°C (+59°F) – CFM56 series engine
FIGURE 1

**ON A/C A319-100



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

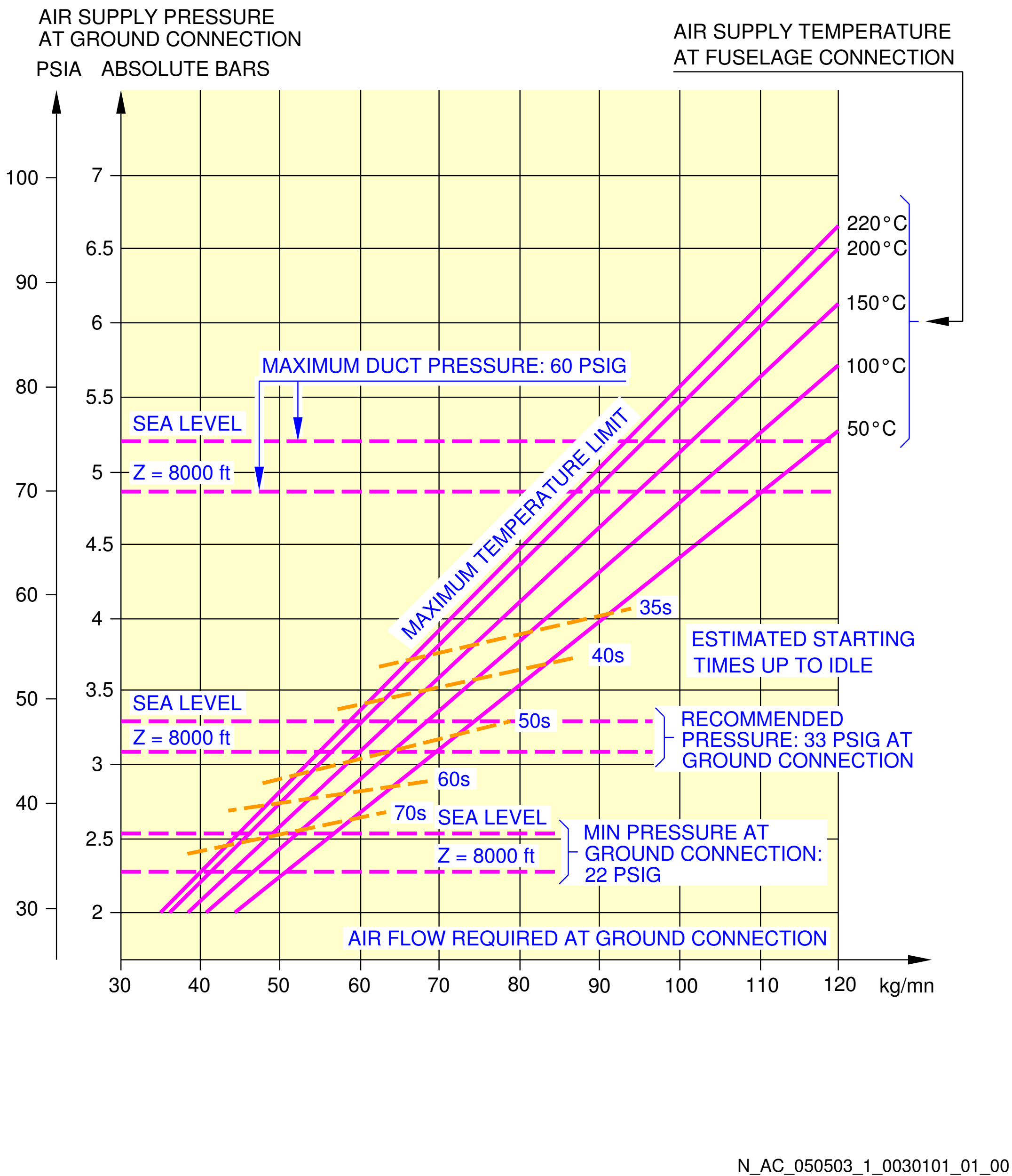
5-5-3 High Temperatures

****ON A/C A319-100**

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

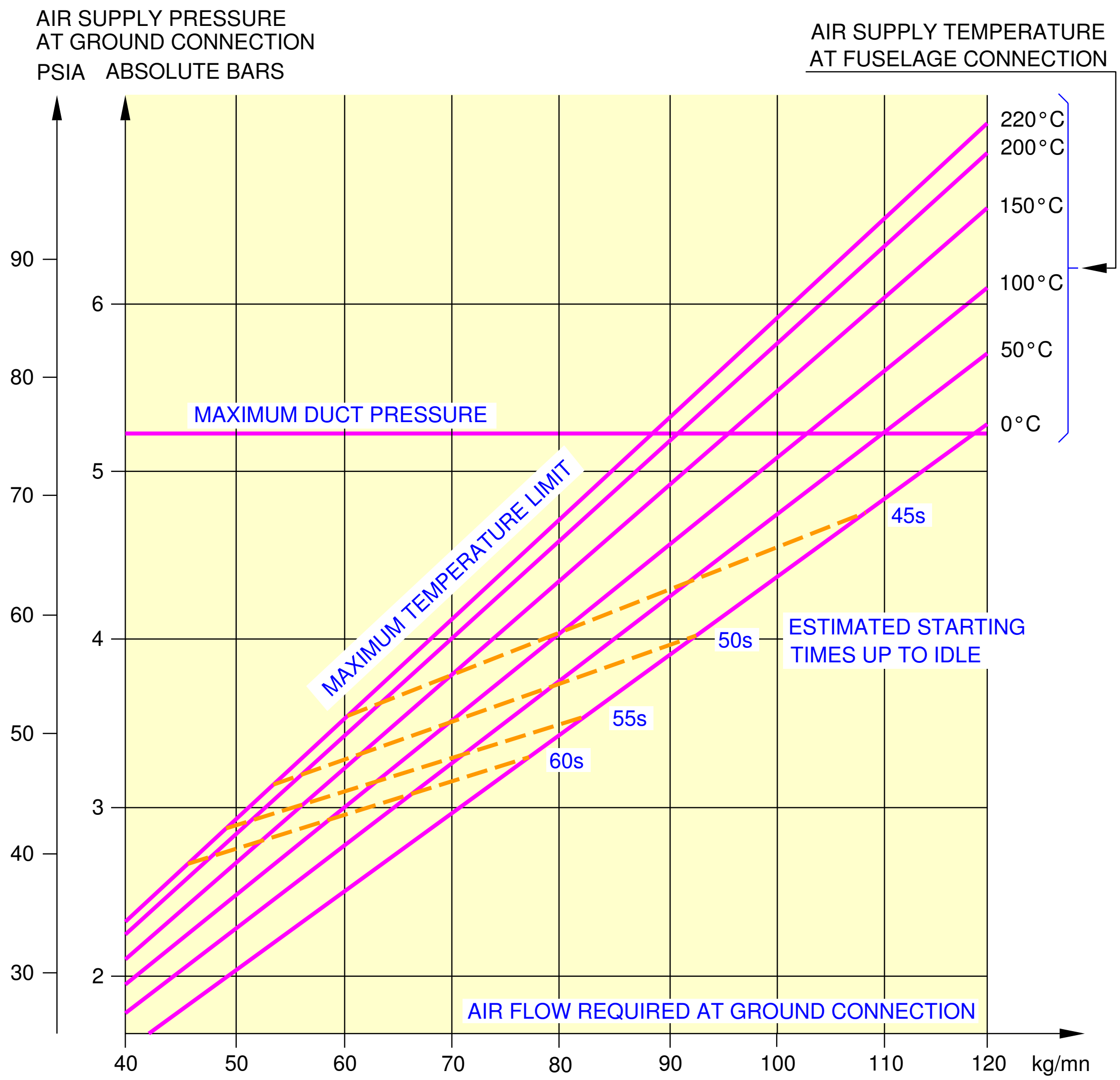
1. This section provides the engine starting pneumatic requirements for a temperature upper:
   - +50°C (+122°F) – IAE V2500
   - +55°C (+131°F) – CFM56

**ON A/C A319-100



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

**ON A/C A319-100



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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 A319-100**

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	0.429	0.946	after 60 min. 13.6°C	–
0.6	1.32	0.515	1.135	after 60 min. 18.2°C	–
0.7	1.54	0.600	1.323	56.5	–
0.8	1.76	0.686	1.512	47.5	after 60 min. 28°C
0.9	1.98	0.772	1.702	40.5	52.5
1.0	2.20	0.858	1.892	35.5	38.5
1.1	2.43	0.944	2.081	31.0	29.5
1.2	2.65	1.030	2.271	27.5	23.5
1.3	2.87	1.115	2.458	24.0	18.5
1.4	3.09	1.201	2.648	21.5	15.0
1.5	3.31	1.287	2.837	19.5	12.0

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

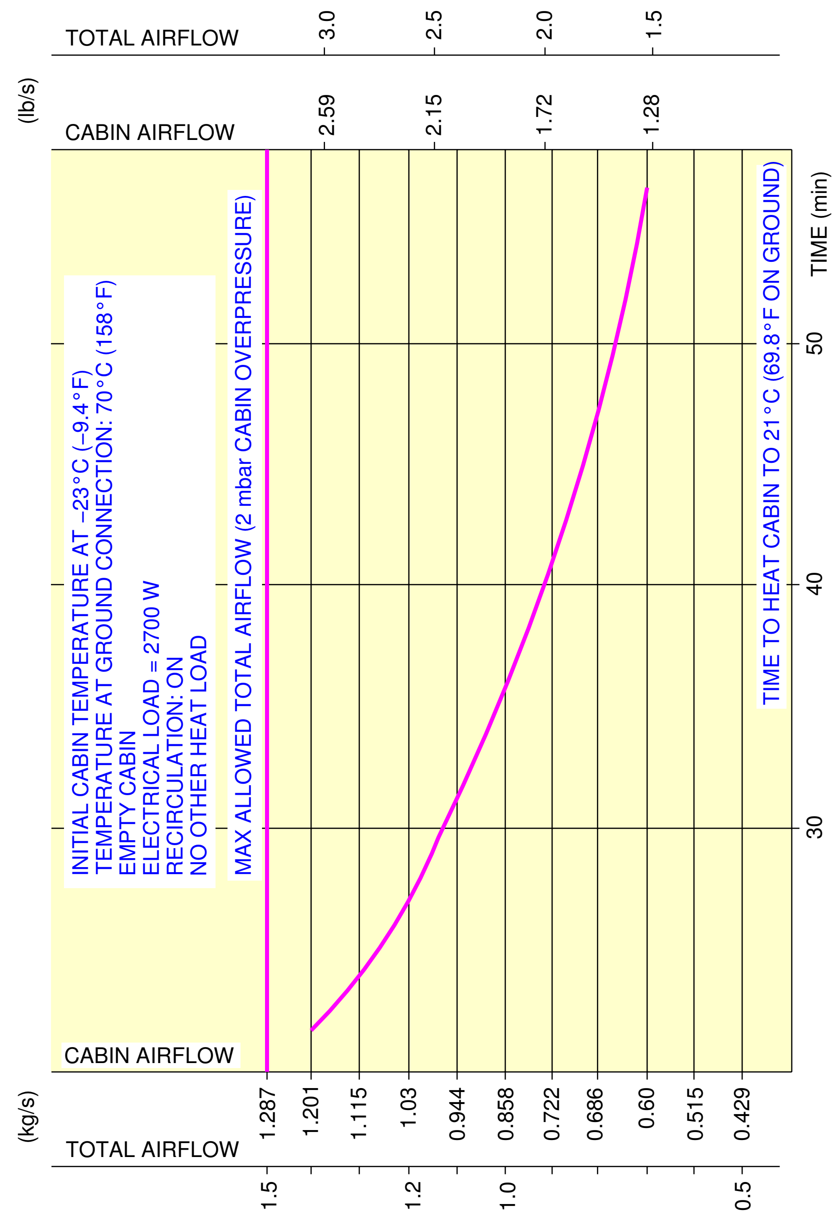
5-6-1 Heating

****ON A/C A319-100**

Heating

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

**ON A/C A319-100



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Ground Pneumatic Power Requirements
Heating
FIGURE 1

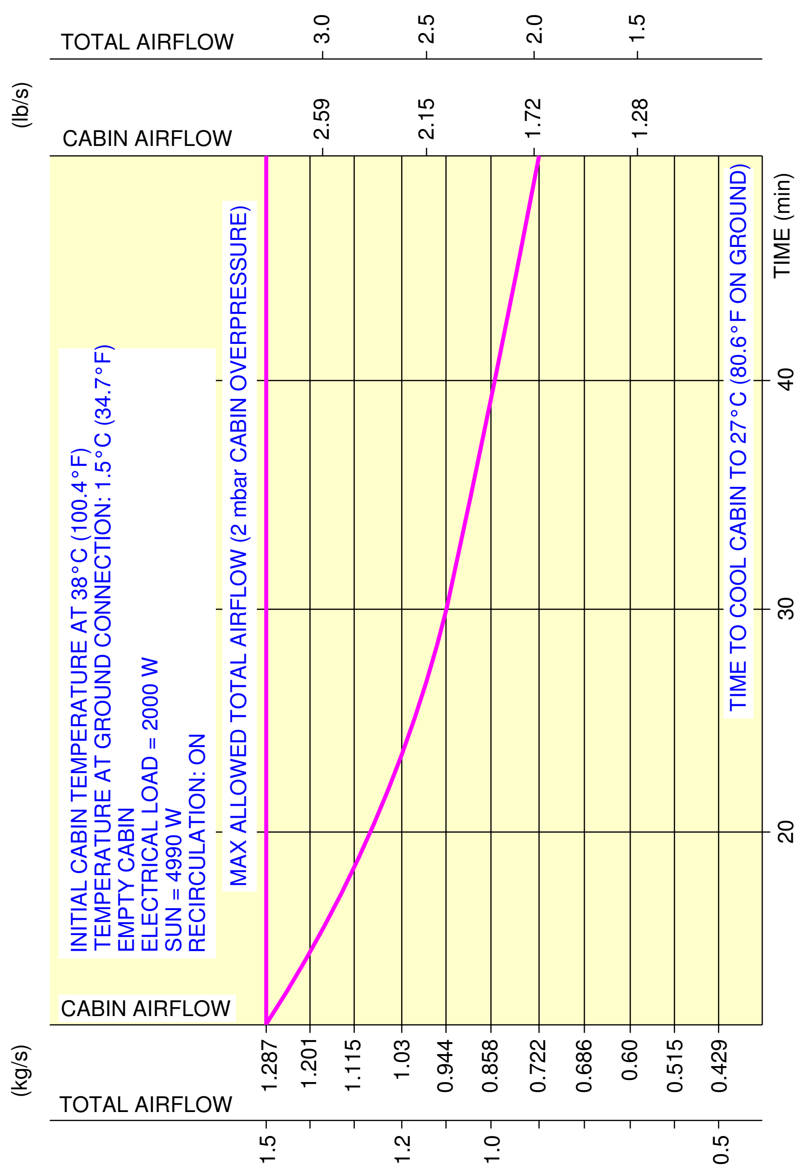
5-6-2 Cooling

**ON A/C A319-100

Cooling

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

****ON A/C A319-100**



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Ground Pneumatic Power Requirements
Cooling
FIGURE 1

5-7-0 Preconditioned Airflow Requirements

**ON A/C A319-100

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	0.429	0.946	-40.4	-40.7
0.6	1.32	0.515	1.135	-28.5	-19.3
0.7	1.54	0.600	1.323	-20.1	-4.2
0.8	1.76	0.686	1.512	-13.9	7.0
0.9	1.98	0.772	1.702	-9.1	15.6
1.0	2.20	0.858	1.892	-5.3	22.5
1.1	2.43	0.944	2.081	-2.2	28.0
1.2	2.65	1.030	2.271	0.4	32.7
1.3	2.87	1.115	2.458	2.6	36.7
1.4	3.09	1.201	2.648	4.4	39.9
1.5	3.31	1.287	2.837	6.0	42.8

   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	0.429	0.946	31.7	89.1
0.6	1.32	0.515	1.135	29.7	85.5
0.7	1.54	0.600	1.323	28.4	83.1
0.8	1.76	0.686	1.512	27.3	81.1
0.9	1.98	0.772	1.702	26.5	79.7
1.0	2.20	0.858	1.892	25.9	78.6
1.1	2.43	0.944	2.081	25.4	77.7
1.2	2.65	1.030	2.271	25.0	77.0
1.3	2.87	1.115	2.458	24.6	76.3
1.4	3.09	1.201	2.648	24.3	75.7

FRESH AIRFLOW				CURVE 2	
TOTAL		CABIN		T FL	
(kg/s)	(lb/s)	(kg/s)	(lb/s)	(˚C)	(˚F)
1.5	3.31	1.287	2.837	24.0	75.2

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	0.429	0.946	36.0	96.8
0.6	1.32	0.515	1.135	33.3	91.9
0.7	1.54	0.600	1.323	31.4	88.5
0.8	1.76	0.686	1.512	29.9	85.8
0.9	1.98	0.772	1.702	28.8	83.8
1.0	2.20	0.858	1.892	27.9	82.2
1.1	2.43	0.944	2.081	27.2	81.0
1.2	2.65	1.030	2.271	26.6	79.9
1.3	2.87	1.115	2.458	26.1	79.0
1.4	3.09	1.201	2.648	25.7	78.3
1.5	3.31	1.287	2.837	25.3	77.5

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

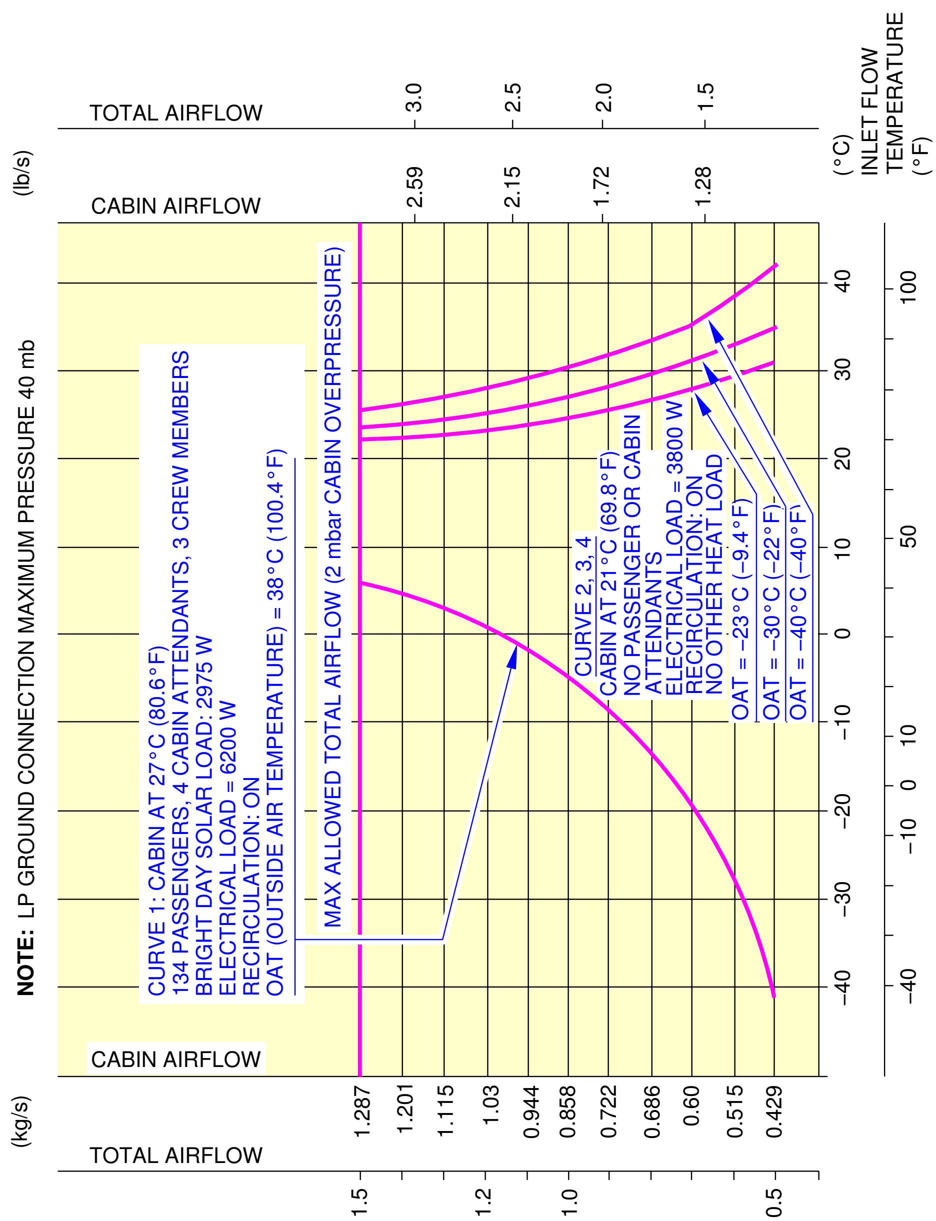
D. Preconditioned Airflow Requirements.

FRESH AIRFLOW				CURVE 4	
TOTAL		CABIN		T FL	
(kg/s)	(lb/s)	(kg/s)	(lb/s)	(˚C)	(˚F)
0.5	1.10	0.429	0.946	42.2	108.0
0.6	1.32	0.515	1.135	38.4	101.1
0.7	1.54	0.600	1.323	35.7	96.3
0.8	1.76	0.686	1.512	33.7	92.7
0.9	1.98	0.772	1.702	32.1	89.8
1.0	2.20	0.858	1.892	30.9	87.6
1.1	2.43	0.944	2.081	29.9	85.8
1.2	2.65	1.030	2.271	29.0	84.2
1.3	2.87	1.115	2.458	28.3	82.9
1.4	3.09	1.201	2.648	27.7	81.9

FRESH AIRFLOW				CURVE 4	
TOTAL		CABIN		T FL	
(kg/s)	(lb/s)	(kg/s)	(lb/s)	(°C)	(°F)
1.5	3.31	1.287	2.837	27.2	81.0

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

****ON A/C A319-100**



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Preconditioned Airflow Requirements
FIGURE 1

5-8-0 Ground Towing Requirements

****ON A/C A319-100**

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.

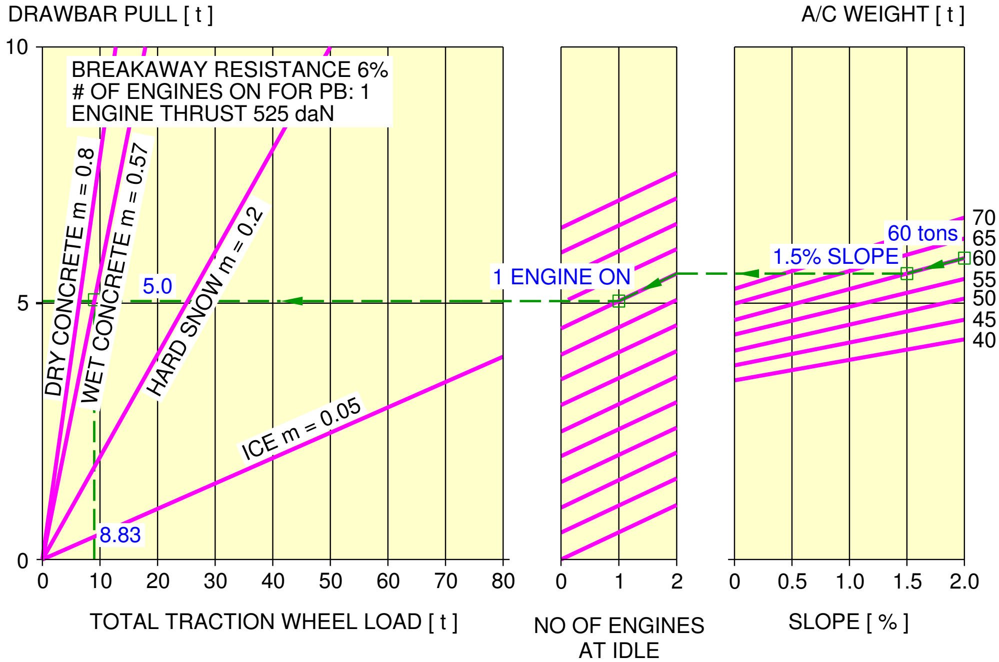
B. The second part of this section supplies guidelines for the tow bar.
   The aircraft tow bar shall respect the following norms:
   - SAE AS 1614, "Main Line Aircraft Tow Bar Attach Fitting Interface"
   - SAE ARP1915 Revision C, "Aircraft Tow Bar"
   - ISO 8267-1, "Aircraft - Tow bar attachment fitting - 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 A319-100



EXAMPLE HOW TO DETERMINE THE MASS REQUIREMENT TO TOW A A319 AT 60 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 (60 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 (5.0 t)
- SEARCH THE INTERSECTION WITH THE "WET CONCRETE" LINE. THE OBTAINED X–COORDINATE IS THE RECOMMENDED MINIMUM TRACTOR WEIGHT (8.8 t)

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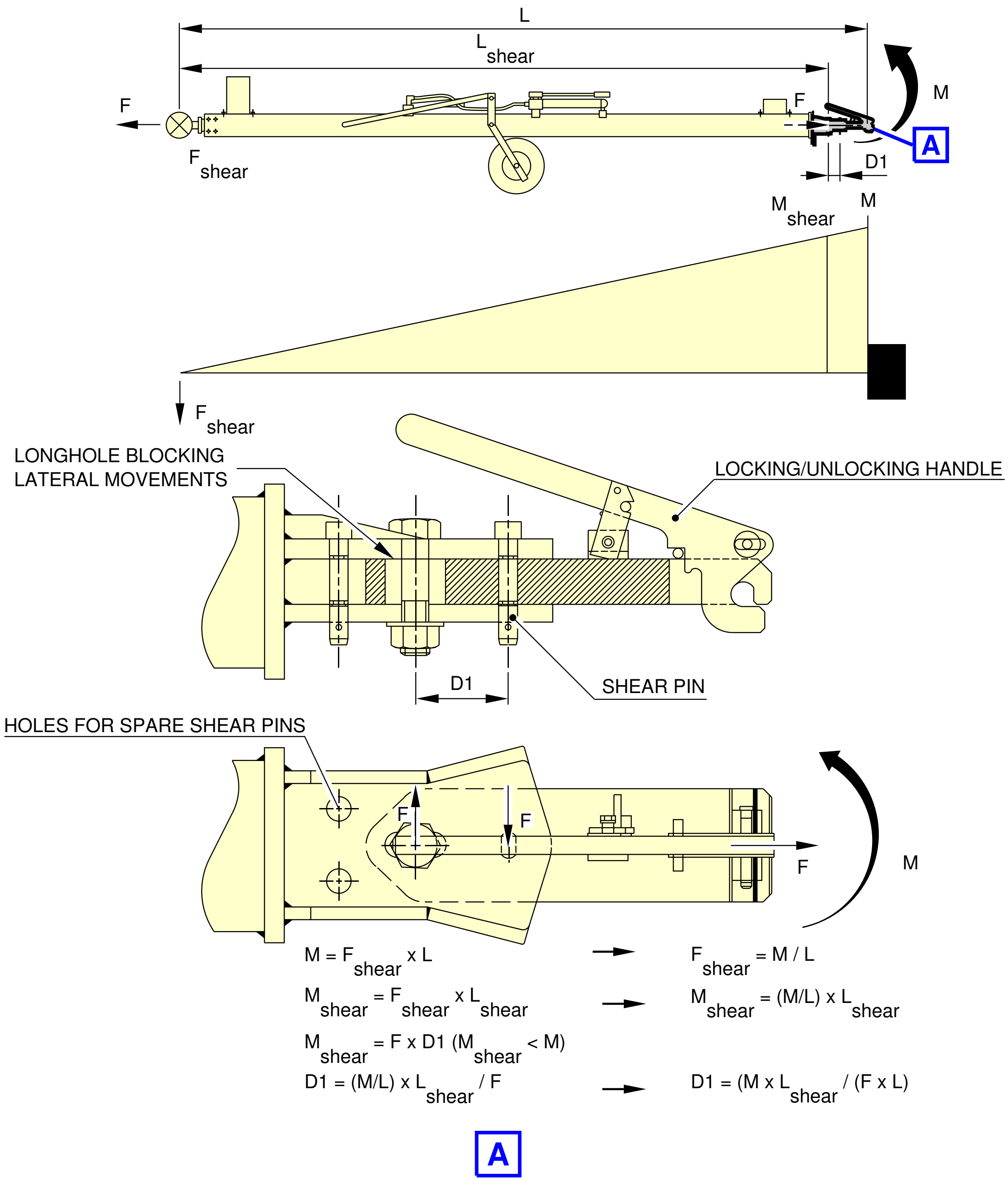
Ground Towing Requirements
FIGURE 1

**ON A/C A319-100



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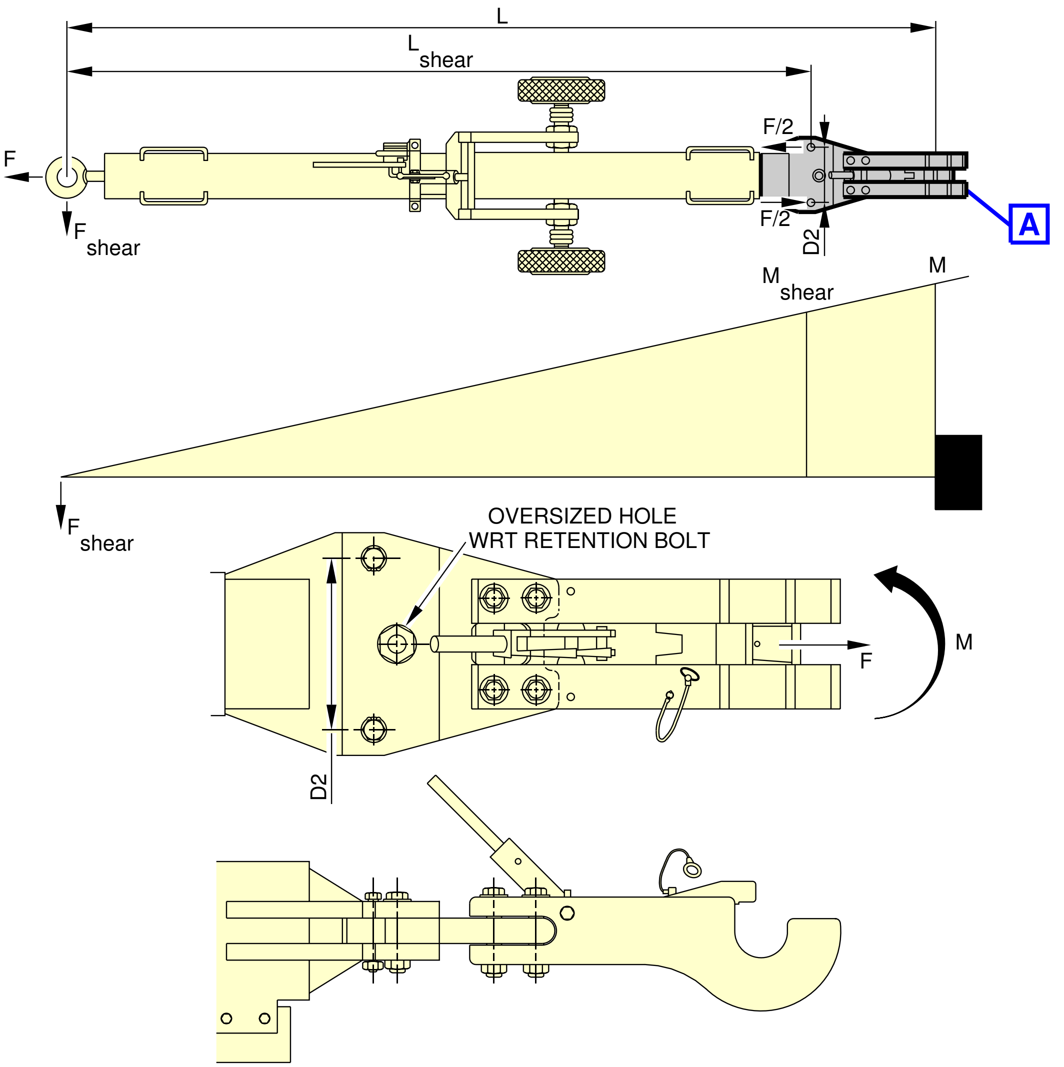
Ground Towing Requirements
Typical Tow Bar Configuration 1
FIGURE 2

**ON A/C A319-100



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

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

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

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

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

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Ground Towing Requirements
Typical Tow Bar Configuration 2
FIGURE 3

OPERATING CONDITIONS

6-1-0 Engine Exhaust Velocities and Temperatures

****ON A/C A319-100**

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.

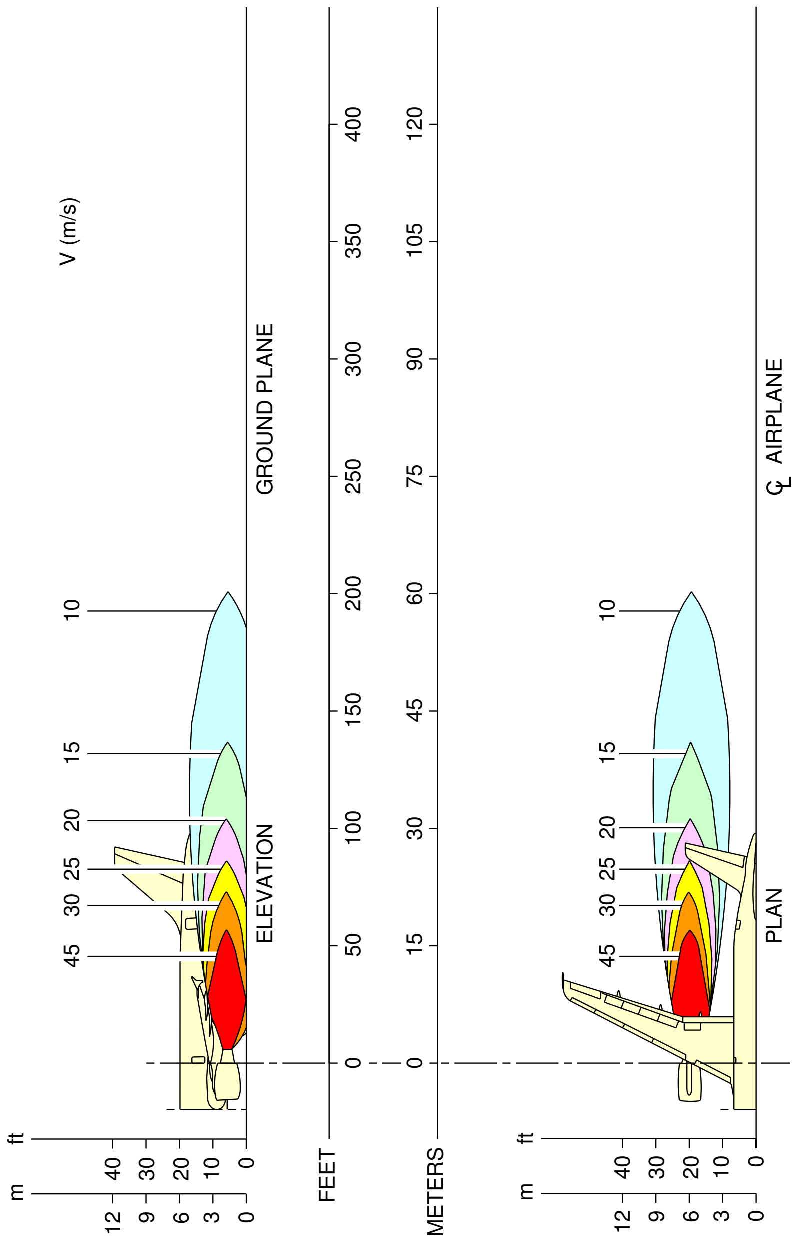
6-1-1 Engine Exhaust Velocities Contours - Ground Idle Power

**ON A/C A319-100

Engine Exhaust Velocities Contours - Ground Idle Power

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

**ON A/C A319-100



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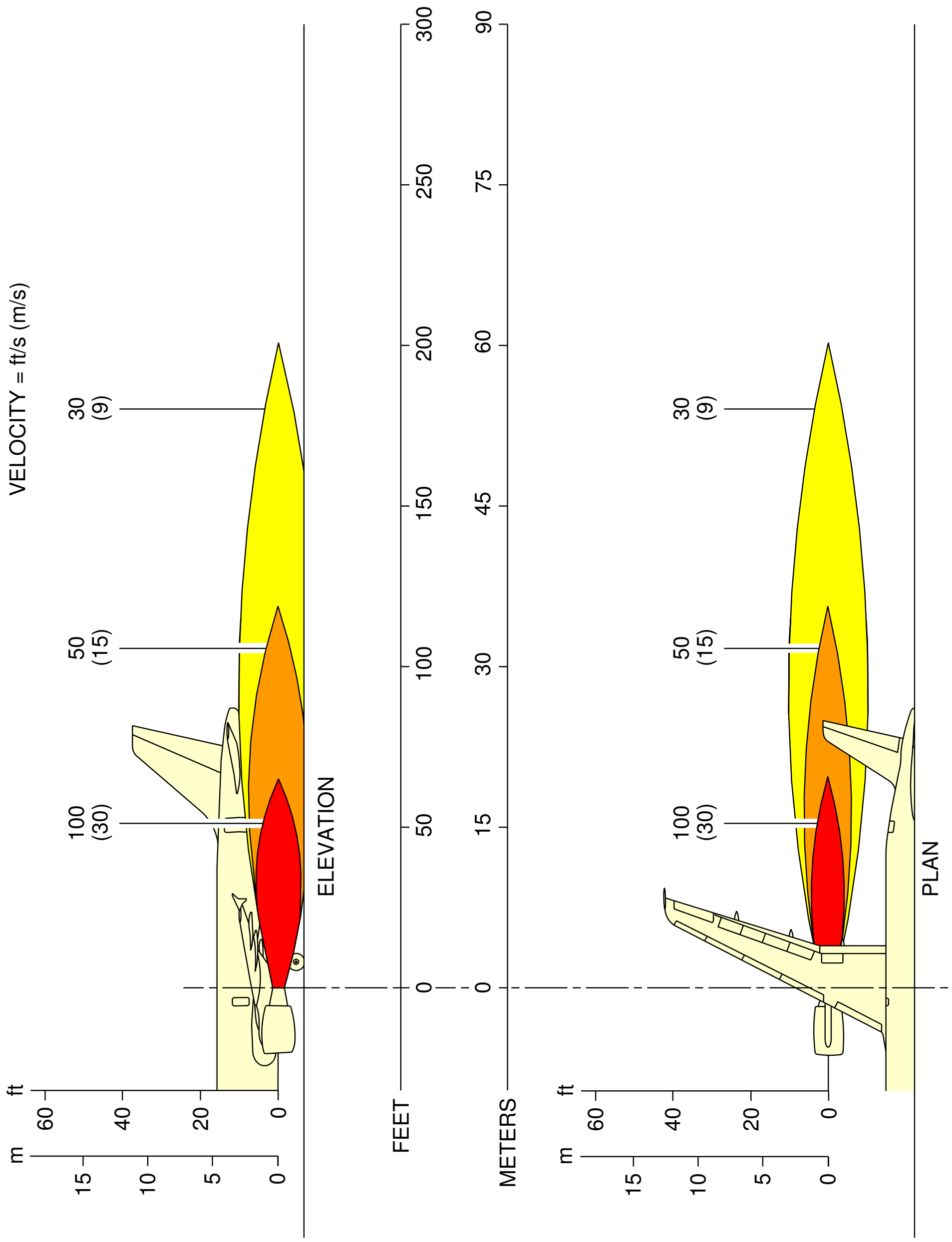
Engine Exhaust Velocities
Ground Idle Power – CFM56 series engine
FIGURE 1

