A330-700L

AIRCRAFT CHARACTERISTICS AIRPORT AND MAINTENANCE PLANNING

AC

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

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HIGHLIGHTS

Revision No. 1 - Jun 01/20

LOCATIONS	CHG CODE	DESCRIPTIONS OF CHANGE
CHAPTER 2		
Section 2-11		
Subject 2-11-0		
FIGURE Antennas and Probes - Location	R	REVISED THE ILLUSTRATION RELATED TO ANTENNAS AND PROBES.
Section 2-13		
Subject 2-13-0		
Leveling and Symmetry	R	
CHAPTER 5	R	
Section 5-1	N	
Subject 5-1-2	N	
05-01-02 Typical Ramp Layout	N	
FIGURE Typical Ramp Layout	N	ILLUSTRATION ADDED
Section 5-4	R	
Subject 5-4-4		
Electrical Servicing	R	
FIGURE Ground Service Connections - Electrical Service Panel	R	REPLACED ACCESS DOOR 125EL BY 121EL FOR ELECTRICAL SERVICE PANEL.
Subject 05-04-09	D	
Subject 5-4-10		
Waste Water System	R	NOTE AMENDED
FIGURE Ground Service Connections - Waste-Water Ground-Service Panels	R	REPLACED ACCESS DOOR 121EL BY 121GL FOR WASTE-WATER GROUND-SERVICE PANEL.
Section 5-8		
Subject 5-8-0		
Ground Towing Requirements	R	
FIGURE Ground Towing Requirements - Location of the RAOs	N	ILLUSTRATION ADDED

LOCATIONS	CHG CODE	DESCRIPTIONS OF CHANGE
CHAPTER 6	R	
Section 6-5	N	
Subject 6-5-0	N	
Pilot Visibility in Approach	N	
FIGURE Pilot Visibility in Approach - Navigation Aids	N	ILLUSTRATION ADDED
CHAPTER 10		
Section 10-0		
Subject 10-0-0		
Aircraft Rescue and Fire Fighting	R	
FIGURE Highly Flammable and Hazardous Materials and Components	R	REVISED ILLUSTRATION RELATED TO THE HIGHLY FLAMMABLE AND HAZARDOUS MATERIALS AND COMPONENTS.
FIGURE Wheel/Brake Overheat - Wheel Safety Area	R	REVISED ILLUSTRATION RELATED TO THE WHEEL SAFETY AREA.
FIGURE Emergency Evacuation Devices	R	REVISED ILLUSTRATION RELATED TO THE EMERGENCY EVACUATION DEVICES.
FIGURE Sliding Windows Evacuation	N	ADDED ILLUSTRATION RELATED TO THE SLIDING WINDOWS EVACUATION. ILLUSTRATION ADDED
FIGURE Belly-Door Exterior Control-Handle	R	REVISED ILLUSTRATION RELATED TO THE BELLY-DOOR EXTERIOR CONTROL-HANDLE.
FIGURE Belly-Door Interior Control-Handle	N	ADDED ILLUSTRATION RELATED TO THE BELLY-DOOR INTERIOR CONTROL-HANDLE. ILLUSTRATION ADDED
FIGURE Pressure Bulkhead Door	N	ADDED ILLUSTRATION RELATED TO THE PRESSURE BULKHEAD DOOR. ILLUSTRATION ADDED
FIGURE Main-Deck Access Door	R	REVISED ILLUSTRATION RELATED TO THE MAIN-DECK ACCESS DOOR.

LOCATIONS	CHG CODE	DESCRIPTIONS OF CHANGE
FIGURE Main-Deck Cargo Door-Control	R	REVISED ILLUSTRATION RELATED TO THE MAIN-DECK CARGO DOOR-CONTROL.
FIGURE Control Panels	R	REVISED ILLUSTRATION RELATED TO THE CONTROL PANELS.
FIGURE APU Air Intake	N	ADDED ILLUSTRATION RELATED TO THE APU AIR INTAKE. ILLUSTRATION ADDED
FIGURE Structural Break-in Points	R	REVISED ILLUSTRATION RELATED TO THE STRUCTURAL BREAK-IN POINTS.

LIST OF EFFECTIVE CONTENT

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SCOPE

1-1-0 Purpose

**ON A/C A330-700L

Introduction

1. The A330-700L AIRCRAFT CHARACTERISTICS - AIRPORT AND MAINTENANCE PLANNING (AC) manual is issued for the A330-700L to give necessary data to airport operators, airlines and Maintenance/Repair Organizations (MRO) for airport and maintenance facilities planning.
   The A330-700L is designed to replace the existing A300-600ST known as Beluga, to modernize and improve Airbus aircraft parts transportation. The A330-700L will offer a large volume in its main deck cargo compartment, which can carry a pair of A350 wings.
   Correspondence concerning this publication should be directed to:
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   FRANCE

1-2-1 Glossary

**ON A/C A330-700L

Glossary

1. List of Abbreviations

A/C	Aircraft
AC	Aircraft Characteristics manual
ACN	Aircraft Classification Number
AMM	Aircraft Maintenance Manual
APU	Auxiliary Power Unit
C/L	Center Line
CBR	California Bearing Ratio
CC	Cargo Compartment
CG	Center of Gravity
CKPT	Cockpit
E	Young's Modulus
ELEC	Electric, Electrical, Electricity
ESWL	Equivalent Single Wheel Load
FAA	Federal Aviation Administration
FDL	Fuselage Datum Line
FR	Frame
FSTE	Full Size Trolley Equivalent
FWD	Forward
GPU	Ground Power Unit
GSE	Ground Support Equipment
HYD	Hydraulic
ICAO	International Civil Aviation Organisation
IDG	Integrated Drive Generator
ISA	International Standard Atmosphere
L	Radius of relative stiffness
LCN	Load Classification Number
LD	Load Device
LD	Lower Deck
LDG	Landing Gear
LH	Left Hand
LMLG	Left Main Landing Gear
MAC	Mean Aerodynamic Chord
MAX	Maximum

MD	Main Deck
MDCC	Main Deck Cargo Compartment
MIN	Minimum
MLG	Main Landing Gear
NLG	Nose Landing Gear
OAT	Outside Air Temperature
PCA	Portland Cement Association
PCN	Pavement Classification Number
RH	Right Hand
RMLG	Right Main Landing Gear
ULD	Unit Load Device
WV	Weight Variant

2. Design Weight Terminology
   - Maximum Design Ramp Weight (MRW):
     Maximum weight for ground maneuver (including weight of taxi and run-up fuel) as limited by aircraft strength and airworthiness requirements. It is also called Maximum Design Taxi Weight (MTW).
   - Maximum Design Landing Weight (MLW):
     Maximum weight for landing as limited by aircraft strength and airworthiness requirements.
   - Maximum Design Take-Off Weight (MTOW):
     Maximum weight for take-off as limited by aircraft strength and airworthiness requirements. (This is the maximum weight at start of the take-off run).
   - Maximum Design Zero Fuel Weight (MZFW):
     Maximum permissible weight of the aircraft without usable fuel.
   - Usable Volume:
     Usable volume available for cargo, pressurized fuselage, passenger compartment and cockpit.
   - Water Volume:
     Maximum volume of cargo compartment.
   - Usable Fuel:
     Fuel available for aircraft propulsion.

AIRCRAFT DESCRIPTION

2-1-1 General Aircraft Characteristics Data

****ON A/C A330-700L**

General Aircraft Characteristics Data

1. The following table gives characteristics of A330-700L model, these data are specific to each weight variant:

Aircraft Characteristics		
	WV000	WV001
Maximum Ramp Weight (MRW)	227 900 kg (502 433 lb)	205 900 kg (453 932 lb)
Maximum Take-Off Weight (MTOW)	227 000 kg (500 449 lb)	205 000 kg (451 948 lb)
Maximum Landing Weight (MLW)	187 000 kg (412 264 lb)	187 000 kg (412 264 lb)
Maximum Zero Fuel Weight (MZFW)	178 000 kg (392 423 lb)	178 000 kg (392 423 lb)
Estimated Maximum Payload	50 500 kg (111 333 lb)	50 500 kg (111 333 lb)
Operating Weight Empty (OWE)	127 500 kg (281 089 lb)	127 500 kg (281 089 lb)

2. The following table gives characteristics of A330-700L model, these data are common to each weight variant:

Aircraft Characteristics	
Seats in courier area	4
Usable Fuel Capacity (density = 0.785 kg/l)	73 000 kg (160 937 lb)
Pressurized Fuselage Volume	87.4 m^3 (3087 ft^3)
Cockpit Volume	5.75 m^3 (203 ft^3)
Main-Deck Cargo-Compartment Water Volume	2 209 m^3 (78 010 ft^3)
Usable Volume, AFT CC	60.7 m^3 (2 144 ft^3)
Usable Volume, Bulk CC	19.7 m^3 (696 ft^3)

Aircraft Characteristics	
Water Volume, AFT CC	85.7 m^3 (3 026 ft^3)
Water Volume, Bulk CC	22.7 m^3 (802 ft^3)

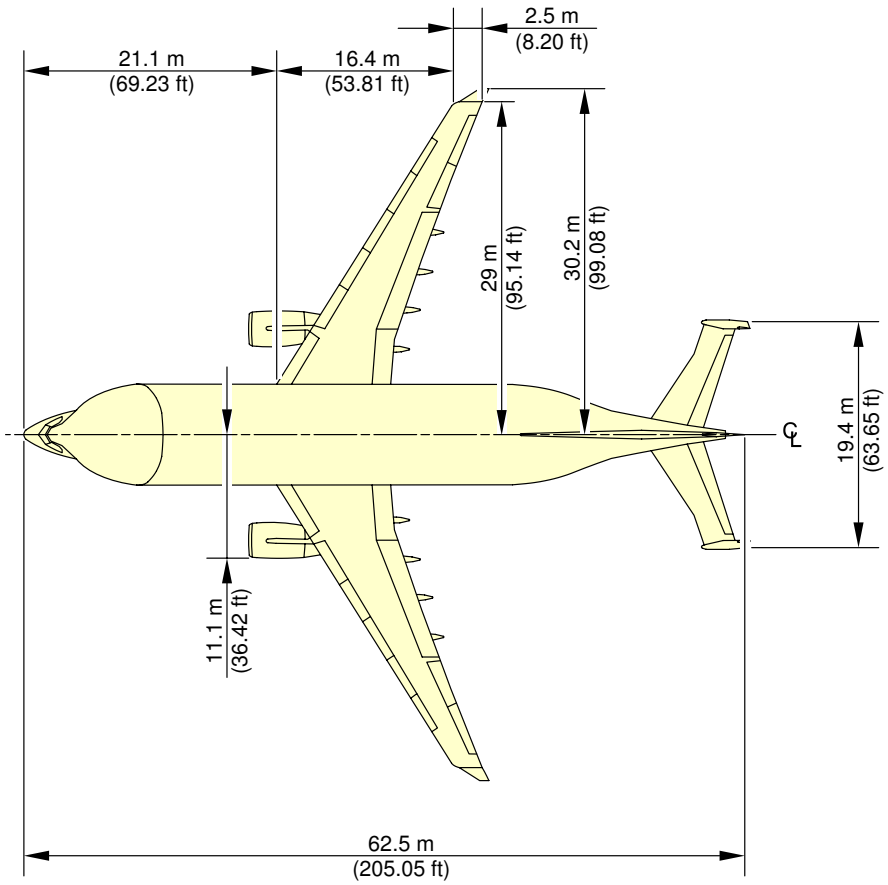
2-2-0 General Aircraft Dimensions

**ON A/C A330-700L

General Aircraft Dimensions

1. This section gives general aircraft dimensions.

**ON A/C A330-700L



NOTE:
RELATED TO AIRCRAFT ATTITUDE AND WEIGHT.

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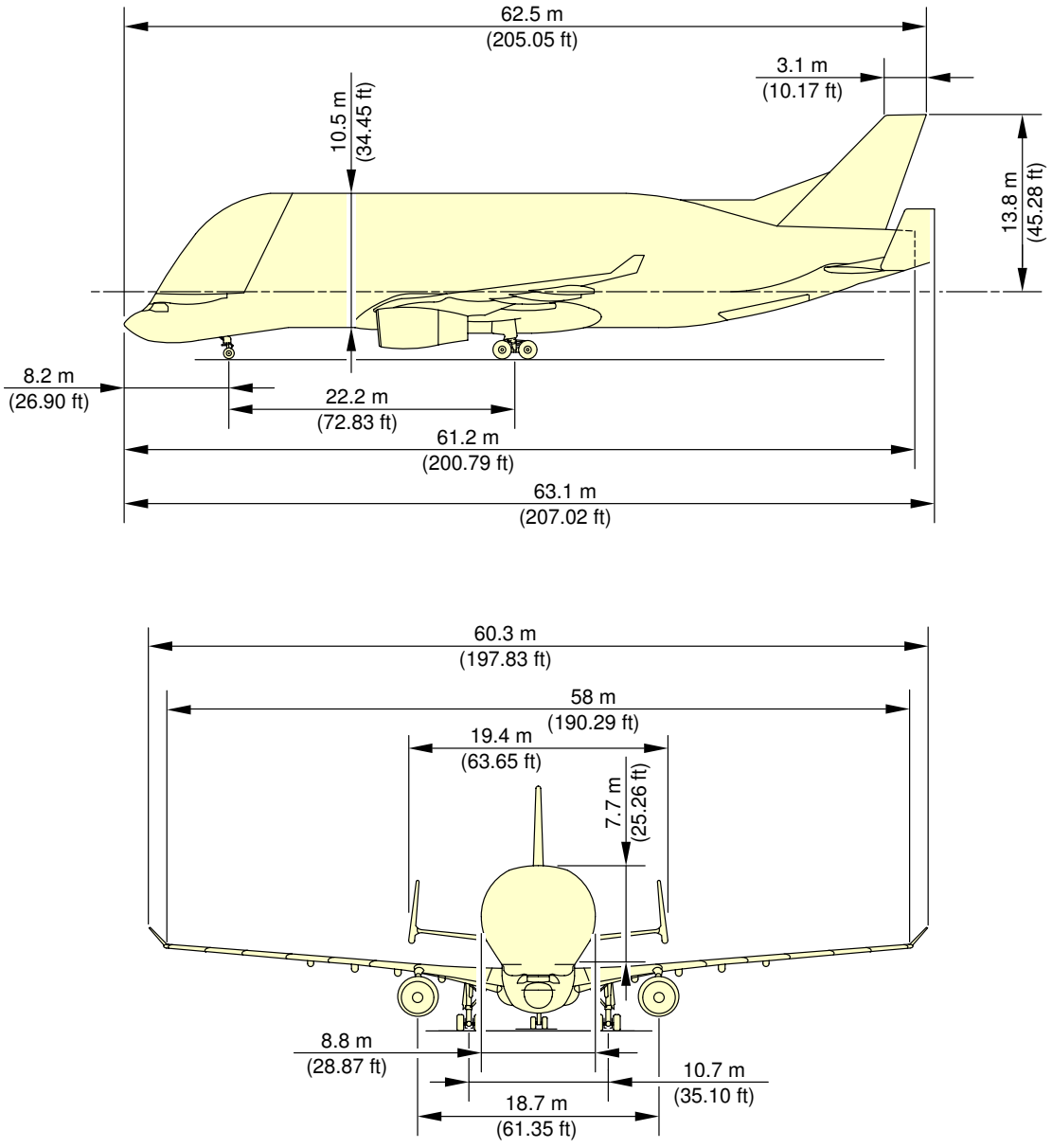
General Aircraft Dimensions
(Sheet 1 of 2)
FIGURE-2-2-0-991-013-A01

**ON A/C A330-700L



NOTE:
RELATED TO AIRCRAFT ATTITUDE AND WEIGHT.

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General Aircraft Dimensions
(Sheet 2 of 2)
FIGURE-2-2-0-991-013-A01

2-3-0 Ground Clearances

****ON A/C A330-700L**

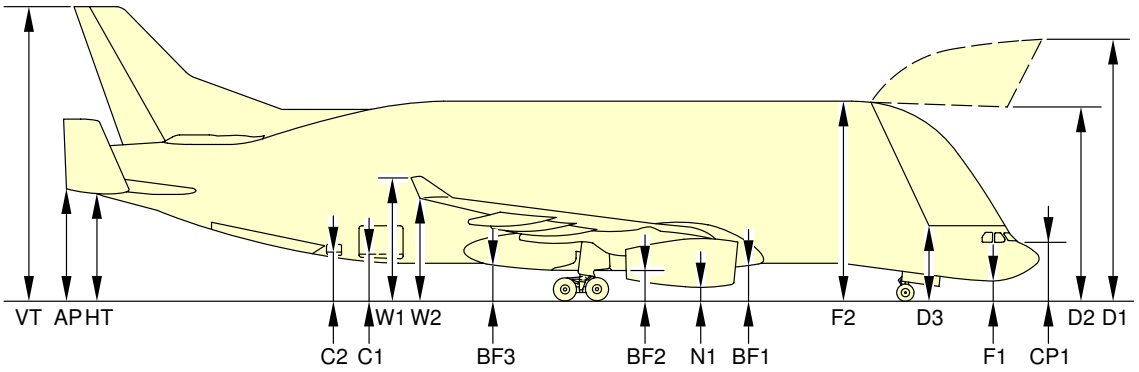
Ground Clearances

1. This section gives the height of various points of the aircraft, above the ground, for different aircraft configurations.
   Dimensions in the tables can change with tire type, weight and balance and other special conditions.

   NOTE : Tire pressure and shock absorbers are fixed in the standard condition.
   The dimensions are given for the weight variant WV000:
   - A light weight 135 000 kg (297 624 lb), with a FWD CG and an AFT CG,
   - An aircraft at MRW 227 000 kg (500 449 lb) with a FWD CG and an AFT CG,
   - A minimum weight at Operating Weight Empty (OWE) 127 500 kg (281 089 lb) with aligned CG,
   - Aircraft on jacks, FDL at 6.515 m (21.37 ft).

   NOTE : Cargo door ground clearances are measured from the floor level.

**ON A/C A330-700L



A/C CONFIGURATION FOR WV000		MRW 227 000 kg (500 450 lb)				135 000 kg (297 625 lb)			
		FWD CG (20.5%)		AFT CG (28%)		FWD CG (18%)		AFT CG (25%)	
		m	ft	m	ft	m	ft	m	ft
FUSELAGE	F2	12.90	42.32	12.94	42.45	13.02	42.72	13.06	42.85
	F1	1.20	3.94	1.27	4.17	1.28	4.20	1.35	4.43
	D1	17.10	56.10	17.18	56.36	17.18	56.36	17.25	56.59
	D2	12.28	40.29	12.35	40.52	12.37	40.58	12.43	40.78
	D3	5.01	16.44	5.09	16.70	5.09	16.70	5.16	16.93
	CP1	3.69	12.11	3.76	12.34	3.77	12.37	3.84	12.60
	BF1	1.94	6.36	1.95	6.40	2.11	6.92	2.12	6.96
	BF2	1.93	6.33	1.93	6.33	2.11	6.92	2.11	6.92
	BF3	1.95	6.40	1.94	6.36	2.15	7.05	2.14	7.02
	HT	6.84	22.44	6.74	22.11	7.16	23.49	7.06	23.16
	AP	7.39	24.25	7.28	23.88	7.71	25.30	7.60	24.93
	VT	18.89	61.98	18.79	61.65	19.21	63.02	19.10	62.66
DOORS	C1	3.07	10.07	3.03	9.94	3.31	10.86	3.27	10.73
	C2	3.10	10.17	3.05	10.01	3.36	11.02	3.30	10.83
WINGS	W1	7.94	26.05	7.91	25.95	8.18	26.84	8.14	26.71
	W2	6.58	21.59	6.54	21.46	6.81	22.34	6.77	22.21
ENGINE	N1	0.88	2.89	0.89	2.92	1.04	3.41	1.05	3.44

NOTE:
CARGO DOOR GROUND CLEARANCES ARE MEASURED FROM FLOOR LEVEL.

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Ground Clearances
Ground Clearances for WV000 at MRW and 135 000 kg (297 624 lb) (Sheet 1 of 2)
FIGURE-2-3-0-991-045-A01

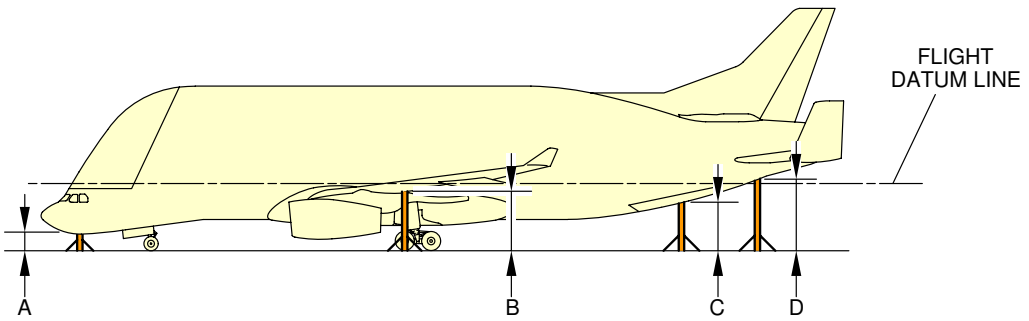
**ON A/C A330-700L

OWE 127 500 kg (281 089 lb)			
A/C CONFIGURATION		CG (23.5%)	
		m	ft
FUSELAGE	F2	13.04	42.78
	F1	1.67	5.48
	D1	17.24	56.56
	D2	12.43	40.78
	D3	8.05	26.41
	CP1	8.83	28.97
	BF1	2.29	7.51
	BF2	2.13	6.99
	BF3	2.17	7.12
	HT	7.14	23.43
	AP	7.66	25.13
	VT	19.86	65.16
DOORS	C1	3.27	10.73
	C2	3.31	10.86
WINGS	W1	8.19	26.87
	W2	6.84	22.44
ENGINE	N1	1.06	3.48

NOTE:
CARGO DOOR GROUND CLEARANCES ARE MEASURED FROM FLOOR LEVEL. F_AC_020300_1_0450102_01_00

Ground Clearances
Ground Clearances for WV000 at 127 500 kg (281 089 lbs) (Sheet 2 of 2)
FIGURE-2-3-0-991-045-A01

**ON A/C A330-700L



	HEIGHT IN m (ft)			
	A	B	C	D
AIRCRAFT ON JACKS, FUSELAGE DATUM REFERENCE PARALLEL TO GROUND AT 6.515 m (21.37 ft) FOR LANDING GEARS EXTENSION/RETRACTION	2.63 (8.63)	5.72 (18.77)	4.98 (16.34)	6.37 (20.90)
AIRCRAFT ON JACKS, FUSELAGE DATUM REFERENCE PARALLEL TO GROUND AT 7.200 m (23.62 ft) FOR LANDING GEARS REMOVAL/INSTALLATION	3.32 (10.89)	6.41 (21.03)	5.67 (18.60)	7.06 (23.16)

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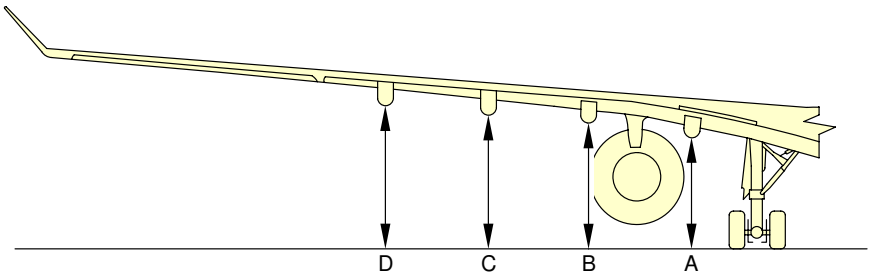
Ground Clearances
Ground Clearances for Aircraft on Jacks
FIGURE-2-3-0-991-046-A01

**ON A/C A330-700L



FLAP TRACKS RETRACTED						
AIRCRAFT TYPE	DESCRIPTION		MRW CG 20.5%		MRW CG 28%	
			m	ft	m	ft
A330–700L	FLAP TRACK 2	A	3.75	12.30	3.74	12.27
	FLAP TRACK 3	B	4.26	13.98	4.25	13.94
	FLAP TRACK 4	C	4.51	14.80	4.49	14.73
	FLAP TRACK 5	D	4.88	16.01	4.85	15.91

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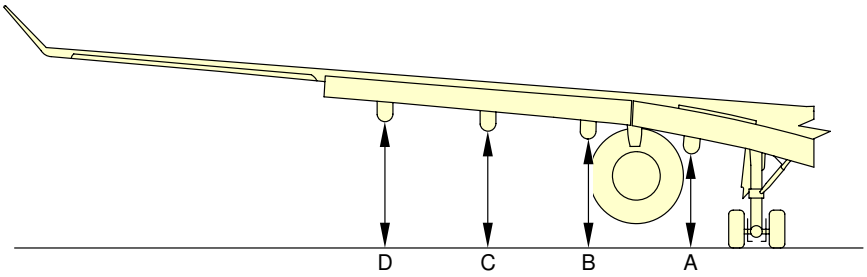
Ground Clearances
Ground Clearances for Flaps Retracted with WV000
FIGURE-2-3-0-991-047-A01

**ON A/C A330-700L



FLAP TRACKS 1+F						
AIRCRAFT TYPE	DESCRIPTION		MRW CG 20.5%		MRW CG 28%	
			m	ft	m	ft
A330–700L	FLAP TRACK 2	A	3.48	11.42	3.37	11.06
	FLAP TRACK 3	B	3.99	13.09	3.88	12.73
	FLAP TRACK 4	C	4.24	13.91	4.12	13.52
	FLAP TRACK 5	D	4.61	15.12	4.48	14.70

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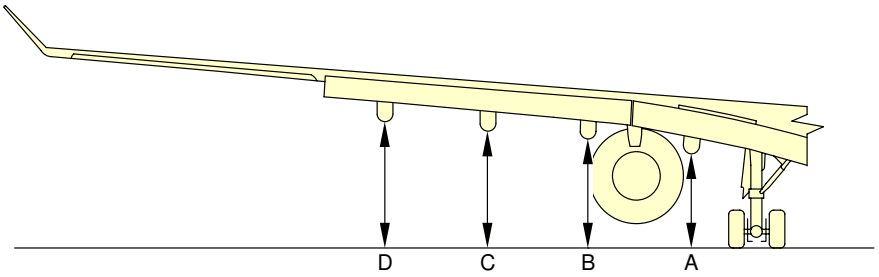
Ground Clearances
Ground Clearances for Flaps in Intermediate Position with WV000
FIGURE-2-3-0-991-048-A01

**ON A/C A330-700L



FLAP TRACKS EXTENDED						
AIRCRAFT TYPE	DESCRIPTION		MRW CG 20.5%		MRW CG 28%	
			m	ft	m	ft
A330–700L	FLAP TRACK 2	A	2.82	9.25	2.81	9.22
	FLAP TRACK 3	B	3.33	10.93	3.32	10.89
	FLAP TRACK 4	C	3.58	11.75	3.56	11.68
	FLAP TRACK 5	D	3.95	12.96	3.92	12.86

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Ground Clearances
Ground Clearances for Flaps Fully Extended with WV000
FIGURE-2-3-0-991-049-A01

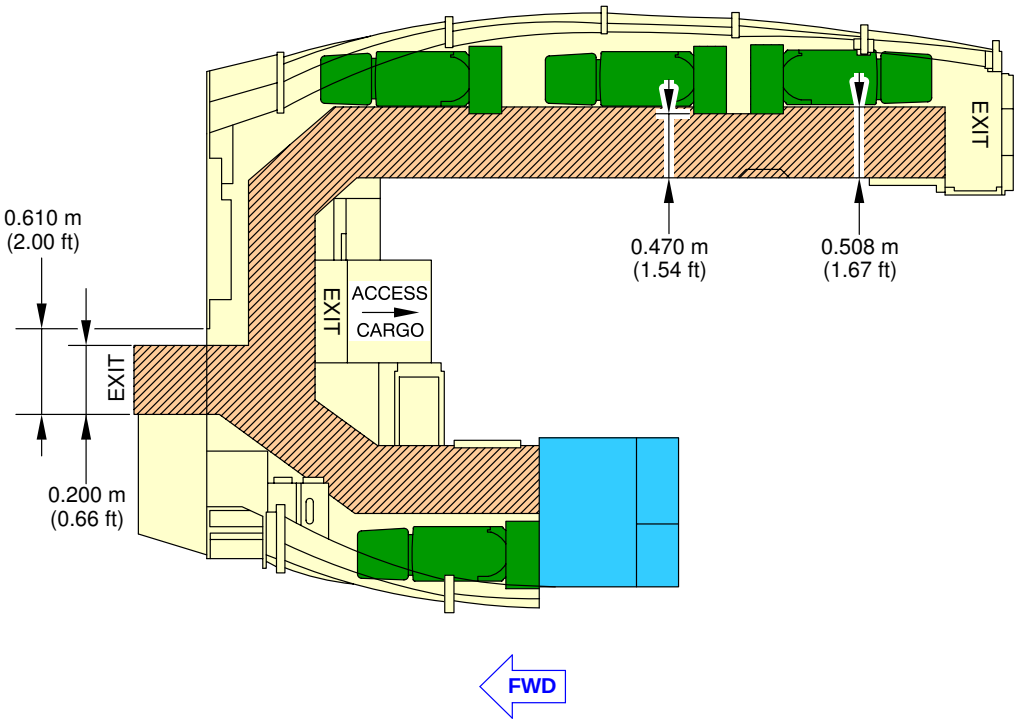
2-4-1 Interior Arrangements - Plan View

**ON A/C A330-700L

Interior Arrangements - Plan View

1. This section gives the interior configuration of courier area showing the width of passway.

**ON A/C A330-700L



NOTE:

SEAT

LAVATORY

COURIER AREA

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Interior Arrangements - Plan View
FIGURE-2-4-1-991-010-A01

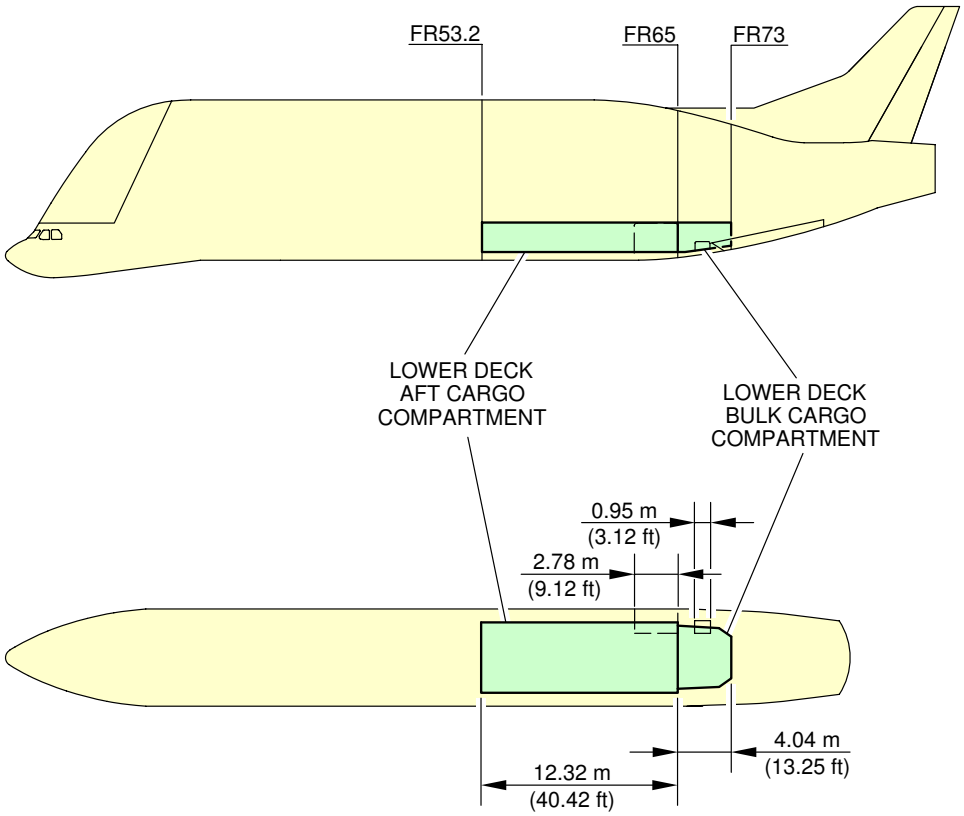
2-6-1 Lower Deck Cargo Compartments

**ON A/C A330-700L

Lower Deck Cargo Compartments

1. This section gives the following data about lower deck cargo compartments:
   - Location and dimensions
   - Loading combinations.

**ON A/C A330-700L



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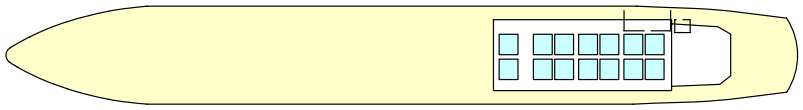
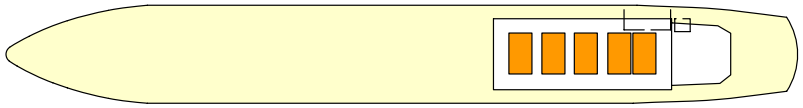
Lower Deck Cargo Compartments
Location and Dimensions (Sheet 1 of 2)
FIGURE-2-6-1-991-013-A01

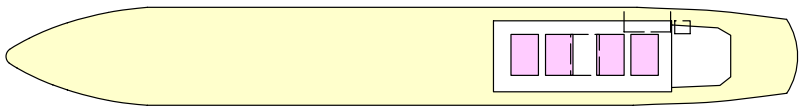
**ON A/C A330-700L



14 LD3 60.4 in X 61.5 in



5 PALLETS 88 in X 125 in



4 PALLETS 96 in X 125 in

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Lower Deck Cargo Compartments
Loading Combinations (Sheet 2 of 2)
FIGURE-2-6-1-991-013-A01

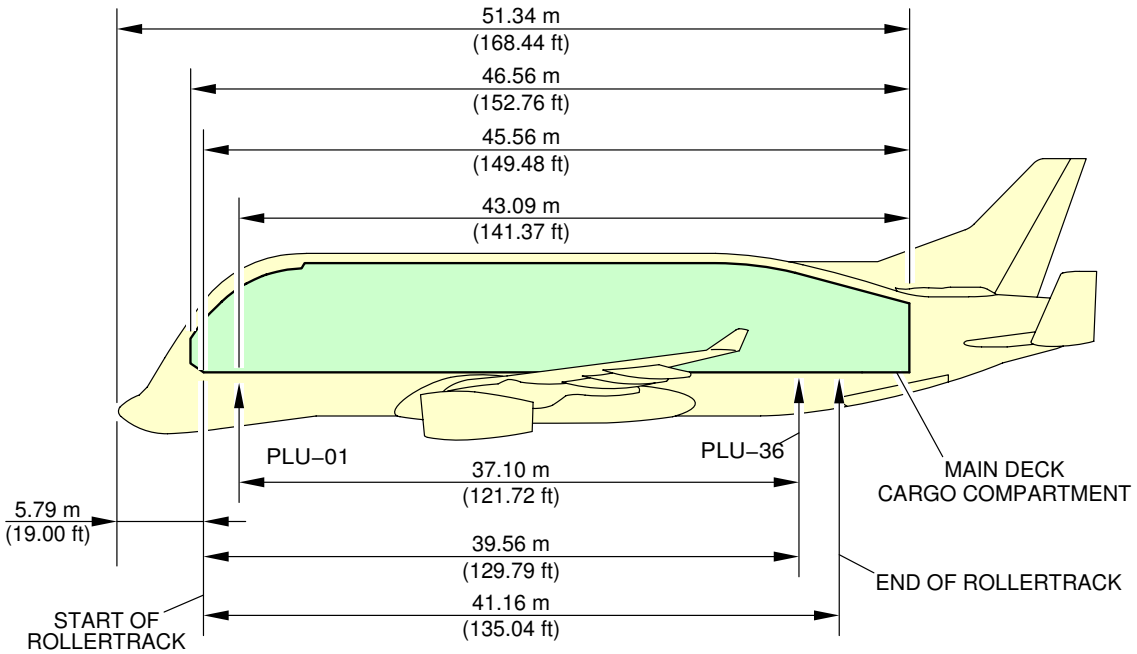
2-6-2 Main Deck Cargo Compartments

**ON A/C A330-700L

Main Deck Cargo Compartment

1. This section gives the following data about the main-deck cargo compartment:
   - Location and dimensions.

**ON A/C A330-700L



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Main-Deck Cargo Compartment
Location and Dimensions
FIGURE-2-6-2-991-007-A01

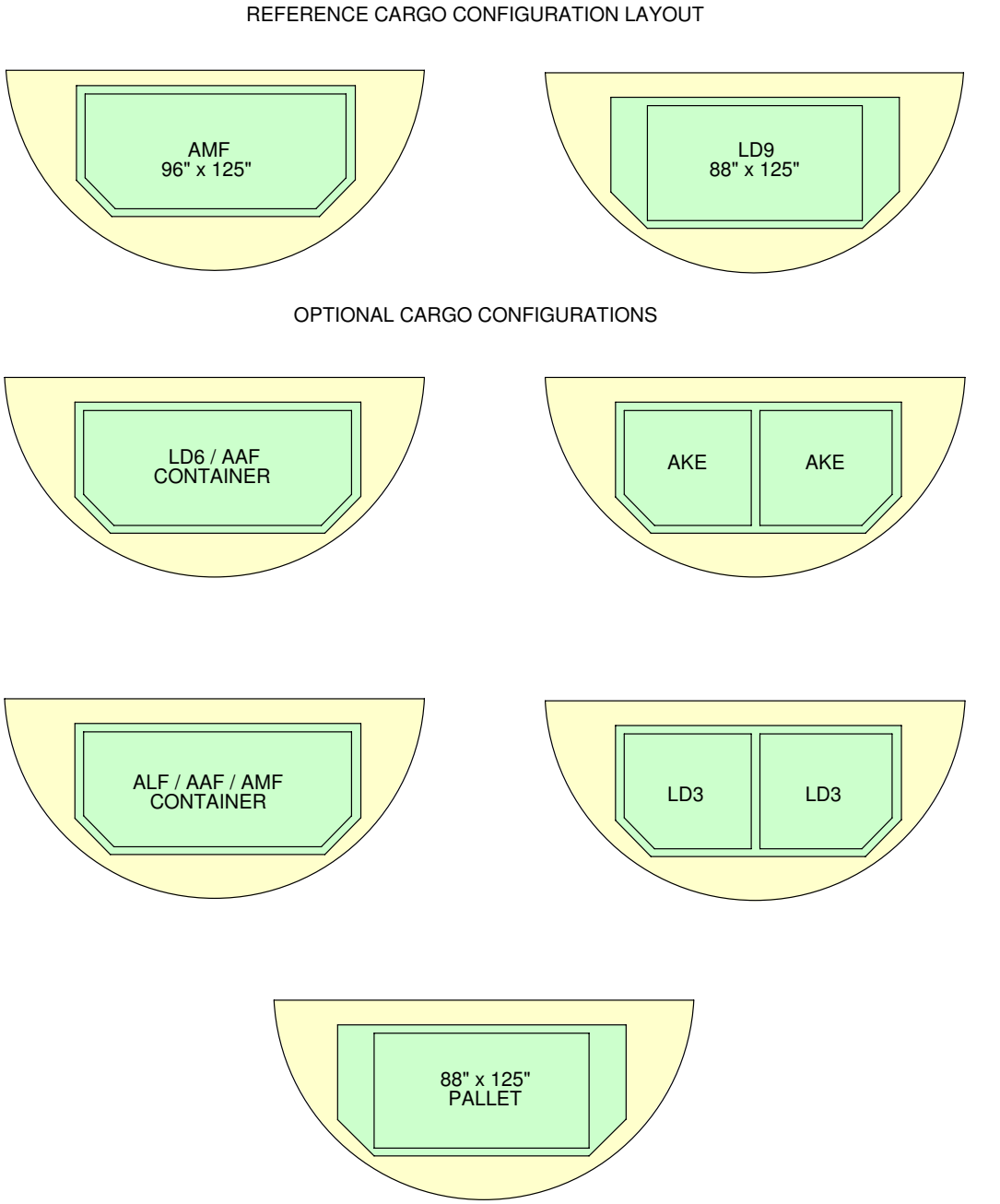
2-6-3 Main and Lower Deck Cross-sections

**ON A/C A330-700L

Main and Lower Deck Cross-sections

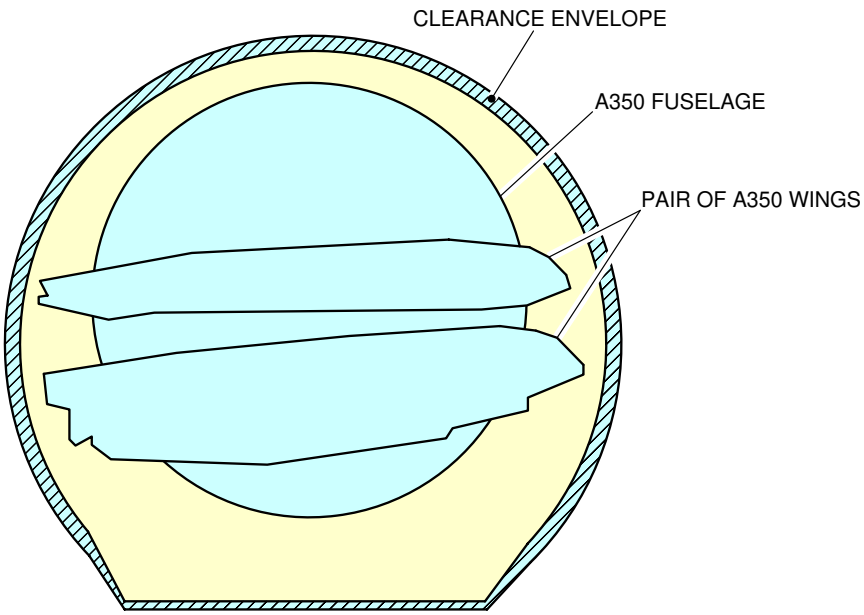
1. This section gives main and lower deck cross-sections for cargo version.

**ON A/C A330-700L



Lower-Deck Cargo Cross-sections
FIGURE-2-6-3-991-002-A01

**ON A/C A330-700L



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Main-Deck-Cargo Arrangement Cross-sections
FIGURE-2-6-3-991-003-A01

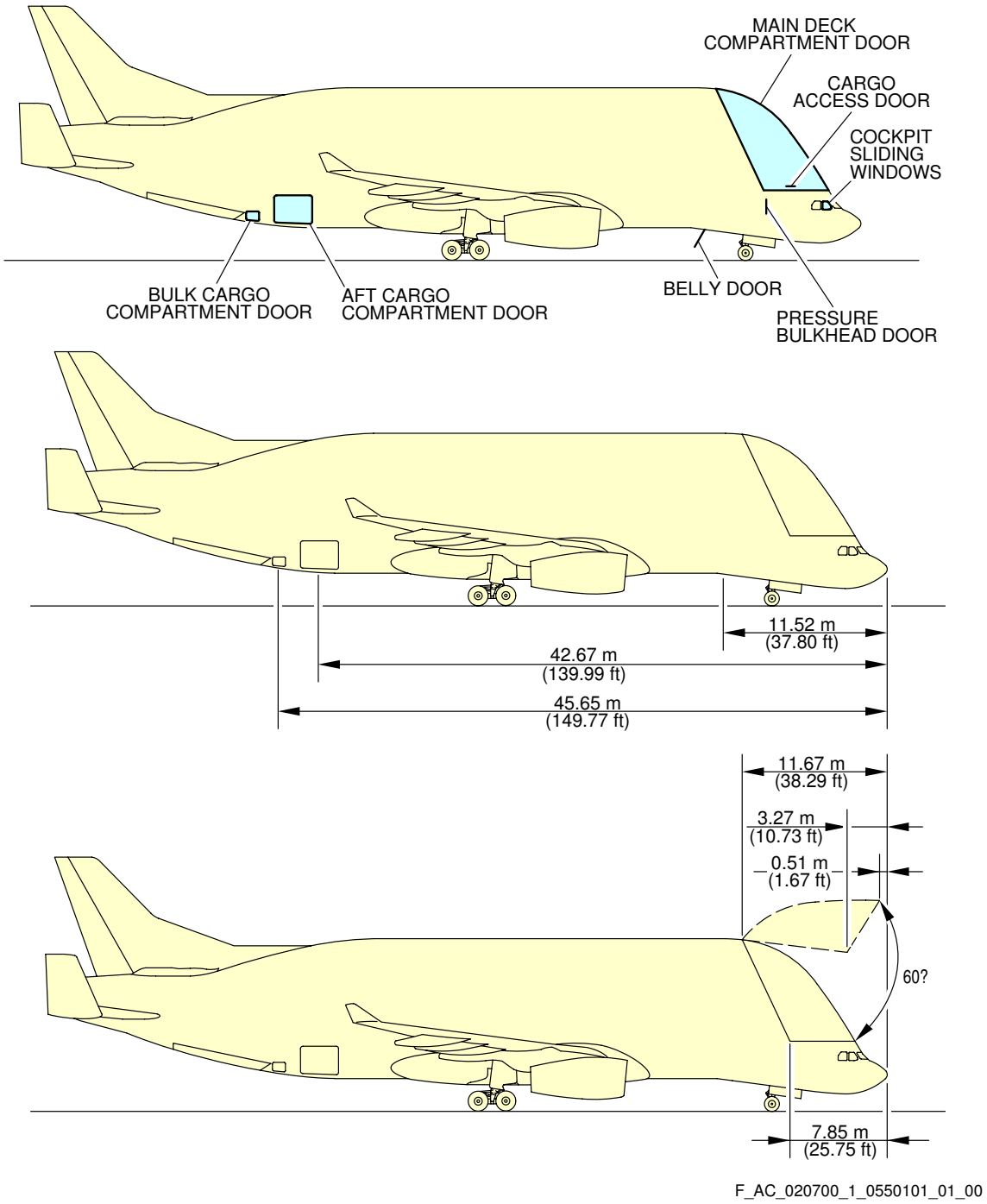
2-7-0 Door Clearances

**ON A/C A330-700L

Door Clearances

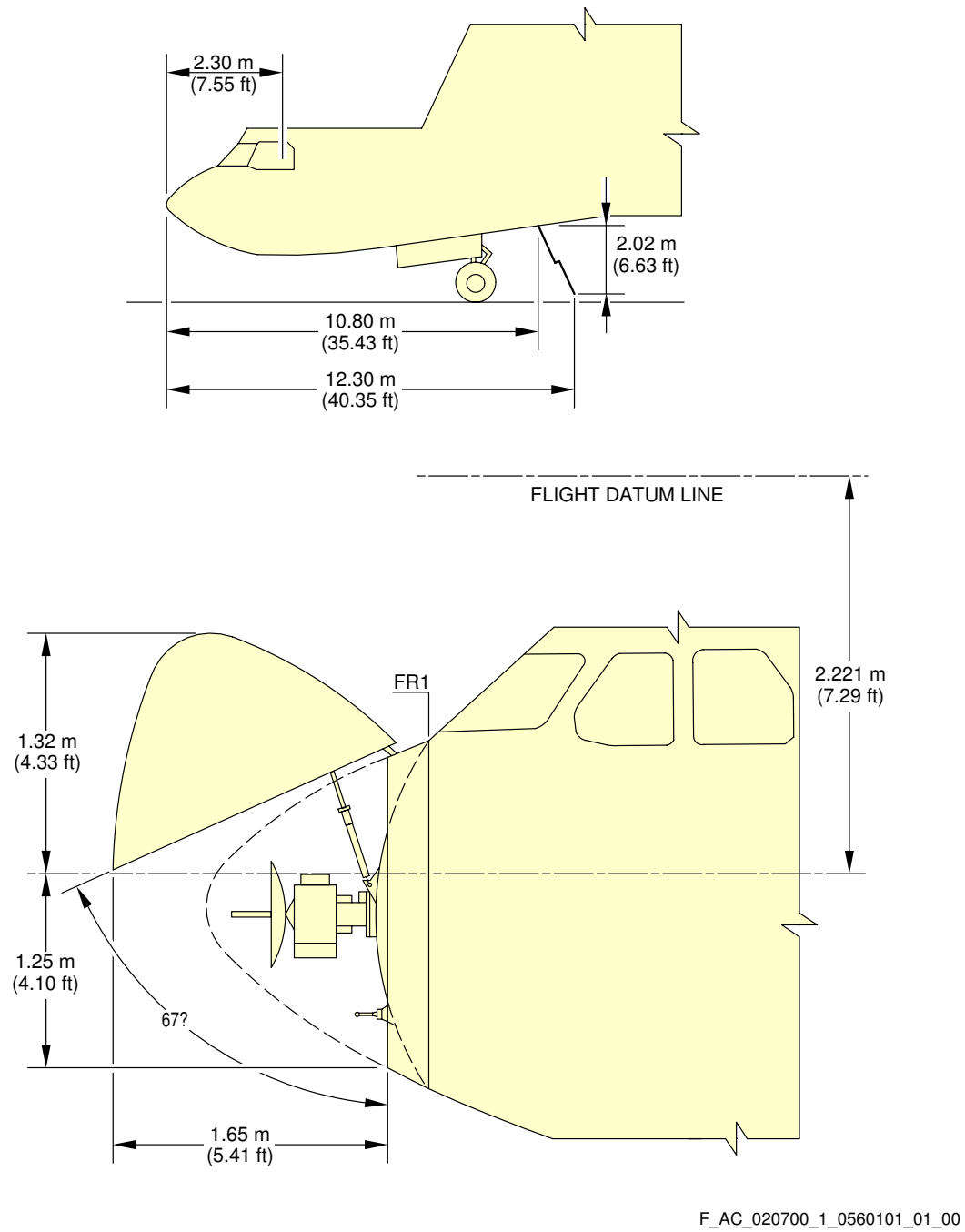
1. This section gives door location, identification and clearances.

**ON A/C A330-700L



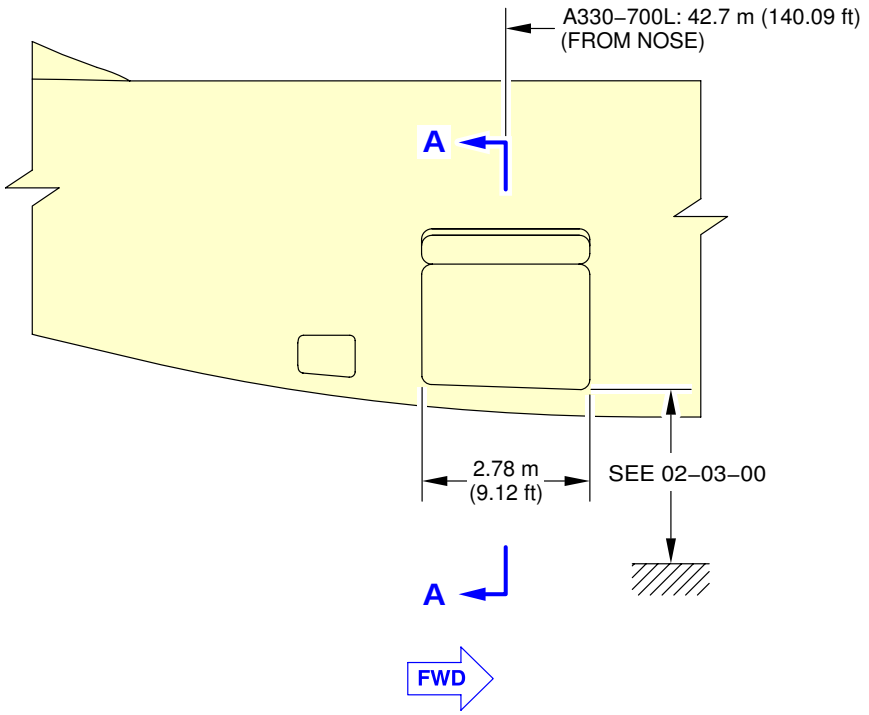
Lateral Position of Doors from Aircraft Nose
FIGURE-2-7-0-991-055-A01

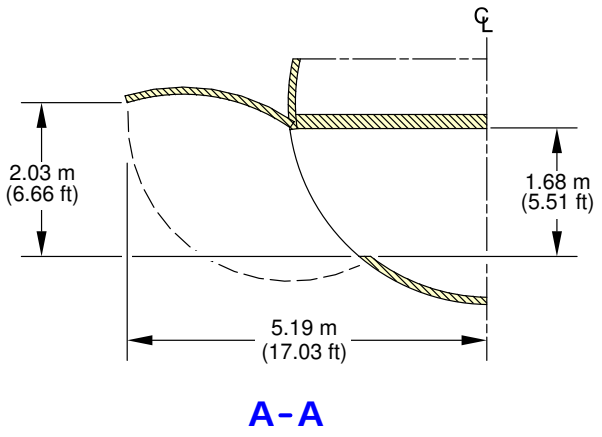
**ON A/C A330-700L



Radome
FIGURE-2-7-0-991-056-A01

**ON A/C A330-700L





A-A

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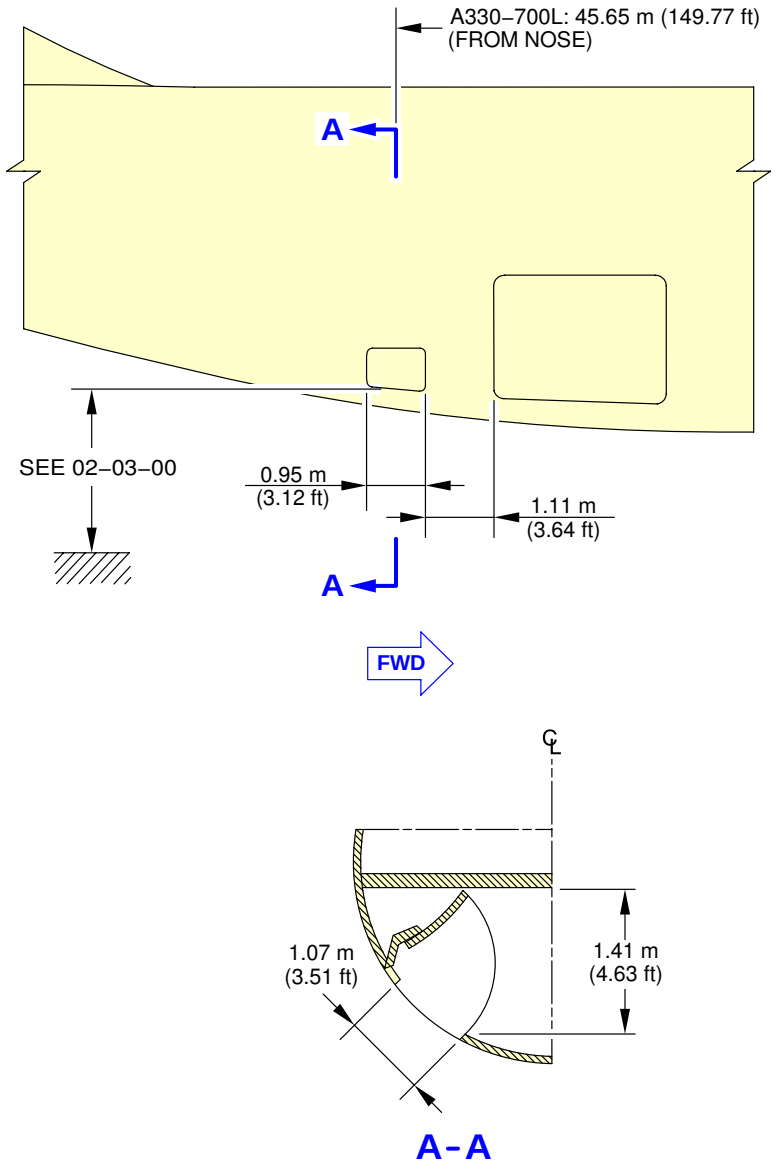
Aft Cargo-Compartment Door
FIGURE-2-7-0-991-057-A01

**ON A/C A330-700L



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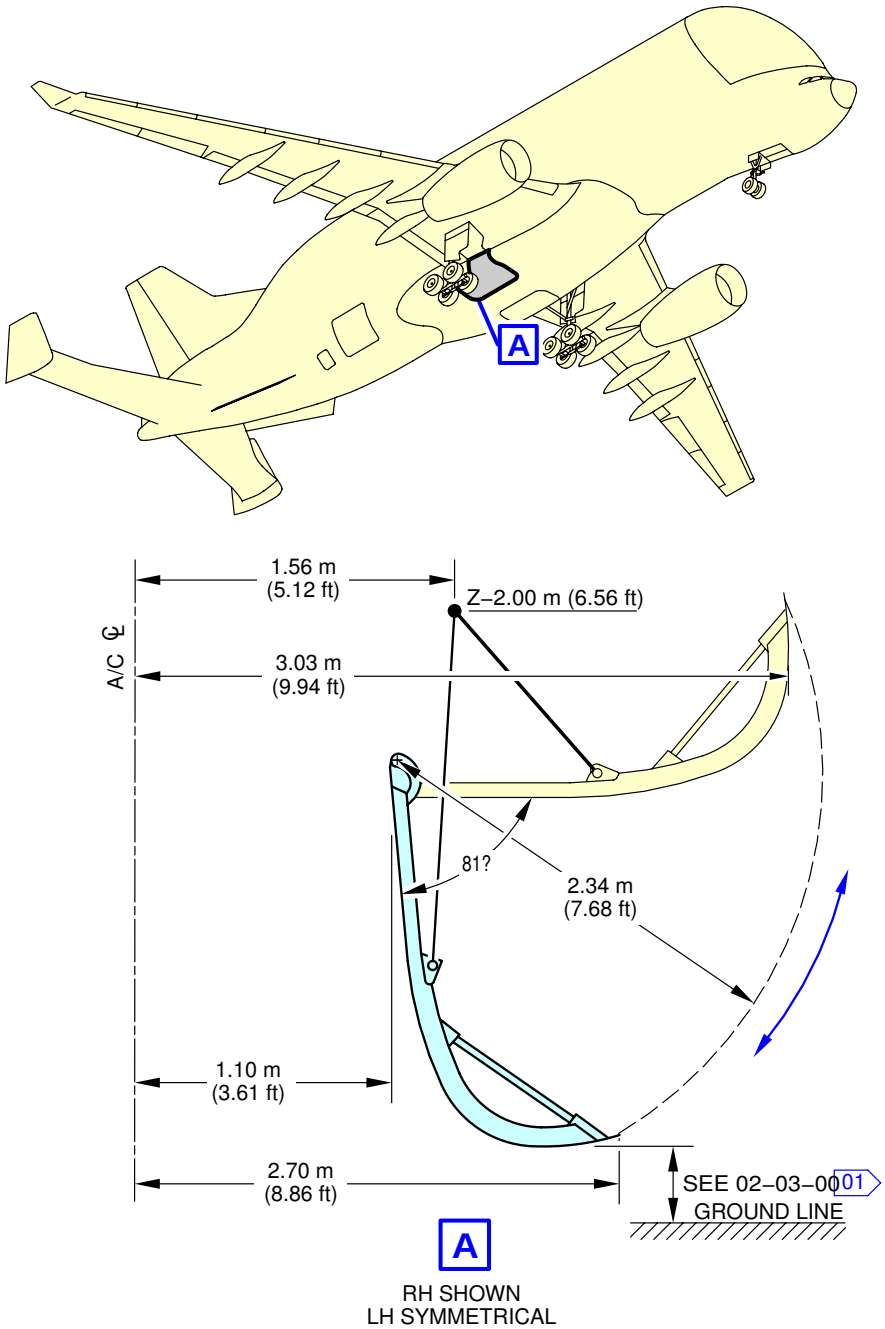
Bulk Cargo-Compartment Door
FIGURE-2-7-0-991-058-A01

**ON A/C A330-700L



NOTE:

01 DEPENDING ON CG POSITION AND AIRCRAFT WEIGHT.

F_AC_020700_1_0590101_01_00

MLG Doors
FIGURE-2-7-0-991-059-A01

2-9-0 Landing Gear

**ON A/C A330-700L

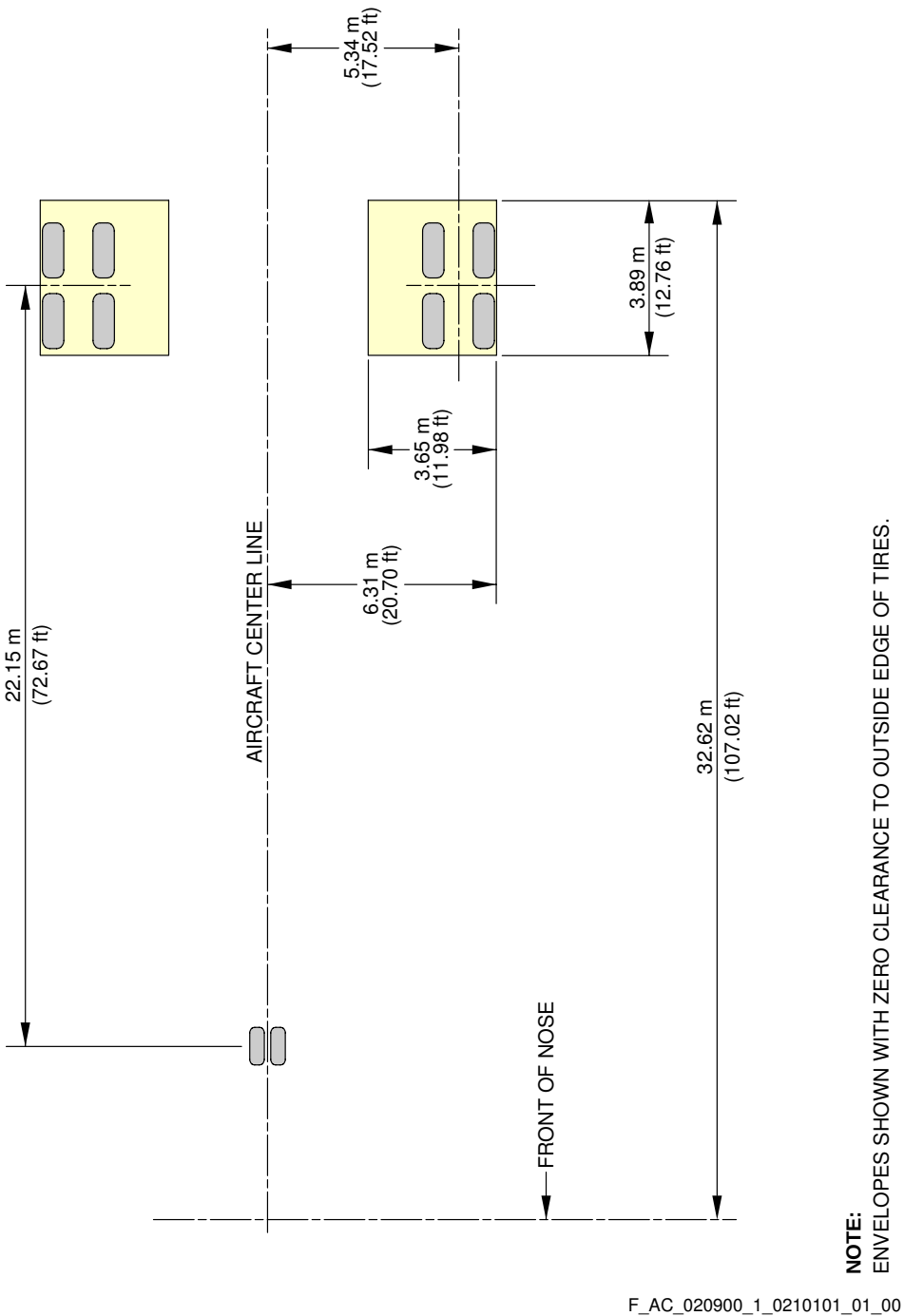
Landing Gear

1. General
   All dimensions shown are minimum dimensions with zero clearances.
   Dimensions for elevators and related mechanisms must be added to the following figures.

   A. Elevators
      These can be either mechanical or hydraulic. Elevators are used to:
      - Let easy movement of persons and equipment around the main landing gears
      - Lift and remove the landing gear assemblies out of the pits.

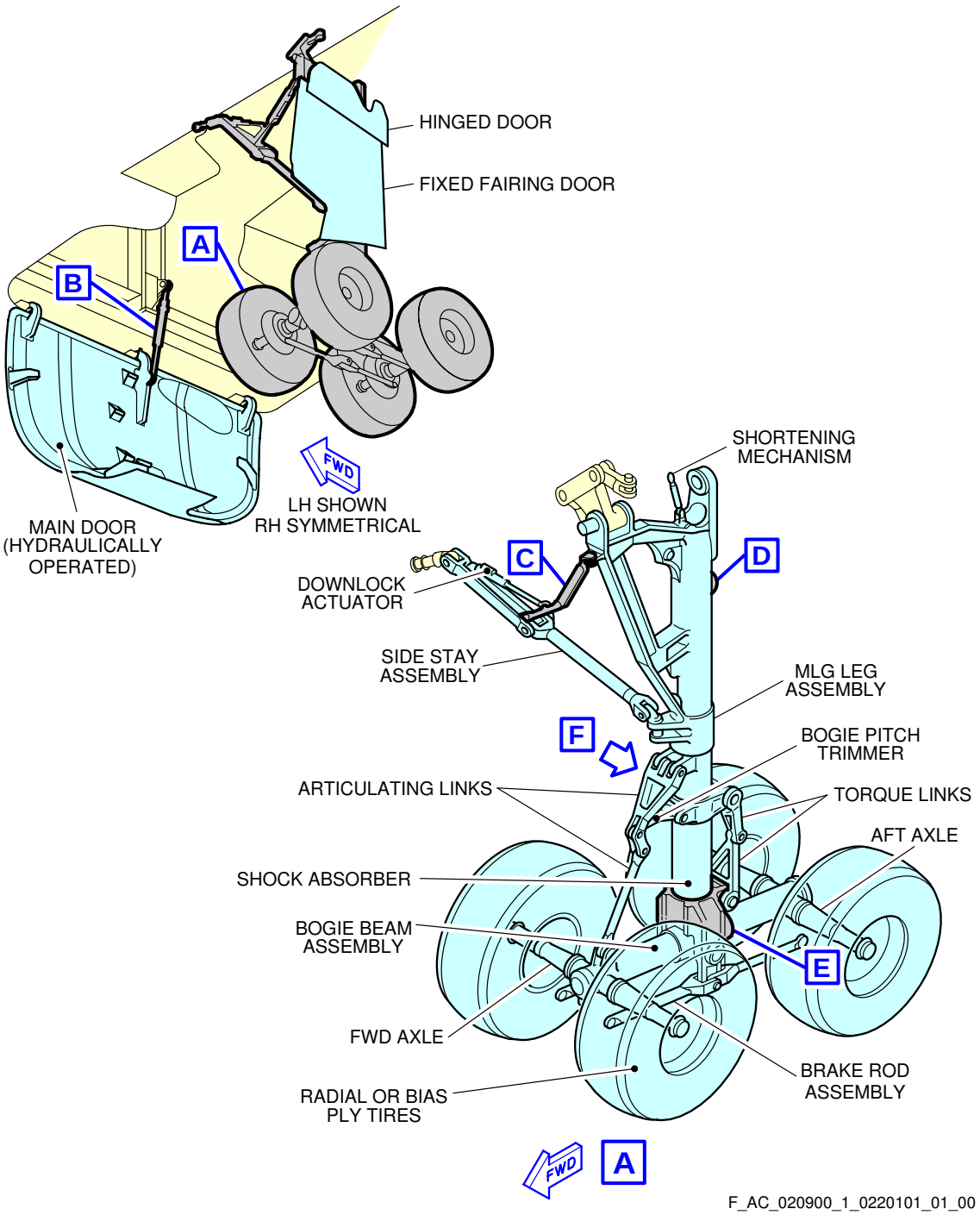
   B. Jacking
      The aircraft must be in position over the pits to put the gear on the elevators. Jacks must be installed and engaged with all the jacking points (Ref. Section 2-14 for Jacking).
      Jacks must support the total aircraft weight i.e. when the landing gears do not touch the elevators on retraction/extension tests.
      When tripod support jacks are used, the tripod-base circle radius must be small because the locations required for positioning the jacks are close to the sides of the pits.

