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1 SCOPE

1.1 GENERAL

The A330-700L AIRCRAFT CHARACTERISTICS (AC) manual is issued for the A330-700L to provide 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 the Beluga, and modernize and improve Airbus aircraft parts transportation. The A330-700L will offer an unequalled volume in its main deck cargo compartment, which will make it able, for example, to carry a pair of A350 wings.

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Customer Services
Technical Data Support and Services
1, Rond Point Maurice BELLONTE
31707 BLAGNAC CEDEX
FRANCE
## 1.2 HIGHLIGHTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Reason for change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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1.3 GLOSSARY

1.3.1 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 (Aircraft vertical reference)
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 (RMLG & LMLG: Right & Left Main Landing Gear)
LH Left Hand
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
ULD Unit Load Device
WV Weight Variant
1.3.2 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.
2 AIRCRAFT DESCRIPTION

2.1 GENERAL AIRCRAFT CHARACTERISTICS DATA

**ON A/C A330-700L

1) The following table provides characteristics of the A330-700L Model, these data are specific to each Weight Variant:

<table>
<thead>
<tr>
<th>Weight characteristics</th>
<th>WV000</th>
<th>WV001</th>
</tr>
</thead>
<tbody>
<tr>
<td>A330-700L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum Ramp Weight (MRW)</td>
<td>227 900 Kg (502433 lb)</td>
<td>205 900 Kg (453931 lb)</td>
</tr>
<tr>
<td>Maximum Take-Off Weight (MTOW)</td>
<td>227 000 Kg (500449 lb)</td>
<td>205 000 Kg (451947 lb)</td>
</tr>
<tr>
<td>Maximum Landing Weight (MLW)</td>
<td>187 000 Kg (412264 lb)</td>
<td>187 000 Kg (412264 lb)</td>
</tr>
<tr>
<td>Maximum Zero Fuel Weight (MZFW)</td>
<td>178 000 Kg (392422 lb)</td>
<td>178 000 Kg (392422 lb)</td>
</tr>
<tr>
<td>Estimated Maximum Payload</td>
<td>50 500 Kg (111333 lb)</td>
<td>50 500 Kg (111333 lb)</td>
</tr>
<tr>
<td>Operating Weight Empty (OWE)</td>
<td>127 500 Kg (281089 lb)</td>
<td>127 500 Kg (281089 lb)</td>
</tr>
</tbody>
</table>

Others characteristics

<table>
<thead>
<tr>
<th>A330-700L</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Seats in courier area</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Usable Fuel Capacity (density = 0.785 kg/l)</td>
<td>73 000 Kg (160937 lb)</td>
<td></td>
</tr>
<tr>
<td>Pressurized Fuselage Volume</td>
<td>87.4 m3 (3086 ft³)</td>
<td></td>
</tr>
<tr>
<td>Cockpit Volume</td>
<td>5.75 m3 (203 ft³)</td>
<td></td>
</tr>
<tr>
<td>Main Deck Cargo Compartment Water Volume</td>
<td>2209 m3 (78010 ft³)</td>
<td></td>
</tr>
<tr>
<td>Usable Volume, AFT CC</td>
<td>60.7 m3 (2143 ft³)</td>
<td></td>
</tr>
<tr>
<td>Usable Volume, Bulk CC</td>
<td>19.7 m3 (695 ft³)</td>
<td></td>
</tr>
<tr>
<td>Water Volume, AFT CC</td>
<td>85.7 m3 (3026 ft³)</td>
<td></td>
</tr>
<tr>
<td>Water Volume, Bulk CC</td>
<td>22.7 m3 (801 ft³)</td>
<td></td>
</tr>
</tbody>
</table>
2.2 GENERAL AIRCRAFT DIMENSIONS

**ON A/C A330-700L

1) This section provides general aircraft dimensions.
General Aircraft Dimensions (B)

General Aircraft Dimensions (C)
2.3 GROUND CLEARANCES

**ON A/C A330-700L

This section provides the height of various points of the aircraft, above the ground, for different Aircraft configurations. Dimensions in the tables may vary with tire type, weight and balance and others special conditions. (tire pressure and shock absorbers are fixed in standard condition) The dimensions are given for the weight variant WV000:
- A light weight (135T), with a FWD CG and an AFT CG,
- An aircraft at Maximum Take-Off Weight (227T) with a FWD CG and an AFT CG,
- A minimum weight at OWE (127T) with the matching CG
- Aircraft on jacks, FDL at 6.515 m.

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

<table>
<thead>
<tr>
<th>A/C Configuration For WV000</th>
<th>MRW 227 000 Kg (500 450 lbs)</th>
<th>135 000 Kg (297 625 lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FWD CG (20.5%)</td>
<td>AFT CG (28%)</td>
</tr>
<tr>
<td></td>
<td>m</td>
<td>ft</td>
</tr>
<tr>
<td>Fuselage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F2</td>
<td>12,90</td>
<td>42,32</td>
</tr>
<tr>
<td>F1</td>
<td>1,20</td>
<td>3,94</td>
</tr>
<tr>
<td>D1</td>
<td>17.10</td>
<td>56.10</td>
</tr>
<tr>
<td>D2</td>
<td>12.28</td>
<td>40.29</td>
</tr>
<tr>
<td>D3</td>
<td>5.01</td>
<td>16.44</td>
</tr>
<tr>
<td>CP1</td>
<td>3.69</td>
<td>12.11</td>
</tr>
<tr>
<td>BF1</td>
<td>1.94</td>
<td>6.36</td>
</tr>
<tr>
<td>BF2</td>
<td>1.93</td>
<td>6.33</td>
</tr>
<tr>
<td>BF3</td>
<td>1.95</td>
<td>6.40</td>
</tr>
<tr>
<td>HT</td>
<td>6.84</td>
<td>22.44</td>
</tr>
<tr>
<td>AP</td>
<td>7.39</td>
<td>24.24</td>
</tr>
<tr>
<td>VT</td>
<td>18.89</td>
<td>61.97</td>
</tr>
<tr>
<td>Doors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C1</td>
<td>3.07</td>
<td>10.07</td>
</tr>
<tr>
<td>C2</td>
<td>3.10</td>
<td>10.17</td>
</tr>
<tr>
<td>Wings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>W1</td>
<td>7.94</td>
<td>26.05</td>
</tr>
<tr>
<td>W2</td>
<td>6.58</td>
<td>21.59</td>
</tr>
<tr>
<td>Engine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N1</td>
<td>0.88</td>
<td>2.89</td>
</tr>
</tbody>
</table>

Ground Clearances for WV000 at MRW and 135T

<table>
<thead>
<tr>
<th></th>
<th>OWE 127 500 Kg (281089 lb)</th>
</tr>
</thead>
</table>

Printed Copies are not controlled. Confirm this is the latest issue available through the Airbus website.
<table>
<thead>
<tr>
<th>A/C Configuration</th>
<th>CG (23.5%)</th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>m</td>
<td>ft</td>
<td></td>
</tr>
<tr>
<td>Fuselage</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>F2</td>
<td>13,04</td>
<td>42,78</td>
<td></td>
</tr>
<tr>
<td>F1</td>
<td>1,67</td>
<td>5,48</td>
<td></td>
</tr>
<tr>
<td>D1</td>
<td>17,24</td>
<td>56,56</td>
<td></td>
</tr>
<tr>
<td>D2</td>
<td>12,43</td>
<td>40,78</td>
<td></td>
</tr>
<tr>
<td>D3</td>
<td>8,05</td>
<td>26,41</td>
<td></td>
</tr>
<tr>
<td>CP1</td>
<td>8,83</td>
<td>28,97</td>
<td></td>
</tr>
<tr>
<td>BF1</td>
<td>2,29</td>
<td>7,51</td>
<td></td>
</tr>
<tr>
<td>BF2</td>
<td>2,13</td>
<td>6,99</td>
<td></td>
</tr>
<tr>
<td>BF3</td>
<td>2,17</td>
<td>7,12</td>
<td></td>
</tr>
<tr>
<td>HT</td>
<td>7,14</td>
<td>23,42</td>
<td></td>
</tr>
<tr>
<td>AP</td>
<td>7,66</td>
<td>25,13</td>
<td></td>
</tr>
<tr>
<td>VT</td>
<td>19,86</td>
<td>65,16</td>
<td></td>
</tr>
<tr>
<td>Doors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C1</td>
<td>3,27</td>
<td>10,73</td>
<td></td>
</tr>
<tr>
<td>C2</td>
<td>3,31</td>
<td>10,86</td>
<td></td>
</tr>
<tr>
<td>Wings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W1</td>
<td>8,19</td>
<td>26,87</td>
<td></td>
</tr>
<tr>
<td>W2</td>
<td>6,84</td>
<td>22,44</td>
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</tr>
<tr>
<td>Engine</td>
<td></td>
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<tr>
<td>N1</td>
<td>1,06</td>
<td>3,48</td>
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</tbody>
</table>