**ON A/C A319-100



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

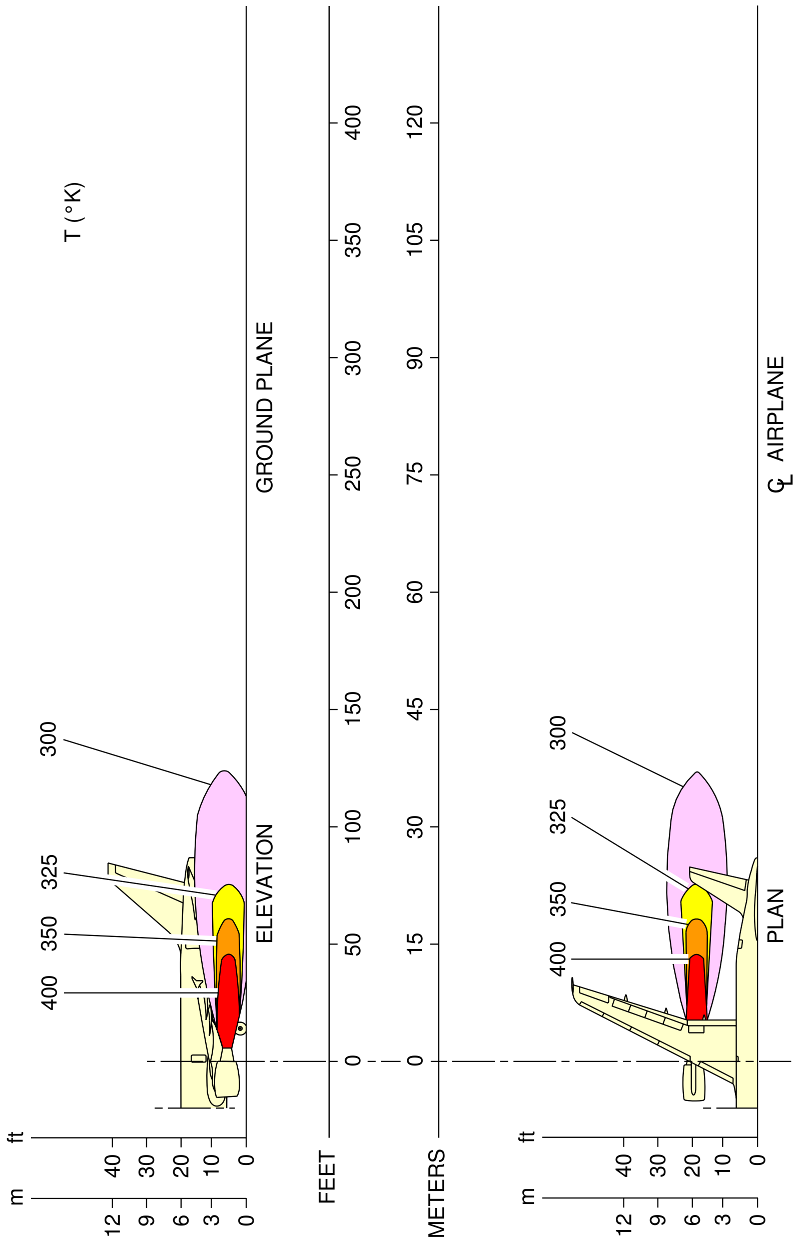
6-1-2 Engine Exhaust Temperatures Contours - Ground Idle Power

****ON A/C A319-100**

Engine Exhaust Temperatures Contours - Ground Idle Power

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

**ON A/C A319-100



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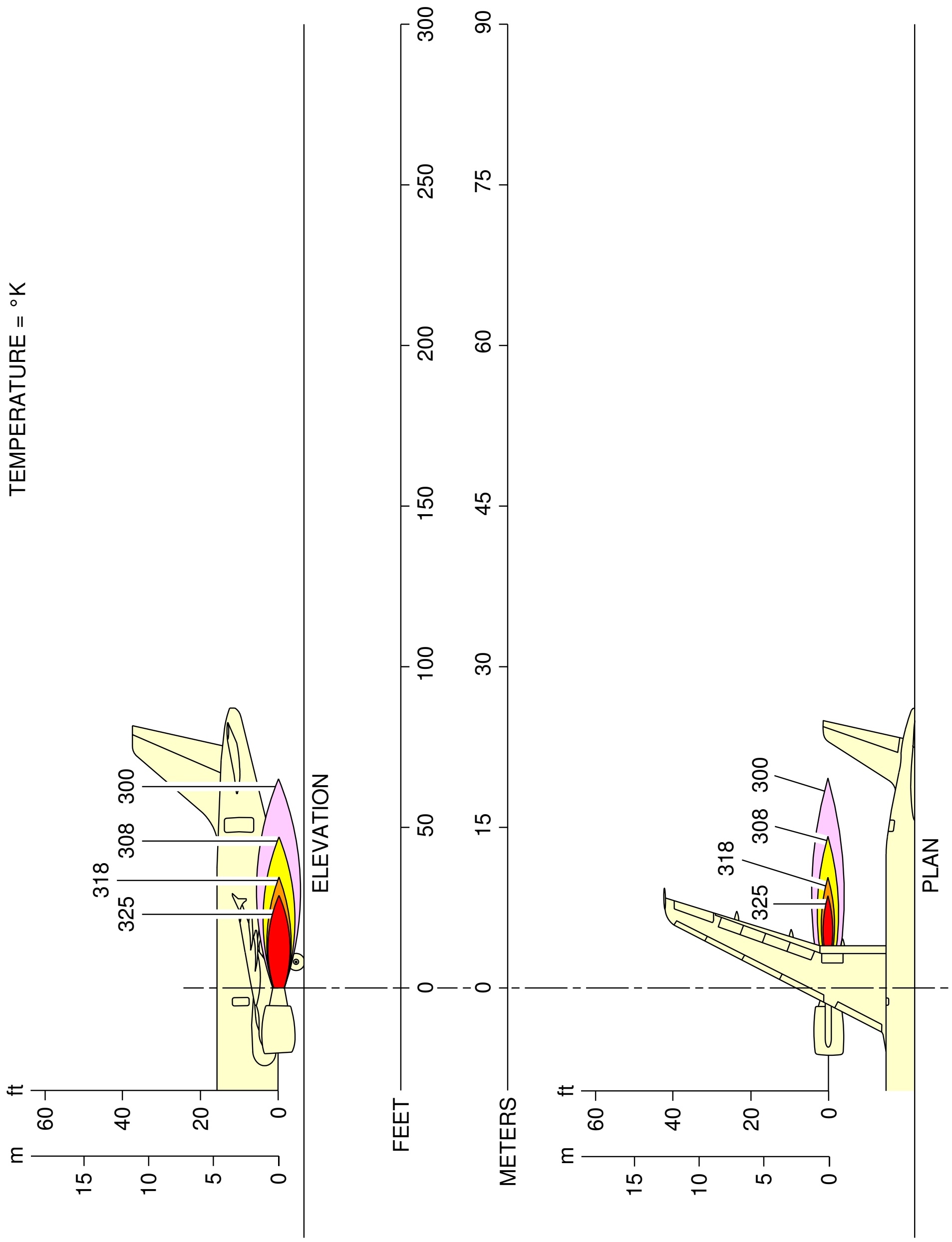
Engine Exhaust Temperatures
Ground Idle Power – CFM56 series engine
FIGURE 1

**ON A/C A319-100



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

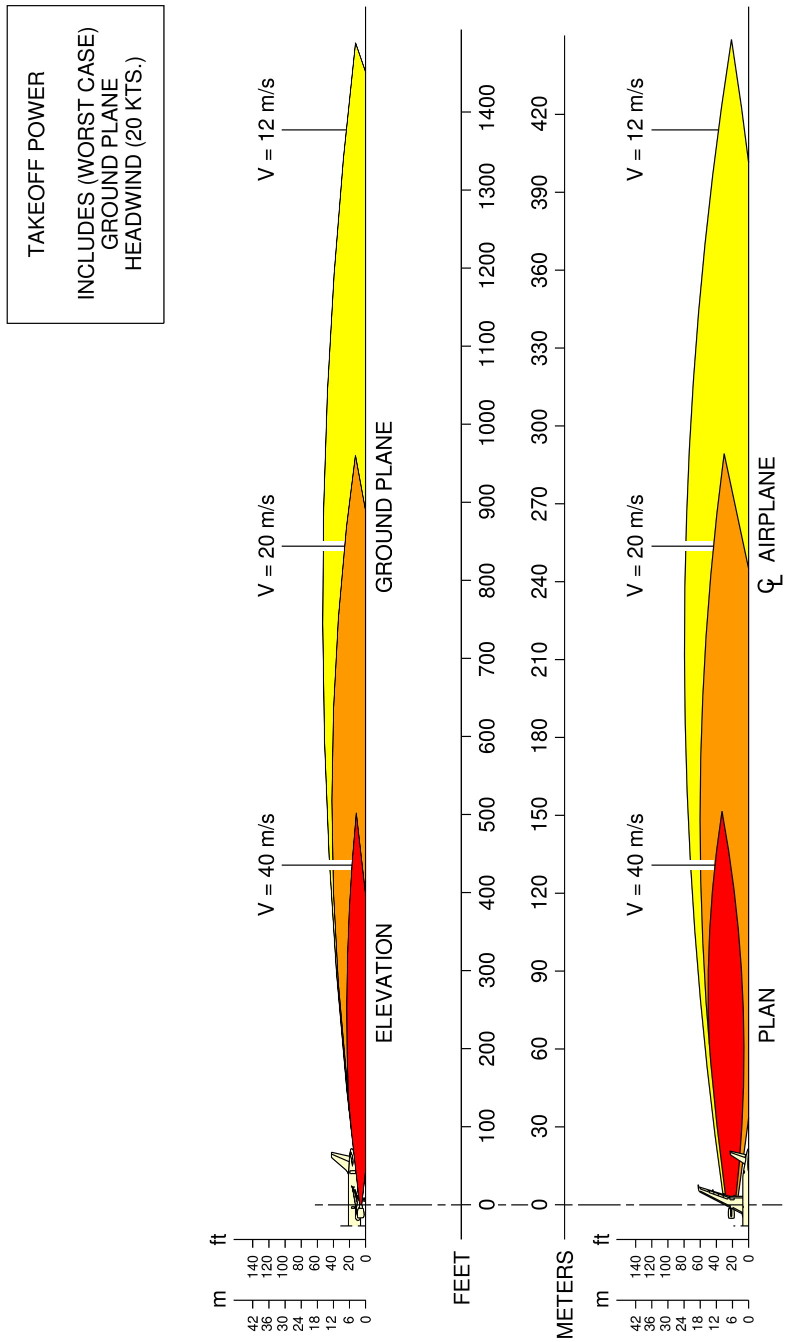
6-1-5 Engine Exhaust Velocities Contours - Takeoff Power

****ON A/C A319-100**

Engine Exhaust Velocities Contours - Takeoff Power

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

**ON A/C A319-100



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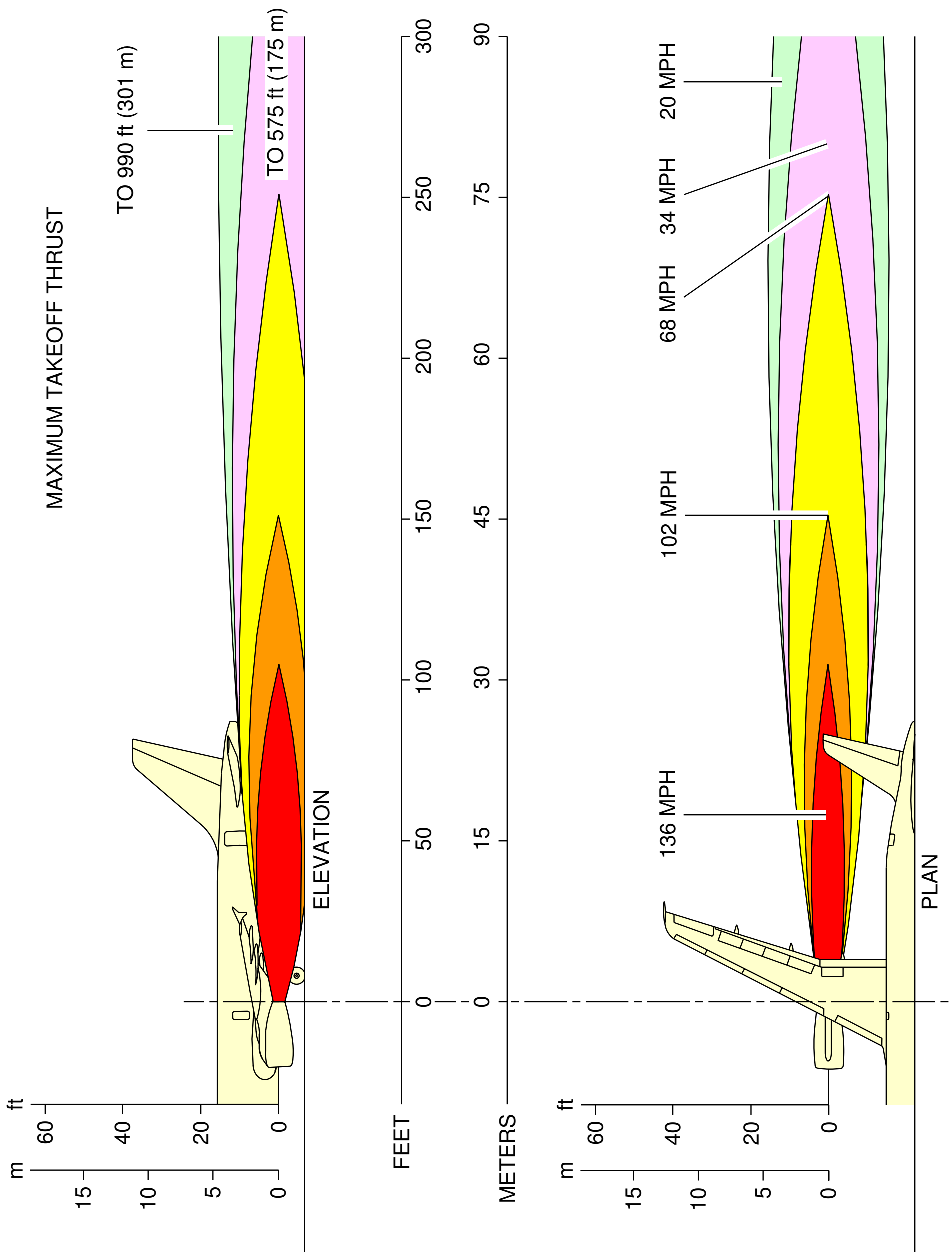
Engine Exhaust Velocities
Takeoff Power – CFM56 series engine
FIGURE 1

**ON A/C A319-100



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

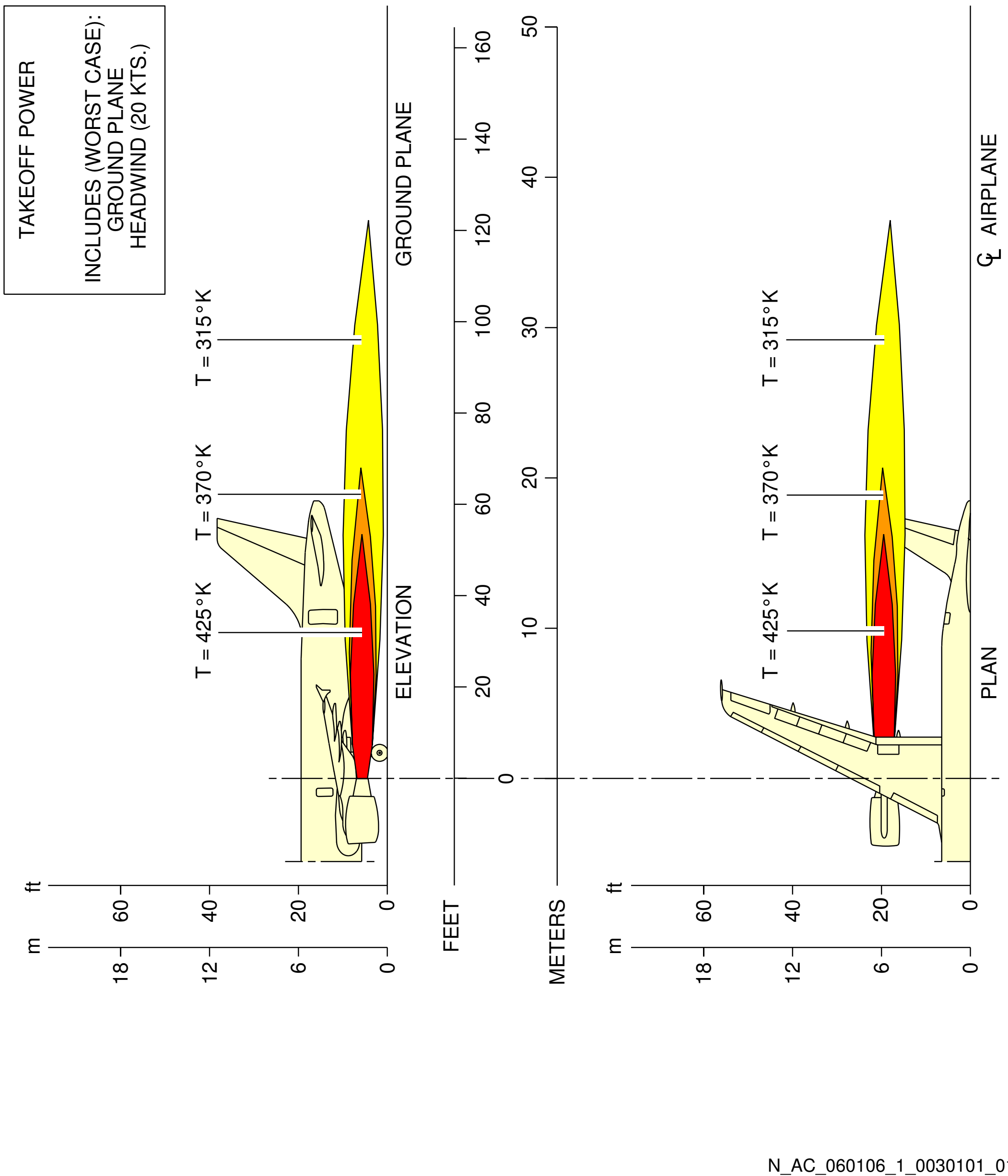
6-1-6 Engine Exhaust Temperatures Contours - Takeoff Power

****ON A/C A319-100**

Engine Exhaust Temperatures Contours - Takeoff Power

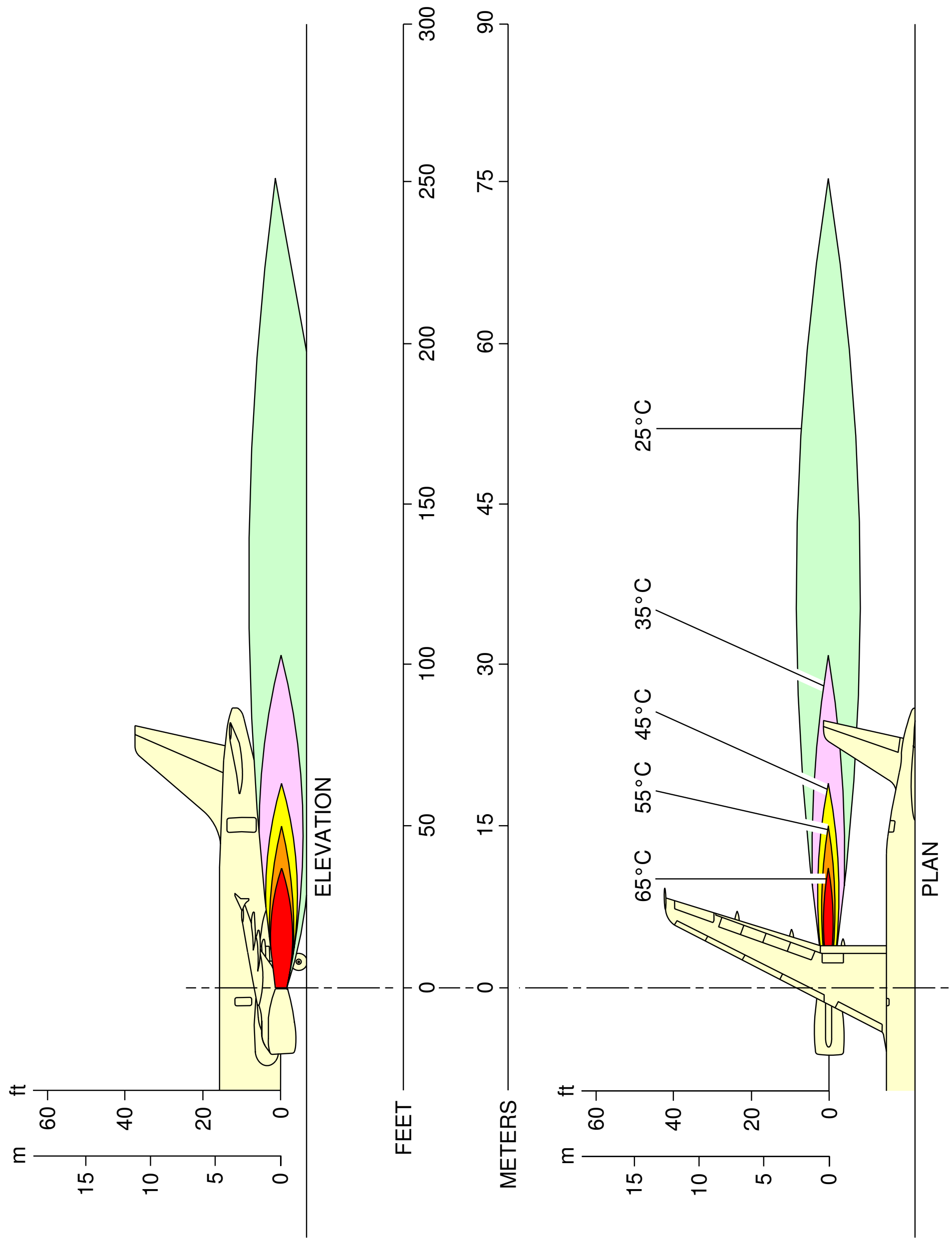
1. This section gives engine exhaust temperatures contours at takeoff power.

**ON A/C A319-100



Engine Exhaust Temperatures
Takeoff Power – CFM56 series engine
FIGURE 1

****ON A/C A319-100**



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

6-2-0 Airport and Community Noise

****ON A/C A319-100**

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 A319-100

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.

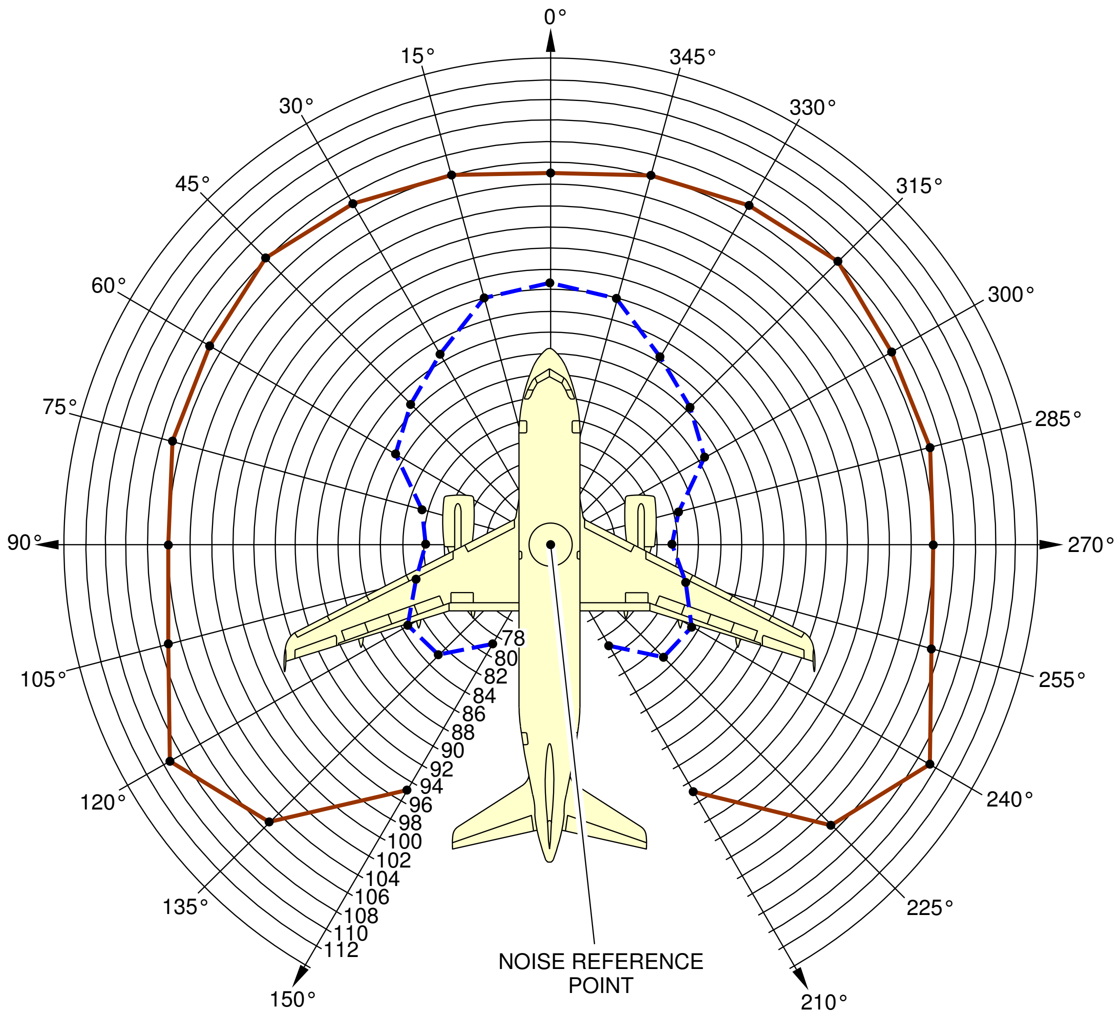
B. Engine parameters: 2 engines running

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: 27 °C (81 °F)
- Relative humidity: 40%
- Atmospheric pressure: 1000 hPa
- Wind speed: Negligible
- No rain

**ON A/C A319-100

	GROUND IDLE	MAX THRUST POSSIBLE ON BRAKES
N1	20.8%	90%
CURVE	(dashed line)	(solid line)



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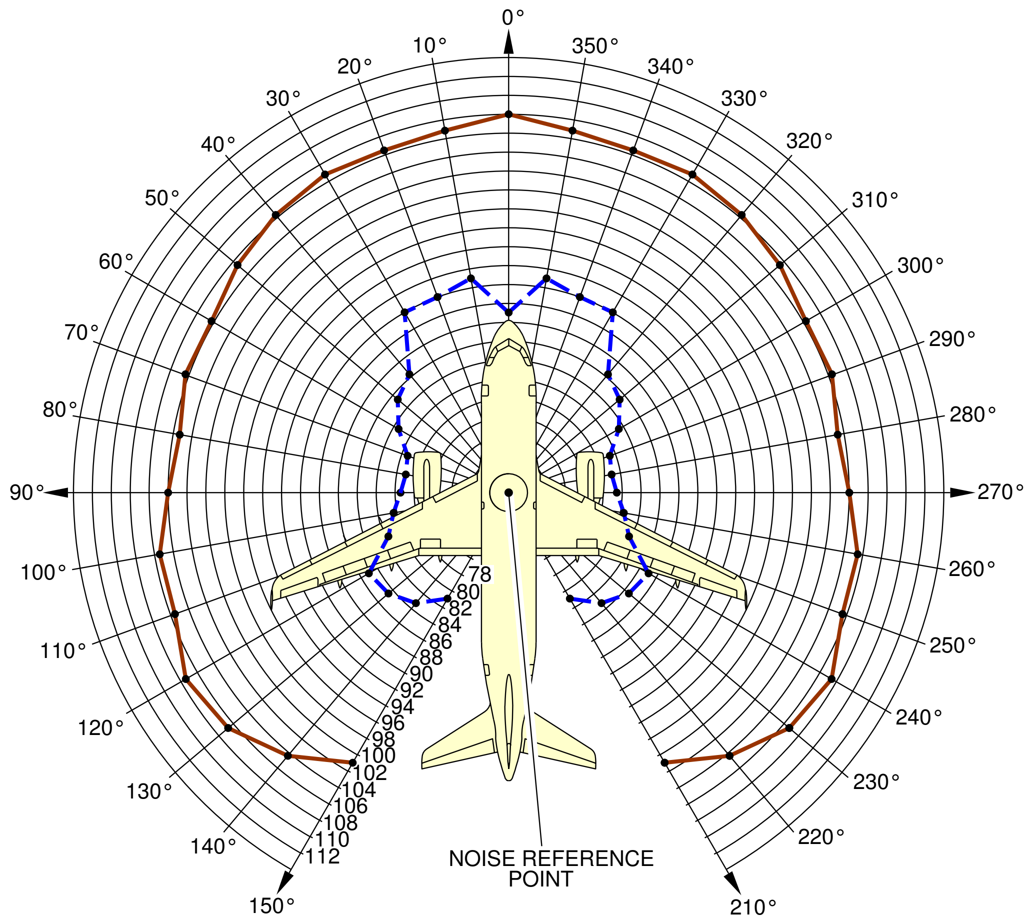
Airport and Community Noise
CFM56-5A series engine
FIGURE 1

**ON A/C A319-100

	GROUND IDLE	MAX THRUST POSSIBLE ON BRAKES
N1	18.9%	87%
CURVE	dashed blue line	solid brown line



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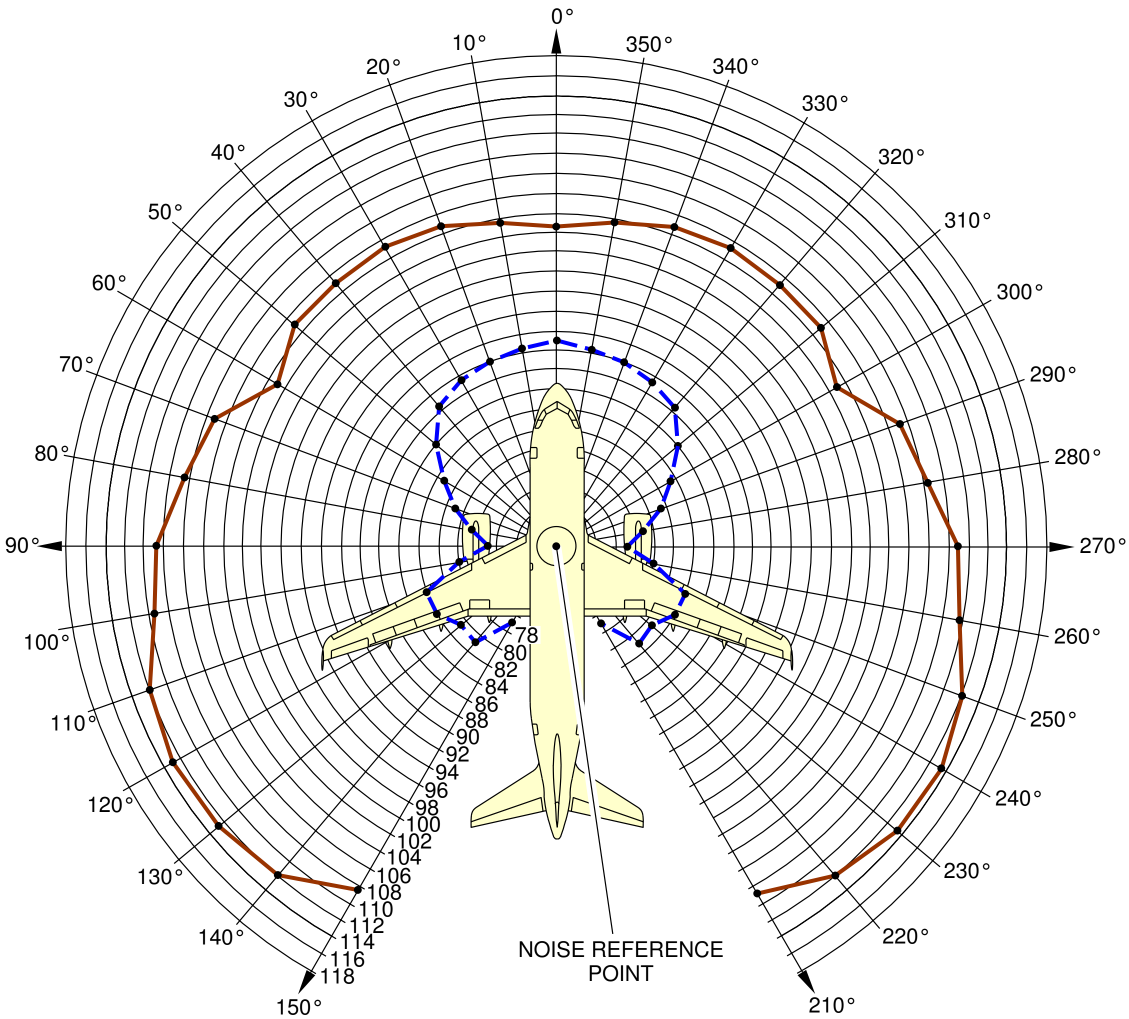
Airport and Community Noise
CFM56-5B series engine
FIGURE 2

**ON A/C A319-100

	GROUND IDLE	MAX THRUST POSSIBLE ON BRAKES
E.P.R	1.012	1.564
N1	25.2%	94.4%
CURVE		



Airport and Community Noise
IAE V2500 series engine
FIGURE 3

6-3-0 Danger Areas of Engines

****ON A/C A319-100**

Danger Areas of Engines

1. Danger Areas of the Engines.

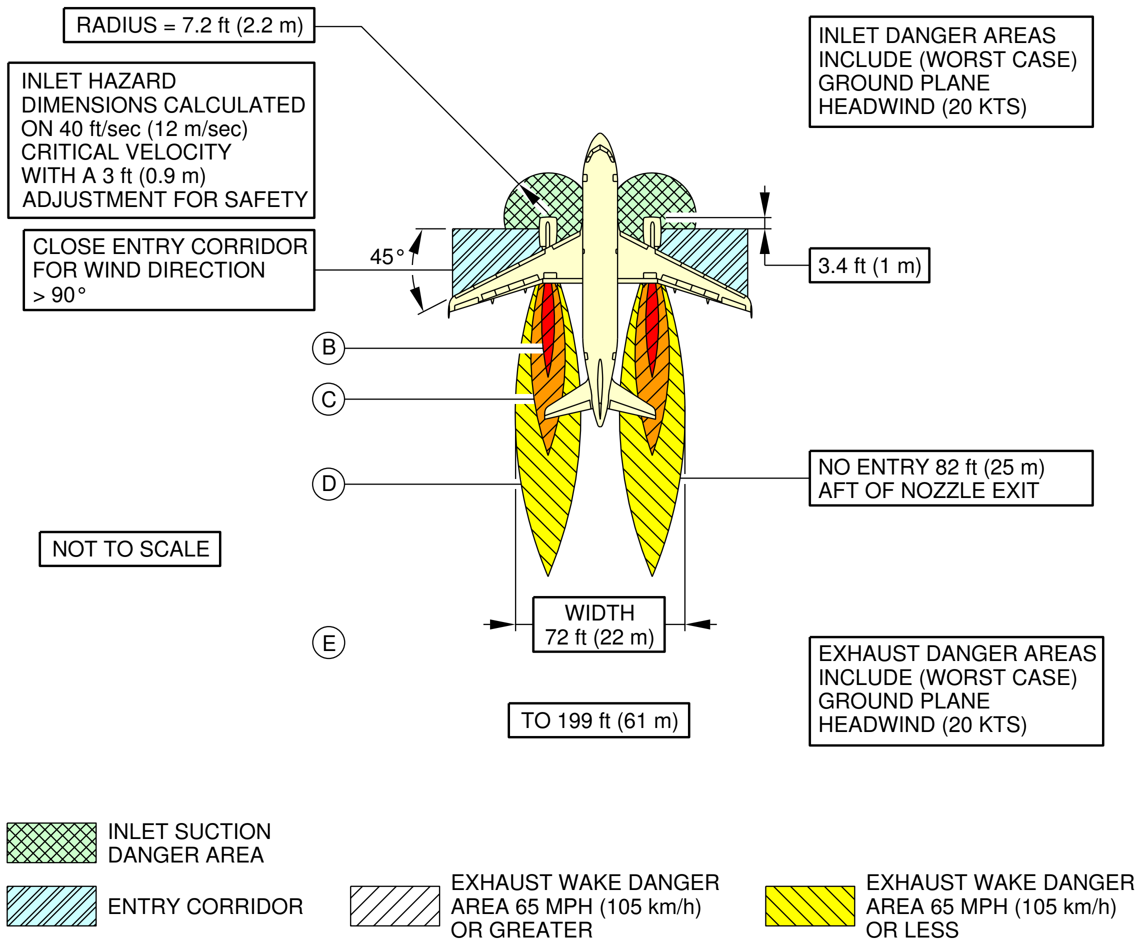
6-3-1 Ground Idle Power

**ON A/C A319-100

Ground Idle Power

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

**ON A/C A319-100



AREA	APPROX. WIND VELOCITY MPH (km/h)	POSSIBLE EFFECTS WITHIN DANGER ZONE BASED ON "RADIOLOGICAL DEFENSE" VOL. II, ARMED FORCES SPECIAL WEAPONS PROJECT, NOV. 1951
A	210–145 (338–233)	A MAN STANDING WILL BE PICKED UP AND THROWN; AIRCRAFT WILL BE COMPLETELY DESTROYED OR DAMAGED BEYOND ECONOMICAL REPAIR: COMPLETE DESTRUCTION OF FRAME OR BRICK HOMES.
B	145–105 (233–169)	A MAN STANDING FACE–ON WILL BE PICKED UP AND THROWN; DAMAGE NEARING TOTAL DESTRUCTION TO LIGHT INDUSTRIAL BUILDINGS OR RIGID STEEL FRAMING: CORRUGATED STEEL STRUCTURES LESS SEVERELY.
C	105–65 (169–105)	MODERATE DAMAGE TO LIGHT INDUSTRIAL BUILDINGS AND TRANSPORT–TYPE AIRCRAFT.
D	65–20 (105–32)	LIGHT TO MODERATE DAMAGE TO TRANSPORT–TYPE AIRCRAFT
E	< 20 (32)	BEYOND DANGER AREA

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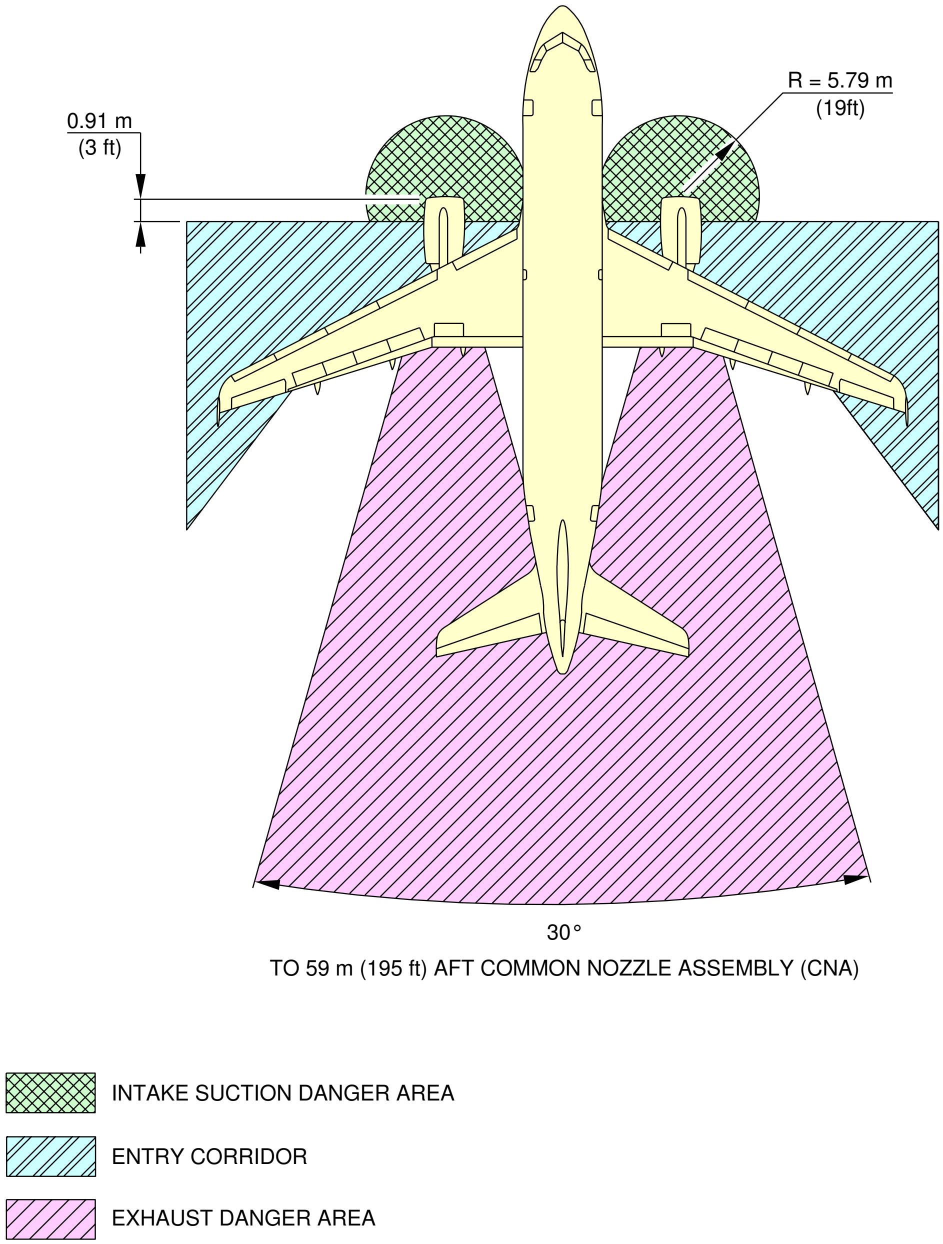
Danger Areas of Engines
CFM56 series engine
FIGURE 1

**ON A/C A319-100



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Danger Areas of Engines
IAE V2500 series engine
FIGURE 2