**ON A/C A330-700L



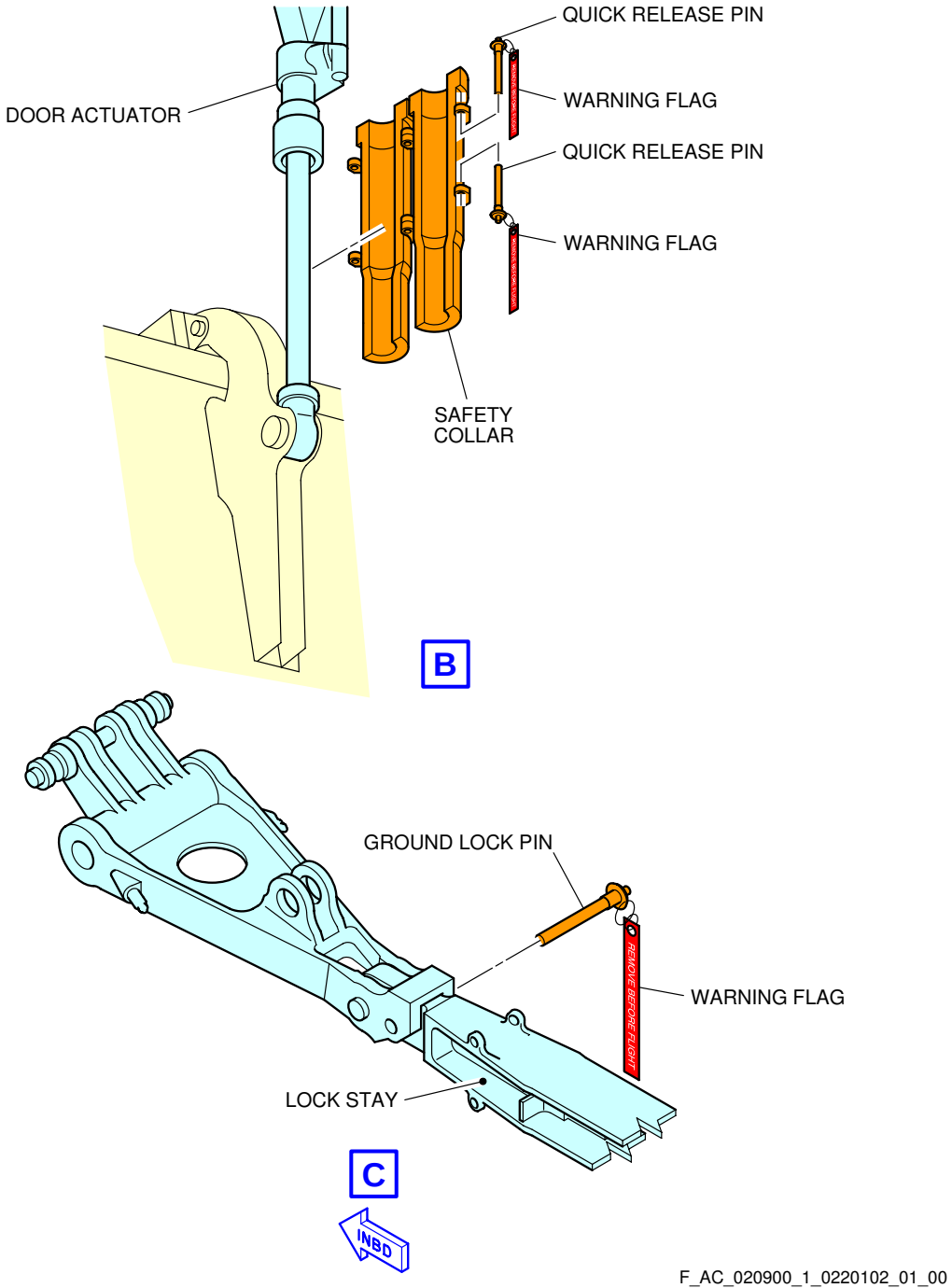
Landing Gear Position
FIGURE-2-9-0-991-021-A01

**ON A/C A330-700L



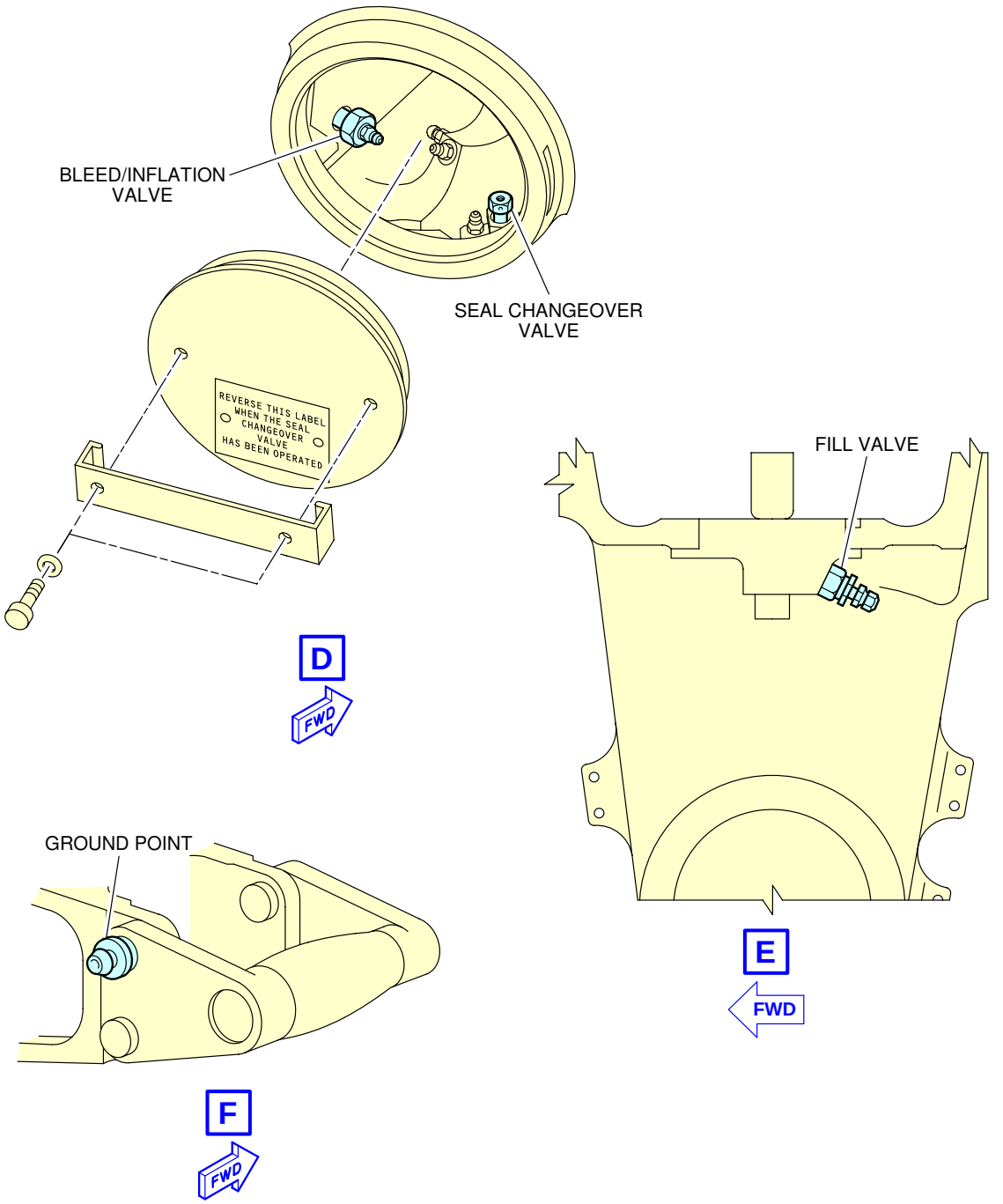
Main Landing Gear
(Sheet 1 of 3)
FIGURE-2-9-0-991-022-A01

**ON A/C A330-700L



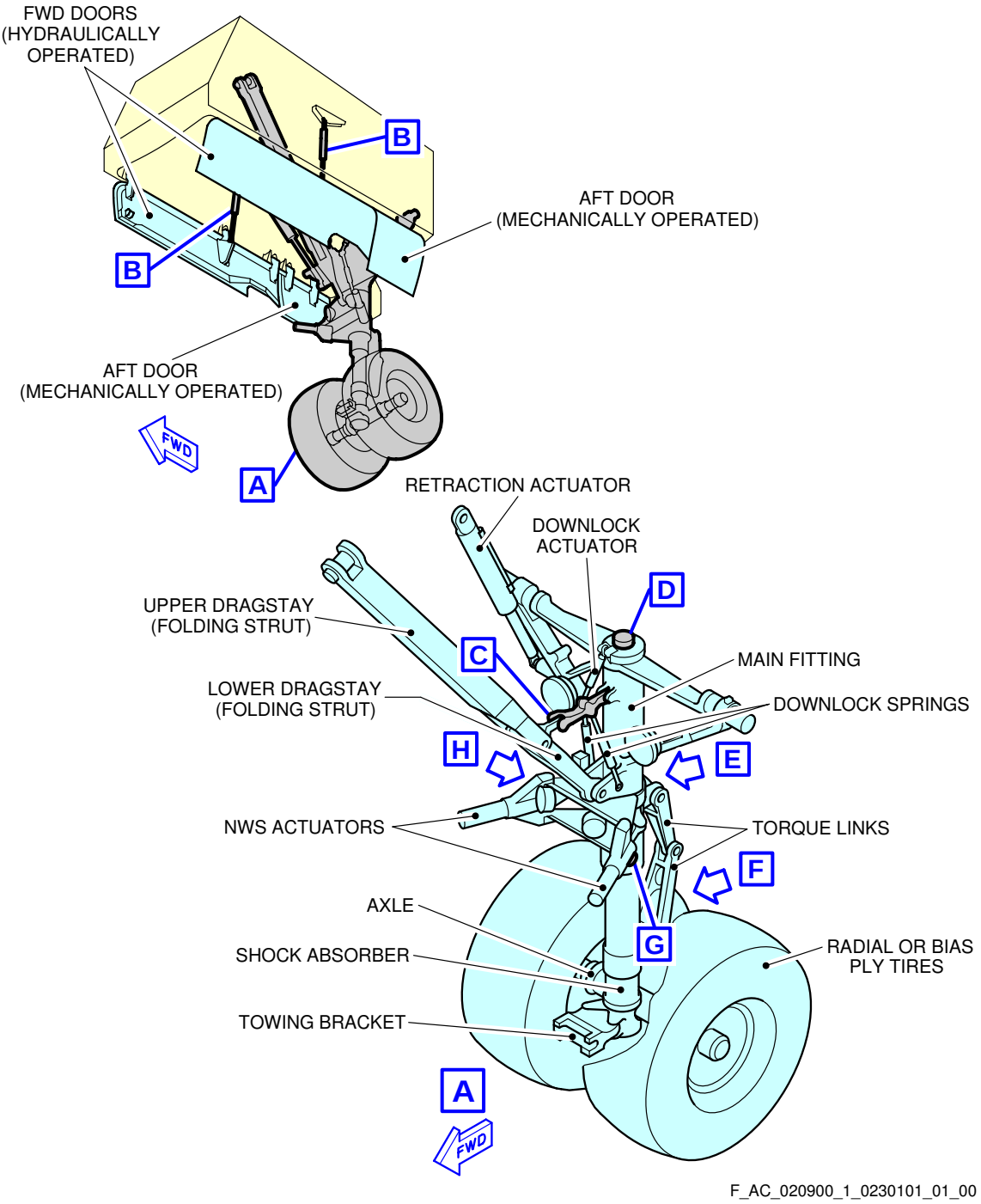
Main Landing Gear
Mechanical locking of MLG (Sheet 2 of 3)
FIGURE-2-9-0-991-022-A01

**ON A/C A330-700L



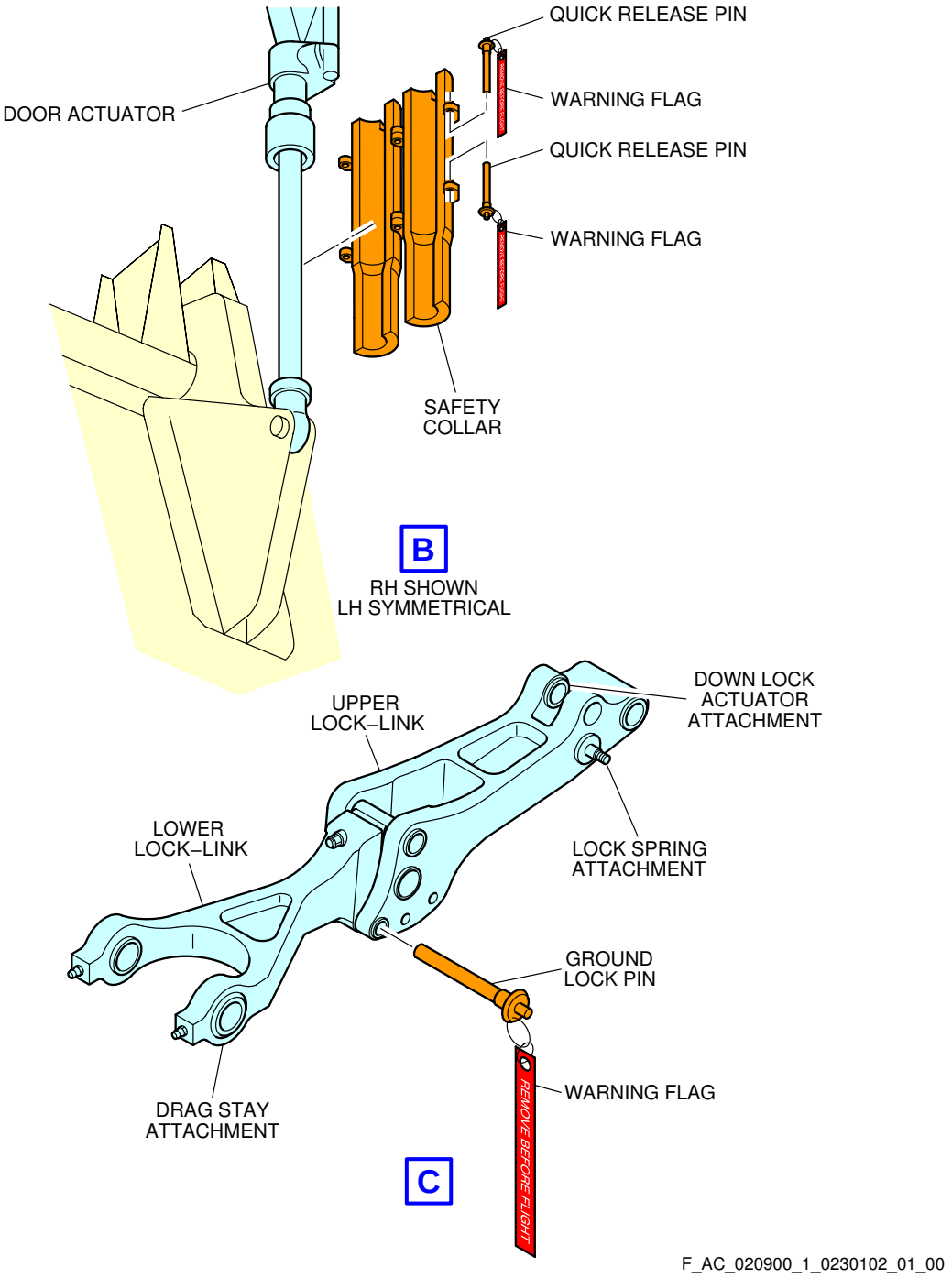
Main Landing Gear
MLG Servicing (Sheet 3 of 3)
FIGURE-2-9-0-991-022-A01

**ON A/C A330-700L



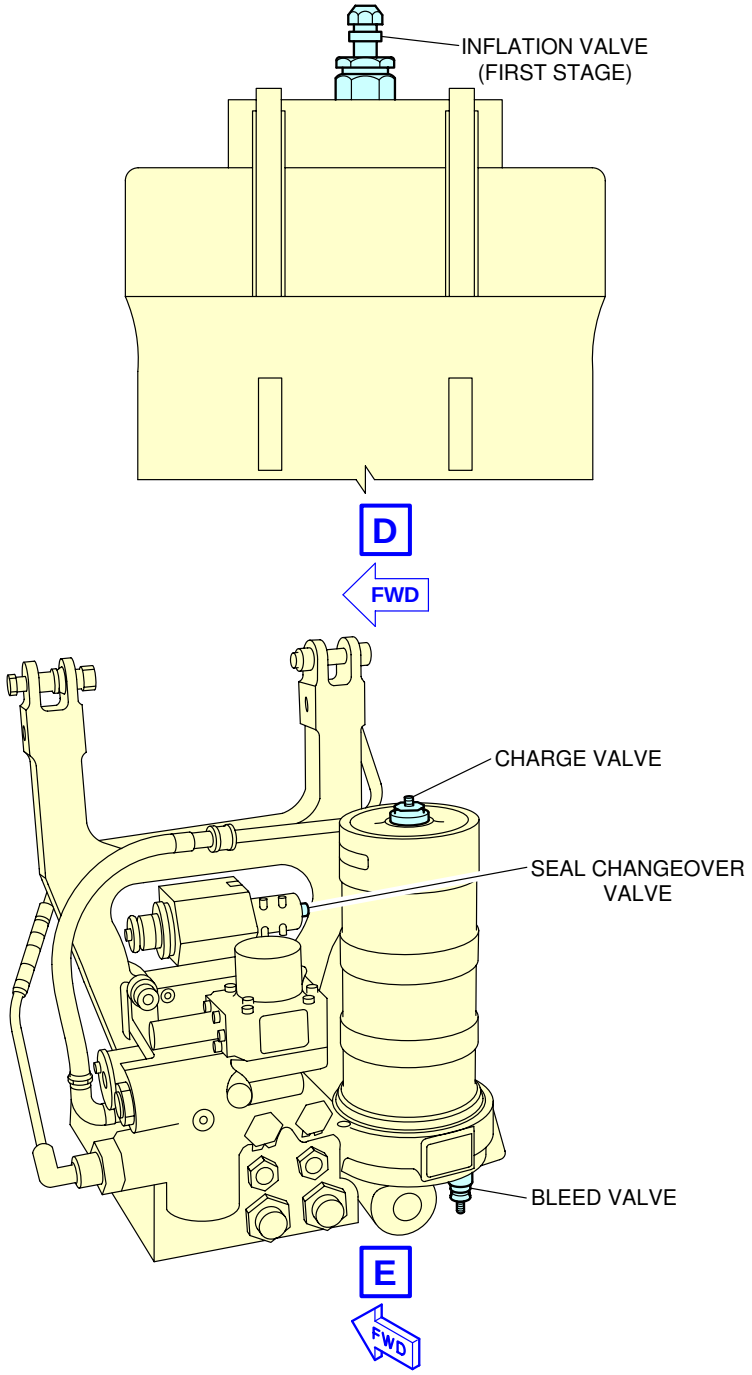
Nose Landing Gear
(Sheet 1 of 4)
FIGURE-2-9-0-991-023-A01

**ON A/C A330-700L



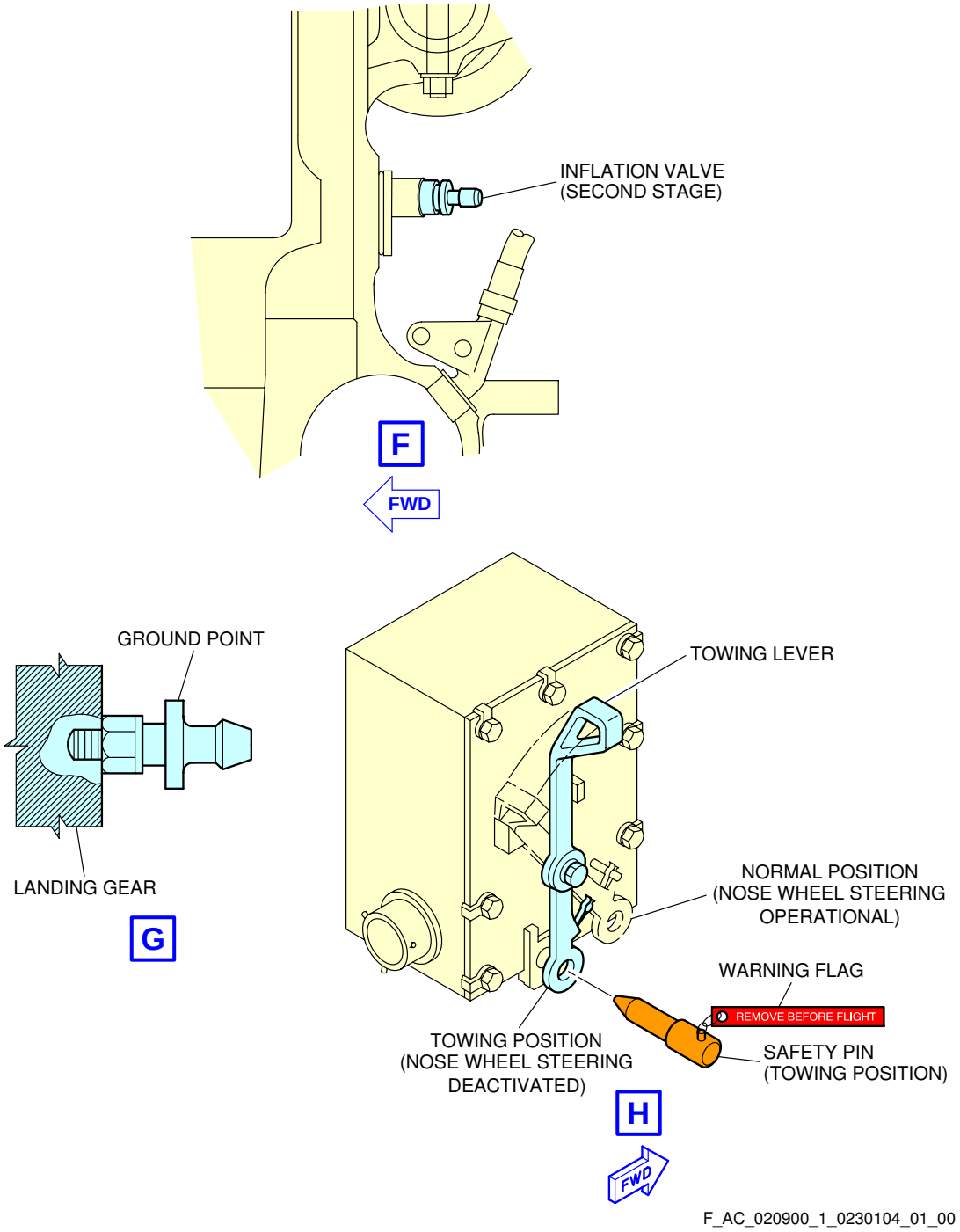
Nose Landing Gear
Mechanical Locking of NLG (Sheet 2 of 4)
FIGURE-2-9-0-991-023-A01

**ON A/C A330-700L



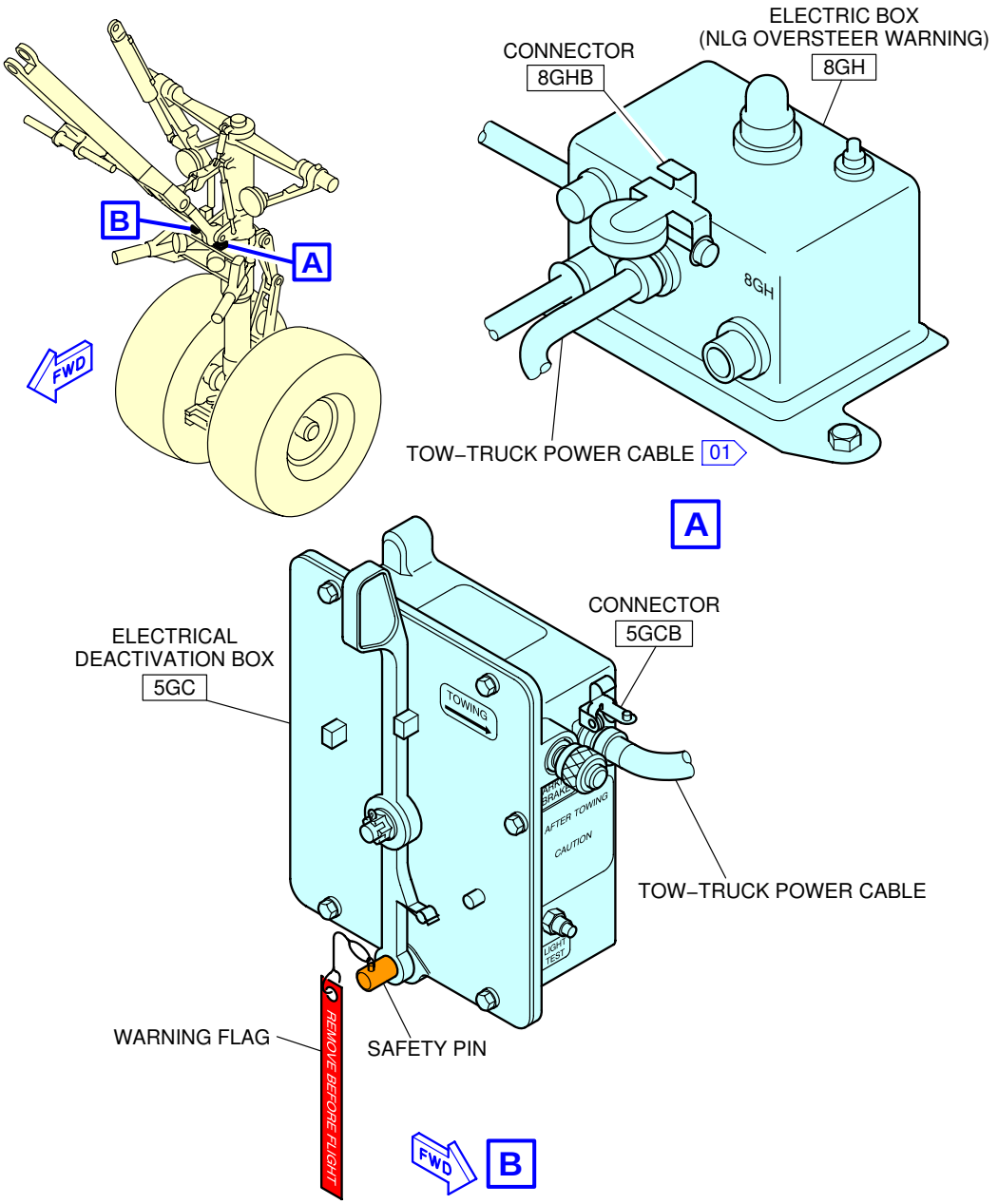
Nose Landing Gear
NLG Servicing 1 (Sheet 3 of 4)
FIGURE-2-9-0-991-023-A01

**ON A/C A330-700L



Nose Landing Gear
NLG Servicing 2 (Sheet 4 of 4)
FIGURE-2-9-0-991-023-A01

**ON A/C A330-700L



NOTE:

01 CONNECT THE TOW–TRUCK POWER CABLE TO CONNECTOR 8GHB IF ELECTRICAL BOX 8GH IS INSTALLED ON THE AIRCRAFT.

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Tow Truck Power
NLG Servicing 3
FIGURE-2-9-0-991-024-A01

2-10-0 Exterior Lighting

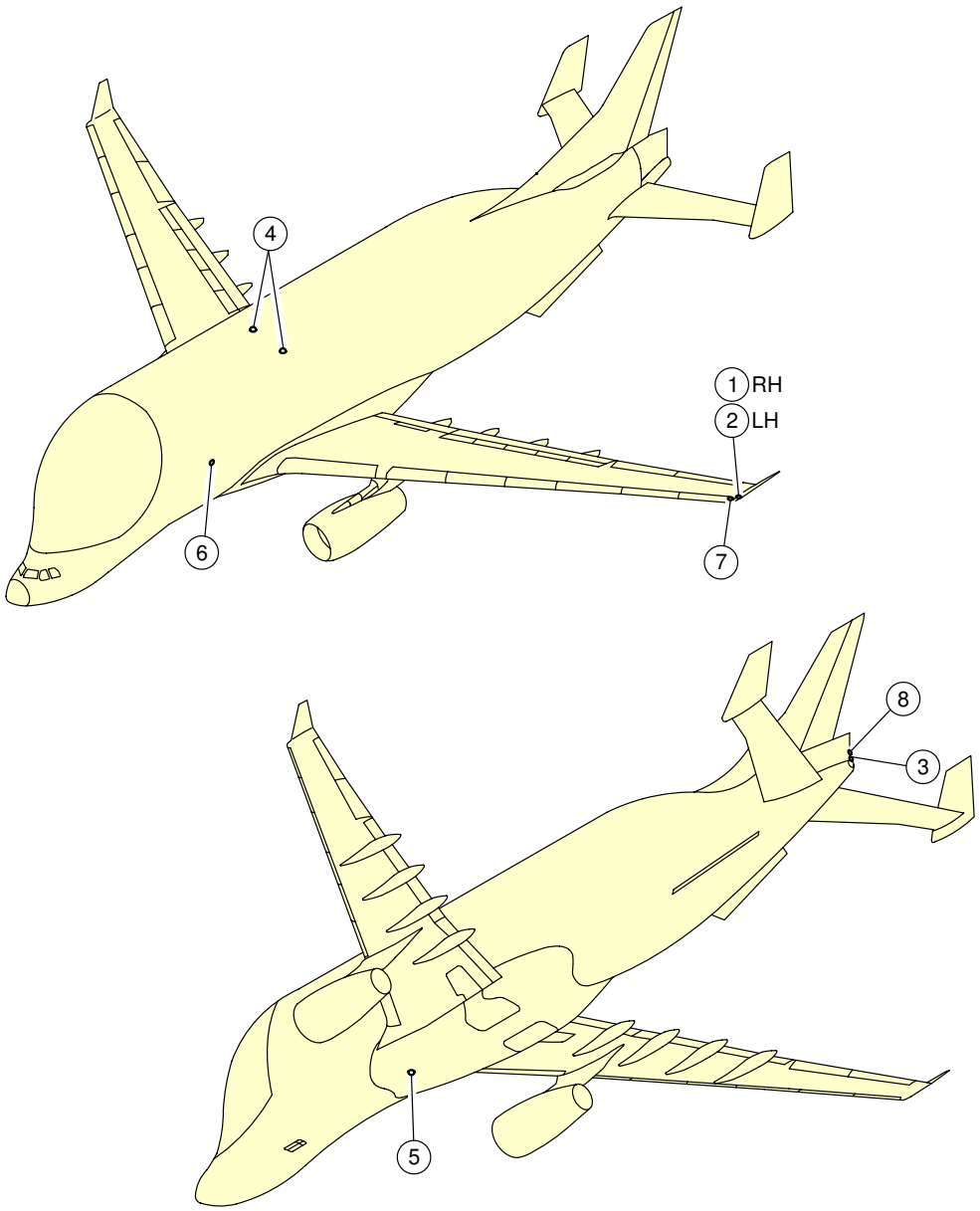
**ON A/C A330-700L

Exterior Lighting

1. General
   This section gives the location of the aircraft exterior lighting.

EXTERIOR LIGHTING	
ITEM	DESCRIPTION
1	RIGHT NAVIGATION LIGHT (GREEN)
2	LEFT NAVIGATION LIGHT (RED)
3	TAIL NAVIGATION LIGHT (WHITE)
4	UPPER ANTI-COLLISION LIGHT/BEACON (RED)
5	LOWER ANTI-COLLISION LIGHT/BEACON (RED)
6	WING SCAN LIGHTS
7	WING STROBE LIGHT (HIGH INTENSITY, WHITE)
8	TAIL STROBE LIGHT (HIGH INTENSITY, WHITE)
9	LANDING LIGHTS
10	RUNWAY TURN-OFF LIGHTS
11	TAXI LIGHTS
12	TAKE-OFF LIGHTS
13	CARGO-COMPARTMENT FLOOD LIGHTS

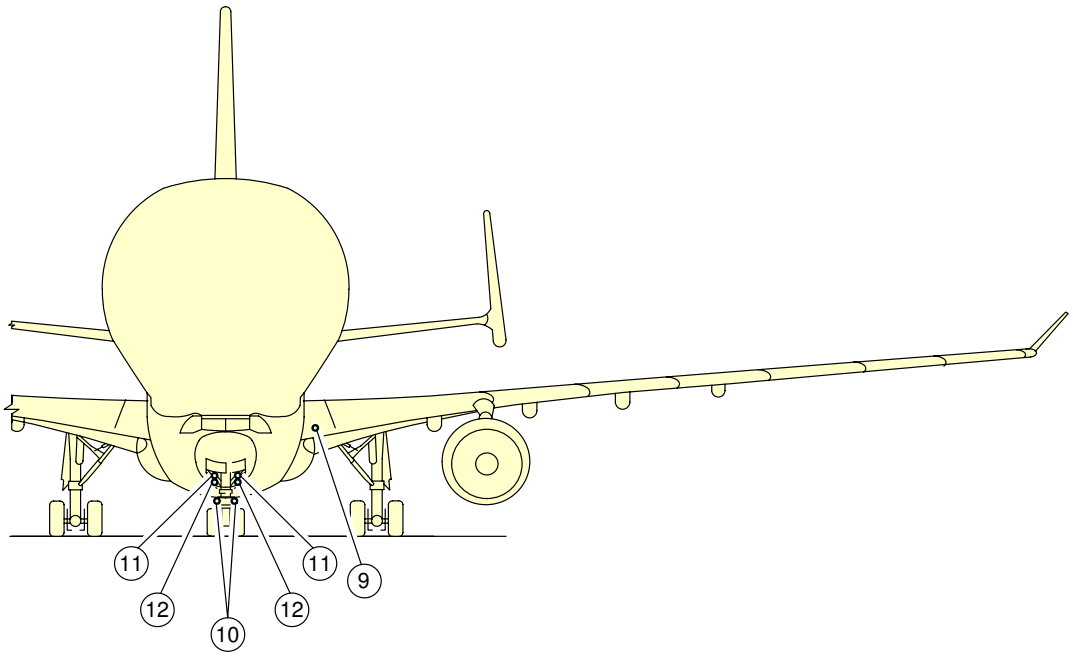
**ON A/C A330-700L



F_AC_021000_1_0100101_01_00

Exterior Lighting
Lights General Layout (Sheet 1 of 5)
FIGURE-2-10-0-991-010-A01

**ON A/C A330-700L



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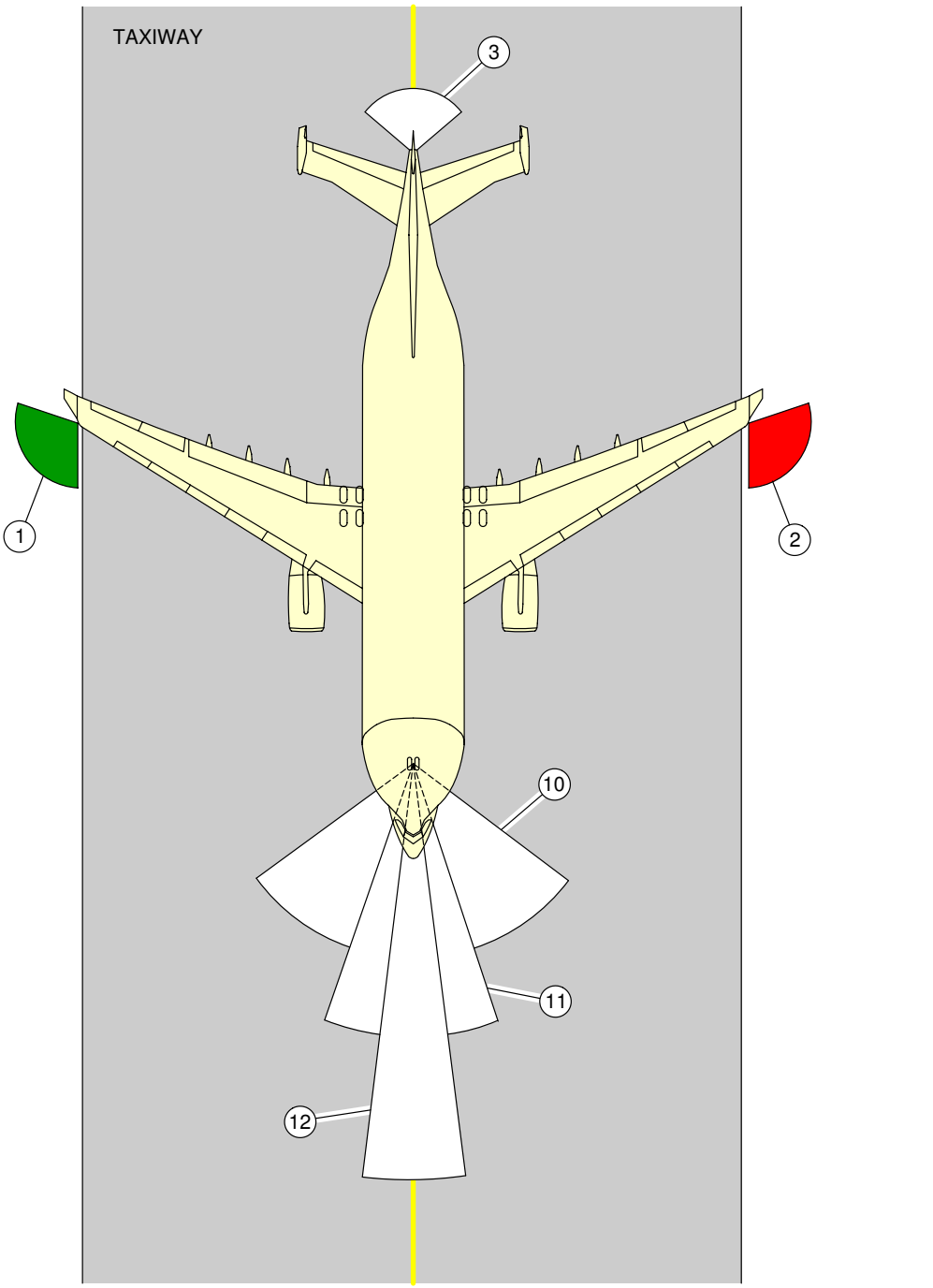
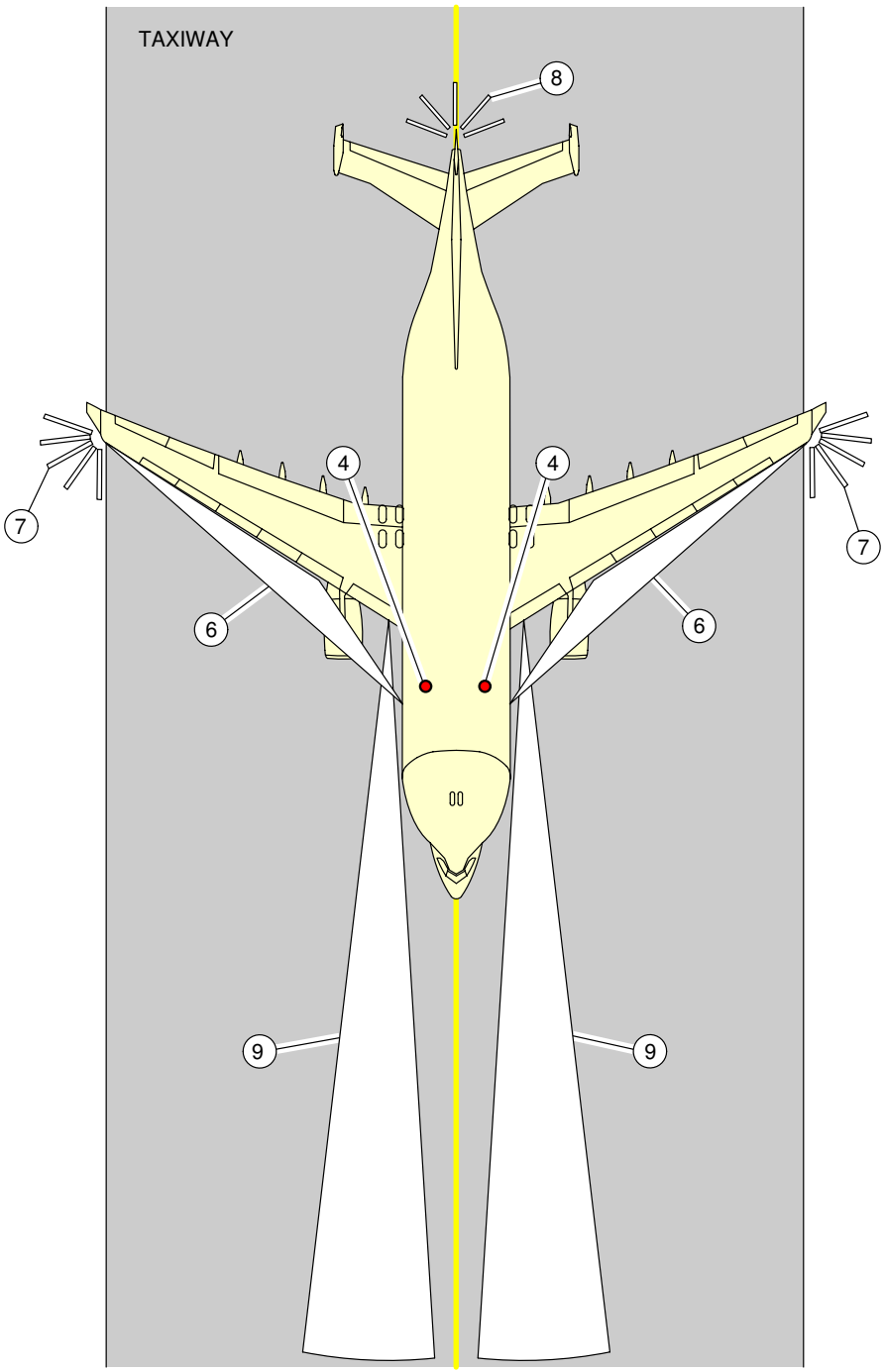
Exterior Lighting
Lights General Layout (Sheet 2 of 5)
FIGURE-2-10-0-991-010-A01

**ON A/C A330-700L



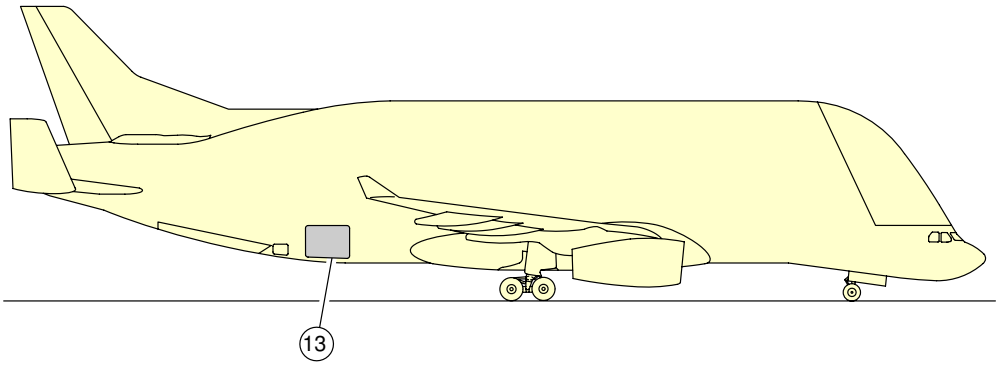
Exterior Lighting
(Sheet 3 of 5)
FIGURE-2-10-0-991-010-A01

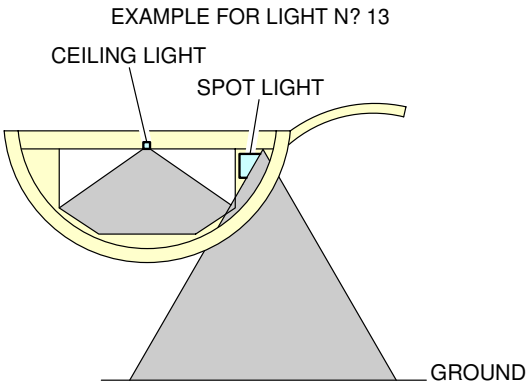
**ON A/C A330-700L



Exterior Lighting
(Sheet 4 of 5)
FIGURE-2-10-0-991-010-A01

**ON A/C A330-700L





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Exterior Lighting
Aft Lower-Cargo light (Sheet 5 of 5)
FIGURE-2-10-0-991-010-A01

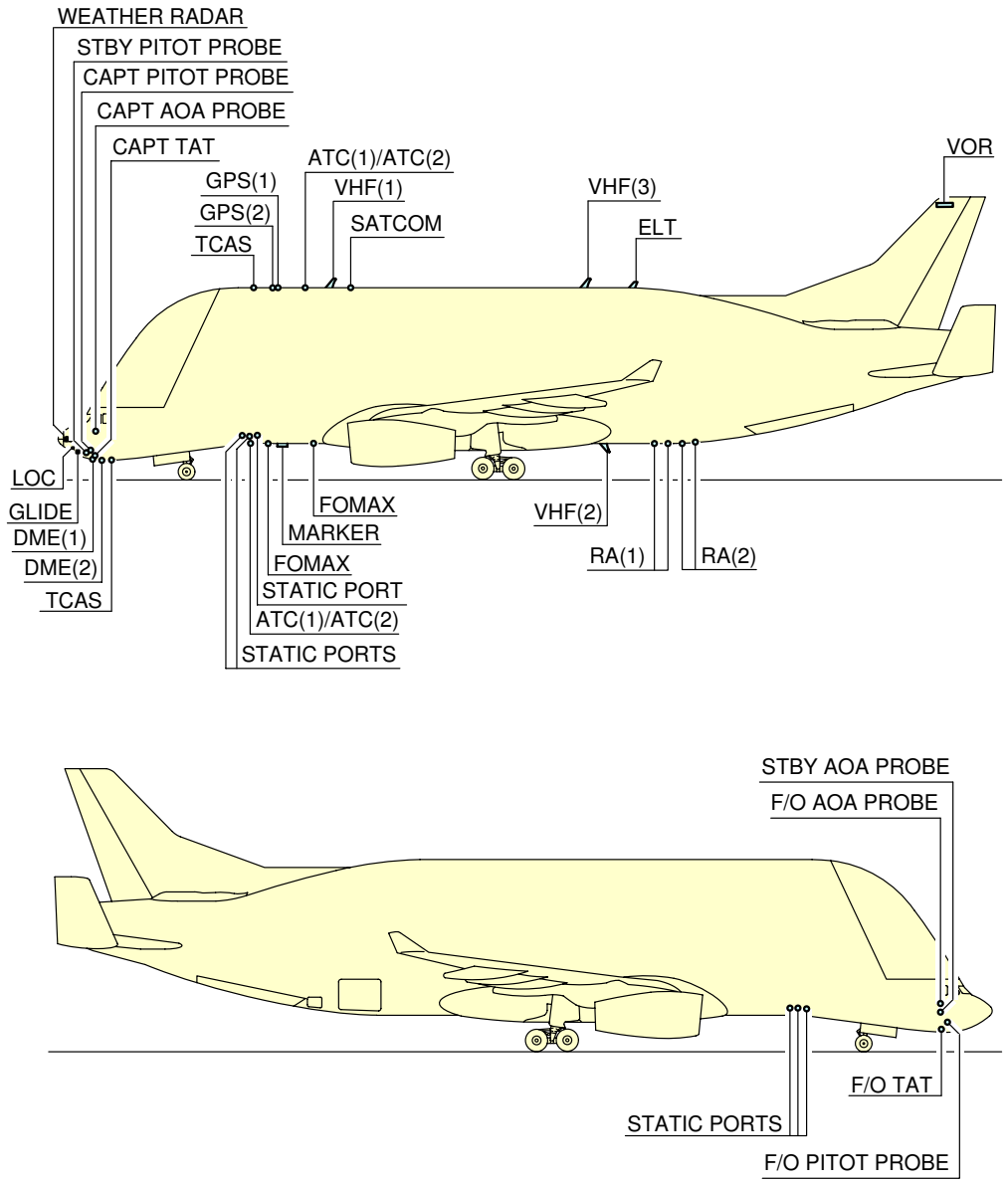
2-11-0 Antennas and Probes Location

**ON A/C A330-700L

Antennas and Probes Location

1. This section gives the location of antennas and probes.

**ON A/C A330-700L



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Antennas and Probes
Location
FIGURE-2-11-0-991-008-A01

2-12-0 Engine and Nacelle

****ON A/C A330-700L**

Engine and Nacelle

1. Engine and Nacelle - RR TRENT 700 Engine

   A. Engine

   The RB211-TRENT 700 engine is a high bypass ratio, triple spool turbofan.
   The principal modules of the engine are:
   - The Low Pressure Compressor (LPC) rotor
   - The Intermediate Pressure (IP) compressor
   - The intermediate case
   - The HP system (this includes the High Pressure Compressor (HPC), the combustion system and the High Pressure Turbine (HPT))
   - The Intermediate Pressure Turbine (IPT)
   - The external gearbox
   - The LPC case
   - The Low Pressure Turbine (LPT).

   The compressor system has three axial flow compressors in a triple spool configuration. The compressors are turned independently by their related turbines, each at its most satisfactory speed.
   The LP system has a single-stage compressor installed at the front of the engine. A shaft connects the compressor to a four-stage turbine at the rear of the gas generator. The gas generator also includes an eight-stage IP compressor, a six-stage HPC and a combustion system. Each of the compressors in the gas generator is connected to, and turned by, a different single stage turbine. Between the HPC and the HPT is the annular combustion system which burns a mixture of fuel and air to supply energy as heat. Behind the LPT there is a common nozzle assembly which mixes the cold air and hot gas exhaust flows. The external gearbox module is installed below the rear case of the fan case. It has a gear train that decreases and increases the speed to meet the specified drive requirements of each accessory.

   B. Nacelle

   The nacelle gives the engine an aerodynamic shape. Each engine is housed in a nacelle suspended from a pylon attached below the wing. The nacelle consists of the following major components:

   (1) Air Intake Cowl

   The air intake cowl is attached to the forward flange of the front LPC case. Its function is to supply inlet air in a satisfactory condition for the engine compressors.

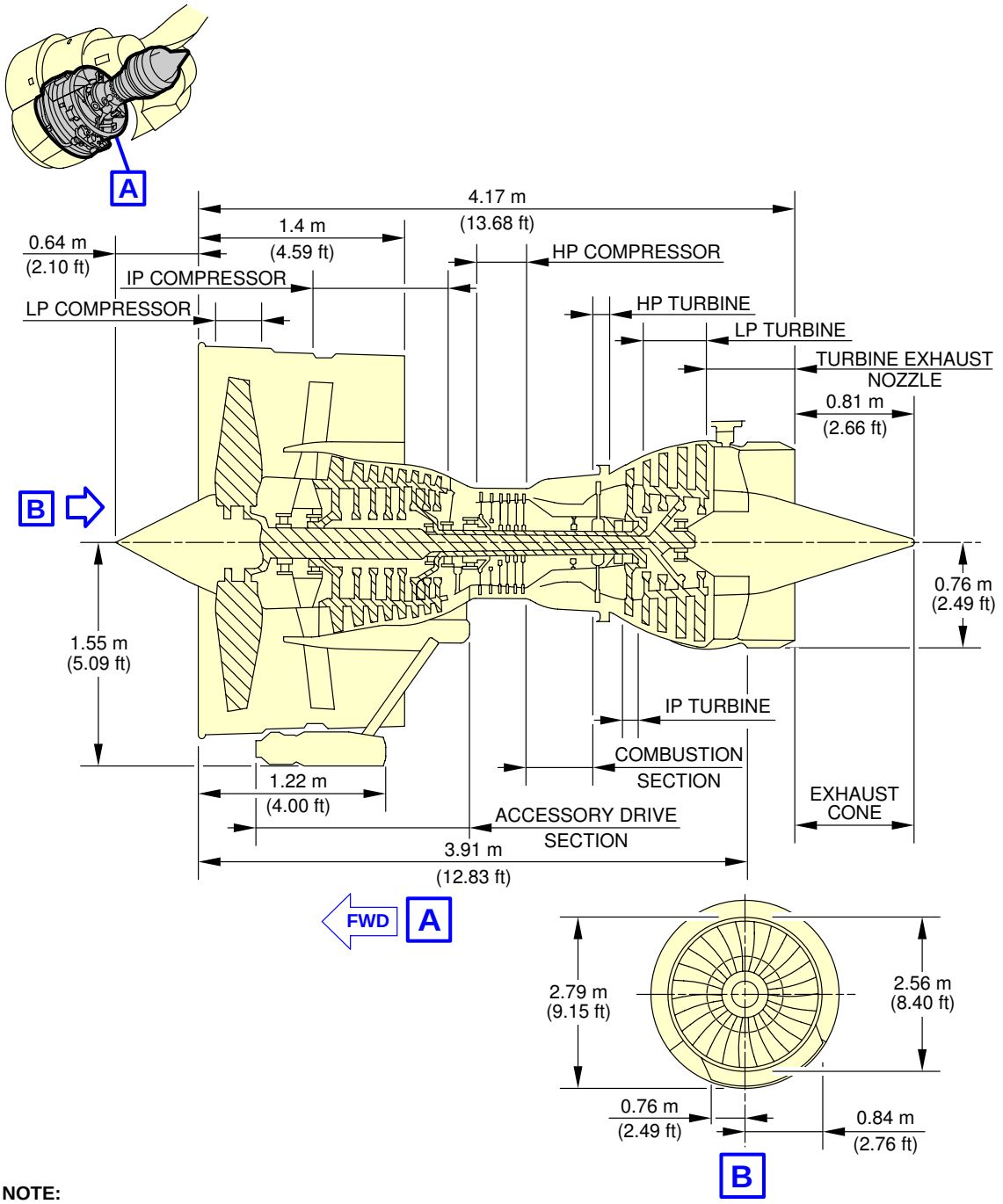
   (2) Fan Cowl Doors

   The fan cowl doors hang on the aircraft wing pylon and are closed around the LPC cases. They can be opened during ground maintenance to give access to the components installed on the cases and to let the thrust reverser cowl doors be opened.

(3) Thrust Reverser
The thrust reverser is a component of the aircraft engine nacelle. The thrust reverser is a twin thrust reverser cowl door ('C' duct) construction providing a fan duct inner wall fairing for the core engine between the top and bottom bifurcation walls. The thrust reverser incorporates hydraulically-powered actuators to operate four pivoting doors which redirect the fan air flow in reverse thrust. Hydraulic power is provided from the aircraft hydraulic system to position the doors in a "stowed" position for forward thrust and "deployed" position for reverse thrust.

(4) Common Nozzle Assembly (CNA)
The CNA is attached to the aft flange of the exhaust case. The function of the CNA is to mix the core engine exhaust with the LPC outlet air.

**ON A/C A330-700L

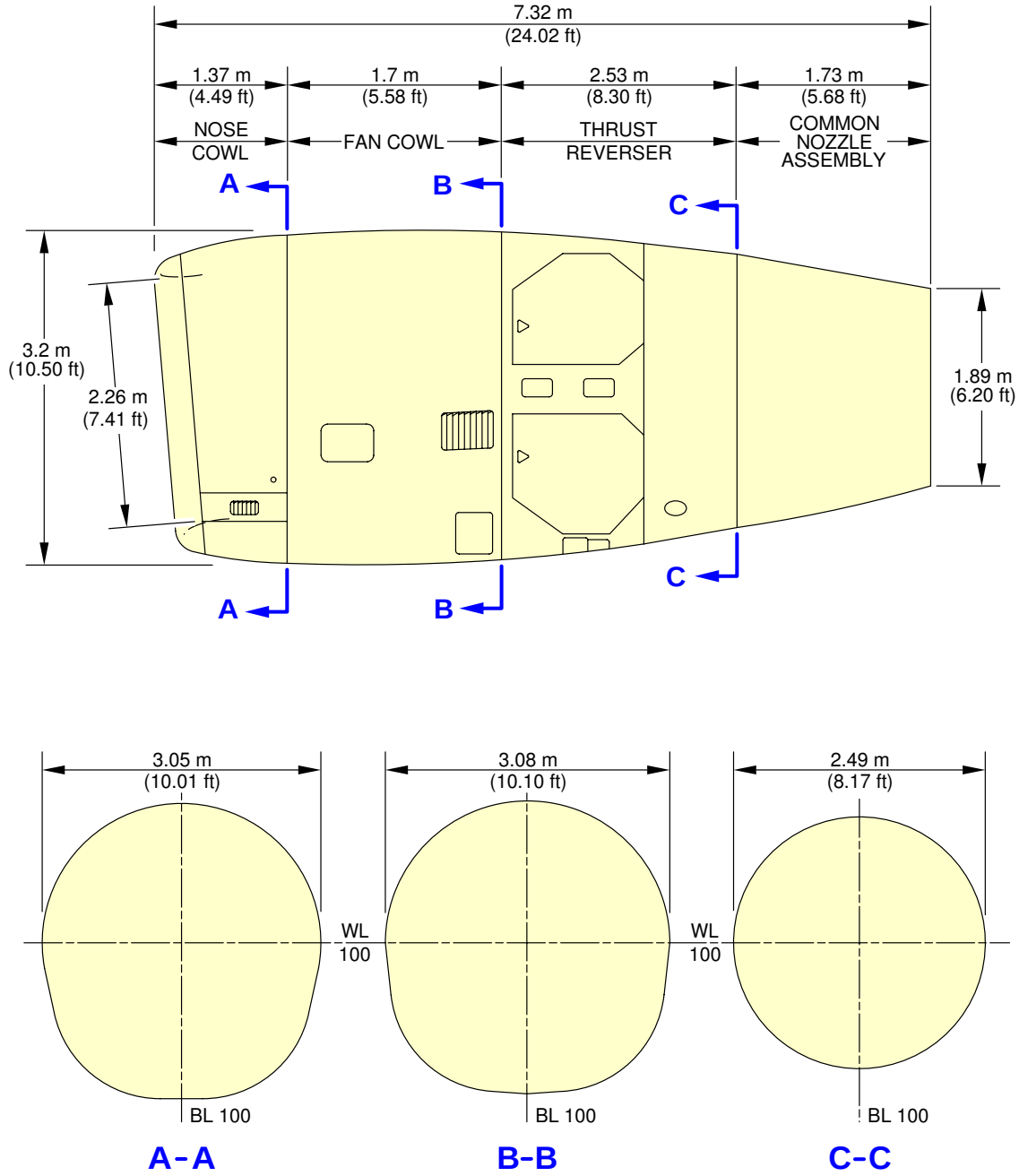


NOTE:
APPROXIMATE DIMENSIONS.

F_AC_021200_1_0300101_01_00

Engine and Nacelle
Engine Dimensions - RR TRENT 700
FIGURE-2-12-0-991-030-A01

**ON A/C A330-700L

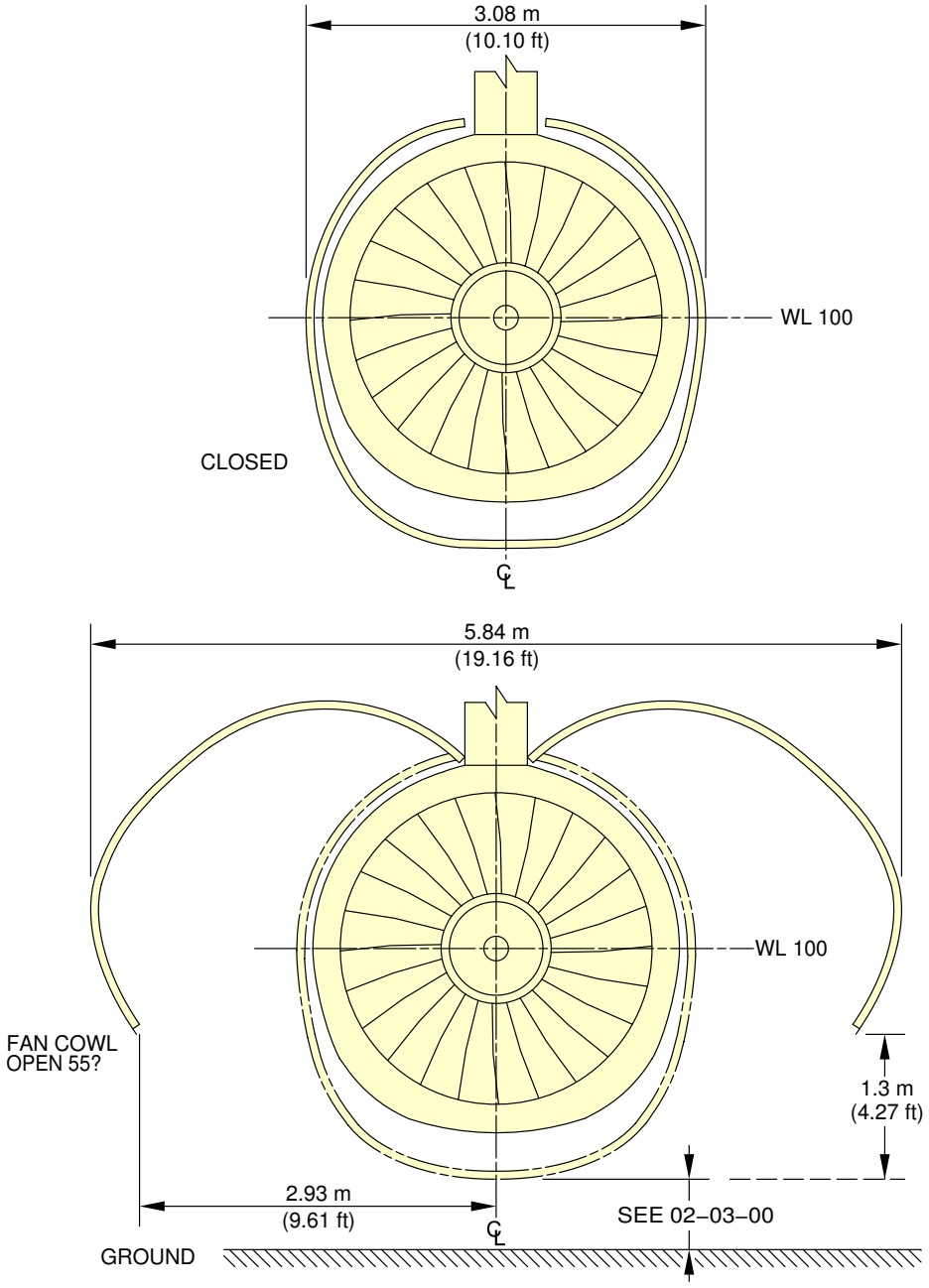


NOTE:
APPROXIMATE DIMENSIONS.

F_AC_021200_1_0310101_01_00

Engine and Nacelle
Nacelle Dimensions - RR TRENT 700
FIGURE-2-12-0-991-031-A01

**ON A/C A330-700L

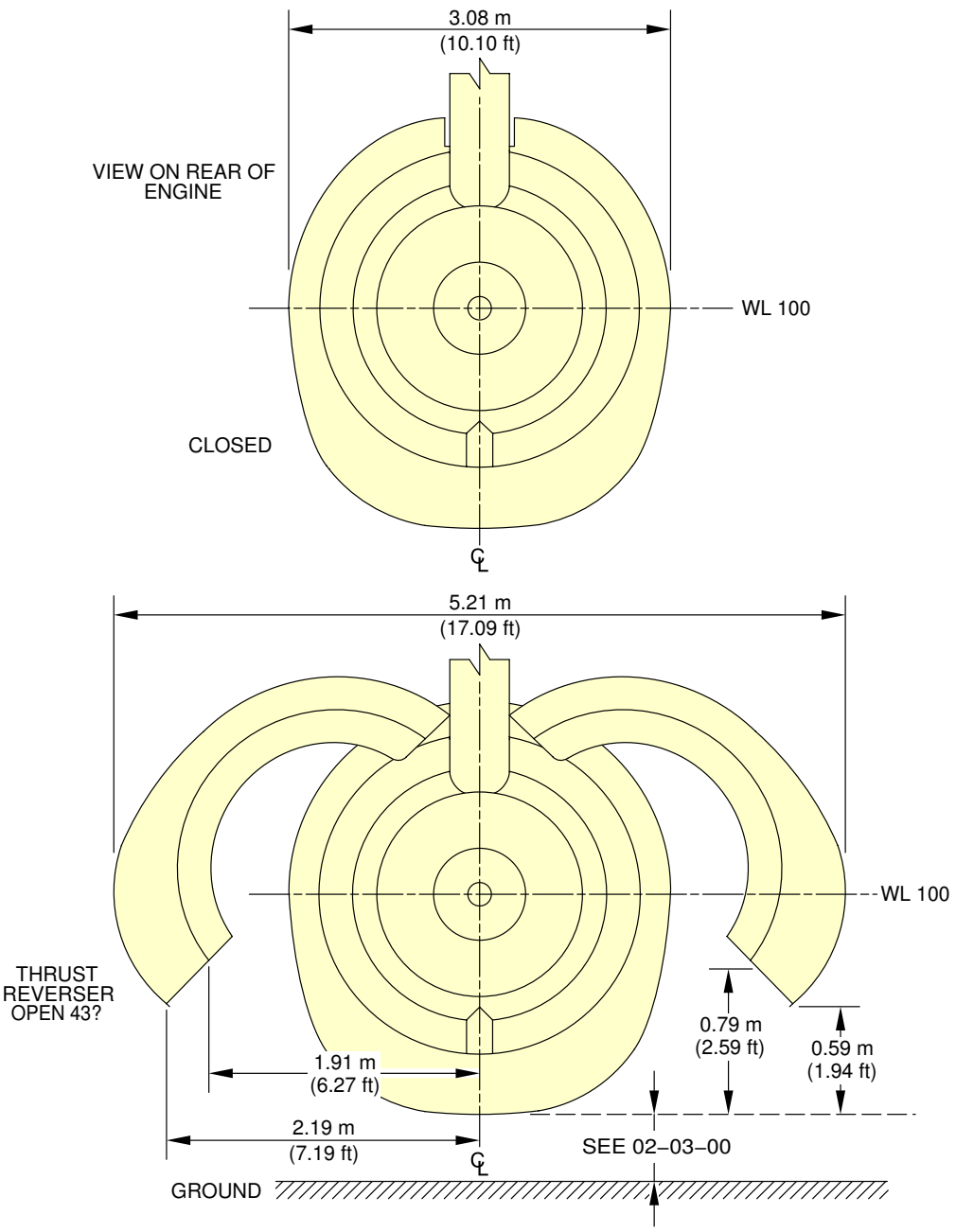


NOTE:
APPROXIMATE DIMENSIONS.

F_AC_021200_1_0320101_01_00

Engine and Nacelle
Fan Cowls - RR TRENT 700
FIGURE-2-12-0-991-032-A01

**ON A/C A330-700L



NOTE:
APPROXIMATE DIMENSIONS.

F_AC_021200_1_0330101_01_00

Engine and Nacelle
Thrust Reverser Cowls - RR TRENT 700
FIGURE-2-12-0-991-033-A01

2-12-1 Auxiliary Power Unit

****ON A/C A330-700L**

Auxiliary Power Unit

1. General

   The Auxiliary Power Unit (APU) and its related mechanical components are installed at the rear part of the fuselage in the tailcone section. The APU compartment is a fireproof area (identified as the Fire Zone).

   The APU is a pneumatic and shaft-power gas-turbine engine and is used for the ground and in-flight power supply of the aircraft.

   The APU supplies:

   - Mechanical shaft-power to operate a generator
   - Bleed-air to the Main Engine Start (MES) and the Environmental Control System (ECS).

   A part of the automatic system, with the pneumatic and the electromechanical controls, operates the start and the acceleration functions of the APU.

   An air intake system with a flap-type door is installed in front of the APU compartment. The exhaust gases pass overboard at the end of the fuselage cone.

2. Powerplant

   The APU is the Garrett Gas-Turbine Compressor Power-unit (GTCP) 331-350C with a single shaft engine.

   The engine is the primary component of the APU, which is of the modular design. The modules of the engine are:

   - The power section
   - The load compressor
   - The accessory drive gearbox with LRU(s).

   The power section has a two-stage centrifugal compressor, a reverse-flow annular combustion chamber and a three-stage axial turbine. The power section directly operates the one-stage centrifugal load-compressor which supplies the bleed-air to the pneumatic system. The inlet guide vanes as part of the load compressor, control the airflow.

   The power section also operates the gearbox which is attached to the load compressor. The following LRU's are mounted on the gearbox :

   - The APU generator,
   - The starter motor,
   - The oil pump,
   - The Fuel Control Unit (FCU),
   - The cooling air fan.

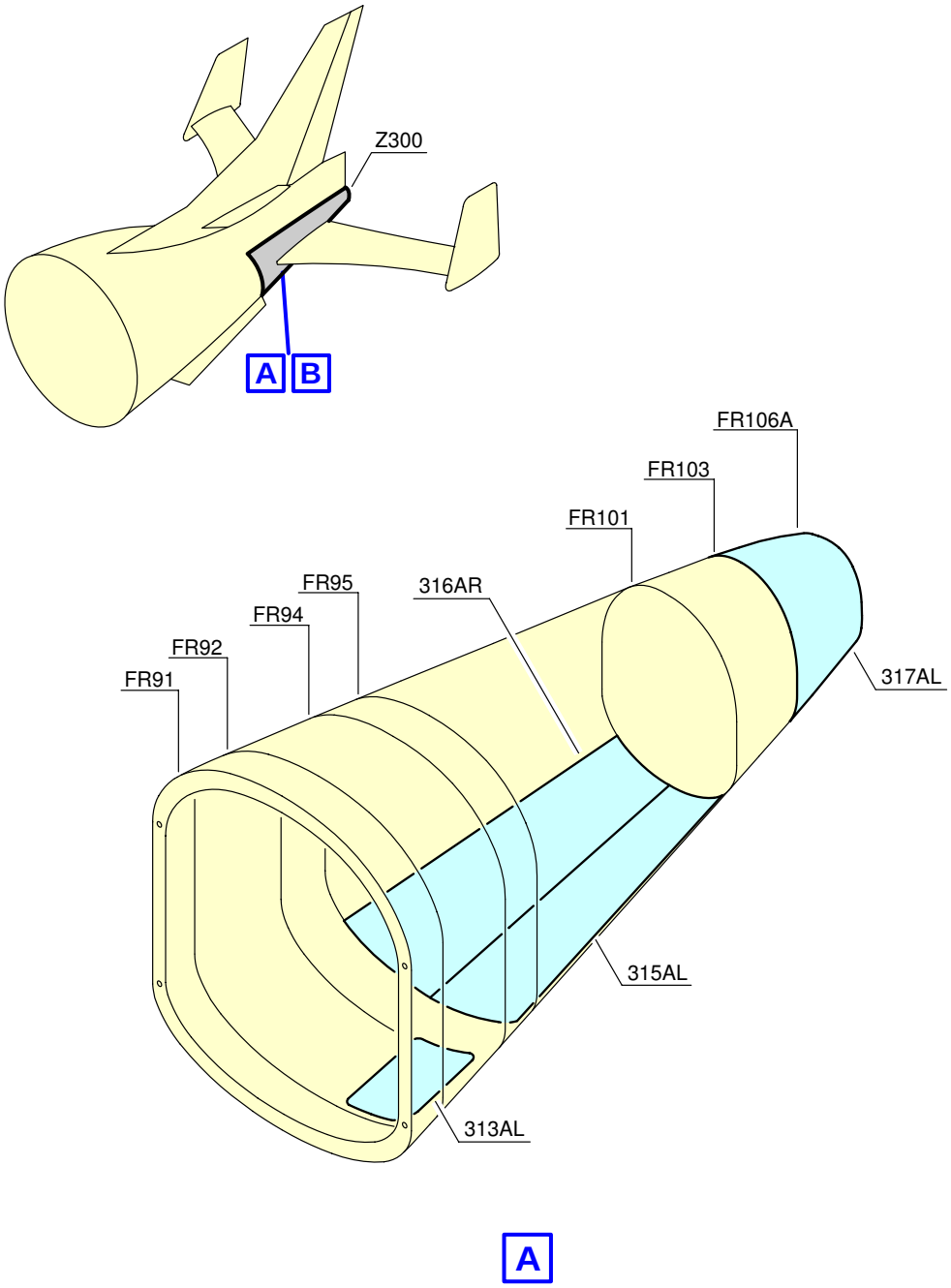
   The APU has a gearbox-driven oil-cooled AC generator.