*Ground Clearances for WV000 at 127500 Kg*
A330-700 Beluga XL
Aircraft Characteristics Manual

Reference FM0400730
Issue 1

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Ground clearances for aircraft on jacks

<table>
<thead>
<tr>
<th>AIRCRAFT ON JACKS, FUSELAGE DATUM REFERENCE</th>
<th>HEIGHT in m (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PARALLEL TO GROUND AT 6,515m (21,37 ft) FOR LANDING</td>
<td>A</td>
</tr>
<tr>
<td>GEARS EXTENSION/RETRACTION</td>
<td>2,63 (8,63)</td>
</tr>
<tr>
<td>AIRCRAFT ON JACKS, FUSELAGE DATUM REFERENCE</td>
<td>A</td>
</tr>
<tr>
<td>PARALLEL TO GROUND AT 7,200m (23,62 ft) FOR LANDING</td>
<td>3,32 (10,90)</td>
</tr>
</tbody>
</table>

Ground clearances for flaps retracted with WV000

<table>
<thead>
<tr>
<th>AIRCRAFT TYPE</th>
<th>DESCRIPTION</th>
<th>MRW CG 20,5%</th>
<th>MRW CG 28%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>m</td>
<td>ft</td>
</tr>
<tr>
<td>A330-700</td>
<td>FLAP TRACK A</td>
<td>3,75</td>
<td>12,30</td>
</tr>
<tr>
<td></td>
<td>FLAP TRACK B</td>
<td>4,26</td>
<td>13,98</td>
</tr>
<tr>
<td></td>
<td>FLAP TRACK C</td>
<td>4,51</td>
<td>14,80</td>
</tr>
<tr>
<td></td>
<td>FLAP TRACK D</td>
<td>4,88</td>
<td>16,01</td>
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</table>
### FLAP TRACKS 1+F

<table>
<thead>
<tr>
<th>AIRCRAFT TYPE</th>
<th>DESCRIPTION</th>
<th>MRW CG 20,5%</th>
<th>MRW CG 28%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>m</td>
<td>ft</td>
</tr>
<tr>
<td>A330-700</td>
<td>FLAP TRACK A</td>
<td>3,48</td>
<td>11,42</td>
</tr>
<tr>
<td></td>
<td>FLAP TRACK B</td>
<td>3,99</td>
<td>13,09</td>
</tr>
<tr>
<td></td>
<td>FLAP TRACK C</td>
<td>4,24</td>
<td>13,91</td>
</tr>
<tr>
<td></td>
<td>FLAP TRACK D</td>
<td>4,61</td>
<td>15,12</td>
</tr>
</tbody>
</table>

*Ground clearances for flaps in intermediate position with WV000*

### FLAP TRACKS EXTENDED

<table>
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<tr>
<th>AIRCRAFT TYPE</th>
<th>DESCRIPTION</th>
<th>MRW CG 20,5%</th>
<th>MRW CG 28%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>m</td>
<td>ft</td>
</tr>
<tr>
<td>A330-700</td>
<td>FLAP TRACK A</td>
<td>2,82</td>
<td>9,25</td>
</tr>
<tr>
<td></td>
<td>FLAP TRACK B</td>
<td>3,33</td>
<td>10,93</td>
</tr>
<tr>
<td></td>
<td>FLAP TRACK C</td>
<td>3,58</td>
<td>11,75</td>
</tr>
<tr>
<td></td>
<td>FLAP TRACK D</td>
<td>3,95</td>
<td>12,96</td>
</tr>
</tbody>
</table>

*Ground clearances for flaps fully extended with WV000*
2.4 INTERIOR ARRANGEMENTS - PLAN VIEW

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

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

*Top view of courier area with interior configuration*
2.5 INTERIOR ARRANGEMENTS - CROSS SECTION

**ON A/C A330-700L

1) This section gives general dimensions of the courier area.

Cross section reference for courier area
2.6 CARGO COMPARTMENTS

2.6.1 LOWER DECK CARGO COMPARTMENTS

**ON A/C A330-700L

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

Lower cargo layout (front & top views)
2.6.2 MAIN DECK CARGO COMPARTMENTS

**ON A/C A330-700L

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

*Main deck cargo allowances*
Cross section of main deck cargo arrangement
2.7 DOOR CLEARANCES

**ON A/C A330-700L

1) This section provides door location, identification and clearances.

*Lateral position of doors from a/c nose*
Lateral position of exits from a/c nose

Radome opening dimensions
Position & dimensions of Aft lower cargo door
A330-700 Beluga XL
Aircraft Characteristics Manual

Reference FM0400730
Issue 1

Position & dimensions of bulk cargo door

*Nose Landing Gear clearances Not Published.
Main Landing Door position

Fig A: Main LDG Door rear view

2.8 ESCAPE SLIDES
Not Applicable
2.9 LANDING GEAR

**ON A/C A330-700L

1. General

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

A. Elevators
These can be either mechanical or hydraulic. Elevators are used to:
- permit 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 limited because the locations required for positioning the jacks are close to the sides of the pits.
Landing Gear position

NOTE: ENVELOPES SHOWN WITH ZERO CLEARANCE TO OUTSIDE EDGE OF TIRES.
Main Landing Gear
**Mechanical locking of MLG**
Main Landing Gear servicing
Nose Landing Gear description
Nose LDG Mechanical locking
Nose LDG servicing 1
Nose LDG servicing 2
Nose LDG servicing 3
2.10 EXTERIOR LIGHTING

**ON A/C A330-700L

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

*Lights general layout*
Exterior lighting
Aft Lower Cargo light
2.11 ANTENNAS & PROBES LOCATION

**ON A/C A330-700L
Antennas and Probes Location

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

Probes & Antennas layout
2.12 POWER PLANT AND APU

2.12.1 ENGINE AND NACELLE

**ON A/C A330-700L  This chapter is similar to A330 with RR TRENT 700 Engines**

Engine and Nacelle - 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.
**RR TRENT 700 Engine**
RR TRENT 700 Engine
**NOTE:**
APPROXIMATE DIMENSIONS

**RR TRENT 700 Engine**
**RR TRENT 700 Engine**
2.12.2 AUXILIARY POWER UNIT

**ON A/C A330-700L** This chapter is similar to other A330 models

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 Fuel Control Unit (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.
APU doors
APU Layout (Garett GTCP 331-350C)
2.13 LEVELING & SYMMETRY

**ON A/C A330-700L

1. Quick Leveling
There are two alternative procedures to level the aircraft (Refer to AMM):
- Quick leveling procedure using Air Data/Inertial Reference System (ADIRS)
- Quick leveling procedure using a spirit level in the Main Deck cargo compartment

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).
2.14 JACKING

2.14.1 JACKING FOR MAINTENANCE

**ON A/C A330-700L

2. Aircraft Jacking Points for Maintenance

A. General
(1) The A330-700 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.

4. 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
The stay stroke enables the aircraft tail to be supported up to the Fuselage Datum Line (FDL) positioned 7.2 m (23.62 ft) from the ground.
Jacking points layout & maximum jacking force

<table>
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<th></th>
<th>Maximum Jacking Force &lt;1&gt;</th>
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<tr>
<td>FWD FUSELAGE JACKING POINT A</td>
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<tr>
<td>WING JACKING POINT B</td>
<td>71923.3 daN</td>
</tr>
<tr>
<td>SAFETY STAY POINT C</td>
<td>4500 daN</td>
</tr>
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</table>

<1> The permitted load values provided are maximum operational loads needed for the task and do not include the 1.33 safety factor of CS25.