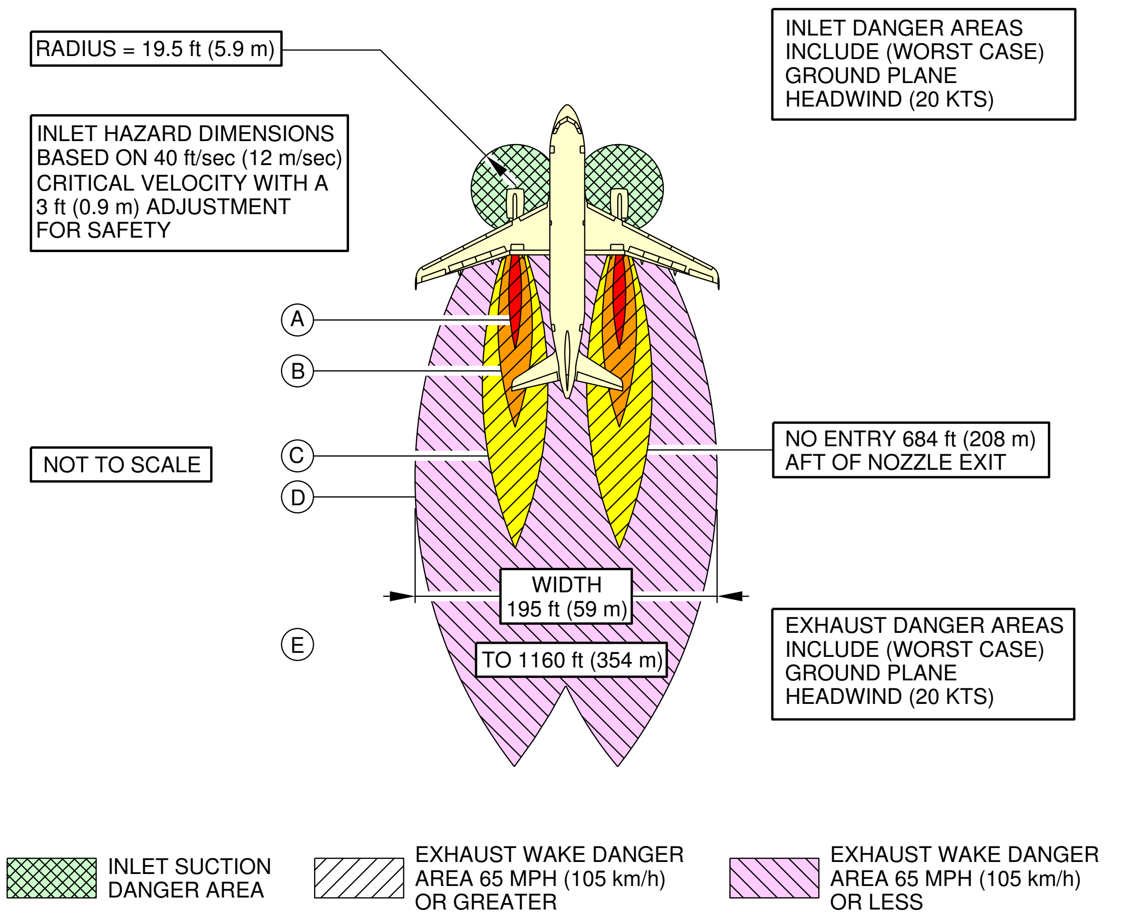
6-3-2 Takeoff Power

****ON A/C A319-100**

Takeoff Power

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

**ON A/C A319-100



AREA	APPROX. WIND VELOCITY MPH (km/h)	POSSIBLE EFFECTS WITHIN DANGER ZONE BASED ON "RADIOLOGICAL DEFENSE" VOL. II, ARMED FORCES SPECIAL WEAPONS PROJECT, NOV. 1951
A	210–145 (338–233)	A MAN STANDING WILL BE PICKED UP AND THROWN; AIRCRAFT WILL BE COMPLETELY DESTROYED OR DAMAGED BEYOND ECONOMICAL REPAIR: COMPLETE DESTRUCTION OF FRAME OR BRICK HOMES.
B	145–105 (233–169)	A MAN STANDING FACE–ON WILL BE PICKED UP AND THROWN; DAMAGE NEARING TOTAL DESTRUCTION TO LIGHT INDUSTRIAL BUILDINGS OR RIGID STEEL FRAMING: CORRUGATED STEEL STRUCTURES LESS SEVERELY.
C	105–65 (169–105)	MODERATE DAMAGE TO LIGHT INDUSTRIAL BUILDINGS AND TRANSPORT–TYPE AIRCRAFT.
D	65–20 (105–32)	LIGHT TO MODERATE DAMAGE TO TRANSPORT–TYPE AIRCRAFT
E	< 20 (32)	BEYOND DANGER AREA

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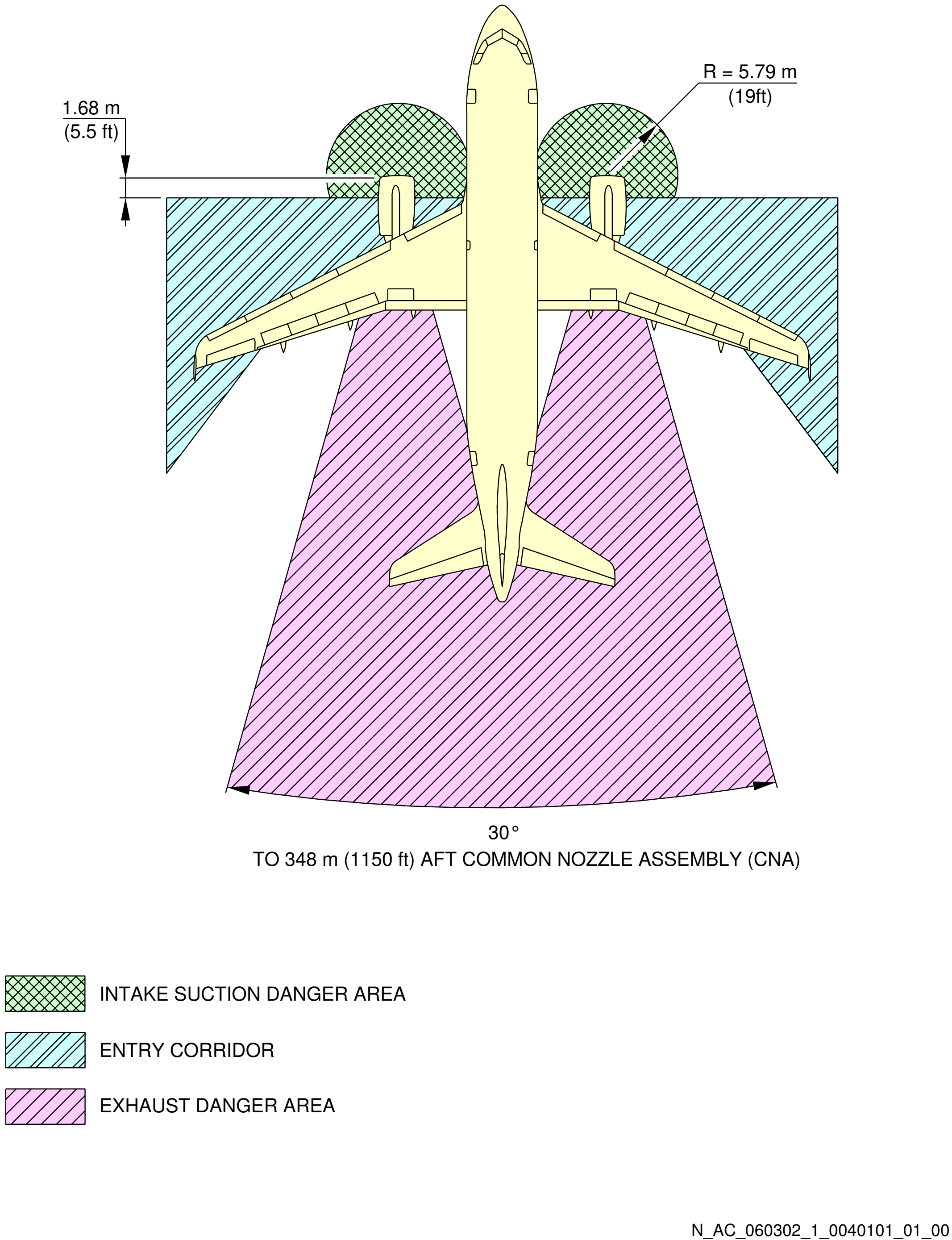
Danger Areas of Engines
CFM56 series engine
FIGURE 1

**ON A/C A319-100



Danger Areas of Engines
IAE V2500 series engine
FIGURE 2

6-4-0 APU Exhaust Velocities and Temperatures

**ON A/C A319-100

APU Exhaust Velocities and Temperatures

1. APU Exhaust Velocities and Temperatures.

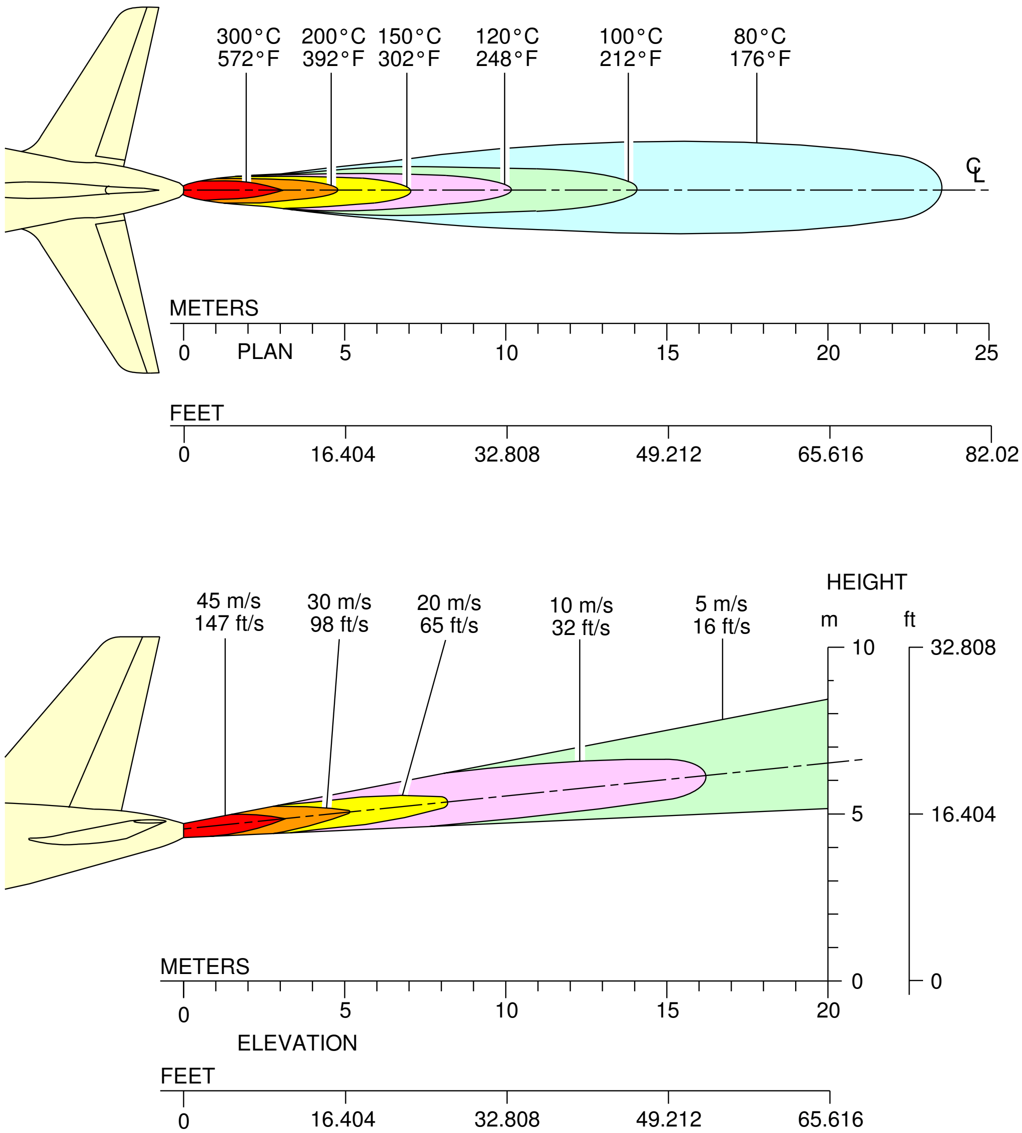
6-4-1 APU

****ON A/C A319-100**

APU - APIC & GARRETT

1. This section gives APU exhaust velocities and temperatures.

**ON A/C A319-100



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Exhaust Velocities and Temperatures
APU – APIC & GARRETT
FIGURE 1

PAVEMENT DATA

7-1-0 General Information

ON A/C A319-100

General Information

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 3: Model 100 and Section 7-2 page 4: Model CJ.

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

Section 7-3 pages 1 to 4: Model 100 and Section 7-3 page 5: Model CJ.

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 4: Model 100 and Section 7-4-1 page 5: Model CJ.

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 5: Model 100 and Section 7-6-1 pages 6 to 7: Model CJ.

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 5: Model 100 and Section 7-8-2 pages 6 to 7: Model CJ.

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 1 to 9: Model 100 and Section 7-9-1 pages 10 to 11: Model CJ 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 9: Model 100 and Section 7-9-2 pages 10 to 11: Model CJ 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 5: Model 100 and Section 7-5-1 pages 6 to 7: Model CJ.

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 5: Model 100 and Section 7-7-1 pages 6 to 7: Model CJ.

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

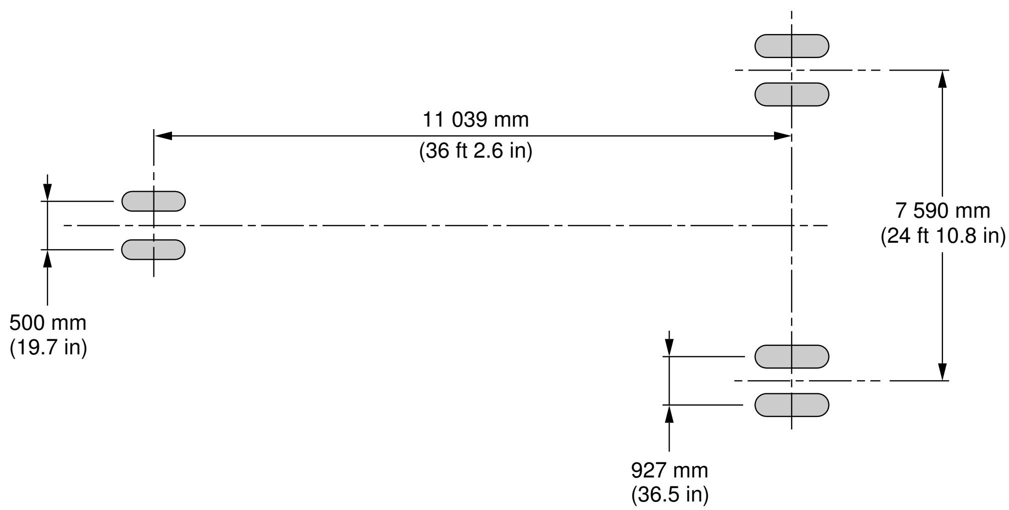
****ON A/C A319-100**

Landing Gear Footprint

1. This section gives Landing Gear Footprint.

**ON A/C A319-100

MAXIMUM RAMP WEIGHT	64 400 kg (141 975 lb)	68 400 kg (150 800 lb)
PERCENTAGE OF WEIGHT ON MAIN GEAR GROUP	SEE SHEET 7–4–1 PAGE 1 & PAGE 2	SEE SHEET 7–4–1 PAGE 1, PAGE 2, PAGE 3 & 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)	12.1 bar (175 psi)
MAIN GEAR TIRE SIZE	46 x 17 R20 (46 x 16 – 20)	
MAIN GEAR TIRE PRESSURE	11.9 bar (173 psi)	12.5 bar (181 psi)



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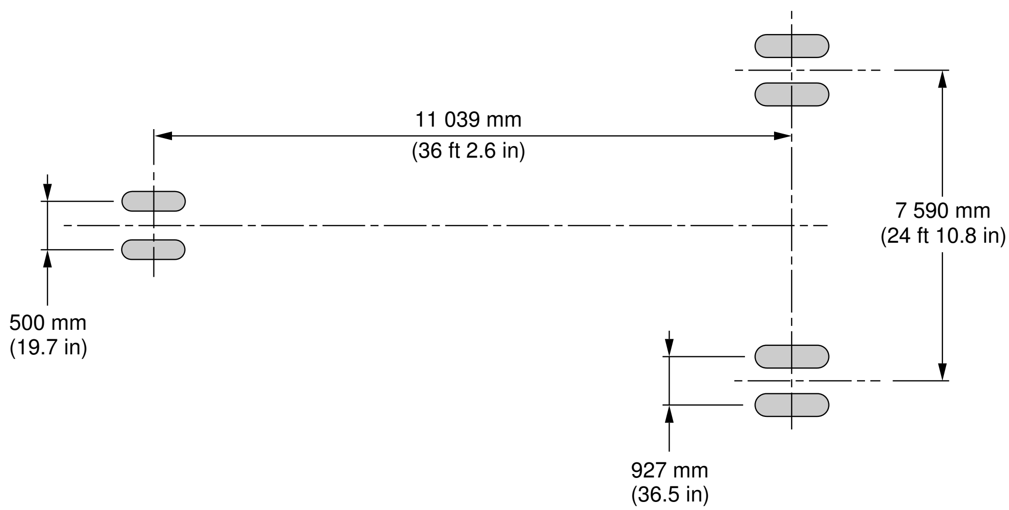
Landing Gear Footprint
MTOW 64 T/68 T
FIGURE 1

**ON A/C A319-100

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, PAGE 2, PAGE 3 & PAGE 4	SEE SHEET 7–4–1 PAGE 3 & PAGE 4
NOSE GEAR TIRE SIZE	30 x 8.8 R15 (30 x 8.8 – 15)	
NOSE GEAR TIRE PRESSURE	12.5 bar (181 psi)	13.5 bar (196 psi)
MAIN GEAR TIRE SIZE	46 x 17 R20 (46 x 16 – 20)	
MAIN GEAR TIRE PRESSURE	12.9 bar (187 psi)	13.4 bar (194 psi)



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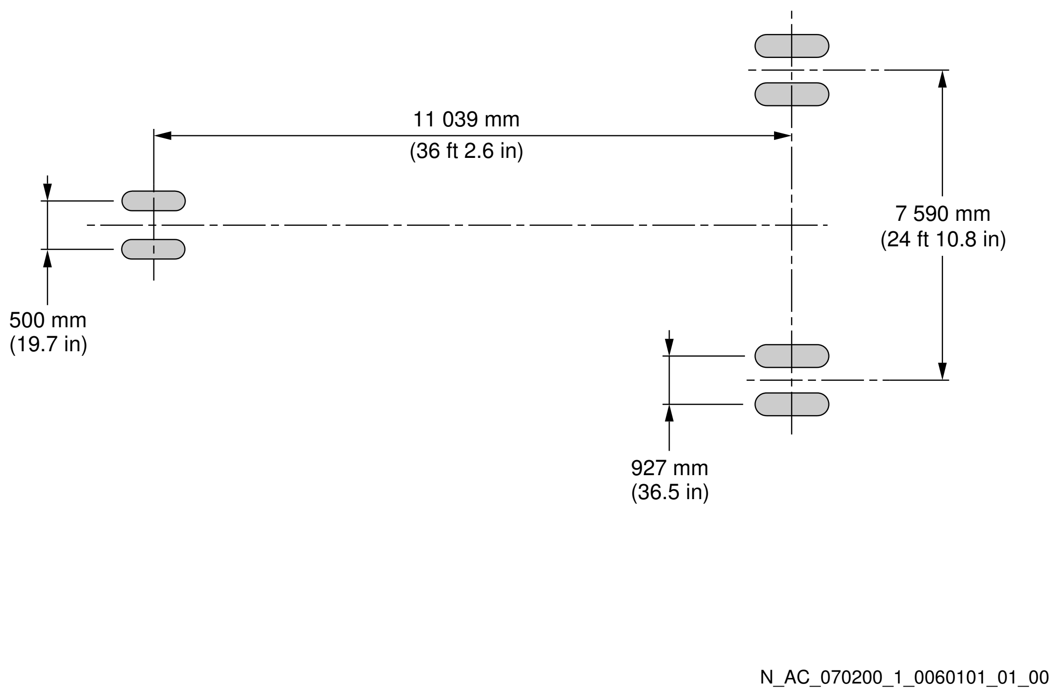
Landing Gear Footprint
MTOW 70 T/73.5 T
FIGURE 2

**ON A/C A319-100

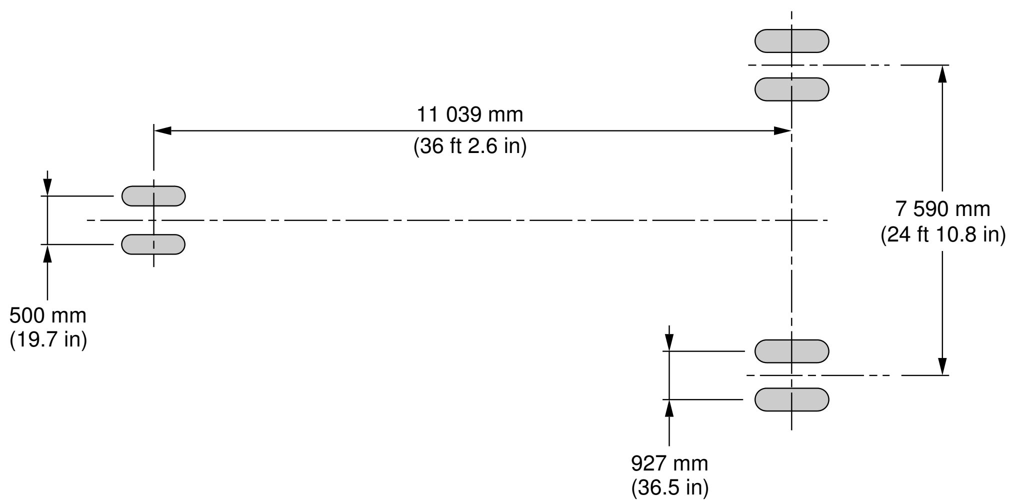
MAXIMUM RAMP WEIGHT	75 900 kg (167 325 lb)
PERCENTAGE OF WEIGHT ON MAIN GEAR GROUP	SEE SHEET 7–4–1 PAGE 1, PAGE 2, PAGE 3 & PAGE 4
NOSE GEAR TIRE SIZE	30 x 8.8 R15 (30 x 8.8 – 15)
NOSE GEAR TIRE PRESSURE	13.2 bar (191 psi)
MAIN GEAR TIRE SIZE	46 x 17 R20 (46 x 16 – 20)
MAIN GEAR TIRE PRESSURE	13.8 bar (200 psi)



Landing Gear Footprint
MTOW 75.5 T
FIGURE 3

**ON A/C A319-100

MAXIMUM RAMP WEIGHT	70 400 kg (155 200 lb)	75 900 kg (167 325 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	13.9 bar (202 psi)	
MAIN GEAR TIRE SIZE	46 x 17 R20 (46 x 16 – 20)	
MAIN GEAR TIRE PRESSURE	13.8 bar (200 psi)	



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Landing Gear Footprint
Model CJ – MTOW 70 T/75.5 T
FIGURE 4

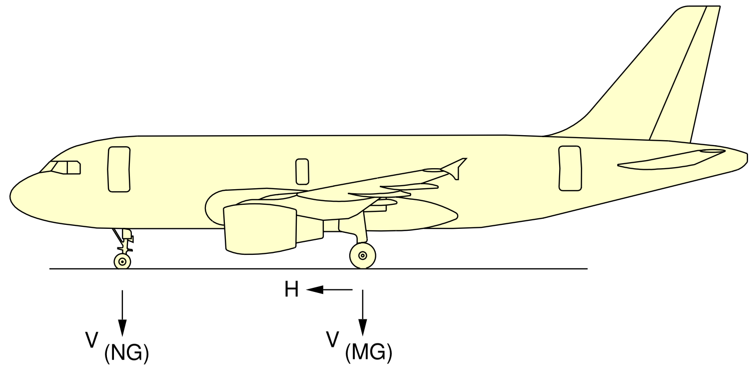
7-3-0 Maximum Pavement Loads

****ON A/C A319-100**

Maximum Pavement Loads

1. This section gives Maximum Pavement Loads.

**ON A/C A319-100



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	141 975	64 400	20 625	9 360	34 025	15 430	64 850 (2)	29 420 (2)	22 075	10 010	51 875	23 530
−100	141 975	64 400	20 625	9 360	34 025	15 430	65 700 (3)	29 800 (3)	22 075	10 010	52 550	23 840

$V_{(NG)}$ 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

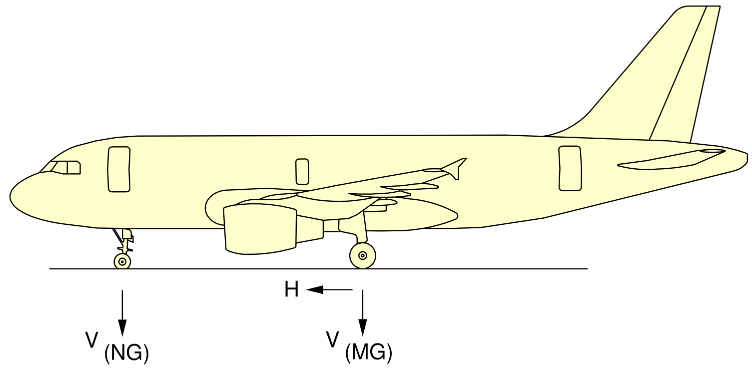
(1) FWD CG = 21 % MAC
(2) AFT CG = 36 % MAC
(3) AFT CG = 39 % MAC

NOTE: ALL LOADS CALCULATED USING AIRPLANE MAXIMUM RAMP WEIGHT

N_AC_070300_1_0040101_01_00

Maximum Pavement Loads
MTOW 64 T
FIGURE 1

**ON A/C A319-100



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	150 800	68 400	21 875	9 920	36 075	16 360	68 900 (2)	31 250 (2)	23 425	10 630	55 100	25 000
–100	150 800	68 400	21 875	9 920	36 075	16 360	69 525 (3)	31 530 (3)	23 425	10 630	55 600	25 230

$V_{(NG)}$ 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

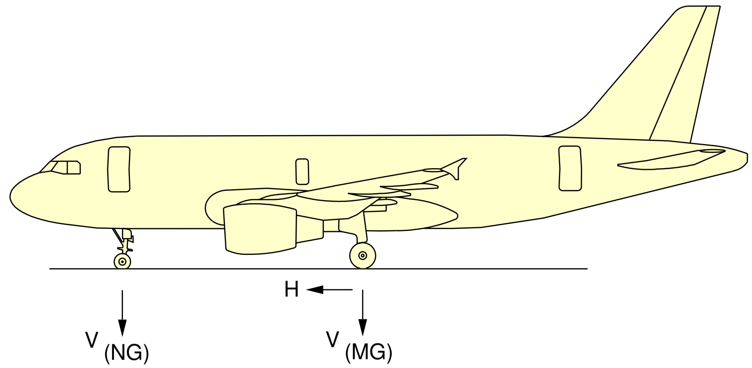
(1) FWD CG = 21 % MAC
(2) AFT CG = 36 % MAC
(3) AFT CG = 38.1 % MAC

NOTE: ALL LOADS CALCULATED USING AIRPLANE MAXIMUM RAMP WEIGHT

N_AC_070300_1_0050101_01_00

Maximum Pavement Loads
MTOW 68 T
FIGURE 2

**ON A/C A319-100



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	155 200	70 400	22 450	10 190	37 050	16 800	70 925 (2)	32 180 (2)	24 125	10 940	56 750	25 740
–100	155 200	70 400	22 450	10 190	37 050	16 800	71 400 (3)	32 390 (3)	24 125	10 940	57 125	25 910

$V_{(NG)}$ 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

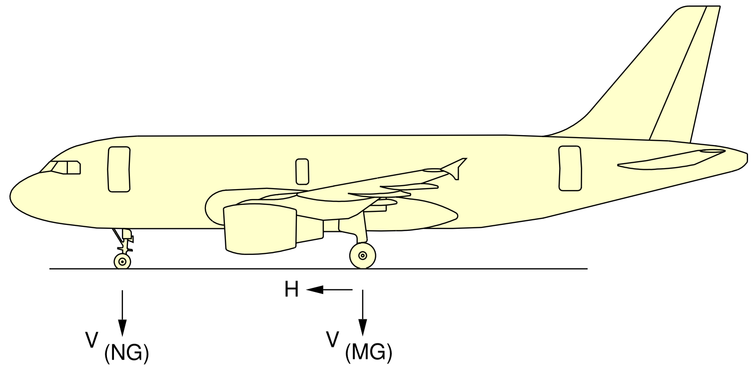
(1) FWD CG = 21 % MAC
(2) AFT CG = 36 % MAC
(3) AFT CG = 37.5 % MAC

NOTE: ALL LOADS CALCULATED USING AIRPLANE MAXIMUM RAMP WEIGHT

N_AC_070300_1_0060101_01_00

Maximum Pavement Loads
MTOW 70 T
FIGURE 3

**ON A/C A319-100



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
–100	162 925	73 900	23 550 (1)	10 690 (1)	32 825	17 610	74 475 (3)	33 780 (3)	25 325	11 480	59 575	27 020
–100	162 925	73 900	23 550 (1)	10 690 (1)	32 825	17 610	74 625 (4)	33 850 (4)	25 325	11 480	59 700	27 080
–100	167 325	75 900	23 725 (2)	10 760 (2)	40 050	18 170	76 550 (3)	34 720 (3)	26 000	11 800	61 250	27 780

$V_{(NG)}$ 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 = 21 % MAC
(2) FWD CG = 21 % MAC AT A/C WEIGHT = 74 500 kg

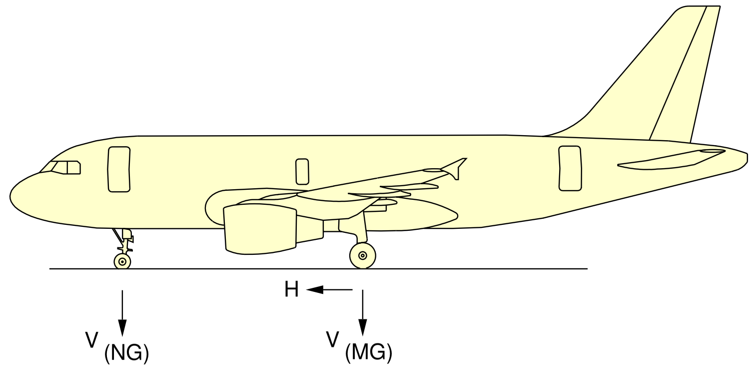
(3) AFT CG = 36 % MAC
(4) AFT CG = 36.52 % MAC

NOTE: ALL LOADS CALCULATED USING AIRPLANE MAXIMUM RAMP WEIGHT

N_AC_070300_1_0070101_01_00

Maximum Pavement Loads
MTOW 73.5 T/75.5 T
FIGURE 4

**ON A/C A319-100



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 (3)		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	155 200	70 400	25 075 (1)	11 380 (1)	40 175	18 230	71 000	32 210	24 125	10 940	56 800	25 770
–100	167 325	75 900	23 650 (2)	10 730 (2)	39 900	18 090	76 600	34 740	26 000	11 800	61 275	27 790

$V_{(NG)}$ 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 = 16.6 % MAC

(2) FWD CG = 21 % MAC AT A/C WEIGHT = 74 500 kg

(3) AFT CG = 36 % MAC

NOTE: ALL LOADS CALCULATED USING AIRPLANE MAXIMUM RAMP WEIGHT

N_AC_070300_1_0080101_01_00

Maximum Pavement Loads
Model CJ – MTOW 70 T/75.5 T
FIGURE 5

7-4-0 Landing Gear Loading on Pavement

****ON A/C A319-100**

Landing Gear Loading on Pavement

1. General

A319-100 Model:

In the example shown in Section 7-4-1, page 1, the Gross Aircraft Weight is 50 tonnes (110231 lb) and the percentage of weight on the Main Landing Gear is 91.5 %.

For these conditions the total weight on the Main Landing Gear Group is 45.75 tonnes (100861 lb).

A319-CJ Model:

In the example shown in Section 7-4-1, page 5, the Gross Aircraft Weight is 50 tonnes (110231 lb) and the percentage of weight on the Main Landing Gear is 91.5 %.

For these conditions the total weight on the Main Landing Gear Group is 45.75 tonnes (100861 lb).

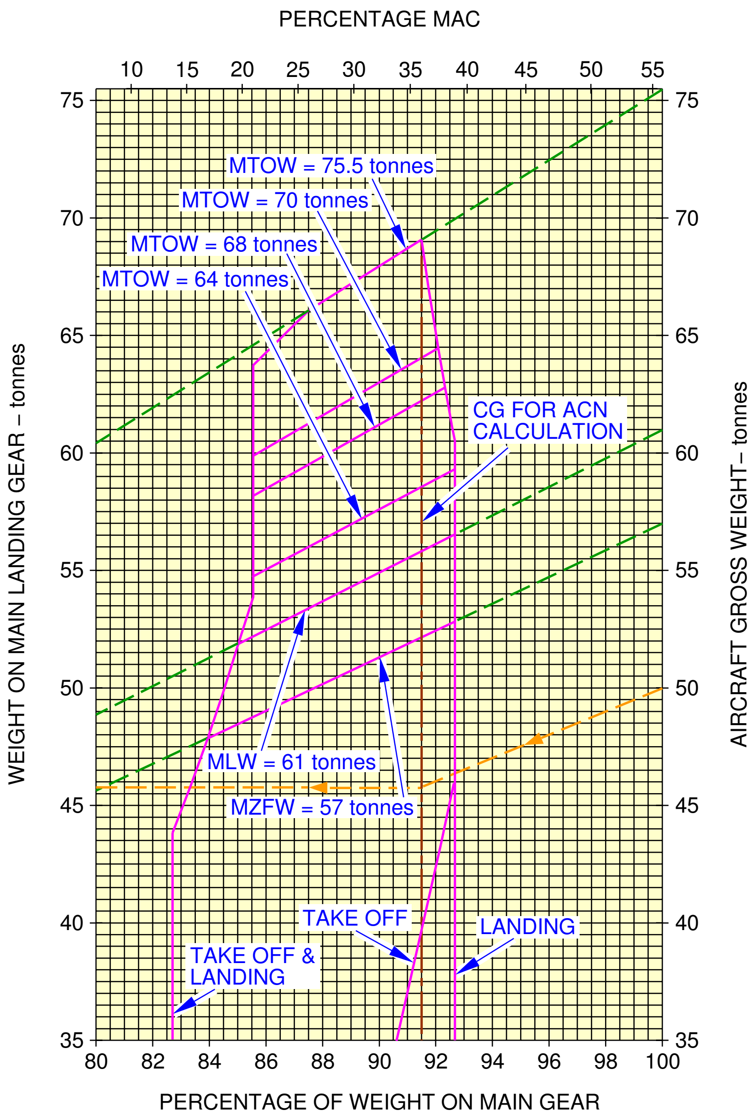
7-4-1 Landing Gear Loading on Pavement

**ON A/C A319-100

Landing Gear Loading on Pavement

1. This section gives Landing Gear Loading on Pavement.

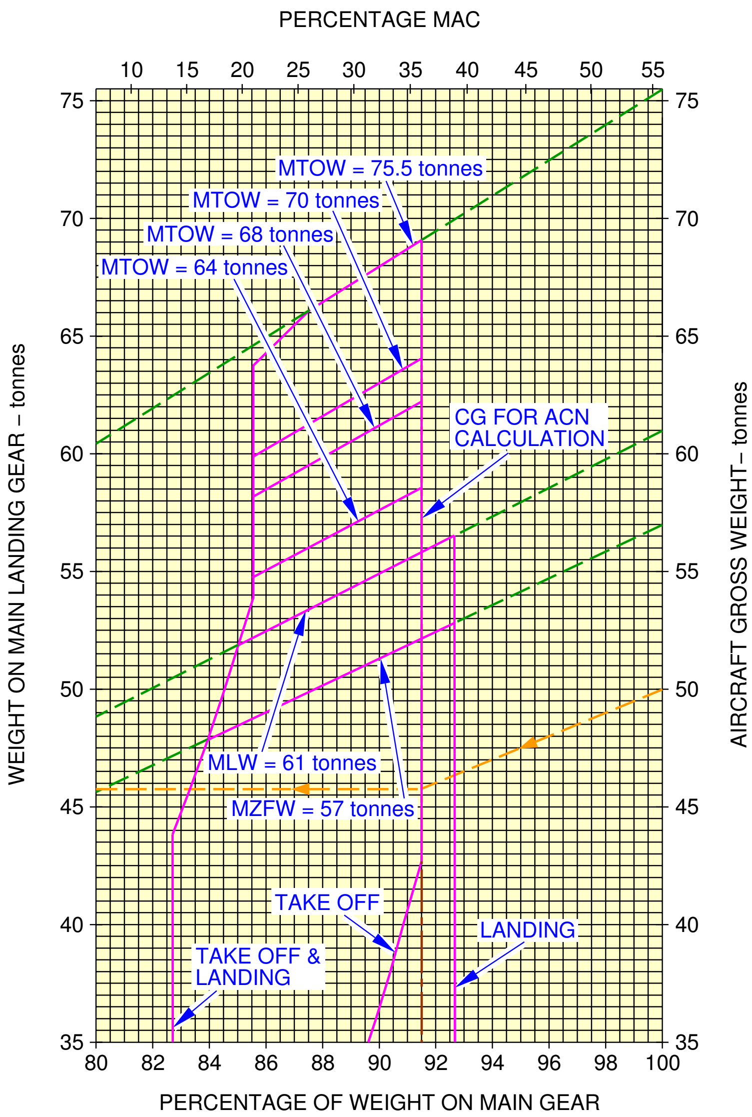
**ON A/C A319-100



N_AC_070401_1_0040101_01_01

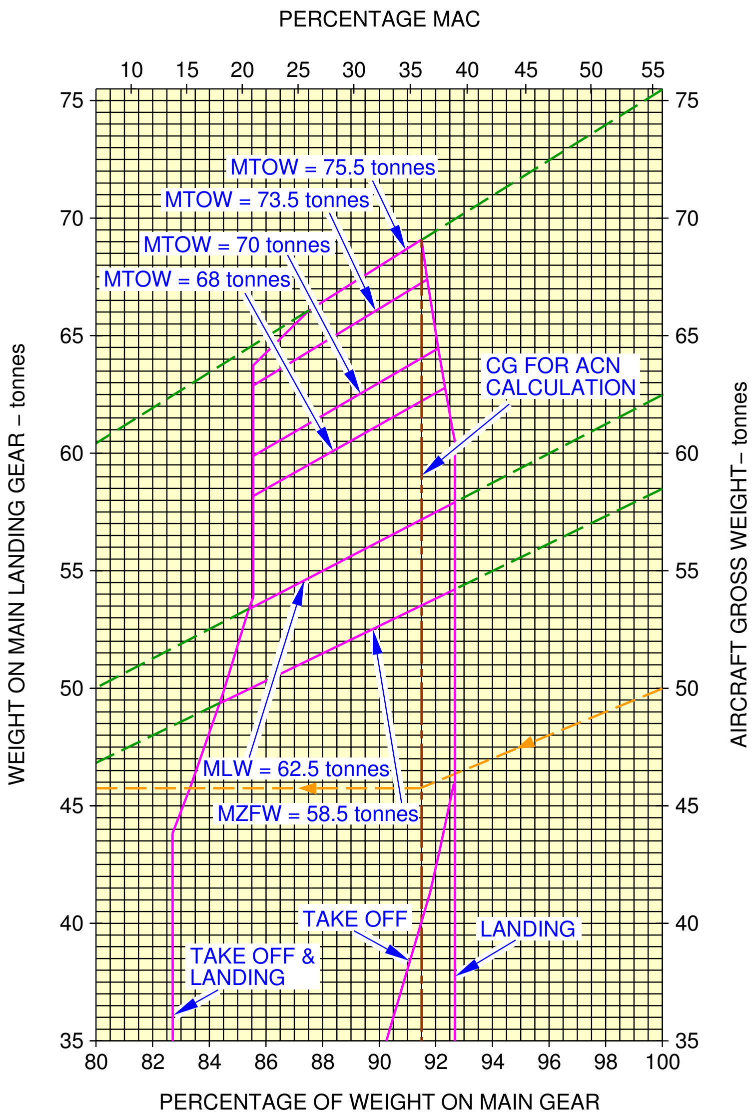
Landing Gear Loading on Pavement
MTOW 75.5 T
FIGURE 1

**ON A/C A319-100



Landing Gear Loading on Pavement
MTOW 75.5 T
FIGURE 2

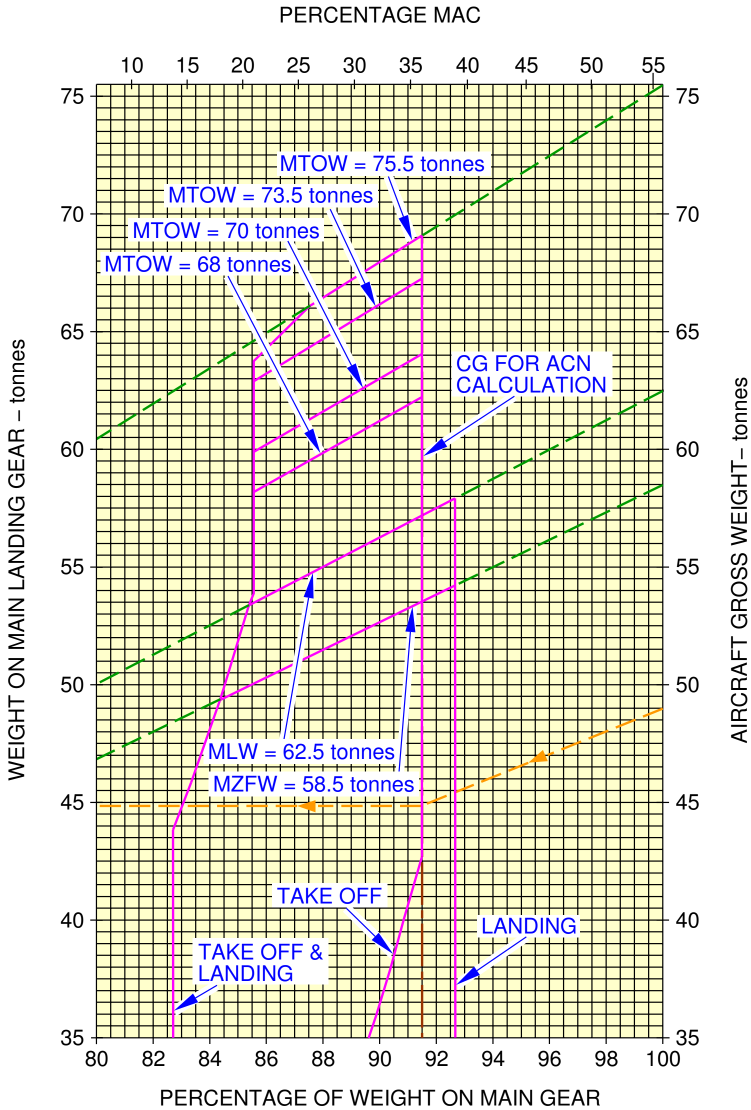
**ON A/C A319-100



N_AC_070401_1_0060101_01_01

Landing Gear Loading on Pavement
MTOW 75.5 T
FIGURE 3

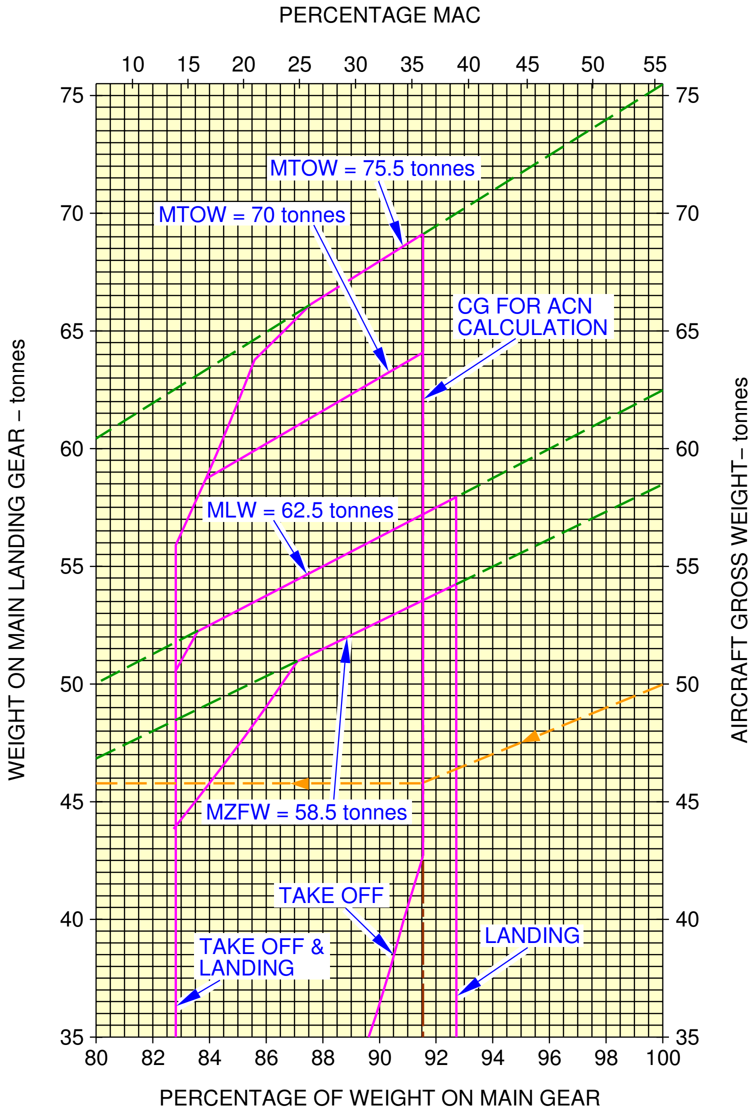
****ON A/C A319-100**



N_AC_070401_1_0070101_01_01

Landing Gear Loading on Pavement
MTOW 75.5 T
FIGURE 4

**ON A/C A319-100



N_AC_070401_1_0080101_01_01

Landing Gear Loading on Pavement
Model CJ – MTOW 75.5 T
FIGURE 5

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

****ON A/C A319-100**

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 Main Landing Gear 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 Main Landing Gear of 20000 kg (44092 lb).