   The cooling air and ventilation system of the APU supplies the air for cooling of the APU and the equipment on the APU. It also supplies the air for ventilation of the APU compartment.

3. Control Circuit
   The Electronic Control Box (ECB), which controls the FCU and the Inlet Guide Vanes (IGV), keeps the APU at a constant speed. The control circuit is used to start the APU, to shut it down, to control it and to prevent internal failure.

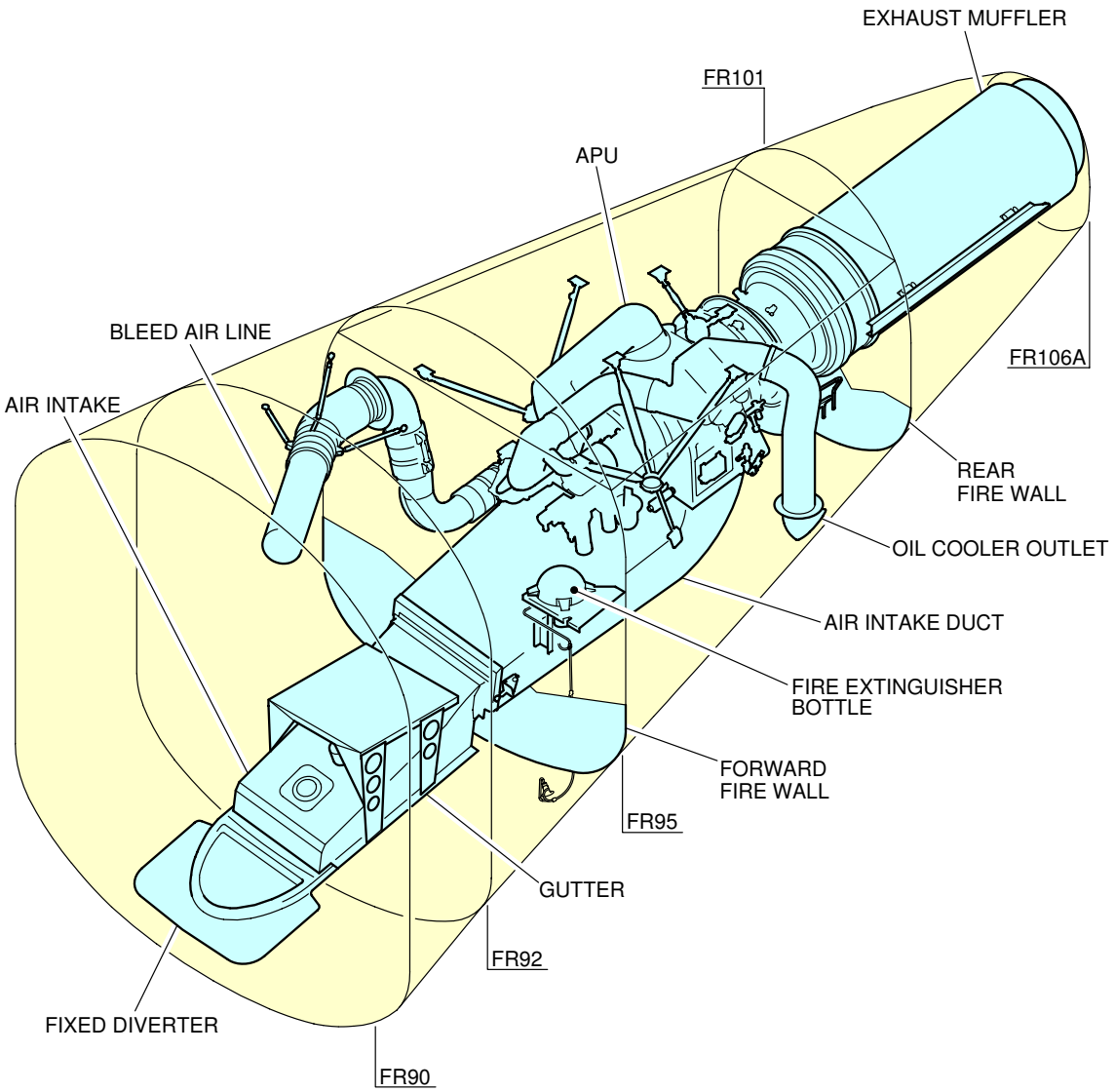
4. Controls and Indication
   The primary APU controls and indications are installed in the overhead panel, on the center pedestal panel and on the forward center panel. External APU panels are also installed on the nose landing gear and on the refuel/defuel panel, to initiate an APU emergency shut-down.

**ON A/C A330-700L



Auxiliary Power Unit
Access Doors (Sheet 1 of 2)
FIGURE-2-12-1-991-004-A01

**ON A/C A330-700L



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Auxiliary Power Unit
General Layout (Sheet 2 of 2)
FIGURE-2-12-1-991-004-A01

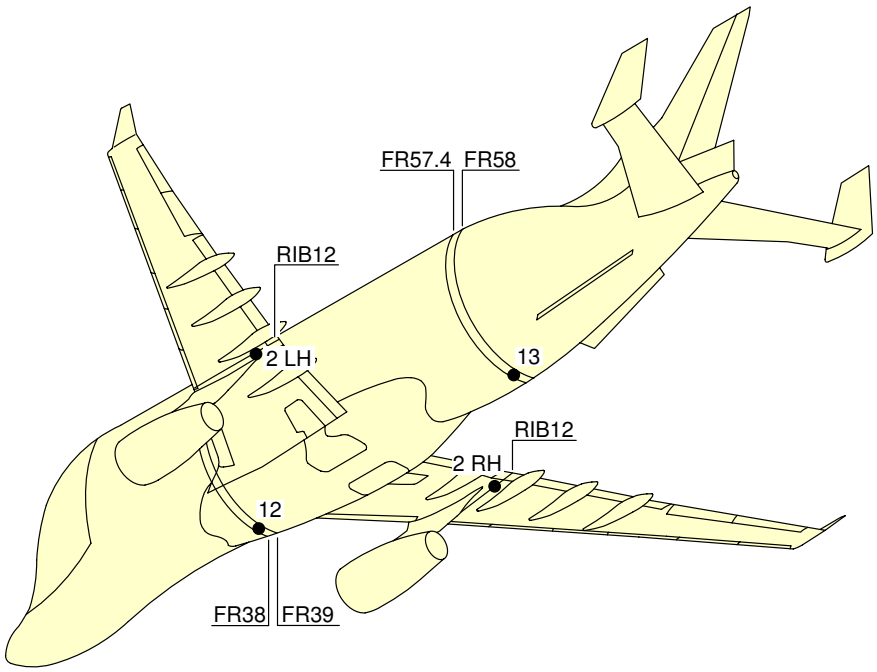
2-13-0 Levelling, symmetry and Alignment

**ON A/C A330-700L

Leveling and Symmetry

1. Quick Leveling
   The quick leveling procedures are documented in AMM.
2. Precision Leveling
   For precise leveling, it is necessary to install sighting rods in the receptacles located under the fuselage (points 12 and 13 for longitudinal leveling) and under the wings (points 2LH and 2RH for lateral leveling) and use a sighting tube. With the aircraft on jacks, adjust the jacks until the reference marks on the sighting rods are aligned in the sighting plane (aircraft level).

**ON A/C A330-700L



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Location of Leveling Points
FIGURE-2-13-0-991-008-A01

2-14-0 Jacking for Maintenance

****ON A/C A330-700L**

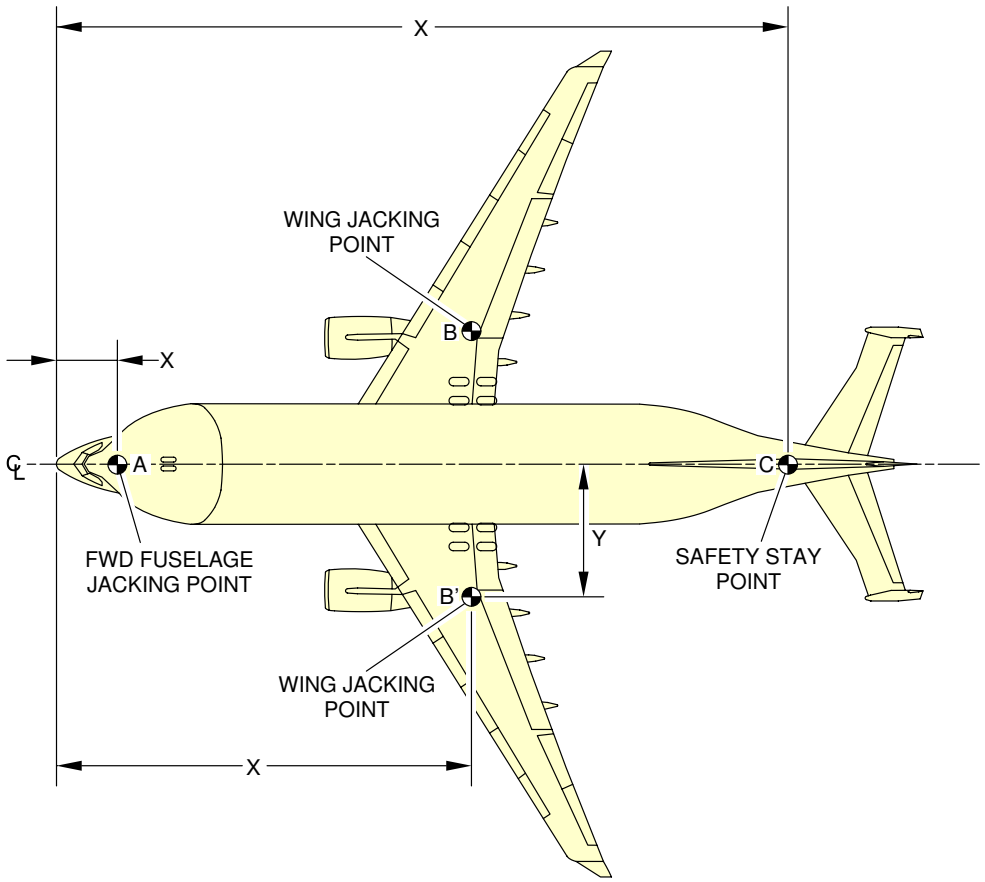
Jacking for Maintenance

1. Aircraft Jacking Points for Maintenance
   - A. General
     - (1) The A330-700L can be jacked:
       - At not more than 152 000 kg (335 103 lb),
       - Within the limits of the permissible wind speed when the aircraft is jacked outside a closed environment.
   - B. Primary Jacking Points
     - (1) The aircraft is provided with three primary jacking points:
       - One located under the forward fuselage (after FR11),
       - Two located under the wings (one under each wing), at the intersection of RIB10 and the rear of the spar-datum.
     - (2) Three jack adapters (ground equipment) are used as intermediary parts between the aircraft jacking points and the jacks:
       - One female spherical jack adapter at the forward fuselage,
       - Two female spherical jack pad adapters at the wings (one at each wing).
   - C. Auxiliary Jacking Point (Safety Stay)
     - (1) When the aircraft is on jacks, a safety stay is placed under the fuselage at FR87 to prevent tail tipping caused by accidental displacement of the aircraft center of gravity.
     - (2) The safety point must not be used for lifting the aircraft.
     - (3) One male spherical stay adapter (ground equipment) is used as an intermediary part between the aircraft safety point and the stay.
2. Jacks and Safety Stay
   - A. Jack Design
     - (1) The maximum eligible loads given in the table are the maximum loads applicable on jack fittings.
     - (2) In fully retracted position (jack stroke at minimum), the height of the jack is such that the jack may be placed beneath the aircraft under the most adverse conditions, namely, tires deflated and shock absorbers depressurized, with sufficient clearance between the aircraft jacking point and the jack upper end.
     - (3) The lifting jack stroke enables the aircraft to be jacked up so that the Fuselage Datum Line (FDL) may be positioned up to 7.2 m (23.62 ft) from the ground to allow all required maintenance procedures and in particular, the removal/installation of the landing-gear shock absorbers.

B. Safety Stay

(1) The stay stroke enables the aircraft tail to be supported up to the FDL positioned 7.2 m (23.62 ft) from the ground.

**ON A/C A330-700L



		X		Y		MAXIMUM JACKING FORCE
		m	ft	m	ft	daN
FORWARD FUSELAGE JACKING POINT	A	5.3	17.39	0	0	12 686.4
WING JACKING POINT	B	29.85	97.93	8.51	27.92	71 923.3
	B'	29.85	97.93	–8.51	–27.92	71 923.3
SAFETY STAY	C	55.17	181.00	0	0	4 500

NOTE:
SAFETY STAY IS NOT USED FOR JACKING.

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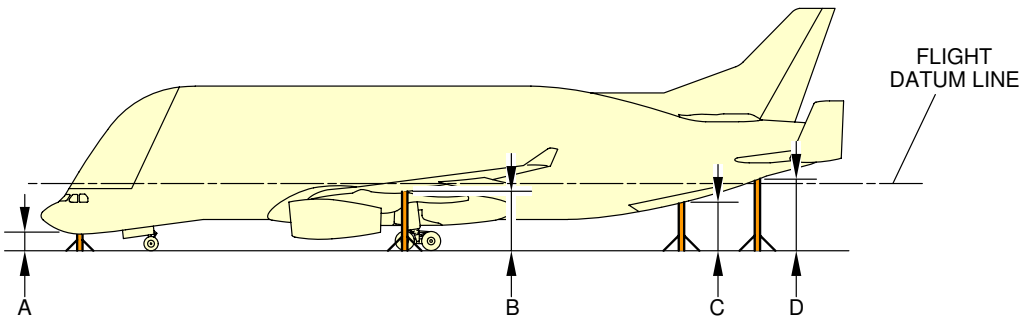
Jacking for Maintenance
Jacking Points Layout and Maximum Jacking Force
FIGURE-2-14-0-991-023-A01

**ON A/C A330-700L



	HEIGHT IN m (ft)			
	A	B	C	D
AIRCRAFT ON JACKS, FUSELAGE DATUM REFERENCE PARALLEL TO GROUND AT 6.515 m (21.37 ft) FOR LANDING GEARS EXTENSION/RETRACTION	2.63 (8.63)	5.72 (18.77)	4.98 (16.34)	6.37 (20.90)
AIRCRAFT ON JACKS, FUSELAGE DATUM REFERENCE PARALLEL TO GROUND AT 7.200 m (23.62 ft) FOR LANDING GEARS REMOVAL/INSTALLATION	3.32 (10.89)	6.41 (21.03)	5.67 (18.60)	7.06 (23.16)

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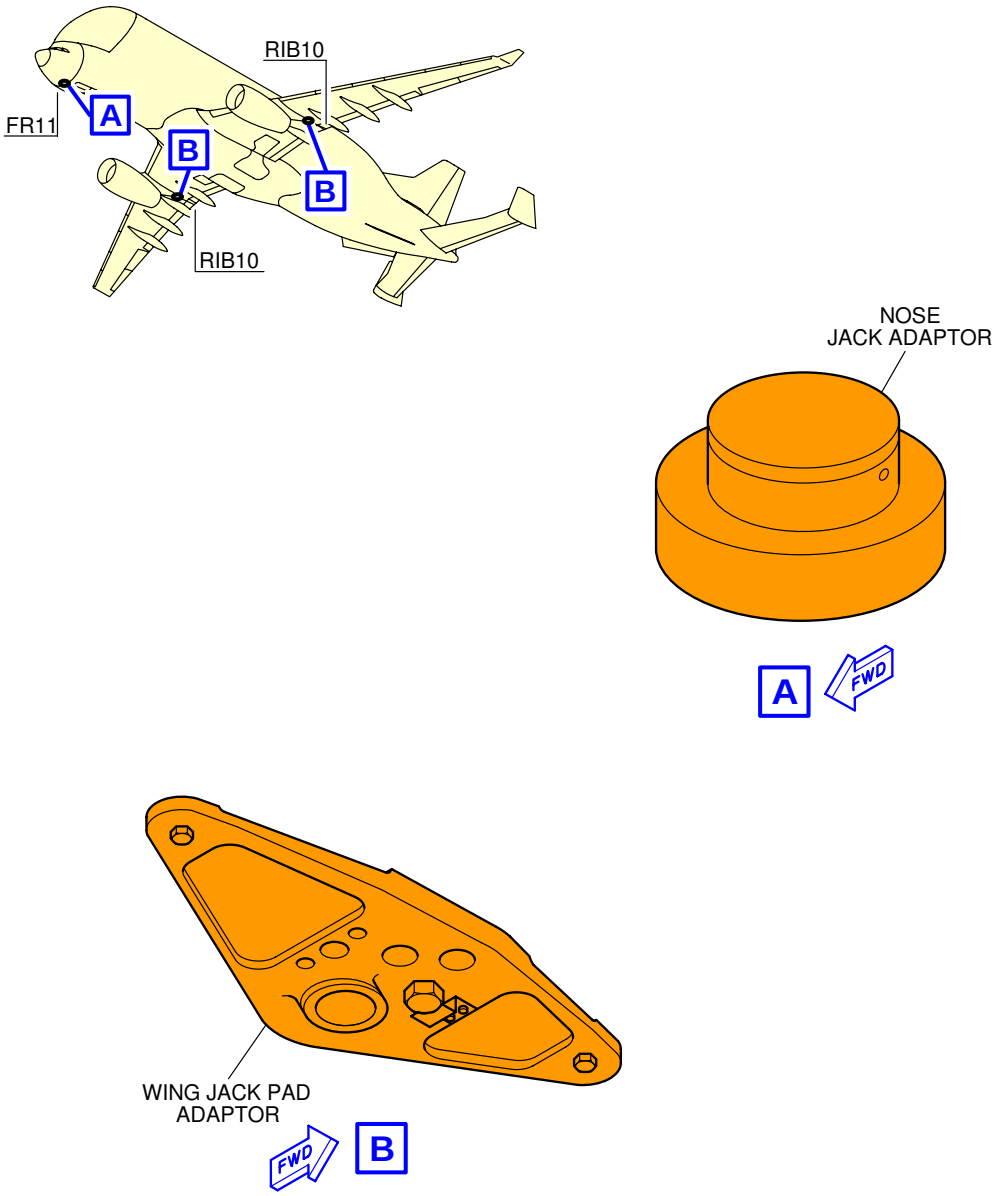
Jacking for Maintenance
Ground Clearance on Jacks
FIGURE-2-14-0-991-024-A01

**ON A/C A330-700L



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Jacking for Maintenance
Jacking Point Adaptors
FIGURE-2-14-0-991-025-A01

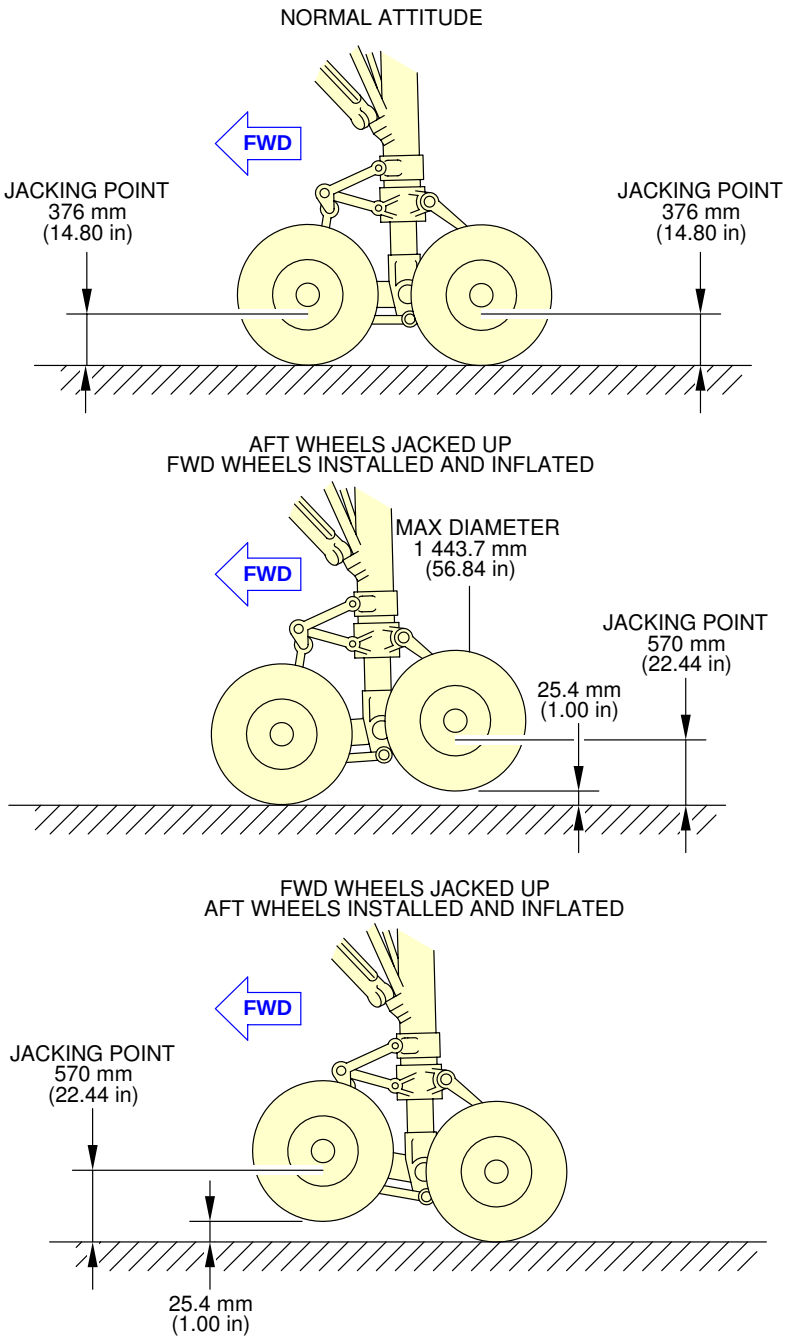
2-14-1 Jacking of the Landing Gear

**ON A/C A330-700L

Jacking of the Landing Gear

1. Not applicable.

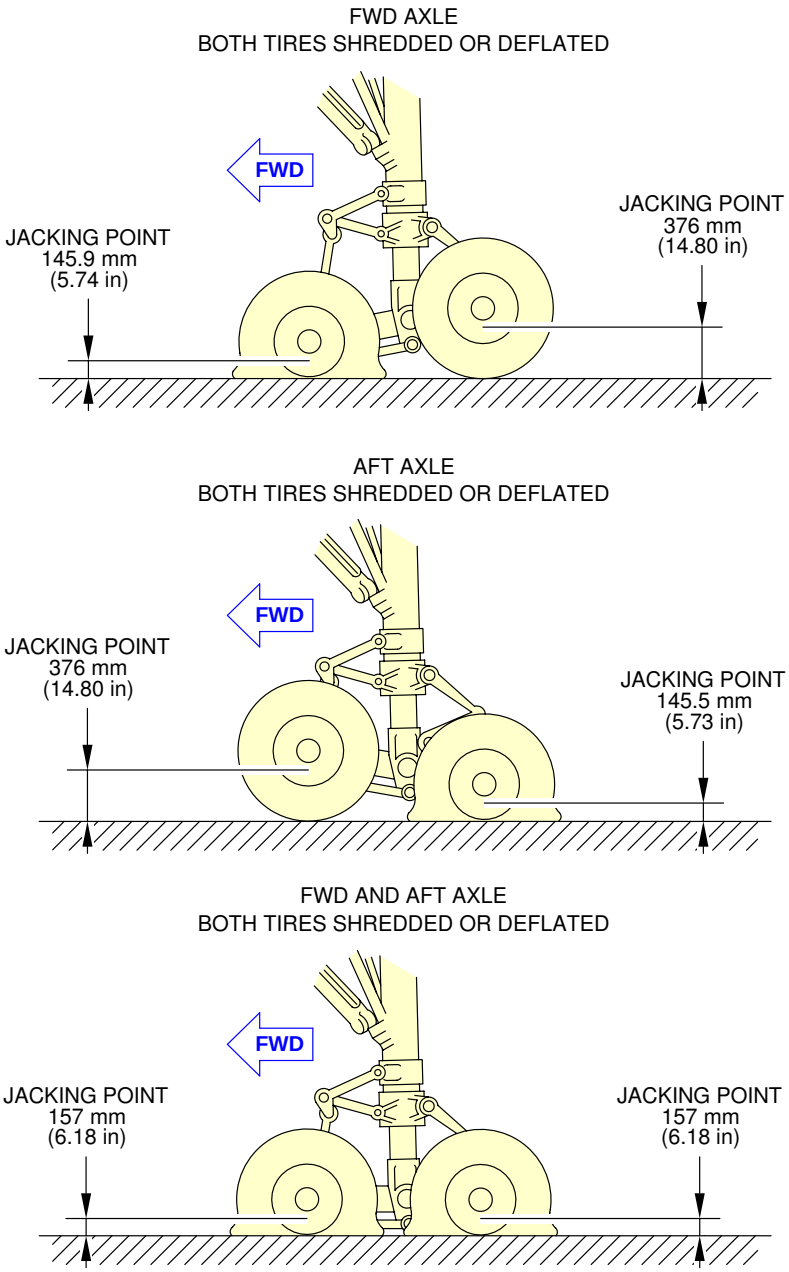
**ON A/C A330-700L



F_AC_021401_1_0270101_01_00

Jacking of the Landing Gear
Jacking of the Landing Gear (Sheet 1 of 3)
FIGURE-2-14-1-991-027-A01

**ON A/C A330-700L



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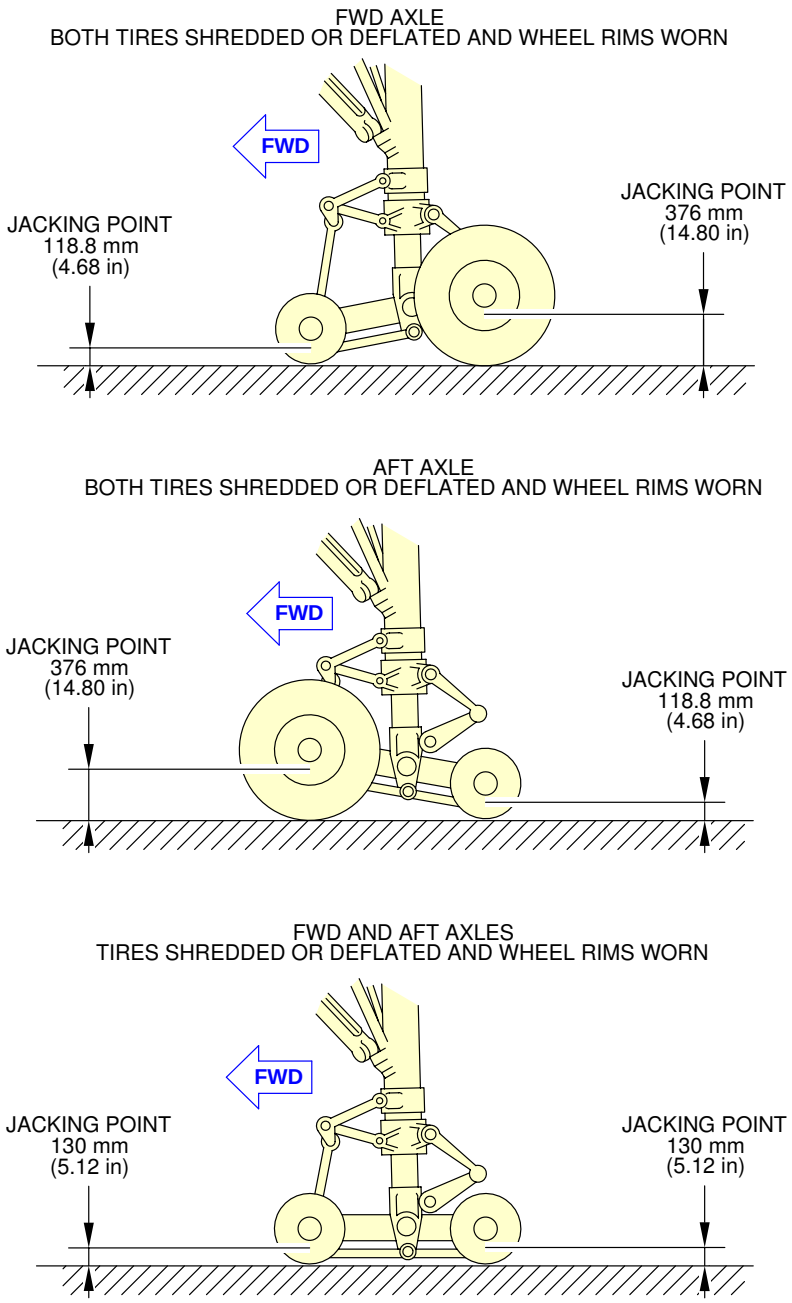
Jacking of the Landing Gear
Jacking of the Landing Gear (Sheet 2 of 3)
FIGURE-2-14-1-991-027-A01

**ON A/C A330-700L



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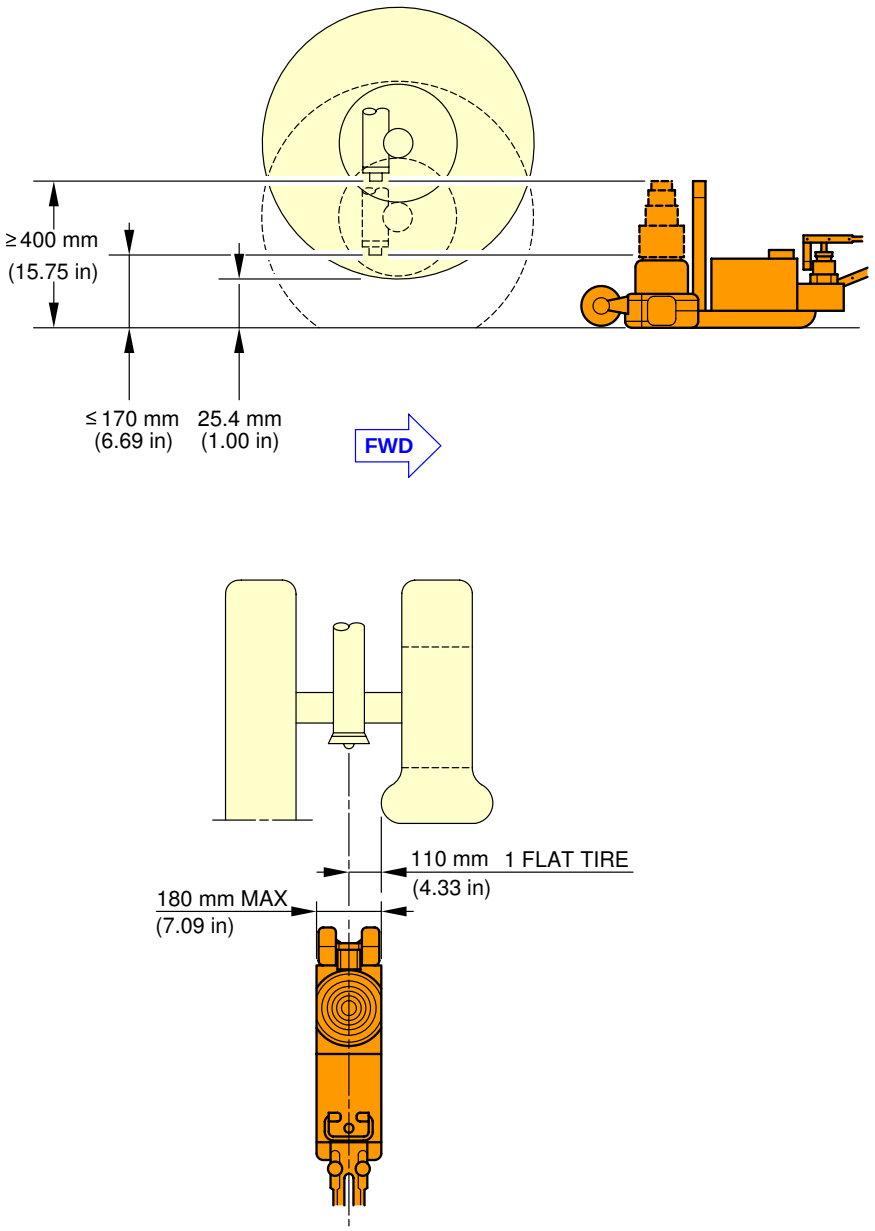
Jacking of the Landing Gear
Jacking of the Landing Gear (Sheet 3 of 3)
FIGURE-2-14-1-991-027-A01

**ON A/C A330-700L



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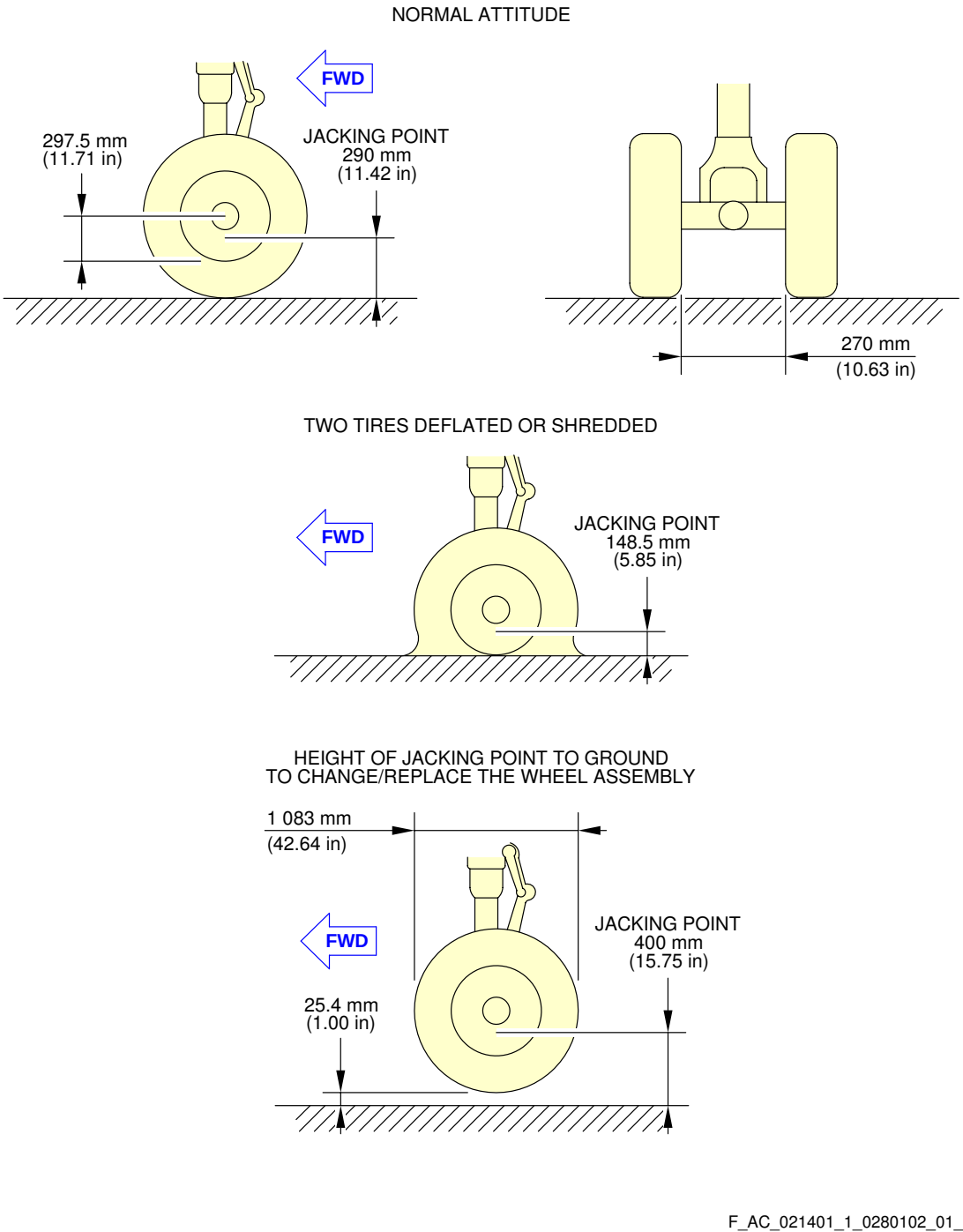
Jacking of the Landing Gear
(Sheet 1 of 2)
FIGURE-2-14-1-991-028-A01

**ON A/C A330-700L



Jacking of the Landing Gear
(Sheet 2 of 2)
FIGURE-2-14-1-991-028-A01

GROUND MANEUVERING

4-1-0 General Information

**ON A/C A330-700L

General Information

1. This section gives aircraft 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 airlines in question prior to layout planning.

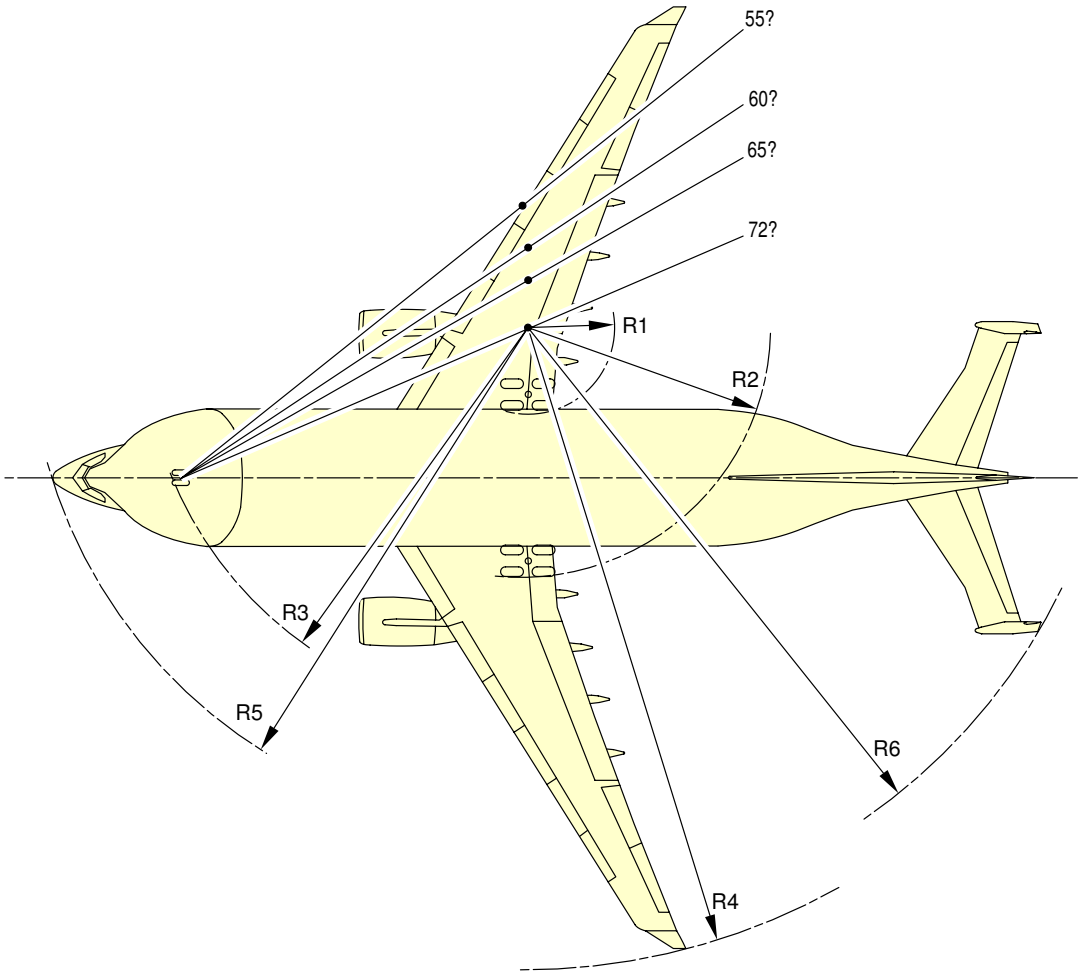
4-2-0 Turning Radii

**ON A/C A330-700L

Turning Radii

1. This section gives the turning radii.

**ON A/C A330-700L



NOTE:
FOR TURNING RADII VALUES, REFER TO SHEET 2.

F_AC_040200_1_0180101_01_00

Turning Radii
(Sheet 1)
FIGURE-4-2-0-991-018-A01

**ON A/C A330-700L

BELUGA XL TURNING RADII									
TYPE OF TURN	STEERING ANGLE (deg)	EFFECTIVE STEERING ANGLE (deg)		R1 RMLG	R2 LMLG	R3 NLG	R4 WING	R5 NOSE	R6 TAIL
2	20	19.2	m	59.3	70.0	68.0	94.4	70.6	80.4
			ft	195	230	223	310	232	264
2	25	23.9	m	45.7	56.4	55.3	80.9	58.5	68.2
			ft	150	185	181	265	192	224
2	30	28.6	m	36.3	47.0	46.8	71.6	50.8	60.1
			ft	119	154	154	235	167	197
2	35	33.3	m	29.4	40.1	40.9	64.7	45.4	54.4
			ft	96	132	134	212	149	178
2	40	38.0	m	24.0	34.7	36.5	59.4	41.6	50.2
			ft	79	114	120	195	136	165
2	45	42.5	m	19.8	30.5	33.2	55.3	38.8	47.1
			ft	65	100	109	181	127	155
2	50	46.9	m	16.4	27.1	30.8	51.9	36.8	44.7
			ft	54	89	101	170	121	147
2	55	51.2	m	13.5	24.1	28.8	49.1	35.2	42.7
			ft	44	79	94	161	115	140
2	60	55.1	m	11.1	21.8	27.4	46.8	34.1	41.3
			ft	36	72	90	154	112	135
2	65	59.6	m	8.6	19.3	26.0	44.4	33	39.8
			ft	28	63	85	146	108	131
2	72	62.0	m	7.4	18.1	25.4	43.2	32.6	39.1
			ft	24	59	83	142	107	128
1	50	48.4	m	15.3	26.0	30.0	50.9	36.2	43.7
			ft	50	85	98	167	119	143
1	55	52.2	m	12.8	23.5	28.4	48.5	34.9	42.4
			ft	42	77	93	159	115	139
1	60	57.7	m	9.6	20.3	26.5	45.4	33.4	40.4
			ft	31	67	87	149	110	133
1	65	62.2	m	7.3	18.0	25.3	43.1	32.5	39
			ft	24	59	83	141	107	128
1	72	68.1	m	4.5	15.2	24.1	40.4	31.6	37.6
			ft	15	50	79	133	104	123

NOTE:

ABOVE 50?, AIRLINES MAY USE TYPE 1 OR TYPE 2 TURNS DEPENDING ON THE SITUATION.
TYPE 1 TURNS USE:
ASYMMETRIC THRUST DURING THE WHOLE TURN AND
DIFFERENTIAL BRAKING TO INITIATE THE TURN ONLY.
TYPE 2 TURNS USE:
SYMMETRIC THRUST DURING THE WHOLE TURN AND NO DIFFERENTIAL BRAKING AT ALL.
IT IS POSSIBLE TO GET LOWER VALUES THAN THOSE FROM TYPE 1 BY APPLYING
DIFFERENTIAL BRAKING DURING THE WHOLE TURN.

F_AC_040200_1_0190101_01_00

Turning Radii
(Sheet 2)
FIGURE-4-2-0-991-019-A01

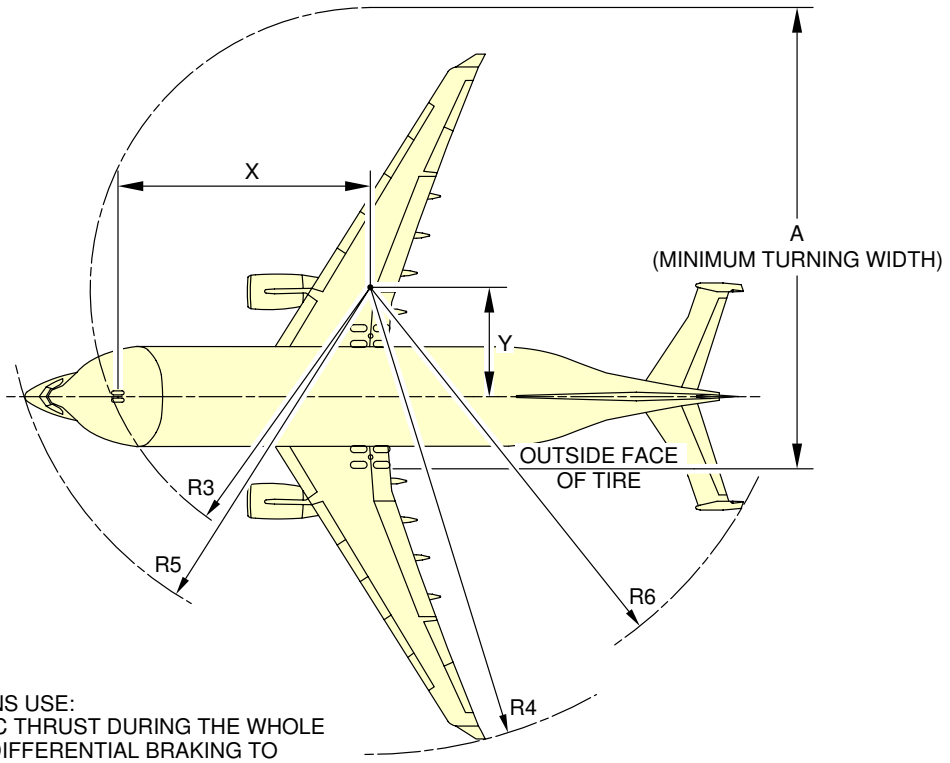
4-3-0 Minimum Turning Radii

**ON A/C A330-700L

Minimum Turning Radii

1. This section gives the minimum turning radii.

**ON A/C A330-700L



NOTE:

TYPE 1 TURNS USE:
ASYMMETRIC THRUST DURING THE WHOLE TURN; AND DIFFERENTIAL BRAKING TO INITIATE THE TURN ONLY.
TYPE 2 TURNS USE:
SYMMETRIC THRUST DURING THE WHOLE TURN; AND NO DIFFERENTIAL BRAKING AT ALL.

BELUGA XL MINIMUM TURNING RADII										
TYPE OF TURN	STEERING ANGLE (deg)	EFFECTIVE STEERING ANGLE (deg)		X	Y	A	R3 NLG	R4 WING	R5 NOSE	R6 TAIL
1	72 (MAX)	68.1	m	22.2	8.9	39.7	24.1	40.4	31.6	37.6
			ft	73	29	130	79	133	104	123
2	72 (MAX)	62.0	m	22.2	11.8	43.8	25.4	43.2	32.6	39.1
			ft	73	39	144	83	142	107	128
1	65 (MAX)	62.2	m	22.2	11.7	43.6	25.3	43.1	32.5	39
			ft	73	38	143	83	141	107	128
2	65 (MAX)	59.6	m	22.2	13	45.6	26	44.4	33	39.8
			ft	73	43	150	85	146	108	131

NOTE:

IT IS POSSIBLE TO GET LOWER VALUES THAN THOSE FROM TYPE 1 BY APPLYING DIFFERENTIAL BRAKING DURING THE WHOLE TURN.

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Minimum Turning Radii
FIGURE-4-3-0-991-010-A01

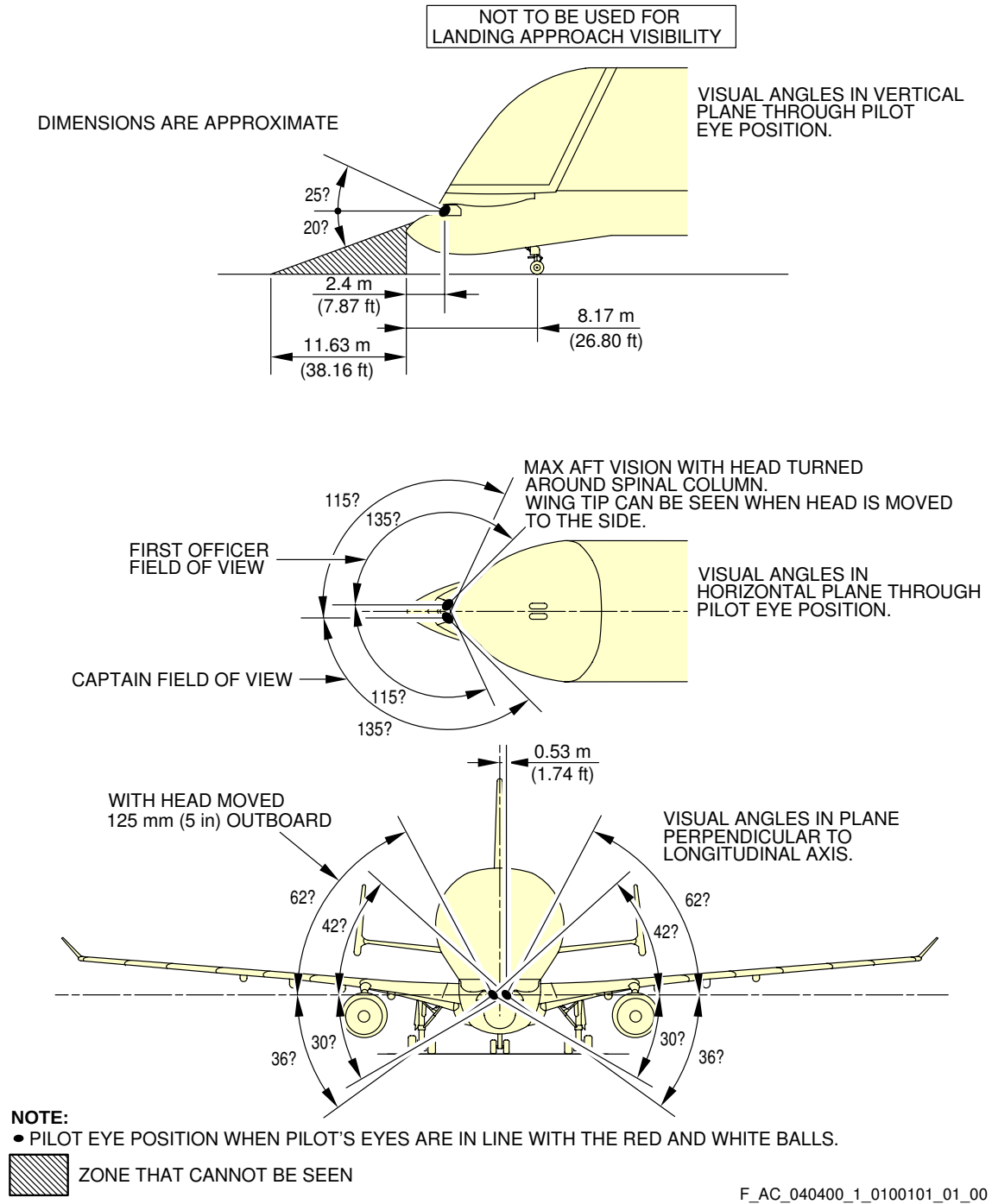
4-4-0 Visibility from Cockpit in Static Position

**ON A/C A330-700L

Visibility from Cockpit in Static Position

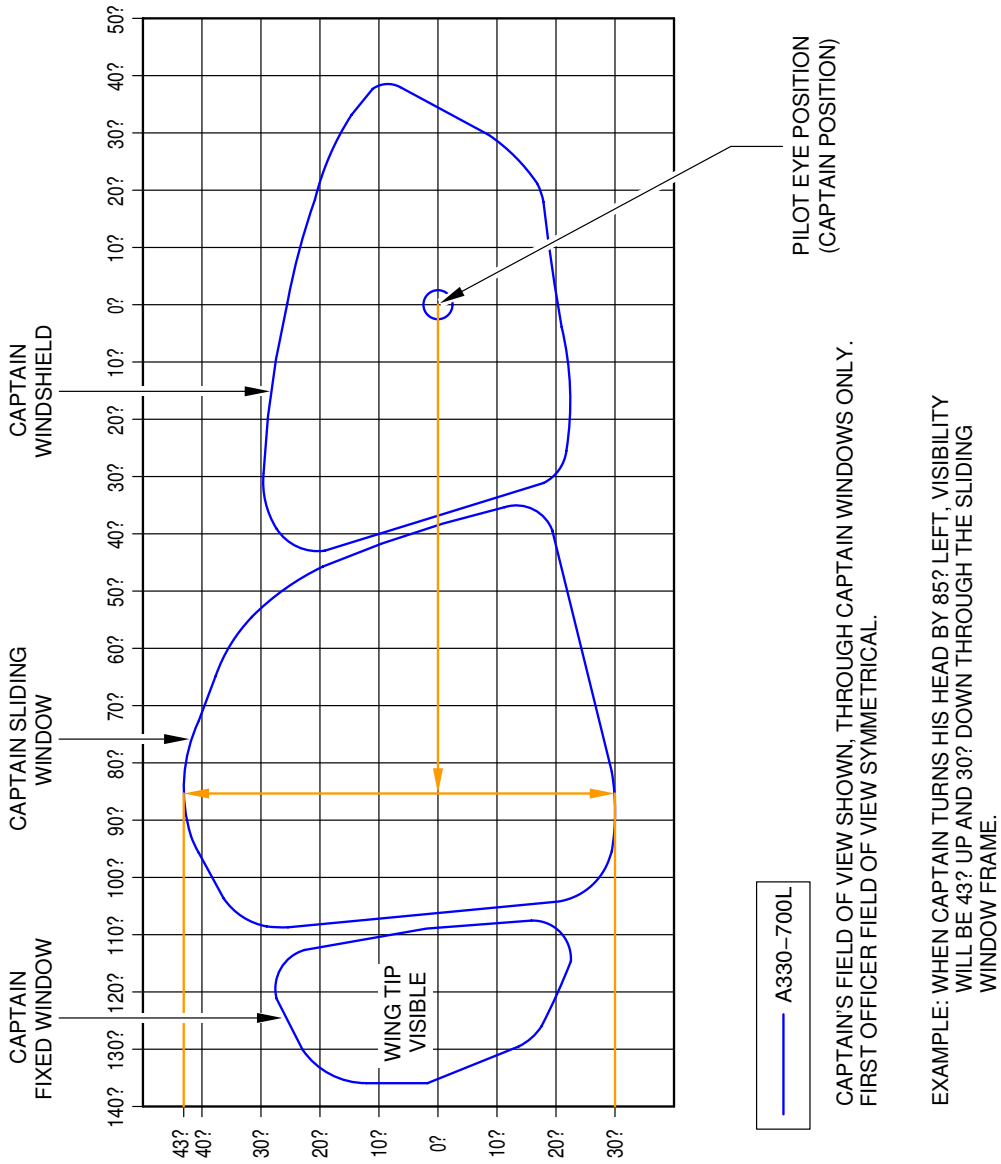
1. This section gives the visibility from cockpit in static position.

**ON A/C A330-700L



Visibility from Cockpit in Static Position
FIGURE-4-4-0-991-010-A01

**ON A/C A330-700L



Binocular Visibility Through Windows from Captain Eye Position
FIGURE-4-4-0-991-011-A01

4-5-0 Runway and Taxiway Turn Paths

**ON A/C A330-700L

Runway and Taxiway Turn Paths

1. Runway and Taxiway Turn Paths.

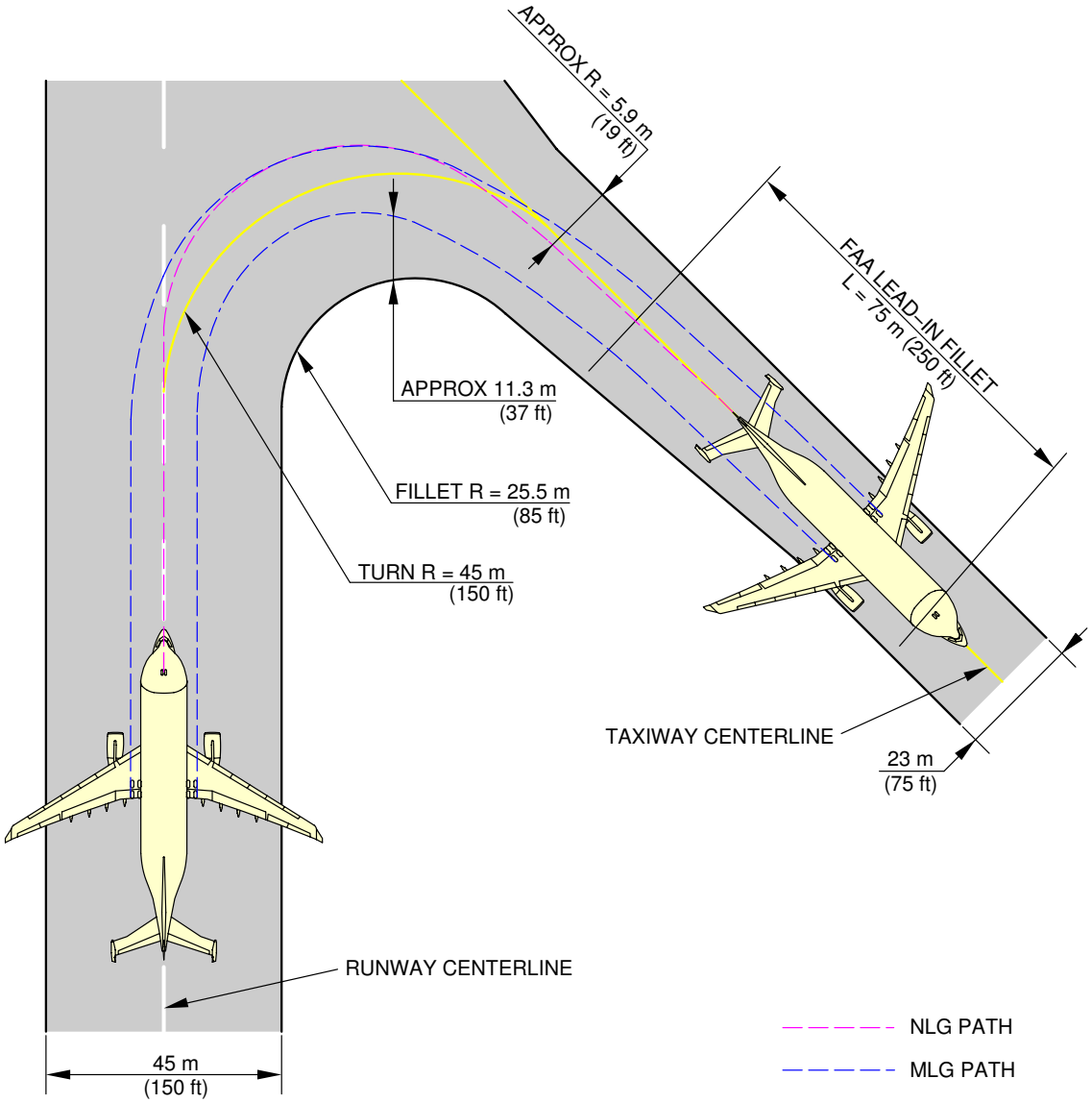
4-5-1 135° Turn - Runway to Taxiway

**ON A/C A330-700L

135° Turn - Runway to Taxiway

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

**ON A/C A330-700L



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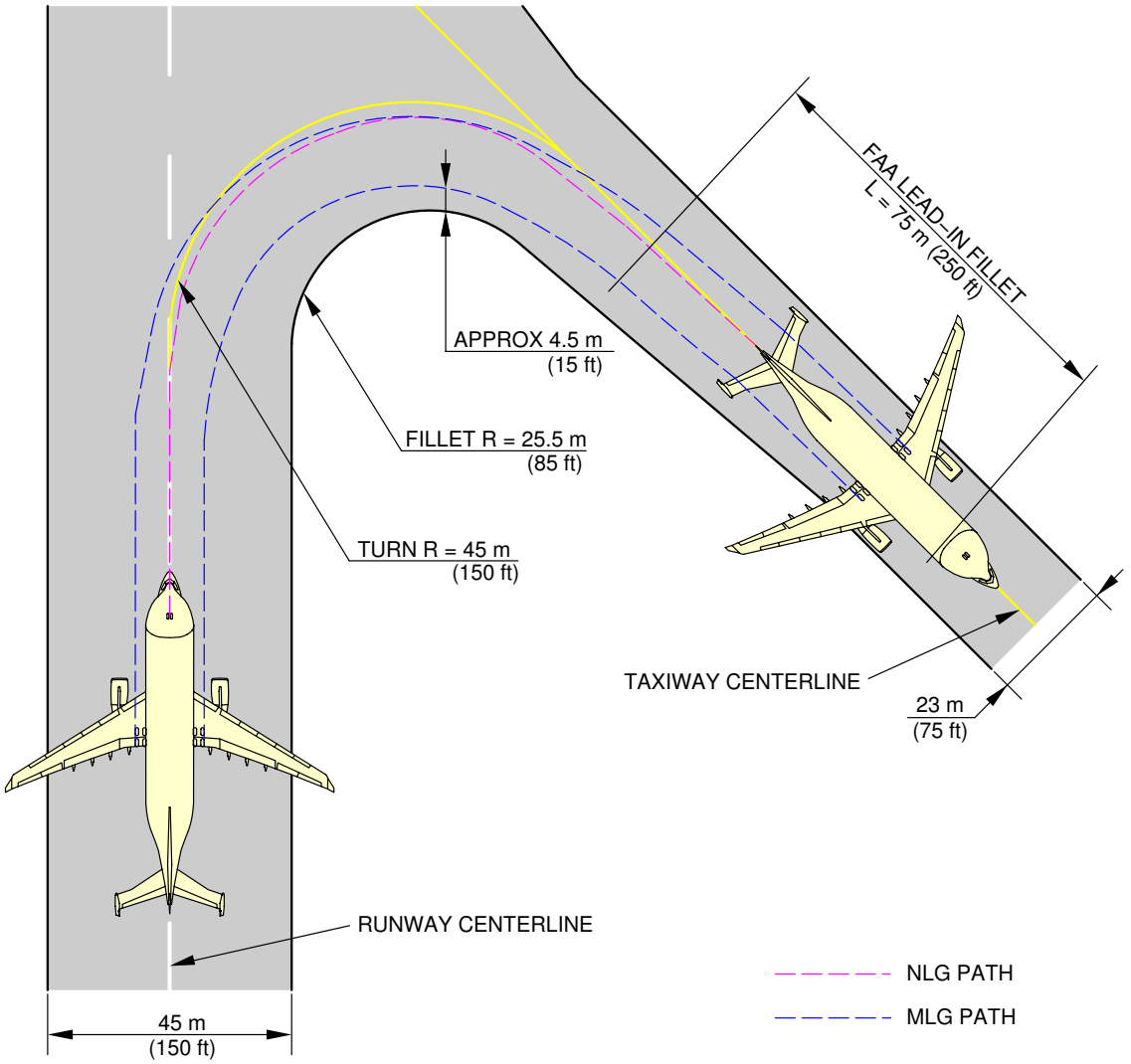
135° Turn - Runway to Taxiway
Judgemental Oversteer Method
FIGURE-4-5-1-991-013-A01

**ON A/C A330-700L



F_AC_040501_1_0140101_01_00

135° Turn - Runway to Taxiway
Cockpit Over Centerline Method
FIGURE-4-5-1-991-014-A01

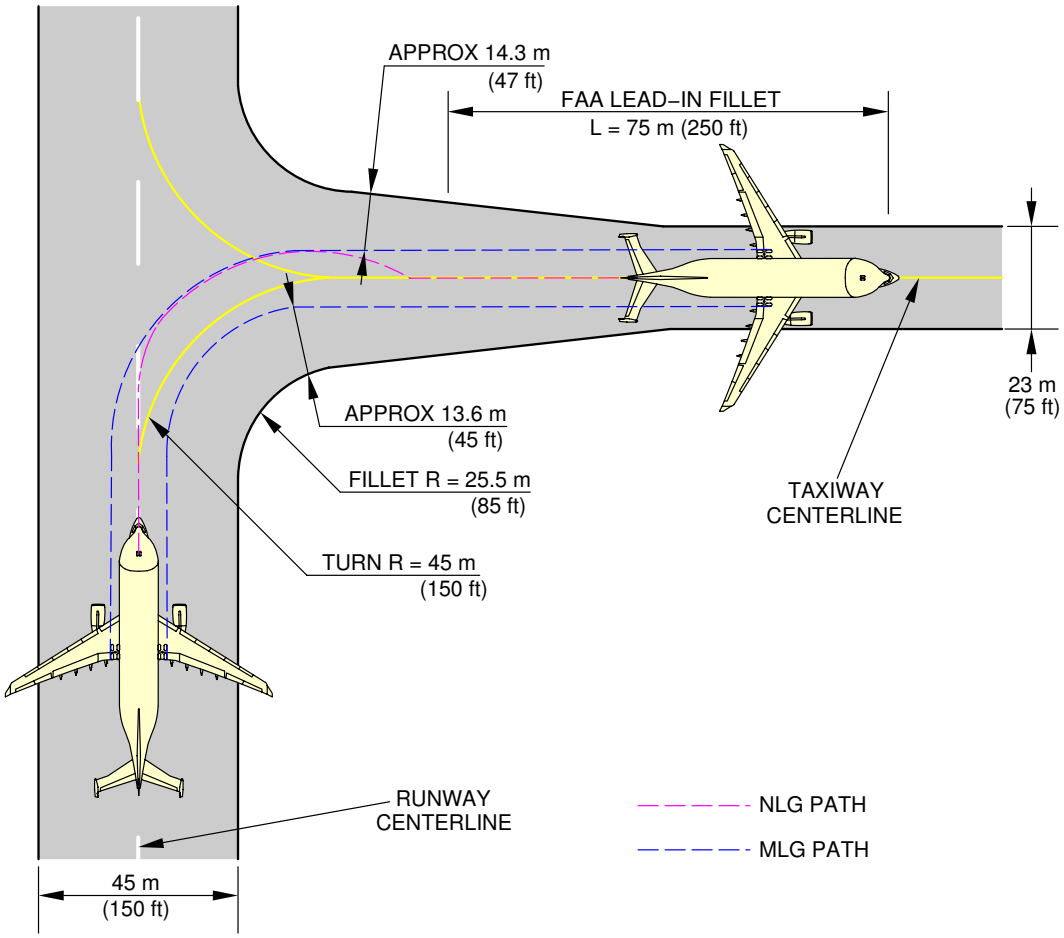
4-5-2 90° Turn - Runway to Taxiway

**ON A/C A330-700L

90° Turn - Runway to Taxiway

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

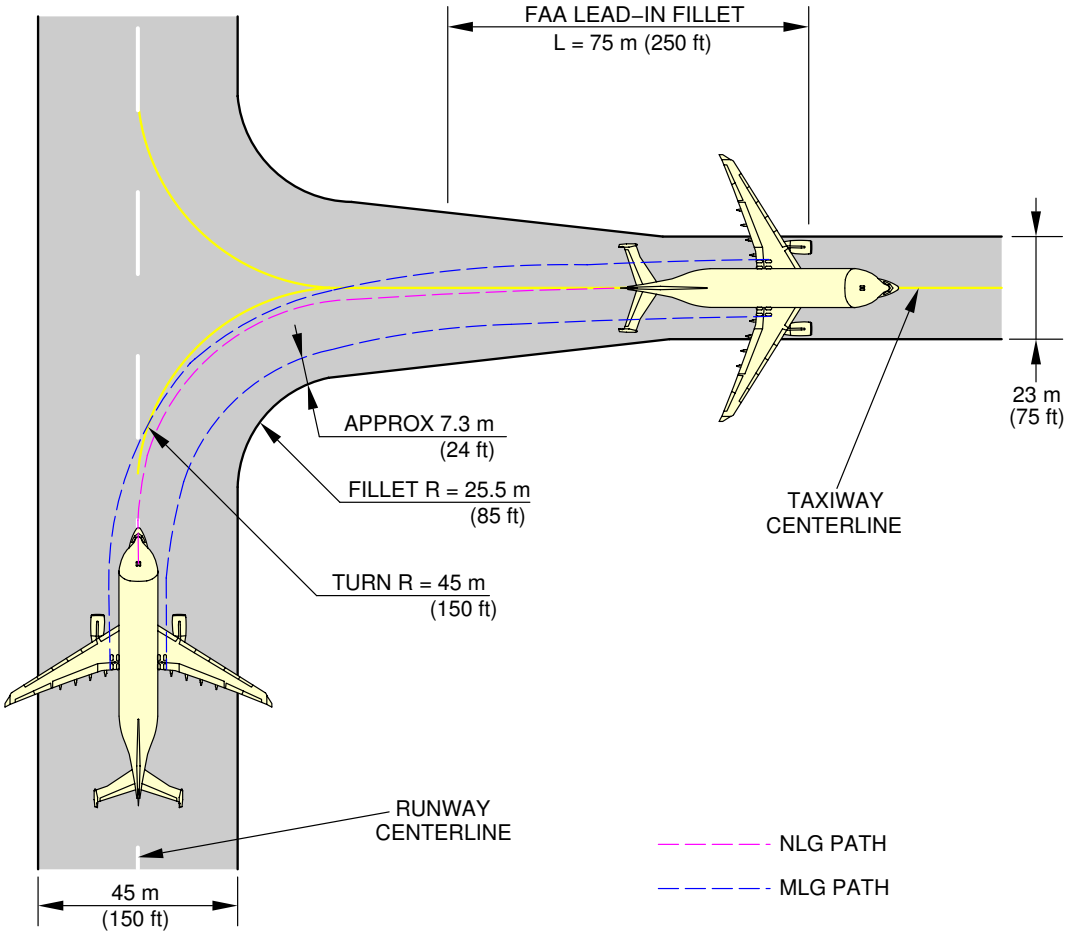
**ON A/C A330-700L



F_AC_040502_1_0150101_01_00

90° Turn - Runway to Taxiway
Judgemental Oversteer Method
FIGURE-4-5-2-991-015-A01