NOTA
THE VALUES IN THESE DRAWINGS ARE THEORETICAL VALUES NOT TAKING INTO ACCOUNT ANY AIRCRAFT DEFLECTIONS
**Ground clearance on jacks**

<table>
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<th>HEIGHT in mm (in.)</th>
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<td>A</td>
<td>B</td>
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<tr>
<td>AIRCRAFT ON JACKS, FUSELAGE DATUM REFERENCE PARALLEL TO GROUND AT 6515mm (256,5 in.) FOR LANDING GEARs EXTENSION/RETRACTION</td>
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</tr>
<tr>
<td>AIRCRAFT ON JACKS, FUSELAGE DATUM REFERENCE PARALLEL TO GROUND AT 7200mm (283,46 in.) FOR LANDING GEARs REMOVAL/INSTALLATION</td>
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Jacking point adaptors
2.14.2 JACKING OF THE LANDING GEAR

**ON A/C A330-700L

**Jackling of the Landing Gear 1**

![Diagram of A330-700 Beluga XL landing gear jack points and dimensions.](image-url)
Jacking of the Landing Gear 2
Jacking of the Landing Gear 3
Jacking of the Landing Gear 4
Jacking of the Landing Gear 5

NORMAL ATTITUDE

297.5 mm
(11.71 in)

270 mm
(10.63 in)

JACKING POINT
260 mm
(10.24 in)

TWO TIREs DEFLATED OR SHREDDED

JACKING POINT
148.5 mm
(5.85 in)

HEIGHT OF JACKING POINT TO GROUND TO CHANGE/REPLACE THE WHEEL ASSEMBLY

1,083 mm
(42.64 in)

25.4 mm
(1 in)

JACKING POINT
403 mm
(15.75 in)
2.14.3 SHORING OF AIRCRAFT

**ON A/C A330-700L

Support of Aircraft

When it is necessary to support the aircraft in order to relieve the loads on the structure for the accomplishment of modifications or major work, it is advisable to provide adapters under the wings and the fuselage for an alternative means of lifting. The aircraft must not be lifted nor supported by the wings or fuselage alone. It is important to support the aircraft fuselage and wings at the same time to prevent structural damage.

Shoring Cradles

Shoring cradles are used when it is necessary to stress-jack the aircraft to carry out maintenance and repair work. These are used to oppose the deflections of the wings and reduce the stresses to an acceptable level at the area of maintenance and repair. The shoring cradles, each with two adjustable pads, 152.4 mm (6 in) square, are positioned at four locations under each wing. The adjustable pads are faced with thin rubber and are in contact with the wing profile at the datum intersections of the ribs and the front and rear spars (F/S and R/S).
- Shoring Cradles

**Shoring cradles location**
- Auxiliary Jacking points
3 AIRCRAFT PERFORMANCE

CAN BE COMPUTED IN PEP (Performance Engineering Program)

CONTACT AIRBUS
4 GROUND MANEUVERING

4.1 GENERAL INFORMATION

1. This section provides 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 TURNING RADII

**ON A/C A330-700L

1. This section provides the turning radii.

![Diagram of Turning Radii](FIGURE-4-2-0-991-004-A01)
<table>
<thead>
<tr>
<th>TYPE OF TURN</th>
<th>STEERING ANGLE (deg)</th>
<th>EFFECTIVE STEERING ANGLE (deg)</th>
<th>R1 RMLG</th>
<th>R2 LMLG</th>
<th>R3 NLG</th>
<th>R4 WING</th>
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<td>24.0</td>
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<td>40.4</td>
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<td>37.6</td>
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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.

Turning Radii
(Sheet 2)
FIGURE-4-2-0-991-003-A01
4.3 MINIMUM TURNING RADII

**ON A/C A330-700L

1. This section provides the minimum turning radii.

**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.

<table>
<thead>
<tr>
<th>TYPE OF TURN</th>
<th>STEERING ANGLE (deg)</th>
<th>EFFECTIVE STEERING ANGLE (deg)</th>
<th>X</th>
<th>Y</th>
<th>A</th>
<th>R3 NLG</th>
<th>R4 WING</th>
<th>R5 NOSE</th>
<th>R5 TAIL</th>
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<td></td>
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<td>r</td>
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</table>

**NOTE:**

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

Minimum Turning Radii

FIGURE-4-3-0-991-007-A01
4.4 VISIBILITY FROM COCKPIT IN STATIC POSITION

**ON A/C A330-700L

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

Visibility from cockpit in static captain position
Visibility from cockpit in static position
Binocular Visibility Through Windows from Captain Eye Position
4.5 RUNWAY & TAXIWAY TURN PATHS

4.5.1 135° TURN – RUNWAY TO TAXIWAY

**ON A/C A330-700L

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

135° turn - runway to taxiway (oversteer method)
135° turn - runway to taxiway
4.5.2 90° TURN – RUNWAY TO TAXIWAY

**ON A/C A330-700L

90° turn - runway to taxiway (oversteer method)
90° turn - runway to taxiway
4.5.3 180° TURN ON A RUNWAY

**ON A/C A330-700L

180° Turn on a Runway
4.5.4 135° TURN – TAXIWAY TO TAXIWAY

**ON A/C A330-700L

135° Turn – Taxiway to Taxiway (oversteer method)
135° Turn – Taxiway to Taxiway
4.5.5 90° TURN – TAXIWAY TO TAXIWAY

**ON A/C A330-700L

90° Turn – Taxiway to Taxiway (oversteer method)
90° Turn – Taxiway to Taxiway

FAA LEAD-IN FILLET
L = 75 m (250 ft)

APPROX 6.2 m
(20 ft)

FILLET R = 25.5 m
(85 ft)

TURN R = 45 m
(150 ft)

23 m

23 m

RUNWAY CENTERLINE

TAXIWAY CENTERLINE
4.6 RUNWAY HOLDING BAY (APRON)

**ON A/C A330-700L

1. This section provides the Runway Holding Bay (Apron) figure
4.7 MINIMUM LINE-UP DISTANCE CORRECTIONS

**ON A/C A330-700L

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. 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. 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. 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.
### Minimum Line-Up Distance Corrections

#### 90° Turn on Runway Entry

<table>
<thead>
<tr>
<th>AIRCRAFT TYPE</th>
<th>MAX STEERING ANGLE</th>
<th>MINIMUM LINE-UP DISTANCE CORRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ON TODA</td>
<td>ON ASDA</td>
</tr>
<tr>
<td>Beluga XL</td>
<td>65°</td>
<td>22.5 m</td>
</tr>
<tr>
<td>Beluga XL</td>
<td>72°</td>
<td>19.7 m</td>
</tr>
</tbody>
</table>

**Note:**
- ASDA: ACCELERATION–STOP DISTANCE AVAILABLE
- TODA: TAKE-OFF DISTANCE AVAILABLE

---

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### 180° TURN ON RUNWAY TURNPAD

<table>
<thead>
<tr>
<th>AIRCRAFT TYPE</th>
<th>MAX STEERING ANGLE</th>
<th>45 m (150 ft)/60 m (200 ft) WIDE RUNWAY</th>
<th>MINIMUM LINE-UP DISTANCE CORRECTION</th>
<th>REQUIRED MINIMUM PAVEMENT WIDTH</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ON TODA</td>
<td>ON ASDA</td>
<td></td>
</tr>
<tr>
<td>Beluga XL</td>
<td>65°</td>
<td>30.1 m</td>
<td>99 ft</td>
<td>52.2 m 171 ft</td>
</tr>
<tr>
<td>Beluga XL</td>
<td>72°</td>
<td>28.9 m</td>
<td>95 ft</td>
<td>51.1 m 168 ft</td>
</tr>
</tbody>
</table>

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

**Minimum Line-Up Distance Corrections**

180° Turn on Runway Turnpad
### 180° TURN ON RUNWAY WIDTH

<table>
<thead>
<tr>
<th>AIRCRAFT TYPE</th>
<th>MAX STEERING ANGLE</th>
<th>45 m (150 ft) WIDE RUNWAY (STANDARD WIDTH)</th>
<th>60 m (200 ft) WIDE RUNWAY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>MINIMUM LINE-UP DISTANCE CORRECTION</td>
<td>MINIMUM LINE-UP DISTANCE CORRECTION</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ON TODA</td>
<td>ON ASDA</td>
</tr>
<tr>
<td>Beluga XL</td>
<td>65°</td>
<td>NOT POSSIBLE</td>
<td></td>
</tr>
<tr>
<td>Beluga XL</td>
<td>72°</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:**