For these conditions the Flexible Pavement Thickness is 41.6 cm (16.4 in).

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

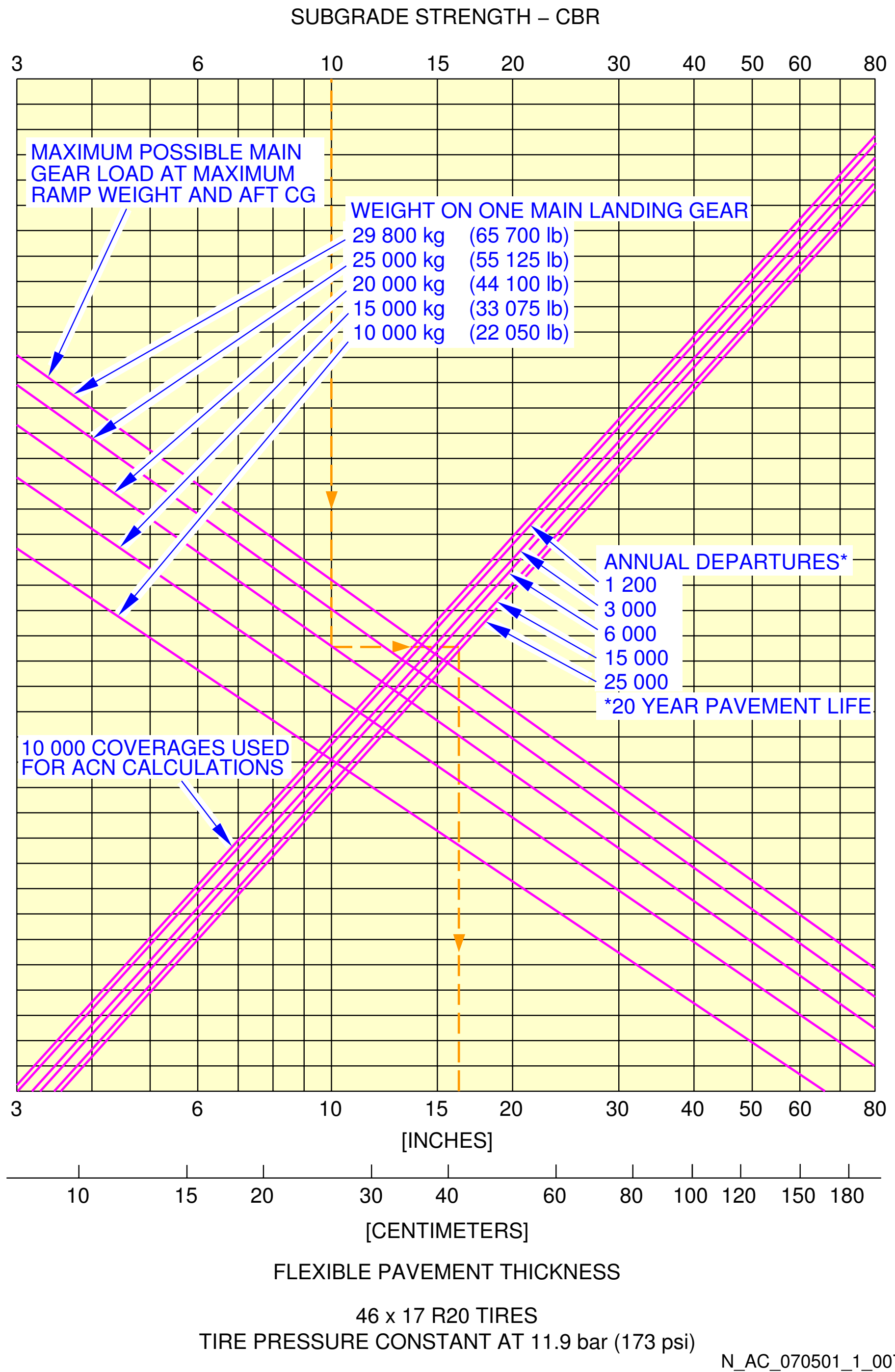
7-5-1 Flexible Pavement Requirements - U.S. Army Corps of Engineers Design Method

**ON A/C A319-100

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

1. This section gives Flexible Pavement Requirements.

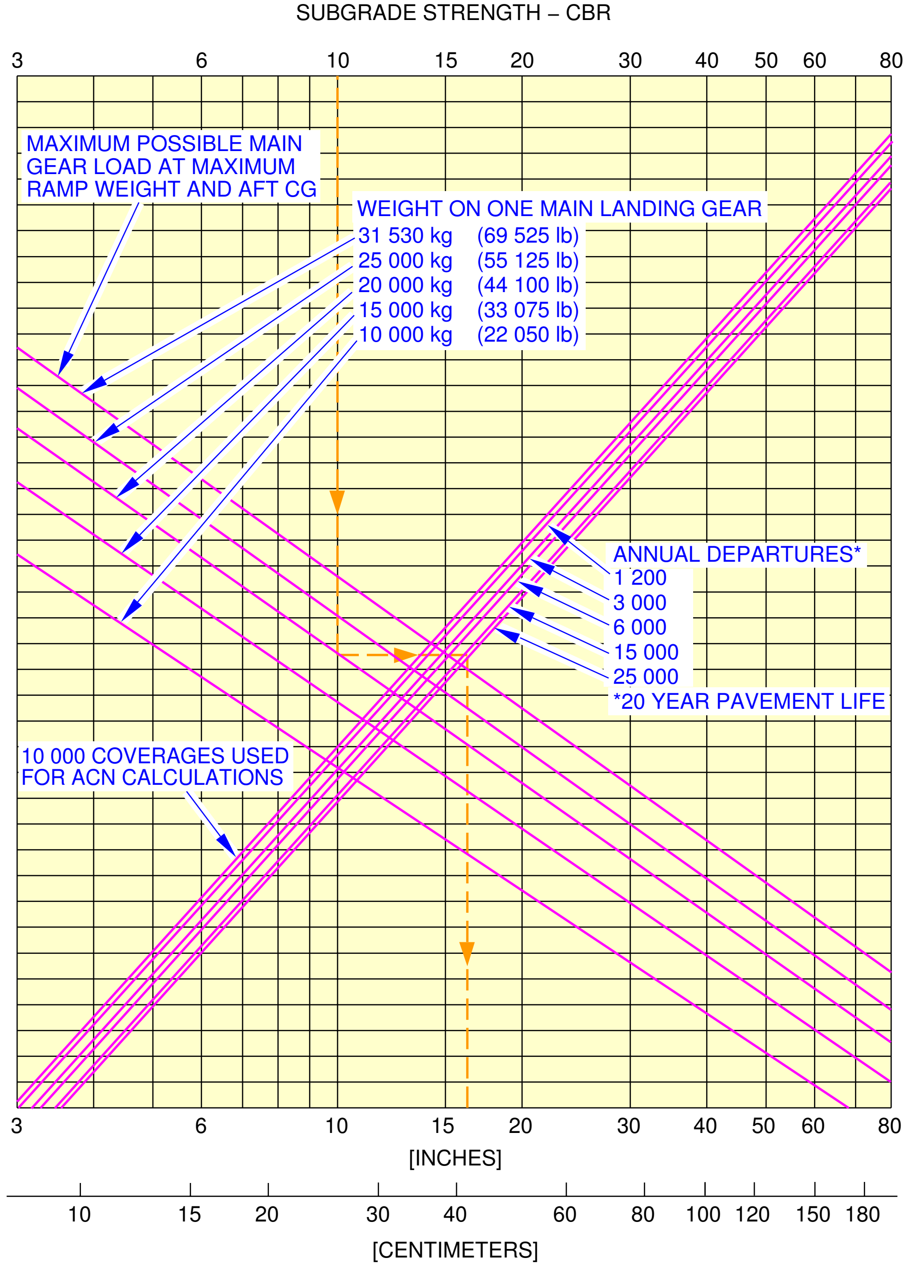
**ON A/C A319-100



N_AC_070501_1_0070101_01_01

Flexible Pavement Requirements
MTOW 64 T
FIGURE 1

**ON A/C A319-100

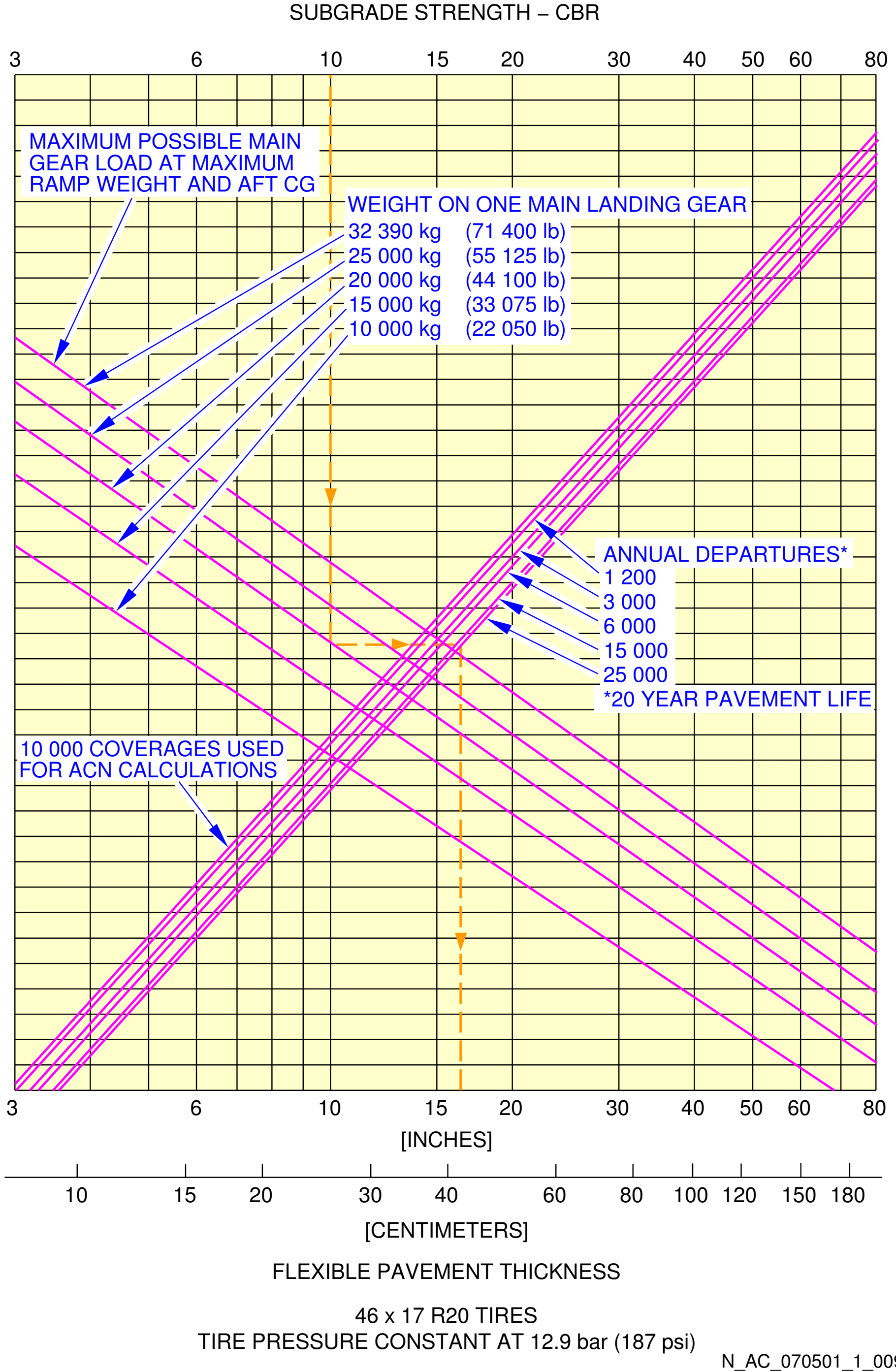


46 x 17 R20 TIRES
TIRE PRESSURE CONSTANT AT 12.5 bar (181 psi)

N_AC_070501_1_0080101_01_01

Flexible Pavement Requirements
MTOW 68 T
FIGURE 2

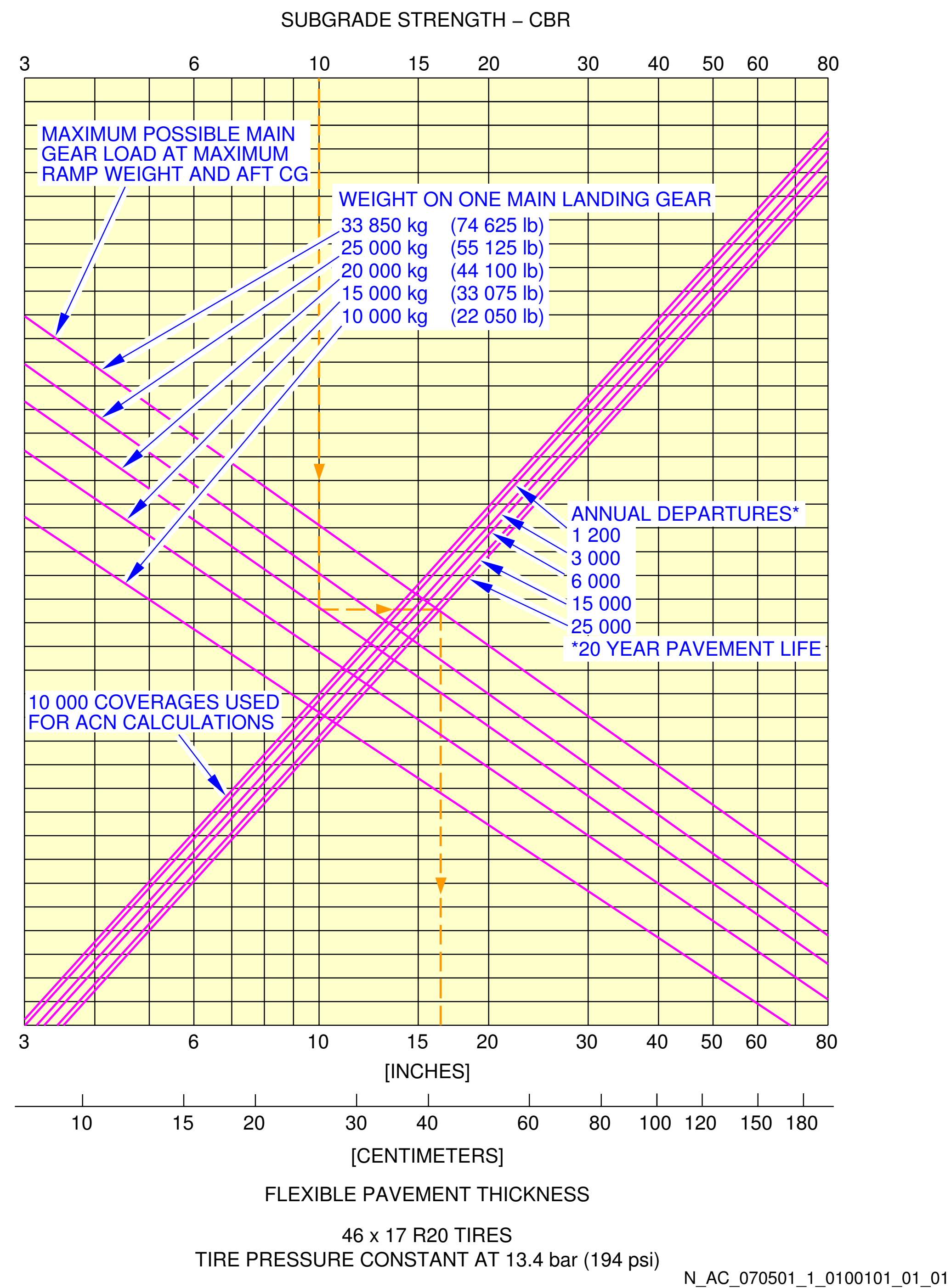
**ON A/C A319-100



N_AC_070501_1_0090101_01_01

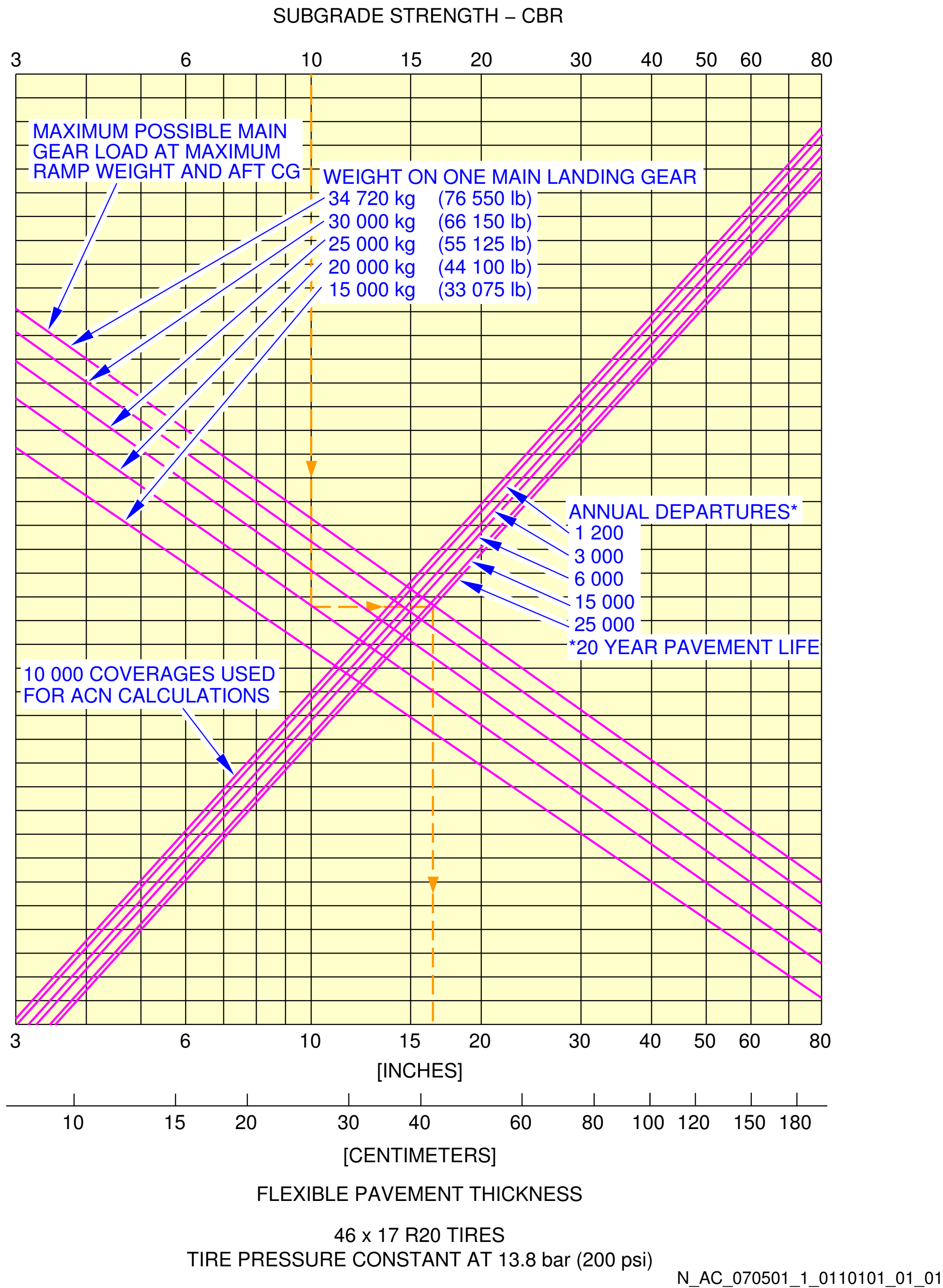
Flexible Pavement Requirements
MTOW 70 T
FIGURE 3

**ON A/C A319-100



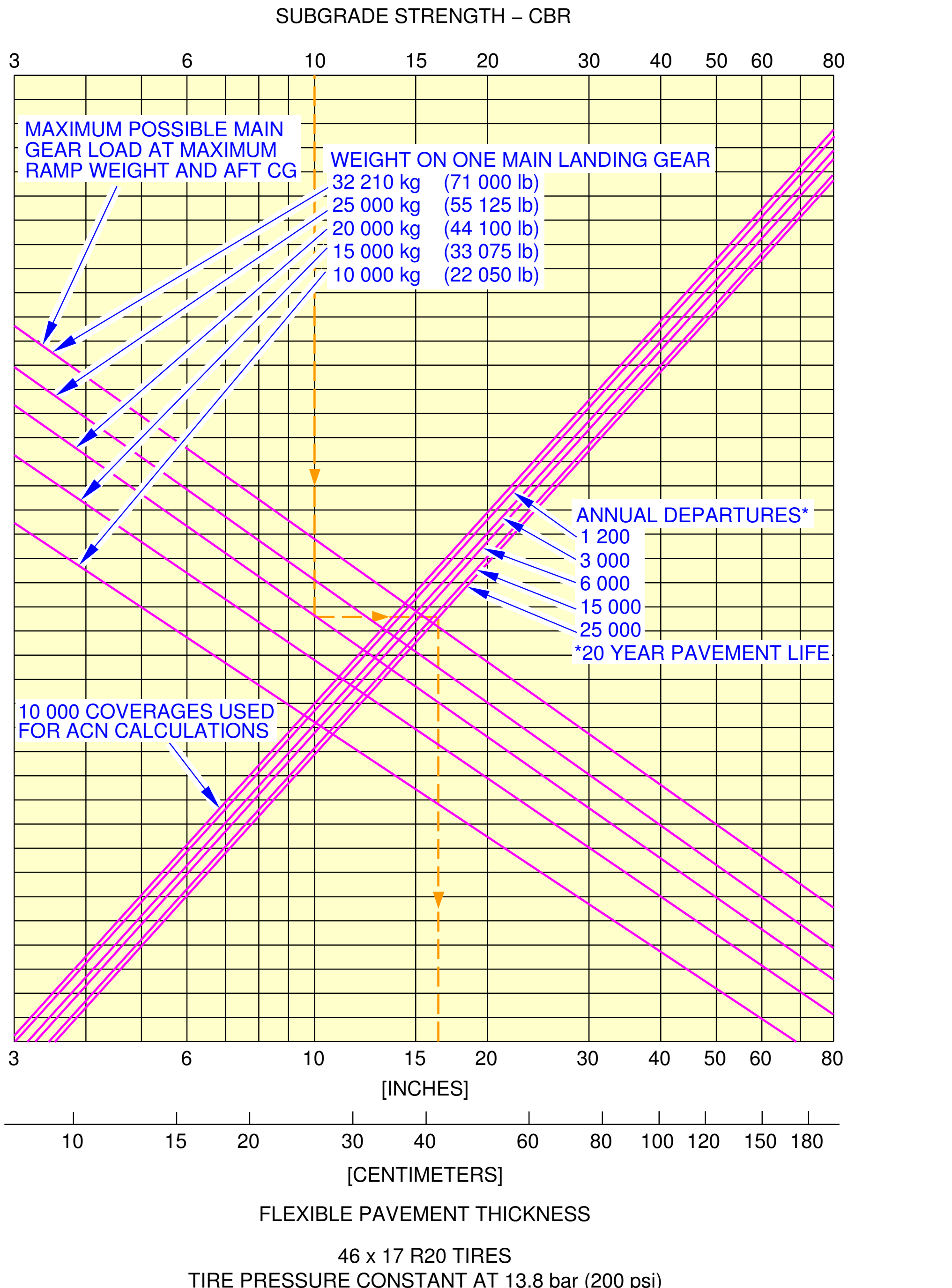
Flexible Pavement Requirements
MTOW 73.5 T
FIGURE 4

**ON A/C A319-100



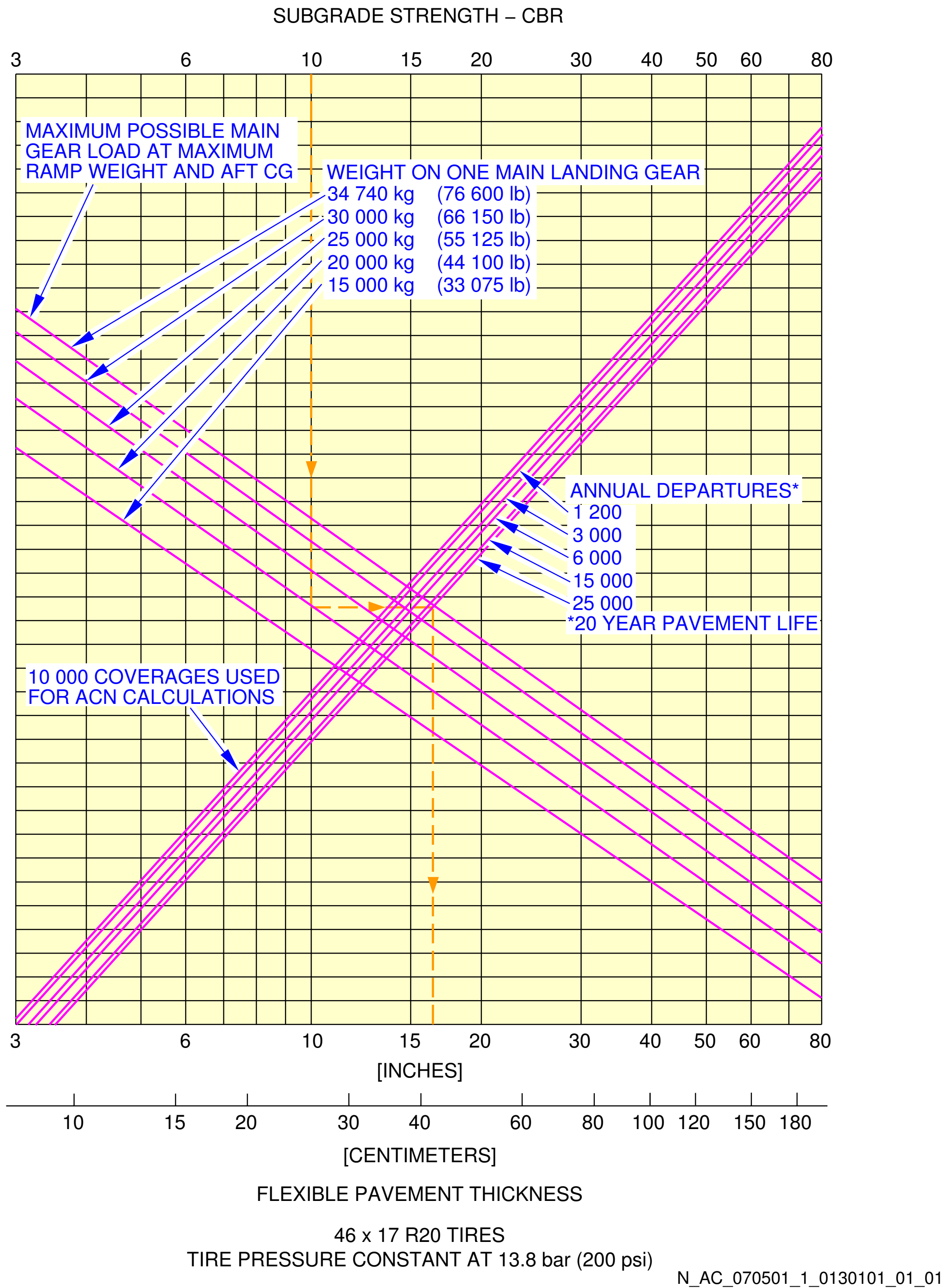
Flexible Pavement Requirements
MTOW 75.5 T
FIGURE 5

**ON A/C A319-100



Flexible Pavement Requirements
Model CJ – MTOW 70 T
FIGURE 6

**ON A/C A319-100



Flexible Pavement Requirements
Model CJ – MTOW 75.5 T
FIGURE 7

7-6-0 Flexible Pavement Requirements - LCN Conversion

****ON A/C A319-100**

Flexible Pavement Requirements - LCN Conversion

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 52.

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 56.

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

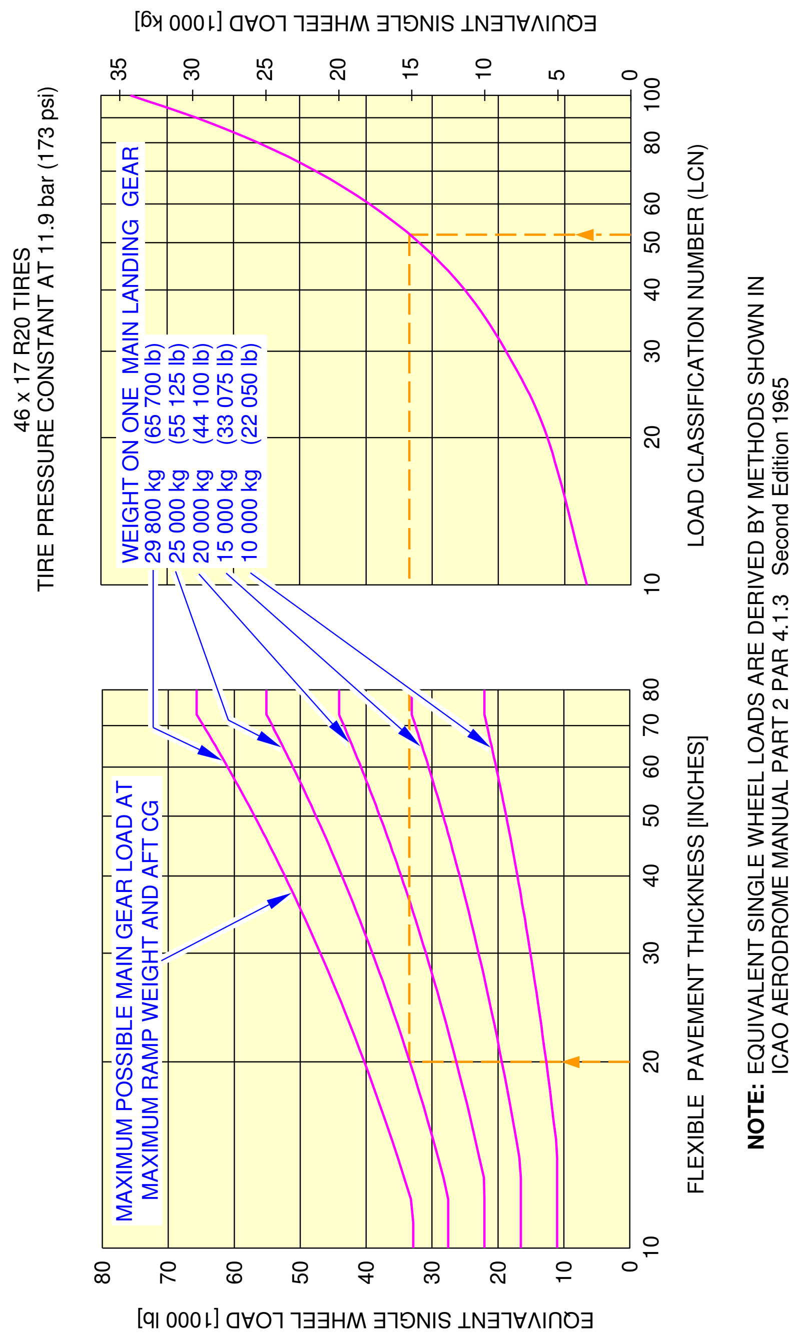
7-6-1 Flexible Pavement Requirements - LCN Conversion