**ON A/C A330-700L



F_AC_040502_1_0160101_01_00

90° Turn - Runway to Taxiway
Cockpit Over Centerline Method
FIGURE-4-5-2-991-016-A01

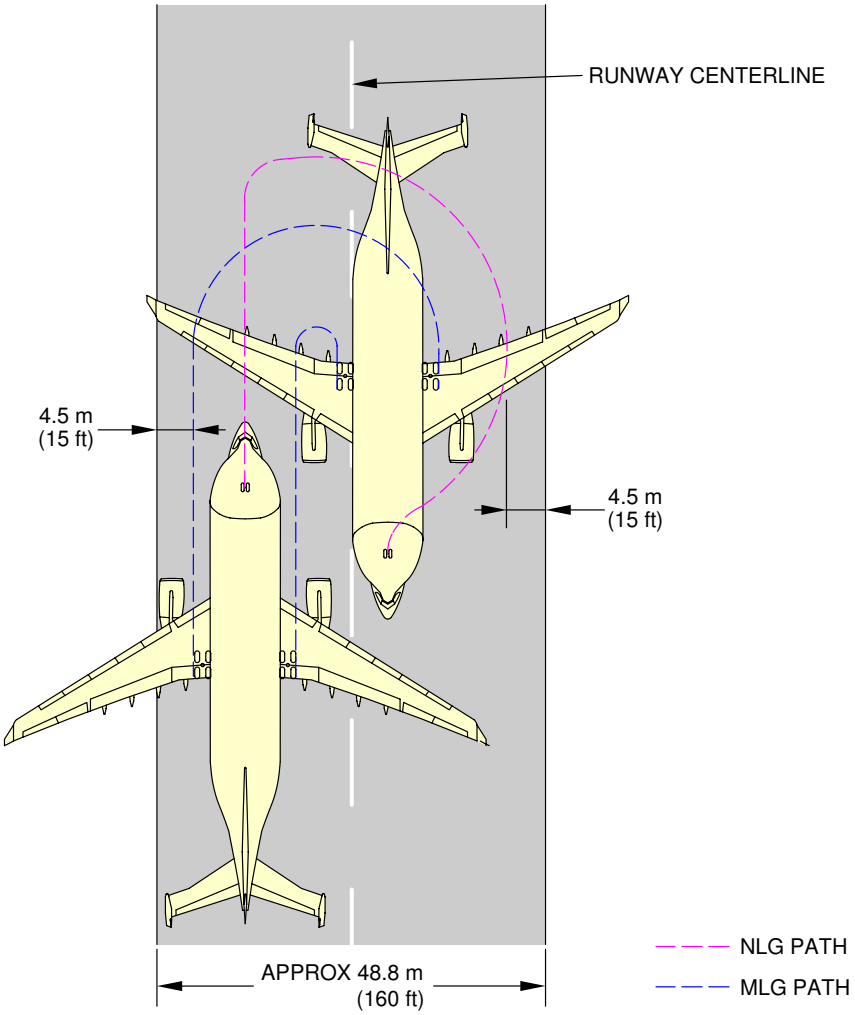
4-5-3 180° Turn on a Runway

**ON A/C A330-700L

180° Turn on a Runway

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

**ON A/C A330-700L



F_AC_040503_1_0170101_01_00

180° Turn on a Runway
FIGURE-4-5-3-991-017-A01

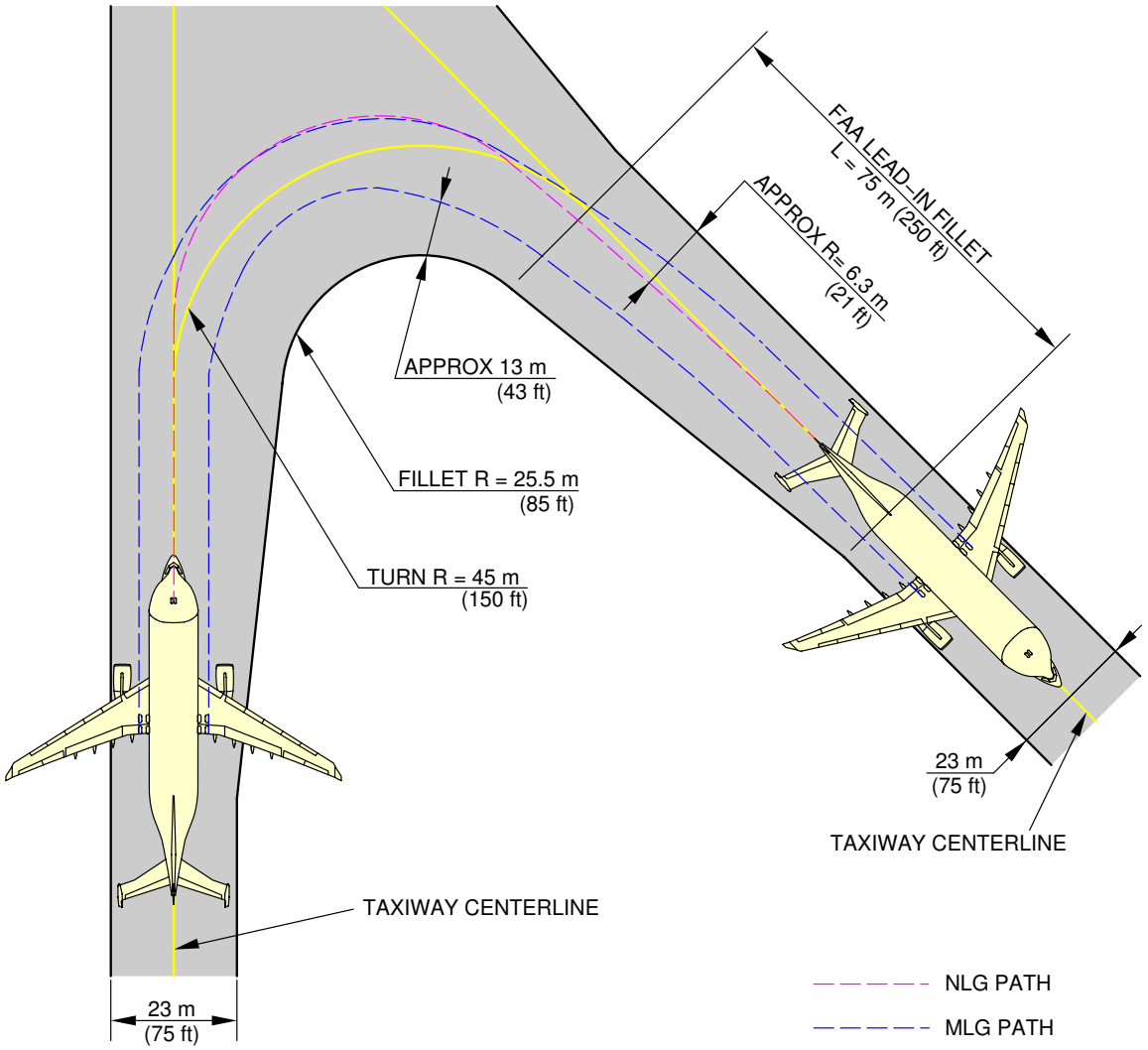
4-5-4 135° Turn - Taxiway to Taxiway

**ON A/C A330-700L

135° Turn - Taxiway to Taxiway

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

**ON A/C A330-700L



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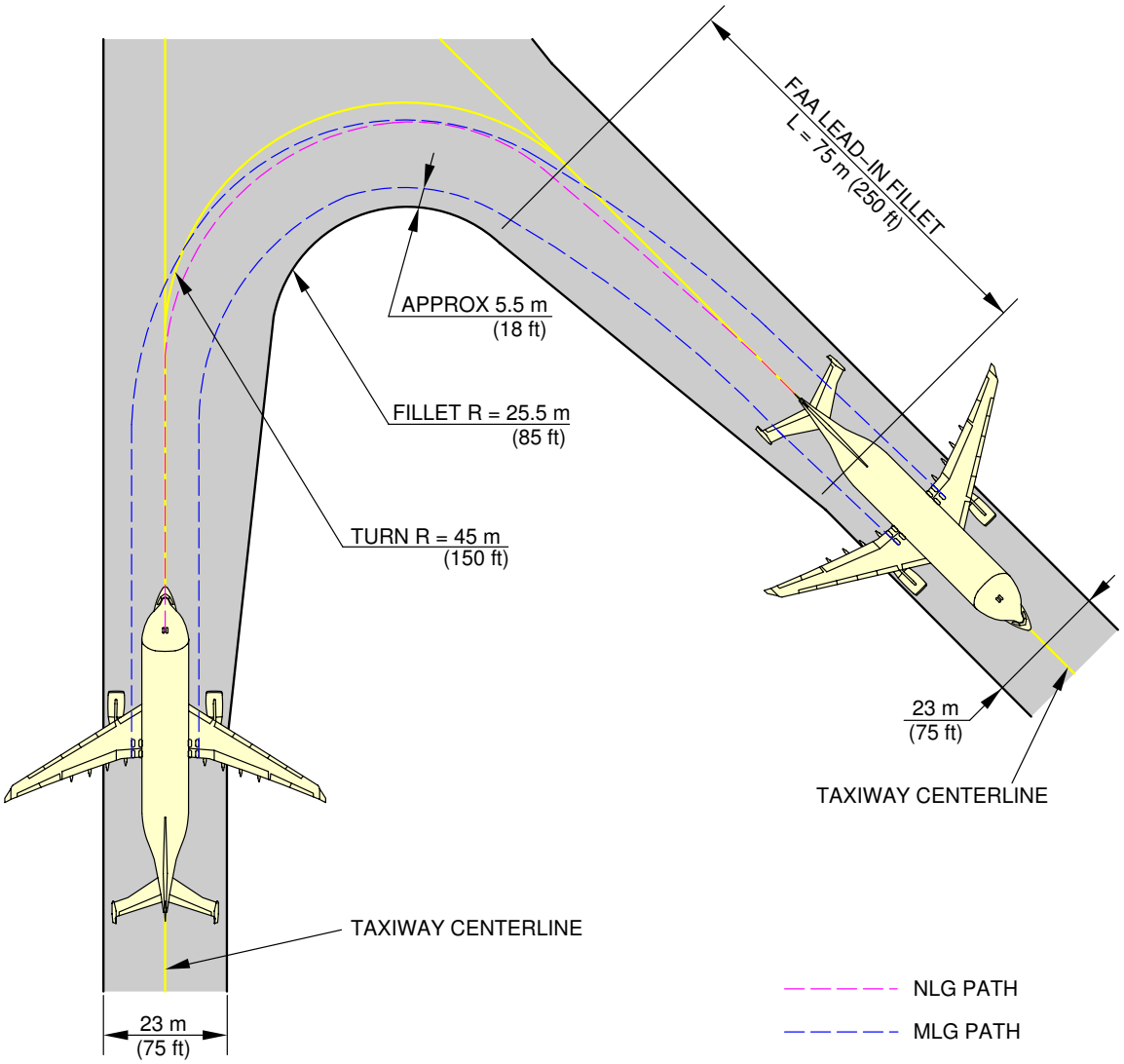
135° Turn - Taxiway to Taxiway
Judgemental Oversteer Method
FIGURE-4-5-4-991-015-A01

**ON A/C A330-700L



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135° Turn - Taxiway to Taxiway
Cockpit Over Centerline Method
FIGURE-4-5-4-991-016-A01

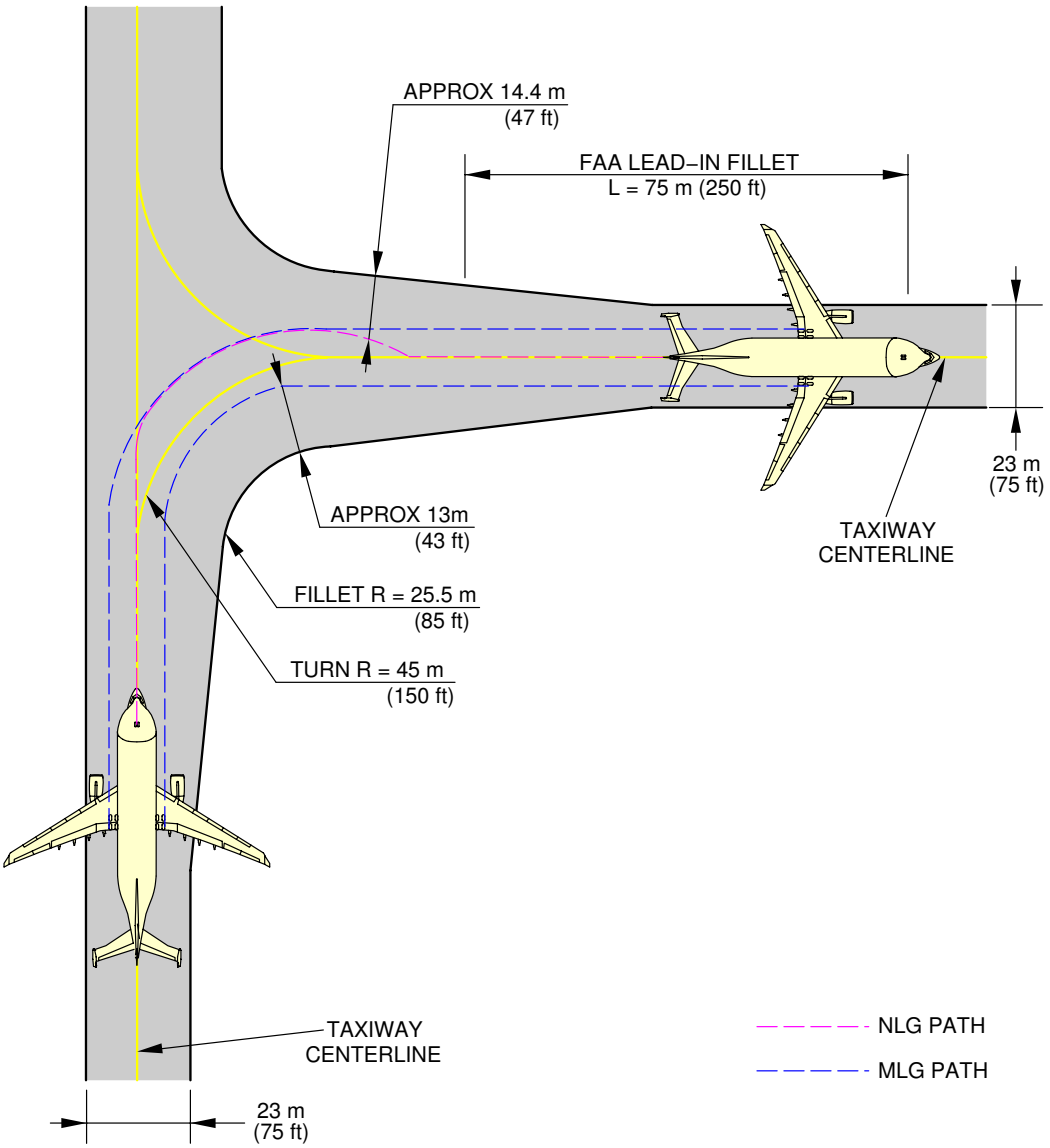
4-5-5 90° Turn - Taxiway to Taxiway

**ON A/C A330-700L

90° Turn - Taxiway to Taxiway

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

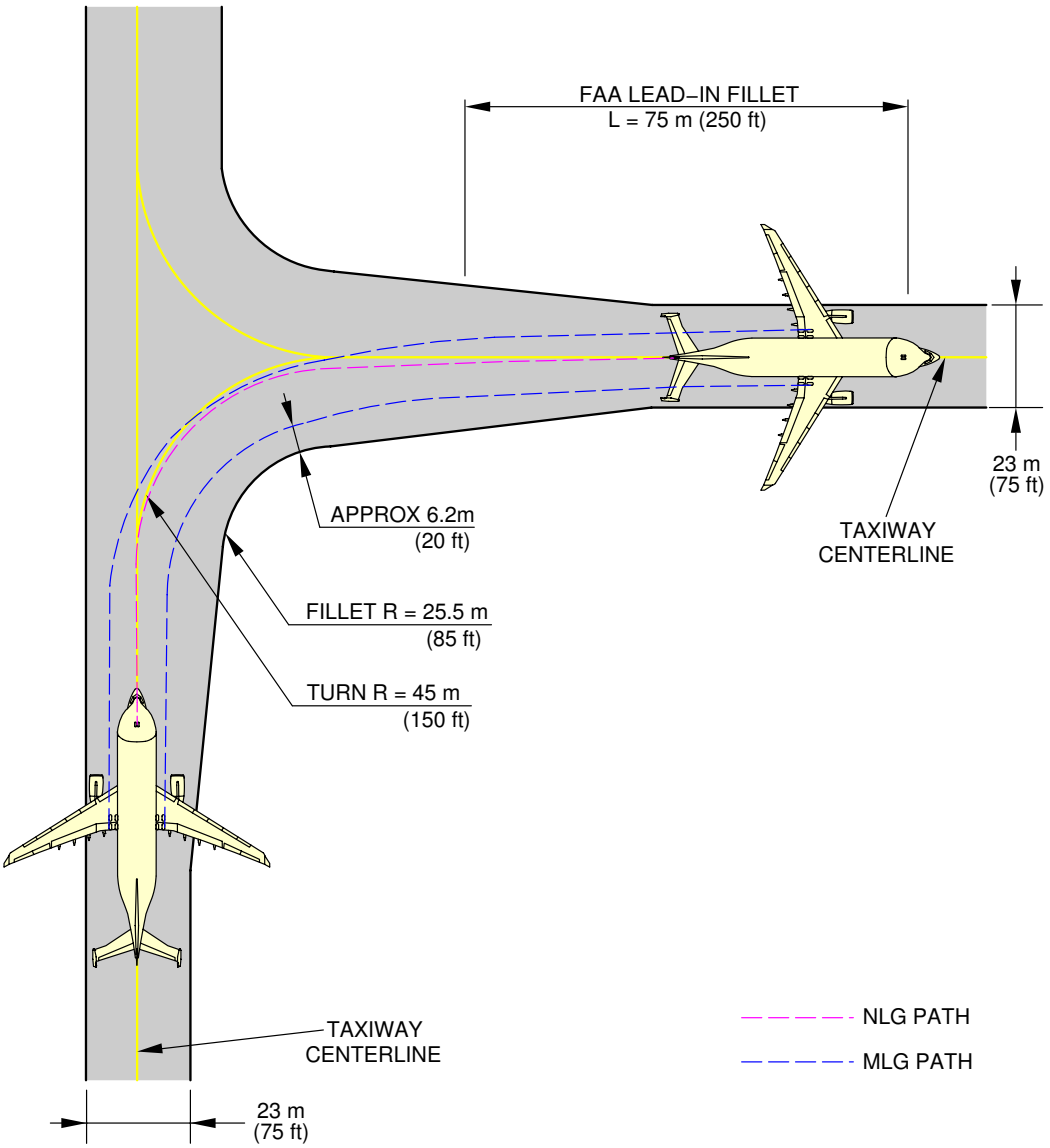
**ON A/C A330-700L



F_AC_040505_1_0170101_01_00

90° Turn - Taxiway to Taxiway
Judgemental Oversteer Method
FIGURE-4-5-5-991-017-A01

**ON A/C A330-700L



F_AC_040505_1_0180101_01_00

90° Turn - Taxiway to Taxiway
Cockpit Over Centerline Method
FIGURE-4-5-5-991-018-A01

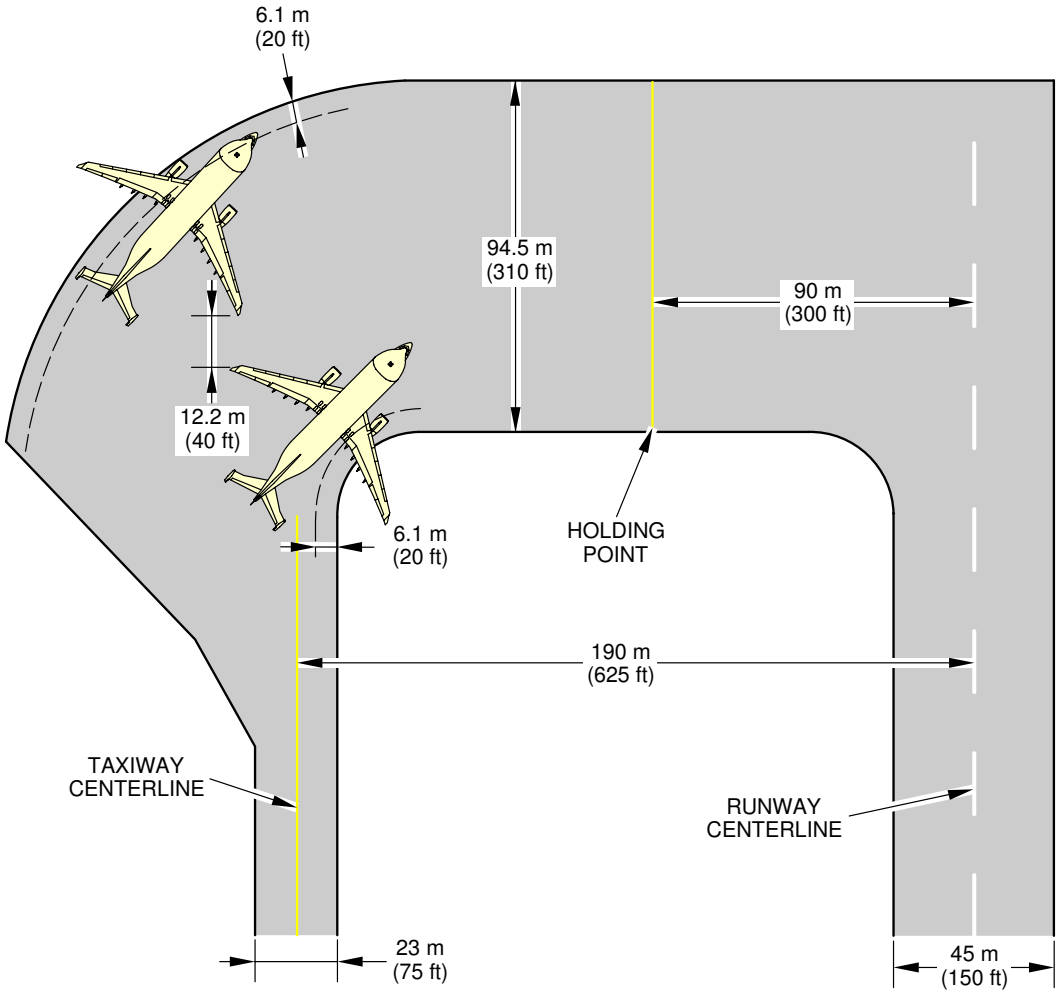
4-6-0 Runway Holding Bay (Apron)

**ON A/C A330-700L

Runway Holding Bay (Apron)

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

**ON A/C A330-700L



NOTE:

COORDINATE WITH USING AIRLINE FOR SPECIFIC PLANNED OPERATING PROCEDURES.

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Runway Holding Bay (Apron)
FIGURE-4-6-0-991-007-A01

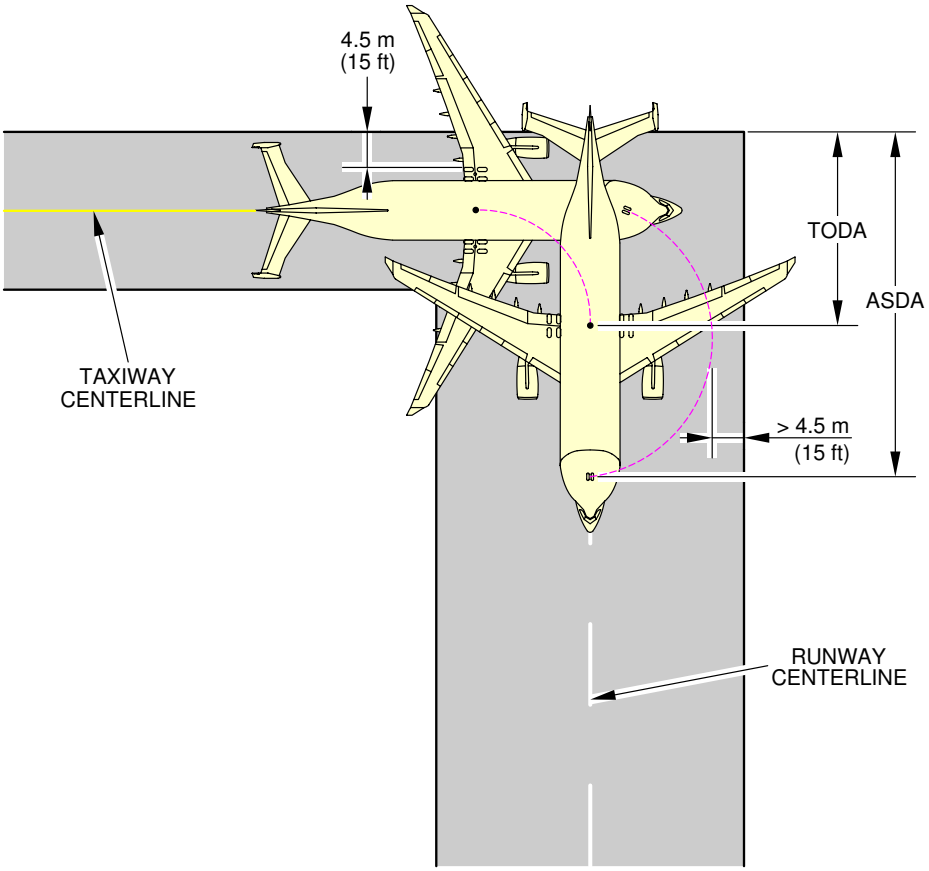
4-7-0 Minimum Line-Up Distance Corrections

**ON A/C A330-700L

Minimum Line-Up Distance Corrections

1. The ground maneuvers were performed using asymmetric thrust and differential-only braking to initiate the turn.
   TODA: Take-Off Distance Available
   ASDA: Acceleration-Stop Distance Available
2. 90° Turn on Runway Entry
   This section gives the minimum line-up distance correction for a 90° turn on runway entry.
   This maneuver consists in a 90° turn at minimum turn radius. It starts with the edge of the MLG at a distance of 4.5 m (15 ft) from the taxiway edge, and finishes with the aircraft aligned on the centerline of the runway, see FIGURE 4-7-0-991-028-A.
   During the turn, all the clearances must meet the minimum value of 4.5 m (15 ft) for this category of aircraft as recommended in ICAO Annex 14.
3. 180° Turn on Runway Turn Pad
   This section gives the minimum line-up distance correction for a 180° turn on the runway turn pad.
   This maneuver consists in a 180° turn at minimum turn radius on a runway turn pad with standard ICAO geometry.
   It starts with the edge of the MLG at a distance of 4.5 m (15 ft) from the pavement edge, and it finishes with the aircraft aligned on the centerline of the runway, see FIGURE 4-7-0-991-029-A.
   During the turn, all the clearances must meet the minimum value of 4.5 m (15 ft) for this category of aircraft as recommended in ICAO Annex 14.
4. 180° Turn on Runway Width
   This section gives the minimum line-up distance correction for a 180° turn on the runway width.
   For this maneuver, the pavement width is considered to be the runway width, which is a frozen parameter (45 m (150 ft) and 60 m (200 ft)).
   As per the standard operating procedures for the "180° turn on runway" (described in the Flight Crew Operating Manual), the aircraft is initially angled with respect to the runway centerline when starting the 180° turn, see FIGURE 4-7-0-991-030-A.
   The value of this angle depends on the aircraft type and is mentioned in the FCOM.
   During the turn, all the clearances must meet the minimum value of 4.5 m (15 ft) for this category of aircraft as recommended in ICAO Annex 14.

**ON A/C A330-700L



90? TURN ON RUNWAY ENTRY					
AIRCRAFT TYPE	MAX STEERING ANGLE	45 m (150 ft)/60 m (200 ft) WIDE RUNWAY			
		MINIMUM LINE–UP DISTANCE CORRECTION			
		ON TODA		ON ASDA	
A330–700L	65?	22.5 m	74 ft	44.7 m	147 ft
A330–700L	72?	19.7 m	65 ft	41.9 m	137 ft

NOTE:
ASDA: ACCELERATION–STOP DISTANCE AVAILABLE
TODA: TAKE–OFF DISTANCE AVAILABLE

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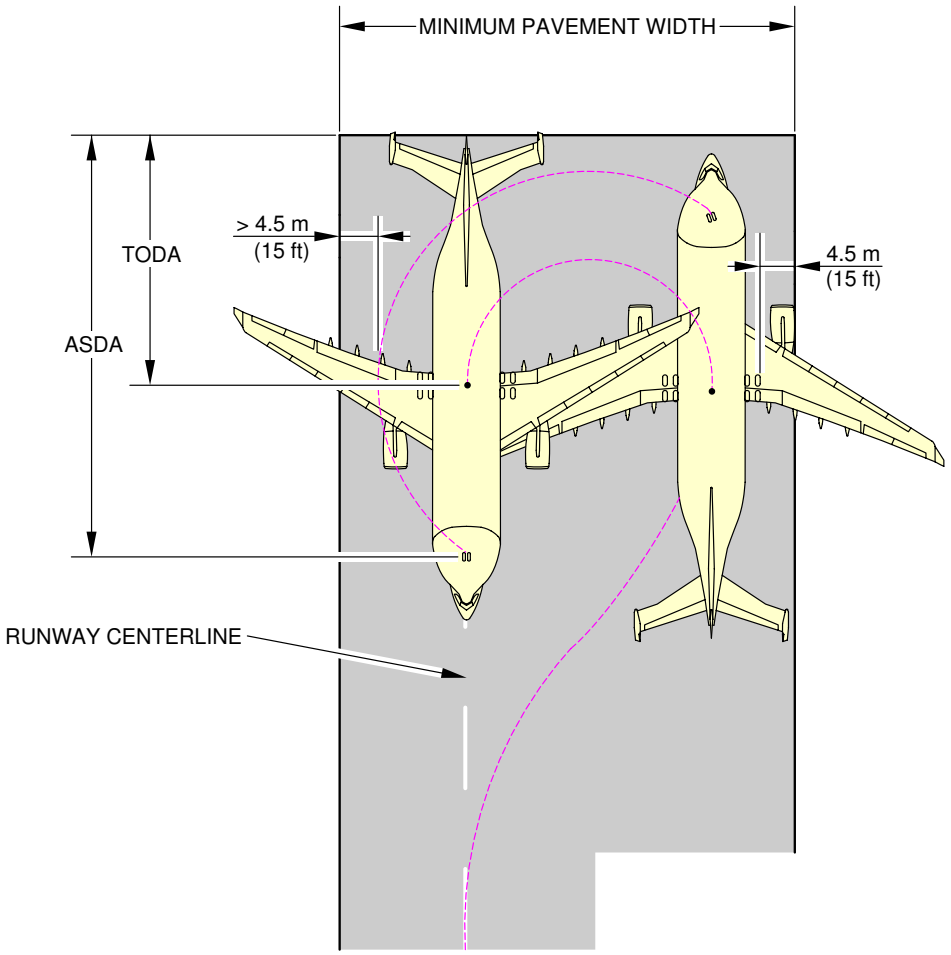
Minimum Line-Up Distance Corrections
90° Turn on Runway Entry
FIGURE-4-7-0-991-028-A01

**ON A/C A330-700L



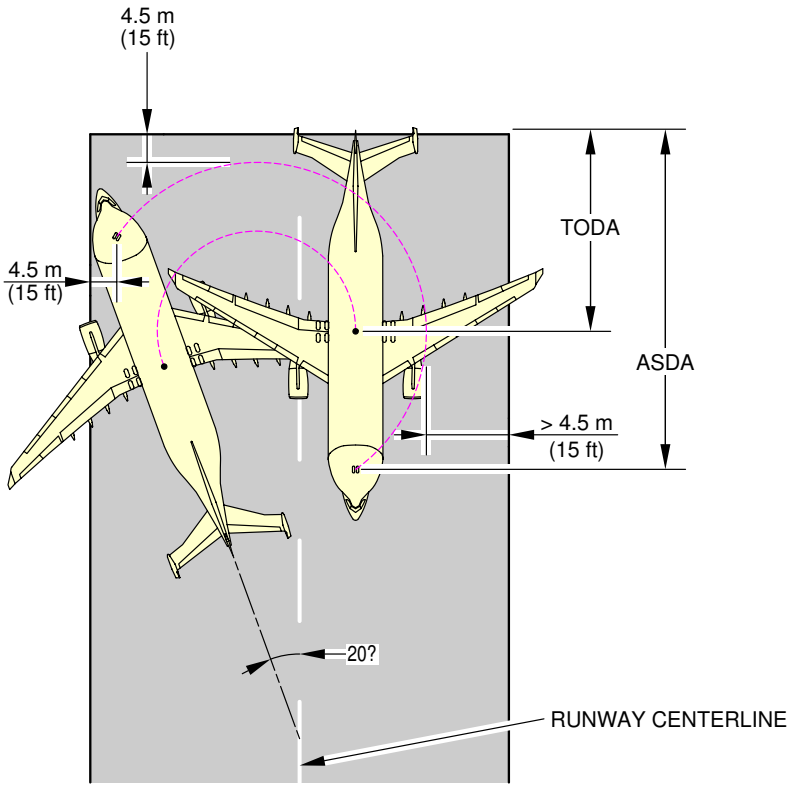
180? TURN ON RUNWAY TURNPAD							
AIRCRAFT TYPE	MAX STEERING ANGLE	45 m (150 ft)/60 m (200 ft) WIDE RUNWAY MINIMUM LINE–UP DISTANCE CORRECTION				REQUIRED MINIMUM PAVEMENT WIDTH	
		ON TODA		ON ASDA			
A330–700L	65?	30.1 m	99 ft	52.2 m	171 ft	56.7 m	186 ft
A330–700L	72?	28.9 m	95 ft	51.1 m	168 ft	51.1 m	168 ft

NOTE:
ASDA: ACCELERATION–STOP DISTANCE AVAILABLE
TODA: TAKE–OFF DISTANCE AVAILABLE

F_AC_040700_1_0290101_01_00

Minimum Line-Up Distance Corrections
180° Turn on Runway Turn Pad
FIGURE-4-7-0-991-029-A01

**ON A/C A330-700L



180? TURN ON RUNWAY WIDTH							
AIRCRAFT TYPE	MAX STEERING ANGLE	45 m (150 ft) WIDE RUNWAY (STANDARD WIDTH)		60 m (200 ft) WIDE RUNWAY			
		MINIMUM LINE–UP DISTANCE CORRECTION		MINIMUM LINE–UP DISTANCE CORRECTION			
		ON TODA	ON ASDA	ON TODA		ON ASDA	
A330–700L	65?	NOT POSSIBLE		44.5 m	146 ft	66.6 m	219 ft
A330–700L	72?			28.9 m	95 ft	51.1 m	168 ft

NOTE:
ASDA: ACCELERATION–STOP DISTANCE AVAILABLE
TODA: TAKE–OFF DISTANCE AVAILABLE

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Minimum Line-Up Distance Corrections
180° Turn on Runway Width
FIGURE-4-7-0-991-030-A01

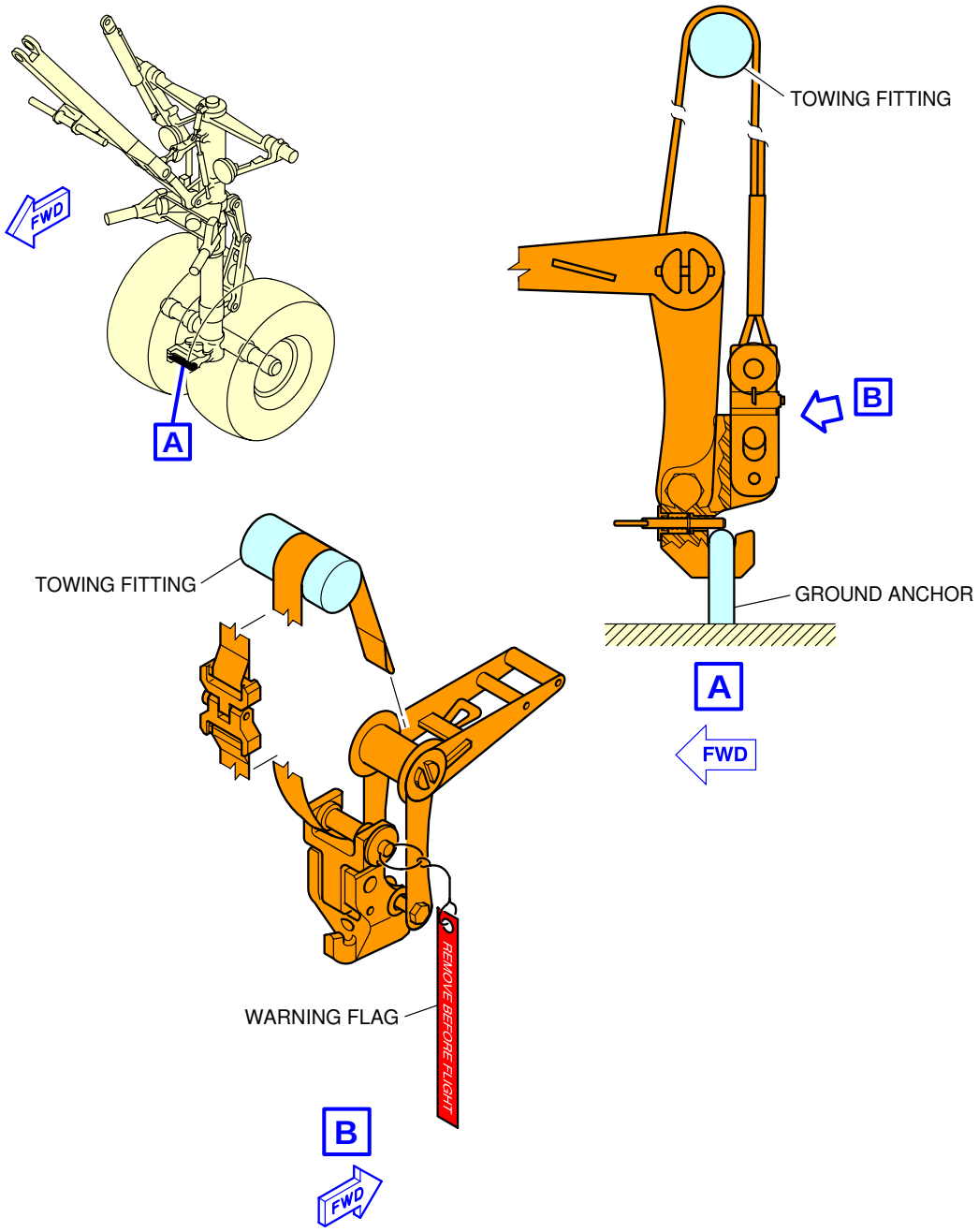
4-8-0 Aircraft Mooring

**ON A/C A330-700L

Aircraft Mooring

1. This section gives information on aircraft mooring.

**ON A/C A330-700L



Aircraft Mooring
FIGURE-4-8-0-991-002-A01

TERMINAL SERVICING

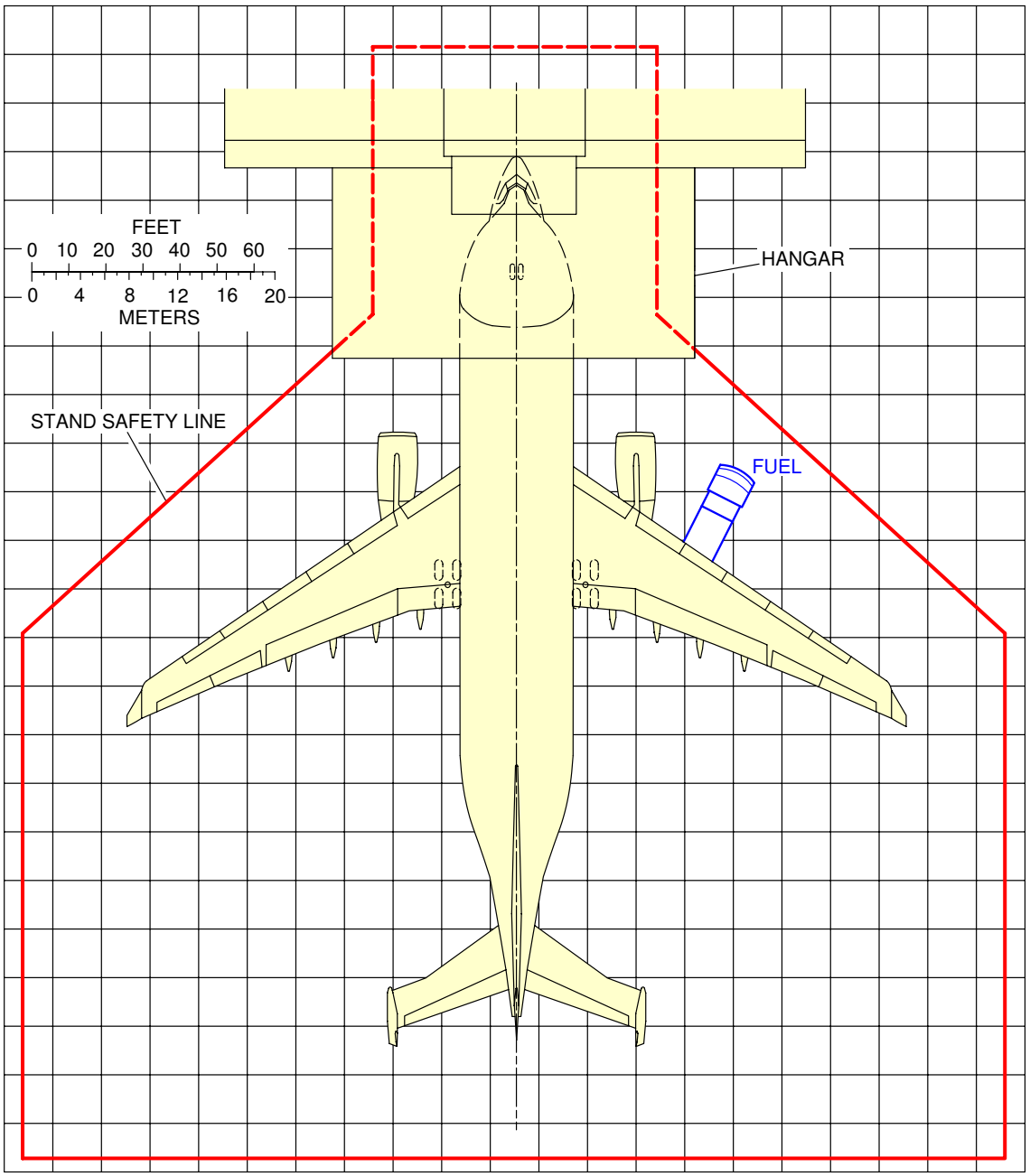
5-1-2 Typical Ramp Layout - Open Apron

**ON A/C A330-700L

05-01-02 Typical Ramp Layout

1. This section gives information about the typical ramp layout.

**ON A/C A330-700L



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Typical Ramp Layout
FIGURE-5-1-2-991-012-A01

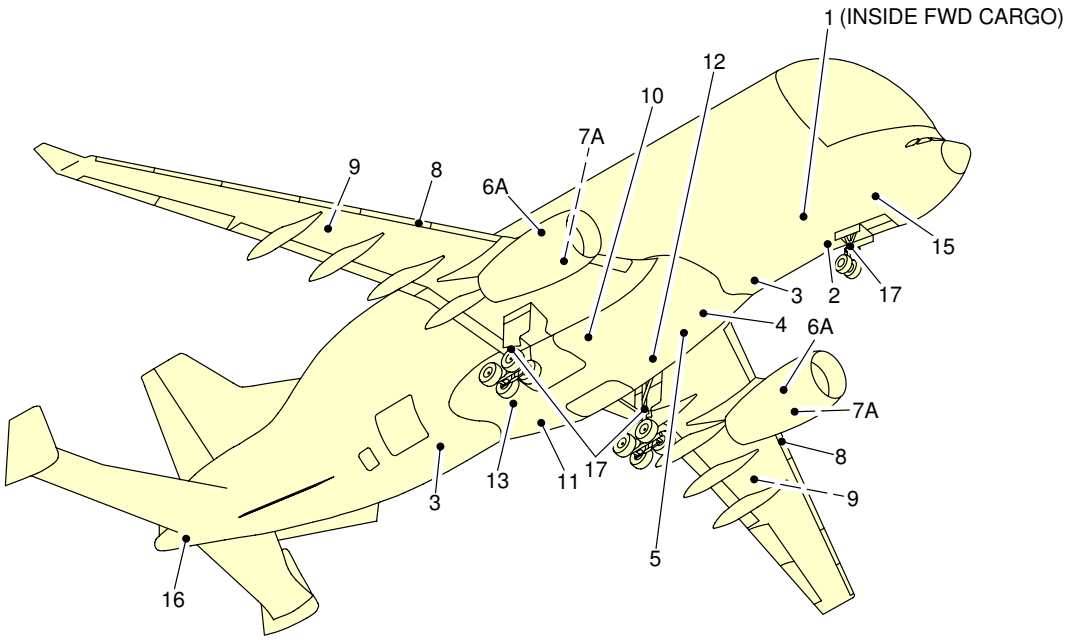
5-4-1 Ground Service Connections Layout

**ON A/C A330-700L

Ground Service Connections Layout

1. This section gives the ground service connections layout.

**ON A/C A330-700L



1 – OXYGEN SERVICING
2 – GROUND ELECTRICAL POWER CONNECTORS
3 – POTABLE WATER DRAIN
4 – LOW PRESSURE AIR PRE–CONDITIONING
5 – HIGH PRESSURE AIR PRE–CONDITIONING AND ENGINE STARTING
6A – ENGINE OIL FILLING
7A – IDG OIL FILLING
8 – PRESSURE REFUEL/DEFUEL COUPLINGS
9 – OVERWING REFUEL
10 – HYDRAULIC GROUND POWER SUPPLY (YELLOW)
11 – HYDRAULIC RESERVOIR FILLING AND GROUND POWER SUPPLY (GREEN)
12 – HYDRAULIC RESERVOIR AIR PRESSURIZATION AND GROUND POWER SUPPLY (BLUE)
13 – REFUEL/DEFUEL PANEL
15 – WASTE WATER SERVICE PANEL
16 – APU OIL FILLING
17 – GROUNDING (EARTHING) POINT

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Ground Service Connections Layout
FIGURE-5-4-1-991-007-A01

5-4-2 Grounding Points

**ON A/C A330-700L

Grounding (Earthing) Points

1. Grounding (Earthing) Points

NOTE : The mean height from ground in the below table may change according to the CG position and aircraft weight.

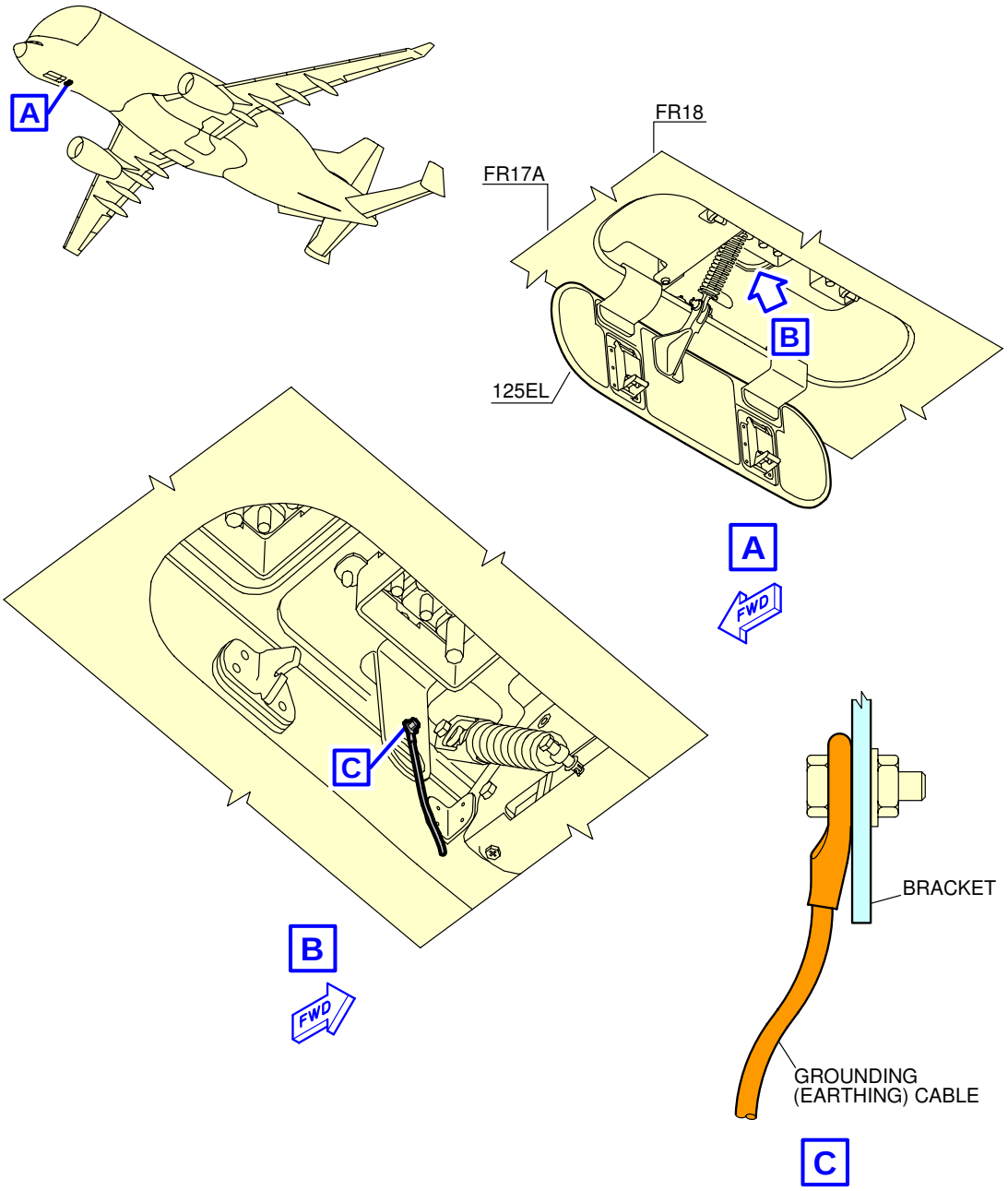
ACCESS	DISTANCE			
	AFT OF NOSE	FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND
		LH SIDE	RH SIDE	
On NLG leg	8.17 m (26.80 ft)	On centerline		1.40 m (4.59 ft)
On left MLG leg	32.1 m (105.31 ft)	5.34 m (17.52 ft)		1.50 m (4.92 ft)
On right MLG leg	32.1 m (105.31 ft)		5.34 m (17.52 ft)	1.50 m (4.92 ft)

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

B. The grounding (earthing) studs are used to connect the aircraft to an approved ground (earth) connection on the ramp or in the hangar for:
- Refuel/defuel operations
- Maintenance operations
- Bad weather conditions
- Loading/Unloading operations.

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

**ON A/C A330-700L



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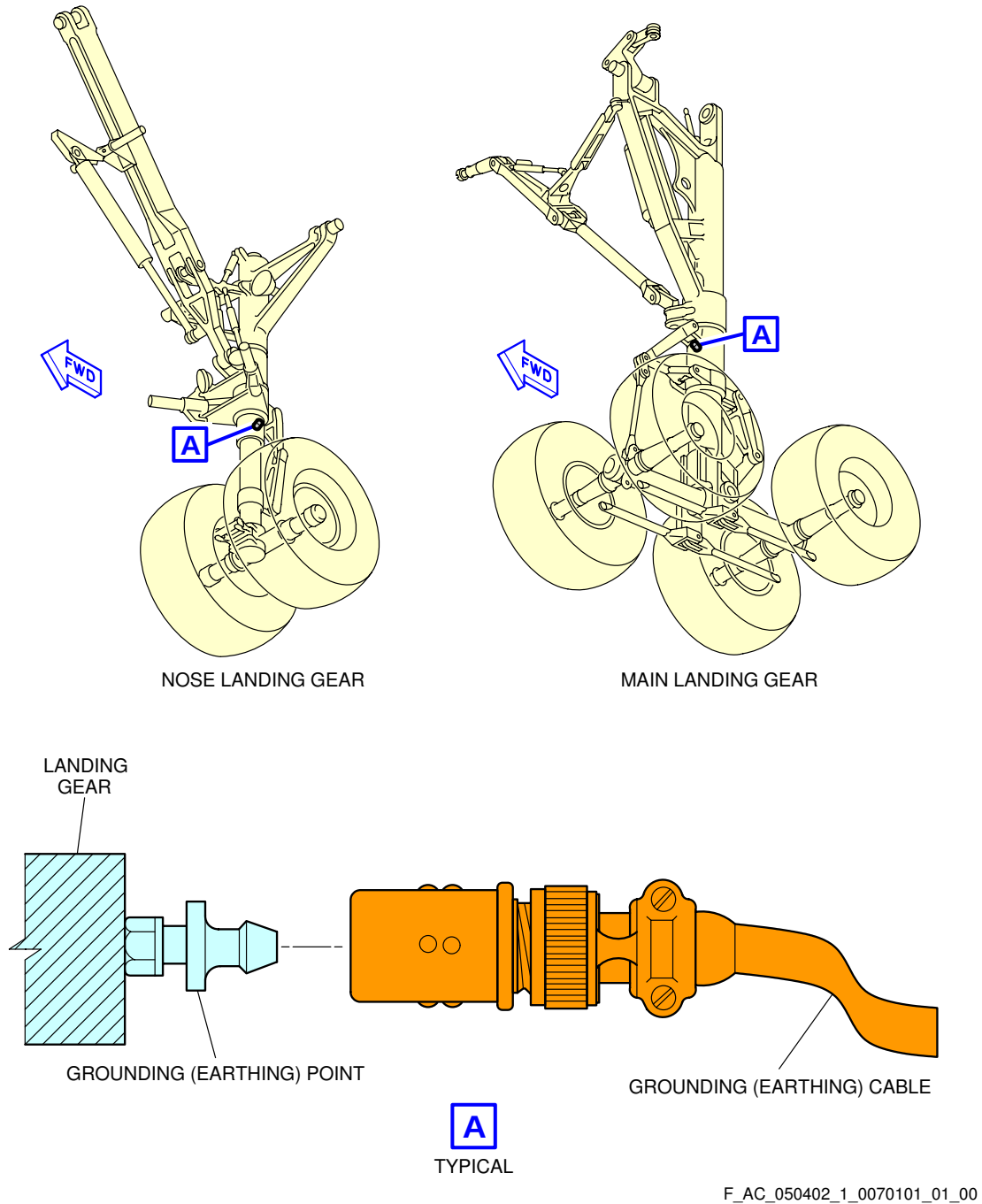
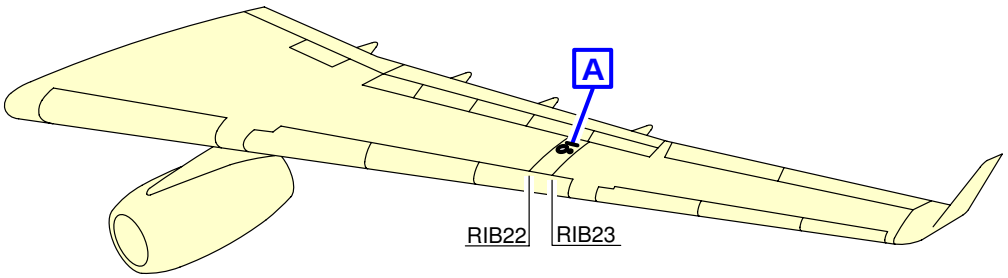
Ground Service Connections
Grounding (Earthing) Points
FIGURE-5-4-2-991-006-A01

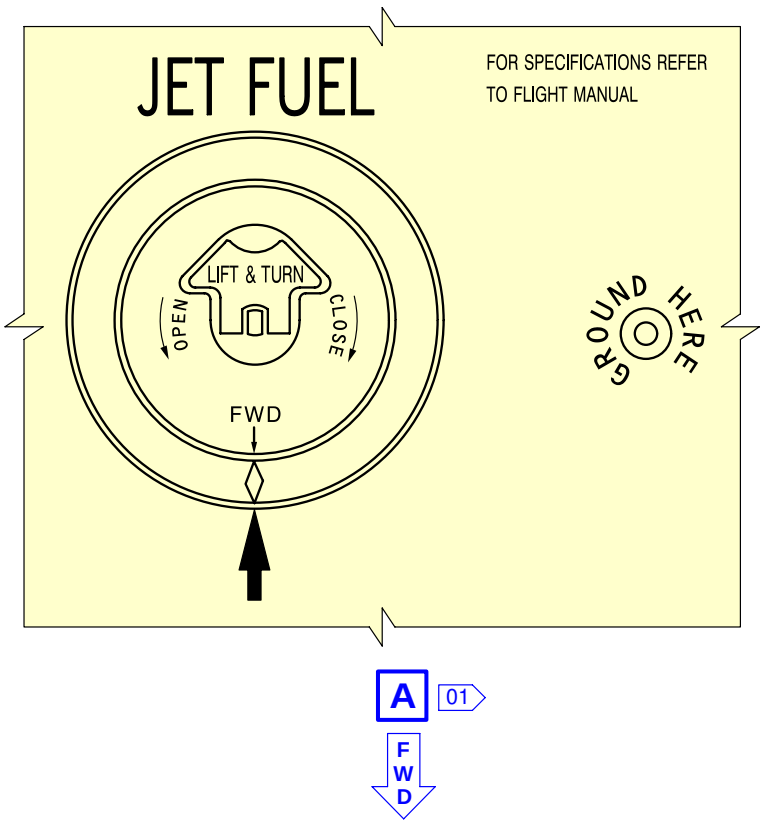
**ON A/C A330-700L



Ground Service Connections
Grounding (Earthing) Points
FIGURE-5-4-2-991-007-A01

**ON A/C A330-700L





NOTE:
01 LH SHOWN RH SYMMETRICAL

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Ground Service Connections
Grounding (Earthing) Points
FIGURE-5-4-2-991-008-A01

5-4-3 Hydraulic System

**ON A/C A330-700L

Hydraulic System

1. Ground Service Panels

NOTE : The mean height from ground in the below table may change according to the CG position and aircraft weight.

ACCESS	DISTANCE			
	AFT OF NOSE	FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND
		LH SIDE	RH SIDE	
Green system: Access door 197CB	33.10 m (108.60 ft)	1.28 m (4.20 ft)		2.23 m (7.32 ft)
Yellow system: Access door 196BB	27.30 m (89.57 ft)		1.32 m (4.33 ft)	1.95 m (6.40 ft)
Blue system: Access door 195BB	26.30 m (86.29 ft)	1.28 m (4.20 ft)		1.94 m (6.36 ft)

2. Reservoir Pressurization

NOTE : The mean height from ground in the below table may change according to the CG position and aircraft weight.

ACCESS	DISTANCE			
	AFT OF NOSE	FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND
		LH SIDE	RH SIDE	
Blue system ground service panel: Access door 195BB	26.34 m (86.42 ft)	1.28 m (4.20 ft)		1.94 m (6.36 ft)

3. Accumulator Charging

NOTE : The mean height from ground in the below table may change according to the CG position and aircraft weight.

ACCESS	DISTANCE			
	AFT OF NOSE	FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND
		LH SIDE	RH SIDE	
Blue system accumulator: Access door 195BB	26.34 m (86.42 ft)	1.28 m (4.20 ft)		1.94 m (6.36 ft)

4. Reservoir Filling
Two connections (one self-sealing connection for pressurized supply on the Green system ground service panel).

NOTE : The mean height from ground in the below table may change according to the CG position and aircraft weight.

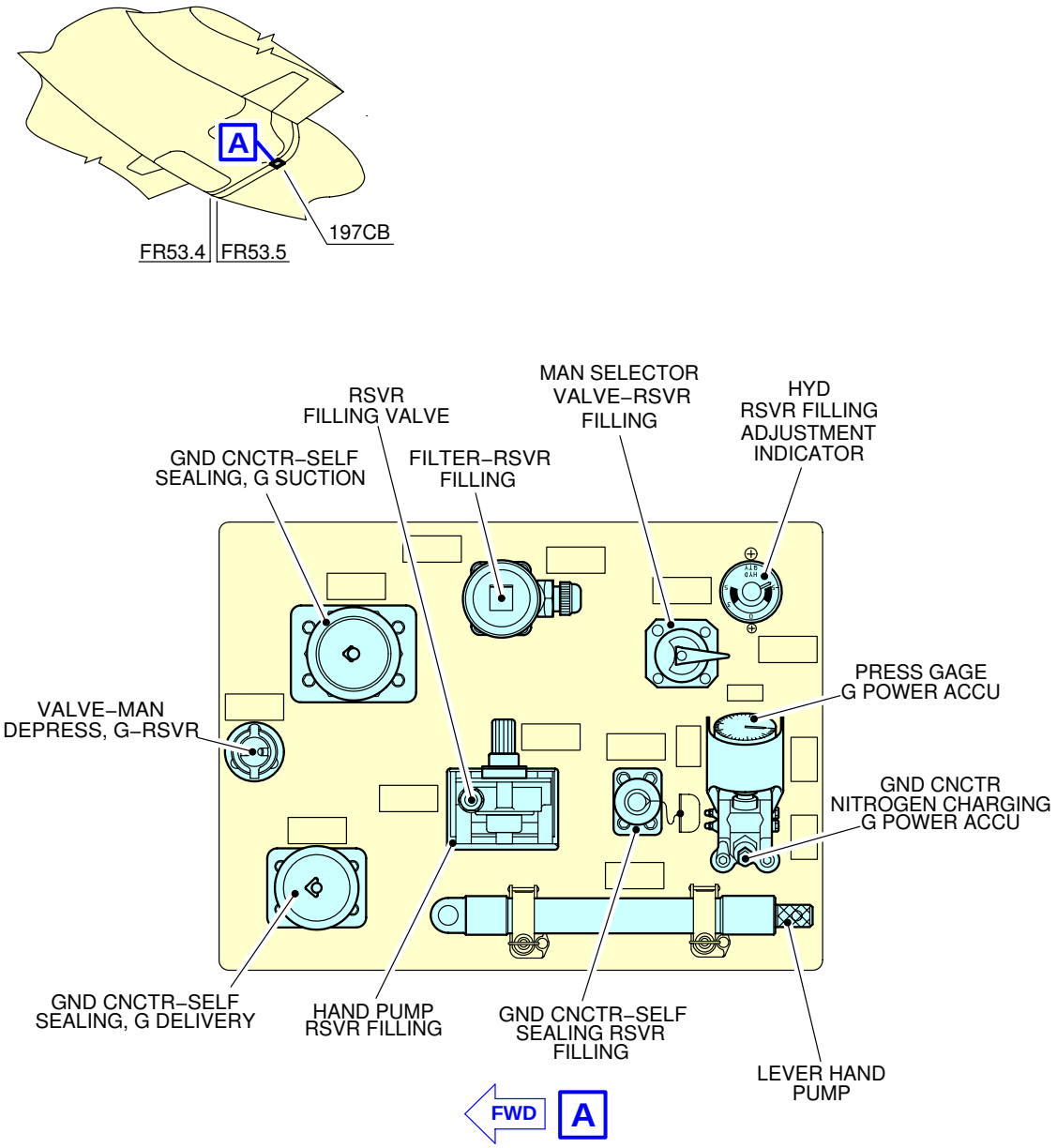
ACCESS	DISTANCE			
	AFT OF NOSE	FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND
		LH SIDE	RH SIDE	
One handpump filling connection: Access door 197CBB	33.22 m (108.99 ft)	1.28 m (4.20 ft)		2.23 m (7.32 ft)

5. A/C Emergency Generation

NOTE : The mean height from ground in the below table may change according to the CG position and aircraft weight.