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

*Minimum Line-Up Distance Corrections*

*180° Turn on Runway Width*
4.8 AIRCRAFT MOORING

**ON A/C A330-700L

1. This section provides information on aircraft mooring.
5 TERMINAL SERVICING

**ON A/C A330-700L

5.1 GROUND SERVICE CONNECTIONS

5.1.1 GROUND SERVICE CONNECTIONS LAYOUT

1. This section provides the ground service connections layout.
5.1.2 GROUNDING POINTS

**ON A/C A330-700L

1. Grounding (Earthing) Points

<table>
<thead>
<tr>
<th>ACCESS</th>
<th>DISTANCE FROM AIRCRAFT CENTERLINE</th>
<th>MEAN HEIGHT FROM GROUND</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AFT OF NOSE</td>
<td>LH SIDE</td>
</tr>
<tr>
<td>On Nose Landing Gear Leg:</td>
<td>8,17 m (26,8 ft)</td>
<td>On centerline</td>
</tr>
<tr>
<td>On left Main Landing Gear leg:</td>
<td>32,1 m (105,3 ft)</td>
<td>5,34 m (17,52 ft)</td>
</tr>
<tr>
<td>On right Main Landing Gear Leg:</td>
<td>32,1 m (105,3 ft)</td>
<td>5,34 m (17,52 ft)</td>
</tr>
</tbody>
</table>

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.
Grounding point for external power connection, see 5.1.4
Main & nose Landing Gear grounding point
Grounding for refuel with painted labels
### 5.1.3 HYDRAULIC SYSTEM

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

1) Ground service panel

<table>
<thead>
<tr>
<th>ACCESS</th>
<th>DISTANCE</th>
<th>FROM AIRCRAFT CENTERLINE</th>
<th>MEAN HEIGHT FROM GROUND</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AFT OF NOSE</td>
<td>LH SIDE</td>
<td>RH SIDE</td>
</tr>
<tr>
<td>Green System: Access Door 197CB</td>
<td>33,10 m (108,60 ft)</td>
<td>1,28 m (4,20 ft)</td>
<td>2,23 m (7,32 ft)</td>
</tr>
<tr>
<td>Yellow System: Access Door 196BB</td>
<td>27,30 m (89,60 ft)</td>
<td>1,32 m (4,33 ft)</td>
<td>1,95 m (6,40 ft)</td>
</tr>
<tr>
<td>Blue System: Access Door 195BB</td>
<td>26,30 m (86,42 ft)</td>
<td>1,28 m (4,20 ft)</td>
<td>1,94 m (6,36 ft)</td>
</tr>
</tbody>
</table>

2) Reservoir Pressurization

<table>
<thead>
<tr>
<th>ACCESS</th>
<th>DISTANCE</th>
<th>FROM AIRCRAFT CENTERLINE</th>
<th>MEAN HEIGHT FROM GROUND</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AFT OF NOSE</td>
<td>LH SIDE</td>
<td>RH SIDE</td>
</tr>
<tr>
<td>Blue System Ground Service Panel: Access Door 195BB</td>
<td>26,34 m (86,42 ft)</td>
<td>1,28 m (4,20 ft)</td>
<td>1,94 m (6,36 ft)</td>
</tr>
</tbody>
</table>

3) Accumulator charging

<table>
<thead>
<tr>
<th>ACCESS</th>
<th>DISTANCE</th>
<th>FROM AIRCRAFT CENTERLINE</th>
<th>MEAN HEIGHT FROM GROUND</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AFT OF NOSE</td>
<td>LH SIDE</td>
<td>RH SIDE</td>
</tr>
<tr>
<td>Blue System Ground Service Panel: Access Door 195BB</td>
<td>26,34 m (86,42 ft)</td>
<td>1,28 m (4,20 ft)</td>
<td>1,94 m (6,36 ft)</td>
</tr>
</tbody>
</table>
4) Reservoir Filling

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

<table>
<thead>
<tr>
<th>ACCESS</th>
<th>DISTANCE</th>
<th>FROM AICRAFT CENTERLINE</th>
<th>MEAN HEIGHT FROM GROUND</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AFT OF NOSE</td>
<td>LH SIDE</td>
<td>RH SIDE</td>
</tr>
<tr>
<td>One handpump filling connection: Access Door 197CBB</td>
<td>33,22 m (109 ft)</td>
<td>1,28 m (4,20 ft)</td>
<td>2,23 m (7,32 ft)</td>
</tr>
</tbody>
</table>

5) A/C Emergency Generation

<table>
<thead>
<tr>
<th>ACCESS</th>
<th>DISTANCE</th>
<th>FROM AICRAFT CENTERLINE</th>
<th>MEAN HEIGHT FROM GROUND</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AFT OF NOSE</td>
<td>LH SIDE</td>
<td>RH SIDE</td>
</tr>
<tr>
<td>RAT Safety-Pin installation: Access Panel 633SL</td>
<td>32,90 m (107,94 ft)</td>
<td>14,20 m (46,59 ft)</td>
<td>4,35 m (14,27 ft)</td>
</tr>
</tbody>
</table>
Green System Ground Service Panel
Blue System Ground Service Panel
Yellow System Ground Service Panel
RAT safety pin
5.1.4 ELECTRICAL SYSTEM

**ON A/C A330-700L

1. A/C External Power

<table>
<thead>
<tr>
<th>ACCESS</th>
<th>DISTANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FROM AIRCRAFT CENTERLINE</td>
</tr>
<tr>
<td></td>
<td>LH SIDE</td>
</tr>
<tr>
<td>A/C External Power: Access Door 125EL</td>
<td>8,70 m</td>
</tr>
<tr>
<td></td>
<td>(28,4 ft)</td>
</tr>
</tbody>
</table>

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
External power access door 125EL
Maintenance Bus switch location
5.1.5 OXYGEN SYSTEM

**ON A/C A330-700L

1. Oxygen Servicing

<table>
<thead>
<tr>
<th>ACCESS</th>
<th>DISTANCE</th>
<th>FROM AIRCRAFT CENTERLINE</th>
<th>MEAN HEIGHT FROM GROUND</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AFT OF NOSE</td>
<td>LH SIDE</td>
<td>RH SIDE</td>
</tr>
<tr>
<td>Oxygen Replenishment (Option 1): 5750HT</td>
<td>12,54 m (41,1 ft)</td>
<td>0,44 m (1,4 ft)</td>
<td>3,46 m (11,3 ft)</td>
</tr>
<tr>
<td>Oxygen Replenishment (Option 2): 5751HT</td>
<td>12,54 m (41,1 ft)</td>
<td>0,44 m (1,4 ft)</td>
<td>3,46 m (11,3 ft)</td>
</tr>
</tbody>
</table>

(Internal charging near the belly door, inside aircraft)
Oxygen filling location
5.1.6 FUEL SYSTEM

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

1) Refuel/Defuel Control Panel

<table>
<thead>
<tr>
<th>ACCESS</th>
<th>DISTANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AFT OF NOSE</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Refuel/Defuel Control Panel: Access Door 198DB</td>
<td>32,6 m (106,9 ft)</td>
</tr>
</tbody>
</table>

A. Flow rate: 1580 l/min (417 US gal/min) per connection.
B. Maximum pressure: 50 psi (3,45 bar).

2) Refuel/Defuel Connectors

<table>
<thead>
<tr>
<th>ACCESS</th>
<th>DISTANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AFT OF NOSE</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Refuel/Defuel Coupling, Right: Access Door 622HB</td>
<td>28,3 m (92,8 ft)</td>
</tr>
<tr>
<td>Overwing Gravity Refuel Cap</td>
<td>32,8 m (107,6 ft)</td>
</tr>
</tbody>
</table>

A. Four standard 2.5 in. ISO 45 connections.
B. Two service connections (gravity refuel).
3) Overpressure Protector and NACA Flame Arrestor