****ON A/C A319-100**

Flexible Pavement Requirements - LCN Conversion

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

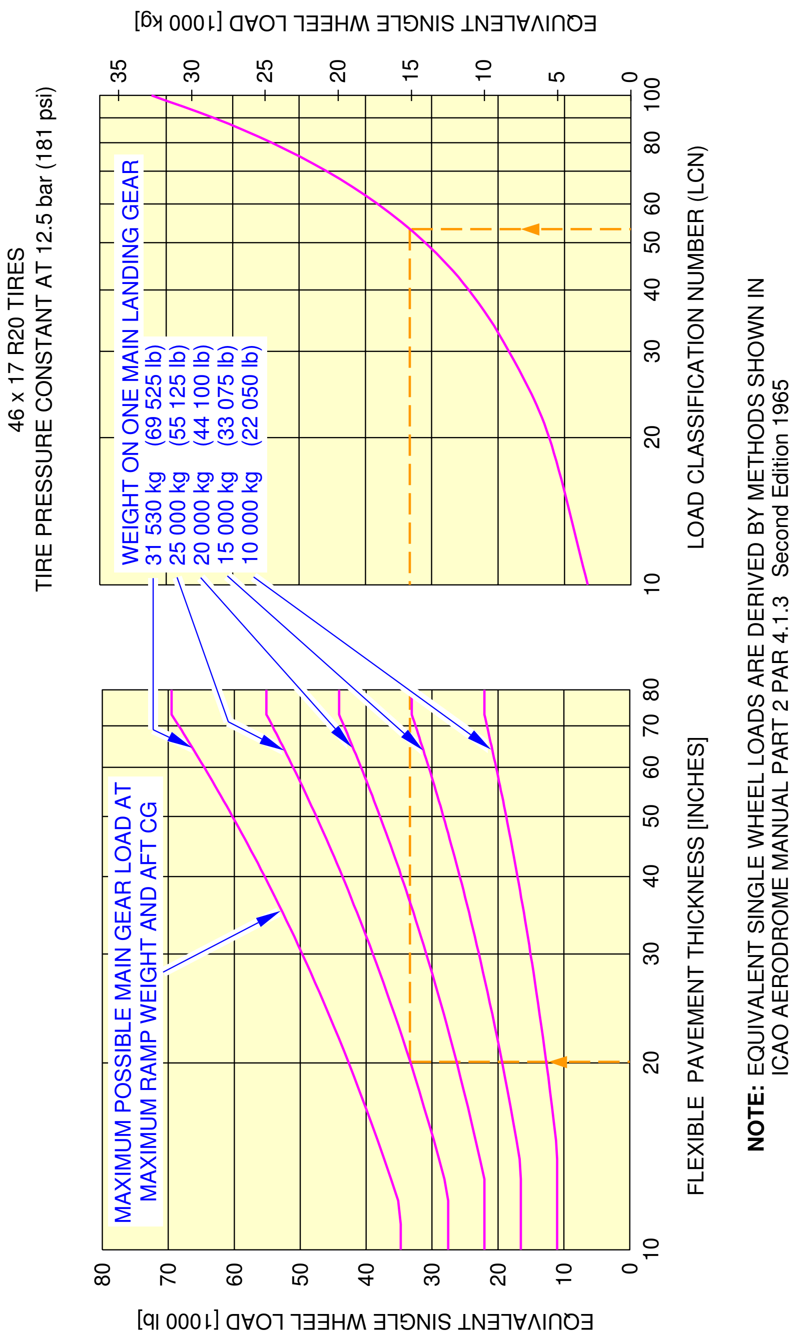
**ON A/C A319-100



N_AC_070601_1_0080101_01_01

Flexible Pavement Requirements - LCN Conversion
MTOW 64 T
FIGURE 1

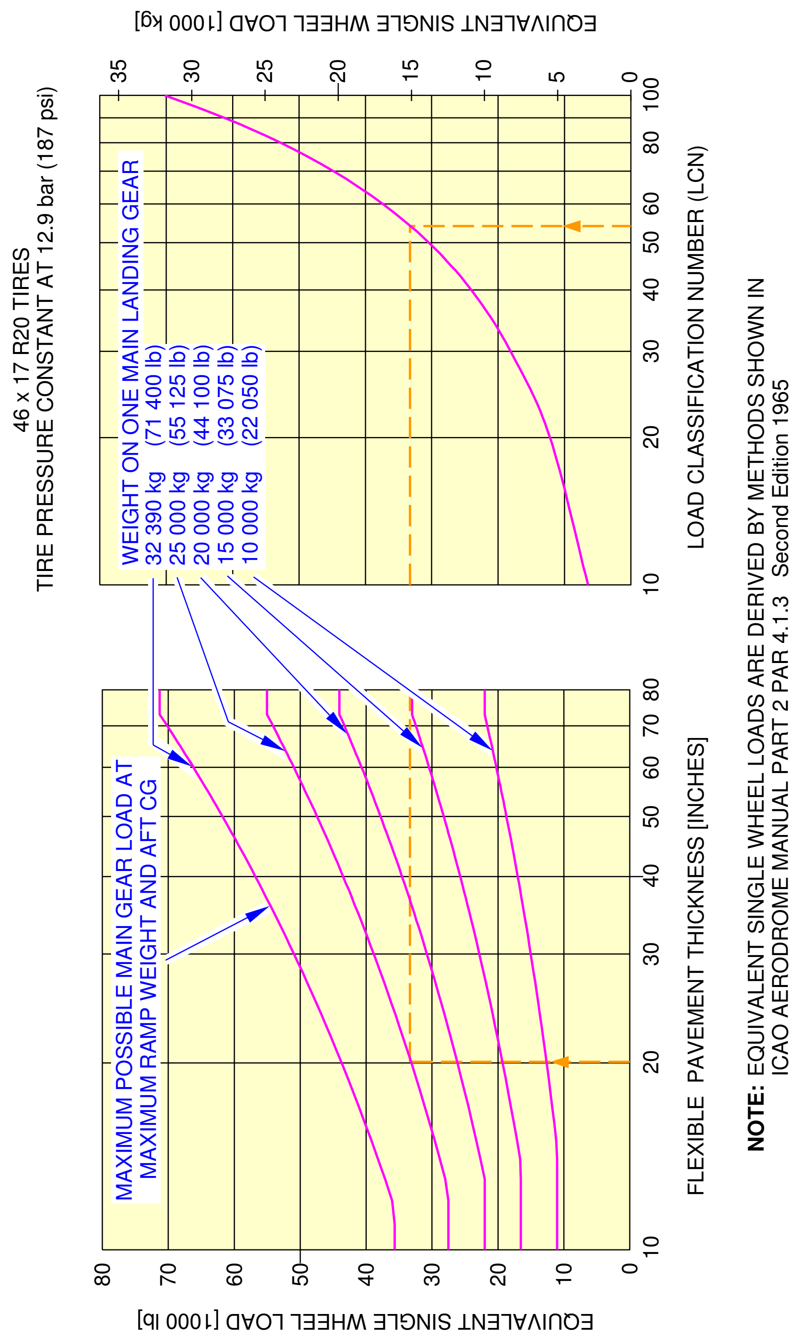
**ON A/C A319-100



N_AC_070601_1_0090101_01_01

Flexible Pavement Requirements - LCN Conversion
MTOW 68 T
FIGURE 2

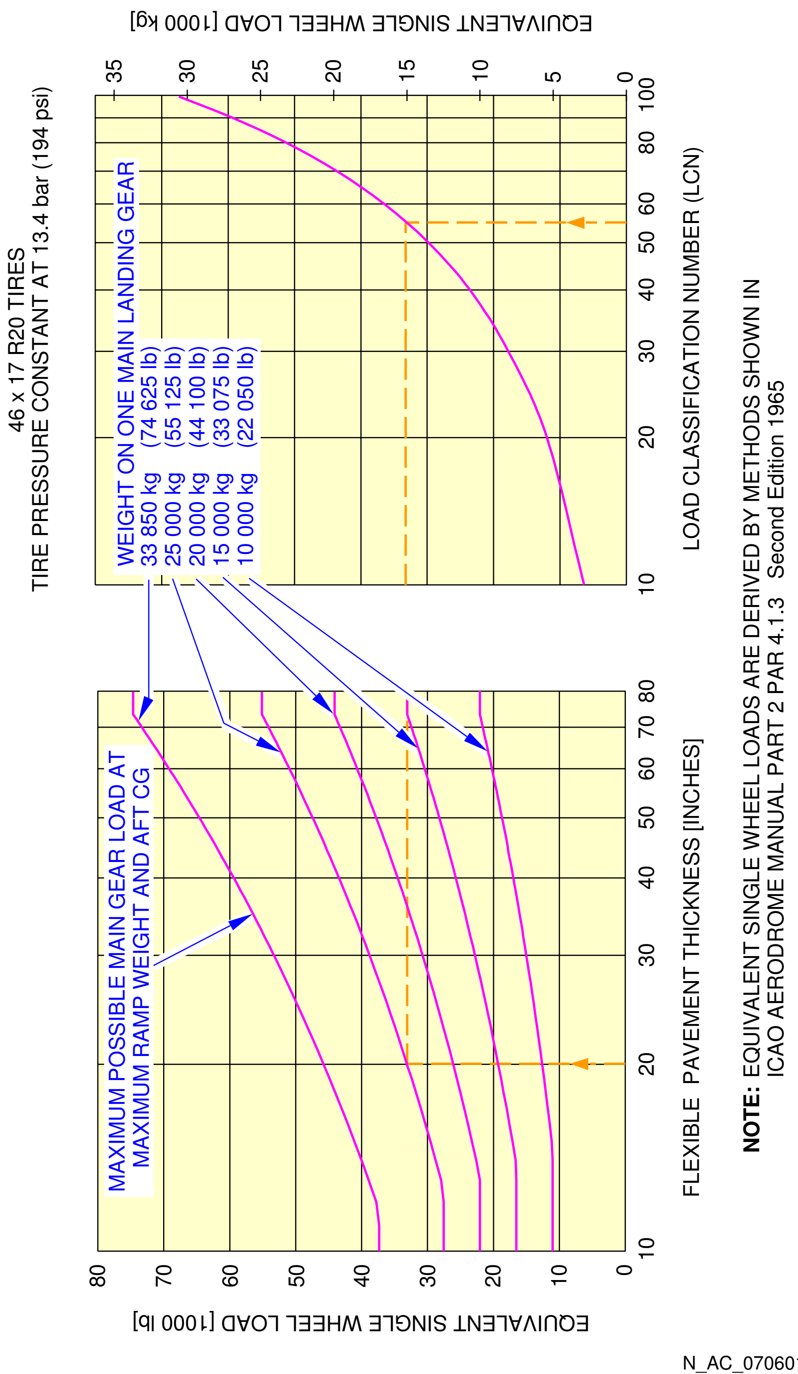
**ON A/C A319-100



N_AC_070601_1_0100101_01_01

Flexible Pavement Requirements - LCN Conversion
MTOW 70 T
FIGURE 3

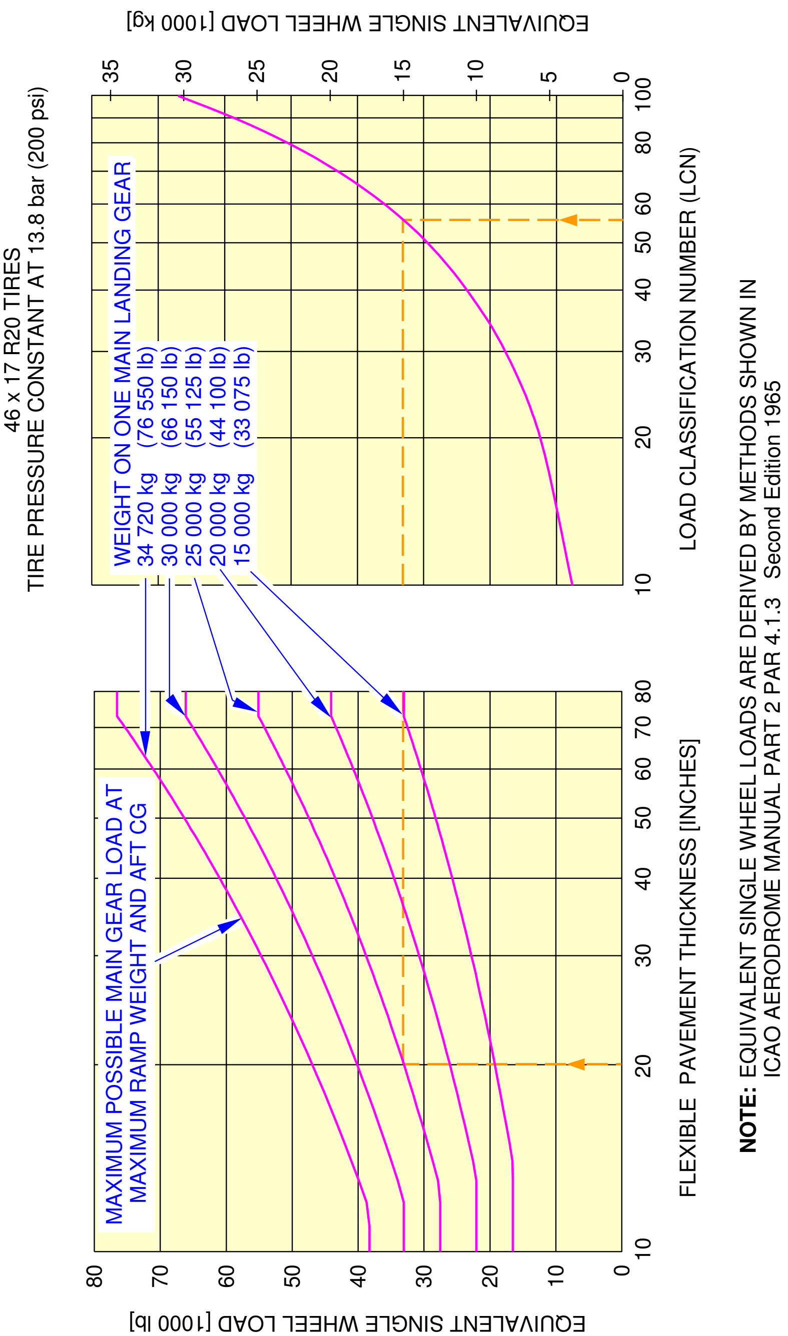
**ON A/C A319-100



N_AC_070601_1_0110101_01_01

Flexible Pavement Requirements - LCN Conversion
MTOW 73.5 T
FIGURE 4

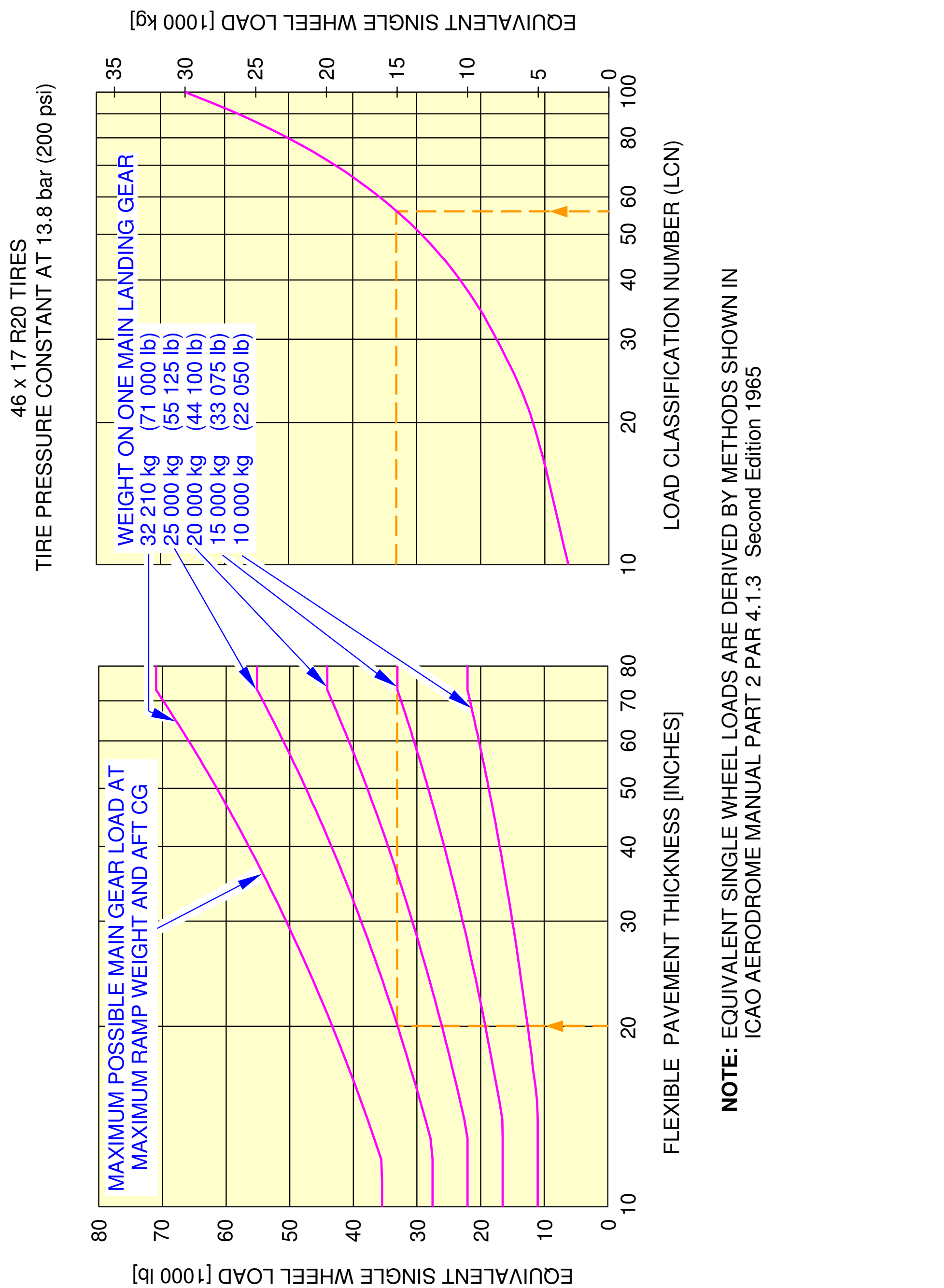
**ON A/C A319-100



N_AC_070601_1_0120101_01_01

Flexible Pavement Requirements - LCN Conversion
MTOW 75.5 T
FIGURE 5

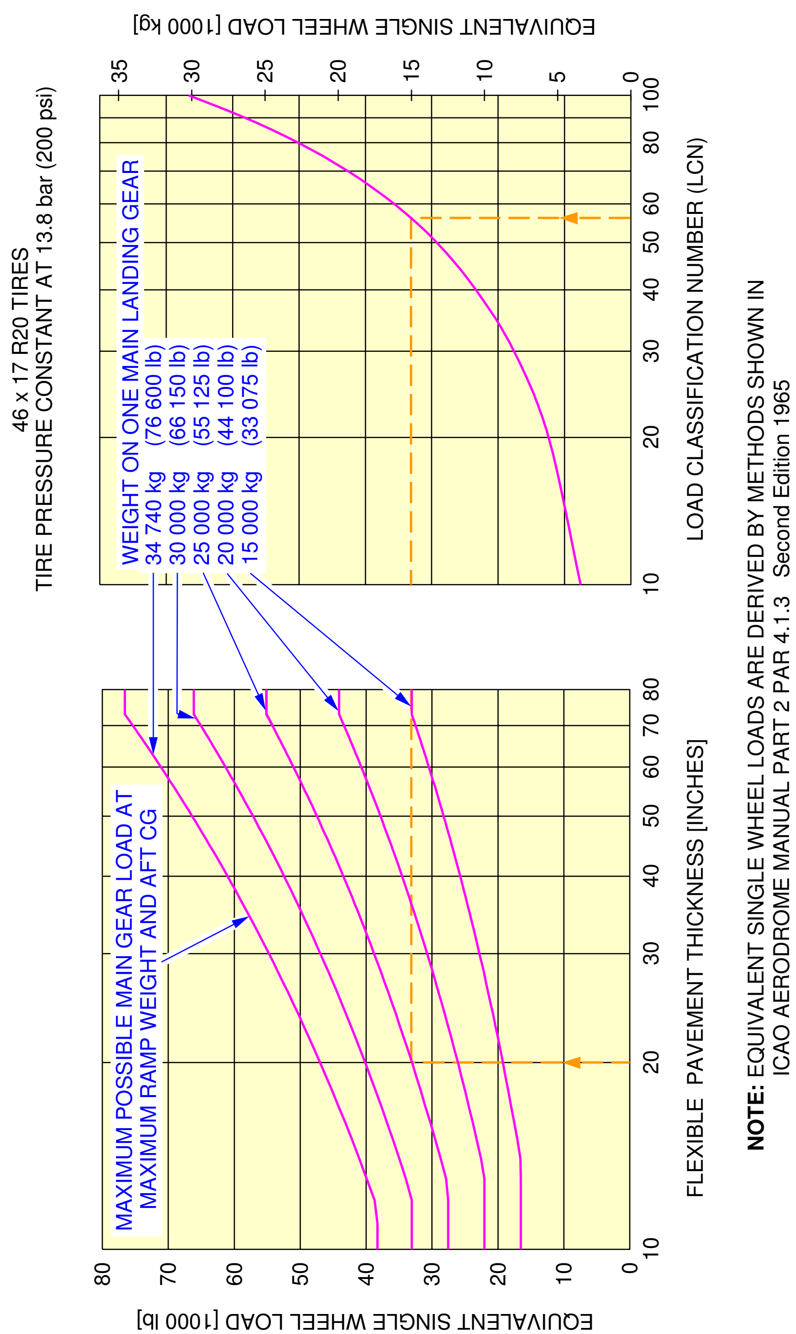
**ON A/C A319-100



N_AC_070601_1_0130101_01_01

Flexible Pavement Requirements - LCN Conversion
Model CJ – MTOW 70 T
FIGURE 6

**ON A/C A319-100



N_AC_070601_1_0140101_01_01

Flexible Pavement Requirements - LCN Conversion
Model CJ – MTOW 75.5 T
FIGURE 7

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

****ON A/C A319-100**

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 33.6 kgf/cm^2 (478 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).

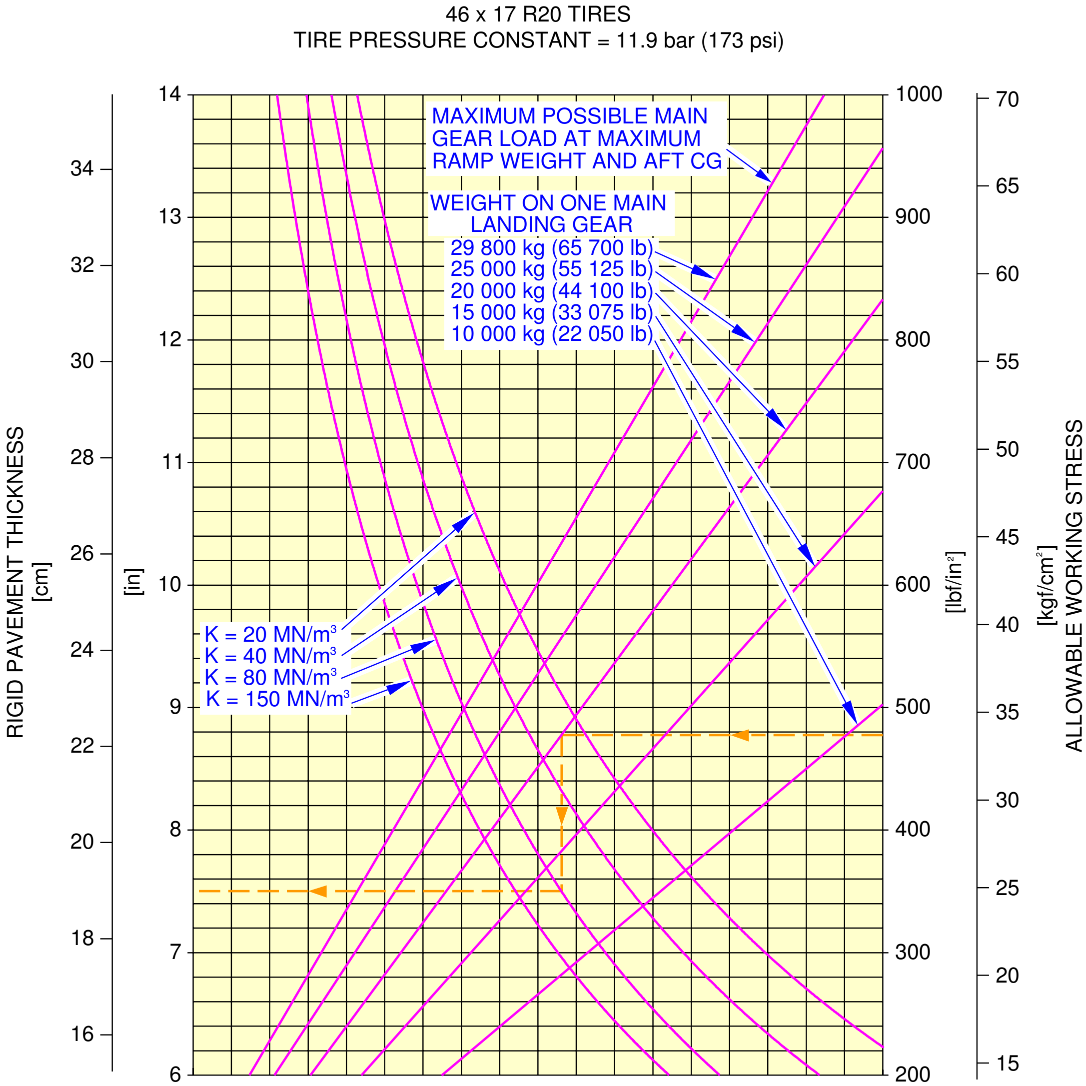
7-7-1 Rigid Pavement Requirements - Portland Cement Association Design Method

****ON A/C A319-100**

Rigid Pavement Requirements - Portland Cement Association Design Method

1. This section gives Rigid Pavement Requirements.

**ON A/C A319-100



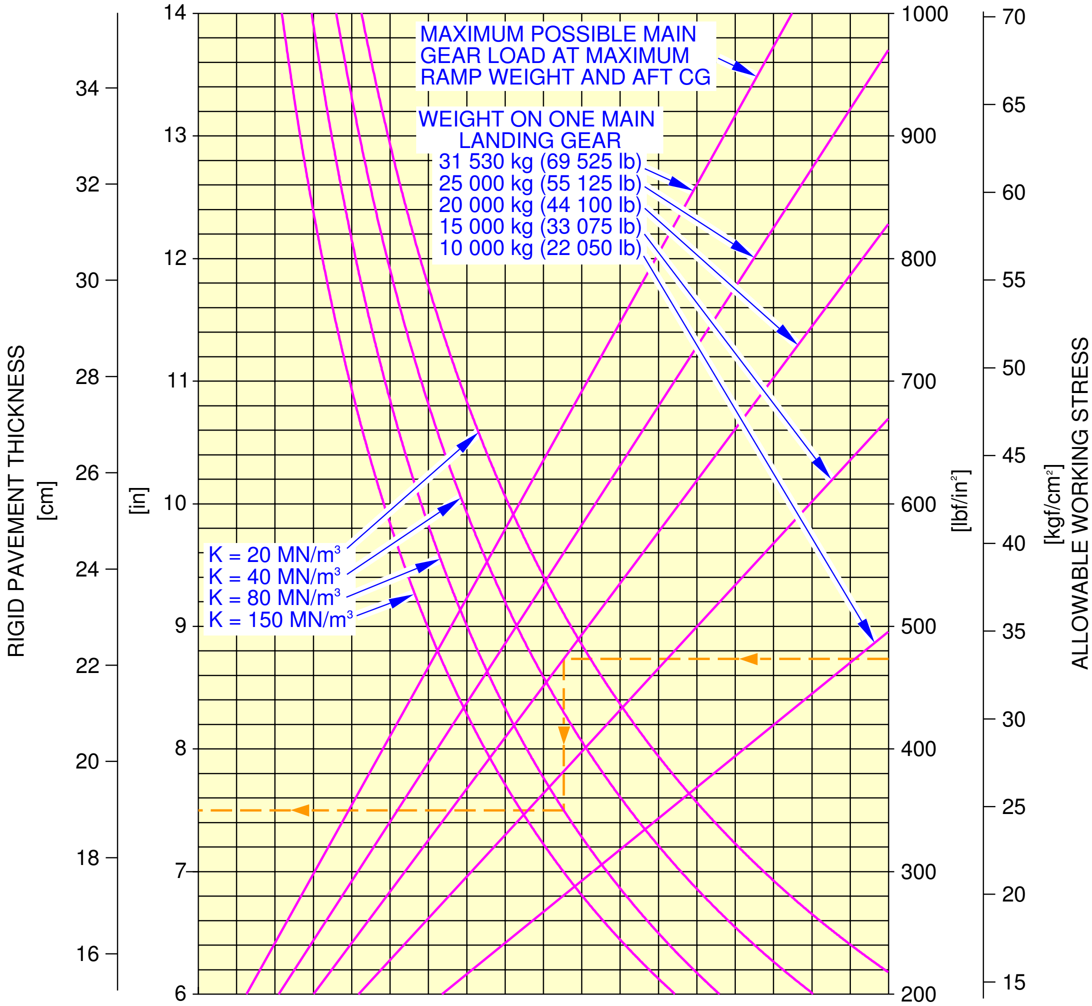
NOTE:
THE VALUES OBTAINED BY USING THE MAXIMUM LOAD REFERENCE LINE AND ANY VALUES FOR K ARE EXACT. FOR LOADS LESS THAN MAXIMUM, THE CURVES ARE EXACT FOR K = 80 MN/m³ BUT DEVIATE SLIGHTLY FOR ANY OTHER VALUES OF K

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

N_AC_070701_1_0070101_01_01

Rigid Pavement Requirements (PCA)
MTOW 64 T
FIGURE 1

**ON A/C A319-100



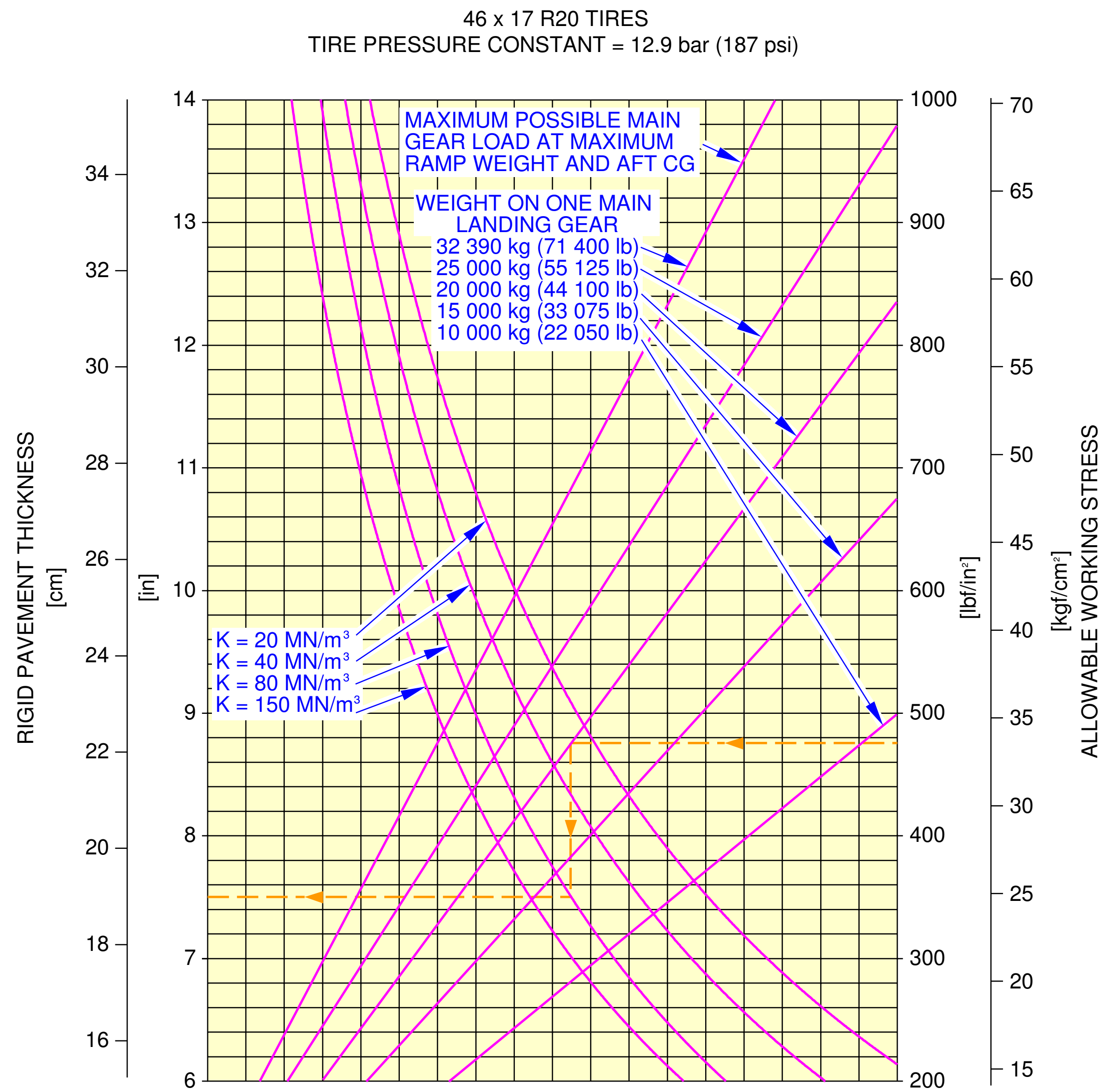
NOTE:
THE VALUES OBTAINED BY USING THE MAXIMUM LOAD REFERENCE LINE AND ANY VALUES FOR K ARE EXACT. FOR LOADS LESS THAN MAXIMUM, THE CURVES ARE EXACT FOR K = 80 MN/m³ BUT DEVIATE SLIGHTLY FOR ANY OTHER VALUES OF K

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

N_AC_070701_1_0080101_01_01

Rigid Pavement Requirements (PCA)
MTOW 68 T
FIGURE 2

**ON A/C A319-100



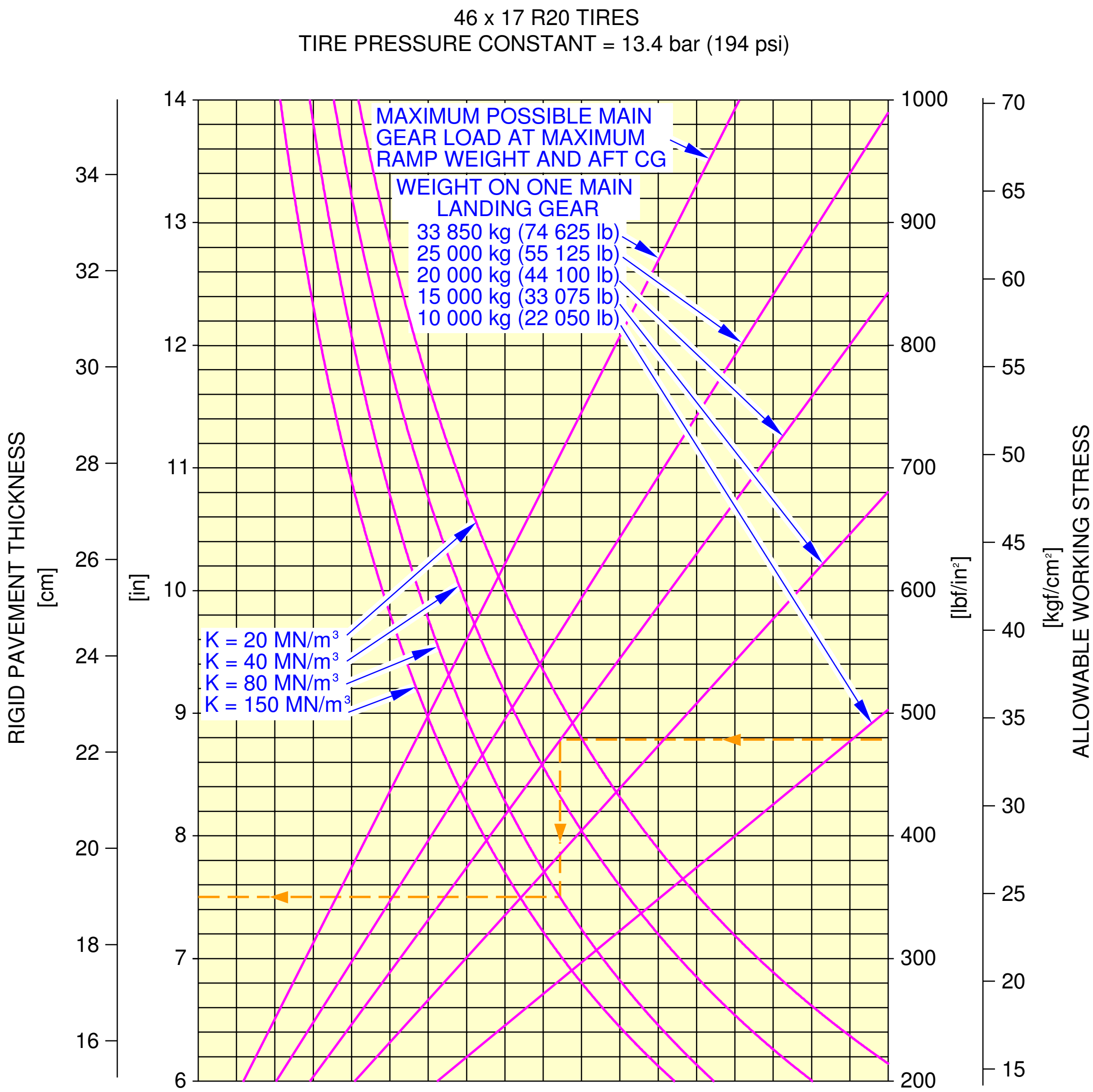
NOTE:
THE VALUES OBTAINED BY USING THE MAXIMUM LOAD REFERENCE LINE AND ANY VALUES FOR K ARE EXACT. FOR LOADS LESS THAN MAXIMUM, THE CURVES ARE EXACT FOR K = 80 MN/m³ BUT DEVIATE SLIGHTLY FOR ANY OTHER VALUES OF K

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

N_AC_070701_1_0090101_01_01

Rigid Pavement Requirements (PCA)
MTOW 70 T
FIGURE 3

**ON A/C A319-100



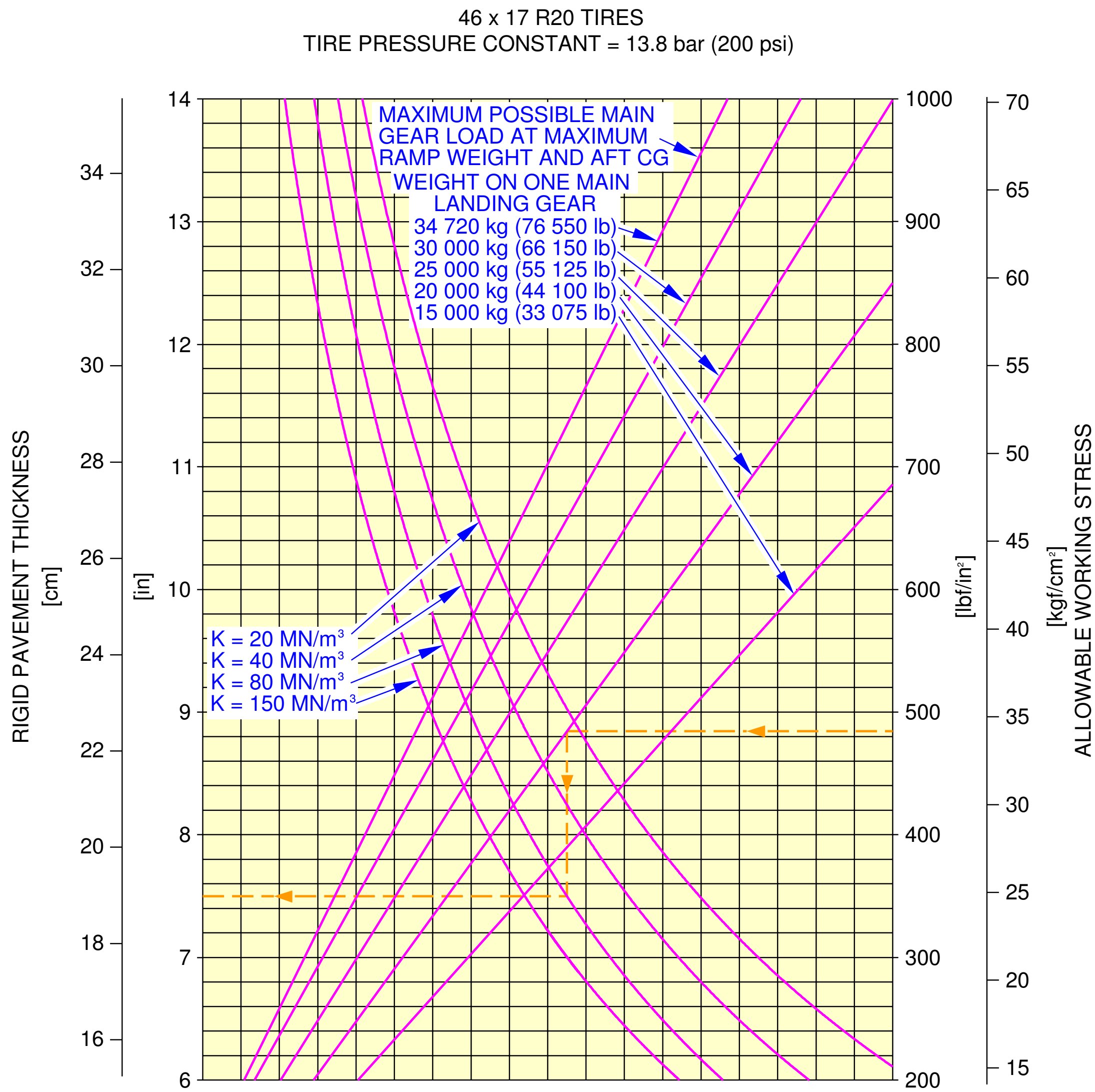
NOTE:
THE VALUES OBTAINED BY USING THE MAXIMUM LOAD REFERENCE LINE AND ANY VALUES FOR K ARE EXACT. FOR LOADS LESS THAN MAXIMUM, THE CURVES ARE EXACT FOR K = 80 MN/m³ BUT DEVIATE SLIGHTLY FOR ANY OTHER VALUES OF K

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

N_AC_070701_1_0100101_01_01

Rigid Pavement Requirements (PCA)
MTOW 73.5 T
FIGURE 4

**ON A/C A319-100



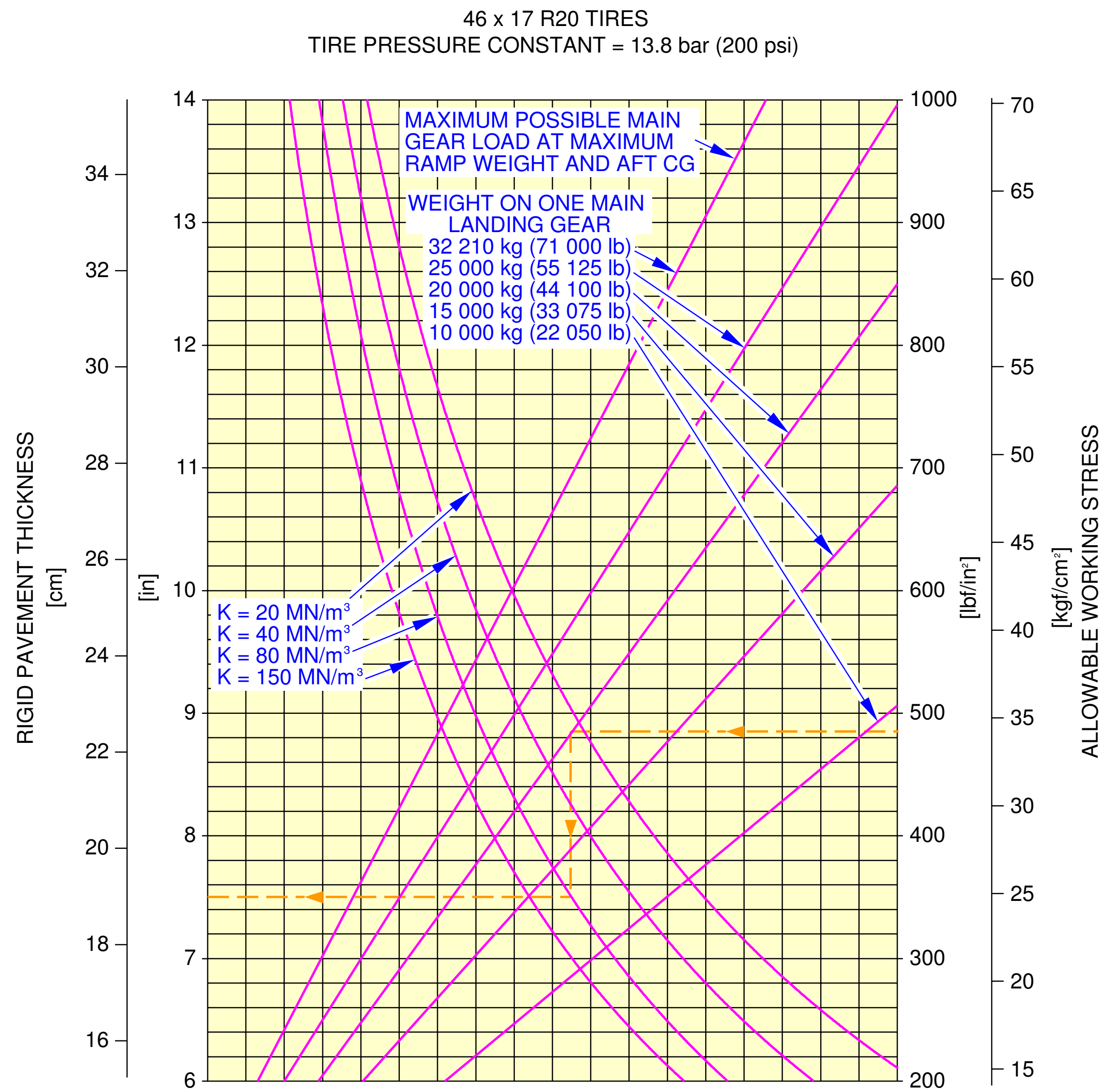
NOTE:
THE VALUES OBTAINED BY USING THE MAXIMUM LOAD REFERENCE LINE AND ANY VALUES FOR K ARE EXACT. FOR LOADS LESS THAN MAXIMUM, THE CURVES ARE EXACT FOR K = 80 MN/m³ BUT DEVIATE SLIGHTLY FOR ANY OTHER VALUES OF K