ACCESS	DISTANCE			
	AFT OF NOSE	FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND
		LH SIDE	RH SIDE	
Ram Air Turbine (RAT) safety-pin installation: Access panel 633SL	32.90 m (107.94 ft)		14.20 m (46.59 ft)	4.35 m (14.27 ft)

**ON A/C A330-700L



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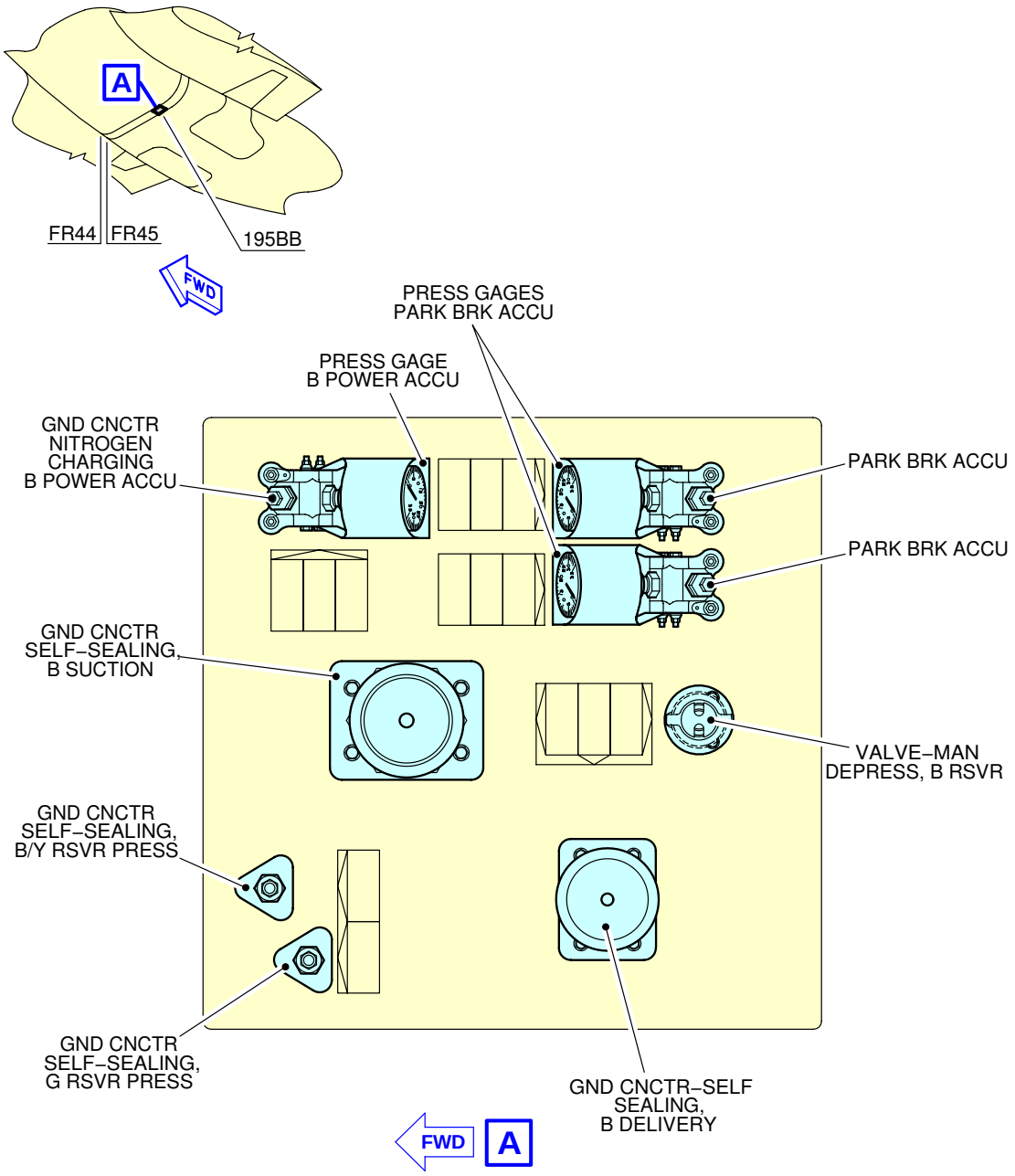
Ground Service Connections
Green System Ground Service Panel
FIGURE-5-4-3-991-013-A01

**ON A/C A330-700L



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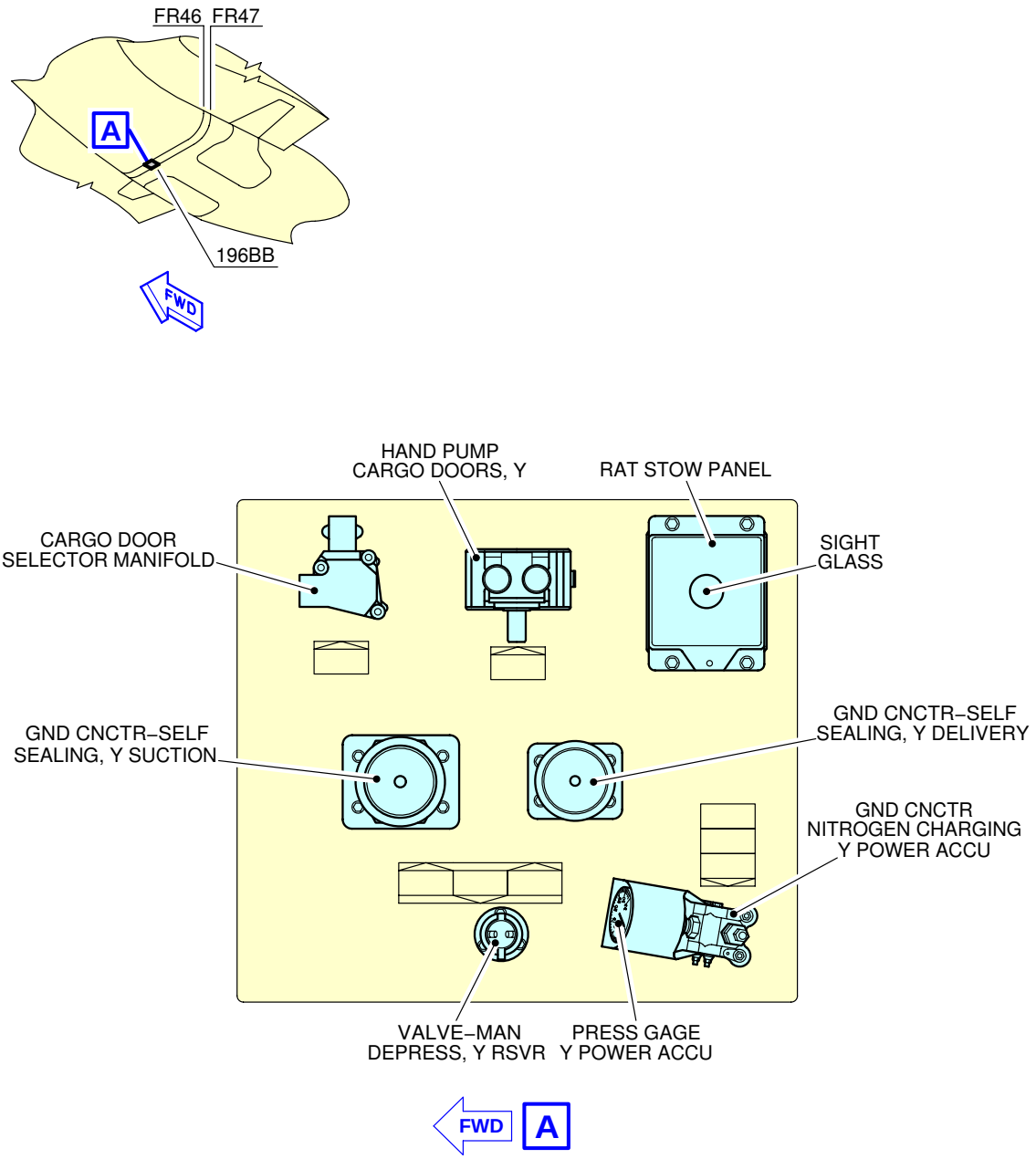
Ground Service Connections
Blue System Ground Service Panel
FIGURE-5-4-3-991-014-A01

**ON A/C A330-700L



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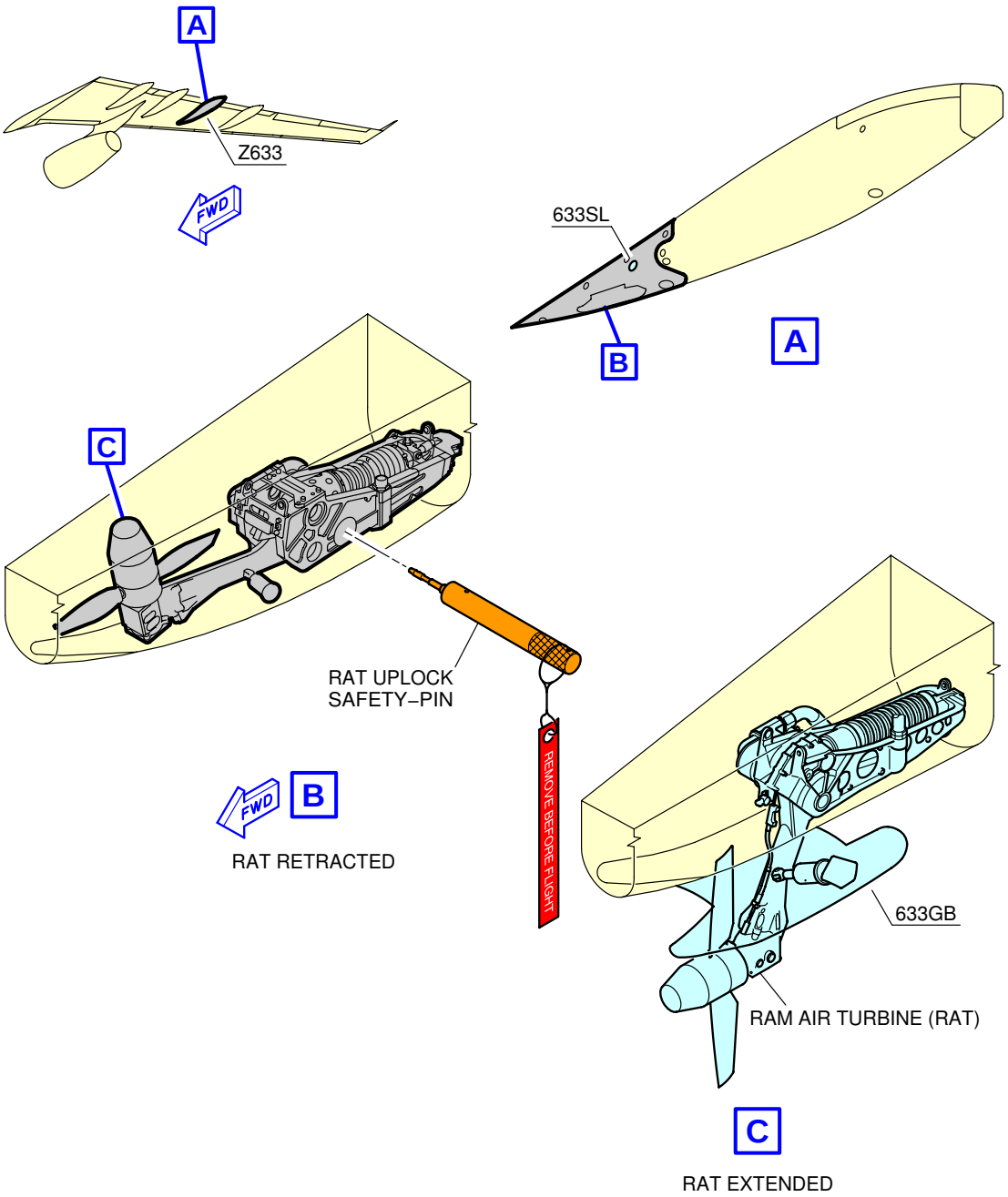
Ground Service Connections
Yellow System Ground Service Panel
FIGURE-5-4-3-991-015-A01

**ON A/C A330-700L



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Ground Service Connections
RAT
FIGURE-5-4-3-991-016-A01

5-4-4 Electrical System

**ON A/C A330-700L

Electrical Servicing

1. A/C External Power

NOTE : The mean height from ground in the below table may change according to the CG position and aircraft weight.

ACCESS	DISTANCE			
	AFT OF NOSE	FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND
		LH SIDE	RH SIDE	
A/C external power: Access door 121EL	8.70 m (28.54 ft)		0.10 m (0.33 ft)	1.95 m (6.40 ft)

NOTE : Distances are approximate.

2. Technical Specifications

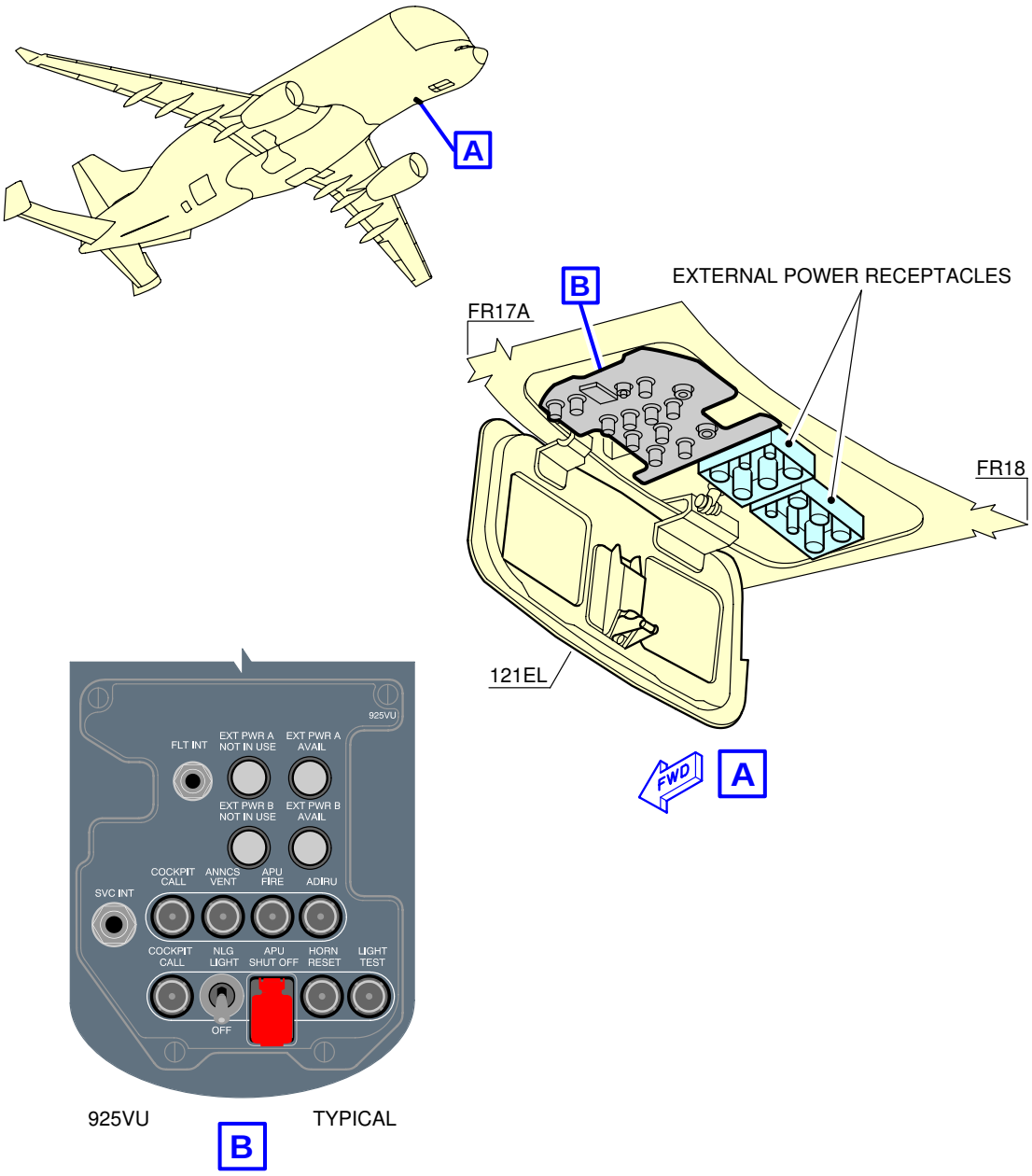
A. External power receptacles:
- Two receptacles according to MS 90362-3 - 90 kVA.

B. Power supply:
- Three-phase, 115 V, 400 Hz.

C. Electrical connectors for servicing:
- AC outlets: HUBBELL 5258
- DC outlets: HUBBELL 7472.

D. Maintenance bus switch:
- Inside A/C near bulkhead door.

**ON A/C A330-700L



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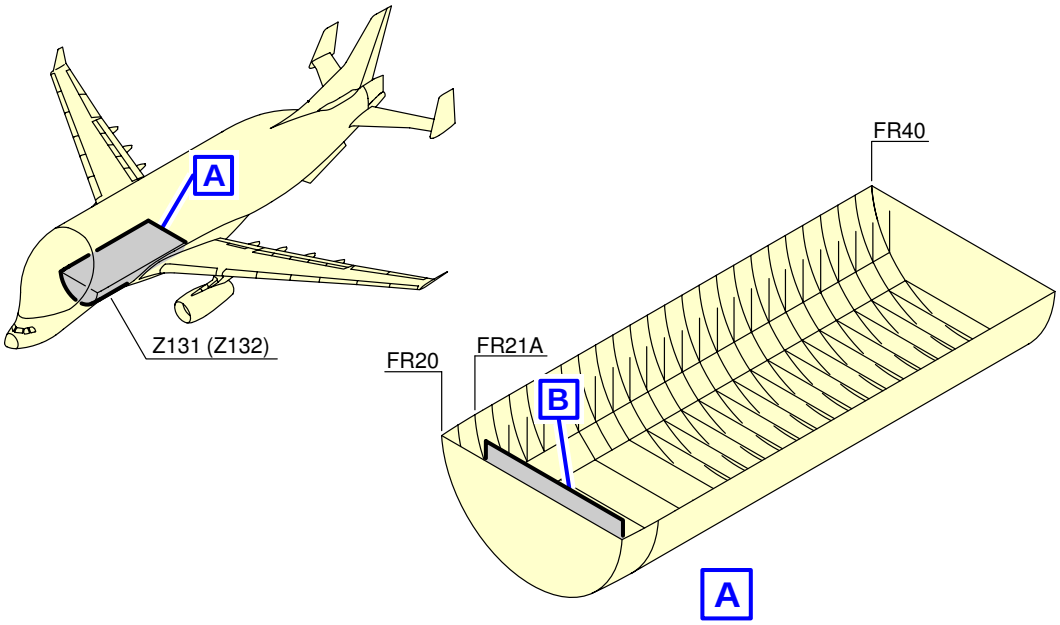
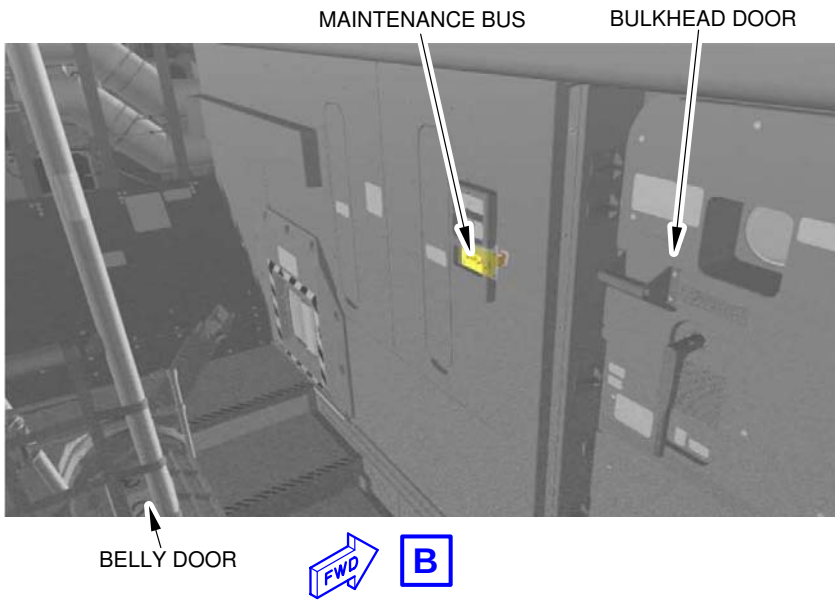
Ground Service Connections
Electrical Service Panel
FIGURE-5-4-4-991-007-A01

**ON A/C A330-700L





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Ground Service Connections
Maintenance Bus-Switch Location
FIGURE-5-4-4-991-008-A01

5-4-5 Oxygen System

**ON A/C A330-700L

Oxygen System

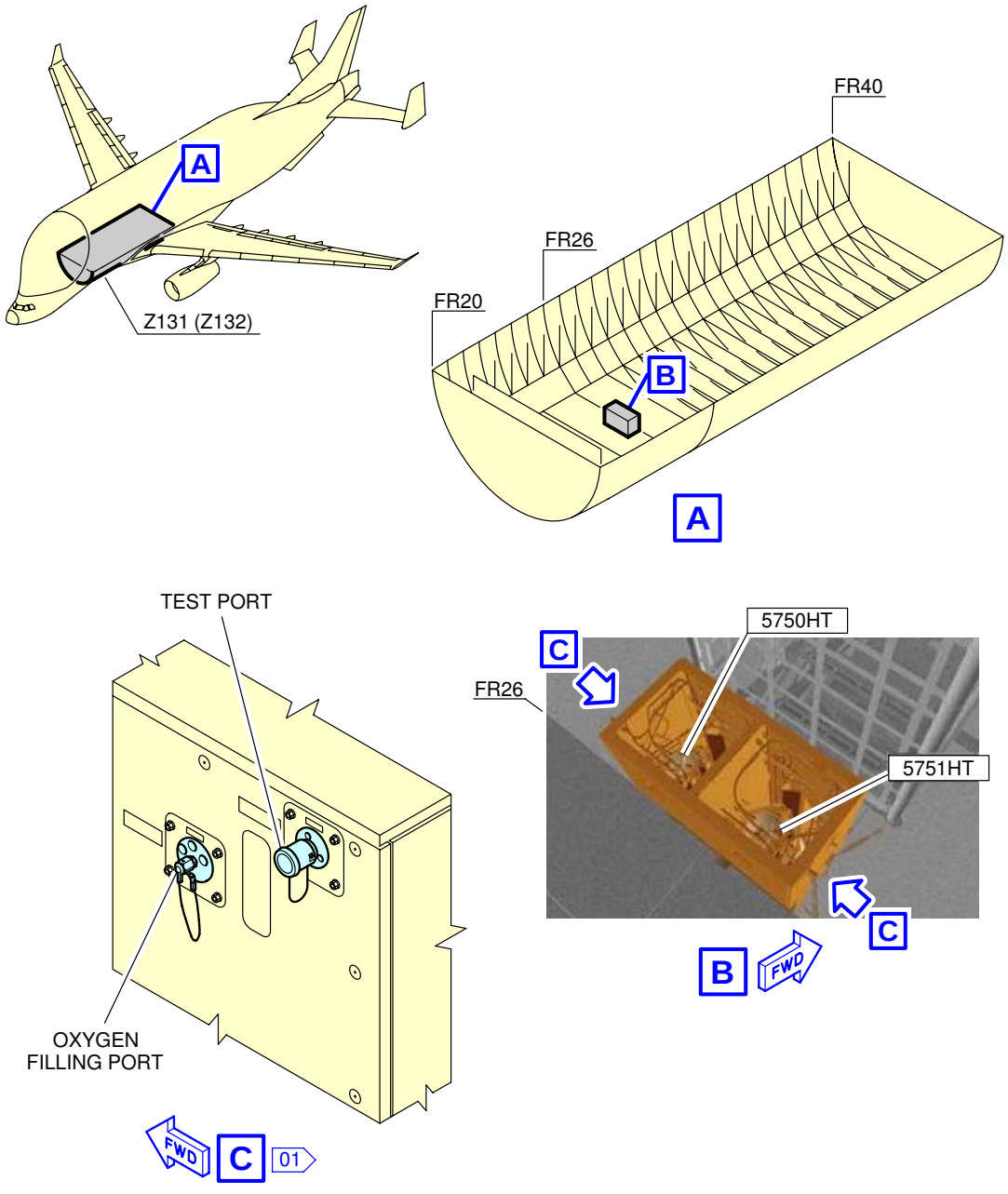
1. Oxygen Servicing

NOTE : The mean height from ground in the below table may change according to the CG position and aircraft weight.

ACCESS	DISTANCE			
	AFT OF NOSE	FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND
		LH SIDE	RH SIDE	
Oxygen replenishment (option 1): 5750HT	12.54 m (41.14 ft)	0.44 m (1.44 ft)		3.46 m (11.35 ft)
Oxygen replenishment (option 2): 5751HT	12.54 m (41.14 ft)		0.44 m (1.44 ft)	3.46 m (11.35 ft)

NOTE : Internal charging connection near the belly door, inside aircraft.

**ON A/C A330-700L



NOTE:
01 LH SHOWN, RH SYMMETRICAL

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Ground Service Connections
Oxygen Servicing
FIGURE-5-4-5-991-005-A01

5-4-6 Fuel System

**ON A/C A330-700L

Fuel System

1. Refuel/Defuel Control Panel

NOTE : The mean height from ground in the below table may change according to the CG position and aircraft weight.

ACCESS	DISTANCE			
	AFT OF NOSE	FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND
		LH SIDE	RH SIDE	
Refuel/Defuel control panel: Access door 198DB	32.6 m (106.96 ft)		0.8 m (2.62 ft)	1.9 m (6.23 ft)

A. Flow rate: 1 580 l/min (417 US gal/min) per connection.

B. Maximum pressure: 50 psi (3.45 bar).

2. Refuel/Defuel Connectors

NOTE : The mean height from ground in the below table may change according to the CG position and aircraft weight.

ACCESS	DISTANCE			
	AFT OF NOSE	FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND
		LH SIDE	RH SIDE	
Refuel/Defuel coupling, right: Access door 622HB	28.3 m (92.85 ft)		12.6 m (41.34 ft)	5.1 m (16.73 ft)
Overwing gravity refuel cap	32.8 m (107.61 ft)	17.2 m (56.43 ft)	17.2 m (56.43 ft)	6.1 m (20.01 ft)

A. Four standard 2.5 in. ISO 45 connections.

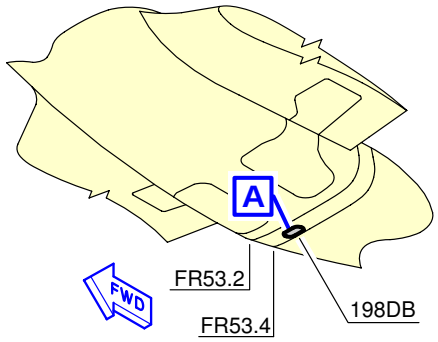
B. Two service connections (gravity refuel).

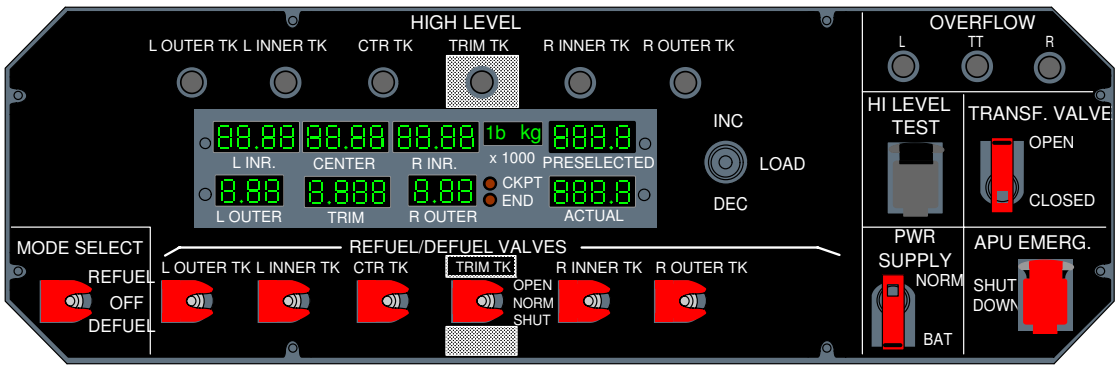
3. Overpressure Protector and NACA Flame Arrestor

NOTE : The mean height from ground in the below table may change according to the CG position and aircraft weight.

ACCESS	DISTANCE			
	AFT OF NOSE	FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND
		LH SIDE	RH SIDE	
Overpressure protector (wing): Access panel 550EB (650EB)	37.8 m (124.02 ft)	27.17 m (89.14 ft)	27.17 m (89.14 ft)	5.75 m (18.86 ft)
NACA flame arrestor (wing): Access panel 550DB (650DB)	37.4 m (122.70 ft)	26.53 m (87.04 ft)	26.53 m (87.04 ft)	5.7 m (18.70 ft)

**ON A/C A330-700L





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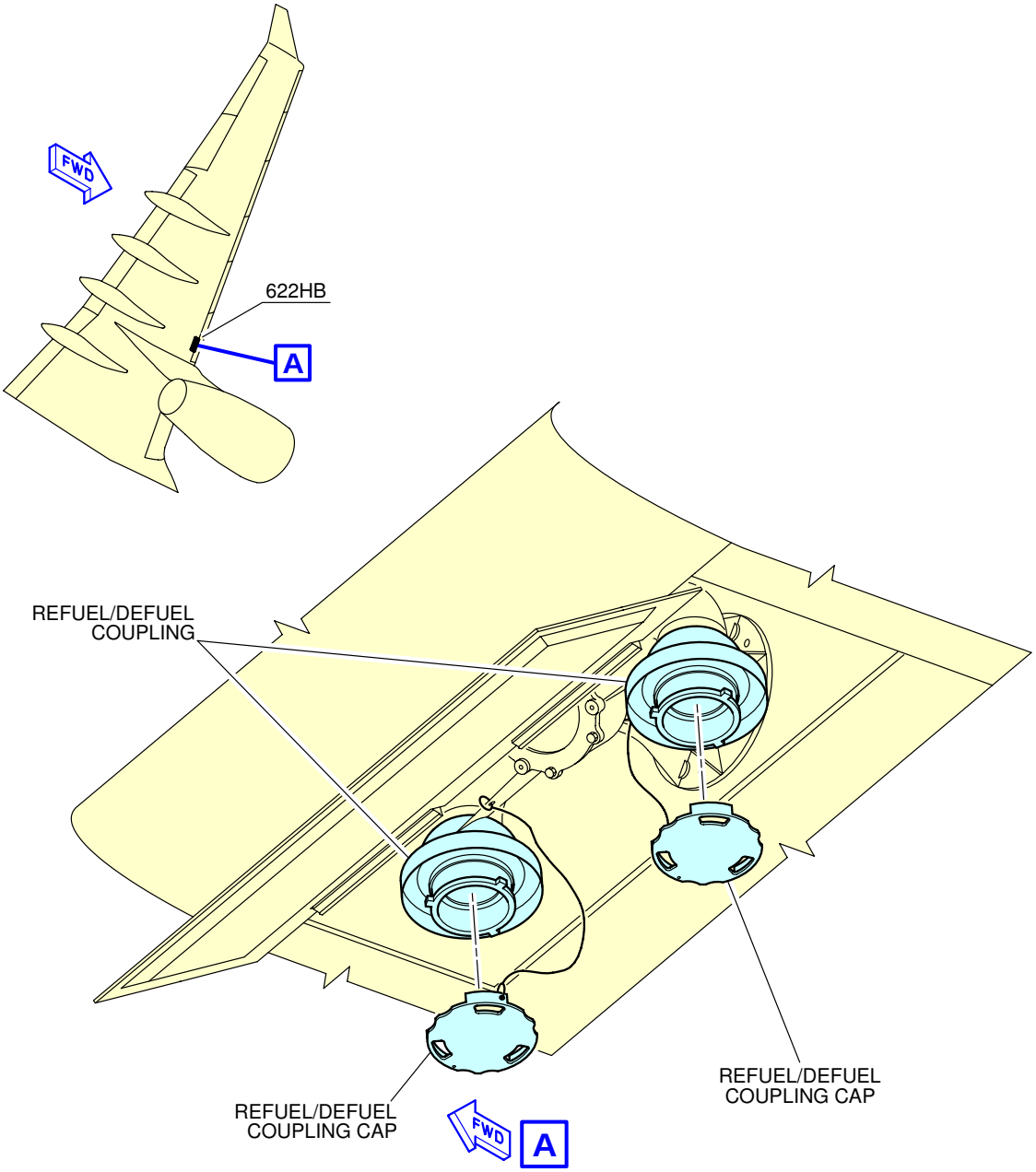
Ground Service Connections
Refuel/Defuel Control Panel
FIGURE-5-4-6-991-021-A01

**ON A/C A330-700L



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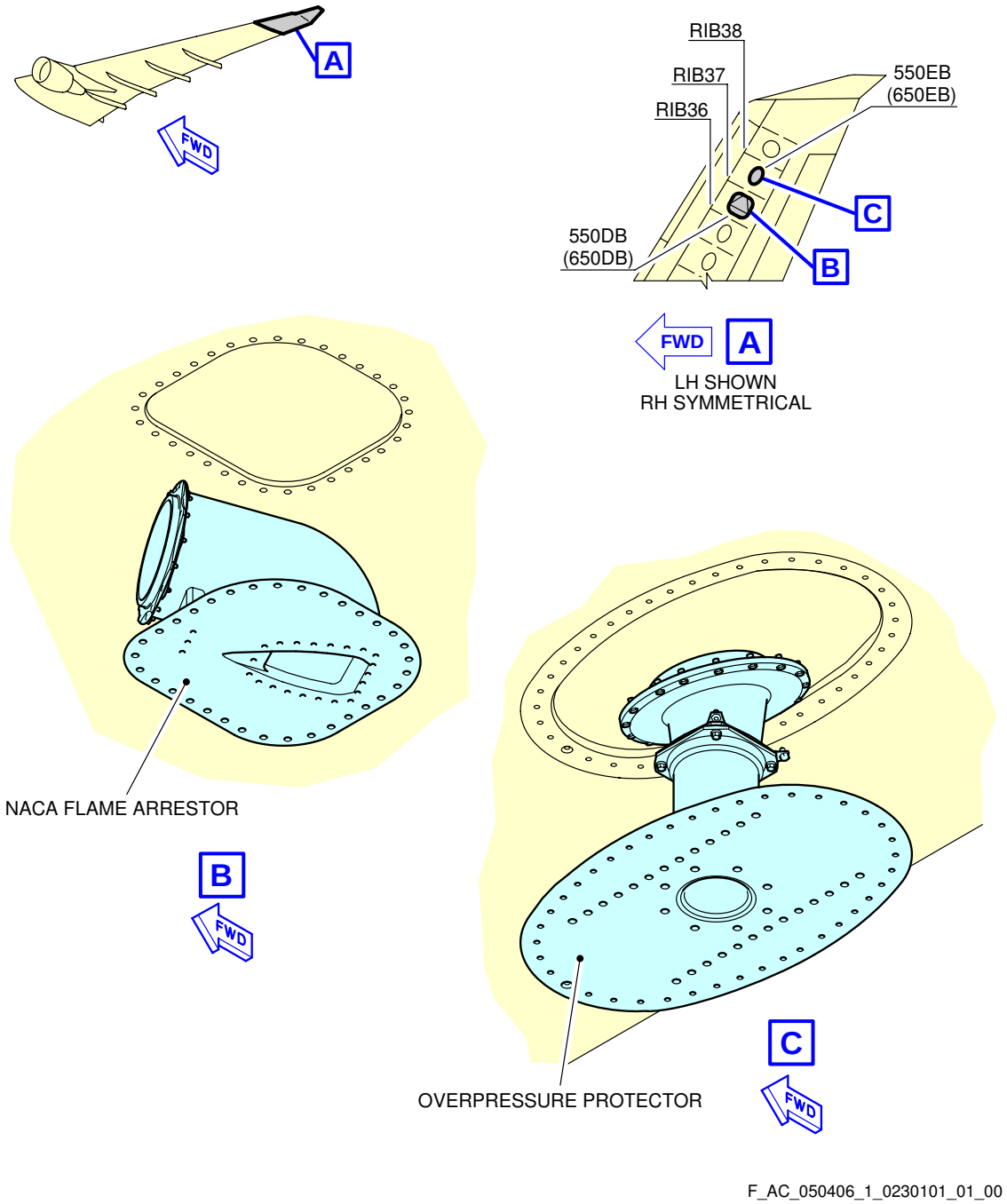
Ground Service Connections
Refuel/Defuel Coupling
FIGURE-5-4-6-991-022-A01

**ON A/C A330-700L



Ground Service Connections
Overpressure Protector and NACA Flame Arrestor - Wing
FIGURE-5-4-6-991-023-A01

5-4-7 Pneumatic System

**ON A/C A330-700L

Pneumatic System

1. High Pressure Air Connection

NOTE : The mean height from ground in the below table may change according to the CG position and aircraft weight.

ACCESS	DISTANCE			
	AFT OF NOSE	FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND
		LH SIDE	RH SIDE	
HP connectors: Access door 193CB	20.94 m (68.70 ft)	0.84 m (2.76 ft)		1.79 m (5.87 ft)

A. Connectors:
- Two standard 3 in. ISO 2026 connections.

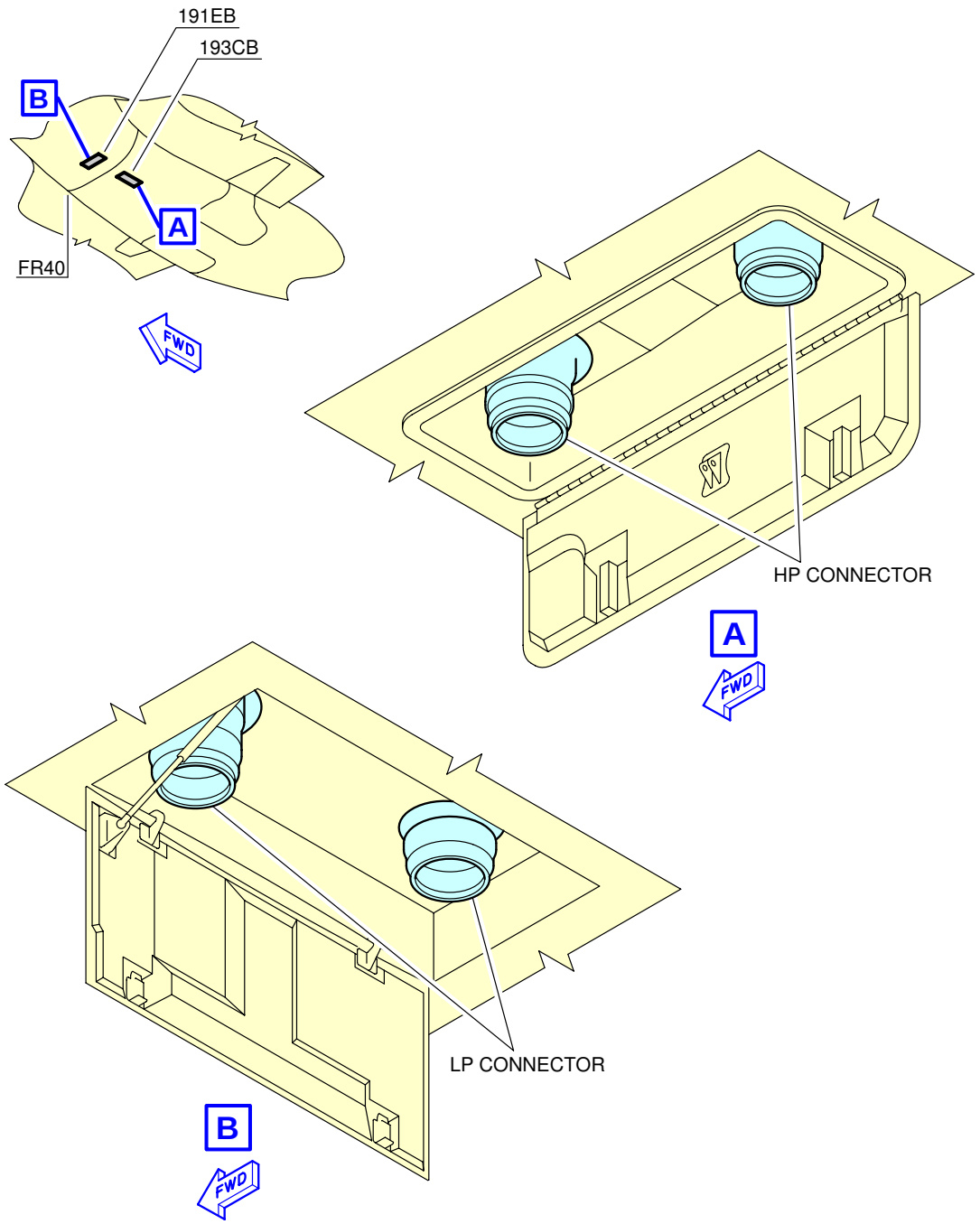
2. Low Pressure Air Connection

NOTE : The mean height from ground in the below table may change according to the CG position and aircraft weight.

ACCESS	DISTANCE			
	AFT OF NOSE	FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND
		LH SIDE	RH SIDE	
LP connectors: Access door 191EB	22.66 m (74.34 ft)	0.4 m (1.31 ft)		8 m (26.25 ft)

A. Connectors:
- Two standard 8 in. SAE AS4262 connections.

**ON A/C A330-700L



Ground Service Connections
LP and HP Ground Connectors
FIGURE-5-4-7-991-004-A01

5-4-8 Oil System

**ON A/C A330-700L

Oil System

1. RR Trent 700 Series Engine

   A. Engine Oil Replenishment:
   One gravity filling cap.
   One ozone self-sealing pressure fill and overfill connector per engine.

   NOTE : The mean height from ground in the below table may change according to the CG position and aircraft weight.

ACCESS	DISTANCE			
	AFT OF NOSE	FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND
		LH SIDE	RH SIDE	
Engine 1: Access door 416CR	25.40 m (83.33 ft)	7.92 m (25.98 ft)		2.05 m (6.73 ft)
Engine 2: Access door 426CR	25.40 m (83.33 ft)		10.82 m (35.50 ft)	2.05 m (6.73 ft)

   (1) Tank capacity:
   - Full level: 23.30 l (6.16 US gal).
   - Usable: 22.71 l (6.00 US gal).

   B. IDG Oil Replenishment:
   One ozone self-sealing pressure fill and overfill connector per engine.

   NOTE : The mean height from ground in the below table may change according to the CG position and aircraft weight.

ACCESS	DISTANCE			
	AFT OF NOSE	FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND
		LH SIDE	RH SIDE	
Engine 1: Access door 415CL	25.9 m (84.97 ft)	9.65 m (31.66 ft)		0.80 m (2.62 ft)
Engine 2: Access door 425CL	25.9 m (84.97 ft)		9.09 m (29.82 ft)	0.80 m (2.62 ft)

   (1) Max delivery pressure required: 2.76 bar (40 psi).

   (2) Max oil capacity of the IDG: 5.50 l (1.45 Us gal).

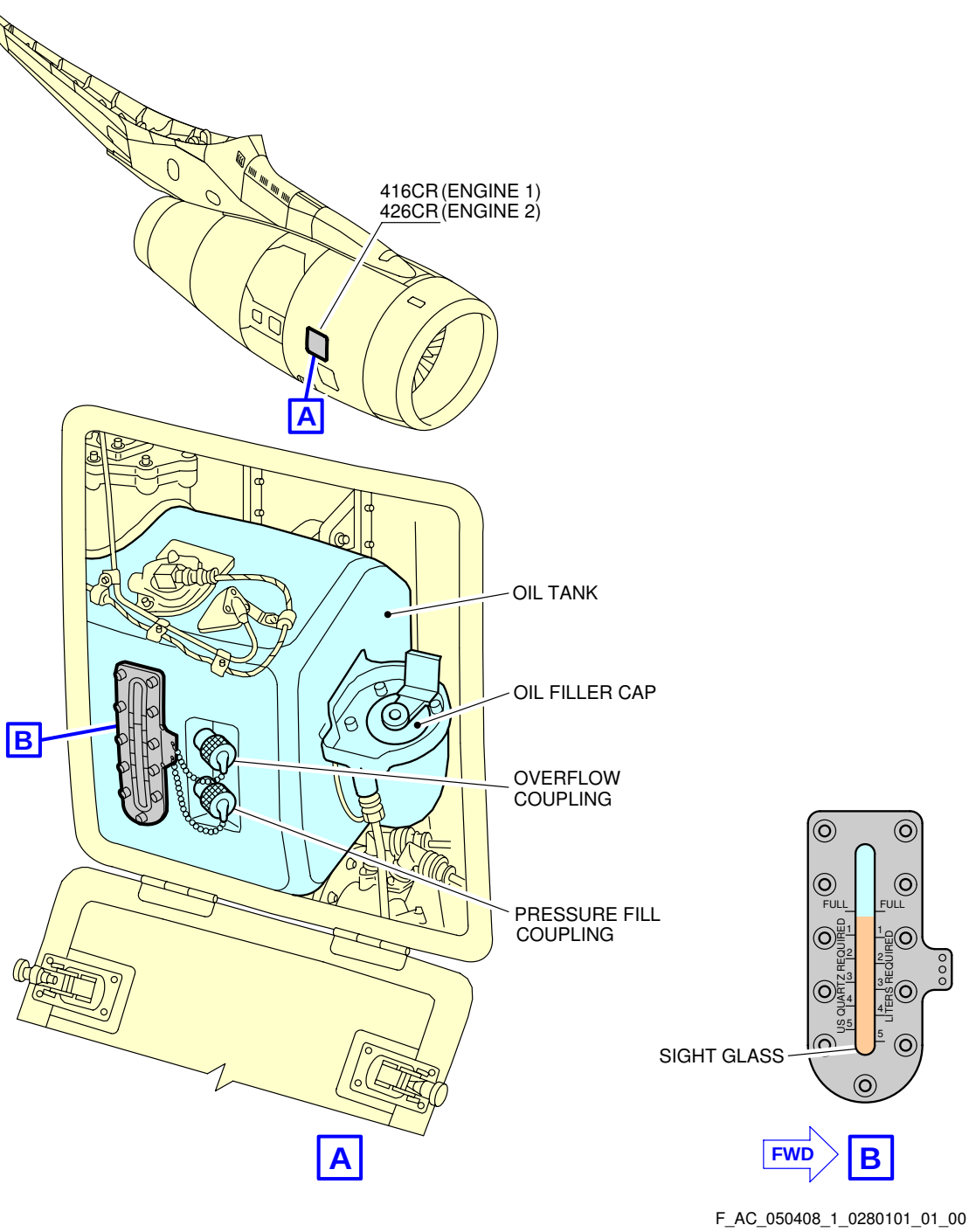
C. Starter Oil Replenishment:
One filling connection per engine.

NOTE : The mean height from ground in the below table may change according to the CG position and aircraft weight.

ACCESS	DISTANCE			
	AFT OF NOSE	FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND
		LH SIDE	RH SIDE	
Engine 1: Access door 415AL (416AR)	25.9 m (84.97 ft)	9.65 m (31.66 ft)		0.80 m (2.62 ft)
Engine 2: Access door 425AL (426AR)	25.9 m (84.97 ft)		9.09 m (29.82 ft)	0.80 m (2.62 ft)

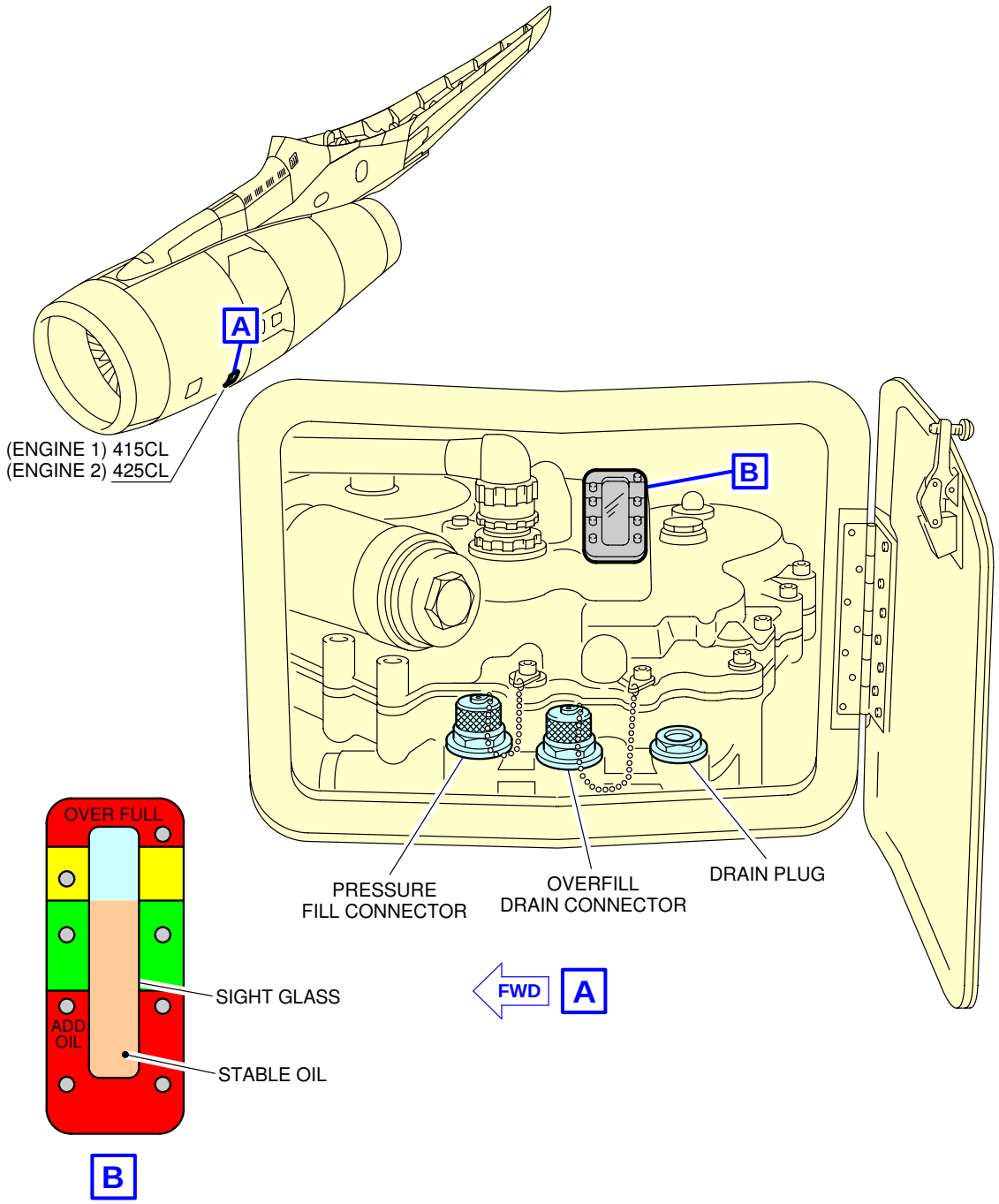
- Max oil capacity of the starter: 0.50 l (0.13 US gal).

**ON A/C A330-700L



Ground Service Connections
Engine Oil Tank - RR Trent 700 Series Engine
FIGURE-5-4-8-991-028-A01

**ON A/C A330-700L



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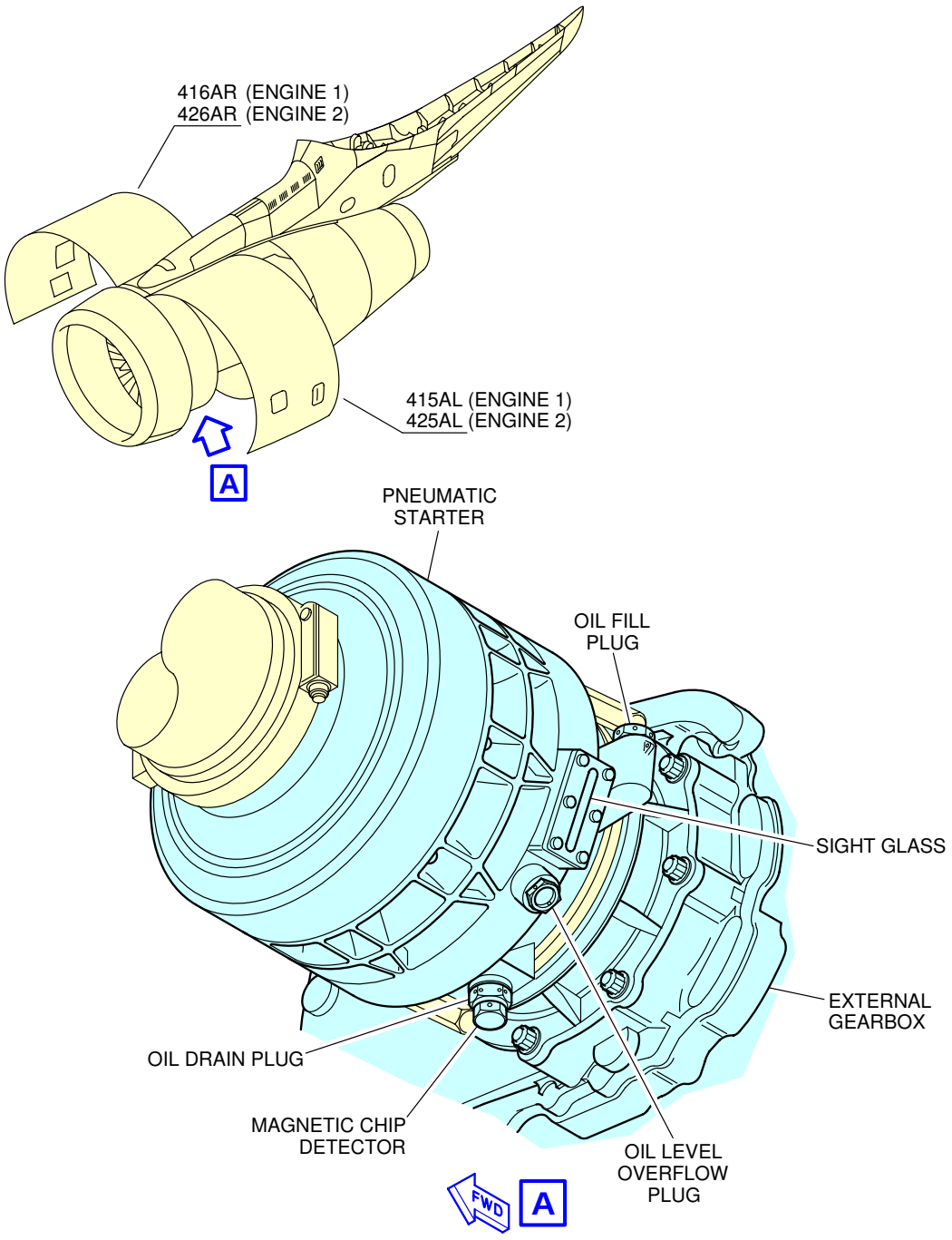
Ground Service Connections
IDG Oil Tank - RR Trent 700 Series Engine
FIGURE-5-4-8-991-029-A01

**ON A/C A330-700L



Ground Service Connections
Starter Oil Tank - RR Trent 700 Series Engine
FIGURE-5-4-8-991-030-A01

**ON A/C A330-700L

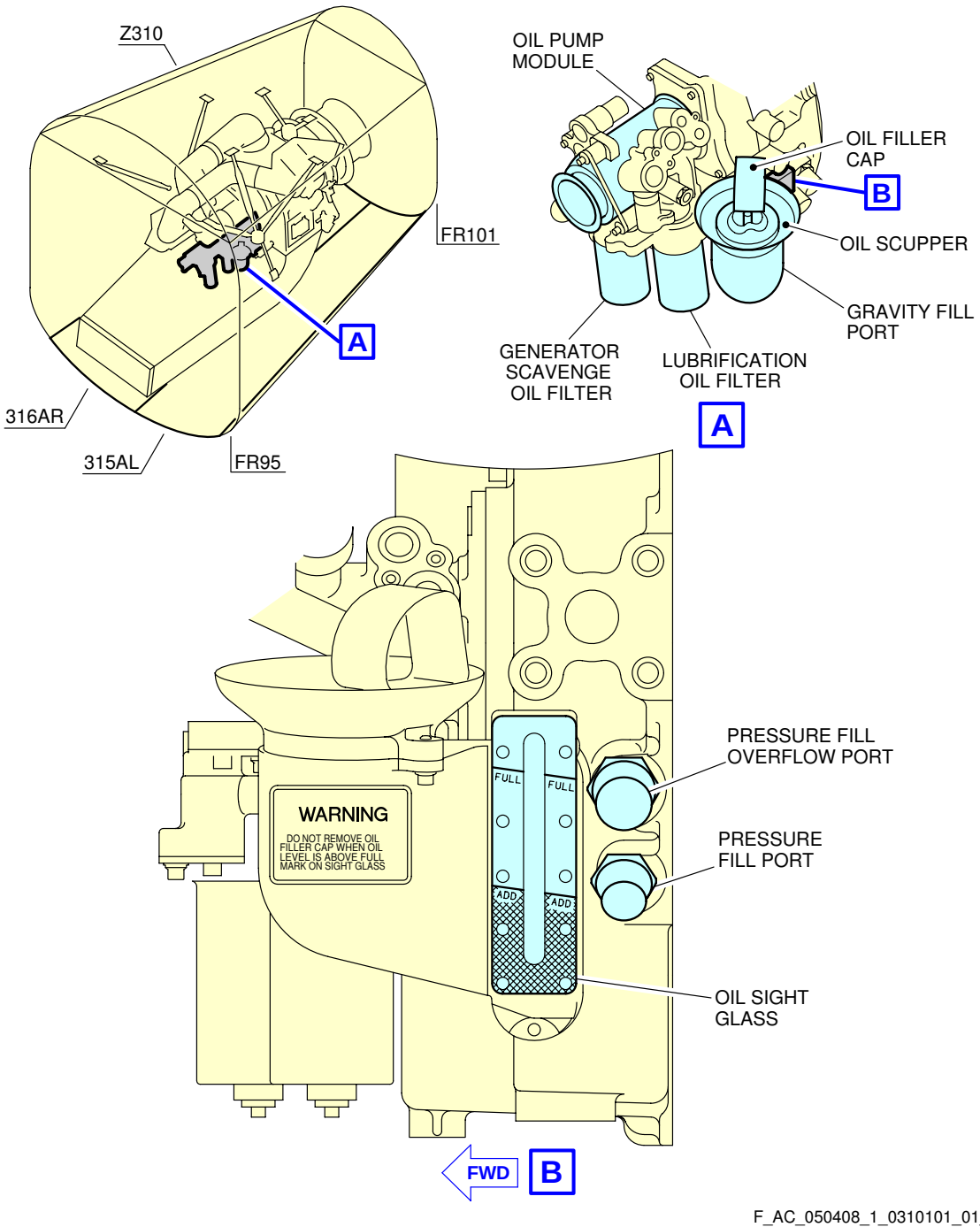
APU Oil Servicing

1. APU Oil Servicing:
   APU oil gravity filling cap.

   NOTE : The mean height from ground in the below table may change according to the CG position and aircraft weight.

ACCESS	DISTANCE			
	AFT OF NOSE	FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND
		LH SIDE	RH SIDE	
APU oil replenishment: Access doors 315AL and 316AR	58.94 m (193.37 ft)	0.4 m (1.31 ft)		8 m (26.25 ft)

**ON A/C A330-700L



Ground Service Connections
APU Oil Servicing
FIGURE-5-4-8-991-031-A01

5-4-10 Waste Water System

**ON A/C A330-700L

Waste Water System

1. Waste Water Servicing

   A. There are two waste-water ground-service panels:
      - First panel: One standard connection Roylyn 1 in. (ISO 17775) for flushing and filling
      - Second panel: One standard Taco type valve 4 in. (ISO 17775) for draining.

      NOTE : Handle used for drainage is located on the first panel.

   B. Capacity waste tanks:
      - Standard: 35 l (9.25 US gal).

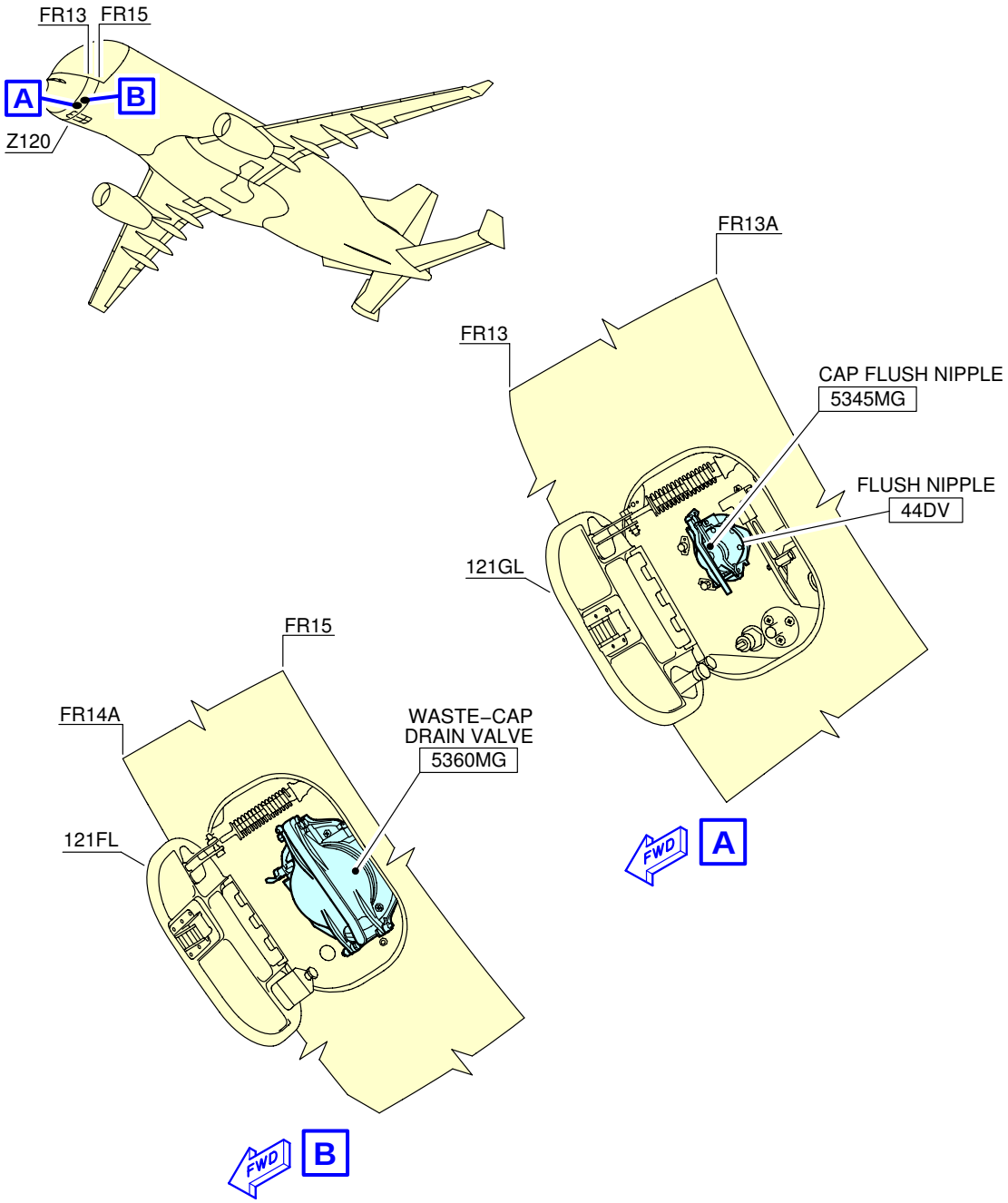
      NOTE : The waste water drain-system discards the waste water from the galley sink and the lavatory washbasin overboard.
      The toilet system moves the waste materials and liquids from the toilet to the waste tank.

   C. Chemical fluid:
      - Standard: 9.5 l (2.51 US gal).

      NOTE : The mean height from ground in the below table may change according to the CG position and aircraft weight.

ACCESS	DISTANCE			
	AFT OF NOSE	FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND
		LH SIDE	RH SIDE	
Waste-water ground-service-panel 1: Access door 121GL	6.39 m (20.96 ft)	2.03 m (6.66 ft)		2.16 m (7.09 ft)
Waste-water ground-service-panel 2: Access door 121FL	7.13 m (23.39 ft)	1.91 m (6.27 ft)		2.19 m (7.19 ft)

**ON A/C A330-700L



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Ground Service Connections
Waste-Water Ground-Service Panels
FIGURE-5-4-10-991-008-A01

5-4-11 Cargo Control Panels

**ON A/C A330-700L

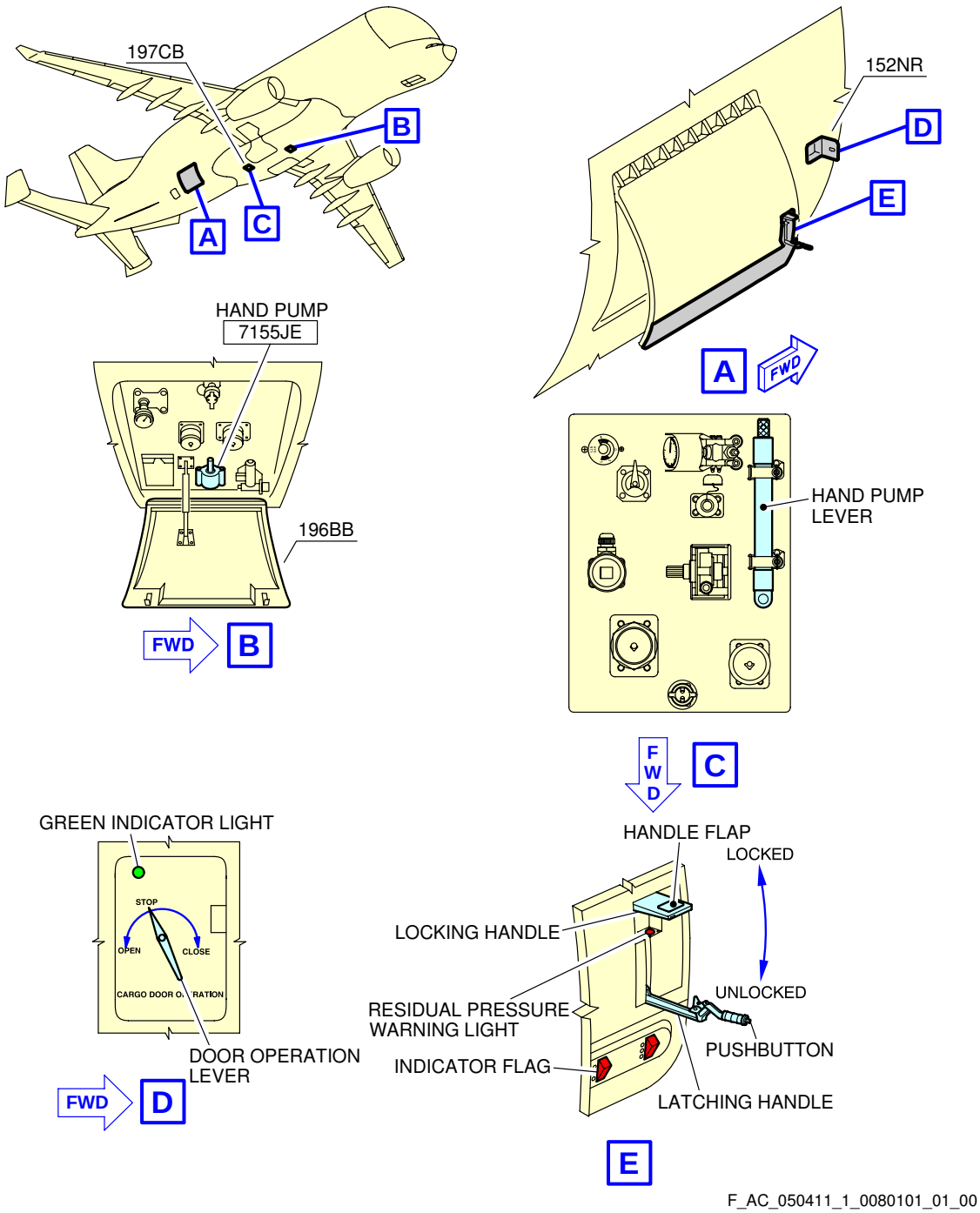
Cargo Control Panels

1. Cargo Control Panels

NOTE : The mean height from ground in the below table may change according to the CG position and aircraft weight.

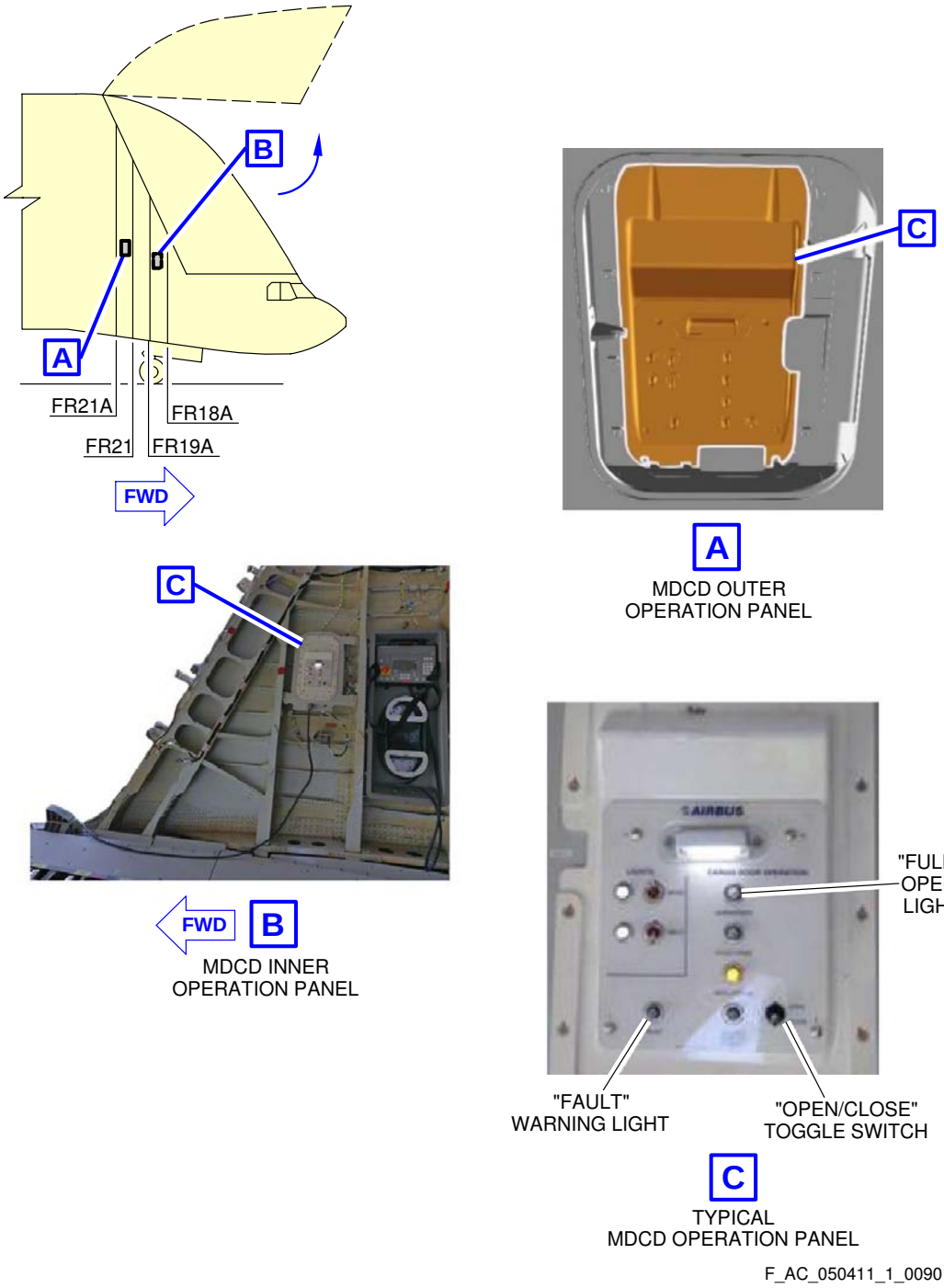
ACCESS	DISTANCE			
	AFT OF NOSE	FROM AIRCRAFT CENTERLINE		MEAN HEIGHT FROM GROUND
		LH SIDE	RH SIDE	
AFT cargo door panel: Access door 152NR	40.73 m (133.6 ft)		2.68 m (8.8 ft)	4.41 m (14.5 ft)
Main Deck Cargo Door (MDCD) inner operation panel	9.26 m (30.4 ft)		3.23 m (10.6 ft)	6.09 m (20.0 ft)
MDCD outer operation panel	10.25 m (33.6 ft)		3.55 m (11.6 ft)	6.26 m (20.5 ft)

**ON A/C A330-700L



Lower Cargo Door Operation Panel
FIGURE-5-4-11-991-008-A01

**ON A/C A330-700L



MDCD Control Panel
FIGURE-5-4-11-991-009-A01

5-5-0 Engine Starting Pneumatic Requirements

**ON A/C A330-700L

Engine Starting Pneumatic Requirements

1. The purpose of this section is to give the minimum air data requirements at the aircraft connection, needed to start the engine within no more than 90 seconds, at sea level (0 feet), for a set of Outside Air Temperatures (OAT).

ABBREVIATION	DEFINITION
A/C	Aircraft
ASU	Air Start Unit
HPGC	High Pressure Ground Connection
OAT	Outside Air Temperature

A. Air data (discharge temperature, absolute discharge pressure) are given at the HPGC.

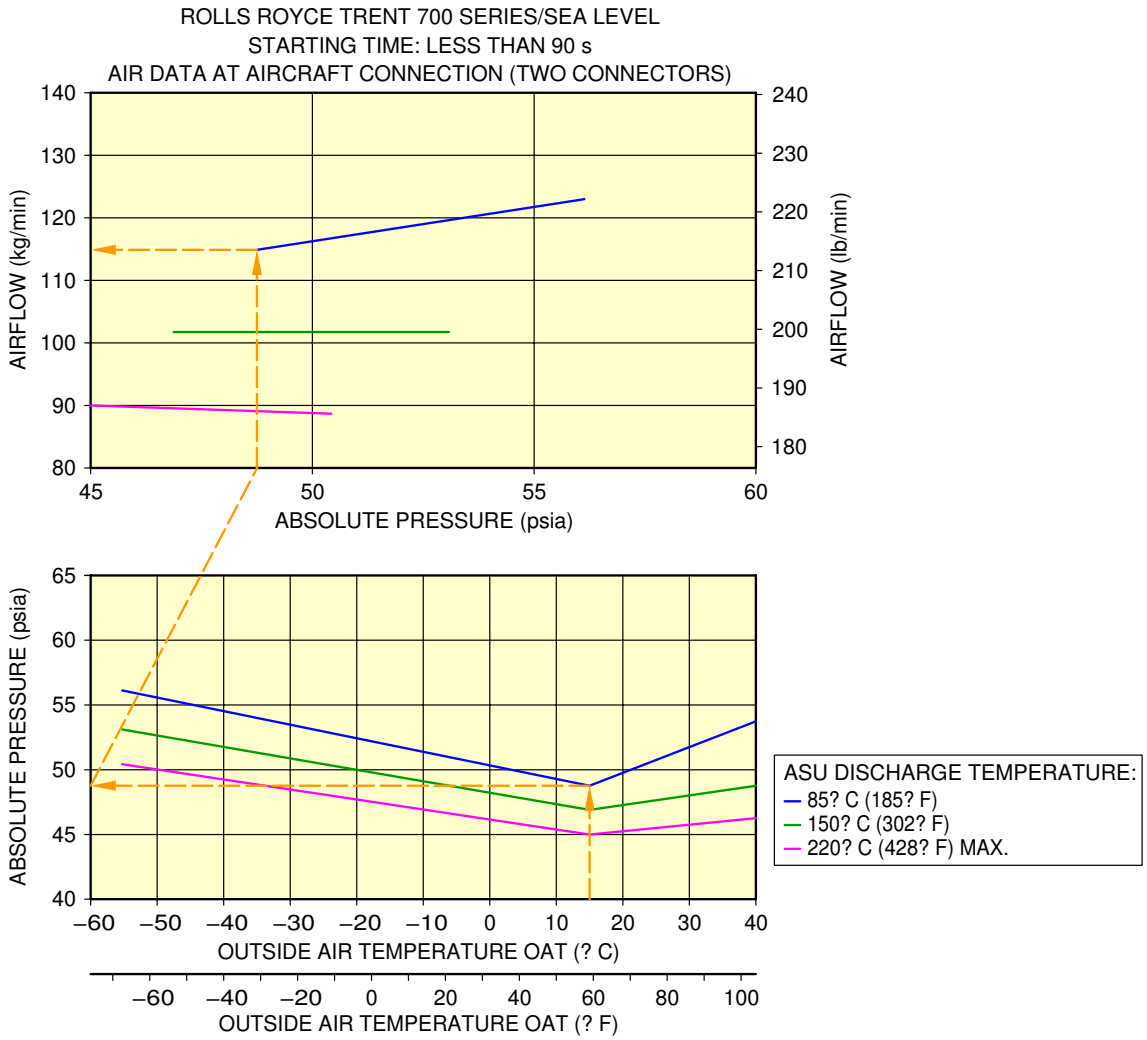
B. For the requirements below, the configuration with two HPGC is used. Using one connector only (for a given mass flow rate and discharge pressure from the ASU) will increase the pressure loss in the ducts of the bleed system and therefore lower the performances at the engine starter.