<table>
<thead>
<tr>
<th>ACCESS</th>
<th>DISTANCE</th>
<th></th>
<th>MEAN HEIGHT</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AFT OF NOSE</td>
<td>FROM AIRCRAFT CENTERLINE</td>
<td>FROM GROUND</td>
<td></td>
</tr>
<tr>
<td>Overpressure Protector (Wing)</td>
<td></td>
<td>LH SIDE</td>
<td>RH SIDE</td>
<td></td>
</tr>
<tr>
<td>Access Panel 550EB (650EB)</td>
<td>37.8 m (124.01 ft)</td>
<td>27.17 m (89.14 ft)</td>
<td>27.17 m (89.14 ft)</td>
<td>5.75 m (18.86 ft)</td>
</tr>
<tr>
<td>NACA Flame Arrestor (Wing)</td>
<td>37.4 m (122.7 ft)</td>
<td>26.53 m (87.04 ft)</td>
<td>26.53 m (87.04 ft)</td>
<td>5.7 m (18.7 ft)</td>
</tr>
<tr>
<td>Access Panel 550DB (650DB)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Refuel/Defuel control panel TYPICAL (center & trim tank display/controls inop)
Refuel/Defuel access door
Flame arrestor & overpressure protector
5.1.7 PNEUMATIC SYSTEM

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

High Pressure Air Connection

<table>
<thead>
<tr>
<th>ACCESS</th>
<th>DISTANCE</th>
<th></th>
<th>MEAN HEIGHT FROM GROUND</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AFT OF NOSE</td>
<td>FROM AIRCRAFT CENTERLINE</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>LH SIDE</td>
<td>RH SIDE</td>
</tr>
<tr>
<td>HP Connectors: Access Door 193CB</td>
<td>20,94 m (68,7 ft)</td>
<td>0,84 m</td>
<td>1,79 m (5,87 ft)</td>
</tr>
<tr>
<td></td>
<td>Connectors:</td>
<td>Two standard 3 in. ISO 2026 connections.</td>
<td></td>
</tr>
</tbody>
</table>

Low Pressure Air Connection

<table>
<thead>
<tr>
<th>ACCESS</th>
<th>DISTANCE</th>
<th></th>
<th>MEAN HEIGHT FROM GROUND</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AFT OF NOSE</td>
<td>FROM AIRCRAFT CENTERLINE</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>LH SIDE</td>
<td>RH SIDE</td>
</tr>
<tr>
<td>LP Connectors: Access Door 191EB</td>
<td>22,66 m (74,3 ft)</td>
<td>0,4 m</td>
<td>8 m (26,25 ft)</td>
</tr>
<tr>
<td></td>
<td>Connectors:</td>
<td>Two standard 8 in. SAE AS4262 connections.</td>
<td></td>
</tr>
</tbody>
</table>
Ground pneumatic connection access
5.1.8 OIL SYSTEM

**ON A/C A330-700L

RR Trent 700 Series Engine
A. Engine Oil Replenishment:
   One gravity filling cap.
   One ozone self-sealing pressure fill and overfill connector per engine.

<table>
<thead>
<tr>
<th>ACCESS</th>
<th>DISTANCE</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AFT OF NOSE</td>
<td>FROM AIRCRAFT CENTERLINE</td>
<td>MEAN HEIGHT FROM GROUND</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>LH SIDE</td>
<td>RH SIDE</td>
<td></td>
</tr>
<tr>
<td>Engine 1:</td>
<td>25.40 m (83.3 ft)</td>
<td>7.92 m (25.98 ft)</td>
<td>2.05 m (6.73 ft)</td>
<td></td>
</tr>
<tr>
<td>Access Door: 416CR</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engine 2:</td>
<td>25.40 m (83.3 ft)</td>
<td>10.82 m (35.50 ft)</td>
<td>2.05 m (6.73 ft)</td>
<td></td>
</tr>
<tr>
<td>Access Door: 426CR</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(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.

<table>
<thead>
<tr>
<th>ACCESS</th>
<th>DISTANCE</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AFT OF NOSE</td>
<td>FROM AIRCRAFT CENTERLINE</td>
<td>MEAN HEIGHT FROM GROUND</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>LH SIDE</td>
<td>RH SIDE</td>
<td></td>
</tr>
<tr>
<td>Engine 1:</td>
<td>25.9 m (84.9 ft)</td>
<td>9.65 m (31.66 ft)</td>
<td>0.80 m (2.62 ft)</td>
<td></td>
</tr>
<tr>
<td>Access Door: 415CL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engine 2:</td>
<td>25.9 m (84.9 ft)</td>
<td>9.09 m (29.82 ft)</td>
<td>0.80 m (2.62 ft)</td>
<td></td>
</tr>
<tr>
<td>Access Door: 425CL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Max delivery pressure required: 2.76 bar (40 psi).
- Max oil capacity of the IDG: 5.50 l (1.45 US gal).

C. Starter Oil Replenishment:
   One filling connection per engine.
- Max oil capacity of the Starter: 0.50 l (0.13 US gal).
A330-700 Beluga XL
Aircraft Characteristics Manual

Reference FM0400730
Issue 1

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IDG oil tank
Starter oil tank
D. APU Oil Servicing:

APU oil gravity filling cap.

<table>
<thead>
<tr>
<th>ACCESS</th>
<th>DISTANCE FROM AICRAFT CENTERLINE</th>
<th>MEAN HEIGHT FROM GROUND</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AFT OF NOSE</td>
<td>LH SIDE</td>
</tr>
<tr>
<td>APU Oil Replenishment: Access Doors: 316AR, 315AL</td>
<td>58,94 m (193,3 ft)</td>
<td>0,4 m (1,3 ft)</td>
</tr>
</tbody>
</table>
APU description & oil tank
5.1.9 POTABLE WATER SYSTEM

**ON A/C A330-700L

1. Potable Water Servicing

<table>
<thead>
<tr>
<th>ACCESS</th>
<th>DISTANCE</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AFT OF NOSE</td>
<td>FROM AIRCRAFT CENTERLINE</td>
<td>MEAN HEIGHT FROM GROUND</td>
</tr>
<tr>
<td>Potable-Water Service Panel:</td>
<td>15,68 m (51,4 ft)</td>
<td>0,76 m (2,5 ft)</td>
<td>2,58 m (8,4 ft)</td>
</tr>
<tr>
<td>Access Door 133BL</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| NOTE : Distances are approximate.

2. Technical Specifications

A. Connections
   (1) On the potable-water service panel (access door 133BL):
   - One heated 3/4 in. (ISO 17775) quick release filling connection
   - One heated 3/4 in. (ISO 17775) overflow and discharge connection
   - One ground pressurization connection.
   (2) On the drain panel (access door 133BL):
   - One standard 3/4 in. (ISO 17775) drain connection with back-up mechanical control.

B. Capacity
   - 100 l (26.42 US gal).

C. Filling by replenishment of a removable water tank in lavatories
Potable water access
5.1.10 WASTE WATER SYSTEM

**ON A/C A330-700L

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:

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).

<table>
<thead>
<tr>
<th>ACCESS</th>
<th>DISTANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FROM AIRCRAFT CENTERLINE</td>
</tr>
<tr>
<td></td>
<td>LH SIDE</td>
</tr>
<tr>
<td>Waste Water Ground Service Panel 1: Access Door 121EL</td>
<td>6,39 m (20,9 ft)</td>
</tr>
<tr>
<td>Waste Water Ground Service Panel 2: Access Door 121FL</td>
<td>7,13 m (23,3 ft)</td>
</tr>
</tbody>
</table>
Waste water flush
Waste water drain
### 5.1.11 CARGO CONTROL PANELS

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

1. Cargo Control Panels

<table>
<thead>
<tr>
<th>ACCESS</th>
<th>DISTANCE FROM AICRAFT CENTERLINE</th>
<th>MEAN HEIGHT FROM GROUND</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AFT OF NOSE</td>
<td>LH SIDE</td>
</tr>
<tr>
<td>AFT cargo door panel</td>
<td>40,73 m (133,6 ft)</td>
<td>2,68 m</td>
</tr>
<tr>
<td>Access door 152 NR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MDCD Inner Operation Panel</td>
<td>9,26 m (30,3 ft)</td>
<td>3,23 m</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MDCD Outer Operation Panel</td>
<td>10,25 m (33,6 ft)</td>
<td>3,55 m</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Lower cargo door operation panel
5.2 ENGINE STARTING PNEUMATICS

**ON A/C A330-700L

Engine Starting Pneumatic Requirements

1. The purpose of this section is to provide 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).

<table>
<thead>
<tr>
<th>ABBREVIATION</th>
<th>DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>A/C</td>
<td>Aircraft</td>
</tr>
<tr>
<td>ASU</td>
<td>Air Start Unit</td>
</tr>
<tr>
<td>HPGC</td>
<td>High Pressure Ground Connection</td>
</tr>
<tr>
<td>OAT</td>
<td>Outside Air Temperature</td>
</tr>
</tbody>
</table>

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.
Engine Starting Pneumatic Requirements
Rolls Royce Trent 700 Series Engine
FIGURE-5-5-0-991-005-A01
5.3 GROUND TOWING REQUIREMENTS

**ON A/C A330-700L

1. This section provides 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 all A330 models.

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 (277 028 lbf.in).