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

N_AC_070701_1_0110101_01_01

Rigid Pavement Requirements (PCA)
MTOW 75.5 T
FIGURE 5

**ON A/C A319-100



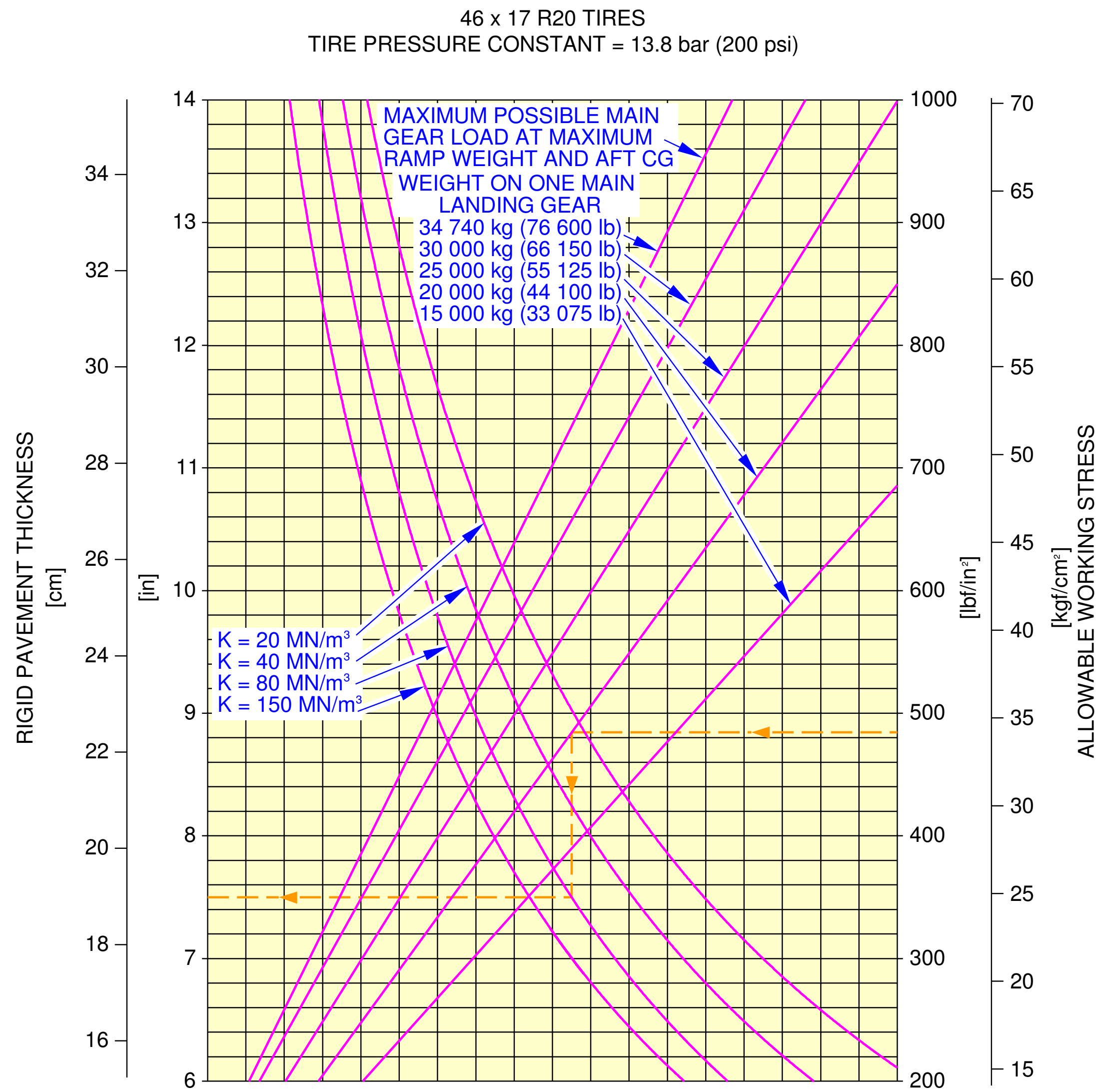
NOTE:
THE VALUES OBTAINED BY USING THE MAXIMUM LOAD REFERENCE LINE AND ANY VALUES FOR K ARE EXACT. FOR LOADS LESS THAN MAXIMUM, THE CURVES ARE EXACT FOR K = 80 MN/m³ BUT DEVIATE SLIGHTLY FOR ANY OTHER VALUES OF K

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

N_AC_070701_1_0120101_01_01

Rigid Pavement Requirements (PCA)
Model CJ – MTOW 70 T
FIGURE 6

**ON A/C A319-100



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_0130101_01_01

Rigid Pavement Requirements (PCA)
Model CJ – MTOW 75.5 T
FIGURE 7

7-8-0 Rigid Pavement Requirements - LCN Conversion

****ON A/C A319-100**

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 56.
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 60.
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 A319-100**

Radius of Relative Stiffness

1. This section gives Radius of Relative Stiffness.

**ON A/C A319-100

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_0020101_01_01

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

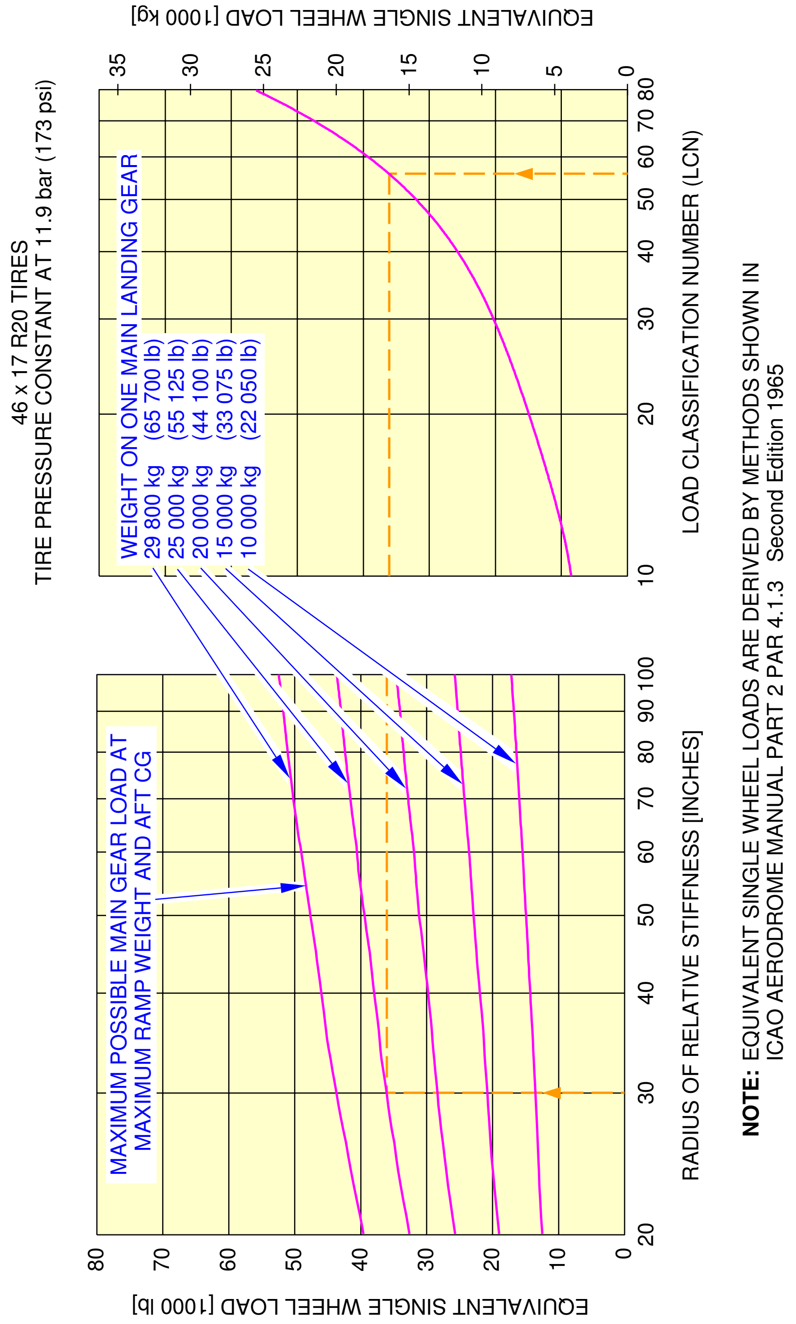
7-8-2 Rigid Pavement Requirements - LCN Conversion

****ON A/C A319-100**

Rigid Pavement Requirements - LCN Conversion

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

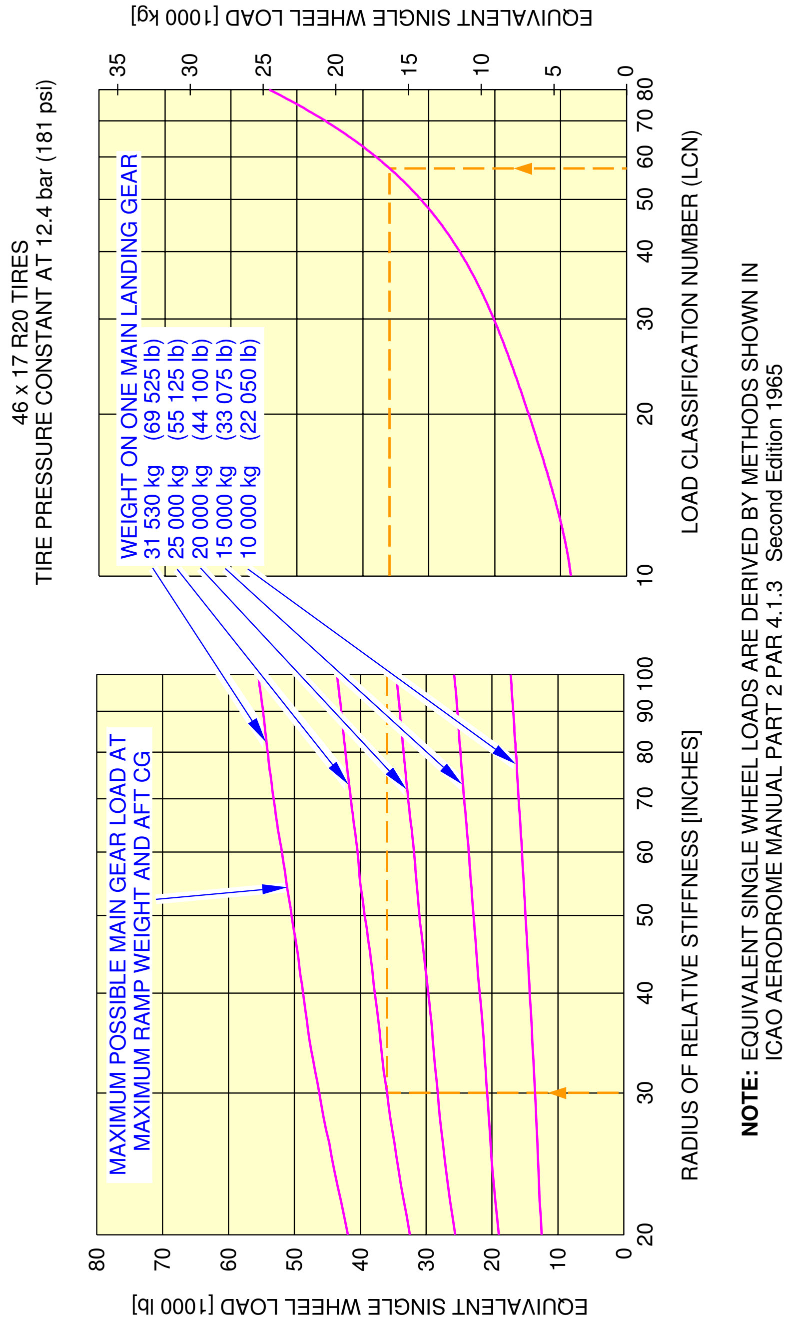
**ON A/C A319-100



N_AC_070802_1_0070101_01_01

Rigid Pavement Requirements - LCN Conversion
MTOW 64 T
FIGURE 1

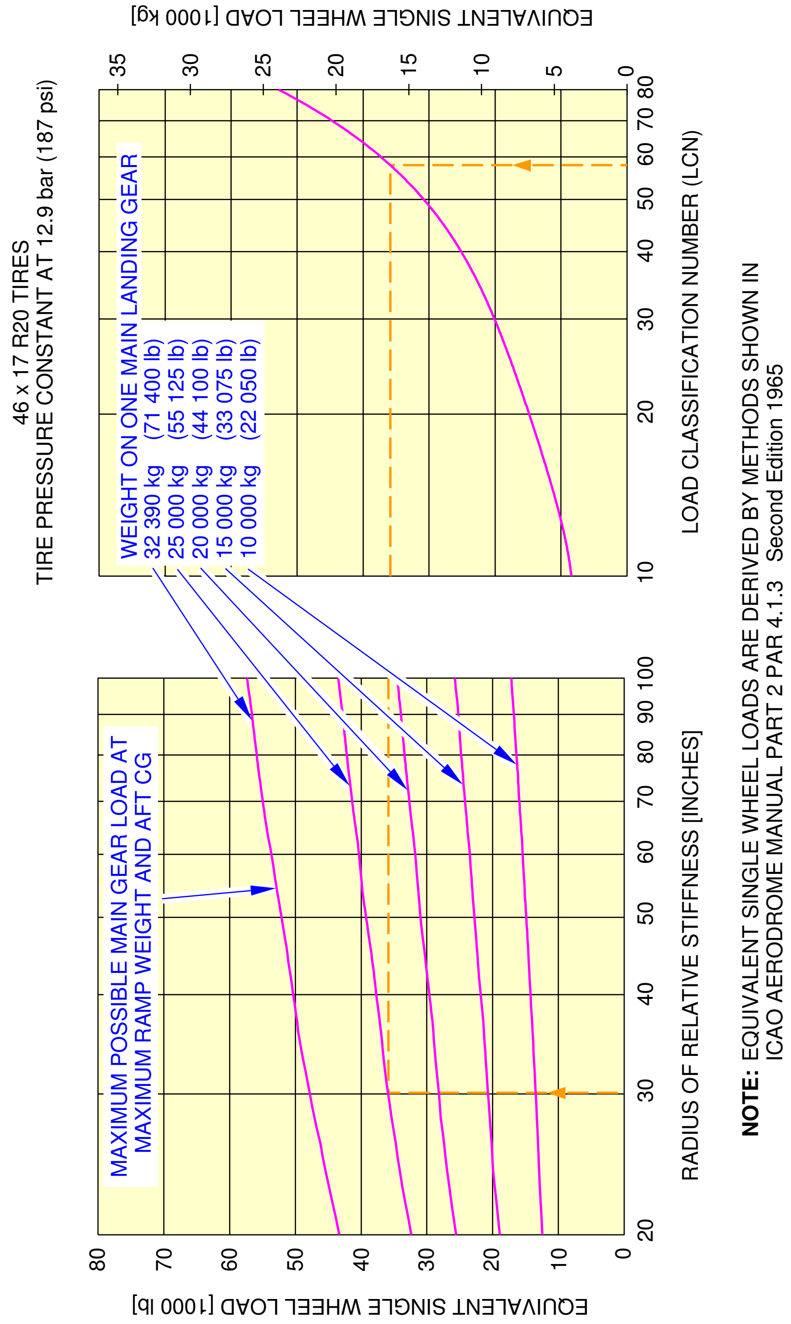
****ON A/C A319-100**



N_AC_070802_1_0080101_01_01

Rigid Pavement Requirements - LCN Conversion
MTOW 68 T
FIGURE 2

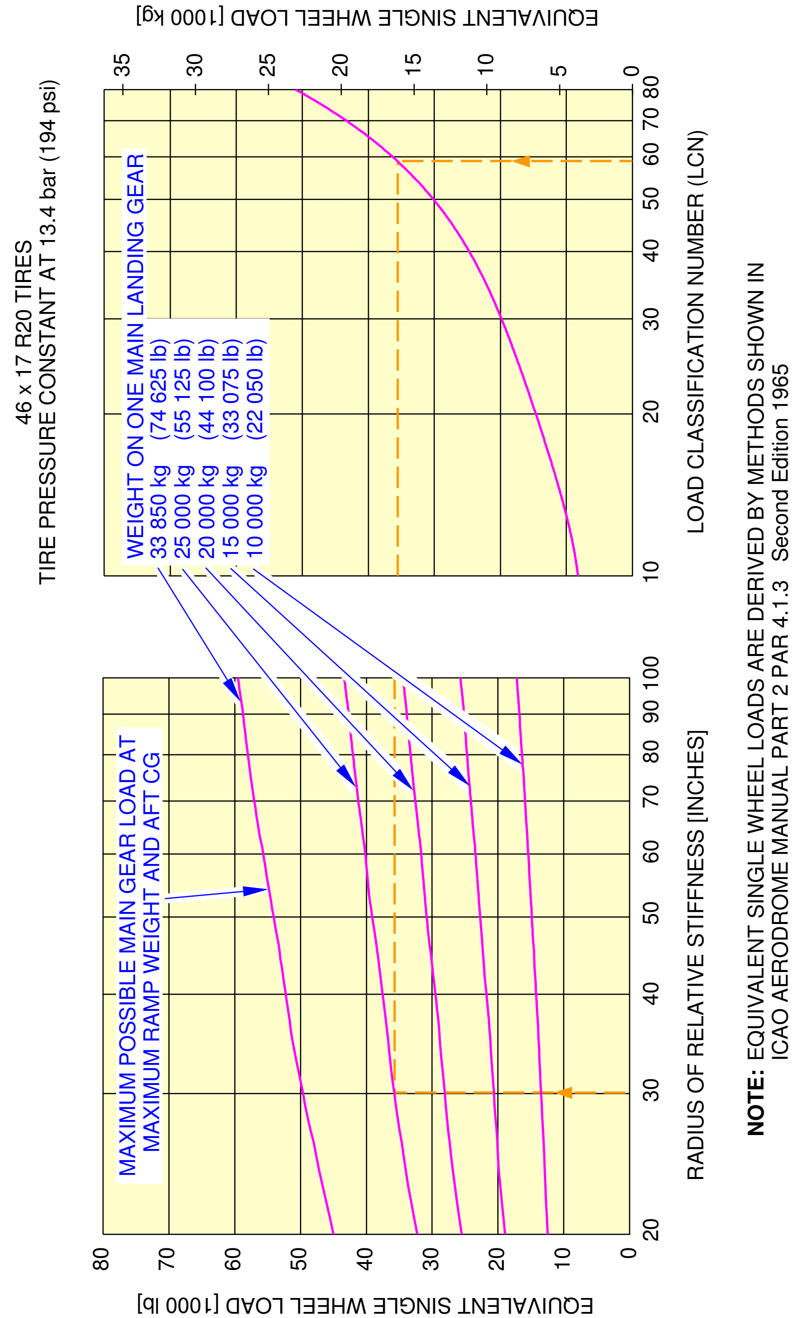
****ON A/C A319-100**



N_AC_070802_1_0090101_01_01

Rigid Pavement Requirements - LCN Conversion
MTOW 70 T
FIGURE 3

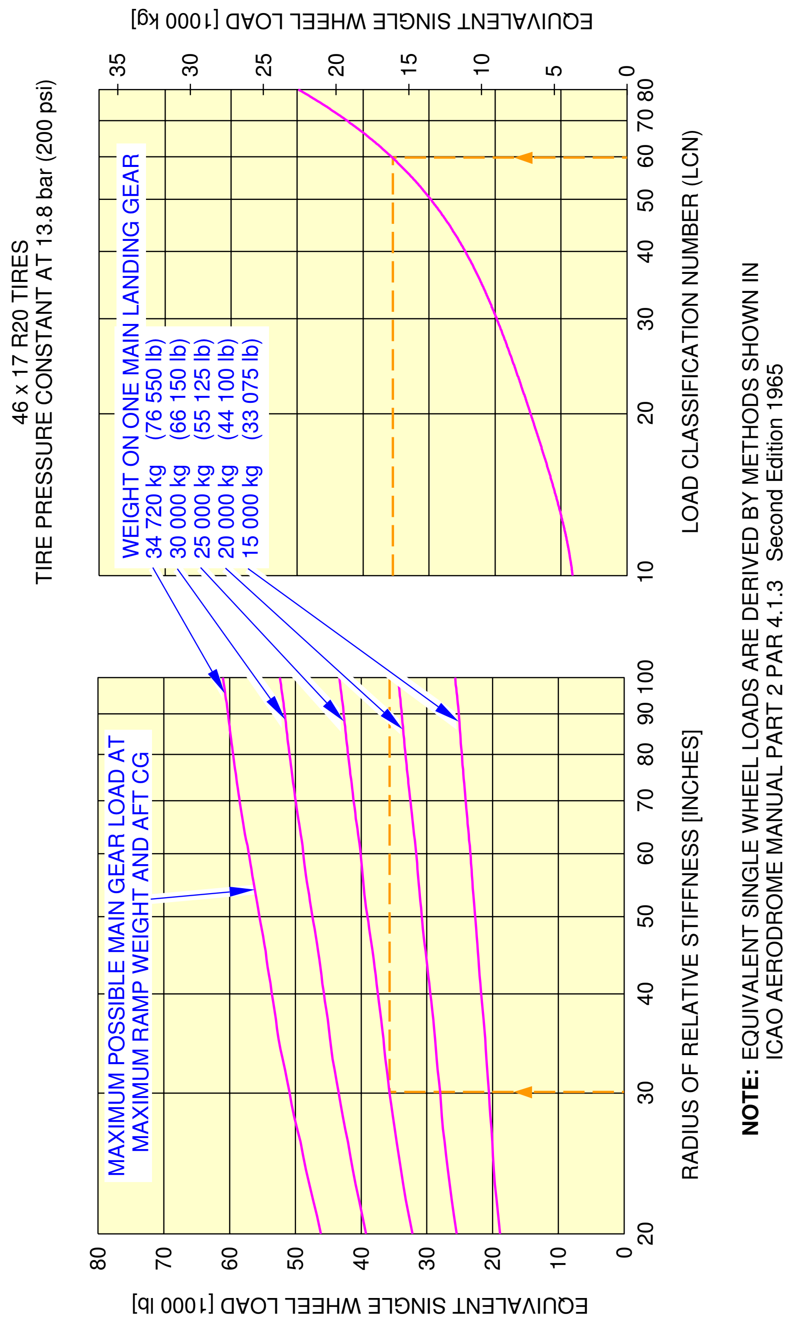
**ON A/C A319-100



N_AC_070802_1_0100101_01_01

Rigid Pavement Requirements - LCN Conversion
MTOW 73.5 T
FIGURE 4

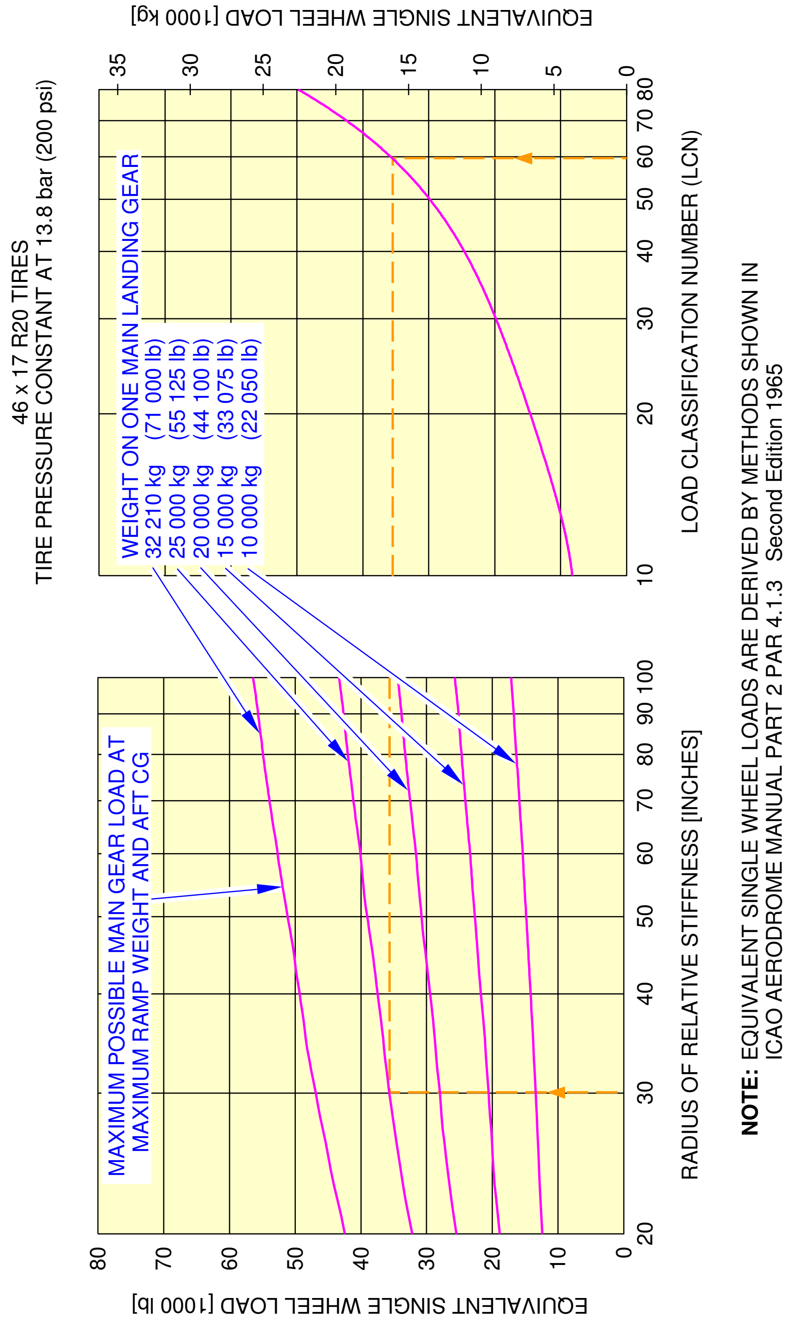
****ON A/C A319-100**



N_AC_070802_1_0110101_01_01

Rigid Pavement Requirements - LCN Conversion
MTOW 75.5 T
FIGURE 5

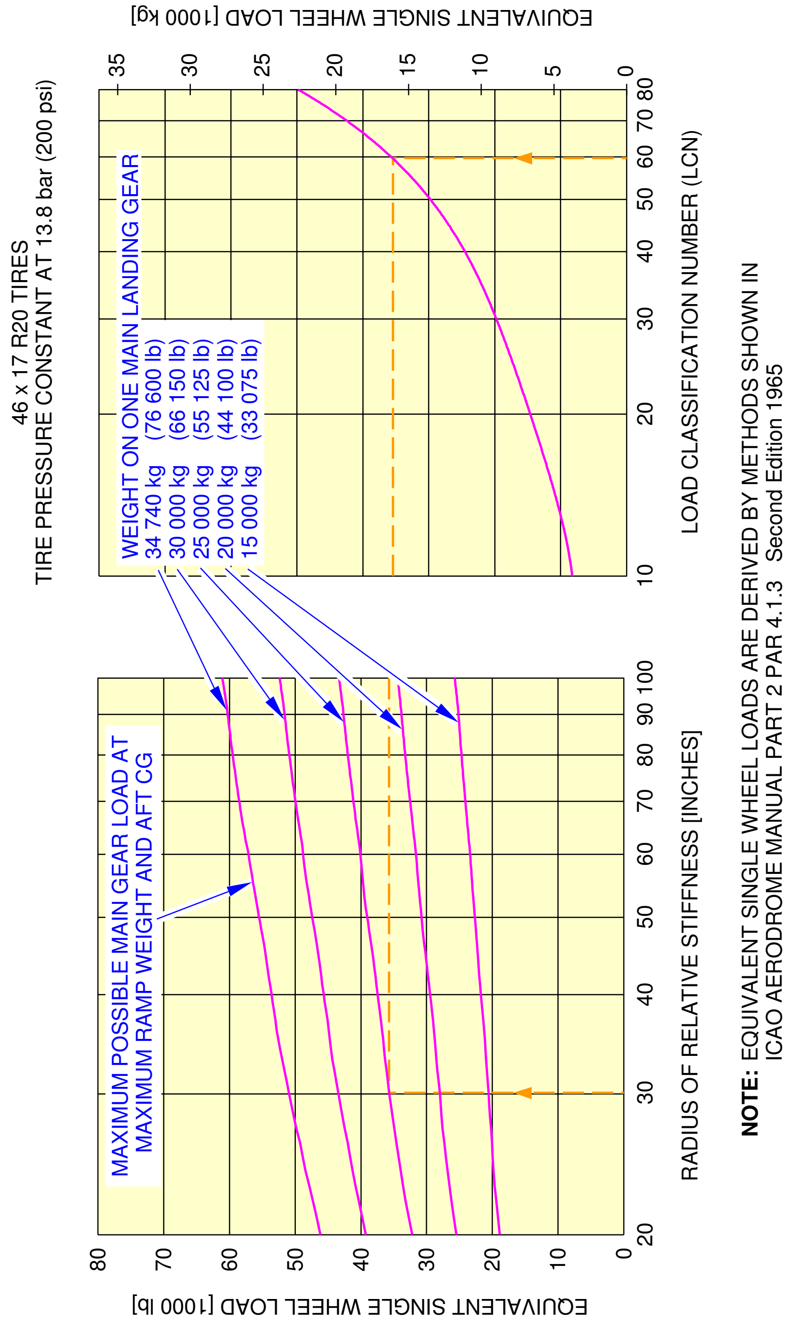
****ON A/C A319-100**



N_AC_070802_1_0120101_01_01

Rigid Pavement Requirements - LCN Conversion
Model CJ – MTOW 70 T
FIGURE 6

****ON A/C A319-100**



N_AC_070802_1_0130101_01_01

Rigid Pavement Requirements - LCN Conversion
Model CJ – MTOW 75.5 T
FIGURE 7

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

****ON A/C A319-100**

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.

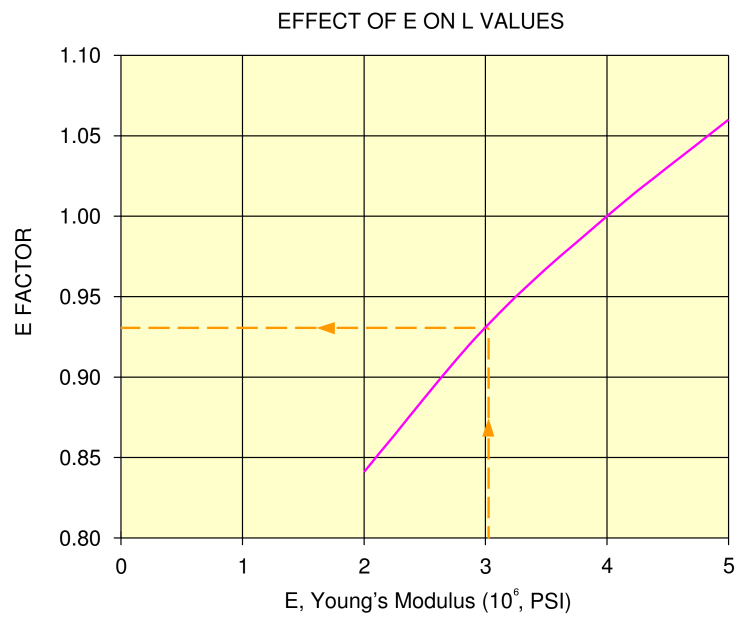
7-8-4 Radius of Relative Stiffness

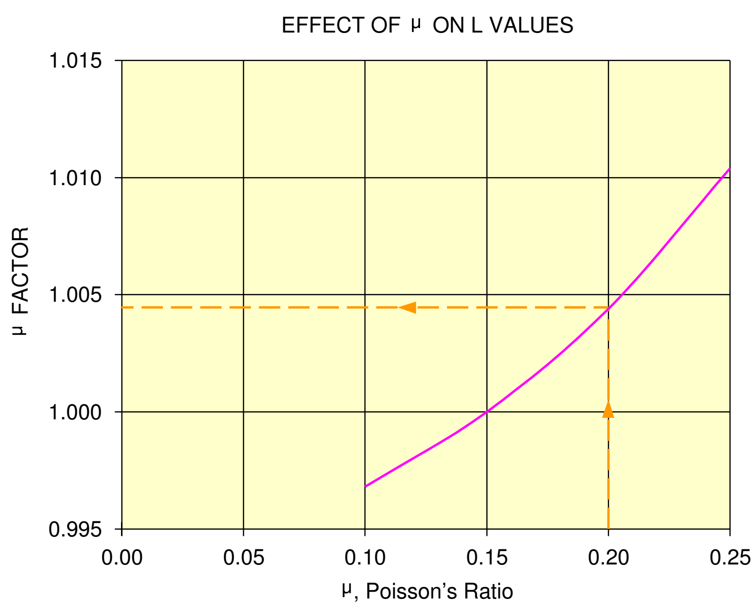
****ON A/C A319-100**

Radius of Relative Stiffness

1. This section gives Radius of Relative Stiffness.

**ON A/C A319-100





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

N_AC_070804_1_0020101_01_01

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

7-9-0 ACN/PCN Reporting System

****ON A/C A319-100**

ACN/PCN Reporting System

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.

A319-100 Model:

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 29.5.

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 32.

A319-CJ Model:

In the example shown in Section 7-9-1, page 10, for an Aircraft Gross Weight of 60 tonnes (132277 lb) and medium subgrade strength (code C), the ACN for the flexible pavement is 33.

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 37.

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).

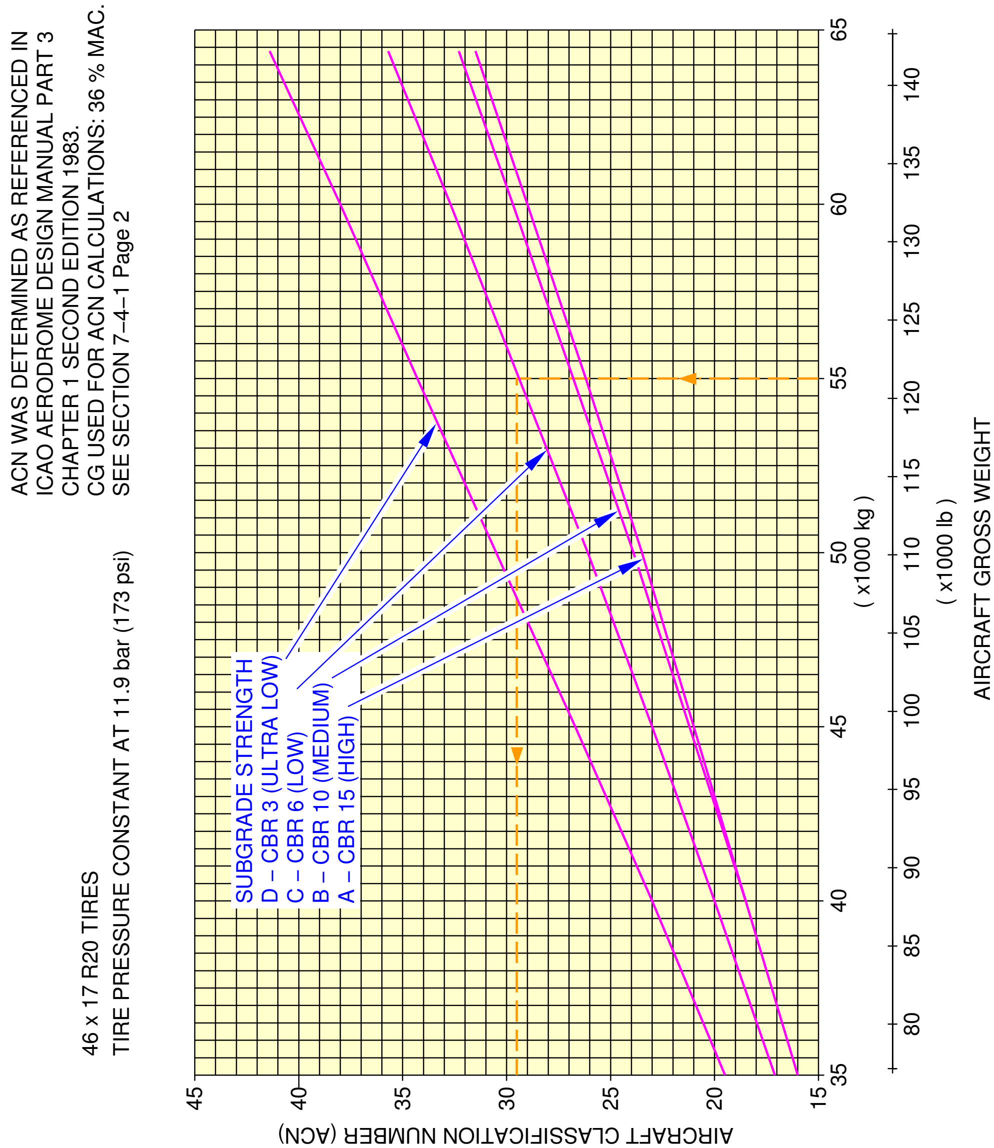
7-9-1 Aircraft Classification Number - Flexible Pavement