C. For a given OAT the following charts are used to determine an acceptable combination for air discharge temperature, absolute discharge pressure and mass flow rate.

D. This section is addressing requirements for the ASU only, and is not representative of the start performance of the aircraft using the APU or engine cross bleed procedure.

E. To protect the A/C, the charts feature, if necessary:
- The maximum discharge pressure at the HPGC
- The maximum discharge temperature at the HPGC.

**ON A/C A330-700L



EXAMPLE:

FOR AN OAT OF 15? C (59? F) AND AN ASU PROVIDING A DISCHARGE TEMPERATURE OF 85? C (185? F) AT HPGC:
– THE REQUIRED PRESSURE AT HPGC IS 48.85 psia
– THE REQUIRED AIRFLOW AT HPGC IS 114.9 kg/min.

NOTE:

IN CASE THE ACTUAL DISCHARGE TEMPERATURE OF THE ASU DIFFERS SUBSTANTIALLY FROM THE ONES GIVEN IN THE CHARTS, A SIMPLE INTERPOLATION (LINEAR) IS SUFFICIENT TO DETERMINE THE REQUIRED AIR DATA.

EXAMPLE:

FOR AN OAT OF 15? C (59? F) AND AN ASU PROVIDING A DISCHARGE TEMPERATURE OF 117.5? C (243.5? F) AT HPGC, INTERPOLATING BETWEEN THE LINES 85? C (185? F) AND 150? C (302? F) RESULTS IN:
– A REQUIRED PRESSURE AT HPGC OF 47.84 psia
– A REQUIRED AIRFLOW AT HPGC OF 113.9 kg/min.

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Engine Starting Pneumatic Requirements
Rolls Royce Trent 700 Series Engine
FIGURE-5-5-0-991-011-A01

5-8-0 Ground Towing Requirements

**ON A/C A330-700L

Ground Towing Requirements

1. This section gives information on aircraft towing.
   The A330-700L 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 ISI 09.11.00001.
   It is possible to tow or push the aircraft, at maximum ramp weight with engines at zero or up to idle thrust, using a towbar attached to the NLG. One towbar fitting is installed at the front of the leg (optional towing fitting for towing from the rear of the NLG available).
   The main landing gears have attachment points for towing or debogging.
   This section shows the chart to determine the drawbar pull and tow tractor mass requirements as a function of the following physical characteristics:
   - Aircraft weight
   - Number of engines at idle
   - Slope.

   The chart is based on the A330 engine type with the highest idle thrust.
   The chart is therefore valid for A330-700L model.

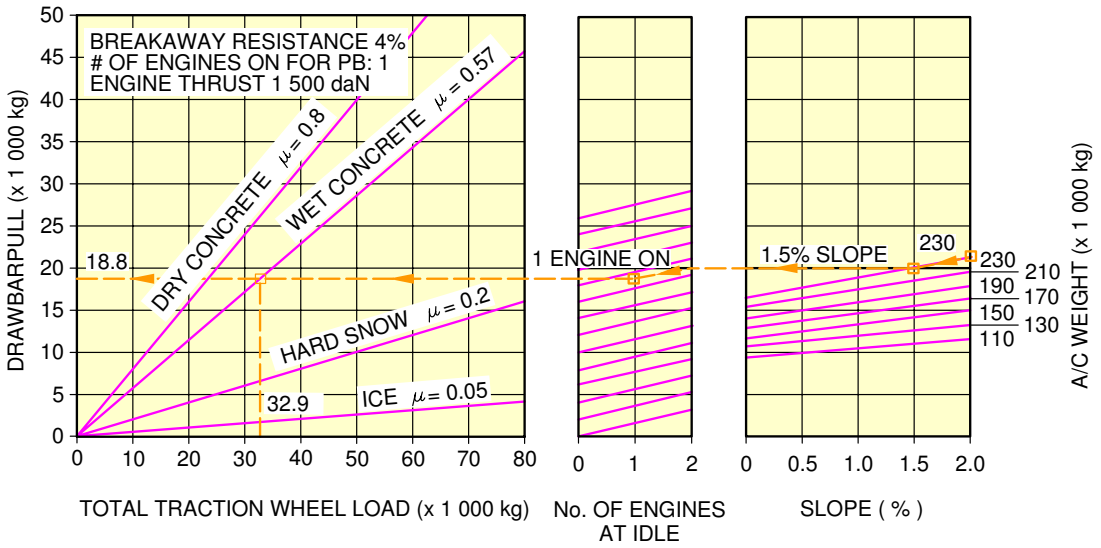
2. Towbar design guidelines
   The aircraft towbar shall comply with the following standards:
   - ISO 8267-1, "Aircraft - Towbar Attachment Fitting - Interface Requirements - Part 1: Main Line Aircraft"
   - ISO 9667, "Aircraft Ground Support Equipment - Towbars"
   - IATA Airport Handling Manual AHM 958, "Functional Specification for an Aircraft Towbar".

   A conventional type towbar is required which should be equipped with a damping system (to protect the NLG against jerks) and with towing shear pins:
   - A traction shear pin calibrated at 28 620 daN (64 340 lbf),
   - A torsion pin calibrated at 3 130 m.daN (276 991 lbf.in).

   The towing head is designed according to ISO 8267-1, cat. III.

3. This section gives information on aircraft towing with towbarless tractors.
   There are special approval procedures for towbarless tractors. Before towing, make sure that the towbarless tractor is approved for towing A330-700L.
   The list of towbarless towing vehicles that are specially accepted for A330-700L are given in Airbus In-Service Information, refer to ISI 09.11.00001.
   Ram Air Outlet (RAO) 1 and RAO 2 must be closed when a towbarless tractor approaches the aircraft.
   If RAO 2 (RH) is stuck open, the towbarless towing is permitted but special attention is necessary because of the space between RAO and the tractor is very less in this configuration.
   For safe approach of the tractor for the aircraft towing, it is recommended to follow the aircraft center-line trajectory.

**ON A/C A330-700L



EXAMPLE HOW TO DETERMINE THE MASS REQUIREMENT TO TOW A A330 AT 230 000 kg, 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 (230 000 kg),
- 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 No. 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 (18 800 kg),
- SEARCH THE INTERSECTION WITH THE "WET CONCRETE" LINE.
  THE OBTAINED X–COORDINATE IS THE RECOMMENDED TOTAL TRACTION WHEEL LOAD (32 900 kg).

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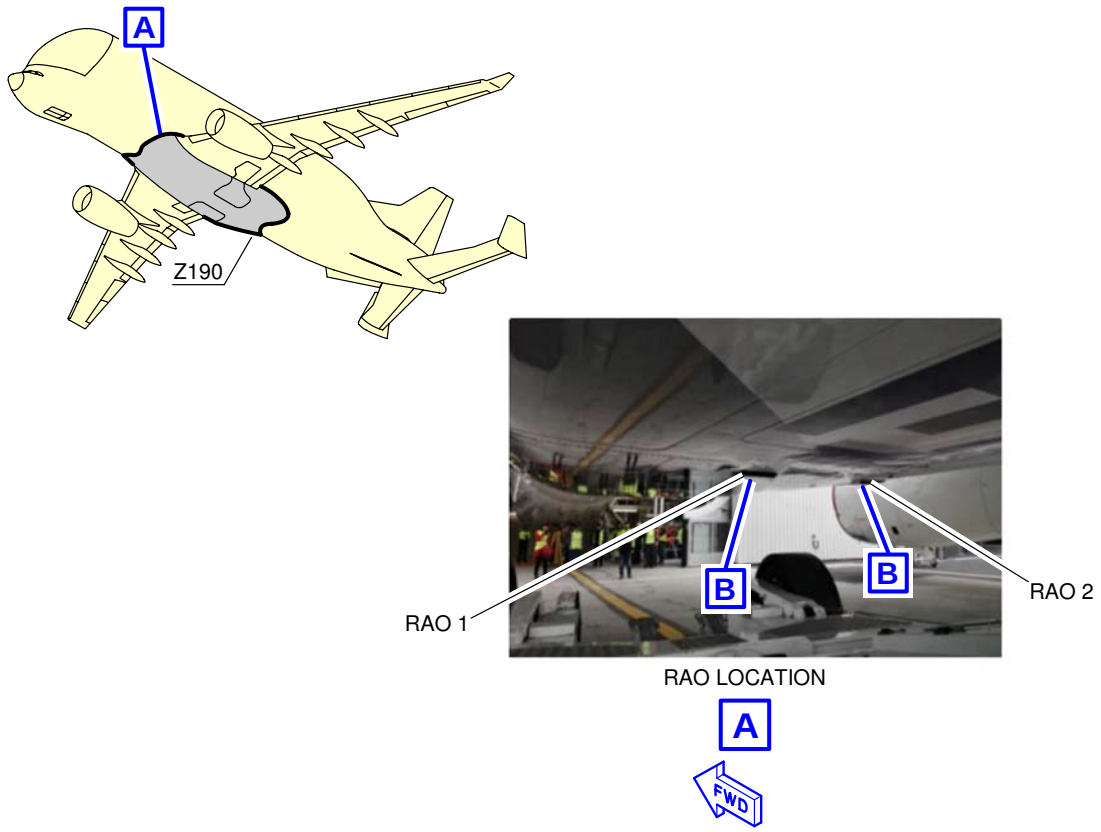
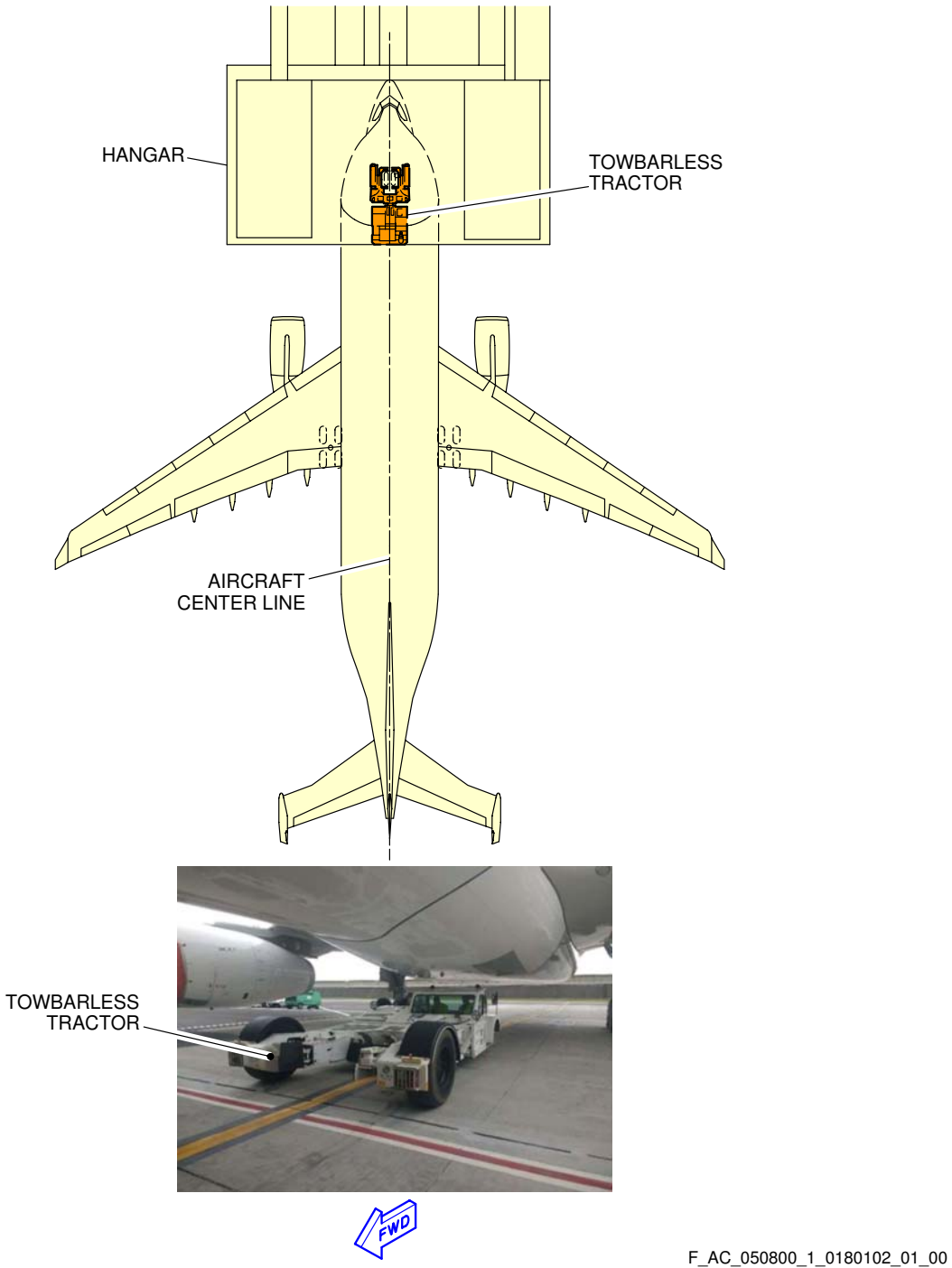
Ground Towing Requirements
FIGURE-5-8-0-991-015-A01

**ON A/C A330-700L



Ground Towing Requirements
Location of the RAOs (Sheet 1 of 2)
FIGURE-5-8-0-991-018-A01

**ON A/C A330-700L



Ground Towing Requirements
Tractor Trajectory for Towing Operations (Sheet 2 of 2)
FIGURE-5-8-0-991-018-A01

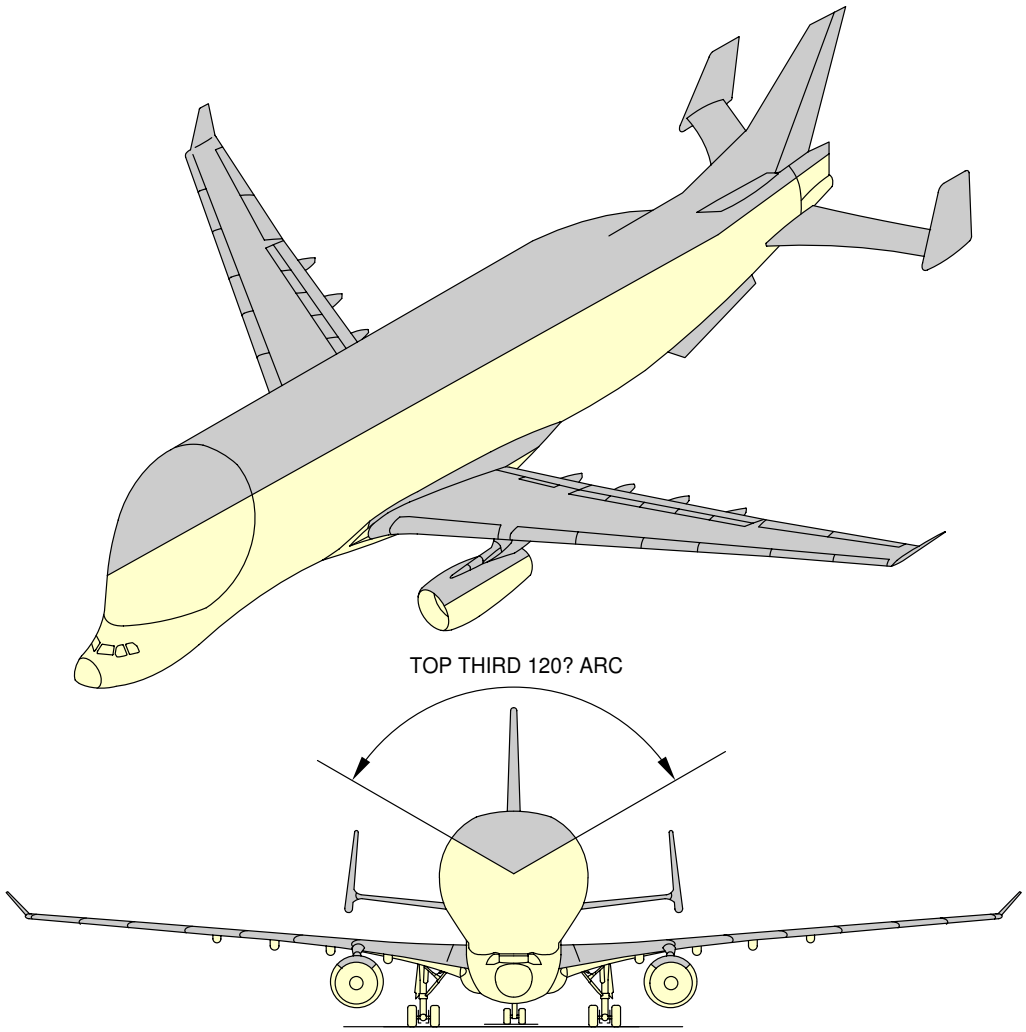
5-9-0 De-Icing and External Cleaning

**ON A/C A330-700L

De-Icing and External Cleaning

1. De-Icing and External Cleaning on Ground
   The mobile equipment for aircraft de-icing and external cleaning must be capable of reaching heights up to approximately 20 m (65.62 ft).

**ON A/C A330-700L



AREA	WING TOP SURFACE (BOTH SIDES)	WING TIP DEVICES (BOTH INSIDE AND OUTSIDE SURFACES) (BOTH SIDES)	HTP TOP SURFACE (BOTH SIDES)	VTP SURFACE (BOTH SIDES)	FUSELAGE TOP SURFACE (TOP THIRD–120? ARC)	NACELLE, PYLON TOP SURFACE (TOP THIRD–120? ARC) (ALL ENGINES)	TOTAL DE–ICED AREA
m? (ft?)	306 (3 294)	11 (118)	65 (700)	210 (2 260)	410 (4 413)	46 (495)	1 048 (11 281)

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De-Icing and External Cleaning
FIGURE-5-9-0-991-001-A01

OPERATING CONDITIONS

6-1-0 Engine Exhaust Velocities and Temperatures

**ON A/C A330-700L

Engine Exhaust Velocities and Temperatures

1. General
   This section shows the estimated engine exhaust efflux velocities and temperatures contours for ground idle, breakaway and maximum takeoff conditions.

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

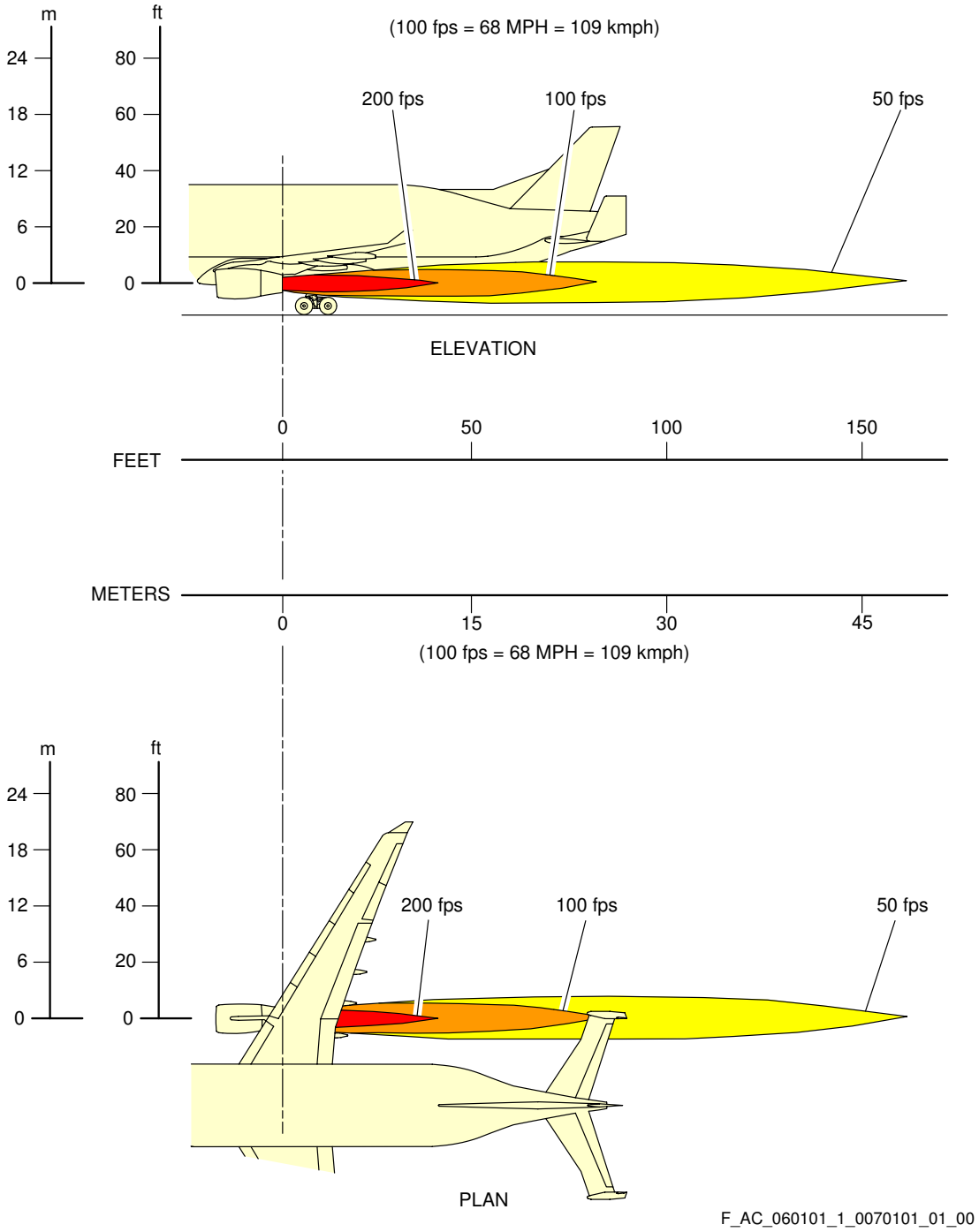
**ON A/C A330-700L

Engine Exhaust Velocities Contours - Ground Idle Power

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

   NOTE : The three values give velocities isolines values at the borders of colored areas.

**ON A/C A330-700L



Engine Exhaust Velocities
Ground Idle Power - RR Trent 700 Series Engine
FIGURE-6-1-1-991-007-A01

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

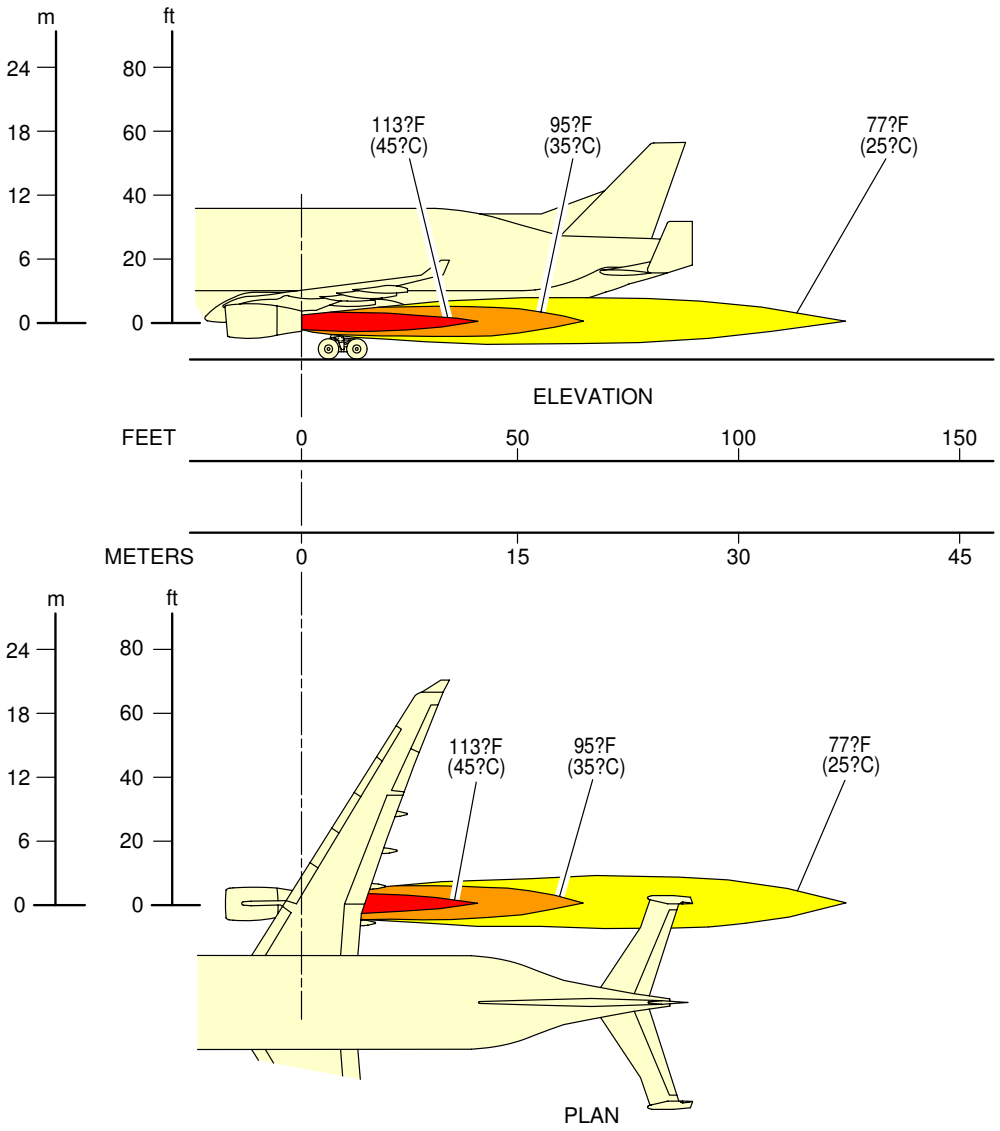
**ON A/C A330-700L

Engine Exhaust Temperatures Contours - Ground Idle Power

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

   NOTE : The three values give temperature isolines values at the borders of colored areas.

**ON A/C A330-700L



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Engine Exhaust Temperatures
Ground Idle Power - RR Trent 700 Series Engine
FIGURE-6-1-2-991-007-A01

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

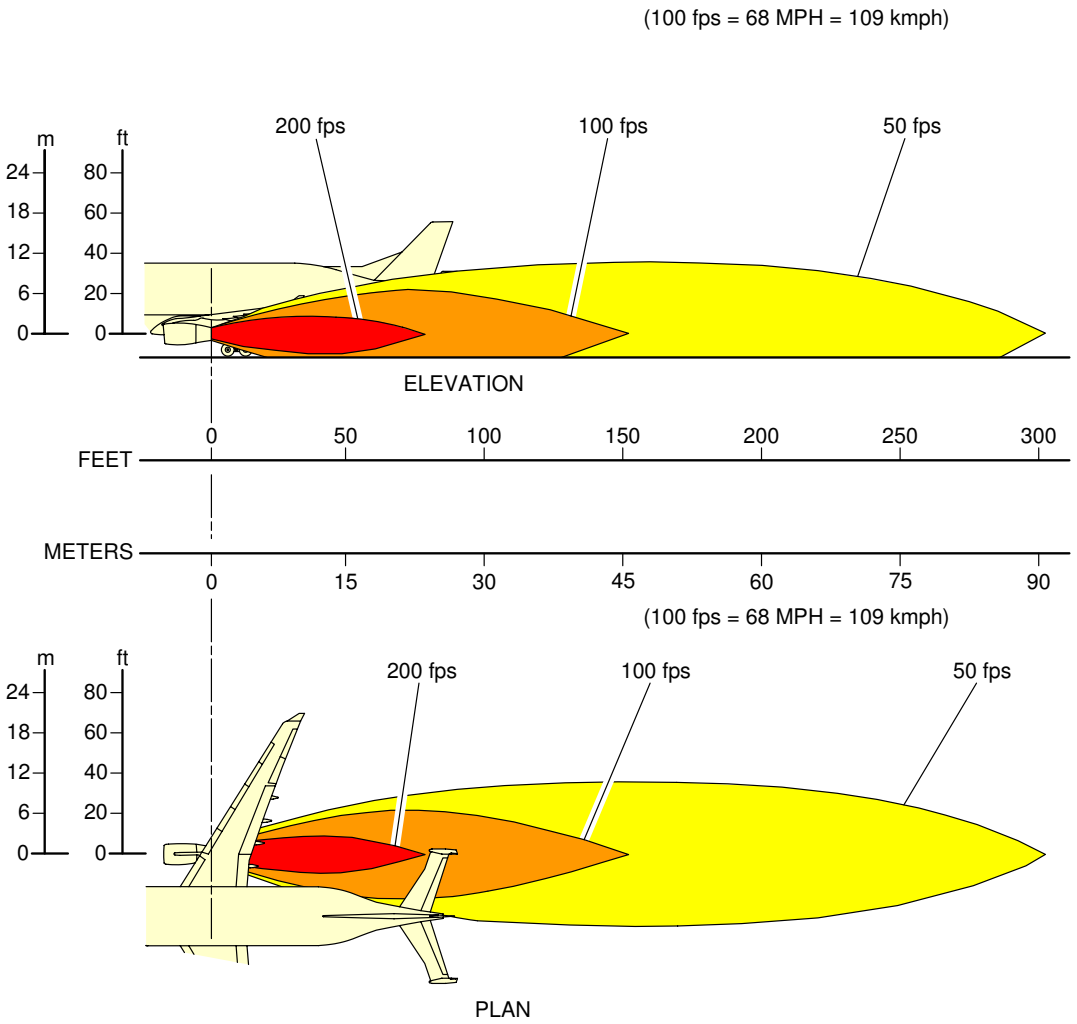
**ON A/C A330-700L

Engine Exhaust Velocities Contours - Breakaway Power

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

   NOTE : The three values give velocities isolines values at the borders of colored areas.

**ON A/C A330-700L



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Engine Exhaust Velocities
Breakaway Power - RR Trent 700 Series Engine
FIGURE-6-1-3-991-009-A01

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

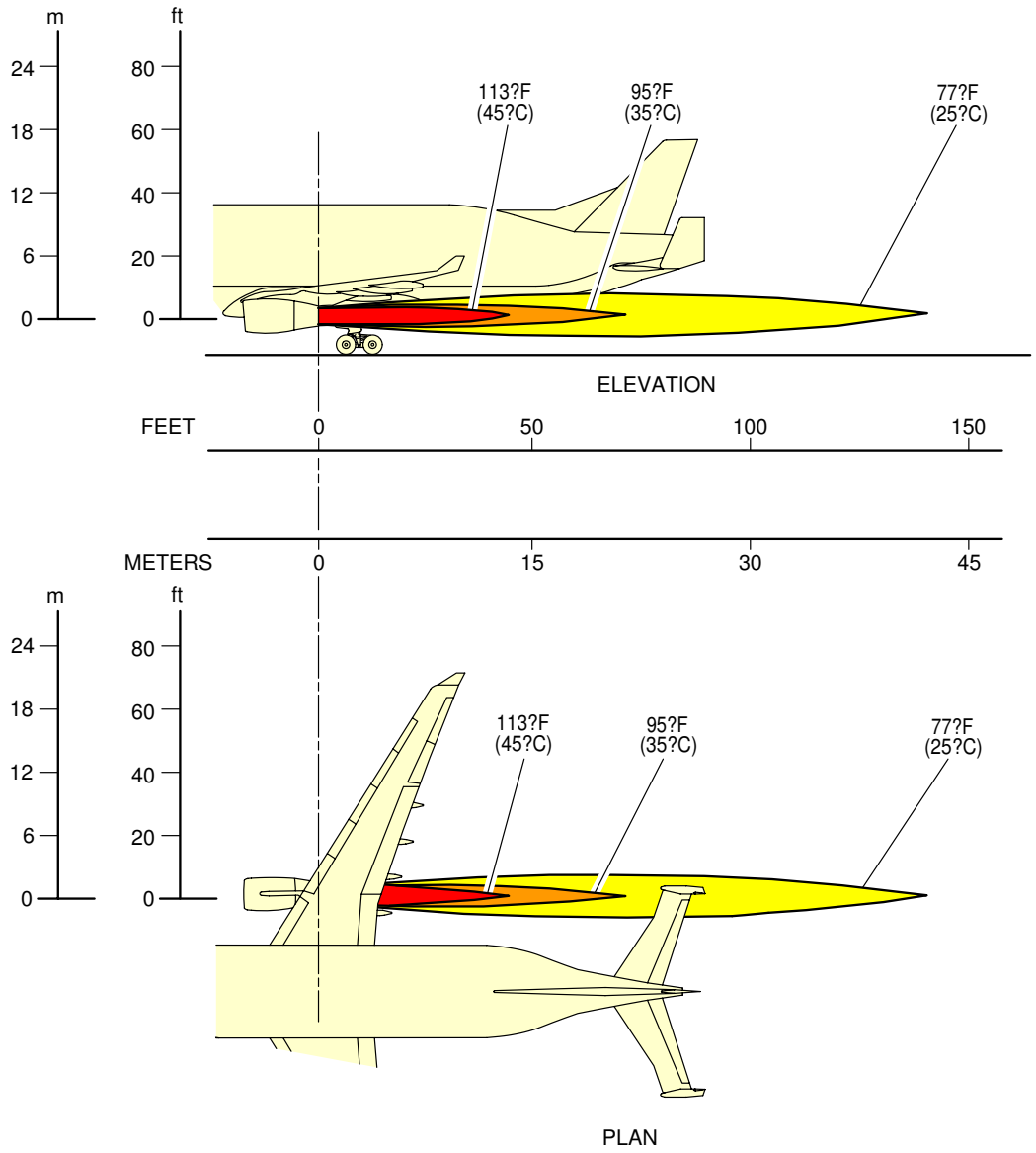
**ON A/C A330-700L

Engine Exhaust Temperatures Contours - Breakaway Power

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

   NOTE : The three values give temperature isolines values at the borders of colored areas.

**ON A/C A330-700L



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Engine Exhaust Temperatures
Breakaway Power - RR Trent 700 Series Engine
FIGURE-6-1-4-991-009-A01

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

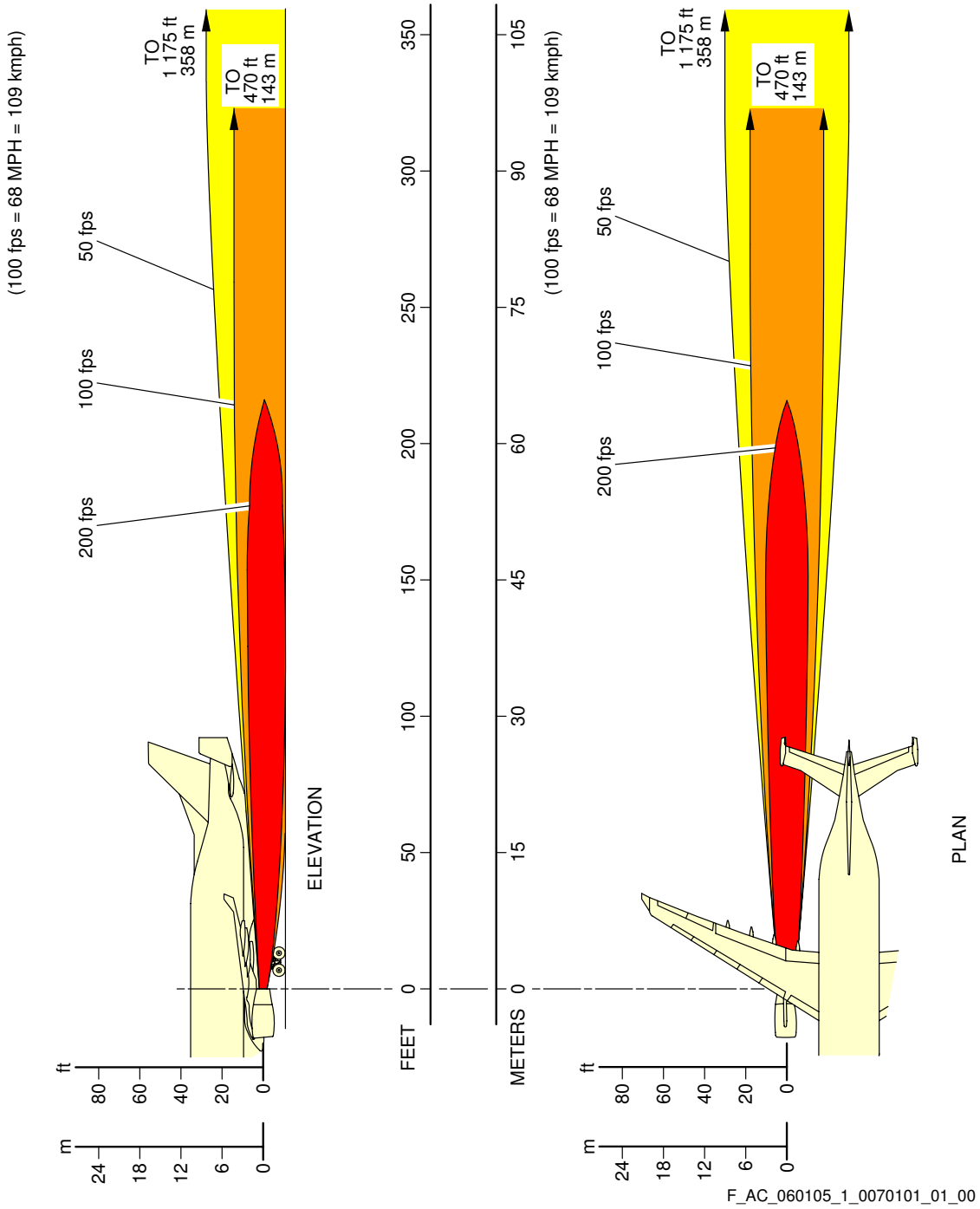
**ON A/C A330-700L

Engine Exhaust Velocities Contours - Takeoff Power

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

   NOTE : The three values give velocities isolines values at the borders of colored areas.

**ON A/C A330-700L



Engine Exhaust Velocities
Takeoff Power - RR Trent 700 Series Engine
FIGURE-6-1-5-991-007-A01

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

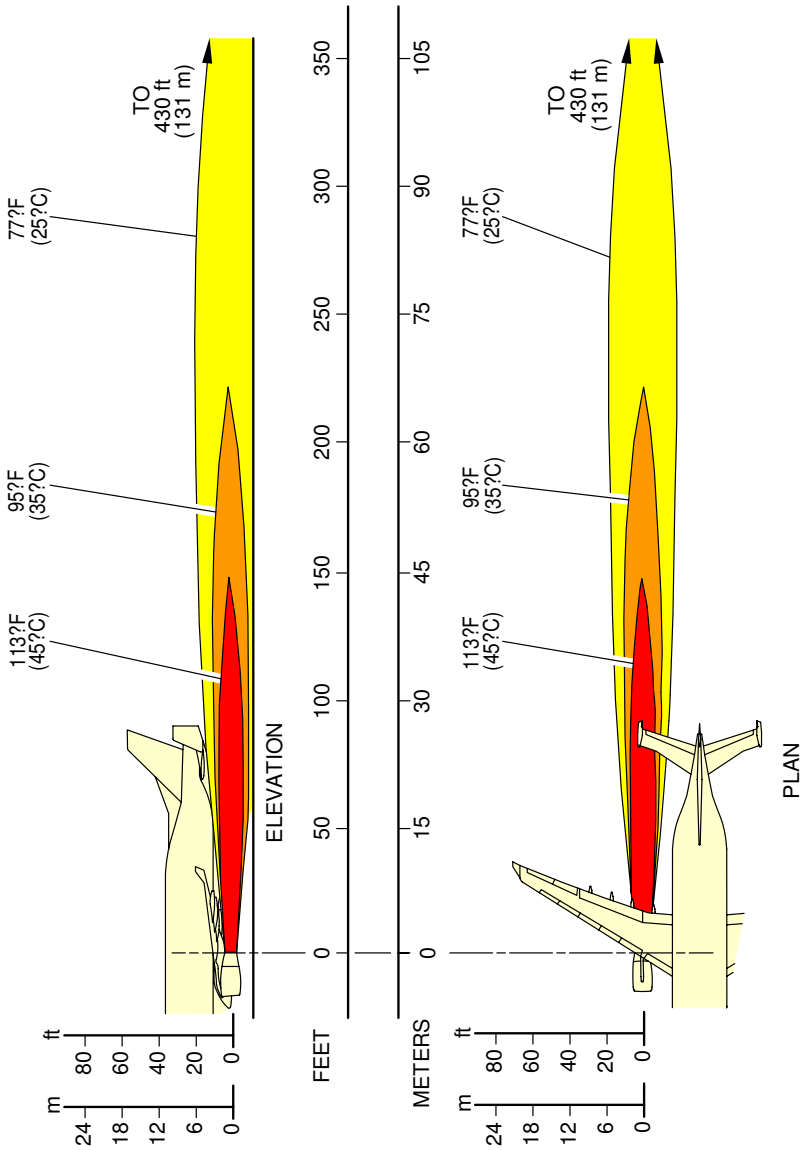
**ON A/C A330-700L

Engine Exhaust Temperatures Contours - Takeoff Power

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

   NOTE : The three values give temperature isolines values at the borders of colored areas.

**ON A/C A330-700L



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Engine Exhaust Temperatures
Takeoff Power - RR Trent 700 Series Engine
FIGURE-6-1-6-991-007-A01

6-3-0 Danger Areas of Engines

**ON A/C A330-700L

Danger Areas of Engines

1. Danger Areas of the Engines.

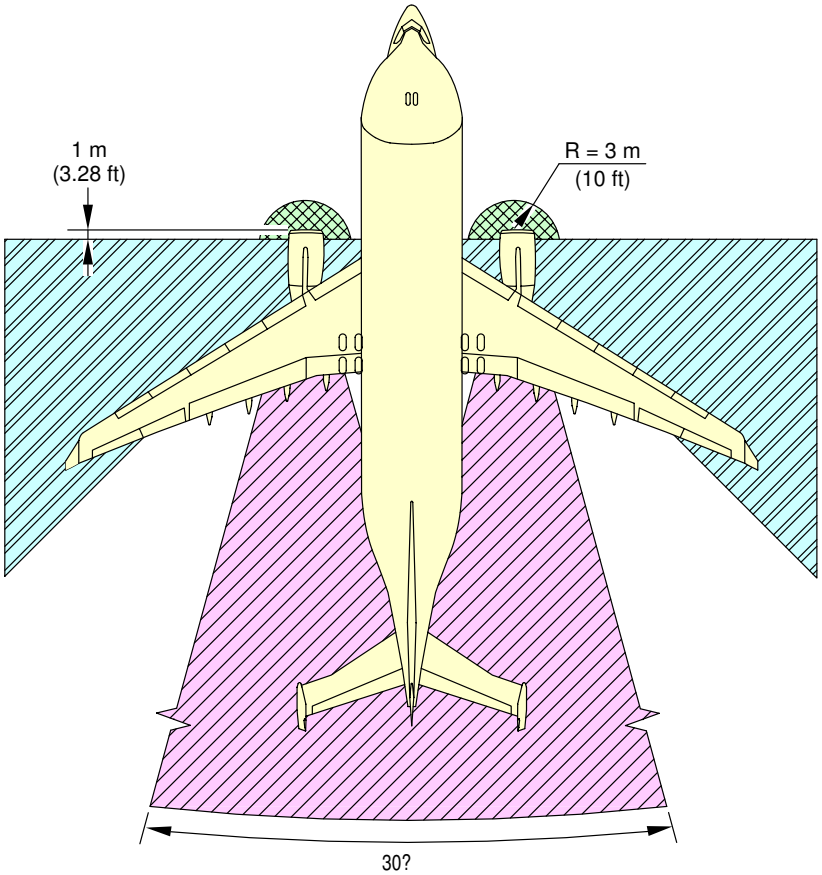
6-3-1 Ground Idle Power

**ON A/C A330-700L

Ground Idle Power

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

**ON A/C A330-700L



NOTE:

INTAKE SUCTION DANGER AREA MINIMUM POWER

ENTRY CORRIDOR

EXHAUST DANGER AREA

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Danger Areas of Engines
RR Trent 700 Series Engine
FIGURE-6-3-1-991-007-A01

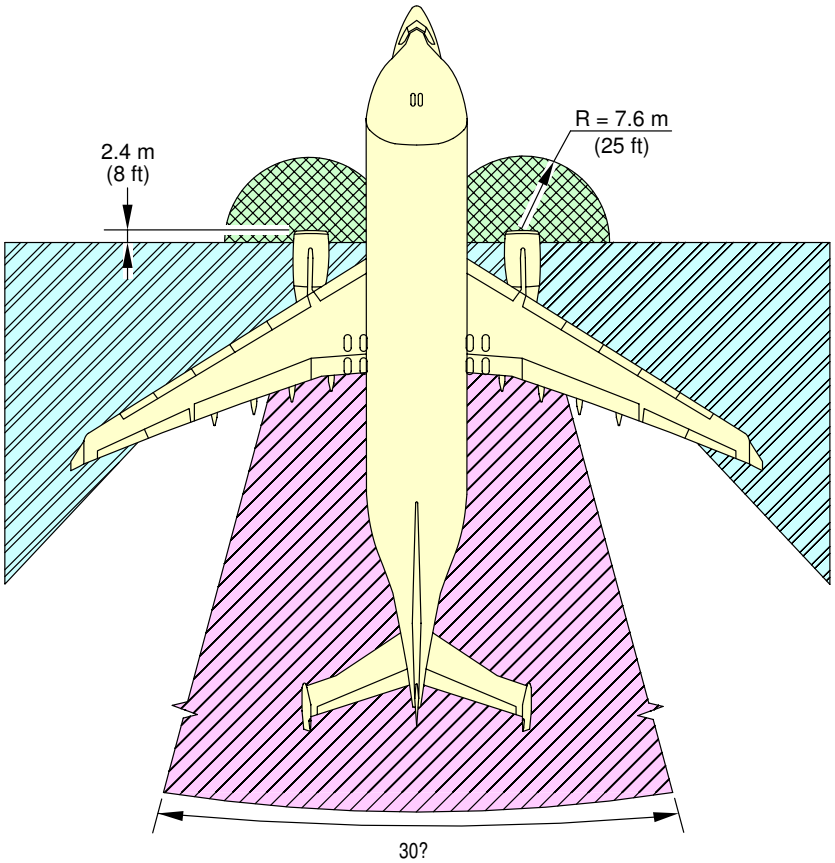
6-3-2 Breakaway Power

**ON A/C A330-700L

Breakaway Power

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

**ON A/C A330-700L



NOTE:

INTAKE SUCTION DANGER AREA BREAKAWAY POWER

ENTRY CORRIDOR

EXHAUST DANGER AREA

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Danger Areas of Engines
RR Trent 700 Series Engine
FIGURE-6-3-2-991-007-A01

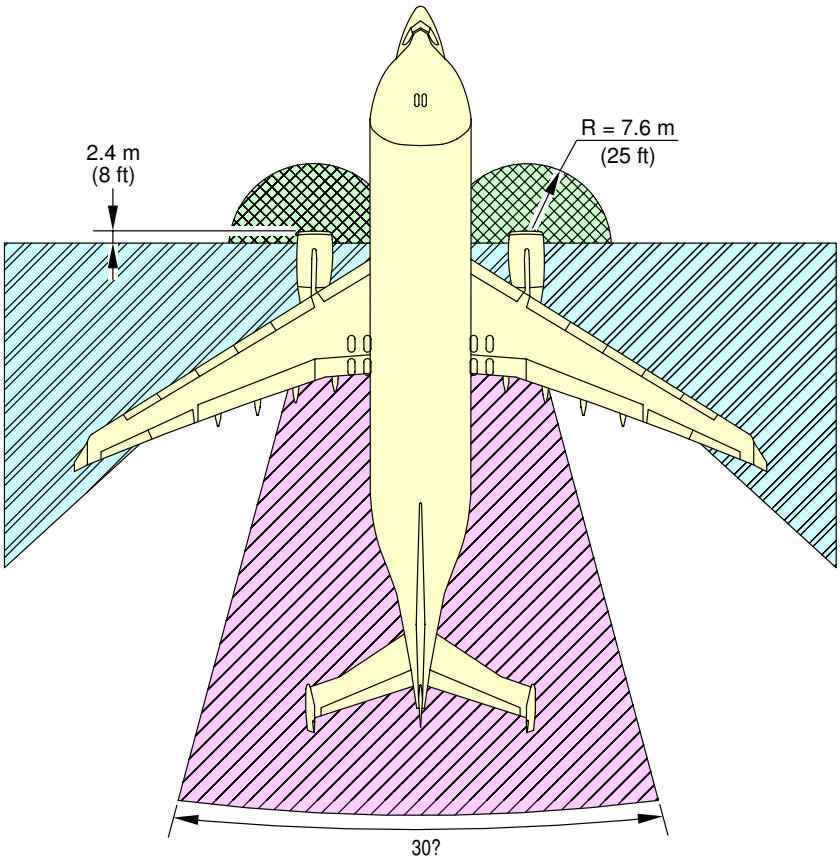
6-3-3 Takeoff Power

**ON A/C A330-700L

Take-Off Power

1. This section gives danger areas of the engines at maximum take-off power conditions.

**ON A/C A330-700L



NOTE:

INTAKE SUCTION DANGER AREA TAKE–OFF POWER

ENTRY CORRIDOR

EXHAUST DANGER AREA

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Danger Areas of Engines
RR Trent 700 Series Engine
FIGURE-6-3-3-991-007-A01

6-4-0 APU Exhaust Velocities and Temperatures

**ON A/C A330-700L

APU Exhaust Velocities and Temperatures

1. APU Exhaust Velocities and Temperatures.

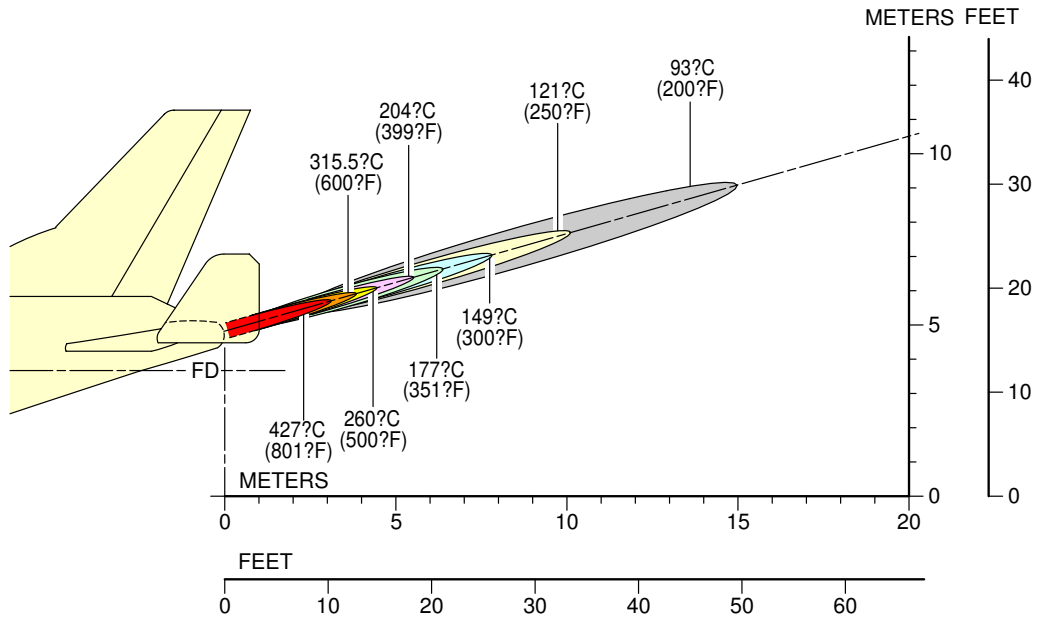
6-4-1 APU

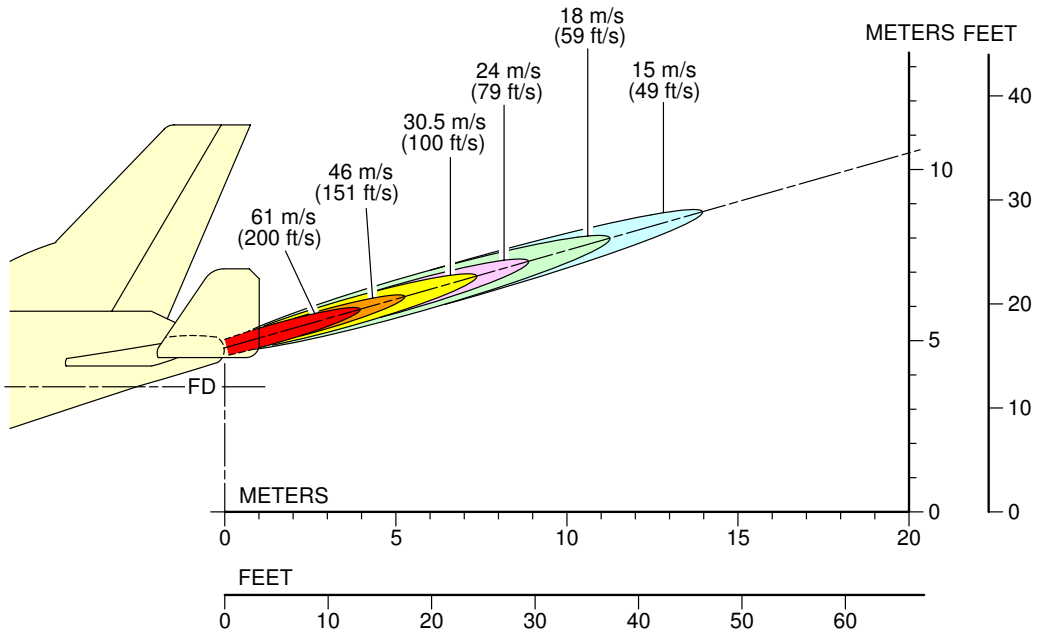
**ON A/C A330-700L

APU - GARRETT

1. This section gives APU exhaust velocities and temperatures.

**ON A/C A330-700L





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Exhaust Velocities and Temperatures
APU – GARRETT GTCP 331-350
FIGURE-6-4-1-991-004-A01

6-5-0 Pilot Visibility in Approach

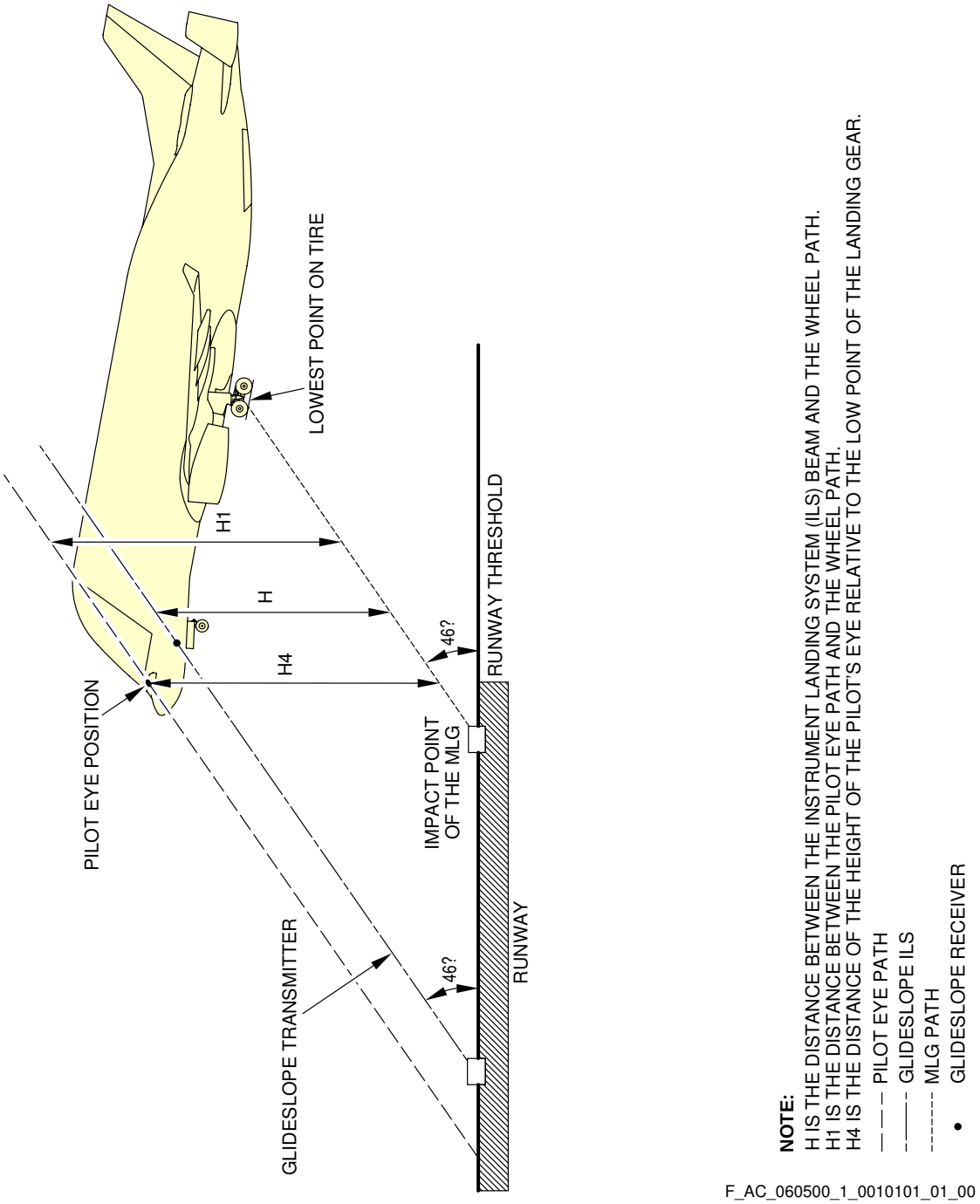
**ON A/C A330-700L

Pilot Visibility in Approach

1. This section gives data about pilot visibility in approach.

Distance	Value m (ft)
H	7.14 m (23.43 ft)
H1	8.91 m (29.23 ft)
H4	7.42 m (24.34 ft)

**ON A/C A330-700L



Pilot Visibility in Approach
Navigation Aids
FIGURE-6-5-0-991-001-A01

PAVEMENT DATA

7-1-0 General Information

****ON A/C A330-700L**

General Information

1. 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 aircraft configuration is shown with a minimum range of five loads on the Main Landing Gear (MLG).
   All curves on the charts represent data at a constant specified tire pressure with:
   - The aircraft loaded to the Maximum Ramp Weight (MRW),
   - The CG at its maximum permissible aft position.

   Pavement requirements for commercial aircraft are derived from the static analysis of loads imposed on the MLG struts.
   Landing Gear Footprint:
   Section 07-02-00presents basic data on the landing gear footprint configuration, MRW and tire sizes and pressures.
   Maximum Pavement Loads:
   Section 07-03-00shows maximum vertical and horizontal pavement loads for certain critical conditions at the tire-ground interfaces.
   Landing Gear Loading on Pavement:
   Section 07-04-00contains charts to find these loads throughout the stability limits of the aircraft at rest on the pavement.
   These MLG loads are used as the point of entry to the pavement design charts which follow, interpolating load values where necessary.
   Flexible Pavement Requirements - US Army Corps of Engineers Design Method:
   Section 07-05-00uses procedures in Instruction Report No. S-77-1 "Procedures for Development of CBR Design Curves", dated June 1977 and as modified according to the methods described in ICAO Aerodrome Design Manual, Part 3. Pavements, 2nd Edition, 1983, Section 1.1 (The ACN-PCN Method), and utilizing the alpha factors approved by ICAO in October 2007.
   The report was prepared by the "U.S. Army Corps Engineers Waterways Experiment Station, Soils and Pavement Laboratory, Vicksburg, Mississippi".
   The line showing 10 000 coverages is used to calculate the Aircraft Classification Number (ACN).
   Flexible Pavement Requirements - LCN Conversion Method:
   The Load Classification Number (LCN) curves are no longer given in section 07-06-00since the LCN system for reporting pavement strength is obsolete, having been replaced by the ICAO recommended ACN/PCN system in 1983.
   For questions regarding the LCN system, contact Airbus.
   Rigid Pavement Requirements - PCA (Portland Cement Association) Design Method:
   Section 07-07-00gives 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.
Rigid Pavement Requirements - LCN Conversion:
Section 07-08-00gives the rigid pavement requirements. All LCN curves shown in 'Rigid Pavement Requirements - Radius of Relative Stiffness (other values of E and μ) - were developed from a computer program based on data in ICAO document 7920- AN/865/2, Aerodrome manual, Part 2, "Aerodrome Physical Characteristics", Second Edition, 1965.
Rigid Pavement Requirements - LCN Conversion - Radius of Relative Stiffness:
The LCN curves are no longer given in section 07-08-00since the LCN system for reporting pavement strength is obsolete, having been replaced by the ICAO recommended ACN/PCN system in 1983. For questions regarding the LCN system, contact Airbus.
ACN/PCN Reporting System:
Section 07-09-00gives ACN data prepared according to the ACN/PCN system as referenced in ICAO Annex 14, "Aerodromes", Volume 1 "Aerodrome Design and Operations" Fourth Edition, July 2004, incorporating Amendments 1 to 6.
The ACN/PCN system gives a standardized international aircraft/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 less than or equal to 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 pressure limit	T - Technical
F - Flexible	B - Medium	X - High pressure limited to 1.75 MPa (254 psi)	U - Using Aircraft
	C - Low	Y - Medium pressure limited to 1.25 MPa (181 psi)	
	D - Ultra Low	Z - Low pressure limited to 0.5 MPa (73 psi)	

For flexible pavements, the four subgrade categories (CBR) are:

- A. High Strength	CBR 15
- B. Medium Strength	CBR 10
- C. Low Strength	CBR 6
- D. Ultra Low Strength	CBR 3

For rigid pavements, the four subgrade categories (k) are:

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

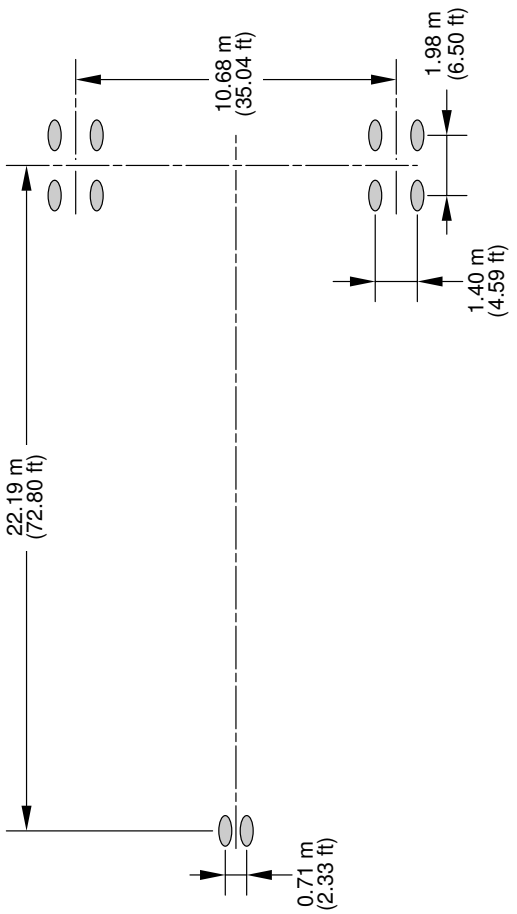
7-2-0 Landing Gear Footprint

**ON A/C A330-700L

Landing Gear Footprint

1. This section gives data about the landing gear footprint in relation to the aircraft MRW and tire sizes and pressures.
   The landing-gear footprint information is given for all the operational weight variants of the aircraft.

**ON A/C A330-700L



CG HEIGHT	MAXIMUM RAMP WEIGHT	PERCENTAGE OF WEIGHT ON MAIN GEAR GROUP	NOSE GEAR TIRE SIZE	NOSE GEAR TIRE PRESSURE	MAIN GEAR TIRE SIZE	MAIN GEAR TIRE PRESSURE
A330−700L ZCG −0.5 m	227 900 kg (502 425 lb)	91.7%	1 050x395R16 28PR	12.7 bar (184 psi)	1 400x530R23 36PR	14.2 bar (206 psi)
A330−700L ZCG −0.4 m	227 900 kg (502 425 lb)	91.7%	1 050x395R16 28PR	12.7 bar (184 psi)	1 400x530R23 36PR	14.2 bar (206 psi)
A330−700L ZCG 0 m	227 900 kg (502 425 lb)	91.7%	1 050x395R16 28PR	12.7 bar (184 psi)	1 400x530R23 36PR	14.2 bar (206 psi)
A330−700L ZCG 0.4 m	227 900 kg (502 425 lb)	90.9%	1 050x395R16 28PR	12.7 bar (184 psi)	1 400x530R23 36PR	14.2 bar (206 psi)
A330−700L ZCG 0.6 m	202 300 kg (446 000 lb)	91.7%	1 050x395R16 28PR	12.7 bar (184 psi)	1 400x530R23 36PR	14.2 bar (206 psi)

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Landing Gear Footprint
FIGURE-7-2-0-991-056-A01

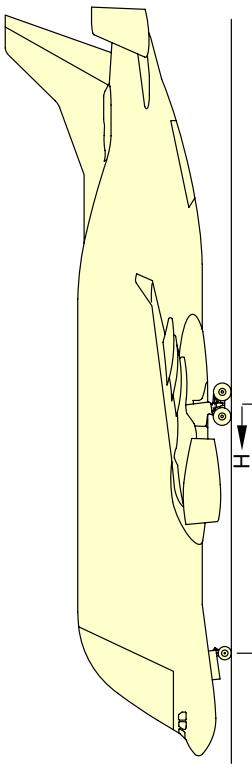
7-3-0 Maximum Pavement Loads

**ON A/C A330-700L

Maximum Pavement Loads

1. This section gives maximum vertical and horizontal pavement loads for some critical conditions at the tire-ground interfaces.
   The maximum pavement loads are given for all the operational weight variants of the aircraft.

**ON A/C A330-700L



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

1	2	3		4	5		6	
		$V_{(NG)}$			$V_{(MG)}$ (PER STRUT)		H (PER STRUT)	
CG HEIGHT	MAXIMUM RAMP WEIGHT	STATIC LOAD AT MOST FWD CG		STATIC BRAKING AT 10 ft/s² DECELERATION	STATIC LOAD AT MAX AFT CG		STEADY BRAKING AT 10 ft/s² DECELERATION	AT INSTANTANEOUS BRAKING COEFFICIENT = 0.8
ZCG –0.5 m	227 900 kg (502 425 lb)	23 280 kg (51 325 lb)	22.5 % MAC (a)	38 150 kg (84 100 lb)	104 440 kg (230 250 lb)	28.2 % MAC (a)	35 420 kg (78 100 lb) (b)	83 550 kg (184 200 lb) (b)
ZCG –0.4 m	227 900 kg (502 425 lb)	24 700 kg (54 450 lb)	20.6 % MAC (a)	39 890 kg (87 950 lb)	104 440 kg (230 250 lb)	28.2 % MAC (a)	35 420 kg (78 100 lb) (b)	83 550 kg (184 200 lb) (b)
ZCG 0 m	227 900 kg (502 425 lb)	24 700 kg (54 450 lb)	20.6 % MAC (a)	41 170 kg (90 775 lb)	104 440 kg (230 250 lb)	28.2 % MAC (a)	35 420 kg (78 100 lb) (b)	83 550 kg (184 200 lb) (b)
ZCG 0.4 m	227 900 kg (502 425 lb)	24 700 kg (54 450 lb)	20.6 % MAC (a)	42 440 kg (93 575 lb)	103 620 kg (228 450 lb)	26 % MAC (a)	35 420 kg (78 100 lb) (b)	82 890 kg (182 750 lb) (b)
ZCG 0.6 m	202 300 kg (446 000 lb)	23 650 kg (52 150 lb)	18 % MAC (a)	39 970 kg (88 125 lb)	92 710 kg (204 400 lb)	28.2 % MAC (a)	31 440 kg (69 325 lb) (b)	74 160 kg (163 500 lb) (b)

NOTE:
(a) LOADS CALCULATED USING AIRCRAFT AT MRW.
(b) BRAKED MAIN GEAR.