The towing head is designed according to ISO 8267-1, cat. III.
**Towing traction diagram**

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 MINIMUM TRACTOR WEIGHT (32 900 kg).
5.4 DE-ICING AND EXTERNAL CLEANING

**ON A/C A330-700L

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 (65.6 ft).

2. De-Icing

<table>
<thead>
<tr>
<th>AREA</th>
<th>WING TOP SURFACE (BOTH SIDES)</th>
<th>WING TIP DEVICES (BOTH INSIDE AND OUTSIDE SURFACES) (BOTH SIDES)</th>
<th>HTP TOP SURFACE (BOTH SIDES)</th>
<th>VTP SURFACE (BOTH SIDES)</th>
<th>FUSELAGE TOP SURFACE (TOP THIRD - 120° ARC)</th>
<th>NACELLE, PYLON TOP SURFACE (TOP THIRD - 120° ARC) (ALL ENGINES)</th>
<th>TOTAL DE-ICED AREA</th>
</tr>
</thead>
<tbody>
<tr>
<td>m²</td>
<td>ft²</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>306</td>
<td>3294</td>
<td>11 (118)</td>
<td>65 (706)</td>
<td>210 (2260)</td>
<td>410 (4413)</td>
<td>46 (495)</td>
<td>1046 (11281)</td>
</tr>
</tbody>
</table>

*Area concerned by De-icing*
6 OPERATING CONDITIONS

6.1 ENGINE EXHAUST VELOCITIES & TEMPERATURES ENGINE EXHAUST

6.1.1 VELOCITIES CONTOURS – GROUND IDLE POWER

**ON A/C A330-700L

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

---

![Diagram of Engine Exhaust Velocities](image)

Engine Exhaust Velocities
Ground Idle Power - RR Trent 700 series engine
6.1.2 ENGINE EXHAUST TEMPERATURES CONTOURS – GROUND IDLE POWER

**ON A/C A330-700L

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

---

Engine Exhaust Temperatures
Ground Idle Power - RR Trent 700 series engine
6.1.3 ENGINE EXHAUST VELOCITIES CONTOURS – BREAKAWAY POWER

**ON A/C A330-700L

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
6.1.4 ENGINE EXHAUST TEMPERATURES CONTOURS – BREAKAWAY POWER

**ON A/C A330-700L

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
6.1.5 ENGINE EXHAUST VELOCITIES CONTOURS – TAKEOFF POWER

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

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
6.1.6 ENGINE EXHAUST TEMPERATURES CONTOURS – TAKEOFF POWER

**ON A/C A330-700L

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
6.2 DANGER AREAS OF ENGINES

6.2.1 GROUND IDLE POWER

**ON A/C A330-700L

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

---

danger areas of the engines at ground idle power conditions
6.2.2 BREAKAWAY POWER

**ON A/C A330-700L
1. This section provides danger areas of the engines at breakaway power conditions.
6.2.3 TAKE-OFF POWER

**ON A/C A330-700L

1. This section provides danger areas of the engines at max take-off power conditions.
6.3 APU EXHAUST VELOCITIES & TEMPERATURES

**ON A/C A330-700L

APU - GARRETT

1. This section gives APU exhaust velocities and temperatures

Exhaust Velocities and Temperatures
APU - GARRETT GTCP 331-350
7 Pavement Data

7.1 General

**ON A/C A330-700L

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

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

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

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

- Landing Gear Footprint:
  Section 7-2-0, presents basic data on the landing gear footprint configuration, maximum ramp weights and tire sizes and pressures.

- Maximum Pavement Loads:
  Section 7-3-0, shows maximum vertical and horizontal pavement loads for certain critical conditions at the tire-ground interfaces.

- Landing Gear Loading on Pavement:
  Section 7-4-0 contains charts to find these loads throughout the stability limits of the airplane at rest on the pavement.
  These main landing gear loads are used as the point of entry to the pavement design charts which follow, interpolating load values where necessary.

- Flexible Pavement Requirements - US Army Corps of Engineers Design Method:
  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 Aircraft Classification Number (ACN).
- Flexible Pavement Requirements - LCN Conversion Method:
The Load Classification Number (LCN) curves are no longer provided in section 7-6-0 since 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 7-7-0 gives the rigid pavement design curves that have been prepared with the use of the Westergaard Equation. This is in general accordance with the procedures outlined in the Portland Cement Association publications, "Design of Concrete Airport Pavement", 1973 and "Computer Program for Airport Pavement Design", (Program PDILB), 1967 both by Robert G. Packard.

- Rigid Pavement Requirements - LCN Conversion:
Section 7-8-0 gives 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 International Civil Aviation Organisation (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 Load Classification Number (LCN) curves are no longer provided in section 7-6-0 since 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 7-9-0 provides 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 provides a standardized international airplane/, pavement rating system replacing the various S, T, TT, LCN, AUW, ISWL, etc., rating systems used throughout the world.
ACN is the Aircraft Classification Number and PCN is the corresponding Pavement Classification Number. An aircraft having an ACN equal to or less than the PCN can operate without restriction on the pavement. Numerically the ACN is two times the derived single wheel load expressed in thousands of kilograms. The derived single wheel load is defined as the load on a single tire inflated to 1.25 Mpa (181 psi) that would have the same pavement requirements as the aircraft. Computationally the ACN/PCN system uses PCA program PDILB for rigid pavements and S-77-1 for flexible pavements to calculate ACN values. The Airport Authority must decide on the method of pavement analysis and the results of their evaluation shown as follows:

<table>
<thead>
<tr>
<th>PCN TYPE</th>
<th>SUBGRADE CATEGORY</th>
<th>TIRE PRESSURE CATEGORY</th>
<th>EVALUATION METHOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>R - Rigid</td>
<td>A - High</td>
<td>W - No Limit</td>
<td>T - Technical</td>
</tr>
<tr>
<td></td>
<td>B - Medium</td>
<td>X - To 1.75 Mpa (217 psi)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C - Low</td>
<td>Y - To 1.25 Mpa (145 psi)</td>
<td>U - Using Aircraft</td>
</tr>
<tr>
<td></td>
<td>D - Ultra Low</td>
<td>Z - To 0.5 Mpa (73 psi)</td>
<td></td>
</tr>
</tbody>
</table>

Section 7-9-0 shows the aircraft ACN values.

For flexible pavements, the four subgrade categories are:

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

For rigid pavements, the four subgrade categories are:

A High Strength Subgrade \( k = 150 \text{ MN/m}^3 \) (550 pci)
B Medium Strength Subgrade \( k = 80 \text{ MN/m}^3 \) (300pci)
C Low Strength Subgrade \( k = 40 \text{ MN/m}^3 \) (150pci)
D Ultra Low Strength Subgrade \( k = 20 \text{ MN/m}^3 \) (75pci)
7.2 LANDING GEAR FOOTPRINT

**ON A/C A330-700L

This section gives data about the landing gear footprint in relation with 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 A330-700L

<table>
<thead>
<tr>
<th>CG Height</th>
<th>Maximum Ramp Weight</th>
<th>Percentage of Weight on Main Gear Group</th>
<th>Nose Gear Tire Size</th>
<th>Nose Gear Tire Pressure</th>
<th>Wing Gear Tire Size</th>
<th>Wing Gear Tire Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>A330-700L ZCG-0.5m</td>
<td>227 900 kg (502 425 lb)</td>
<td>91.7%</td>
<td>1050x395R16 PR28</td>
<td>12.7 bar (184 psi)</td>
<td>1400x530R23 PR36</td>
<td>14.2 bar (206 psi)</td>
</tr>
<tr>
<td>A330-700L ZCG-0.4m</td>
<td>227 900 kg (502 425 lb)</td>
<td>91.7%</td>
<td>1050x395R16 PR28</td>
<td>12.7 bar (184 psi)</td>
<td>1400x530R23 PR36</td>
<td>14.2 bar (206 psi)</td>
</tr>
<tr>
<td>A330-700L ZCG0m</td>
<td>227 900 kg (502 425 lb)</td>
<td>91.7%</td>
<td>1050x395R16 PR28</td>
<td>12.7 bar (184 psi)</td>
<td>1400x530R23 PR36</td>
<td>14.2 bar (206 psi)</td>
</tr>
<tr>
<td>A330-700L ZCG0.4m</td>
<td>227 900 kg (502 425 lb)</td>
<td>90.9%</td>
<td>1050x395R16 PR28</td>
<td>12.7 bar (184 psi)</td>
<td>1400x530R23 PR36</td>
<td>14.2 bar (206 psi)</td>
</tr>
<tr>
<td>A330-700L ZCG0.5m</td>
<td>202 300 kg (446 000 lb)</td>
<td>91.7%</td>
<td>1050x395R16 PR28</td>
<td>12.7 bar (184 psi)</td>
<td>1400x530R23 PR36</td>
<td>14.2 bar (206 psi)</td>
</tr>
</tbody>
</table>
7.3 MAXIMUM PAVEMENT LOADS