****ON A/C A319-100**

Aircraft Classification Number - Flexible Pavement

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

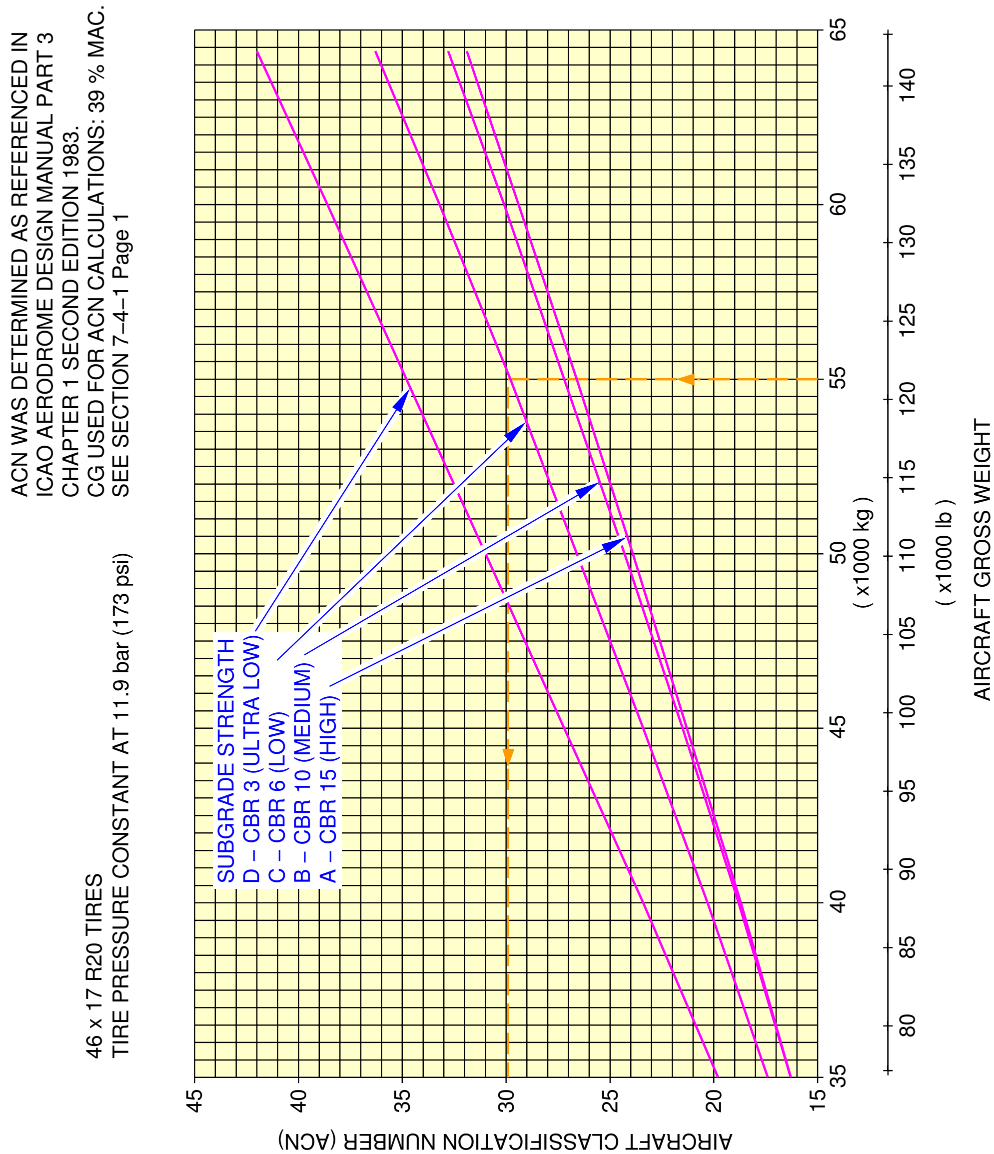
**ON A/C A319-100



N_AC_070901_1_0070101_01_01

Aircraft Classification Number – Flexible Pavement
MTOW 64 T
FIGURE 1

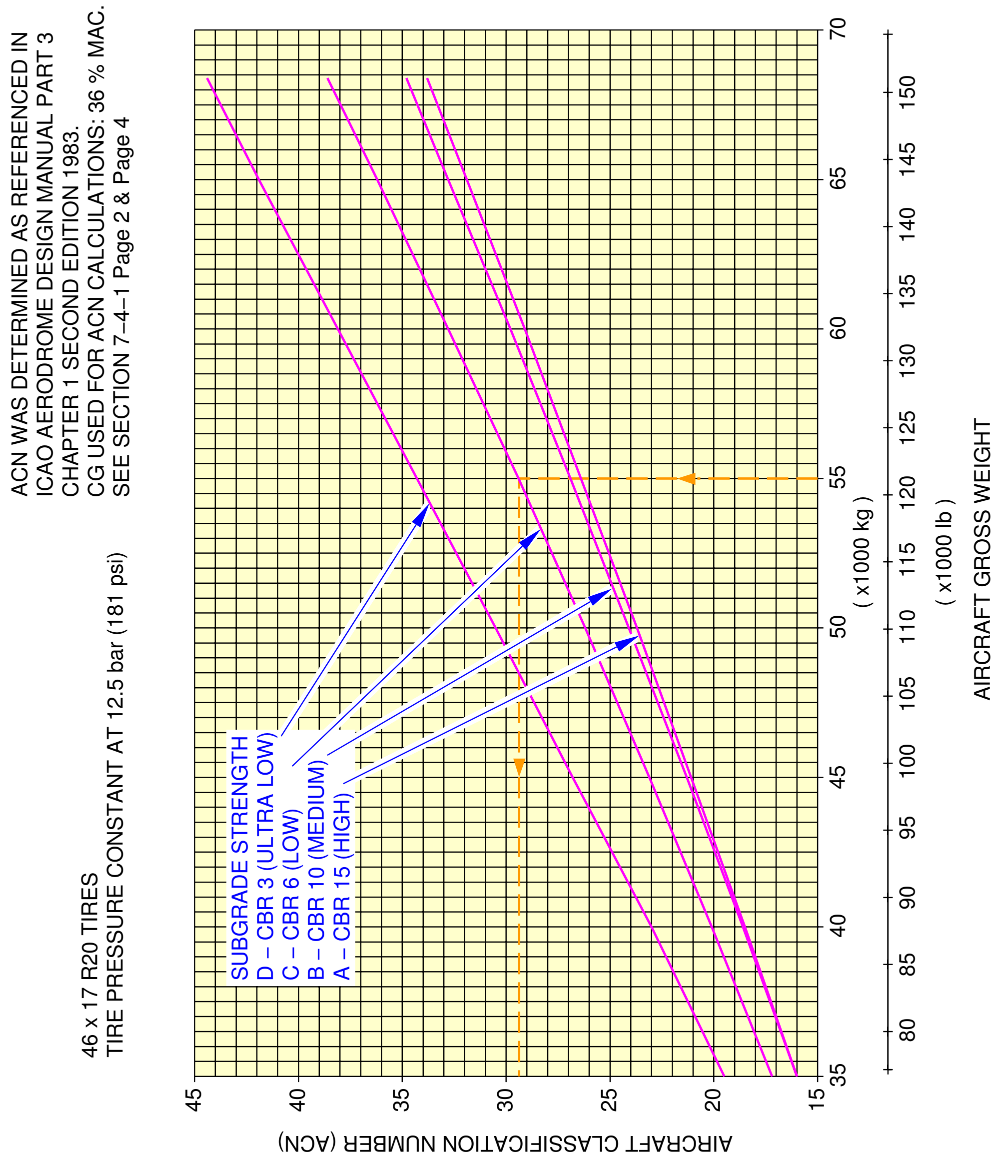
**ON A/C A319-100



N_AC_070901_1_0080101_01_01

Aircraft Classification Number – Flexible Pavement
MTOW 64 T
FIGURE 2

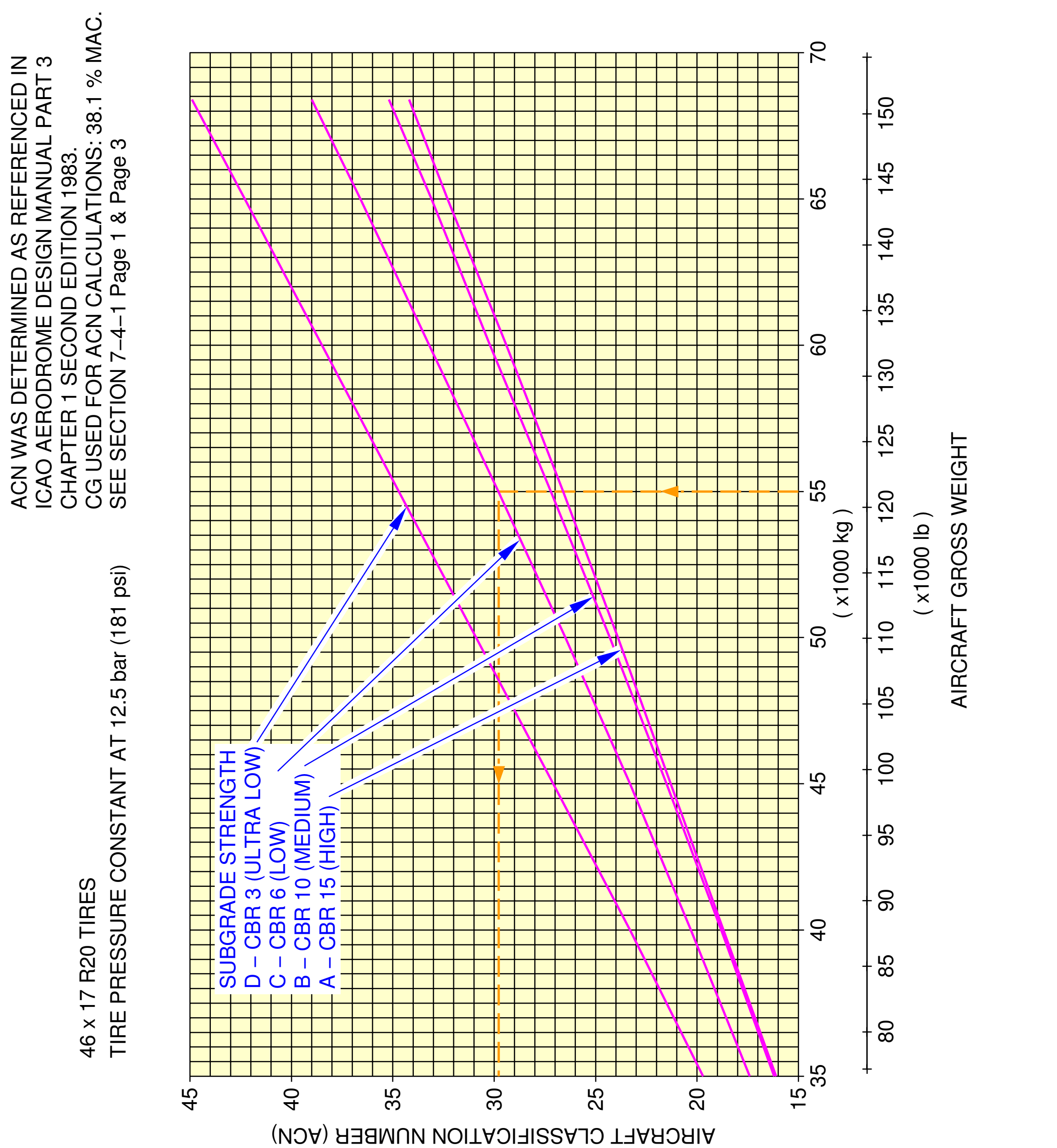
**ON A/C A319-100



N_AC_070901_1_0090101_01_01

Aircraft Classification Number − Flexible Pavement
MTOW 68 T
FIGURE 3

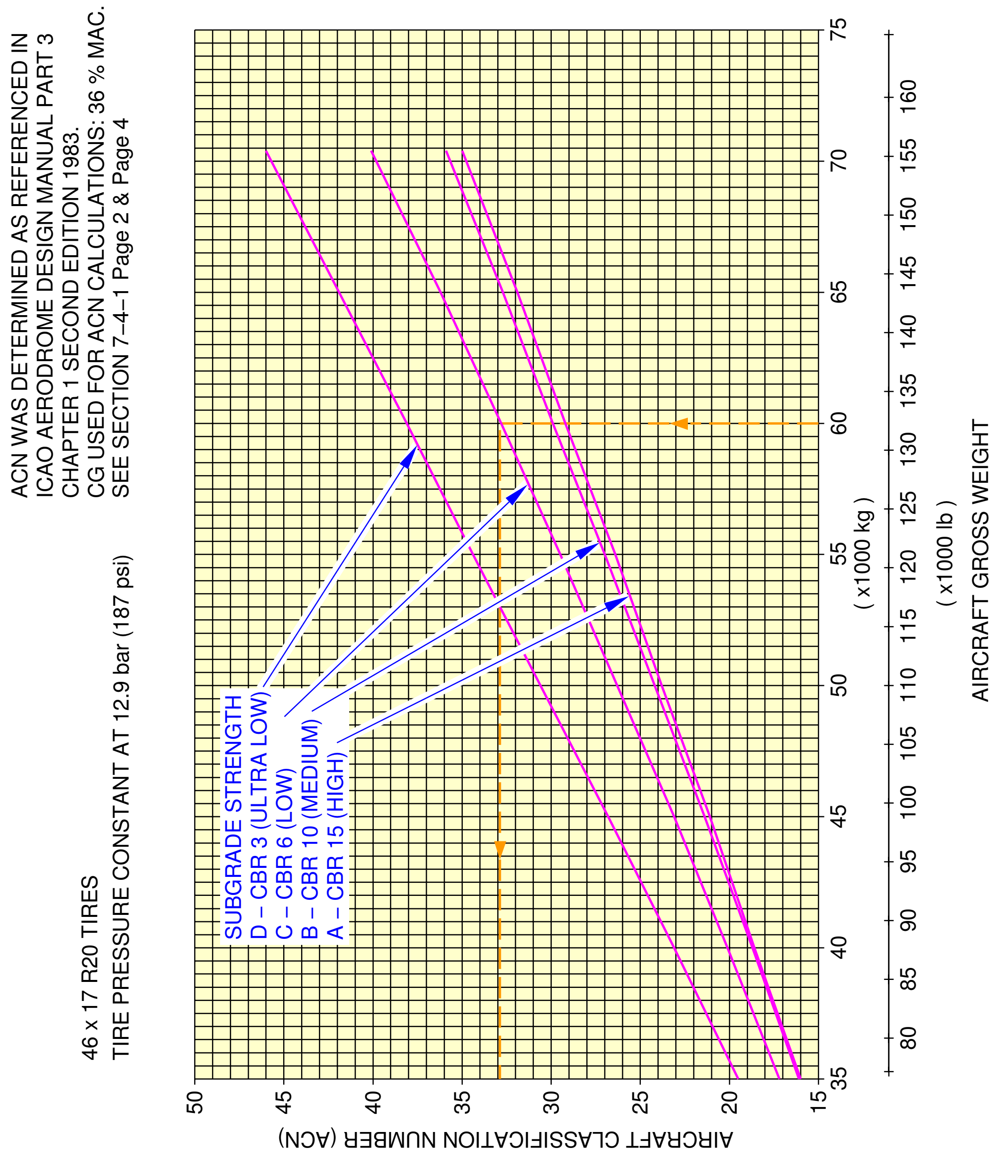
**ON A/C A319-100



N_AC_070901_1_0100101_01_01

Aircraft Classification Number – Flexible Pavement
MTOW 68 T
FIGURE 4

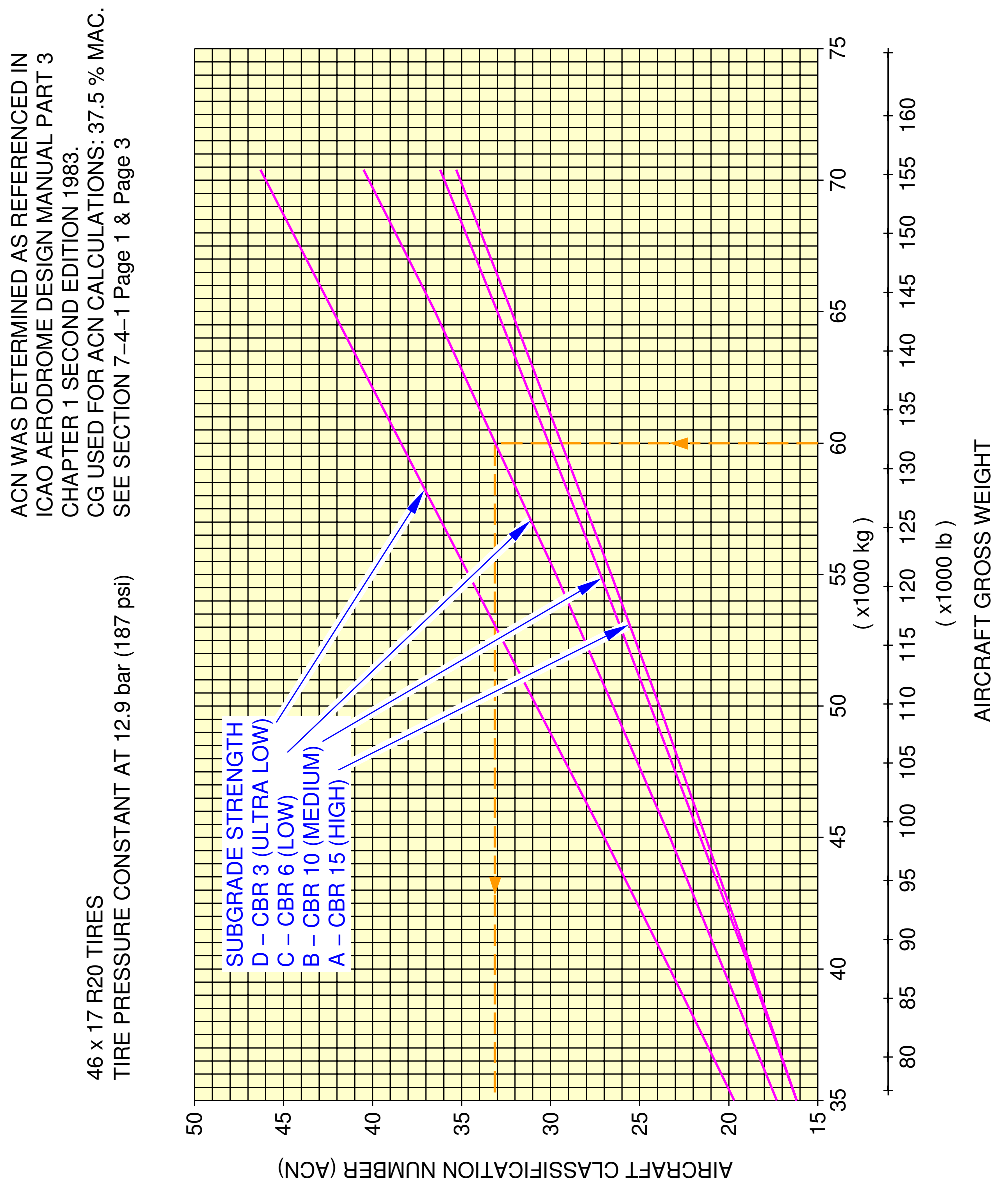
****ON A/C A319-100**



N_AC_070901_1_0110101_01_01

Aircraft Classification Number – Flexible Pavement
MTOW 70 T
FIGURE 5

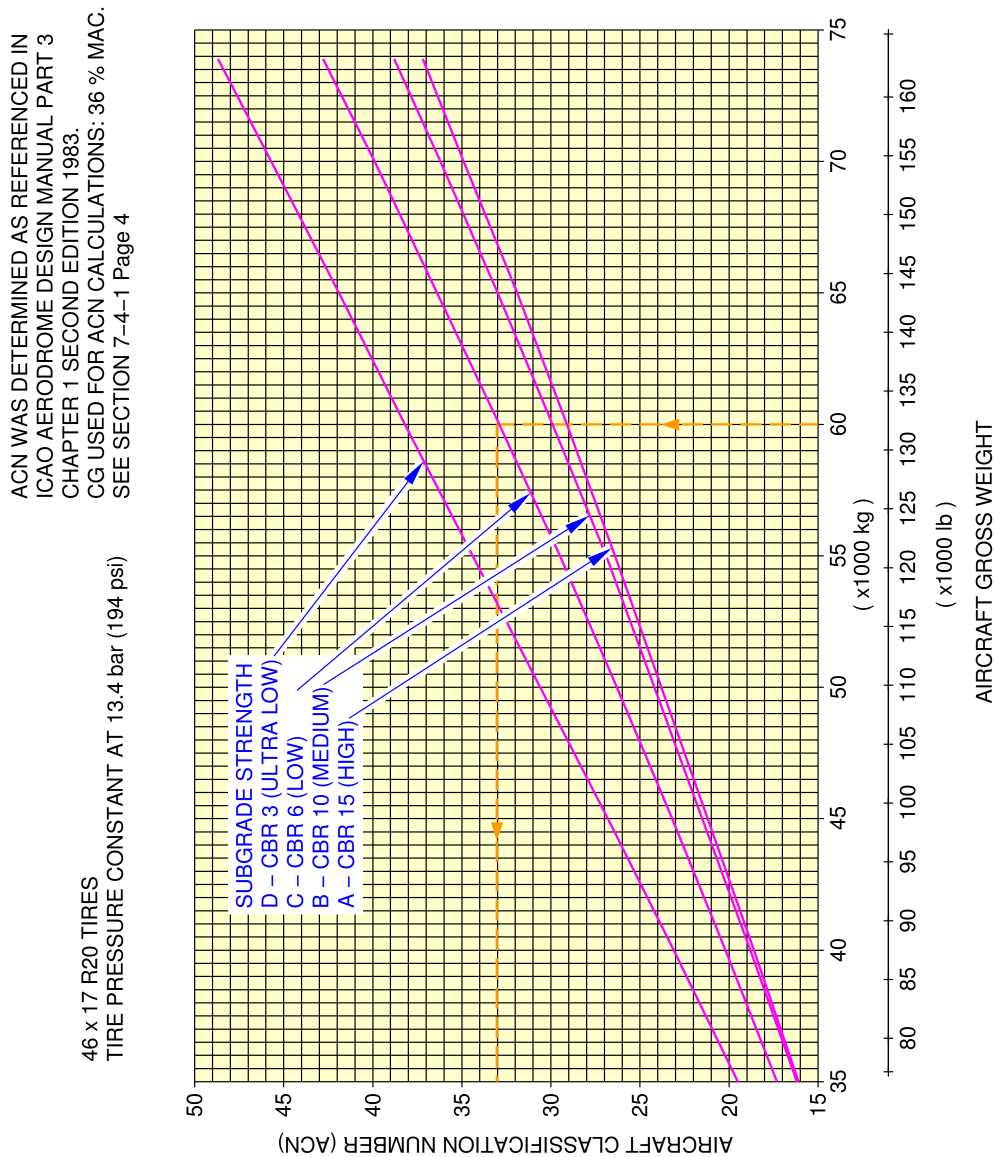
**ON A/C A319-100



N_AC_070901_1_0120101_01_01

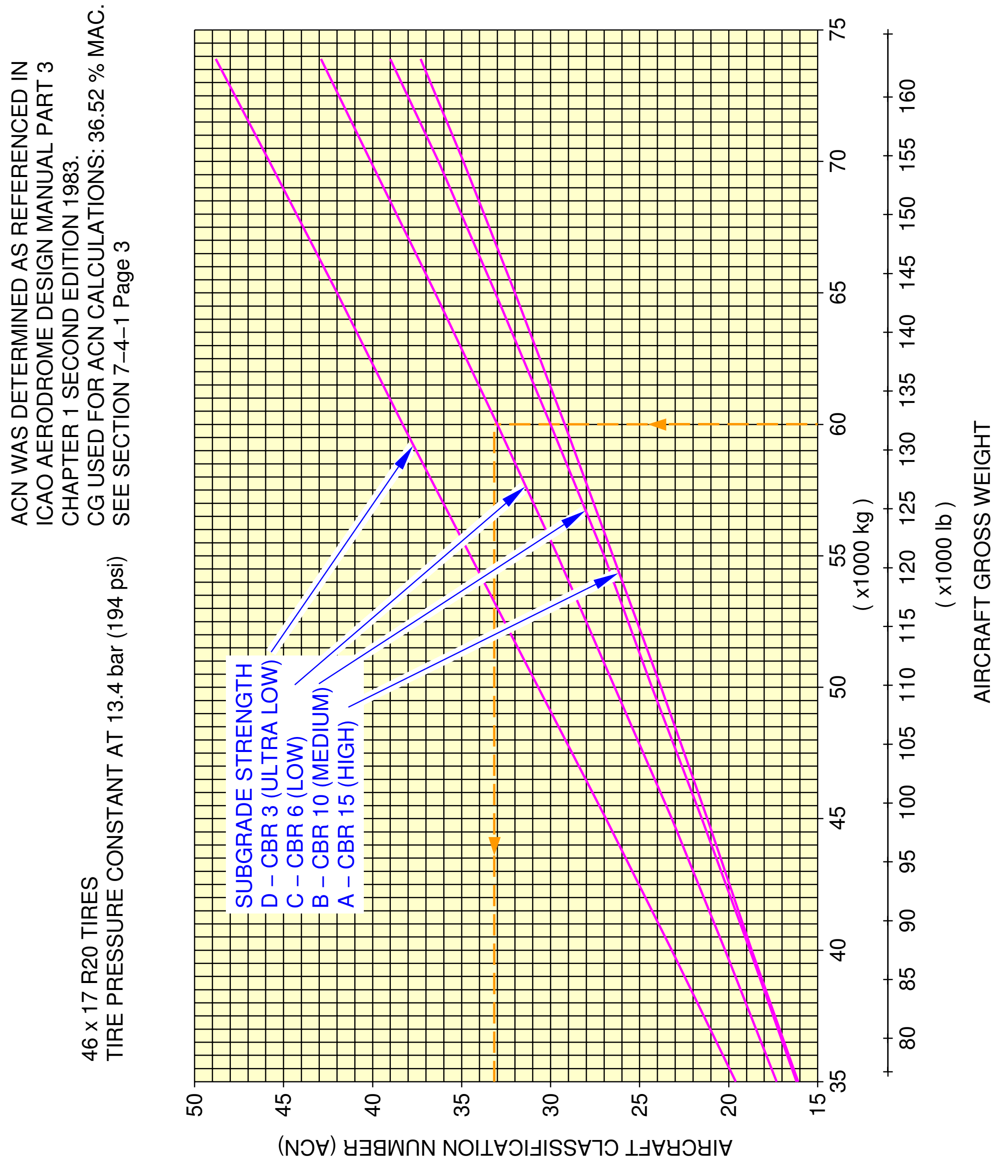
Aircraft Classification Number – Flexible Pavement
MTOW 70 T
FIGURE 6

**ON A/C A319-100



Aircraft Classification Number – Flexible Pavement
MTOW 73.5 T
FIGURE 7

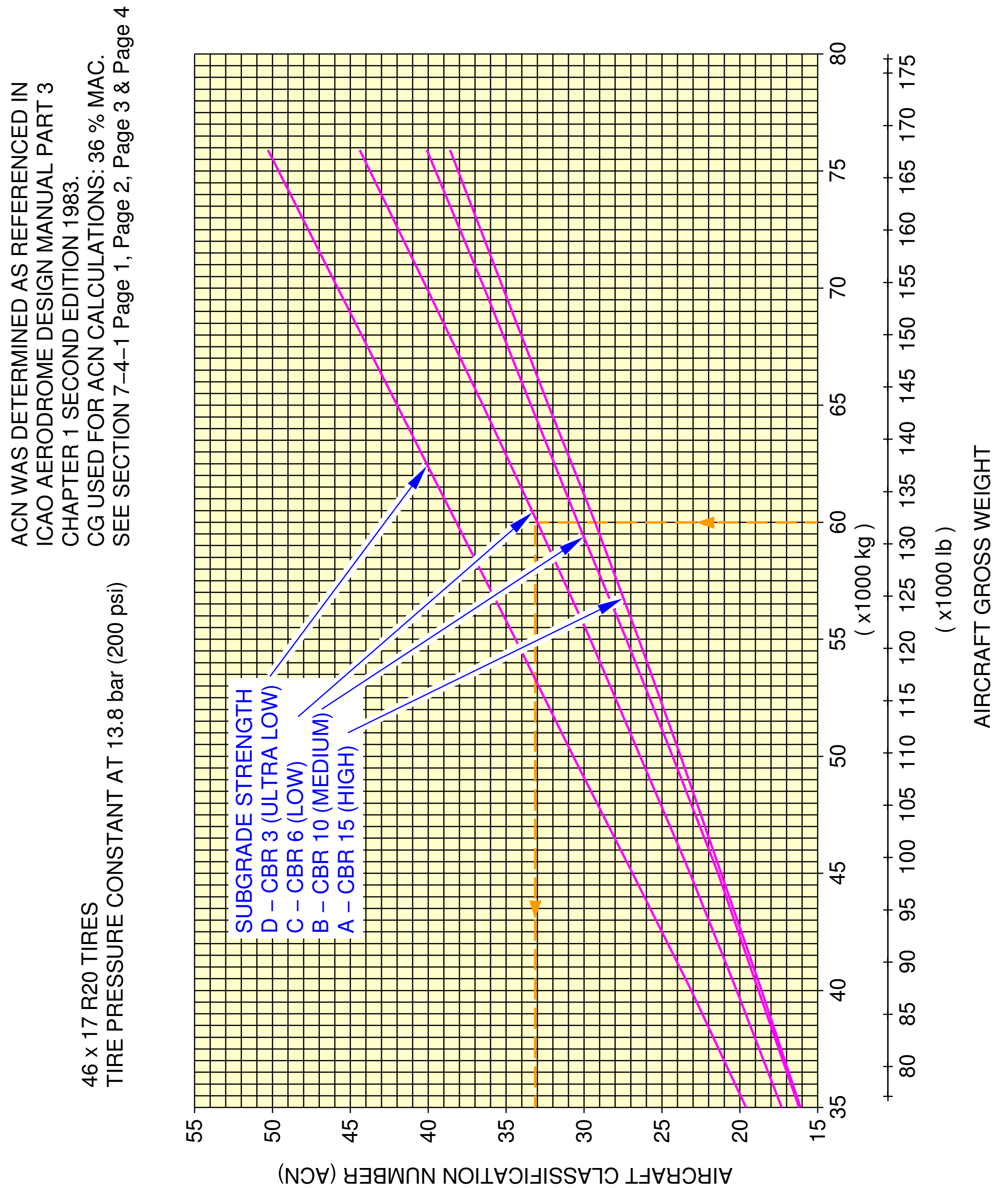
**ON A/C A319-100



N_AC_070901_1_0140101_01_01

Aircraft Classification Number – Flexible Pavement
MTOW 73.5 T
FIGURE 8

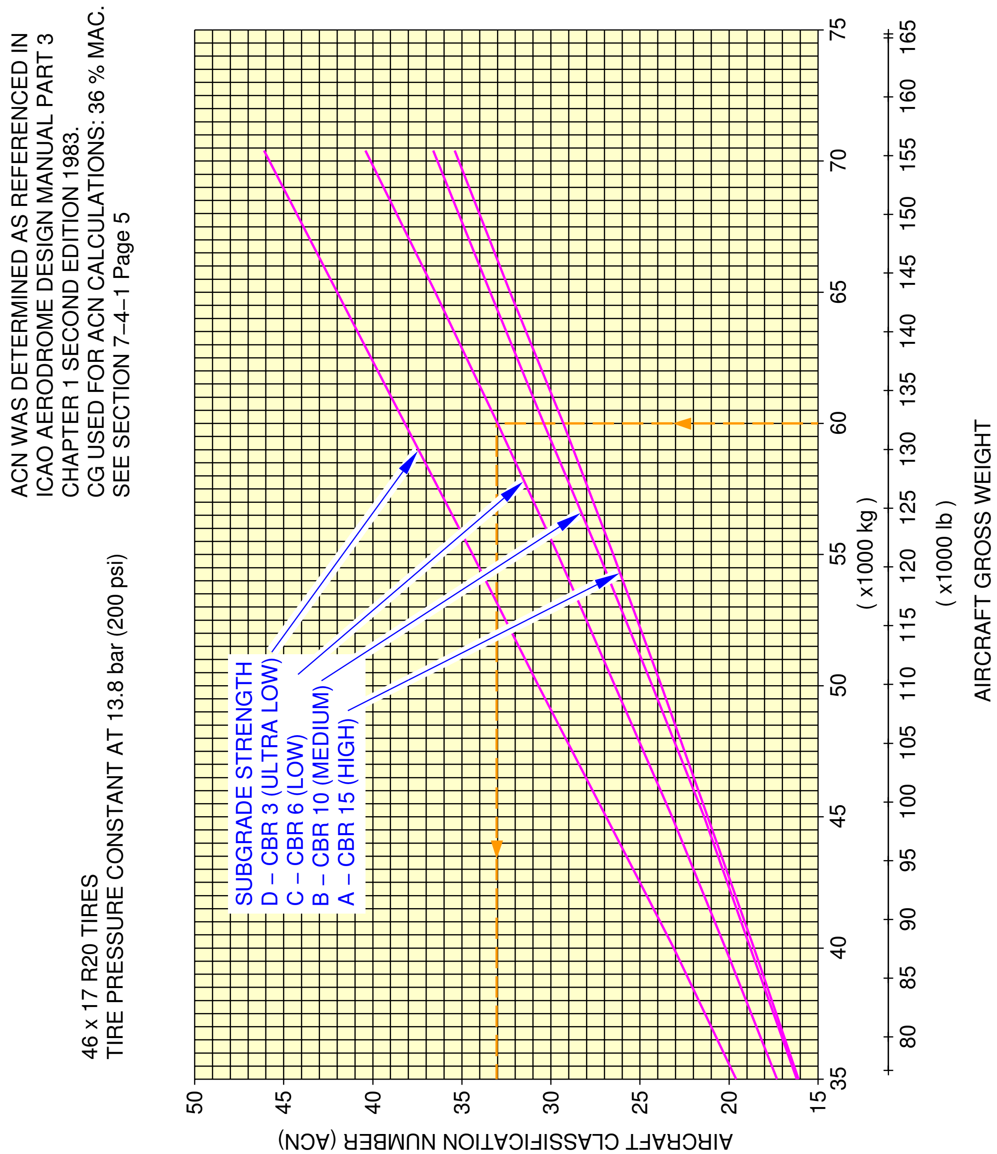
**ON A/C A319-100



N_AC_070901_1_0150101_01_01

Aircraft Classification Number – Flexible Pavement
MTOW 75.5 T
FIGURE 9

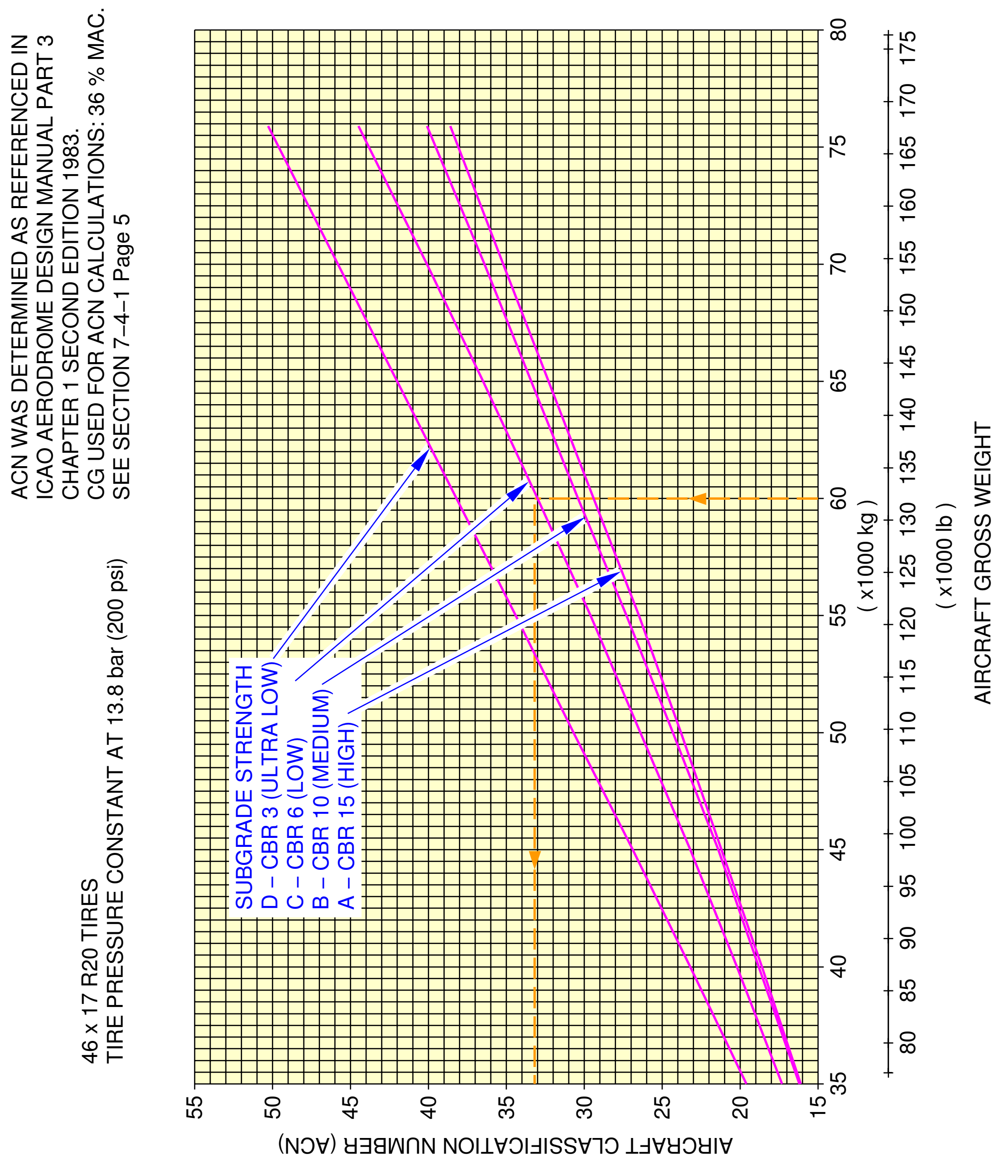
**ON A/C A319-100



N_AC_070901_1_0160101_01_01

Aircraft Classification Number − Flexible Pavement
Model CJ − MTOW 70 T
FIGURE 10

**ON A/C A319-100



N_AC_070901_1_0170101_01_01

Aircraft Classification Number – Flexible Pavement
Model CJ – MTOW 75.5 T
FIGURE 11

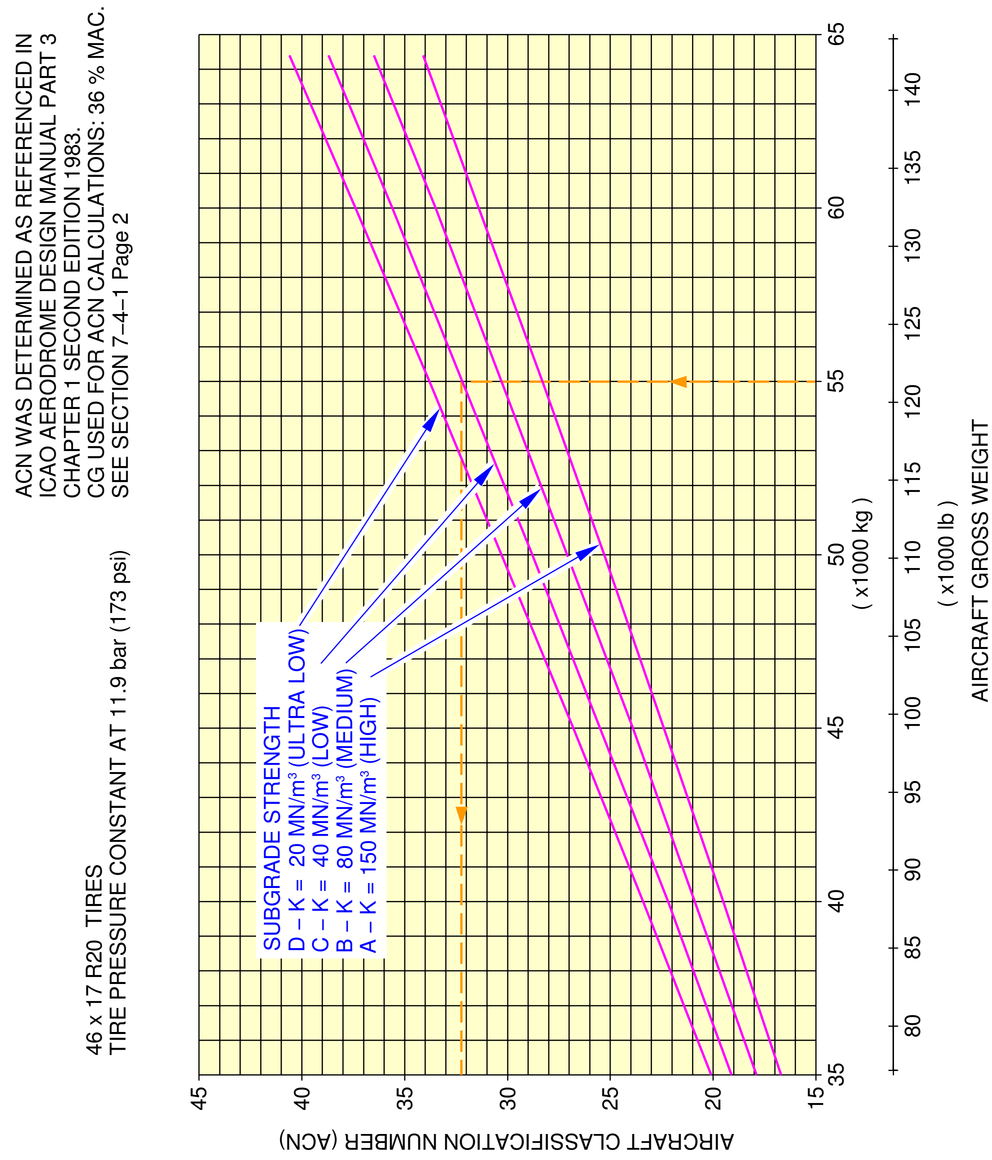
7-9-2 Aircraft Classification Number - Rigid Pavement