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Maximum Pavement Loads
FIGURE-7-3-0-991-022-A01

7-4-0 Landing Gear Loading on Pavement

**ON A/C A330-700L

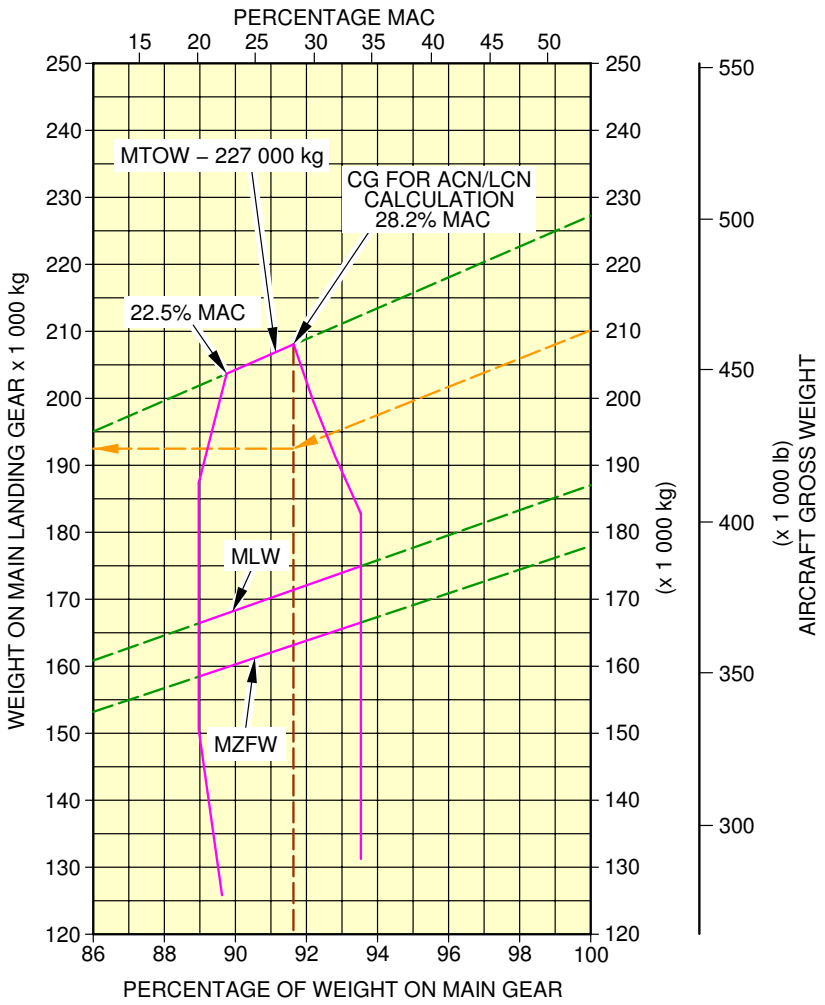
Landing Gear Loading on Pavement

1. This section gives data about the landing gear loading on pavement.
   The MLG loading on pavement graphs are given at standard tire pressure for all the aircraft operational weight variants.
   Example, see FIGURE 7-4-0-991-015-A(Sheet 5), calculation of the total weight on the MLG for:
   - An aircraft with a MRW of 202 300 kg (446 000 lb),
   - The aircraft gross weight is 195 000 kg (429 900 lb),
   - A percentage of weight on the MLG of 91.65% (percentage of weight on the MLG at MRW and maximum aft CG at MRW).

   The total weight on the MLG group is 178 720 kg (394 000 lb).

   NOTE : The CG in the figure title is the CG used for ACN/LCN calculation.

**ON A/C A330-700L



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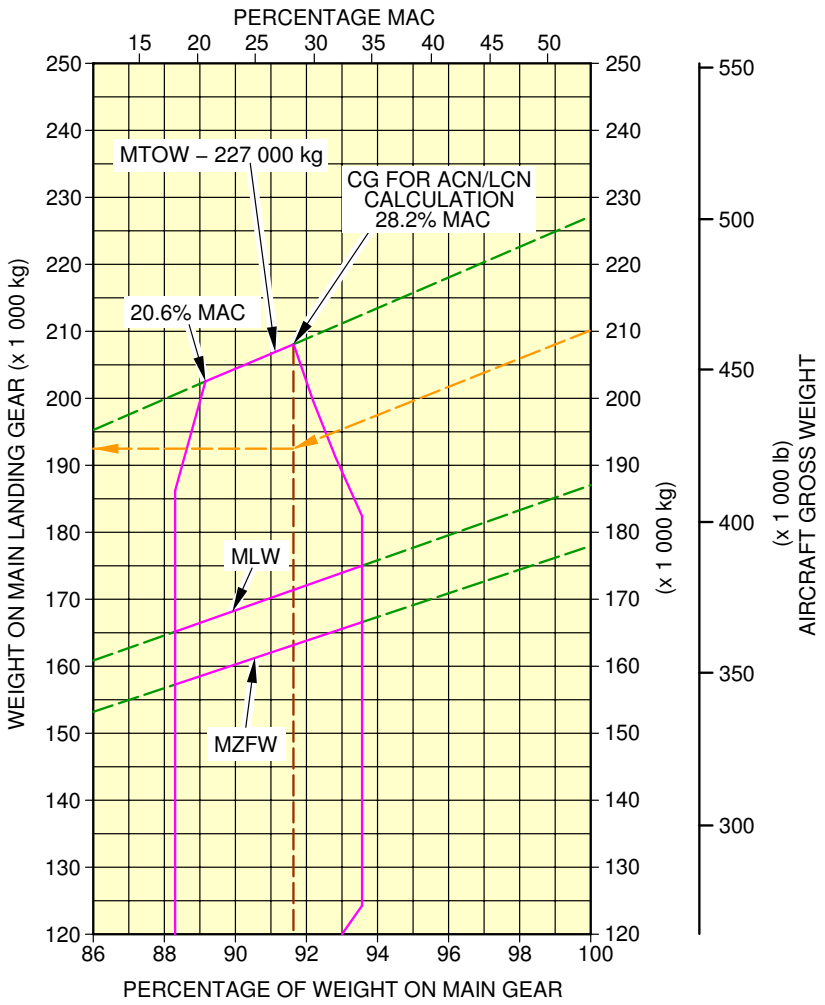
Landing Gear Loading on Pavement
WVZCG -0.5 m, MRW 227 900 kg, CG 28.2% (Sheet 1 of 5)
FIGURE-7-4-0-991-015-A01

**ON A/C A330-700L



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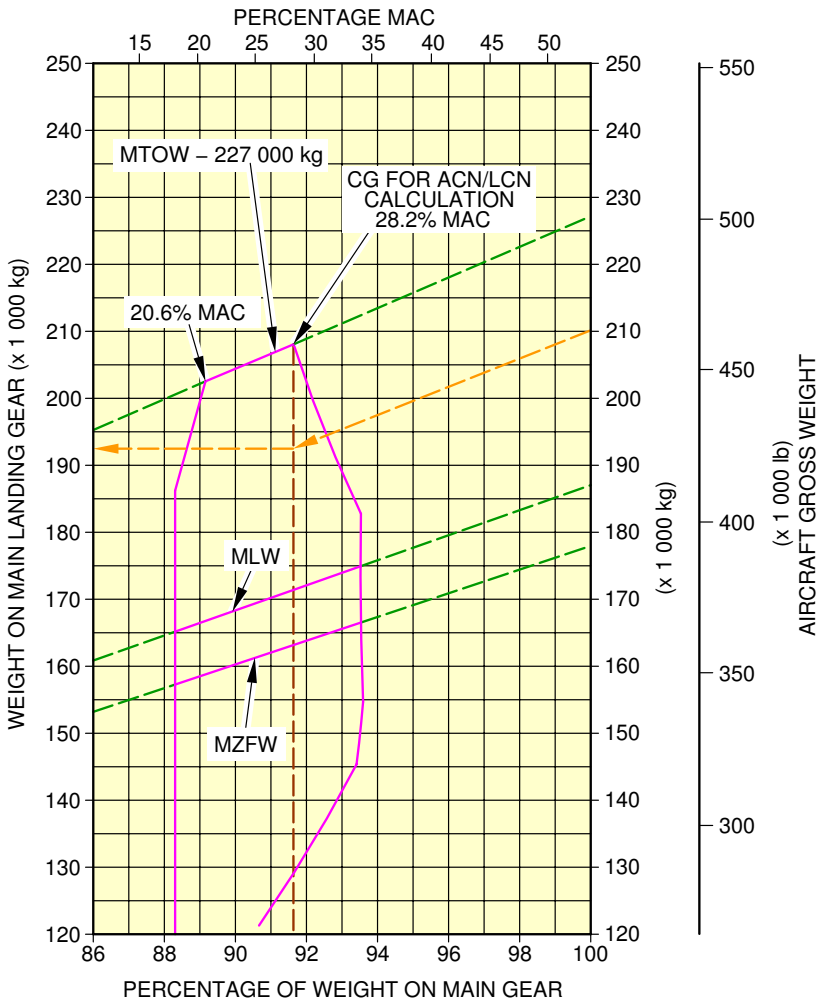
Landing Gear Loading on Pavement
WVZCG -0.4 m, MRW 227 900 kg, CG 28.2% (Sheet 2 of 5)
FIGURE-7-4-0-991-015-A01

**ON A/C A330-700L



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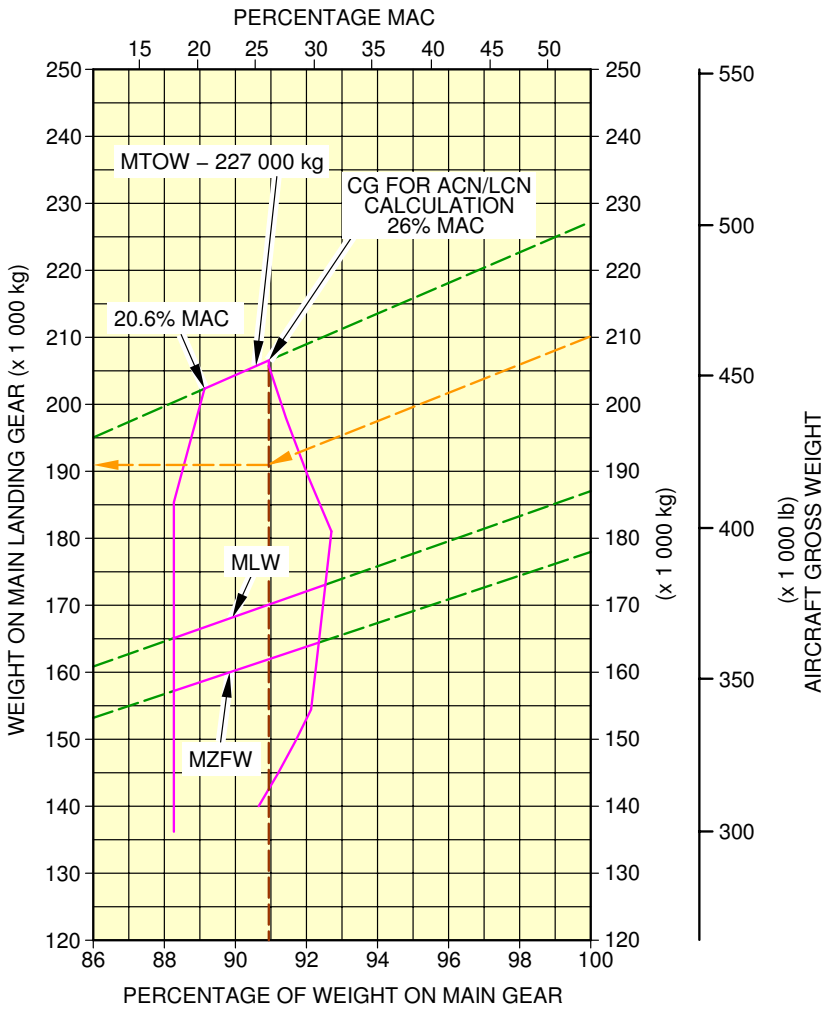
Landing Gear Loading on Pavement
WVZCG 0 m, MRW 227 900 kg, CG 28.2% (Sheet 3 of 5)
FIGURE-7-4-0-991-015-A01

**ON A/C A330-700L



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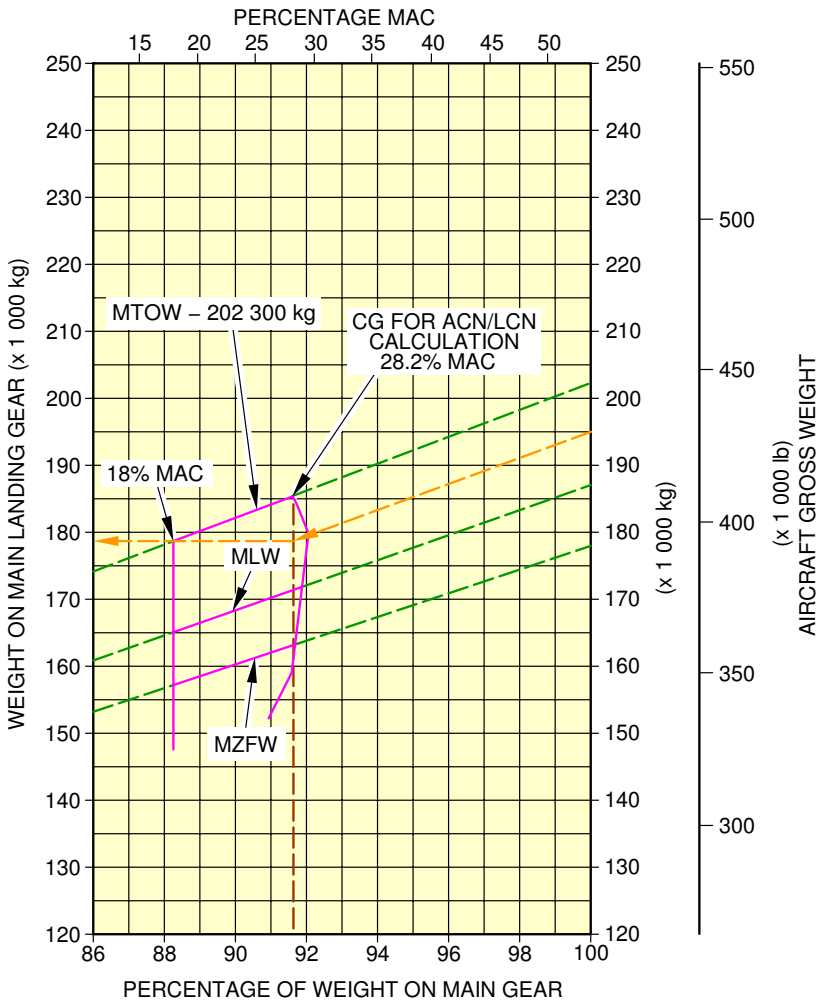
Landing Gear Loading on Pavement
WVZCG 0.4 m, MRW 227 900 kg, CG 26% (Sheet 4 of 5)
FIGURE-7-4-0-991-015-A01

**ON A/C A330-700L



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Landing Gear Loading on Pavement
WVZCG 0.6 m, MRW 202 300 kg, CG 28.2% (Sheet 5 of 5)
FIGURE-7-4-0-991-015-A01

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

**ON A/C A330-700L

Flexible Pavement Requirements - US Army Corps of Engineers Design Method

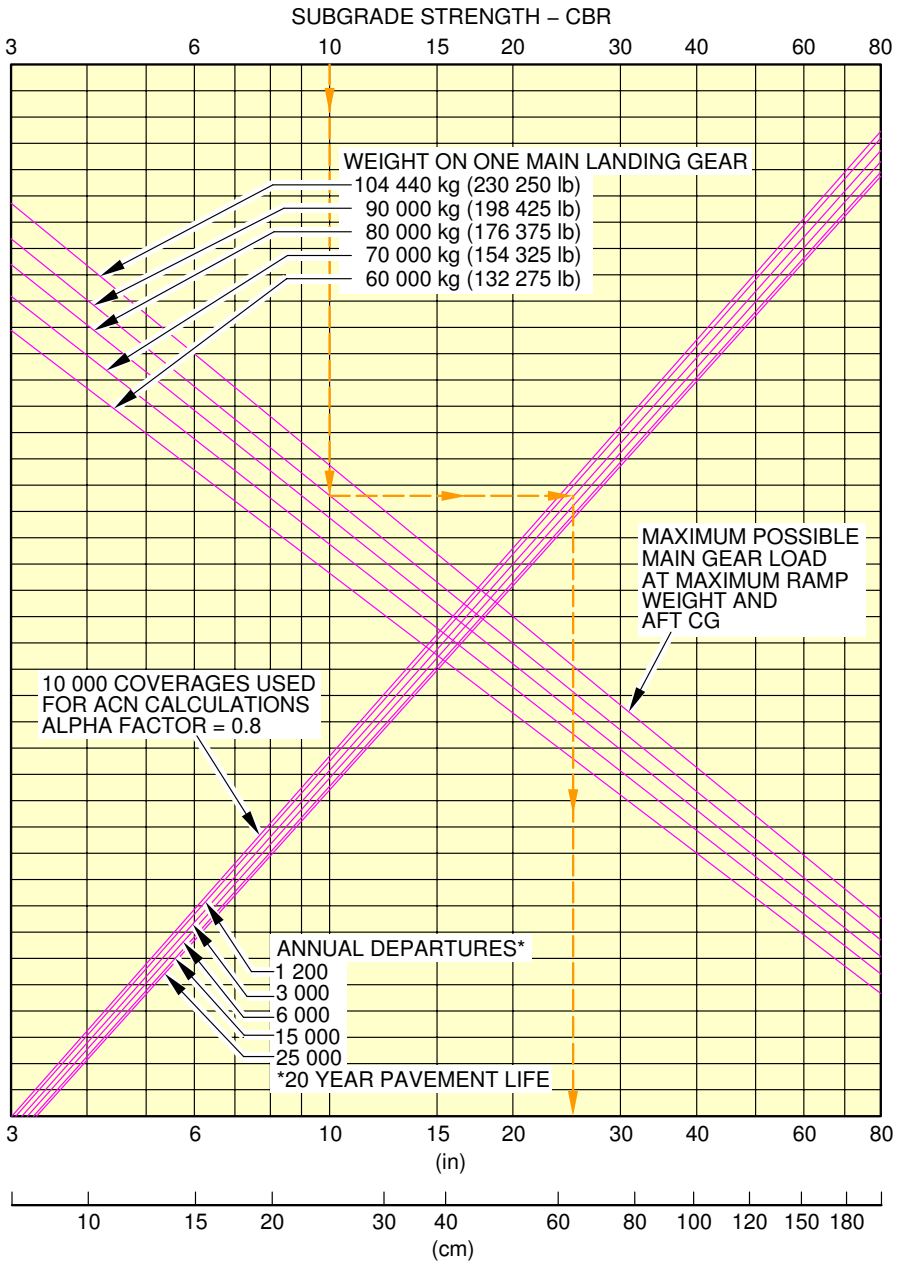
1. This section gives data about the flexible pavement requirements.
   The flexible pavement requirements graphs are given at standard tire pressure for all the aircraft operational weight variants.
   They are calculated with the US Army Corps of Engineers Design Method.
   To find a flexible pavement thickness, you must know the Subgrade Strength (CBR), the annual departure level and the weight on one MLG.
   The line that shows 10 000 coverages is used to calculate the Aircraft Classification Number (ACN).
   The procedure that follows is used to develop flexible pavement design curves:
   - With the scale for pavement thickness at the bottom and the scale for CBR at the top, a random line is made to show 10 000 coverages,
   - A plot is then made of the incremental values of the weight on the MLG,
   - Annual departure lines are made based on the load lines of the weight on the MLG that is shown on the graph.

   Example, see FIGURE 7-5-0-991-013-A(Sheet 3), calculation of the thickness of the flexible pavement for:
   - An aircraft with a Maximum Ramp Weight (MRW) of 202 300 kg (446 000 lb),
   - A "CBR" value of 10,
   - An annual departure level of 3 000,
   - The load on one MLG of 80 000 kg (176 375 lb).

   The required flexible pavement thickness is 59.4 cm (23 in).

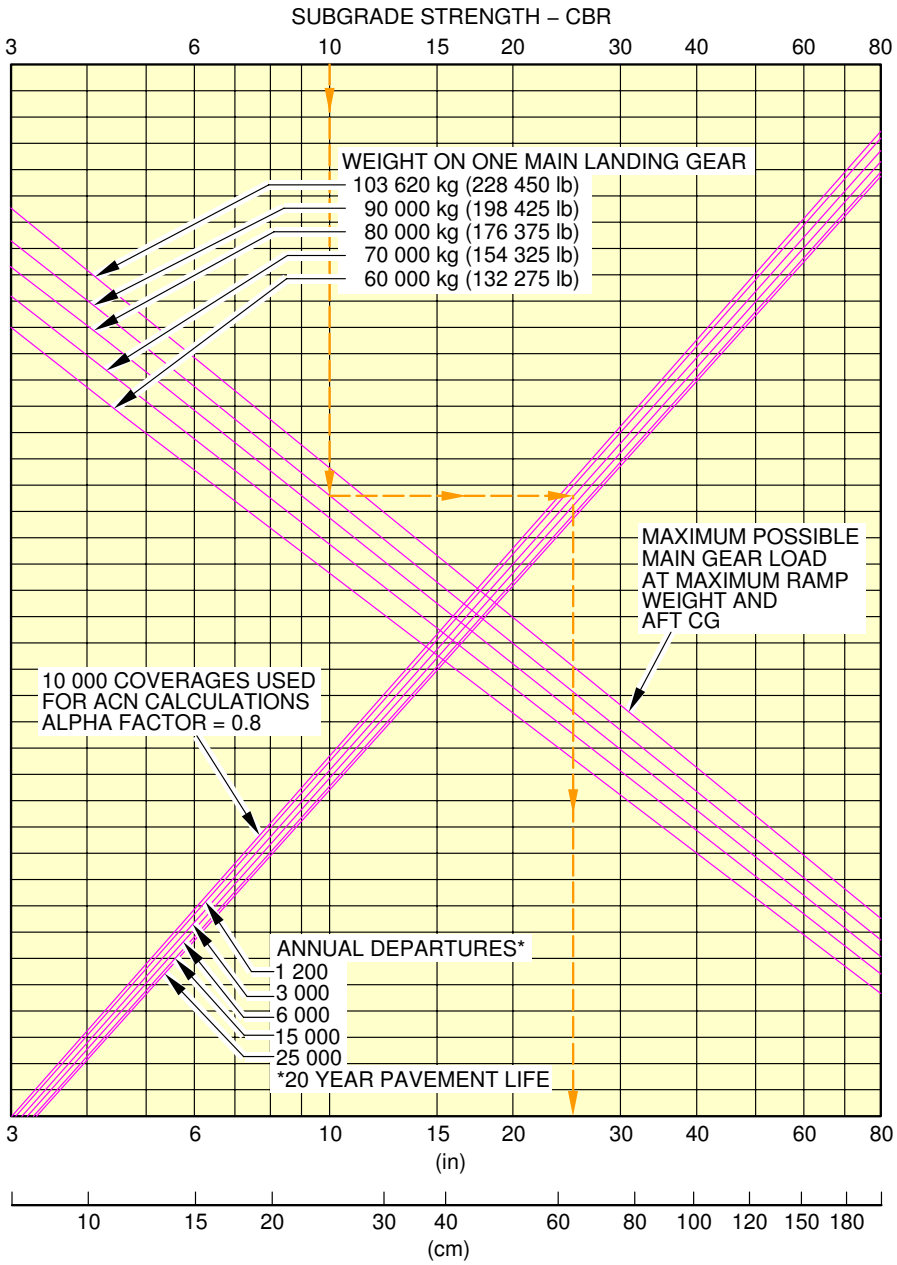
   NOTE : The CG in the figure title is the CG used for ACN calculation.

**ON A/C A330-700L



Flexible Pavement Requirements
WVZCG -0.5 m, WVZCG -0.4 m, WVZCG 0 m, MRW 227 900 kg, CG 28.2% (Sheet 1 of 3)
FIGURE-7-5-0-991-013-A01

**ON A/C A330-700L



FLEXIBLE PAVEMENT THICKNESS

1 400x530R23 PR36 TIRES

TIRE PRESSURE CONSTANT AT 14.2 bar (206 psi)

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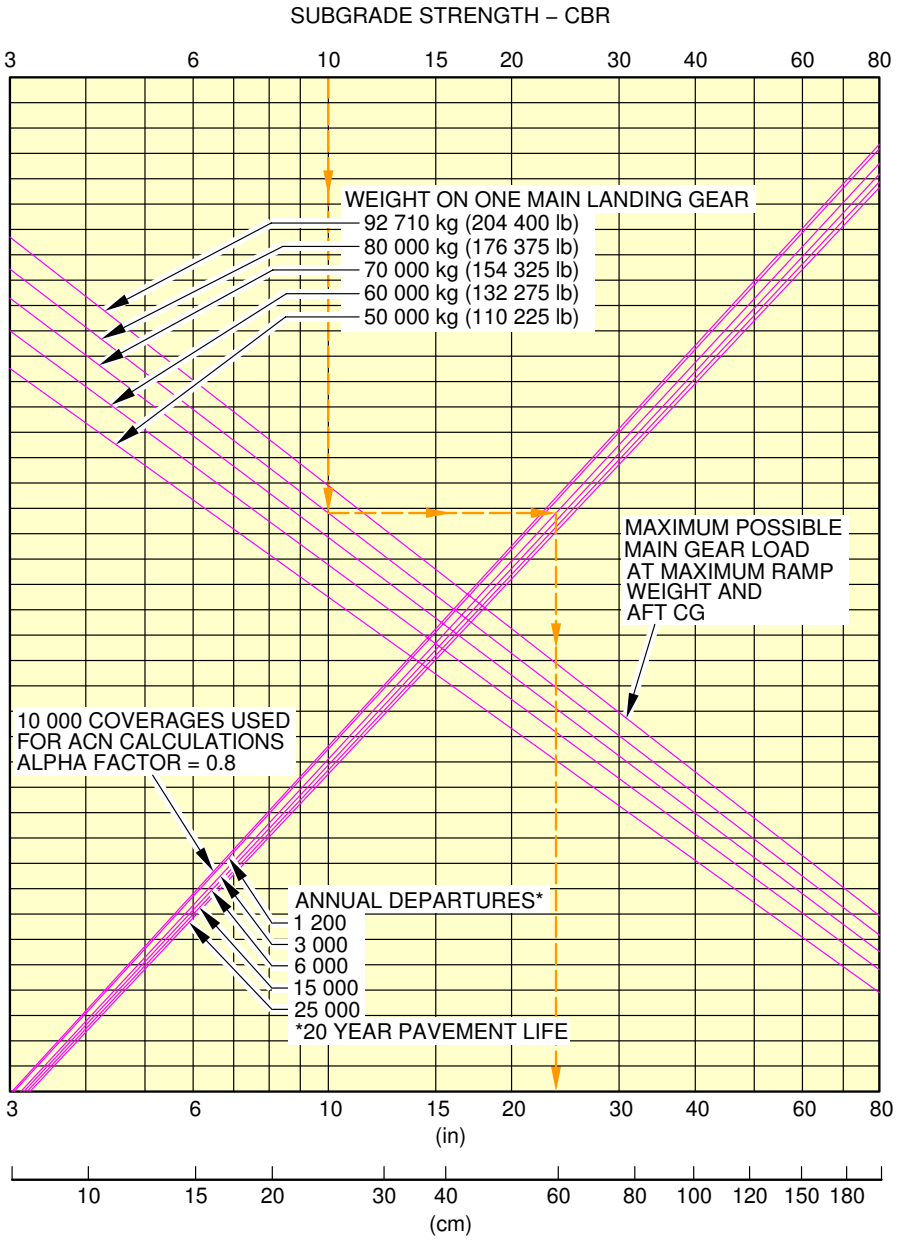
Flexible Pavement Requirements
WVZCG 0.4 m, MRW 227 900 kg, CG 26% (Sheet 2 of 3)
FIGURE-7-5-0-991-013-A01

**ON A/C A330-700L



FLEXIBLE PAVEMENT THICKNESS

1 400 x 530R23 PR36 TIRES

TIRE PRESSURE CONSTANT AT 14.2 bar (206 psi)

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Flexible Pavement Requirements
WVZCG 0.6 m, MRW 202 300 kg, CG 28.2% (Sheet 3 of 3)
FIGURE-7-5-0-991-013-A01

7-6-0 Flexible Pavement Requirements - LCN Conversion

**ON A/C A330-700L

Flexible Pavement Requirements - LCN Conversion

1. The Load Classification Number (LCN) curves are no longer provided in section 07-06-00since the LCN system for reporting pavement strength is obsolete, having been replaced by the ICAO recommended ACN/PCN system in 1983.
   For questions regarding the LCN system, contact Airbus.

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

**ON A/C A330-700L

Rigid Pavement Requirements - Portland Cement Association Design Method

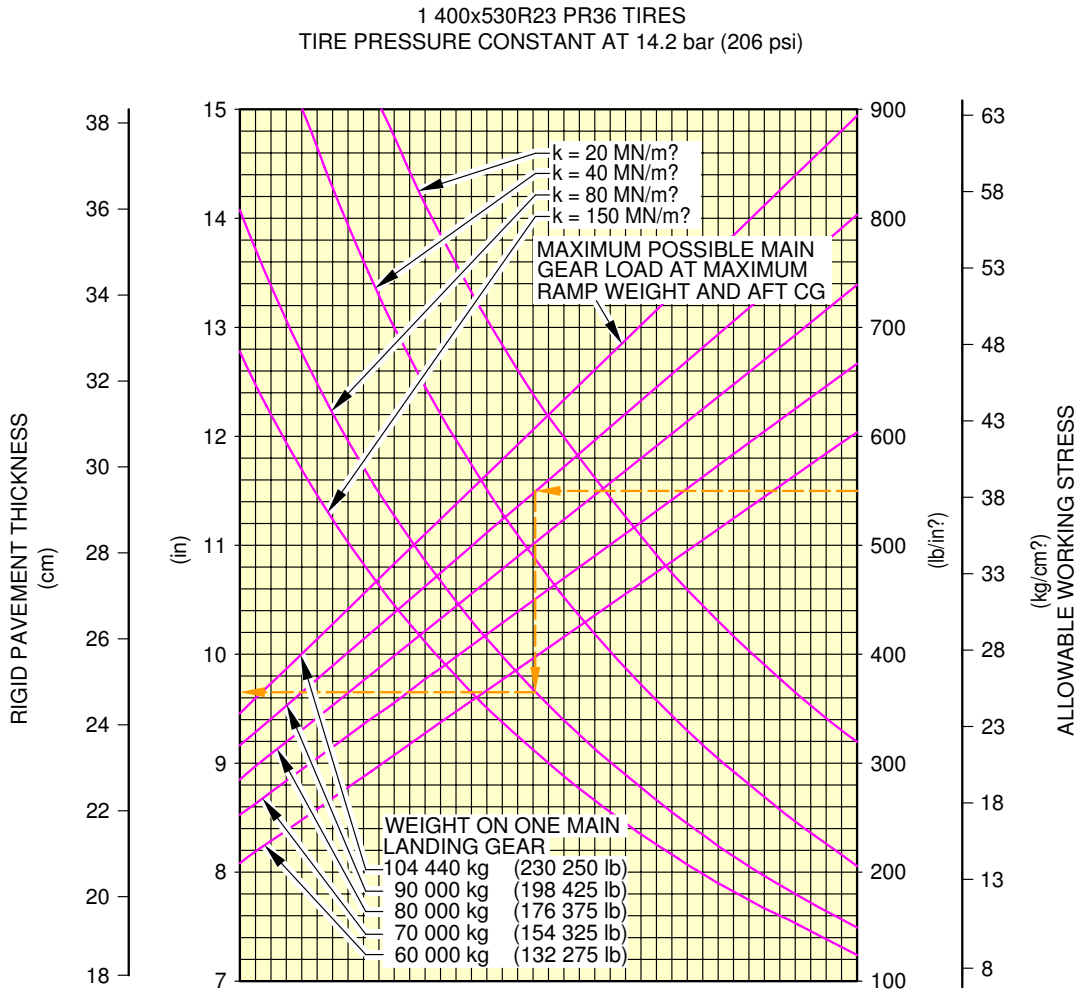
1. This section gives data about the rigid pavement requirements for the PCA (Portland Cement Association) design method.
   The rigid pavement requirements graphs are given at standard tire pressure for all the aircraft operational weight variants.
   They are calculated with the PCA design method.
   To find a rigid pavement thickness, you must know the Subgrade Modulus (k), the permitted working stress and the weight on one MLG.
   The procedure that follows is used to develop rigid pavement design curves:
   - With the scale for pavement thickness on the left and the scale for permitted working stress on the right, a random load line is made. This represents the MLG maximum weight to be shown,
   - A plot is then made of all values of the subgrade modulus (k values),
   - More load lines for the incremental values of the weight on the MLG are made based on the curve for k = 80 MN/m^3, which is already shown on the graph.

   Example, see FIGURE 7-7-0-991-012-A(sheet 3), calculation of the thickness of the rigid pavement for:
   - An aircraft with a Maximum Ramp Weight (MRW) of 202 300 kg (446 000 lb),
   - A k value of 80 MN/m^3 (300 lbf/in^3),
   - A permitted working stress of 38.67 kg/cm^2 (550 lb/in^2),
   - The load on one MLG is 80 000 kg (176 375 lb).

   The required rigid pavement thickness is 230 mm (9 in).

   NOTE : The CG in the figure title is the CG used for ACN calculation.

**ON A/C A330-700L



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/m? 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.

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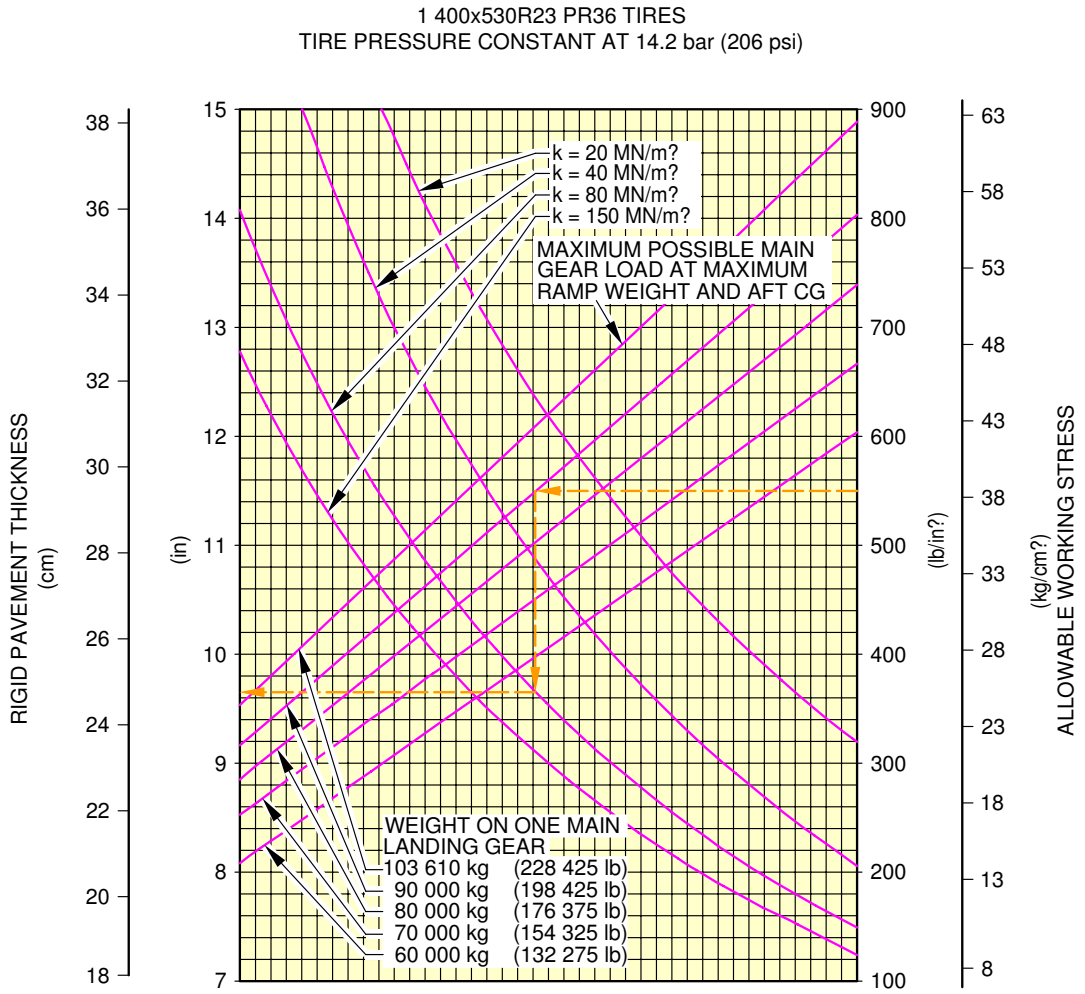
Rigid Pavement Requirements
WVZCG -0.5 m, WVZCG -0.4 m, WVZCG 0 m, MRW 227 900 kg, CG 28.2% (Sheet 1 of 3)
FIGURE-7-7-0-991-012-A01

**ON A/C A330-700L



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/m? 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.

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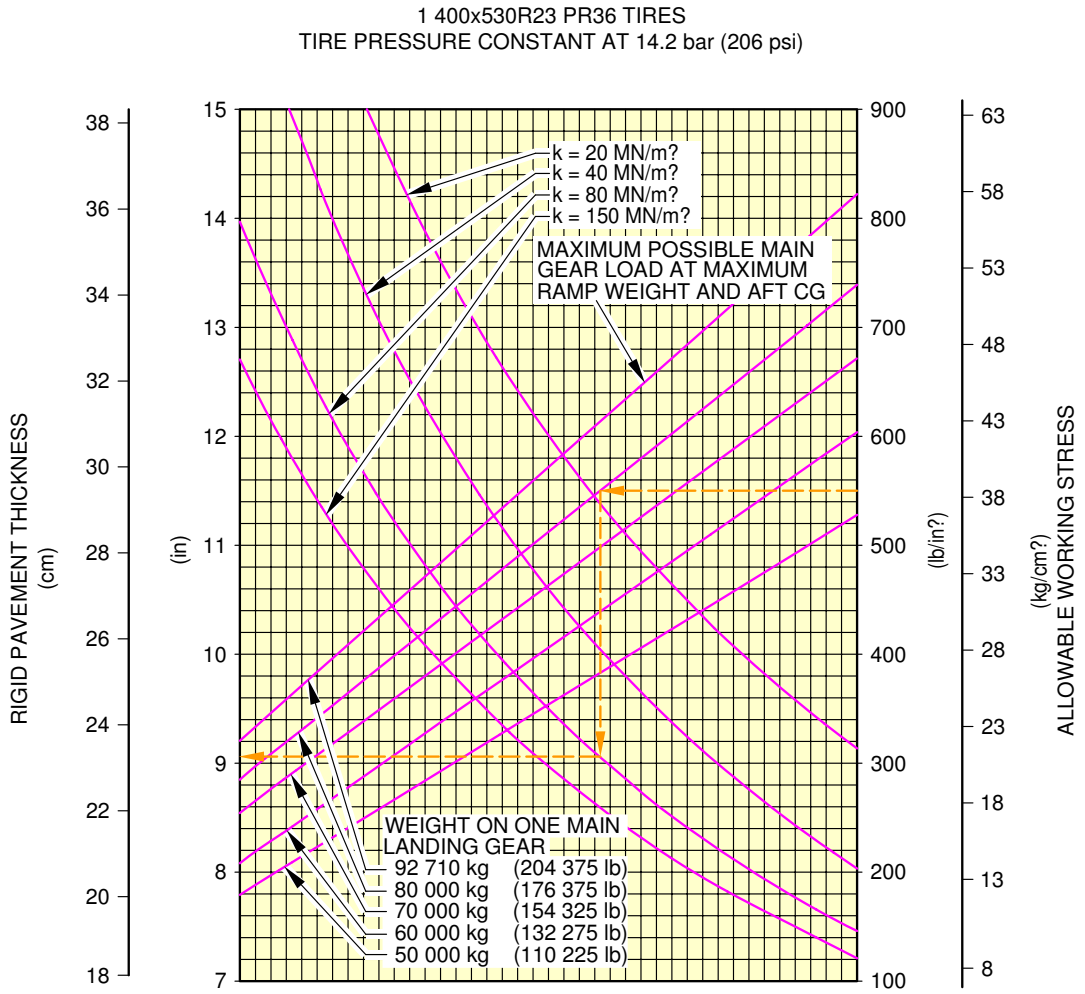
Rigid Pavement Requirements
WVZCG 0.4 m, MRW 227 900 kg, CG 26% (Sheet 2 of 3)
FIGURE-7-7-0-991-012-A01

**ON A/C A330-700L



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/m? 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.

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Rigid Pavement Requirements
WVZCG 0.6 m, MRW 202 300 kg, CG 28.2% (Sheet 3 of 3)
FIGURE-7-7-0-991-012-A01

7-8-0 Rigid Pavement Requirements - LCN Conversion

**ON A/C A330-700L

Rigid Pavement Requirements - LCN Conversion

1. The Load Classification Number (LCN) curves are no longer provided in section 07-08-00since the LCN system for reporting pavement strength is obsolete, having been replaced by the ICAO recommended ACN/PCN system in 1983.
   For questions regarding the LCN system, contact Airbus.

7-9-0 ACN/PCN Reporting System - Flexible and Rigid Pavements

**ON A/C A330-700L

Aircraft Classification Number - Flexible and Rigid Pavements

1. This section gives data about the Aircraft Classification Number (ACN) for an aircraft gross weight in relation to a subgrade strength value for flexible and rigid pavement.
   The flexible and rigid pavement requirements graphs are given at standard tire pressure for all the aircraft operational weight variants.
   To find the ACN of an aircraft on flexible and rigid pavement, you must know the aircraft gross weight and the subgrade strength.

   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).

   Example, see FIGURE 7-9-0-991-031-A(sheet 1), calculation of the ACN for flexible pavement for:
   - An aircraft with a MRW of 202 300 kg (446 000 lb),
   - An aircraft gross weight of 195 000 kg (429 900 lb),
   - A medium subgrade strength (code B).

   The ACN for flexible pavement is 48.
   Example, see FIGURE 7-9-0-991-031-A(sheet 2), calculation of the ACN for rigid pavement for:
   - An aircraft with a MRW of 202 300 kg (446 000 lb),
   - An aircraft gross weight of 195 000 kg (429 900 lb),
   - A medium subgrade strength (code B).

   The ACN for rigid pavement is 47.
   Aircraft Classification Number - ACN table
   The table in FIGURE 7-9-0-991-028-Agives ACN data in tabular format similar to the one used by ICAO in the "Aerodrome Design Manual Part 3, Pavements - Edition 1983" for all the operational weight variants of the aircraft.
   As an approximation, use a linear interpolation in order to get the ACN at the required operating weight using the following equation:
   - ACN = ACN min + (ACN max - ACN min) x (Operating Weight - 130 000 kg)/(MRW - 130 000 kg)

   As an approximation, also use a linear interpolation in order to get the aircraft weight at the pavement PCN using the following equation:
   - Operating weight = 130 000 kg + (MRW - 130 000 kg) x (PCN - ACN min)/(ACN max - ACN min)

   With ACN max = ACN calculated at the MRW in the table and with ACN min = ACN calculated at 130 000 kg.

**ON A/C A330-700L

AIRCRAFT TYPE	MRW/OWE MASS (kg)	LOAD ON ONE MAIN GEAR LEG (%)	TIRE PRESSURE (MPa)	ACN FOR RIGID PAVEMENT SUBGRADES – MN/m?				ACN FOR FLEXIBLE PAVEMENT SUBGRADES – CBR			
				High 150	Medium 80	Low 40	Ultra–low 20	High 15	Medium 10	Low 6	Ultra–low 3
A330–700L WVZCG –0.5 m	227 900	45.80	1.42	49	57	68	79	54	58	67	90
	130 000	45.80		29	29	32	37	28	29	31	39
A330–700L WVZCG –0.4 m	227 900	45.80	1.42	49	57	68	79	54	58	67	90
	130 000	45.80		29	29	32	37	28	29	31	39
A330–700L WVZCG 0 m	227 900	45.80	1.42	49	57	68	79	54	58	67	90
	130 000	45.80		29	29	32	37	28	29	31	39
A330–700L WVZCG 0.4 m	227 900	45.50	1.42	49	57	67	79	53	58	66	89
	130 000	45.50		29	28	32	37	27	29	31	39
A330–700L WVZCG 0.6 m	202 300	45.80	1.42	43	49	58	68	47	50	57	76
	130 000	45.80		29	29	32	37	28	29	31	39

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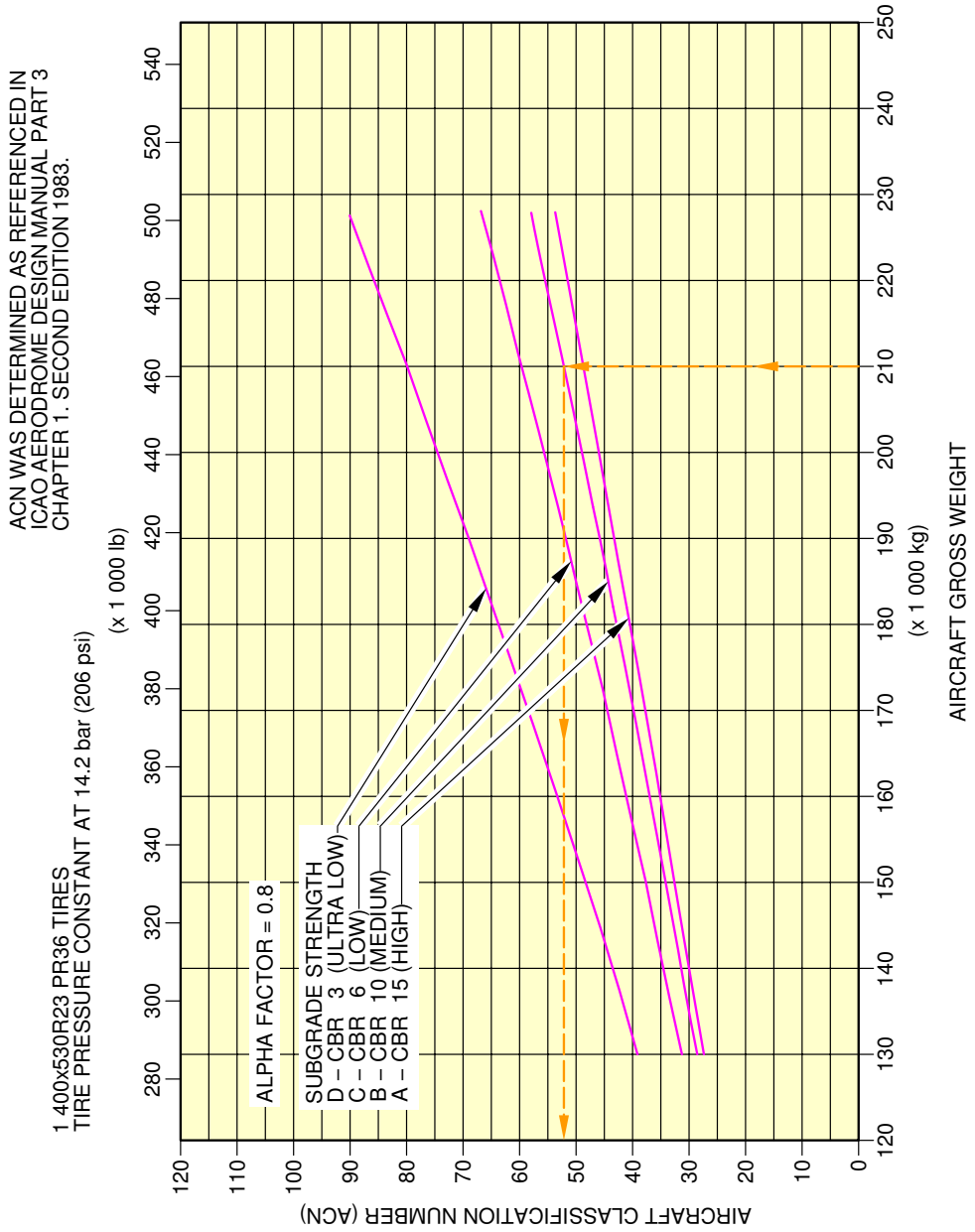
Aircraft Classification Number
ACN Table
FIGURE-7-9-0-991-028-A01

**ON A/C A330-700L



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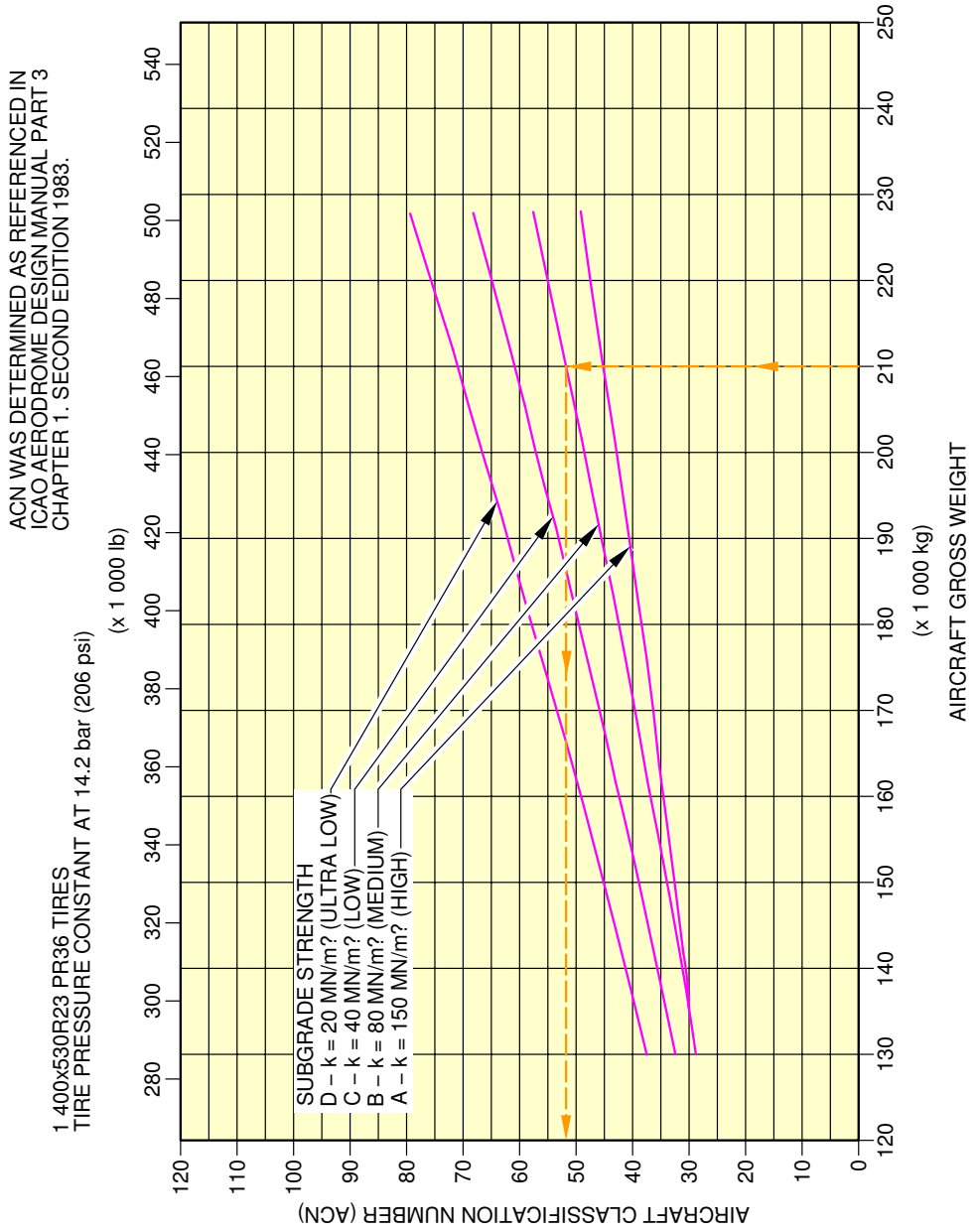
Aircraft Classification Number
Flexible Pavement - WVZCG -0.5 m, WVZCG -0.4 m, WVZCG 0 m, MRW 227 900 kg, CG 28.2% (Sheet 1 of 2)
FIGURE-7-9-0-991-029-A01

**ON A/C A330-700L



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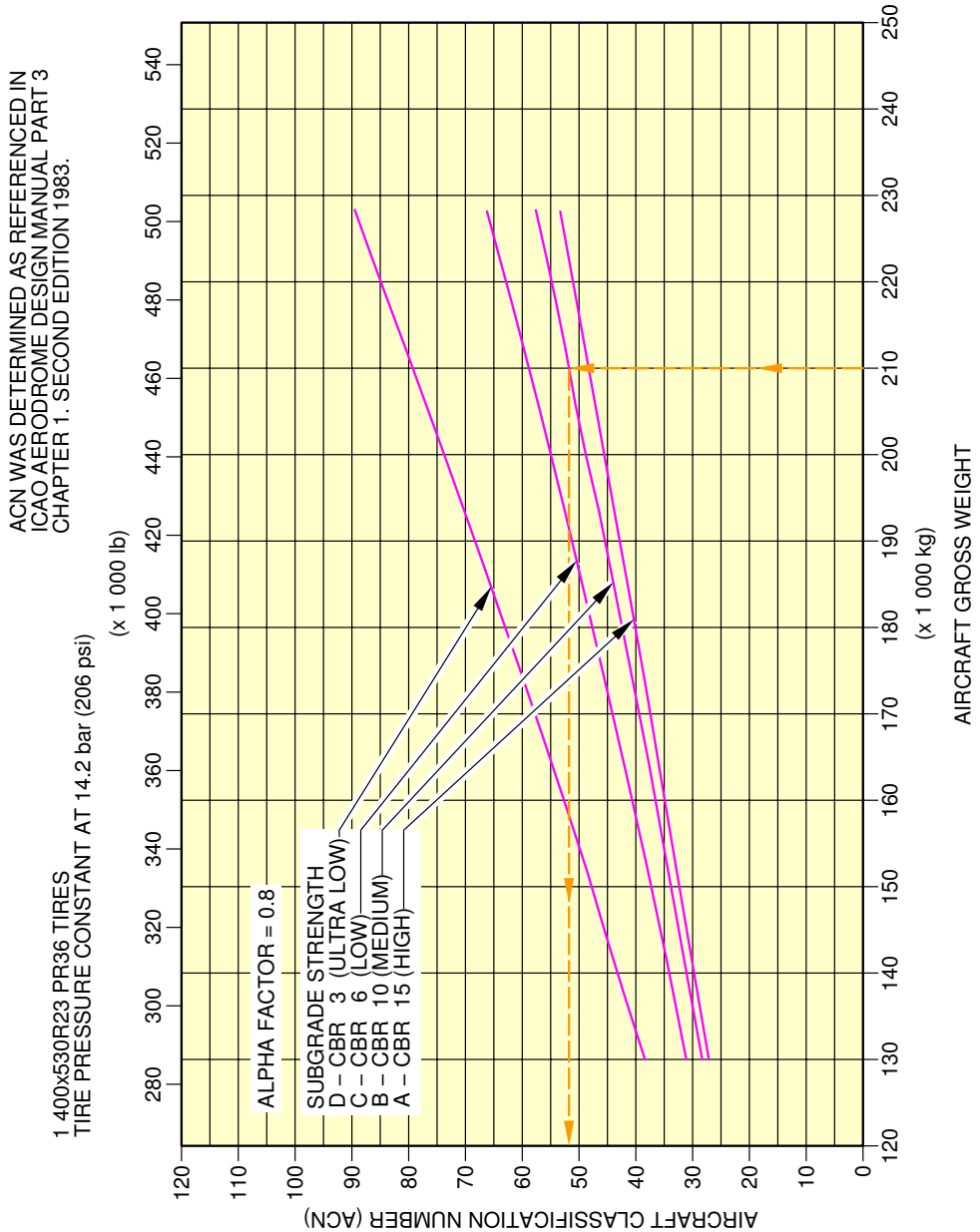
Aircraft Classification Number
Rigid Pavement - WVZCG -0.5 m, WVZCG -0.4 m, WVZCG 0 m, MRW 227 900 kg, CG 28.2% (Sheet 2 of 2)
FIGURE-7-9-0-991-029-A01

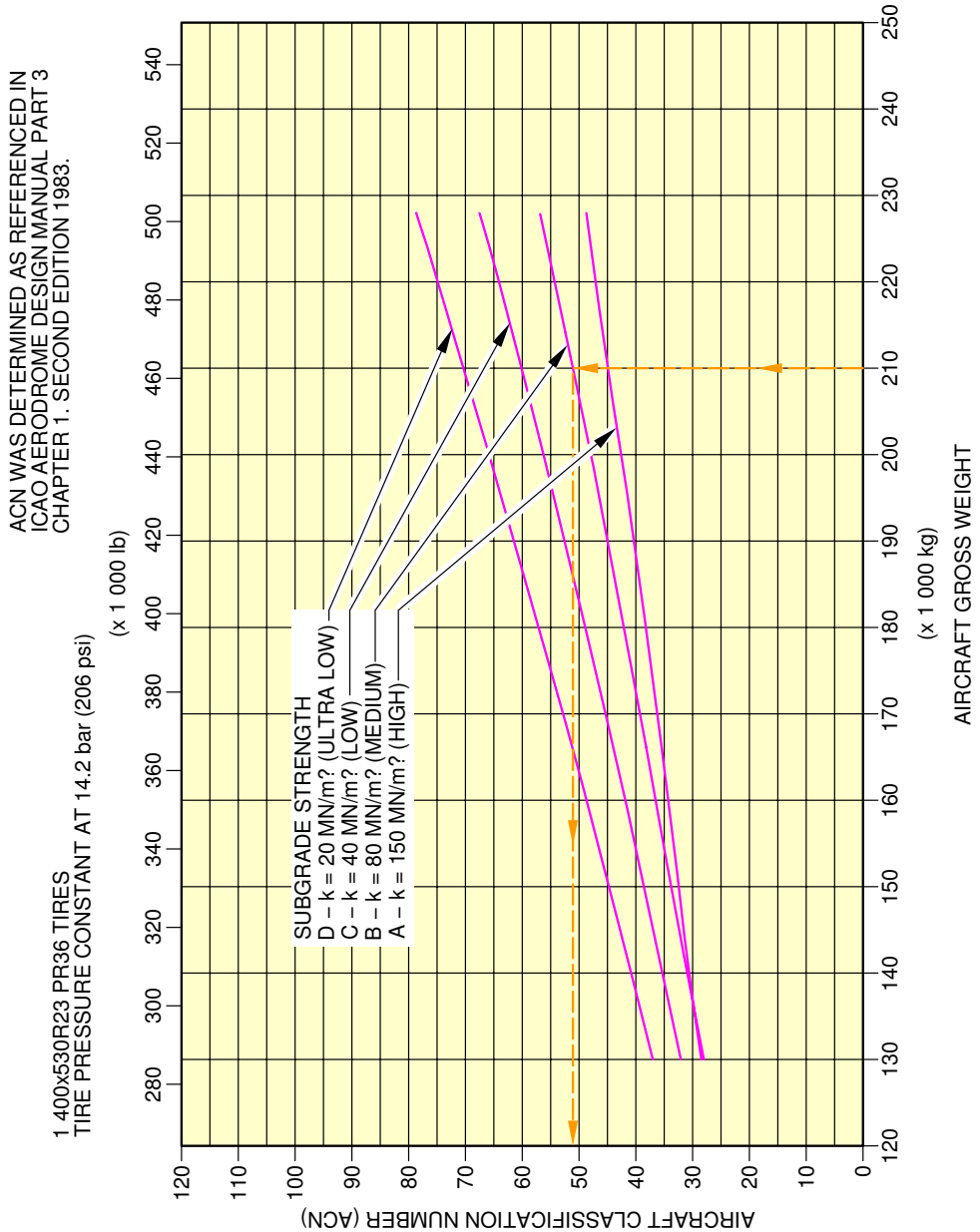
**ON A/C A330-700L



F_AC_070900_1_0300101_01_00

Aircraft Classification Number
Flexible Pavement - WVZCG 0.4 m, MRW 227 900 kg, CG 26% (Sheet 1 of 2)
FIGURE-7-9-0-991-030-A01

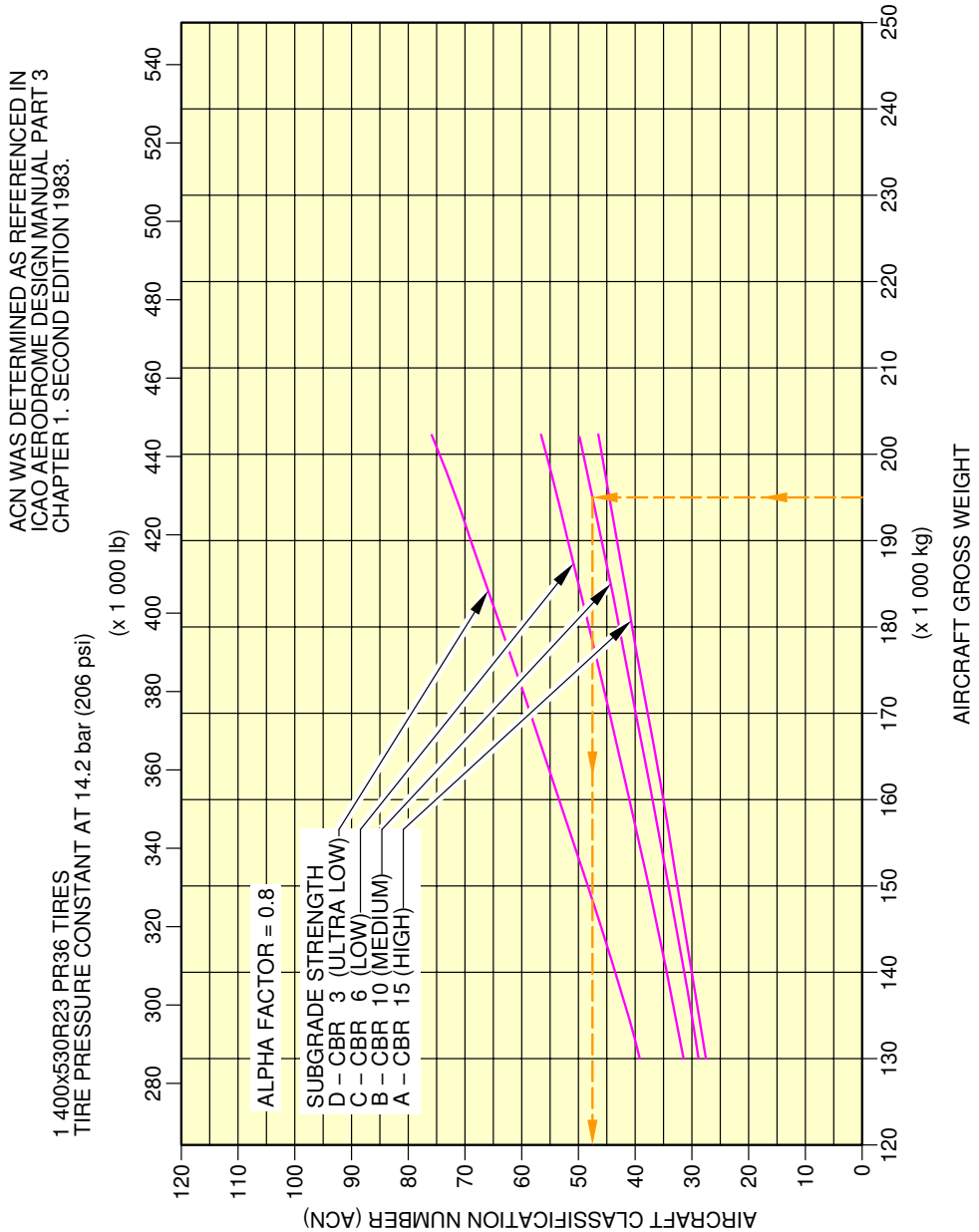
**ON A/C A330-700L



F_AC_070900_1_0300102_01_00

Aircraft Classification Number
Rigid Pavement - WVZCG 0.4 m, MRW 227 900 kg, CG 26% (Sheet 2 of 2)
FIGURE-7-9-0-991-030-A01

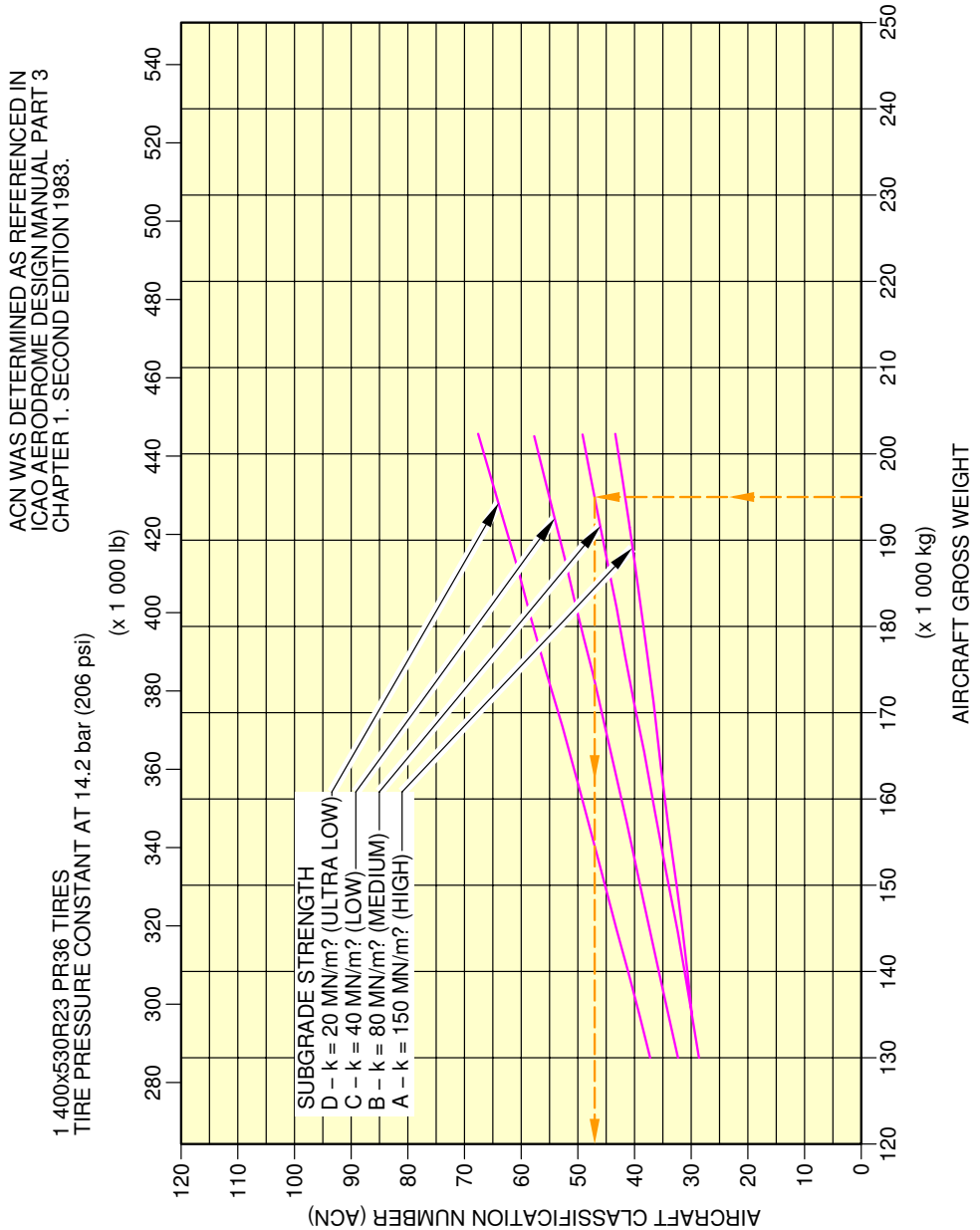
**ON A/C A330-700L



F_AC_070900_1_0310101_01_00

Aircraft Classification Number
Flexible Pavement - WVZCG 0.6 m, MRW 202 300 kg, CG 28.2% (Sheet 1 of 2)
FIGURE-7-9-0-991-031-A01

**ON A/C A330-700L



F_AC_070900_1_0310102_01_00

Aircraft Classification Number
Rigid Pavement - WVZCG 0.6 m, MRW 202 300 kg, CG 28.2% (Sheet 2 of 2)
FIGURE-7-9-0-991-031-A01

SCALED DRAWINGS

8-0-0 SCALED DRAWINGS

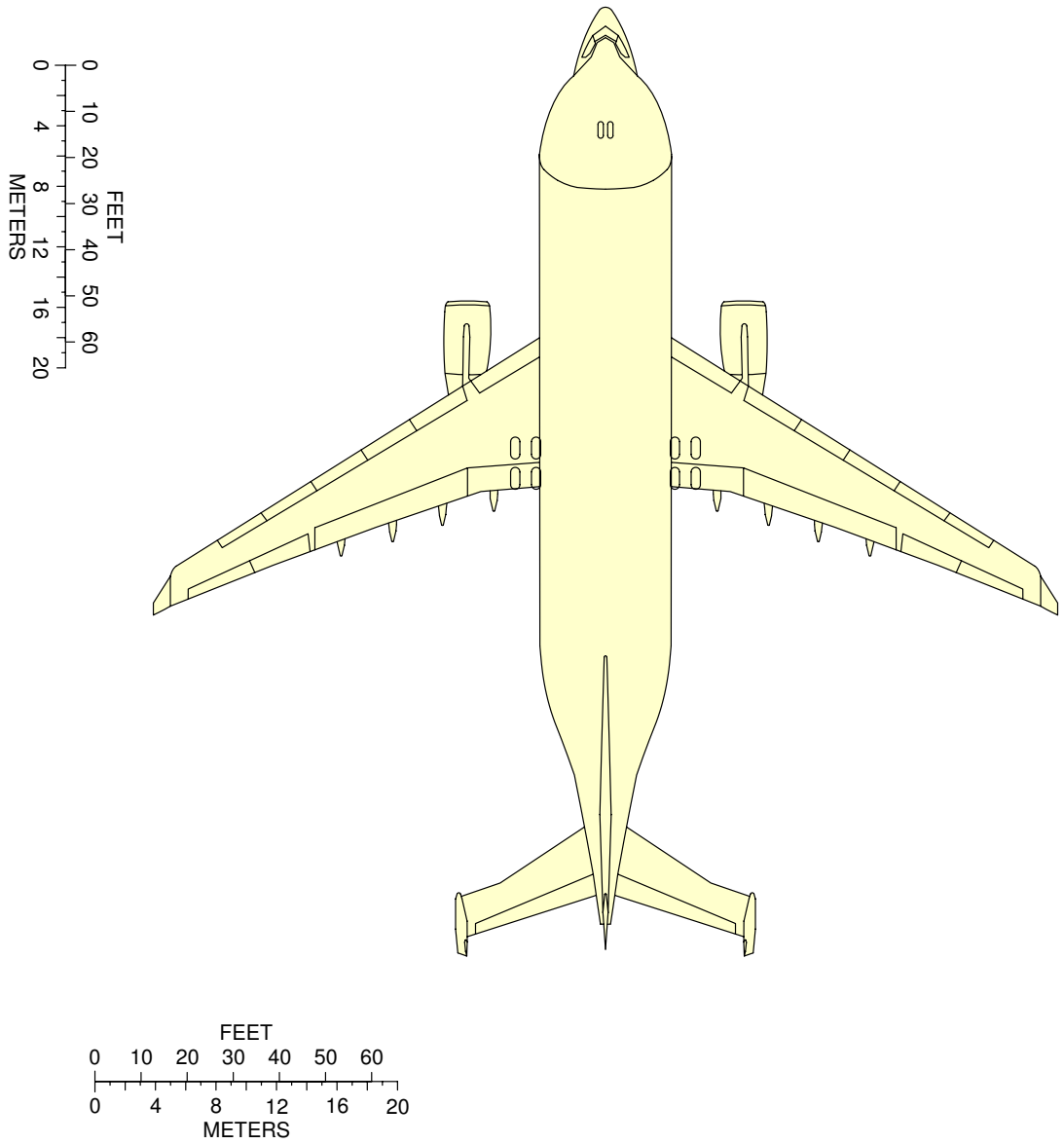
**ON A/C A330-700L

Scaled Drawings

1. This section gives the scaled drawings.

   NOTE : When printing this drawing, make sure to adjust for proper scaling.