**ON A/C A330-700L

This section shows 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.
### Maximum Pavement Loads

<table>
<thead>
<tr>
<th>CG Height</th>
<th>Maximum Ramp Weight</th>
<th>Static Load at Most FWD C.G.</th>
<th>Static Braking @ 10 ft/s² Deceleration</th>
<th>Static Load at Most Aft C.G.</th>
<th>Steady Braking @ 10 ft/s² Deceleration</th>
<th>At Instantaneous Braking Coefficient = 0.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZCG-0.5m</td>
<td>227 900 kg (502 425 lb)</td>
<td>23 386 kg (51 325 lb)</td>
<td>PWD CG = 22.5% MAC (1)</td>
<td>35 150 kg (77 416 lb)</td>
<td>104 440 kg (230 250 lb)</td>
<td>AFT CG = 28.2% MAC (1)</td>
</tr>
<tr>
<td>ZCG-0.4m</td>
<td>227 900 kg (502 425 lb)</td>
<td>24 706 kg (54 450 lb)</td>
<td>PWD CG = 20.6% MAC (1)</td>
<td>39 800 kg (87 350 lb)</td>
<td>104 440 kg (230 250 lb)</td>
<td>AFT CG = 28.2% MAC (1)</td>
</tr>
<tr>
<td>ZCG0m</td>
<td>227 900 kg (502 425 lb)</td>
<td>24 706 kg (54 450 lb)</td>
<td>PWD CG = 20.6% MAC (1)</td>
<td>41 170 kg (90 775 lb)</td>
<td>104 440 kg (230 250 lb)</td>
<td>AFT CG = 28.2% MAC (1)</td>
</tr>
<tr>
<td>ZCG6.4m</td>
<td>227 900 kg (502 425 lb)</td>
<td>24 706 kg (54 450 lb)</td>
<td>PWD CG = 20.6% MAC (1)</td>
<td>42 440 kg (93 375 lb)</td>
<td>103 620 kg (228 450 lb)</td>
<td>AFT CG = 28% MAC (1)</td>
</tr>
<tr>
<td>ZCG6.5m</td>
<td>202 300 kg (446 000 lb)</td>
<td>23 656 kg (52 150 lb)</td>
<td>PWD CG = 19% MAC (1)</td>
<td>33 570 kg (73 125 lb)</td>
<td>102 710 kg (226 400 lb)</td>
<td>AFT CG = 28.2% MAC (1)</td>
</tr>
</tbody>
</table>

**Definitions:**

- $V_{NG}$: Maximum Vertical Nose Gear Ground Load at Most Forward CG
- $V_{MG}$: Maximum Vertical Main Gear Ground Load at Most Aft CG
- $H$: Maximum Horizontal Ground Load from Braking

(1) Loads calculated using aircraft at MRW
(2) Braked main gear
7.4 LANDING GEAR LOADING ON THE PAVEMENT

**ON A/C A330-700L

This section provides 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 A330-700L WVZCG0.6m, calculation of the total weight on the MLG for:
- An aircraft with a Maximum Ramp Weight (MRW) of 202 300 kg (446 000 lb),
- The aircraft gross weight is 195 000 kg (429 900 lb),
- A percentage of weight on MLG of 91.65% (percentage of weight on MLG at MRW and CG max aft 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
Landing Gear Loading on Pavement
A330-700L Models - MRW 227 900 kg
WVZCG-0.5m
CG Used for ACN/LCN Calculation : 28.2%
Landing Gear Loading on Pavement
A330-700L Models - MRW 227 900 kg
WVZCG-0.4m
CG Used for ACN/LCN Calculation: 26.2%
Landing Gear Loading on Pavement
A330-700L Models - MRW 227 900 kg
WVZCG0m

CG Used for ACN/LCN Calculation : 28.2%
Landing Gear Loading on Pavement
A330-700L Models - MRW 227,900 kg
WVZCG0.4m
CG Used for ACN/ LCN Calculation: 20%
Landing Gear Loading on Pavement
A330-700L Models - MRW 202 300 kg
WVZCG0.6m

CG Used for ACN/LCN Calculation : 28.2%
7.5 U.S. ARMY CORPS OF ENGINEERS DESIGN METHOD

**ON A/C A330-700L

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 A330-700L WVZCG0.6m, 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 3000,
- 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.
FLEXIBLE PAVEMENT THICKNESS

1400x530R23 PR36 TIRES
TIRE PRESSURE CONSTANT AT 14.2 BAR (206 PSI)

Flexible Pavement Requirements
A330-700L Models - MRW 227 900 kg
WVZCG-0.5m - WVZCG-0.4m - WVZCG0m
CG Used for ACN Calculation : 28.2%
SUBGRADE STRENGTH - CBR

WEIGHT ON ONE WING LANDING GEAR
- 103,620 kg (230,450 lb)
- 90,000 kg (198,425 lb)
- 80,000 kg (176,375 lb)
- 60,000 kg (132,275 lb)

MAXIMUM POSSIBLE MAIN GEAR LOAD AT MAXIMUM RAMP WEIGHT AND AFT CG

10,000 COVERAGES USED FOR ACN CALCULATIONS

ALPHA FACTOR = 0.8

ANNUAL DEPARTURES
- 1,200
- 3,000
- 6,000
- 15,000
- 25,000

20 YEAR PAVEMENT LIFE

FLEXIBLE PAVEMENT THICKNESS

1400x530R23 PR36 TIRES
TIRE PRESSURE CONSTANT AT 14.2 BAR (206 PSI)

Flexible Pavement Requirements
A330-700L Models - MRW 227 900 kg
WVZCG0.4m
CG Used for ACN Calculation: 26%
FLEXIBLE PAVEMENT THICKNESS

1400x530R23 PR36 TIRES
TIRE PRESSURE CONSTANT AT 14.2 BAR (206 PSI)

Flexible Pavement Requirements
A330-700L Models - MRW 202 300 kg
WVZCG 0.6m
CG Used for ACN Calculation: 26.2%
7.6 FLEXIBLE PAVEMENT REQUIREMENTS / LCN CONVERSION

**ON A/C A330-700L

The Load Classification Number (LCN) curves are no longer provided in section 7-6-0 since 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 PORTLAND CEMENT ASSOCIATION DESIGN METHOD

**ON A/C A330-700L

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 weight on the MLG are made based on the curve for k= 80MN/m3 already shown on the graph.