****ON A/C A319-100**

Aircraft Classification Number - Rigid Pavement

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

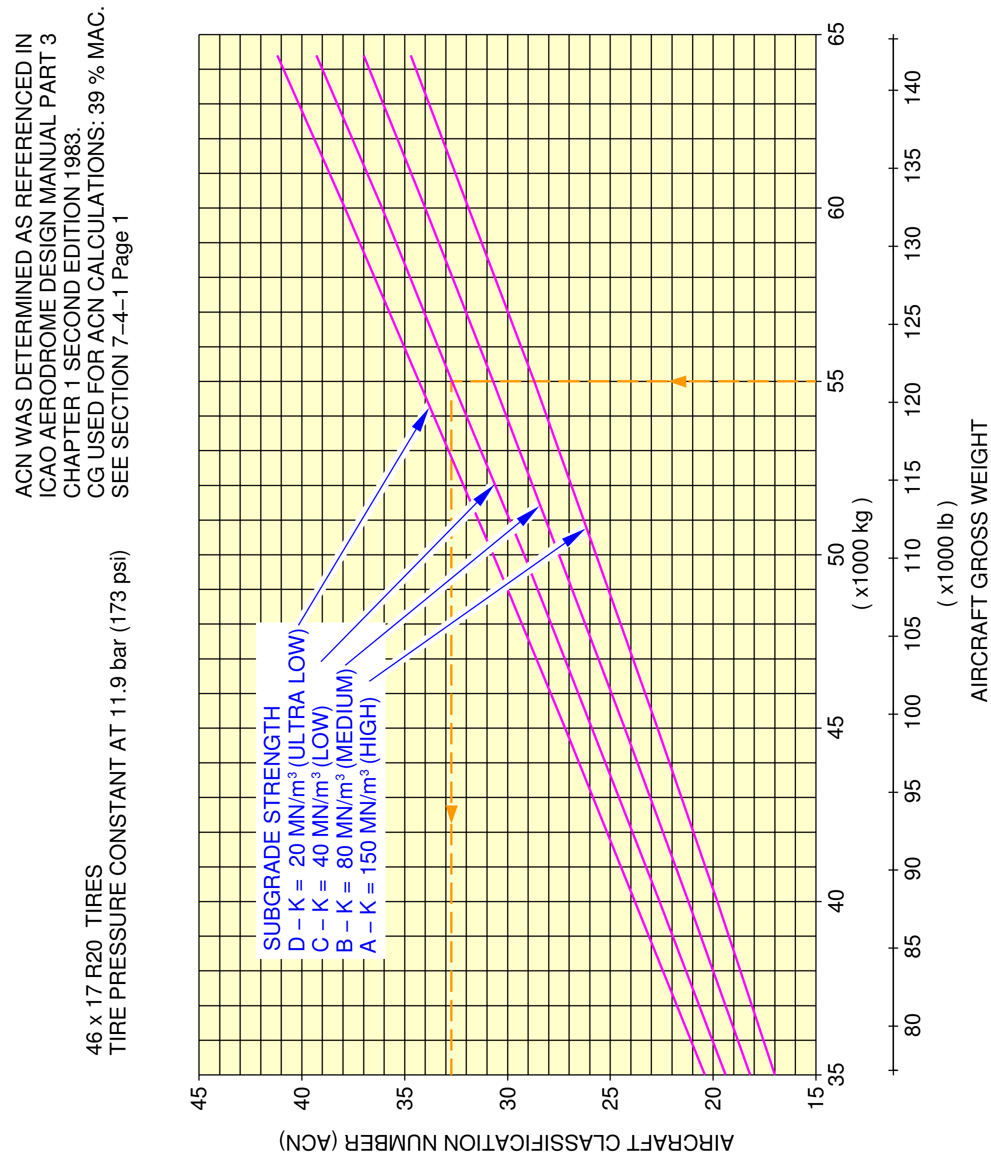
****ON A/C A319-100**



N_AC_070902_1_0070101_01_01

Aircraft Classification Number – Rigid Pavement
MTOW 64 T
FIGURE 1

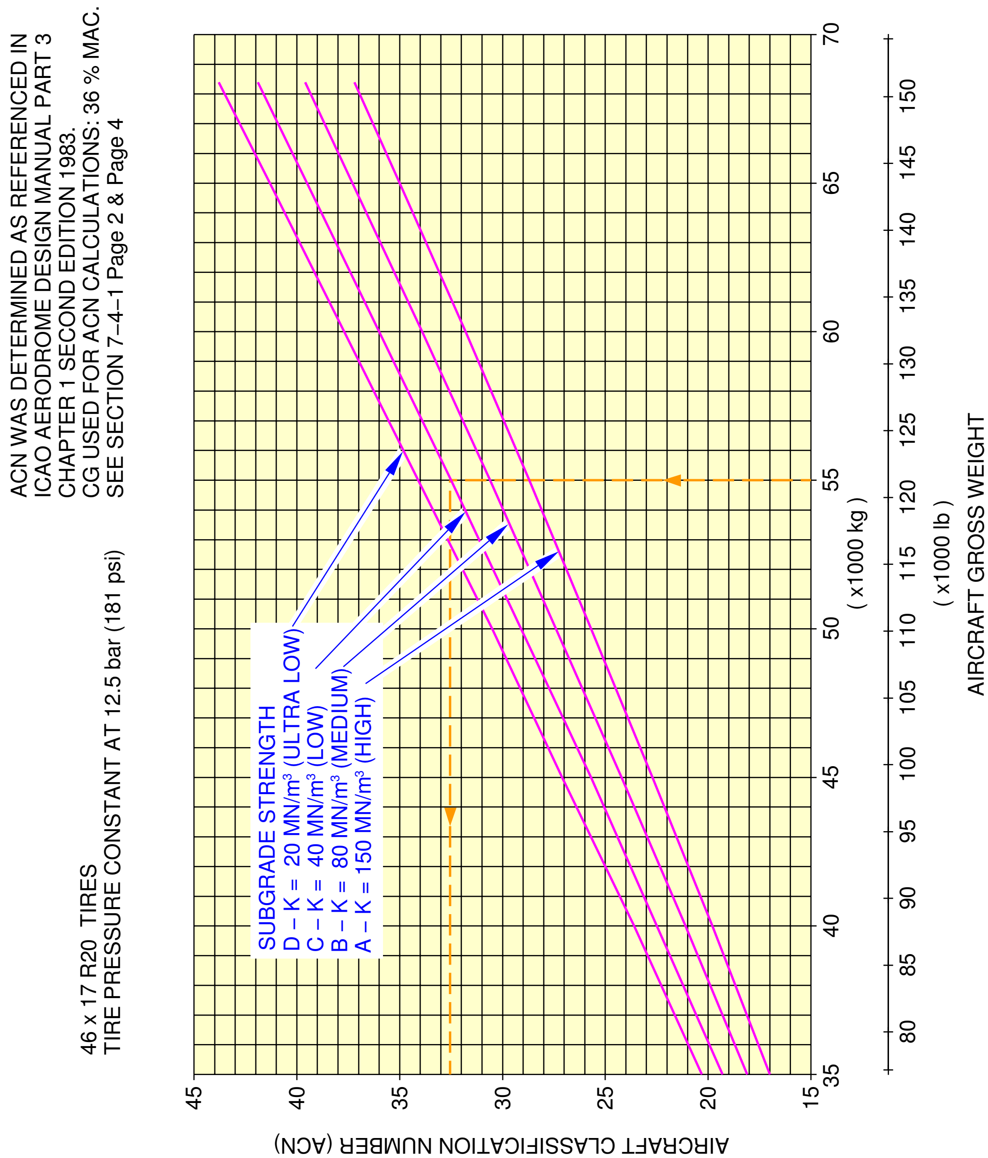
**ON A/C A319-100



N_AC_070902_1_0080101_01_01

Aircraft Classification Number – Rigid Pavement
MTOW 64 T
FIGURE 2

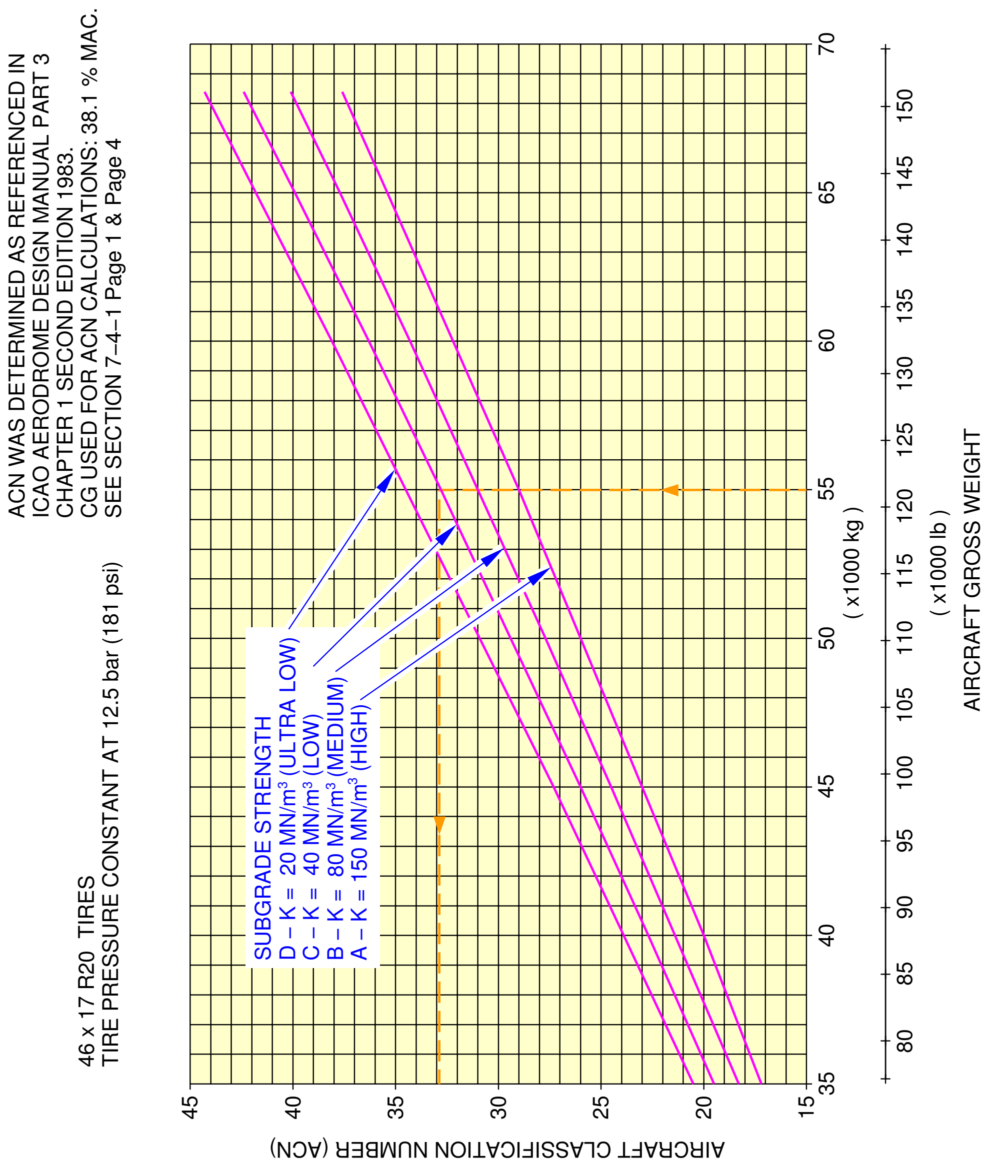
**ON A/C A319-100



N_AC_070902_1_0090101_01_01

Aircraft Classification Number – Rigid Pavement
MTOW 68 T
FIGURE 3

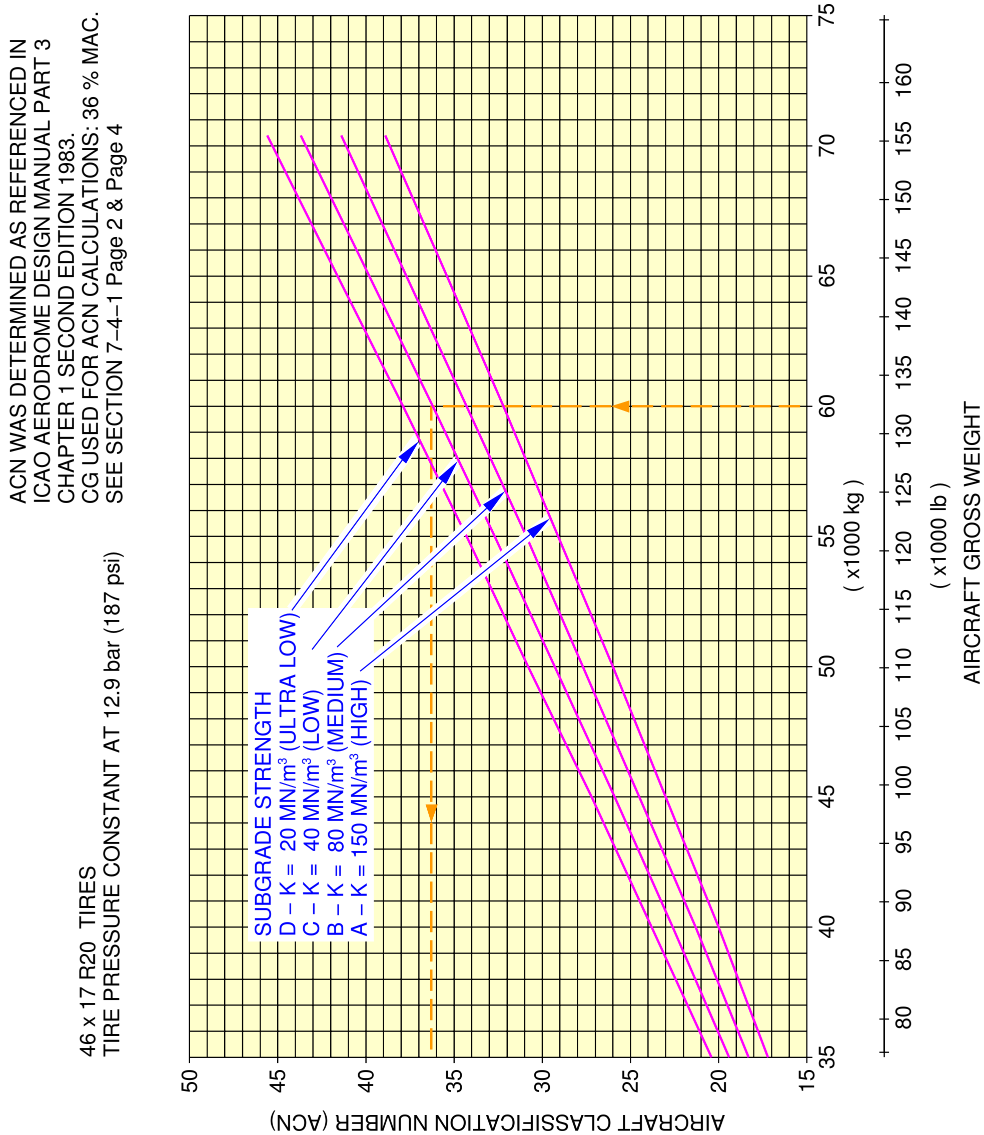
**ON A/C A319-100



N_AC_070902_1_0100101_01_01

Aircraft Classification Number – Rigid Pavement
MTOW 68 T
FIGURE 4

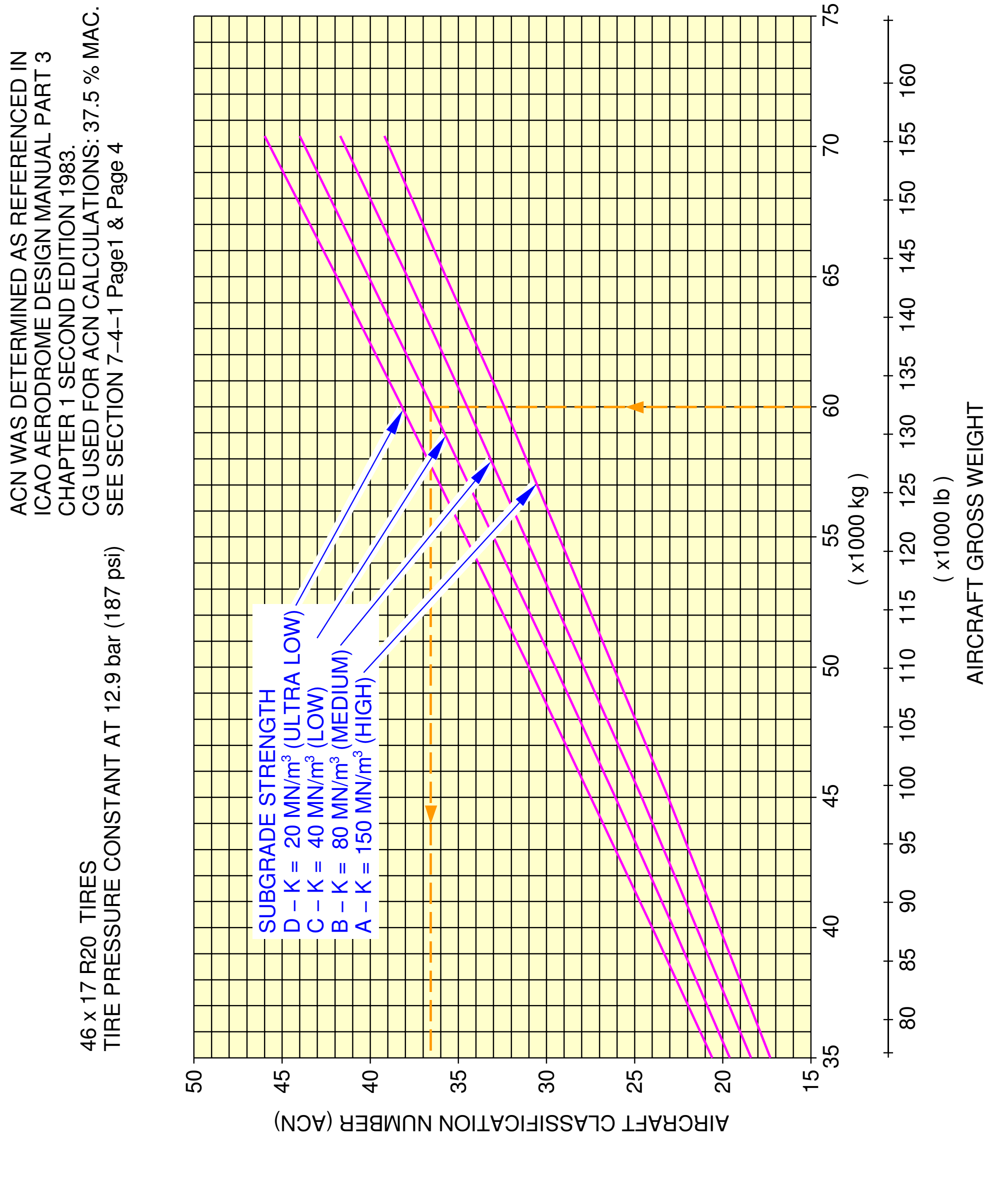
**ON A/C A319-100



N_AC_070902_1_0110101_01_01

Aircraft Classification Number − Rigid Pavement
MTOW 70 T
FIGURE 5

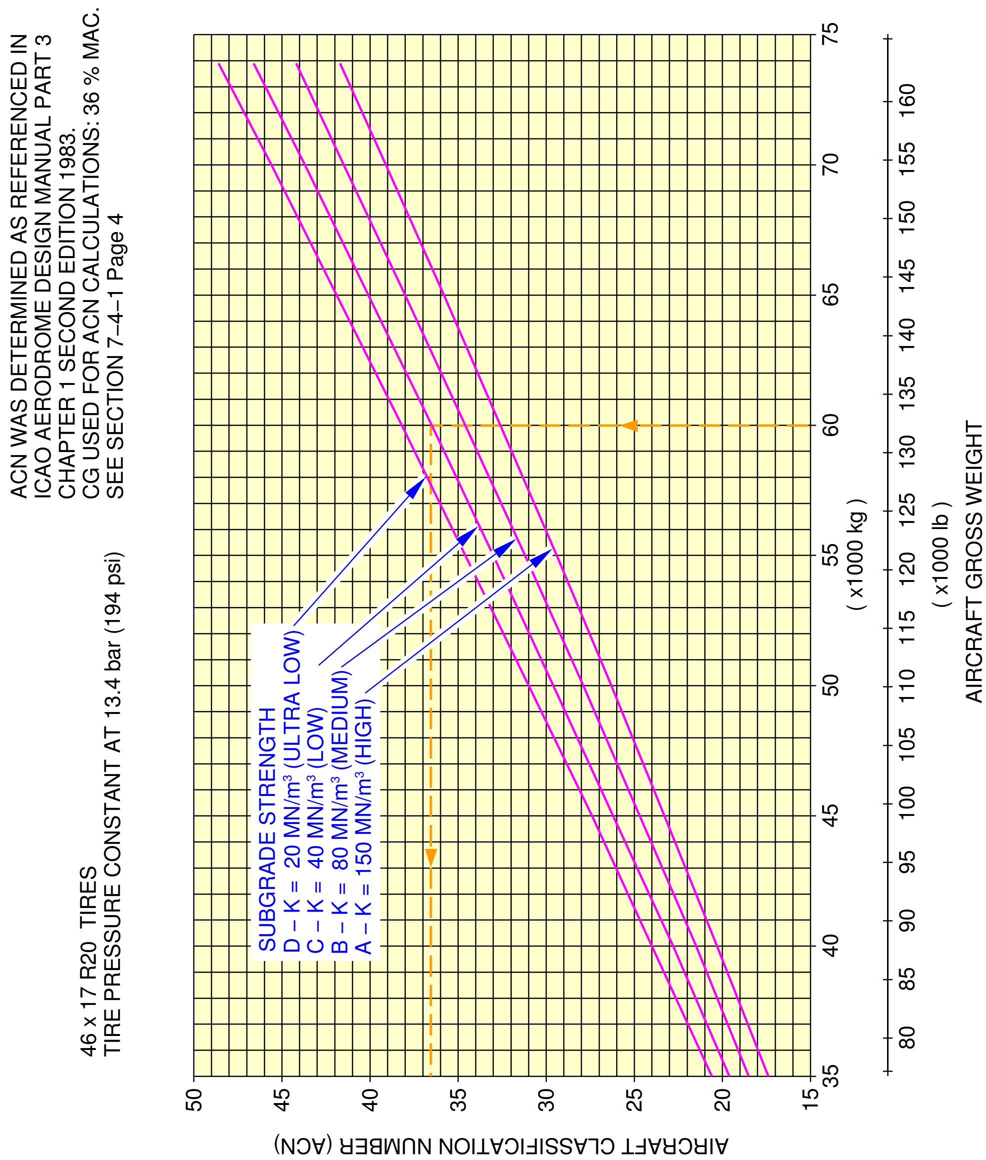
****ON A/C A319-100**



N_AC_070902_1_0120101_01_01

Aircraft Classification Number – Rigid Pavement
MTOW 70 T
FIGURE 6

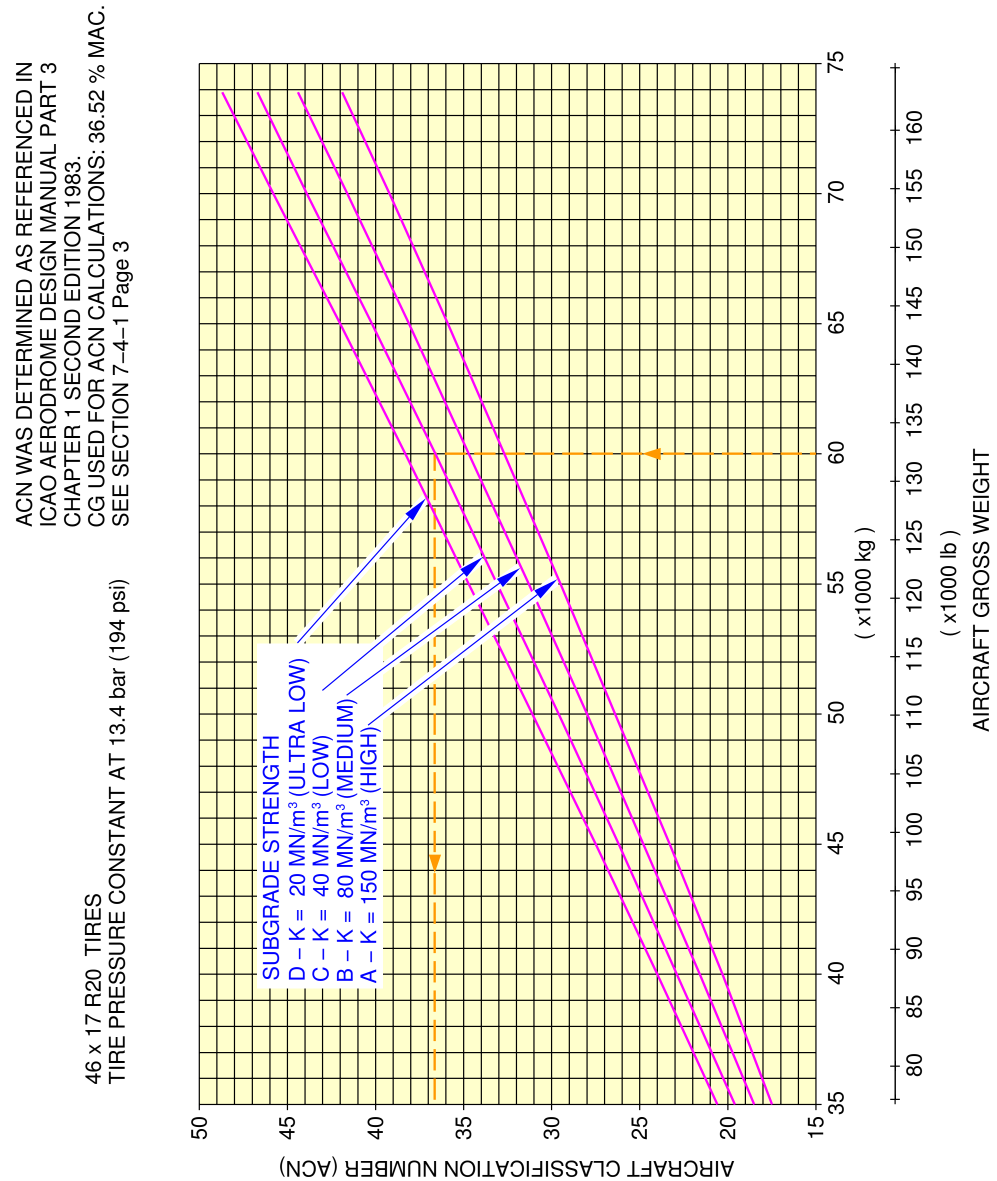
**ON A/C A319-100



N_AC_070902_1_0130101_01_01

Aircraft Classification Number – Rigid Pavement
MTOW 73.5 T
FIGURE 7

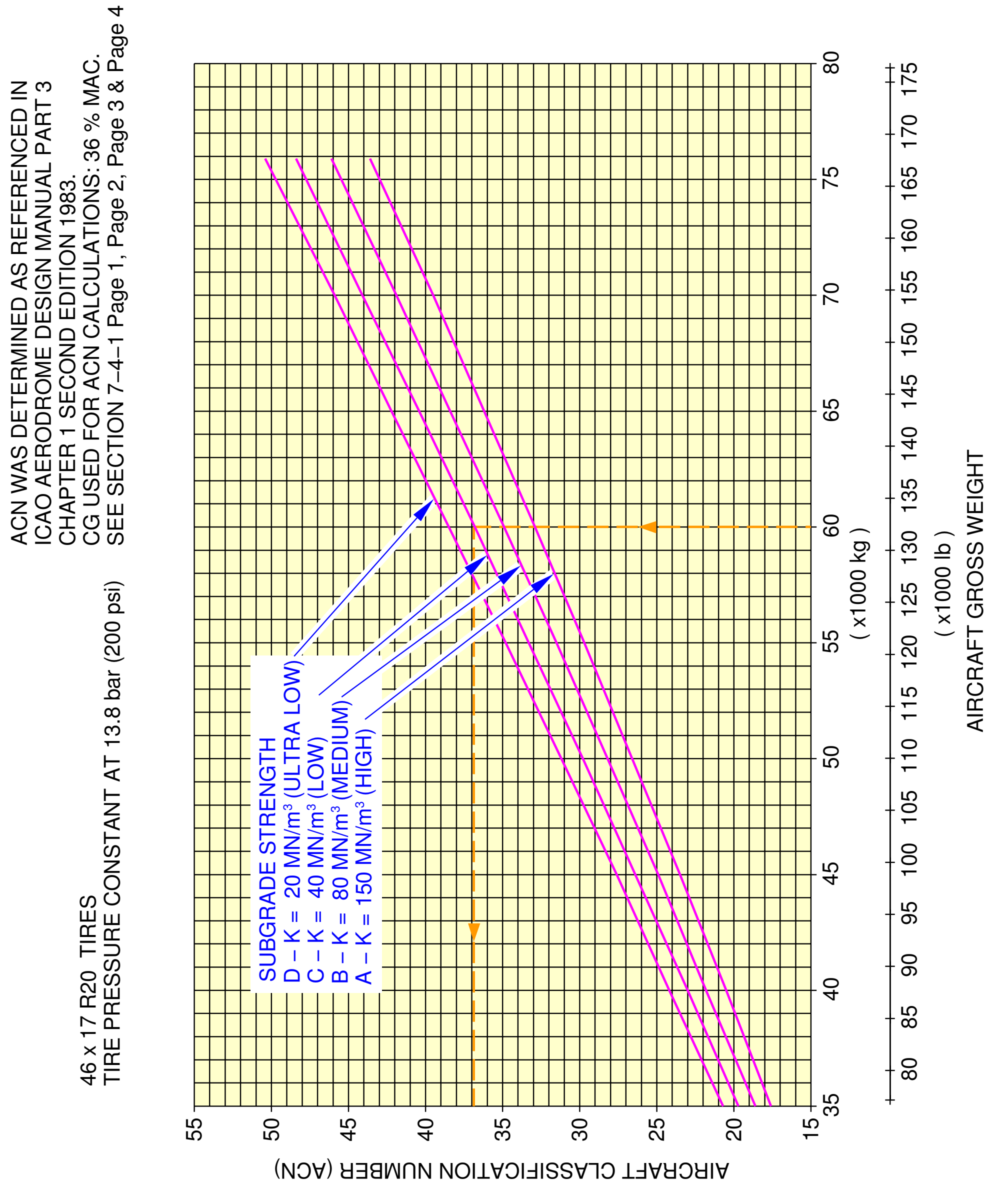
**ON A/C A319-100



N_AC_070902_1_0140101_01_01

Aircraft Classification Number – Rigid Pavement
MTOW 73.5 T
FIGURE 8

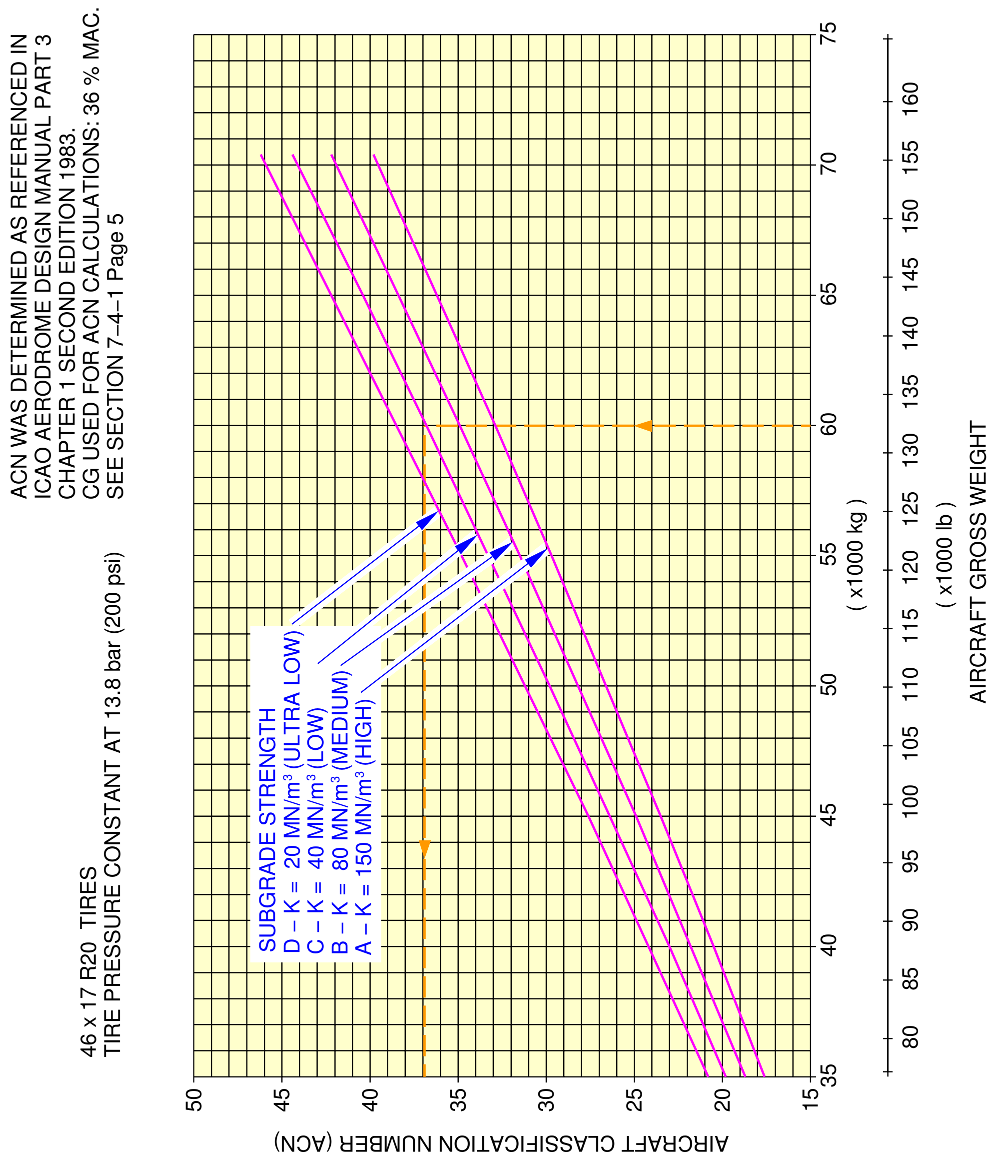
****ON A/C A319-100**



N_AC_070902_1_0150101_01_01

Aircraft Classification Number – Rigid Pavement
MTOW 75.5 T
FIGURE 9

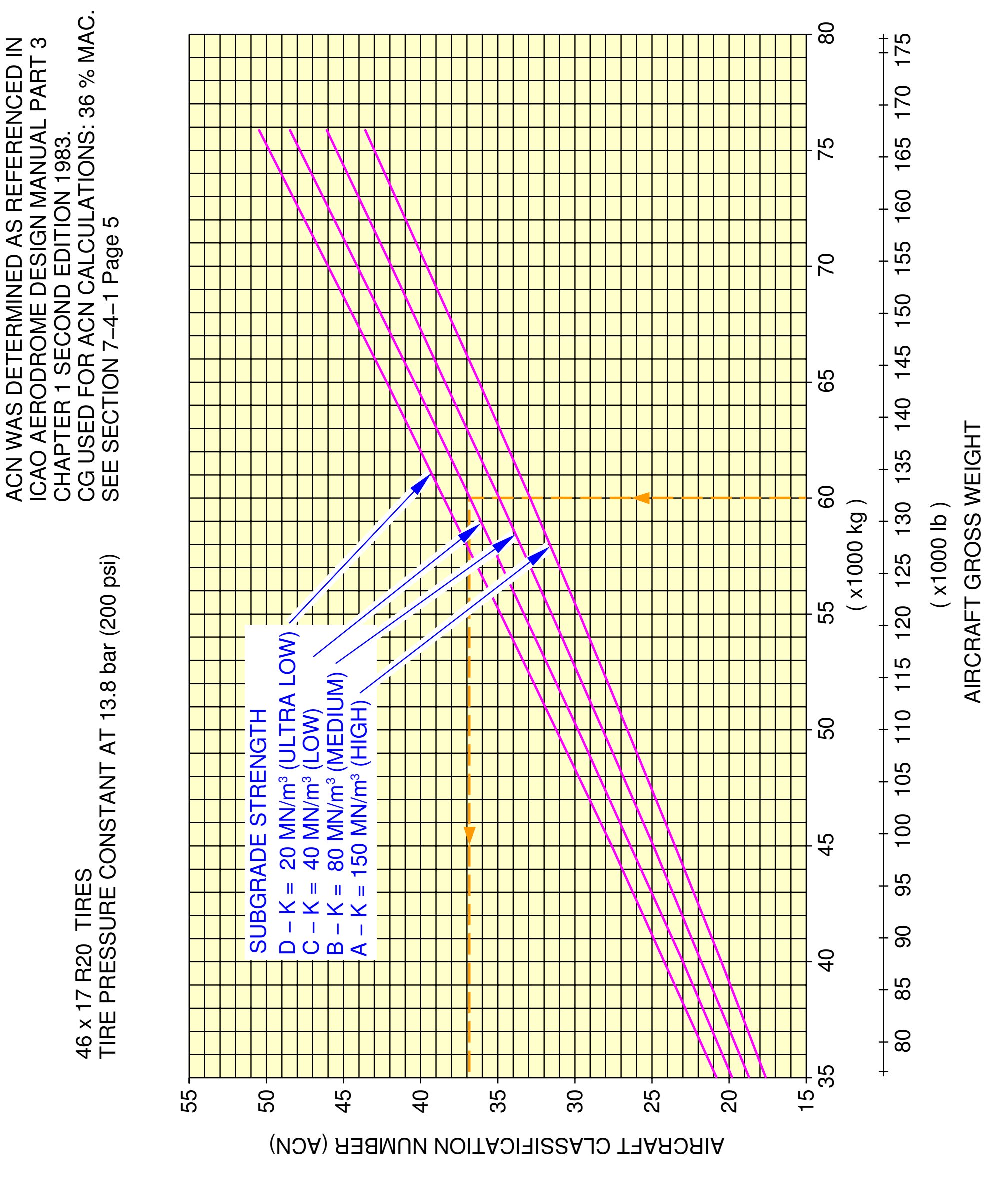
**ON A/C A319-100



N_AC_070902_1_0160101_01_01

Aircraft Classification Number – Rigid Pavement
Model CJ – MTOW 70 T
FIGURE 10

**ON A/C A319-100



N_AC_070902_1_0170101_01_01

Aircraft Classification Number – Rigid Pavement
Model CJ – MTOW 75.5 T
FIGURE 11

DERIVATIVE AIRPLANES

8-1-0 Possible Future Derivative Airplane

****ON A/C A319-100**

Possible Future Derivative Airplane

1. General

Derivative versions of the A319 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

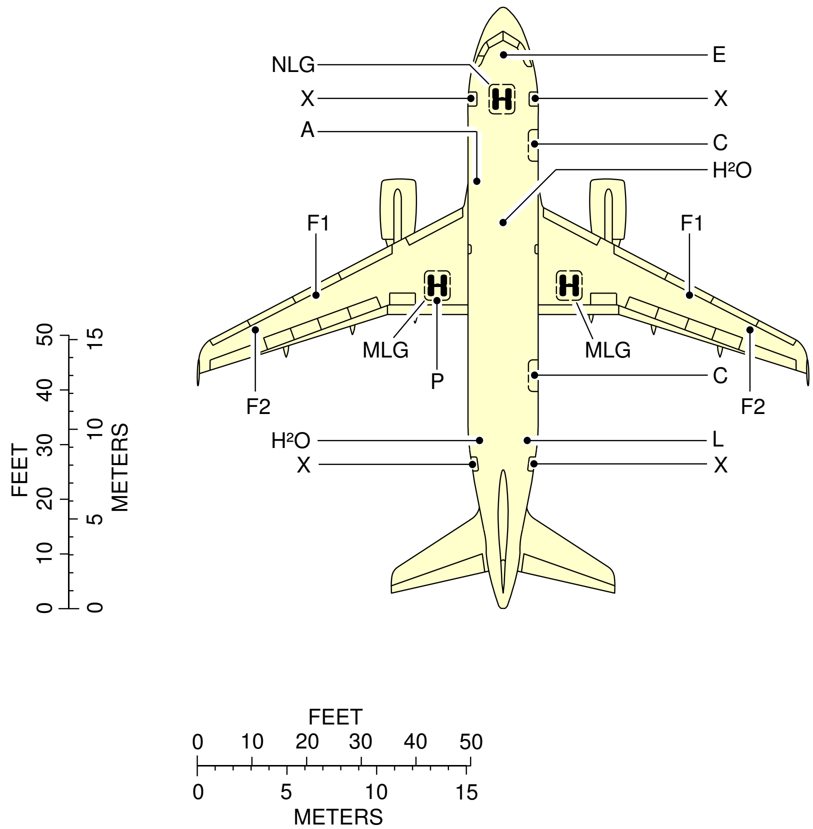
9-1-0 Scaled Drawings

**ON A/C A319-100

Scaled Drawings

1. This section gives scaled drawings of the aircraft.

**ON A/C A319-100



LEGEND:

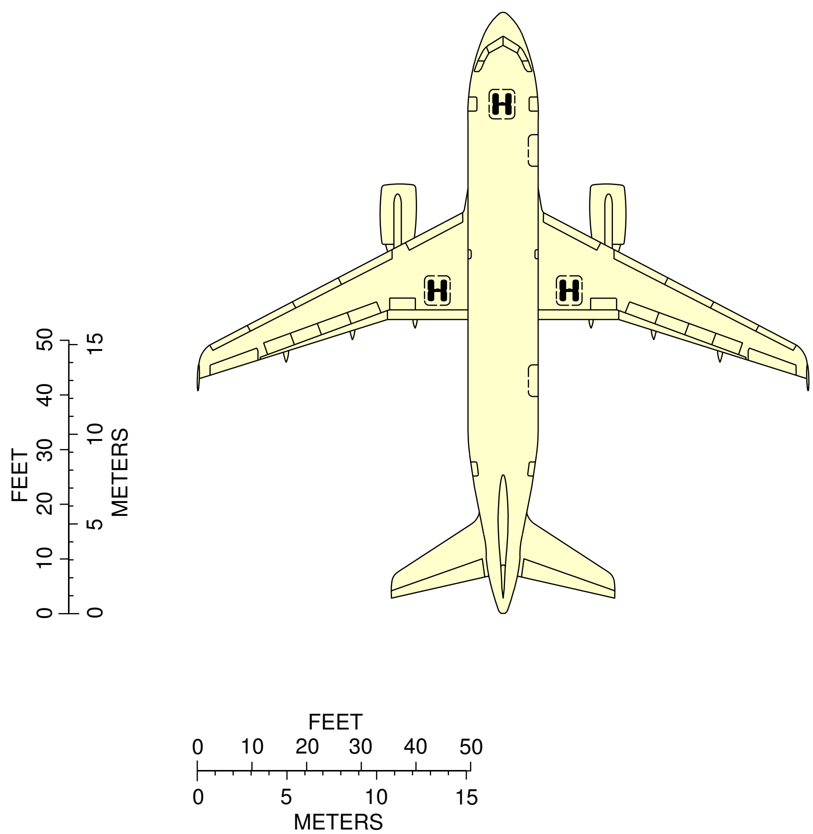
A	AIR CONDITIONING		
C	CARGO COMPT DOOR	L	LAVATORY
E	ELECTRICAL	MLG	MAIN LANDING GEAR
F1	FUEL (COUPLING)	NLG	NOSE LANDING GEAR
F2	FUEL (GRAVITY)	P	PNEUMATIC
H²O	POTABLE WATER	X	PASSENGER/CREW DOOR

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

N_AC_090100_1_0030101_01_03

Scaled Drawing
FIGURE 1

**ON A/C A319-100



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

N_AC_090100_1_0040101_01_03

Scaled Drawing
FIGURE 2