**ON A/C A330-700L



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

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Scaled Drawing
FIGURE-8-0-0-991-007-A01

AIRCRAFT RESCUE AND FIRE FIGHTING

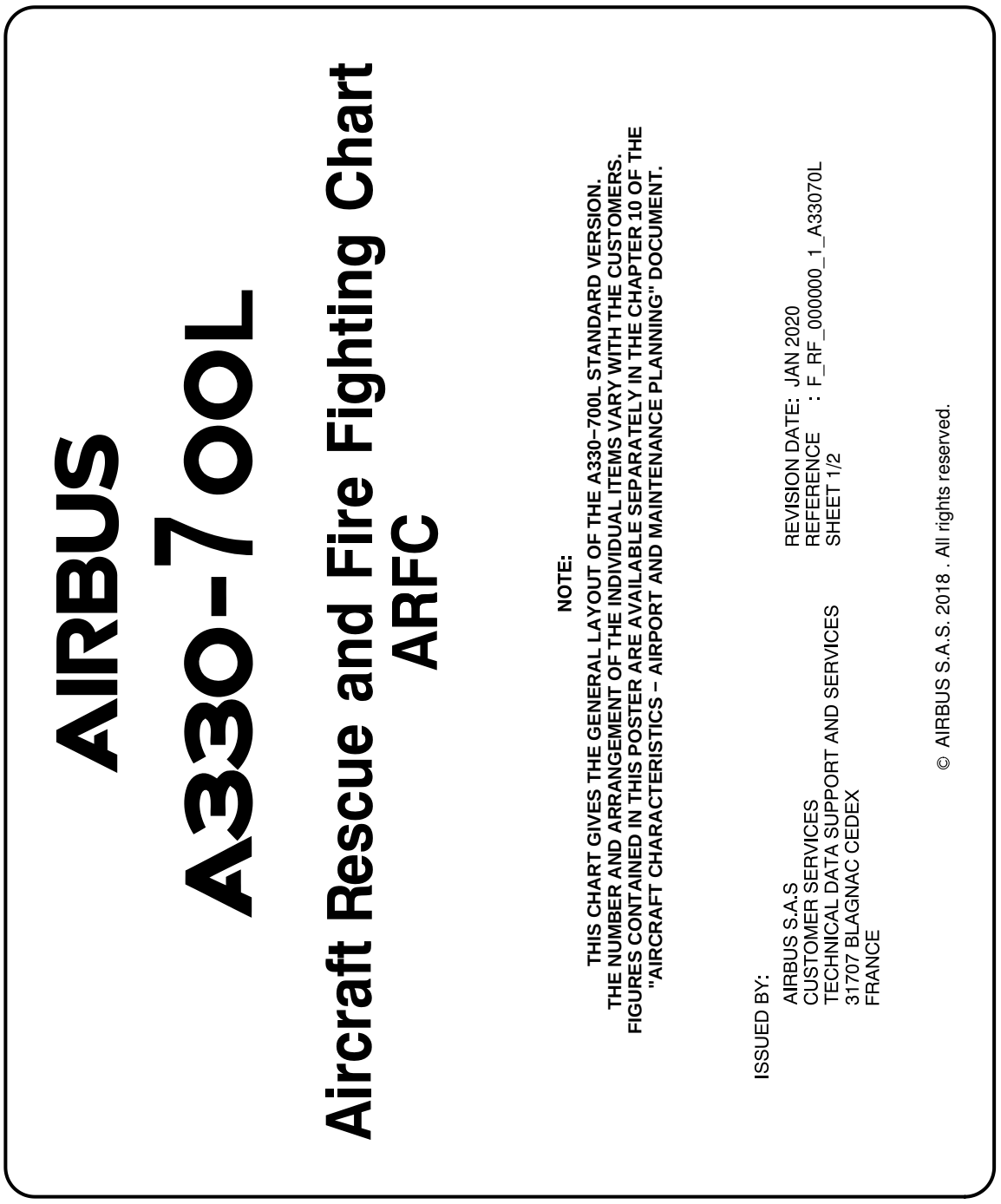
10-0-0 AIRCRAFT RESCUE AND FIRE FIGHTING

**ON A/C A330-700L

Aircraft Rescue and Fire Fighting

1. Aircraft Rescue and Fire Fighting Charts
   This sections gives the data related to aircraft rescue and fire fighting.
   The figures contained in this section are the figures that are in the Aircraft Rescue and Fire Fighting Charts poster available for download on AIRBUSWorld and the Airbus website.

**ON A/C A330-700L



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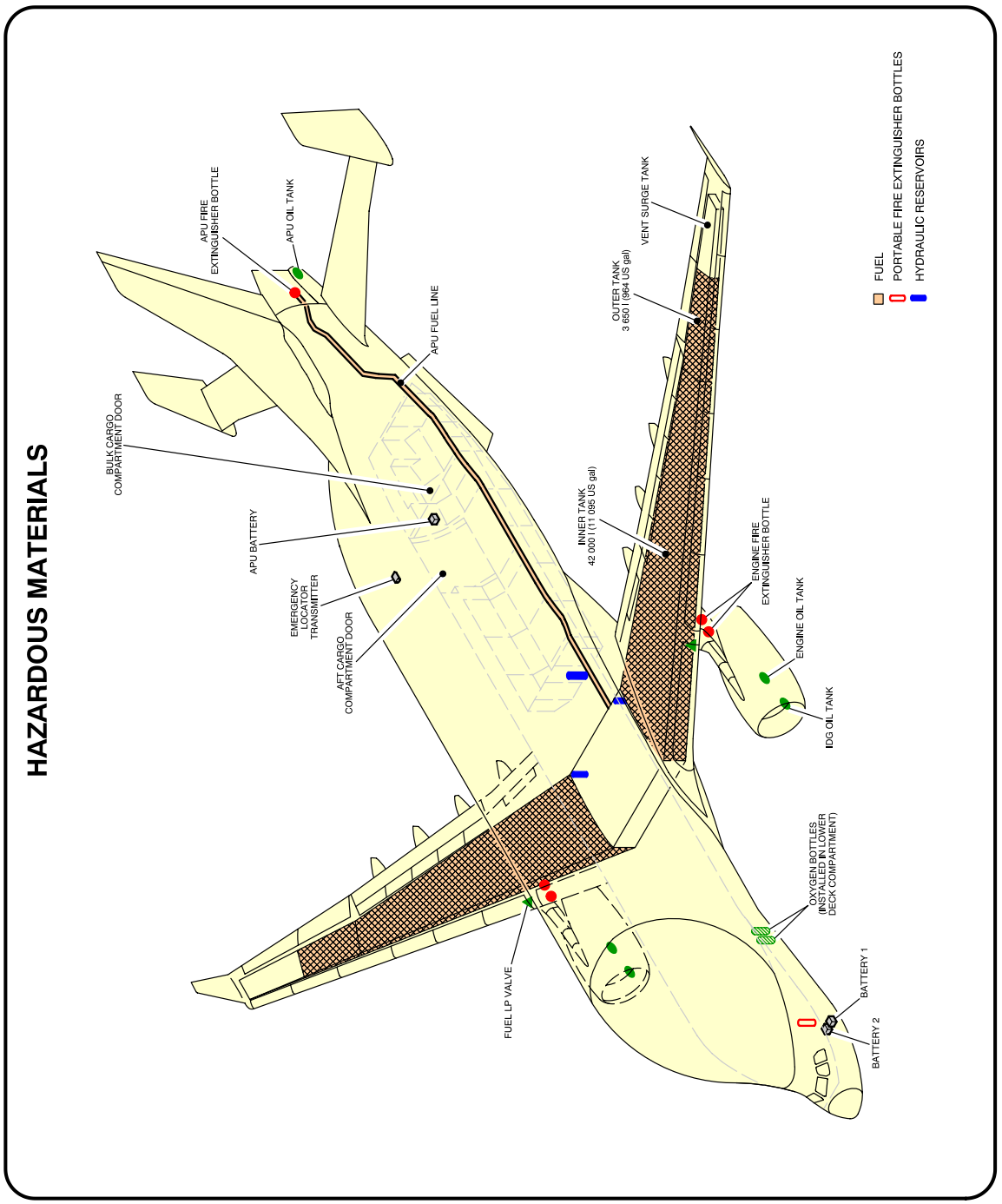
Front Page
FIGURE-10-0-0-991-086-A01

**ON A/C A330-700L



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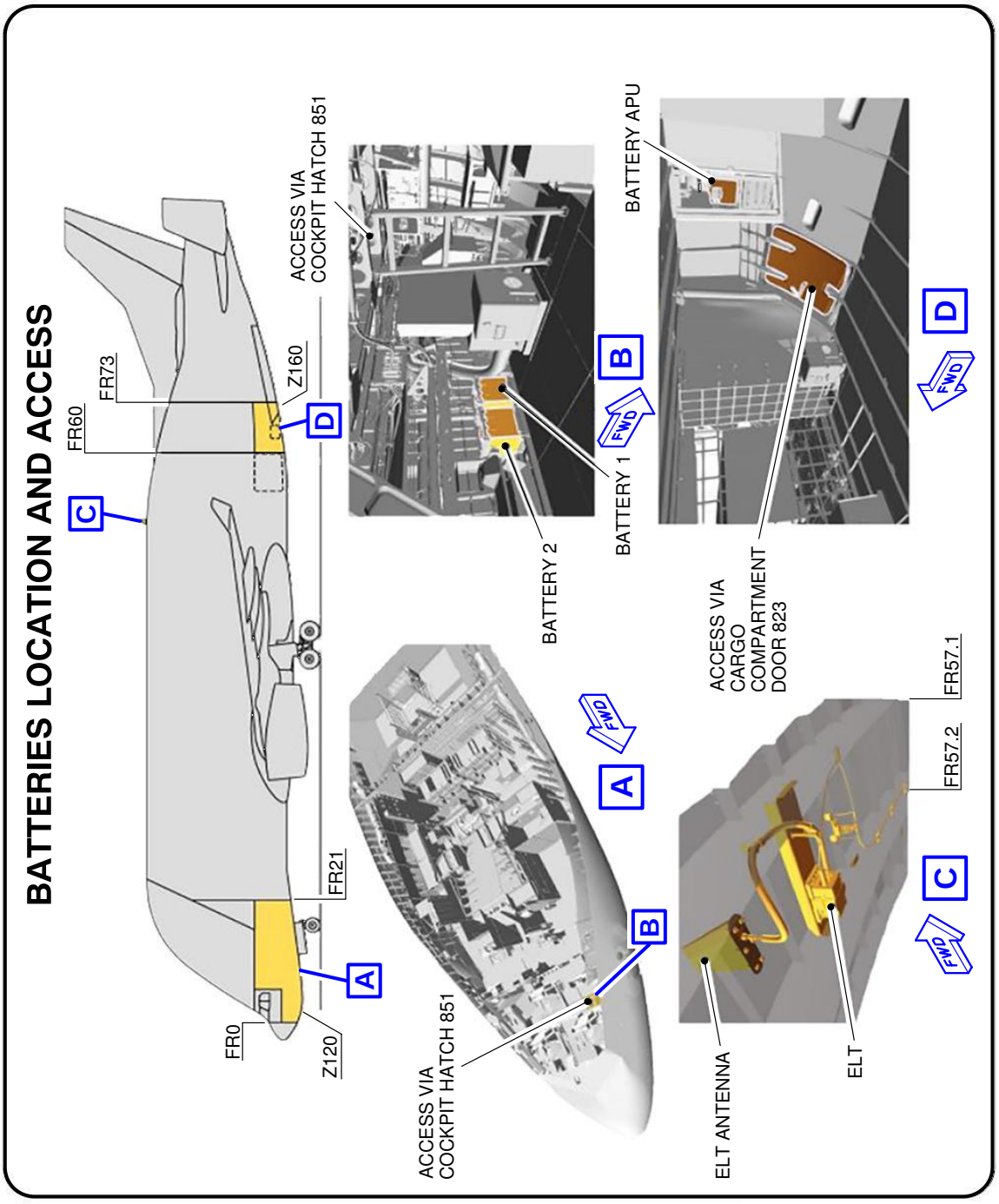
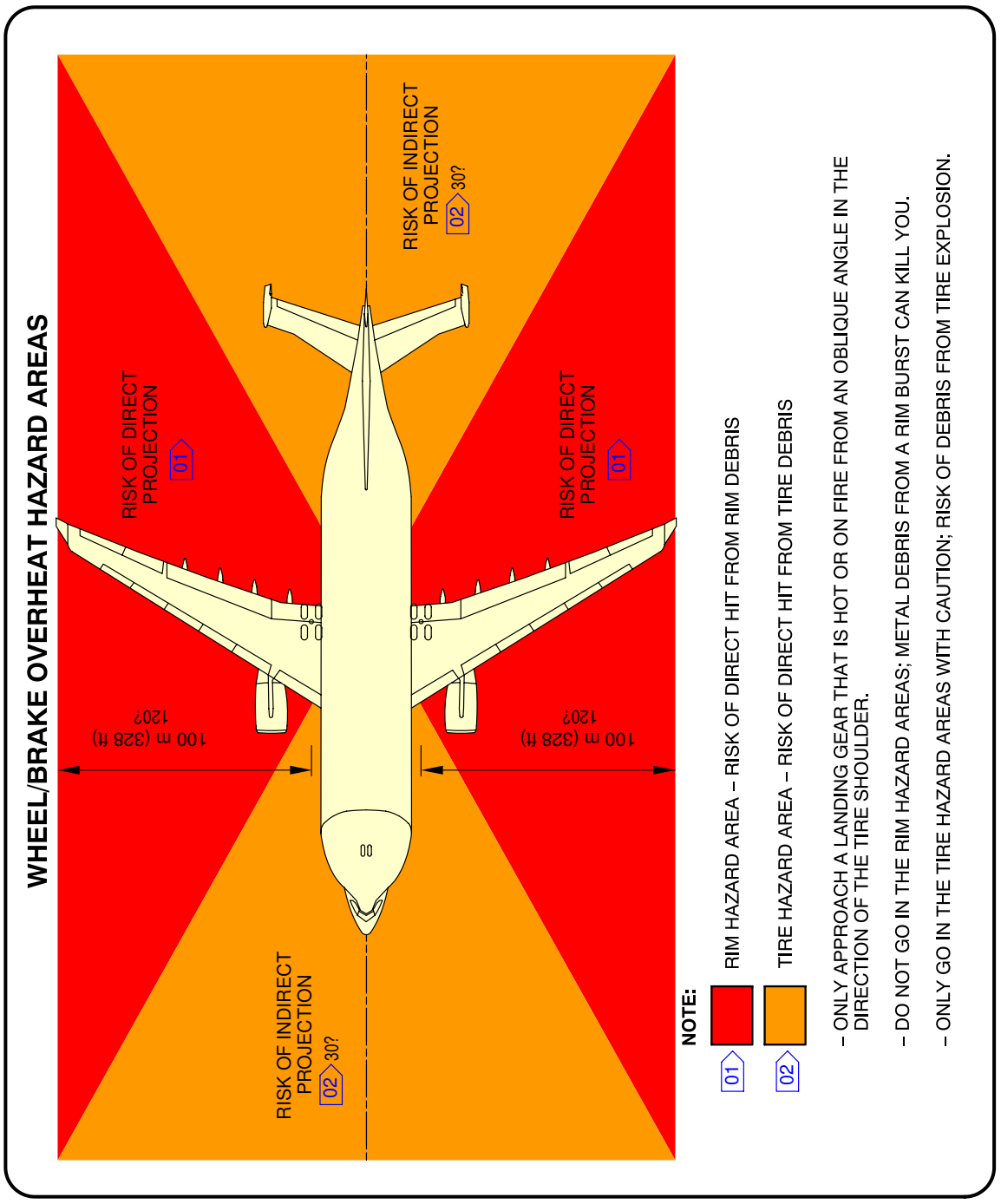
Highly Flammable and Hazardous Materials and Components
FIGURE-10-0-0-991-087-A01

**ON A/C A330-700L



Batteries Location and Access
FIGURE-10-0-0-991-088-A01

**ON A/C A330-700L



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Wheel/Brake Overheat
Wheel Safety Area (Sheet 1 of 2)
FIGURE-10-0-0-991-089-A01

**ON A/C A330-700L

BRAKE OVERHEAT AND LANDING GEAR FIRE

WARNING: BE VERY CAREFUL WHEN THERE IS A BRAKE OVERHEAT AND/OR LANDING GEAR FIRE.
THERE IS A RISK OF TIRE EXPLOSION AND/OR WHEEL RIM BURST THAT CAN CAUSE DEATH OR INJURY.
MAKE SURE THAT YOU OBEY THE SAFETY PRECAUTIONS THAT FOLLOW.

THE PROCEDURES THAT FOLLOW GIVE RECOMMENDATIONS AND SAFETY PRECAUTIONS FOR THE COOLING OF VERY HOT BRAKES AFTER ABNORMAL OPERATIONS SUCH AS A REJECTED TAKE–OFF OR OVERWEIGHT LANDING.
FOR THE COOLING OF BRAKES AFTER NORMAL TAXI–IN, REFER TO YOUR COMPANY PROCEDURES.

BRAKE OVERHEAT:

1 – GET THE BRAKE TEMPERATURE FROM THE COCKPIT OR USE A REMOTE MEASUREMENT TECHNIQUE.
THE REAL TEMPERATURE OF THE BRAKES CAN BE MUCH HIGHER THAN THE TEMPERATURE SHOWN ON THE ECAM.
NOTE: AT HIGH TEMPERATURES (>800°C), THERE IS A RISK OF WARPING OF THE LANDING GEAR STRUTS AND AXLES.

2 – APPROACH THE LANDING GEAR WITH EXTREME CAUTION AND FROM AN OBLIQUE ANGLE IN THE DIRECTION OF THE TIRE SHOULDER. DO NOT GO INTO THE RIM HAZARD AREA AND ONLY GO IN THE TIRE HAZARD AREA WITH CAUTION. (REF FIG. WHEEL/BRAKE OVERHEAT HAZARD AREAS). IF POSSIBLE, STAY IN A VEHICLE.

3 – LOOK AT THE CONDITION OF THE TIRES:
IF THE TIRES ARE STILL INFLATED (FUSE PLUGS NOT MELTED), THERE IS A RISK OF TIRE EXPLOSION AND RIM BURST.
DO NOT USE COOLING FANS BECAUSE THEY CAN PREVENT OPERATION OF THE FUSE PLUGS.

4 – USE WATER MIST TO DECREASE THE TEMPERATURE OF THE COMPLETE WHEEL AND BRAKE ASSEMBLY.
USE A TECHNIQUE THAT PREVENTS SUDDEN COOLING. SUDDEN COOLING CAN CAUSE WHEEL CRACKS OR RIM BURST.
DO NOT APPLY WATER, FOAM OR CO2. THESE COOLING AGENTS (AND ESPECIALLY CO2, WHICH HAS A VERY STRONG COOLING EFFECT) CAN CAUSE THERMAL SHOCKS AND BURST OF HOT PARTS.

LANDING GEAR FIRE:

CAUTION: AIRBUS RECOMMENDS THAT YOU DO NOT USE DRY POWDERS OR DRY CHEMICALS ON HOT BRAKES OR TO EXTINGUISH LANDING GEAR FIRES. THESE AGENTS CAN CHANGE INTO SOLID OR ENAMELED DEPOSITS.
THEY CAN DECREASE THE SPEED OF HEAT DISSIPATION WITH A POSSIBLE RISK OF PERMANENT STRUCTURAL DAMAGE TO THE BRAKES, WHEELS OR WHEEL AXLES.

1 – IMMEDIATELY STOP THE FIRE:

A) APPROACH THE LANDING GEAR WITH EXTREME CAUTION FROM AN OBLIQUE ANGLE IN THE DIRECTION OF THE TIRE SHOULDER. DO NOT GO INTO THE RIM HAZARD AREA AND ONLY GO IN THE TIRE HAZARD AREA WITH CAUTION.
IF POSSIBLE, STAY IN A VEHICLE.

B) USE LARGE AMOUNTS OF WATER, WATER MIST; IF THE FUEL TANKS ARE AT RISK, USE FOAM.
USE A TECHNIQUE THAT PREVENTS SUDDEN COOLING. SUDDEN COOLING CAN CAUSE WHEEL CRACKS OR RIM BURST.

C) DO NOT USE FANS OR BLOWERS.

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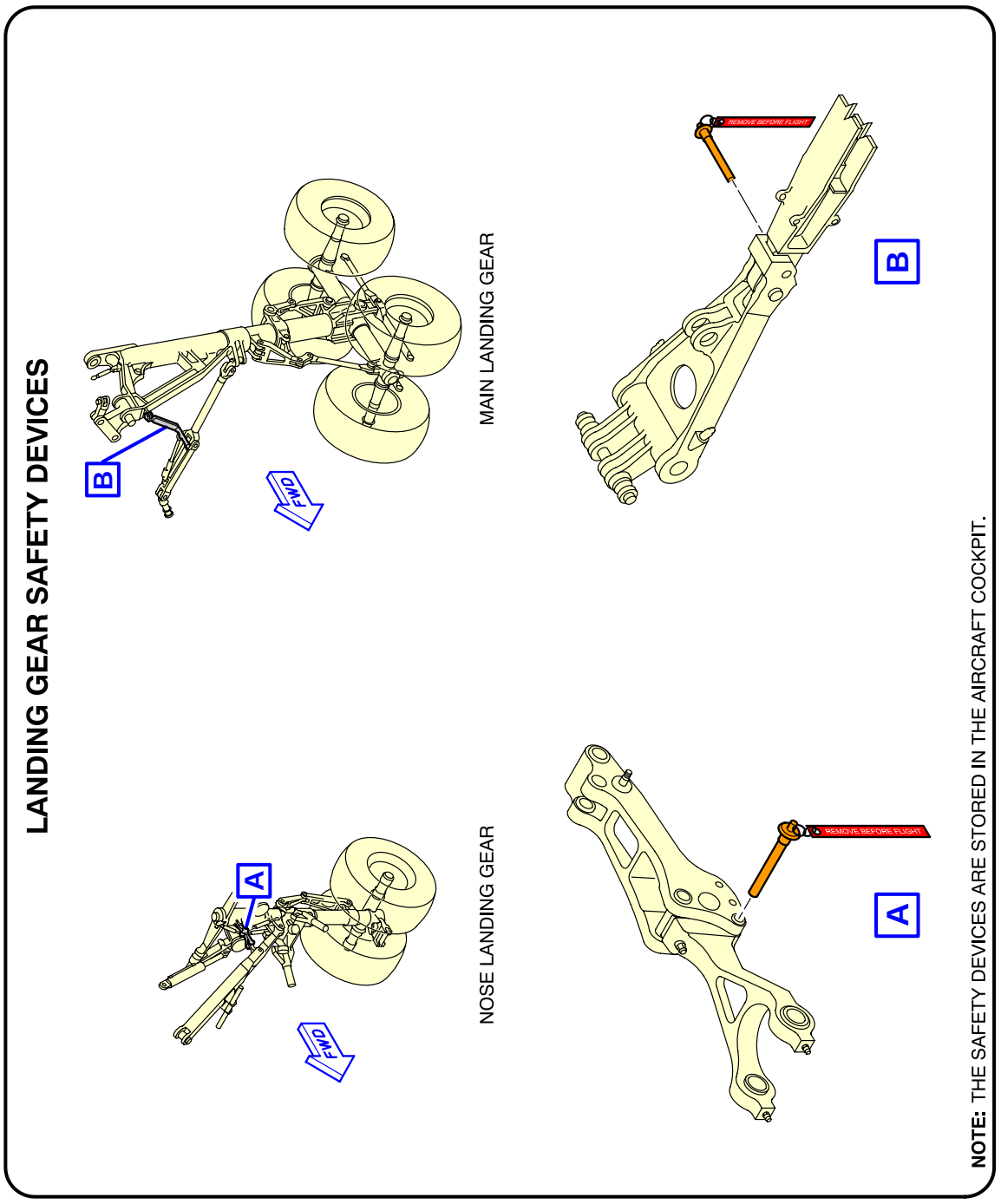
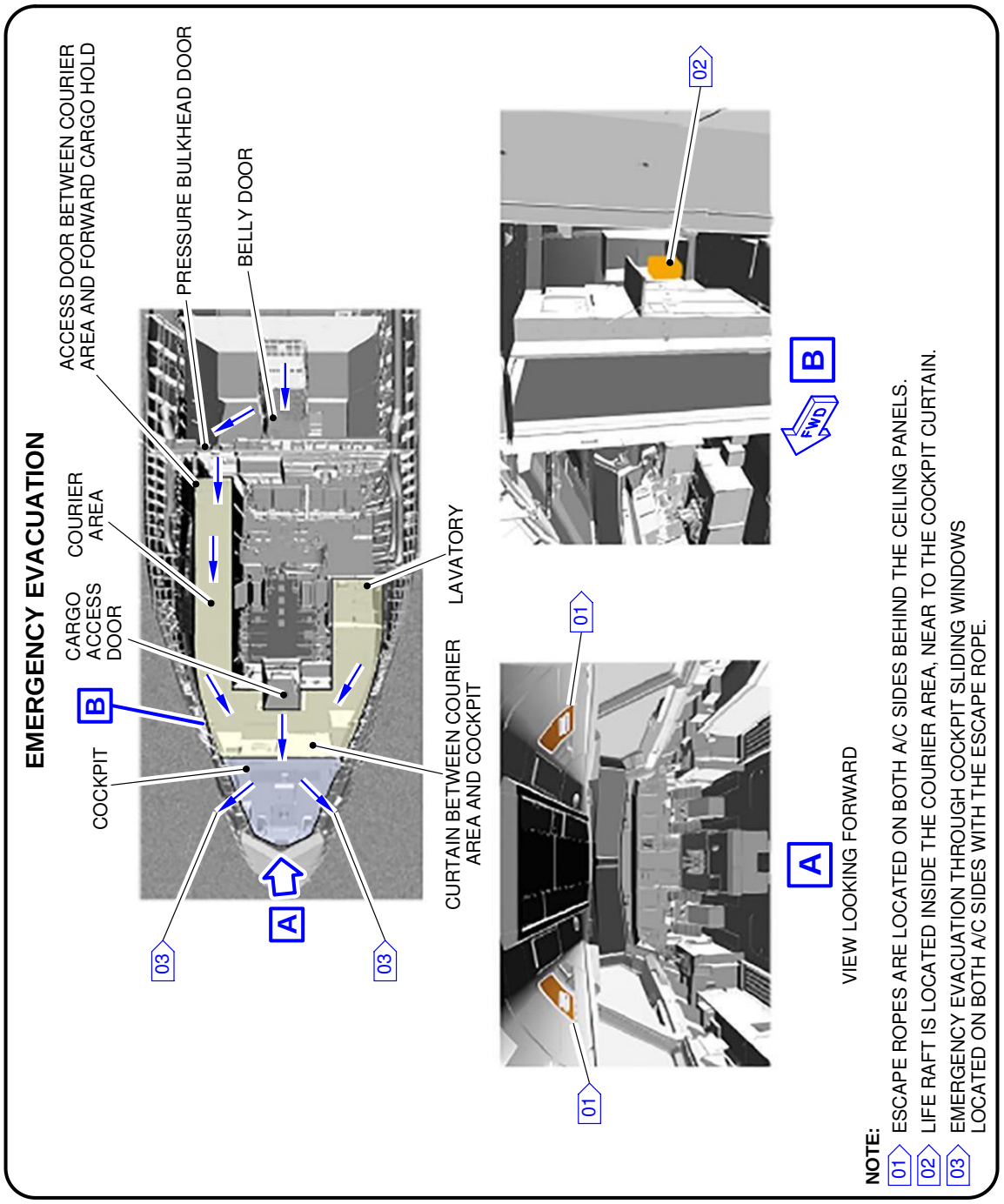
Wheel/Brake Overheat
Recommendations (Sheet 2 of 2)
FIGURE-10-0-0-991-089-A01

**ON A/C A330-700L



Ground Lock Safety-Devices
FIGURE-10-0-0-991-091-A01

**ON A/C A330-700L



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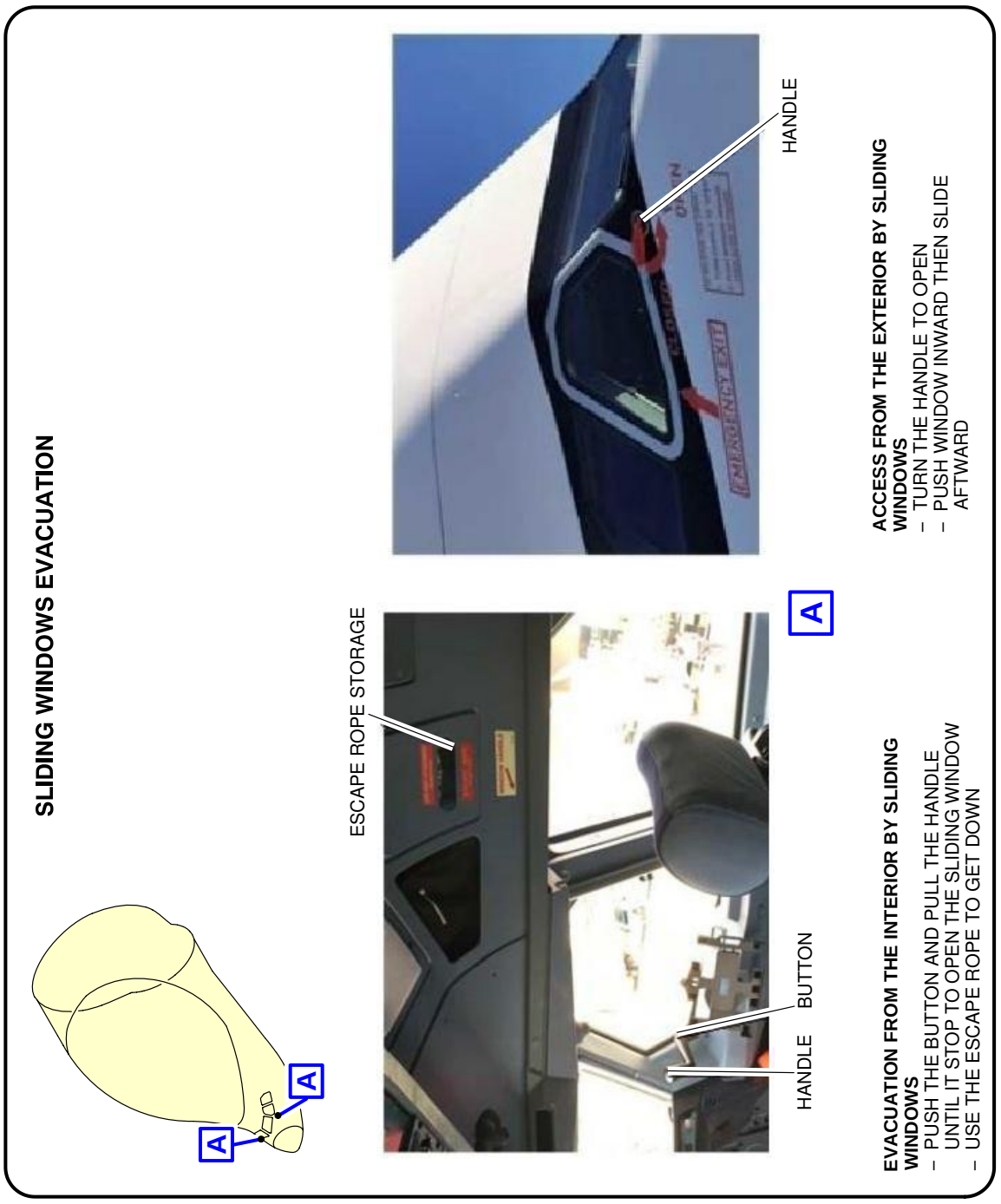
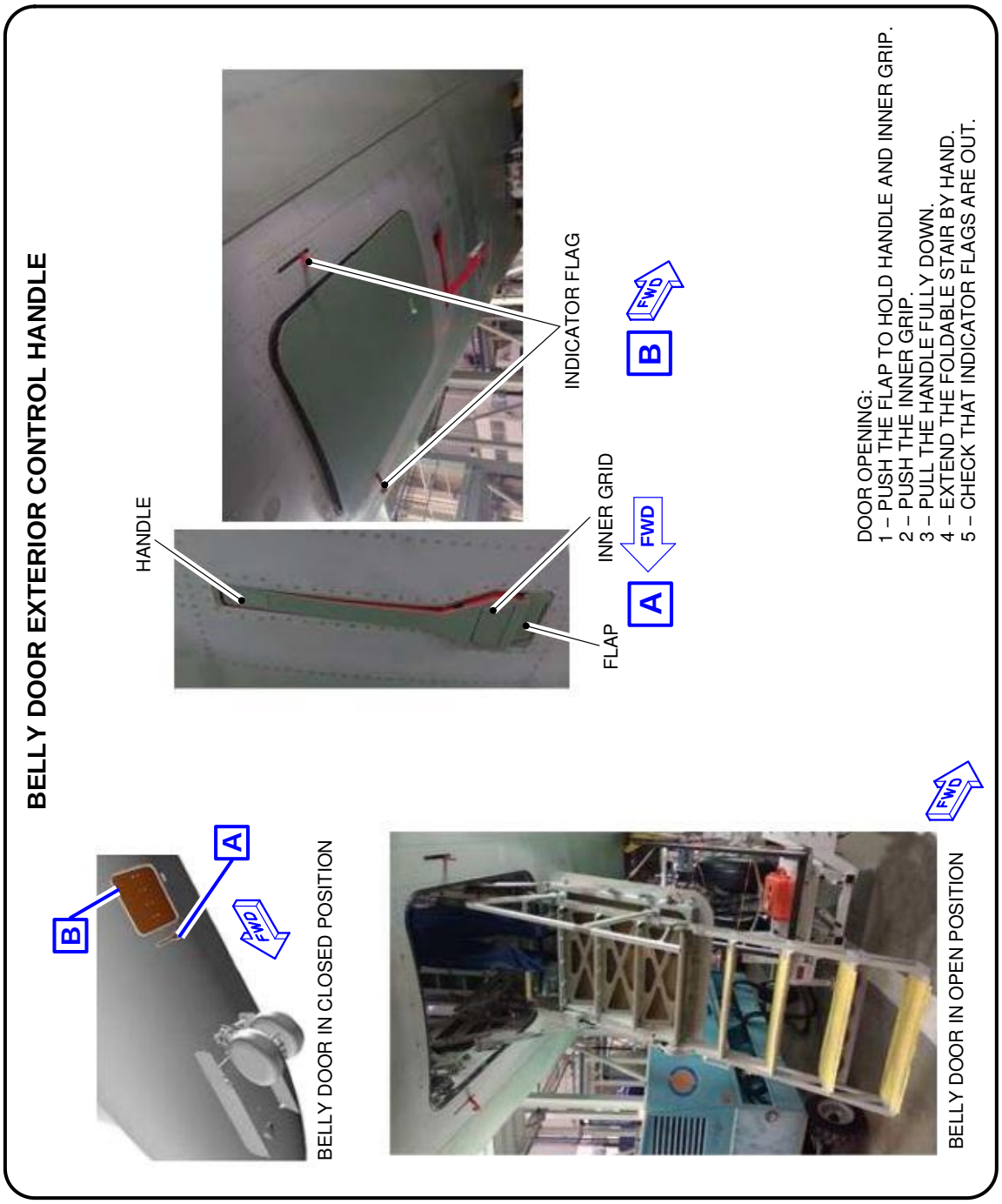
Emergency Evacuation Devices
FIGURE-10-0-0-991-092-A01

**ON A/C A330-700L



Sliding Windows Evacuation
FIGURE-10-0-0-991-101-A01

**ON A/C A330-700L



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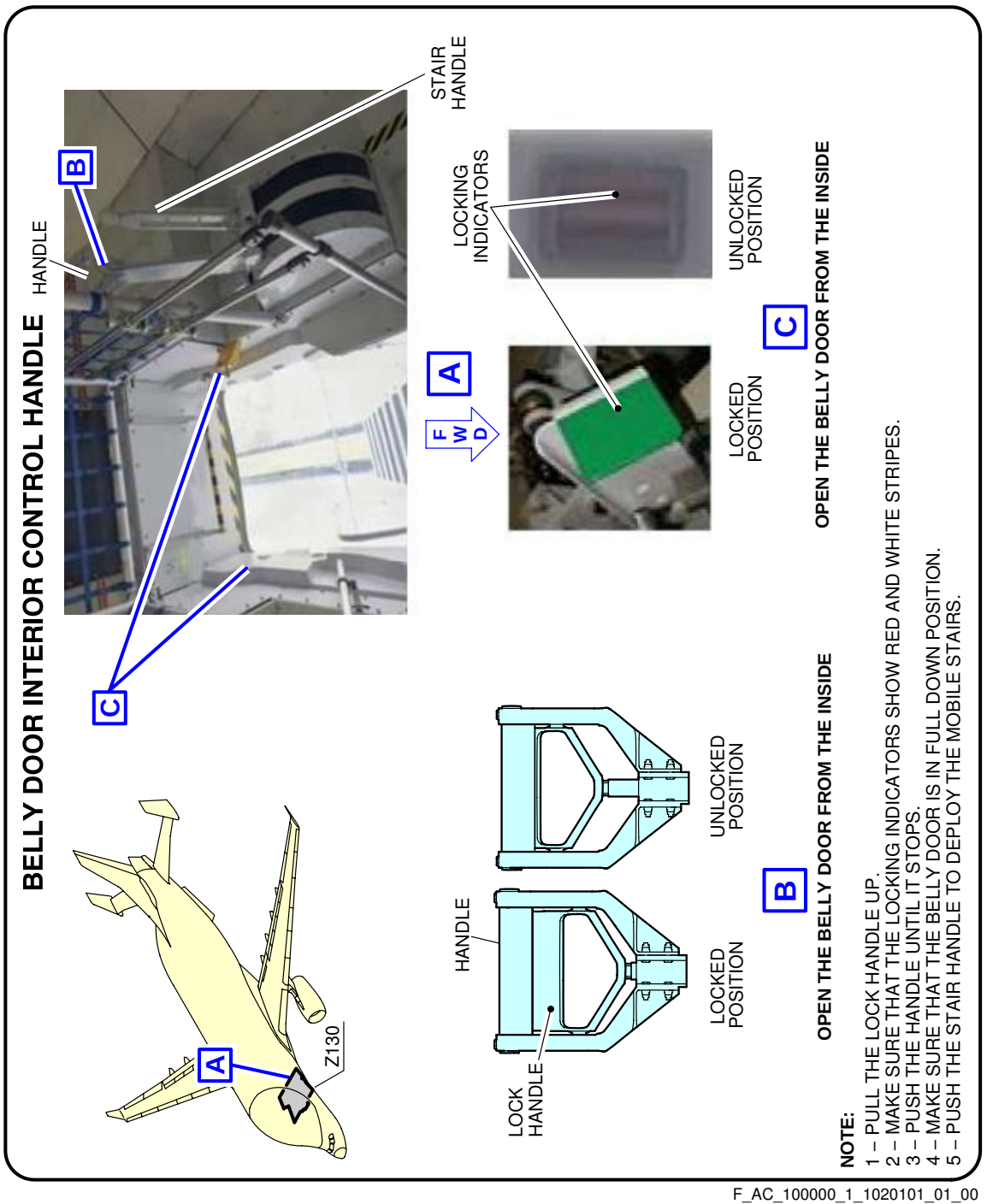
Belly-Door Exterior Control-Handle
FIGURE-10-0-0-991-093-A01

**ON A/C A330-700L



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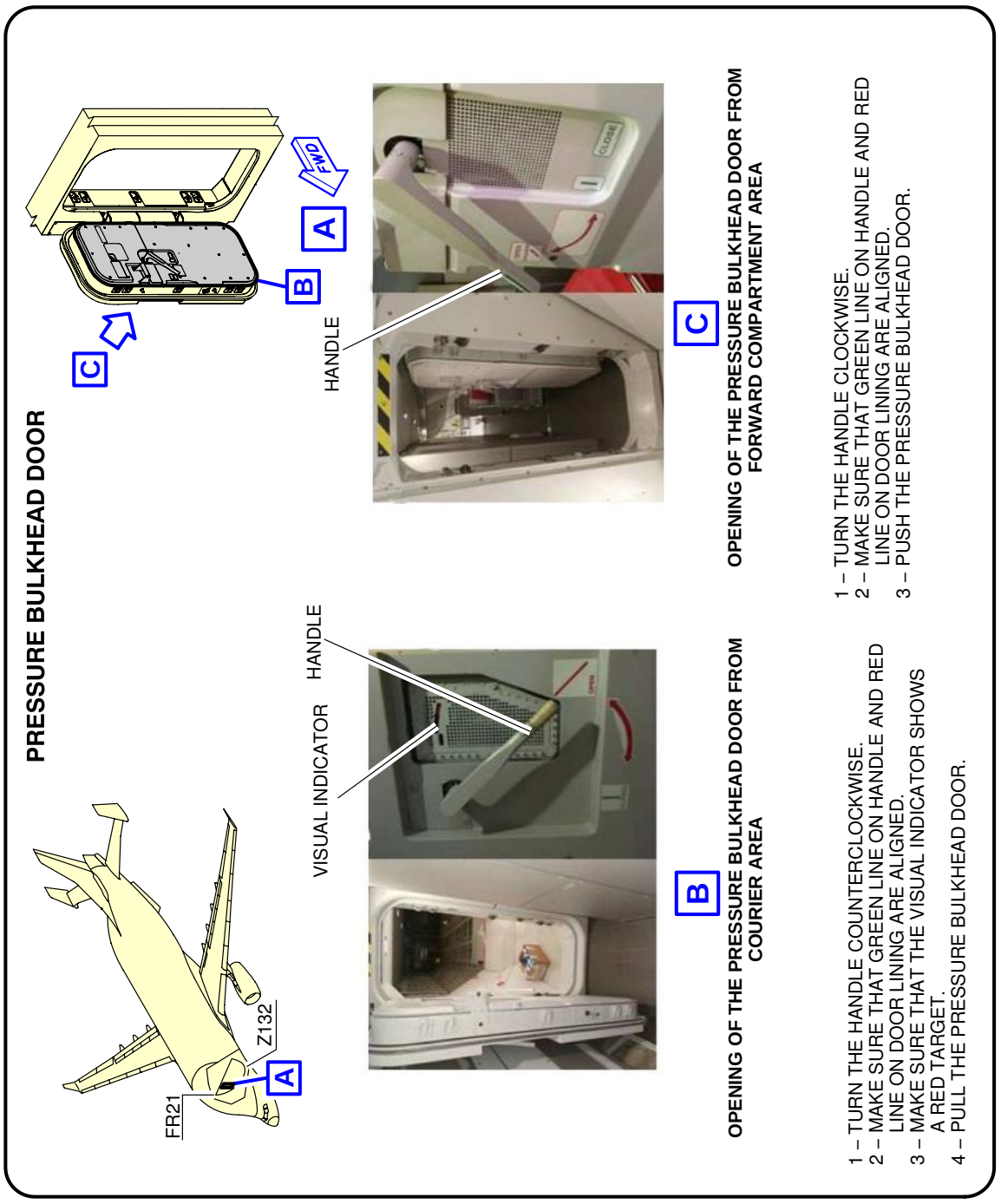
Belly-Door Interior Control-Handle
FIGURE-10-0-0-991-102-A01

**ON A/C A330-700L



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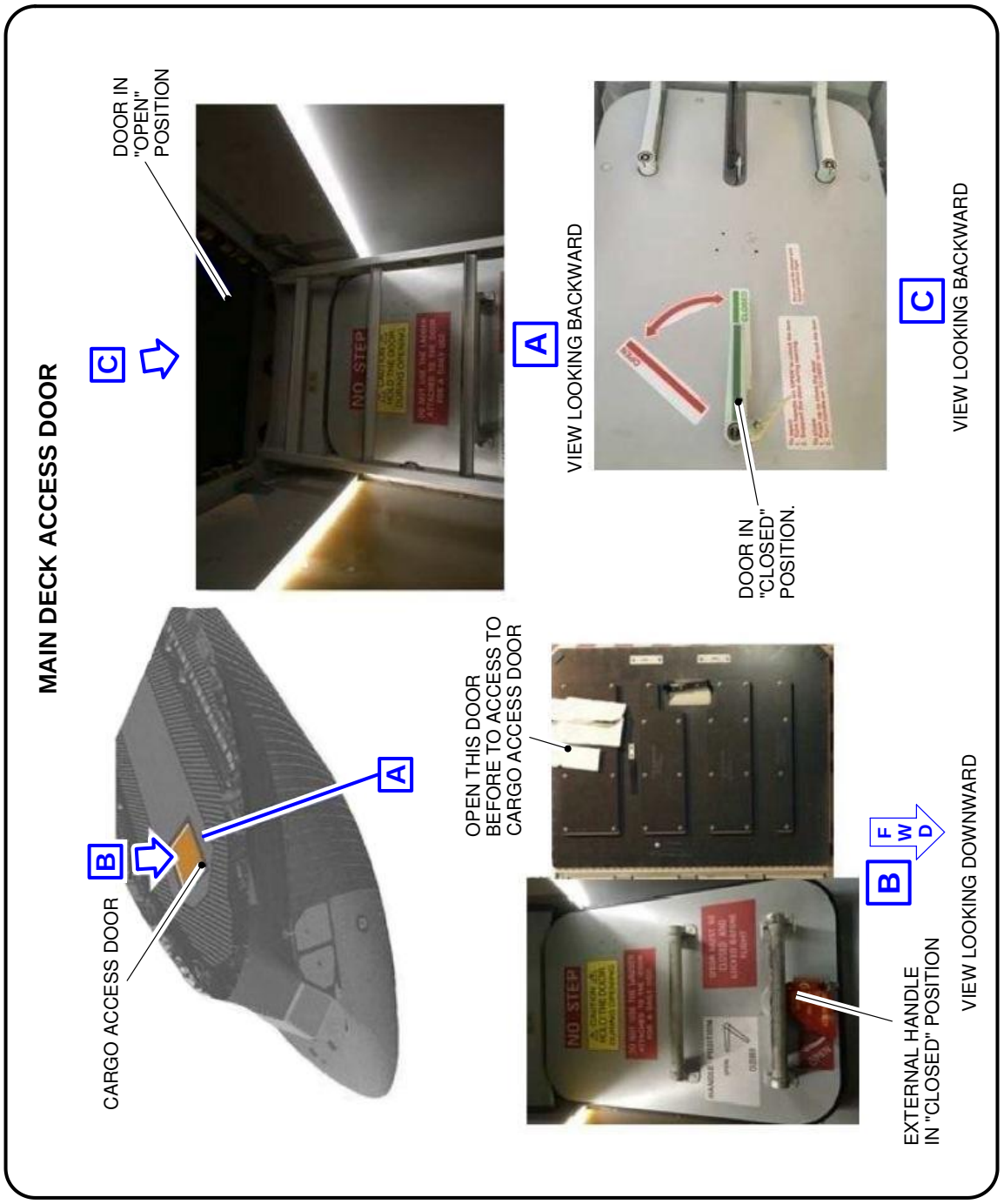
Pressure Bulkhead Door
FIGURE-10-0-0-991-103-A01

**ON A/C A330-700L



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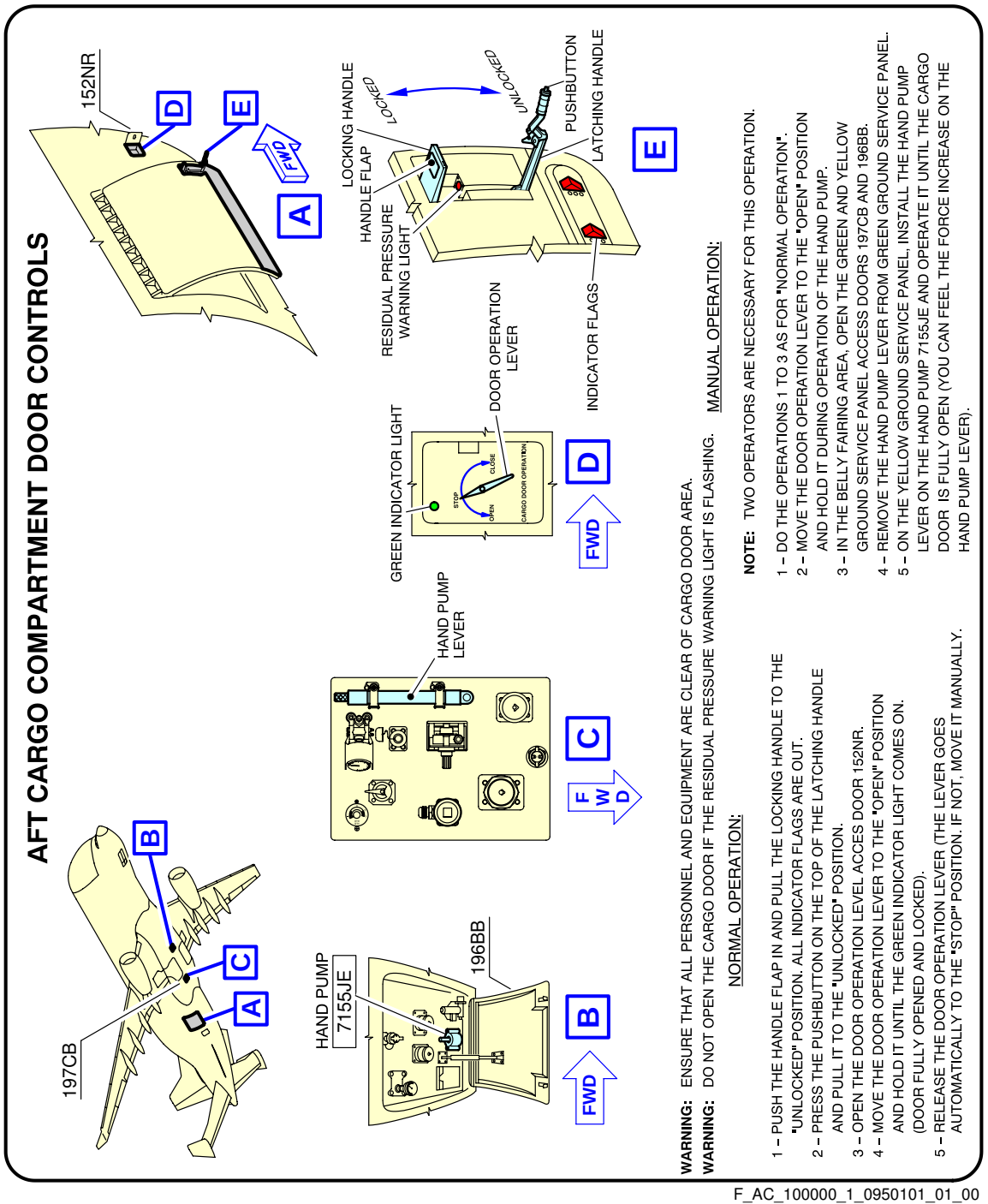
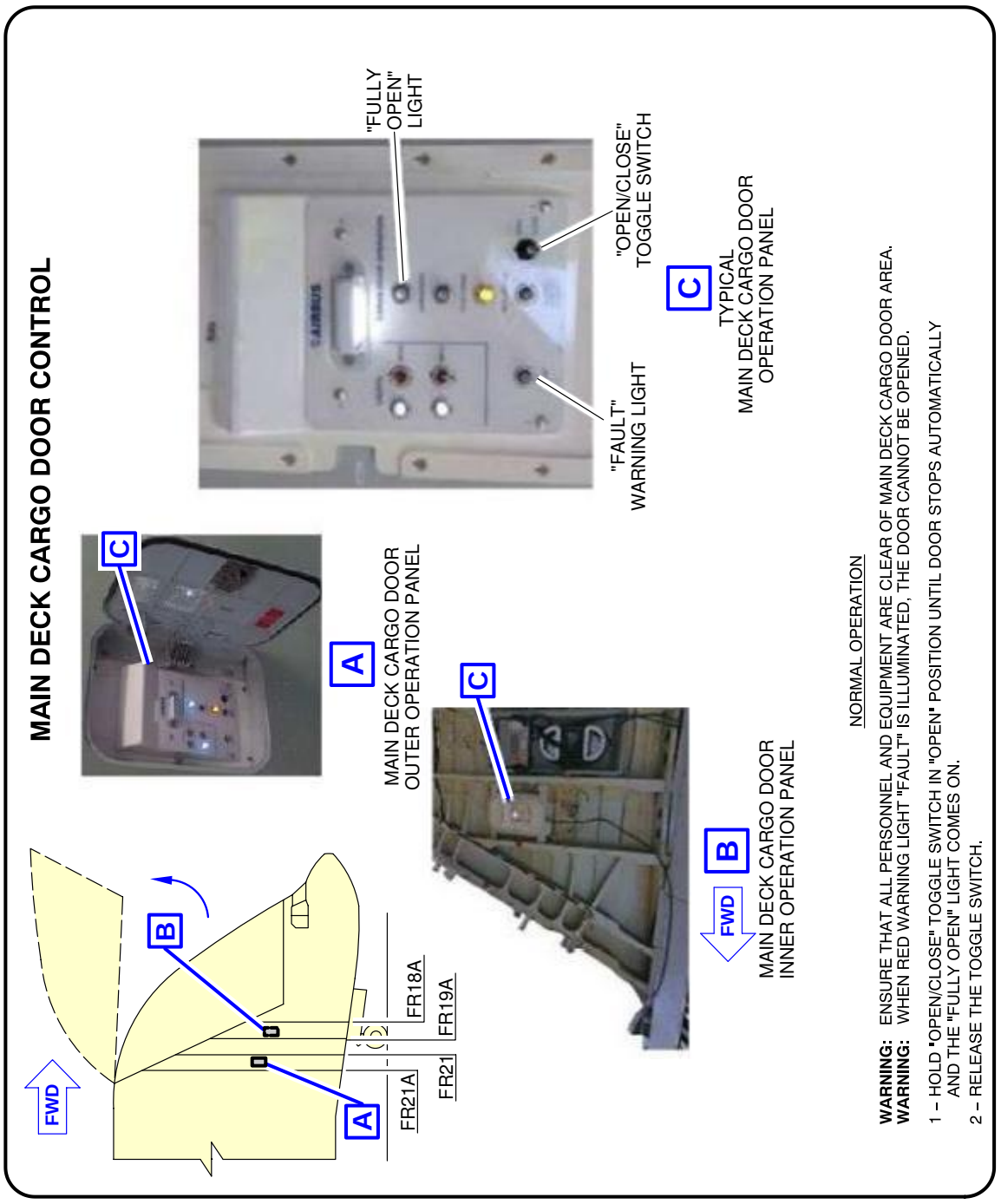
Main-Deck Access Door
FIGURE-10-0-0-991-094-A01

**ON A/C A330-700L



Aft-Cargo-Compartment Door Controls
FIGURE-10-0-0-991-095-A01

**ON A/C A330-700L



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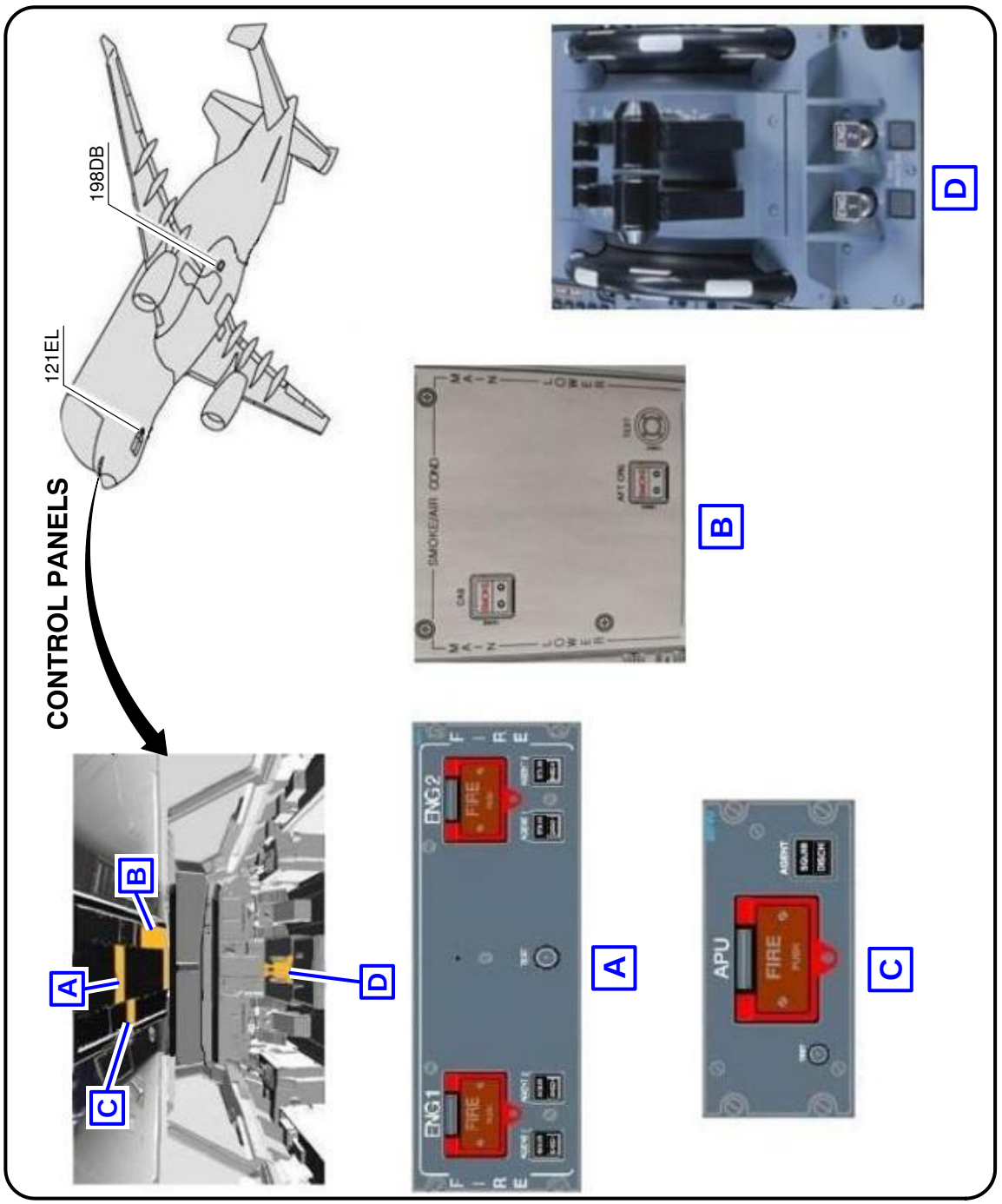
Main-Deck Cargo Door-Control
FIGURE-10-0-0-991-096-A01

**ON A/C A330-700L



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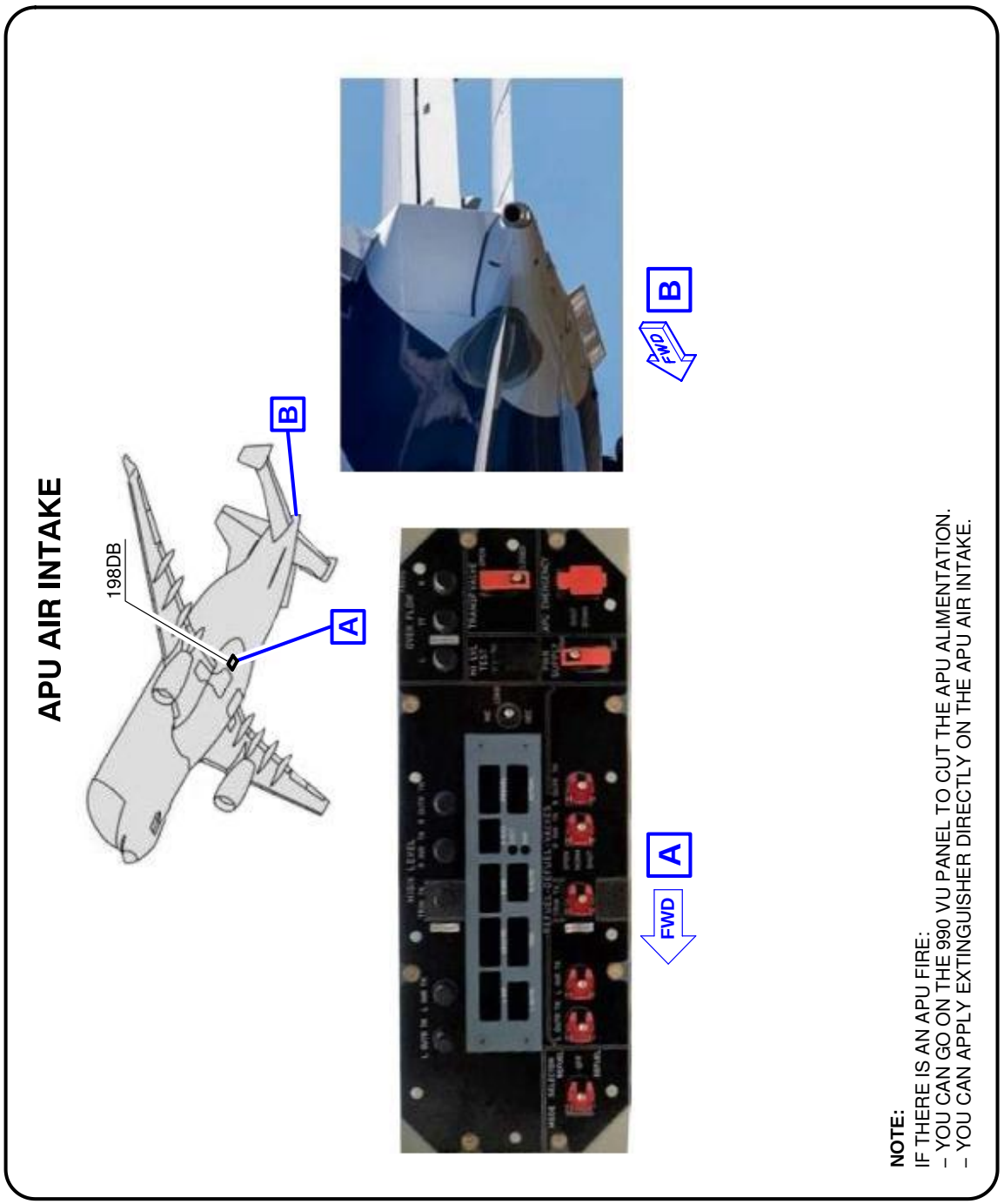
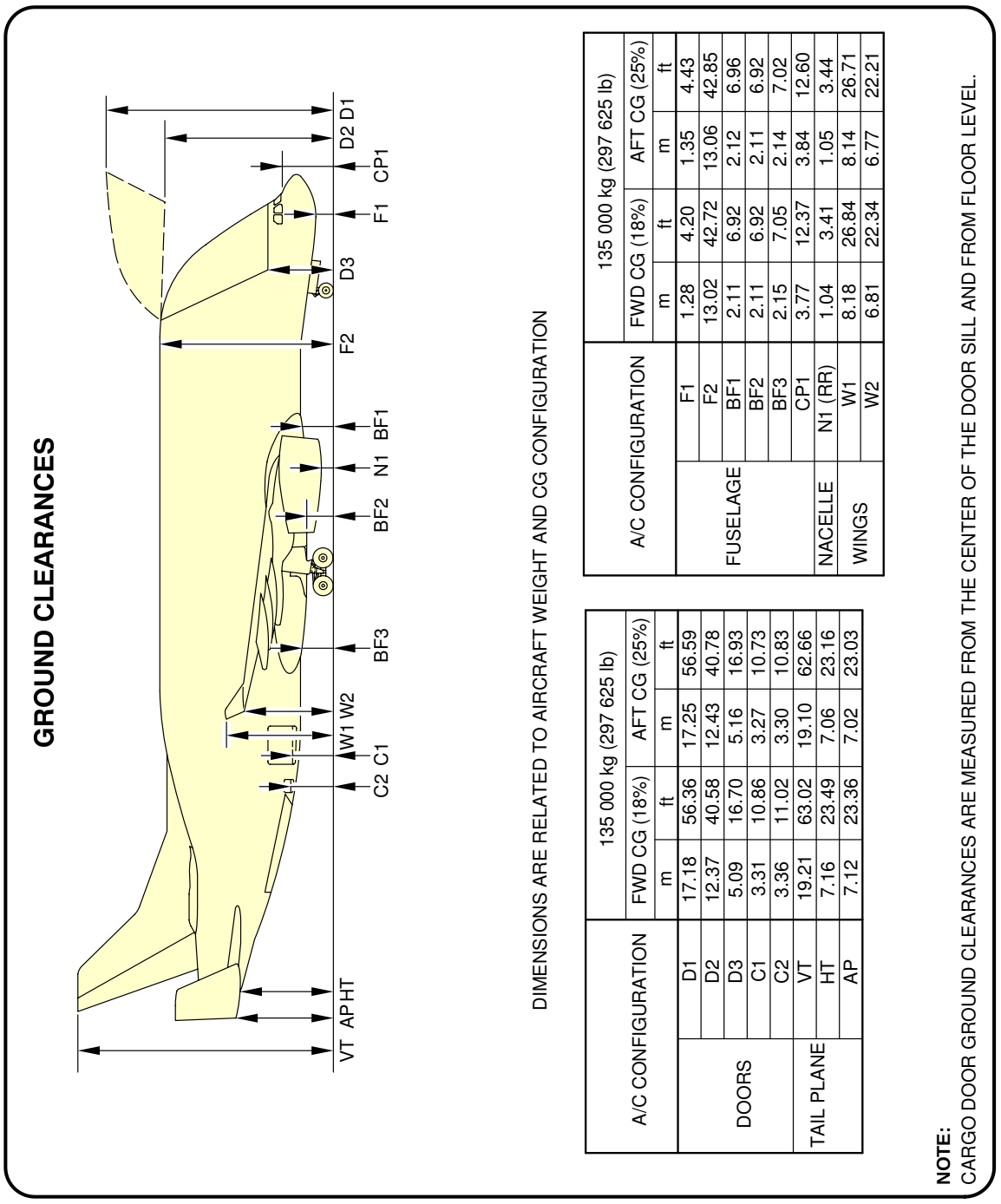
Control Panels
FIGURE-10-0-0-991-097-A01

**ON A/C A330-700L



APU Air Intake
FIGURE-10-0-0-991-104-A01

**ON A/C A330-700L



A/C CONFIGURATION		135 000 kg (297 625 lb)			
		FWD CG (18%)		AFT CG (25%)	
		m	ft	m	ft
DOORS	D1	17.18	56.36	17.25	56.59
	D2	12.37	40.58	12.43	40.78
	D3	5.09	16.70	5.16	16.93
	C1	3.31	10.86	3.27	10.73
	C2	3.36	11.02	3.30	10.83
TAIL PLANE	VT	19.21	63.02	19.10	62.66
	HT	7.16	23.49	7.06	23.16
	AP	7.12	23.36	7.02	23.03

A/C CONFIGURATION		135 000 kg (297 625 lb)			
		FWD CG (18%)		AFT CG (25%)	
		m	ft	m	ft
FUSELAGE	F1	1.28	4.20	1.35	4.43
	F2	13.02	42.72	13.06	42.85
	BF1	2.11	6.92	2.12	6.96
	BF2	2.11	6.92	2.11	6.92
	BF3	2.15	7.05	2.14	7.02
	CP1	3.77	12.37	3.84	12.60
NACELLE	N1 (RR)	1.04	3.41	1.05	3.44
WINGS	W1	8.18	26.84	8.14	26.71
	W2	6.81	22.34	6.77	22.21

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Ground Clearances
FIGURE-10-0-0-991-099-A01

**ON A/C A330-700L

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Structural Break-in Points
FIGURE-10-0-0-991-100-A01