Example, see FIGURE A330-700L WVZCG0.6m, 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/m3 (300 lbf/in3)
- A permitted working stress of 38.67 kg/cm² (550 lb/in²),
- 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.
1400x530R23 PR36 TIRE
TIARE PRESSURE CONSTANT AT 14.2 BAR (200 PSI)

**Rigid Pavement Thickness [Centimeters]**

**Allowable Working Stress**

**Notes:**
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/m² but deviate slightly for any other values of K.

**Reference:**
"Design of Concrete Airport Pavers" and "Computer Program for Airport Pavement Design - Program PDILB Portland Cement Association"

**Rigid Pavement Requirements**
A330-700L Models - MRW 227 900 kg
WVZCG-0.5m - WVZCG-0.4m - WVZCG0m

CG Used for ACN Calculation: 28.2%
Rigid Pavement Requirements

A330-700L Models - MRW 227 900 kg
WVZCG0.4m

CG Used for ACN Calculation: 26%

NOTES:
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/m² BUT DEVIATE SLIGHTLY
FOR ANY OTHER VALUES OF K

REFERENCE:
"DESIGN OF CONCRETE AIRPORT
PAVEMENTS" AND "COMPUTER
PROGRAM FOR AIRPORT
Pavement Design - Program
PDILP® Portland Cement
Association

1400x530R23 PR36 TIRES
TIRED PRESSURE CONSTANT AT 14.2 BAR (206 PSI)
1400x53GR23 PR36 TIRES
TIRE PRESSURE CONSTANT AT 14.2 BAR (208 PSI)

RIGID PAVEMENT THICKNESS
[CENTIMETERS]

[INCHES]

ALLOWABLE WORKING STRESS
[kg/cm²]

NOTES:
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 = 60 MN/m² 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

Rigid Pavement Requirements
A330-700L Models - MRW 202 300 kg
WVZCG0.6m
CG Used for ACN Calculation : 28.2%
7.8 RIGID PAVEMENT REQUIREMENTS / LCN CONVERSION

**ON A/C A330-700L

The Load Classification Number (LCN) curves are no longer provided in section 7-6-0 since 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 ACN/PCN REPORTING SYSTEM - FLEXIBLE AND RIGID PAVEMENTS

**ON A/C A330-700L

This section gives data about the Aircraft Classification Number (ACN) for an aircraft gross weight in relation with 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 A330-700L WVZCG0.6m (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 A330-700L WVZCG0.6m (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 page 2 provides 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:

\[- \text{ACN} = \text{ACN min} + (\text{ACN max} - \text{ACN min}) \times \frac{\text{Operating Weight} - 130 000 \text{ kg}}{\text{MRW} - 130 000 \text{ kg}}\]

As an approximation, use a linear interpolation in order to get the aircraft weight at the pavement PCN using the following equation:

\[- \text{Operating weight} = 130 000 \text{ kg} + (\text{MRW} - 130 000 \text{ kg}) \times \frac{\text{PCN} - \text{ACN min}}{(\text{ACN max} - \text{ACN min})}\]

With ACN max = ACN calculated at the MRW in the table and with ACN min = ACN calculated at 130 000 kg
<table>
<thead>
<tr>
<th>Aircraft Type</th>
<th>MRW / OWE mass (kg)</th>
<th>Load on one main gear leg (%)</th>
<th>Tire Pressure (Mpa)</th>
<th>ACN for Rigid Pavement Subgrades - MN/m3</th>
<th>ACN for Flexible Pavement Subgrades - CBR</th>
</tr>
</thead>
<tbody>
<tr>
<td>A330-700L</td>
<td>227900</td>
<td>45.80</td>
<td>1.42</td>
<td>49  57  68  79</td>
<td>54  58  67  90</td>
</tr>
<tr>
<td>WVZC0.6m</td>
<td>130000</td>
<td>45.80</td>
<td></td>
<td>29  29  32  37</td>
<td>28  29  31  39</td>
</tr>
<tr>
<td>A330-700L</td>
<td>227900</td>
<td>45.80</td>
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<td>WVZC0.6m</td>
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</tr>
<tr>
<td>A330-700L</td>
<td>202300</td>
<td>45.80</td>
<td>1.42</td>
<td>43  49  58  68</td>
<td>47  50  57  75</td>
</tr>
<tr>
<td>WVZC0.6m</td>
<td>130000</td>
<td>45.80</td>
<td></td>
<td>29  29  32  37</td>
<td>28  29  31  39</td>
</tr>
</tbody>
</table>
Aircraft Classification Number - Flexible Pavement

A330-700L Models - MRW 227 900 kg
WVZCG-0.5m - WVZCG-0.4m - WVZCG0m

CG Used for ACN Calculation: 28.2%
Aircraft Classification Number - Rigid Pavement

A330-700L Models - MRW 227 900 kg
WVZCG-0.5m - WVZCG-0.4m - WVZCG0m

CG Used for ACN Calculation: 28.2%
Aircraft Classification Number - Flexible Pavement
A330-700L Models - MRW 227 900 kg
WVZCG0.4m

CG Used for ACN Calculation : 26%
ACN WAS DETERMINED AS REFERENCED IN ICAO AERODROME DESIGN MANUAL PART 3, CHAPTER 1.  SECOND EDITION 1983.

TIRE PRESSURE CONSTANT AT 14.2 BAR (205 PSI)

1400x530r23 P36 Tires

SUBGRADE STRENGTH
D. K = 20 MN/m²  (ULTRA-LOW)
C. K = 40 MN/m²  (LOW)
B. K = 80 MN/m²  (MID)
A. K = 150 MN/m²  (HIGH)

AIRCRAFT CLASSIFICATION NUMBER (ACN)

AIRCRAFT GROSS WEIGHT

(x1000 lb)

(x1000 kg)

Aircraft Classification Number - Rigid Pavement

A330-700L Models - MRW 227 900 kg
WVZCG0.4m

CG Used for ACN Calculation: 26%
Aircraft Classification Number - Flexible Pavement

A330-700L Models - MRW 202 300 kg
WVZCG0.6m

CG Used for ACN Calculation : 28.2%
Aircraft Classification Number - Rigid Pavement

A330-700L Models - MRW 202 300 kg
WVZCG0.6m

CG Used for ACN Calculation : 28.2%

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8 SCALED DRAWINGS

**ON A/C A330-700L

This section provides the scaled drawings.

NOTE : When printing this drawing, make sure to adjust for proper scaling.
9 AIRCRAFT RESCUE AND FIREFIGHTING

**ON A/C A330-700L

1. Aircraft Rescue and Fire Fighting Charts

This sections provides 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.
A330-700L

Aircraft Rescue and Firefighting Chart
ARFC

NOTE:
THIS CHART GIVES THE GENERAL LAYOUT OF THE A330-700L STANDARD VERSION.
THE NUMBER AND ARRANGEMENT OF THE INDIVIDUAL ITEMS VARY WITH THE CUSTOMERS.
FIGURES CONTAINED IN THIS POSTER ARE AVAILABLE SEPARATELY IN THE CHAPTER 10 OF THE
"AIRCRAFT CHARACTERISTICS - AIRPORT AND MAINTENANCE PLANNING" DOCUMENT.

ISSUED BY:
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TECHNICAL DATA SUPPORT AND SERVICES
31707 BLAGNAC CEDEX
FRANCE

REVISION DATE: MAY 2018
REFERENCE: F_RF_000000_1_A33070L
SHEET 1/2

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NOTE:

01  RIM HAZARD AREA – RISK OF DIRECT HIT FROM RIM DEBRIS

02  TIRE HAZARD AREA – RISK OF DIRECT HIT FROM TIRE DEBRIS

- ONLY APPROACH A LANDING GEAR THAT IS HOT OR ON FIRE FROM AN OBLIQUE ANGLE IN THE DIRECTION OF THE TIRE SHOULDER.

- DO NOT GO IN THE RIM HAZARD AREAS; METAL DEBRIS FROM A RIM BURST CAN KILL YOU.

- ONLY GO IN THE TIRE HAZARD AREAS WITH CAUTION: RISK OF DEBRIS FROM TIRE EXPLOSION.
**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. **IMEDIATELY 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.**
AFT CARGO COMPARTMENT DOOR CONTROLS

WARNING: ENSURE THAT ALL PERSONNEL AND EQUIPMENT ARE CLEAR OF CARGO DOOR AREA.

NORMAL OPERATION:

1. PUSH THE HANDLE RAPIDLY AND PULL THE LOCKING HANDLE TO THE "UNLOCKED" POSITION. TWO LEVER ACCESS DOORS 152NR.
2. PRESS THE PUSHBUTTON ON THE TOP OF THE LATCHING HANDLE AND PULL THE LOCKING HANDLE TO THE "UNLOCKED" POSITION.
3. OPEN THE DOOR OPERATION LEVER ACCESS DOOR 152NR.
4. MOVE THE DOOR OPERATION LEVER TO THE "OPEN" POSITION.
5. RELEASE THE DOOR OPERATION LEVER. THE LEVER GOES AUTOMATICALLY TO THE "STOP" POSITION IF NOT, MOVE MANUALLY.

NOTE: TWO OPERATORS ARE NECESSARY FOR THIS OPERATION.

MANUAL OPERATION:

1. SHAKE THE CARGO DOOR IF THE RESIDUAL PRESSURE WARNING LIGHT IS FLASING.

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